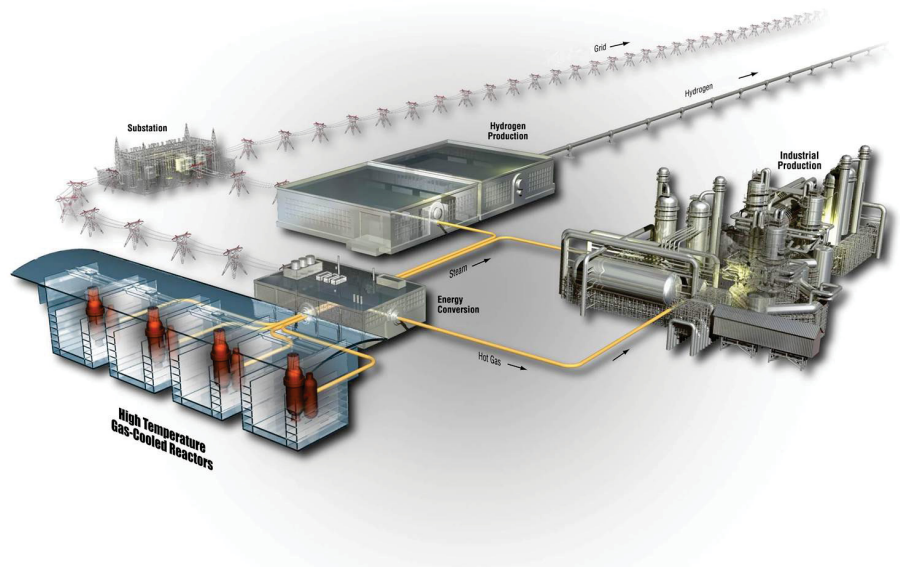


AGC-2 Graphite Preirradiation Data Analysis Report

William E. Windes
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David T. Rohrbaugh
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August 2013

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VHTR Program

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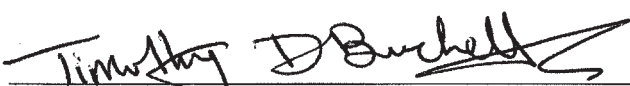
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SUMMARY

This report describes the specimen-loading order and documents all preirradiation examination material property measurement data for graphite specimens contained within the Second Advanced Graphite Capsule (AGC-2) irradiation capsule. The AGC-2 capsule is the second in six planned irradiation capsules comprising the Advanced Graphite Creep (AGC) test series. The AGC test series is used to irradiate graphite specimens in order to garner quantitative data necessary for predicting the irradiation behavior and operating performance of new nuclear-grade graphites. This testing will ascertain the in-service behavior of the graphite for pebble-bed and prismatic very high temperature reactor designs. Similar to the First Advanced Graphite Capsule (AGC-1) preirradiation examination report, material property tests were conducted on specimens from 18 nuclear-grade graphite types. However, AGC-2 tested an increased number of specimens (i.e., 512) prior to loading them into the AGC-2 irradiation assembly. All AGC-2 specimen testing was conducted at Idaho National Laboratory from July 2009 to August 2010.

This report also details the specimen-loading methodology for graphite specimens inside the AGC-2 irradiation capsule. The AGC-2 capsule design requires “matched pair” creep specimens that have similar dose levels above and below the neutron flux profile mid-plane. This provides similar specimens with and without an applied load. Analysis in this document utilizes the neutron flux profile calculated for the AGC-2 capsule design, the capsule dimensions, and the size (i.e., length) of the selected graphite specimens to create a stacking order that produces “matched pairs” of graphite specimens above and below the AGC-2 capsule elevation mid-point, thus providing specimens with similar neutron dose levels.

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ACRONYMS

AG	against-grain
AGC	Advanced Graphite Creep
AGC-1	First Advanced Graphite Capsule
AGC-2	Second Advanced Graphite Capsule
ASTM	American Society for Testing and Materials
ATR	Advanced Test Reactor
COV	coefficient of variation
CTE	coefficient of thermal expansion
dpa	displacements per atom
EFPD	effective full-power days
GPa	gigapascals
HTGR	high-temperature gas-cooled reactor
INL	Idaho National Laboratory
IQR	interquartile range
LFA	laser flash apparatus
MCNP	Monte Carlo N-Particle Transport Code
NGNP	Next Generation Nuclear Plant
PB	piggy-back specimen
PIE	post-irradiation examination
Pre-IE	preirradiation examination
R&D	research and development
TC	thermocouple
TDP	Technology Development Plan
VHTR	very high temperature reactor
WG	with-grain

1. INTRODUCTION

The Next Generation Nuclear Plant (NGNP) will be a helium-cooled, very high temperature reactor (VHTR) with a large graphite core. In past applications, graphite has been used effectively as a structural and moderator material in both research and commercial high temperature gas-cooled reactor (HTGR) designs.^[1,2] Nuclear graphite H-451, used previously in the United States for nuclear reactor graphite components, is no longer available. New nuclear graphites have been developed and are considered suitable candidates for the new NGNP reactor design. To support the design and licensing of NGNP core components within a commercial reactor, a complete properties database must be developed for these current grades of graphite. Quantitative data on in-service material performance is required for the physical, mechanical, and thermal properties of each graphite grade with a specific emphasis on data accounting for the life-limiting effects of irradiation creep on key physical properties of the NGNP candidate graphites. Further details on the research and development activities and associated rationale required to qualify nuclear-grade graphite for use within the NGNP are documented in the NGNP graphite technology research and development plan.^[3,4]

Based on experience with previous graphite-core components, the phenomenon of irradiation-induced creep within the graphite has been shown to be critical to the total useful lifetime of graphite components. Irradiation-induced creep occurs under the simultaneous application of high temperatures, neutron irradiation, *and* applied stresses within the graphite components. Significant internal stresses within the graphite components can result from a second phenomenon—irradiation-induced dimensional change—where the graphite physically changes (i.e., first shrinking and then expanding with increasing neutron dose). This disparity in material-volume change can induce significant internal stresses within graphite components. Irradiation-induced creep relaxes these large internal stresses, thus reducing the risk of crack formation and component failure. Obviously, higher irradiation-creep levels tend to relieve more internal stress, thus allowing the components longer useful lifetimes within the core. Determining the irradiation-creep rates of nuclear-grade graphites is critical for determining the useful lifetime of graphite components and is a major component of the Advanced Graphite Creep (AGC) experiment.

The AGC experiment is currently underway to determine the in-service behavior of these new graphites for both pebble-bed and prismatic reactor designs. This experiment will examine properties and behavior of nuclear-grade graphites over a large spectrum of temperatures, irradiation fluencies, and applied stress levels that are expected to induce irradiation creep strains within a VHTR graphite component. Irradiation data are provided through the AGC test series, which comprises six planned capsules irradiated in the Advanced Test Reactor (ATR) in a large flux trap^[3] at the Idaho National Laboratory (INL) Site. This test series exposes the selected graphite specimens to temperatures and a range of doses that are expected within a VHTR design. Each irradiation capsule consists of over 400 graphite specimens that are characterized before and after irradiation.

The First Advanced Graphite Capsule (AGC-1) of the AGC test series was initially characterized, loaded into ATR, irradiated, and is currently undergoing post-irradiation examination (PIE).^[5,6,7] Characterization of the graphite specimens for the Second Advanced Graphite Capsule (AGC-2) was recently completed, and the measurements are reported in this document. Data gathered for the characterization of AGC-2 specimens is contained in Appendixes A, B, and C of this report. The original design called for AGC-1 and -2 capsule irradiations to be as similar as possible—similar graphites, irradiation temperatures, and loads applied to the creep specimens with the only difference being total received dose to the specimens. Consequently, material property tests were conducted on specimens of similar graphites as tested in the AGC-1 capsule, but on an increased number of specimens (i.e., 512) due to a change in the stacking order of the specimens within the capsule. All AGC-2 specimen testing was conducted from July 2009 to August 2010.^[8]

To achieve the proper irradiation conditions and applied loads to the creep specimens, an exact specimen loading order is critical. Because irradiation creep is usually determined by the difference in dimensional change occurring within specimens that have an applied load and those that do not, these “matched pair” specimens are assumed to have the same irradiation dose and irradiation temperature values. To achieve these similar irradiation conditions for “matched pairs,” a careful map of where each specimen resides within the irradiation capsule is required. A detailed analysis of the reactor flux profile is required to ascertain the dose levels for each specimen, as well as the designed loading configurations within the capsule, in order to guarantee that the matched pairs experience the same temperature and dose levels. This document discusses details of the specimen loading order, the capsule loading design, the flux profile within ATR, and the resulting estimated dose profiles for each graphite specimen for the AGC-2 irradiation capsule.

2. Description of the Advanced Graphite Creep Experiment

The AGC experiment is designed to establish the data necessary to determine the safe operating envelope of graphite core components for a VHTR by measuring the irradiated material property changes and behavior of several new nuclear grade graphites over a large range of temperatures, neutron fluencies, and mechanical compressive loads. The experiment consists of three interrelated stages: preirradiation characterization of the graphite specimens, the irradiation test series (designated as six separate irradiation capsules), and PIE of the graphite specimens after irradiation. Separate reports for each distinct stage are prepared after the activity is completed. The preirradiation examination (pre-IE) reports detail the total number of graphites and specimens, the specimen loading configuration to expose all specimens to the entire range of irradiation conditions, and the preirradiation material property testing results. The irradiation test series reports detail the irradiation history of each capsule while in reactor, noting any changes from the technical and functional specifications for each specific test series capsule, and identifying the possible improvements to the next test series capsule design. The PIE reports detail the changes in the specimen material property measurements, compare the results to the pre-IE material property measurements, and analyze the data to assist in determining a credible safe operating envelope for graphite core components in a VHTR design and licensing application.

2.1 Background Information for the Advanced Graphite Creep Experiment

The AGC experiments will provide data on irradiated material properties for current graphites available for use within a VHTR design. Due to volume limitations within typical material test reactors (i.e. ATR), only a limited number of specimens can be irradiated, which are far fewer than can be used in an accurate statistical specimen population analysis. Therefore, the AGC only measures the changes in irradiated material properties and the behavior of relatively few specimens of new nuclear-grade graphites over the anticipated range of operating temperatures, neutron fluence, and mechanical loads. The experiment does generate quantitative material property change data (and limited irradiation creep data), which will be used in conjunction with the as-fabricated material property to predict the in-service behavior and operating performance of these new nuclear-grade graphites for pebble-bed and prismatic reactor designs. Changes to key thermal, physical, and mechanical material properties are determined by comparing the material properties of each specimen before and after irradiation. Differences measured from the irradiation conditions will provide irradiation-behavior data for graphite, with a specific emphasis on those data that account for the life-limiting effects of irradiation creep on key physical properties of several candidate graphites for use in NGNP.

The critical component of the AGC experiment is the irradiation test series, which irradiates the graphite specimens after pre-IE characterization has been completed. The AGC test series comprises six planned irradiation capsules, which are irradiated in ATR in a large flux trap, as described in the Graphite

Technology Development Plan.^[3] The test series exposes test specimens of the selected nuclear-grade graphites to temperatures and the range of doses that are expected within an VHTR design. Specifically, graphite specimens will be exposed to fast neutron dose ranging from 1 to 7 displacements per atom (dpa) and temperatures of 600, 900, and 1200°C, as shown in Figure 1. Similar to the AGC-1 irradiation capsule, AGC-2 was designed to be irradiated within the ATR’s South Flux Trap.^[9] Generally, irradiations within the South Flux Trap require approximately 175 effective full-power days to provide a nominal fast-neutron-dose range (in graphite) of 1–3.5 dpa. For those capsules requiring a 3.5–7.0-dpa dose range, the irradiation capsule (containing the graphite specimens) is irradiated for twice as long inside the ATR, for approximately 350 effective full-power days.

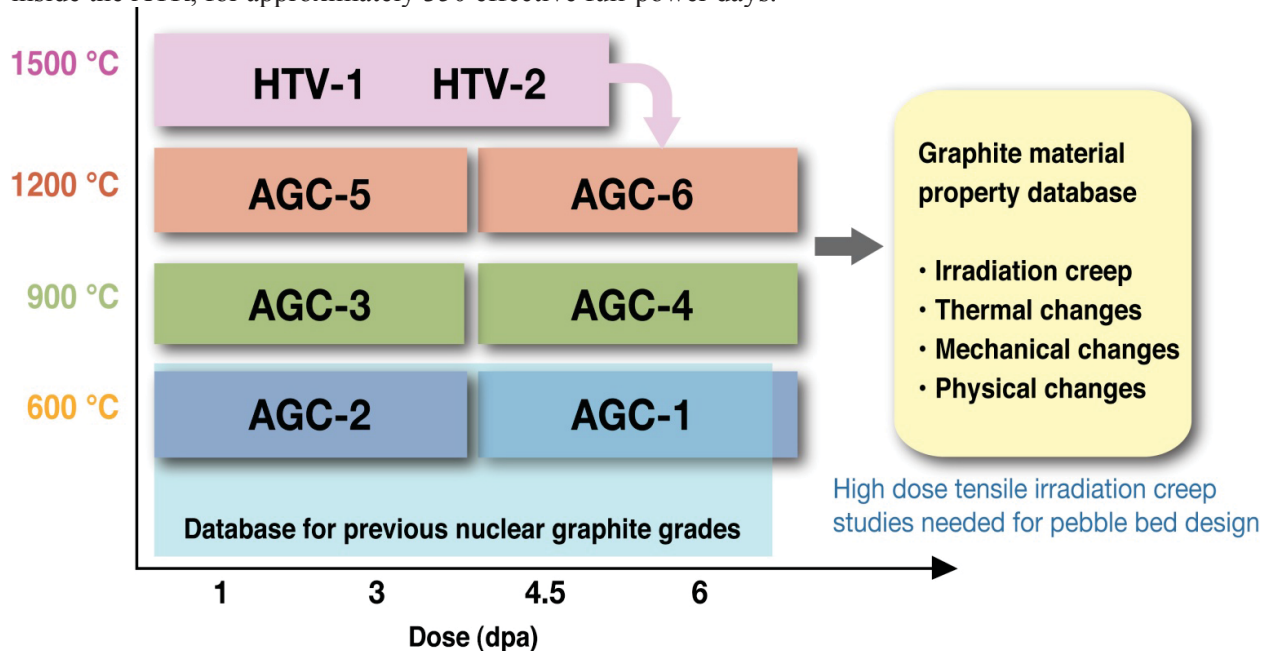


Figure 1. Irradiation dose and temperature parameters of the AGC test series.

The AGC test series dedicates a significant amount of scope to determining rates of irradiation-induced creep for different nuclear-grade graphite. The traditional method for measuring irradiation-induced creep is to apply a significant load to half the specimens during irradiation while leaving the remaining half of the specimens unloaded. The resulting difference in dimensional change between the loaded and unloaded specimens (assuming that temperature and dose levels are the same) provides the amount of irradiation-induced strain for each “matched pair” of graphite specimens. From this strain level, a creep rate for each graphite grade can be calculated as a function of dose if both specimens were irradiated at the same constant temperature. Thus, each capsule is designed to be irradiated at a constant temperature, allowing only the dose and applied mechanical load to vary within the test train of each test-series capsule. With all graphite specimens at a constant temperature, only the applied load and dose will affect the calculated creep rate of each graphite grade within a test series capsule.

To ascertain the temperature dependency of irradiation-induced material property changes, the creep rates of similar graphite specimens, at similar dose and load levels, must be compared between capsules. This implies that similar graphite grades must be in the same locations in every capsule to receive similar dose and load levels at different temperatures.

To provide all necessary material property tests in the AGC experiments, each test-series capsule contains two primary specimens: (1) creep specimens, providing irradiation creep-rate values as well as

mechanical properties, and (2) "piggyback" specimens, providing thermal material property changes to the graphite. Generally, the creep specimens are larger (25.4 mm tall) and are irradiated in the mechanically loaded outer stack positions of the capsule body where an applied load can be imposed upon half of the specimens. Piggyback specimens are short (i.e., 6 mm tall) button specimens that reside in the axial spine of the capsule or the lower half of the outer stack positions—receiving no applied load and subjected only to neutron irradiation at high operating temperatures—to assess the effects of a reactor environment on the specific graphite grade. Together, both types of specimens provide the changes in material properties for stressed and unstressed graphite grades. The physical dimensions for both "Creep" and "Piggy-back" specimens are shown in INL Drawing 600786, Rev. 2.^[10]

2.2 Description of AGC-2 Test Series

AGC-2 was originally designed to be the longer duration irradiation capsule providing specimens irradiated at the 3.5–7.0-dpa dose level (see Figure 1) at the 600°C temperature conditions. However, due to issues with temperature control within the first AGC-1 capsule,^[6] it was decided during AGC-1 irradiation to hold the capsule inside ATR as long as possible to ascertain the viability of the capsule design at high dose levels. Therefore, the irradiation dose levels for AGC-1 were changed to the longer duration irradiation (i.e., 3.5–7.0 dpa) at the 600°C temperature conditions.

Because the AGC-1 specimen temperature limits exceeded the technical specifications, determining material property changes and creep rates at a constant temperature proved to be difficult. Therefore, an intermediate, 1.5–5-dpa dose level, irradiated at 600°C, was selected as the final irradiation condition for the AGC-2 test series to bridge between the two original 600°C test-series capsules, Figure 2. It was assumed that some of the specimens from AGC-1 could be utilized in conjunction with the AGC-2 graphite specimens to produce more reliable material property changes at the constant 600°C-temperature condition. While not optimal, it was determined that providing graphite specimens, irradiated over this overlapping dose level at a more consistent temperature condition, would be sufficient to ascertain the irradiation creep and material property changes for the selected graphites.

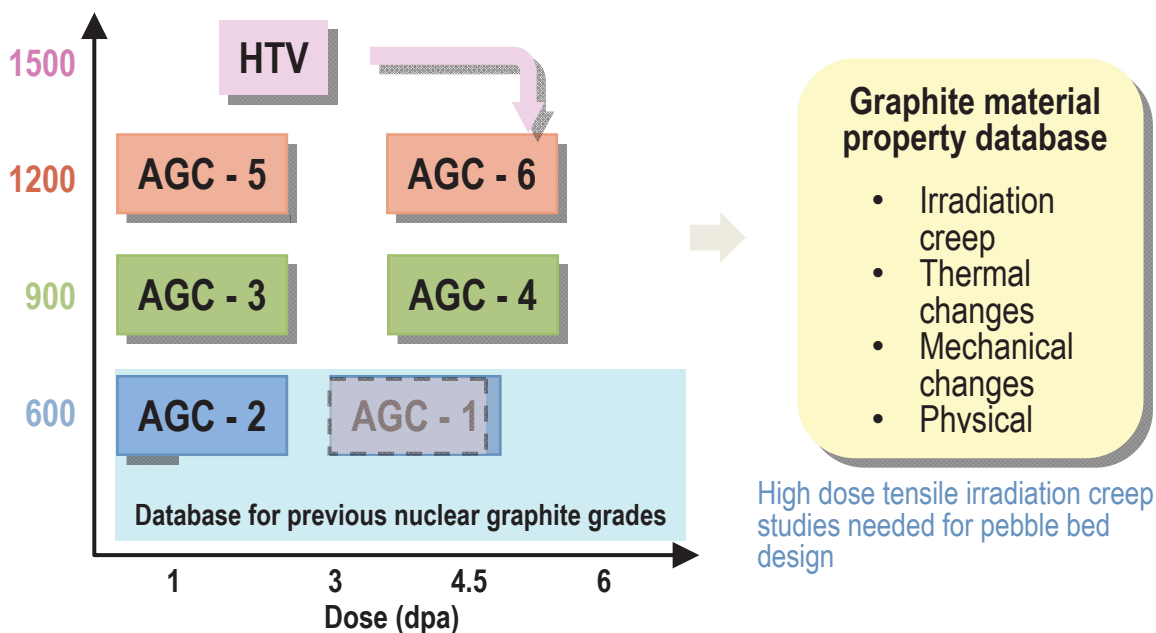


Figure 2. Revised irradiation dose and temperature parameters of the AGC test series. Note the gray area between AGC-1 and AGC-2 is the expected dose overlap between capsule irradiation.

Additionally, one of the graphite grades was changed by request of the graphite vendor (Mersen, USA). Piggy-back specimens of graphite grade 2114 were directly substituted for graphite grade 2020 and irradiated within the AGC-2 central stack (axial spine of capsule). All other graphites irradiated within AGC-2 were similar to the graphites in AGC-1. To duplicate the specimen stacking order as in the AGC-1 test series capsule, the AGC-2 capsule contained the following major graphite grades NBG-17, NBG-18, PCEA, IG-430, H-451, and IG-110. The minor grades of graphite (i.e., “piggyback” specimens) included NBG-25, PCIB, PPEA, NBG-10, BAN, HLM, PGX, 2114, HOPG, and A3 Matrix.

2.2.1 Establishing the Capsule’s Physical Centerline to the Core Neutron Flux Mid-Plane

The capsule elevation sketch provided in Figure 3 was generated from a number of AGC-2 capsule and ATR core drawings and used to determine the position of each specimen in the capsule as a function of height above and below the mid-plane of the core neutron flux profile.^[11,12] Other considerations included the size of each creep specimen, the need for periodically placed spacers containing flux wires, and the space requirements in the top of the stacks for the push rods. The core flux mid-plane, in relation to the capsule arrangement, was established so that the reactor neutron flux field could be correlated to the physical elevations and positions in the capsule.

experiment in the South Flux Trap, and the number of effective full-power days planned for the test-series capsule.

Irradiation dose values, as a function of distance from the reactor core centerline, were calculated from the total estimated fluence, using standard conversion factors for carbon in a fast neutron irradiation field ($E > 0.1$ MeV).^[13] There is a neutron flux gradient across the capsule thickness requiring the capsule to be rotated 180 degrees at the irradiation mid-point. This rotation results in a uniform neutron-fluence profile for all stacks, regardless of their position within the capsule, as shown in Figure 4. Because all stacks within the capsule are estimated to have similar dose profiles after complete irradiation, the dose profile for the center stack within the capsule was used to determine the proper stacking order and specimen offset position in the lower half of the irradiation capsule.

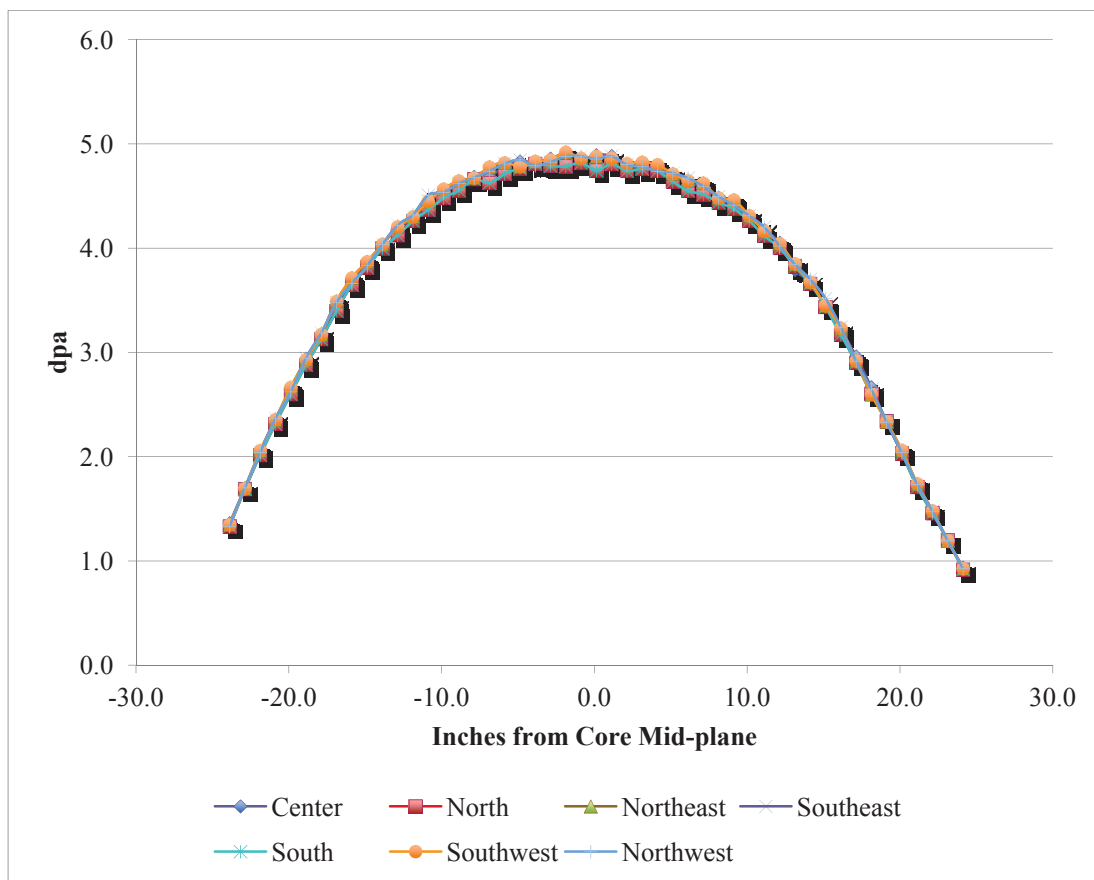


Figure 4. Calculated dose levels for AGC-2 after 140 effective full-power days.

As described in Section 1, “Introduction,” of this report and as shown in Figure 4, the ATR neutron flux profile is not completely symmetrical along the vertical axis. Thus, to produce matched-pair specimens that have similar dose profiles both above and below the core mid-plane, an offset from the mid-plane is required. This offset adjusts the specimen positions and to matches the dose levels for “matched pair” specimen. For AGC-2, the offset spacing was determined using the accumulated dose levels from the central stack profile, both below and above the core mid-plane. Average dose values at 0.25-in. increments (i.e. height of a piggyback specimen) were calculated along both top and bottom curves allowing for direct comparison between matched positions within each stack.

The dose profiles for the lower and upper core were superimposed upon each other, as shown in Figure 5. To determine the length of the offset space, the dose values above and below the core mid-plane were compared, and the specimens in the bottom half of the AGC capsule were moved farther away from the mid-plane, Figure 5. An offset of 1.25 inches from the core mid-plane for the bottom creep specimens produced the closest dose matches between specimens.

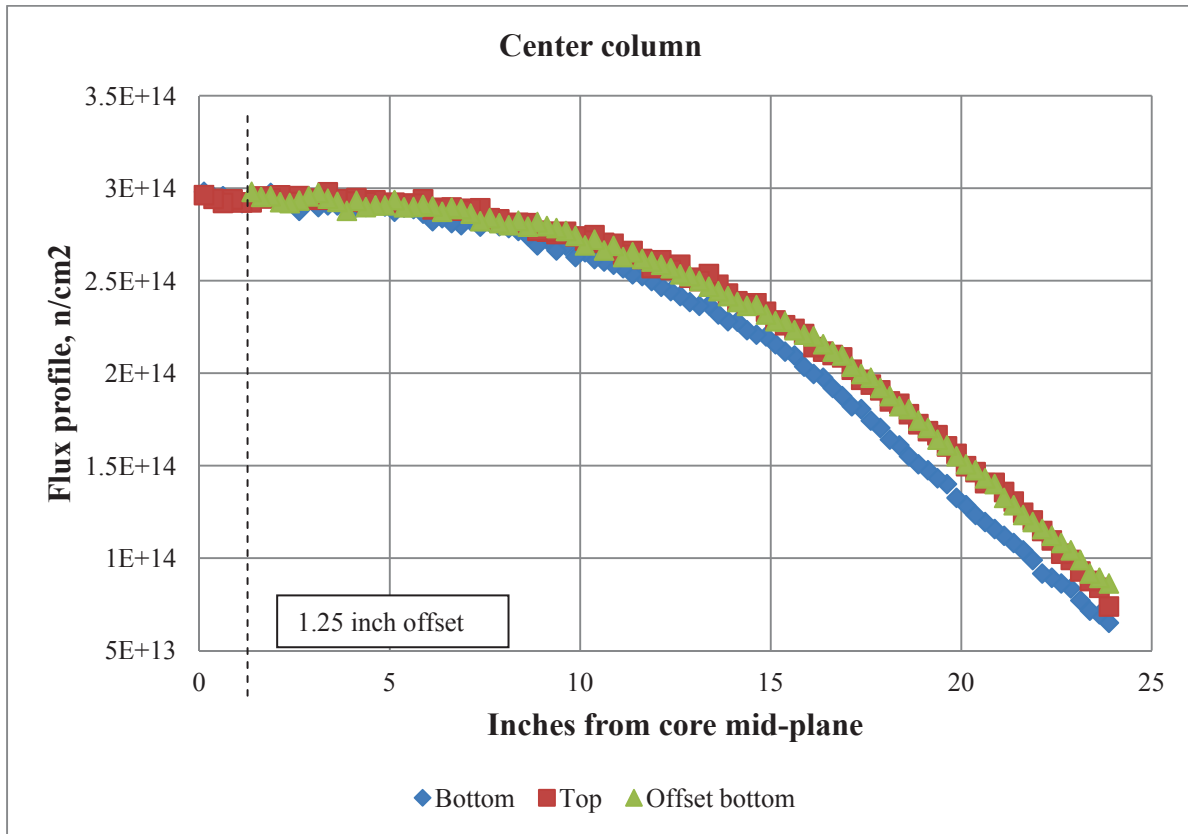


Figure 5. Advanced Test Reactor flux profile, as a function of core mid-plane position.

While it was impossible to exactly match both the upper and lower specimens, the dose levels for each specimen pair were fairly close, ranging from 0–11%. In addition, over time, the specimens in the top stacks should dimensionally shrink more than the bottom specimens (during irradiation) due to the compressive load applied. This effectively moves the top specimens closer to the centerline, thus creating a closer dose match to the specimens in the bottom stack. While this irradiation-induced shrinkage of the top stack of specimens is anticipated to be relatively small at the end of irradiation (i.e., <6 mm for the total stack of specimens), the dose levels do slightly converge rather than diverge.

It should be noted here that the specimen offset distance/position in the lower half of the AGC-1 capsule is significantly different from these offset calculations for the AGC-2 capsule.^[14,15] AGC-1 used an older ATR flux profile that did not accurately reflect the current flux profiles within the South Flux Trap. Consequently, the offset was approximately 3.75 in. (i.e., 15 piggyback specimen heights), leading to slightly larger differences between the upper and lower matched-specimen pairs than expected for AGC-2, as shown in Table 1. This will need to be addressed in detail in the AGC-1 PIE report to be issued after PIE is complete.

Table 1. Typical dose differences between matched pairs in the AGC-1 test-series capsule.

Representative Stack (Stack No. 1)	
Matched Pairs	AGC-1 Estimated Dose Difference (%)
1S1/1U1	0.34
1S2/1U2	0.69
1S3/1U3	2.11
1S4/1U4	1.81
1S5/1U5	2.57
1S6/1U6	3.01
1S7/1U7	1.54
1S8/1U8	5.76
1S9/1U9	6.55
1S10/1U10	9.43
1S11/1U11	13.40
1S12/1U11	3.09
1S13/1U12	5.23
1S14/1U13	3.33
1S15/1U14	1.53

2.2.3 Determining the Physical Positions of Irradiation Creep Specimens in the Stacks

Once the specimen-position offset was established for the bottom half of the specimens, the number of total creep specimens for each grade of graphite was determined. To increase the number of creep specimens in the AGC-2 test-series capsule, the 0.25-in.-tall NBG-25 graphite spacers between creep specimens were eliminated. This decision to eliminate the spacers increased the total number of specimens by over 20 in the entire capsule. This allowed more specimens per graphite grade to be irradiated within the AGC-2 capsule.

A further decision was made to increase the creep specimen number population for the newer graphite grades because little-to-no irradiation data are available on these grades. Specifically, more specimens of graphite grades NBG-18 and PCEA were chosen to be irradiated than the IG-110, IG-430, and NBG-17 graphite grades. NBG-18 and PCEA were determined to have 16 specimens per applied stress level, for a total of 48 specimens within AGC-2. Graphite grades IG-110 and IG-430 were represented by only 12 specimens per applied stress level, for a total of 36 specimens within AGC-2. Table 2 shows the total number of specimens irradiated per graphite grade.

Table 2. Total number of irradiated creep specimens in the AGC-2 test-series capsule.

Graphite Grade	Total Number of Creep Specimens
PCEA	48
NBG-18	48
IG-110	36
IG-430	36
NBG-17	24
H-451	24

Other factors had to be considered before the stacking order for each stack could be finalized. First, three load levels are applied to the specimens in the loaded upper parts of the stacks (i.e., loads of 13.8, 17.2, and 20.7 MPa). The six outer stacks in the capsule allow the specimens in two of the stacks to be loaded at 13.8 MPa, while the other two pairs of stacks are loaded at 17.2 and 20.7 MPa, respectively. Because two stacks are at similar applied stress levels, the specimen loading order can be shifted between the two stacks, allowing the same grade of graphite loaded at the specimen stress levels to be exposed over a broader neutron dose range, as shown in Figure 6. Assuming that both stacks will have the same applied stress level, receive similar dose levels per position, and have a constant temperature allows for this shifting of the specimens, and consequently more uniform, smoother dose profile for each graphite grade.

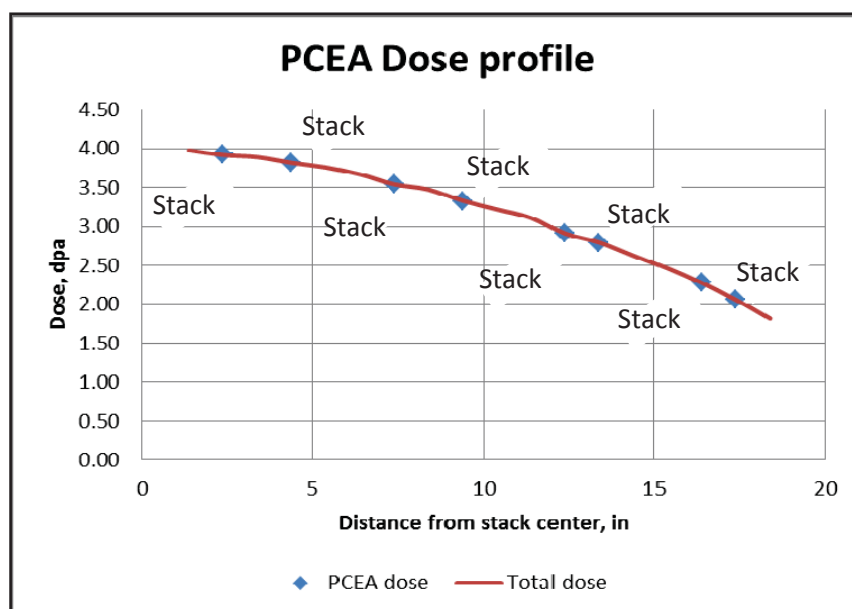


Figure 6. Typical AGC-2 dose profile for creep-graphite specimens utilizing similar applied stress levels in matched stacks.

A further consideration is the grain orientation of the specimens. A decision was made to have approximately 75% of the specimens be orientated in the “with-grain” (WG) direction and 25% of the specimens be “against-grain” (AG). However, in the case of the vibration-molded graphites (i.e., NBG-17 and -18), there are actually two with-grain directions and one against-grain direction as a consequence of the fabrication process. As such, it was logical to split the with-grain and against-grain specimens evenly (i.e., 50/50 ratio) rather than following the 75/25 ratio established for the other specimens.

Once these considerations were accounted for, the dose-level profiles were determined for each graphite grade and within each stack. The estimated creep specimen dose profiles for each graphite grade for each stress level are illustrated in Figure 7a, 7b, and 7c.

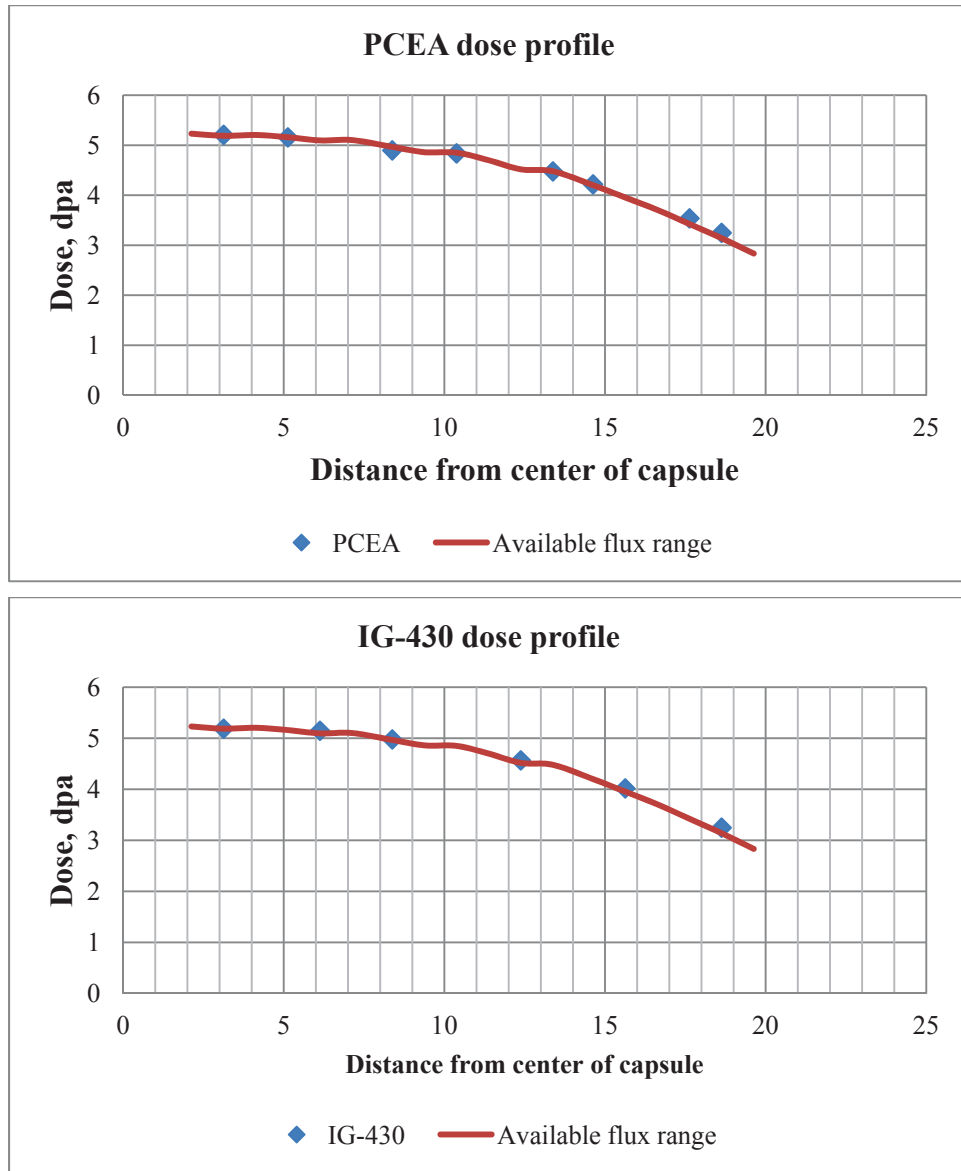


Figure 7a. Estimated creep-specimen dose profiles for each major graphite grade.

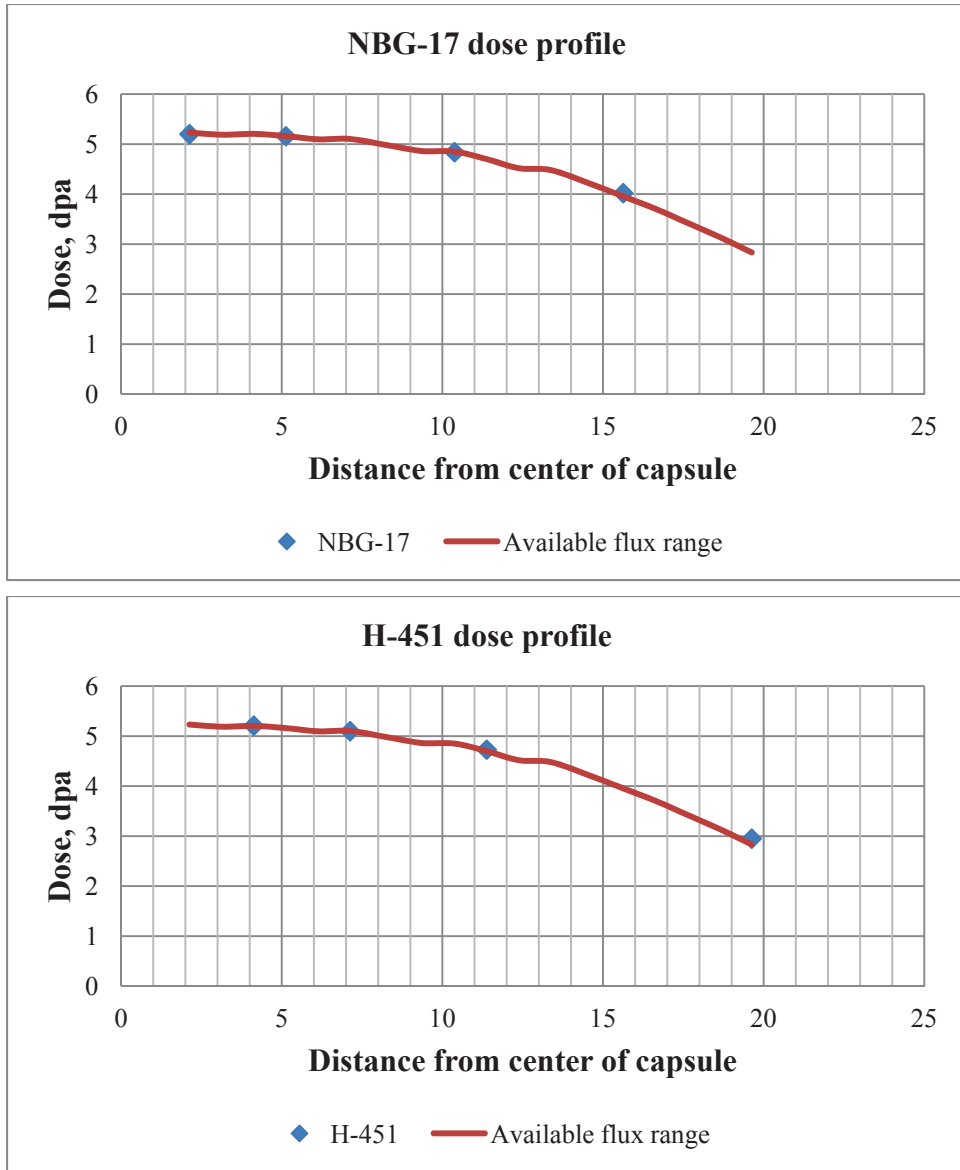


Figure 7b. Estimated creep-specimen dose profiles for each major graphite grade.

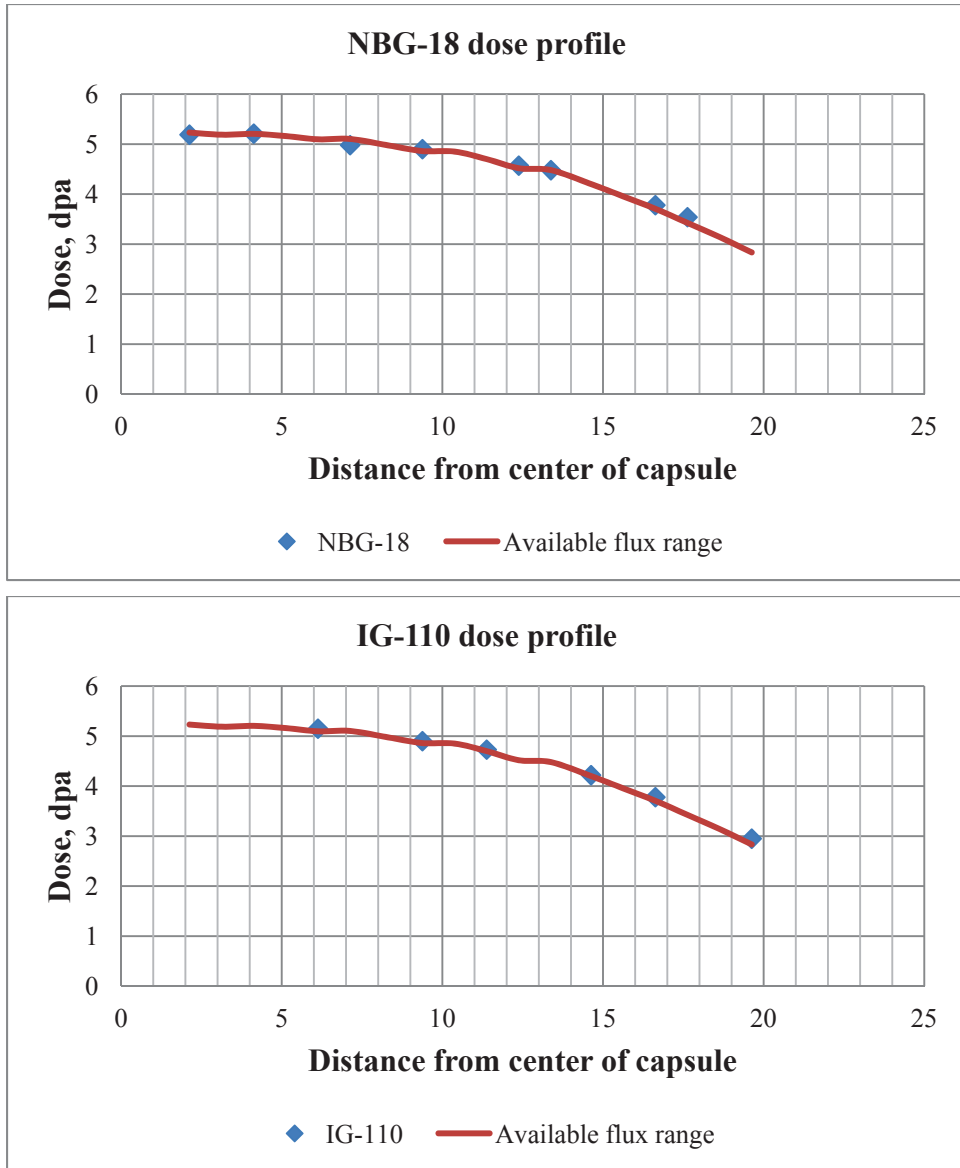


Figure 7c. Estimated creep-specimen dose profiles for each major graphite type.

The final loading configuration for the outer stacks was established once a smooth dose profile was achieved for each graphite grade, Figure 7a, 7b, and 7c. The lower stack offset, the flux wire spacers, creep specimens, and specimen symmetry above and below the capsule mid-plane were mapped for each graphite specimen in Table 3.

Table 3. Final loading configuration for AGC-2 creep specimens in outer stacks.

Stack 1			Stack 2			Stack 3			Stack 4			Stack 5			Stack 6		
ID#	Graphite	Height	ID#	Graphite	Height	ID#	Graphite	Height	ID#	Graphite	Height	ID#	Graphite	Height	ID#	Graphite	Height
CW101	H-451	19.63	EW0301	IG-110	19.63	CW1202	H-451	19.63	EW0601	IG-110	19.63	CW301	H-451	19.63	EW0901	IG-110	19.63
	Flux wire			Flux wire			Flux wire			Flux wire			Flux wire			Flux wire	
DW101	PCEA	18.63	FW0301	IG-430	18.63	DW1203	PCEA	18.63	FW0602	IG-430	18.63	DW1504	PCEA	18.63	FW0903	IG-430	18.63
BW101	NBG-18	17.63	DA402	PCEA	17.63	BW1301	NBG-18	17.63	DA503	PCEA	17.63	BW201	NBG-18	17.63	DA303	PCEA	17.63
EW102	IG-110	16.63	BP402	NBG-18	16.63	EW0403	IG-110	16.63	BP503	NBG-18	16.63	EW0703	IG-110	16.63	BP401	NBG-18	16.63
FW101	IG-430	15.63	AW103	NBG-17	15.63	FW0401	IG-430	15.63	AW1103	NBG-17	15.63	FW0703	IG-430	15.63	AW1303	NBG-17	15.63
DW102	PCEA	14.63	EW0302	IG-110	14.63	DW1204	PCEA	14.63	EW0602	IG-110	14.63	DW1601	PCEA	14.63	EW0902	IG-110	14.63
	Flux wire			Flux wire			Flux wire			Flux wire			Flux wire			Flux wire	
BW102	NBG-18	13.38	DW1103	PCEA	13.38	BW1302	NBG-18	13.38	DW1403	PCEA	13.38	BW202	NBG-18	13.38	DW201	PCEA	13.38
FW102	IG-430	12.38	BW1103	NBG-18	12.38	FW0402	IG-430	12.38	BW1503	NBG-18	12.38	FW0704	IG-430	12.38	BW403	NBG-18	12.38
EW104	IG-110	11.38	CW1003	H-451	11.38	EW0404	IG-110	11.38	CW1303	H-451	11.38	EW0704	IG-110	11.38	CW402	H-451	11.38
DW1001	PCEA	10.38	AW1001	NBG-17	10.38	DW1301	PCEA	10.38	AW1201	NBG-17	10.38	DW1602	PCEA	10.38	AW1401	NBG-17	10.38
BW103	NBG-18	9.375	EW0303	IG-110	9.375	BW1303	NBG-18	9.375	EW0603	IG-110	9.375	BW203	NBG-18	9.375	EW0903	IG-110	9.375
FW103	IG-430	8.375	DA403	PCEA	8.375	EW0404	IG-430	8.375	DA601	PCEA	8.375	FW0801	IG-430	8.375	DA302	PCEA	8.375
	Flux wire			Flux wire			Flux wire			Flux wire			Flux wire			Flux wire	
CW102	H-451	7.125	BP403	NBG-18	7.125	CW1203	H-451	7.125	BP601	NBG-18	7.125	CW302	H-451	7.125	BP303	NBG-18	7.125
EW0201	IG-110	6.125	FW0302	IG-430	6.125	EW0501	IG-110	6.125	FW0603	IG-430	6.125	EW0801	IG-110	6.125	FW0904	IG-430	6.125
DW1002	PCEA	5.125	AP402	NBG-17	5.125	DW1302	PCEA	5.125	AP501	NBG-17	5.125	DW1603	PCEA	5.125	AP503	NBG-17	5.125
BW1001	NB-18	4.125	BW1101	H-451	4.125	BW1401	NB-18	4.125	CW201	H-451	4.125	BW301	NB-18	4.125	CW403	H-451	4.125
FW0104	IG-430	3.125	DW1104	PCEA	3.125	FW0501	IG-430	3.125	DW1404	PCEA	3.125	FW0802	IG-430	3.125	DW202	PCEA	3.125
	Flux wire			Flux wire			Flux wire			Flux wire			Flux wire			Flux wire	
AW101	NBG-17	2.125	BW1201	NBG-18	2.125	AW1101	NBG-17	2.125	BW1601	NBG-18	2.125	AW1301	NBG-17	2.125	BW501	NBG-18	2.125
	Centerline	0		Centerline	0		Centerline	0		Centerline	0		Centerline	0		Centerline	0
AW102	NBG-17	2.125	BW1202	NBG-18	2.125	AW1102	NBG-17	2.125	BW1602	NBG-18	2.125	AW1302	NBG-17	2.125	BW502	NBG-18	2.125
	Flux wire			Flux wire			Flux wire			Flux wire			Flux wire			Flux wire	
FW0201	IG-430	3.125	DW1201	PCEA	3.125	FW0502	IG-430	3.125	DW1502	PCEA	3.125	FW0803	IG-430	3.125	DW203	PCEA	3.125
BW1002	NB-18	4.125	CW1102	H-451	4.125	BW1402	NB-18	4.125	CW202	H-451	4.125	BW302	NB-18	4.125	CW501	H-451	4.125
DW1003	PCEA	5.125	AP403	NBG-17	5.125	DW1303	PCEA	5.125	AP502	NBG-17	5.125	DW1604	PCEA	5.125	AP601	NBG-17	5.125
EW0202	IG-110	6.125	FW0303	IG-430	6.125	EW0502	IG-110	6.125	FW0604	IG-430	6.125	EW0802	IG-110	6.125	FW1001	IG-430	6.125
CW103	H-451	7.125	BP501	NBG-18	7.125	CW1301	H-451	7.125	BP602	NBG-18	7.125	CW303	H-451	7.125	BP302	NBG-18	7.125
	Flux wire			Flux wire			Flux wire			Flux wire			Flux wire			Flux wire	
FW0202	IG-430	8.375	DA501	PCEA	8.375	FW0503	IG-430	8.375	DA602	PCEA	8.375	FW0804	IG-430	8.375	DA203	PCEA	8.375
BW1003	NBG-18	9.375	EW0304	IG-110	9.375	BW1403	NBG-18	9.375	EW604	IG-110	9.375	BW303	NBG-18	9.375	EW0904	IG-110	9.375
DW1004	PCEA	10.38	AW1002	NBG-17	10.38	DW1304	PCEA	10.38	AW1202	NBG-17	10.38	DW1701	PCEA	10.38	AW1402	NBG-17	10.38
EW0203	IG-110	11.38	CW1103	H-451	11.38	EW0503	IG-110	11.38	CW203	H-451	11.38	EW0803	IG-110	11.38	CW503	H-451	11.38

Stack 1		
ID#	Graphite	Height
FW0203	IG-430	12.38
BW1101	NBG-18	13.38
	Flux wire	
DW1101	PCEA	14.63
FW0204	IG-430	15.63
EW0204	IG-110	16.63
BW1102	NBG-18	17.63
DW1102	PCEA	18.63
	Flux wire	
CW1002	H-451	19.63

Stack 2		
ID#	Graphite	Height
BW1203	NBG-18	12.38
DW1202	PCEA	13.38
	Flux wire	
EW0401	IG-110	14.63
AW1003	NBG-17	15.63
BP502	NBG-18	16.63
DA502	PCEA	17.63
FW0304	IG-430	18.63
	Flux wire	
EW0402	IG-110	19.63

Stack 3		
ID#	Graphite	Height
FW0504	IG-430	12.38
BW1501	NBG-18	13.38
	Flux wire	
DW1401	PCEA	14.63
FW0601	IG-430	15.63
EW0504	IG-110	16.63
BW1502	NBG-18	17.63
DW1402	PCEA	18.63
	Flux wire	
CW1302	H-451	19.63

Stack 4		
ID#	Graphite	Height
BW1603	NBG-18	12.38
DW1503	PCEA	13.38
	Flux wire	
EW0701	IG-110	14.63
AW1203	NBG-17	15.63
BP603	NBG-18	16.63
DA701	PCEA	17.63
FW0701	IG-430	18.63
	Flux wire	
EW0702	IG-110	19.63

Stack 5		
ID#	Graphite	Height
FW0901	IG-430	12.38
BW401	NBG-18	13.38
	Flux wire	
DW1702	PCEA	14.63
FW0902	IG-430	15.63
EW0804	IG-110	16.63
BW402	NBG-18	17.63
DW1704	PCEA	18.63
	Flux wire	
CW401	H-451	19.63

Stack 6		
ID#	Graphite	Height
BW503	NBG-18	12.38
DW204	PCEA	13.38
	Flux wire	
EW1001	IG-110	14.63
AW1403	NBG-17	15.63
BP301	NBG-18	16.63
DA202	PCEA	17.63
FW1002	IG-430	18.63
	Flux wire	
EW1002	IG-110	19.63

NBG-17 specimen - AW### = "with-grain", AP### = "against-grain"
 NBG-18 specimen - BW### = "with-grain", BP### = "against-grain"
 H-451 specimen - CW### = "with-grain", CA### = "against-grain"
 PCEA specimen - DW### = "with-grain", DA### = "against-grain"
 IG-110 specimen - EW##### = "with-grain" (isotropic so no "against grain" direction)
 IG-430 specimen - FW##### = "with-grain" (isotropic so no "against grain" direction)

2.2.4 Determining the Physical Positions of Piggyback Specimens in the Central Stack

Similar to the AGC-1 design, the AGC-2 piggyback specimens were contained within the central stack and did not have an applied stress imposed. Because AGC-2 has the same number of major and minor graphite types as the AGC-1 design, the same piggyback stacking order was used.^[14, 15]

One major change to AGC-2 piggy-back specimens was the elimination of a central hole through each graphite-type specimen. AGC-1 piggyback had a central hole to allow a series of SiC temperature monitors to be placed down the central spine of the experiment to provide independent temperature measurements from the capsule thermocouples (TC). Unfortunately, this central hole in the specimens precluded thermal diffusivity testing on the specimens above room temperature.

A decision was made to not machine a central hole in the AGC-2 piggyback specimens and allow each to be tested for high temperature thermal diffusivity. This eliminated the independent temperature monitoring capability for the AGC-2 capsule, but it was determined that being able to measure the changes to the thermal diffusivity at high temperatures was of more importance.

3. GENERAL TESTING PROVISIONS

A significant level of preparation was needed to meet Nuclear Quality Assurance Level 2 quality requirements prior to actual material property testing. An approved characterization plan was developed that was dependent upon the two graphite specimens geometry and on the material properties to be measured. In general, all testing was performed through ASTM approved standards; however, due to small size of the graphite specimens some methods required modifications and variations of the testing standards. Details of these testing standard variations along with equipment calibration, personnel training on testing methodology, and data acquisition are provided.

3.1 Characterization Plans and Work Procedures

The AGC-2 specimens have been characterized in accordance with PLN-3267, “AGC-2 Characterization Plan.”^[16] This plan describes thermal, physical, and mechanical measurement methods used to characterize the graphite specimens and is intended to meet the requirements of MCP-1380, “Research and Development Test Control.”^[17] Described within the plan are the instruments, fixtures, and methods used for preirradiation material-property measurements of bulk density, thermal diffusivity, coefficient of thermal expansion (CTE), elastic modulus, and electrical resistivity.

All work was performed in accordance with LWP-21220, “Work Management.”^[18] All records designated in implementing documents as Quality Assurance records were controlled in accordance with PLN-3319, “Records Management Plan for the VHTR Technology Development Office Program.”^[19]

Data resulting from the preirradiation characterization are plotted in Appendix A and listed in Appendix C. Statistical evaluation has been performed using an inner quartile range analysis to identify levels of uncertainty and outliers in the data. The measured properties and characteristics of different graphite types will be compared along with the effect of grain orientation.

3.2 Specimen Description and Preparation

The major grades of the nuclear graphite to be tested in AGC-2 are NBG17, NBG-18, PCEA, IG-430, H-451, 2114, and IG-110. Minor grades of graphite include NBG-25, PCIB, PPEA, NBG-10, BAN, HLM, PGX, 2114, HOPG, and A3 Matrix. All major grades have been characterized fully in accordance with PLN-3267, and the minor grades have only had dimensional, density, and thermal diffusivity measurements performed on them. The two primary specimen types in the AGC experiments are creep specimens and piggyback specimens. “Creep” specimens from major grade graphite types are shown in INL Drawing 600786, Rev. 1, “ATR Advanced Graphite Capsule (AGC-2) Graphite Specimen

Machining Details,”^[20] and will be subjected to a mechanical load during irradiation to induce irradiation creep within the specimens. “Piggyback” specimens from both major and minor grade graphite types are shown in INL Drawing 600786, Rev. 1. They are not subjected to a mechanical load and are subjected only to neutron irradiation at high operating temperatures to assess the effects of a reactor environment on the specific graphite grade.

All specimens are 12.7 mm in diameter, with the creep specimens being 25.4 mm long and the piggyback specimens being 6 mm long (INL Drawing 600786, Rev. 2).^[10] Details of how specimens were cut from the graphite blocks are contained in INL Drawing 600787, Rev. 3.^[21]

Immediately after being machined, each specimen is placed in an individual container that is bar coded with a unique identification number, in accordance with INL Drawing 600787, Rev. 3. Each graphite specimen is then laser-engraved with that same unique identification number around the circumference at one end. Prior to any material property measurement, each specific specimen is identified by its unique identification number, and the data are recorded/stored under this identification number. After the specimens have been laser-engraved, they are ultrasonically cleaned, as follows:

1. Handle the specimens only while wearing cotton or powder-free nitrile gloves
2. Remove all dust and debris using an aerosol pressurized dust-off product
3. Ultrasonically clean specimens for 20 minutes in deionized water
4. Rinse specimens in ethyl alcohol to help displace water
5. Allow to air dry
6. Place specimens in a laboratory oven at 130°C for 2 hours.

Allow specimens to cool in a desiccator and retain there in storage until resistivity or bulk density measurements are taken.

It should be noted that irradiated specimens are not washed again prior to characterization measurements. However, for measurements of density and resistivity, Steps 6 and 7 above are followed (i.e., irradiated specimens are dried in a laboratory oven at 130°C for 2 hours and allowed to cool in a desiccators, where they are retained until resistivity and/or bulk density measurements are performed).

3.3 Personnel and Training

Personnel who perform the measurements identified in this report are qualified in accordance with MCP-3052, “VHTR TDO Personnel Qualification and Certification.”^[22] Their ability to adequately perform measurements described in this report is demonstrated by instrument manufacturers’ training and certification and/or performance of an instrument/measurement operational validation. Personnel qualifications are reviewed by the NGNP Graphite Research and Development Technical Lead and documented in the laboratory notebooks.

3.4 Variations, Exceptions, and Discrepancies

Several variations, exceptions, and discrepancies may occur. The first is a known departure from the applicable American Society for Testing and Materials (ASTM) standard. These departures are typically related to geometrical constraints. All currently known departures or exceptions taken to the ASTM standard are described in detail in Section 3 of this plan. Any departure not captured in this plan will be recorded in laboratory notebooks associated with the measurement. In most cases, the effects of the exception or departure from the ASTM method/standard on the measured value are not well understood. When possible, sensitivity studies will be performed and documented in laboratory notebooks to understand the impact of these exceptions and departures.

It is likely that the ASTM standards and/or test methods will be revised and improved during the 10+ year AGC experiment cycle. Each revision or development will be evaluated for how it could impact future measurements and their consistency with measurements made under previous revisions or techniques. A programmatic determination will be made whether to continue with the current version of the ASTM method or use the updated version. This determination will be documented in laboratory notebooks associated with the affected measurement.

While measurements are being made, it is possible that something out of the ordinary may occur. Any unusual event that occurs during a measurement will be documented in the laboratory notebook associated with that specific measurement and duly noted within the database associated with the data generated for this program. The principal investigator will be notified of the event and will determine what impact it has on the data. The significance of the result will be documented in the laboratory notebook by the principal investigator.

3.5 Calibration and Functional Validation

The measurement protocol consists of calibration, functional validation, and data acquisition. Functional validations established for each measurement, in collaboration with the instrument manufacturer, will be performed periodically to ensure that accurate and consistent data are acquired. All validations will be performed on traceable standards and documented in retrievable laboratory notebooks associated with each measurement. In the event that an instrument functional validation fails, the reason for the failure will be investigated and resolved prior to that measurement being used for further characterization. Upon resolution, a determination will be made as to the impact the failure might have had on data taken prior to the failure and back to the last valid measurement. If it is determined the data captured during this interval are suspect, the impacted data will be evaluated for accuracy.

MCP-3066, “VHTR TDO Control of Measuring and Test Equipment,”^[23] will be followed for calibration standards, methods, and frequencies that have been established for each measurement. Where it is not possible to use the INL Standards and Calibration Laboratory, calibration by user procedures will be established, based on ASTM standards and manufacturers’ instructions and performed against international standards. These procedures will be documented in laboratory notebooks associated with each measurement.

4. GRAPHITE STANDARDS AND METHODS

A brief summary of the AGC specimen testing methods is included in Table 4 and includes precise dimensional measurements (before and after heating to 1000°C in the dilatometer) and nondestructive characterization of the physical properties. A detailed description of each preirradiation testing method is provided in Section 5, “Detailed Description of Test Methods.”

Table 4. NGNP graphite specimen measurement and test equipment.

Measurement	Standard	Instrumentation	Calibration Method	Result
Physical dimensions and mass	ASTM C559-90 (reapproved 2010)	Mitutoyo Micrometer 121-155 INL ID: 725884 INL ID: 727312 Mitutoyo Caliper CD-6" CSX INL ID: 725813 INL ID: 726607 INL ID: 727194 Sartorius Scale ME235P INL ID: 412642 INL ID: 415907	INL Standards and Calibration Laboratory	Bulk density
Fundamental frequency	ASTM C747-93 ^[24] (reapproved 2010) ASTM C1259-08 ^[25]	J. W. Lemmens Grindosonic INL ID: 412850	No calibration required per instrument manufacturer	Elastic modulus
Sonic velocity	ASTM C769-09 ^[26]	Olympus NDT Sq. Wave Pulser/Receiver 5077PR INL ID: 728024 National Instruments Digitizer USB 5133 INL ID: 726725 INL ID: 415868	INL Standards and Calibration Laboratory	Young's modulus, Shear modulus, Poisson ratio
Four-point electrical resistivity	ASTM C611-98 (reapproved 2010)	Kiethly 6220 Precision Current Source INL ID: 725865 INL ID: 727290 Kiethly 2182A Nano Voltmeter INL ID: 725866 INL ID: 727289	INL Standards and Calibration Laboratory	Electrical resistivity
Laser flash diffusivity	ASTM E1461-07	Netzsch LFA 457 2 ea. INL ID: 412855 INL ID: 412864	Calibration by user per manufacturer's instructions	Thermal diffusivity
Push rod dilatometry	ASTM E228-06	Netzsch DIL 402 C 2 ea. INL ID: 412860 INL ID: 412861	Calibration by user per manufacturer's instructions	Coefficient of thermal expansion
Environmental monitoring	All	Visala Pressure, Humidity and Temperature PTU301 INL ID: 726912 INL ID: 727884 INL ID: 727502	INL Standards and Calibration Laboratory	Laboratory environmental conditions

The equipment necessary for the measurements listed in the above Table 4 are segregated into individual stations. Each station has a bar scanner for reading unique specimen identification bar codes, a computer for automated data acquisition, and the test equipment. The bar code of the individual specimen container is read, and the file for that specimen is automatically opened for data input prior to each measurement. Associated with each measurement type/station is a unique laboratory notebook maintained in accordance with MCP-2875, "Maintaining Laboratory Notebooks,"^[27] and PLN-2690, "VHTR Technology Development Office Quality Assurance Program Plan,"^[28] paragraph 3.3. Accepted data are

stored in the NGNP Data Management and Analysis System, a satellite file location for NGNP. Data are transmitted in standardized Excel file format to the NGNP Data Management and Analysis System using Form 435.78, “VHTR Technology Development Office Information Input Sheet,”^[29] in accordance with PLN-3319.

In addition to data stored in laboratory notebooks, the specific measuring instruments are networked to a server computer where the measurement data are automatically stored. This has been implemented in the INL Carbon Characterization Laboratory where custom LabVIEW software was written to facilitate automated data acquisition. This software comprises five main programs: Manufacturers Data, Physical and Dimensional Measurements, Electrical Resistivity Measurements, Sonic Resonance (Fundamental Frequency) Measurements, and Sonic Velocity Measurements. These five programs acquire data from instrumentation or user input and record the results in an Excel spreadsheet located on a server computer. In the case of thermal expansion and thermal diffusivity measurements, two other LabVIEW programs have also been written to parse vendor software-acquired data into Excel spreadsheets. MCP-3058, “VHTR TDO Software Quality Assurance,”^[30] and FRM-959, “VHTR Software Management Plan,”^[31] are currently used to govern the development, accuracy, and configuration control of this software.

Measurements are made in the following sequence:

1. Wash and dry – all specimens
2. Mass and dimensions – all specimens
3. Thermal diffusivity – piggyback specimens
4. Elastic modulus by sonic resonance – creep specimens
5. Electrical resistivity – creep specimens
6. Elastic modulus by measurement of sonic velocity – creep specimens
7. Wash and dry to remove couplant – creep specimens
8. Coefficient of thermal expansion – creep specimens
9. Postcharacterization of mass and dimensions – all specimens.

5. DETAILED DESCRIPTION OF TEST METHODS

Before any measurements are made, specimen numbers and basic information about each type of graphite will be entered into the manufacturer’s data program. Once basic information about the graphite type has been recorded, it will be automatically saved to an Excel spreadsheet file, and the individual specimen numbers will be entered using a bar code reader. Following the initial input of general information, individual material property measurements will be made, starting with mass and dimensional measurements for determining bulk density.

5.1 Mass, Dimensions, and Bulk Density

Dimensional change is one of the key parameters affecting the performance of graphite in a neutron environment. Determining volumetric and linear dimension as a function of temperature and radiological dose is necessary to understand critical performance measures (e.g., dimensional change turnaround, irradiation creep, and internal stresses imposed upon graphite components). Dimensional and mass measurements will be performed to ASTM Standard C559-90, “Standard Test Method for Bulk Density by Physical Measurements of Manufactured Carbon and Graphite Articles” (reapproved 2010),^[32] which describes in detail the procedure for making dimensional measurements and calculating bulk density.

The accuracy of the dial micrometers used here is stated by the manufacture to be 2 μm . For the larger graphite creep specimens with a 25.4 mm length measurement this corresponds to a 0.008% accuracy for this technique. However, when evaluating the uncertainty of the density determination other

factors must be considered, such as, the hardness of the material and the force with which the micrometer blade is engaged with the material, specimen temperature variation, technician skill, etc. These and other factors were considered in a propagation of error analysis to arrive at an uncertainty of 0.08% with the measurement of the specimen diameter being the largest contributor to the error.

5.2 Electrical Resistivity

Electrical resistivity is used as a rapid, simple means to determine grain orientation, structure, and crystallinity of graphite. In conjunction with optical microscopy, it can be used to determine the microstructural texture of graphite components without much specimen preparation work. Resistivity is measured following ASTM C611-98, “Standard Test Method for Electricity Resistivity of Manufactured Carbon and Graphite Articles at Room Temperature” (reapproved 2010).^[33] The measurement technique is commonly referred to as “four-point probe.” It consists of passing a known current through the specimen and measuring the voltage across the specimen at known locations. Based on Ohms law, the resistance is determined, and the resistivity is calculated from Equation (1):

$$\rho = R \cdot A / L \quad (1)$$

where

ρ = Electrical resistivity

R = Measured resistance

A = Cross sectional area

L = Length over which the voltage is measured.

Figure 8 shows a test fixture fabricated at INL that allows a specimen to be rotated for multiple measurements of voltage around its periphery.

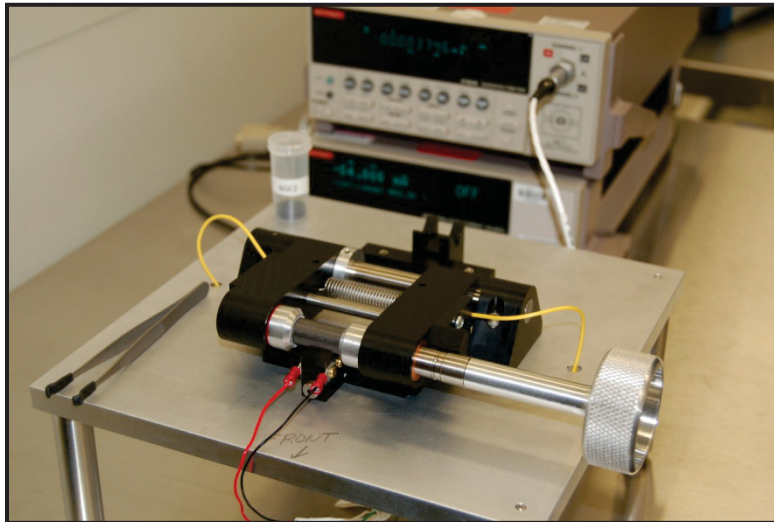


Figure 8. Electrical resistivity measurement station.

Uncertainty in the resistivity measurement is mainly comprised of the contact resistance between the specimen and the contacting blades for the voltage measurement. Specimen temperature and the temperature of other bimetal junctions in the voltage measuring leads are also significant factors. These effects are minimized by passing the current through the sample in two directions and averaging the measured voltage for each direction. In this way any thermoelectric or small differences in junction resistances will cancel. A round robin test series reported in ASTM C 611 precision and bias section

states a lab to lab variability of 2.5%. A round robin test series such as this would take into account the variables discussed above and is considered a good estimate of the measurement uncertainty.

5.3 Approximation of Elastic Modulus from the Measurement of Sonic Velocity

The mechanical properties of graphite are necessary to determine the structural integrity of graphite components. These properties are vital to determining the viability of the structural strength and integrity of the reactor core. The as-received and irradiated values are needed for whole-core models, which will be used for the graphite design code. This test is carried out in accordance with ASTM C 769-09, “Standard Test Method for Sonic Velocity in Manufactured Carbon and Graphite Materials for Use in Obtaining Young's Modulus.” In this measurement, the transmitting piezoelectric transducer sends a 2.25-MHz sound wave through the specimen. At the opposite end of the specimen, the acoustic wave is received by another piezoelectric transducer. The sonic velocity of the specimen is the ratio of specimen length to the signal time lapse between transducers. An approximate value for Young’s modulus, E , can be obtained from Equation (2):

$$E = \rho V^2 \quad (2)$$

where

E = Young’s modulus

ρ = Specimen density

V = Sonic velocity.

Figure 9 shows the sonic velocity measurement station. In the foreground are fixtures for clamping the specimen between the transducer and receiver. These fixtures have unique features that improve measurement accuracy, precision, and efficiency. Specimens are easily and rapidly loaded into the fixture using the cam-operated clamp. Measurement precision is improved because the spring-loaded clamp applies consistent pressure between the transducers and specimen, resulting in repeatable couplant thickness.

As specified in paragraphs 8.1 and 8.5.1 of ASTM C 769-09, a suitable coupling medium should be used and reported with the data. Here, “Shear Gel,” manufactured by Sonotech, Inc., is used for a shear wave couplant, and “Ultra Gel II,” also manufactured by Sonotech, Inc., is used for the transverse wave couplant.

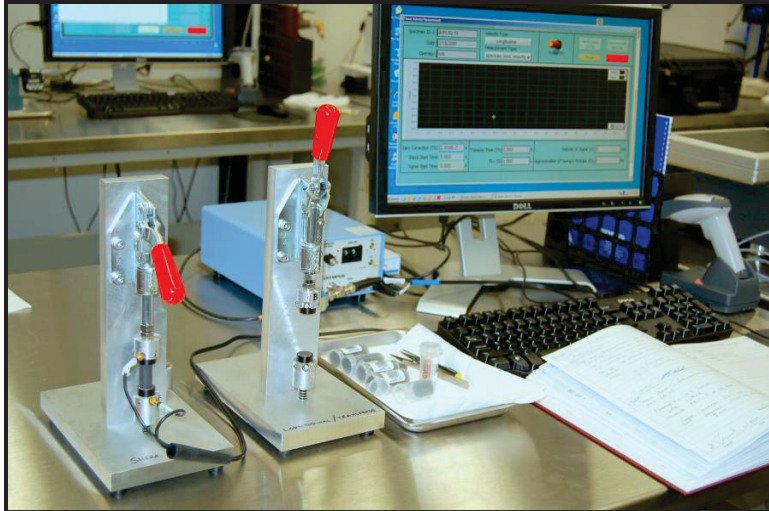
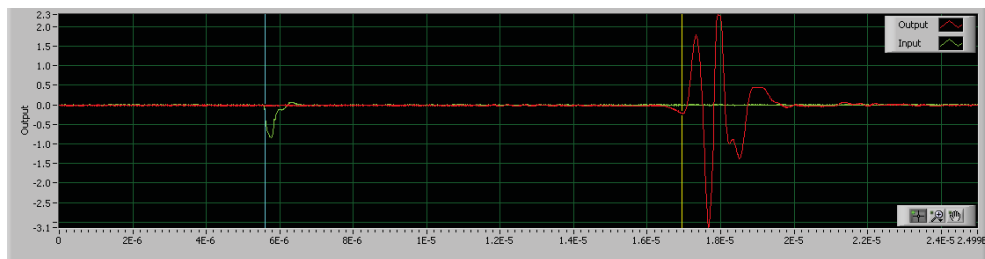


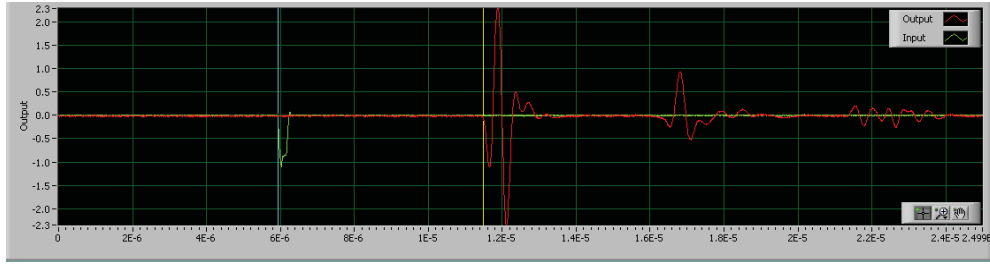
Figure 9. Sonic velocity measurement station.

Figure 9 shows the LabVIEW software user interface display for sonic velocity measurements after scanning the bar code of the specimen to be tested. This screen is used to acquire sonic velocity measurements of a specimen in both the longitudinal and shear directions. Operating much like an oscilloscope, the cursors automatically mark the time between the transmitted wave and the received wave. Also shown in Figure 9 are two examples of the shear wave and transverse wave timing locations for properly coupled specimens. The specimen length divided by this transit time yields the sonic velocity.

The uncertainty in determining of elastic moduli from the measurement of sonic velocity comes from several sources. First there is the effect of material and geometry related dispersion of the transmitted wave. ASTM C-769 provides guidance on how to minimize this problem by choosing the correct frequency. This technique also assumes linear elastic behavior and graphite is not completely linearly elastic. And finally, the operator's judgment on the positions of the timing cursors is somewhat subjective. Clean wave forms to base these judgments on are highly dependent on the quality of the transducer-material coupling. These sources of error are difficult to quantify and therefore difficult to combine in a propagation of error analysis. However, ASTM C769 describes in some detail a round robin test series between different labs. Using round robin test data to determine a coefficient of variation (COV) is a good means of estimating the measurement uncertainty. With caution, the COV of 3.8% (reported in C769) is taken here to be representative of the uncertainty for these measurements. When considering a single material and making comparisons between the pre and post irradiation signal values the precision of these measurements is good enough to consider differences greater than 4% significant. However, one is cautioned to refrain from using the values here as absolute or better than $\pm 10\%$ accurate.



Shear wave timing



Transverse wave timing

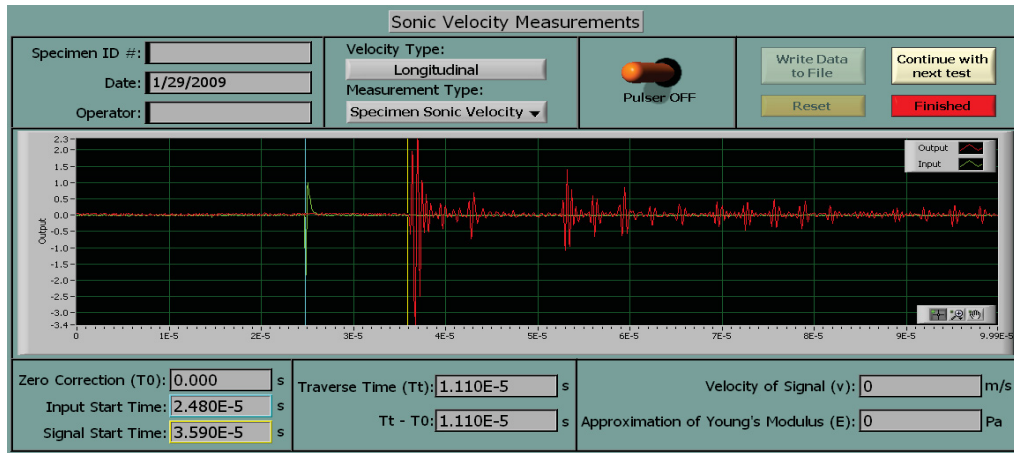


Figure 10. Sonic velocity measurement user interface.

After the longitudinal and shear modulus values have been determined, each specimen Poisson's ratio can be calculated from these results through equation (3):

$$v = \left[\frac{E}{2G} \right] - 1 \quad (3)$$

Where:

v = Poisson's ratio

E = Elastic modulus

G = Shear modulus

5.4 Modulus of Elasticity by Measurement of Fundamental Frequency

Understanding the mechanical properties of graphite is necessary to determine the structural integrity of graphitic components. These properties are vital to determining the viability of the structural strength and integrity of the reactor core. This test method measures the fundamental resonant frequency of test specimens of suitable geometry by exciting them mechanically with a singular elastic strike. Specimen supports, impulse locations, and signal pick-up points are selected to induce and measure specific modes of the transient vibration of the specimen. The transient signals are analyzed, and the fundamental resonant frequency is isolated and measured by the signal analyzer. The measured fundamental resonant frequency, specimen dimensions, and mass are used to calculate the dynamic Young's modulus, shear modulus, and Poisson's ratio in accordance with ASTM C747-93, "Standard Test Method for Moduli of

Elasticity and Fundamental Frequencies of Carbon and Graphite Materials by Sonic Resonance,” (reapproved 2010) in combination with apparatus and calculations described in ASTM C1259-08, “Standard Test Method for Dynamic Young’s Modulus, Shear Modulus, and Poisson’s Ratio for Advanced Ceramics by Impulse Excitation of Vibration.” The fundamental frequency measurement station is shown in Figure 11.

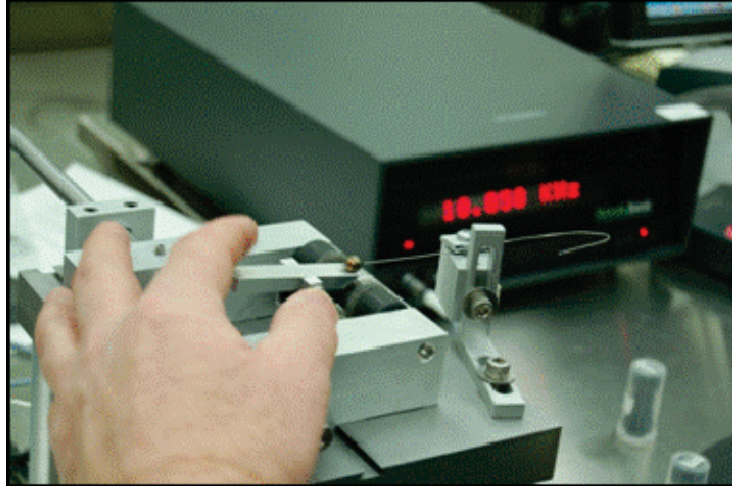


Figure 11. Fundamental frequency measurement station.

After placing a specimen in the test fixture, the user excites it by lightly tapping it with a small mechanical impulse. A consistent impulse is achieved by placing the ball hammer onto a lever that rotates out from under the hammer as it is raised. The specimen is supported in such a way that it vibrates at its natural frequency. A microphone placed underneath one end of the specimen, in combination with the Grindosonic electronics, measures this frequency, which is recorded and displayed by the computer. The modulus of elasticity is calculated and displayed next to the newly acquired frequency. If the results are satisfactory, the user can press the “Save 1st Frequency” button and go on to the next measurement. Following the recommendations of ASTM C-1259-08, 10 readings of the fundamental frequency are measured before the results of the test are written to the applicable Excel spreadsheet.

ASTM C-1259 describes in detail a round robin test series using ceramic materials along with an analysis of the propagation of errors in the calculation of moduli from the measurement of resonant frequency, geometry and mass of the sample. This error analysis shows the major sources of experimental variation are the measurement of the fundamental frequency and the smallest dimension (diameter) of the specimens due to their higher exponent in the modulus calculations. Both the propagation of error analysis and round robin data indicated an uncertainty of less than 2%. However, the creep specimens tested here do not meet the geometry requirements of C-1259. With the current specimen length-to-diameter ratio of only 2 (rather than 5 as specified) the AGC-2 graphite specimens are, at times, difficult to excite consistently and in a single mode of vibration. After significant training, an experienced operator was able to consistently obtain a resonant frequency within 2% uncertainty for the flexural mode of vibration within the specimens.

5.5 Thermal Expansion

Understanding the CTE for graphite components is critical for determining the dimensional changes that occur as a result of temperature cycles. Localized external stresses can be imposed upon mechanically interlocked graphite-core components because the individual pieces suffer differential thermal expansion. Internal stresses can occur within larger graphite components if there is a temperature gradient causing differential expansion within the piece (i.e., one side has a higher temperature than the

other). Finally, the thermal expansion is highly dependent upon the graphite microstructure (e.g., orientation/anisotropy, pore size and distribution, and crystallinity). Irradiation damage can significantly alter graphite microstructure and thus CTE values. Determining the extent of the changes as a function of irradiation dose and temperature will be a key parameter for reliable calculation of stress states within graphite components, volumetric changes, and irradiation creep rates.

The CTE measured here follows ASTM E228-06, “Standard Test Method for Linear Thermal Expansion of Solid Materials with a Push-Rod Dilatometer.”^[34] This test method uses a push-rod type dilatometer to determine the change in length of a graphite specimen relative to that of the holder as a function of temperature from the specified reference temperature. The temperature is varied over the desired range at a slow, constant heating or cooling rate. The linear thermal expansion and mean CTE, α , are calculated from the recorded data using Equation (4):

$$\alpha = \frac{1}{L_0} \frac{\Delta L}{\Delta T} \quad (4)$$

where

- α = Mean CTE
- L_0 = Specimen initial length
- ΔL = Change in length
- ΔT = Temperature difference between a specified reference temperature and the temperature at which the change in length was measured.

The Netzsch DIL 402 C commercial system, shown in Figure 12, currently used at INL does not have the capability to cool the specimen below ambient temperature. Therefore, the initial length at 20°C is linearly extrapolated from expansion data between 100 and 150°C, and the mean CTE is calculated from a 20°C reference temperature.

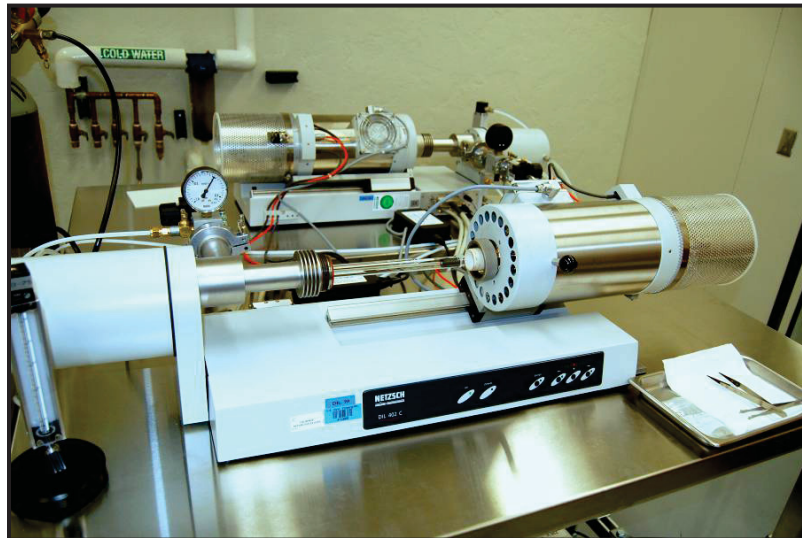


Figure 12. Commercial push rod dilatometer for measuring the coefficient of thermal expansion.

The greatest source of experimental error in the dilatometry method described here is the correction made for the expansion of the specimen holder and push rod/LVDT mechanism. This differential between the specimen and the apparatus must be accounted for in order to isolate the specimen expansion only.

Studies reported in the precision and bias section of ASTM E228 have indicated that this type of dilatometry can be accurate to 4% when calibrations are performed carefully.

5.6 Thermal Diffusivity

The ability to conduct heat through the graphite core is critical to the passive removal of decay heat. Reduction of the thermal conductivity within graphite can have a significant effect on the passive heat-removal rate and thus the peak temperature that the core and, subsequently, the fuel particles will experience during off-normal events. Determining changes to the conductivity as a function of irradiation dose and temperature is important for the HTGR safety analysis. Here, ASTM E1461-07, “Standard Test Method for Thermal Diffusivity by the Flash Method,”^[35] is followed for calculating thermal diffusivity and conductivity. Thermal diffusivity (δ) is measured and defined as the ratio of thermal conductivity to volumetric heat capacity, as shown in Equation (5):

$$\delta = \frac{k}{\rho C_p} \quad (5)$$

Where

- δ = Thermal diffusivity
- k = Thermal conductivity
- ρ = Density
- C_p = Specific heat.

The measurement is performed on small, thin, disk-shaped specimens. A pulsed laser is used to subject one surface of the specimen to a high-intensity, short-duration energy pulse. The energy of this pulse is absorbed on the front surface of the specimen, and the resulting rise in rear-face temperature is recorded. The thermal diffusivity is calculated from the specimen thickness and the time required for the rear-face temperature to reach 50% of its maximum value. Figure 13 shows a commercially available laser flash apparatus, complete with vendor-developed software for instrument control and data acquisition.



Figure 13. Laser flash apparatus measurement station for determining thermal diffusivity.

Uncertainty in the measurement of thermal diffusivity occurs from specimen heat loss and temperature measurement. Specimen temperature measurement is performed with a calibrated type S thermocouple in the near vicinity of the specimen. Being a relatively straight forward, the specimen temperature measurement is typically a small contribution to the overall measurement error or uncertainty.

The main contributor to the measurement uncertainty is heat loss from the specimen. Because this measurement technique depends on the assumption of one-dimensional heat transfer from the flat face receiving the laser pulse to the flat face radiating to the detector, heat loss errors are mainly attributed to radiative heat loss from the circumference of the specimen at temperatures above 300°C. Typically provided with the instrument software are several correction models to account for this heat loss. As the specimen diameter to thickness ratio decreases the heat loss increases to the point that the correction models no longer can account for the error. A study was performed to gain a fuller understanding of the limits of the models made available with the NETZSCH LFA and the dependence of the diameter to thickness ratio on measurement error. In this study the heat loss models were applied to data taken on specimens with various diameter to thickness ratios and at specimen temperatures between 25°C and 1000°C. It was determined that the Cowan^[36] model along with diameter to thickness ratios greater than or equal to 2 resulted in determination of the diffusivity within ASTM E1461 and the manufactures specified uncertainties of 4% and 3%, respectively. This was further verified by instrument functional tests performed monthly on a pure iron validation sample for which the diffusivity was determined to be within 3% of the Touloukian^[37] values between 100°C and 700°C.

6. DATA ANALYSIS

Data gathered for the characterization of AGC-2 specimens is contained in the appendixes of this report. Appendix A contains plots of the individual data points for each specimen. Shown by the dashed lines in each plot are the upper and lower limits of the interquartile range (IQR). These limits are established by the lesser of either the least or greatest value in the data or by multiplying the interquartile range by 1.5 and adding or subtracting this value from the third and first quartile. Any datum value outside of these limits is a suspected outlier of the established pattern. However, it is important to note that these outlying values are not only subject to measurement variability but also material variability and, therefore, cannot necessarily be discarded. These outlying values are examined in the context of the entire data set and will be evaluated further following irradiation. Other statistical parameters are calculated and presented in the tables of Appendix B. The mean, standard deviation and coefficient of variance are all calculated for the different measurement data sets and graphite types. Upper and lower limits called out in the tables of Appendix B are the IQR limits described above. Appendix C contains all of the raw data, including parameters specified by the applicable ASTM standard (e.g., dates, performer identifier, and room conditions).

There are many ways to combine and compare the data presented here. In doing so, the validity of the data is exercised and scrutinized. First, the data sets are considered independently with the statistical analysis described above. Additionally, a limited comparison of the absolute property values is performed between different graphite types and grades. The degree of isotropy is also evaluated for a limited number of grades by calculating the anisotropy ratio, as shown in Equation (6).

$$\text{Anisotropy ratio} = \frac{\text{Value of the property in the against - grain direction}}{\text{Value of the property in the with - grain direction}} \dots\dots\dots(6)$$

Note that in the case of isostatically molded graphite “with-grain” and “against-grain” indicate specimens taken from orthogonal planes in the billet.

6.1 Analysis of Mass, Dimensions, and Density Data

Plots of the measured mass, dimensions, and density for all AGC-2 specimens are shown in Figures A-1 through A-88 (see Appendix A). Beginning with graphite grade H-451, the calculated density of with-grain specimens has a higher degree of scatter as compared to the against-grain specimens (see Figure A-1). Both length and mass measurements for the with-grain specimens have relatively high COV (see Figures A-23 and A-67, respectively), but do not compensate for each other in the distribution of density. The higher scatter in density is most likely a result of material variation in the area of the billet from which these specimens were machined; however, it is difficult to completely rule out measurement inaccuracies. Therefore, the with-grain specimen length and mass measurements should be treated with caution. Comparison to the postirradiation measurements should provide more information on this observation.

Similar variations in density were observed in graphite grade NBG-17. In this case, a bimodal distribution in density was observed for both with- and against-grain specimens (see Figure A-4). Dimensional measurements were consistent and well-behaved for all specimens, but the bimodal distribution was observed in the mass measurements. To understand this unusual distribution, a study was completed to investigate the density as a function of depth in the NBG-17 billet. Twenty-three specimens ($12 \times 12 \times 5.5$ mm thick) were cut from the top of the billet to a depth of ~ 125 mm (see Figure 14). Figure 15 shows the density of specimens as a function of depth from the surface. In just 25 mm, the density increases 3%. This low-density area or area of inconsistent properties at the outer surface of the billet is often referred to as the skin effect of the billet.

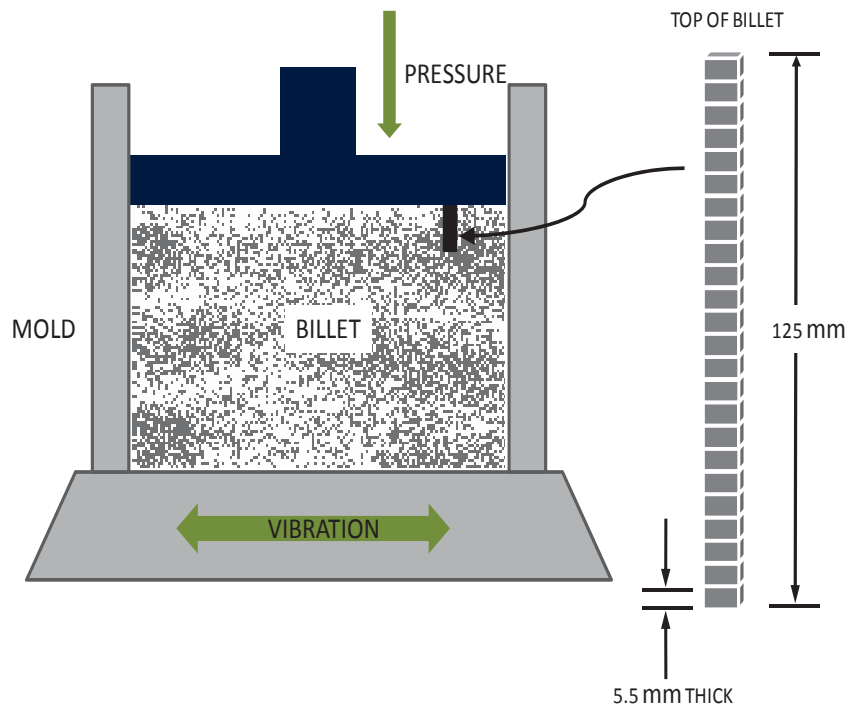


Figure 14. Schematic showing location and dimensional details of NBG-17 billet density investigation.

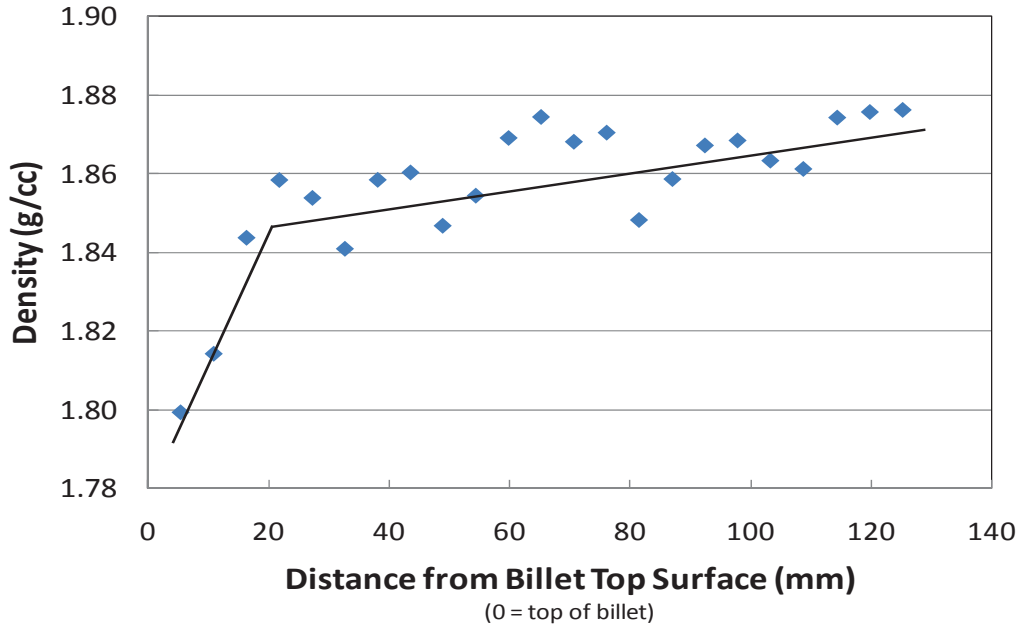


Figure 15. Density of NBG-18 as a function of depth in the billet.

Initially, it appeared unfortunate that specimens were taken from the skin of the billet, but in hindsight, this provided a variation in a significant property. With specimens of the same graphite type (i.e., coke, binder, and particle size) other material variables are held constant. This makes it possible to correlate the effect of density on other intrinsic properties (e.g., resistivity, elastic modulus, and diffusivity). Figure 16 shows an example of this for the resistivity measurements of the NBG-17 specimens. The expected difference in resistivity due to grain orientation is shown for the specimens at a similar density of ~ 1.864 g/cc. The higher resistivity for low-density with-grain specimens compared to the higher density specimens is most likely a result of higher porosity or micro-crack density inhibiting the flow of electrons. Further discussion of the resistivity data is provided in Section 3.2 of this report.

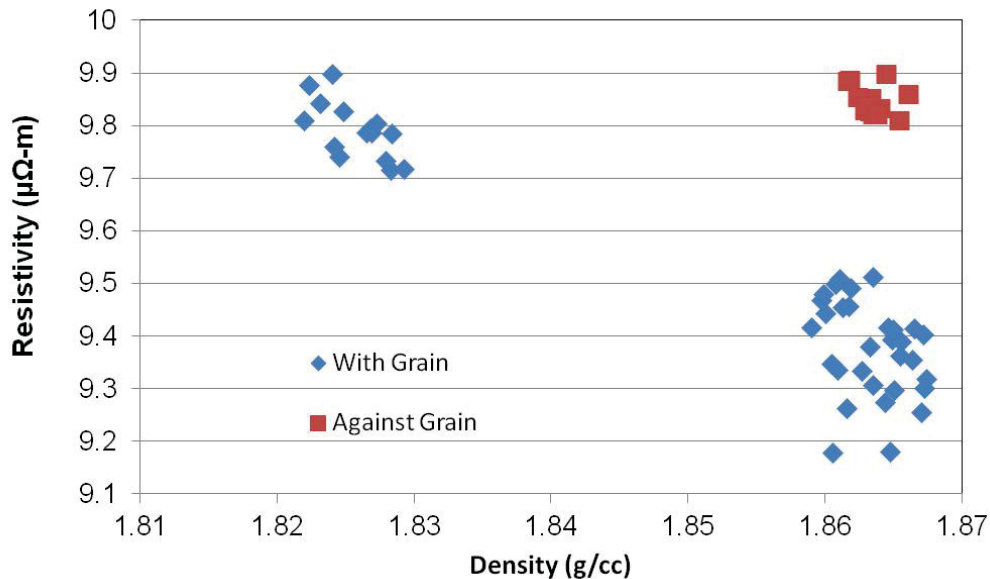


Figure 16. Resistivity of NBG-17 as a function of density.

Occasions arise when the determination of bulk density can be used to evaluate outliers or data that are near the IQR limits in either the dimensional or mass measurements. For example, Figures A-24, A-27, and A-28 show several data values for IG-110, NBG-18 and PCEA dimensional measurements that are near or outside the IQR limits. Evaluation of the corresponding density plots, Figures A-5 and A-16, show that all values fall within the quartile limits, with relatively low COVs. From this, it can be concluded that the dimensional outliers are simply specimens that were machined with different dimensions, resulting in them being outside or near the limit of the quartile analysis.

The density data of all other graphite grades (i.e., 2114, IG-110, NBG-18, NBG-25, BAN, HLM, IG-430, NBG-10, PCIB, PPEA, A3 Matrix, and New Matrix) is well-behaved and consistent with what was expected. The fact that these density data are so well-behaved indicates any outliers found in the associated dimensional or mass data are simply a result of machining tolerances and are valid.

Additionally, the dimensions and mass were measured following the thermal measurement of the CTE and diffusivity. These measurements were performed up to 1000°C, and concerns existed that the specimens maintained some residual stress due to the machining operations and that this stress would relax during the thermal cycle to 1000°C. Figures A-137 through A-202 contain plots of a comparison between the pre and post thermal treatment dimensions and mass. The comparison plots of specimen length show a slight trend of shrinkage of approximately 0.03%. For a 25-mm specimen, the accuracy of the dial micrometers used is 0.01%. Uncertainty in the measurement comprises not only accuracy of the dial micrometer but also other variables (e.g., room temperature, micrometer clutch wear, micrometer blade design, and velocity of blade approach) relative to the specimen hardness. Although there is a definite trend to the decrease in length measurements after the thermal measurements, it is difficult to draw concrete conclusions, considering that the length change is probably on the order of the measurement uncertainty. Furthermore, the annealing of residual stress would tend to increase the size of the specimen, not decrease it. However, oxidation could decrease the size of the specimen during the thermal measurements if the furnace is not purged of all air; and indeed, the post mass measurements trend to lower values by ~0.03% on average, indicating that a very small amount of oxidation was occurring. Several specimens of graphite type 2114 (specimen numbers TP19 and TP21 were used as filler piggybacks in capsules 2 and 4, respectively, and TP21 was not used in the irradiation experiment) and NBG-18 (specimen number BP502 was not used in the irradiation experiment) displayed mass loss in excess of 0.5% (see Figures A-185 and A-187). This suspected oxidation is corroborated in the relatively large reduction in length and diameter of these specimens. In the analysis of postirradiation dimensional change, these specimens will require careful evaluation, using the post thermal measurement dimensions, if they are used for any calculation of irradiation creep.

6.2 Electrical Resistivity

Plots of electrical resistivity are shown in Figures A-119 through A-124 for graphite grades of PCEA, NBG-18, H-451, IG-110, IG-430, and NBG-17. All of the resistivity measurements were performed on the creep specimens only. Several noteworthy observations resulted from the statistical analysis, and all are related to billet density variations discussed in Section 3.1. Looking at Figure A-122, resistivity measurements for NBG-17 were only performed on the against-grain specimens taken from central locations in the billet where the density is consistent (refer to INL Drawing 600787, Rev. 3). In this case, the resistivity values are extremely consistent, with a coefficient of variance of 0.3%, which is well below the 2.5% uncertainty reported in a round robin test series of ASTM C611-98. The COV of with-grain specimens is much higher than the against-grain specimens at 2.2%. Although this value is relatively high, analysis of the data clearly shows a correlation of specimen density to resistivity (see Figure 15), and therefore, the high COV is a result of material density variation. A similar conclusion can be drawn for the spread of resistivity shown in Figure A-124 for the against-grain specimens of PCEA.

An example of a simple comparison between graphite grades and grain orientation is shown in Figure 17. Here, the resistivity values of several primary grades of graphite are plotted for both grain

orientations, and the anisotropy ratio is displayed above the bars. It is interesting to note that all current grades of graphite have improved resistivity isotropy. This plot also shows that there is a 30% difference in resistivity for the current graphite types of interest.

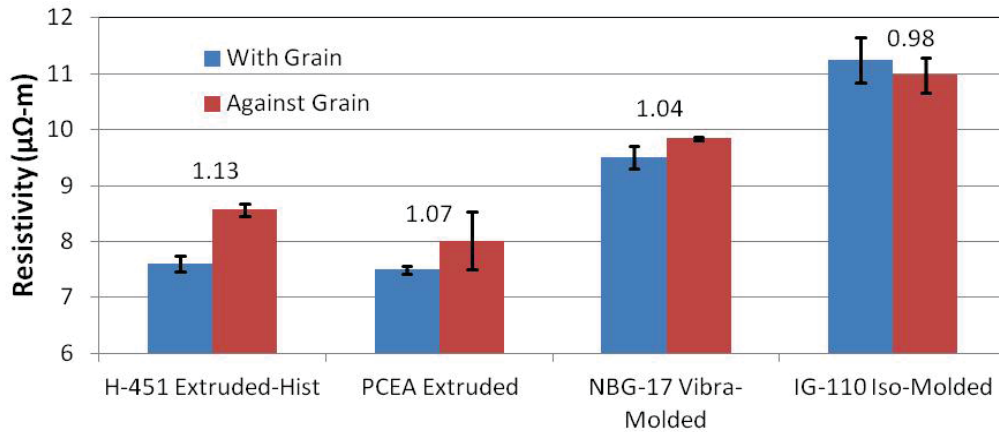


Figure 17. Electrical resistivity for several nuclear-grade graphite types. The anisotropy ratio is called out above each set of data bars.

6.3 Approximation of Elastic Modulus from the Measurement of Sonic Velocity

Figures A-125 through A-136 are plots of Young’s and shear moduli determined from the measurement of sonic velocity. Statistical parameters are shown in Tables C-10 and C-11 for Young’s and shear moduli, respectively. The IQR analysis does not reveal any inconsistency or outlier problems. As with resistivity, the moduli are easily correlated with the density of the specimens. Figure 18 shows that the sonic velocity increases with density for NBG-17. Therefore, in the calculation of the elastic modulus (i.e., density × the velocity squared), the density effect is compounded. This known behavior results from the fact that material containing more porosity and cracks (lower density) is more compliant and, therefore, will have a lower modulus of elasticity. The bimodal distribution of moduli resulting from density variations in the NBG-17 and PCEA specimens is clearly seen in Figures A-128, A-130, and A-134.

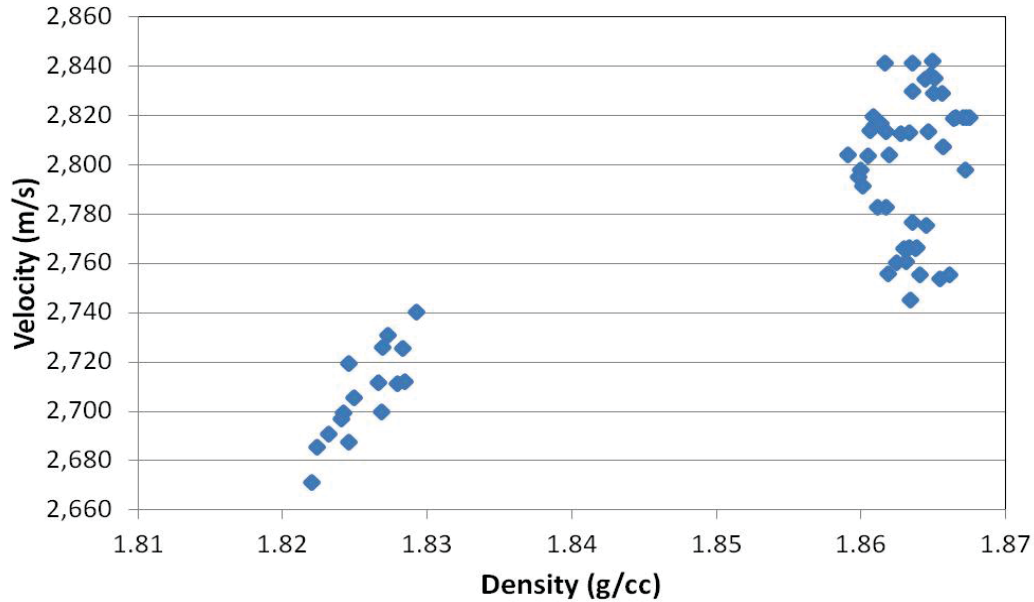


Figure 18. Measured longitudinal velocity as a function of density for NBG-17 creep specimens.

Table 5 shows Young’s modulus measured using the sonic velocity technique. Although the COV includes potential material variability, these values compare favorably to a COV of 3.8% reported in the precision and bias section of ASTM C769. Consistent with the discussion of the effects of density here, it is observed that the highest-density graphite (i.e., NBG-17 and -18) produce the highest moduli. With the exception of IG-430, the modulus isotropy of the relevant graphite grades characterized here is better than the historical grade of H-451.

Table 5. Young’s modulus by measurement of sonic velocity.

Graphite Type and Process Method	Young’s Modulus Against-Grain Mean (GPa)	Against-Grain COV (%)	Young’s Modulus With-Grain Mean (GPa)	With-Grain COV (%)	Young’s Modulus Anisotropy Ratio
H451 extruded-hist	10.29	0.94	12.06	2.94	0.85
IG-110 iso-molded	11.20	3.97	10.81	3.08	1.04
IG-430 iso-molded	12.01	1.94	10.46	2.54	1.15
NBG-17 vibra-molded	14.23	0.72	14.31	4.86	0.99
NBG-18 vibra-molded	16.11	1.08	15.46	1.70	1.04
PCEA extruded	11.76	0.97	12.47	1.40	0.94

COV = coefficient of variation
GPa = gigapascals

6.4 Modulus of Elasticity by Measurement of Fundamental Frequency

Young’s modulus, determined by measurement of fundamental frequency, is plotted in Figures A-113 through A-118, and the statistical data are contained in Table B-8. Statistically, these data are well-behaved, with the IQR analysis showing no problems with outliers. Again, a bimodal effect of density is shown for the with-grain specimens of NBG-17 (see Figure A-116).

Table 5 shows a comparison of Young’s modulus from the measurement of fundamental frequency for the primary grades of graphite. The COVs for all except the against-grain specimens of PCEA compare favorably with ~3% uncertainty in the measurement technique. The scatter in modulus values for the against-grain specimens can be seen in Figure A-118. It was noted throughout the resonance testing of PCEA that achieving consistent values for the resonant frequency was difficult. More than 100 strikes were necessary to obtain 10 consistent values, and the average standard deviation of the frequencies measured was an order of magnitude higher than that of the other graphite grades. This can only be explained by the relatively large elongated porosity that existed in the PCEA graphite billet tested. This porosity is termed “wiggler porosity,” and based on the testing in this program, the manufacturer has since corrected this problem in their manufacturing process. These elongated pores appear as cracks that run parallel to the grain and extrusion direction. In against-grain specimens, the size of these cracks or flaws can be on the order of the diameter of the specimen and run perpendicular to the direction of the flexural vibration mode, causing very inconsistent damping of the vibrational energy.

Also shown in Table 6 is the consistent fact that the new grades of graphite being tested exhibit better isotropy.

Table 6. Young’s modulus by measurement of fundamental frequency.

Graphite Type and Process Method	Young’s Modulus Against-Grain Mean (GPa)	Against-Grain COV (%)	Young’s Modulus With-Grain Mean (GPa)	With-Grain COV (%)	Young’s Modulus Anisotropy Ratio
H451 extruded-hist	8.01	1.64	9.94	3.07	0.80
IG-110 iso-molded	9.99	2.92	9.65	3.16	1.04
IG-430 iso-molded	10.64	2.07	9.39	2.43	1.13
NBG-17 vibra-molded	11.16	0.29	11.28	4.51	0.99
NBG-18 vibra-molded	12.42	0.84	11.99	1.59	1.04
PCEA extruded	8.73	23.35	9.92	2.38	0.87

COV = coefficient of variation
GPa = gigapascals

6.5 Thermal Expansion

Mean CTE data are plotted in Figures A-89 through A-112. A statistical evaluation of the CTE data was performed at three discrete temperatures (i.e., 100, 500, and 900°C) for each graphite type. Again, the dashed lines in these plots indicate the upper and lower IQR limits, and there are no outliers to consider. Tables B-5 through B-7 (see Appendix B) contain the mean, standard deviation, and COV values for data evaluated at the discrete temperatures. With the exception of PCEA, all COVs are below or on the order

of the $\pm 3\%$ measurement uncertainty when calculated for the with- and against-grain specimen groups individually.

Figure 19 shows the average of all specimens for several of the primary grades of graphite, with error bars indicating ± 1 standard deviation. All increase with temperature in a near-linear fashion between 100 and 1000°C. As an example of how these data may be used in future reactor designs, engineers will need to account for the fact that NBG-18 has a mean CTE that is $\sim 50\%$ higher than the historical grade H-451 if that grade is chosen for the core material.

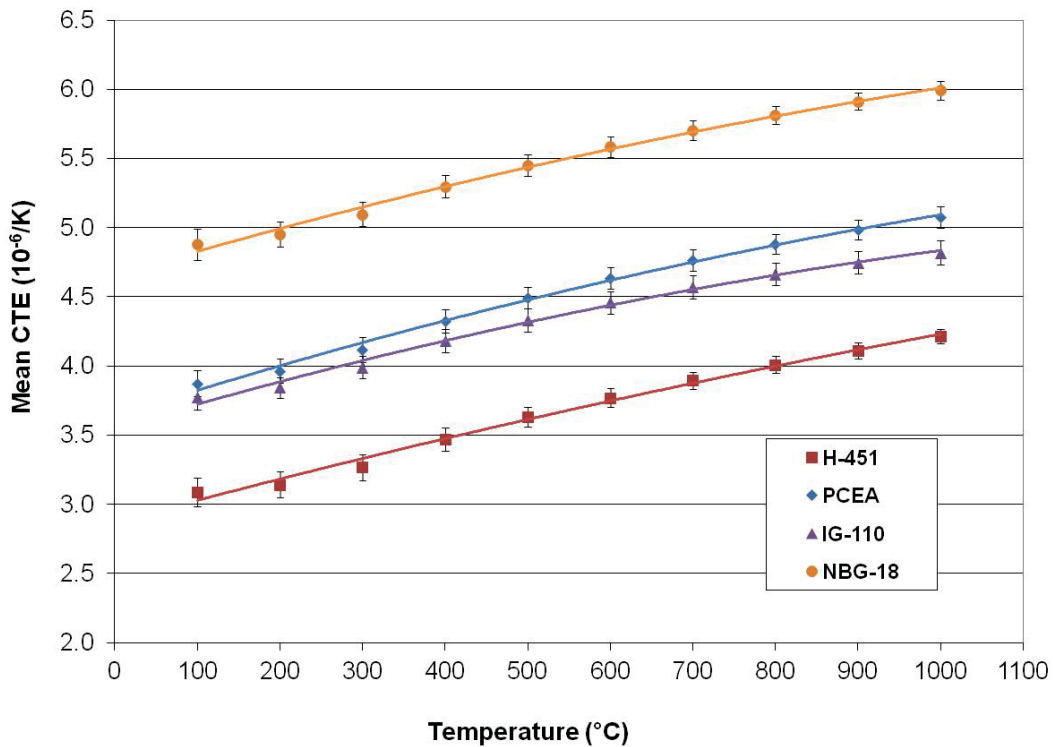


Figure 19. Mean coefficient of thermal expansion for several types of nuclear-grade graphite as a function of temperature. Error bars represent ± 1 standard deviation in the data used to obtain the averages plotted.

Measurements of CTE were performed on both with-grain and against-grain specimens. Figure 20 shows the CTE anisotropy ratio for the same primary grades of graphite as a function of temperature. All are relatively constant with temperature. As in other properties, the new grades are more isotropic.

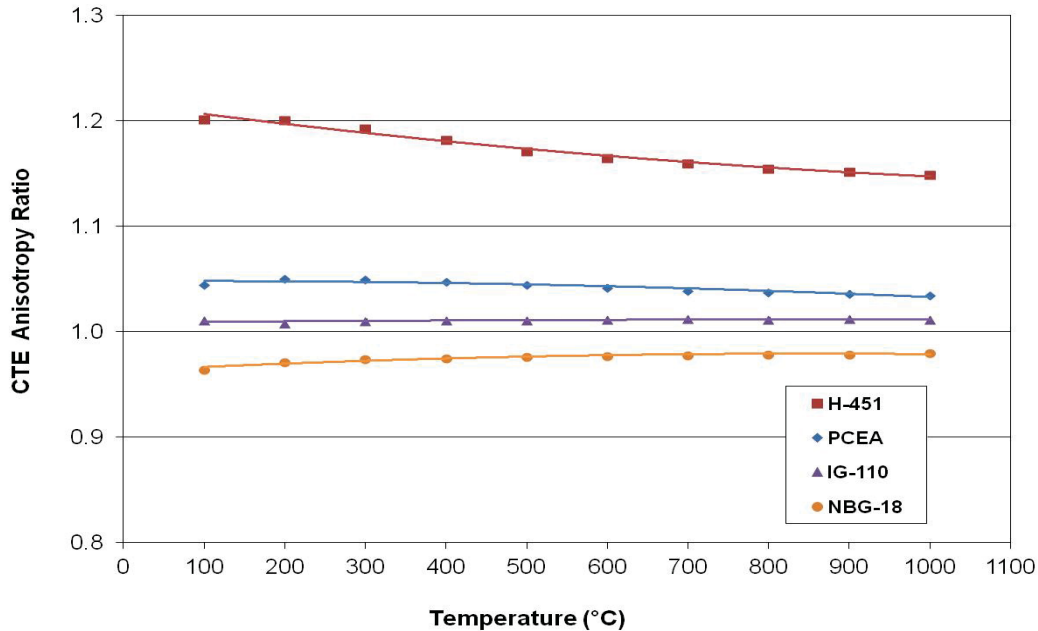


Figure 20. Coefficient of thermal expansion anisotropy ratio for several types of nuclear-grade graphite as a function of temperature.

6.6 Thermal Diffusivity

Plots of thermal diffusivity are shown in Figures A-203 through A-266. As with the CTE data, discrete temperatures of 100, 500, and 1000°C were statistically evaluated. Table B-16a through B-18c contain values of the mean, standard deviation, and COV. Four graphite types show COVs that are higher than the measurement uncertainty of $\pm 3\%$. Graphite types A3 Matrix and New Matrix are both extremely small-batch graphite specimens, mixed and pressed individually with intentional variations in their composition. Therefore, it is not surprising that these specimens vary in their thermal diffusivity. The variation in diffusivity of PCEA is most likely due to the material variable called wiggler porosity discussed in Section 3.1, and it is speculated that the variation in H-451 is also due to material variability in the billet. For the most part, the diffusivity data are well-behaved, with only a few values that somewhat exceed the IQR limits and again are most likely a result of slight material variability.

Figure 21 shows the average thermal diffusivity for four of the primary graphites of interest. Error bars are ± 1 standard deviation and, in most cases, are smaller than the plotted symbol. Also shown on the alternate ordinate is the percent difference between the historical grade of graphite H-451 and the relatively new grade, IG-110. The current grades of graphite all have a lower diffusivity than the historical grade, H-451, with IG-110 being 20–33% lower, depending on the temperature. H-451 is an extruded grade graphite made with relatively large filler coke particle size (0.5 mm). IG-110 is an isomolded graphite and has a filler particle size of 20 microns. This is why H-451 has a high diffusivity in the with-grain orientation. As seen in the CTE measurements, these differences in diffusivity are significant and will need to be considered in future reactor designs.

Figure 22 shows the anisotropy ratio for the same graphite grades. The anisotropy for all grades of graphite are constant with temperature, and as with the other properties, the current grades of graphite show much-improved isotropy of thermal diffusivity.

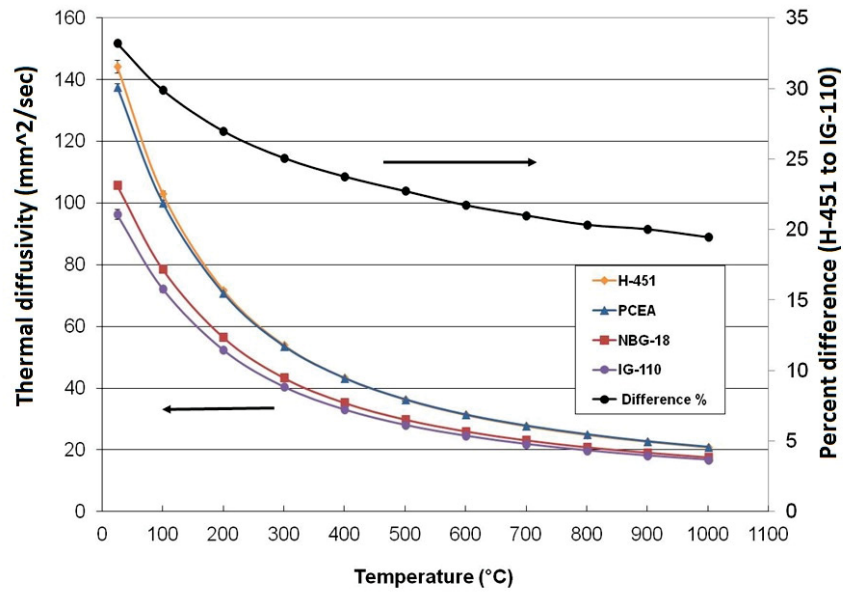


Figure 21. Thermal diffusivity for various with-grain graphite types. Error bars are 1 standard deviation in the data and in some cases smaller than the data symbol. The percent difference between H451 and IG-110 is plotted on the right-hand scale.

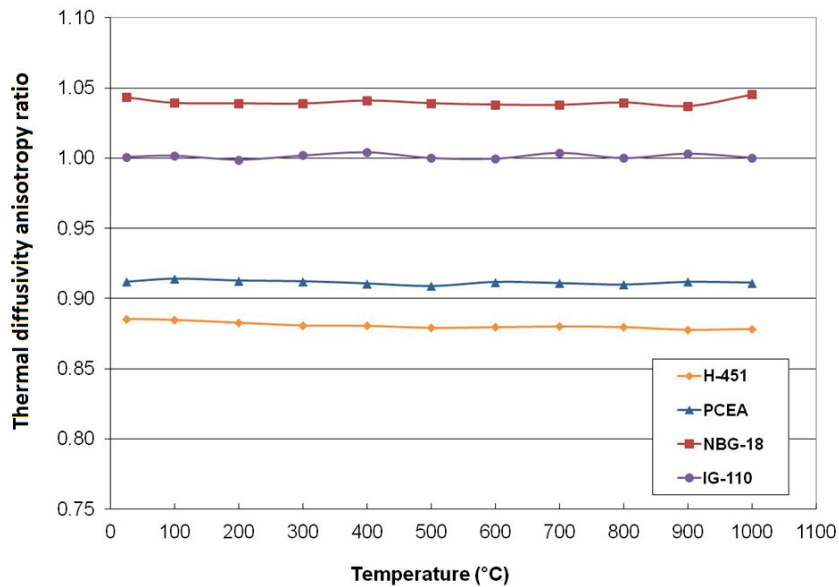


Figure 22. Thermal diffusivity anisotropy ratio for several types of nuclear-grade graphite as a function of temperature.

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Appendix A

Data Plots

Appendix A Data Plots

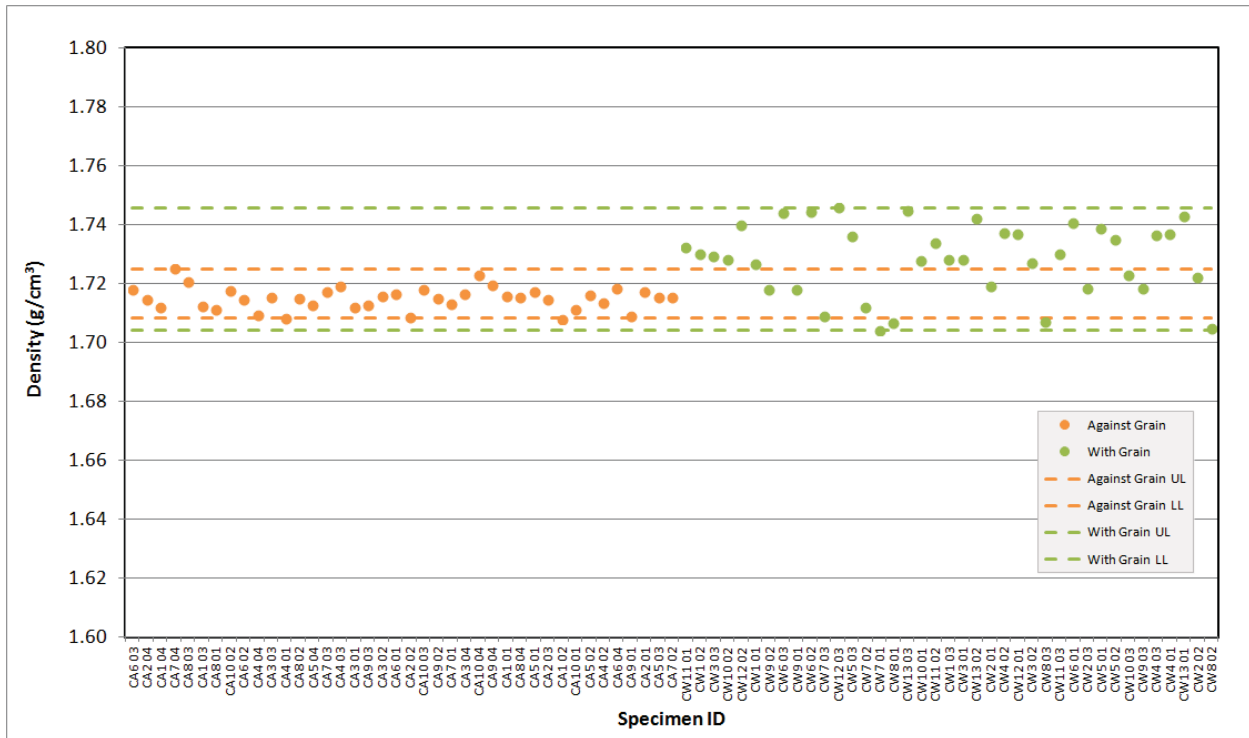


Figure A-1. H-451 Creep Pre Thermal Measurement Density.

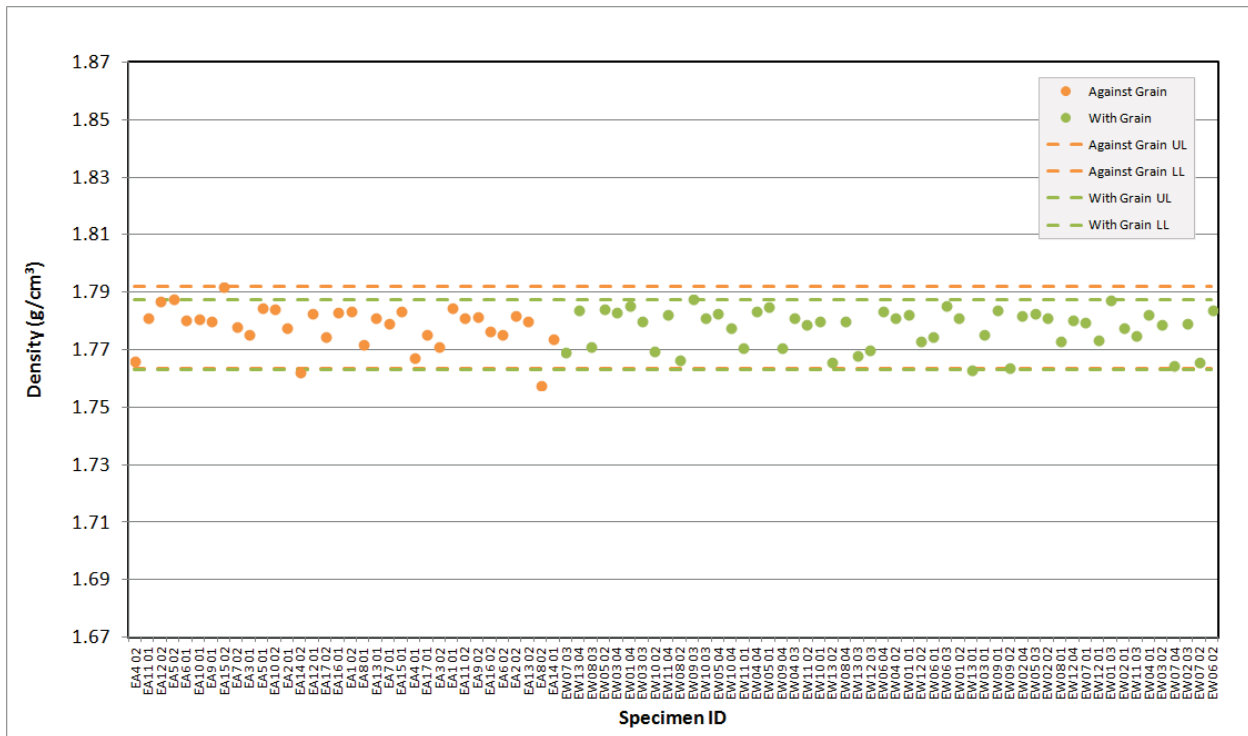


Figure A-2. IG-110 Creep Pre Thermal Measurement Density.

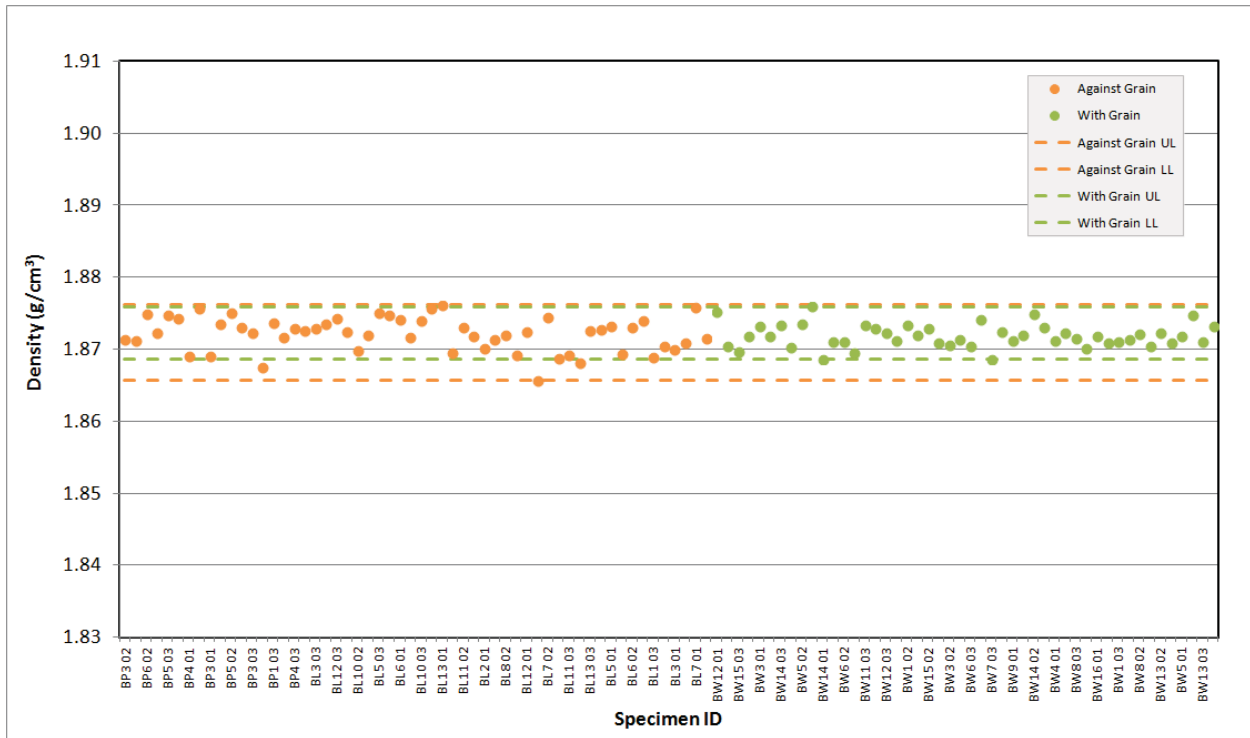


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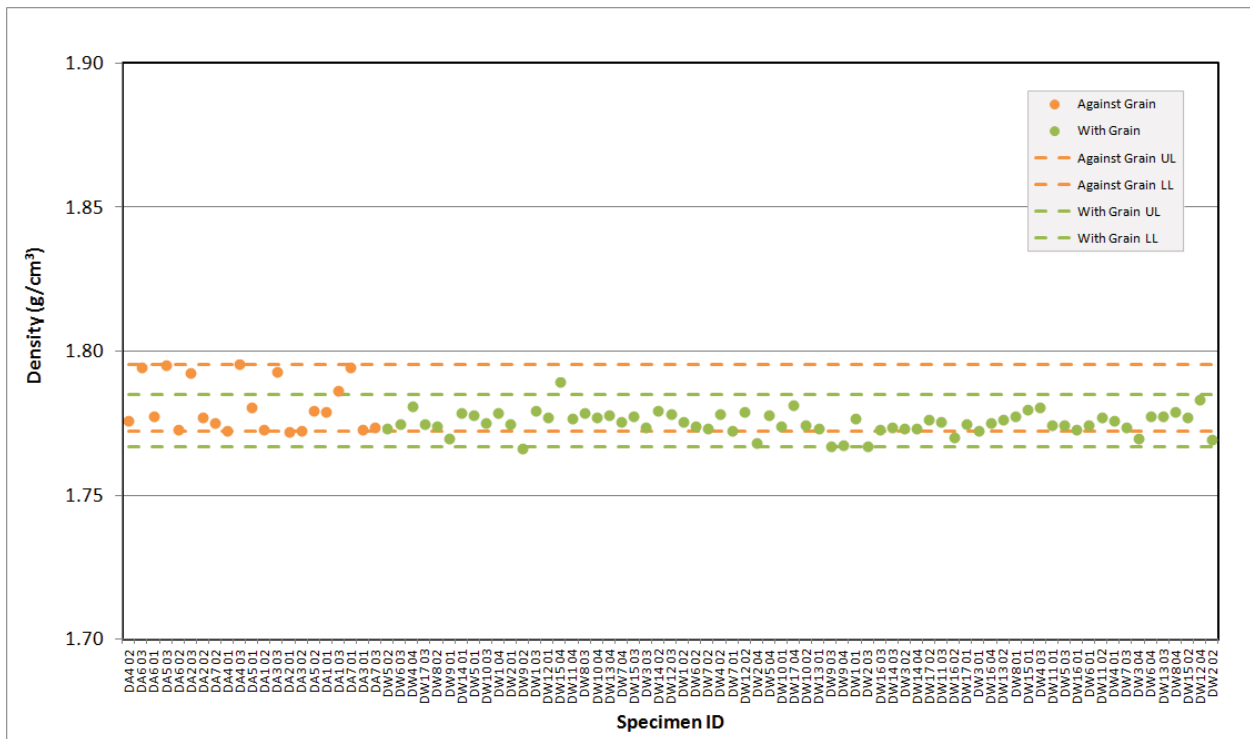


Figure A-6. PCEA Creep Pre Thermal Measurement Density.

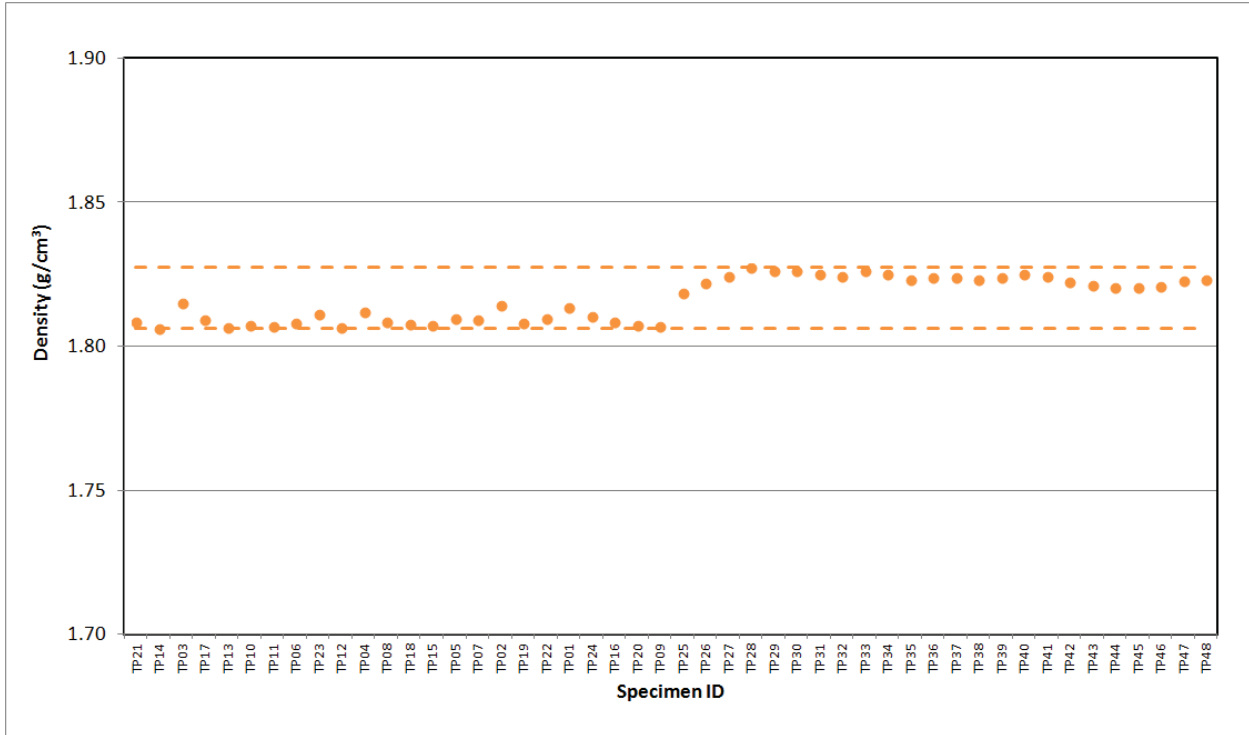


Figure A-7. 2114 Piggyback Pre Thermal Measurement Density.

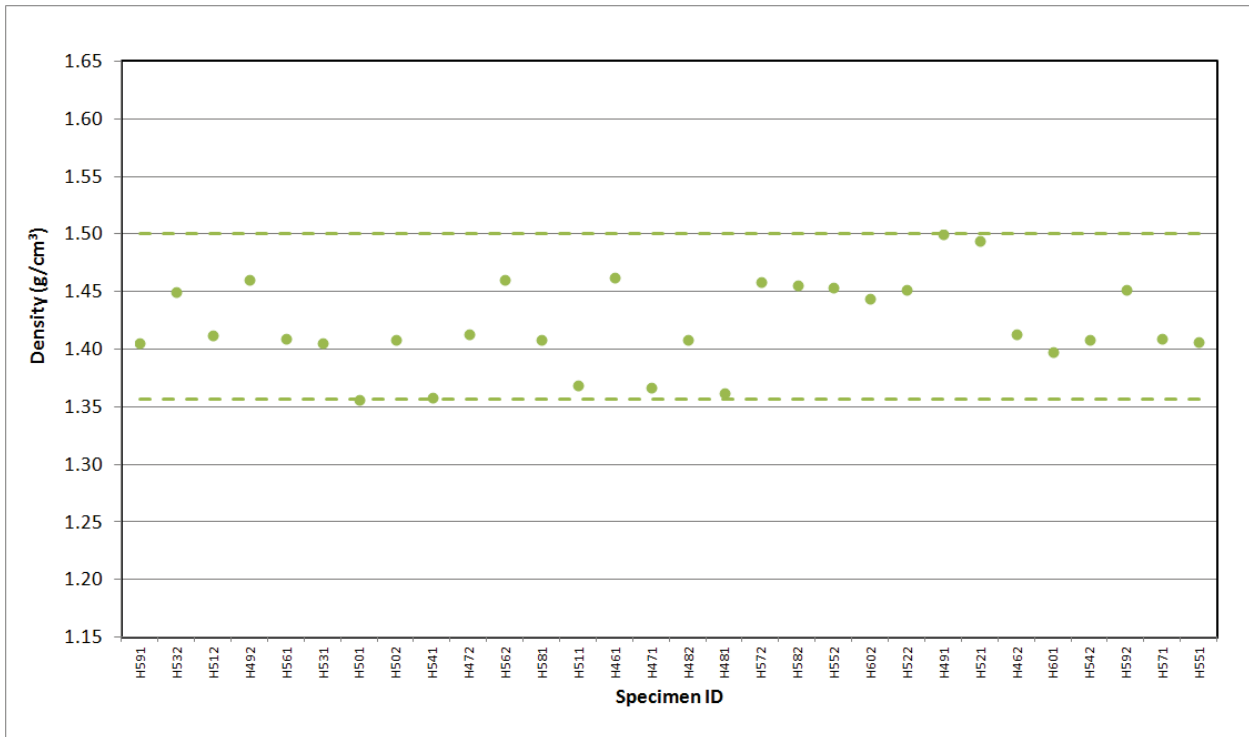


Figure A-8. A3 Matrix Piggyback Pre Thermal Measurement Density.

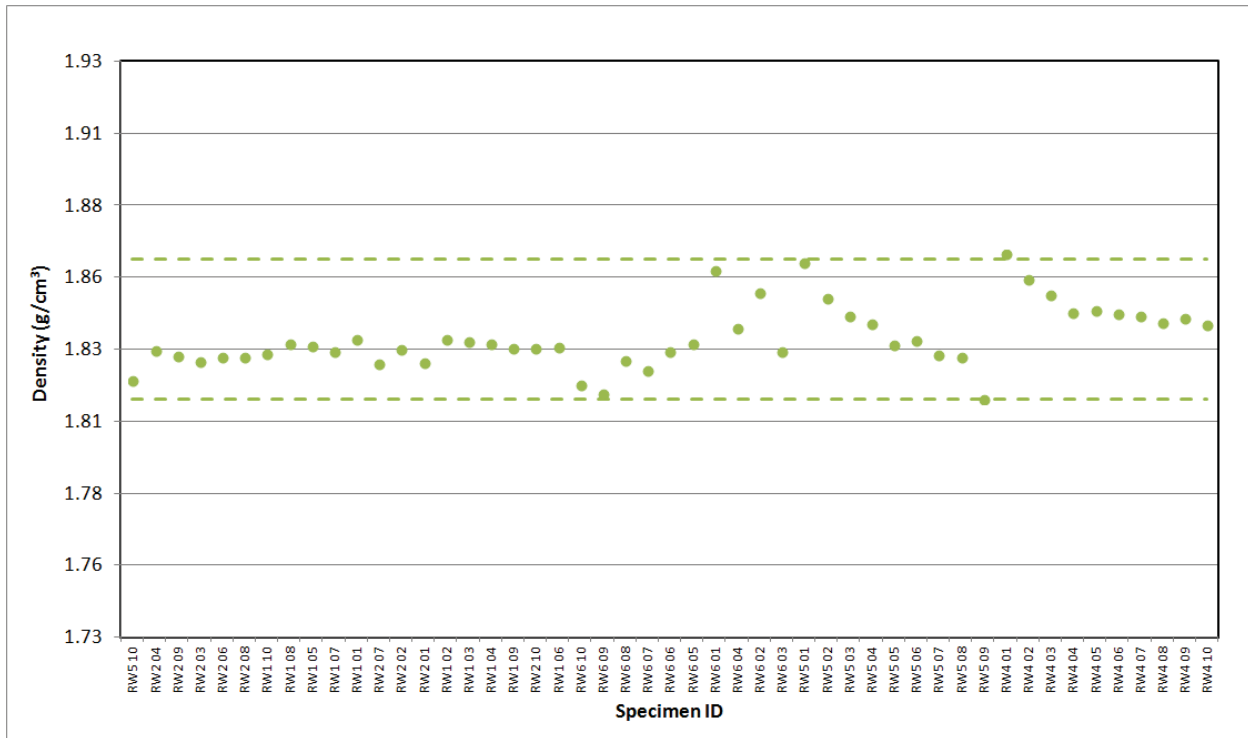


Figure A-9. BAN Piggyback Pre Thermal Measurement Density.

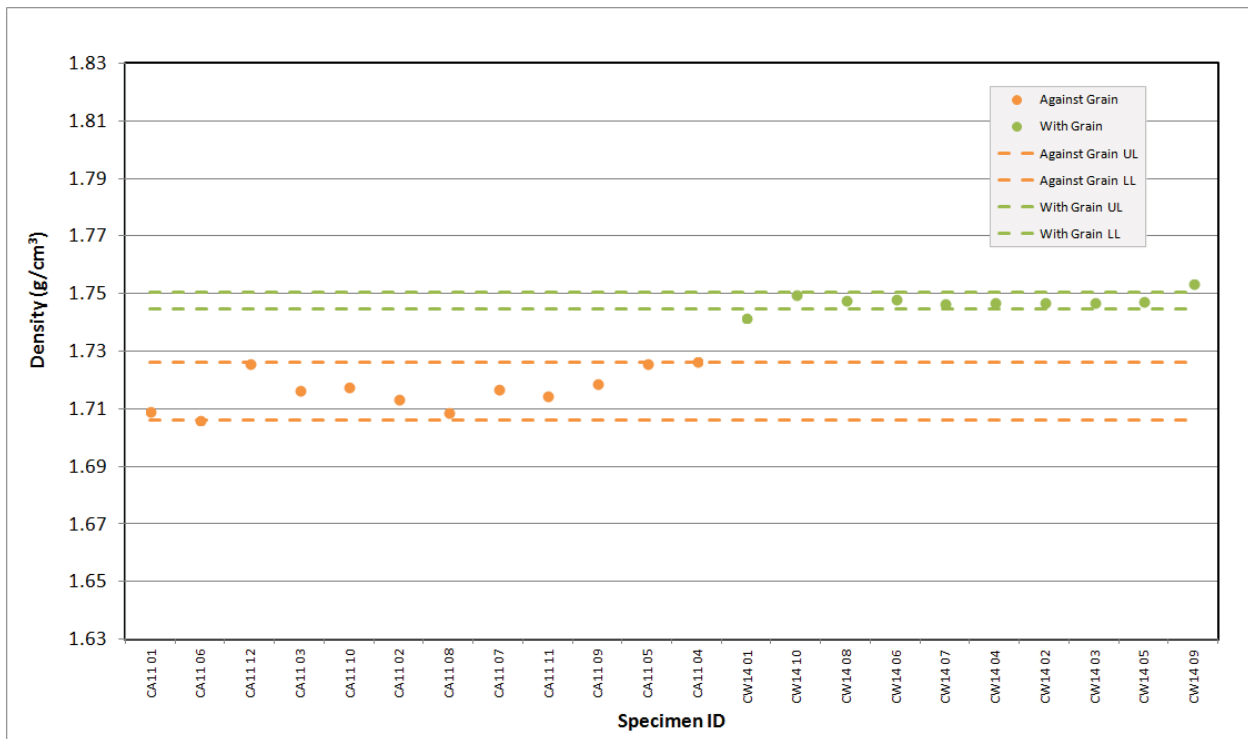


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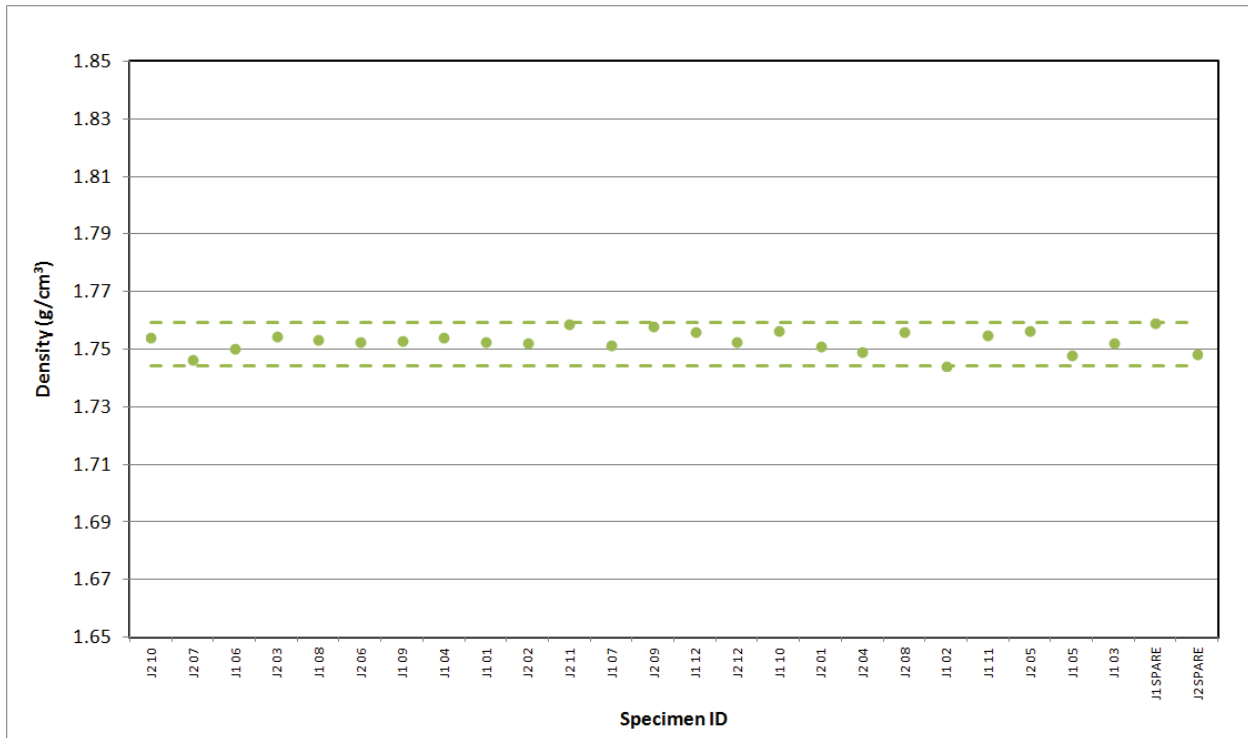


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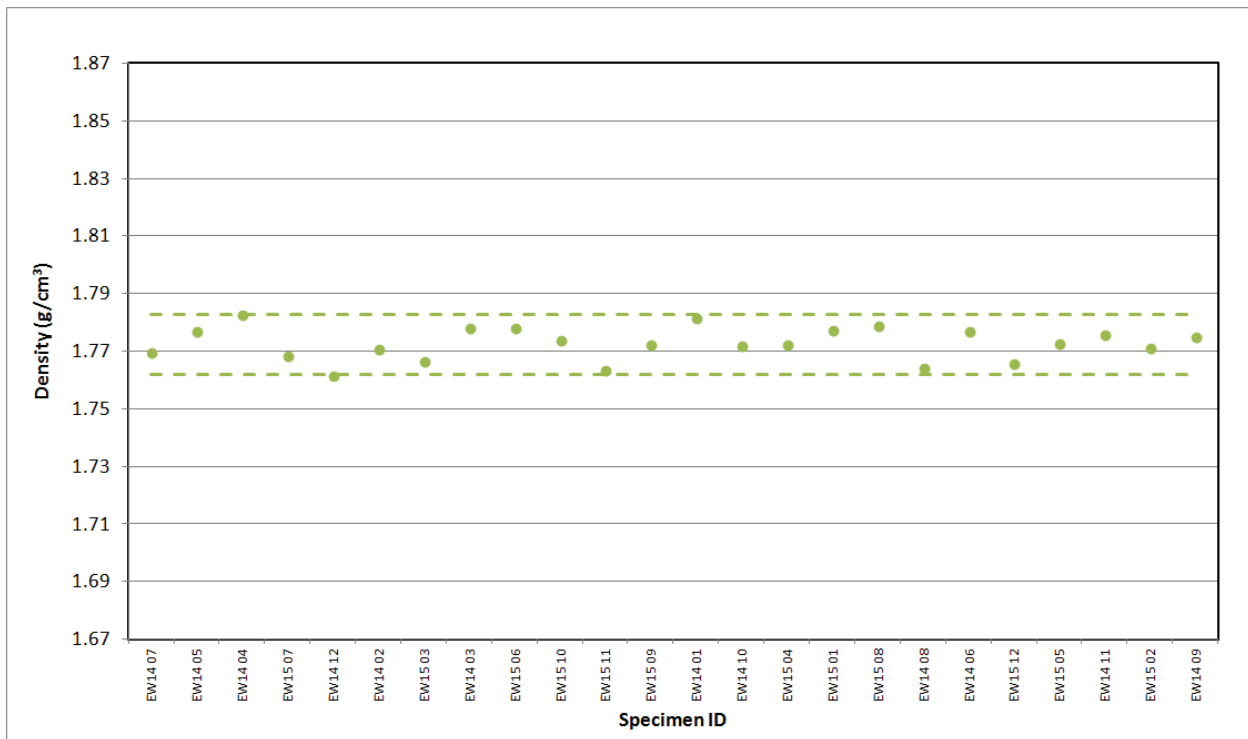


Figure A-12. IG-110 Piggyback Pre Thermal Measurement Density.

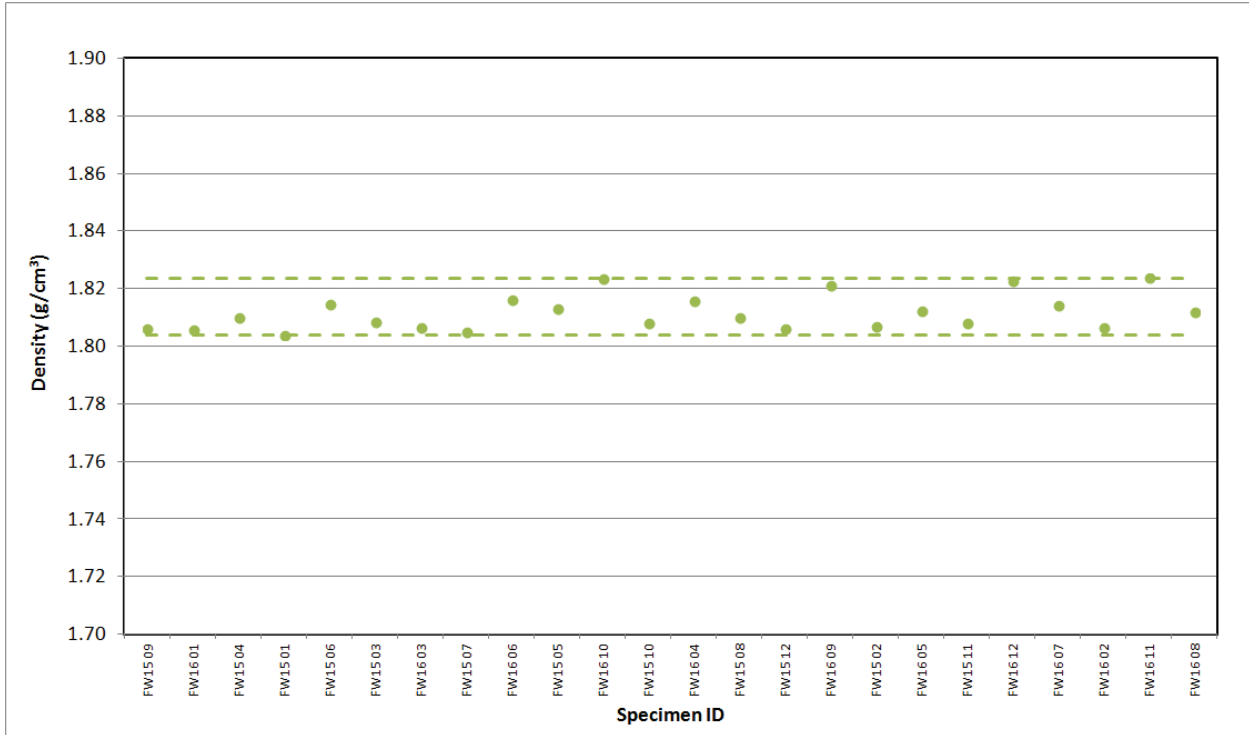


Figure A-13. IG-430 Piggyback Pre Thermal Measurement Density.

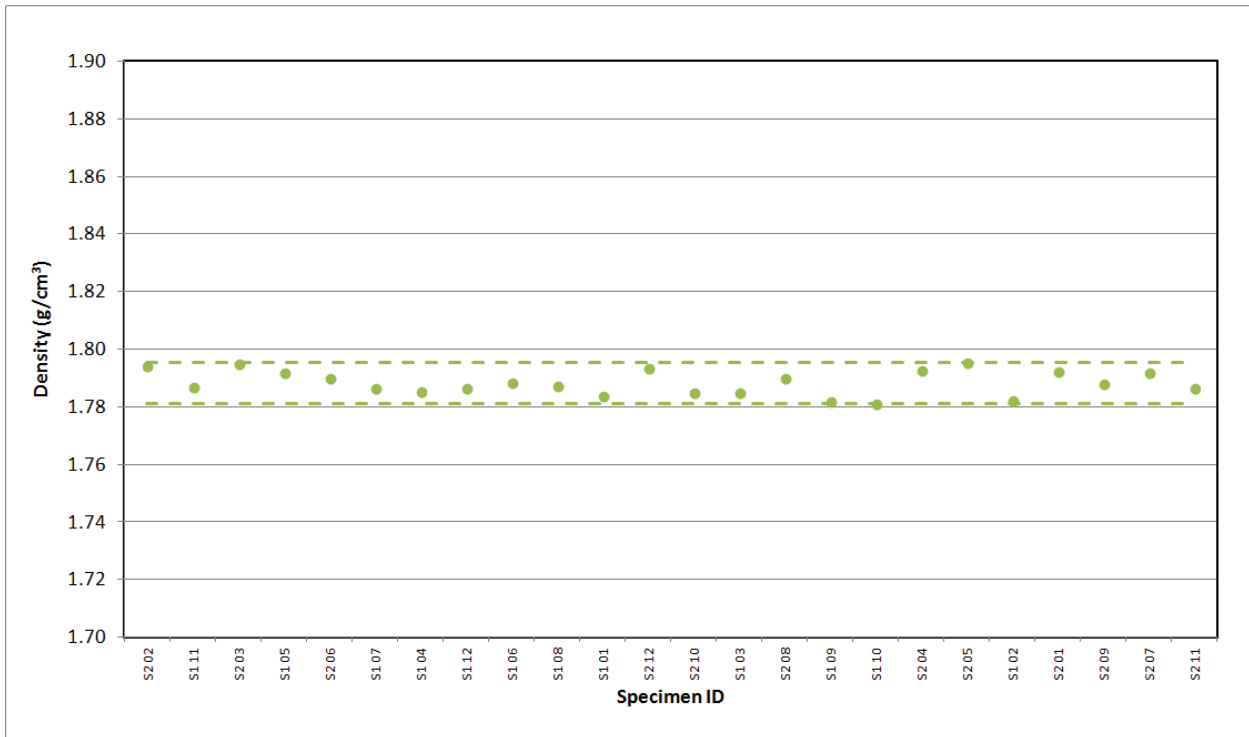


Figure A-14. NBG-10 Piggyback Pre Thermal Measurement Density.

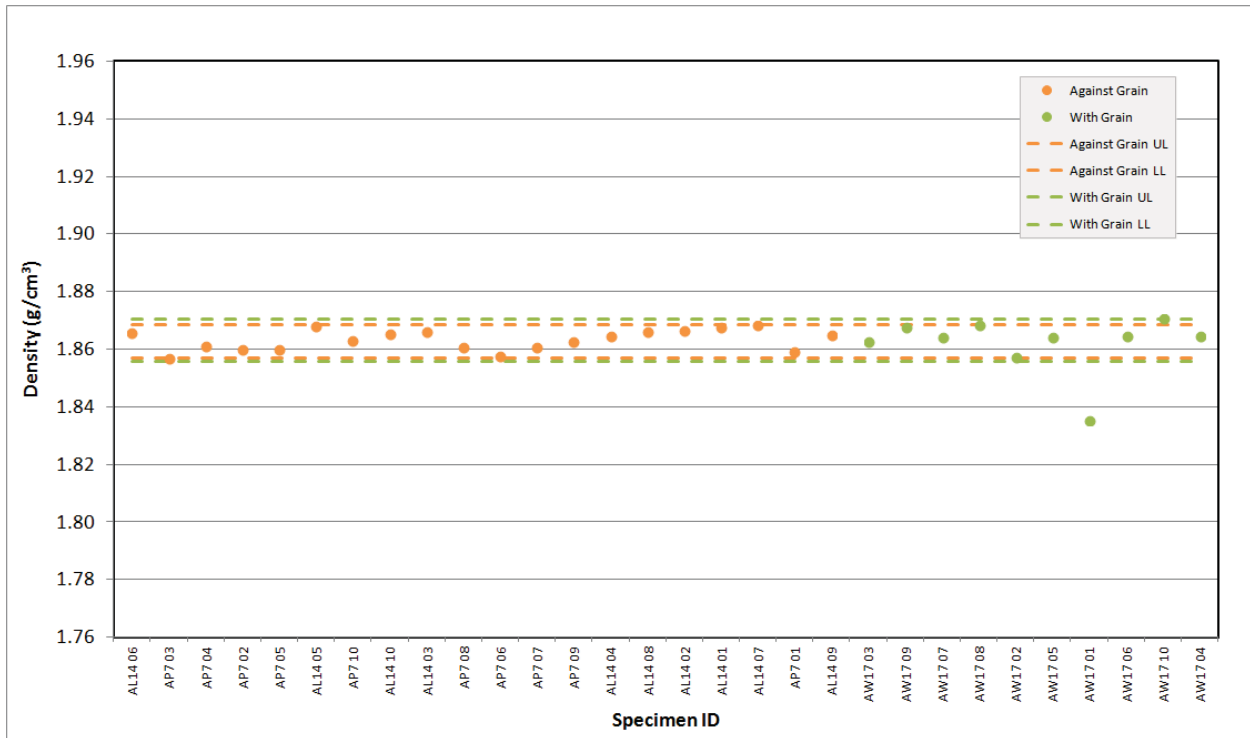


Figure A-15. NBG-17 Piggyback Pre Thermal Measurement Density.

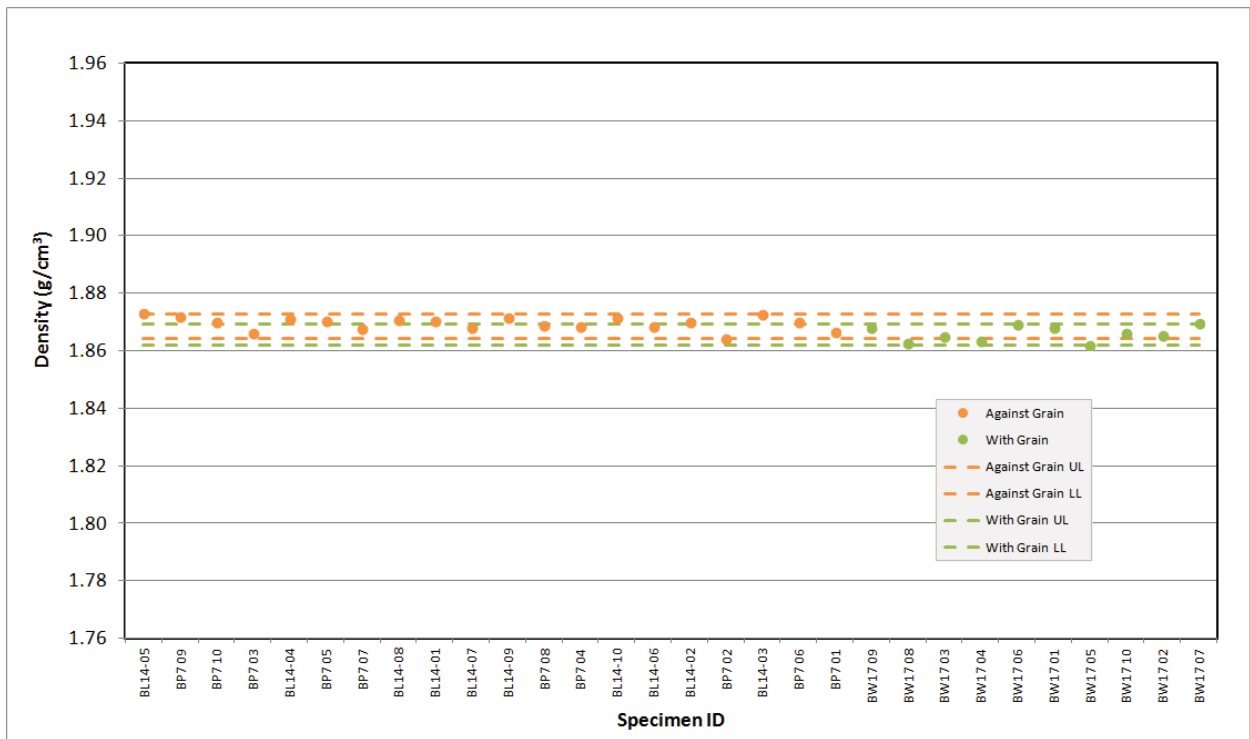


Figure A-16. NBG-18 Piggyback Pre Thermal Measurement Density.

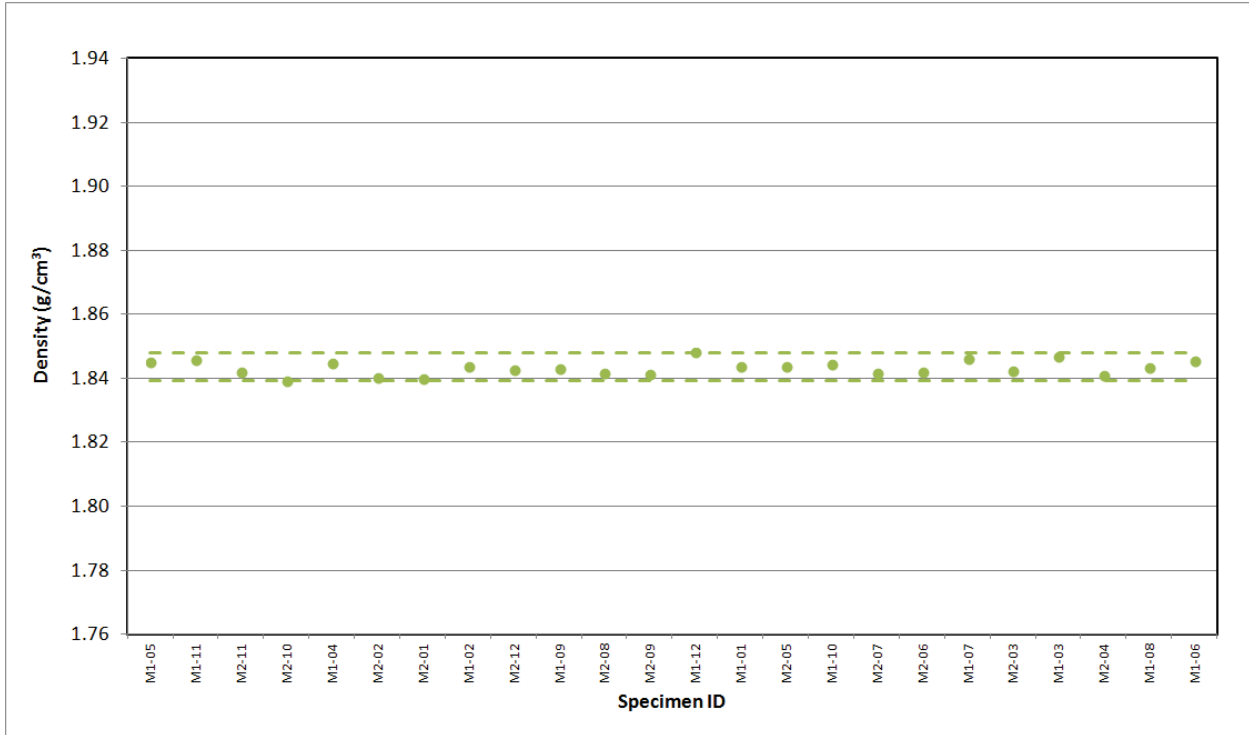


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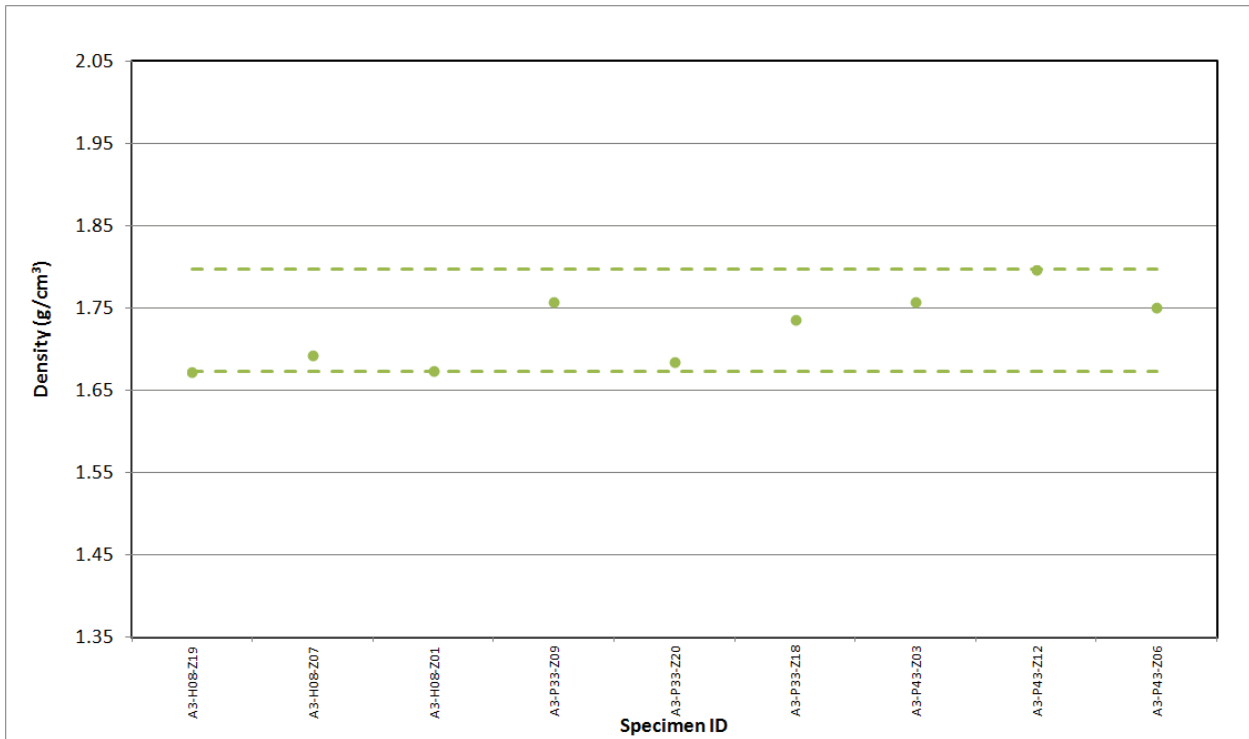


Figure A-18. New Matrix Piggyback Pre Thermal Measurement Density.

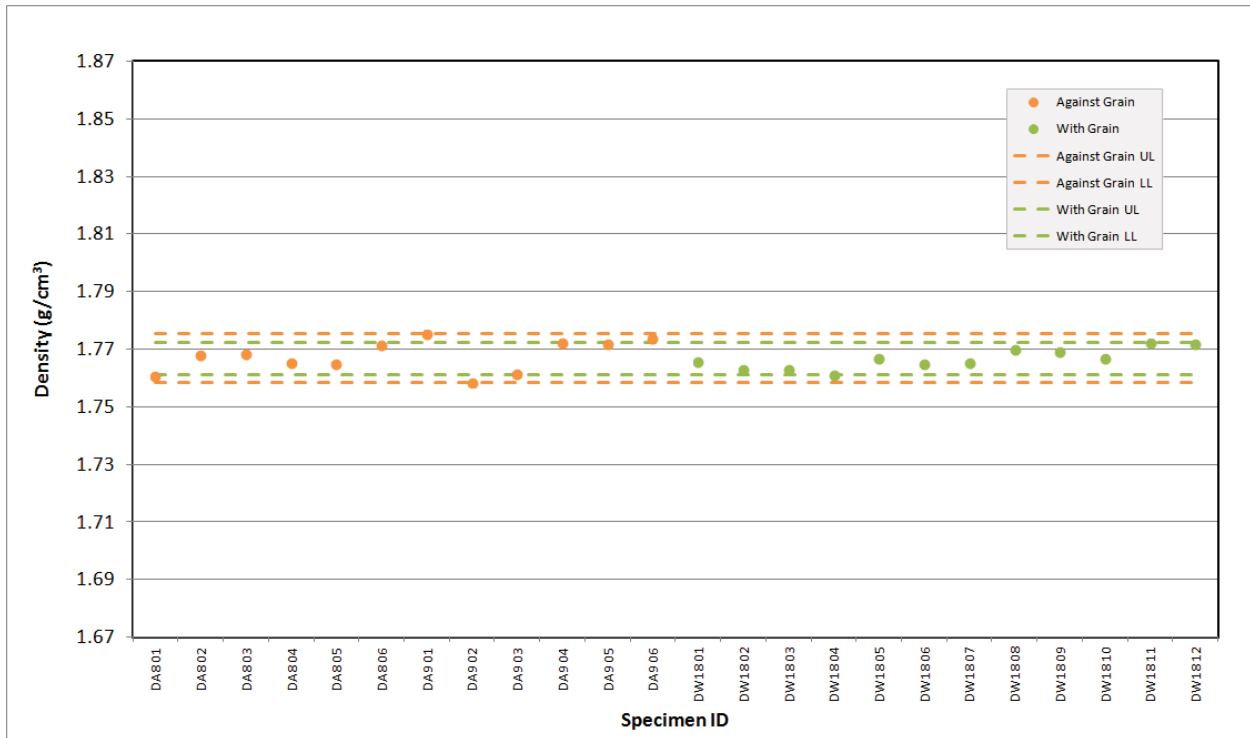


Figure A-19. PCEA Piggyback Pre Thermal Measurement Density.

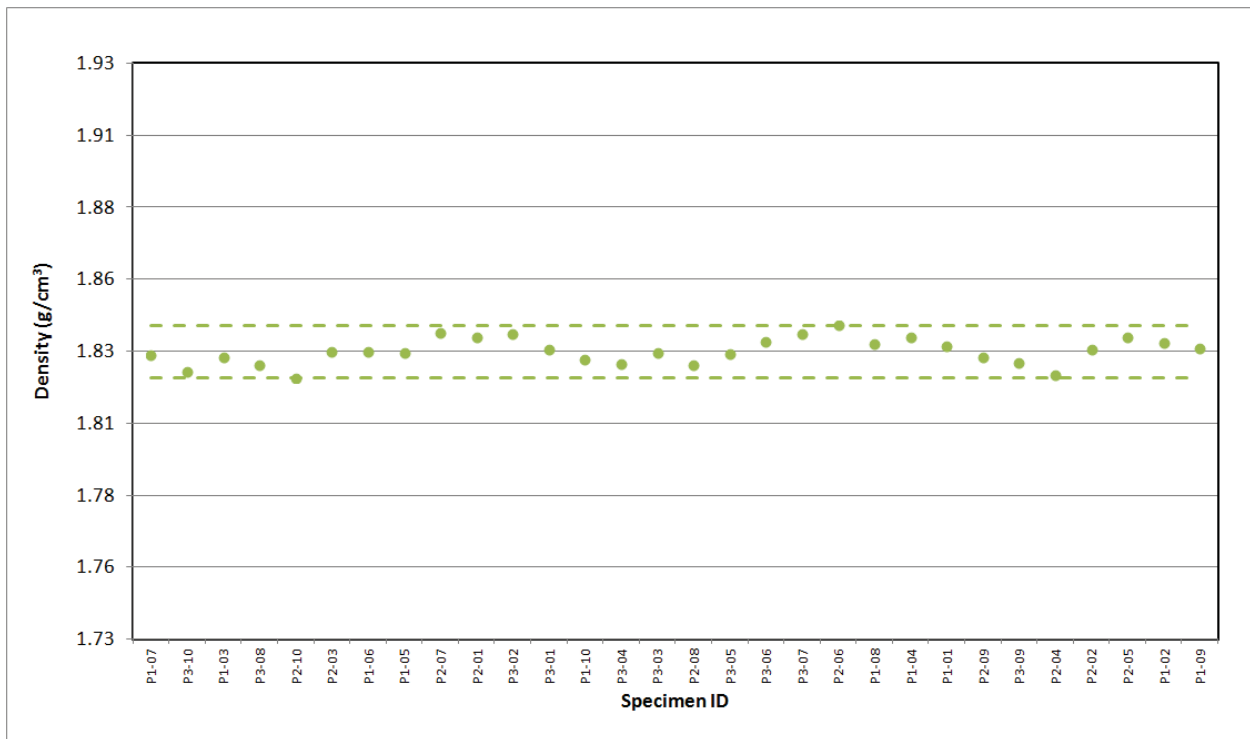


Figure A-20. PCIB Piggyback Pre Thermal Measurement Density.

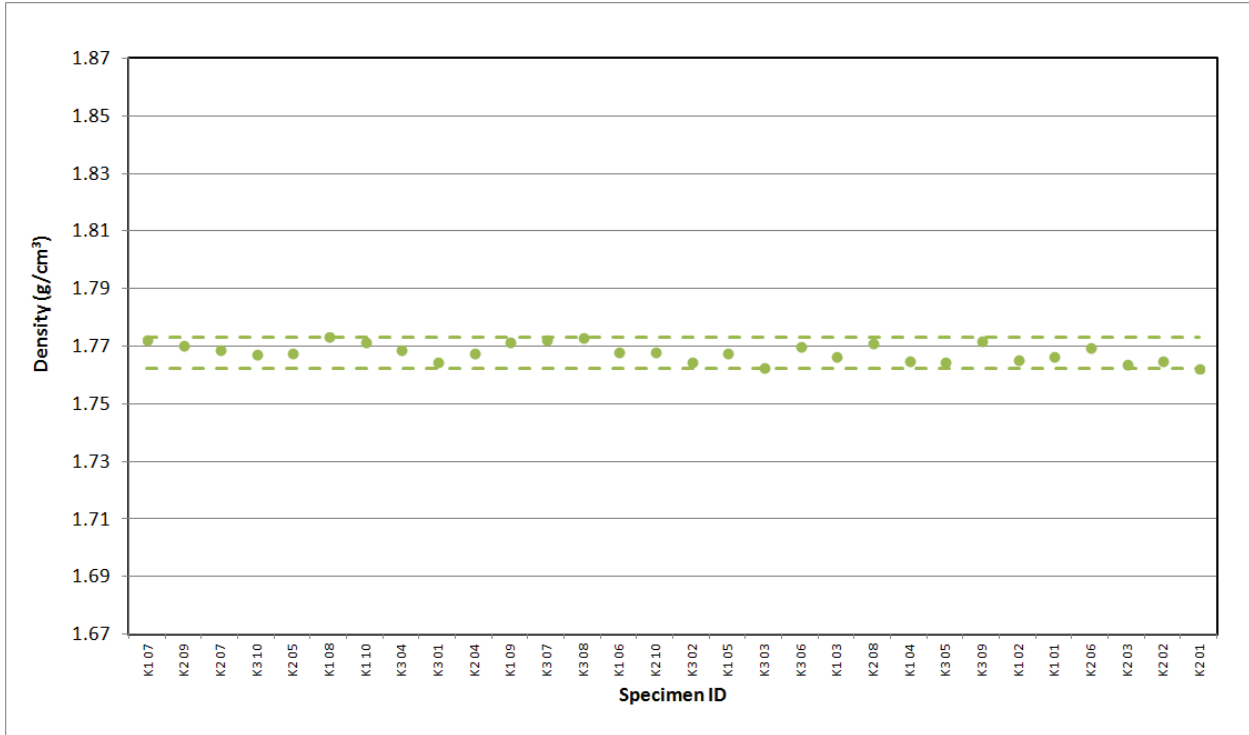


Figure A-21. PGX Piggyback Pre Thermal Measurement Density.

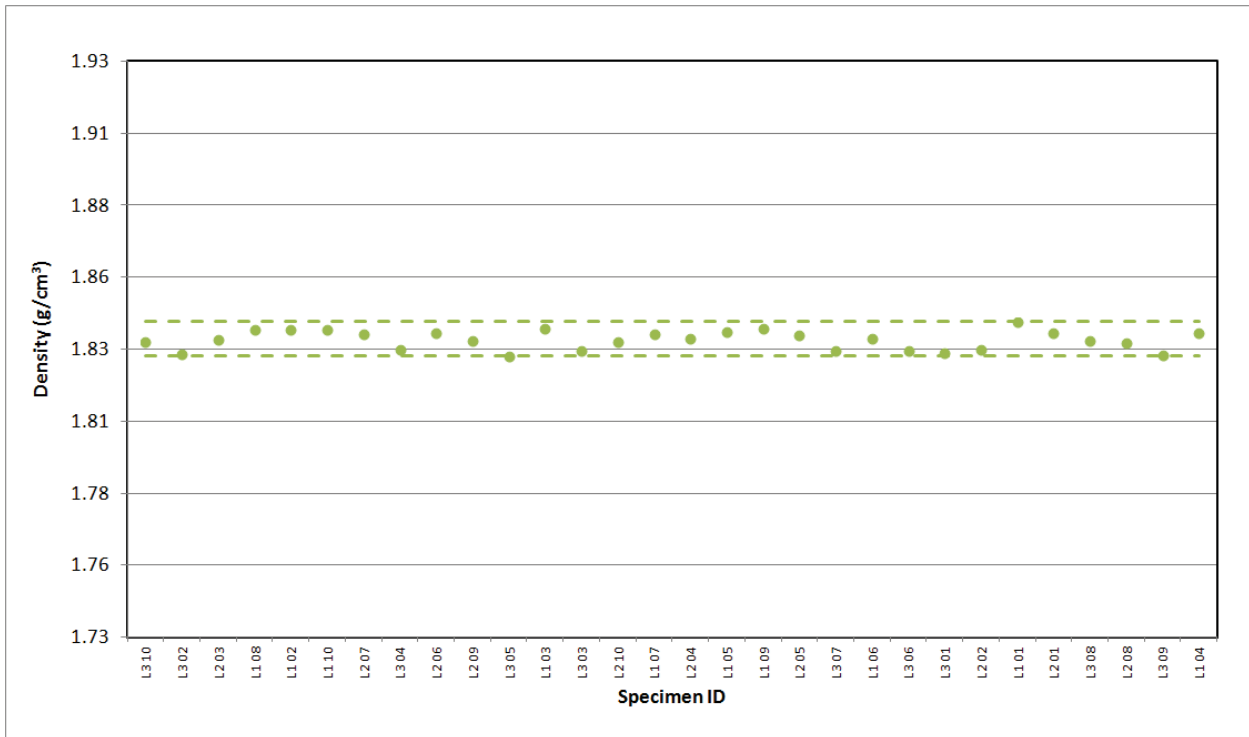


Figure A-22. PPEA Piggyback Pre Thermal Measurement Density.

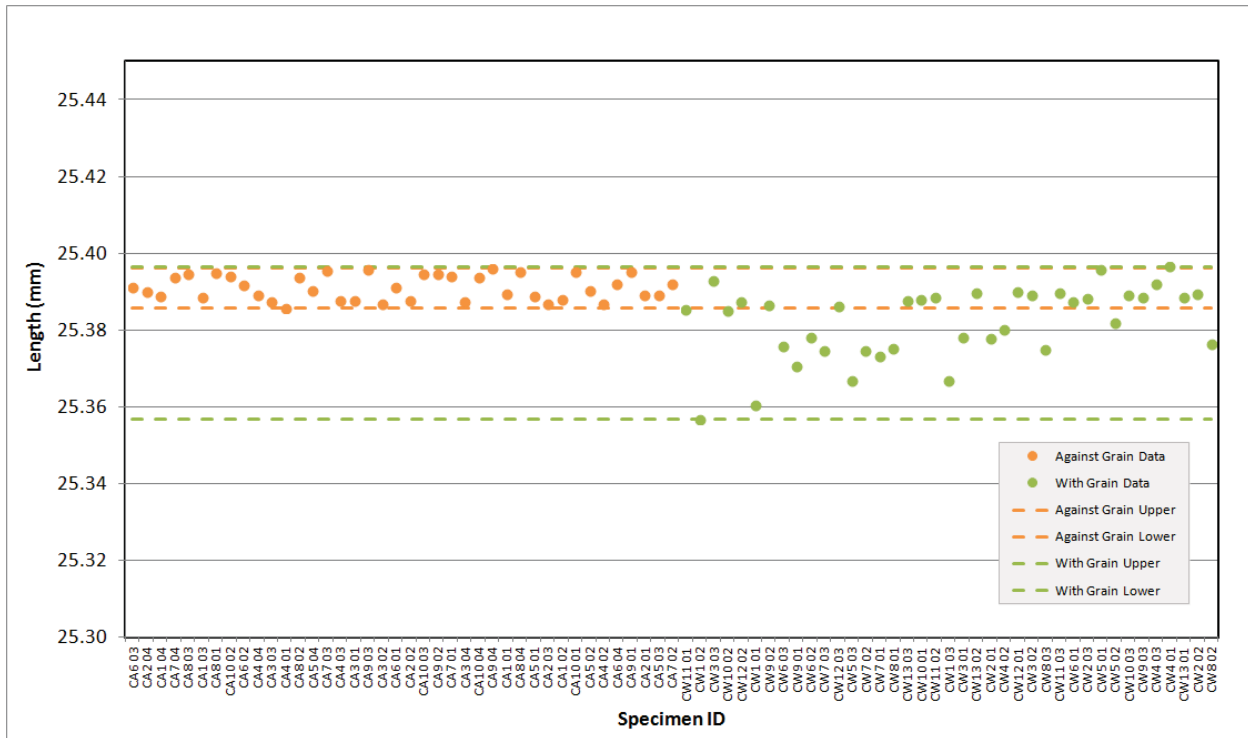


Figure A-23. H-451 Creep Pre Thermal Measurement Length.

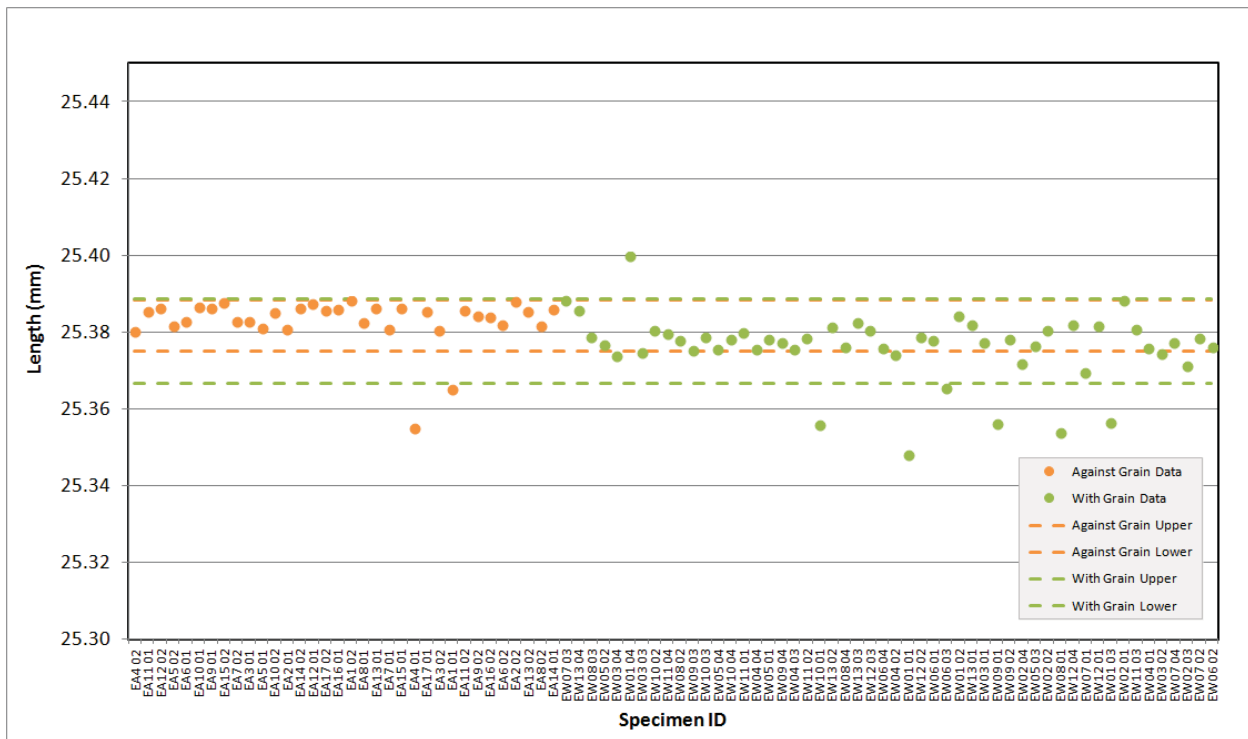


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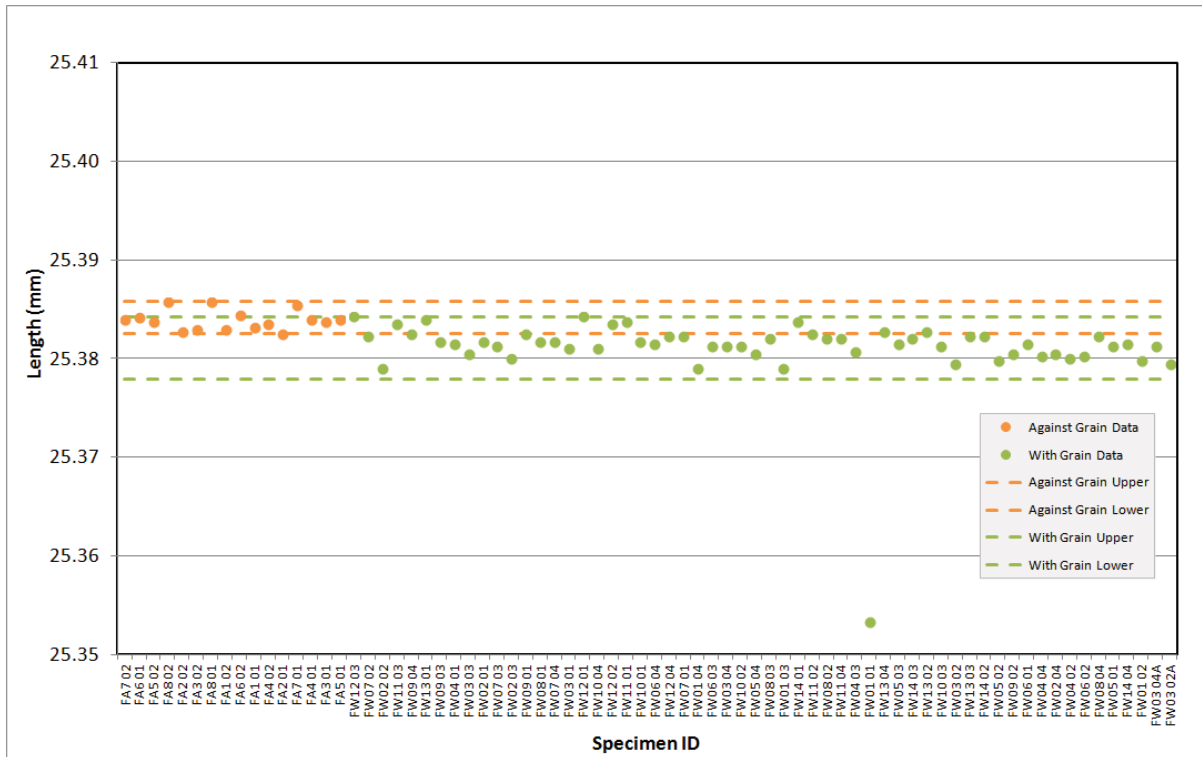


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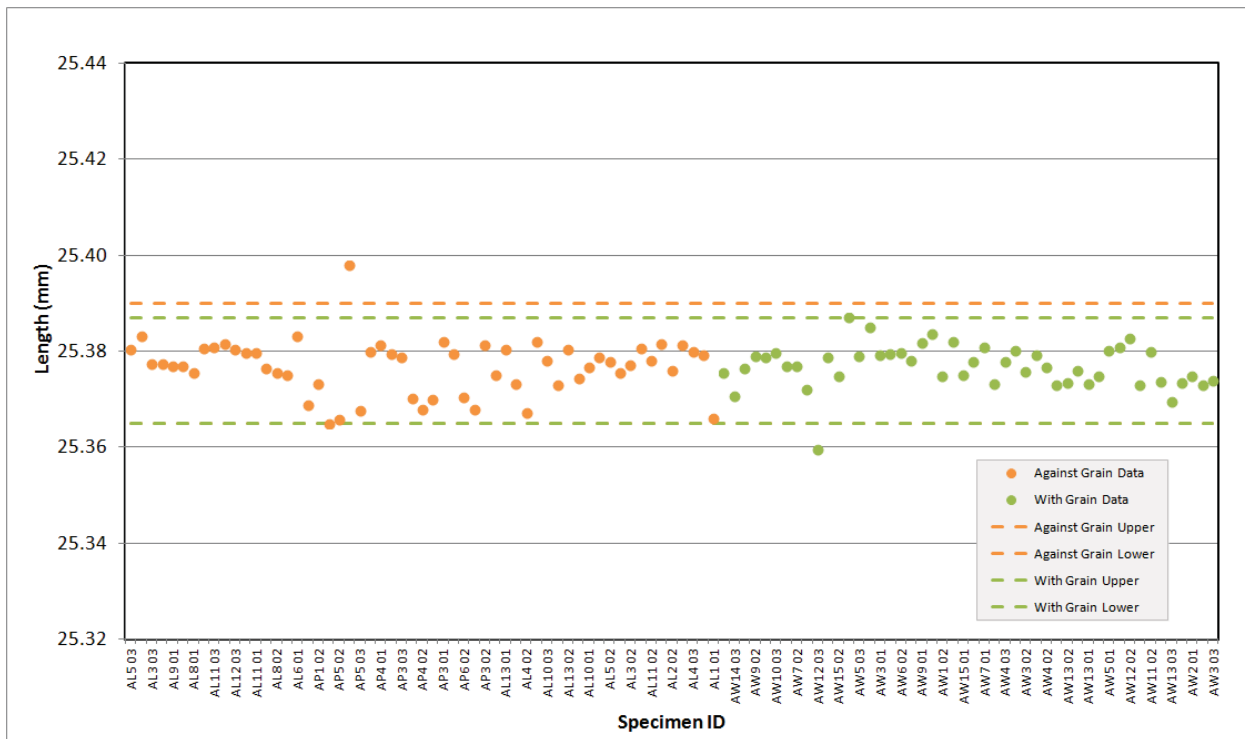


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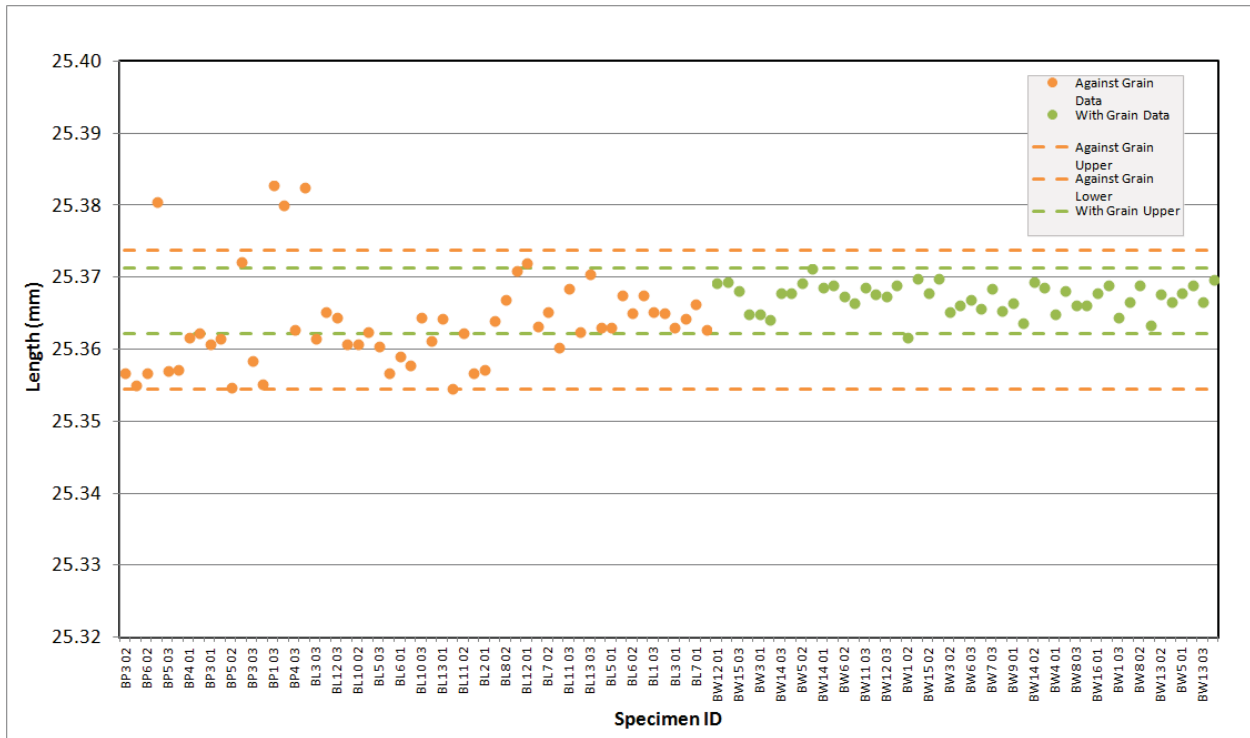


Figure A-27. NBG-18 Creep Pre Thermal Measurement Length.

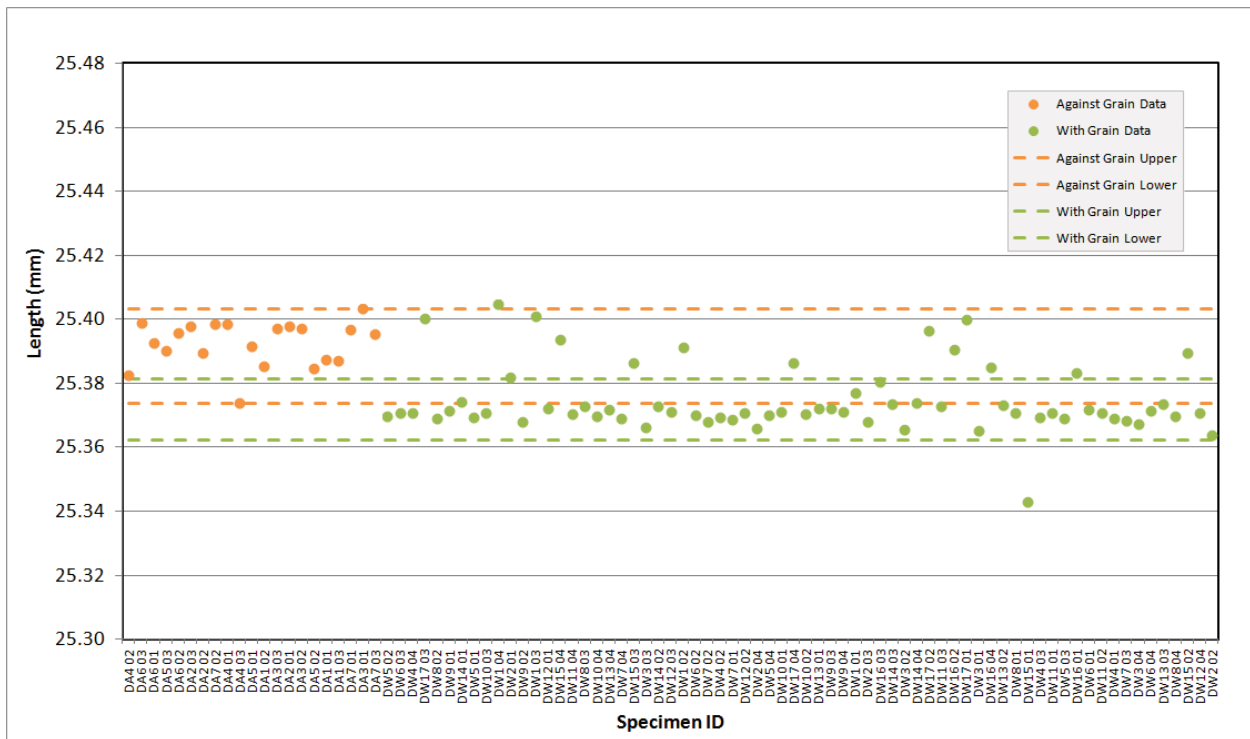


Figure A-28. PCEA Creep Pre Thermal Measurement Length.

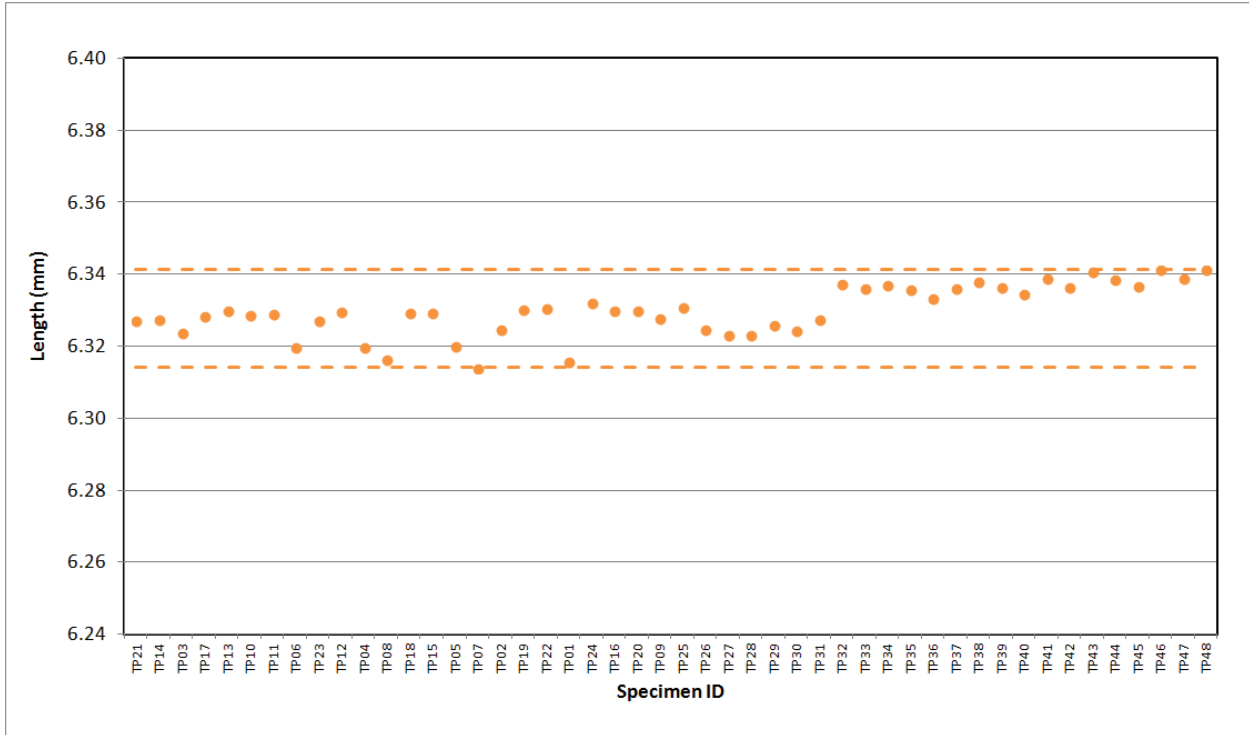


Figure A-29. 2114 Piggyback Pre Thermal Measurement Length.

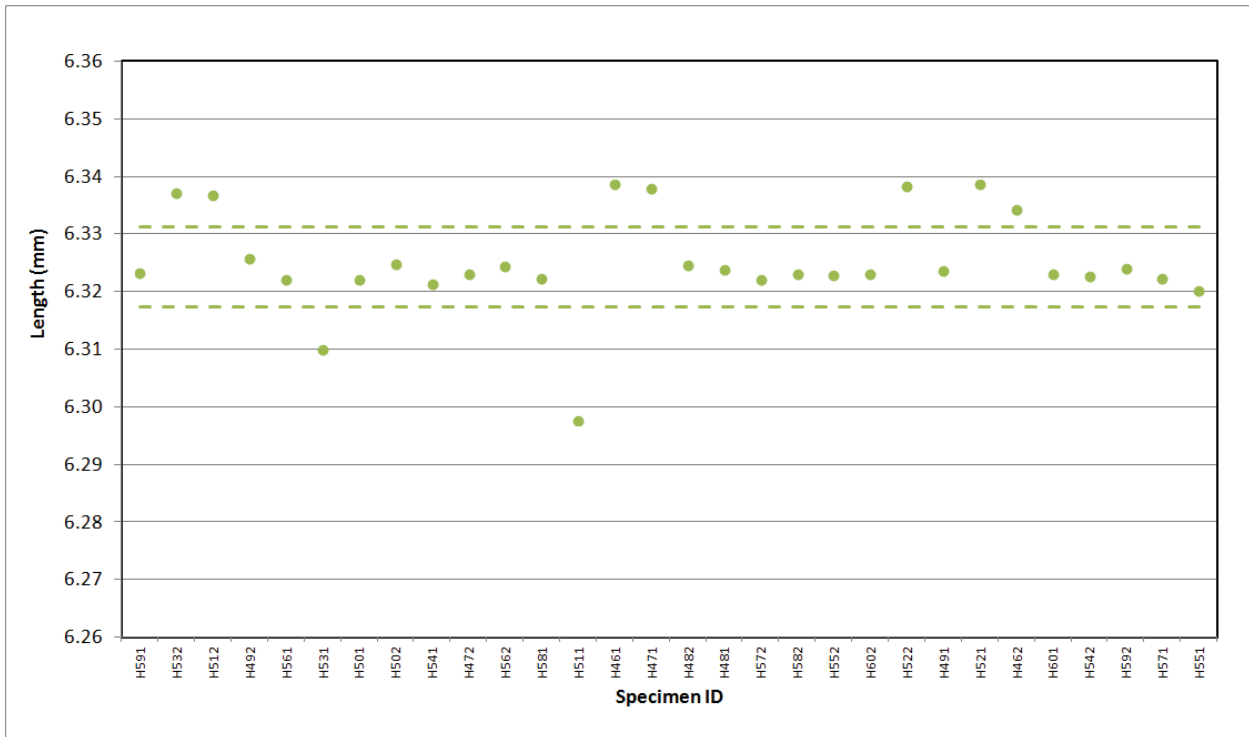


Figure A-30. A3 Matrix Piggyback Pre Thermal Measurement Length.

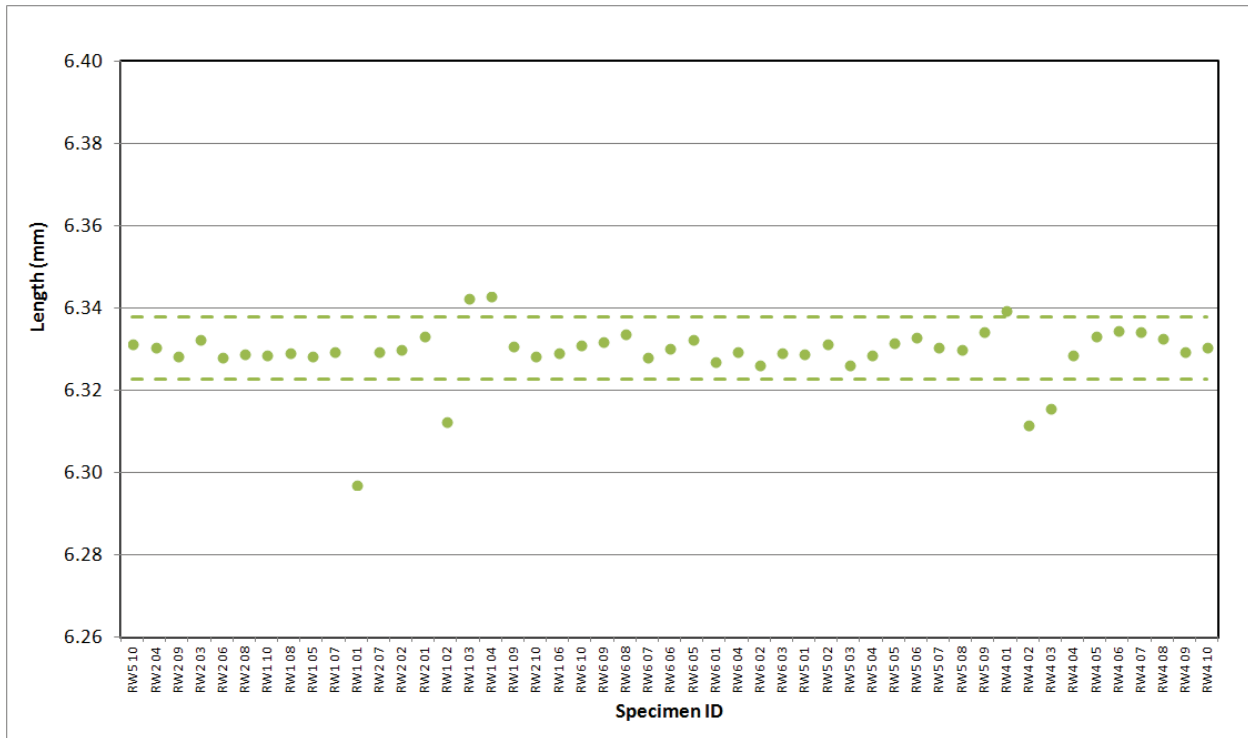


Figure A-31. BAN Piggyback Pre Thermal Measurement Length.

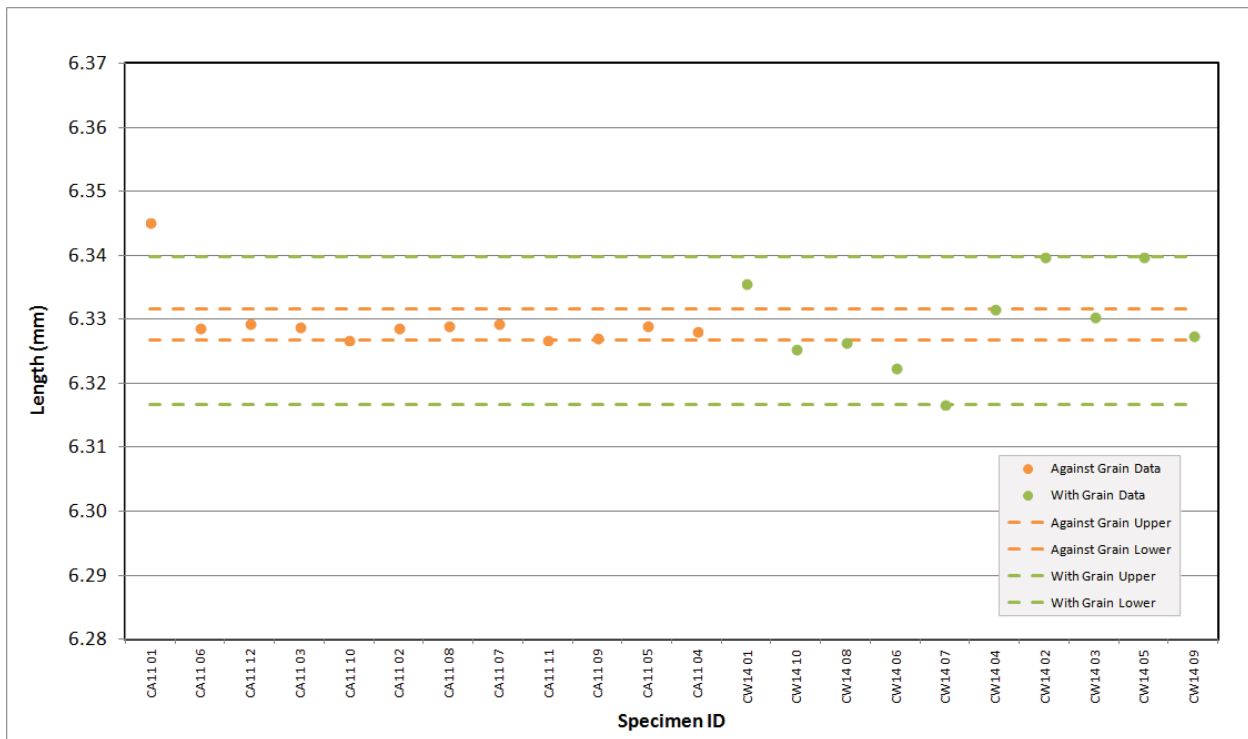


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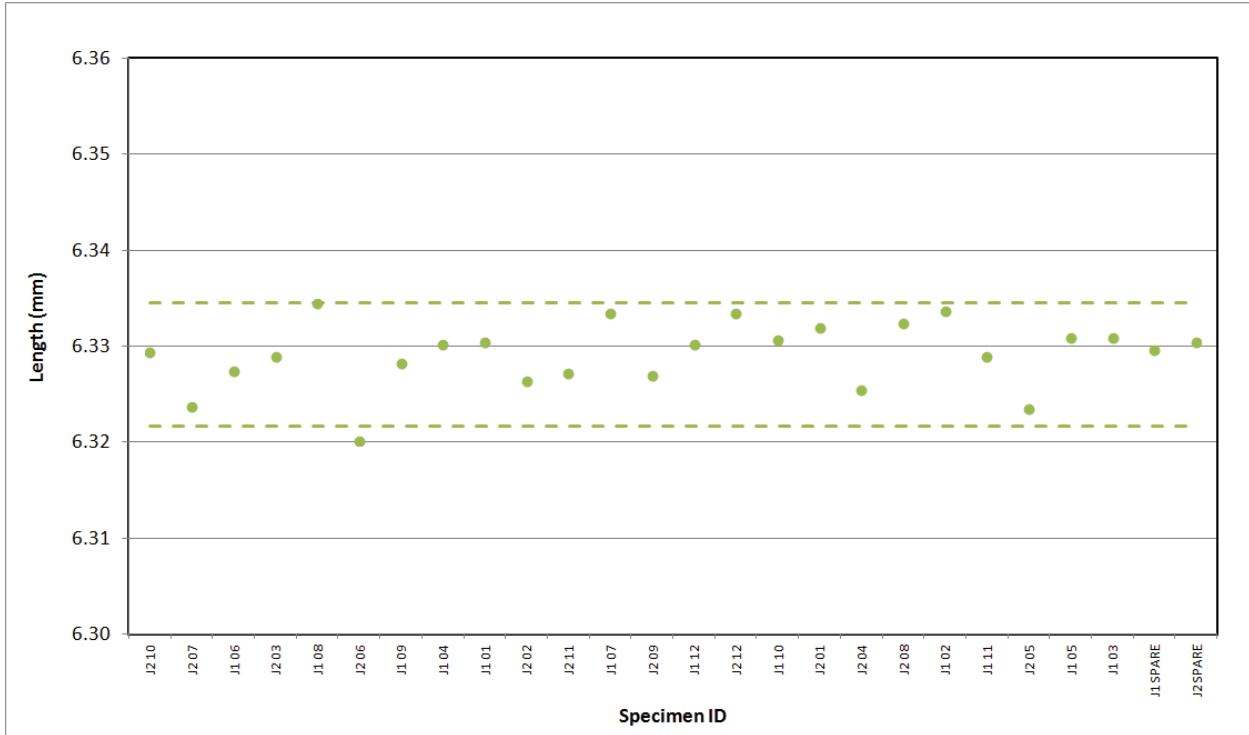


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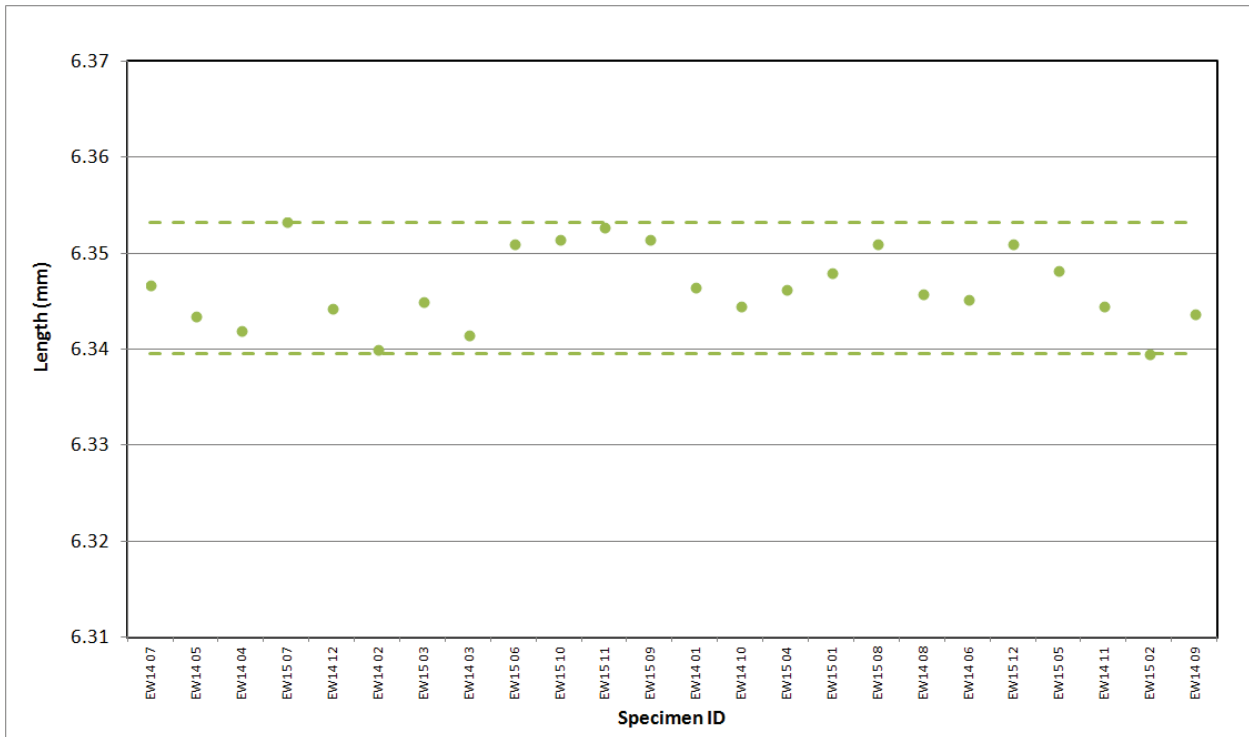


Figure A-34. IG-110 Piggyback Pre Thermal Measurement Length.

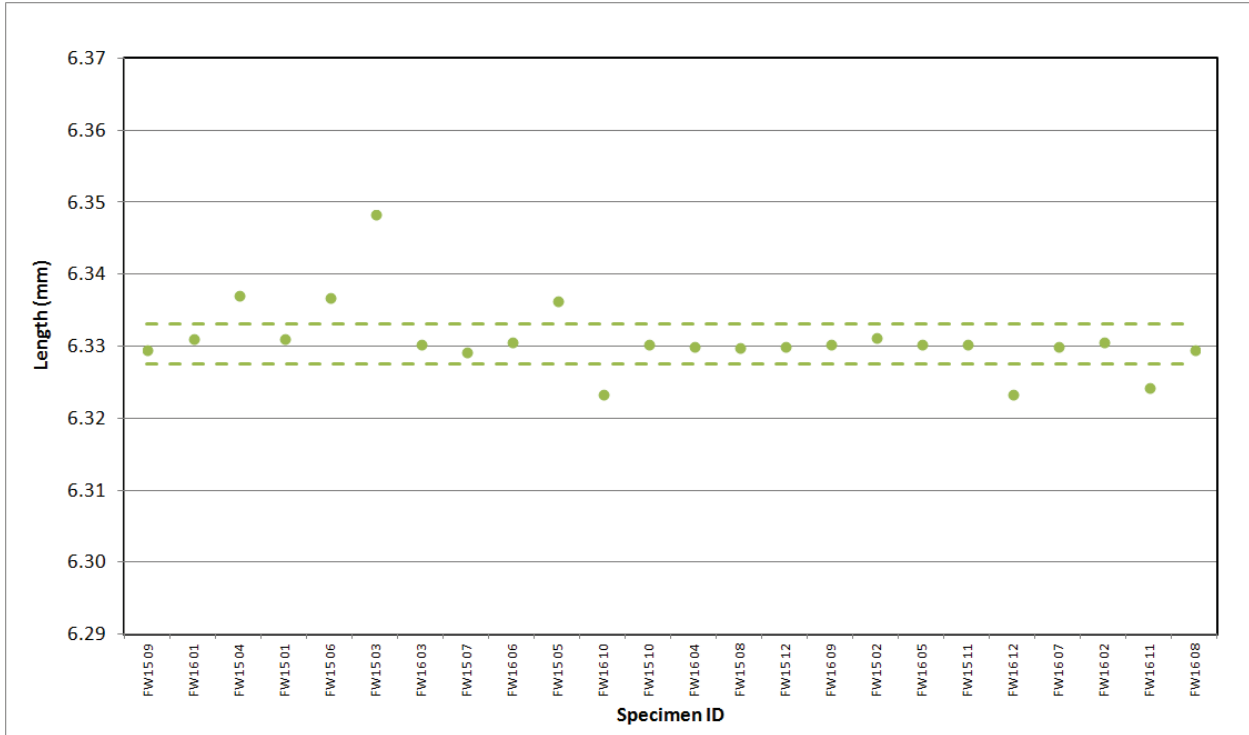


Figure A-35. IG-430 Piggyback Pre Thermal Measurement Length.

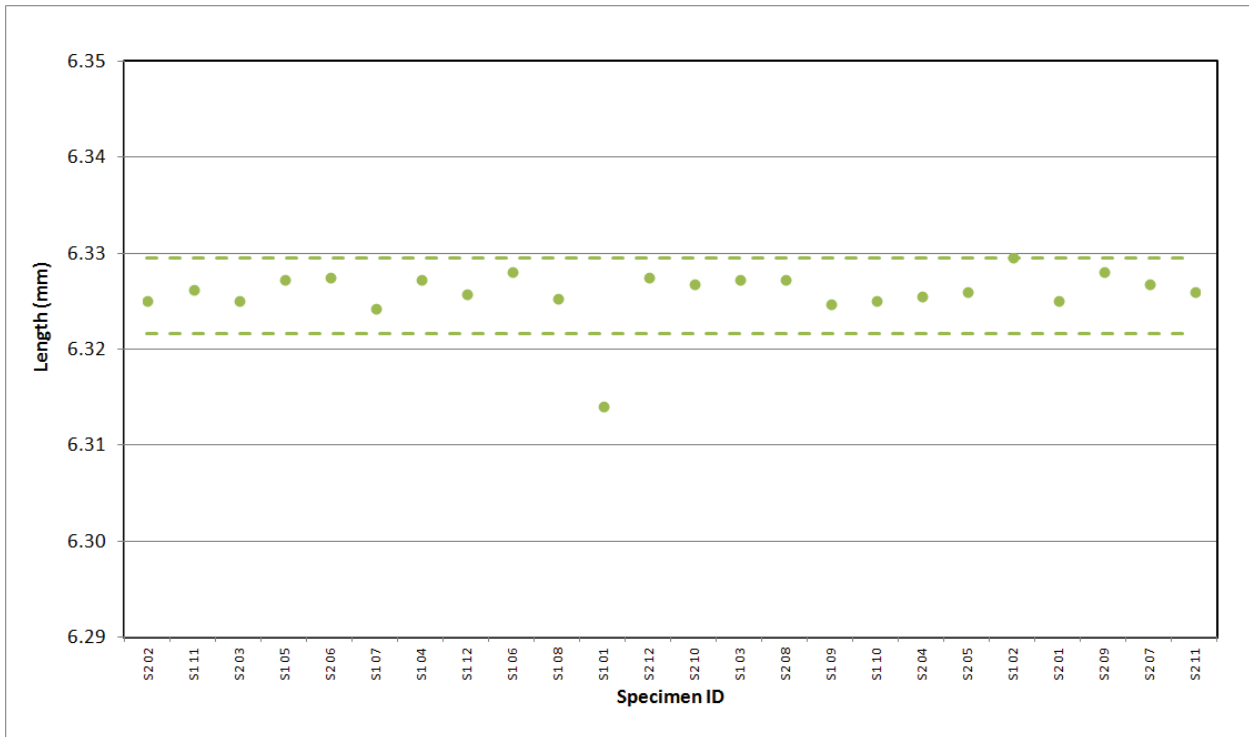


Figure A-36. NBG-10 Piggyback Pre Thermal Measurement Length.

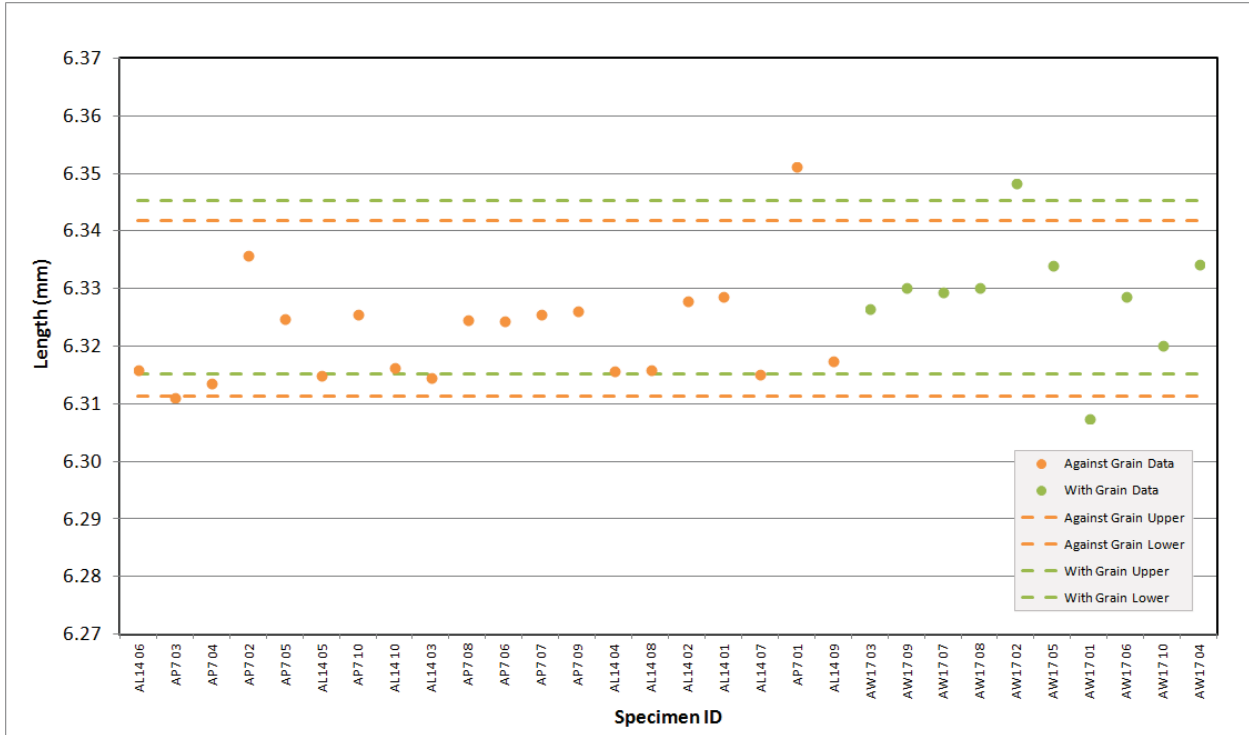


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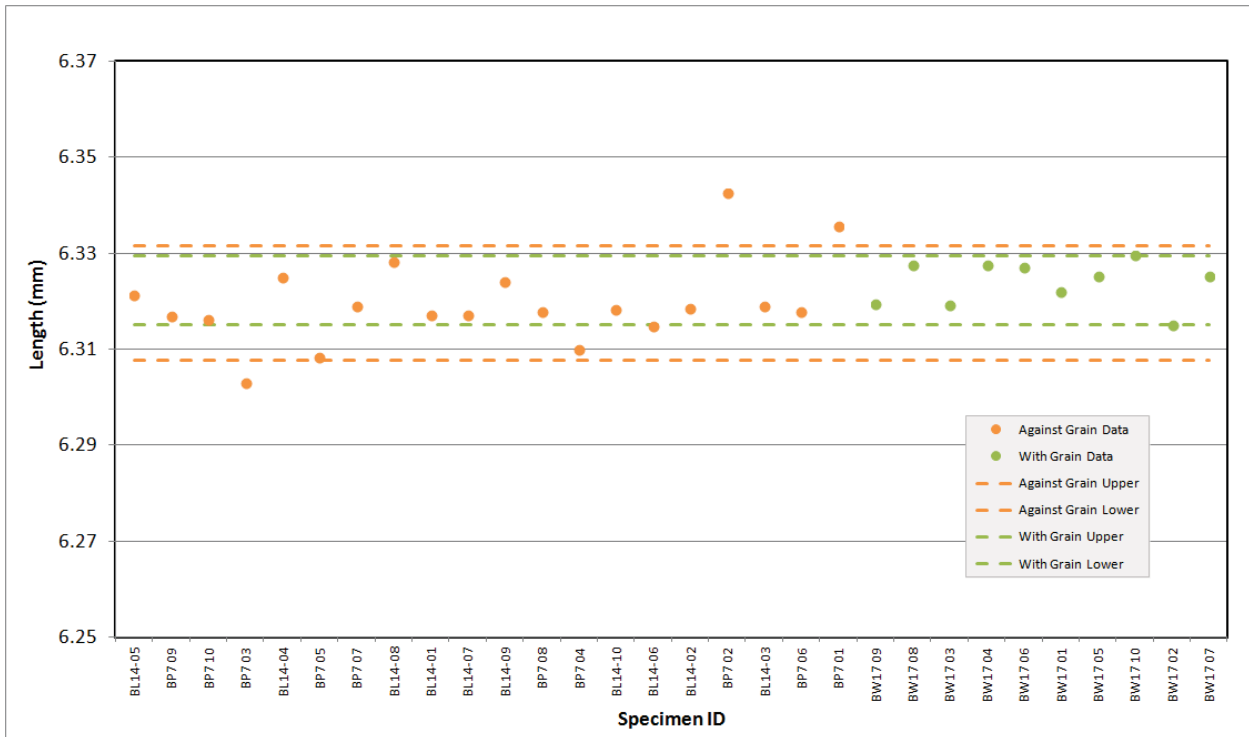


Figure A-38. NBG-18 Piggyback Pre Thermal Measurement Length.

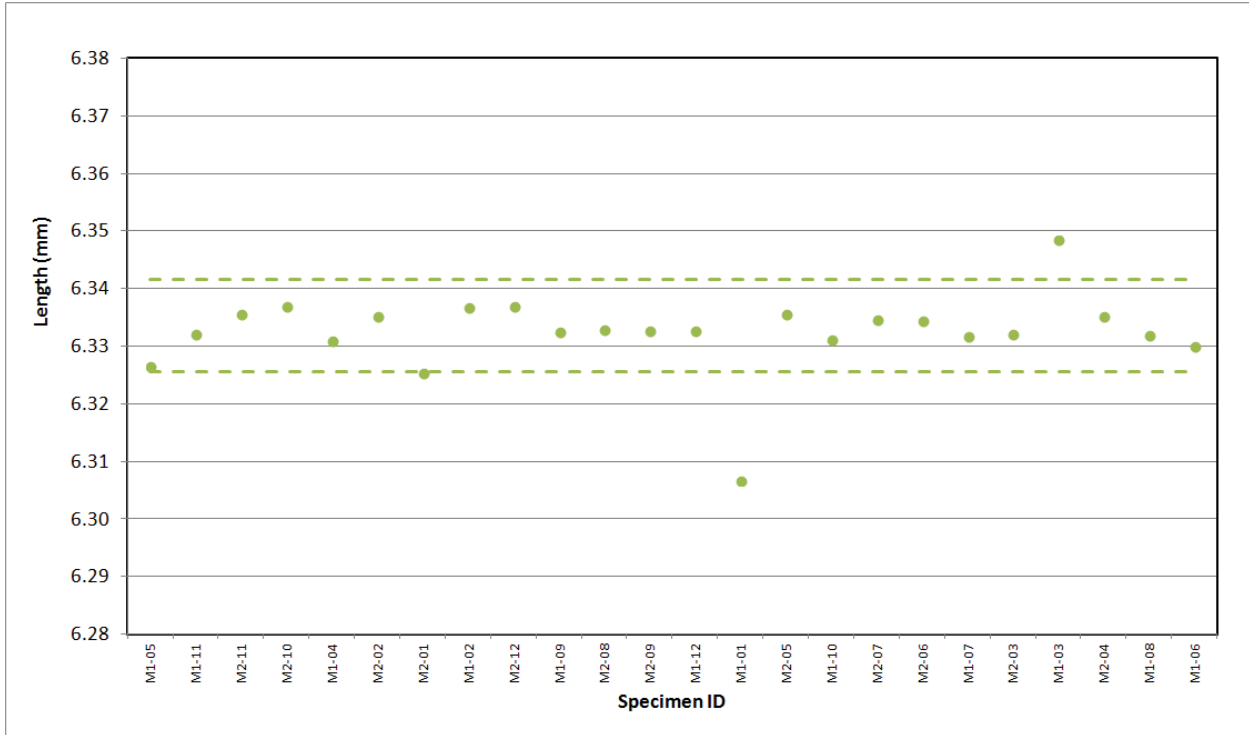


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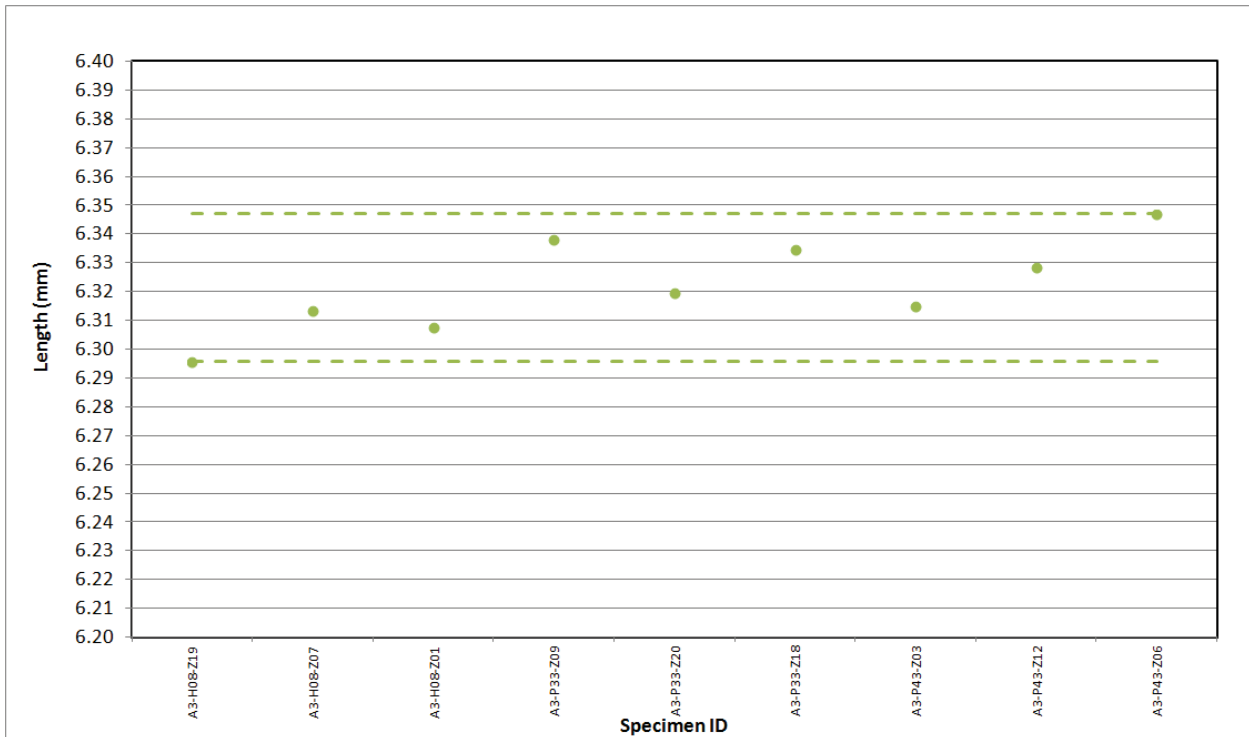


Figure A-40. New Matrix Piggyback Pre Thermal Measurement Length.

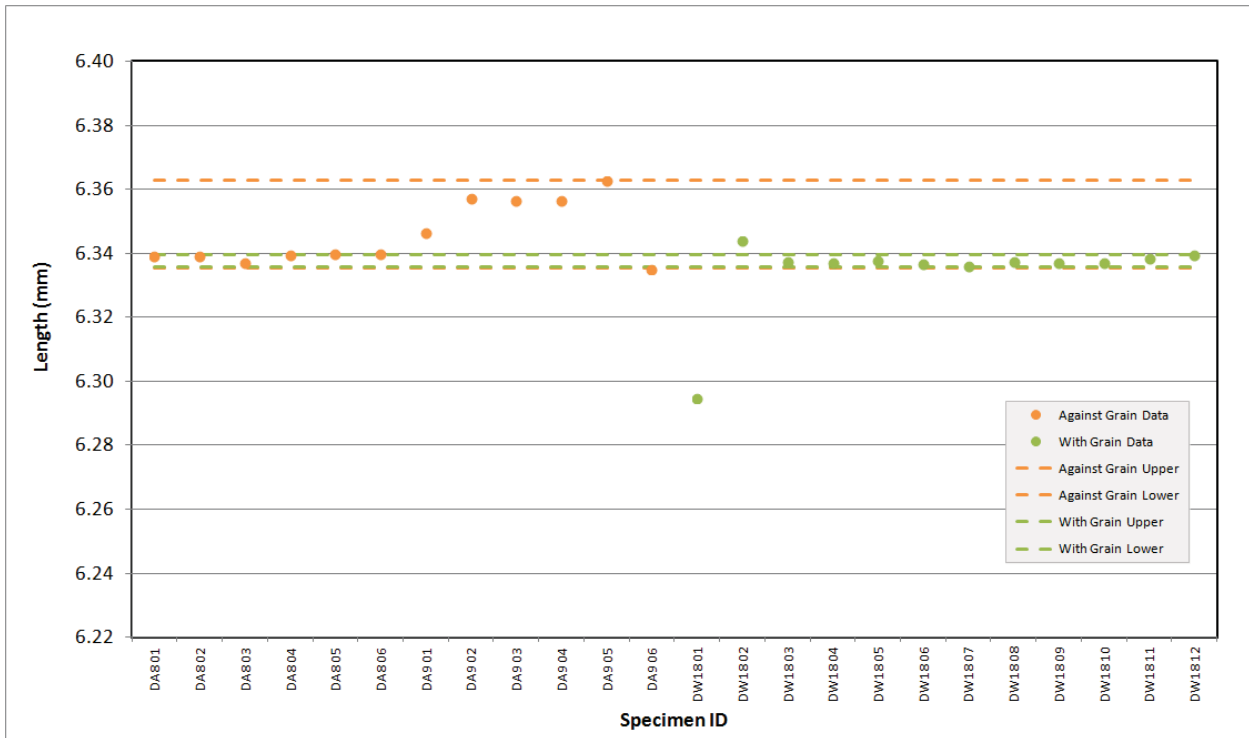


Figure A-41. PCEA Piggyback Pre Thermal Measurement Length.

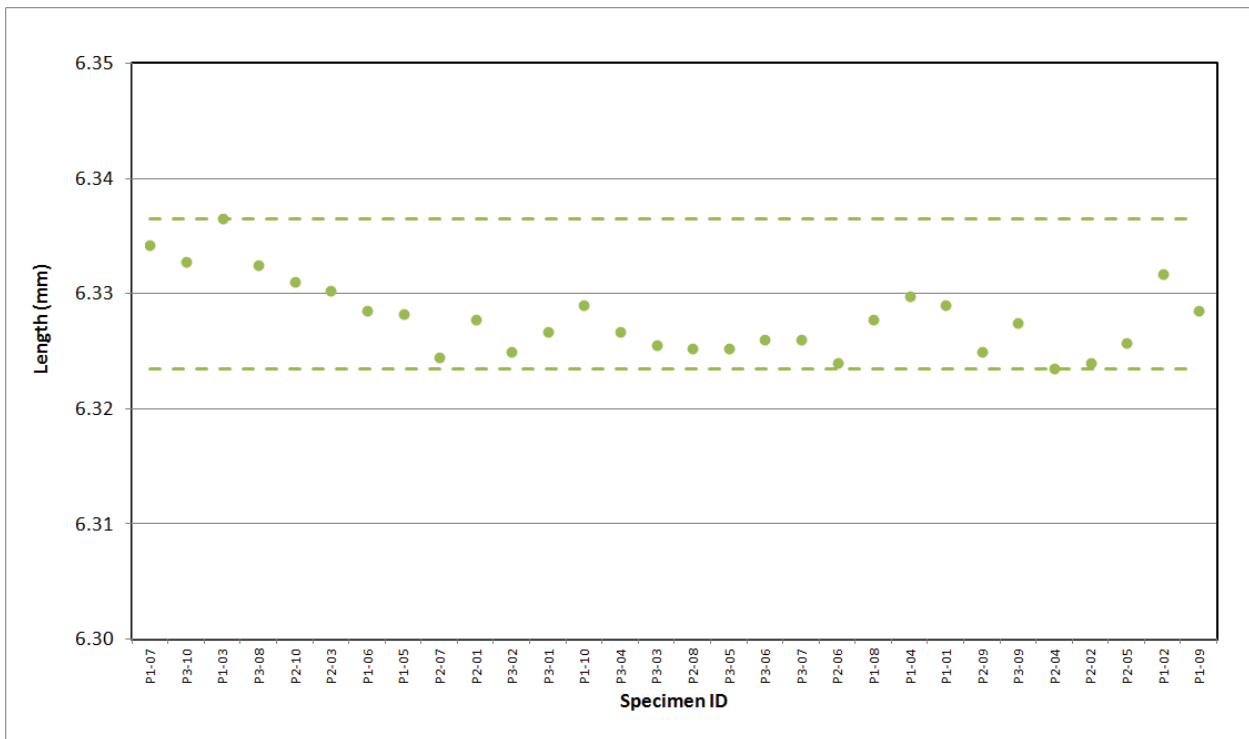


Figure A-42. PCIB Piggyback Pre Thermal Measurement Length.

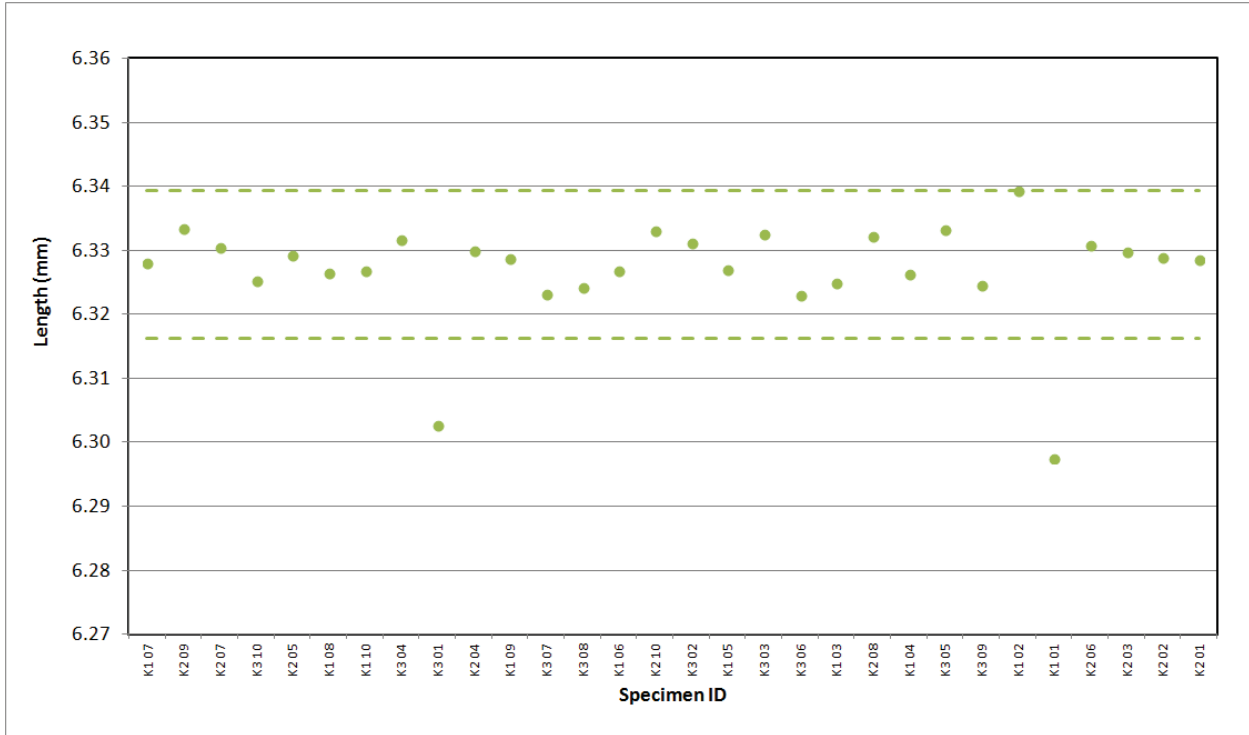


Figure A-43. PGX Piggyback Pre Thermal Measurement Length.

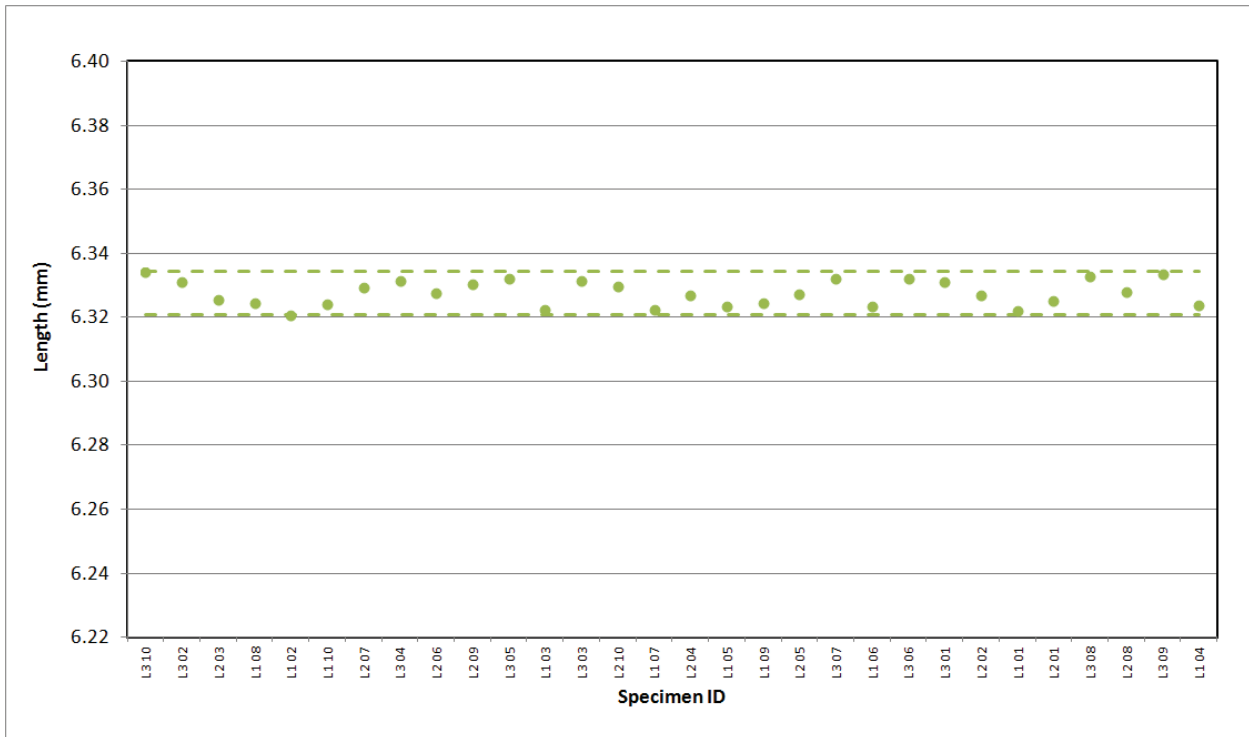


Figure A-44. PPEA Piggyback Pre Thermal Measurement Length.



Figure A-45. H-451 Creep Pre Thermal Measurement Diameter.

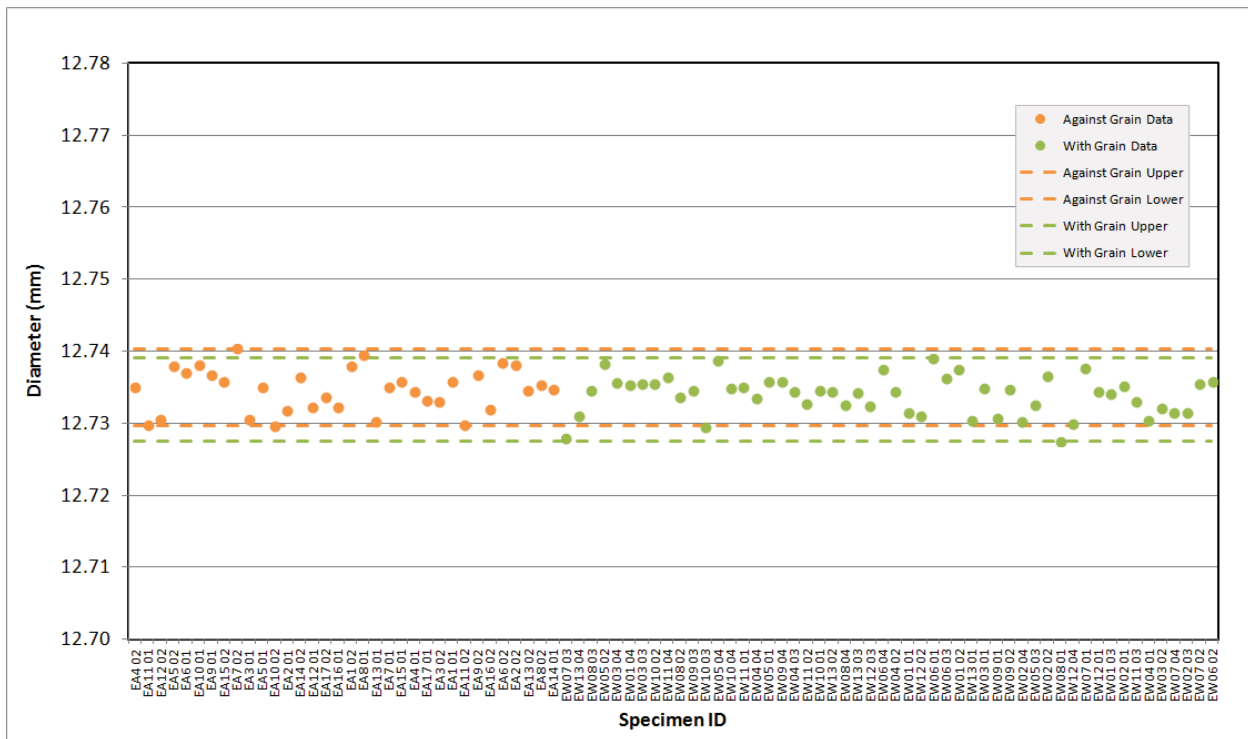


Figure A-46. IG-110 Creep Pre Thermal Measurement Diameter.

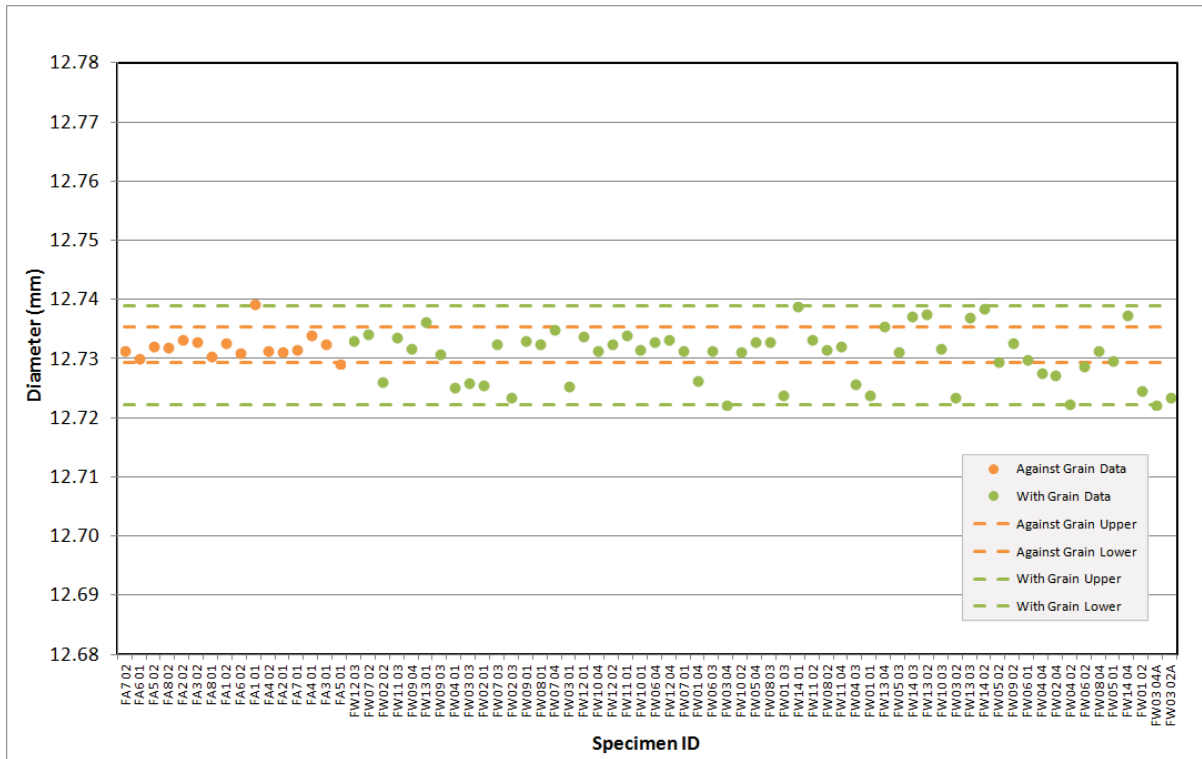


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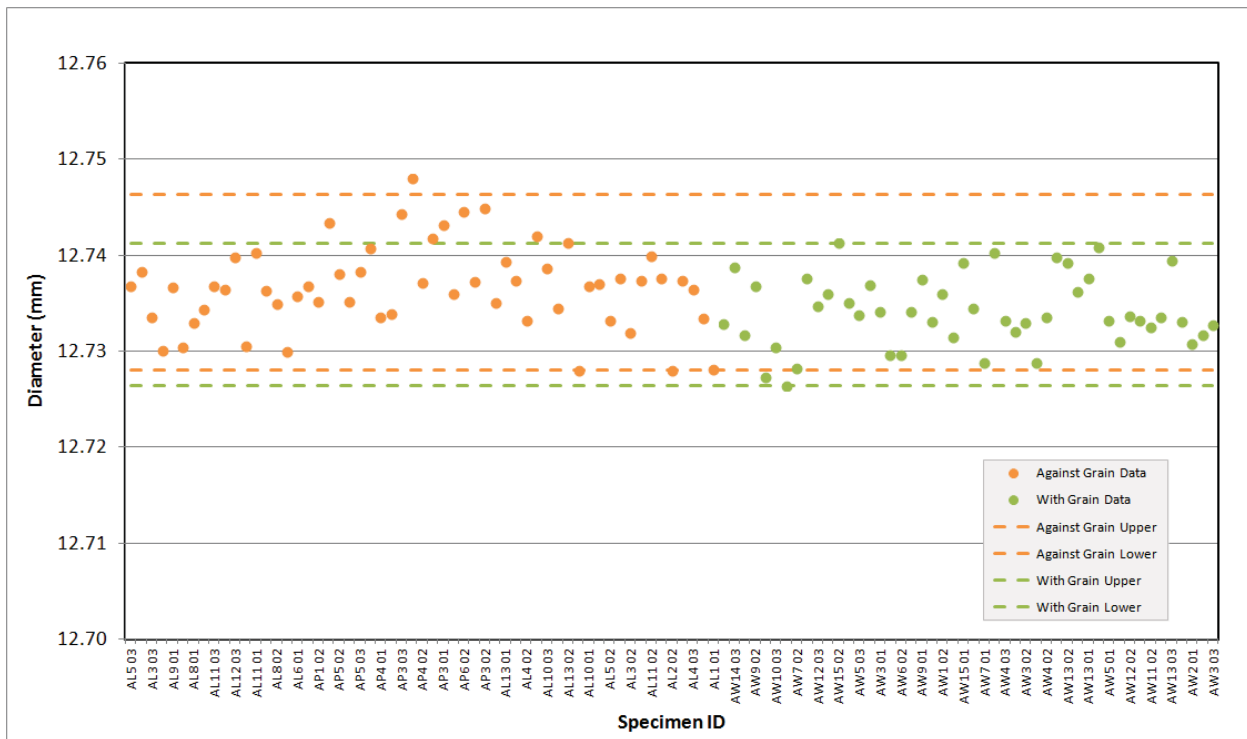


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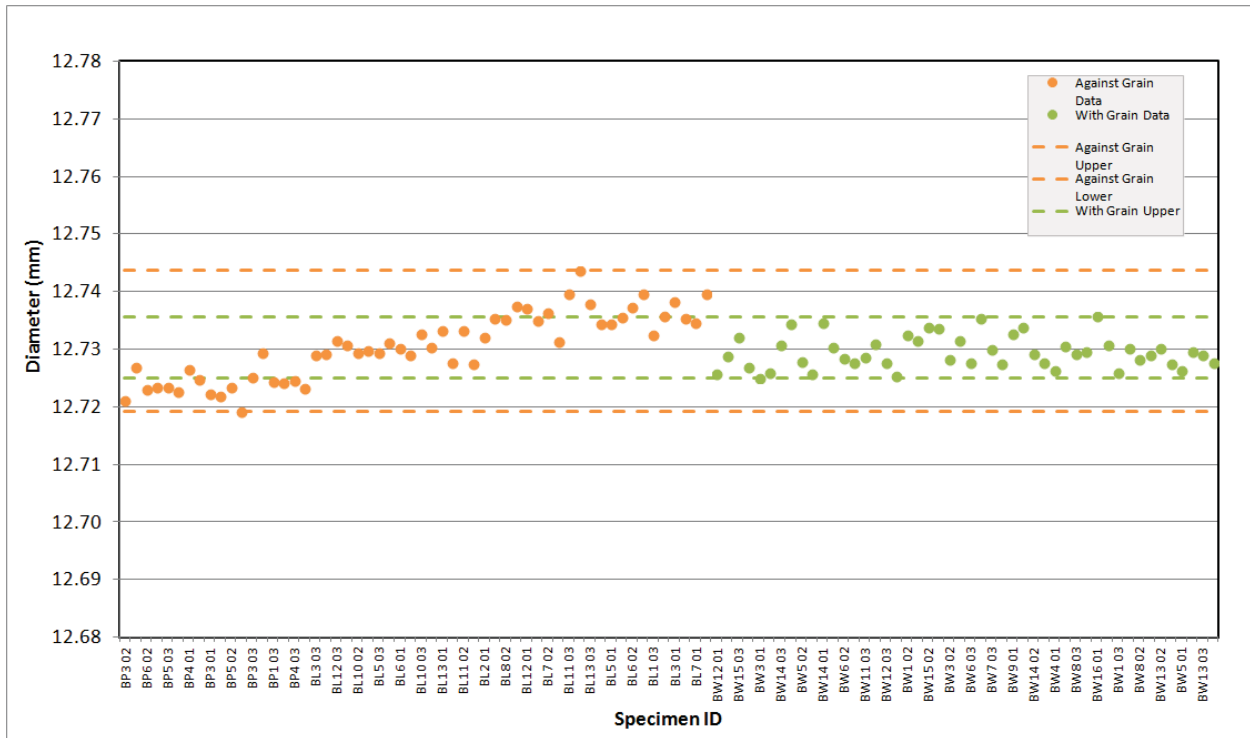


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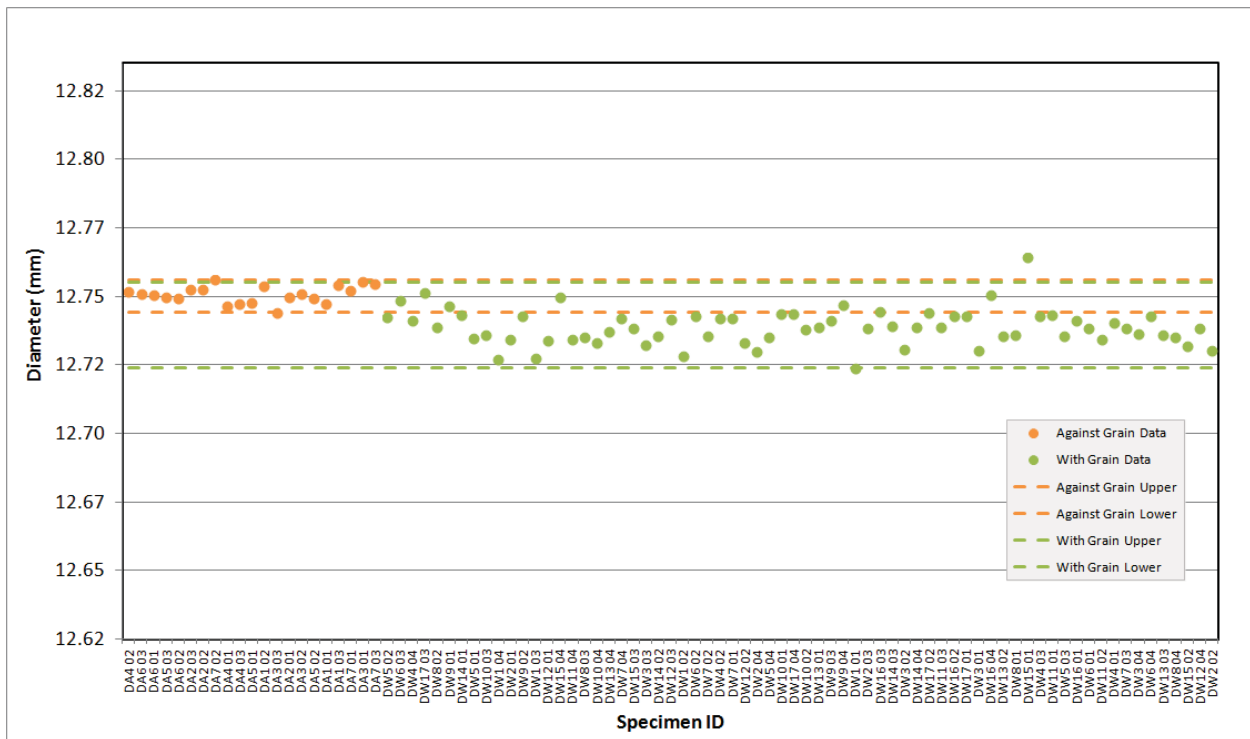


Figure A-50. PCEA Creep Pre Thermal Measurement Diameter.

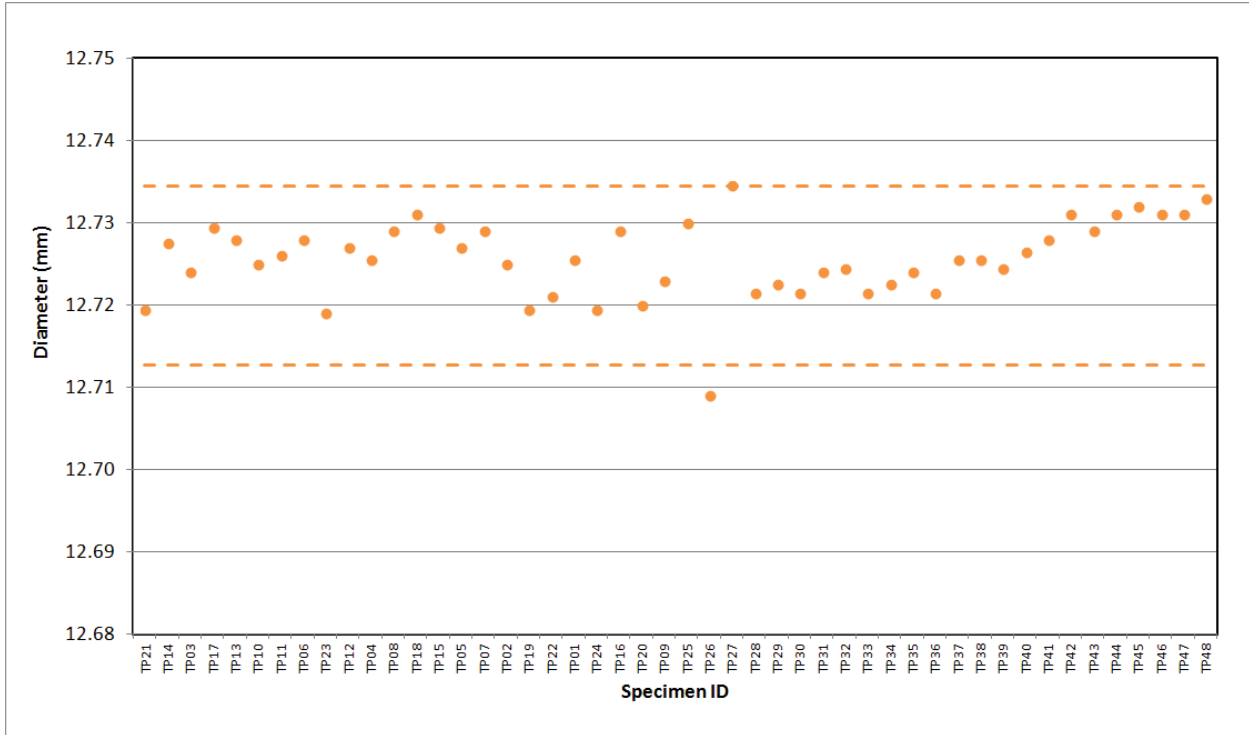


Figure A-51. 2114 Piggyback Pre Thermal Measurement Diameter.

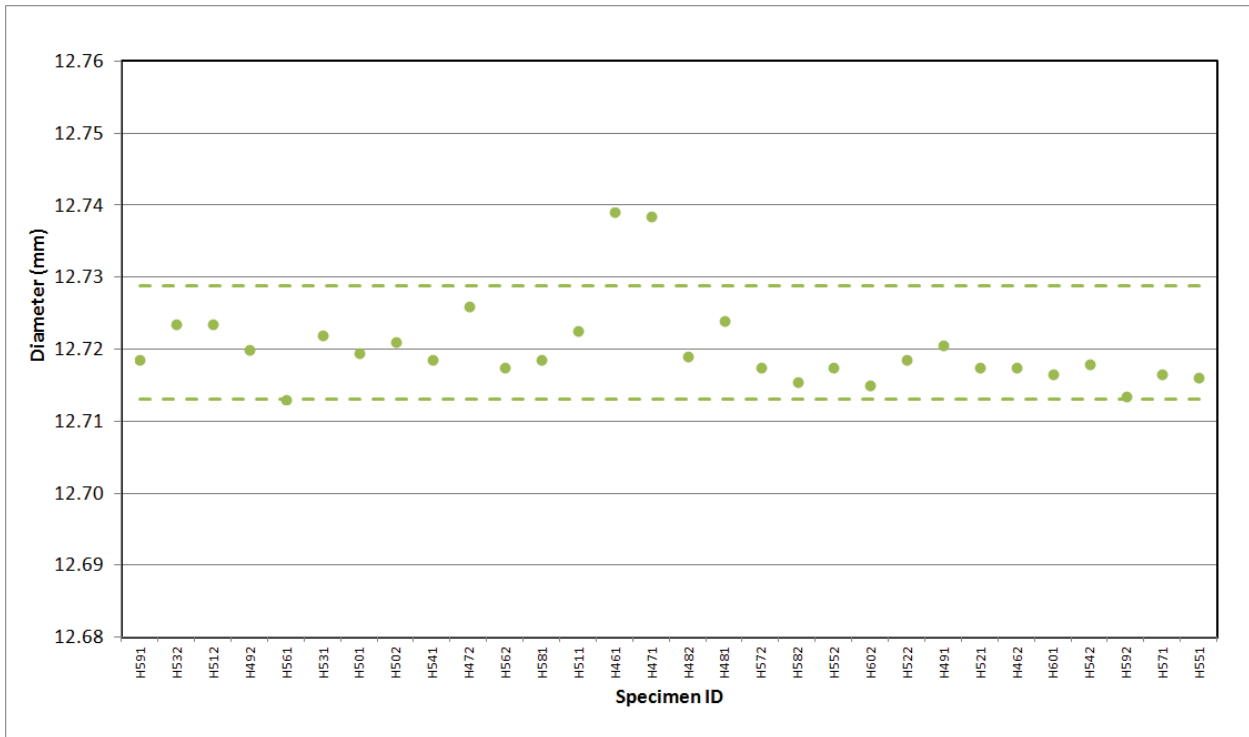


Figure A-52. A3 Matrix Piggyback Pre Thermal Measurement Diameter.

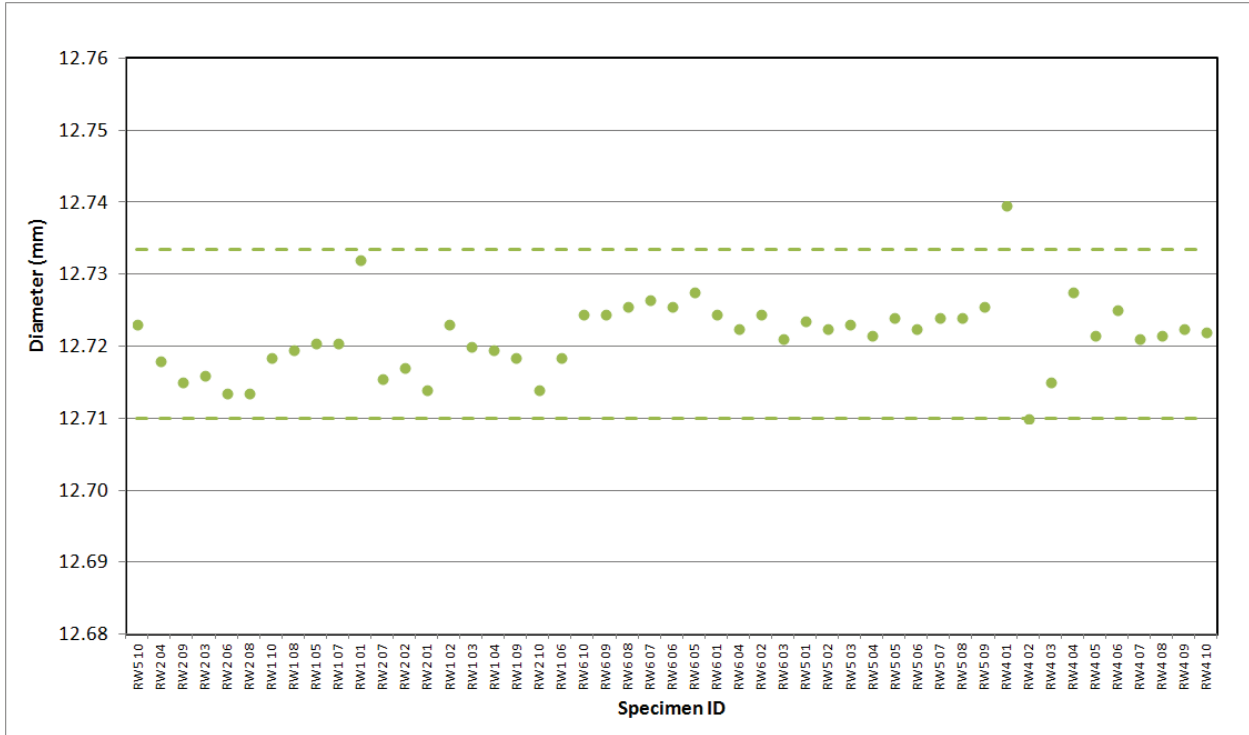


Figure A-53. BAN Piggyback Pre Thermal Measurement Diameter.

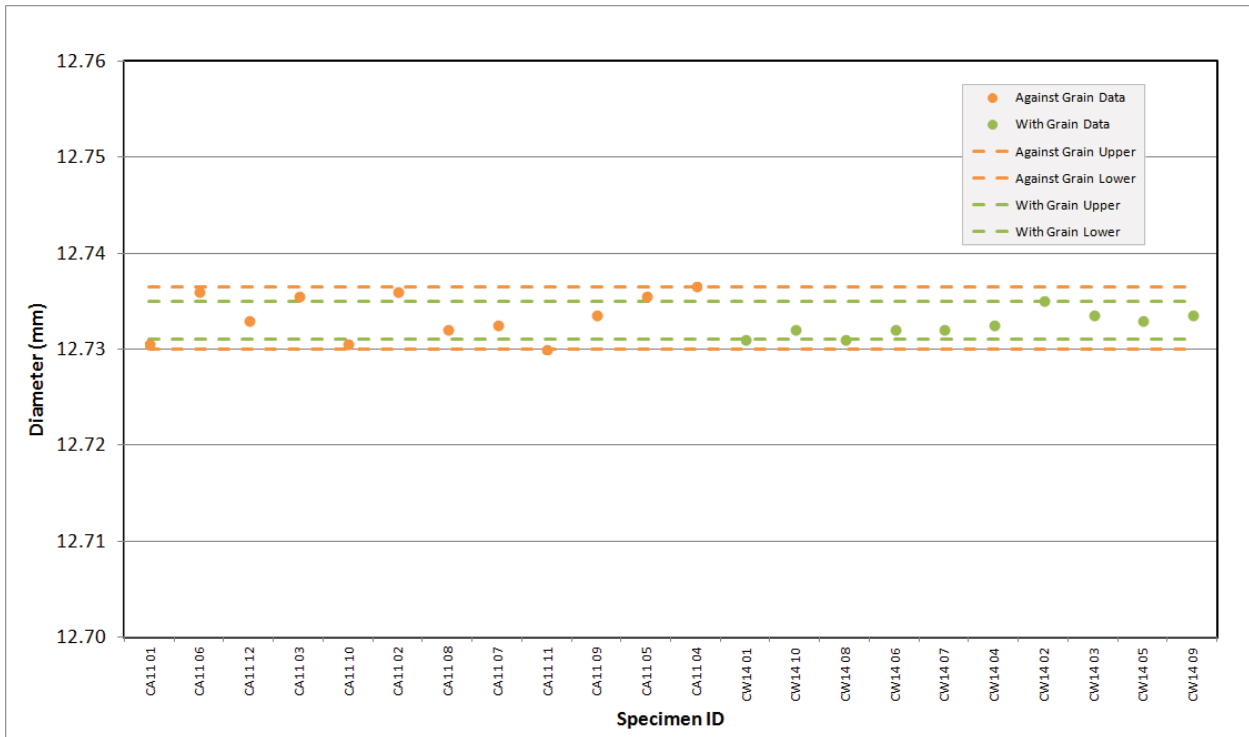


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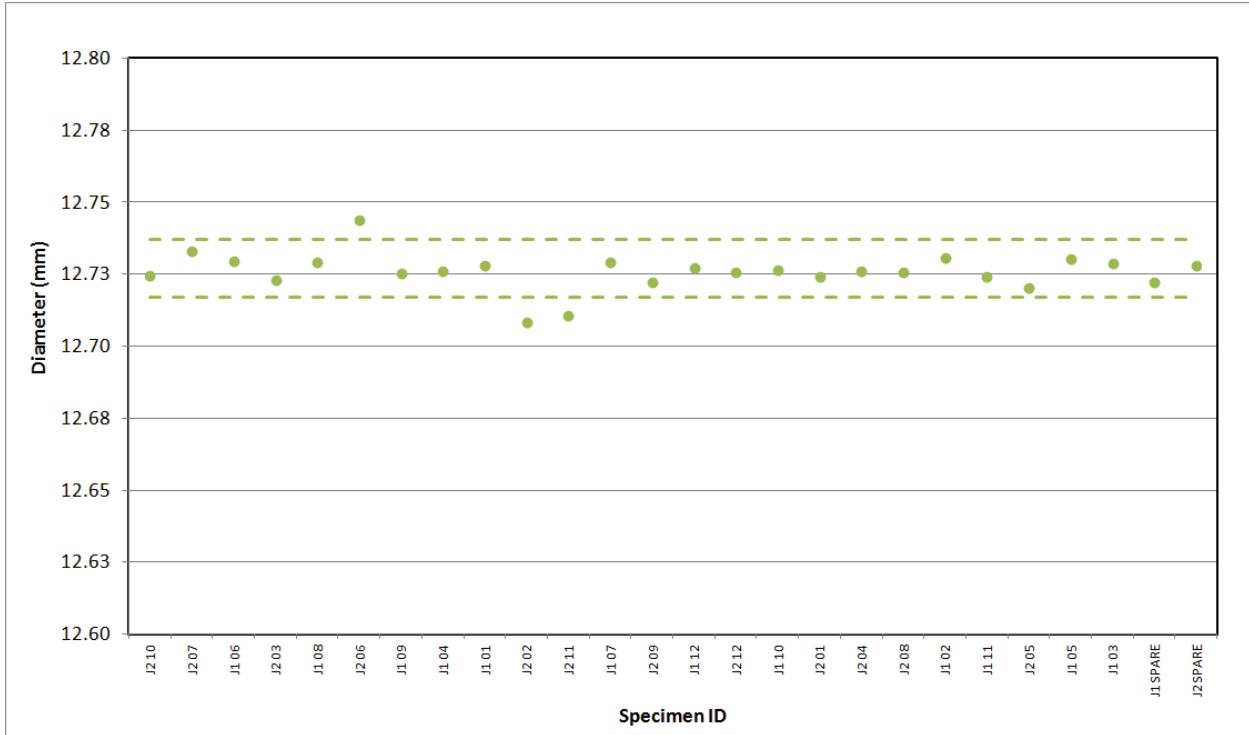


Figure A-55. HLM Piggyback Pre Thermal Measurement Diameter.

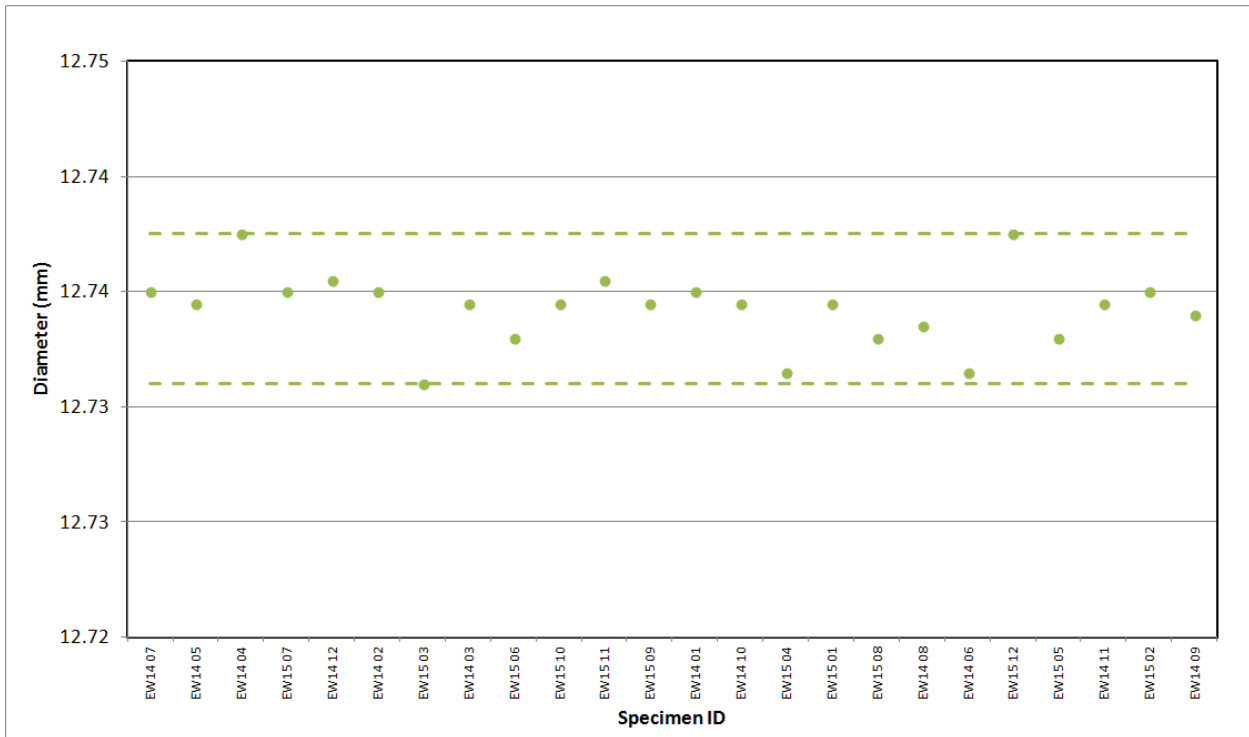


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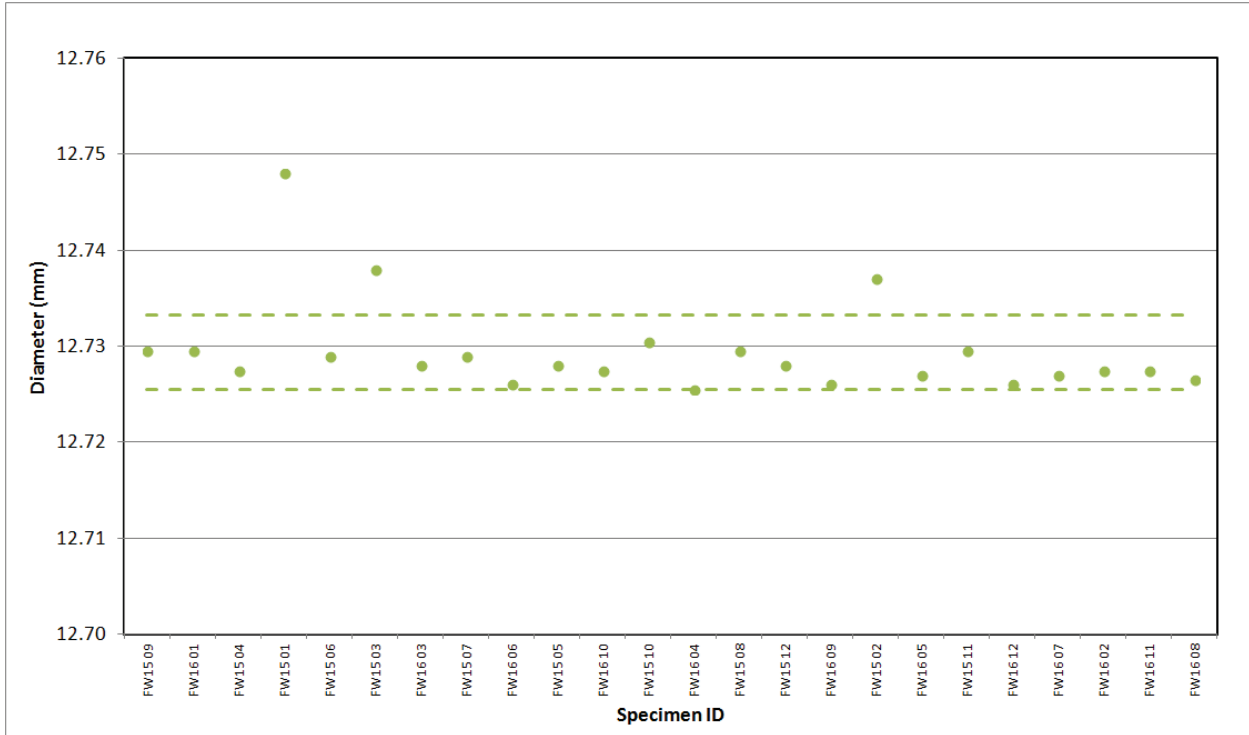


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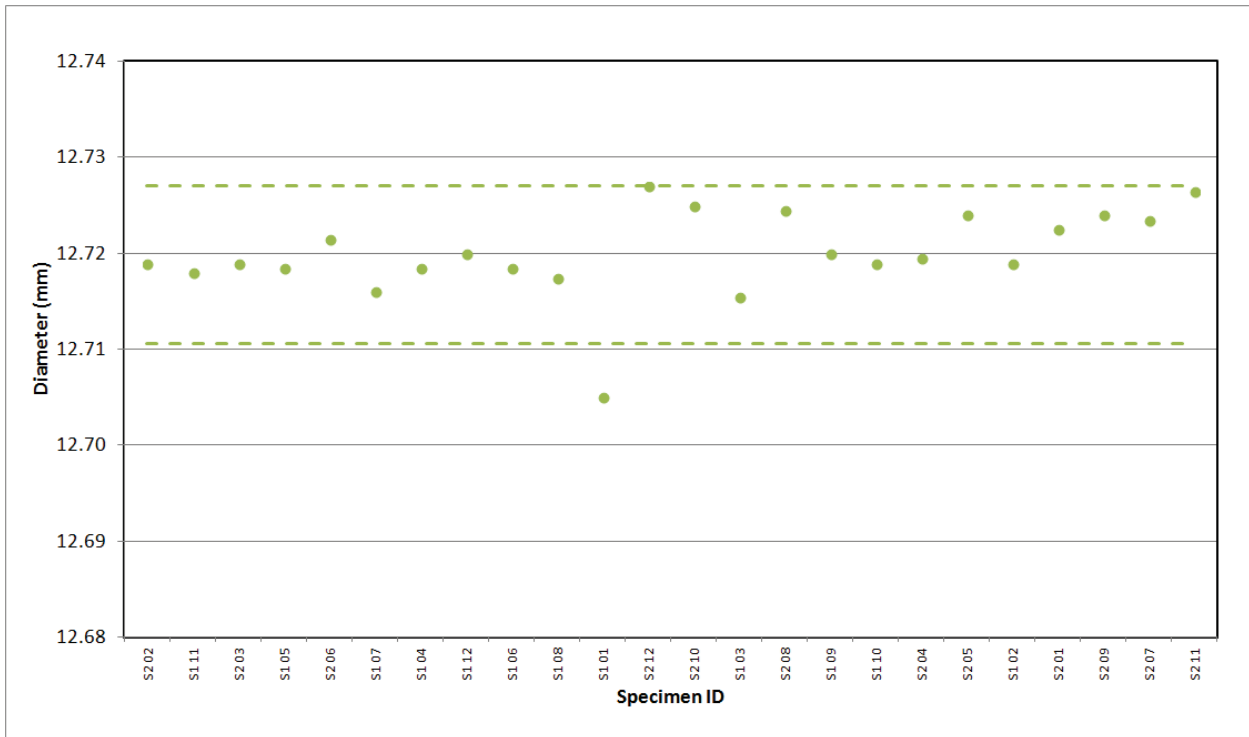


Figure A-58. NBG-10 Piggyback Pre Thermal Measurement Diameter.

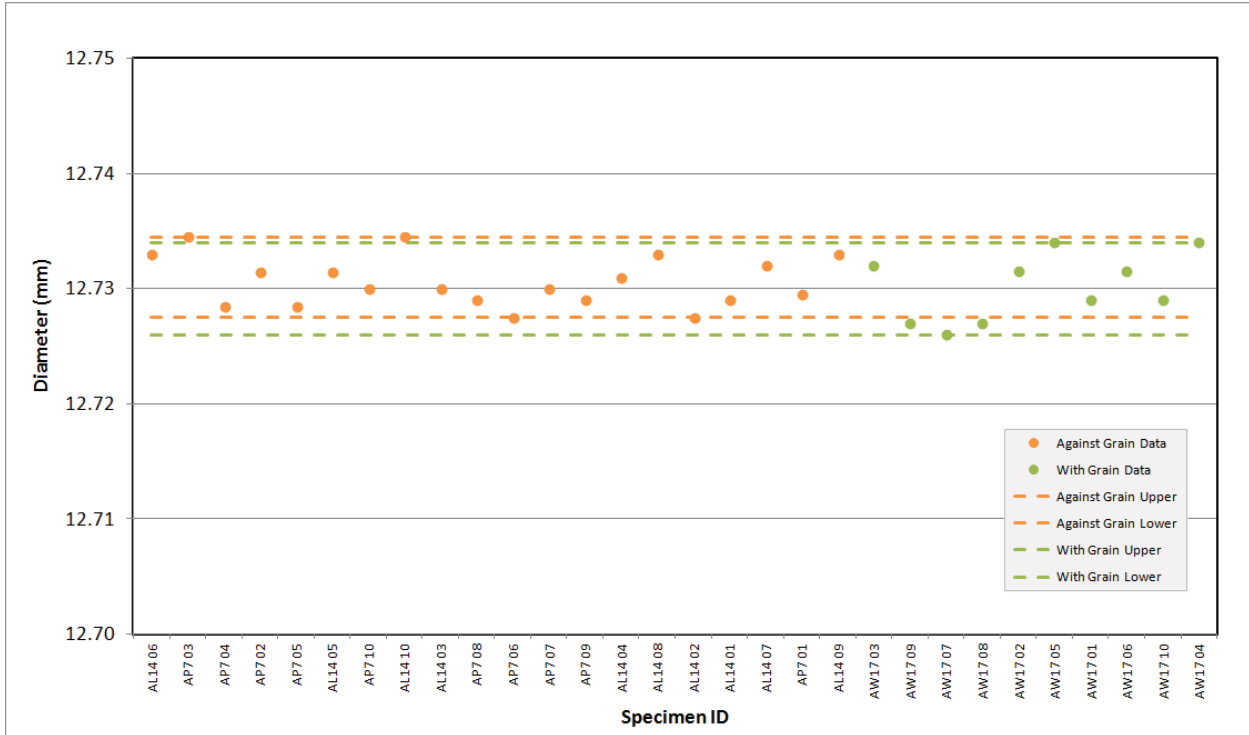


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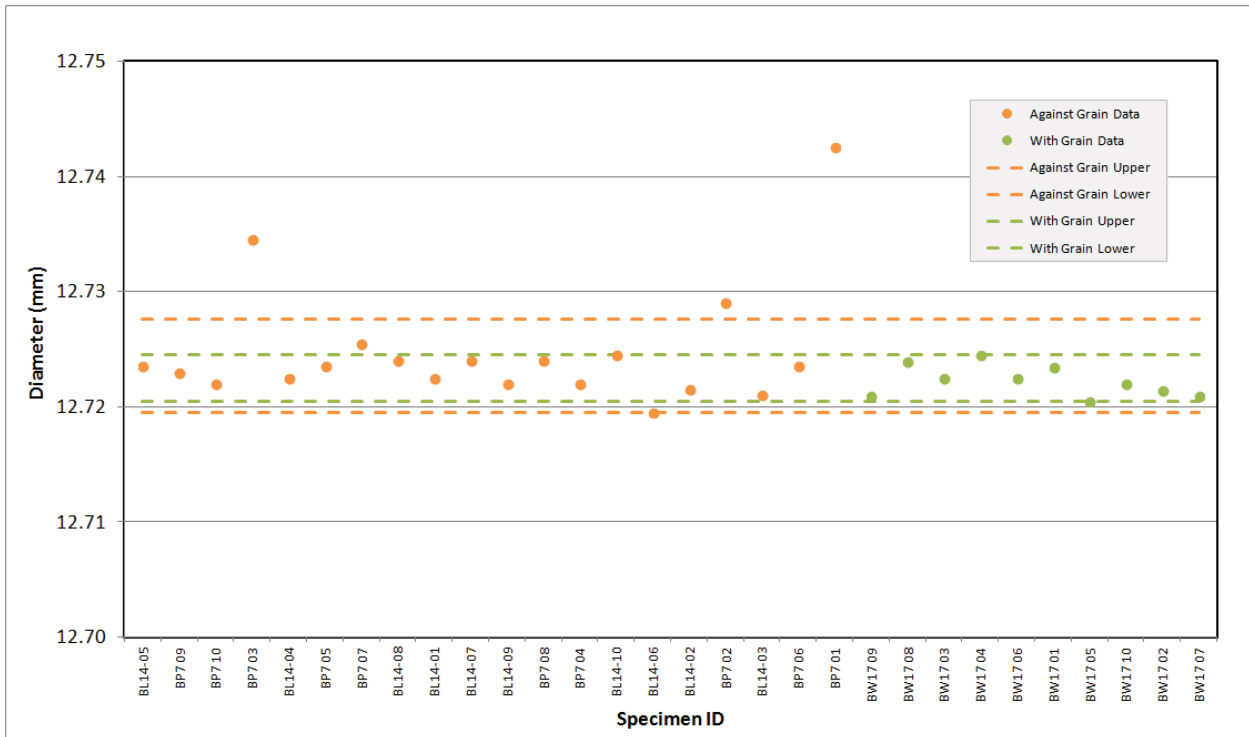


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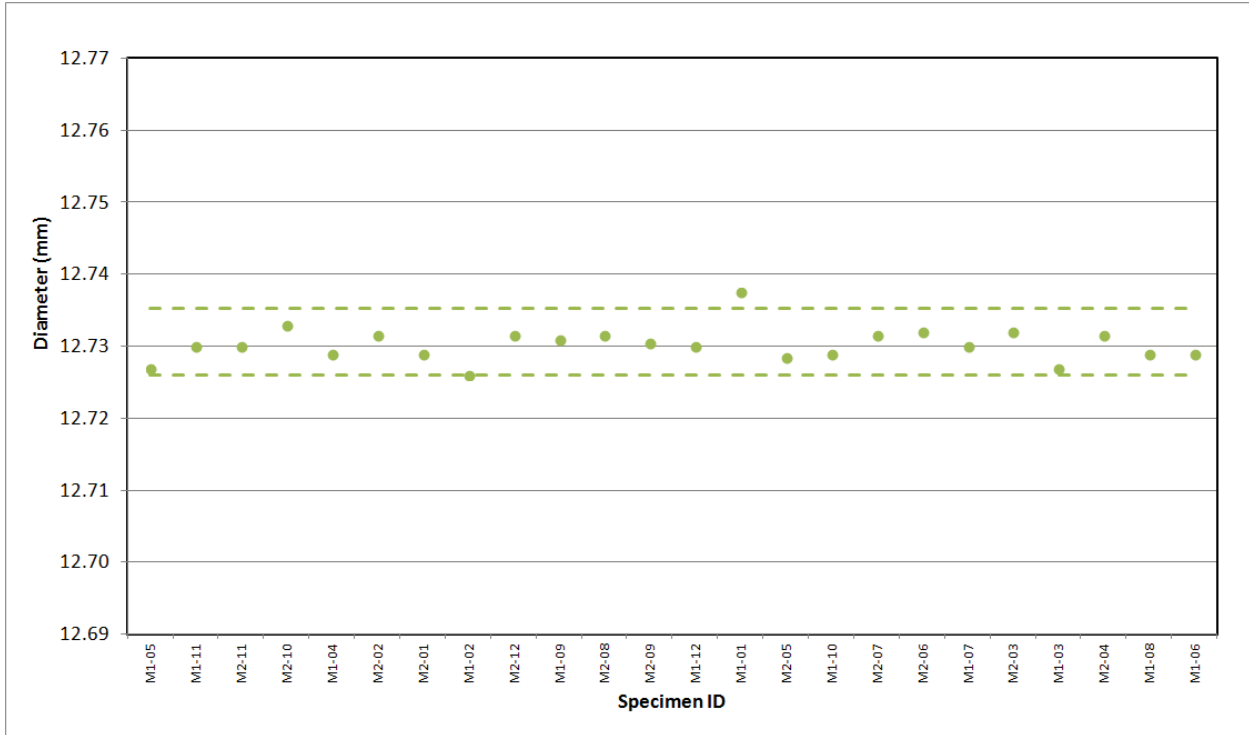


Figure A-61. NBG-25 Piggyback Pre Thermal Measurement Diameter.

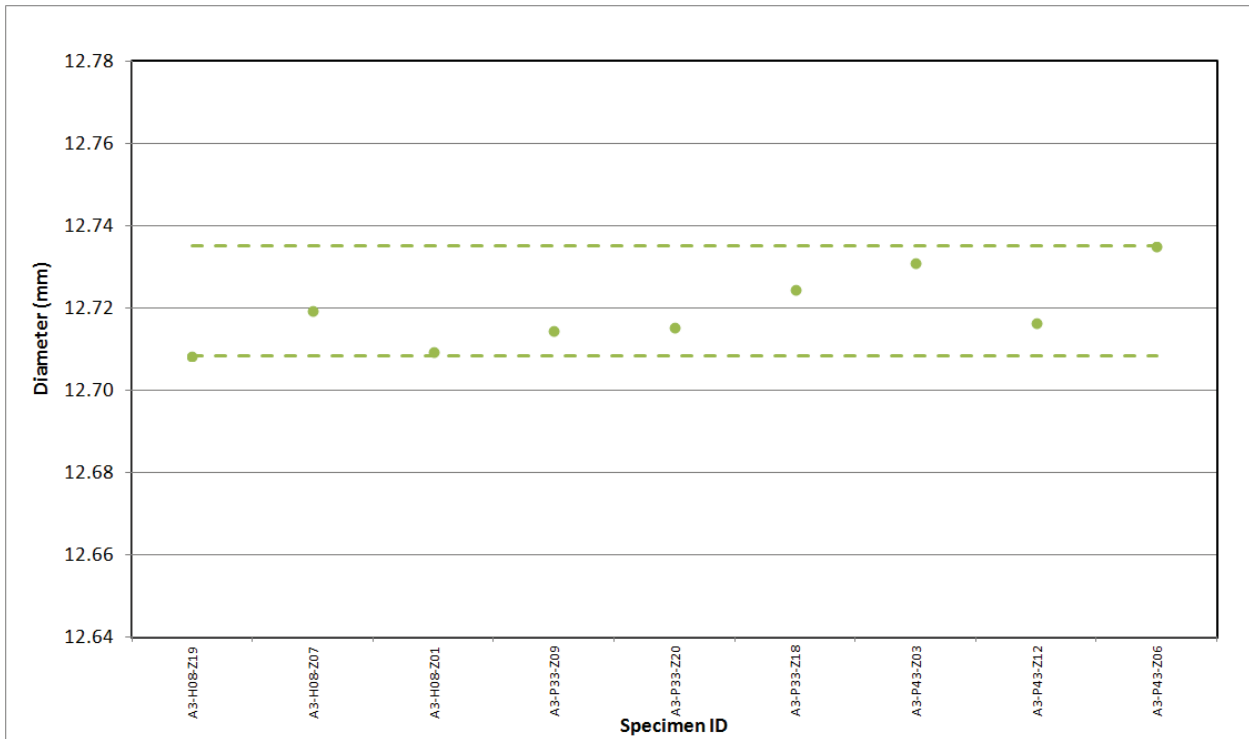


Figure A-62. New Matrix Piggyback Pre Thermal Measurement Diameter.

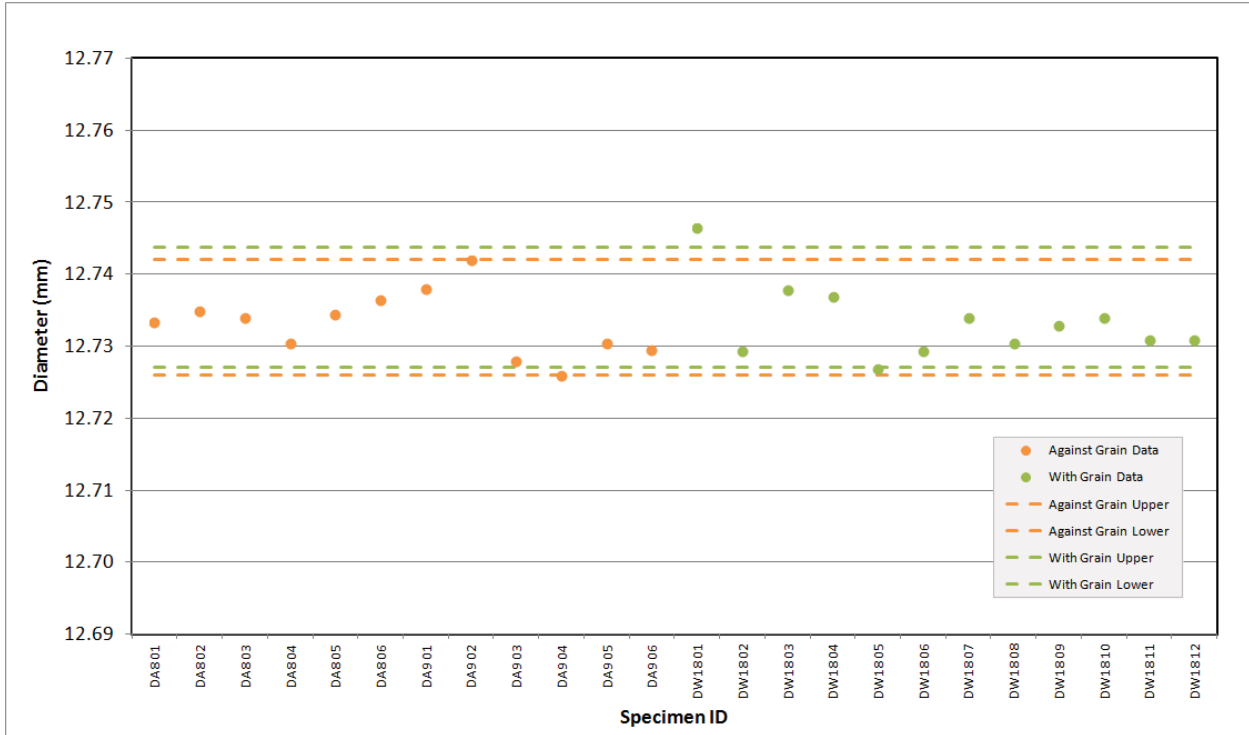


Figure A-63. PCEA Piggyback Pre Thermal Measurement Diameter.

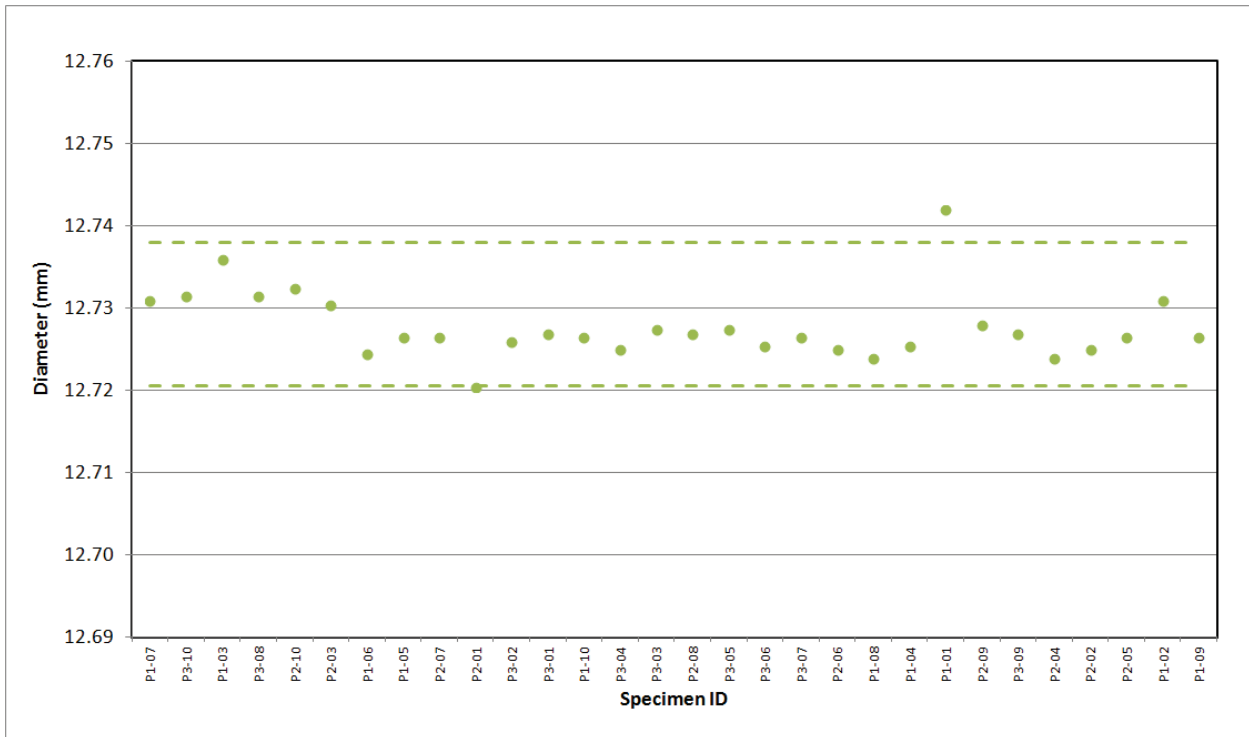


Figure A-64. PCIB Piggyback Pre Thermal Measurement Diameter.

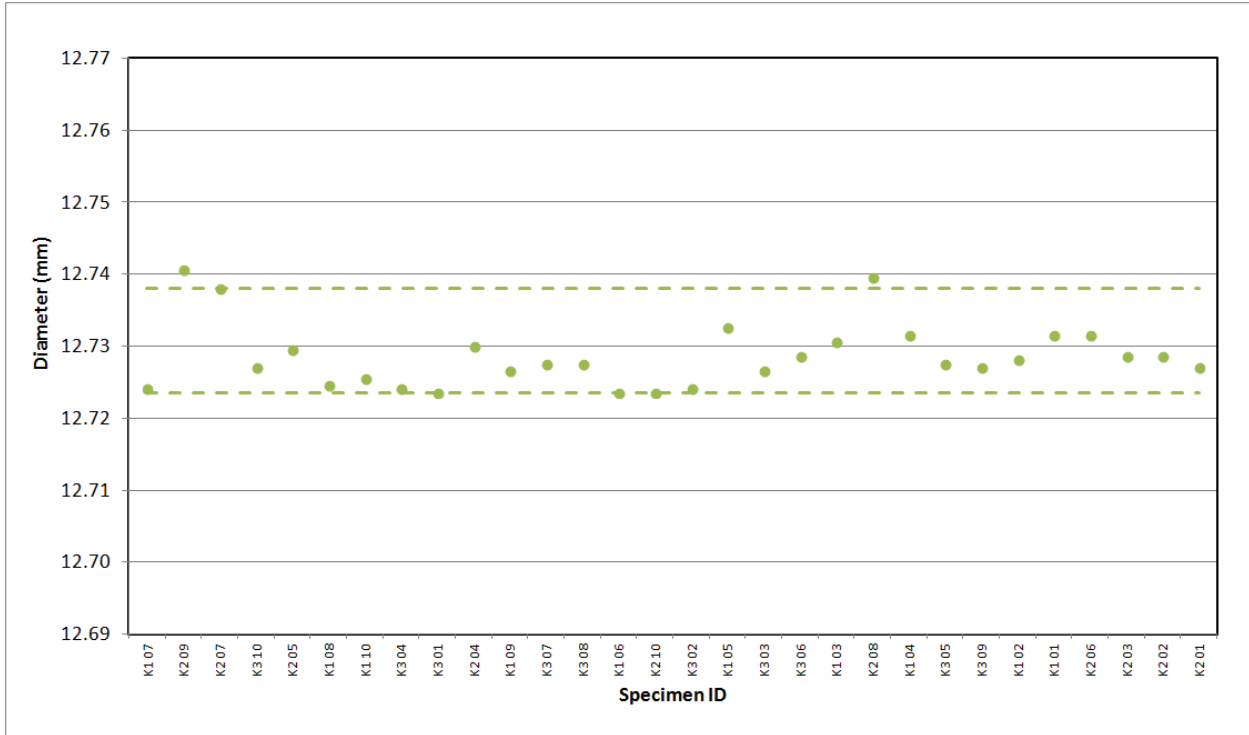


Figure A-65. PGX Piggyback Pre Thermal Measurement Diameter.

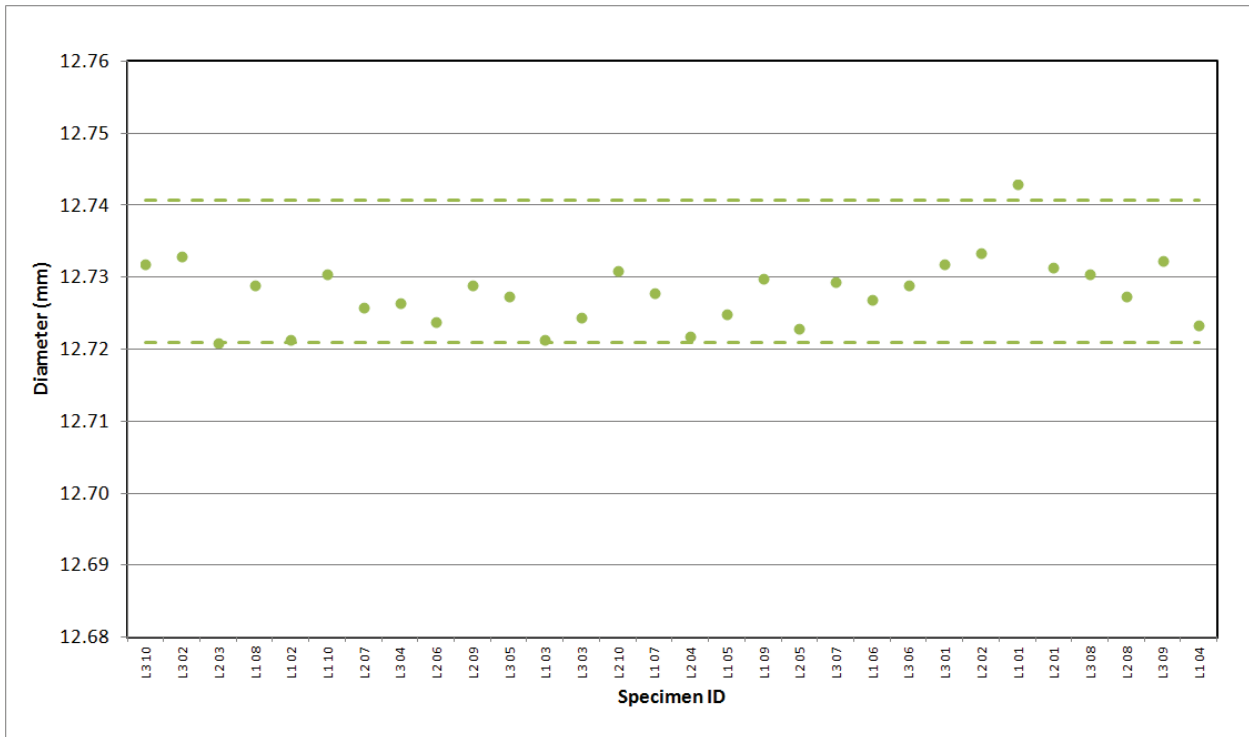


Figure A-66. PPEA Piggyback Pre Thermal Measurement Diameter.



Figure A-67. H-451 Creep Pre Thermal Measurement Mass.

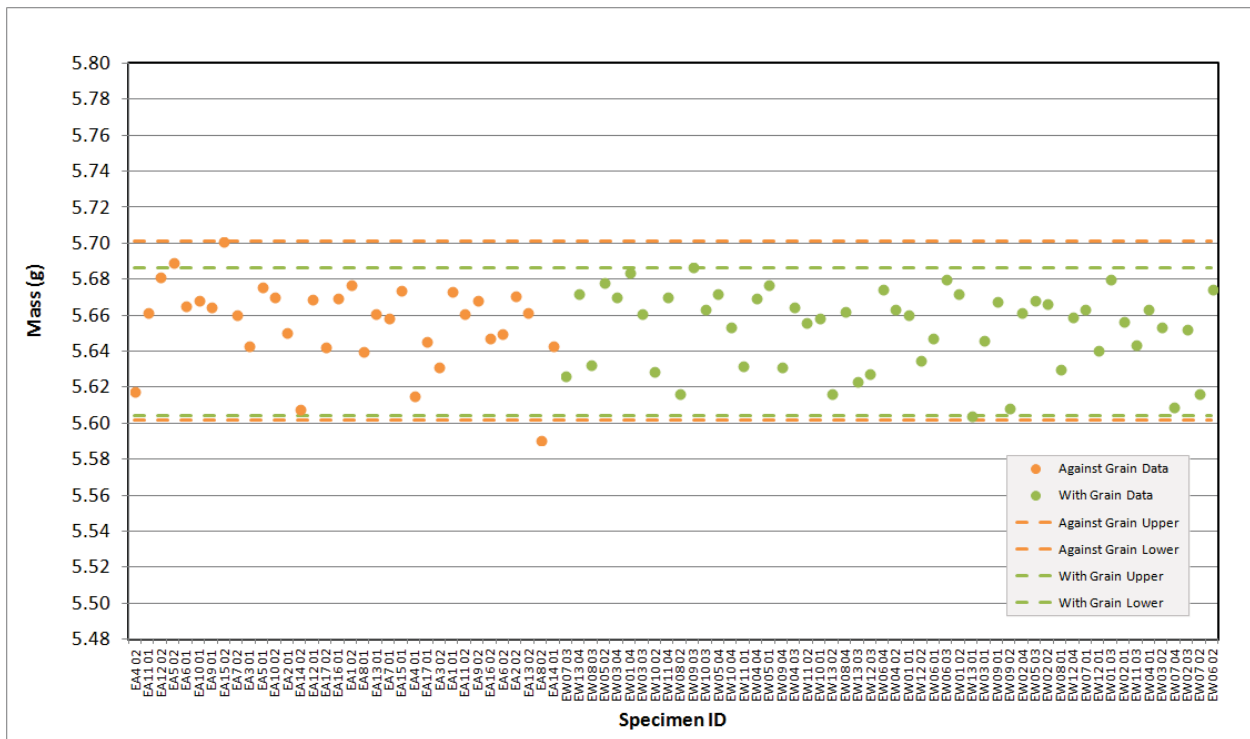


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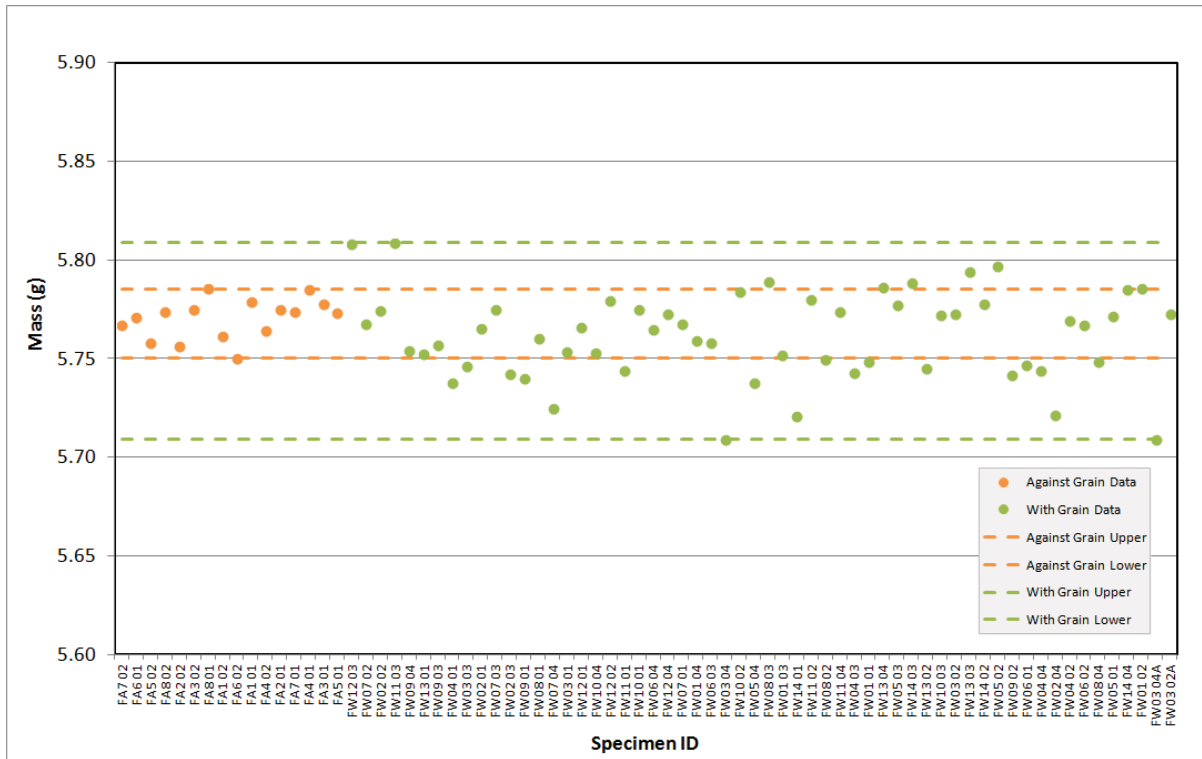


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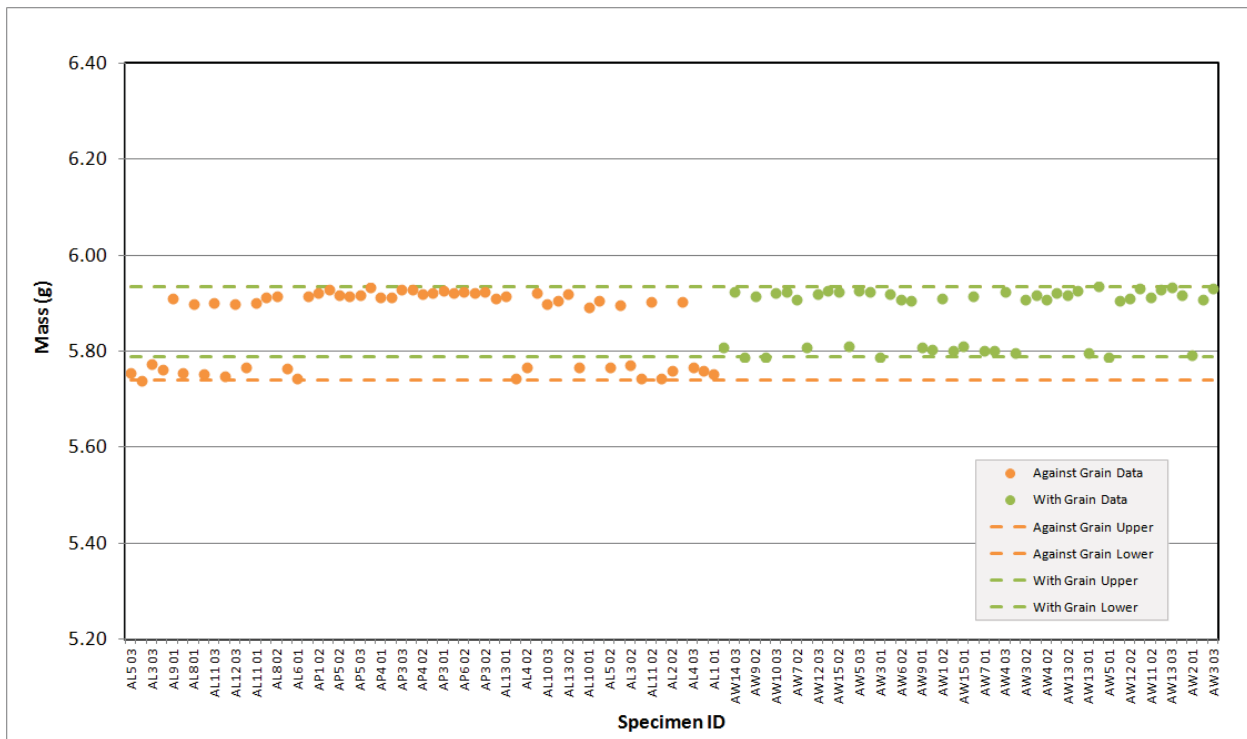


Figure A-70. NBG-17 Creep Pre Thermal Measurement Mass.

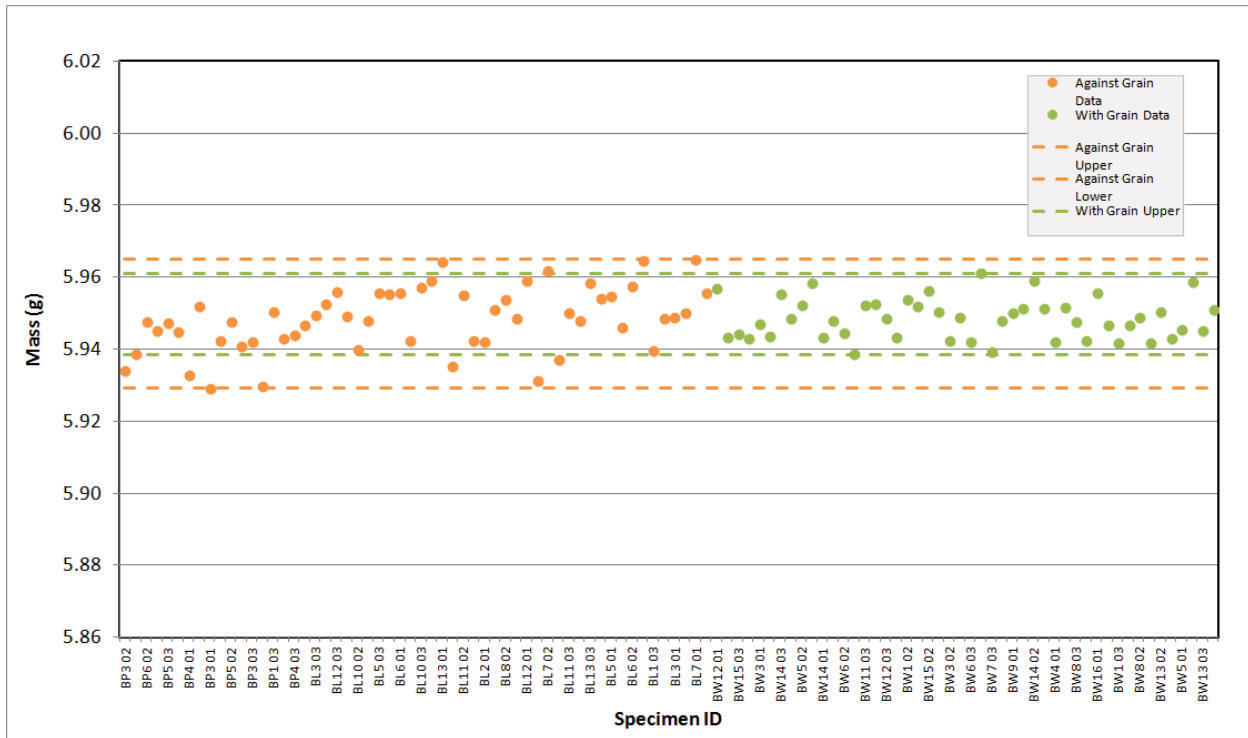


Figure A-71. NBG-18 Creep Pre Thermal Measurement Mass.

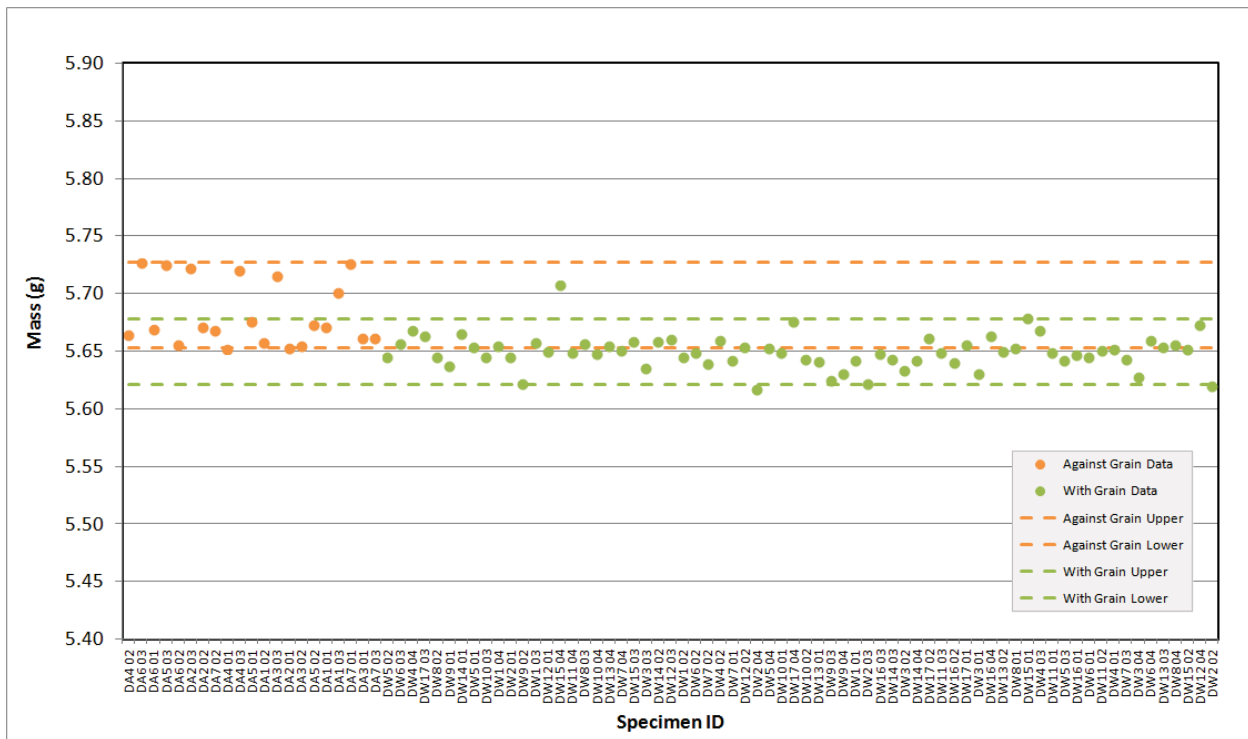


Figure A-72. PCEA Creep Pre Thermal Measurement Mass.

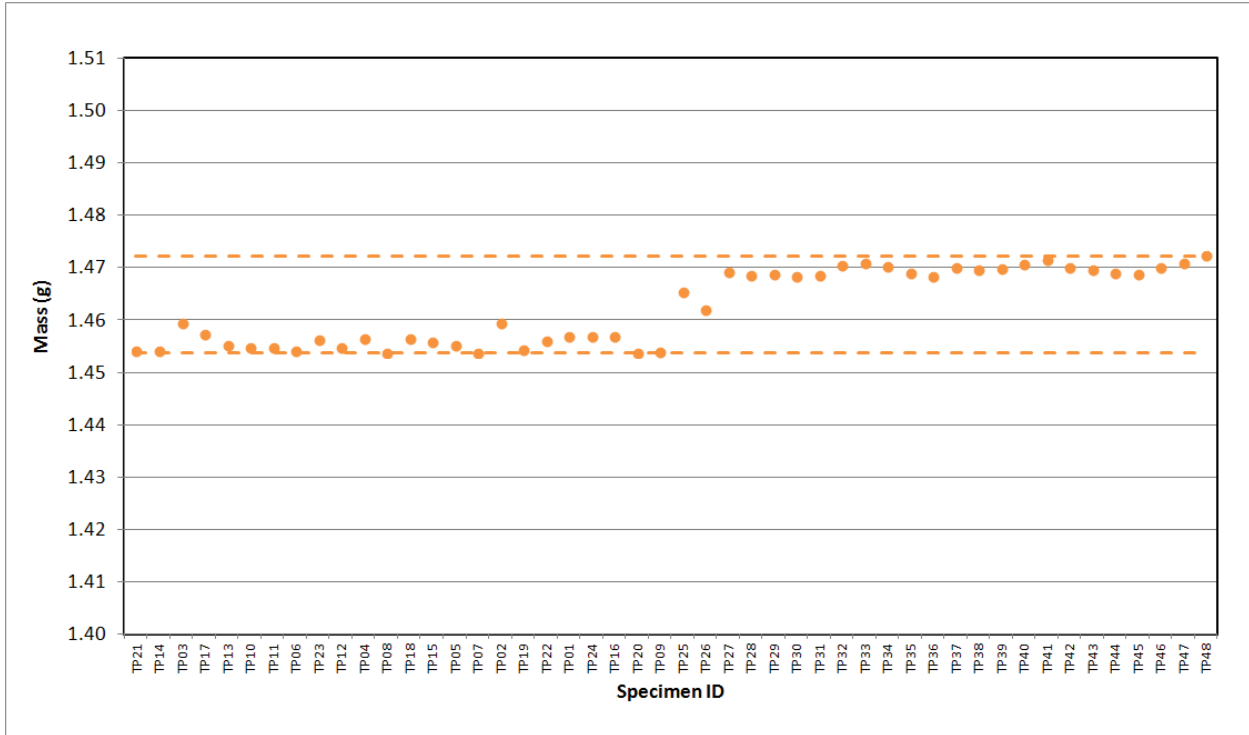


Figure A-73. 2114 Piggyback Pre Thermal Measurement Mass.

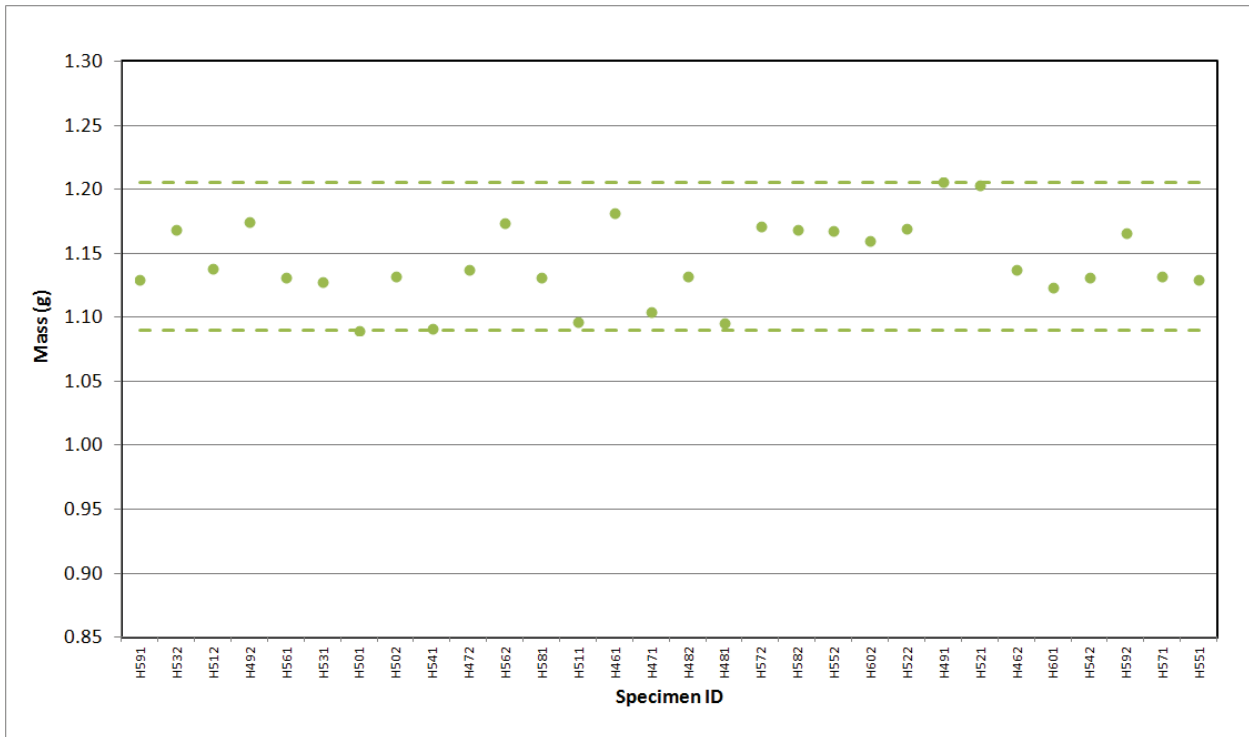


Figure A-74. A3 Matrix Piggyback Pre Thermal Measurement Mass.

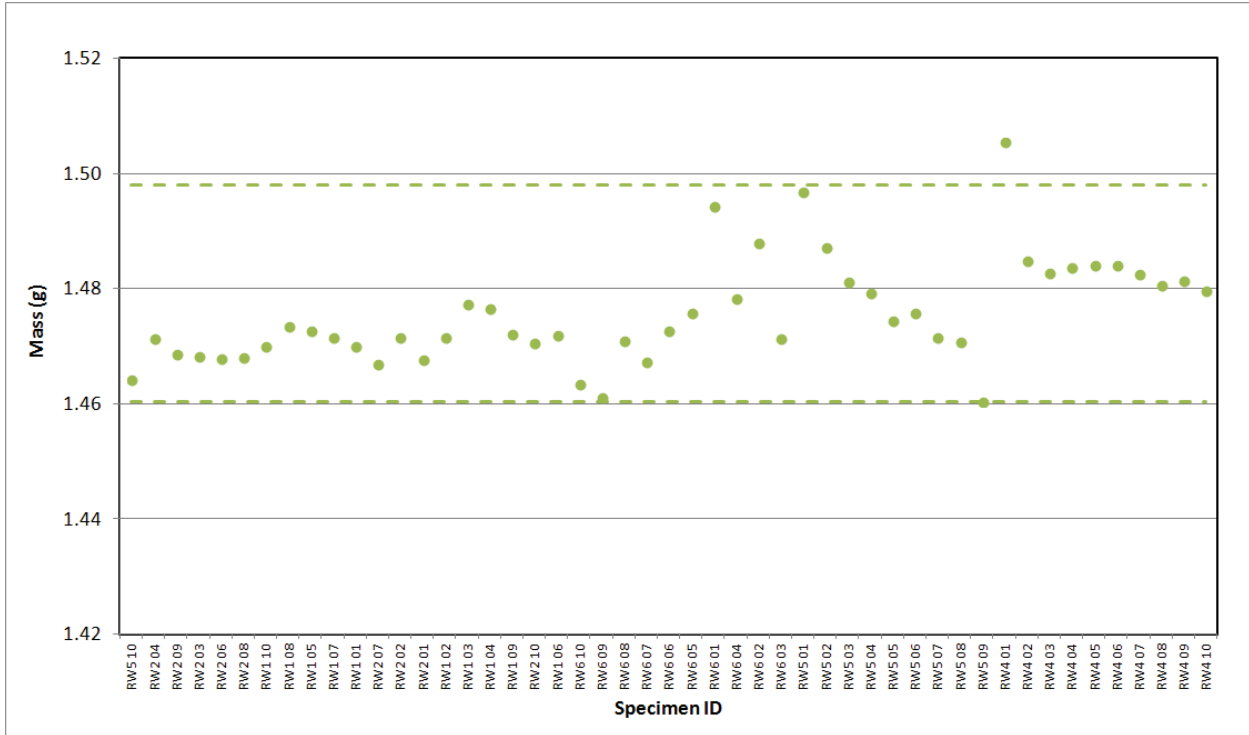


Figure A-75. BAN Piggyback Pre Thermal Measurement Mass.

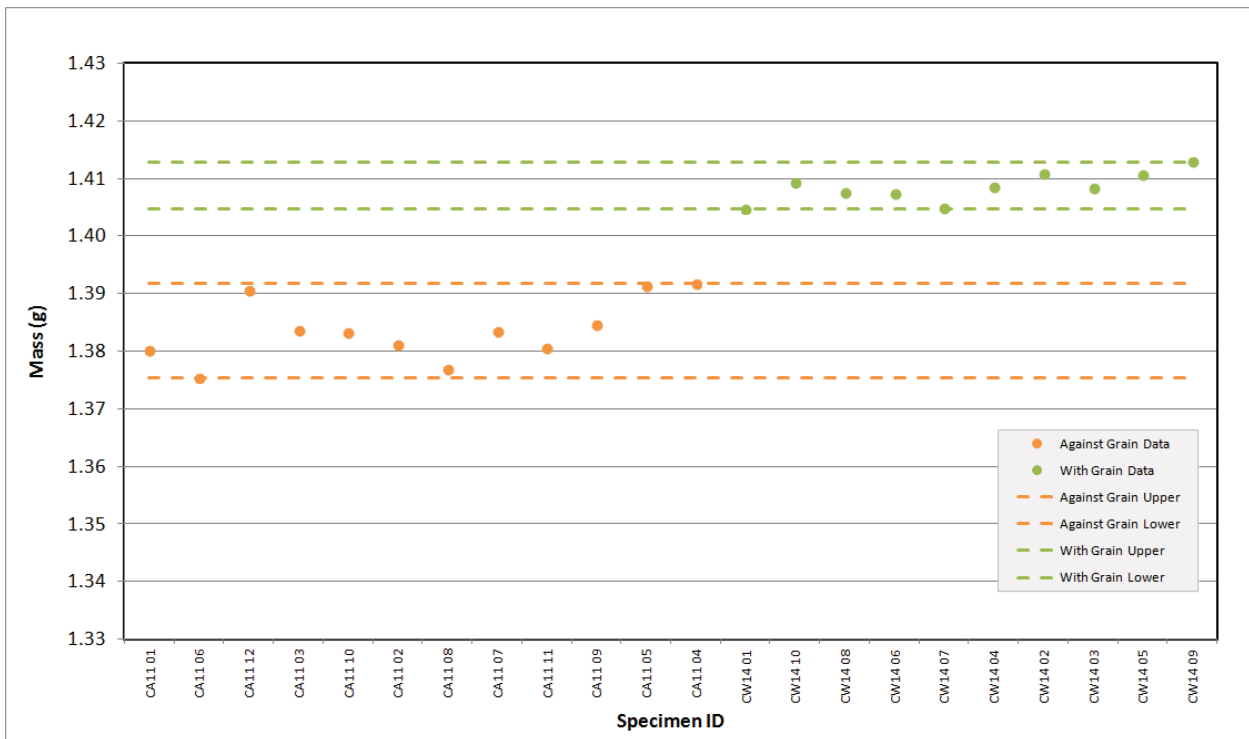


Figure A-76. H-451 Piggyback Pre Thermal Measurement Mass.

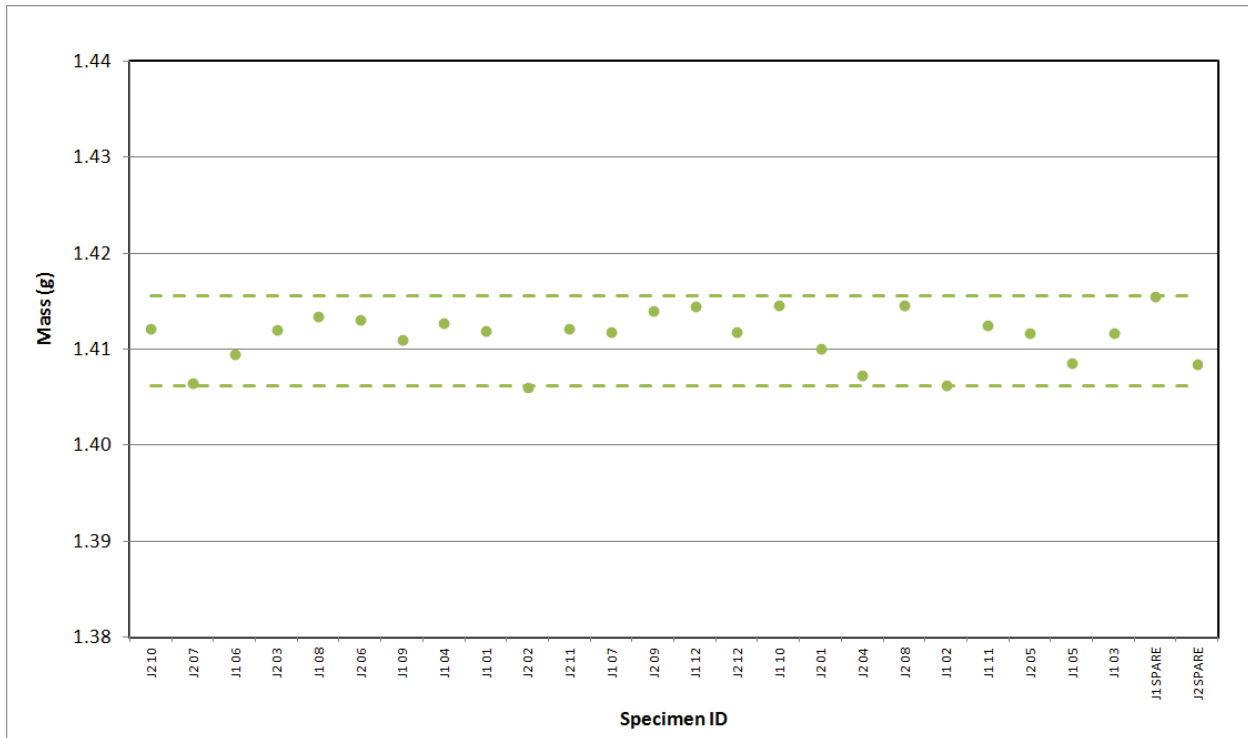


Figure A-77. HLM Piggyback Pre Thermal Measurement Mass.

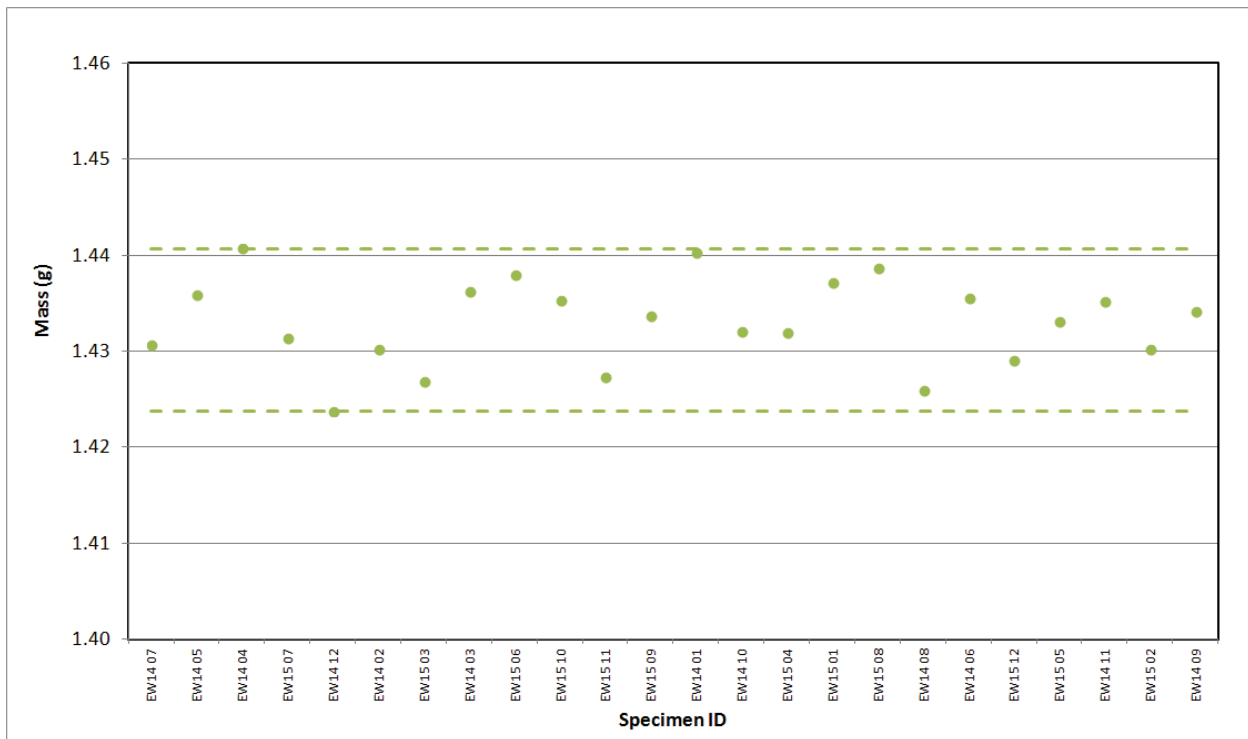


Figure A-78. IG-110 Piggyback Pre Thermal Measurement Mass.

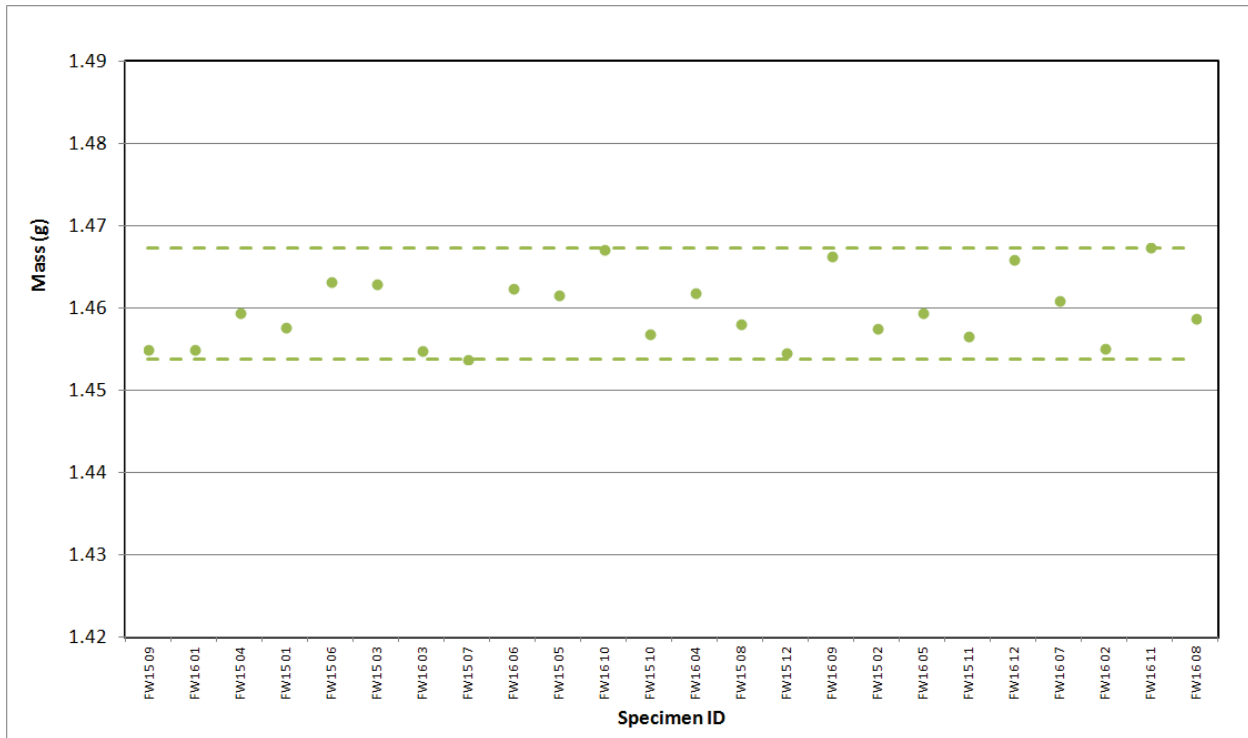


Figure A-79. IG-430 Piggyback Pre Thermal Measurement Mass.

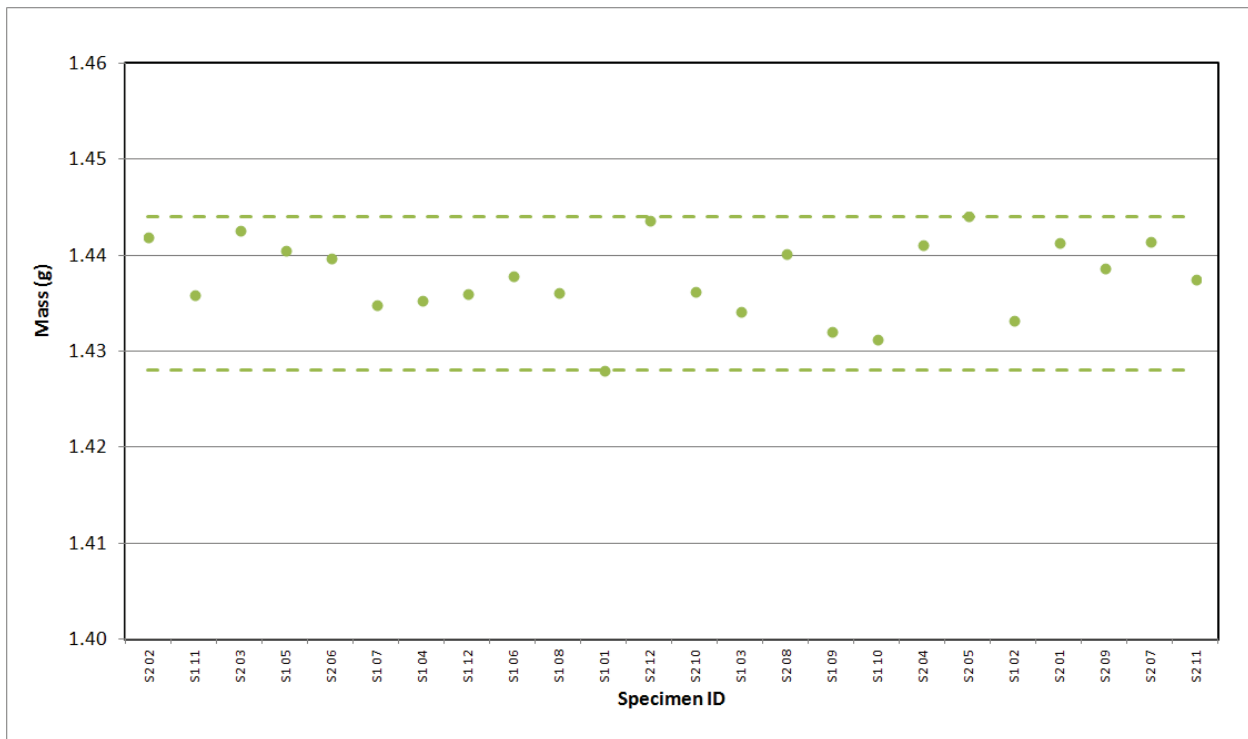


Figure A-80. NBG-10 Piggyback Pre Thermal Measurement Mass.

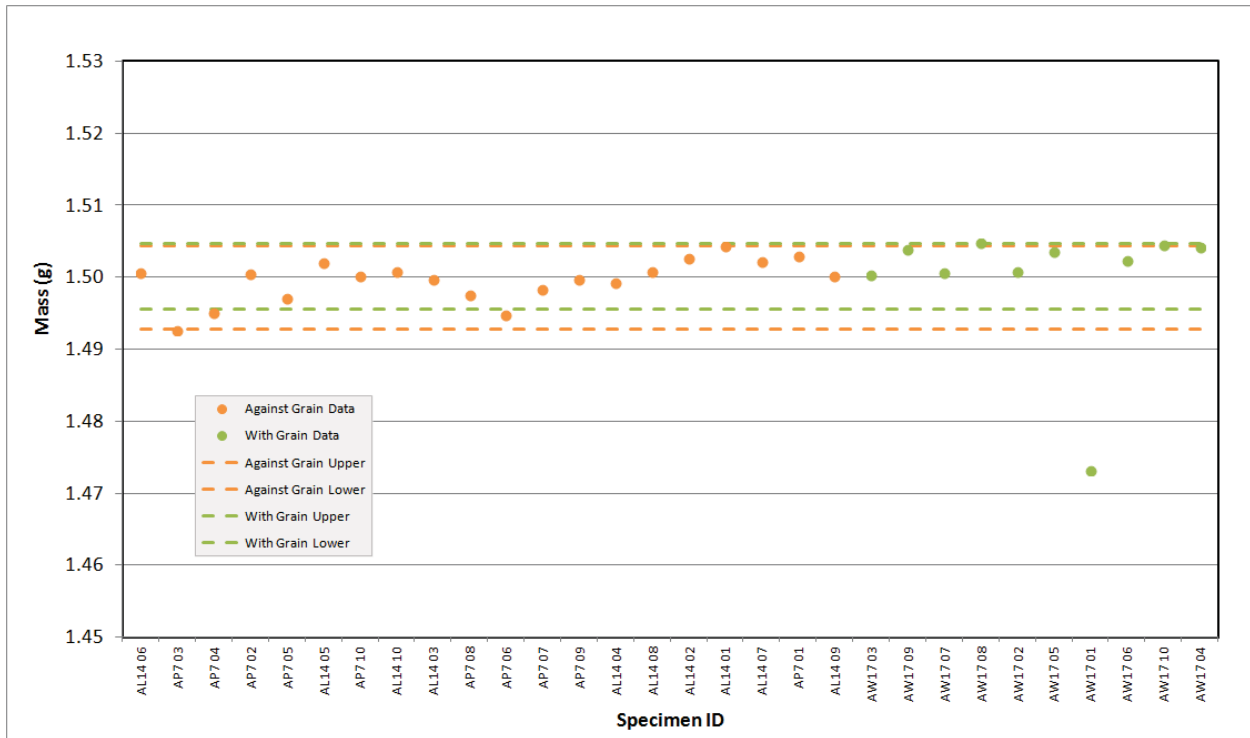


Figure A-81. NBG-17 Piggyback Pre Thermal Measurement Mass.

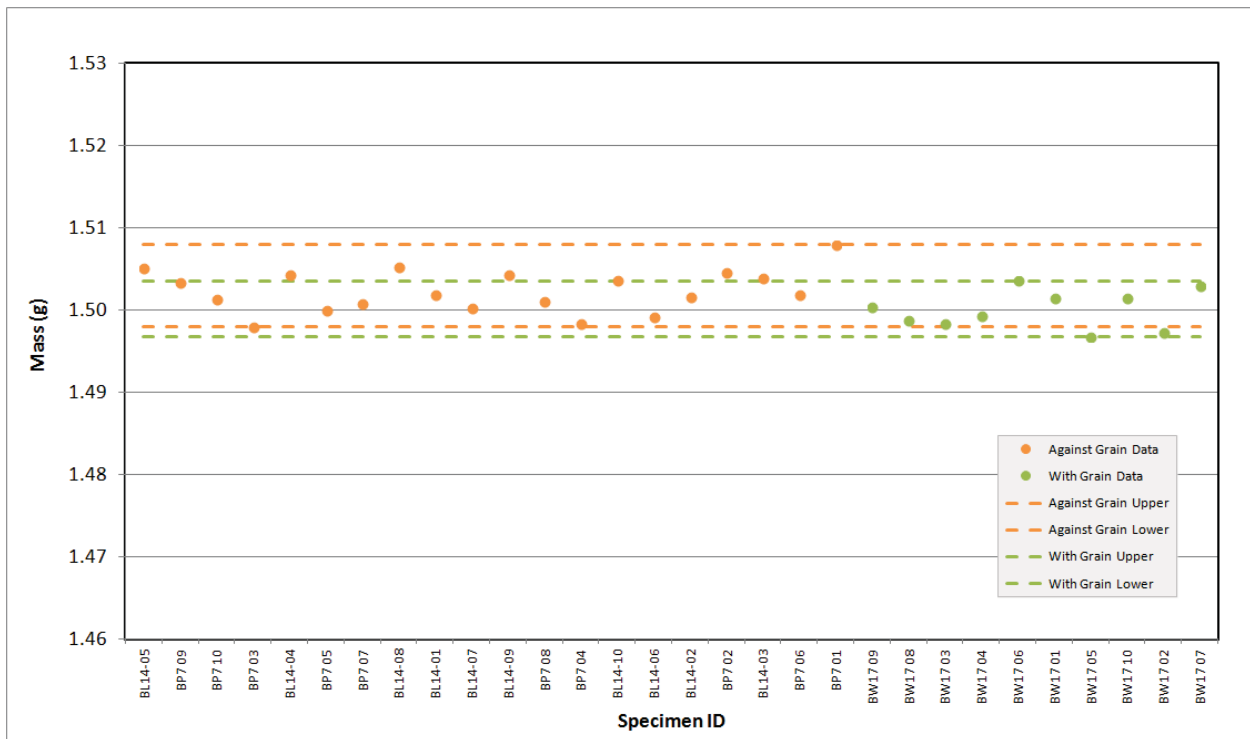


Figure A-82. NBG-18 Piggyback Pre Thermal Measurement Mass.

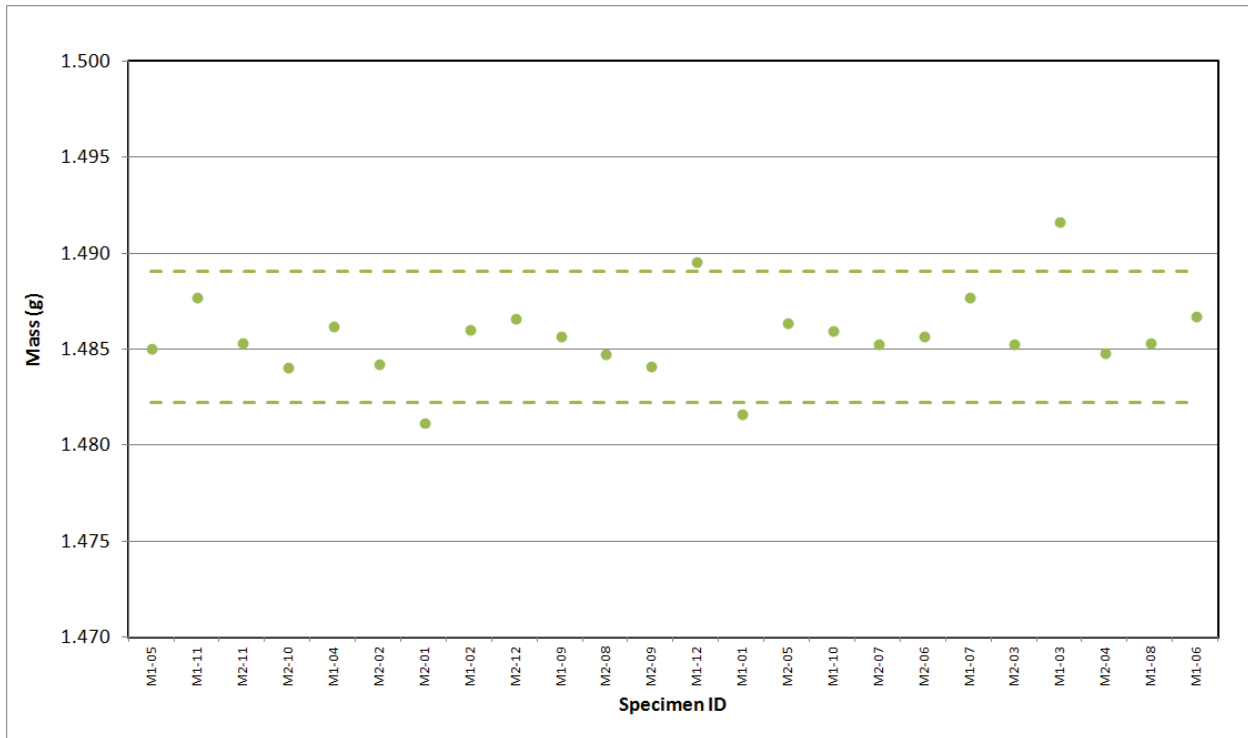


Figure A-83. NBG-25 Piggyback Pre Thermal Measurement Mass.

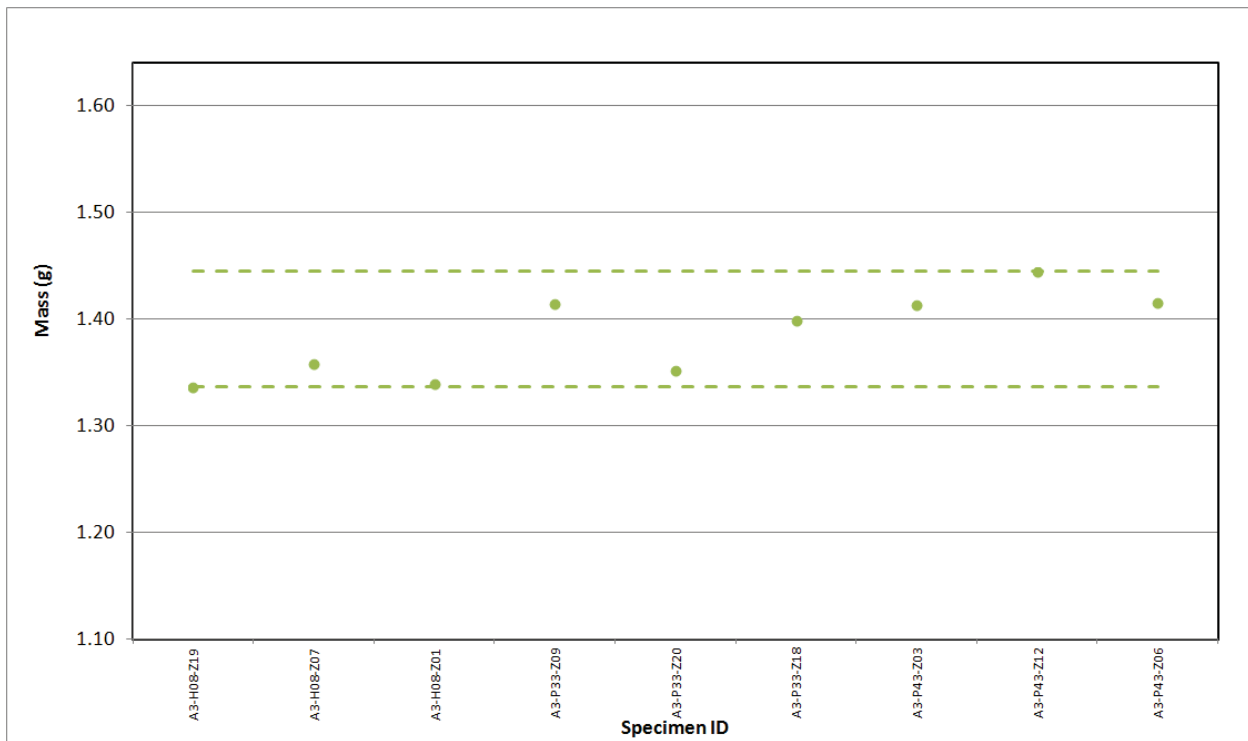


Figure A-84. New Matrix Piggyback Pre Thermal Measurement Mass.

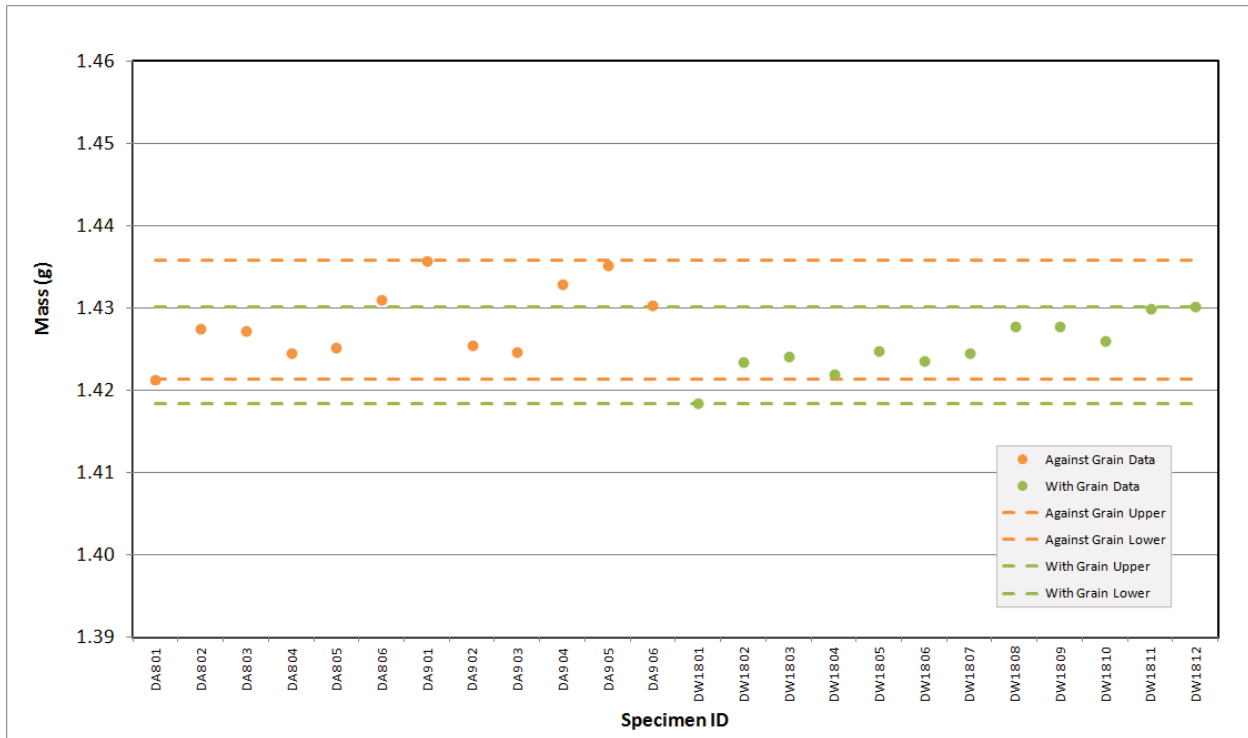


Figure A-85. PCEA Piggyback Pre Thermal Measurement Mass.

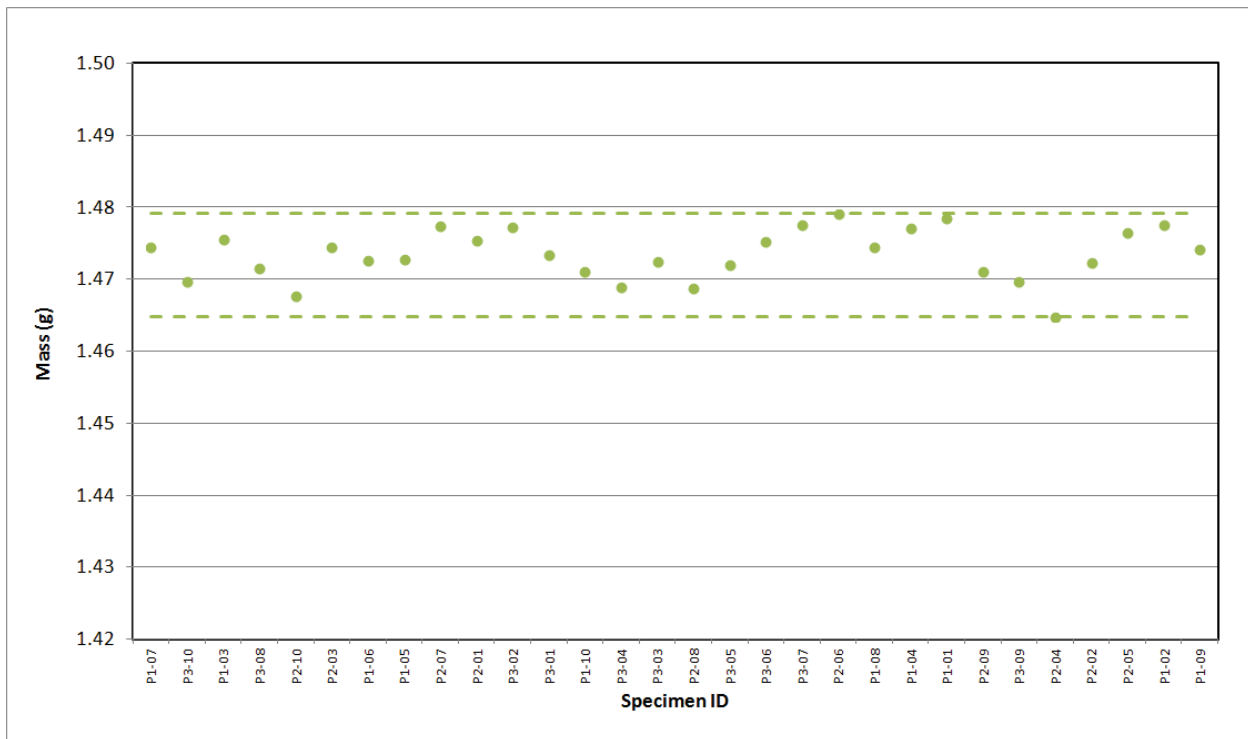


Figure A-86. PCIB Piggyback Pre Thermal Measurement Mass.

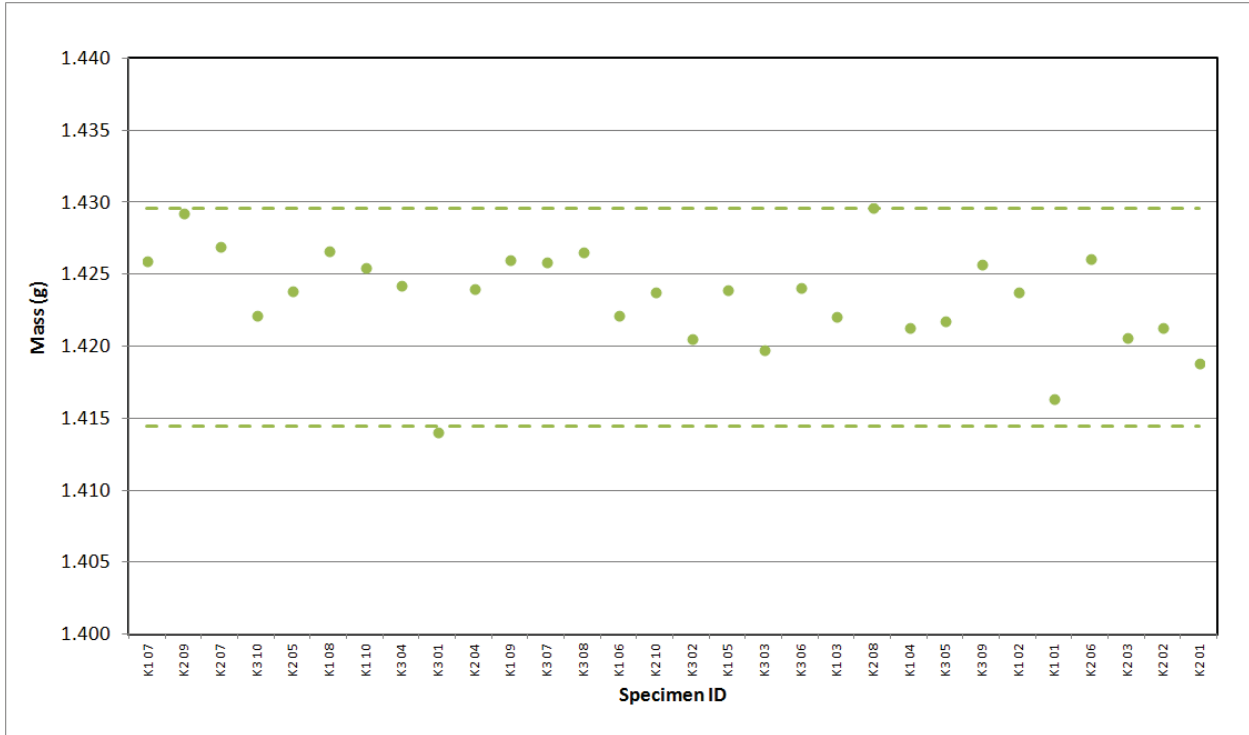


Figure A-87. PGX Piggyback Pre Thermal Measurement Mass.

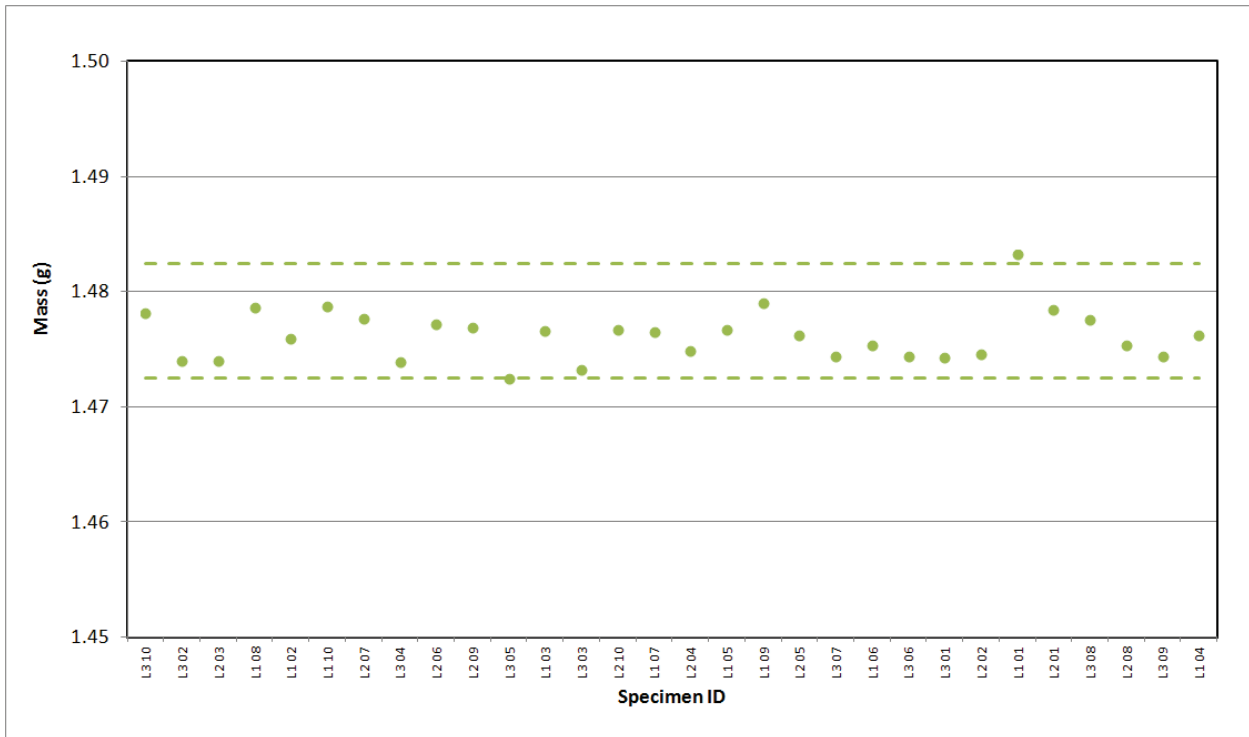


Figure A-88. PPEA Piggyback Pre Thermal Measurement Mass.

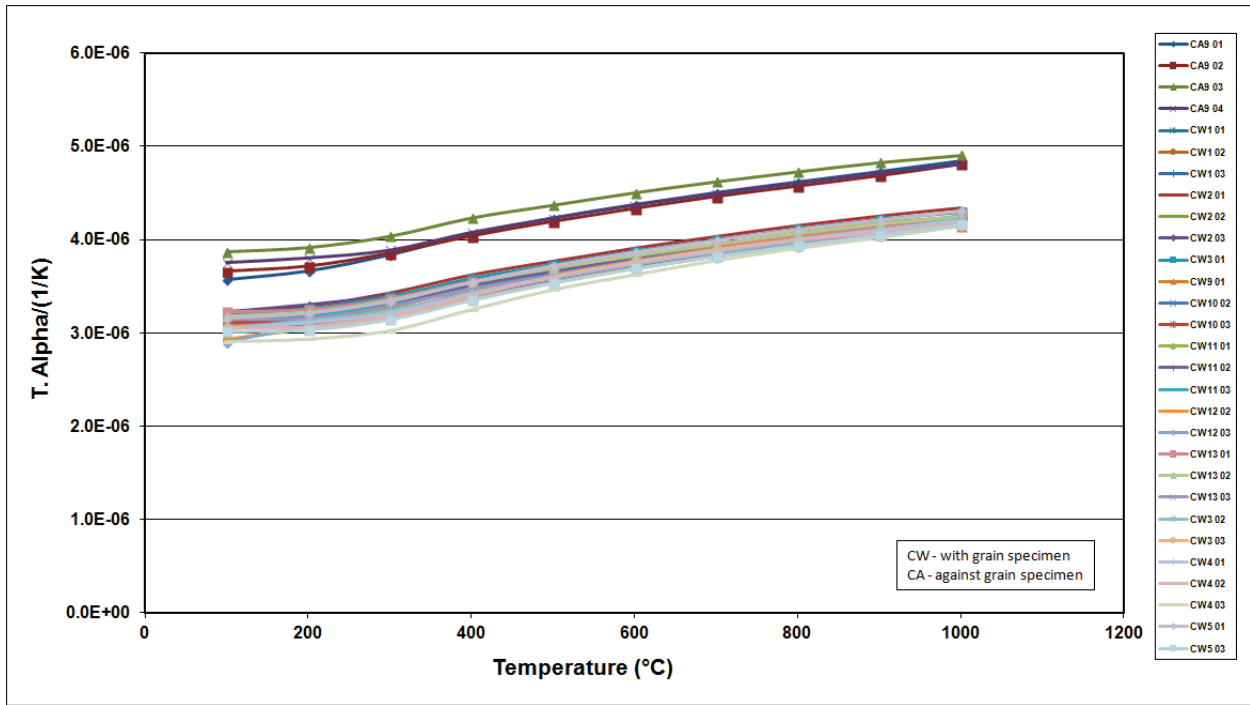


Figure A-89. H-451 Creep Coefficient of Thermal Expansion.

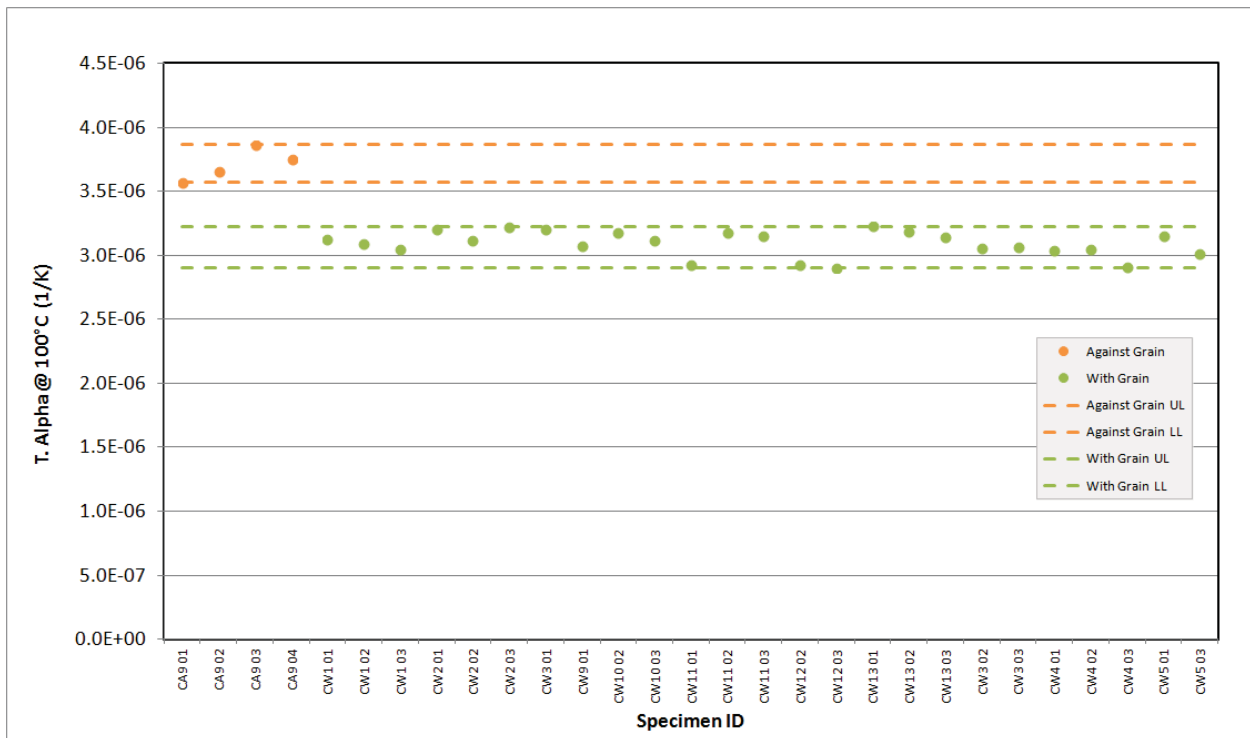


Figure A-90. H-451 Creep Coefficient of Thermal Expansion @ $100^{\circ}C$.

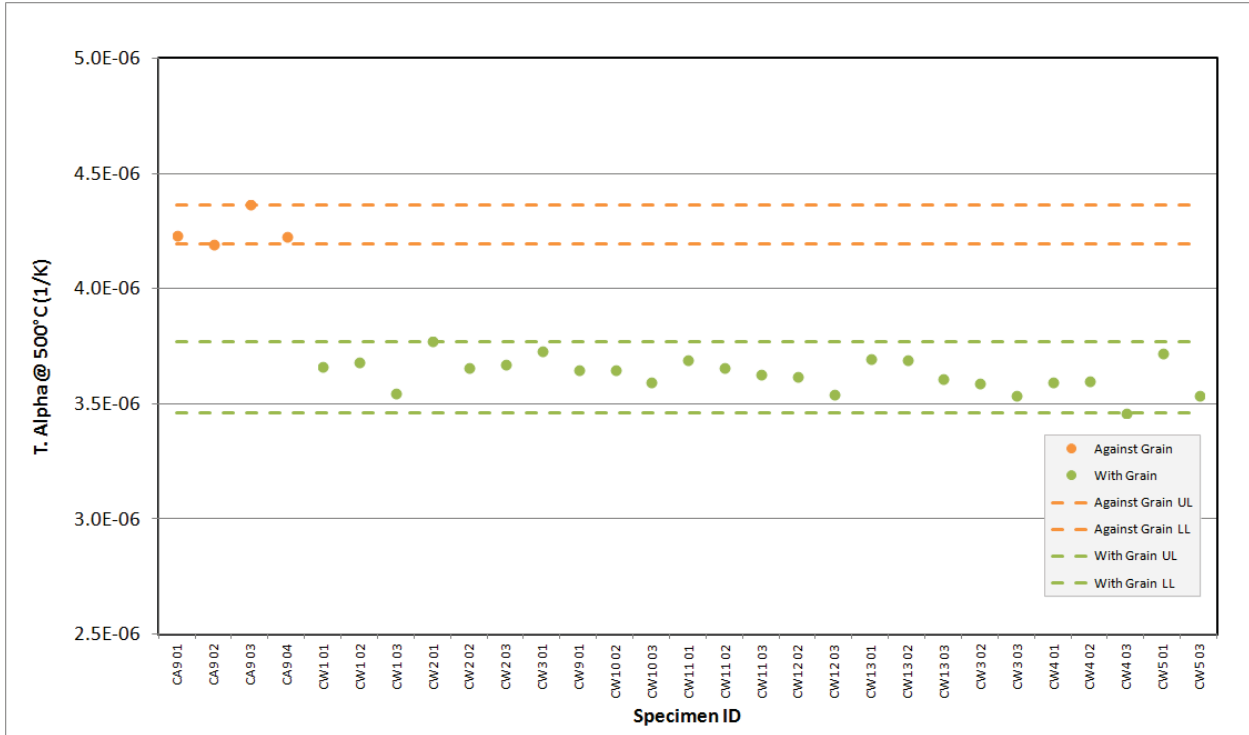


Figure A-91. H-451 Creep Coefficient of Thermal Expansion @ 500°C.

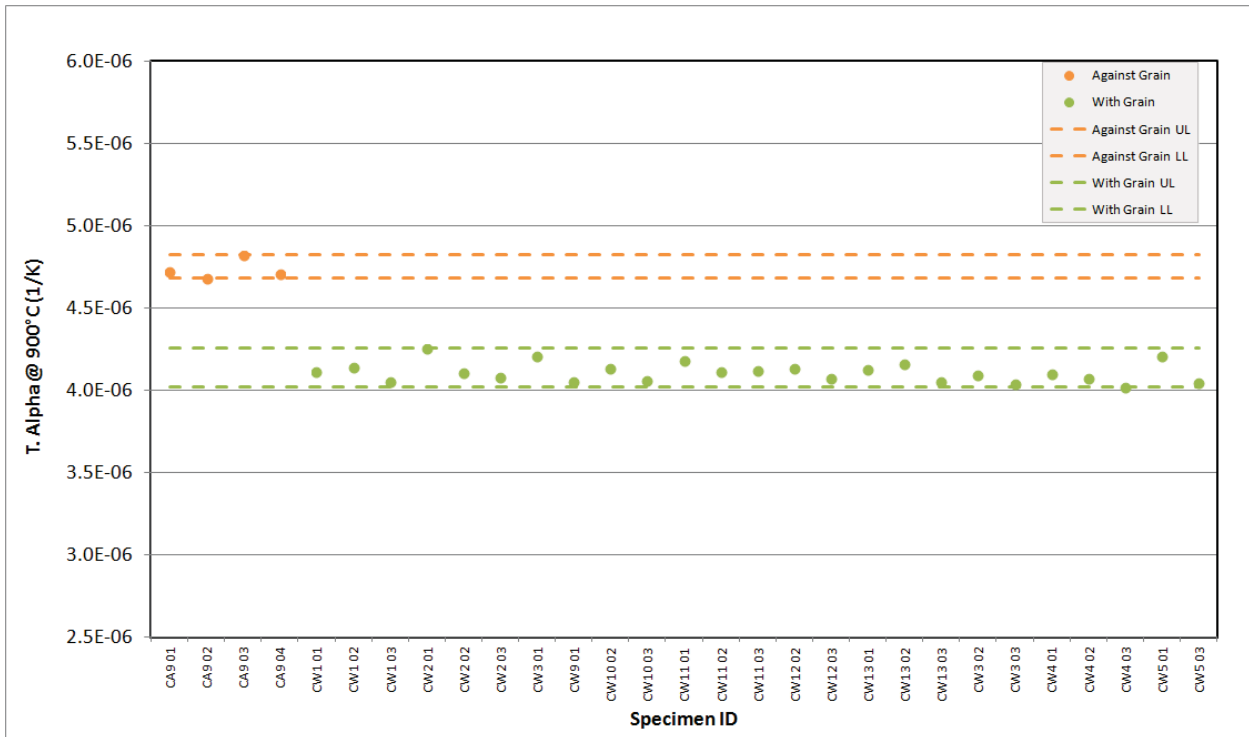


Figure A-92. H-451 Creep Coefficient of Thermal Expansion @ 900°C.

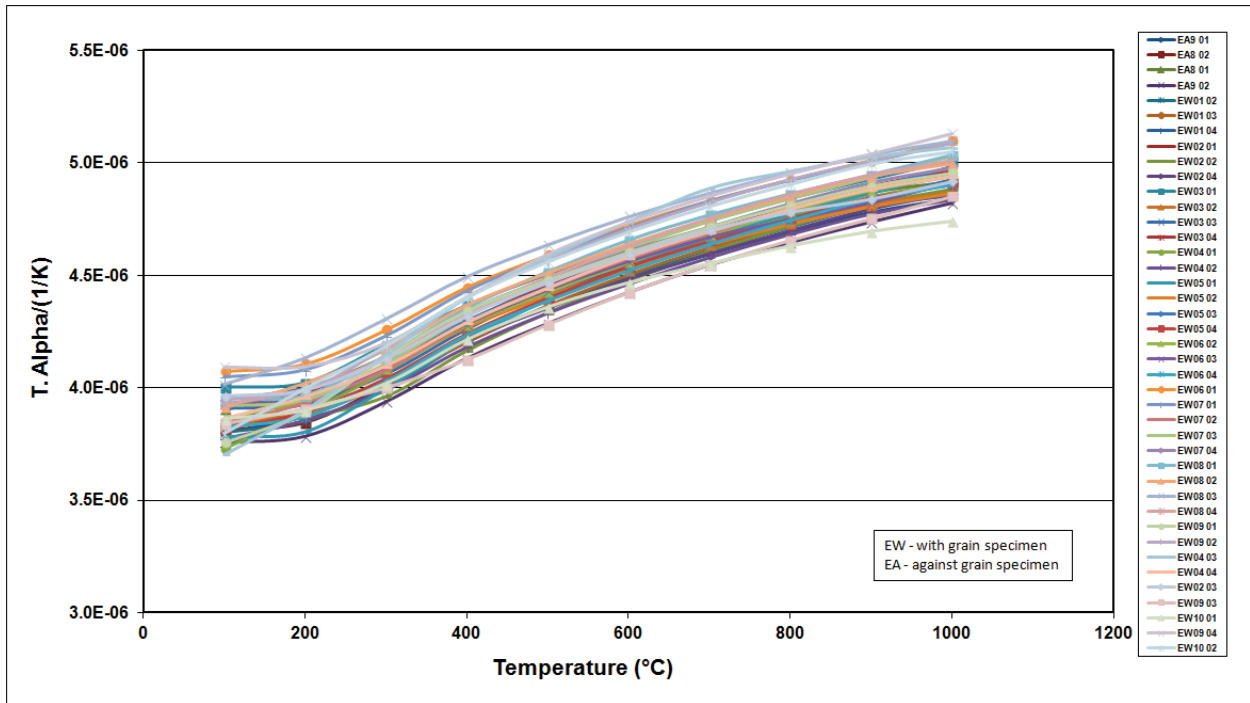


Figure A-93. IG-110 Creep Coefficient of Thermal Expansion.

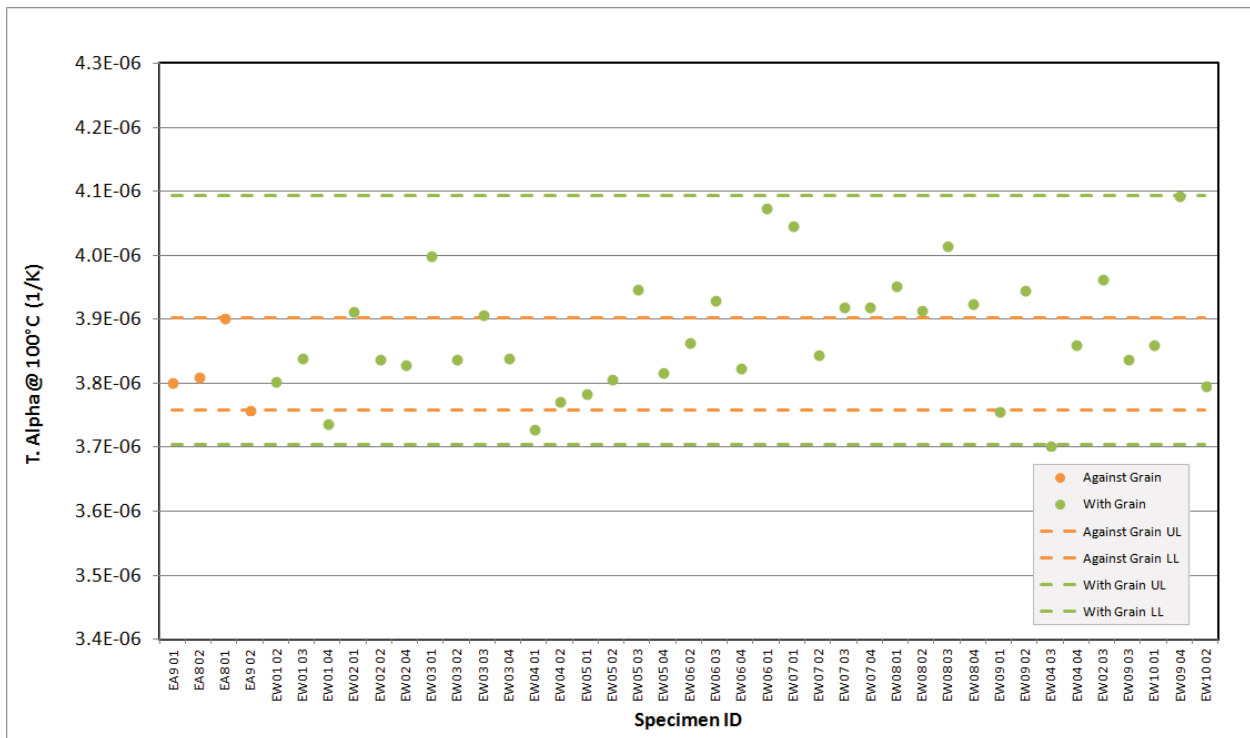


Figure A-94. IG-110 Creep Coefficient of Thermal Expansion @ 100°C.

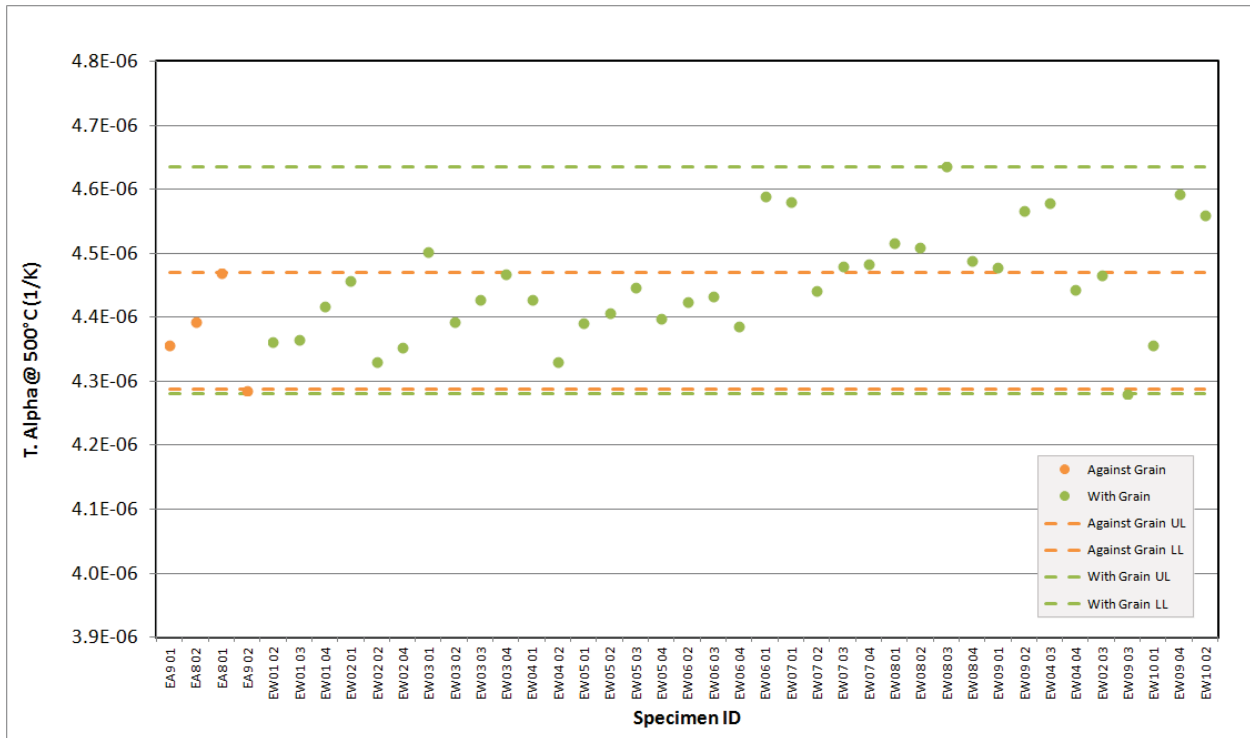


Figure A-95. IG-110 Creep Coefficient of Thermal Expansion @ 500°C.

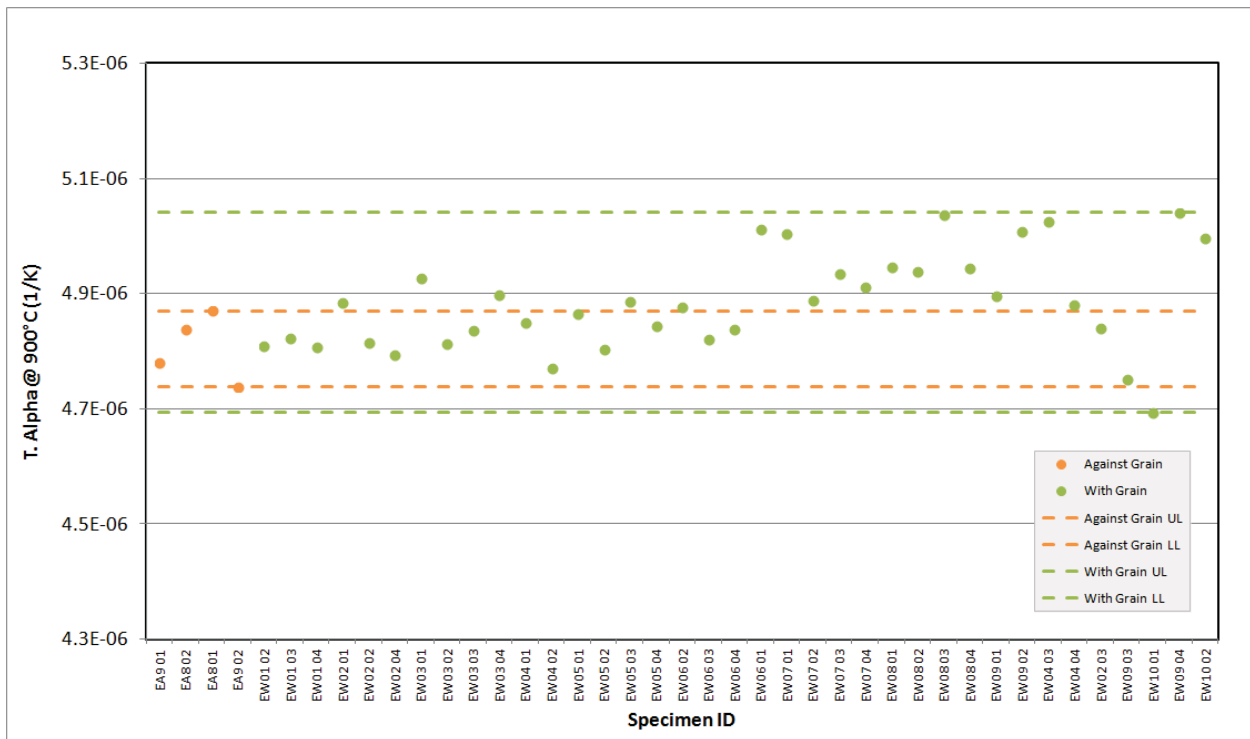


Figure A-96. IG-110 Creep Coefficient of Thermal Expansion @ 900°C.

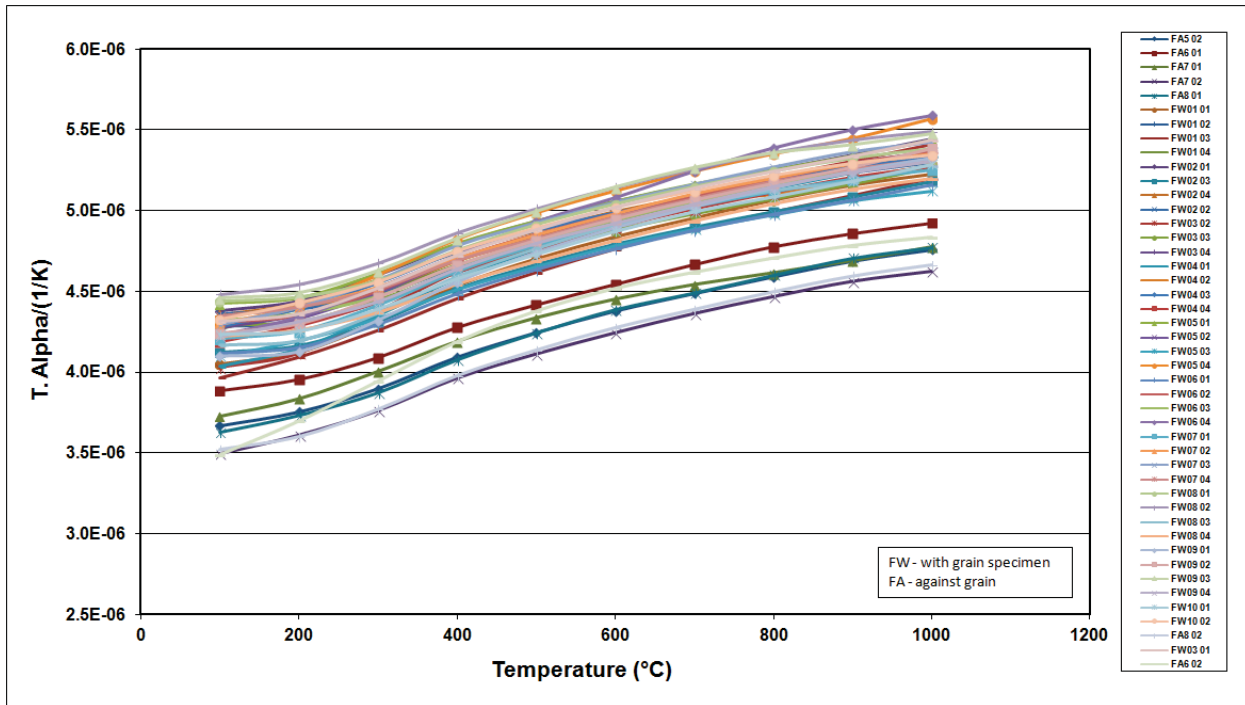


Figure A-97. IG-430 Creep Coefficient of Thermal Expansion.

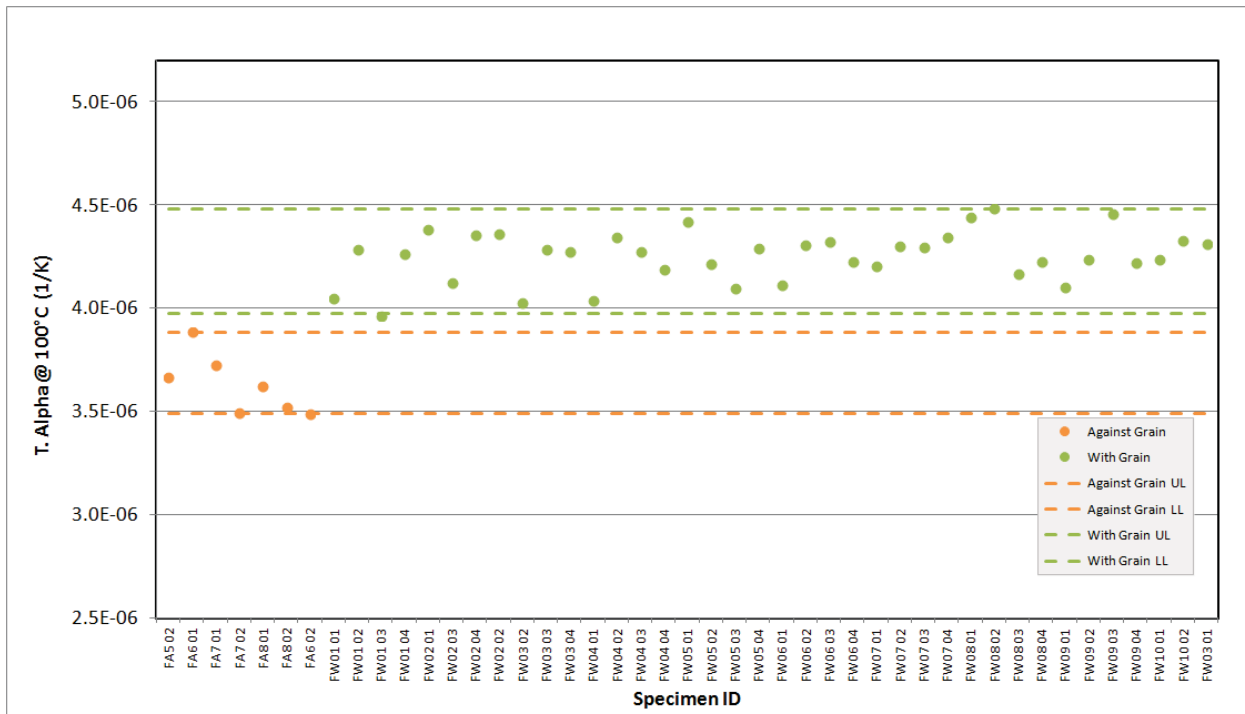


Figure A-98. IG-430 Creep Coefficient of Thermal Expansion @ 100°C.

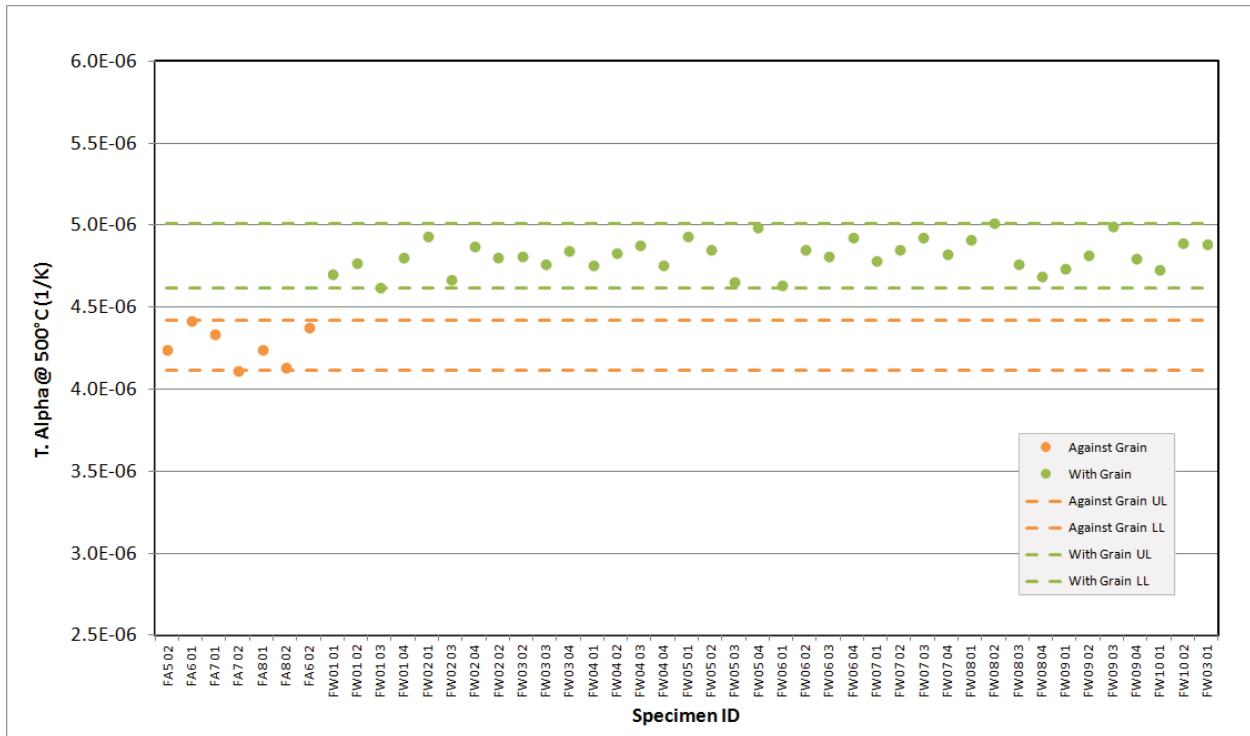


Figure A-99. IG-430 Creep Coefficient of Thermal Expansion @ 500°C.

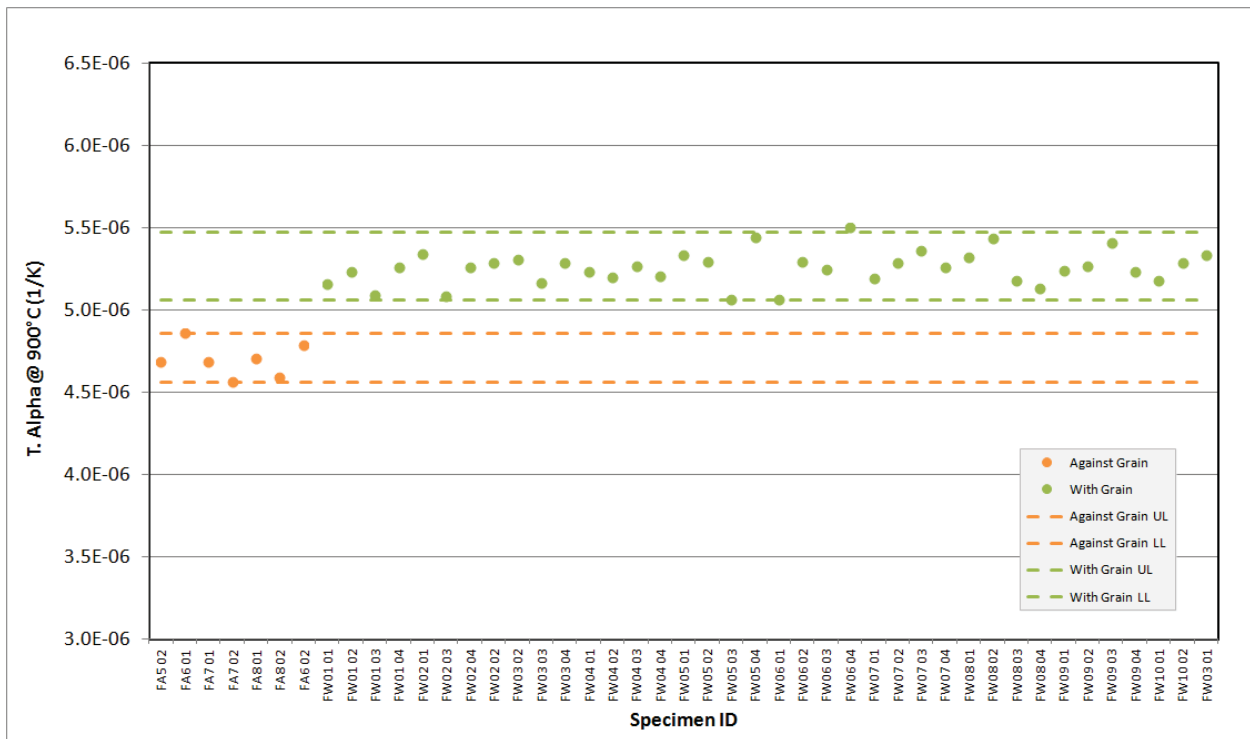


Figure A-100. IG-430 Creep Coefficient of Thermal Expansion @ 900°C.

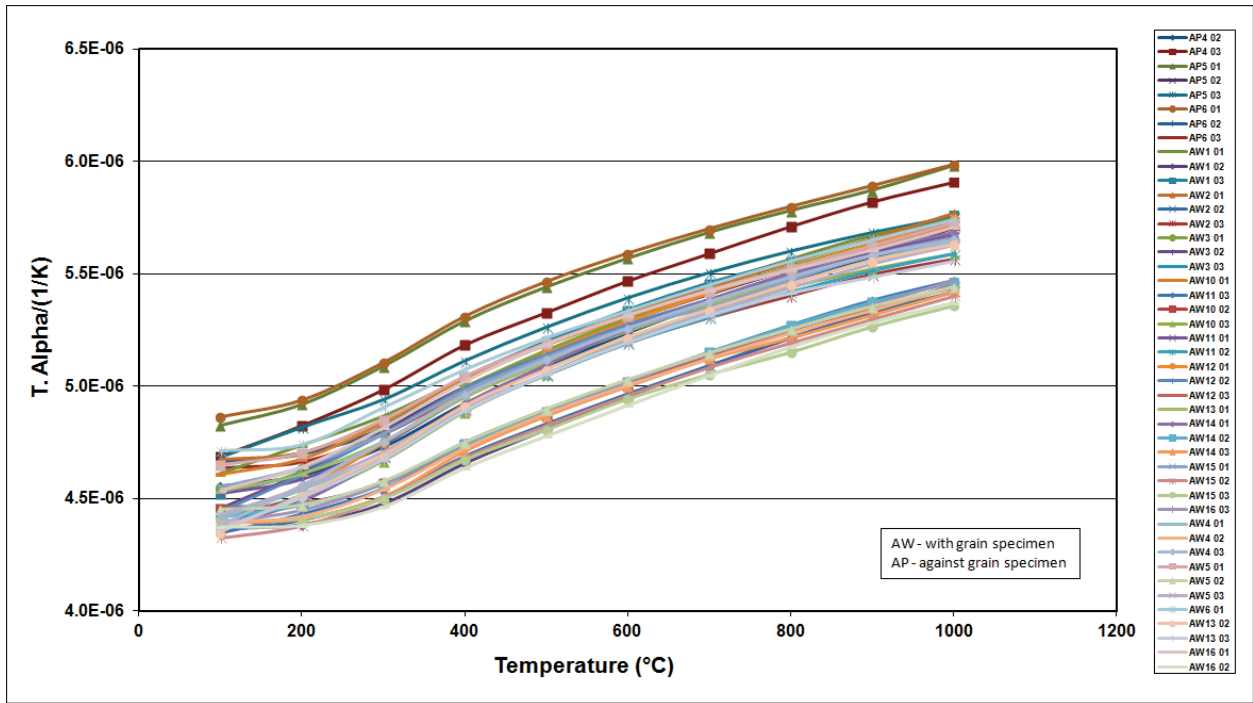


Figure A-101. NBG-17 Creep Coefficient of Thermal Expansion.

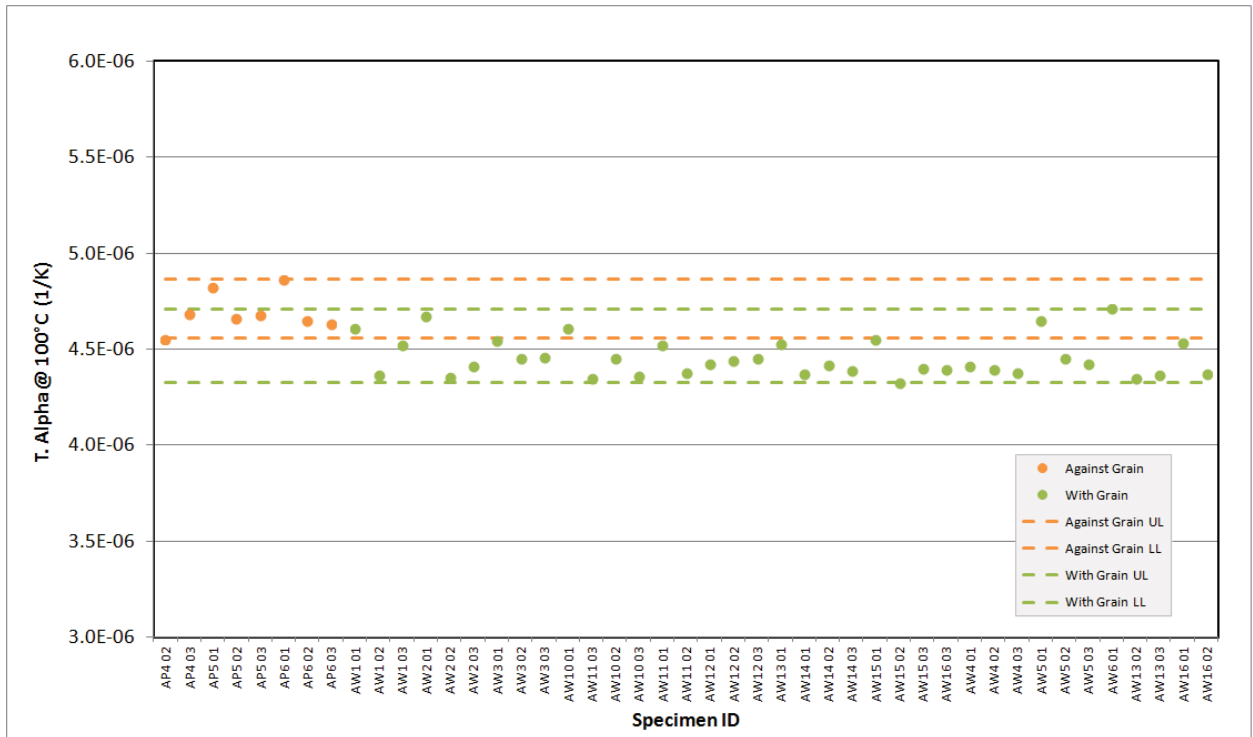


Figure A-102. NBG-17 Creep Coefficient of Thermal Expansion @ 100°C.

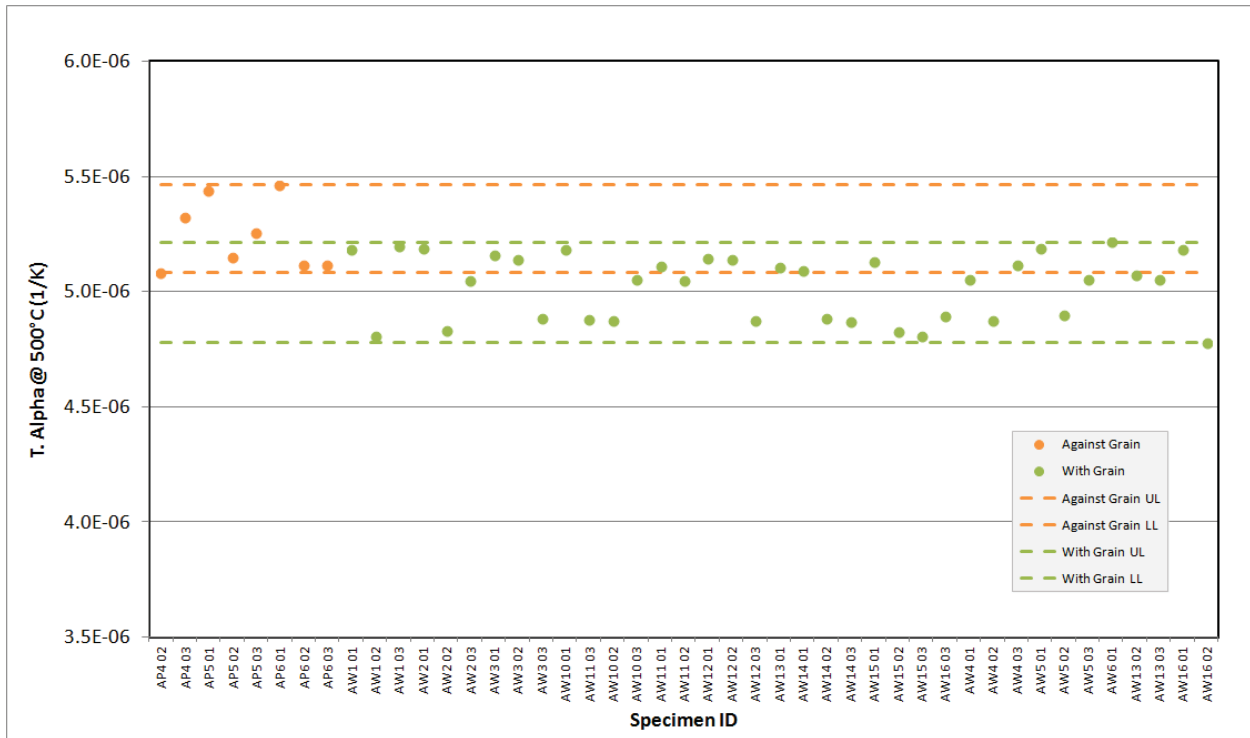


Figure A-103. NBG-17 Creep Coefficient of Thermal Expansion @ 500°C.

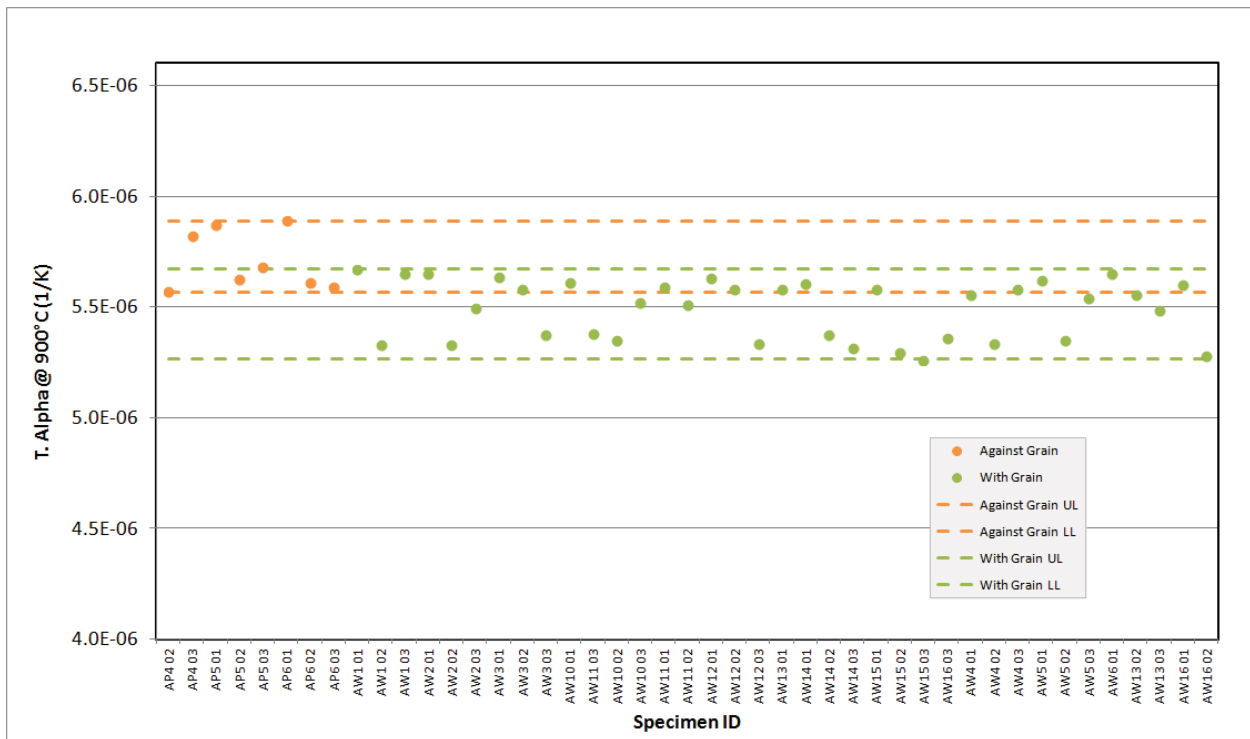


Figure A-104. NBG-17 Creep Coefficient of Thermal Expansion @ 900°C.

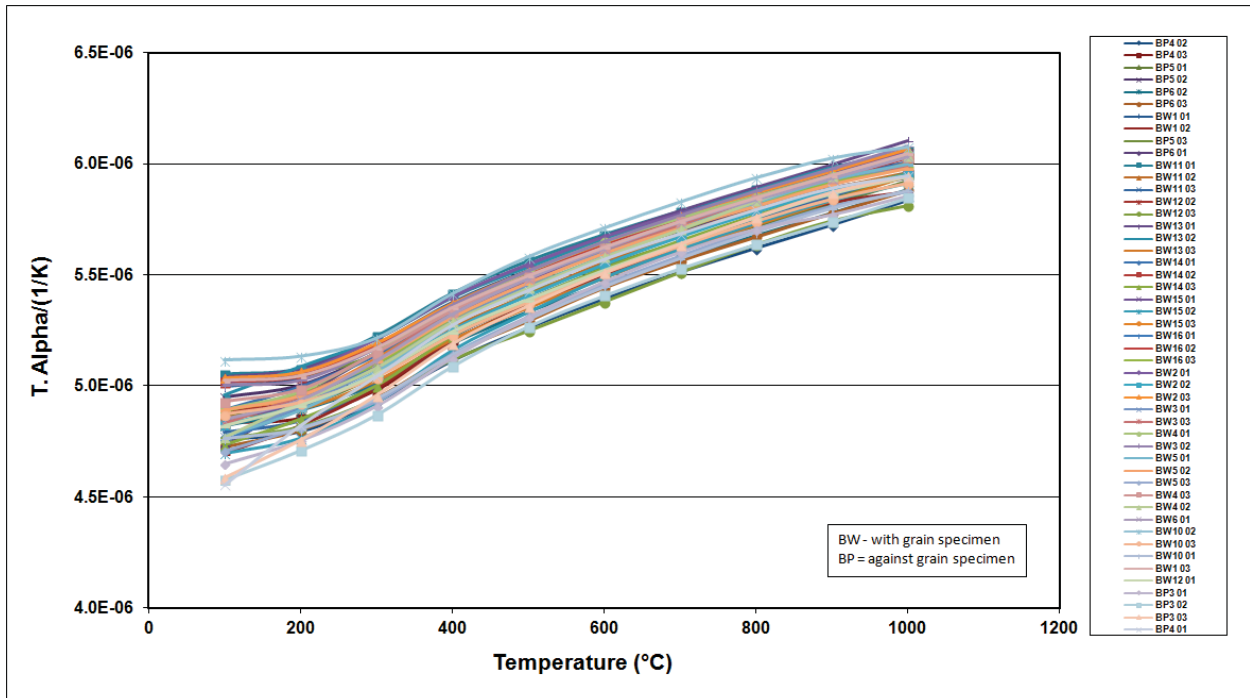


Figure A-105. NBG-18 Creep Coefficient of Thermal Expansion.

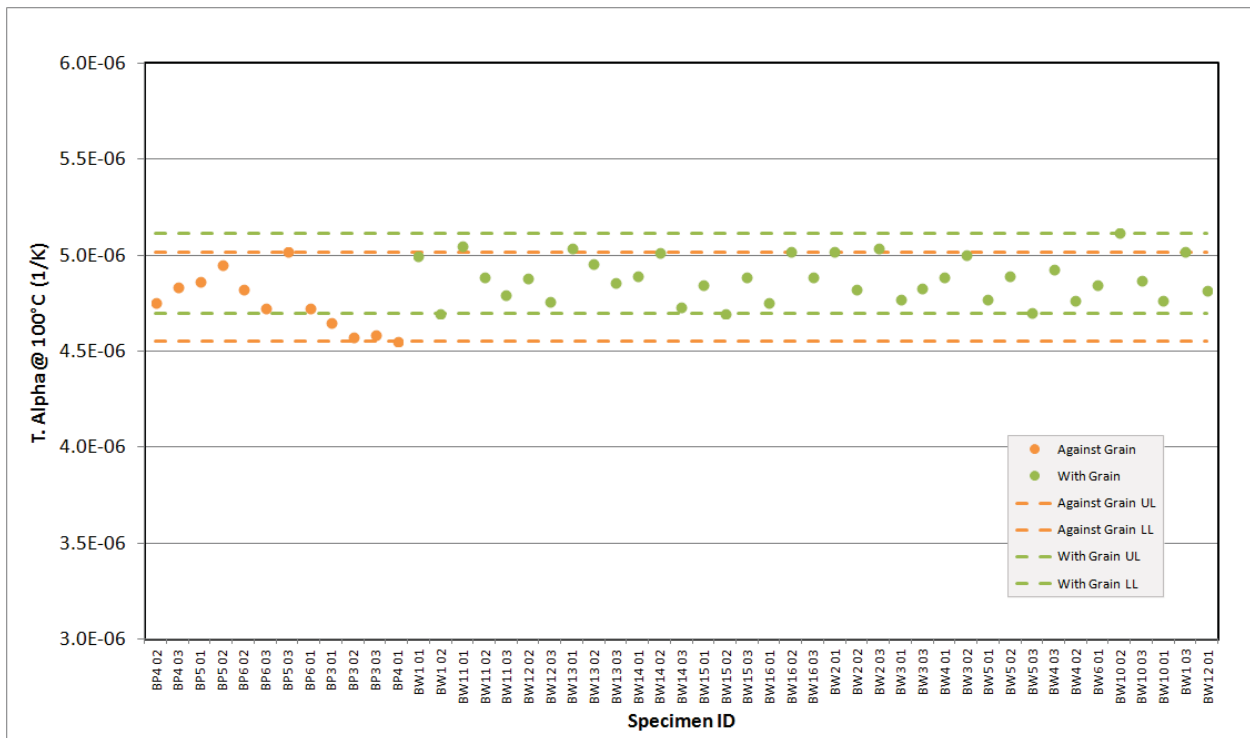


Figure A-106. NBG-18 Creep Coefficient of Thermal Expansion @ $100^{\circ}C$.

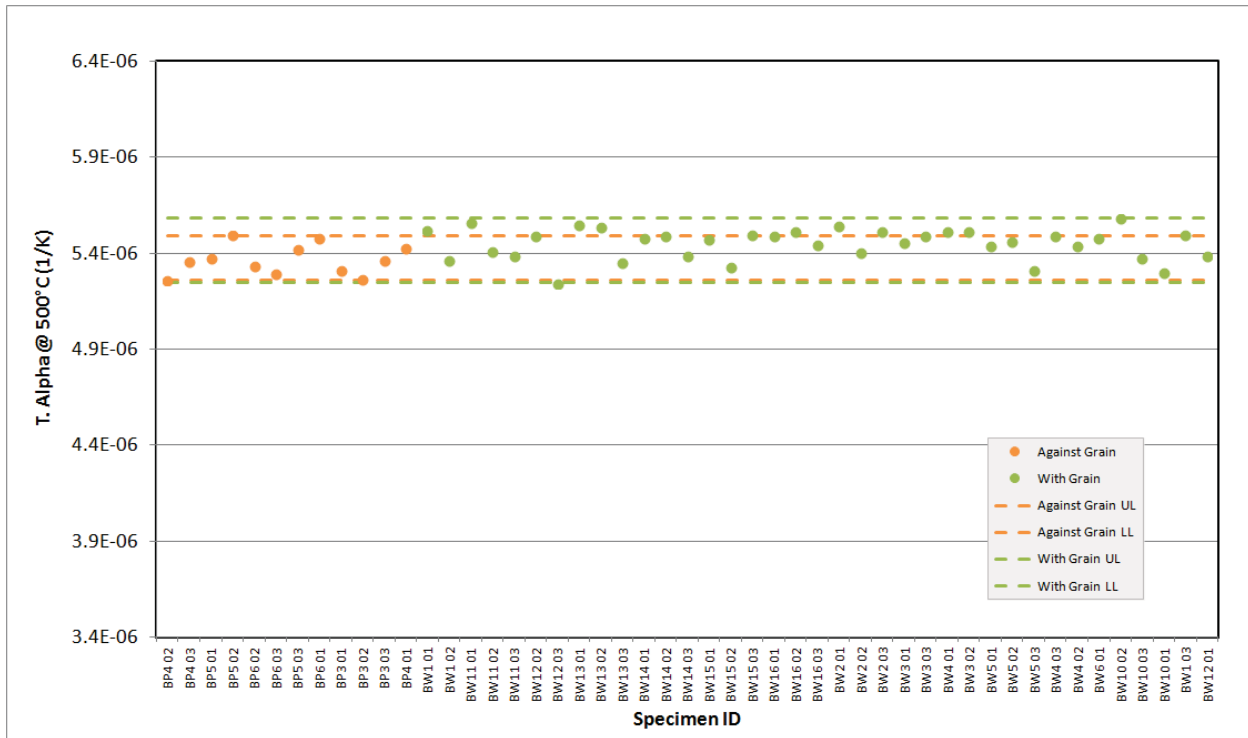


Figure A-107. NBG-18 Creep Coefficient of Thermal Expansion @ 500°C.

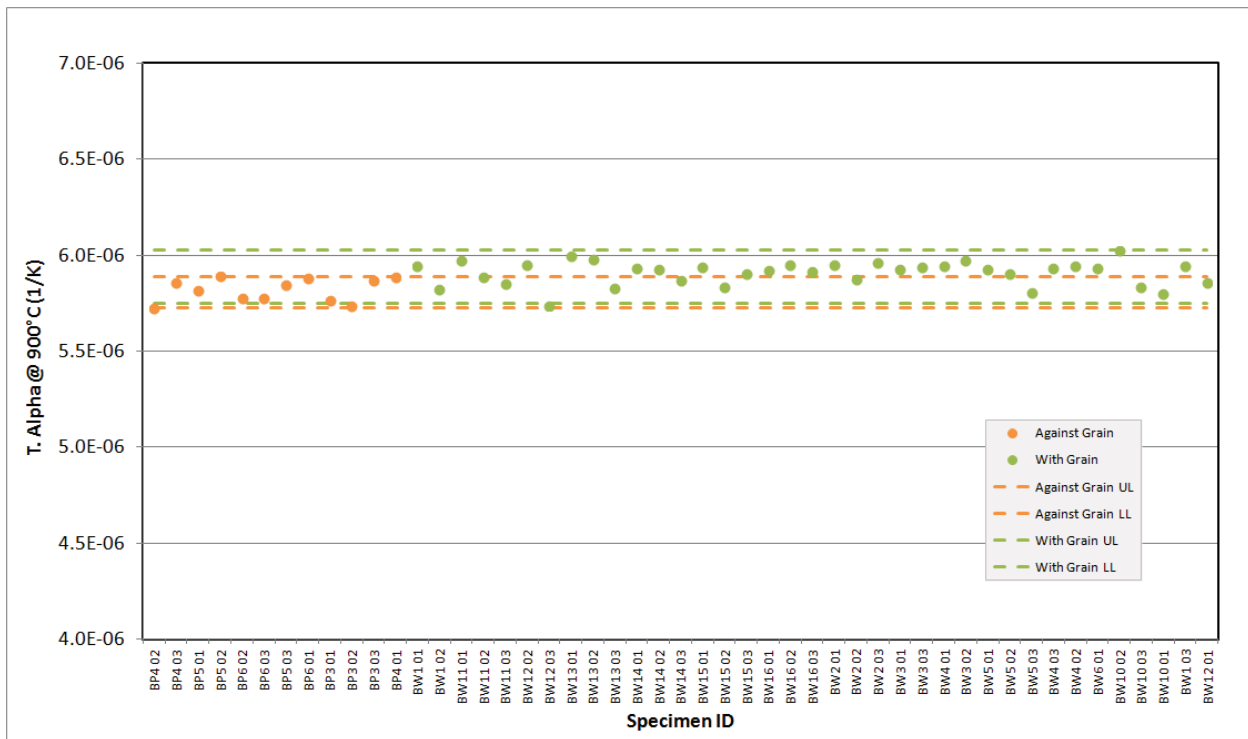


Figure A-108. NBG-18 Creep Coefficient of Thermal Expansion @ 900°C.

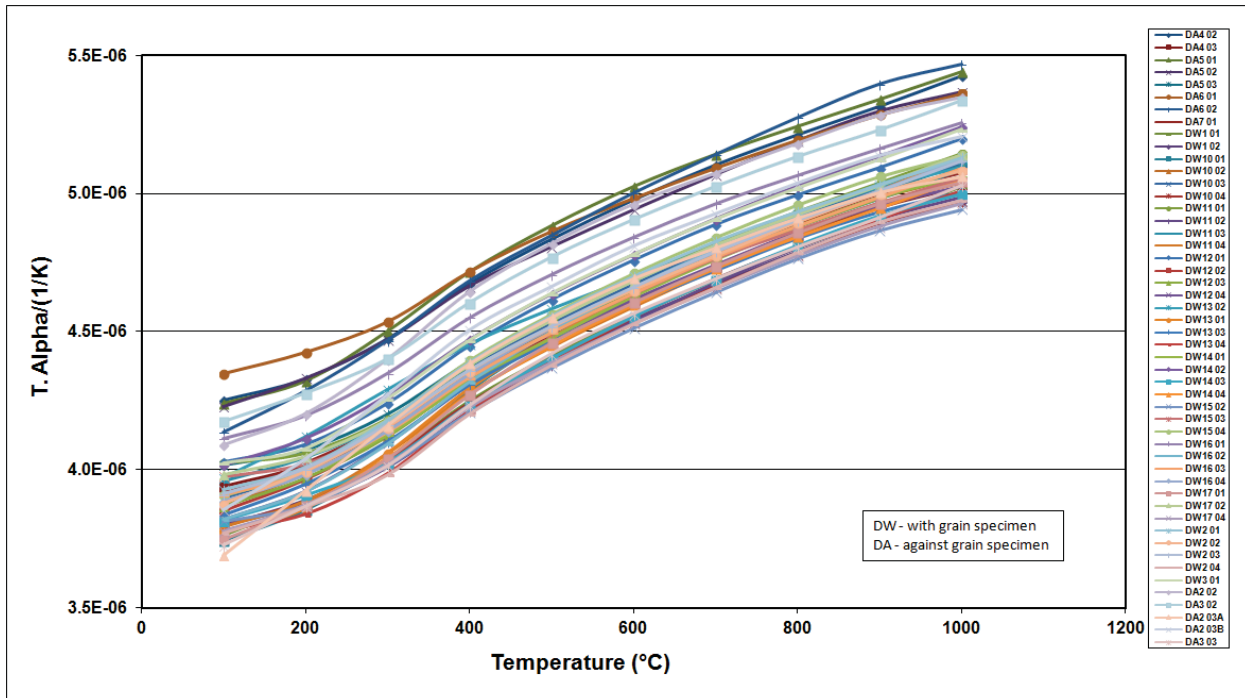


Figure A-109. PCEA Creep Coefficient of Thermal Expansion.

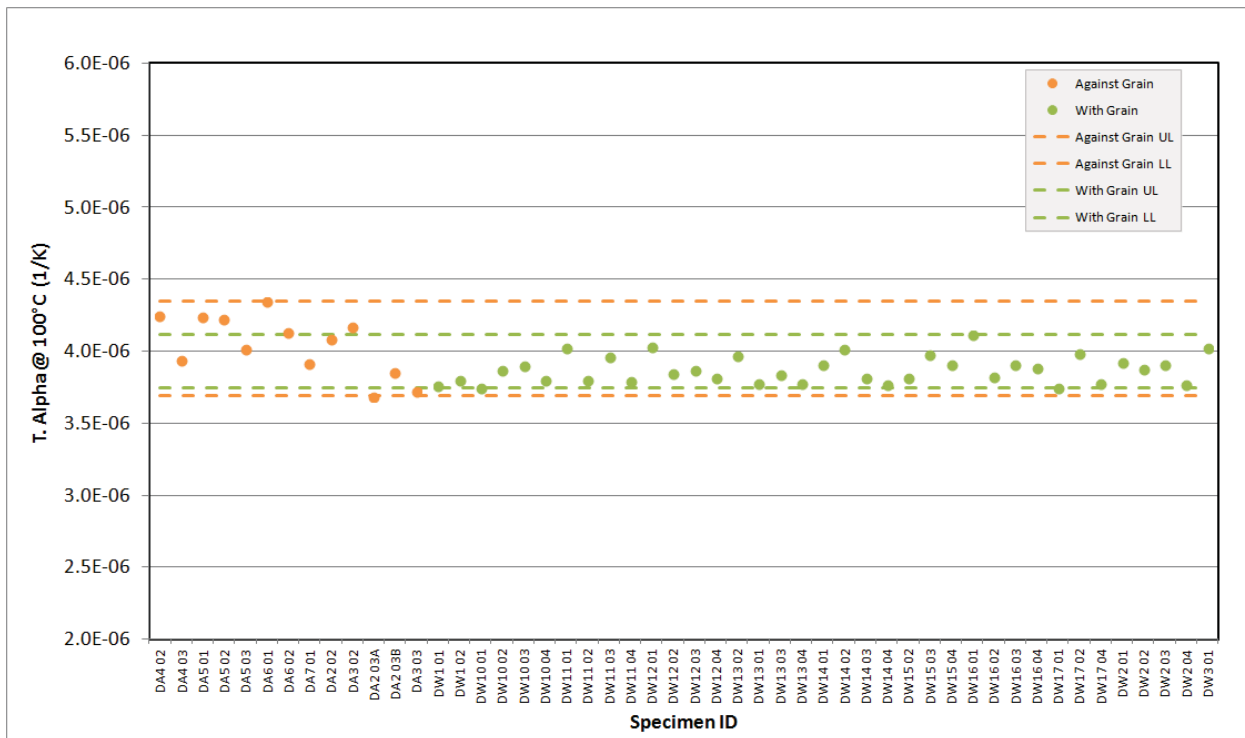


Figure A-110. PCEA Creep Coefficient of Thermal Expansion @ $100^{\circ}C$.

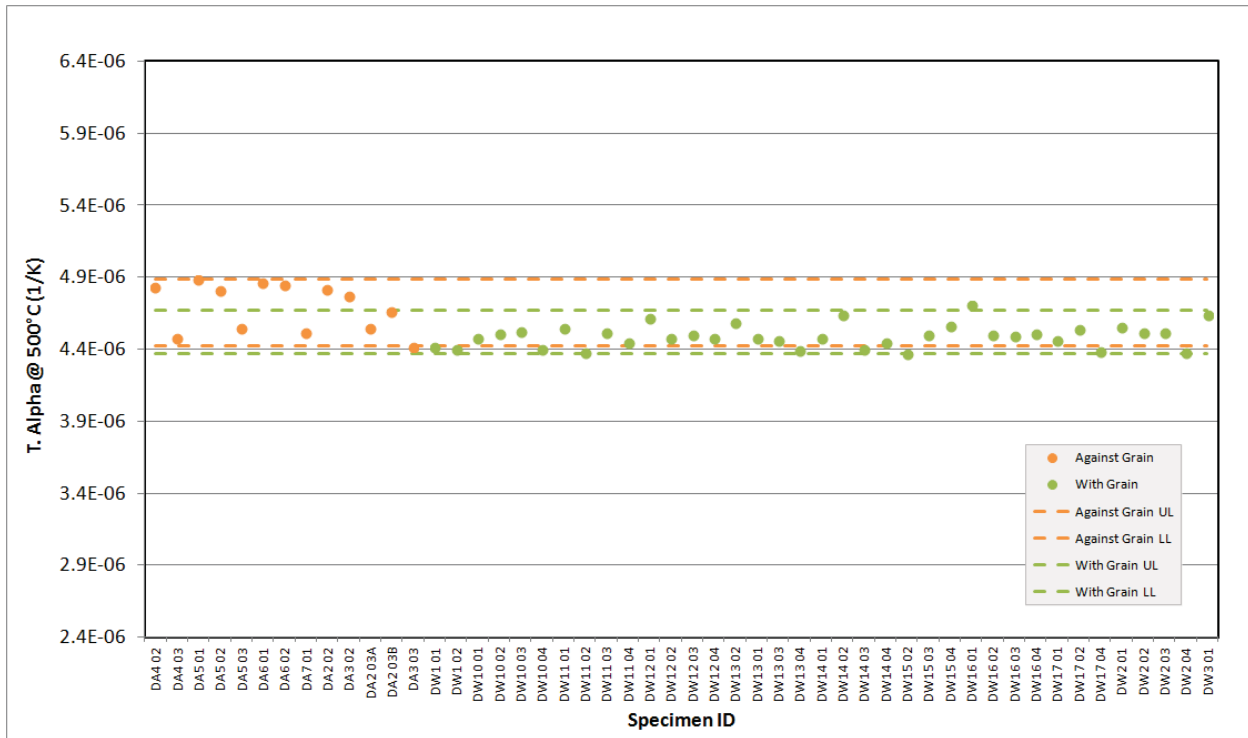


Figure A-111. PCEA Creep Coefficient of Thermal Expansion @ 500°C.

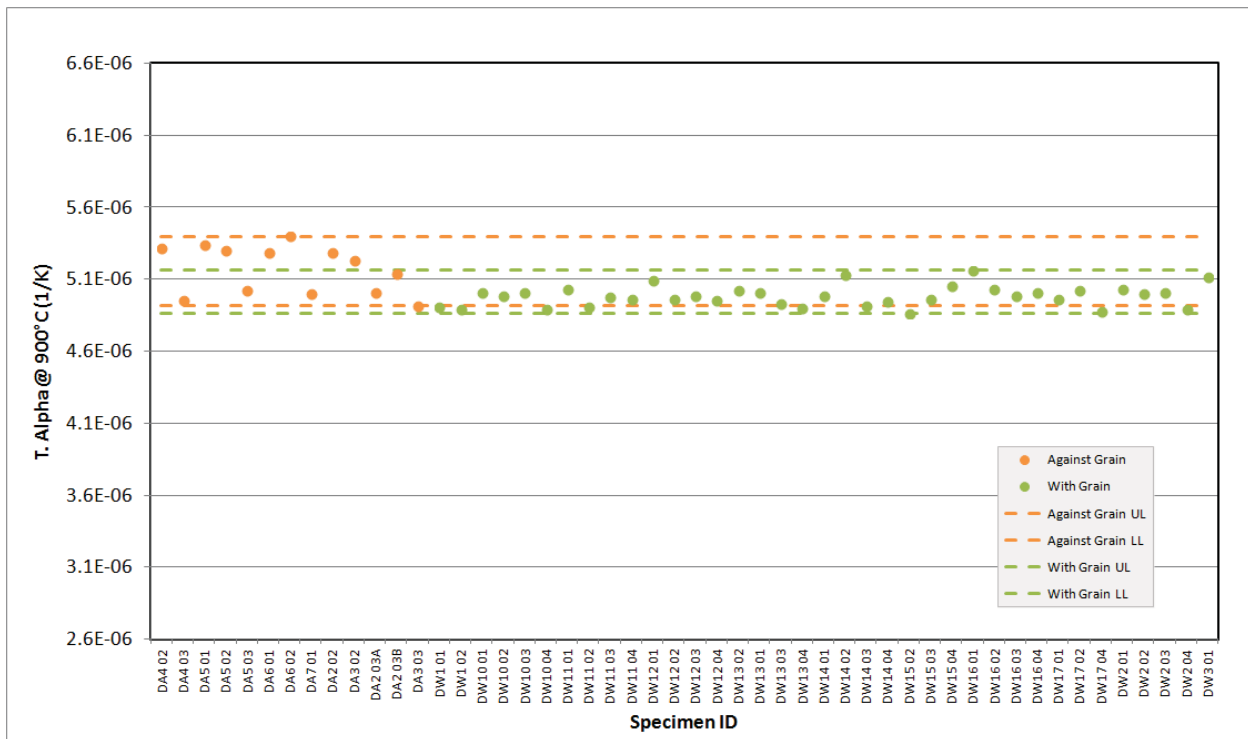


Figure A-112. PCEA Creep Coefficient of Thermal Expansion @ 900°C.

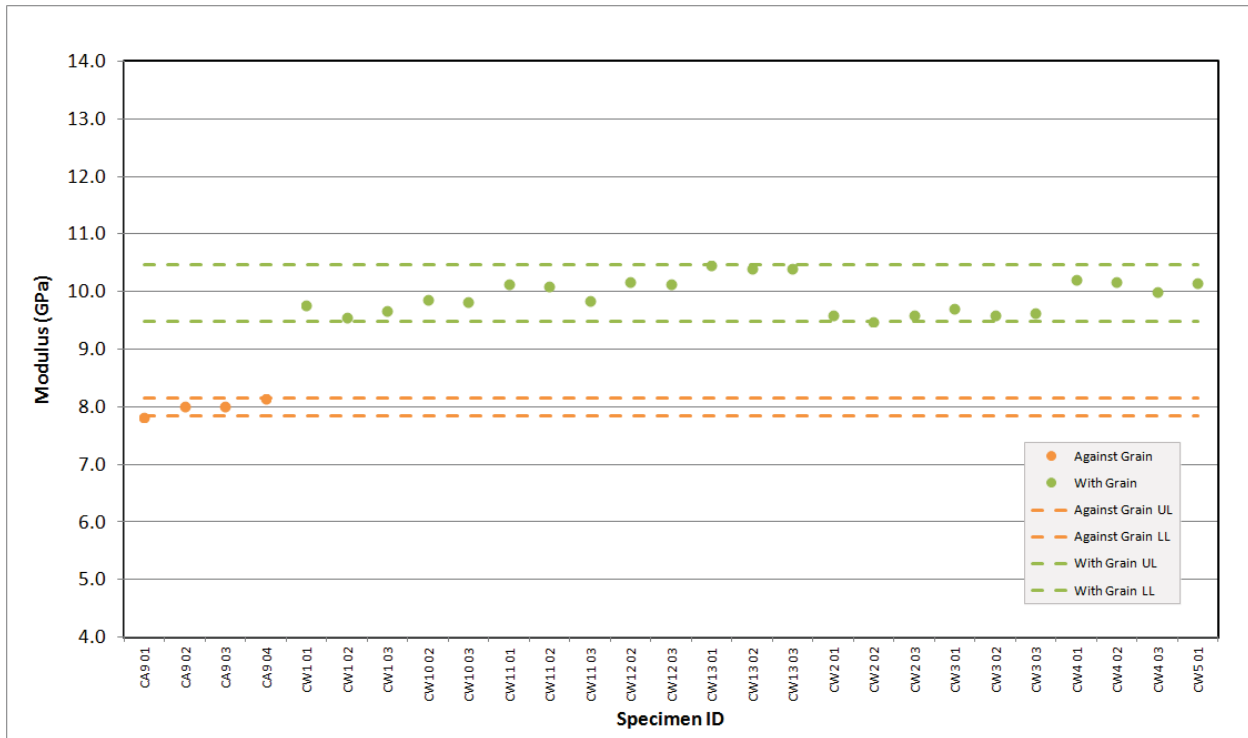


Figure A-113. H-451 Creep Modulus by Sonic Resonance.

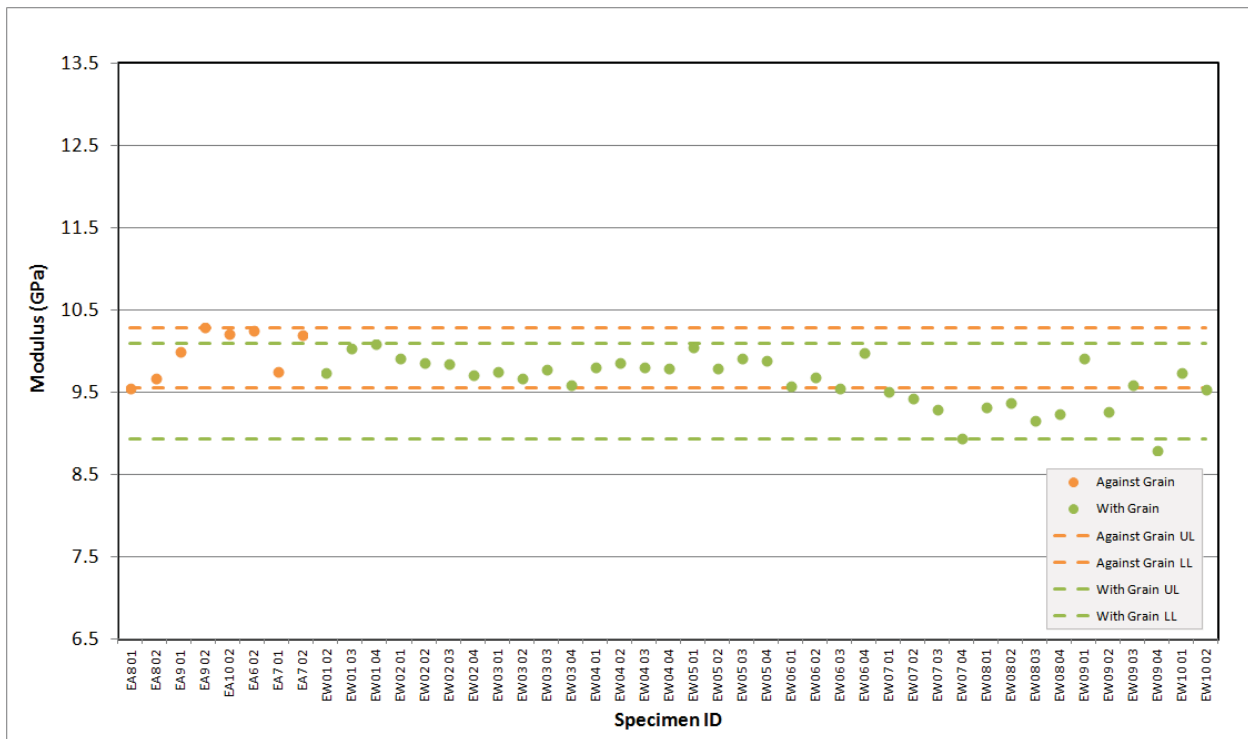


Figure A-114. IG-110 Creep Modulus by Sonic Resonance.

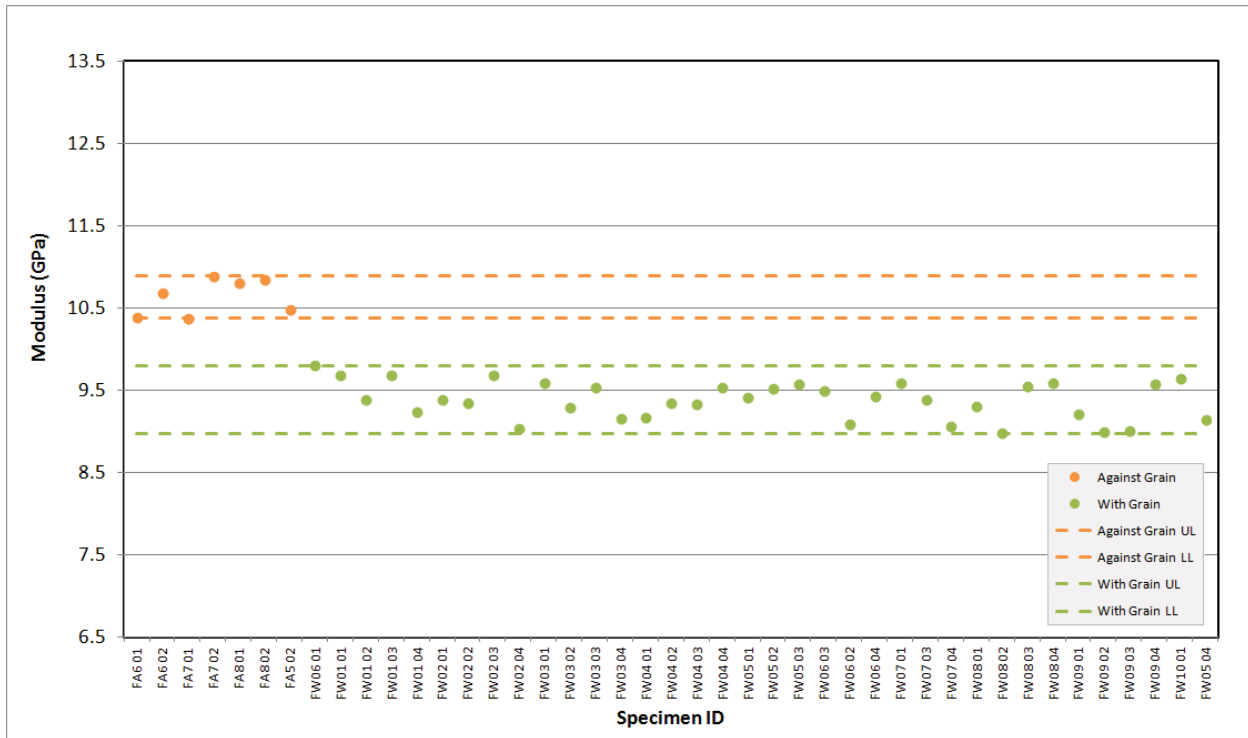


Figure A-115. IG-430 Creep Modulus by Sonic Resonance.

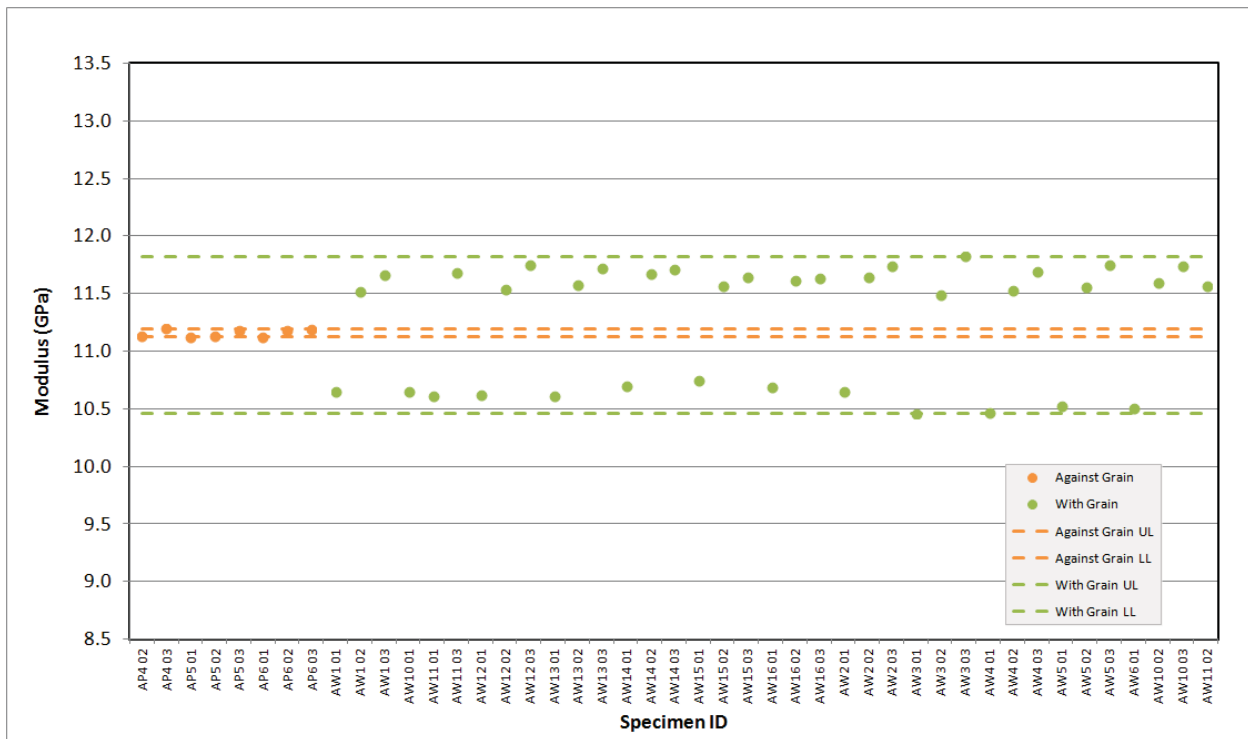


Figure A-116. NBG-17 Creep Modulus by Sonic Resonance.

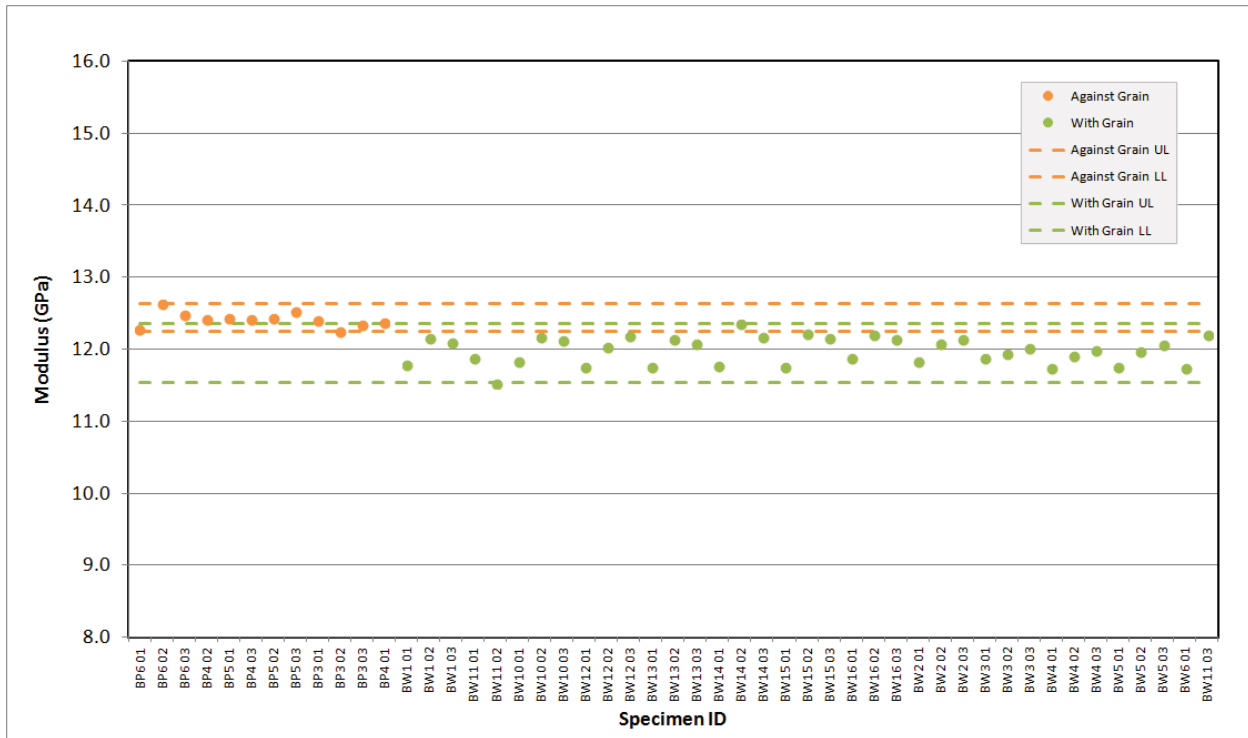


Figure A-117. NBG-18 Creep Modulus by Sonic Resonance.

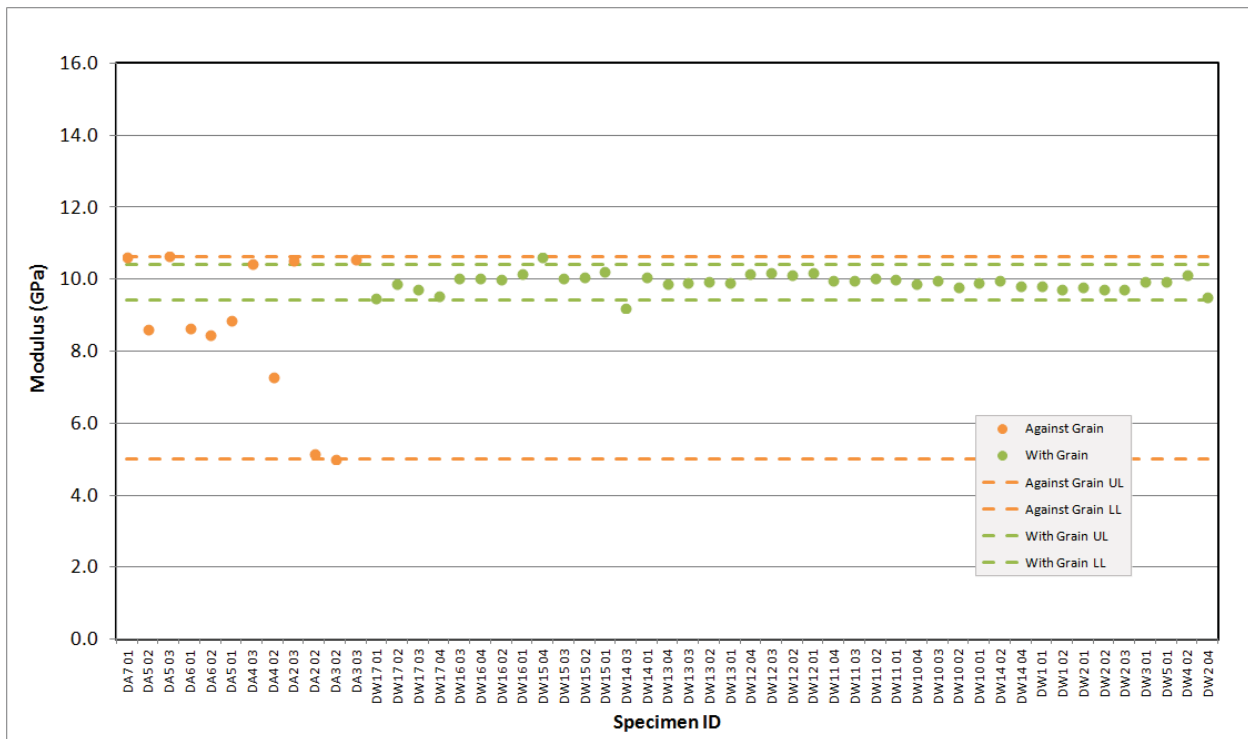


Figure A-118. PCEA Creep Modulus by Sonic Resonance.

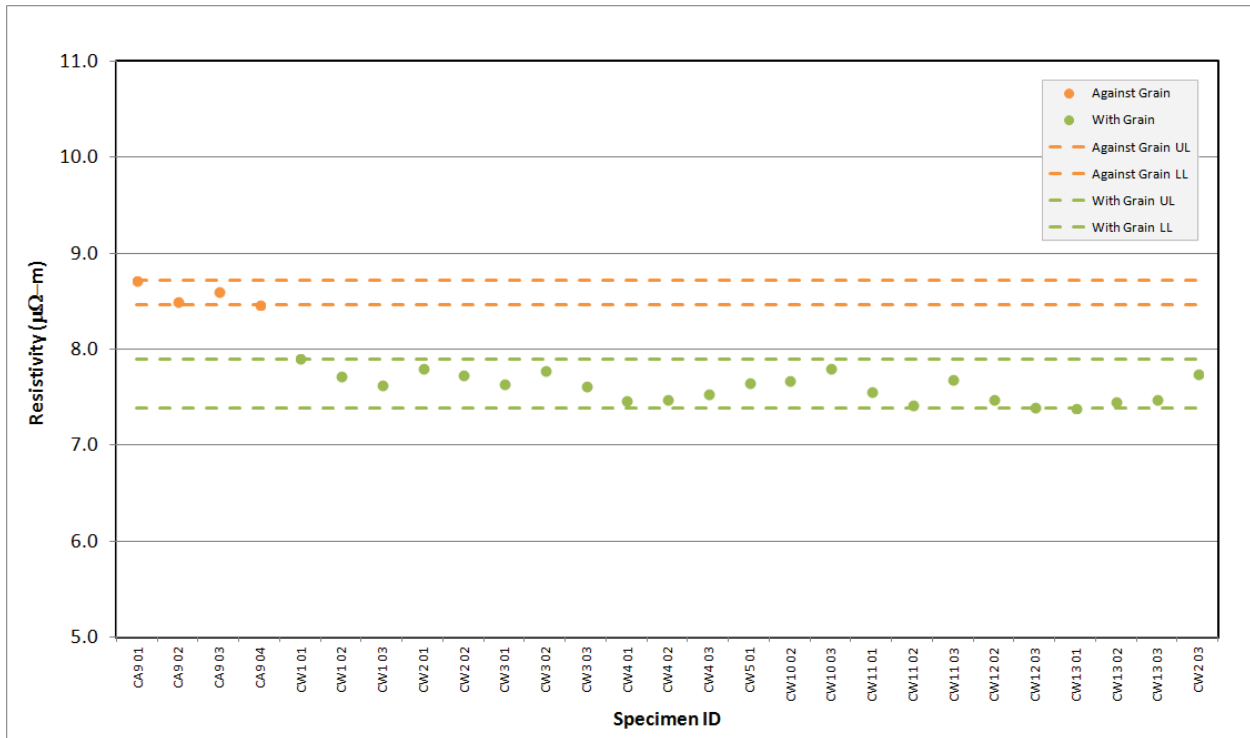


Figure A-119. H-451 Creep Resistivity.

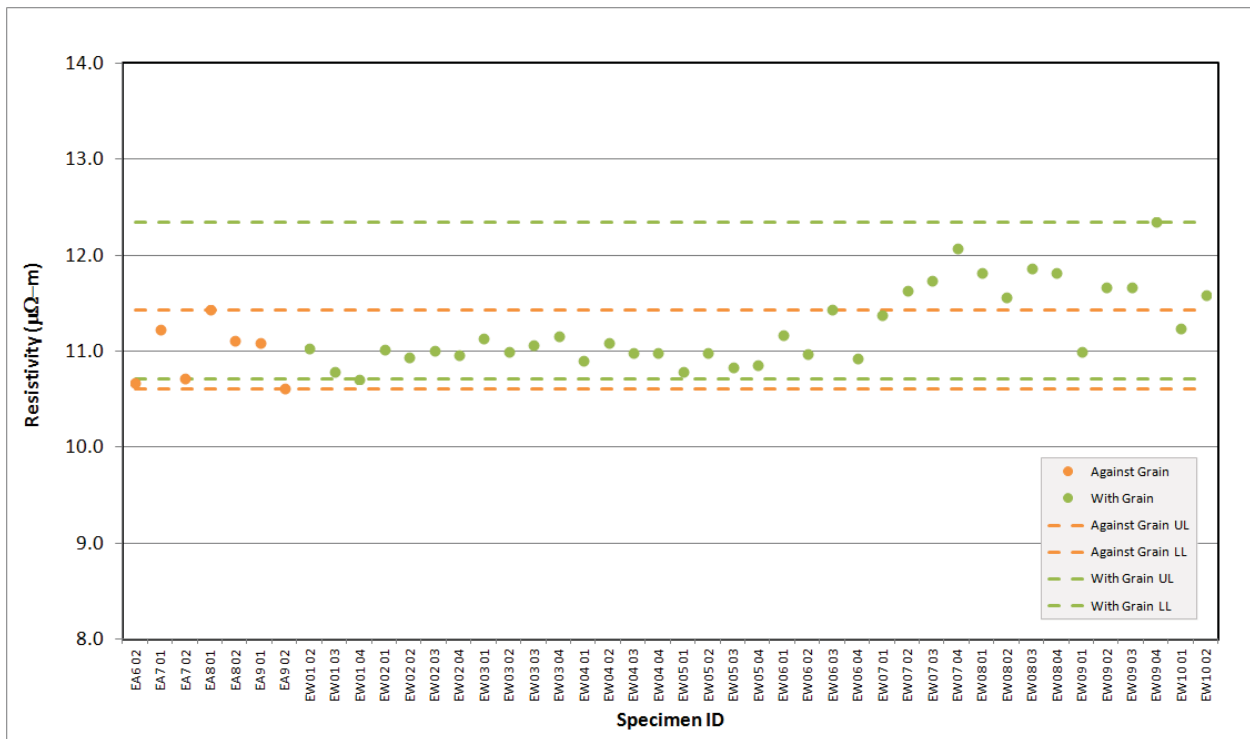


Figure A-120. IG-110 Creep Resistivity.

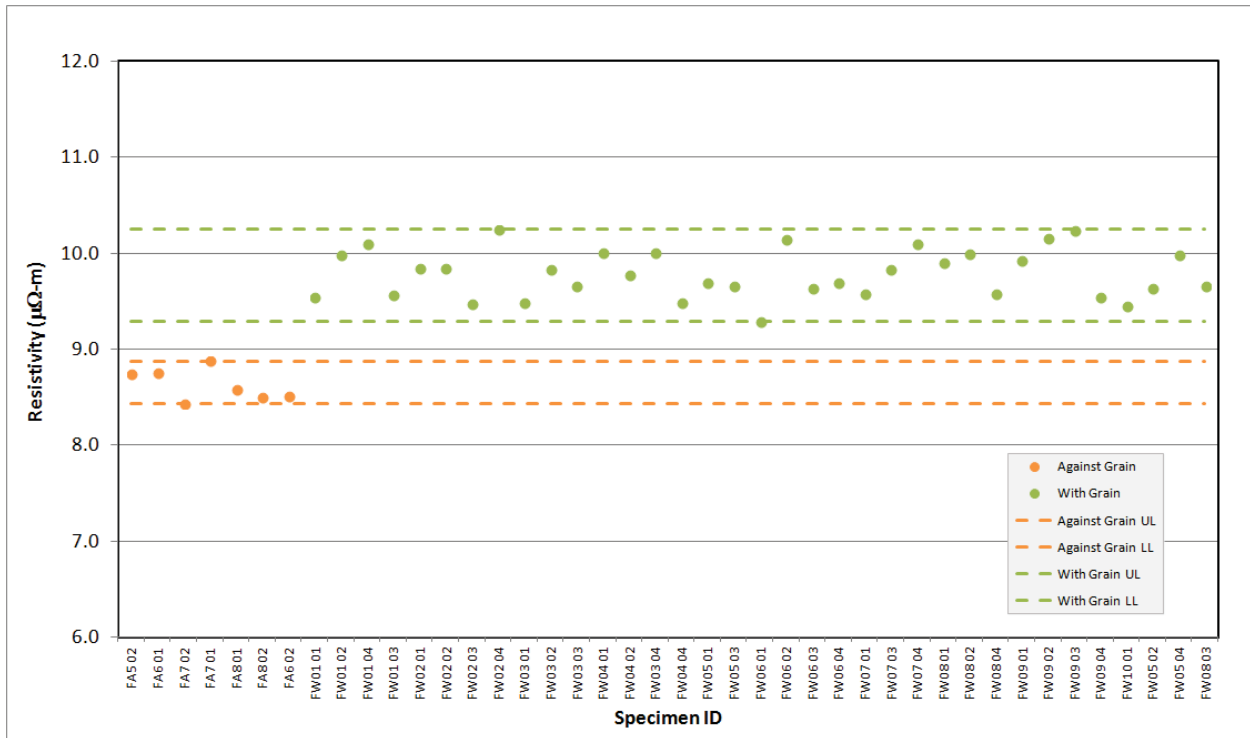


Figure A-121. IG-430 Creep Resistivity.

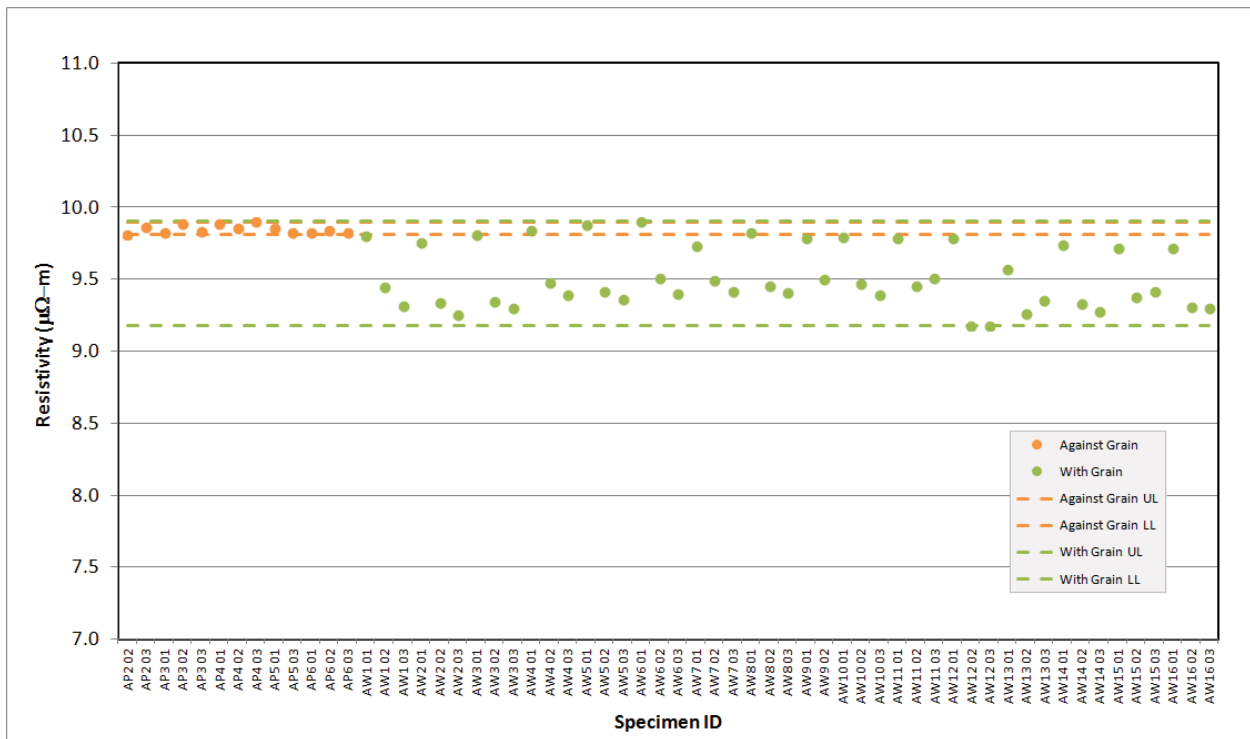


Figure A-122. NBG-17 Creep Resistivity.

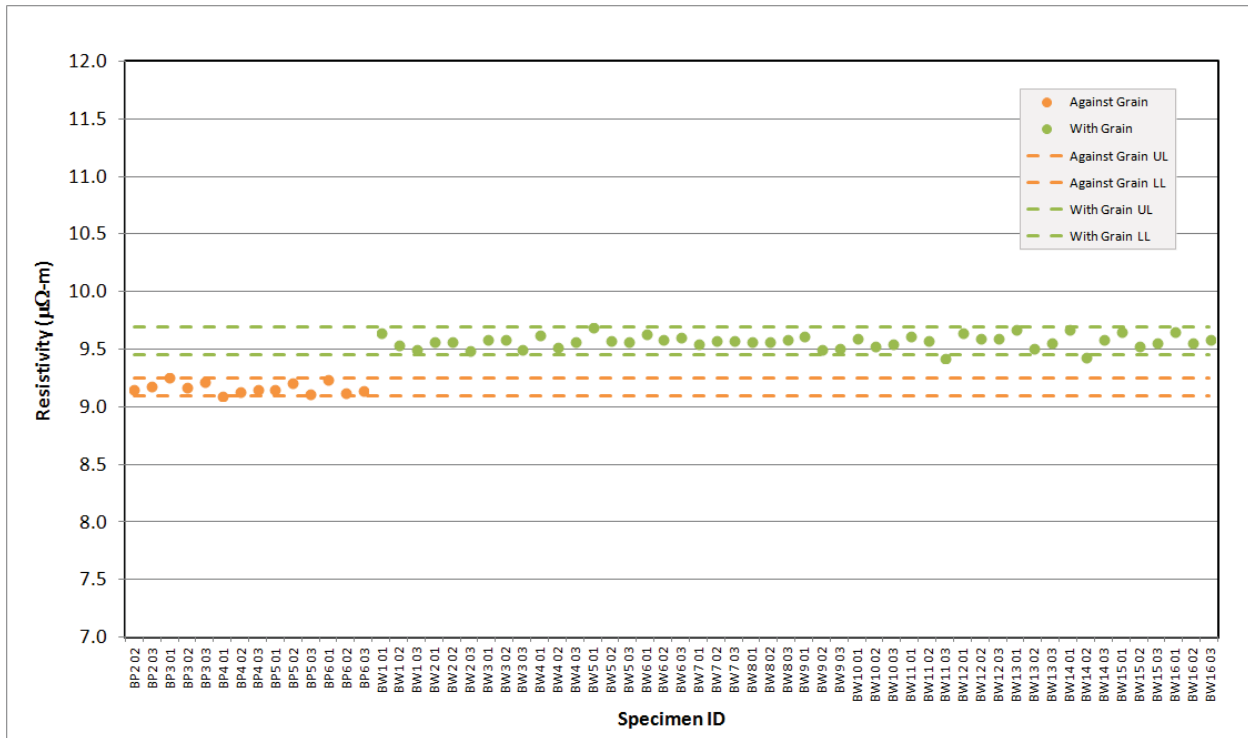


Figure A-123. NBG-18 Creep Resistivity.

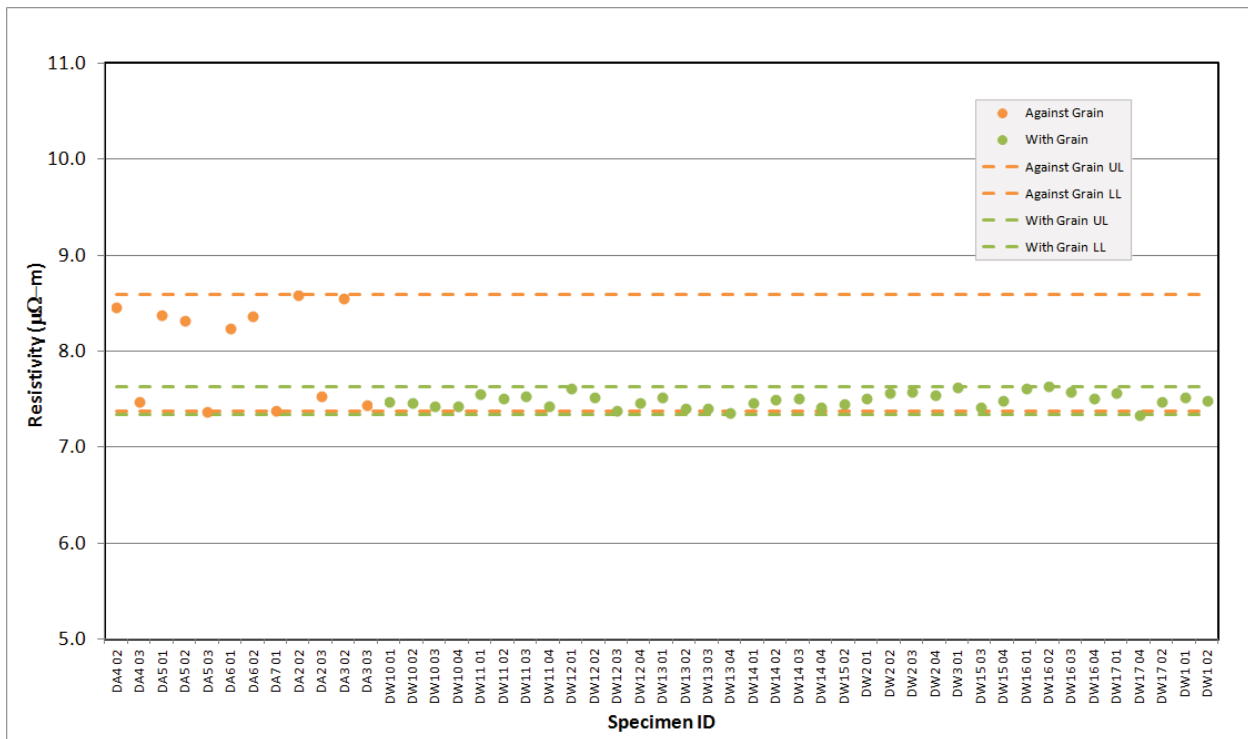


Figure A-124. PCEA Creep Resistivity.

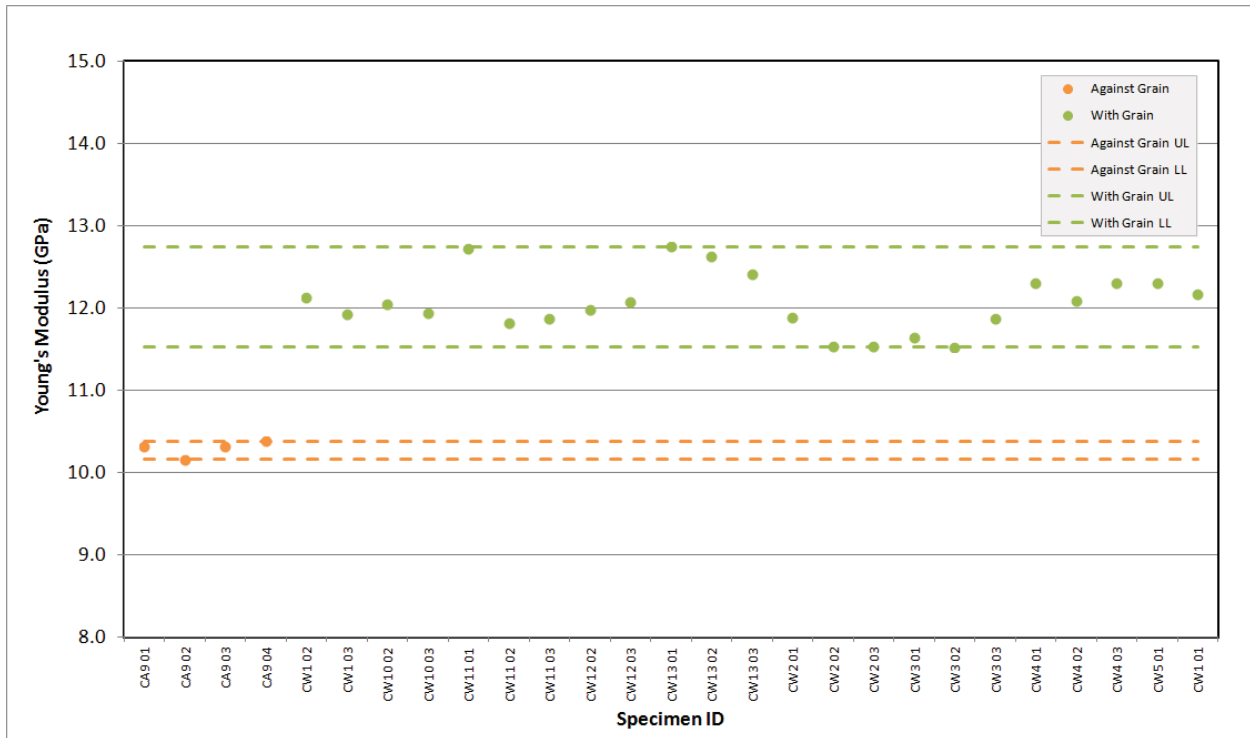


Figure A-125. H-451 Creep Young's Modulus by Sonic Velocity.



Figure A-126. IG-110 Creep Young's Modulus by Sonic Velocity.

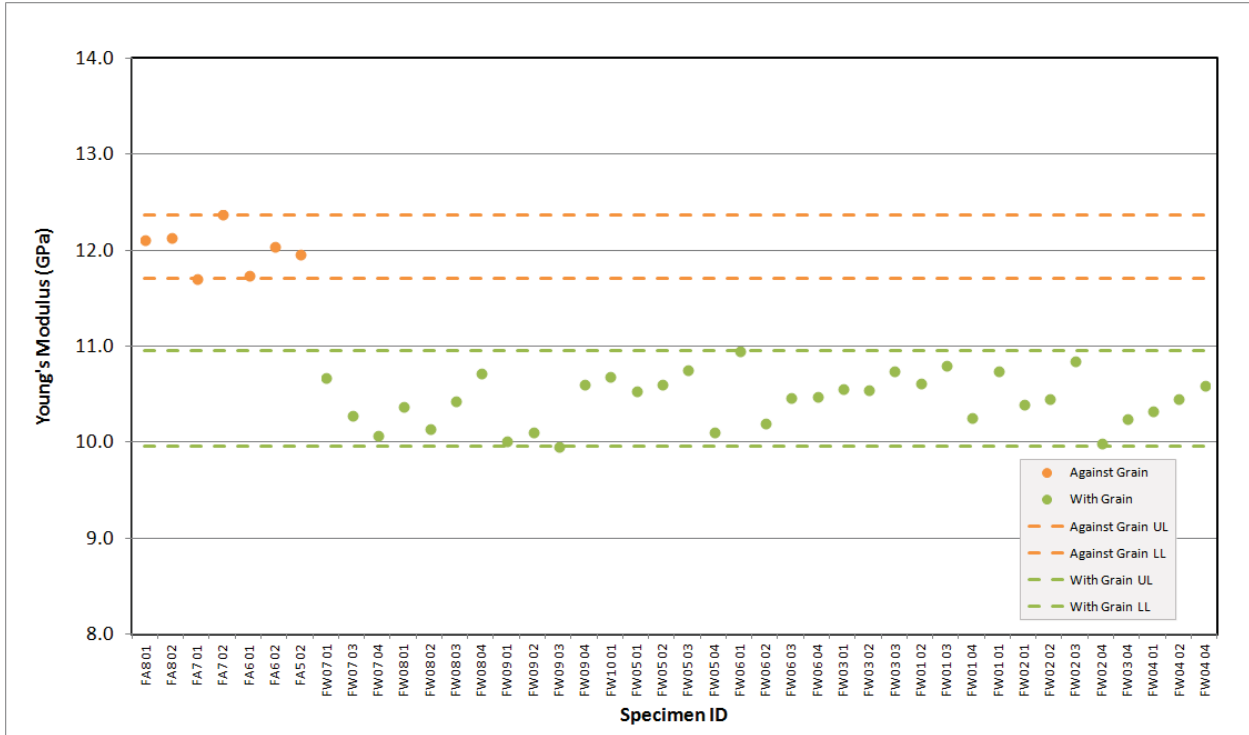


Figure A-127. IG-430 Creep Young's Modulus by Sonic Velocity.

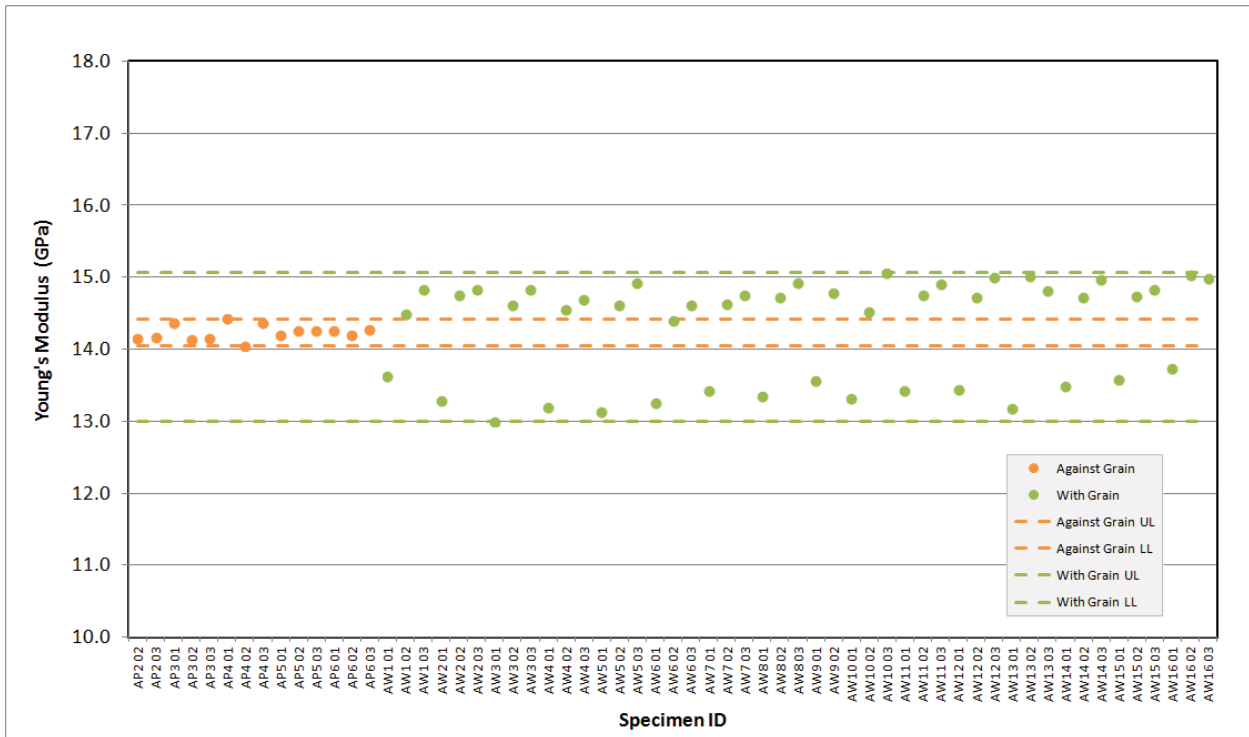


Figure A-128. NBG-17 Creep Young's Modulus by Sonic Velocity.

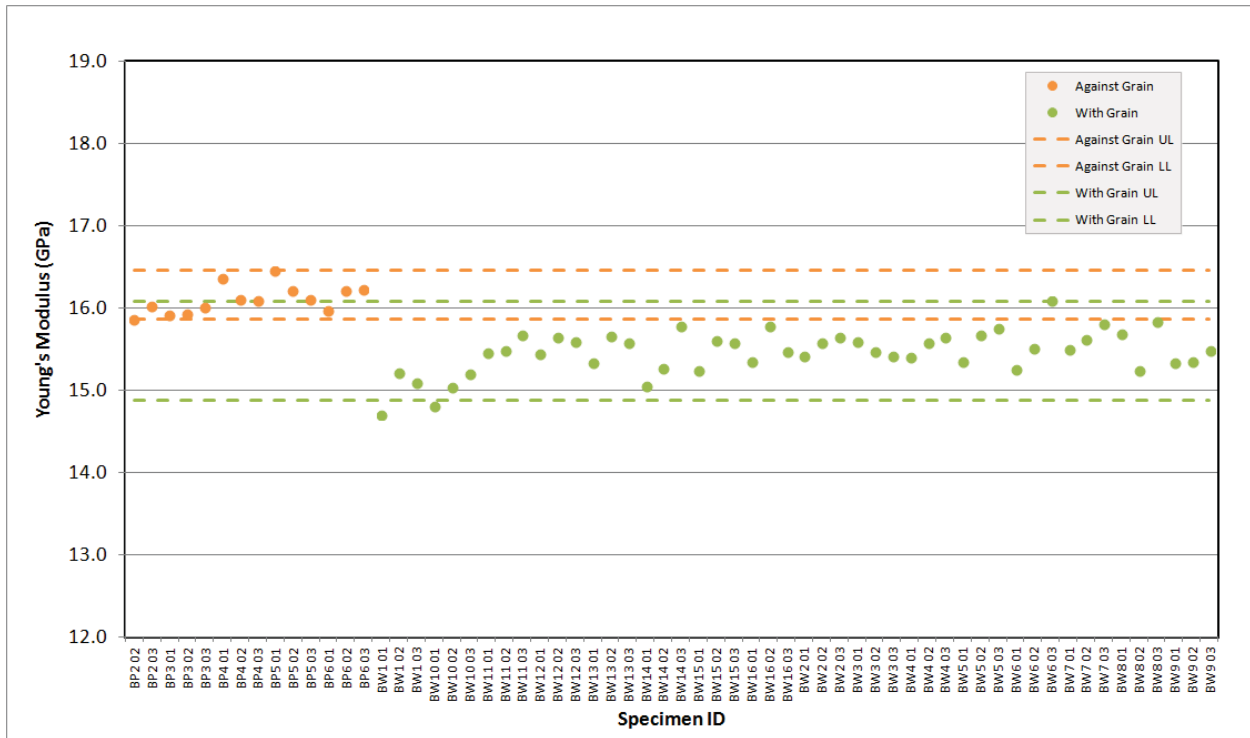


Figure A-129. NBG-18 Creep Young's Modulus by Sonic Velocity.

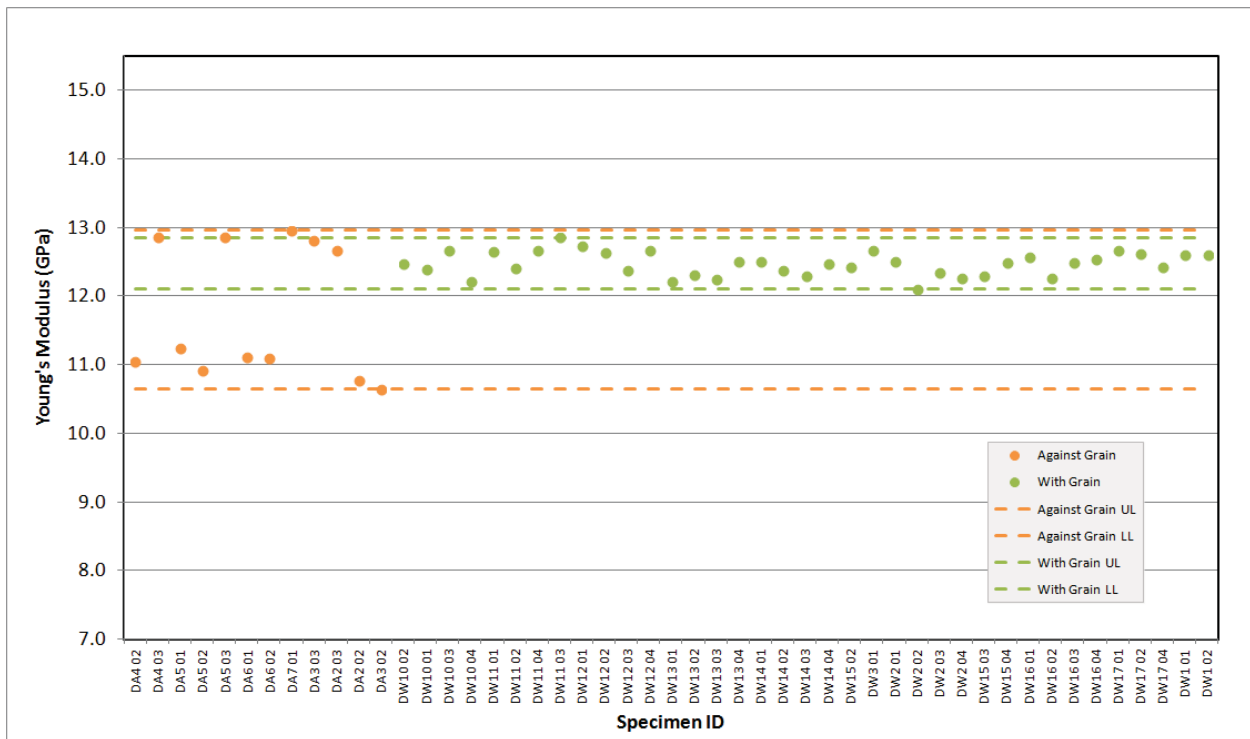


Figure A-130. PCEA Creep Young's Modulus by Sonic Velocity.

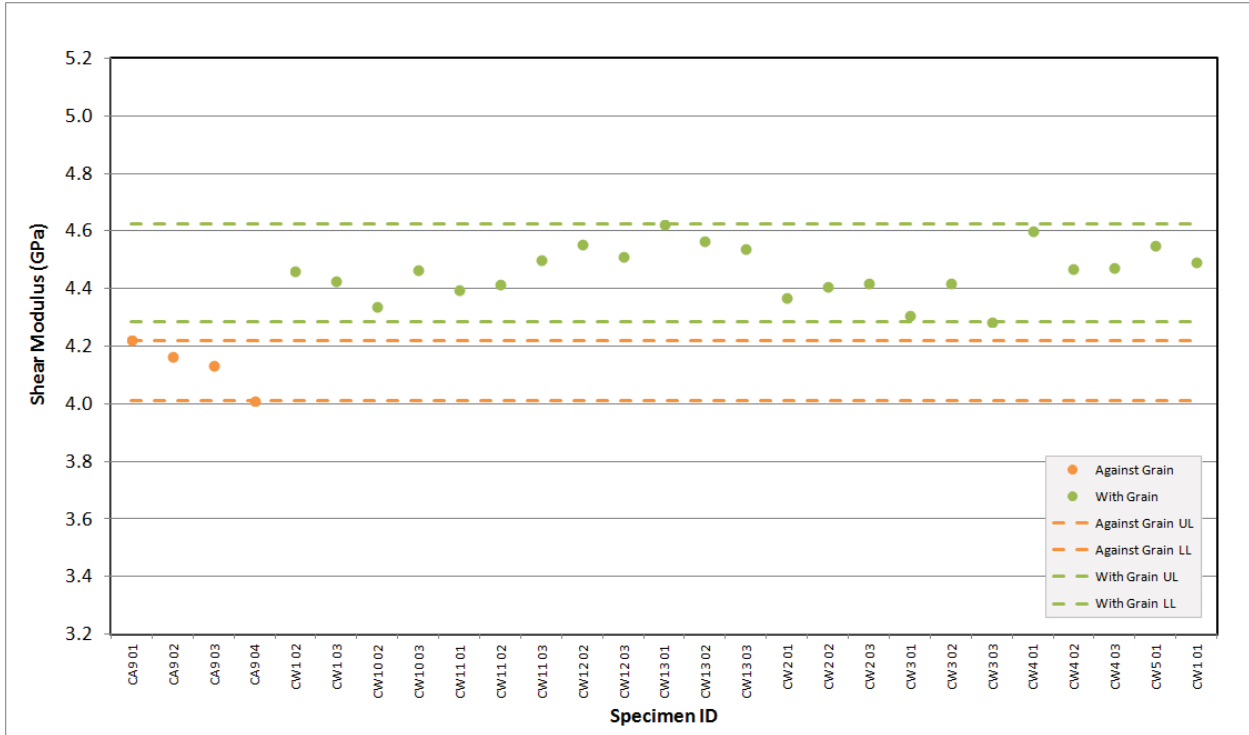


Figure A-131. H-451 Creep Shear Modulus by Sonic Velocity.

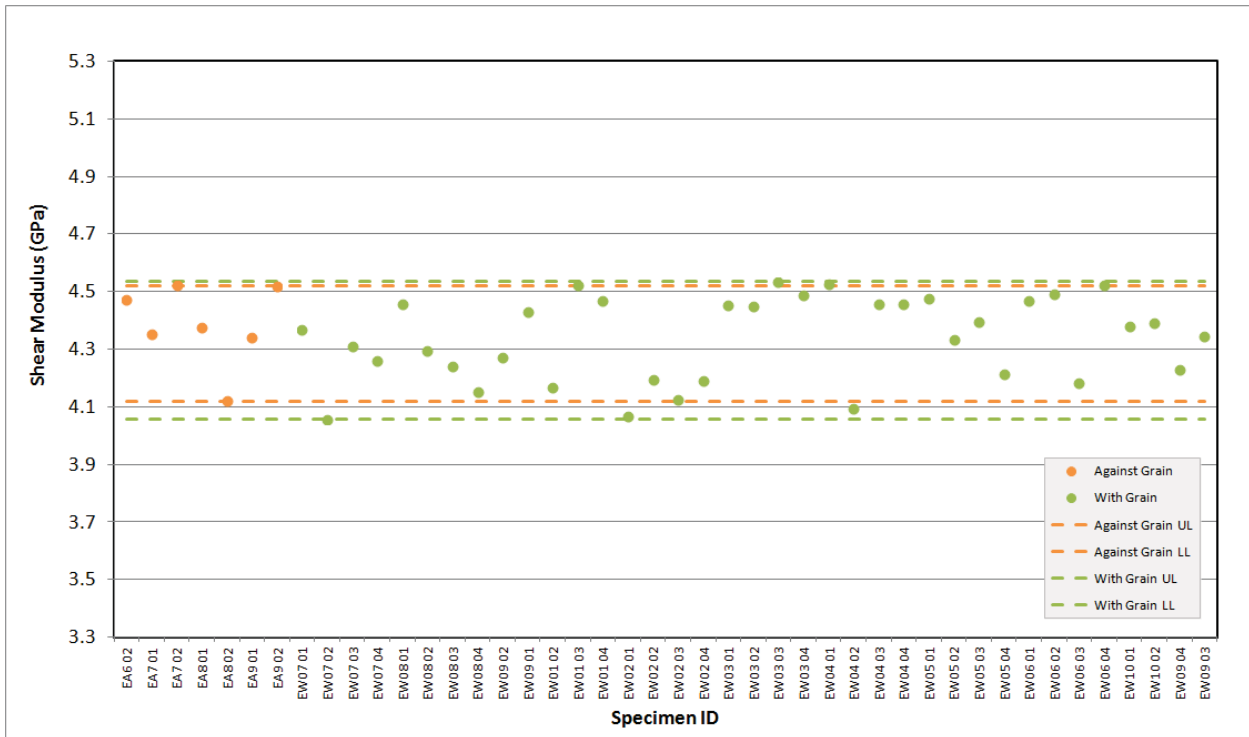


Figure A-132. IG-110 Creep Shear Modulus by Sonic Velocity.

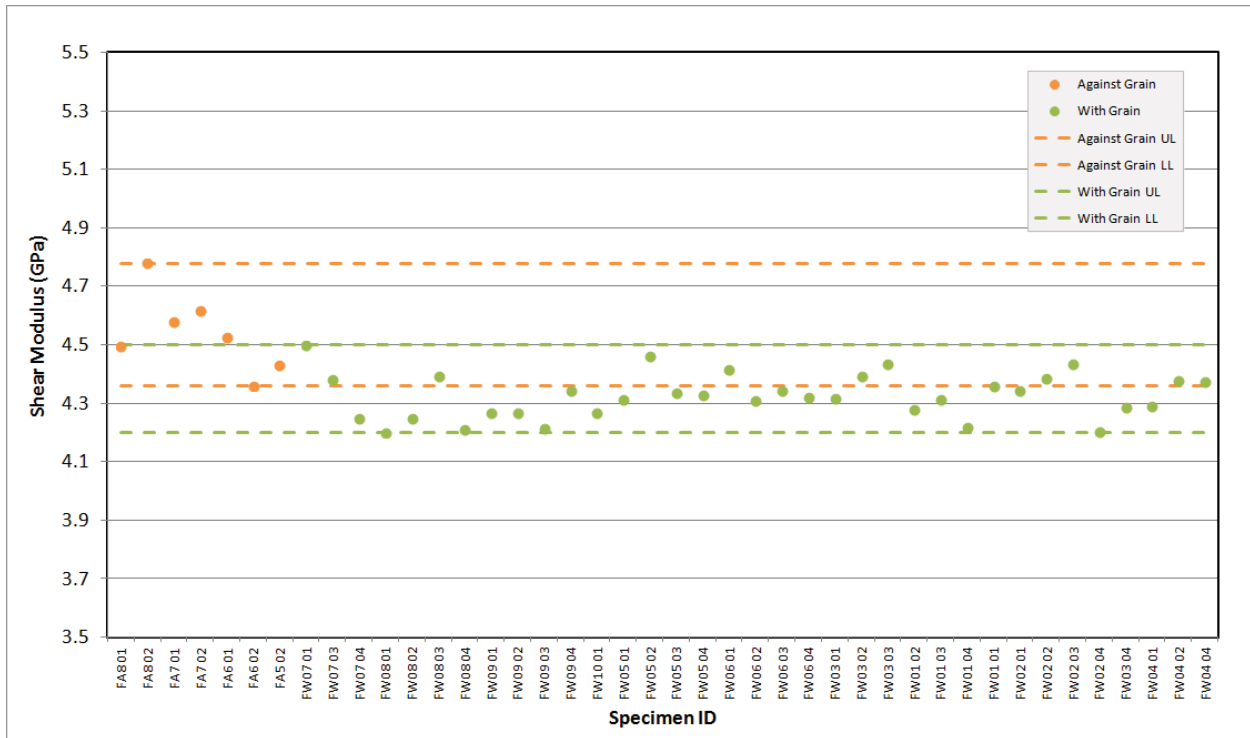


Figure A-133. IG-430 Creep Shear Modulus by Sonic Velocity.

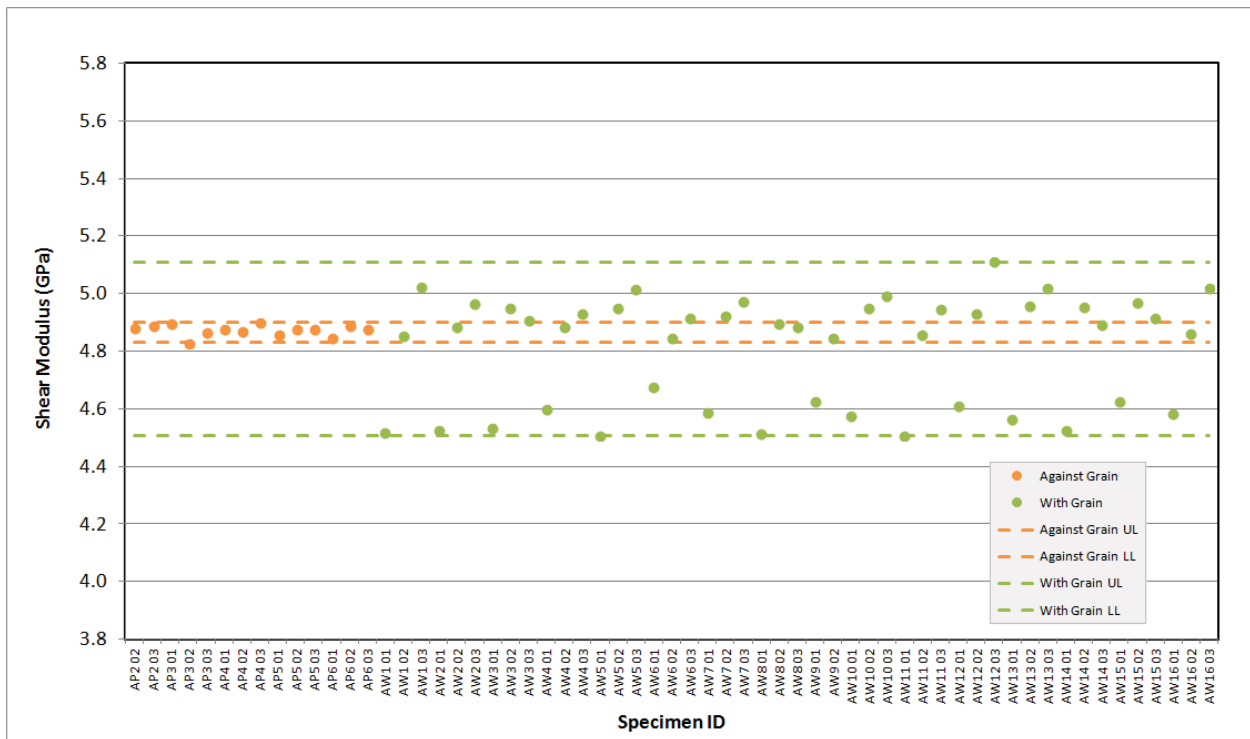


Figure A-134. NBG-17 Creep Shear Modulus by Sonic Velocity.

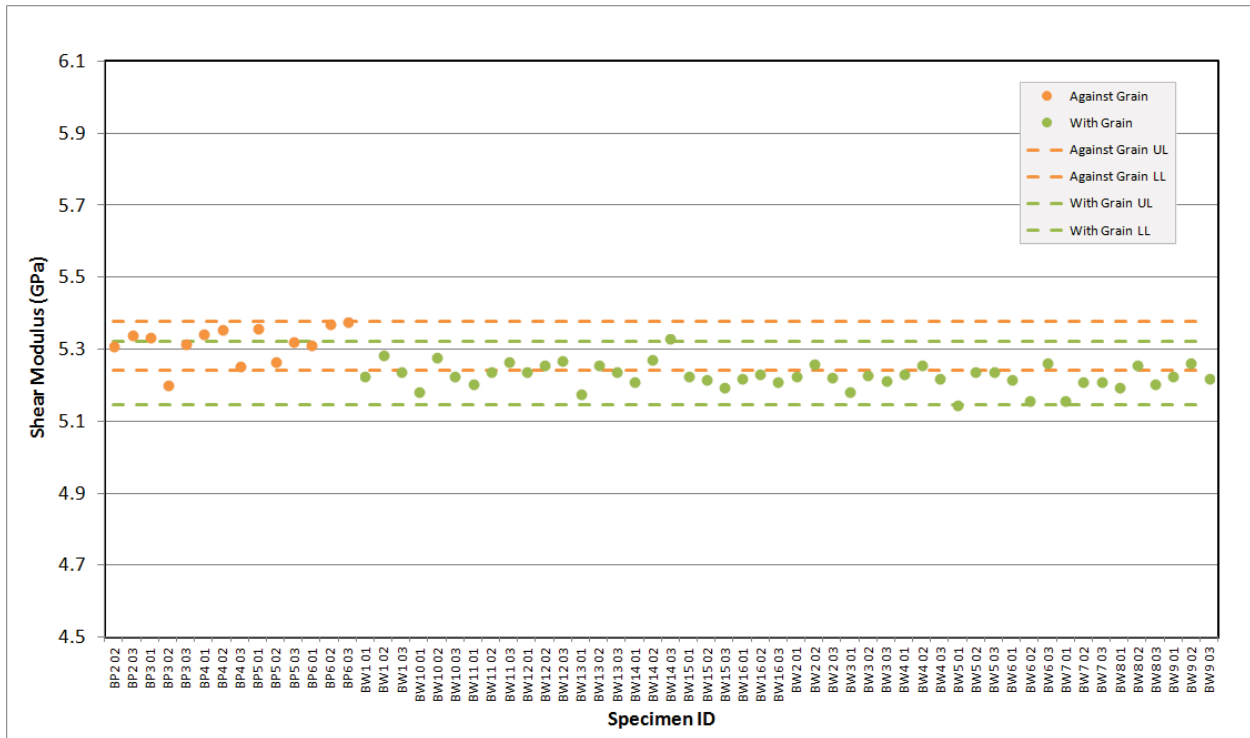


Figure A-135. NBG-18 Creep Shear Modulus by Sonic Velocity.

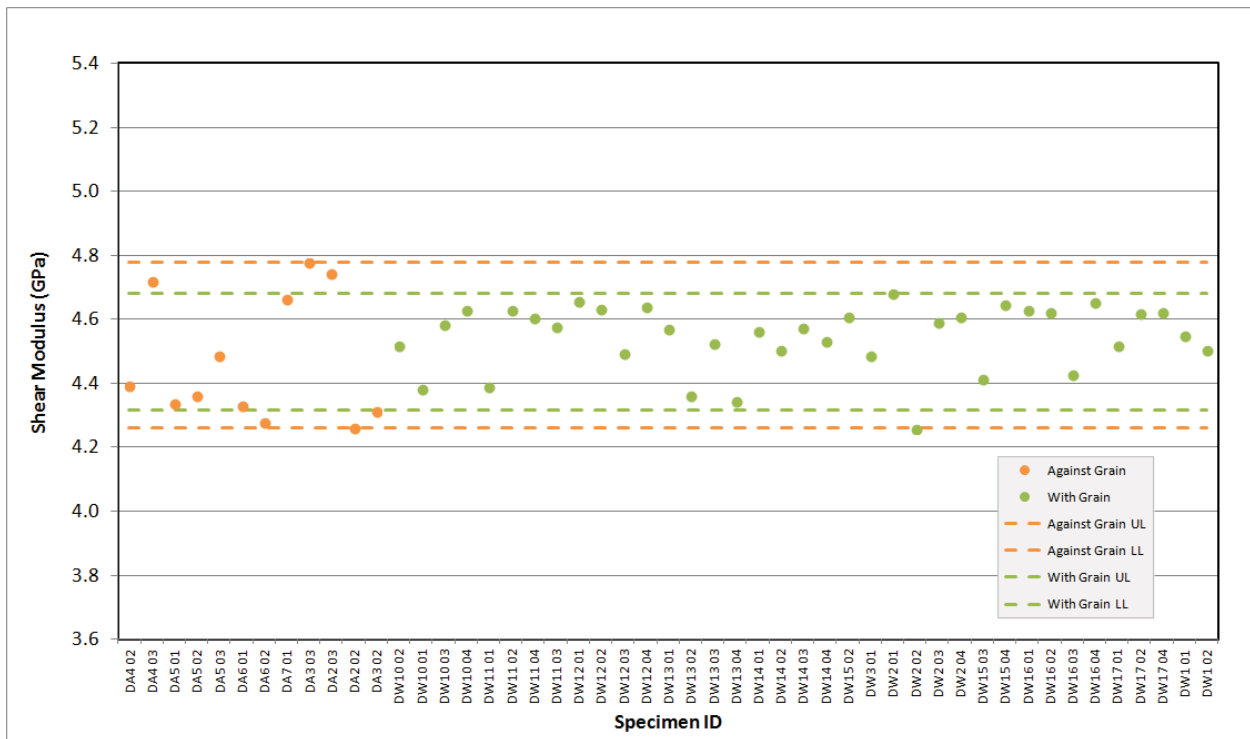


Figure A-136. PCEA Creep Shear Modulus by Sonic Velocity.

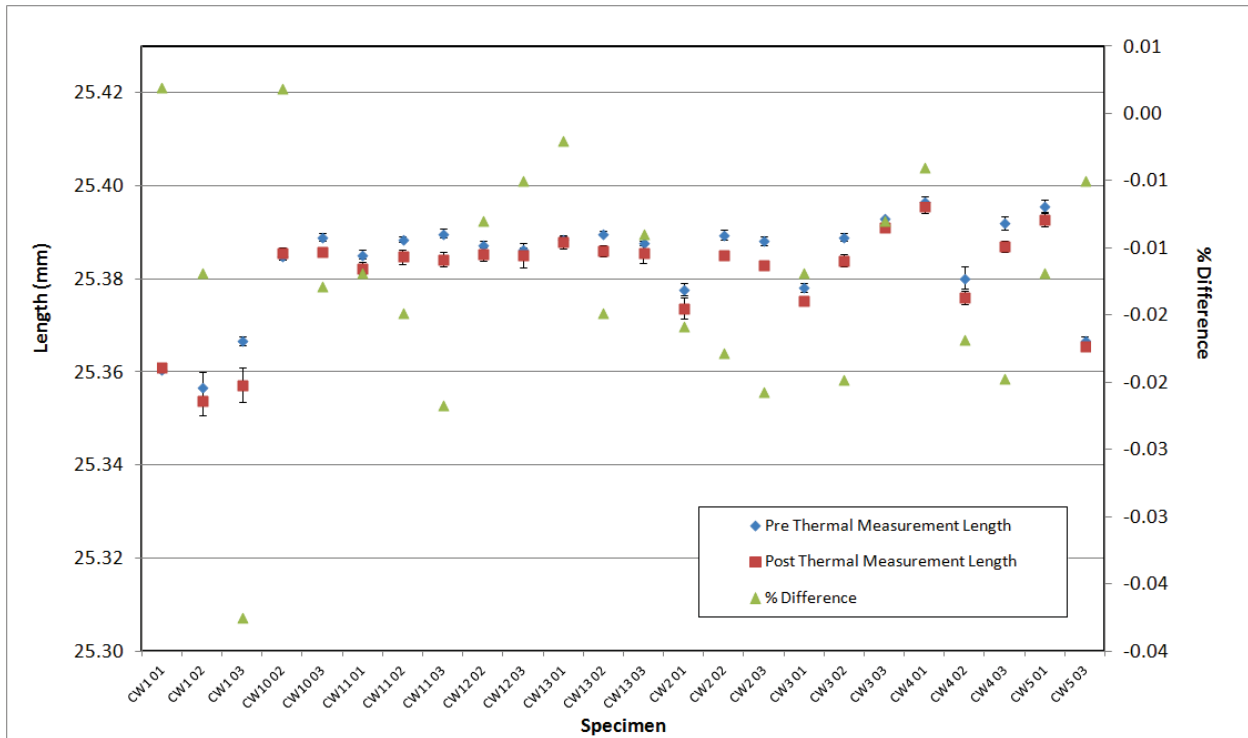


Figure A-137. H-451 Creep Pre vs. Post Thermal Measurement Length Comparison.

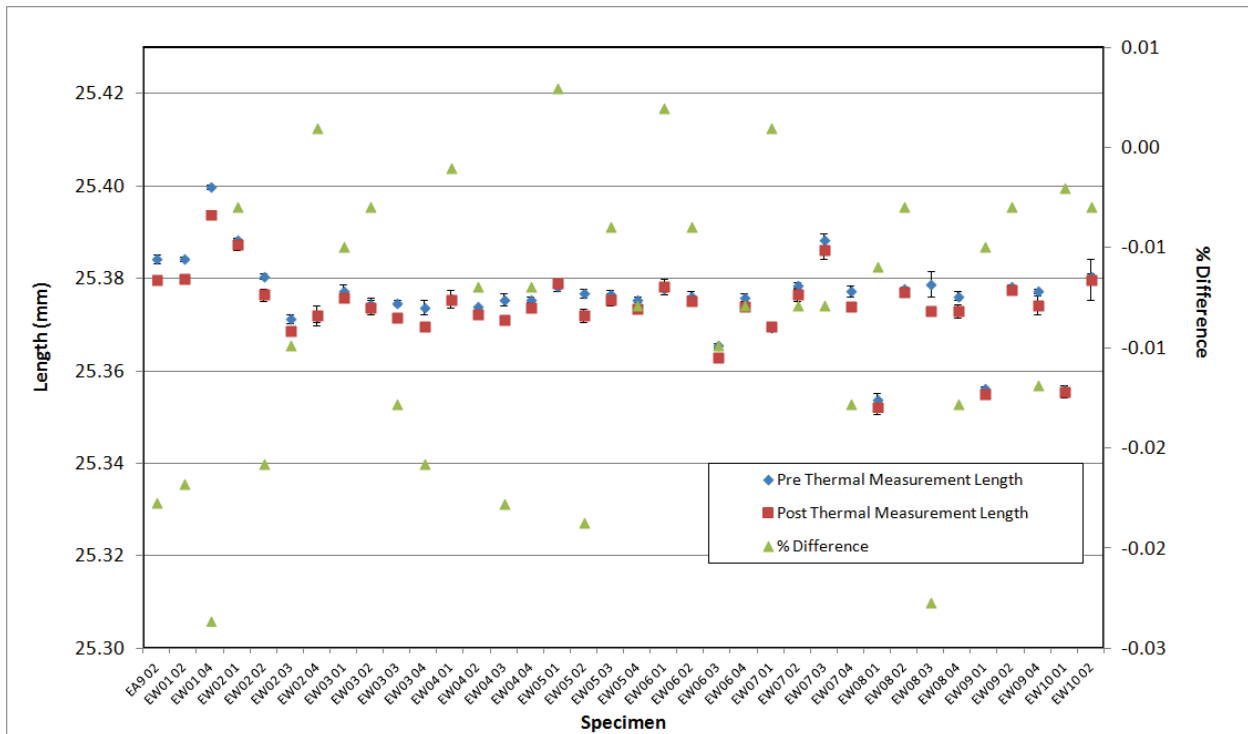


Figure A-138. IG-110 Creep Pre vs. Post Thermal Measurement Length Comparison.

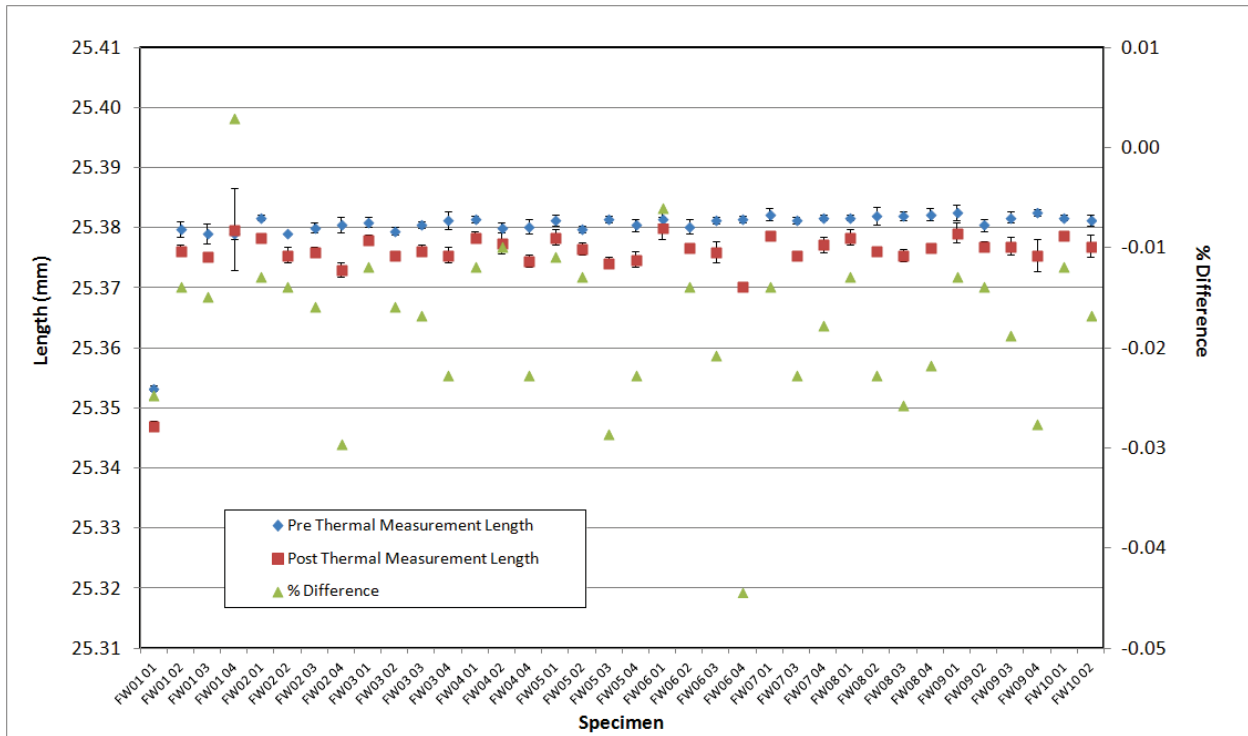


Figure A-139. IG-430 Creep Pre vs. Post Thermal Measurement Length Comparison.

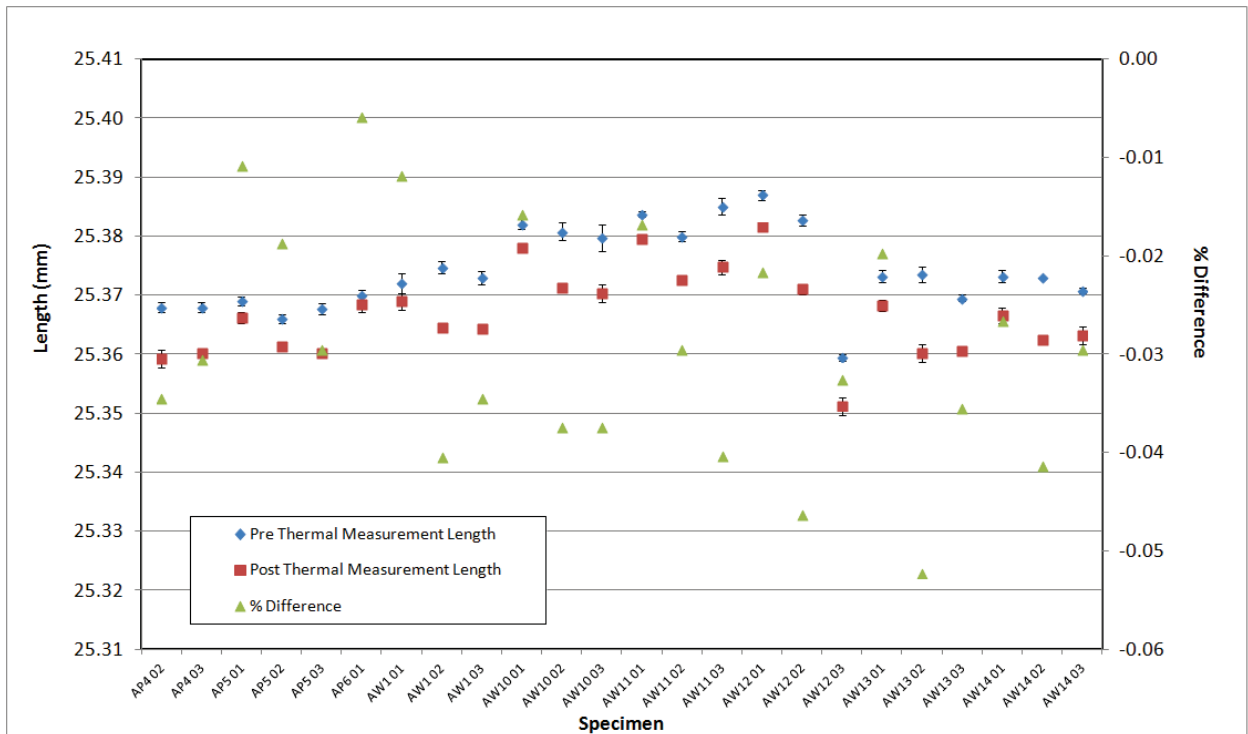


Figure A-140. NBG-17 Creep Pre vs. Post Thermal Measurement Length Comparison.

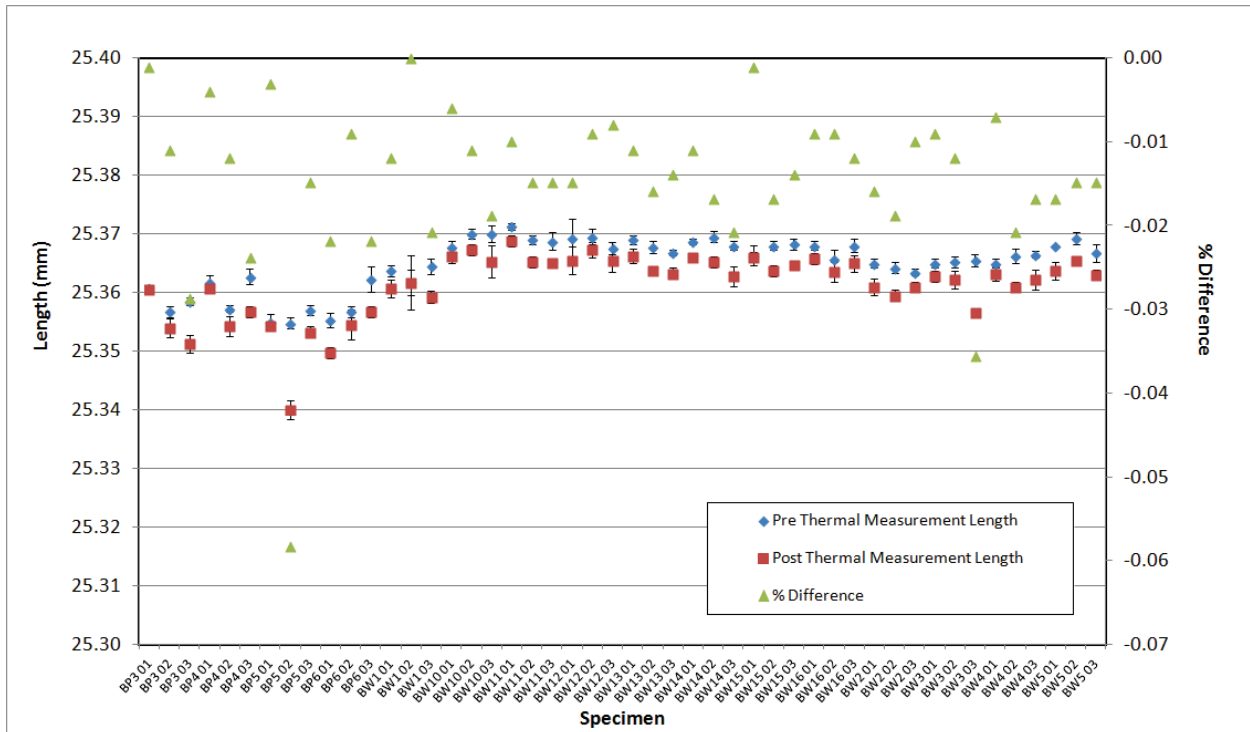


Figure A-141. NBG-18 Creep Pre vs. Post Thermal Measurement Length Comparison.

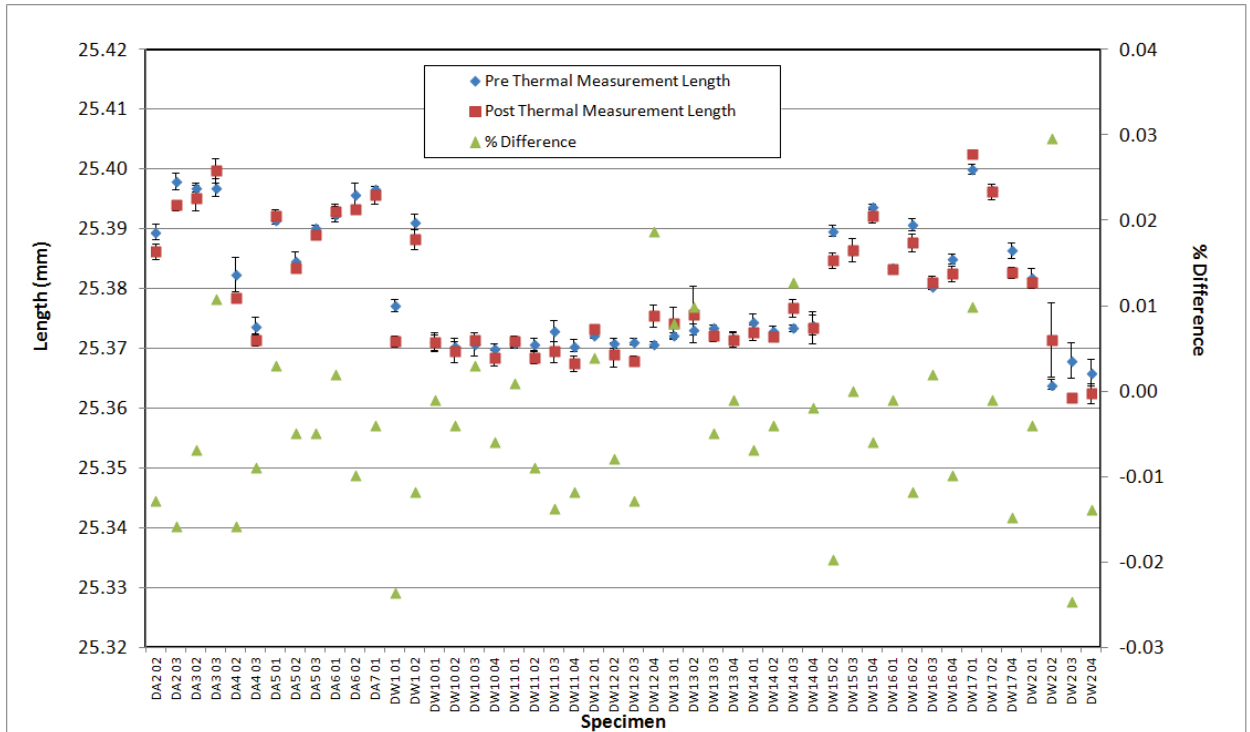


Figure A-142. PCEA Creep Pre vs. Post Thermal Measurement Length Comparison.

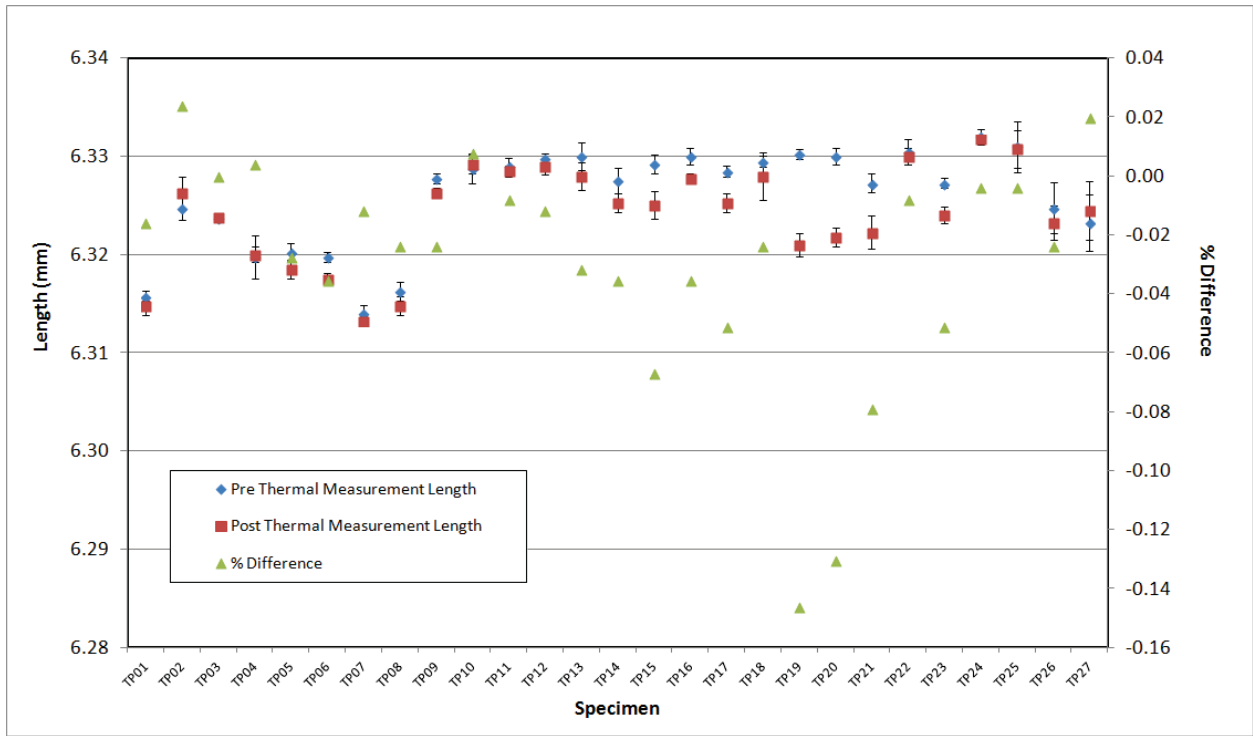


Figure A-143. 2114 Piggyback Pre vs. Post Thermal Measurement Length Comparison.

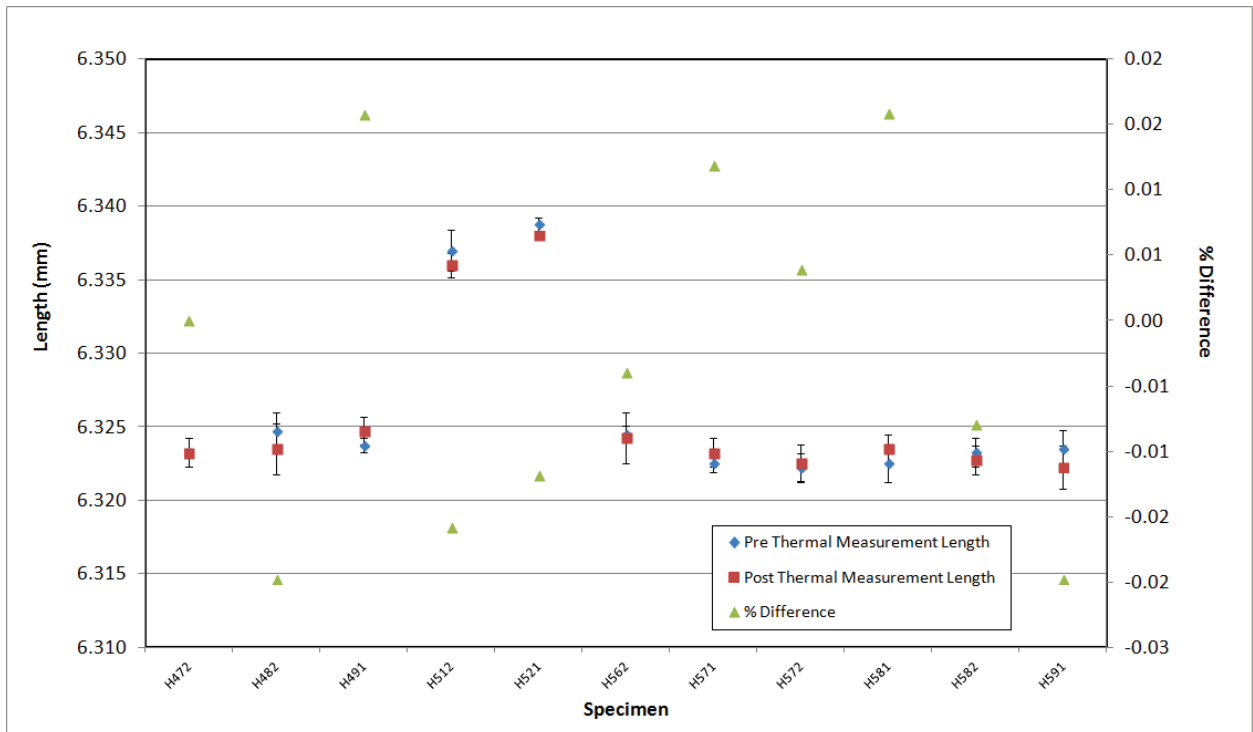


Figure A-144. A3 Matrix Piggyback Pre vs. Post Thermal Measurement Length Comparison.

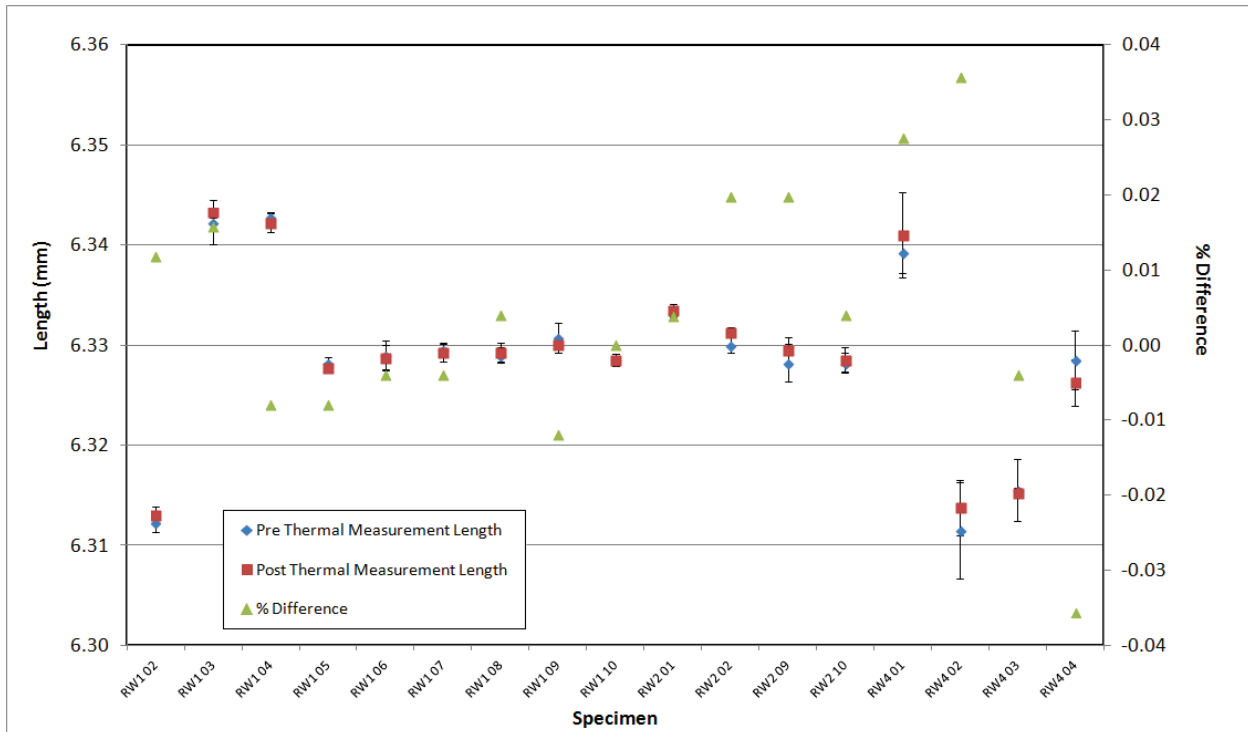


Figure A-145. BAN Piggyback Pre vs. Post Thermal Measurement Length Comparison.

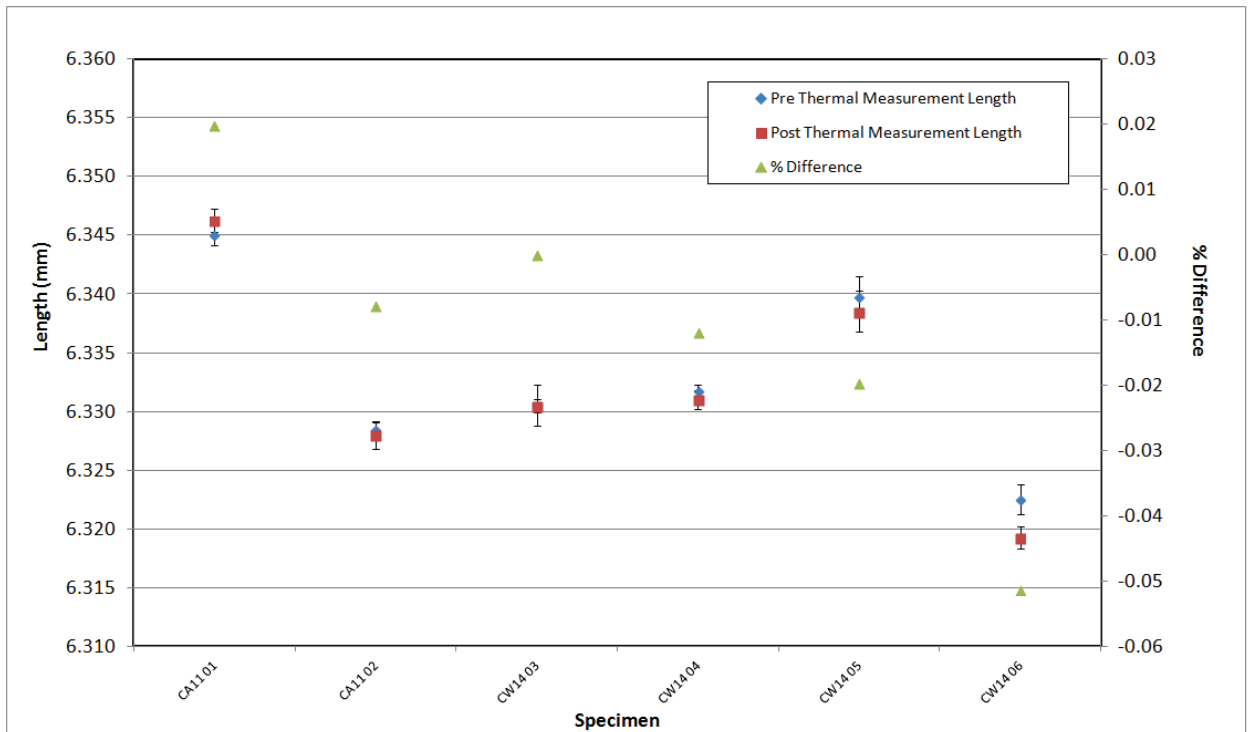


Figure A-146. H-451 Piggyback Pre vs. Post Thermal Measurement Length Comparison.

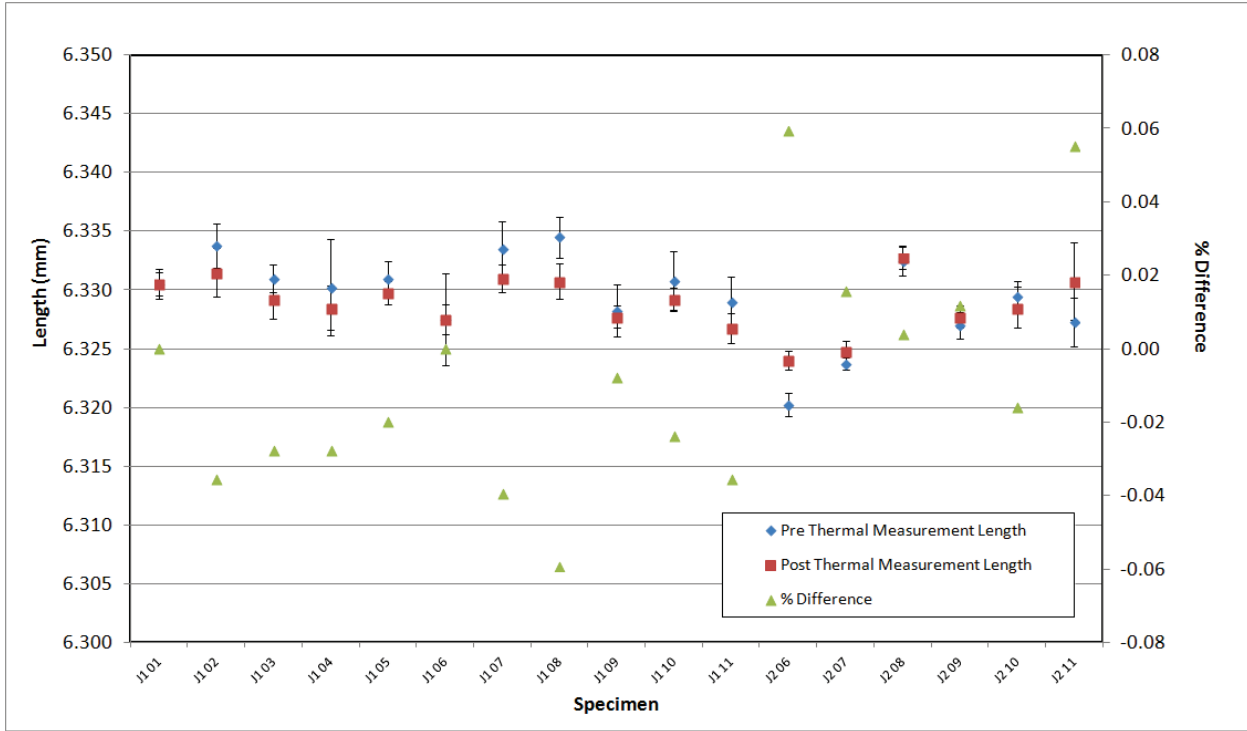


Figure A-147. HLM Piggyback Pre vs. Post Thermal Measurement Length Comparison.

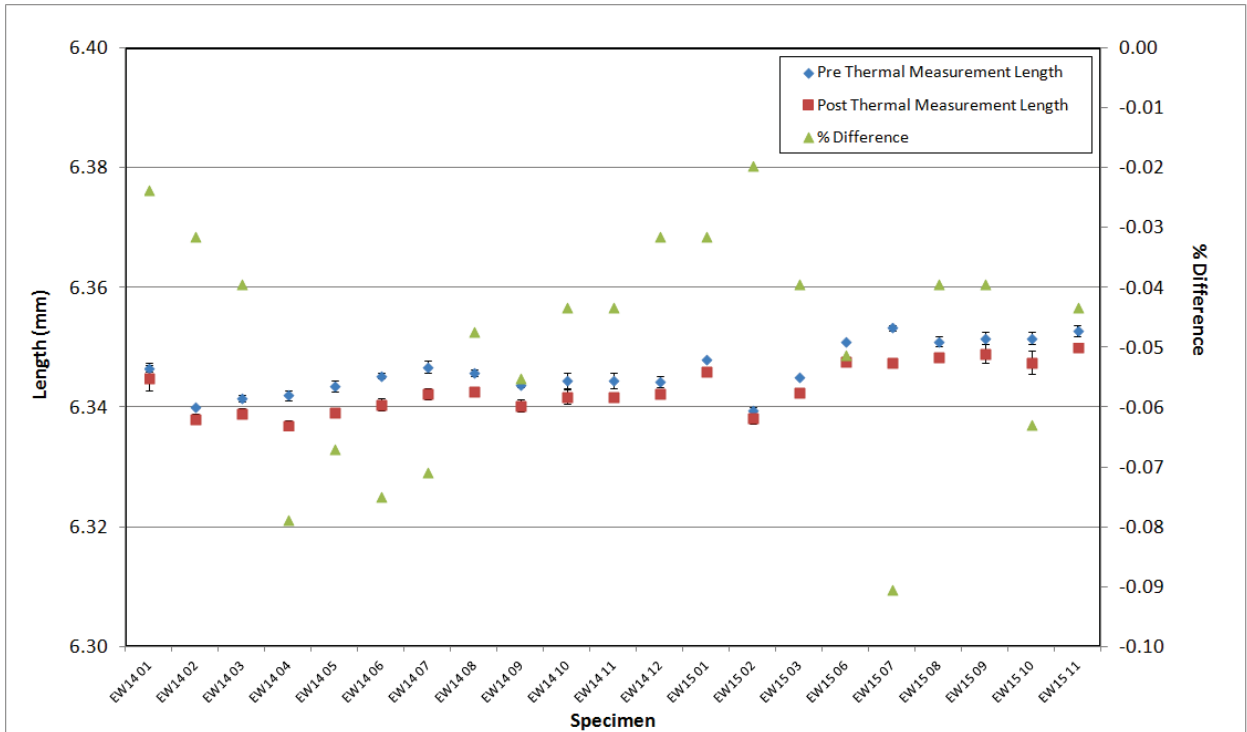


Figure A-148. IG-110 Piggyback Pre vs. Post Thermal Measurement Length Comparison.

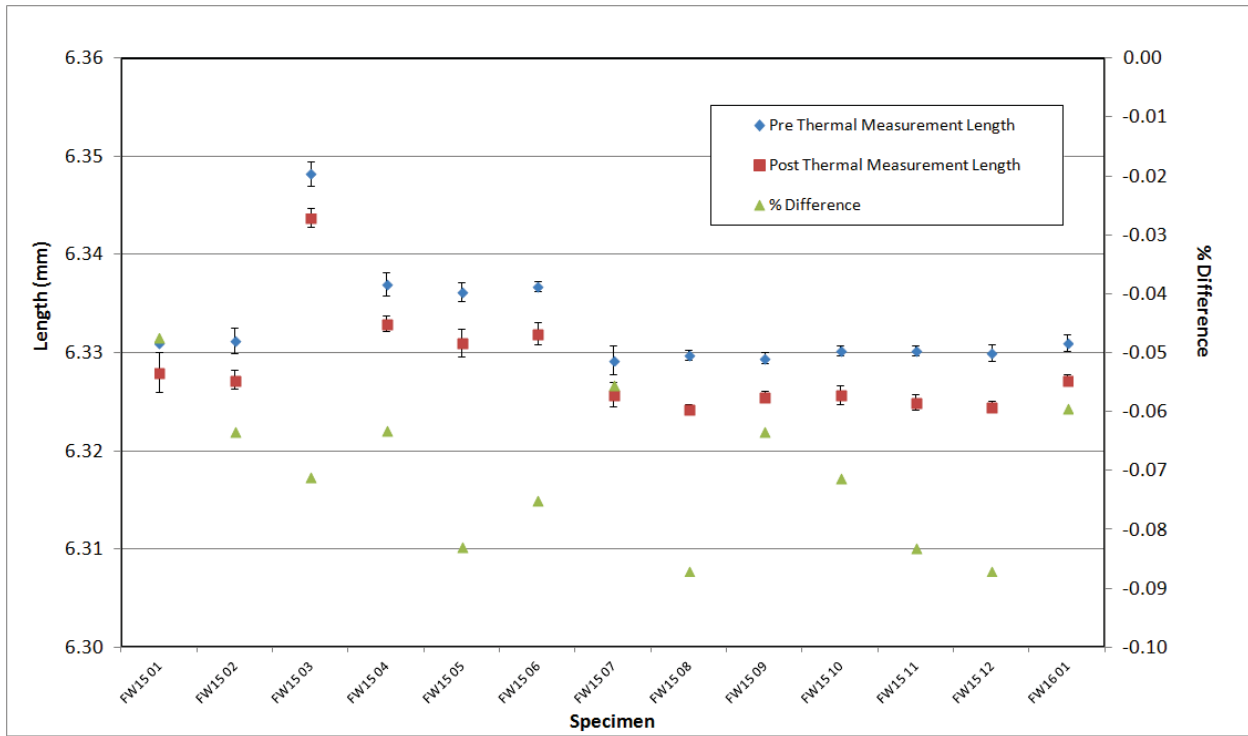


Figure A-149. IG-430 Piggyback Pre vs. Post Thermal Measurement Length Comparison.

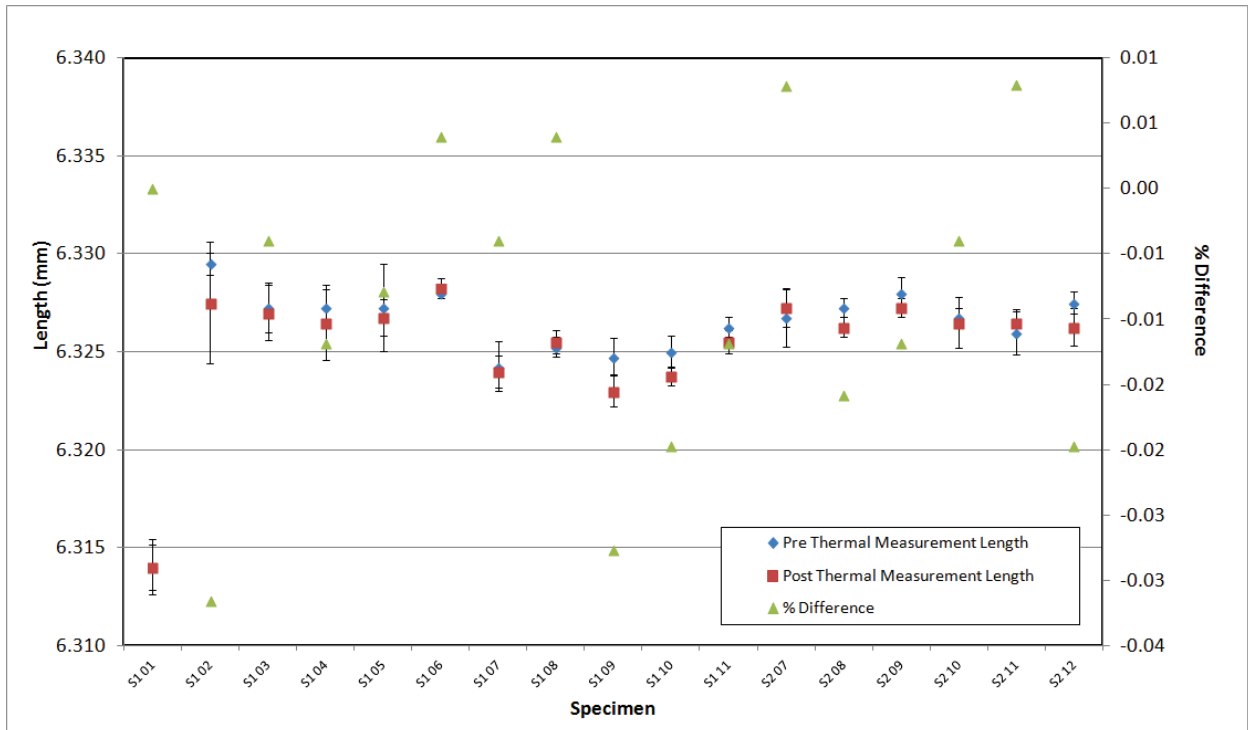


Figure A-150. NBG-10 Piggyback Pre vs. Post Thermal Measurement Length Comparison.

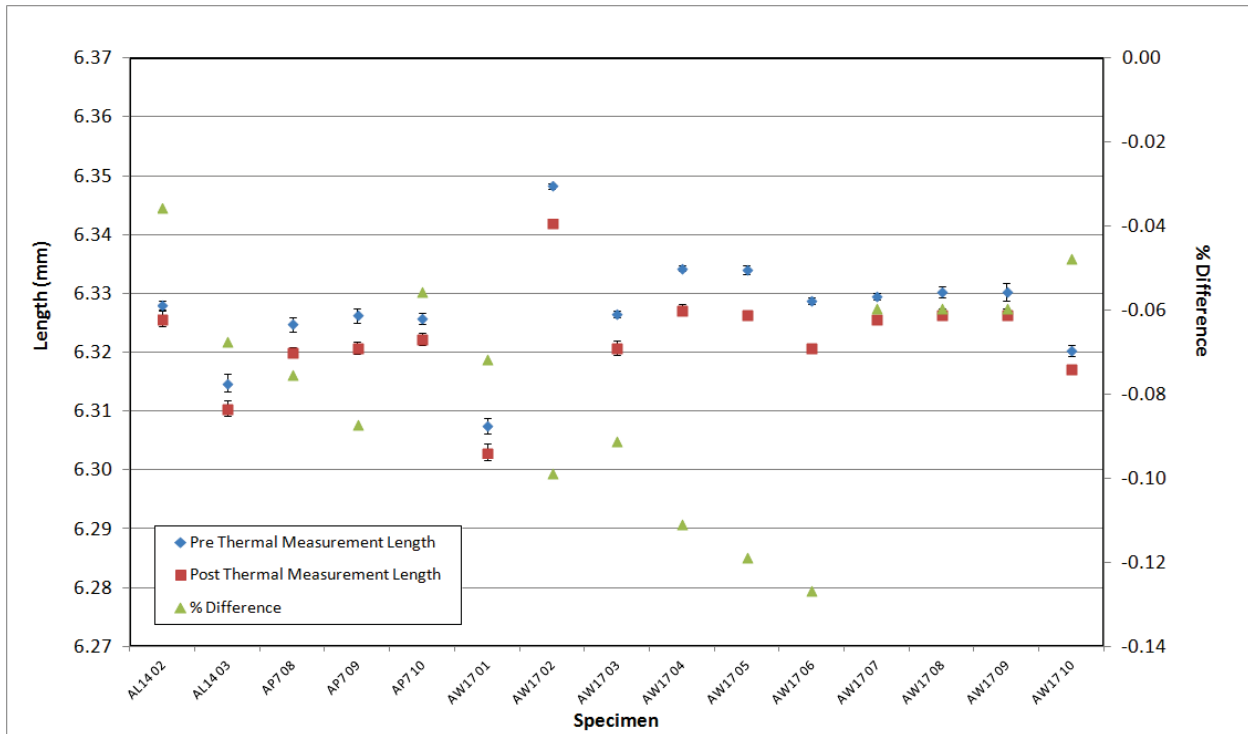


Figure A-151. NBG-17 Piggyback Pre vs. Post Thermal Measurement Length Comparison.

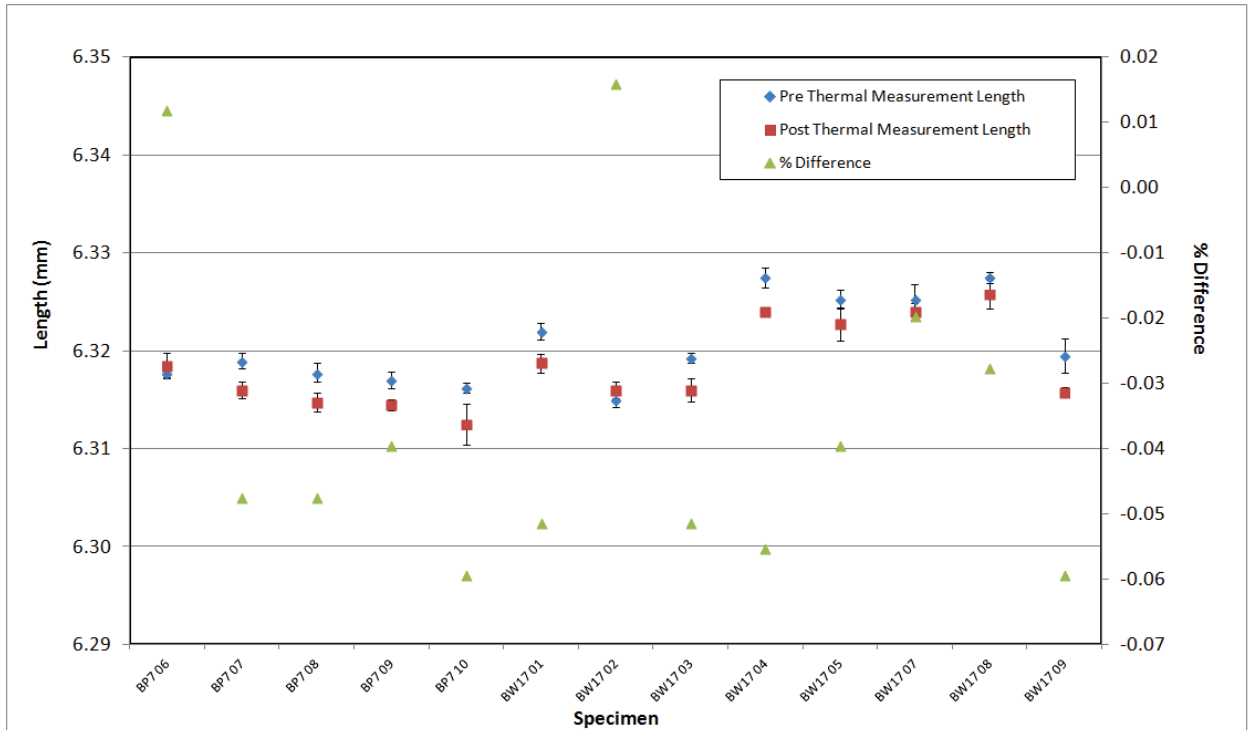


Figure A-152. NBG-18 Piggyback Pre vs. Post Thermal Measurement Length Comparison.

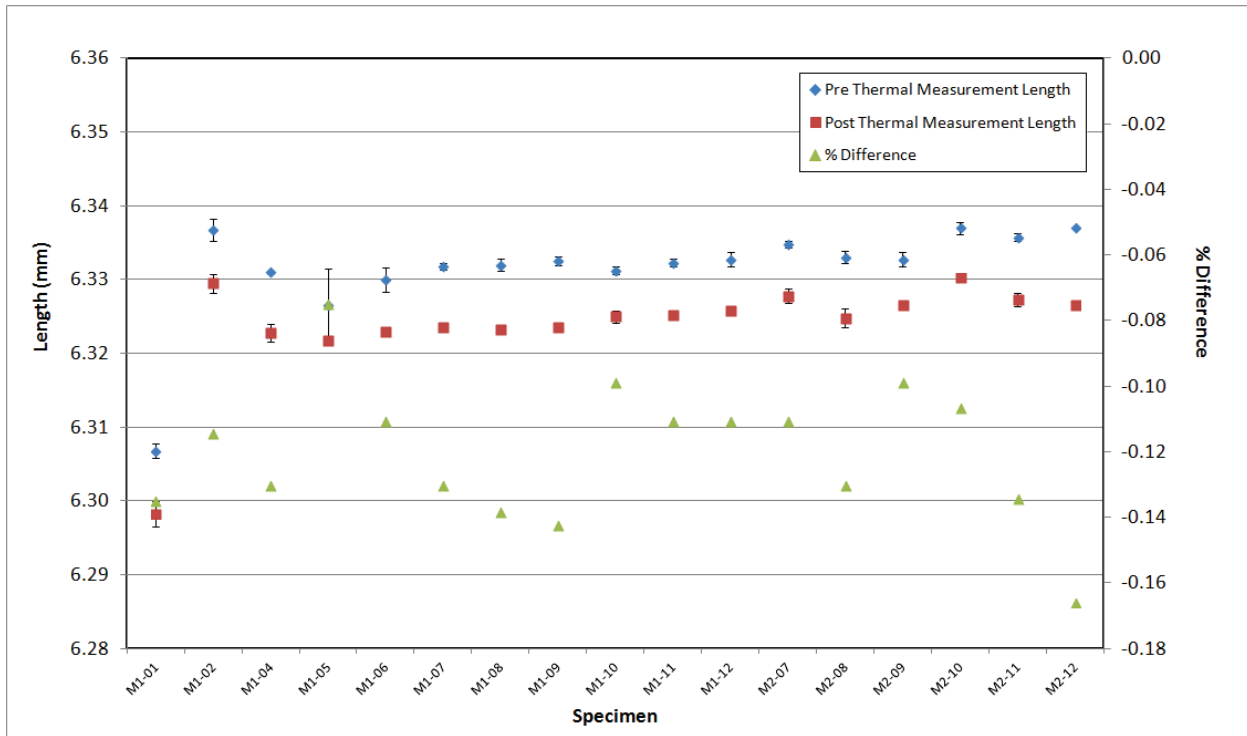


Figure A-153. NBG-25 Piggyback Pre vs. Post Thermal Measurement Length Comparison.

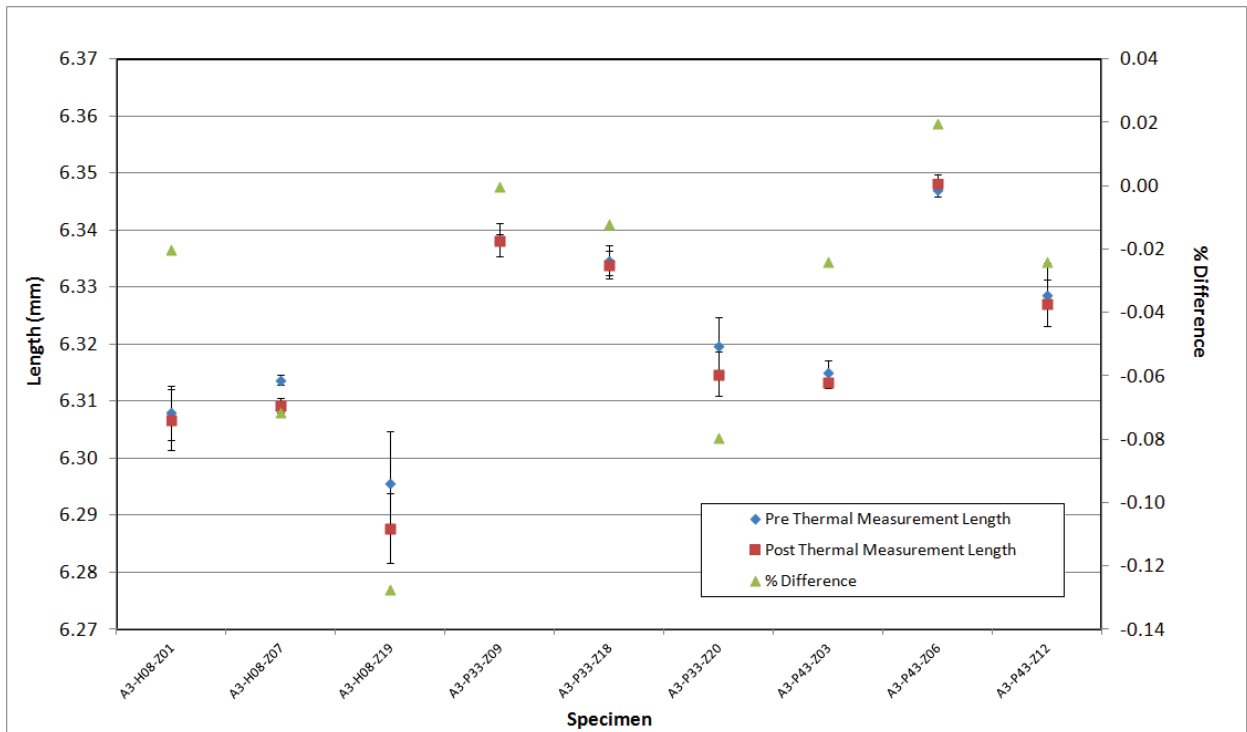


Figure A-154. New Matrix Piggyback Pre vs. Post Thermal Measurement Length Comparison.

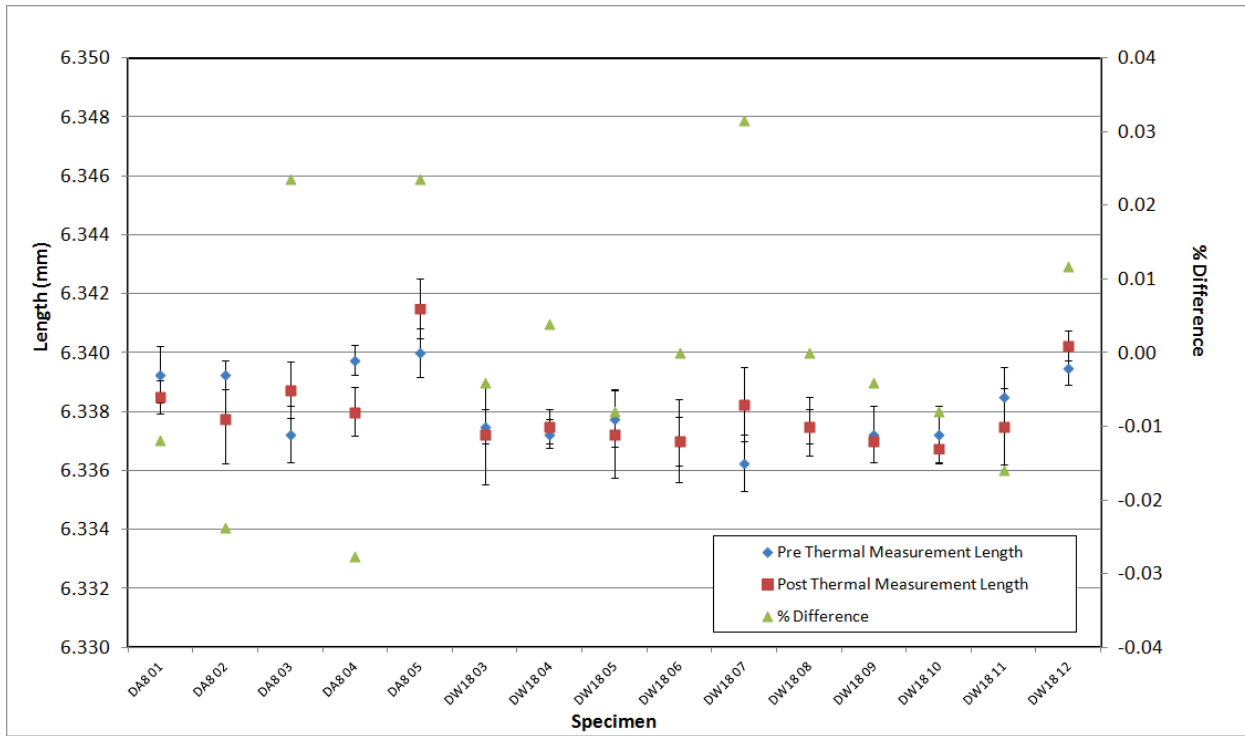


Figure A-155. PCEA Piggyback Pre vs. Post Thermal Measurement Length Comparison.

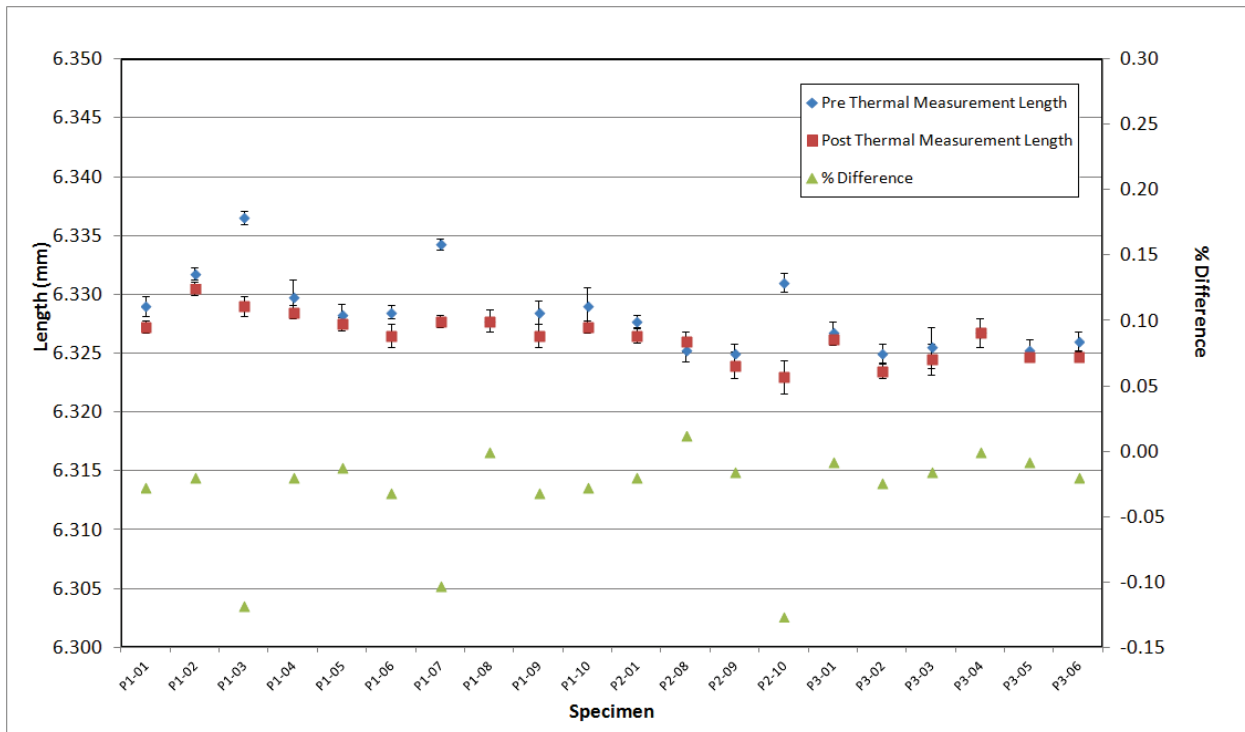


Figure A-156. PCIB Piggyback Pre vs. Post Thermal Measurement Length Comparison.

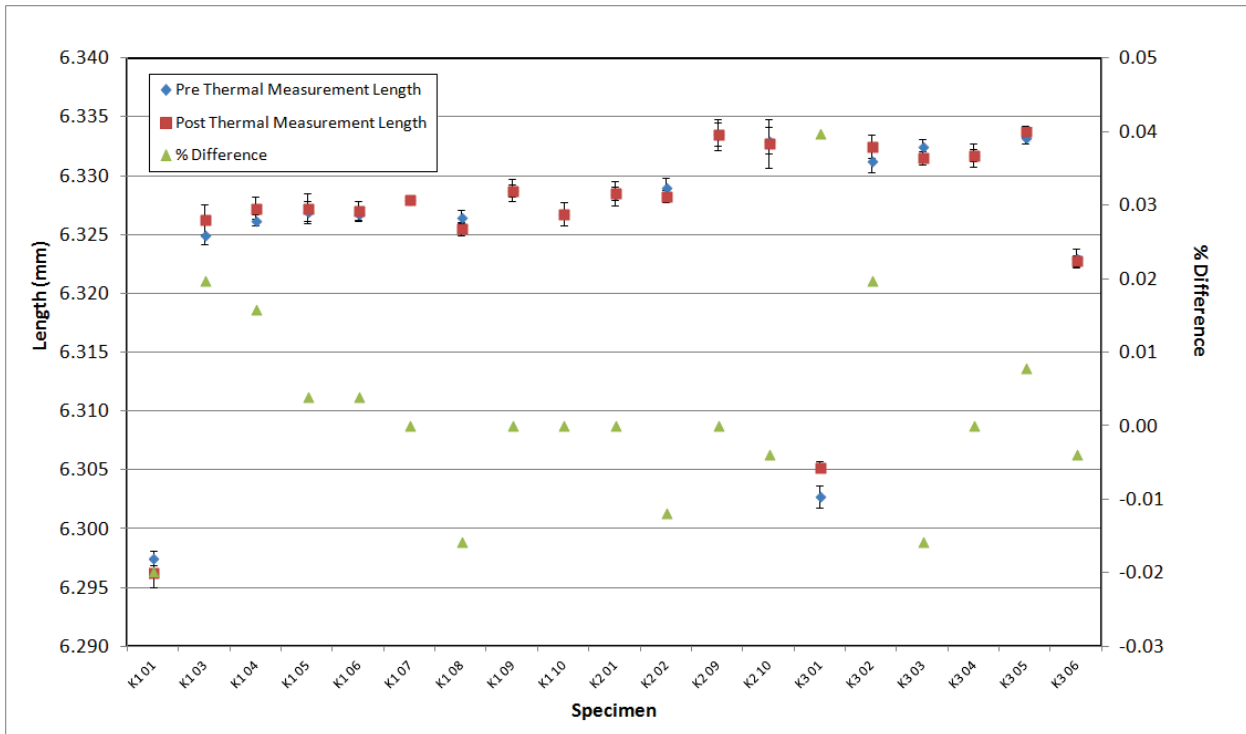


Figure A-157. PGX Piggyback Pre vs. Post Thermal Measurement Length Comparison.

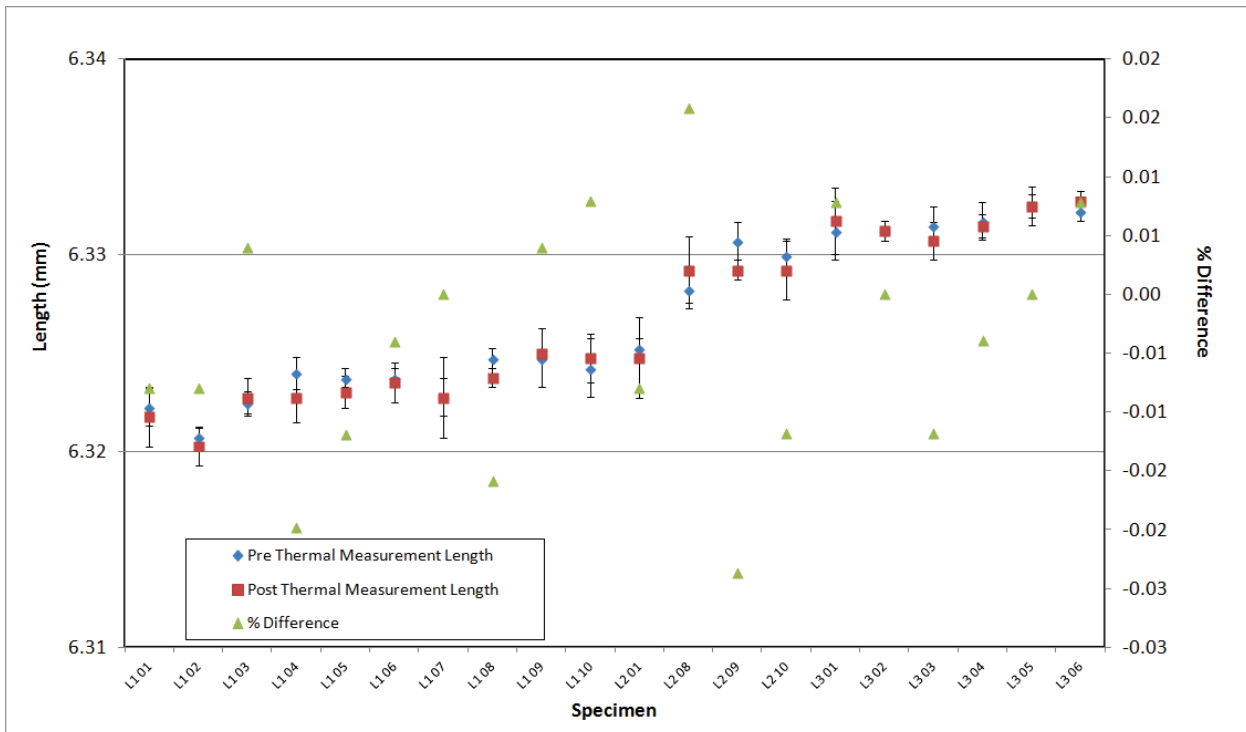


Figure A-158. PPEA Piggyback Pre vs. Post Thermal Measurement Length Comparison.

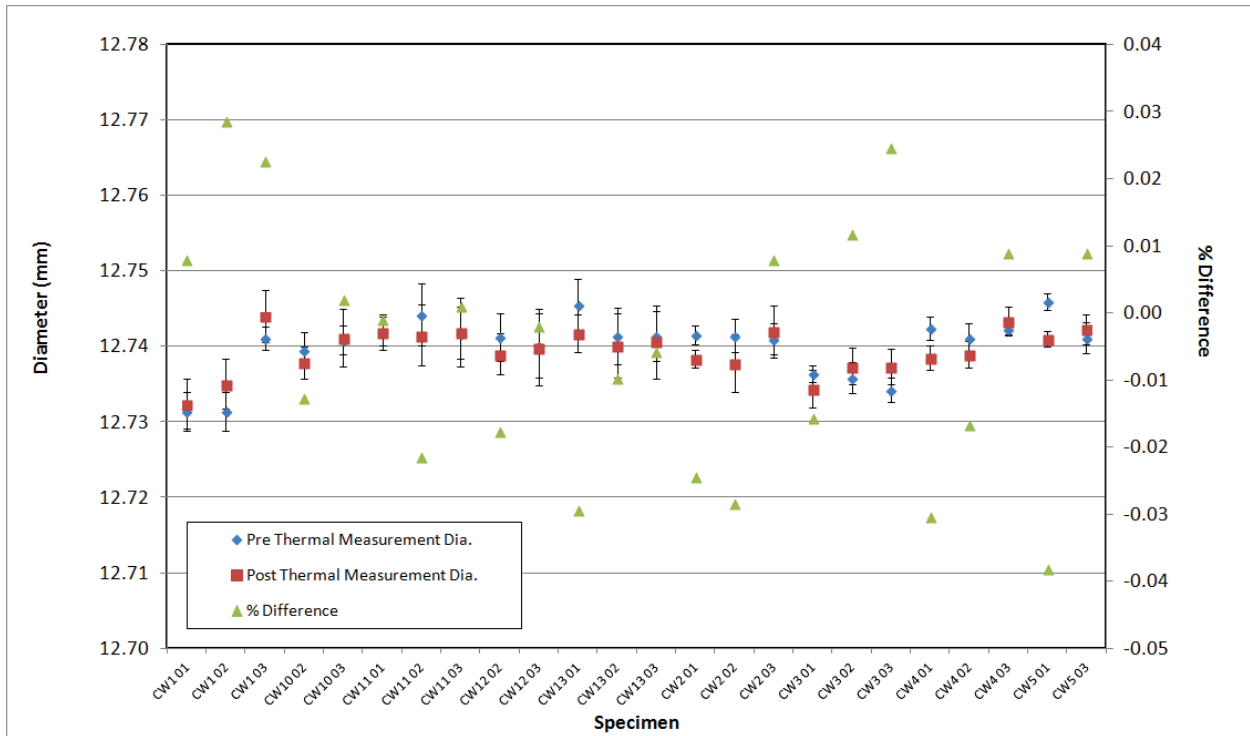


Figure A-159. H-451 Creep Pre vs. Post Thermal Measurement Diameter Comparison.

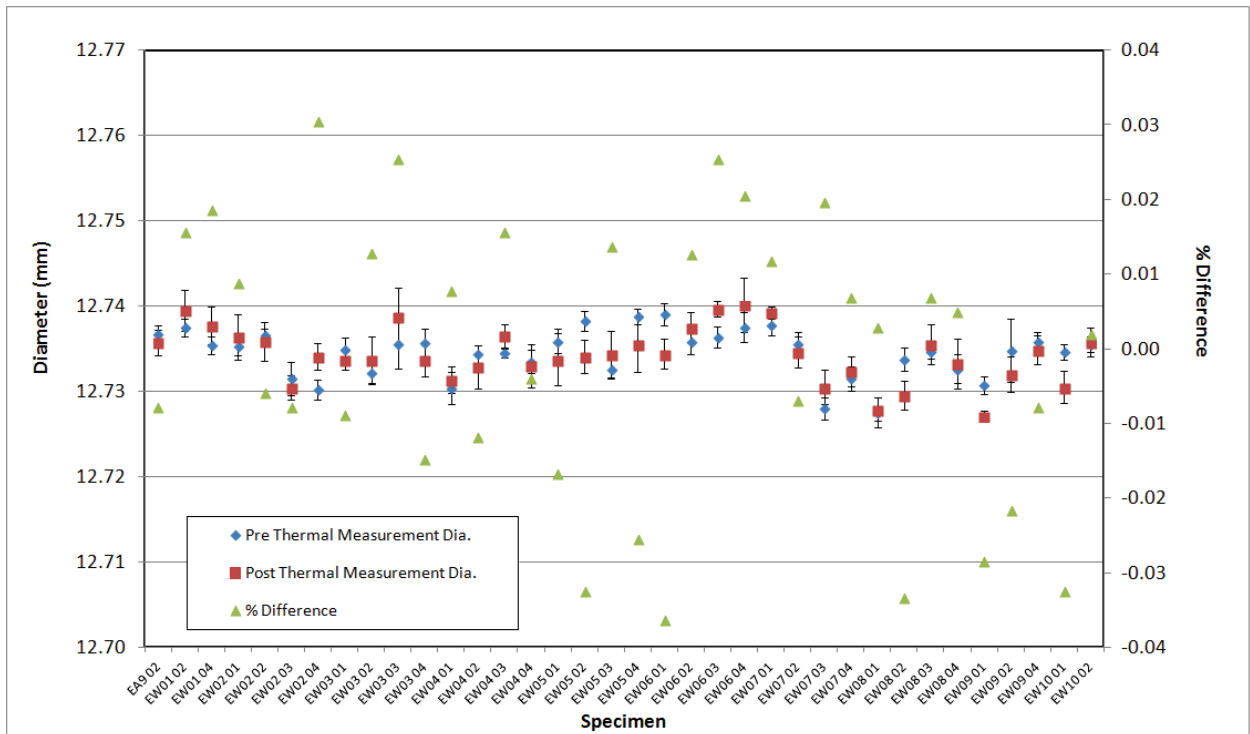


Figure A-160. IG-110 Creep Pre vs. Post Thermal Measurement Diameter Comparison.

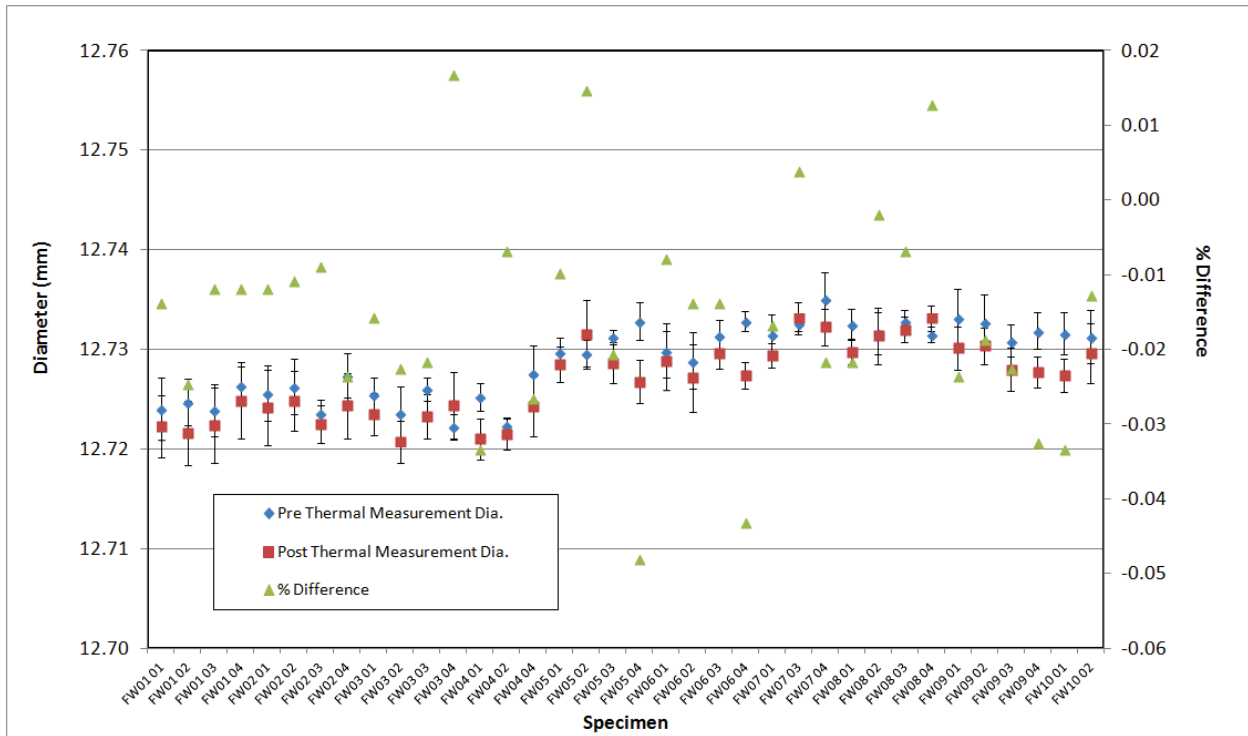


Figure A-161. IG-430 Creep Pre vs. Post Thermal Measurement Diameter Comparison.

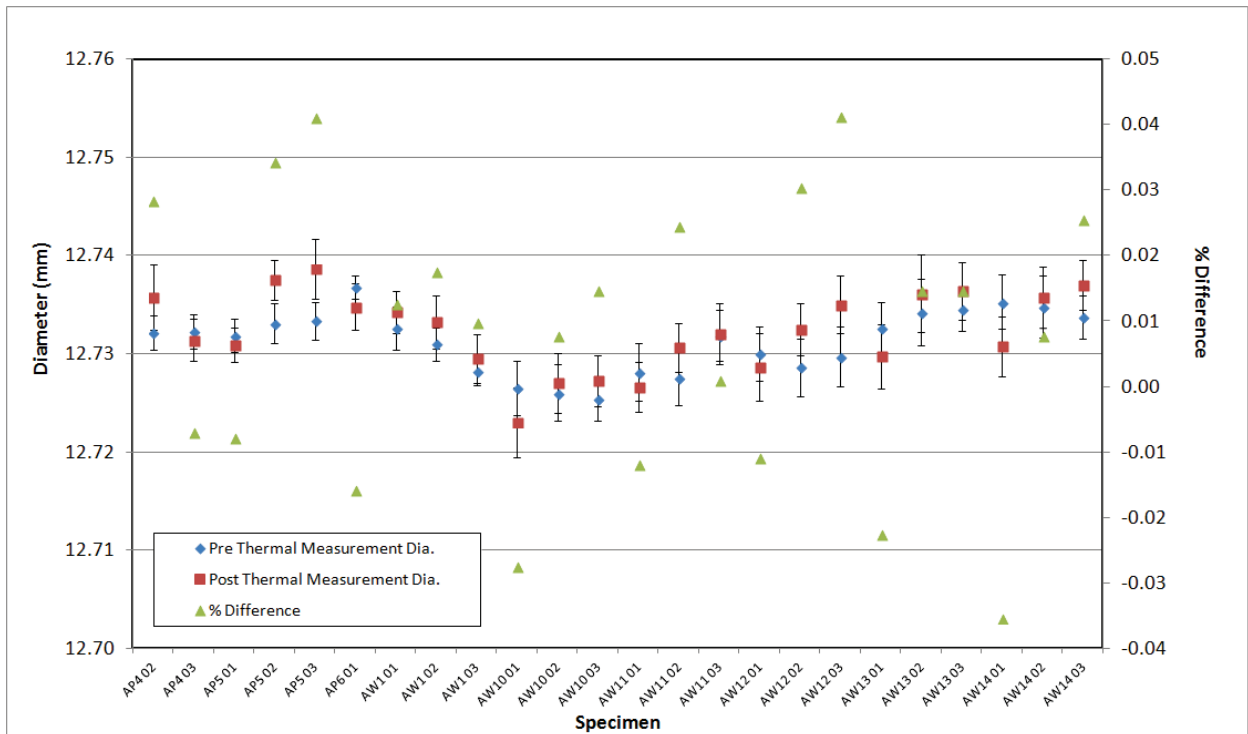


Figure A-162. NBG-17 Creep Pre vs. Post Thermal Measurement Diameter Comparison.

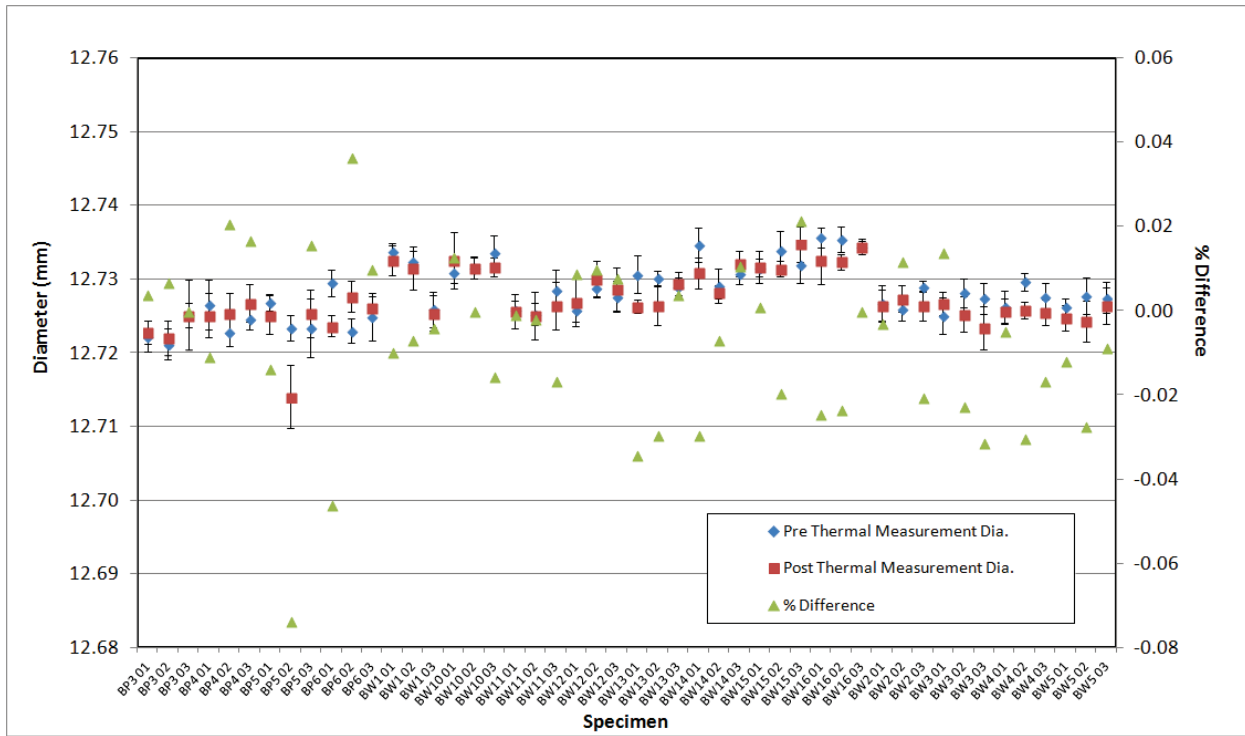


Figure A-163. NBG-18 Creep Pre vs. Post Thermal Measurement Diameter Comparison.

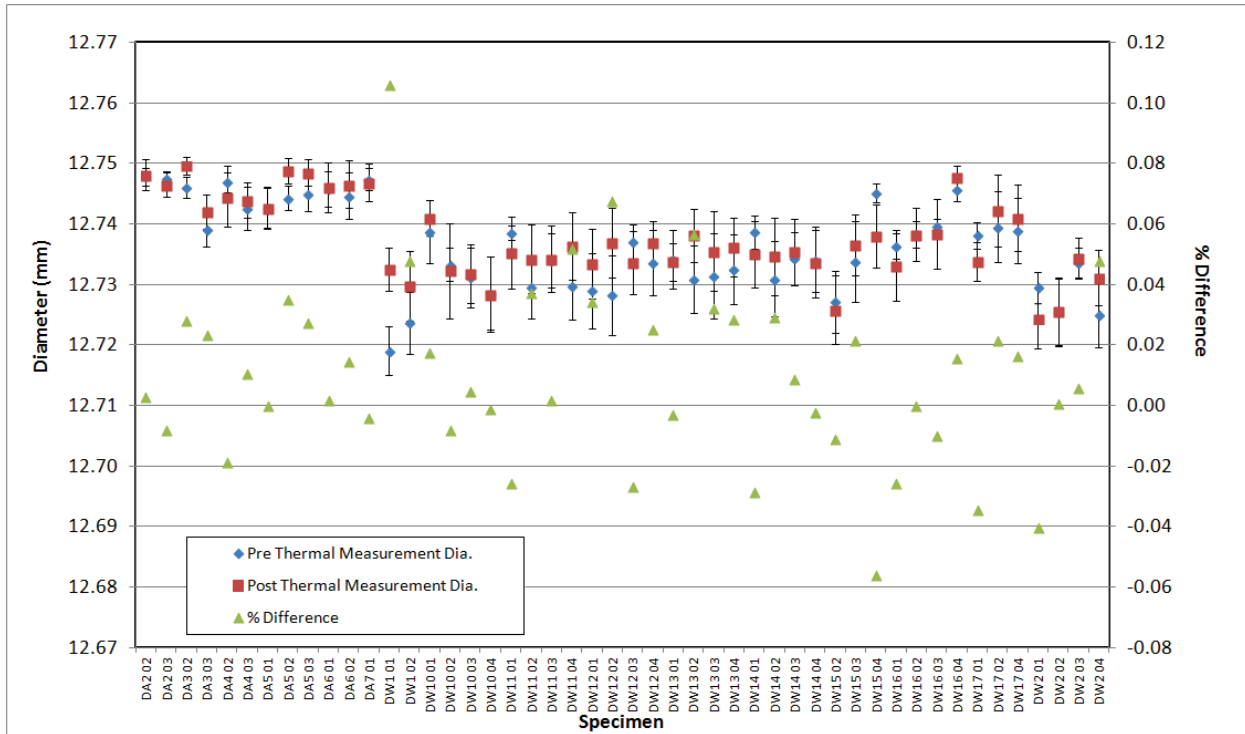


Figure A-164. PCEA Creep Pre vs. Post Thermal Measurement Diameter Comparison.

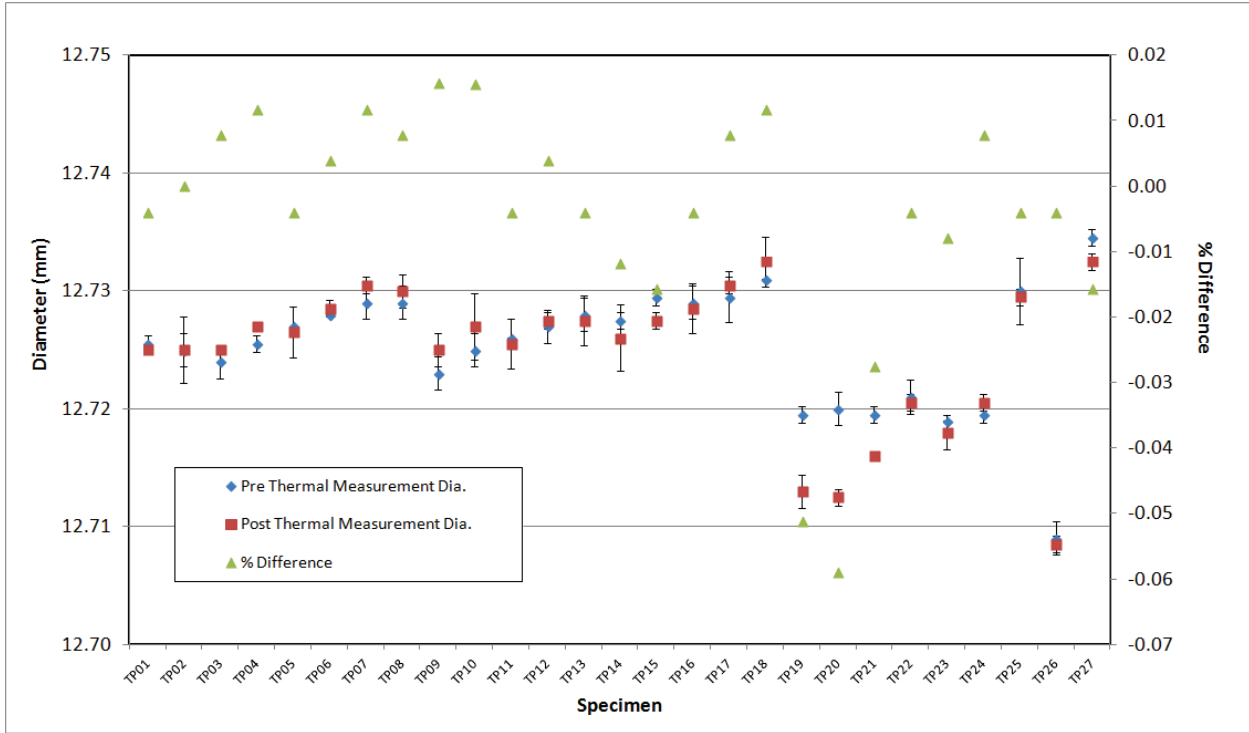


Figure A-165. 2114 Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

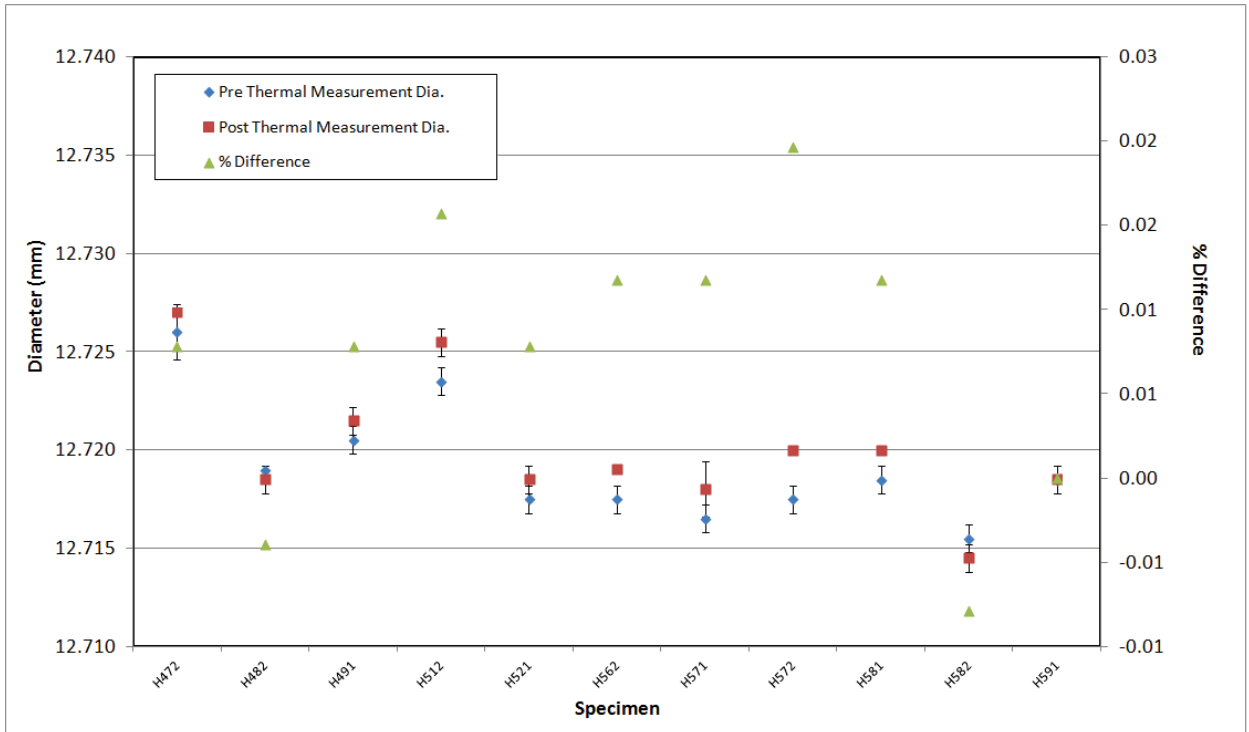


Figure A-166. A3 Matrix Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

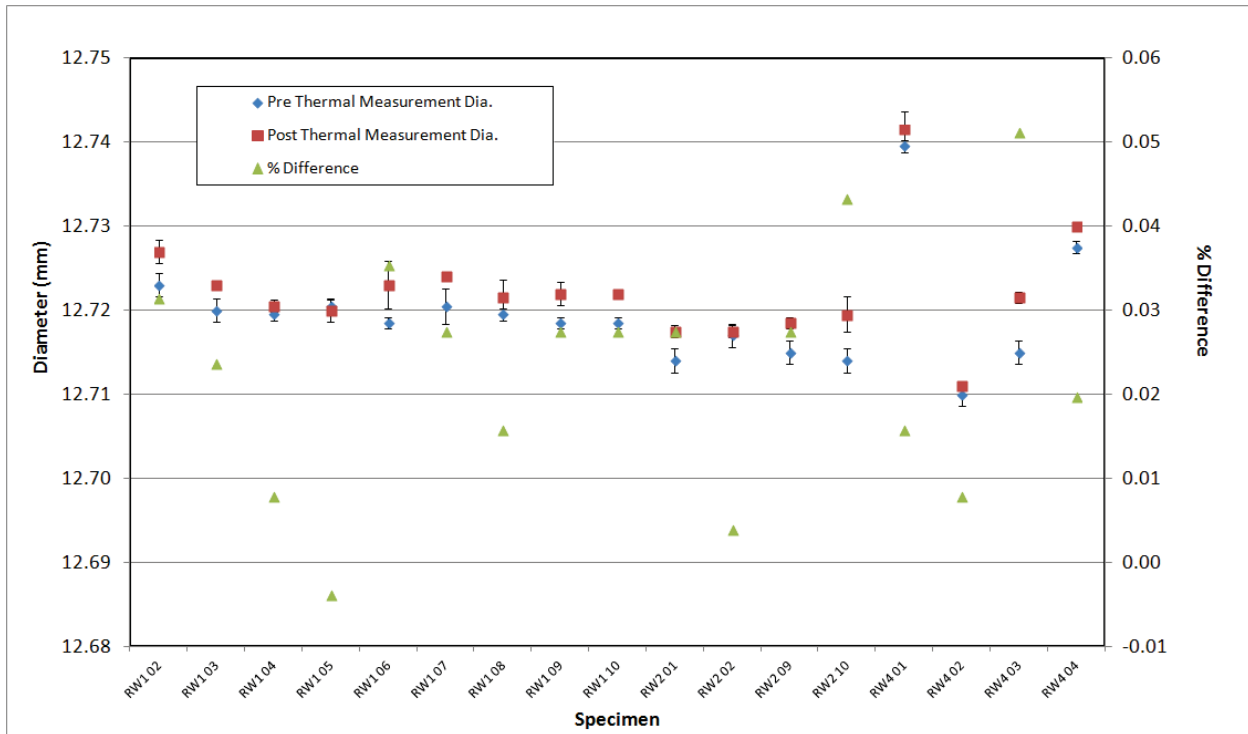


Figure A-167. BAN Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

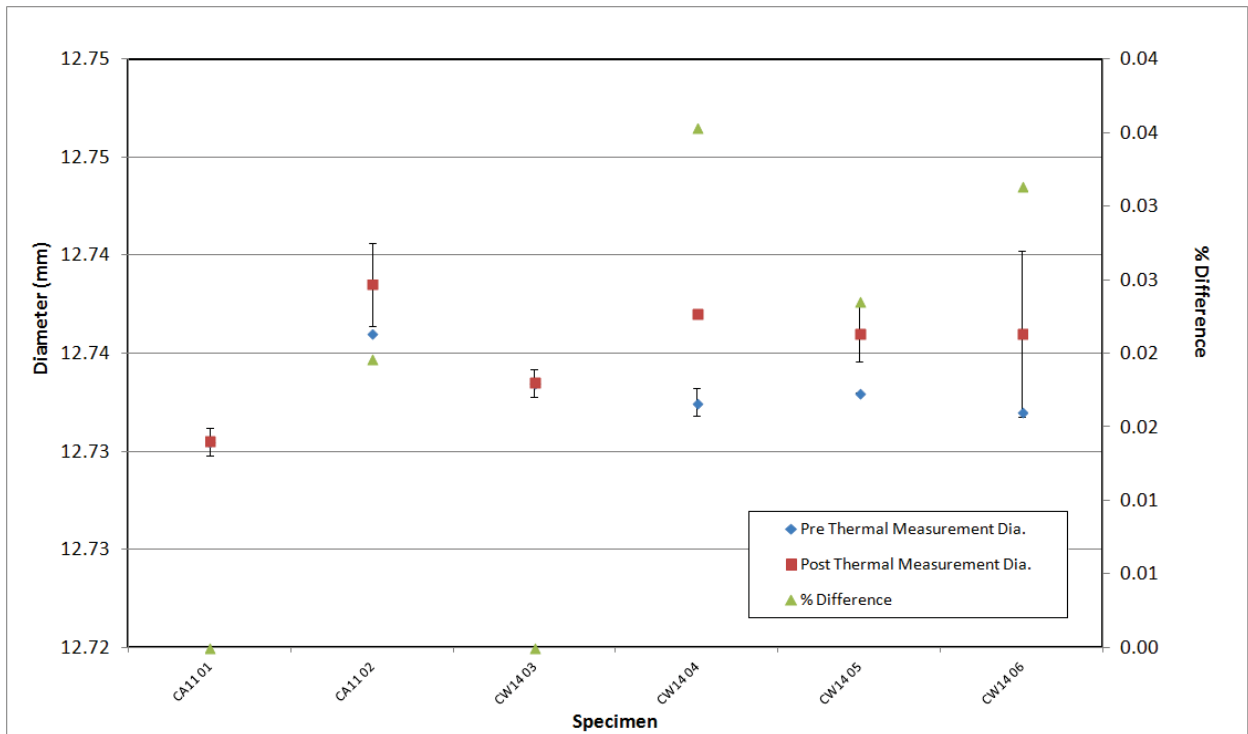


Figure A-168. H-451 Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

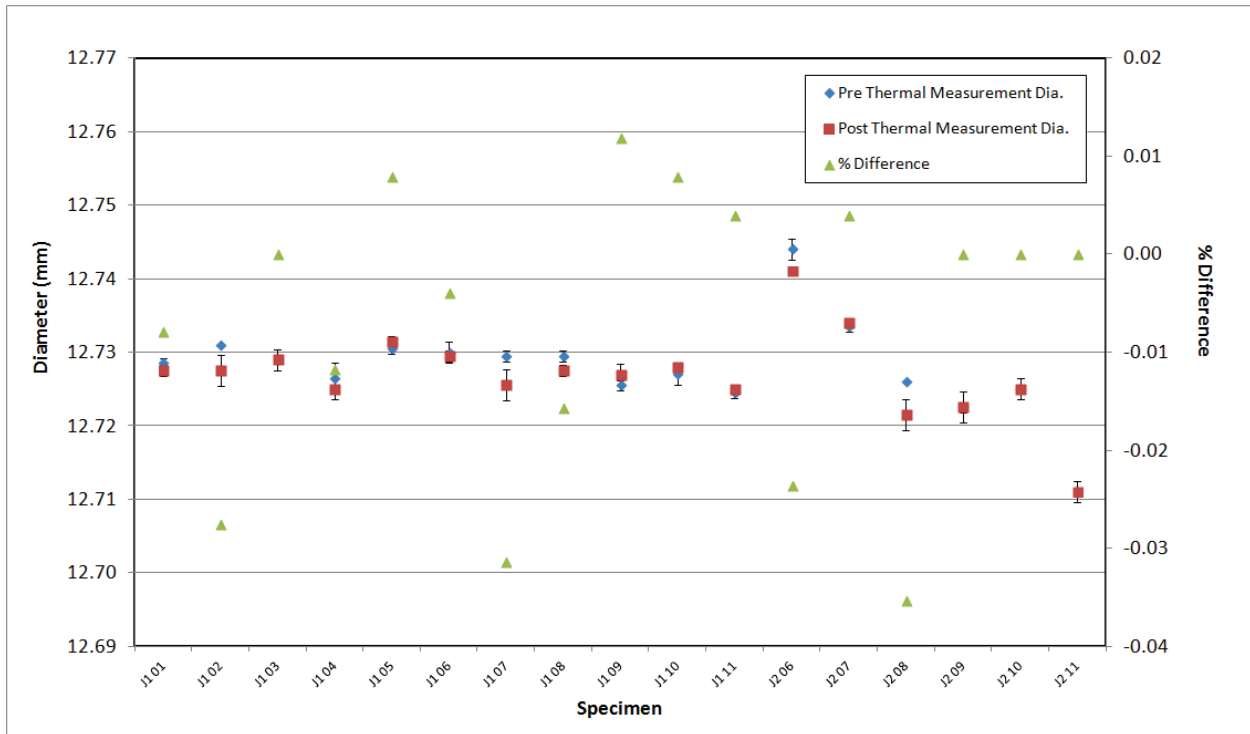


Figure A-169. HLM Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

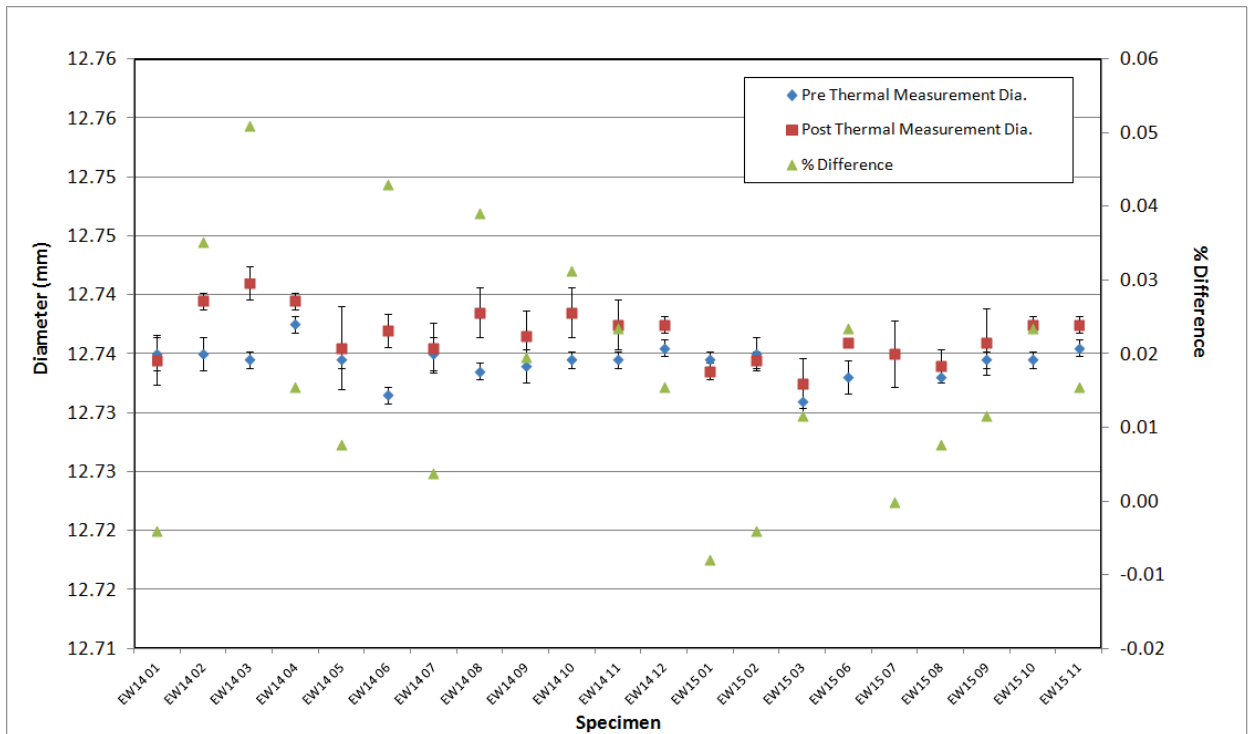


Figure A-170. IG-110 Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

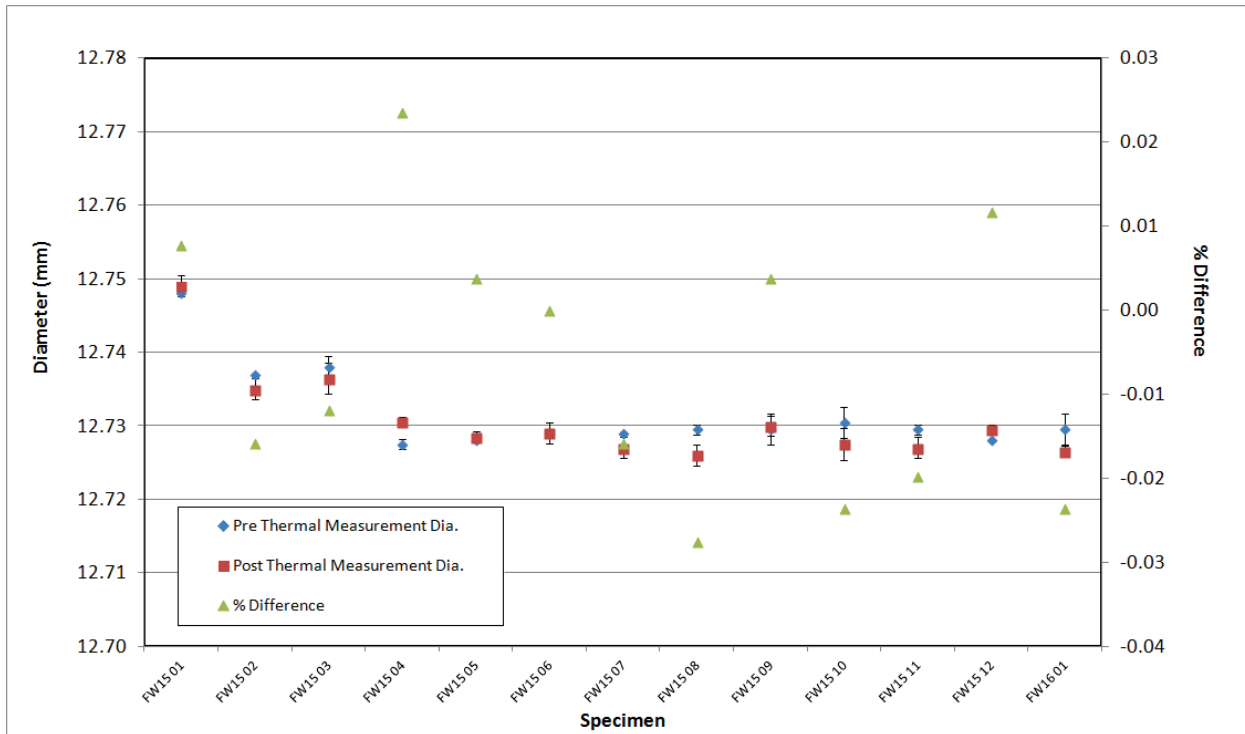


Figure A-171. IG-430 Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

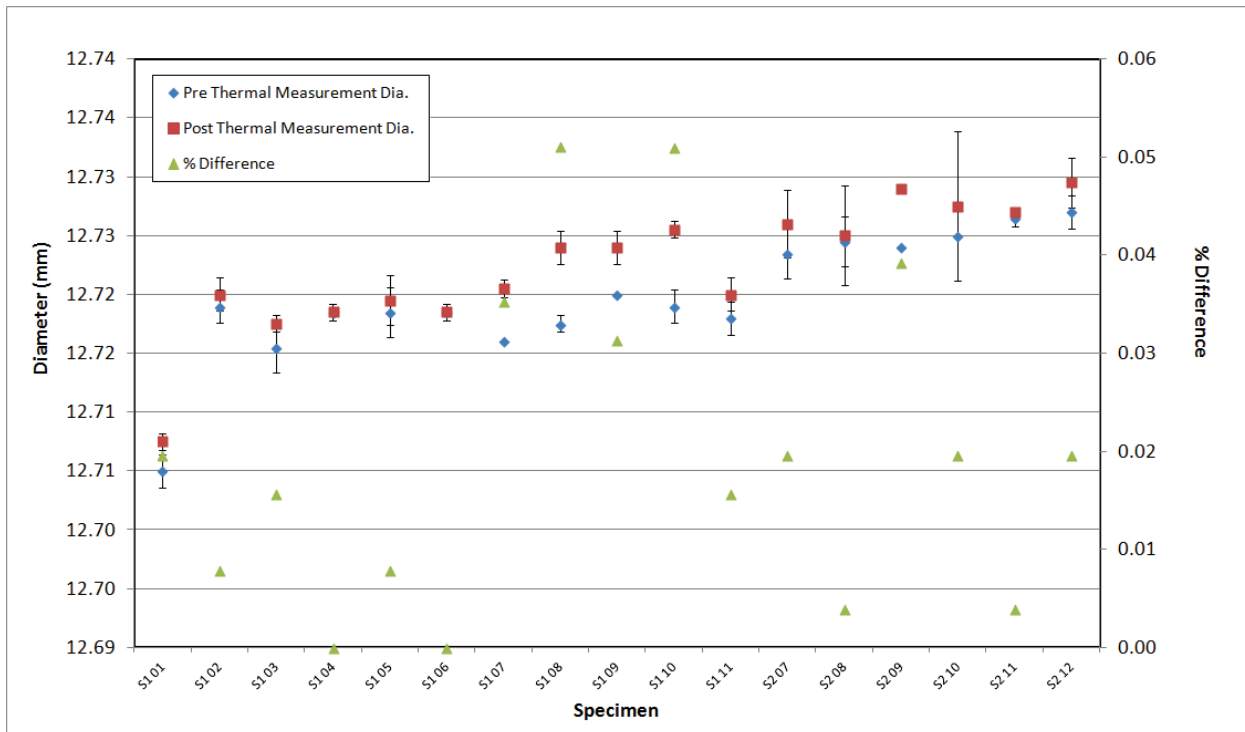


Figure A-172. NBG-10 Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

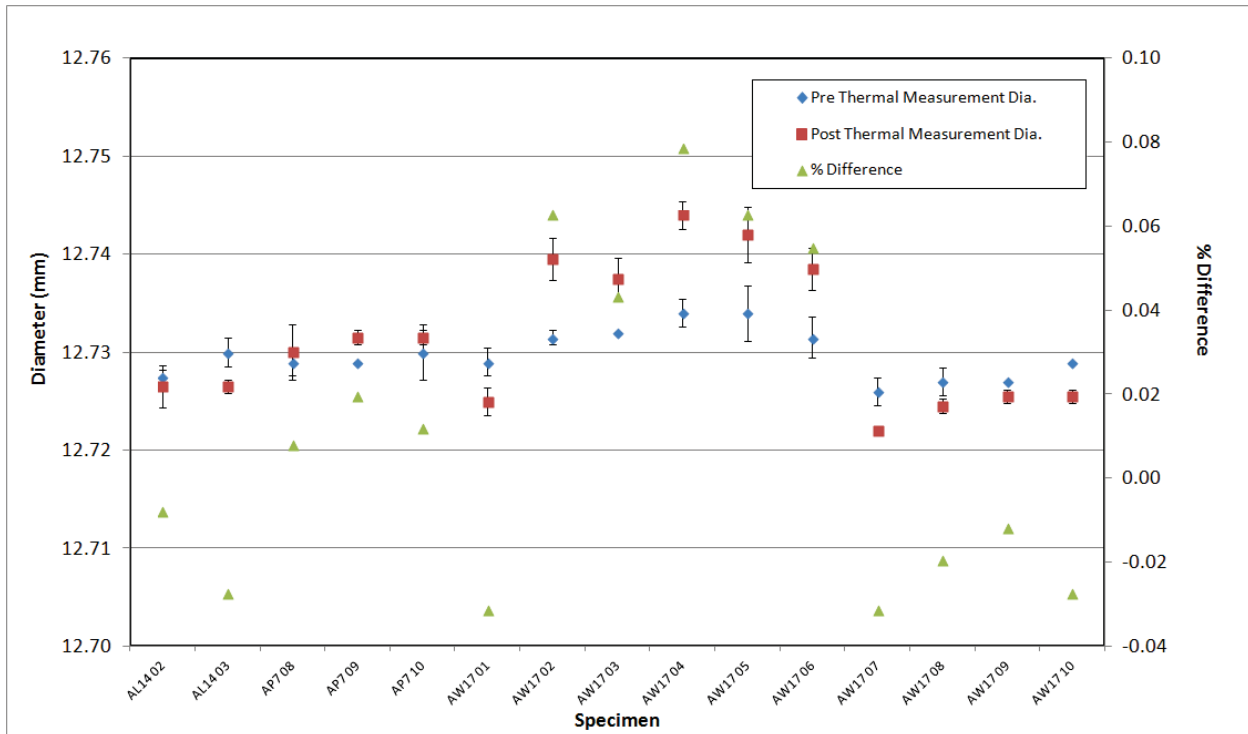


Figure A-173. NBG-17 Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

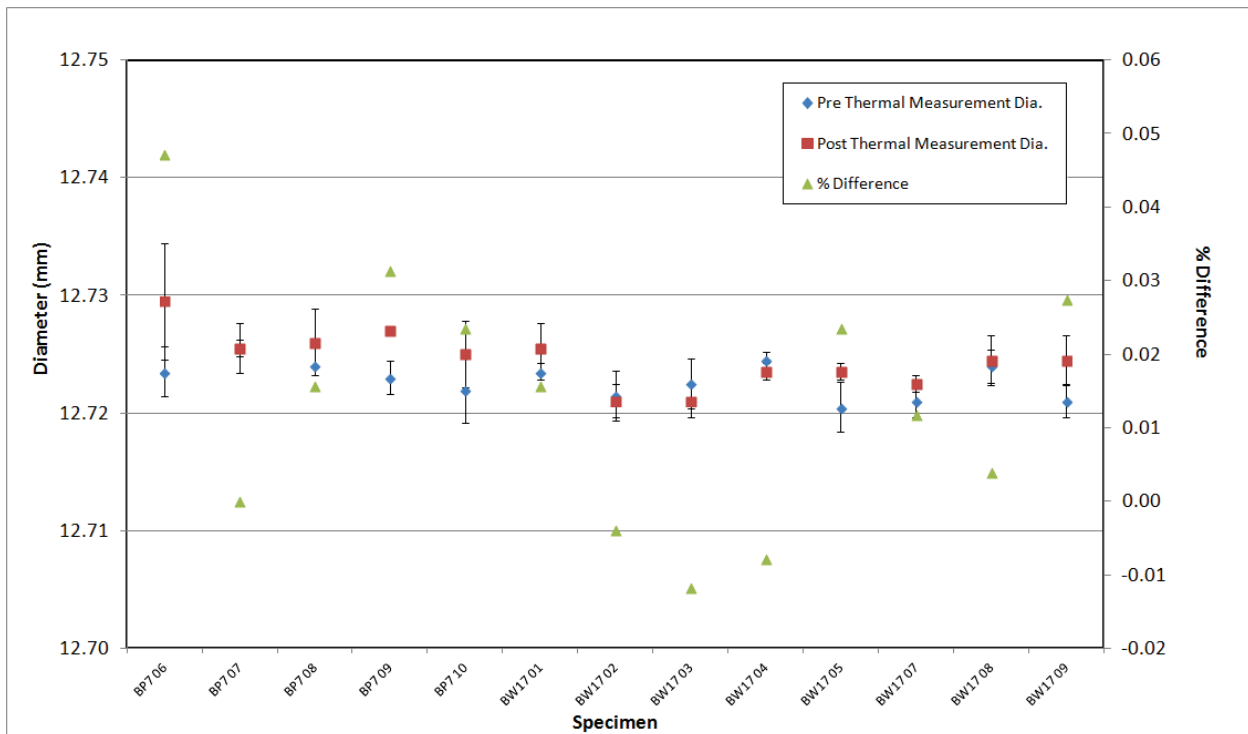


Figure A-174. NBG-18 Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

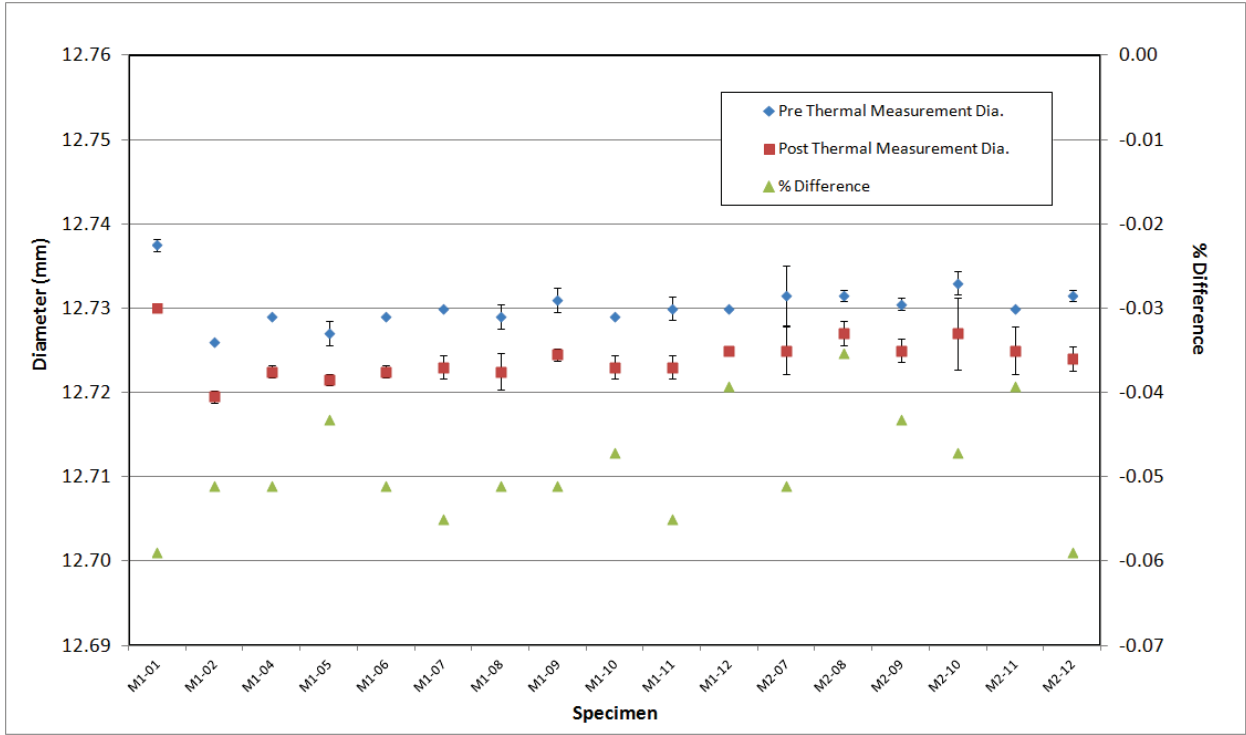


Figure A-175. NBG-25 Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

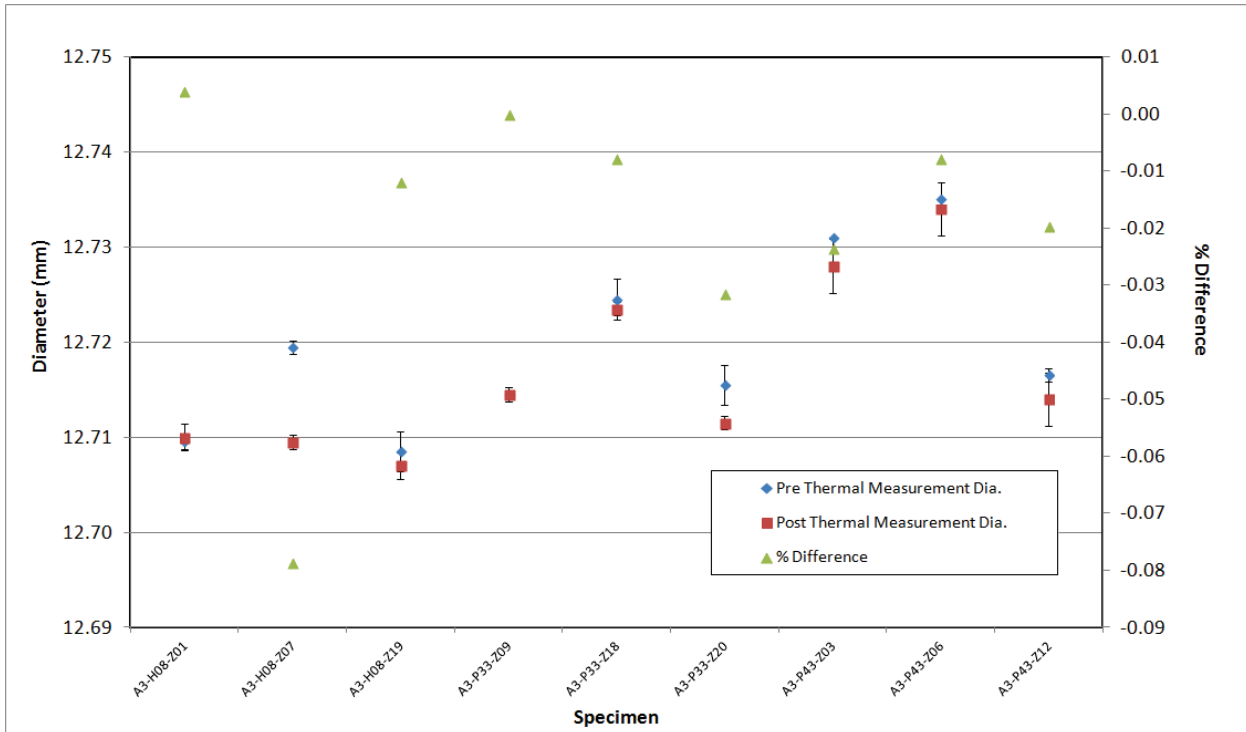


Figure A-176. New Matrix Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

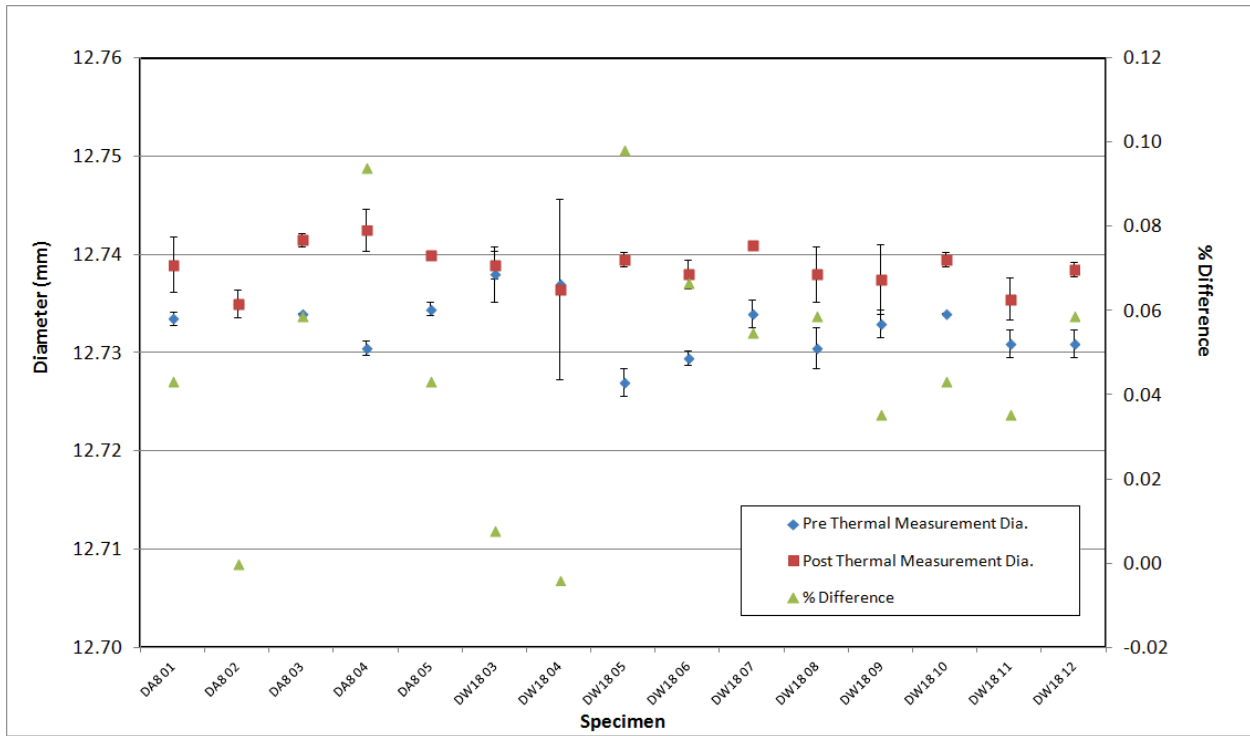


Figure A-177. PCEA Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

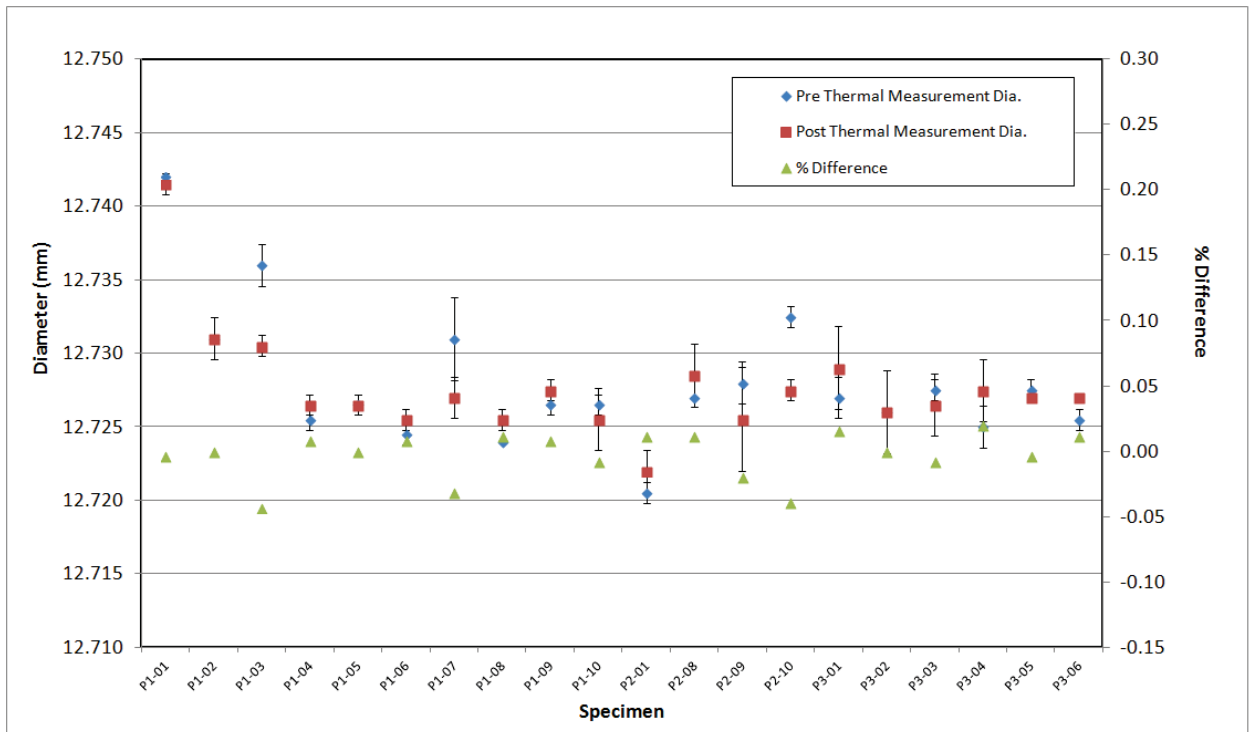


Figure A-178. PCIB Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

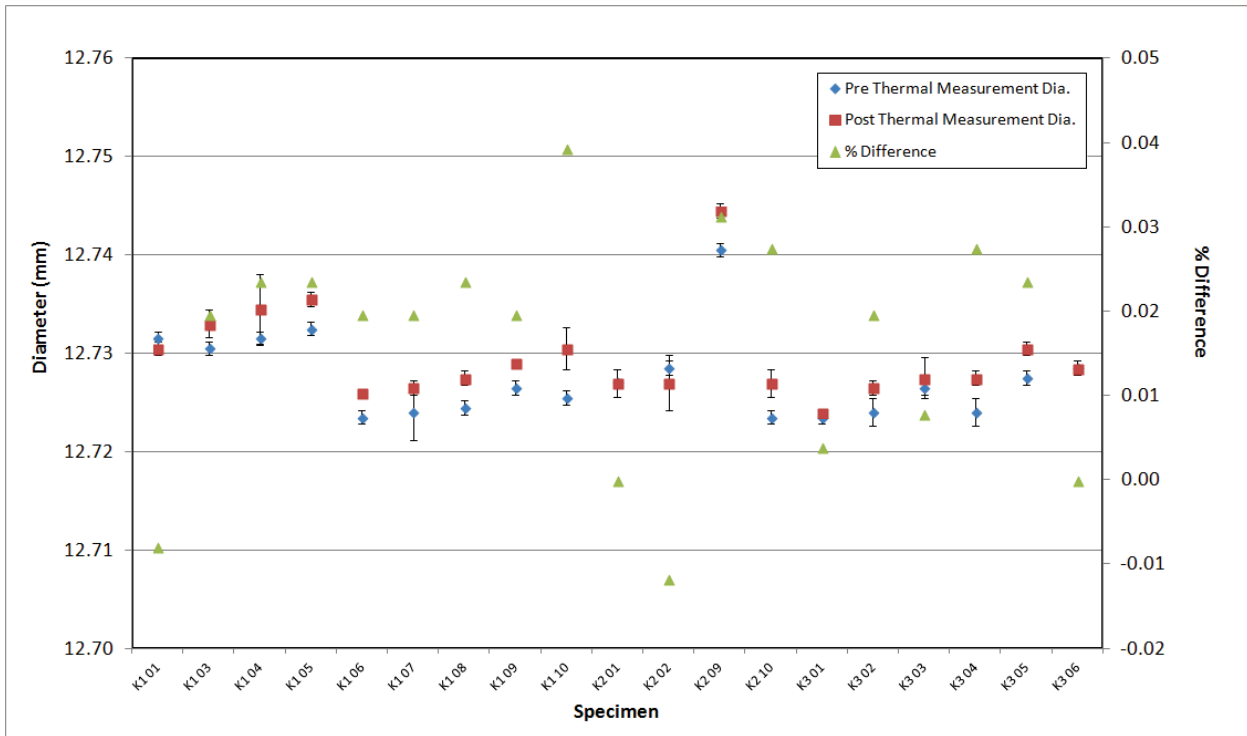


Figure A-179. PGX Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

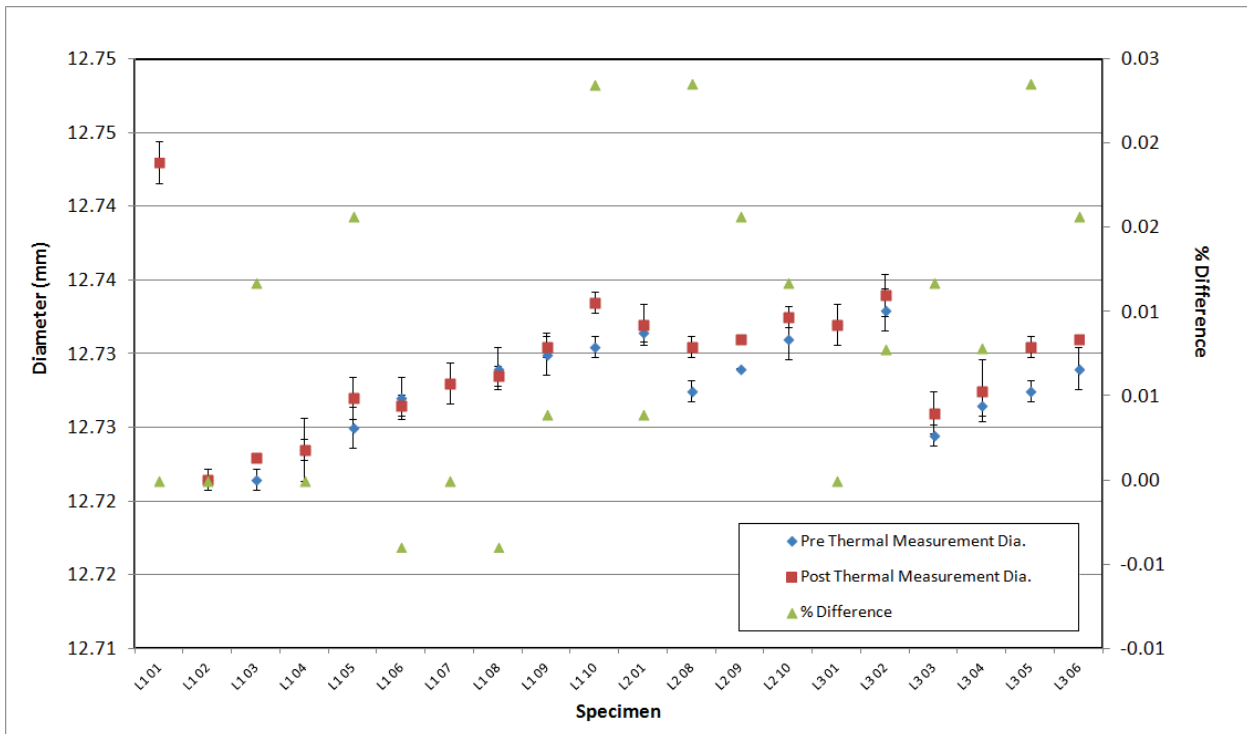


Figure A-180. PPEA Piggyback Pre vs. Post Thermal Measurement Diameter Comparison.

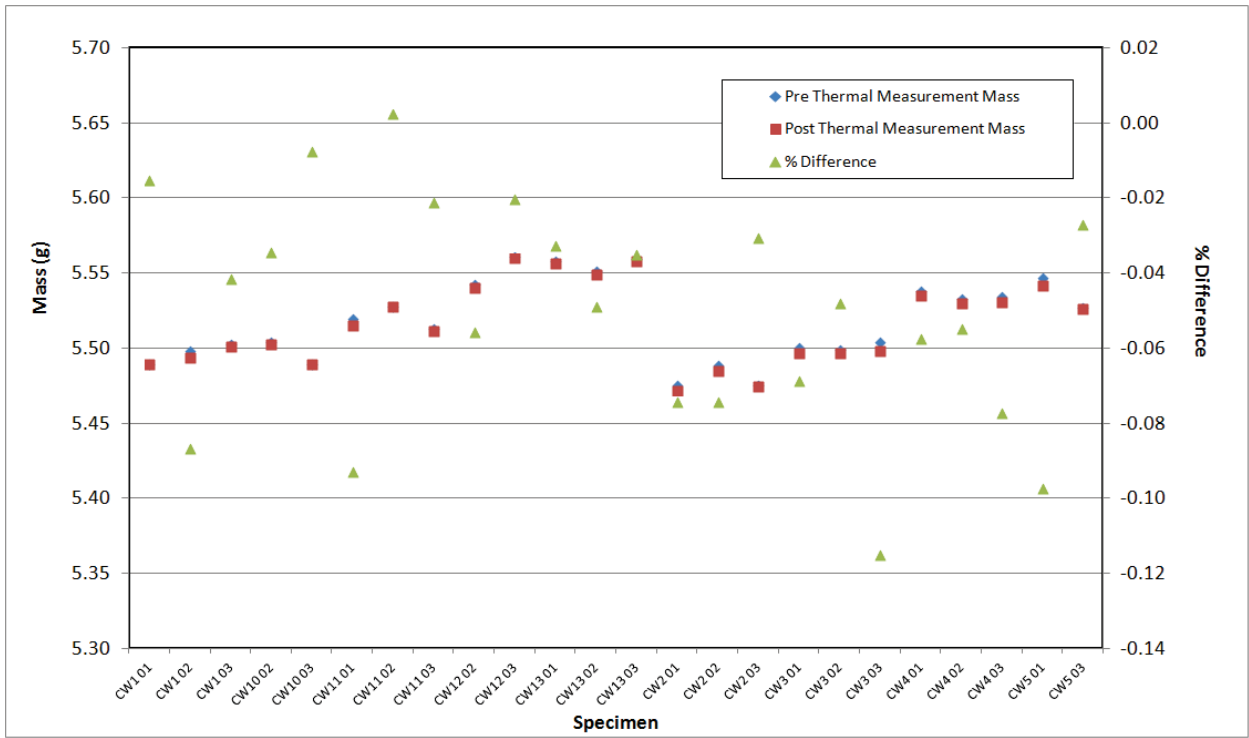


Figure A-181. H-451 Creep Pre vs. Post Thermal Measurement Mass Comparison.

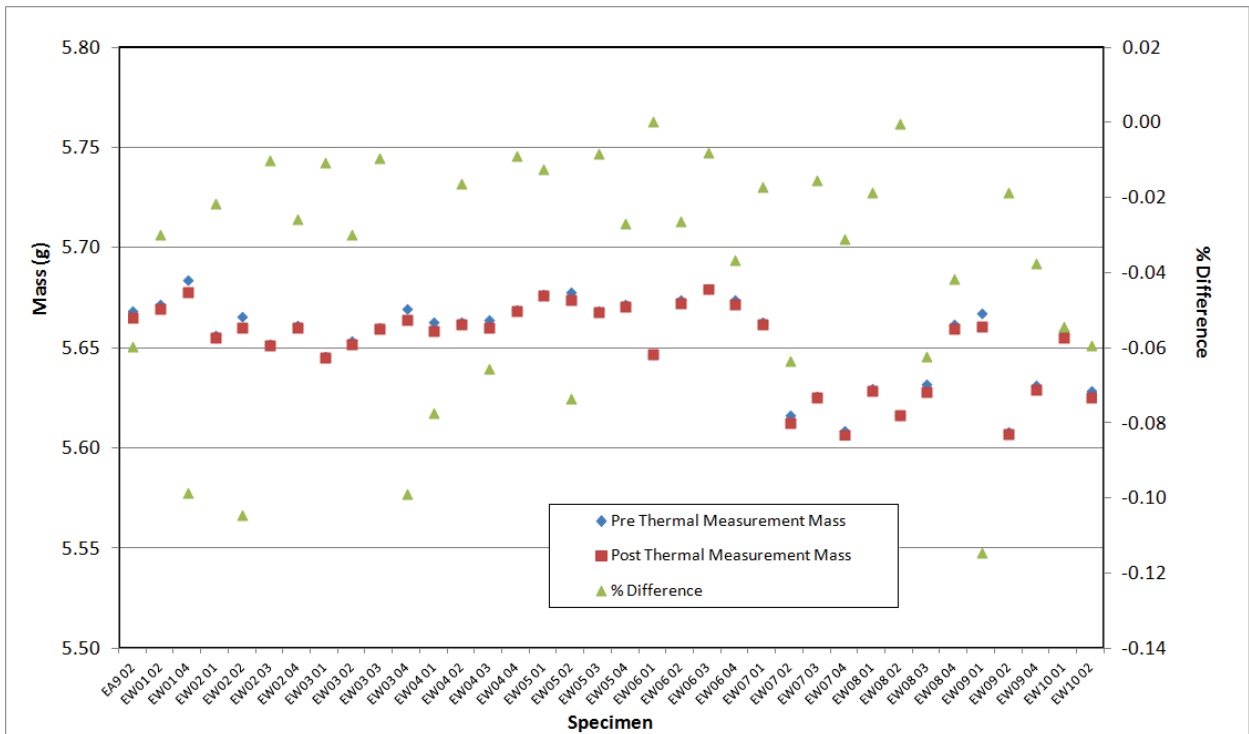


Figure A-182. IG-110 Creep Pre vs. Post Thermal Measurement Mass Comparison.

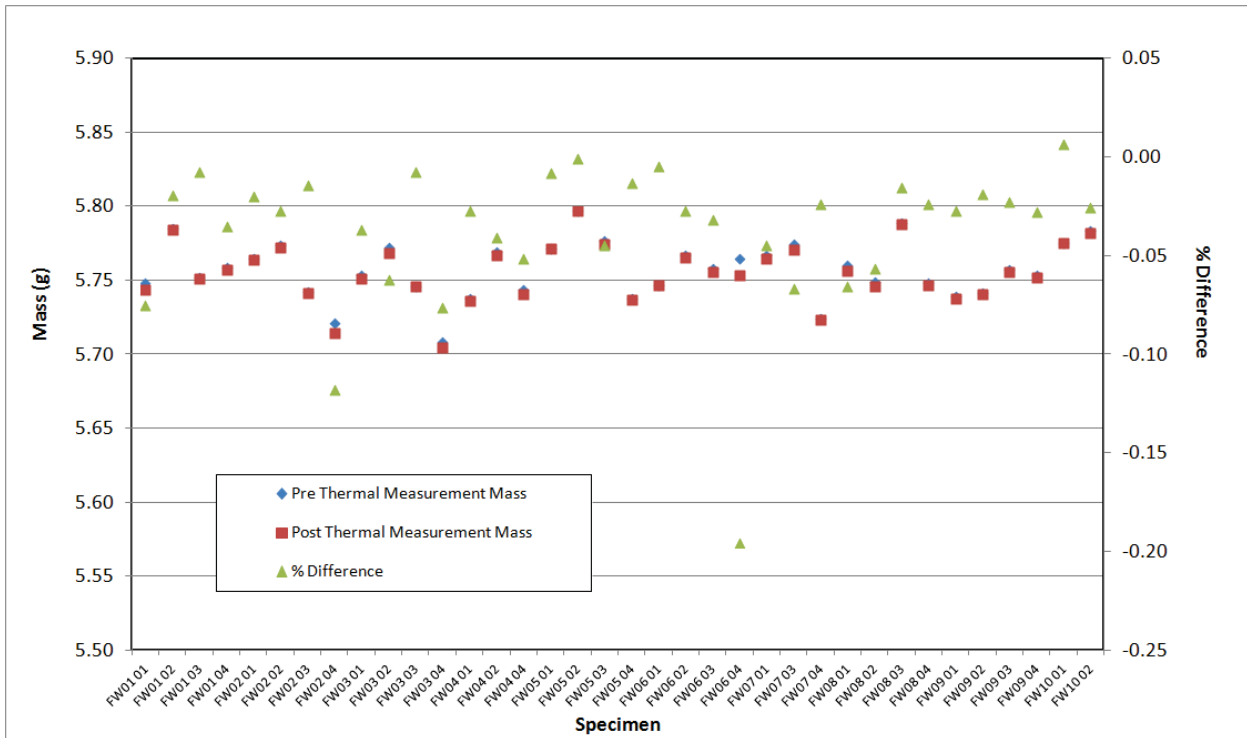


Figure A-183. IG-430 Creep Pre vs. Post Thermal Measurement Mass Comparison.

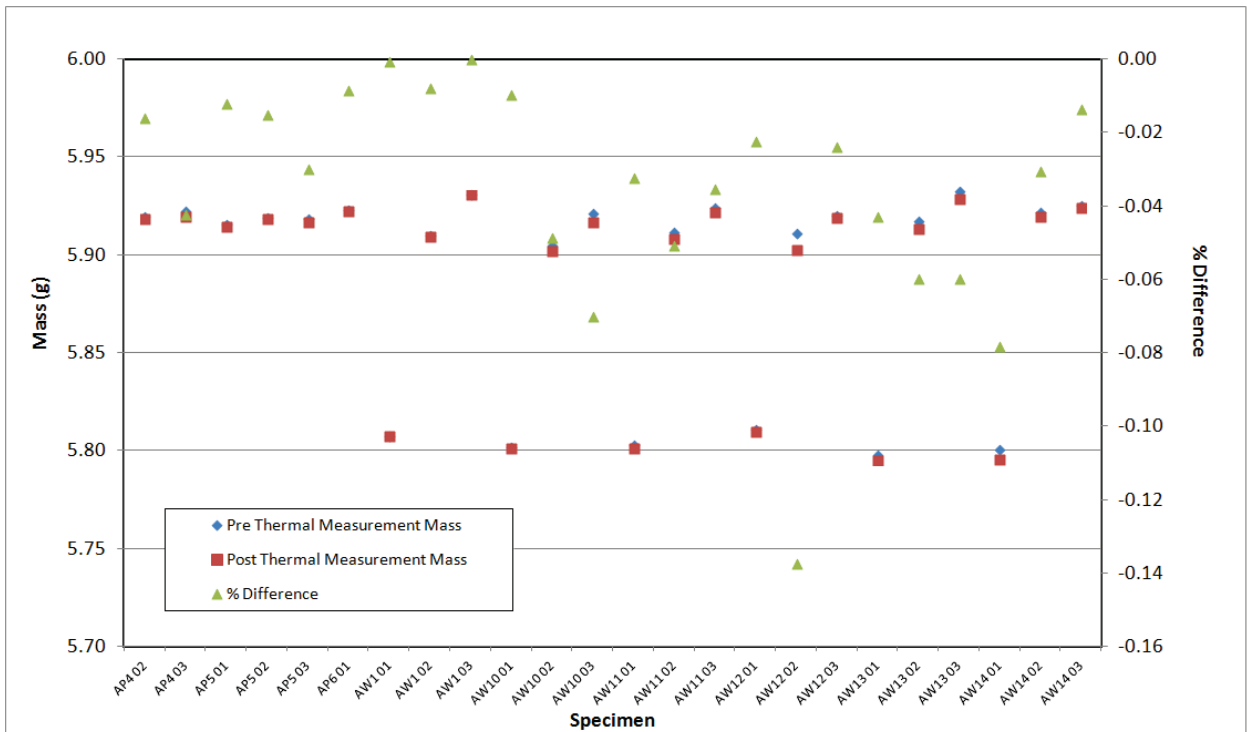


Figure A-184. NBG-17 Creep Pre vs. Post Thermal Measurement Mass Comparison.

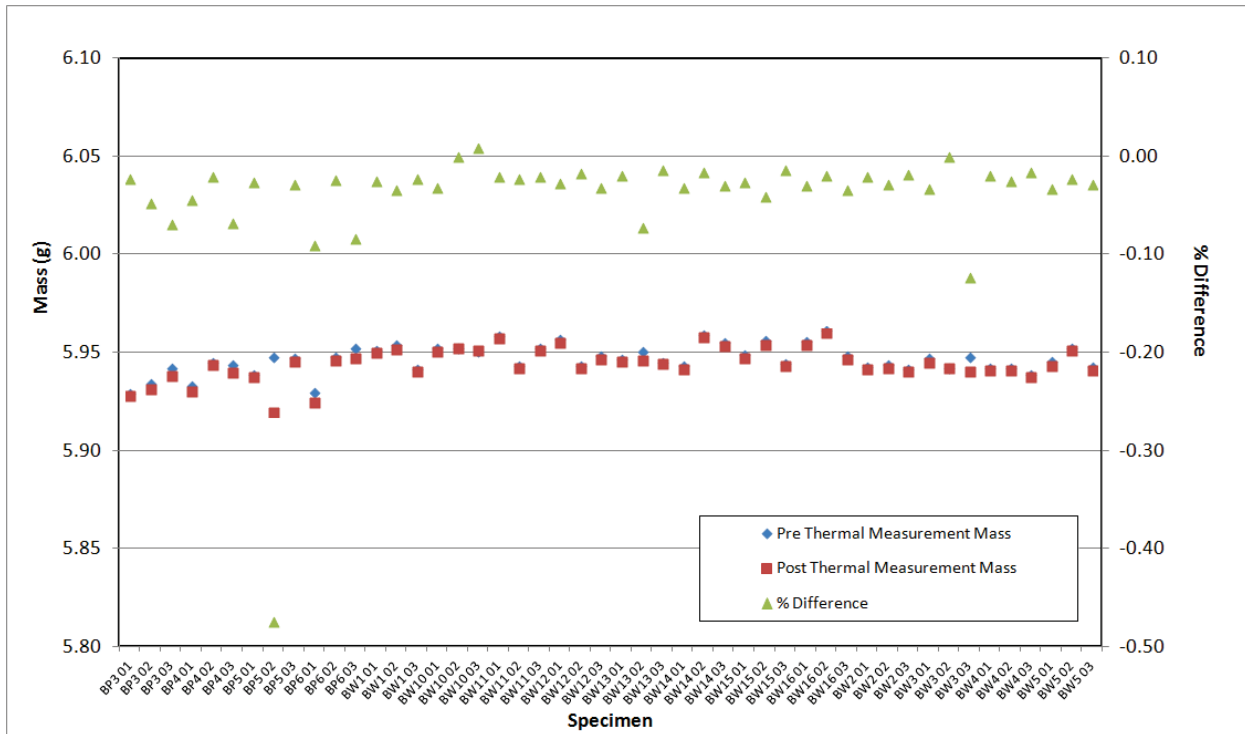


Figure A-185. NBG-18 Creep Pre vs. Post Thermal Measurement Mass Comparison.

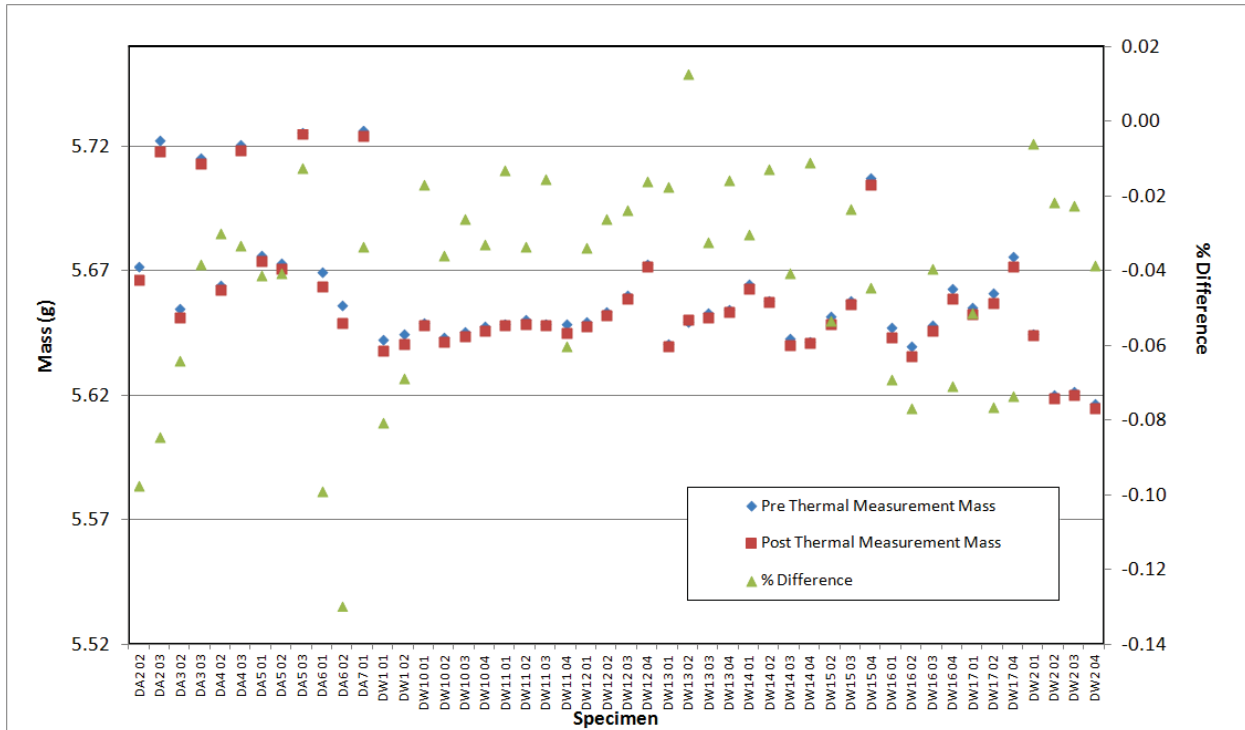


Figure A-186. PCEA Creep Pre vs. Post Thermal Measurement Mass Comparison.

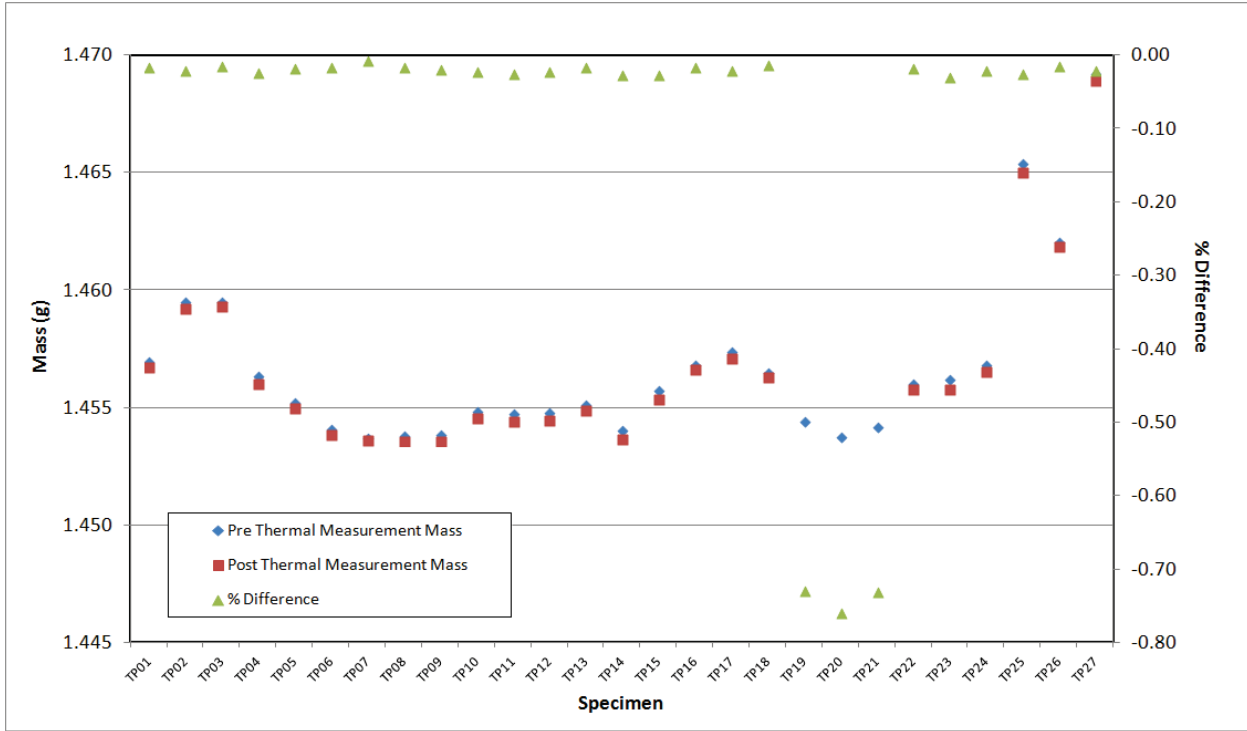


Figure A-187. 2114 Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

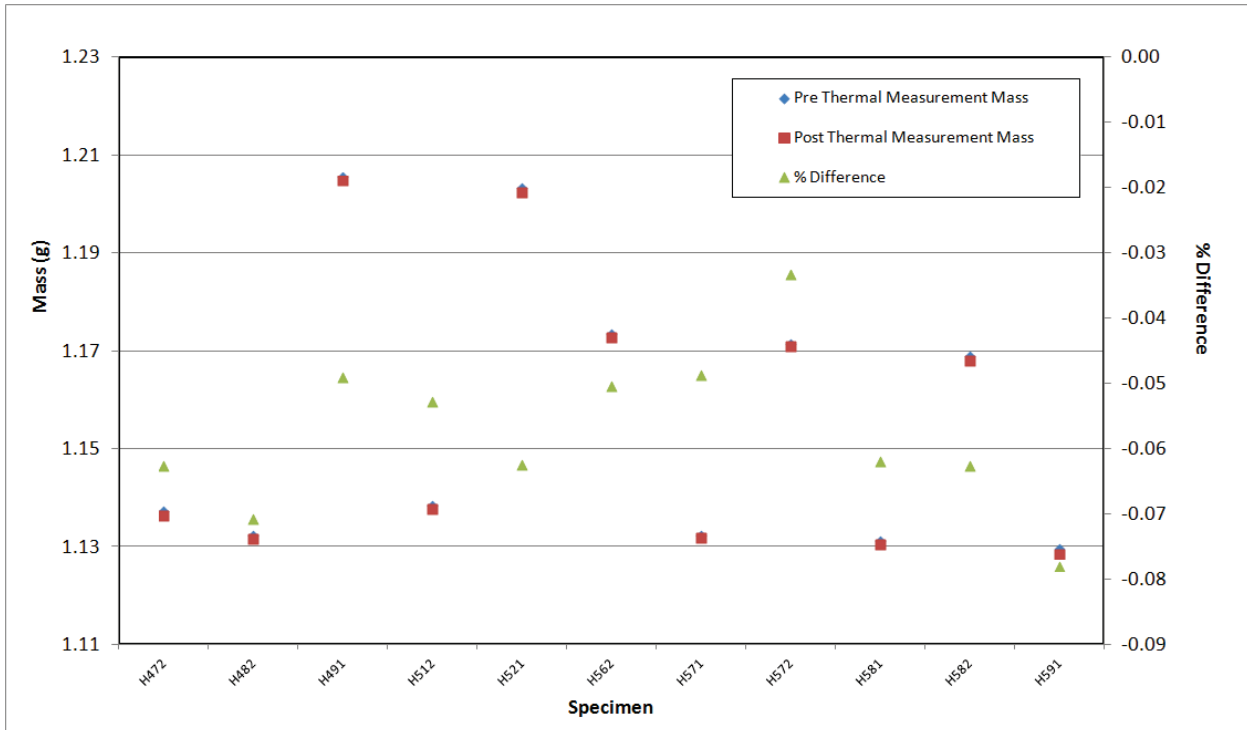


Figure A-188. A3 Matrix Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

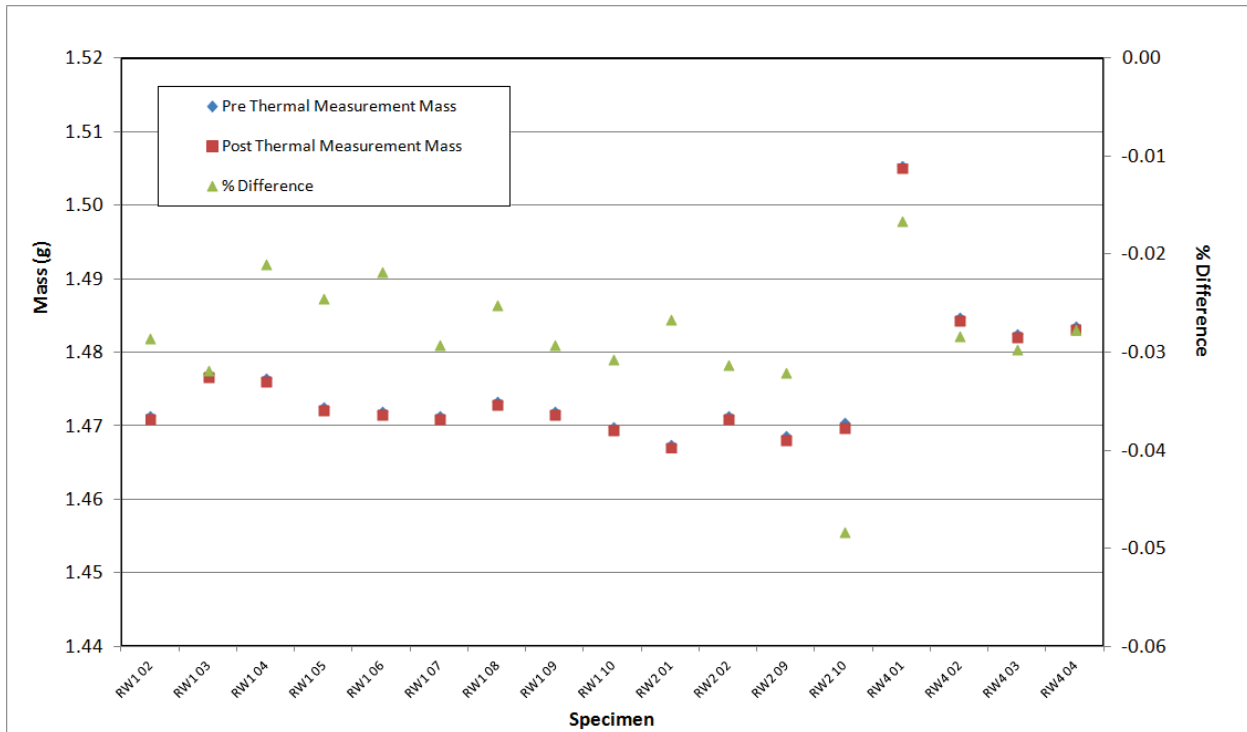


Figure A-189. BAN Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

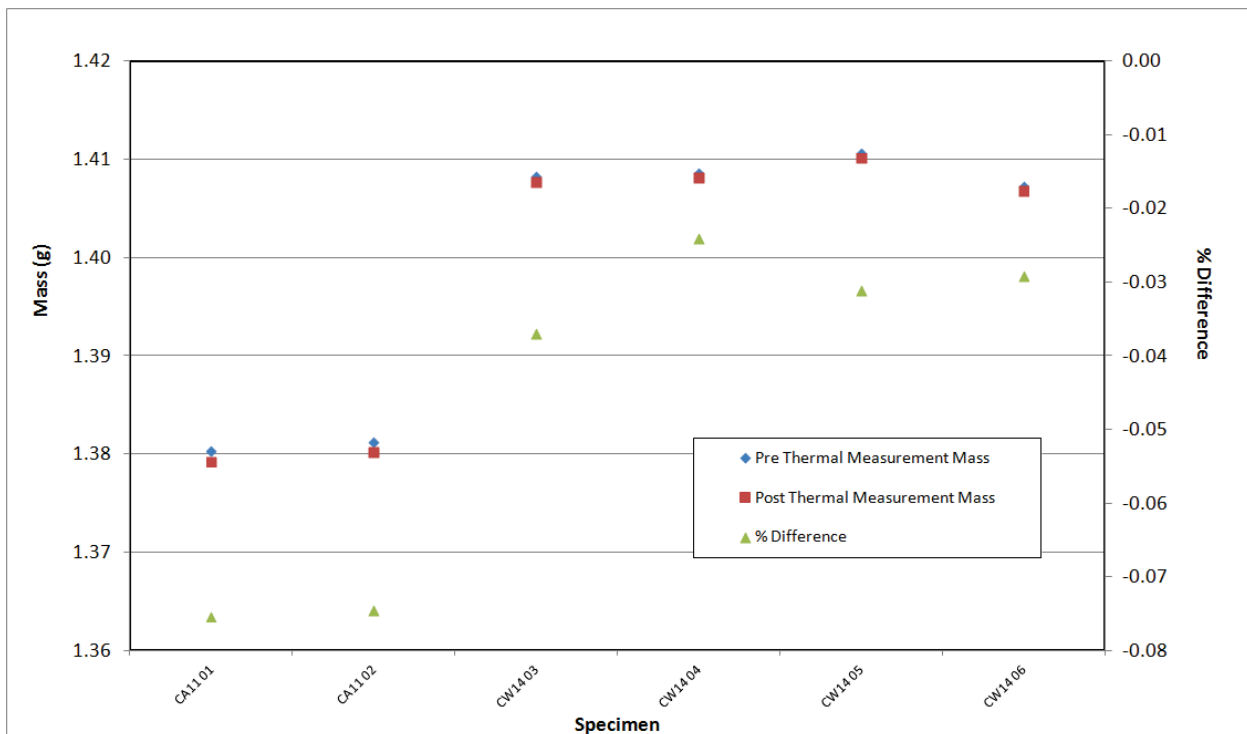


Figure A-190. H-451 Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

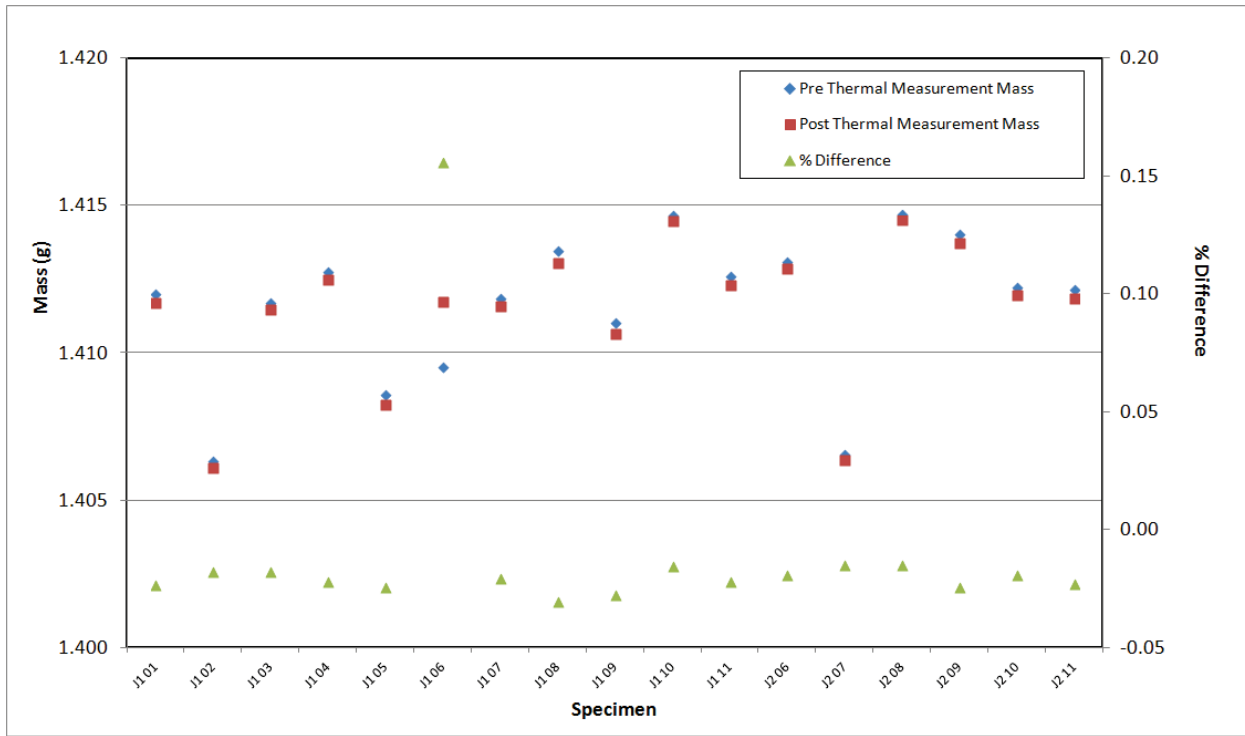


Figure A-191. HLM Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

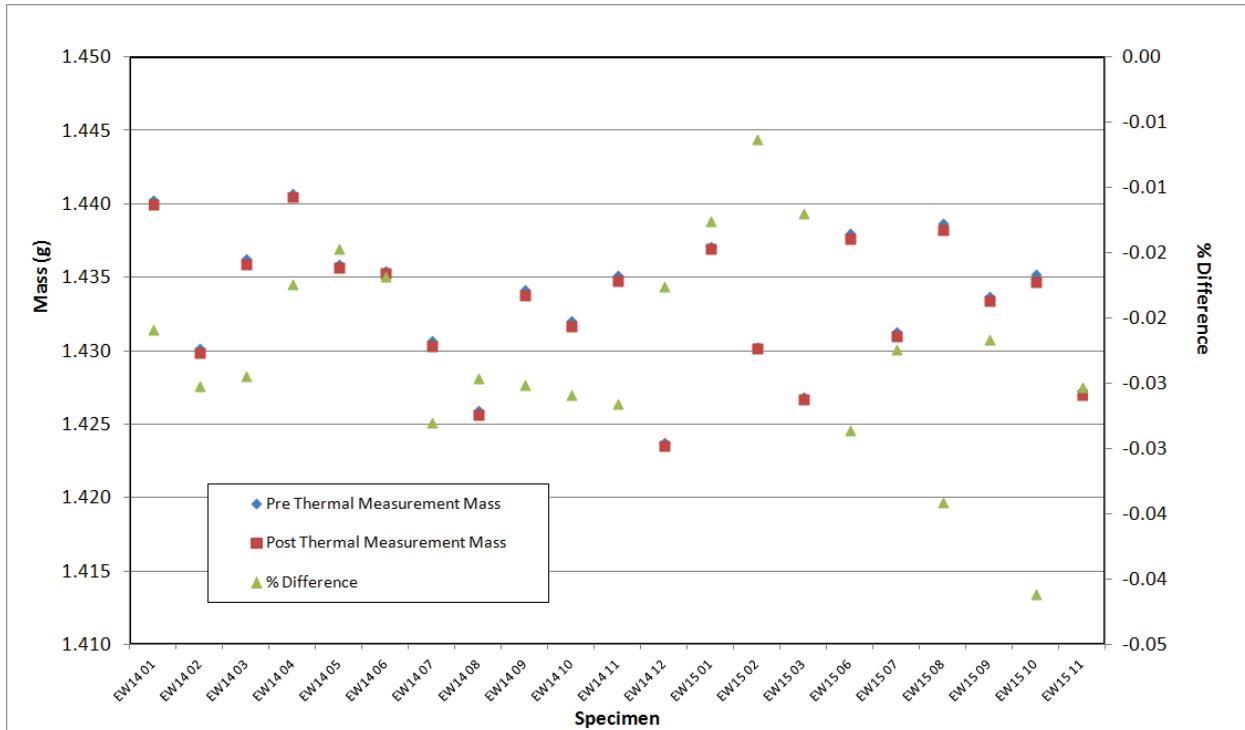


Figure A-192. IG-110 Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

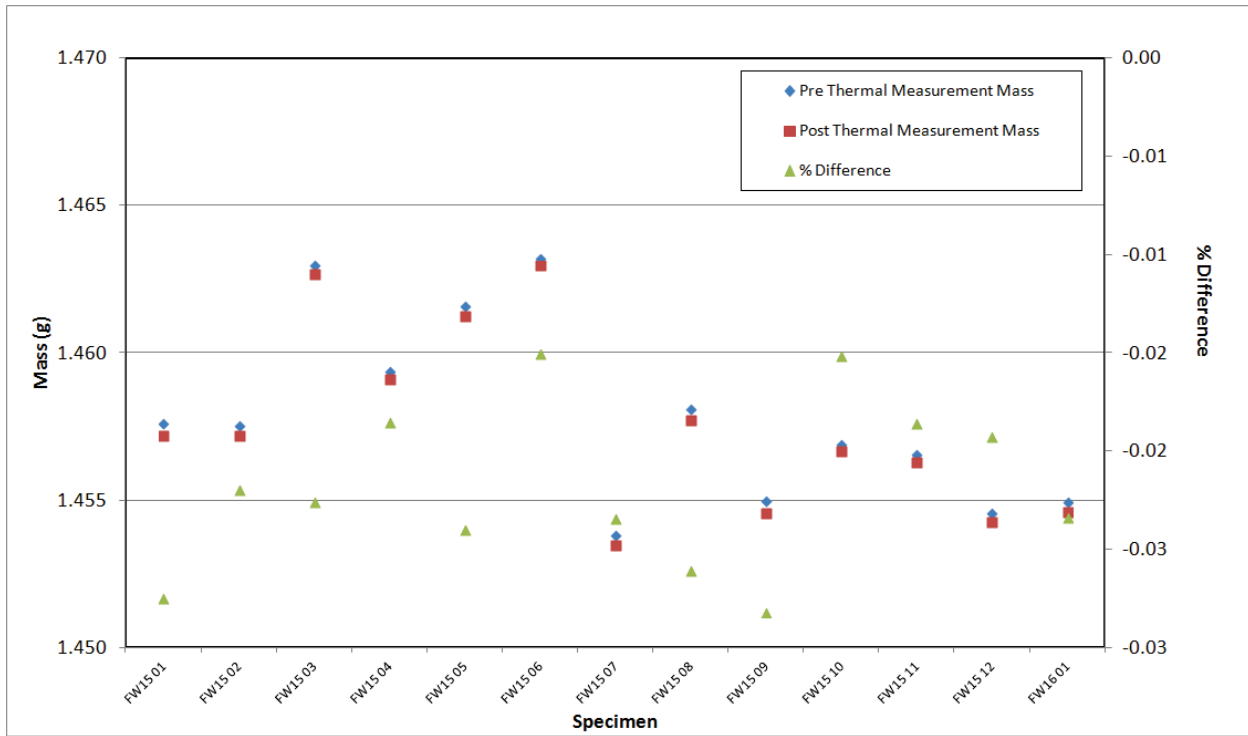


Figure A-193. IG-430 Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

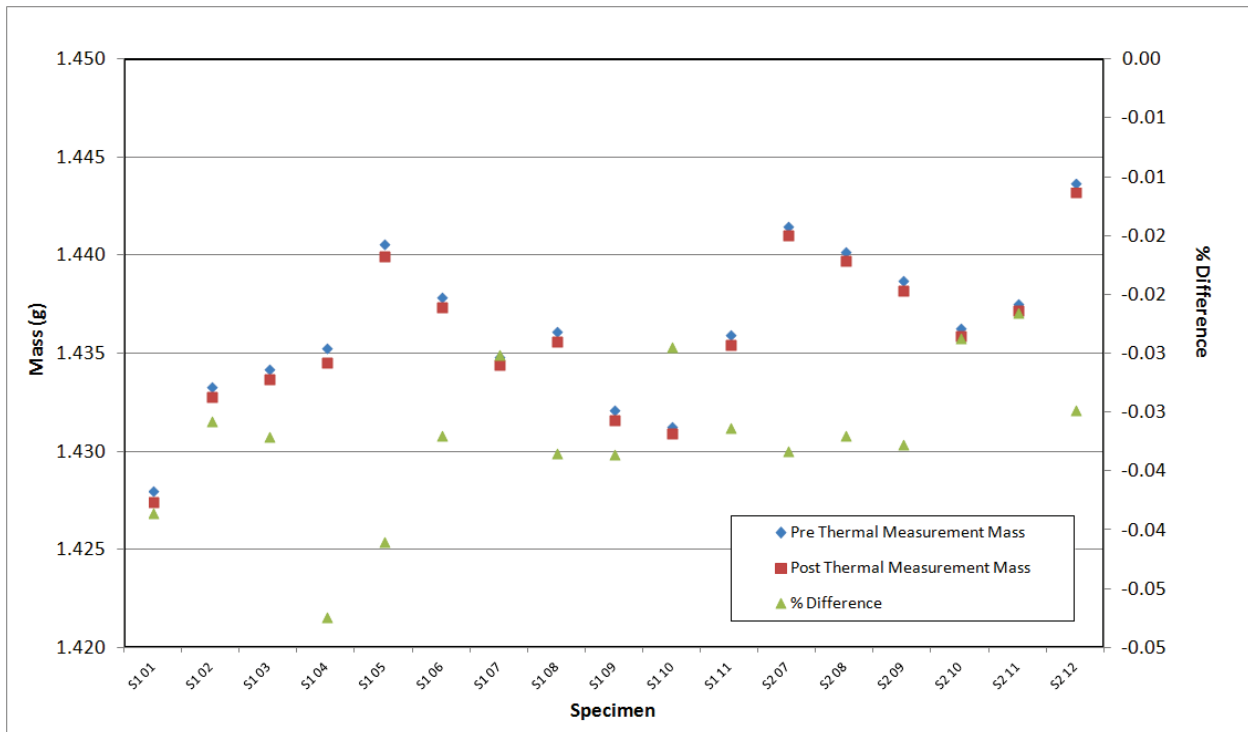


Figure A-194. NBG-10 Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

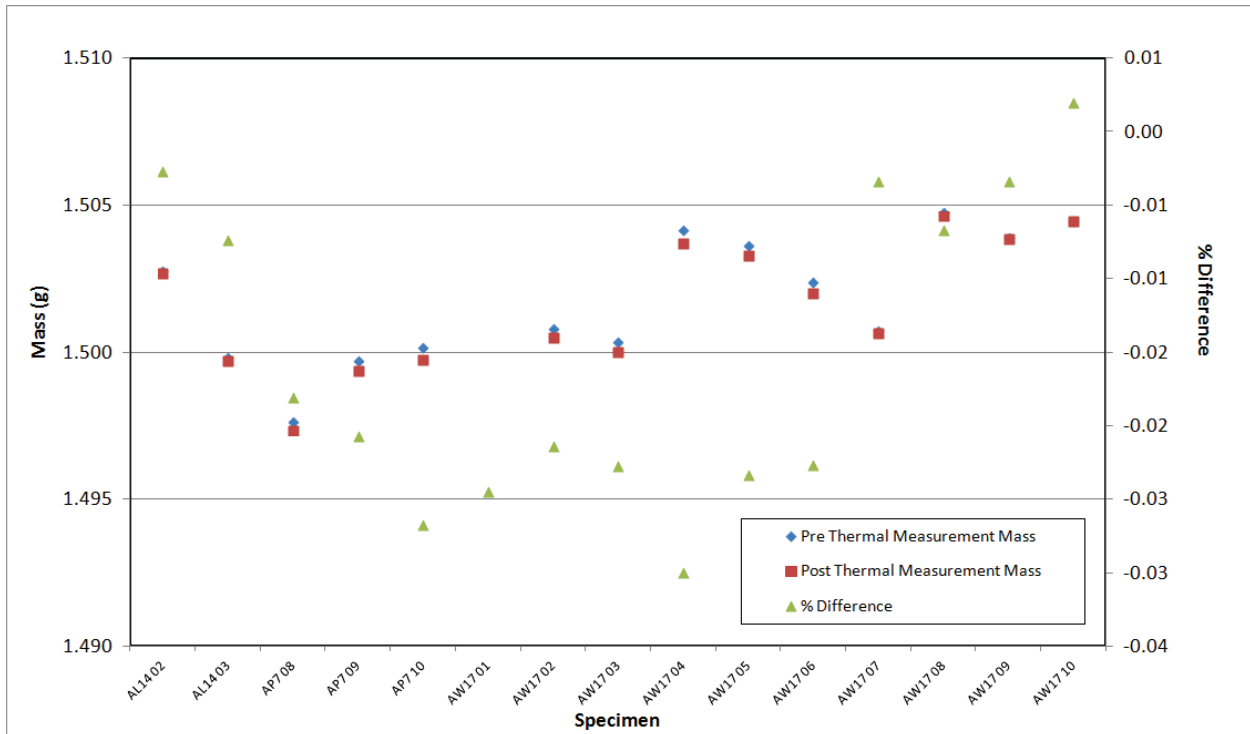


Figure A-195. NBG-17 Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

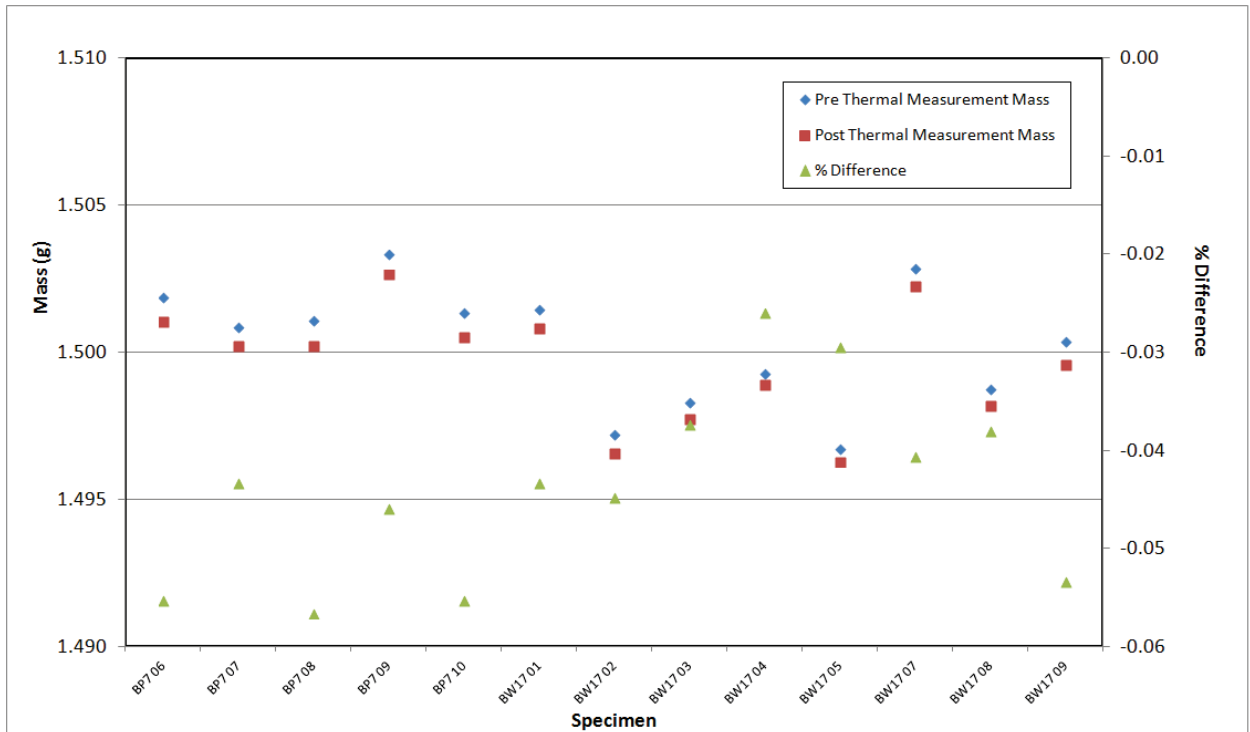


Figure A-196. NBG-18 Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

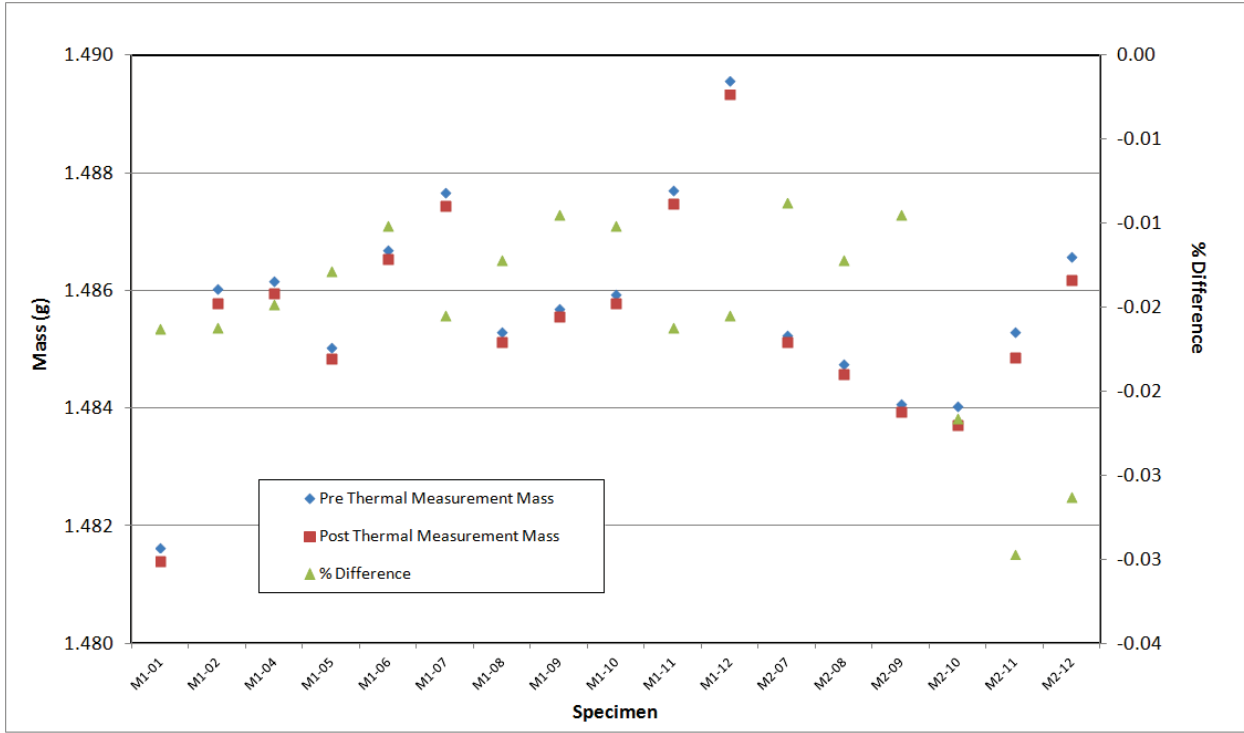


Figure A-197. NBG-25 Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

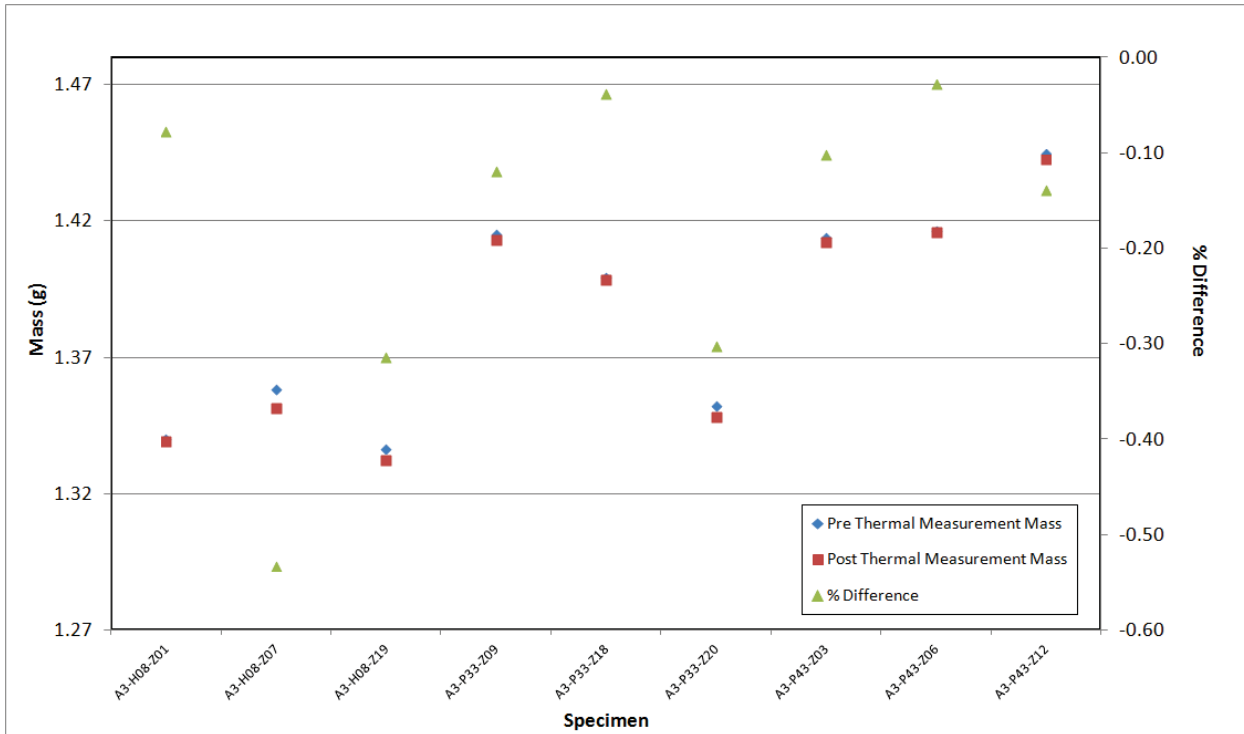


Figure A-198. New Matrix Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

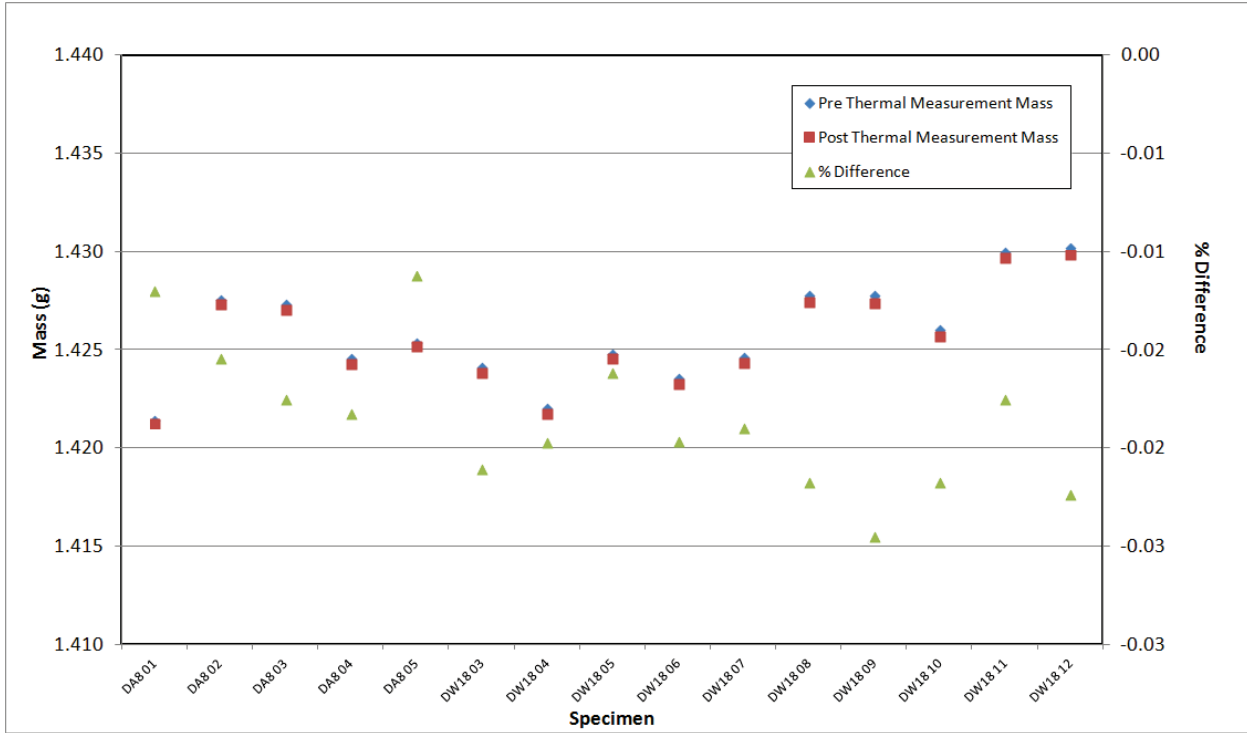


Figure A-199. PCEA Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

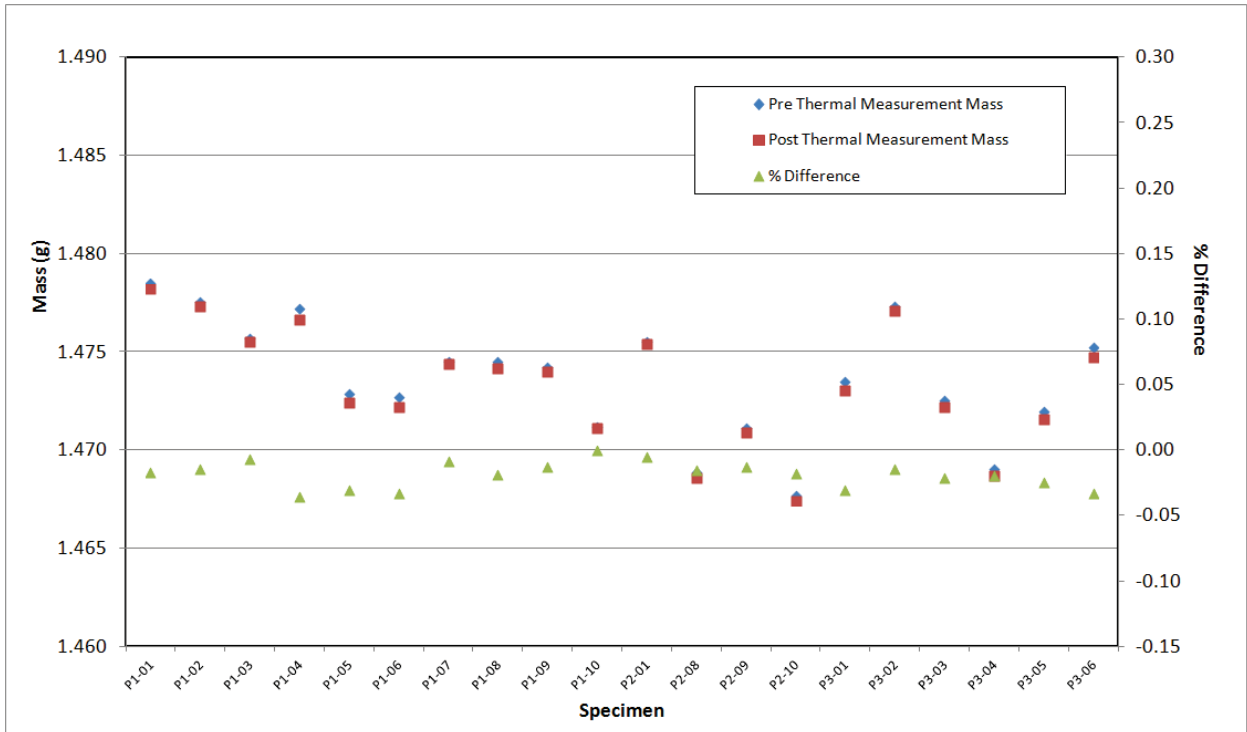


Figure A-200. PCIB Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

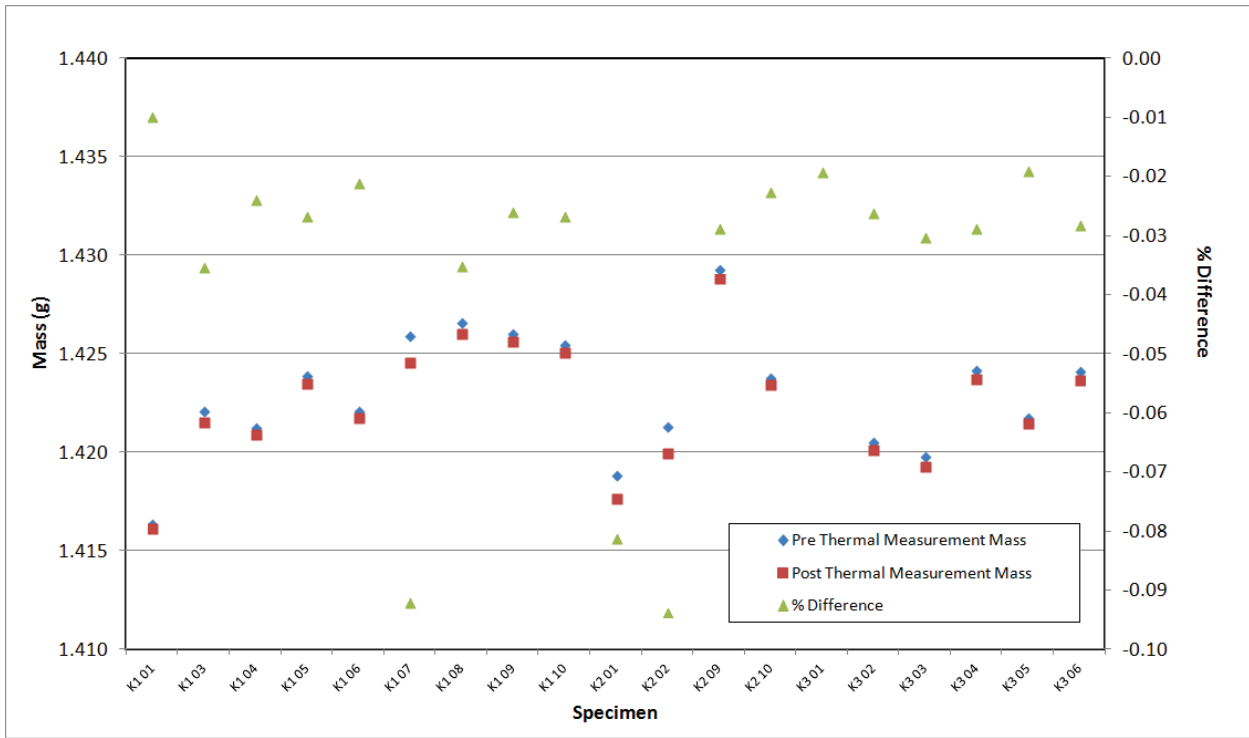


Figure A-201. PGX Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

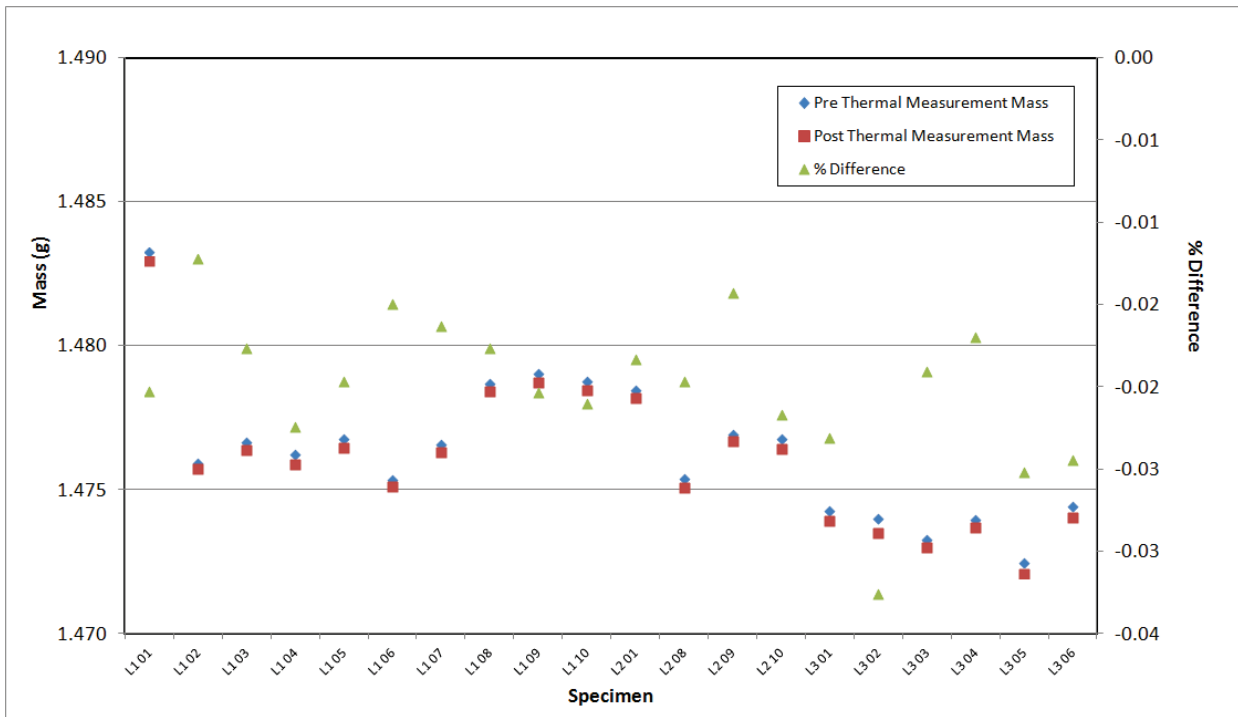


Figure A-202. PPEA Piggyback Pre vs. Post Thermal Measurement Mass Comparison.

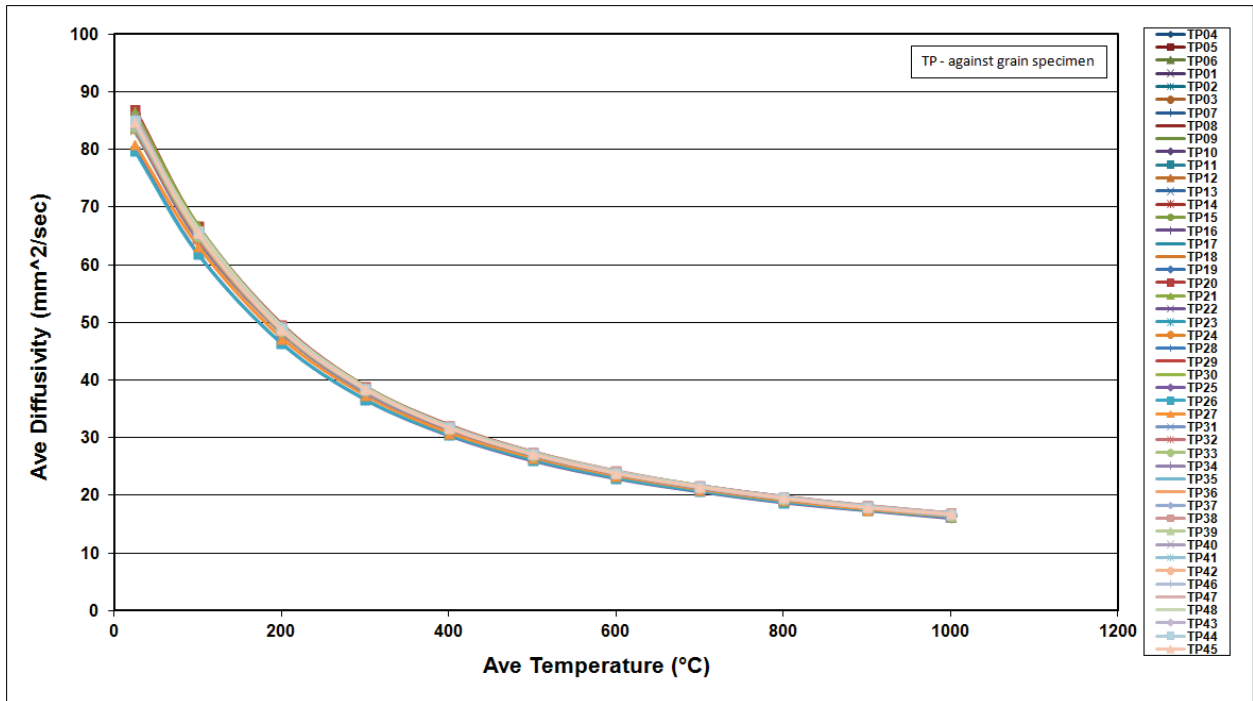


Figure A-203. 2114 Piggyback Diffusivity.

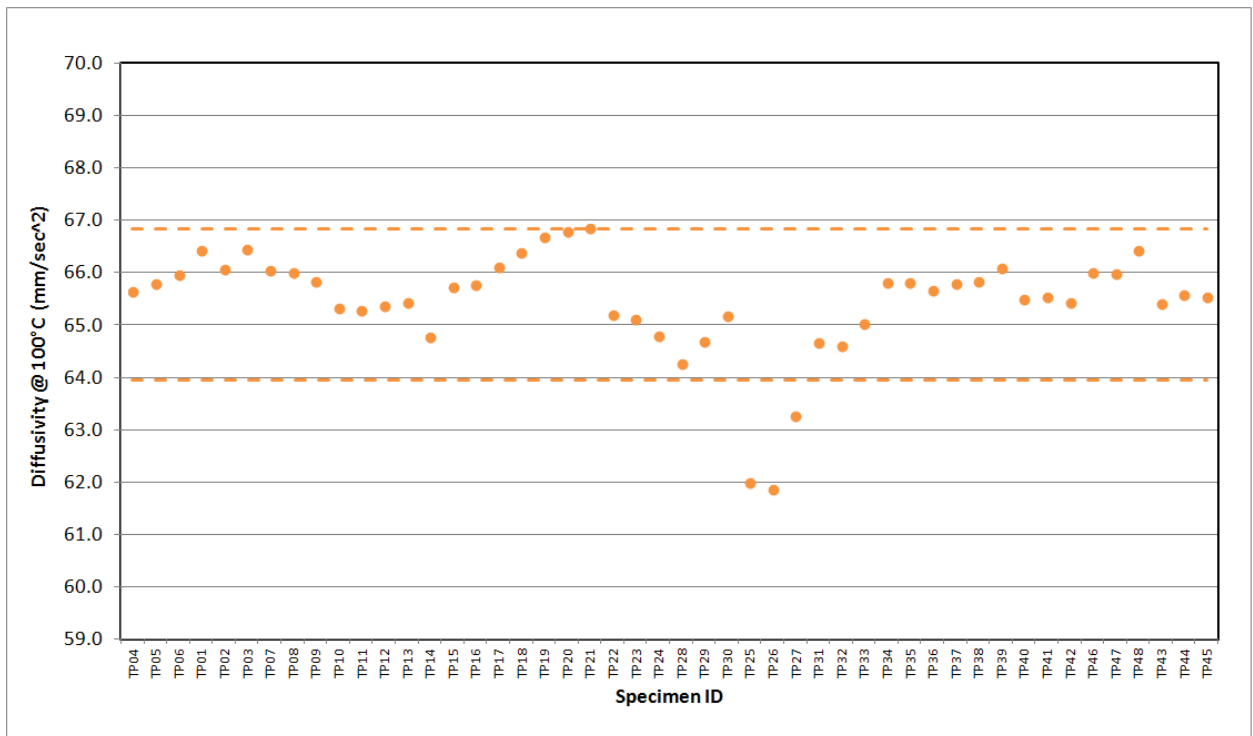


Figure A-204. 2114 Piggyback Diffusivity @ 100°C.

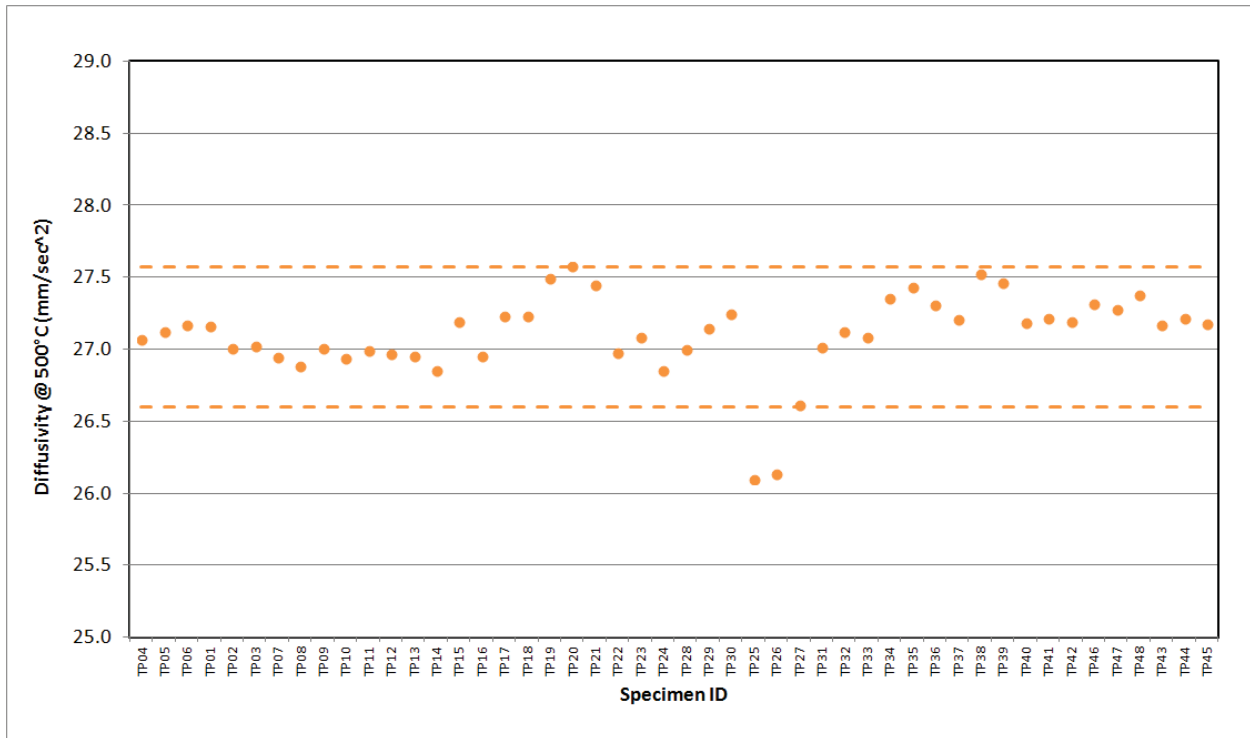


Figure A-205. 2114 Piggyback Diffusivity @ 500°C.

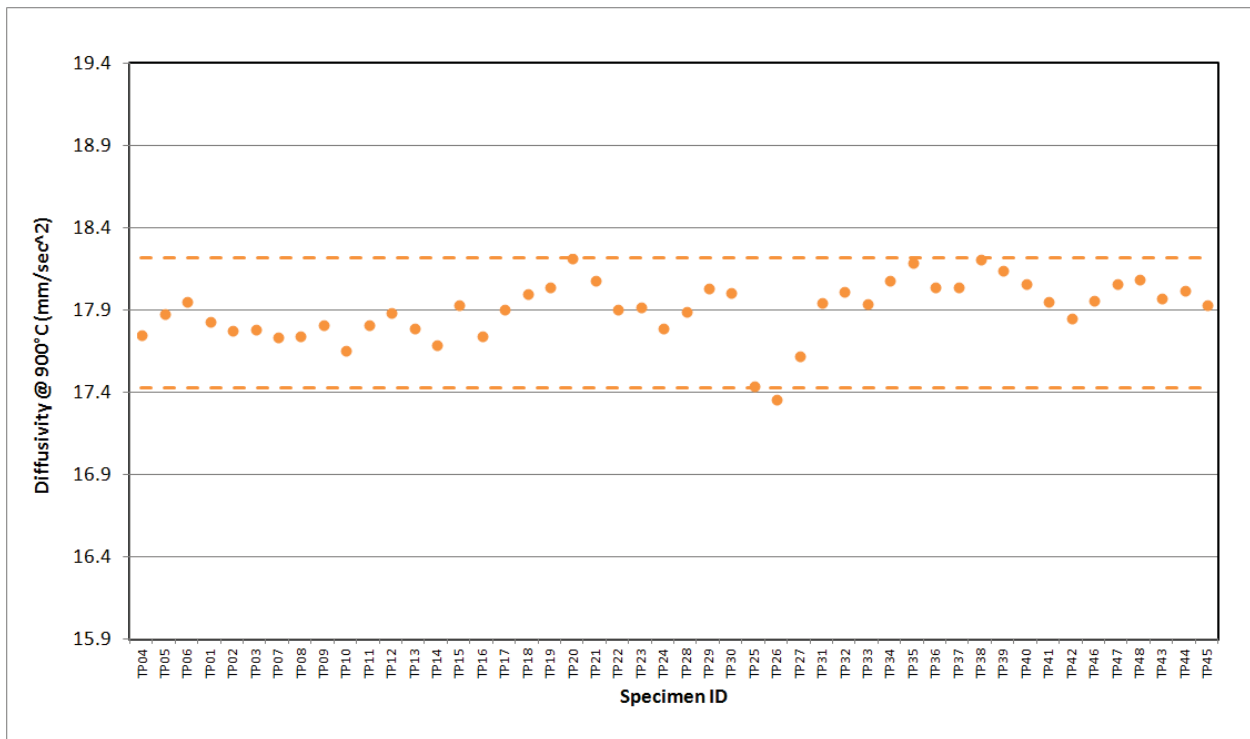


Figure A-206. 2114 Piggyback Diffusivity @ 900°C.

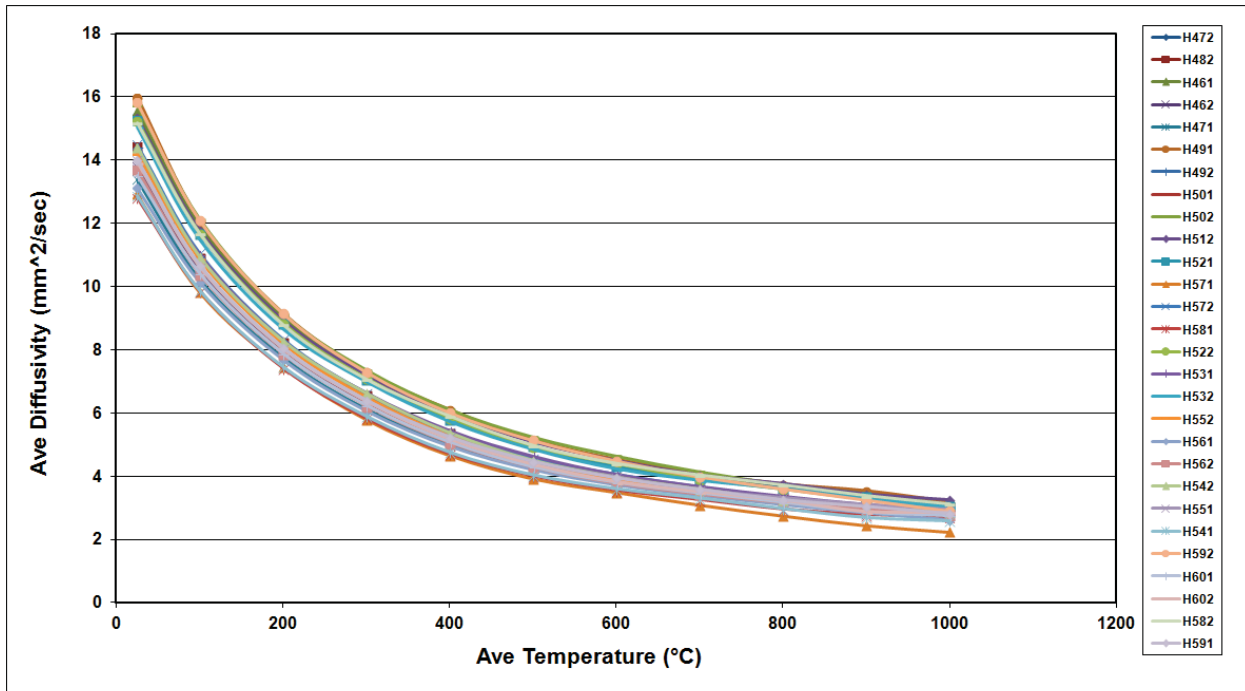


Figure A-207. A3 Matrix Piggyback Diffusivity.

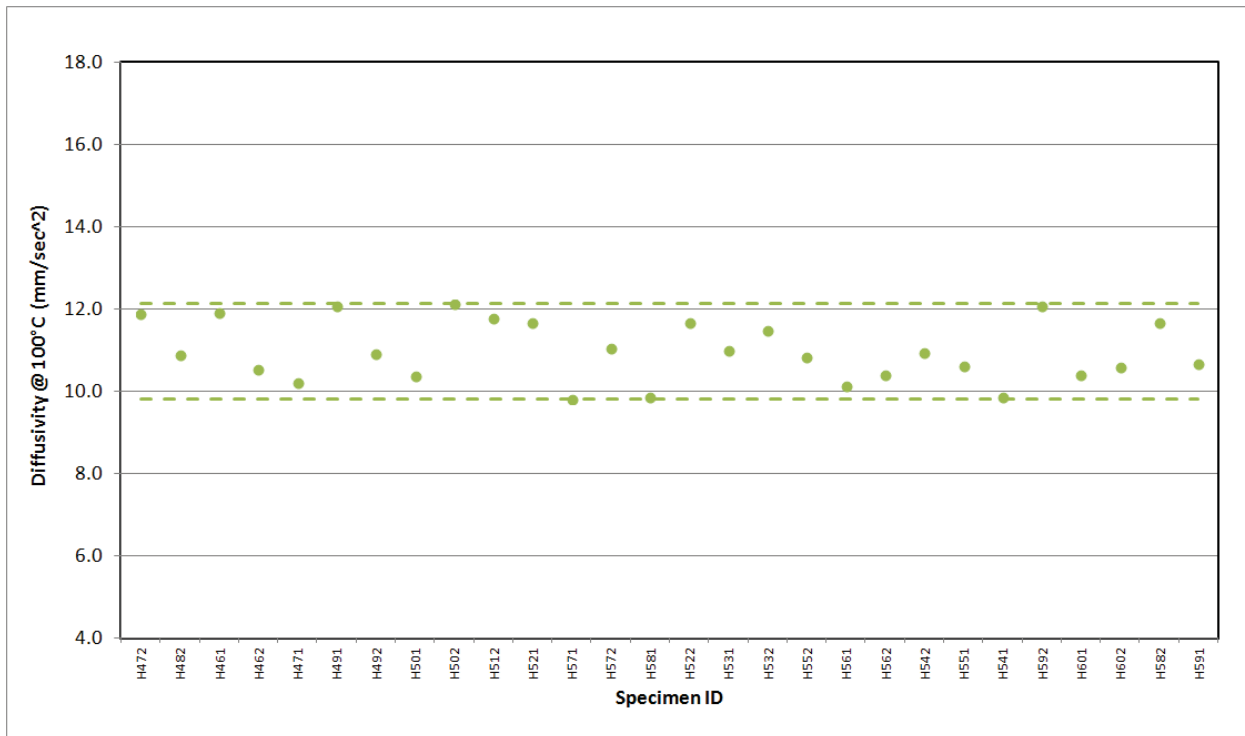


Figure A-208. A3 Matrix Piggyback Diffusivity @ 100°C.

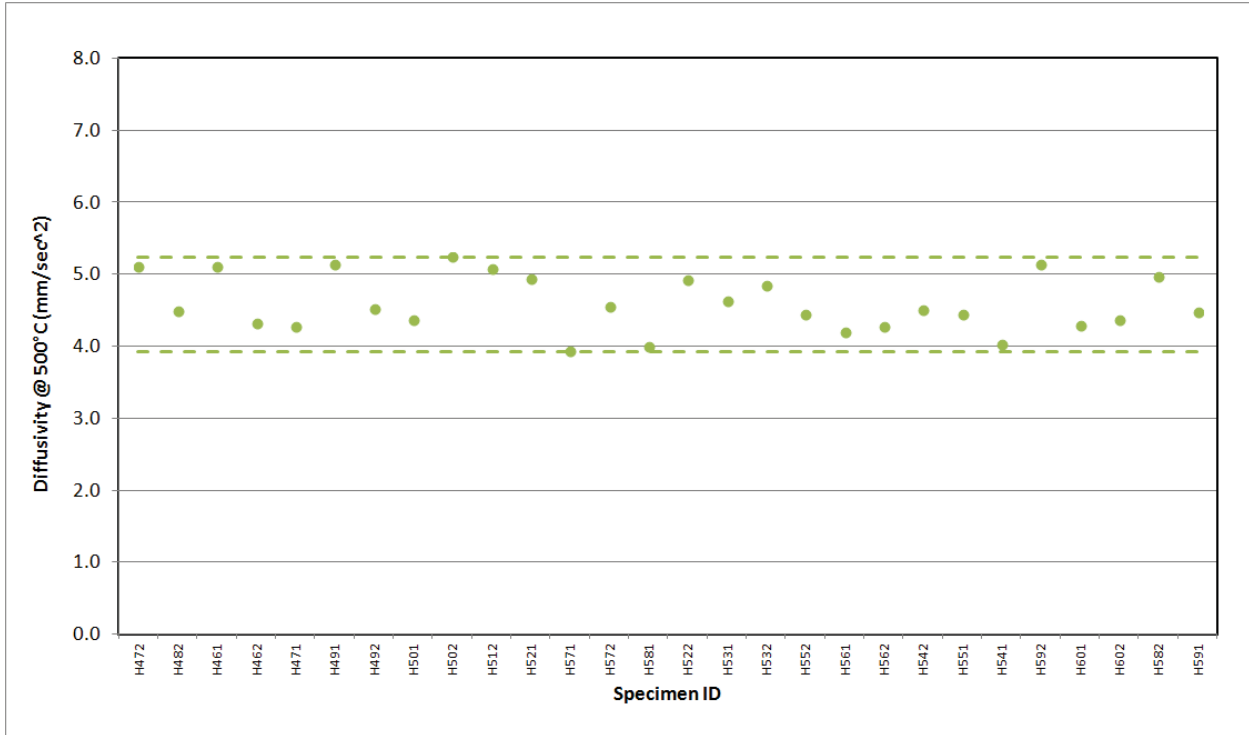


Figure A-209. A3 Matrix Piggyback Diffusivity @ 500°C.

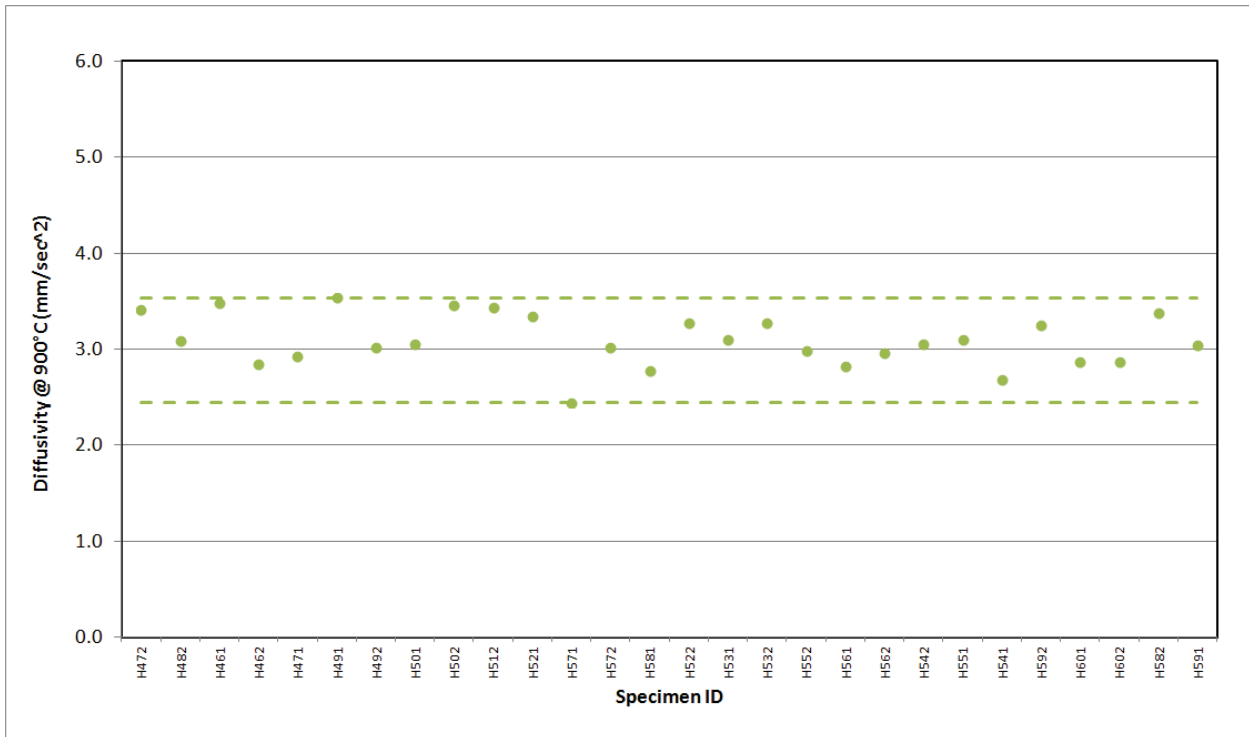


Figure A-210. A3 Matrix Piggyback Diffusivity @ 900°C.

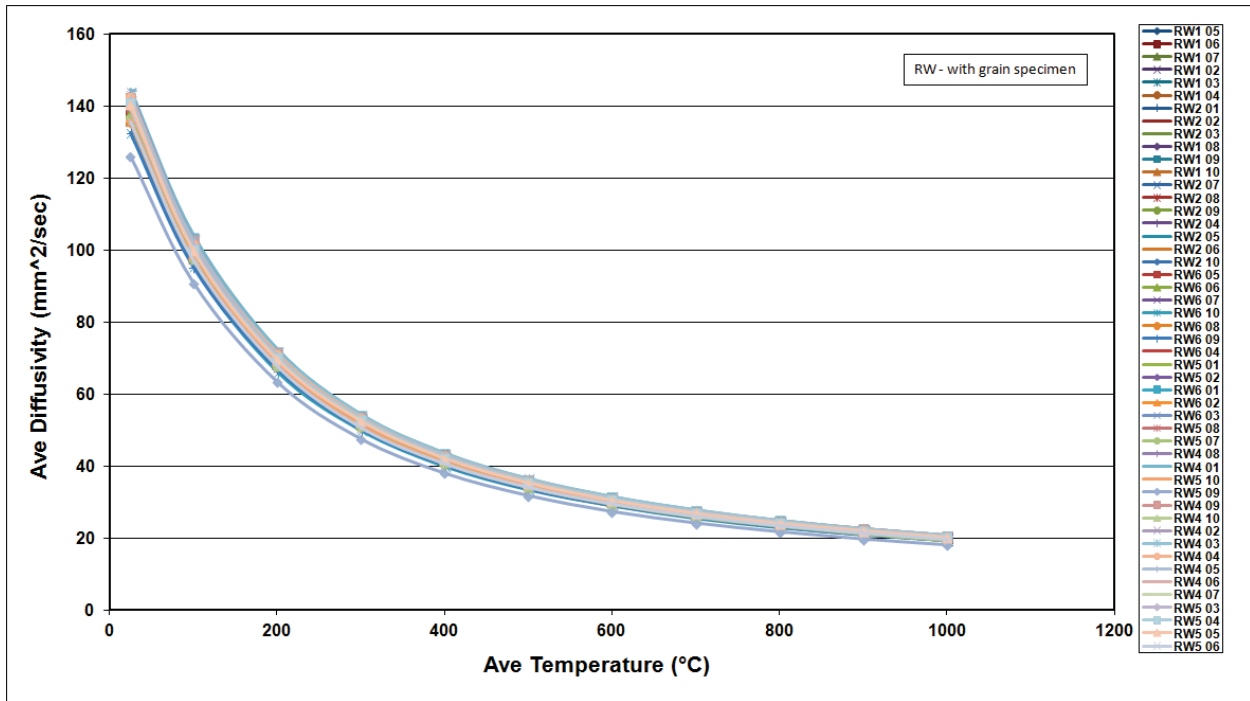


Figure A-211. BAN Piggyback Diffusivity.

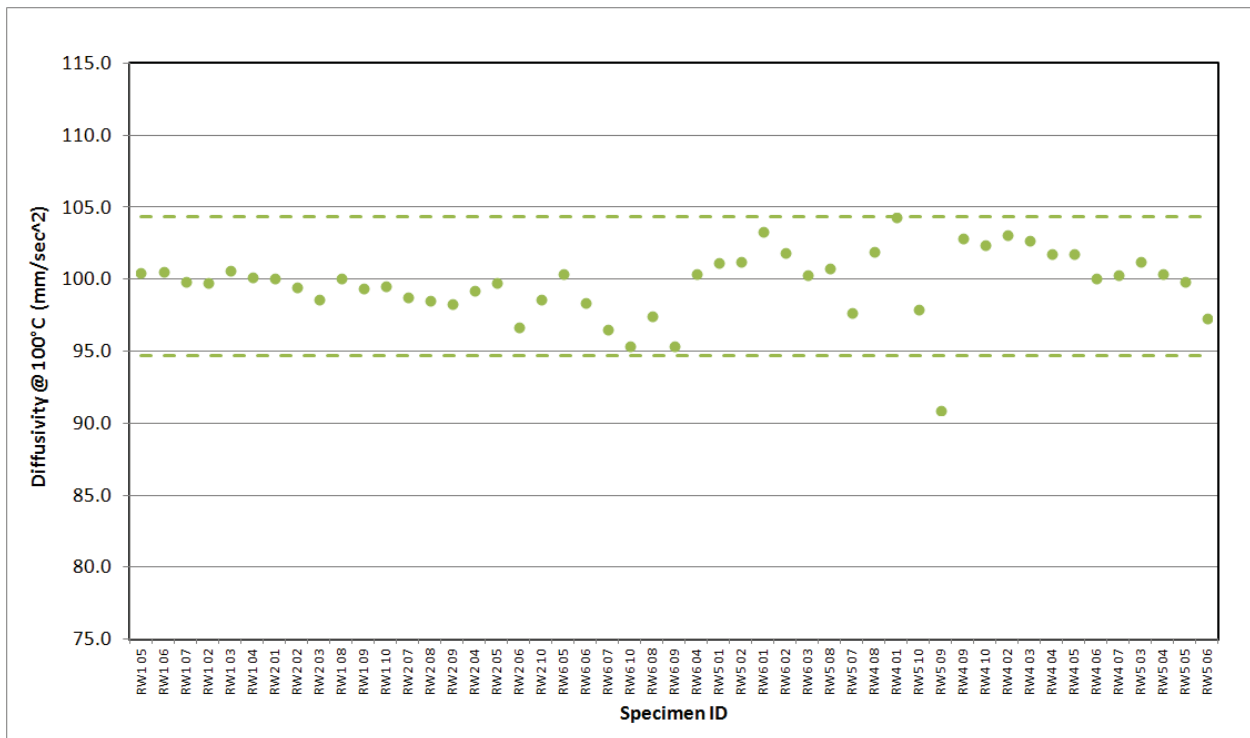
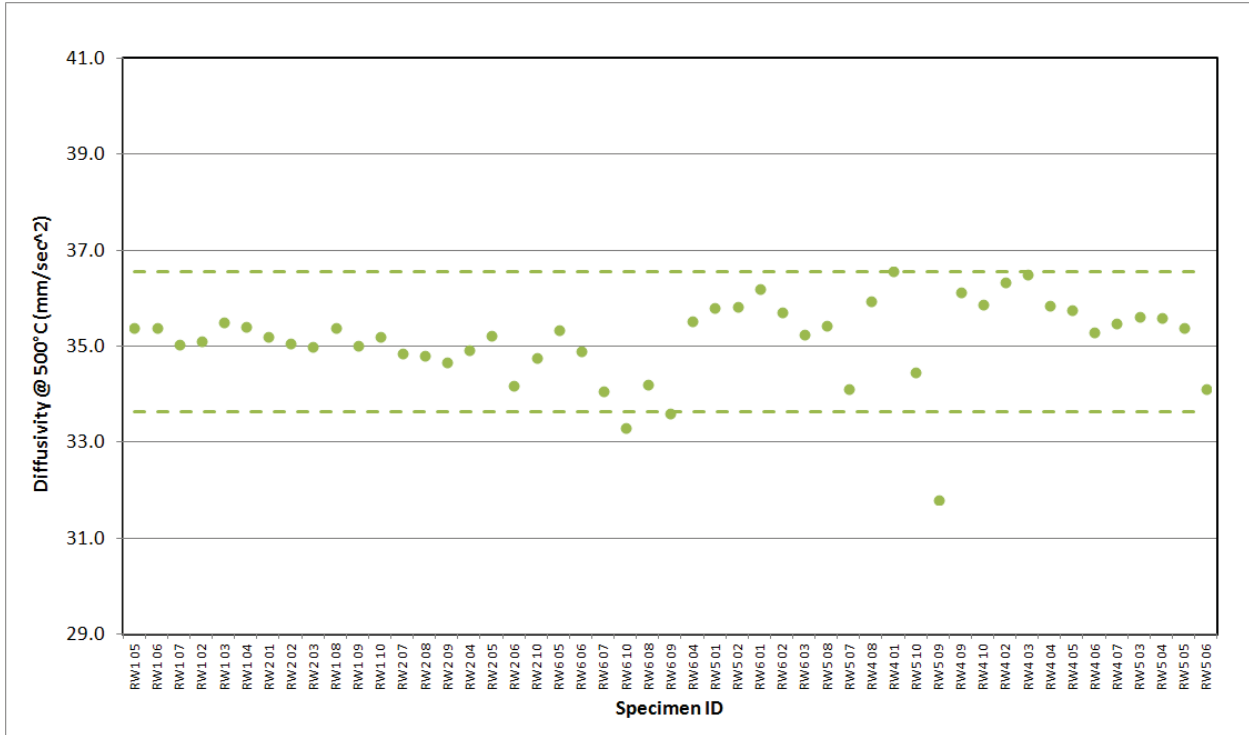


Figure A-212. BAN Piggyback Diffusivity @ 100°C.



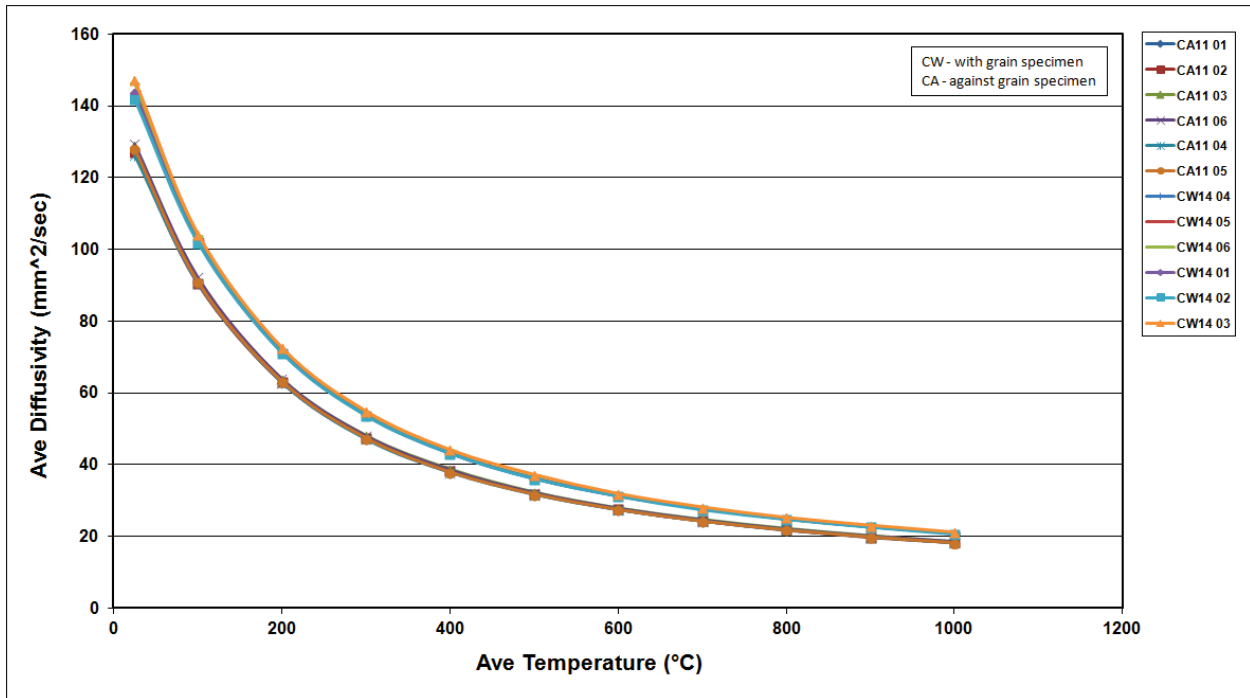


Figure A-215. H-451 Piggyback Diffusivity.

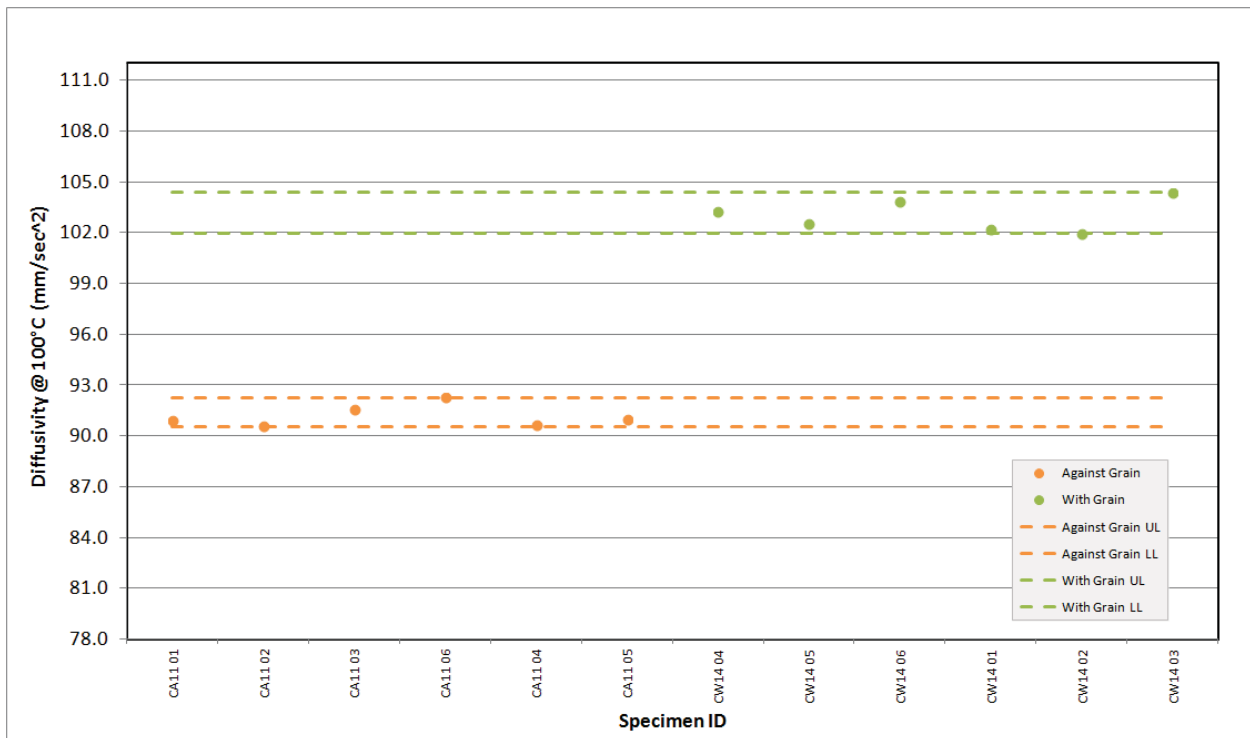


Figure A-216. H-451 Piggyback Diffusivity @ 100°C.

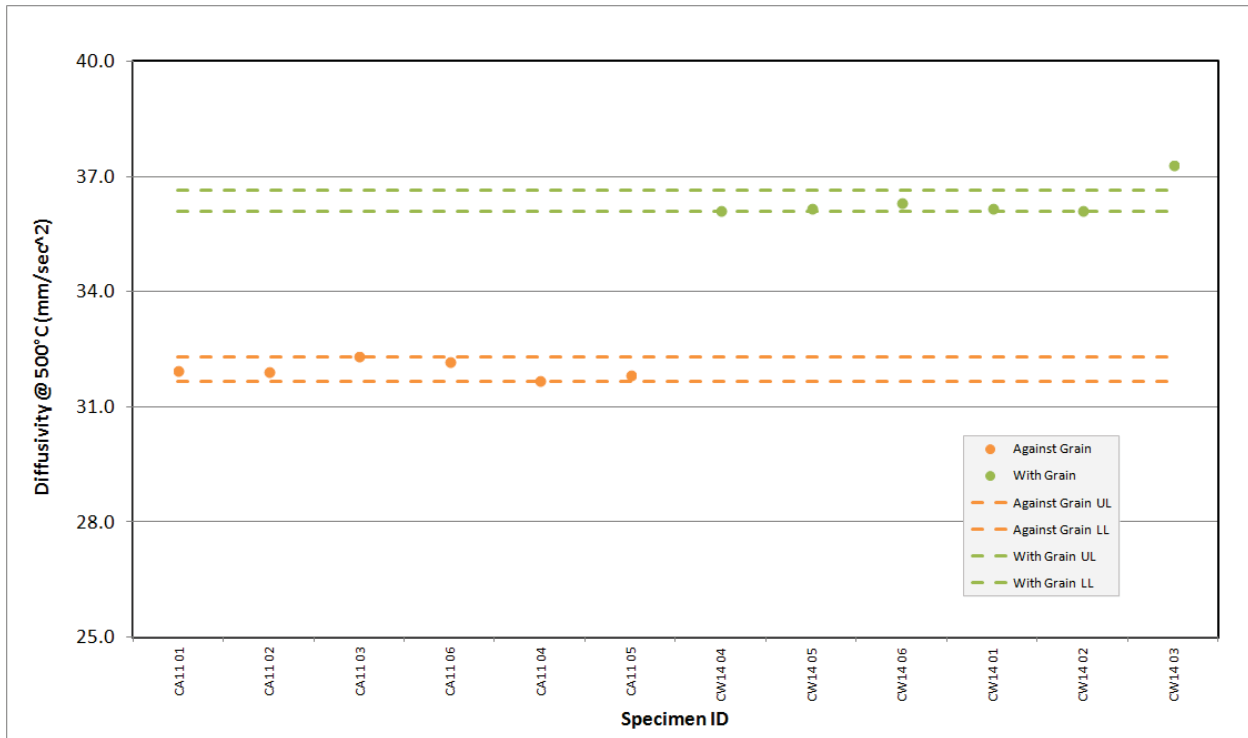


Figure A-217. H-451 Piggyback Diffusivity @ 500°C.

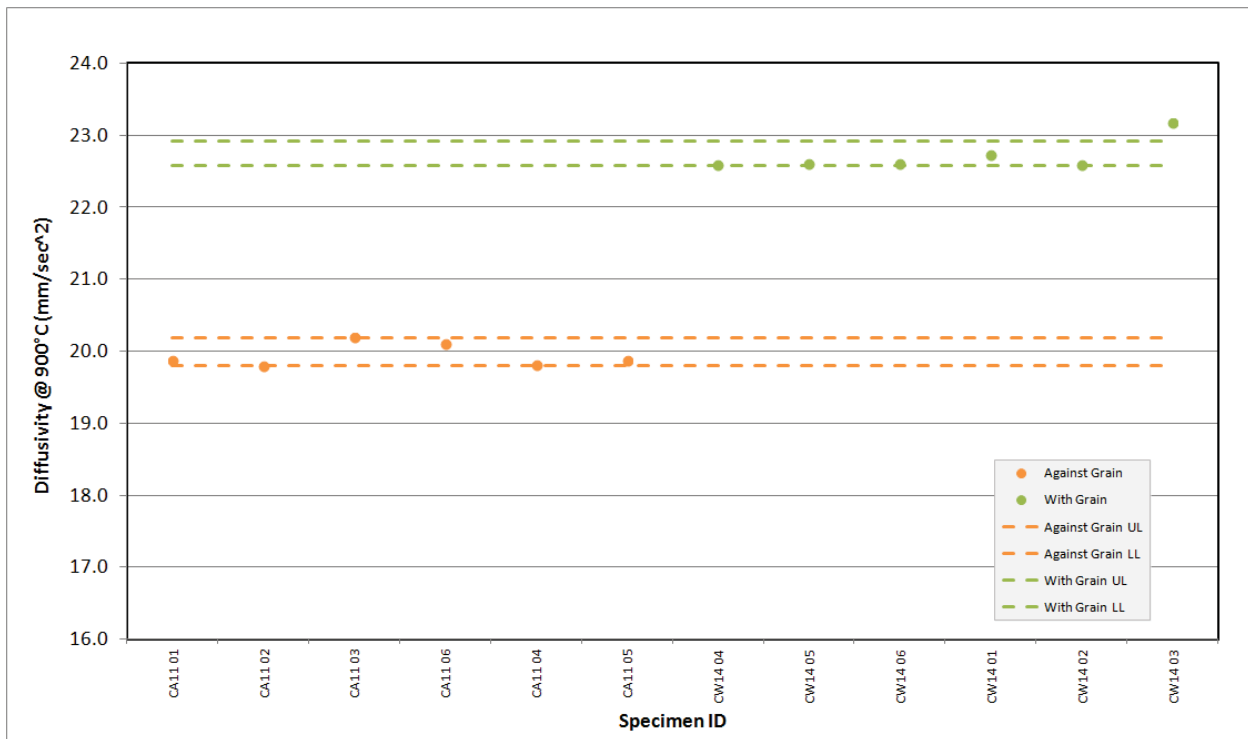


Figure A-218. H-451 Piggyback Diffusivity @ 900°C.

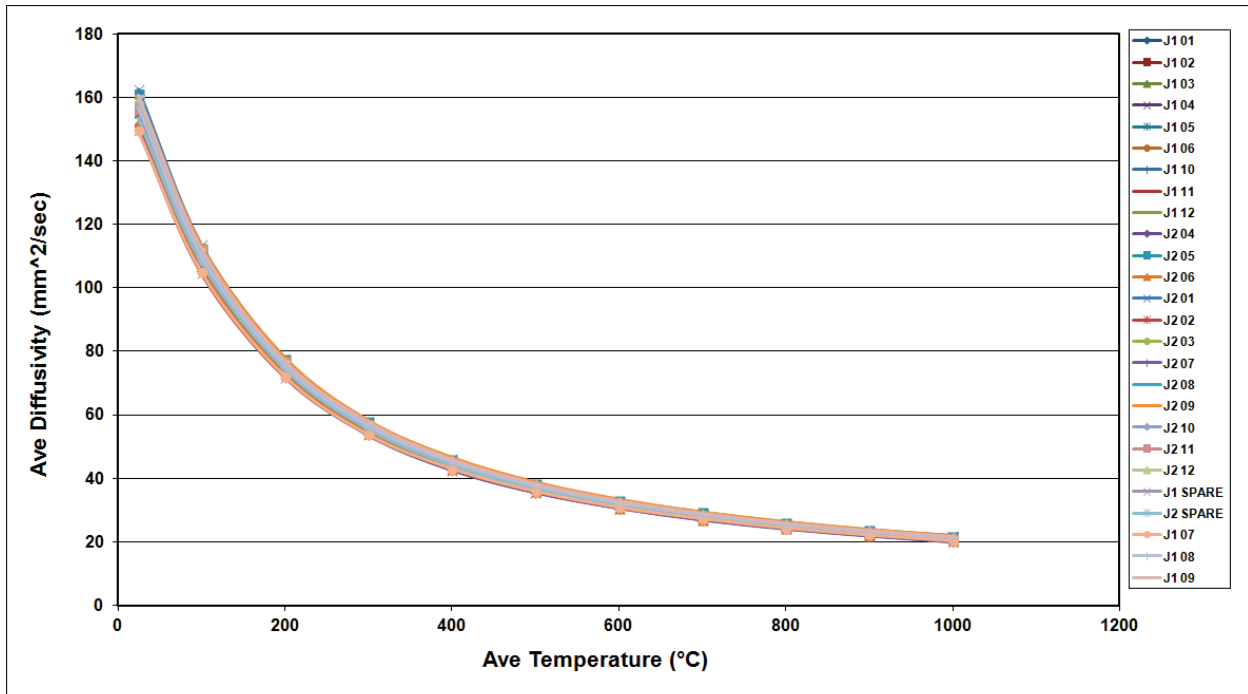


Figure A-219. HLM Piggyback Diffusivity.

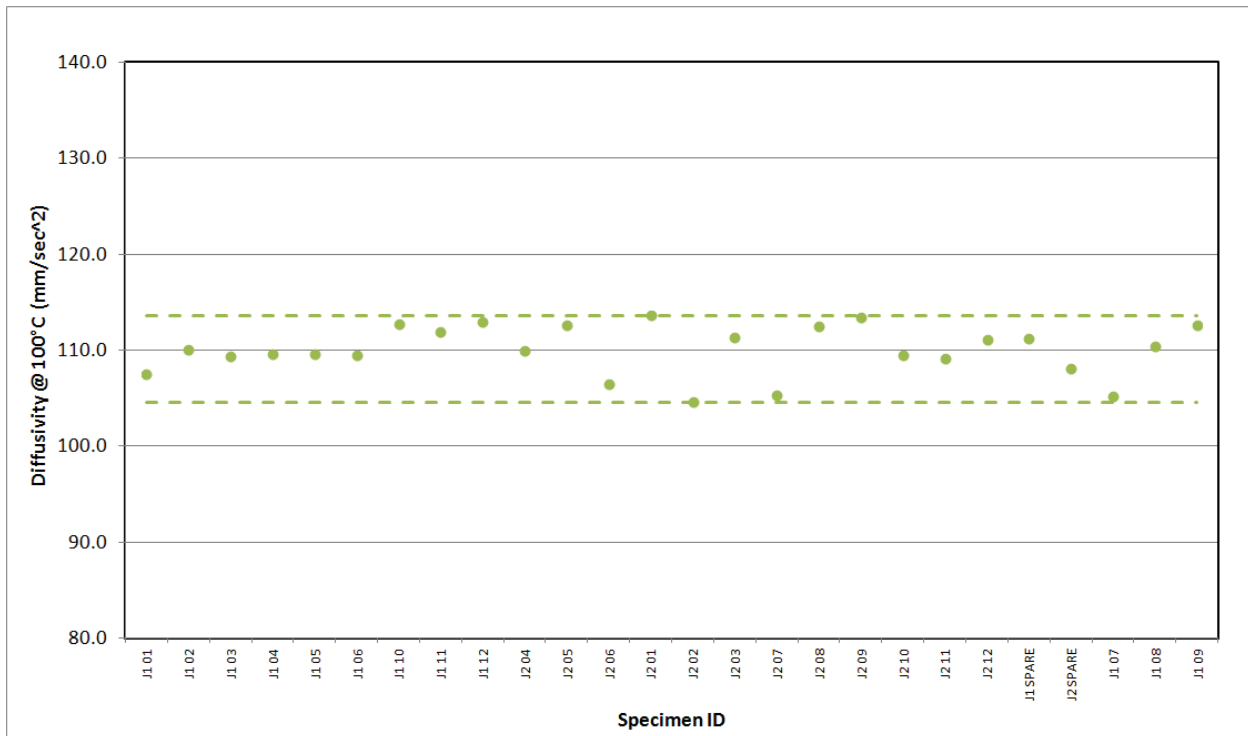


Figure A-220. HLM Piggyback Diffusivity @ 100°C.

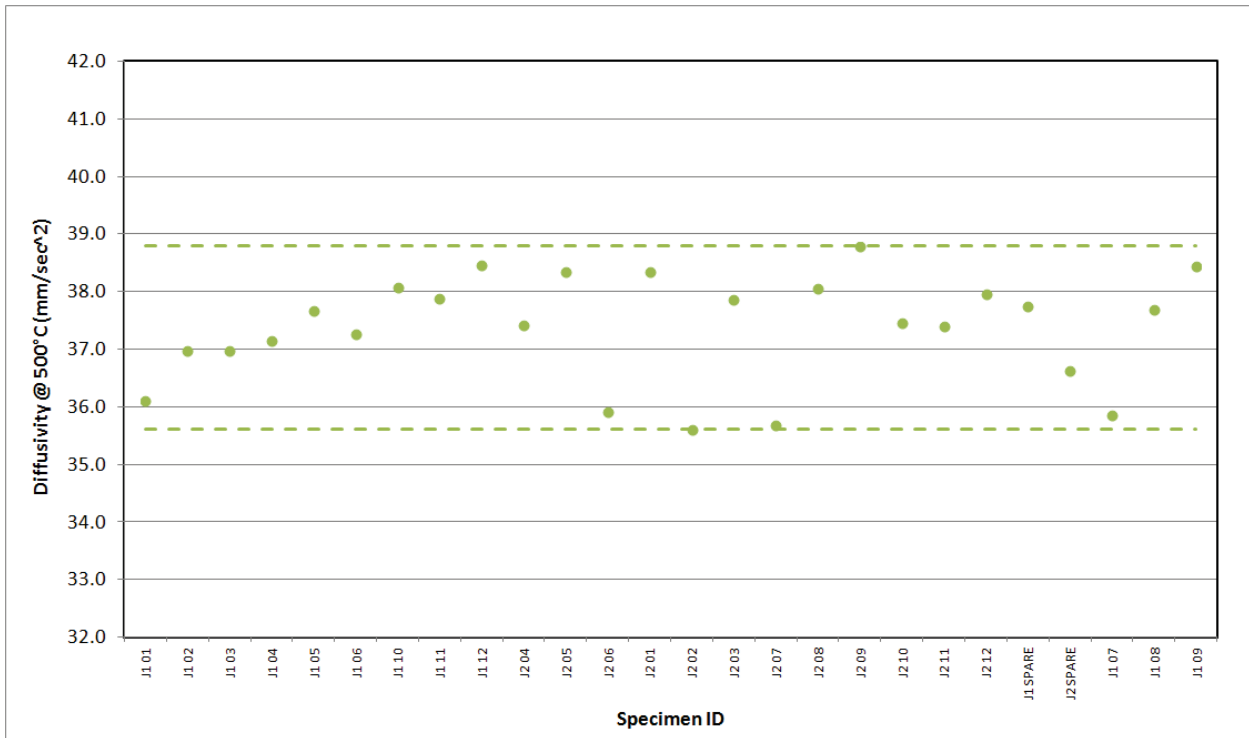


Figure A-221. HLM Piggyback Diffusivity @ 500°C.

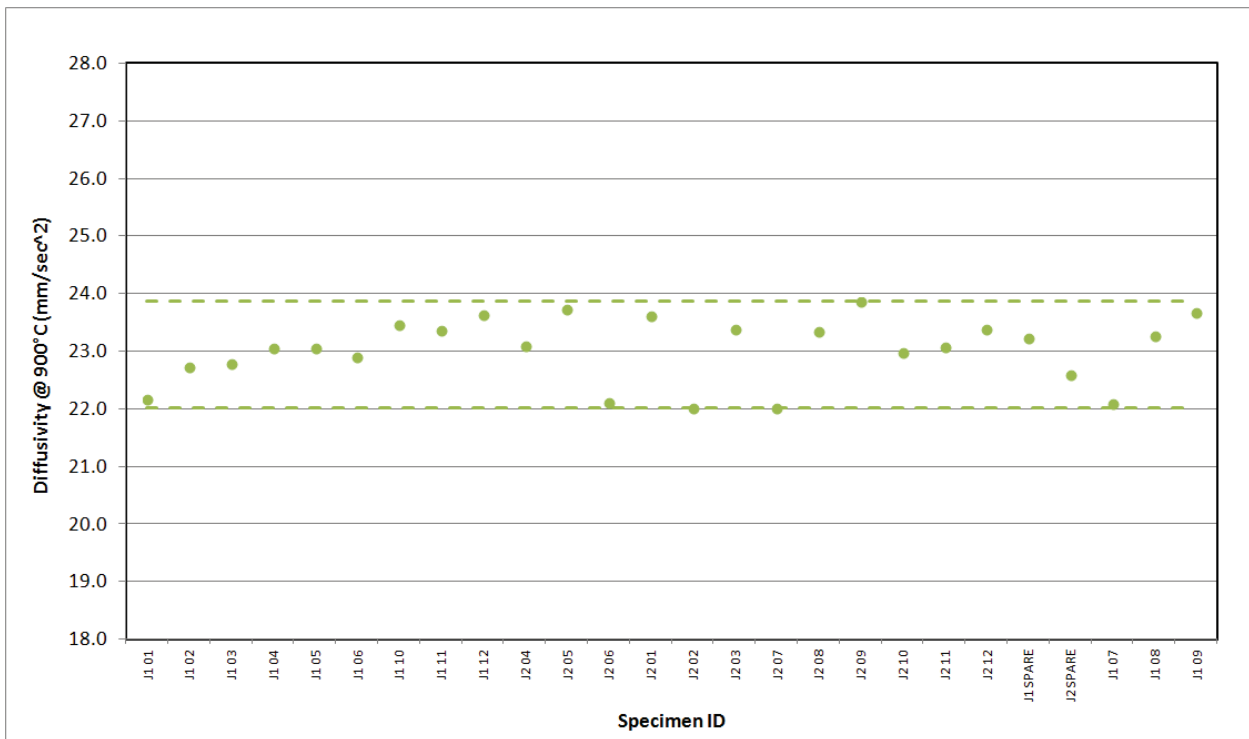


Figure A-222. HLM Piggyback Diffusivity @ 900°C.

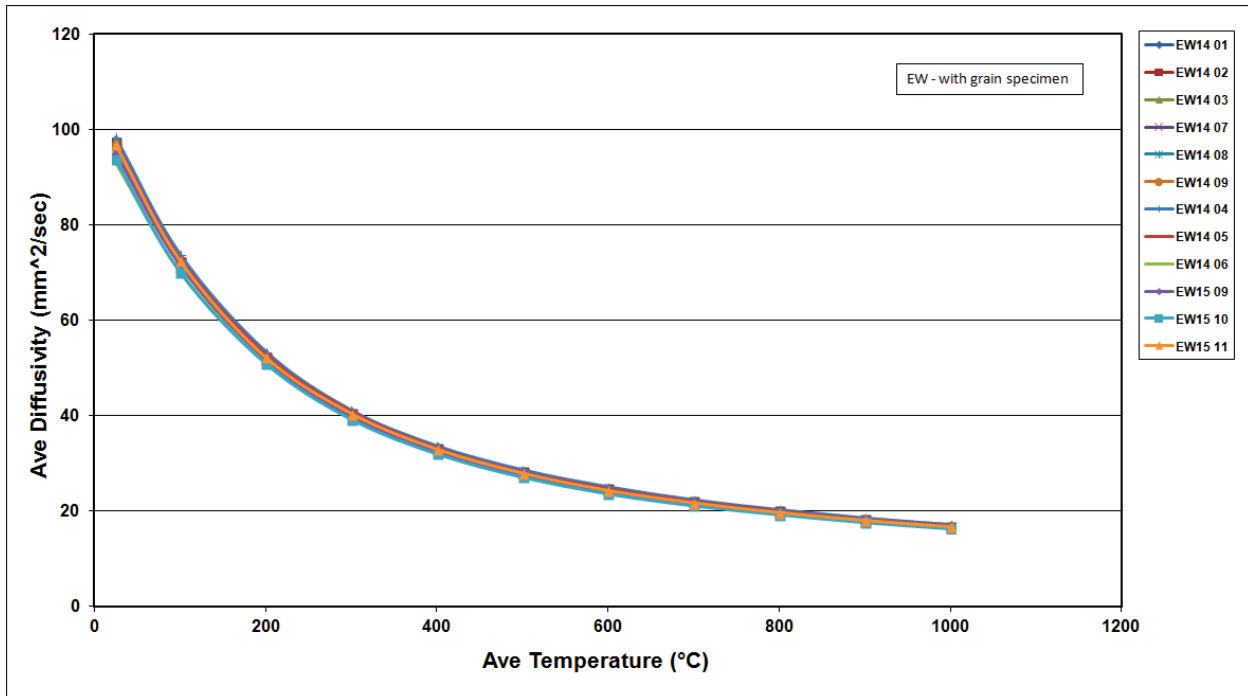


Figure A-223. IG-110 Piggyback Diffusivity.

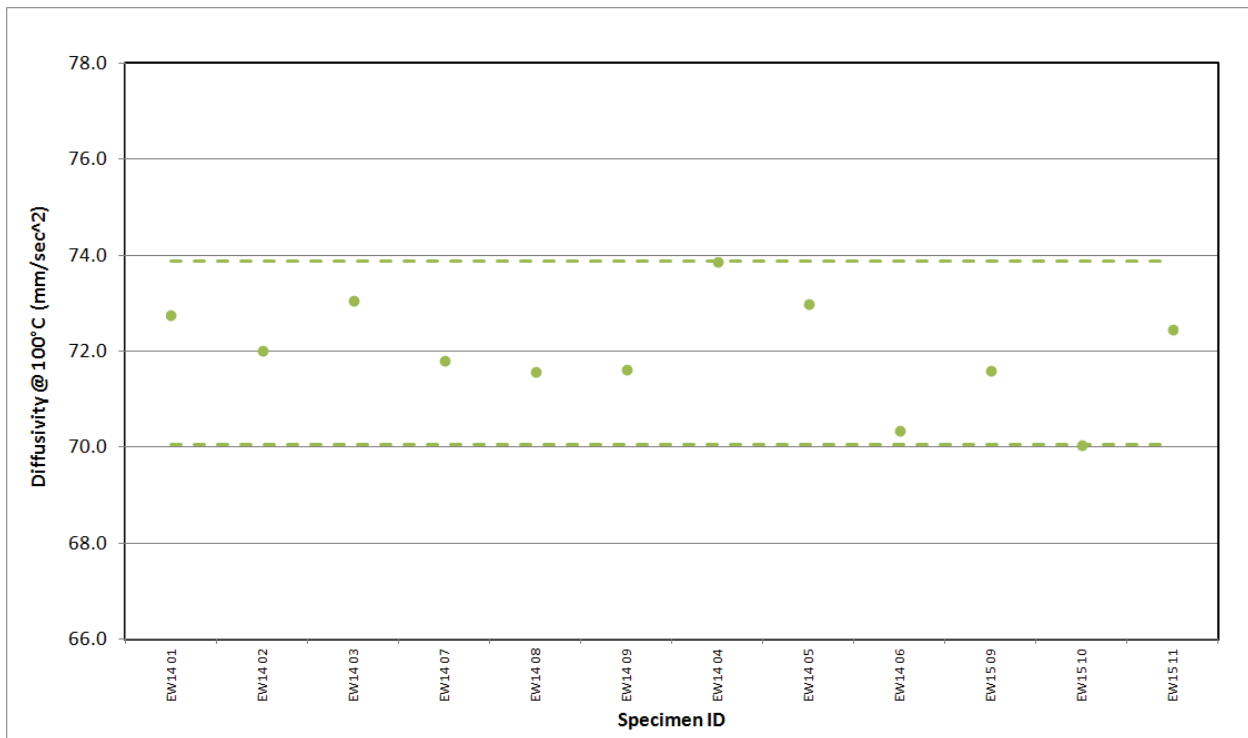


Figure A-224. IG-110 Piggyback Diffusivity @ 100°C.

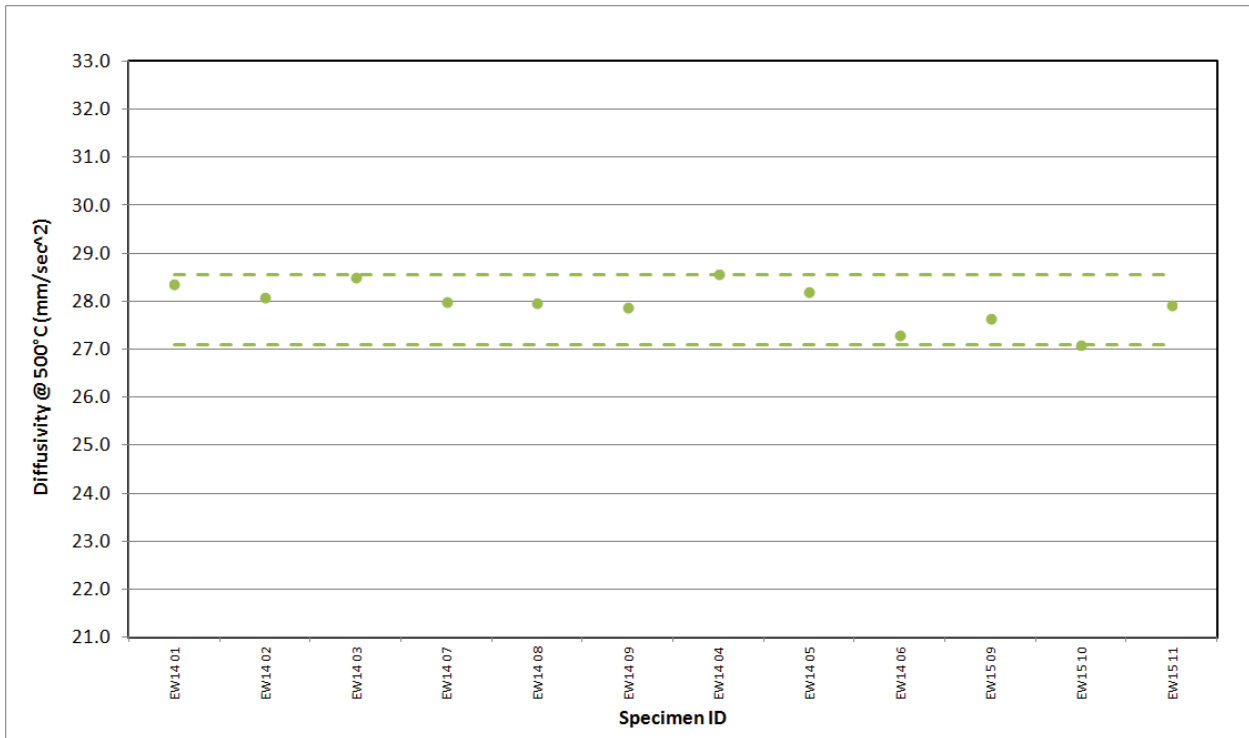


Figure A-225. IG-110 Piggyback Diffusivity @ 500°C.

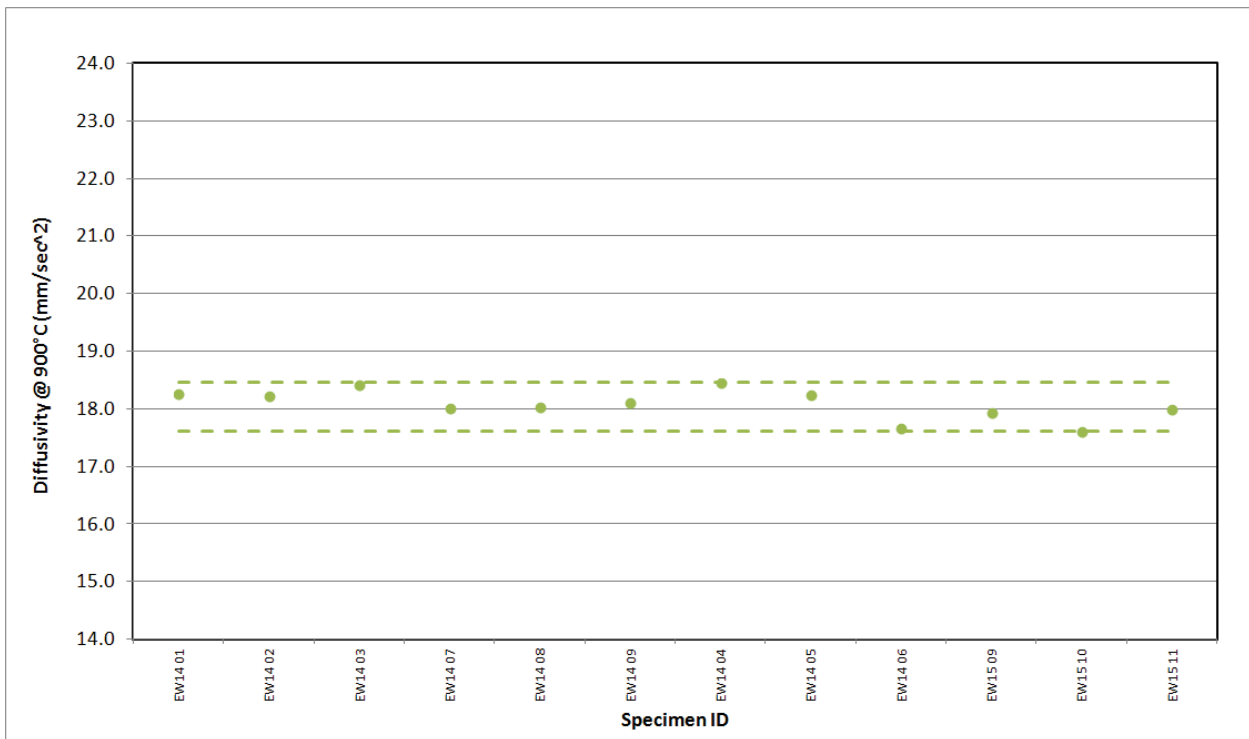


Figure A-226. IG-110 Piggyback Diffusivity @ 900°C.

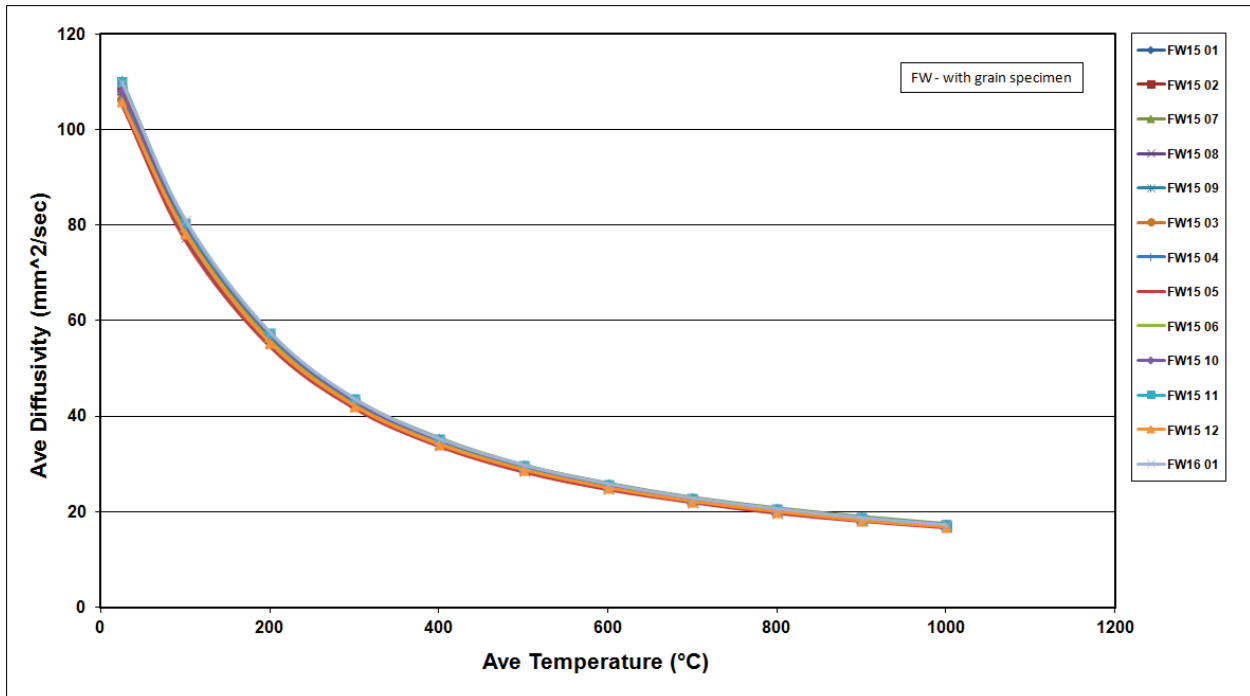


Figure A-227. IG-430 Piggyback Diffusivity.

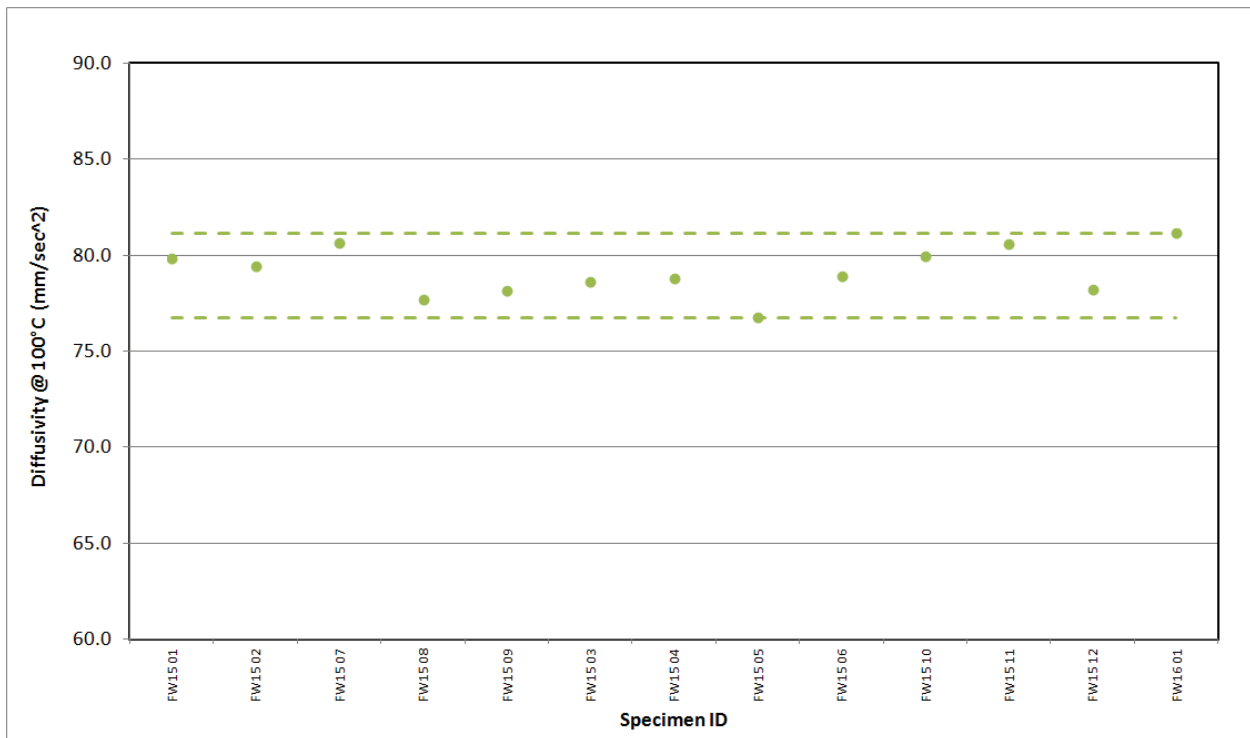


Figure A-228. IG-430 Piggyback Diffusivity @ 100°C.

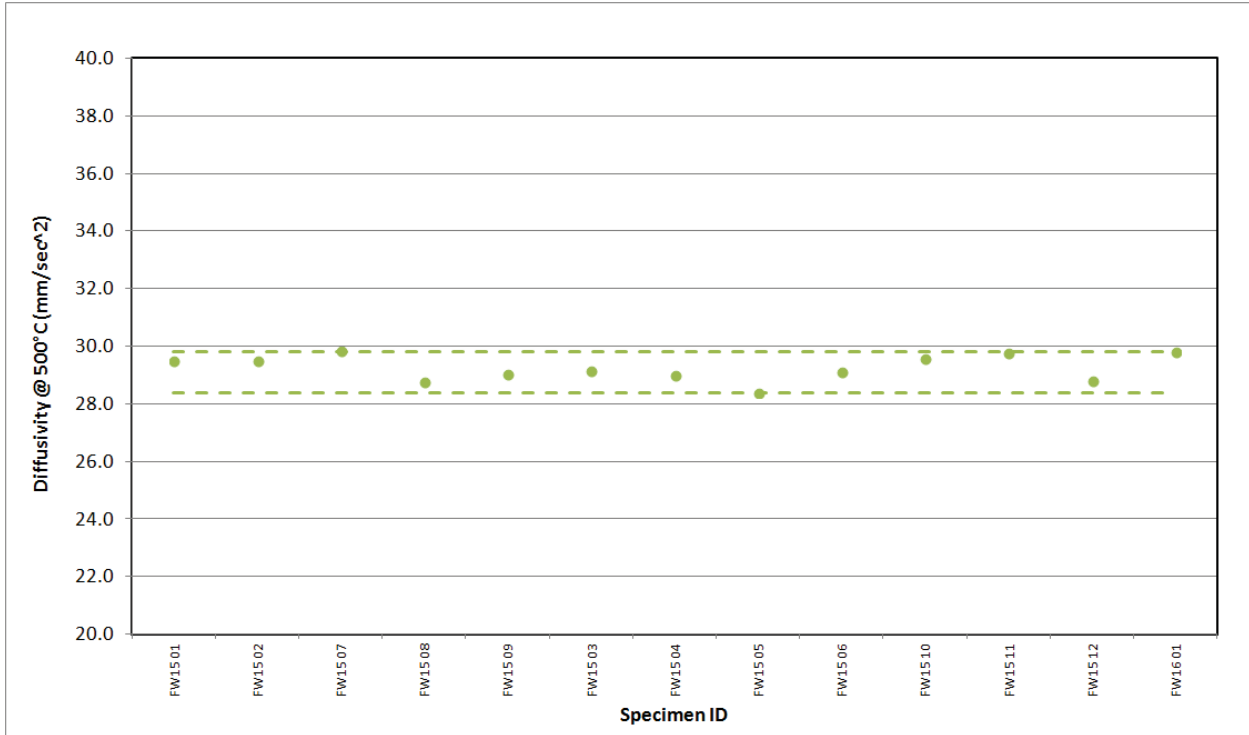


Figure A-229. IG-430 Piggyback Diffusivity @ 500°C.

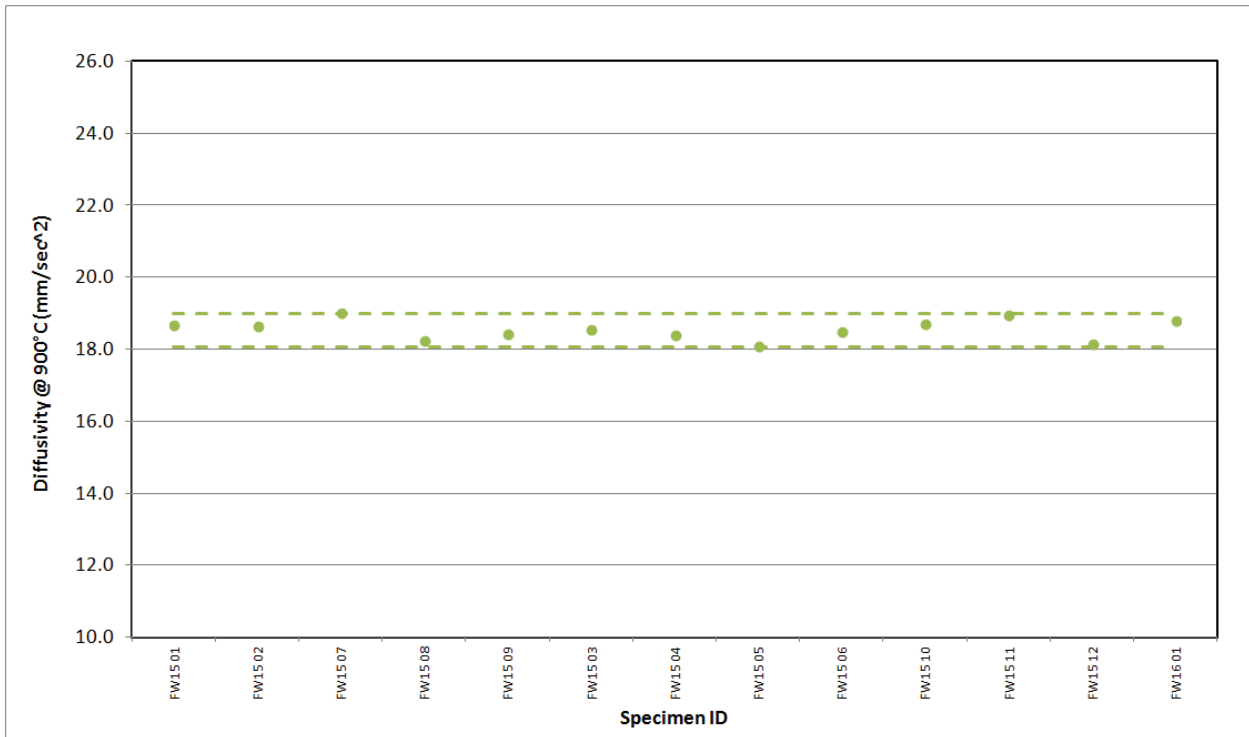


Figure A-230. IG-430 Piggyback Diffusivity @ 900°C.

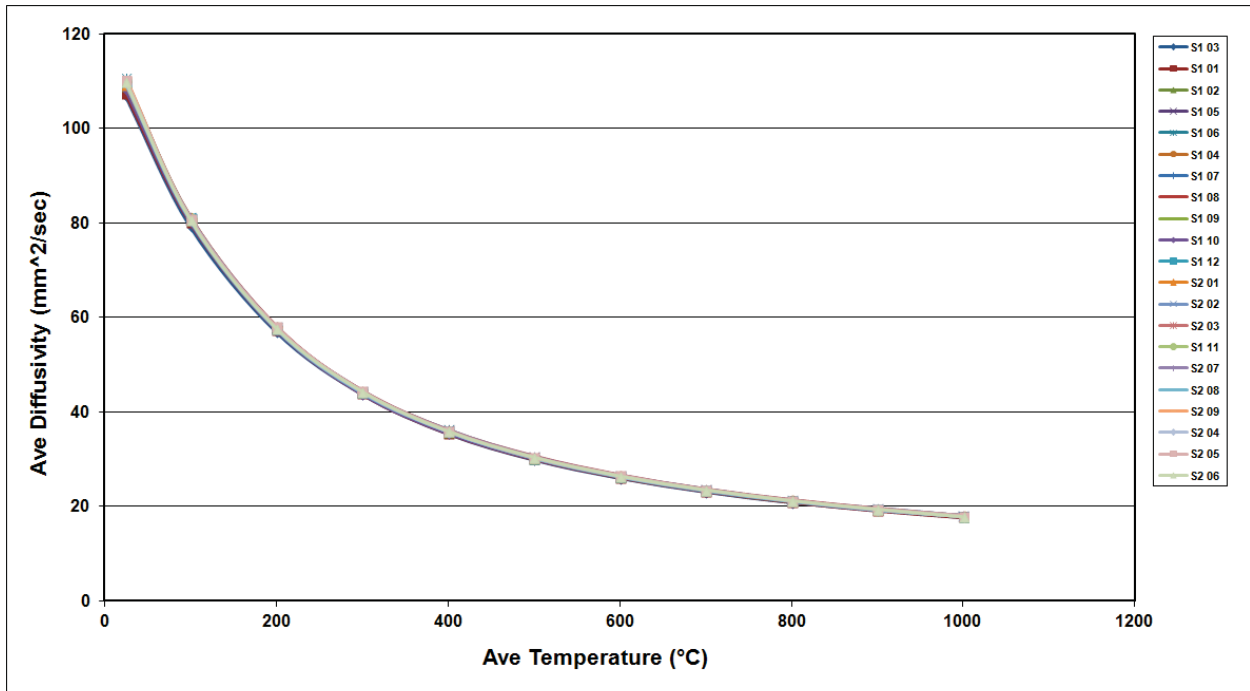


Figure A-231. NBG-10 Piggyback Diffusivity.

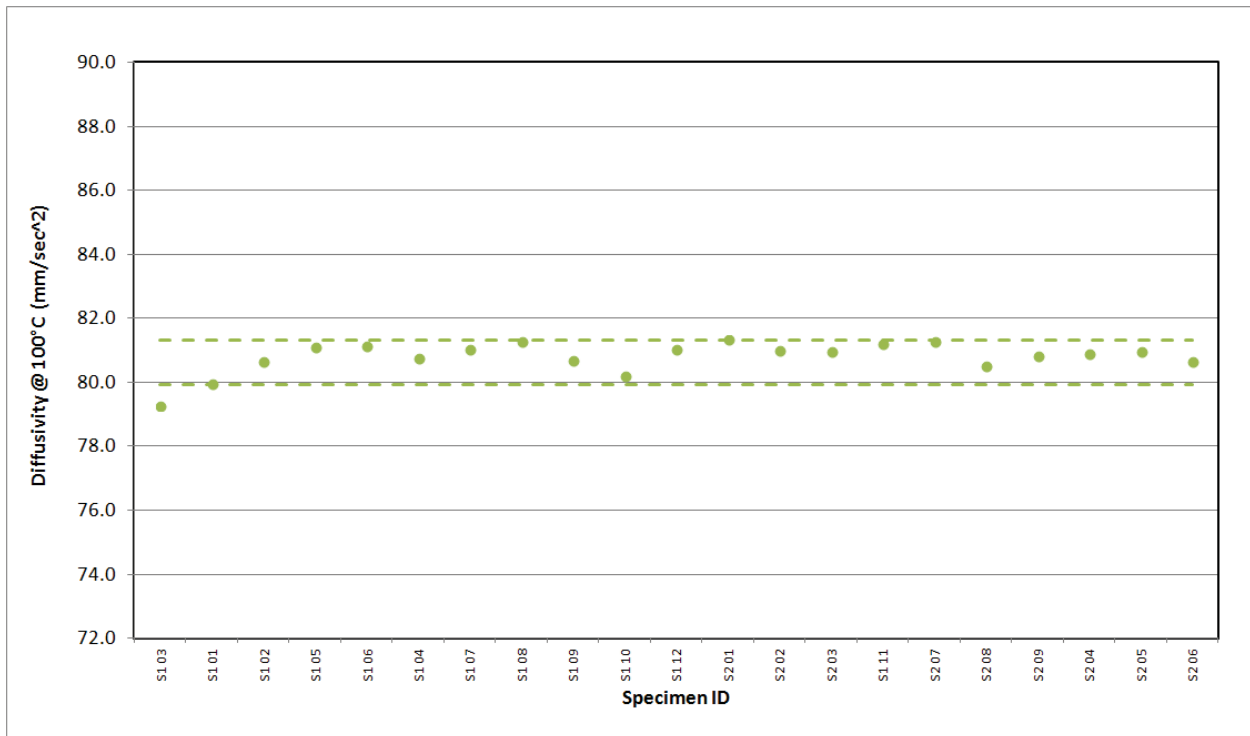


Figure A-232. NBG-10 Piggyback Diffusivity @ 100°C.

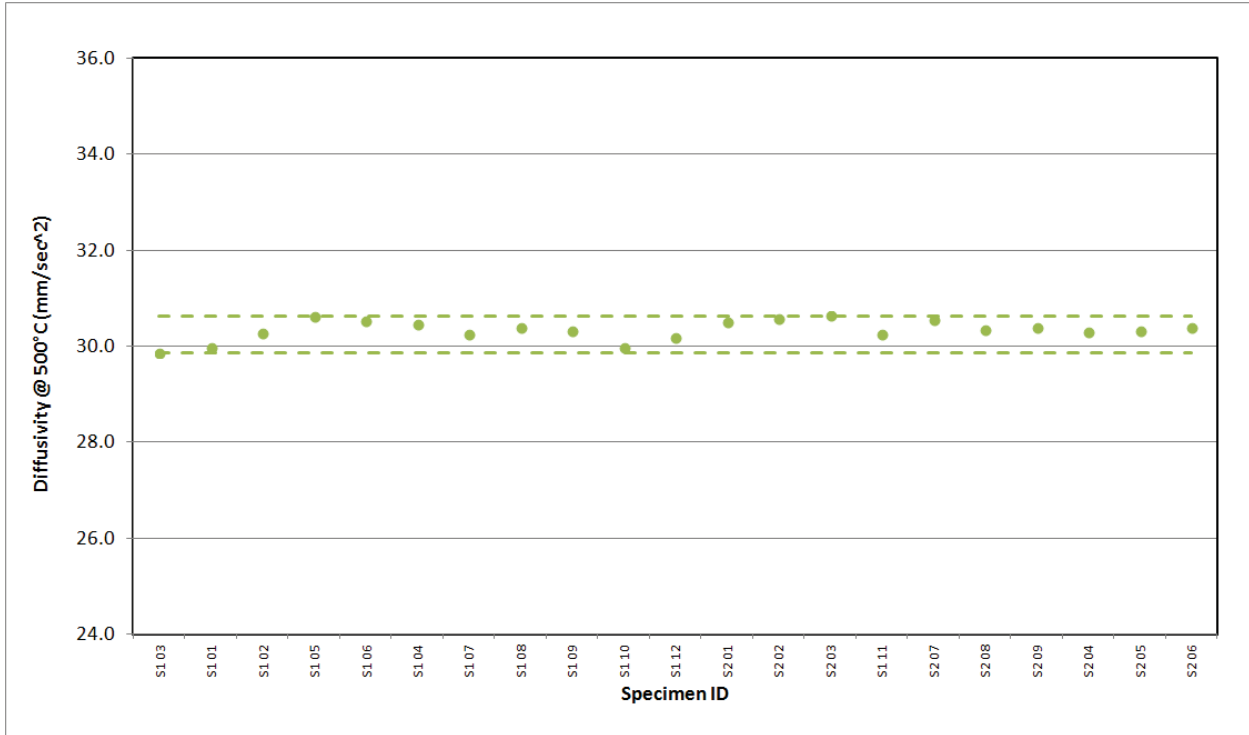


Figure A-233. NBG-10 Piggyback Diffusivity @ 500°C.

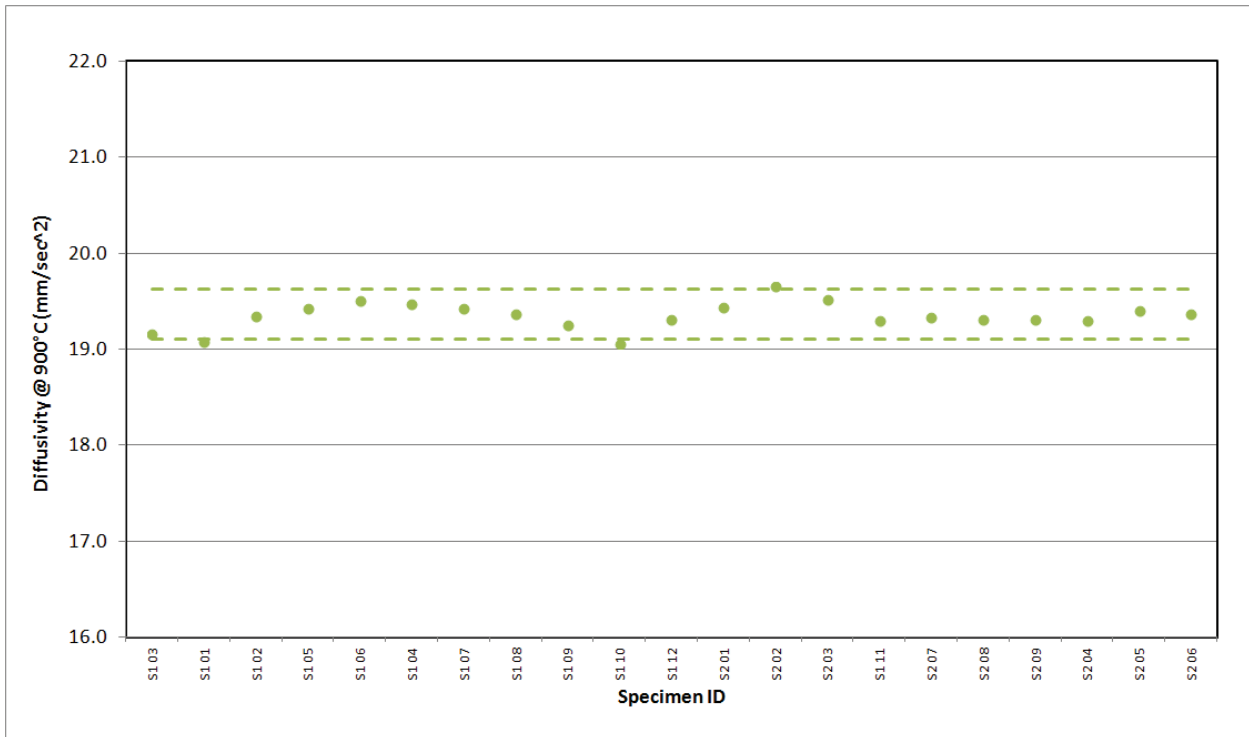


Figure A-234. NBG-10 Piggyback Diffusivity @ 900°C.

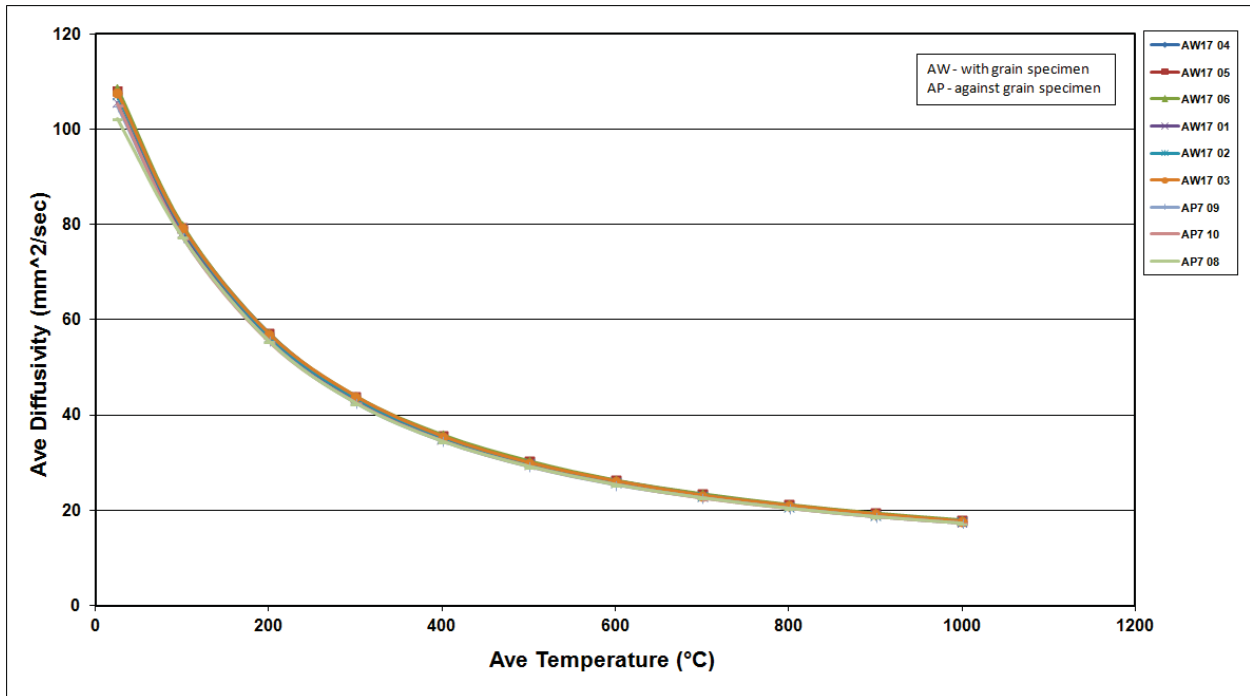


Figure A-235. NBG-17 Piggyback Diffusivity.

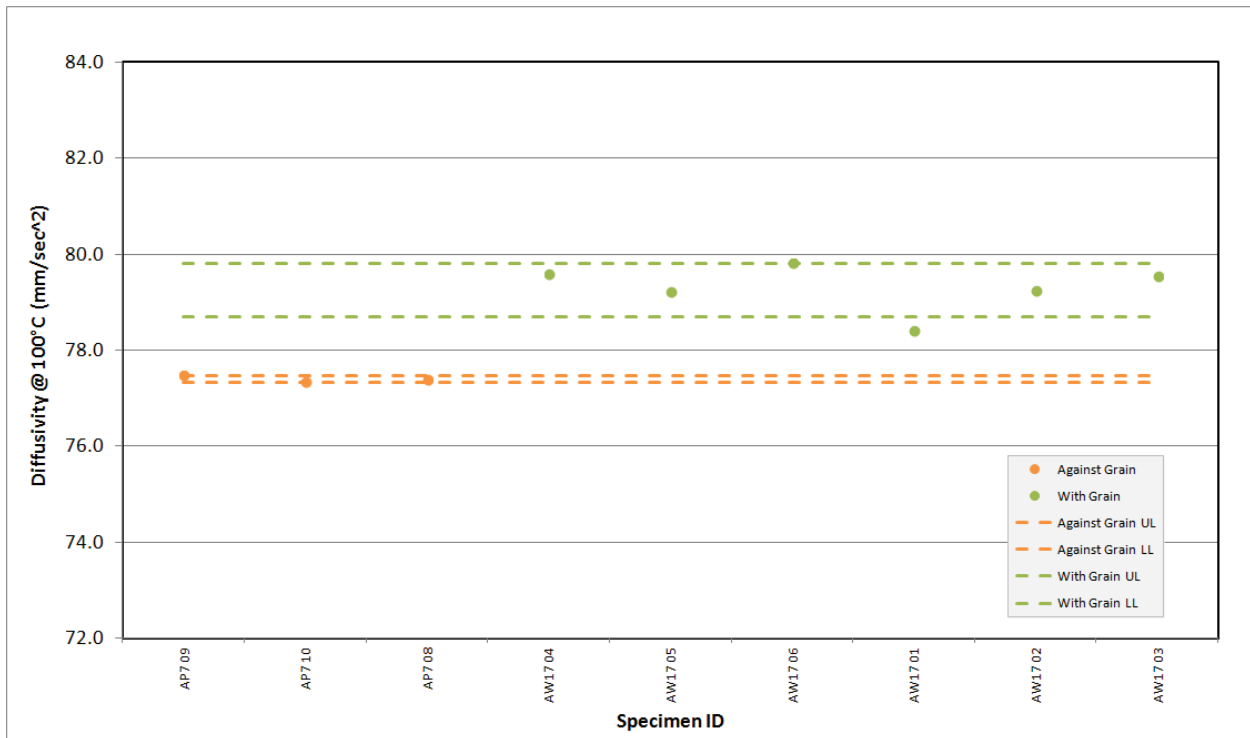


Figure A-236. NBG-17 Piggyback Diffusivity @ 100°C.

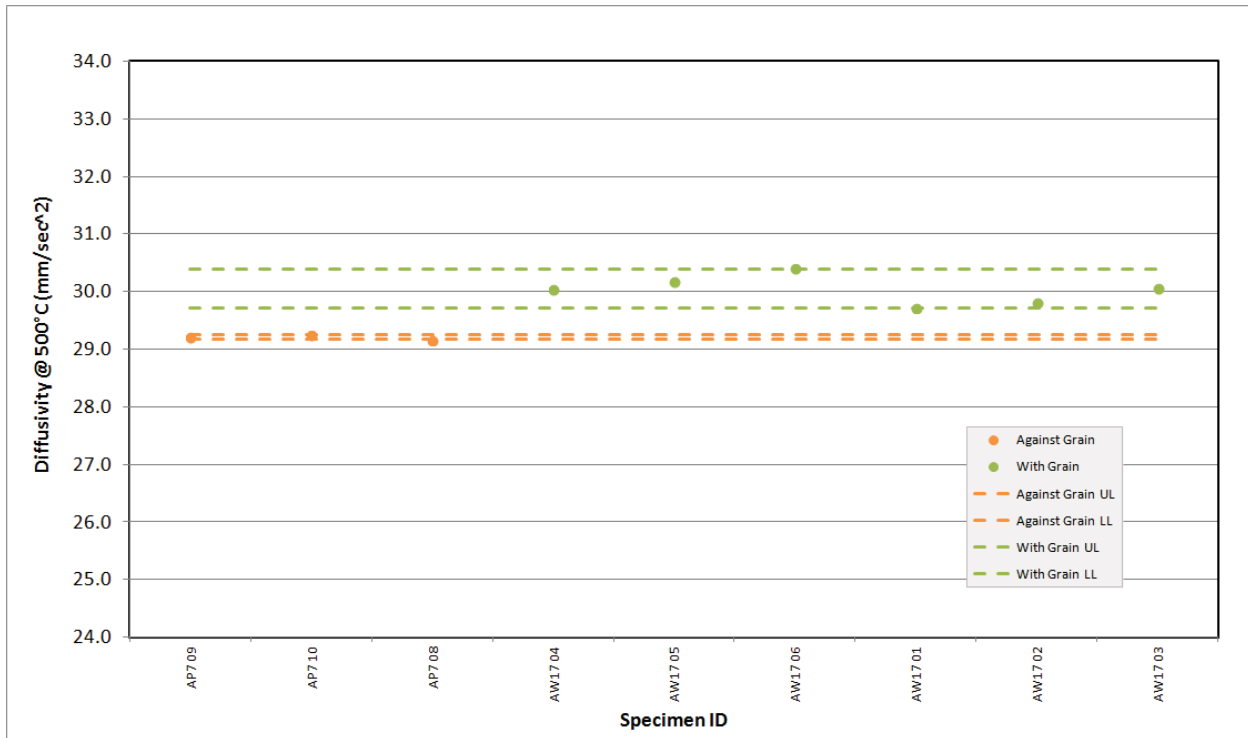


Figure A-237. NBG-17 Piggyback Diffusivity @ 500°C.

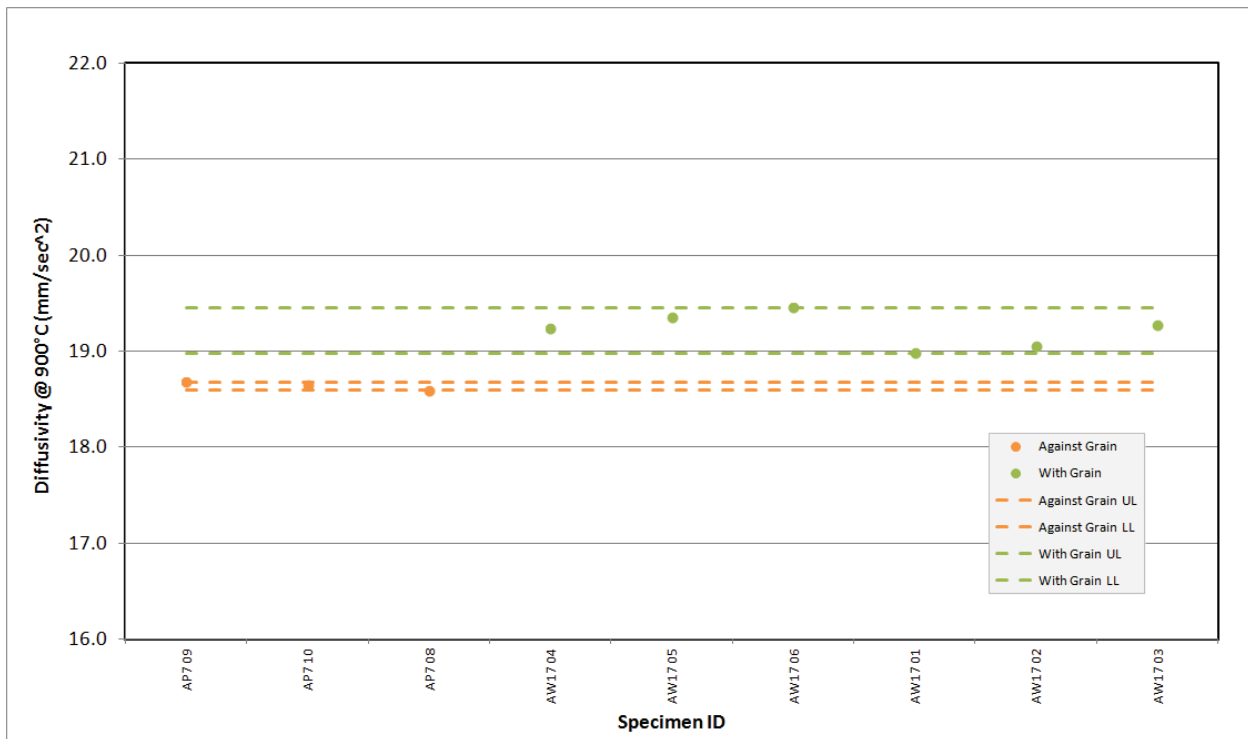


Figure A-238. NBG-17 Piggyback Diffusivity @ 900°C.

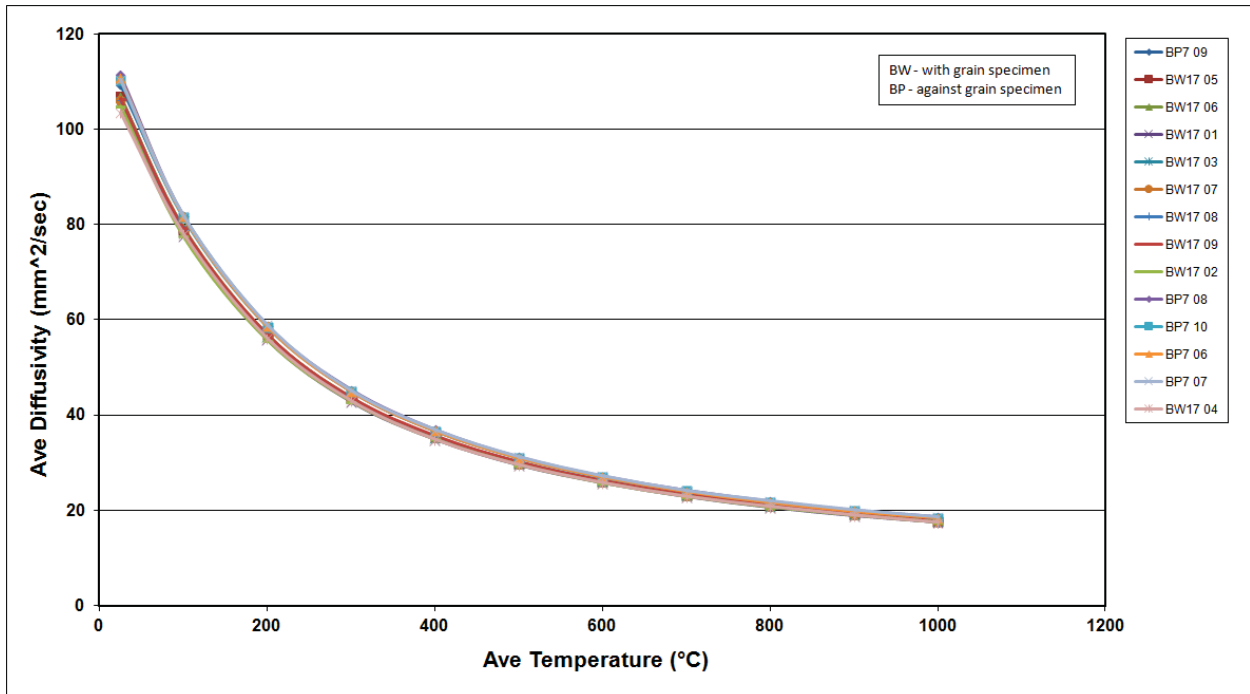


Figure A-239. NBG-18 Piggyback Diffusivity.

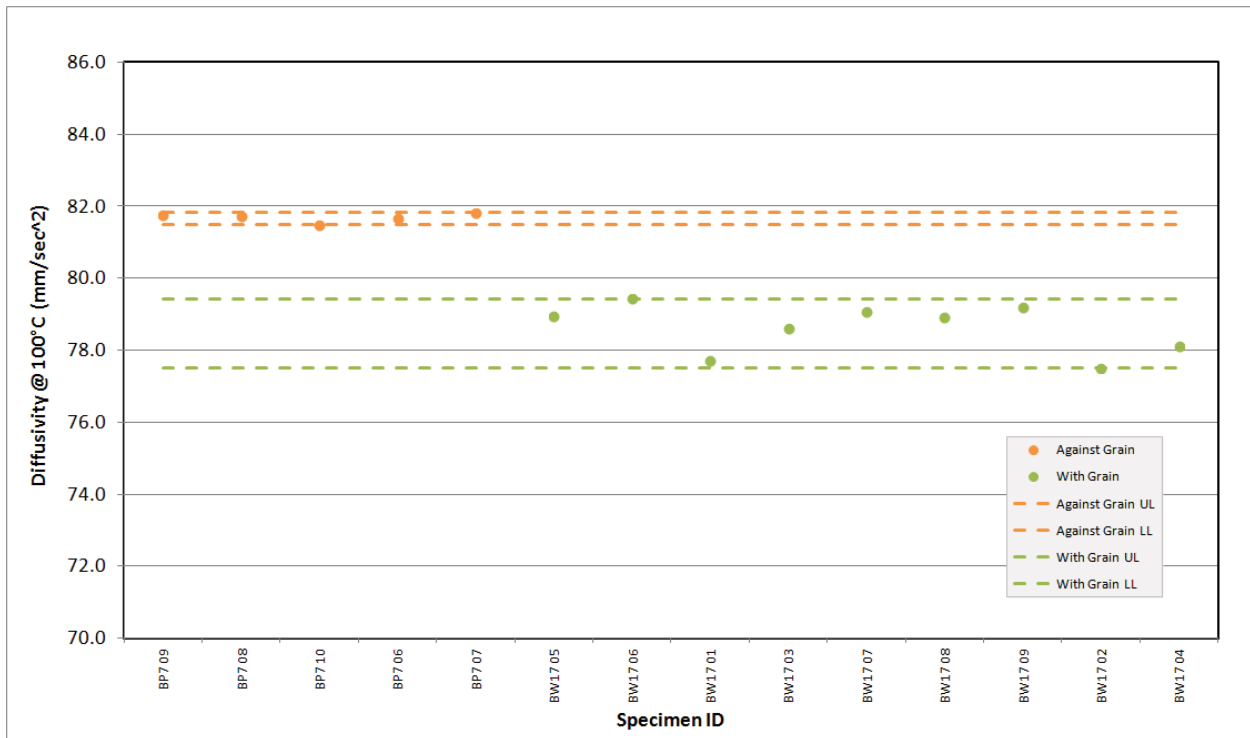


Figure A-240. NBG-18 Piggyback Diffusivity @ 100°C.

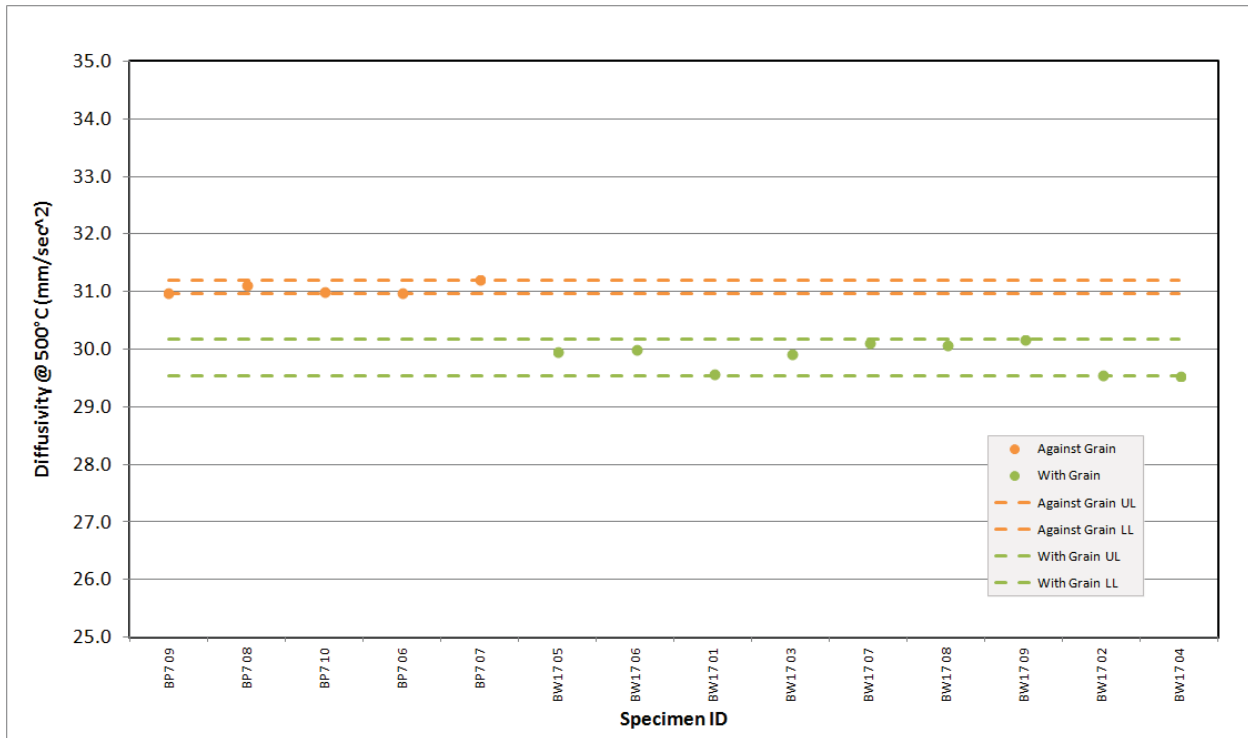


Figure A-241. NBG-18 Piggyback Diffusivity @ 500°C.

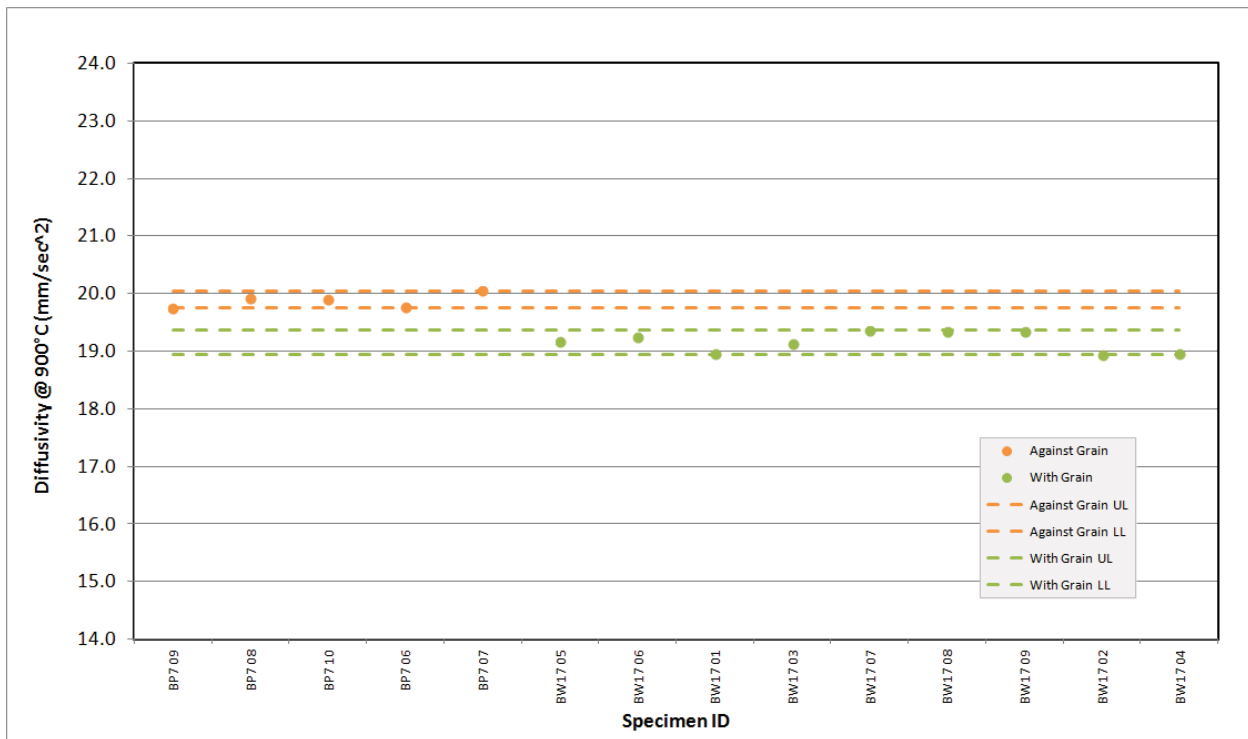


Figure A-242. NBG-18 Diffusivity @ 900°C.

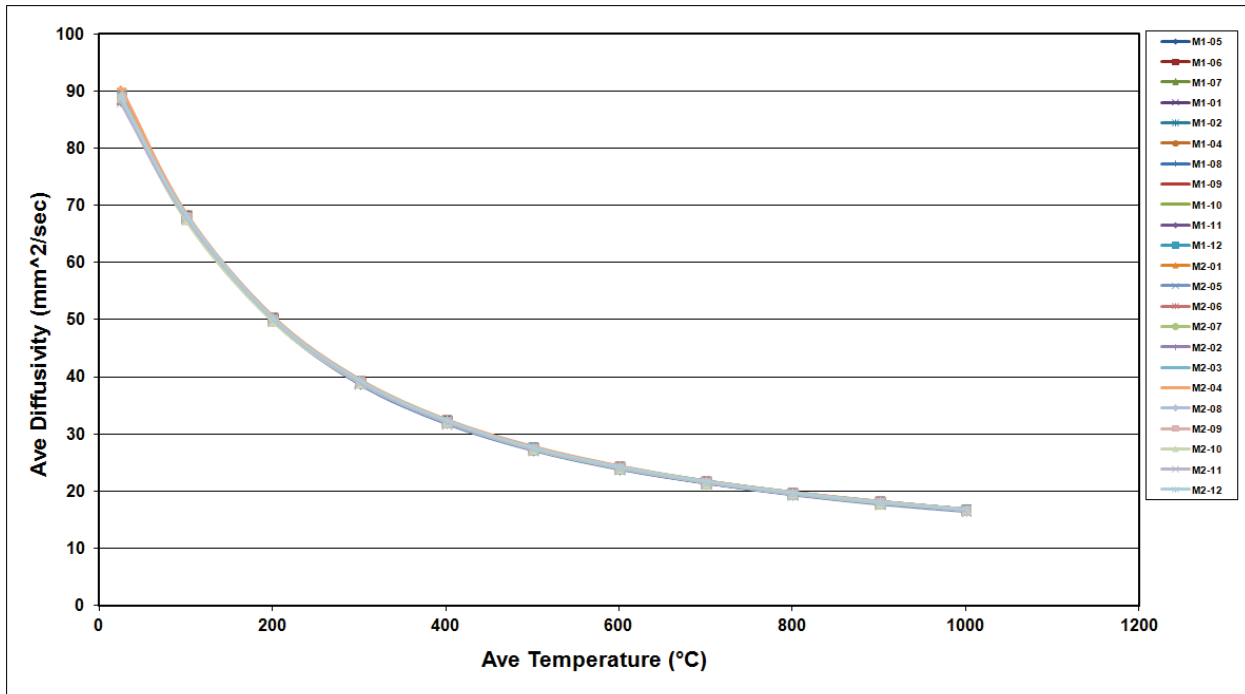


Figure A-243. NBG-25 Piggyback Diffusivity.

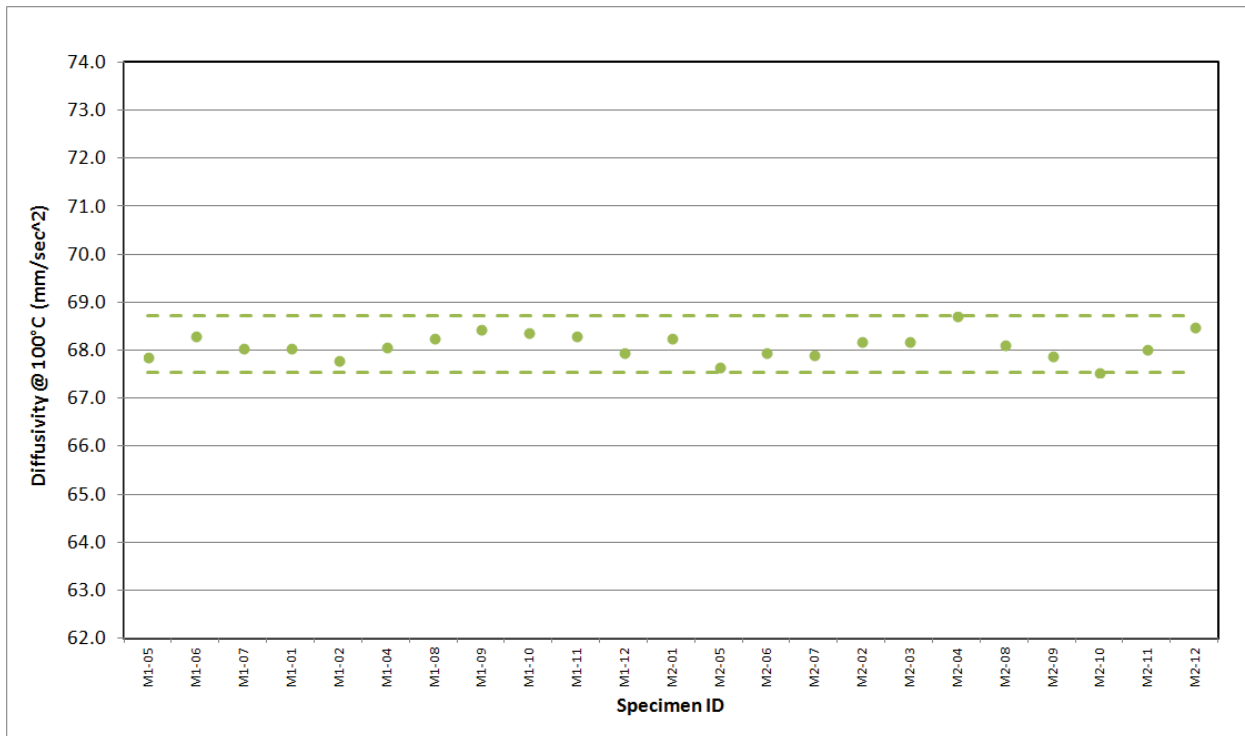


Figure A-244. NBG-25 Piggyback Diffusivity @ 100°C.

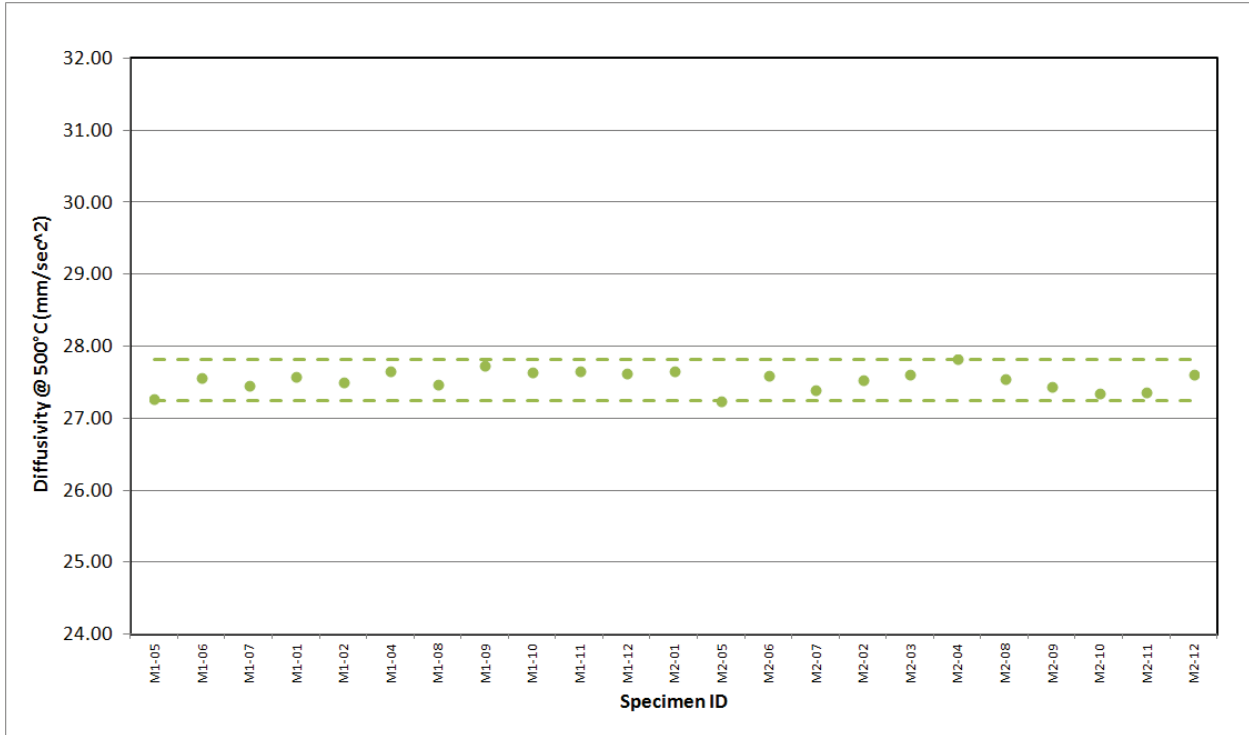


Figure A-245. NBG-25 Piggyback Diffusivity @ 500°C.

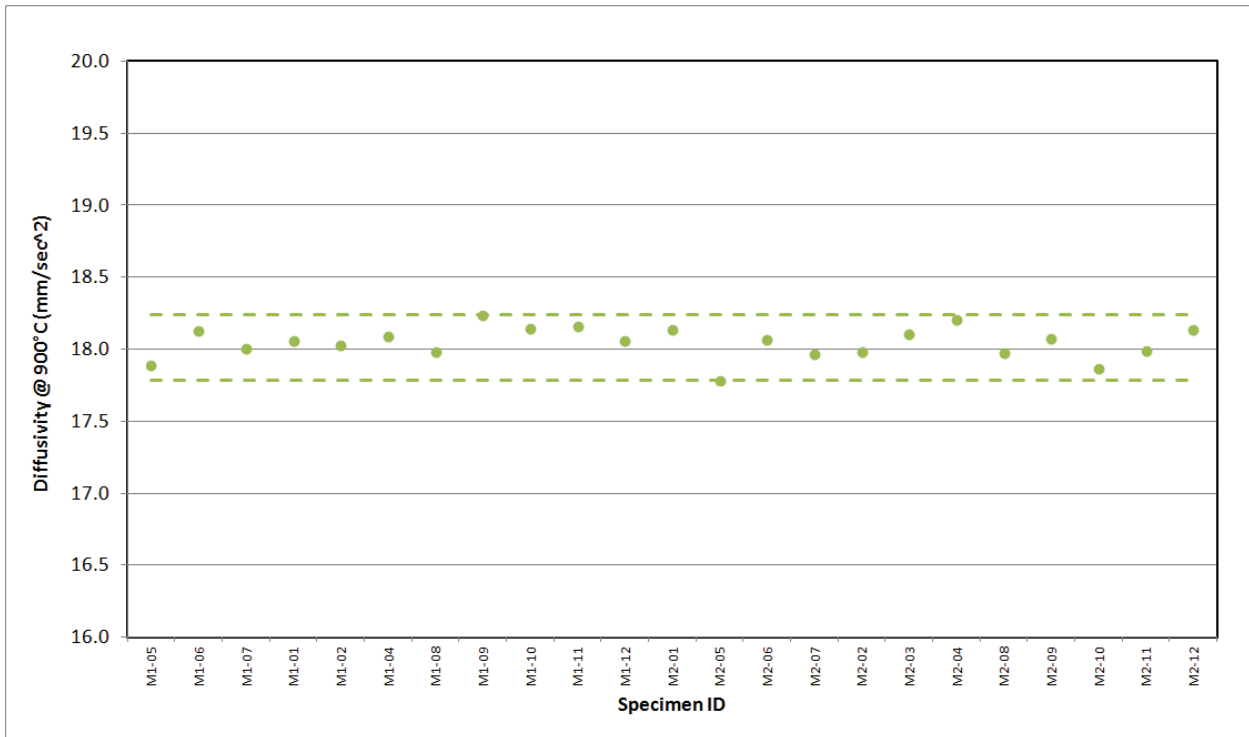


Figure A-246. NBG-25 Piggyback Diffusivity @ 900°C.

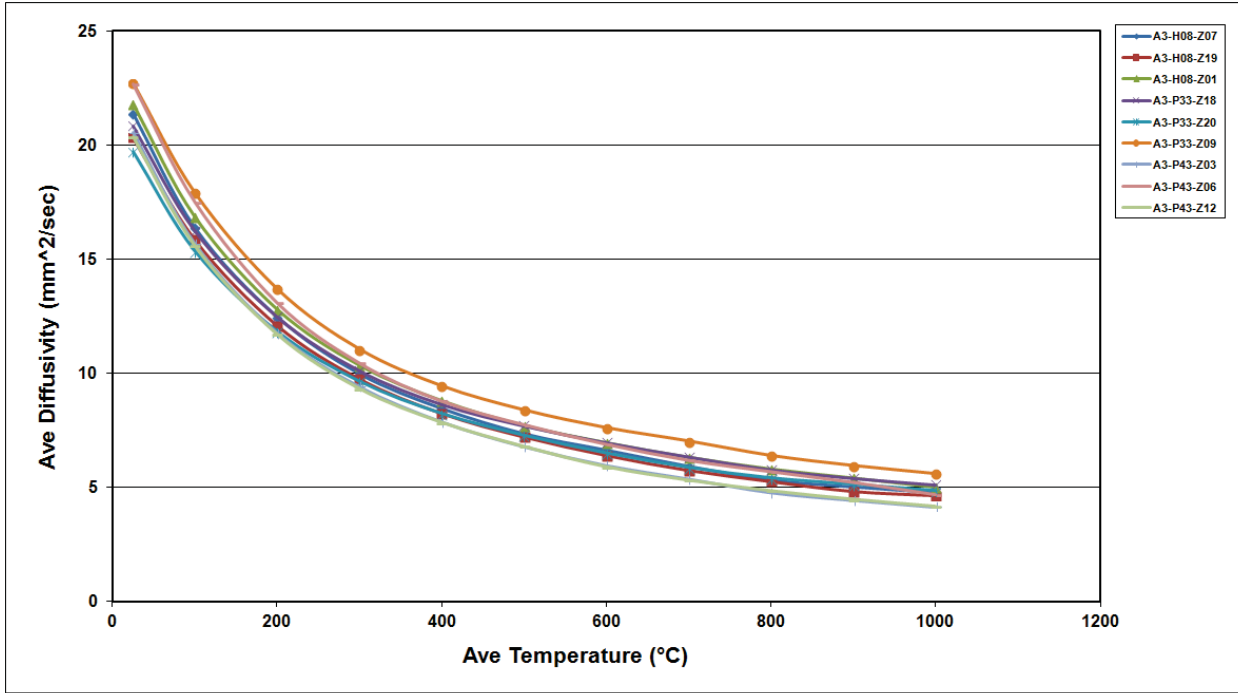


Figure A-247. New Matrix Piggyback Diffusivity.

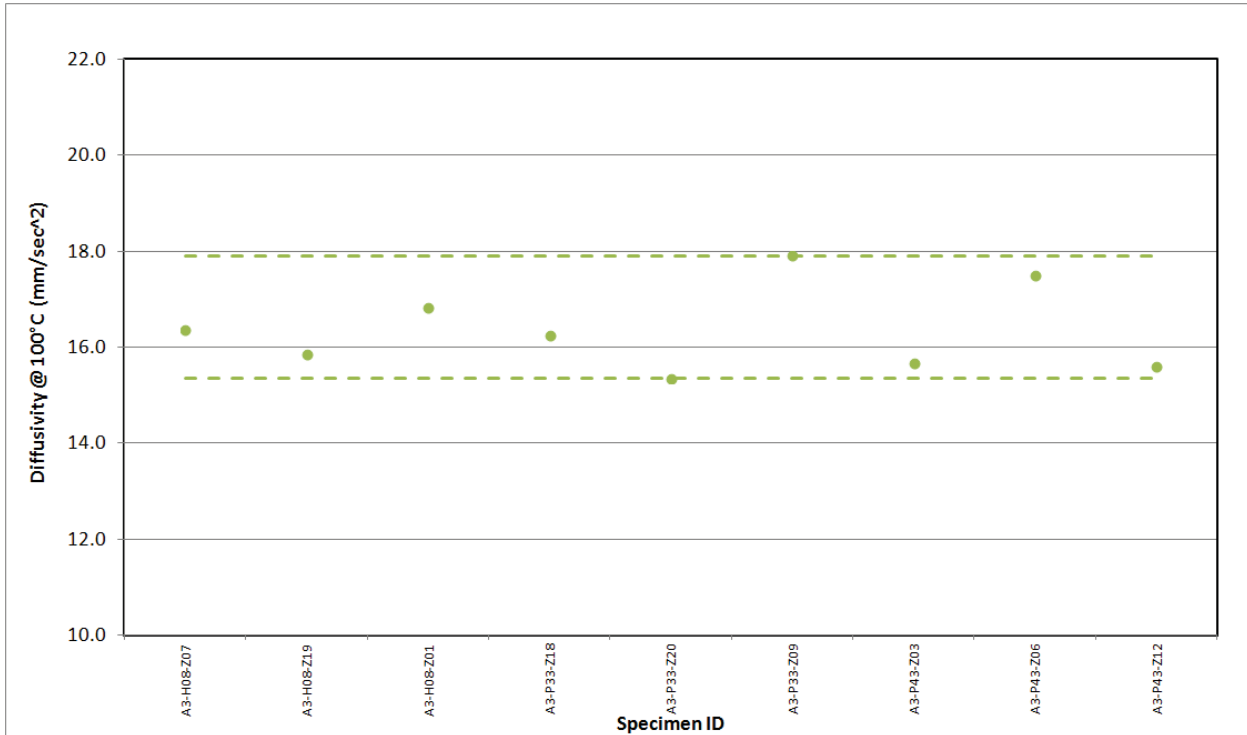


Figure A-248. New Matrix Piggyback Diffusivity @ 100°C.

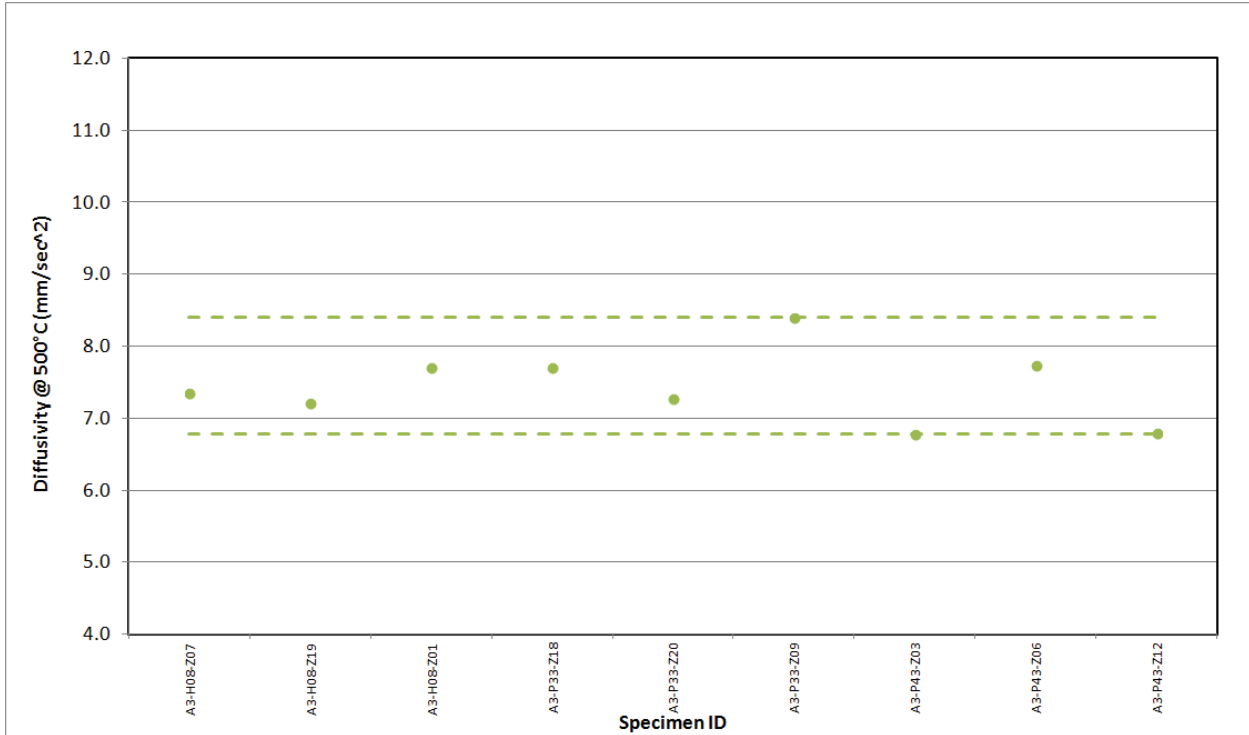


Figure A-249. New Matrix Piggyback Diffusivity @ 500°C.

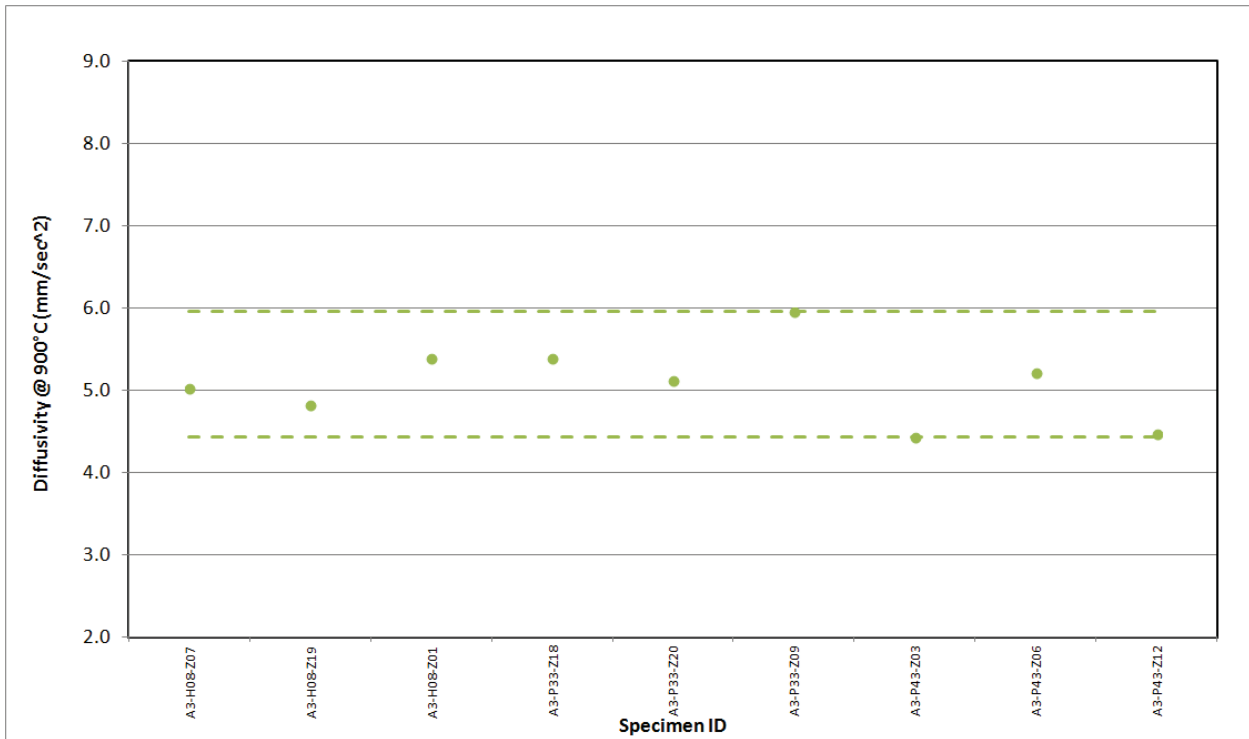


Figure A-250. New Matrix Piggyback Diffusivity @ 900°C.

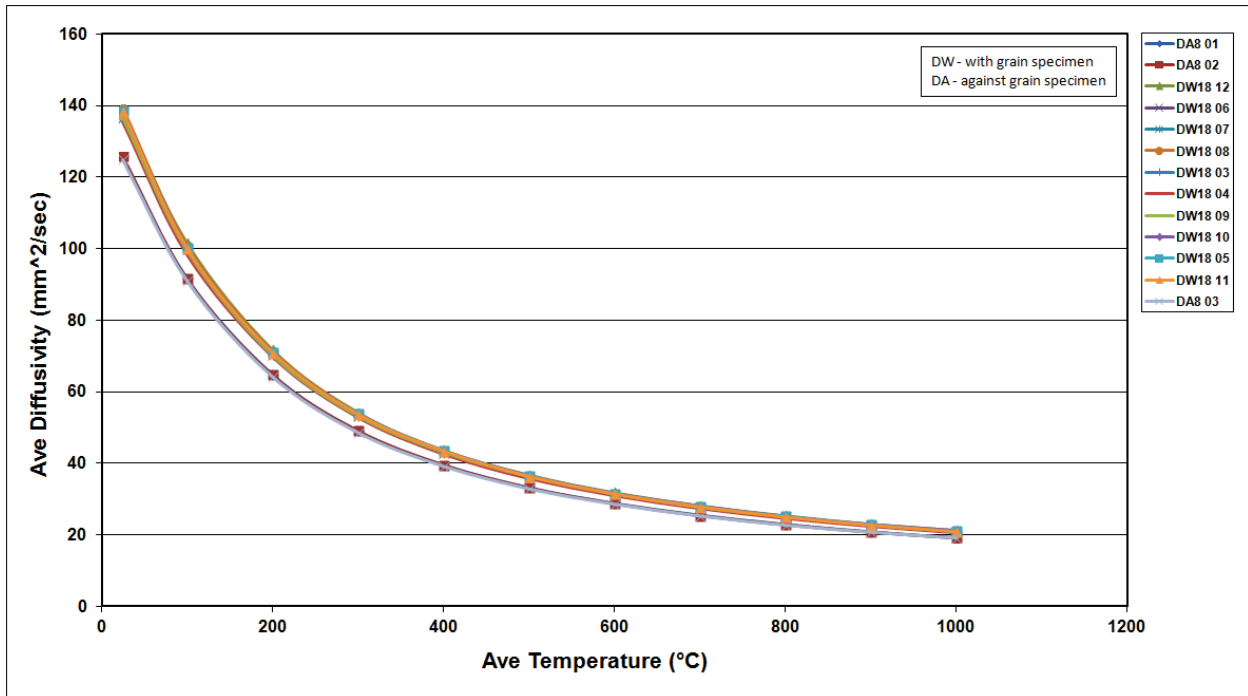


Figure A-251. PCEA Piggyback Diffusivity.

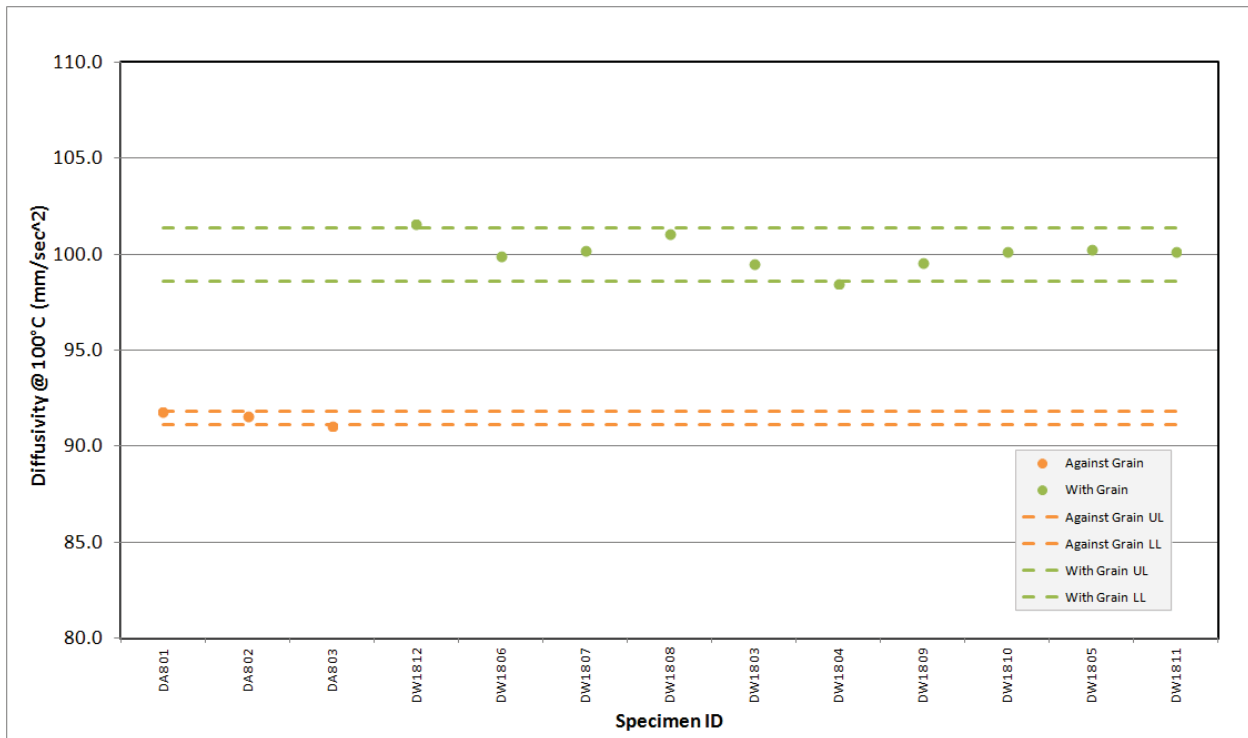


Figure A-252. PCEA Piggyback Diffusivity @ 100°C.

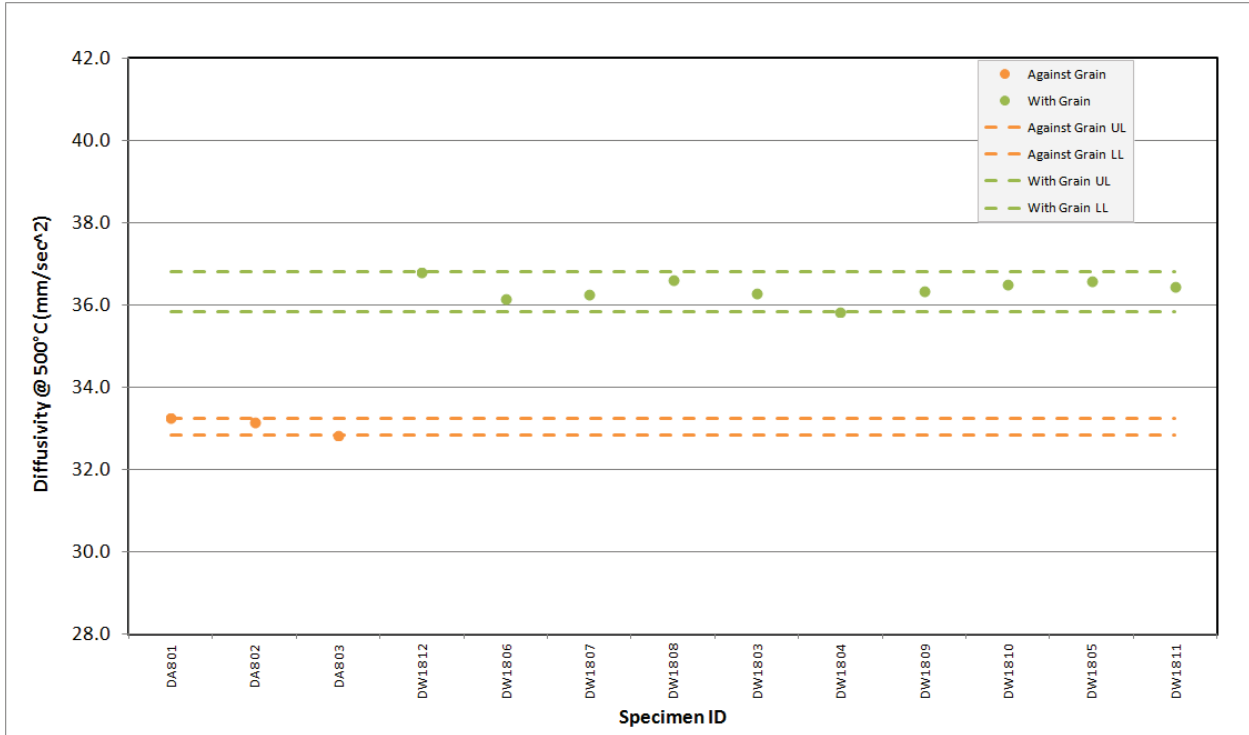


Figure A-253. PCEA Piggyback Diffusivity @ 500°C.

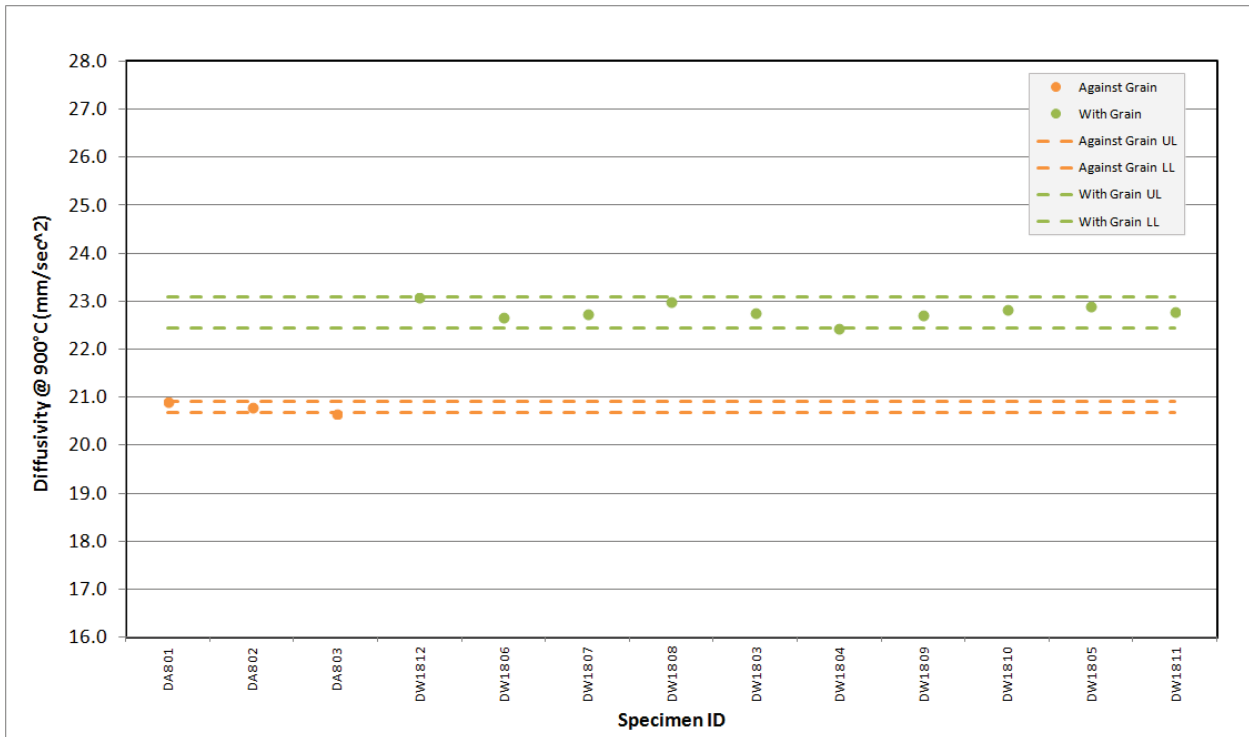


Figure A-254. PCEA Piggyback Diffusivity @ 900°C.

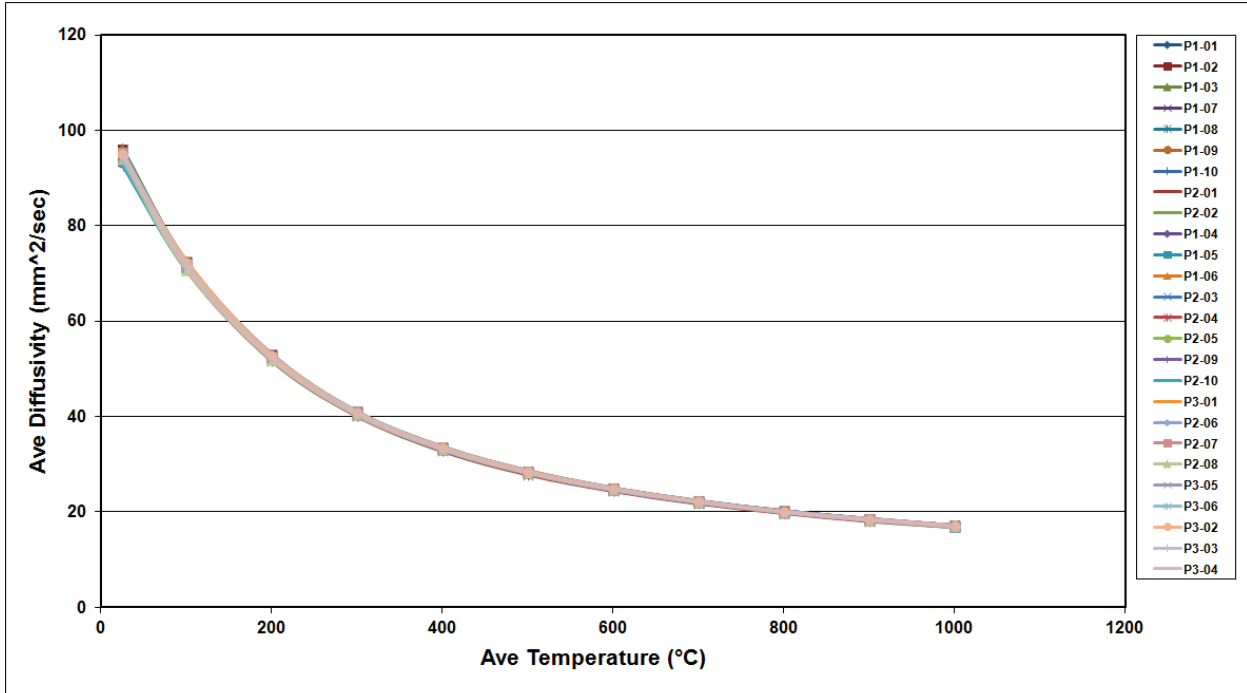


Figure A-255. PCIB Piggyback Diffusivity.

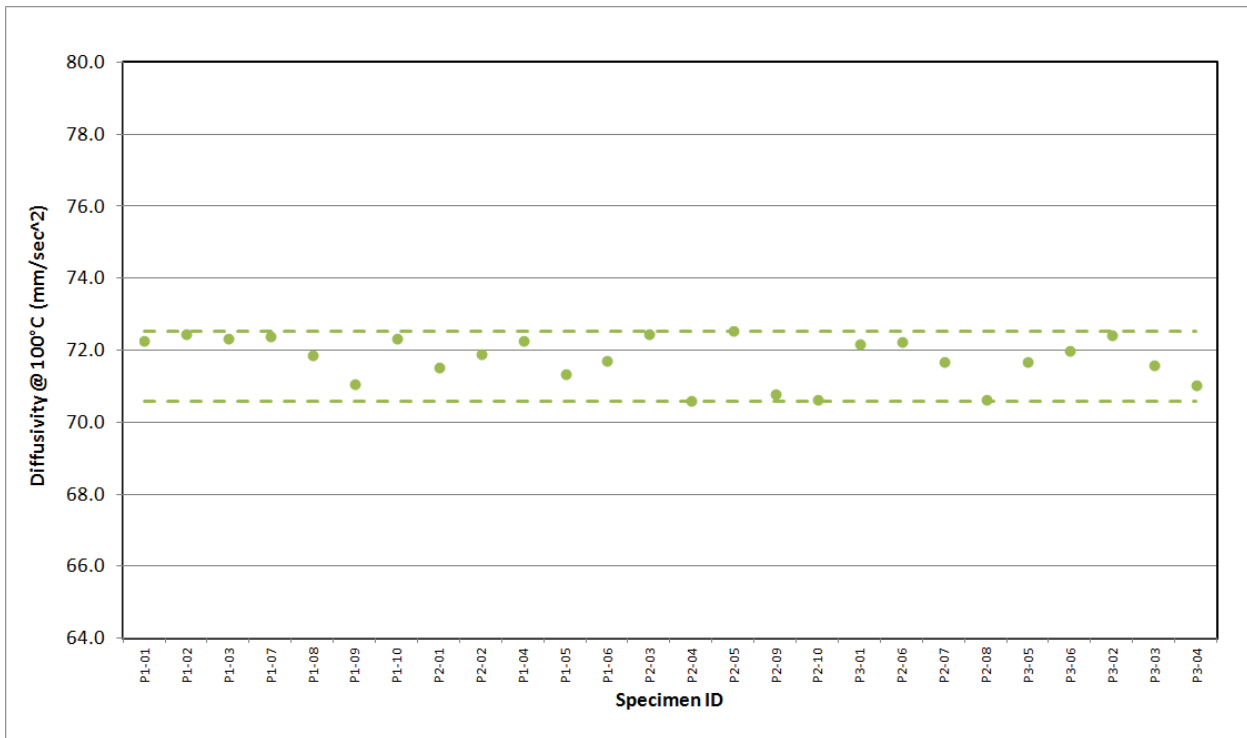


Figure A-256. PCIB Piggyback Diffusivity @ 100°C.

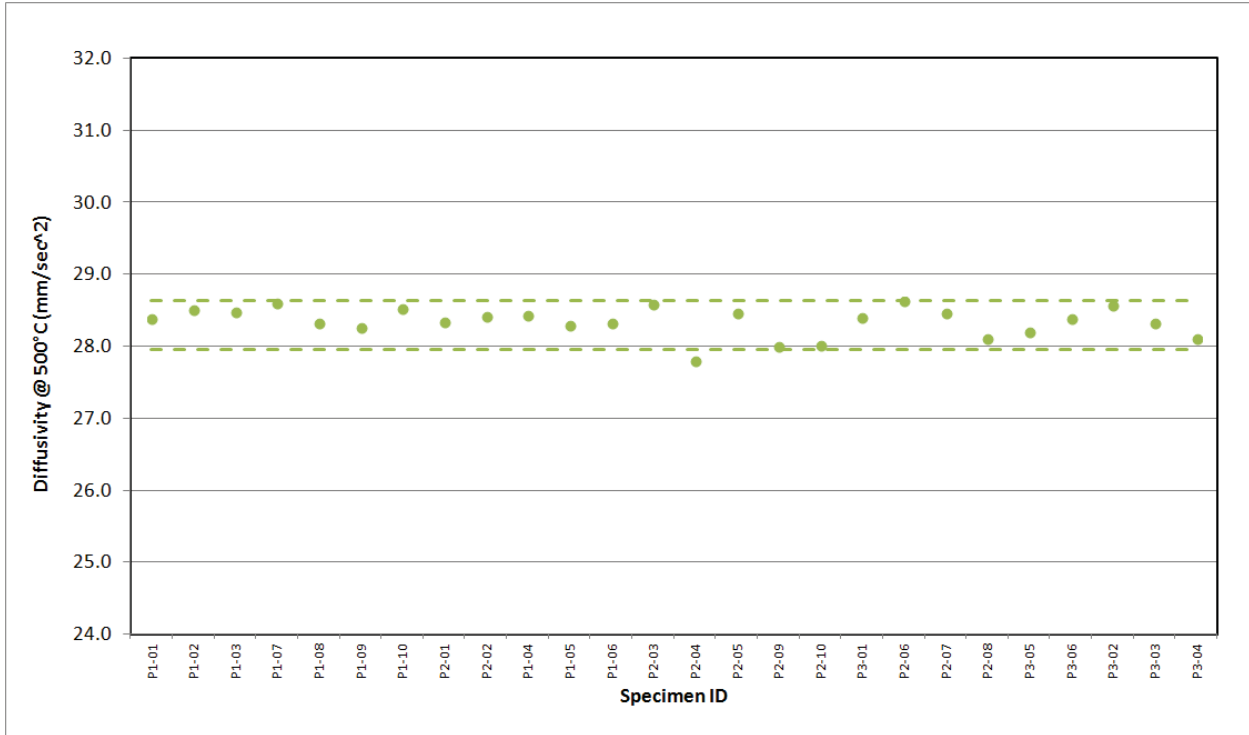


Figure A-257. PCB Piggyback Diffusivity @ 500°C.

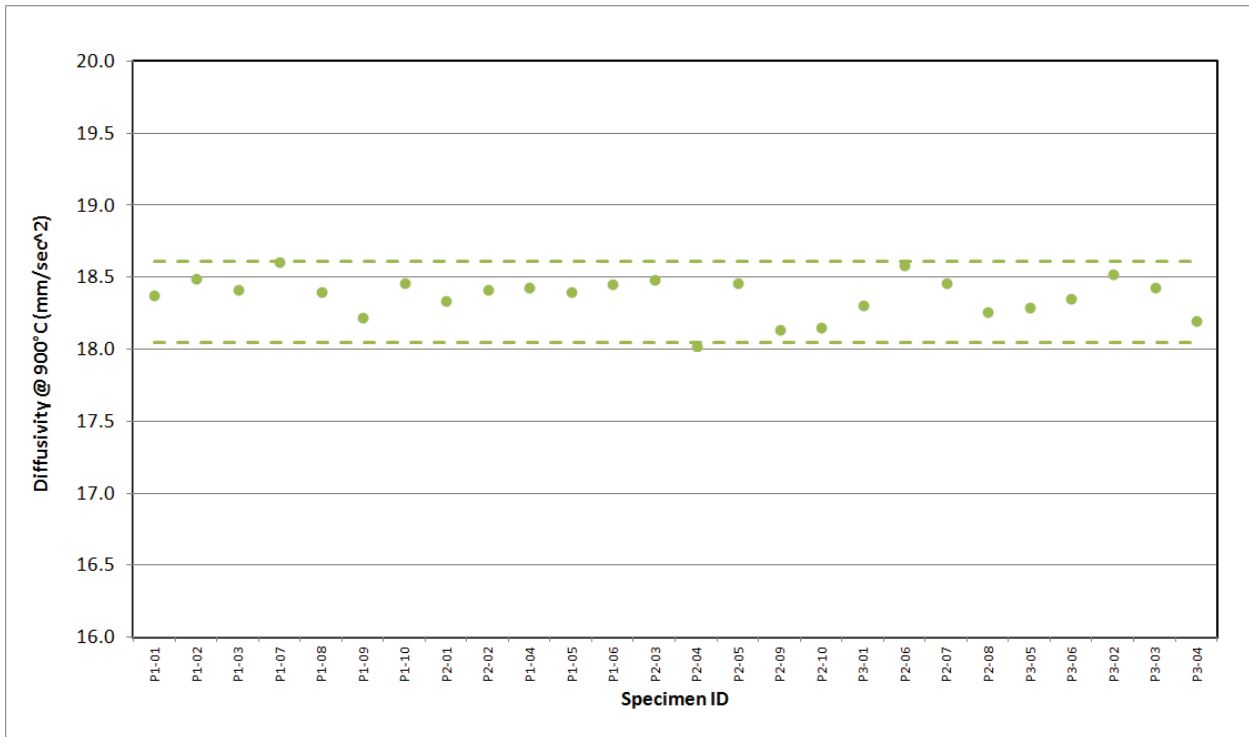


Figure A-258. PCB Piggyback Diffusivity @ 900°C.

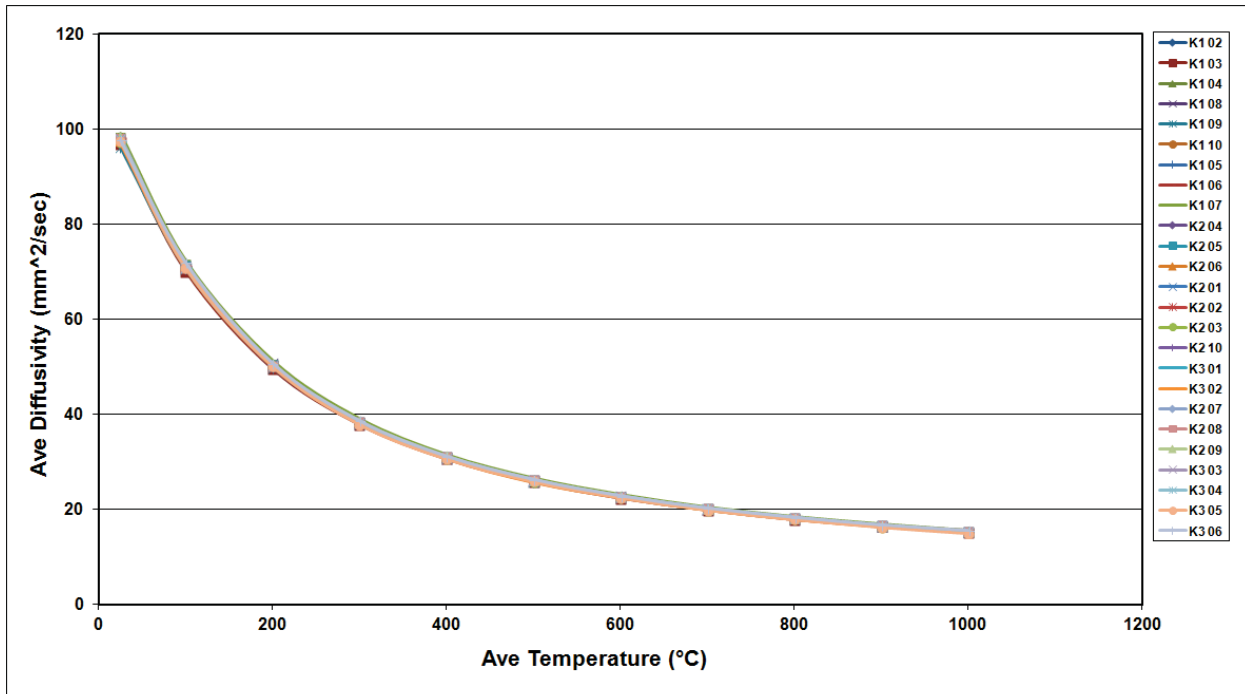


Figure A-259. PGX Piggyback Diffusivity.

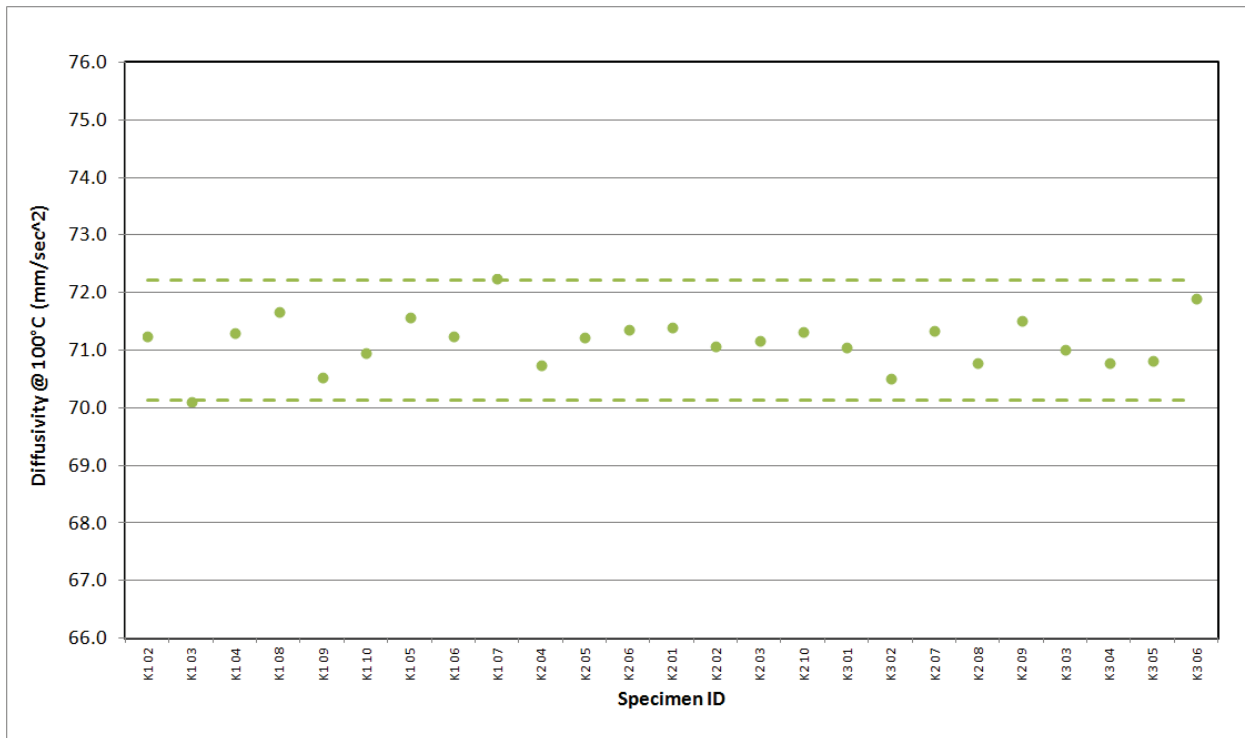


Figure A-260. PGX Piggyback Diffusivity @ 100°C.

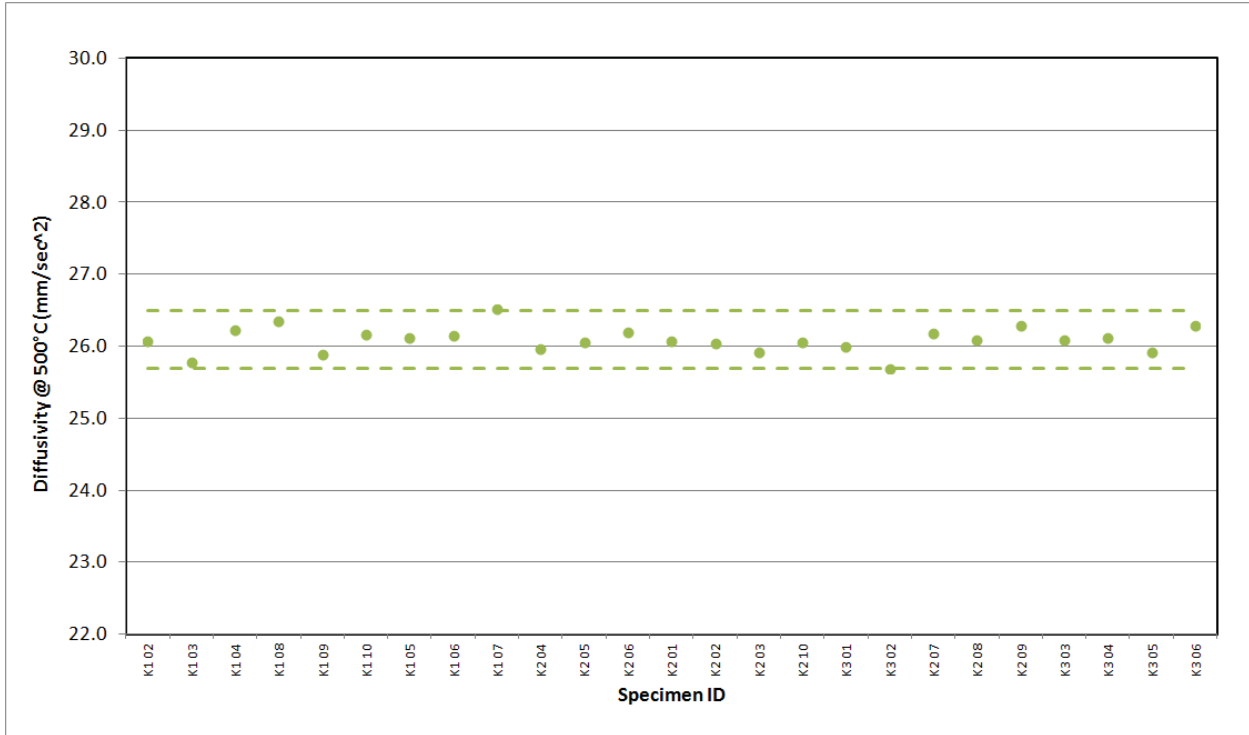


Figure A-261. PGX Piggyback Diffusivity @ 500°C.

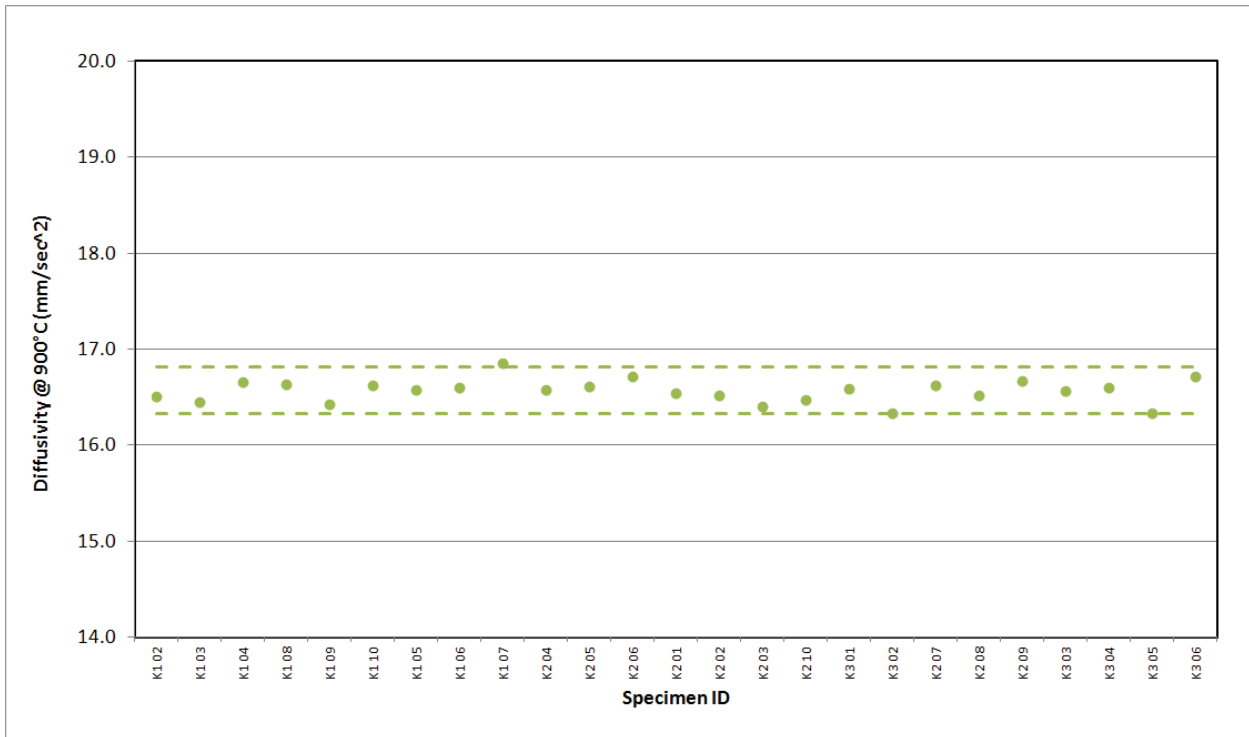


Figure A-262. PGX Piggyback Diffusivity @ 900°C.

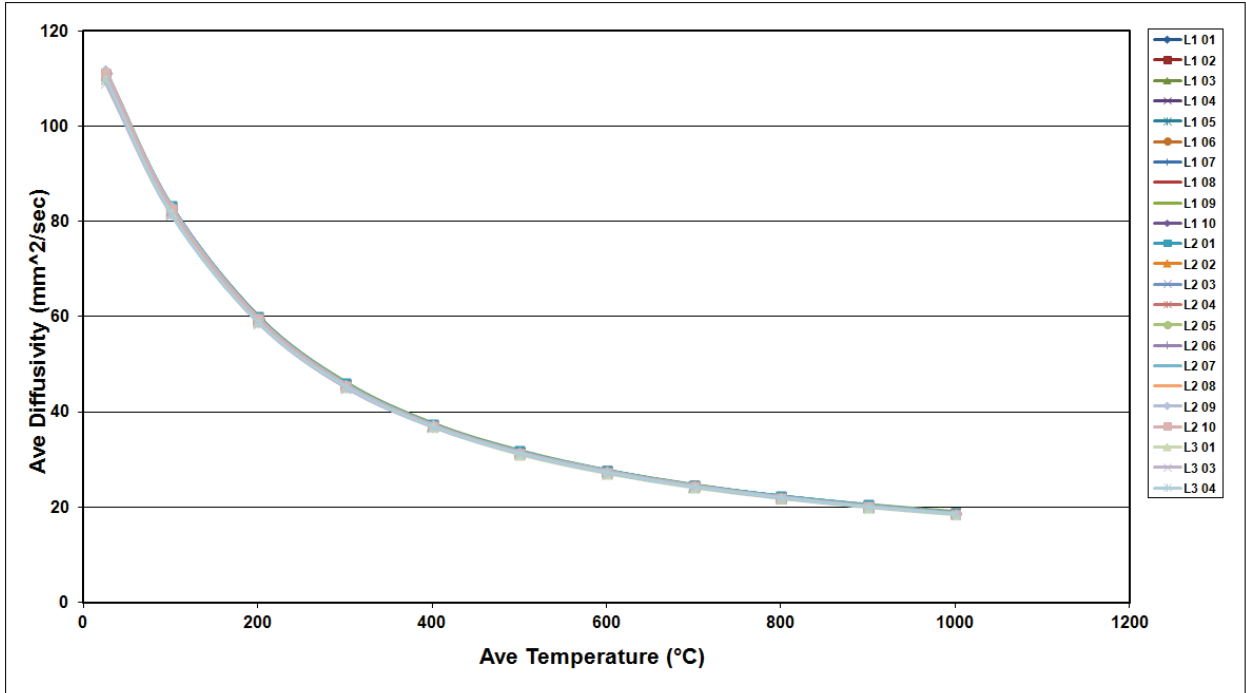


Figure A-263. PPEA Piggyback Diffusivity.

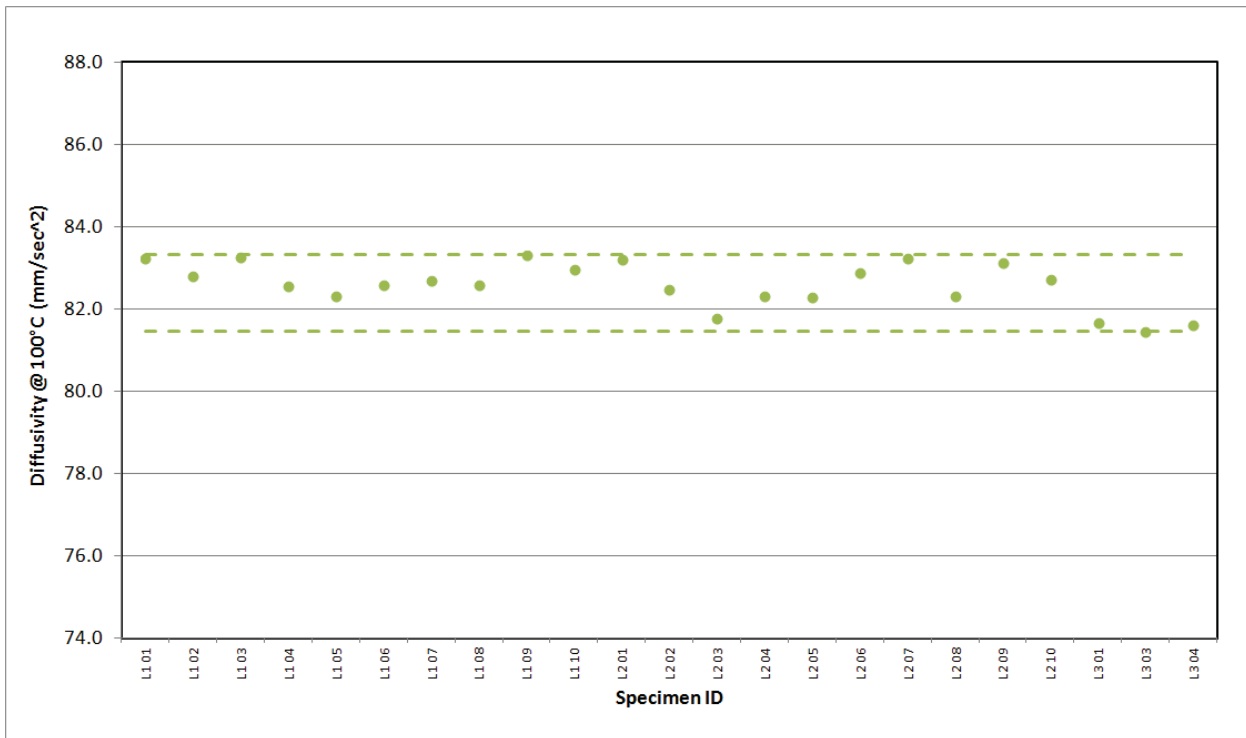


Figure A-264. PPEA Piggyback Diffusivity @ 100°C.

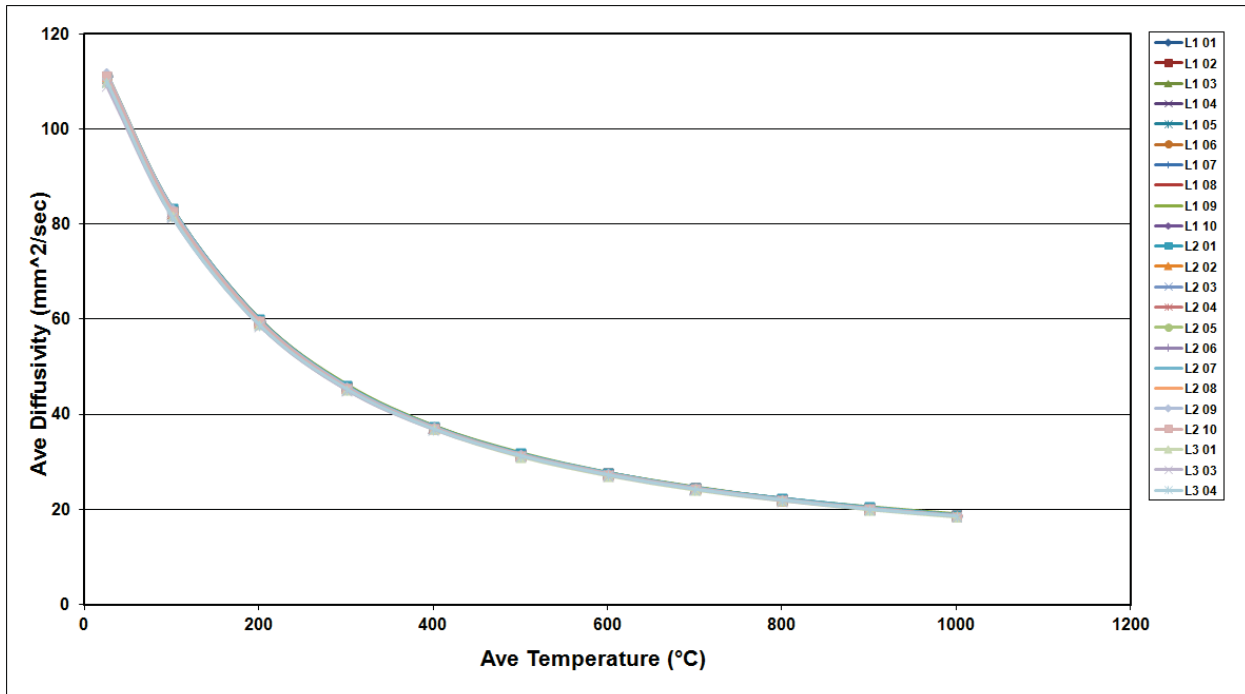


Figure A-263. PPEA Piggyback Diffusivity.

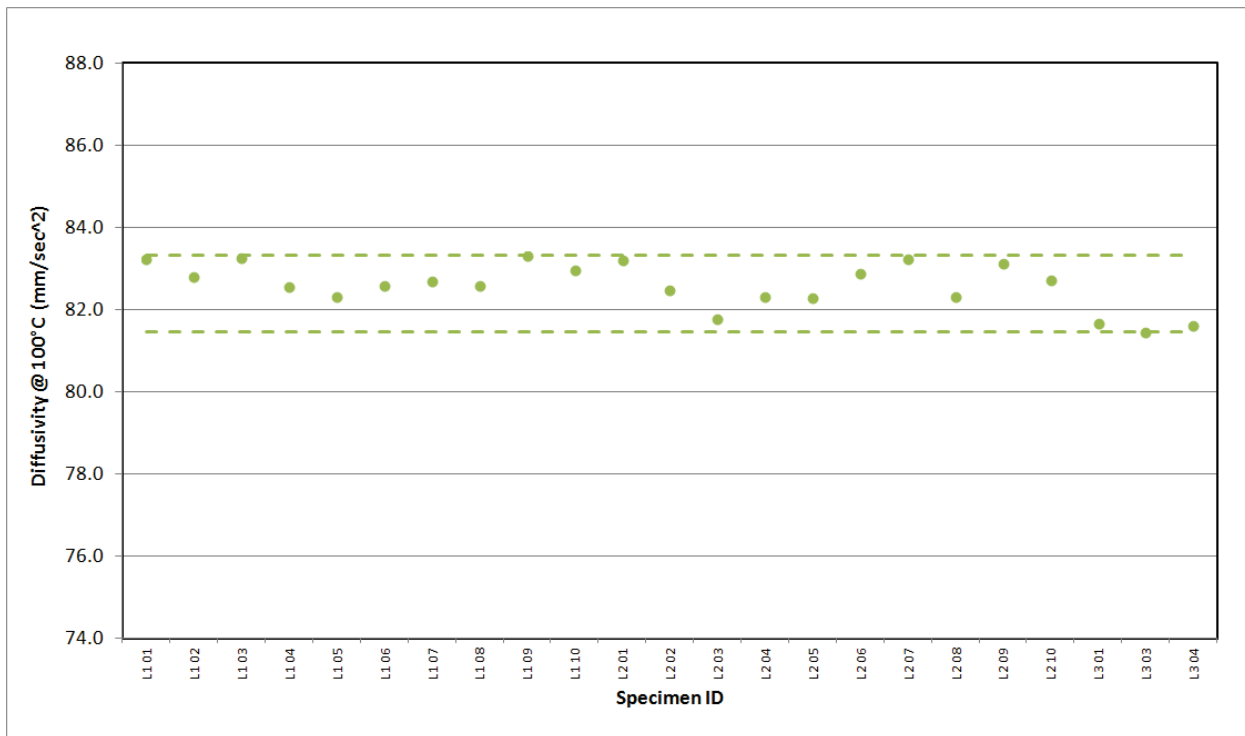


Figure A-264. PPEA Piggyback Diffusivity @ 100°C.

Appendix B
Statistical Tables

Appendix B Statistical Tables

Table B-1. Creep Pre Thermal Measurement Length (mm) Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	25.387	0.0083	0.03	25.389	25.397	25.377
IG-110	25.379	0.0087	0.03	25.381	25.399	25.363
IG-430	25.382	0.0037	0.01	25.382	25.386	25.378
NBG-17	25.377	0.0052	0.02	25.378	25.390	25.364
NBG-18	25.365	0.0053	0.02	25.365	25.377	25.355
PCEA	25.379	0.0124	0.05	25.373	25.405	25.343
Against Grain Specimens						
Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	25.391	0.0032	0.01	25.391	25.396	25.386
IG-110	25.383	0.0064	0.03	25.385	25.388	25.375
IG-430	25.384	0.0010	0.00	25.384	25.386	25.383
NBG-17	25.377	0.0057	0.02	25.378	25.390	25.365
NBG-18	25.364	0.0066	0.03	25.363	25.374	25.355
PCEA	25.392	0.0070	0.03	25.396	25.403	25.374
With Grain Specimens						
With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	25.382	0.0095	0.04	25.386	25.397	25.357
IG-110	25.376	0.0089	0.04	25.378	25.389	25.367
IG-430	25.381	0.0039	0.02	25.382	25.384	25.378
NBG-17	25.377	0.0045	0.02	25.377	25.387	25.365
NBG-18	25.367	0.0020	0.01	25.368	25.371	25.362
PCEA	25.375	0.0105	0.04	25.371	25.381	25.362

Table B-2. Creep Pre Thermal Measurement Diameter (mm) Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	12.740	0.0041	0.03	12.740	12.748	12.731
IG-110	12.734	0.0028	0.02	12.735	12.740	12.728
IG-430	12.731	0.0042	0.03	12.732	12.739	12.723
NBG-17	12.731	0.0043	0.03	12.730	12.740	12.721
NBG-18	12.730	0.0047	0.04	12.730	12.743	12.719
PCEA	12.737	0.0078	0.06	12.737	12.759	12.719
Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	12.739	0.0044	0.03	12.738	12.748	12.733
IG-110	12.735	0.0030	0.02	12.735	12.740	12.730
IG-430	12.732	0.0022	0.02	12.732	12.735	12.729
NBG-17	12.732	0.0043	0.03	12.732	12.741	12.723
NBG-18	12.731	0.0058	0.05	12.731	12.744	12.719
PCEA	12.746	0.0031	0.02	12.746	12.751	12.739
With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	12.740	0.0037	0.03	12.741	12.747	12.731
IG-110	12.734	0.0027	0.02	12.734	12.739	12.728
IG-430	12.731	0.0045	0.04	12.732	12.739	12.722
NBG-17	12.729	0.0037	0.03	12.729	12.736	12.721
NBG-18	12.729	0.0028	0.02	12.729	12.736	12.725
PCEA	12.734	0.0065	0.05	12.734	12.750	12.719

Table B-3.Creep Pre Thermal Measurement Mass (g) Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	5.485	0.0360	0.66	5.473	5.561	5.424
IG-110	5.654	0.0225	0.40	5.661	5.701	5.597
IG-430	5.764	0.0205	0.36	5.767	5.809	5.711
NBG-17	5.867	0.0694	1.18	5.909	5.935	5.740
NBG-18	5.948	0.0075	0.13	5.948	5.965	5.929
PCEA	5.657	0.0234	0.41	5.653	5.691	5.617
Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	5.465	0.0117	0.21	5.466	5.491	5.444
IG-110	5.656	0.0234	0.41	5.662	5.701	5.602
IG-430	5.770	0.0101	0.17	5.773	5.785	5.750
NBG-17	5.857	0.0771	1.32	5.904	5.934	5.740
NBG-18	5.948	0.0088	0.15	5.949	5.965	5.929
PCEA	5.683	0.0282	0.50	5.671	5.727	5.652
With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	5.505	0.0408	0.74	5.505	5.561	5.424
IG-110	5.652	0.0220	0.39	5.659	5.686	5.604
IG-430	5.762	0.0222	0.39	5.765	5.809	5.709
NBG-17	5.879	0.0575	0.98	5.911	5.935	5.788
NBG-18	5.949	0.0056	0.09	5.948	5.961	5.939
PCEA	5.649	0.0147	0.26	5.649	5.678	5.621

Table B-4. Creep Pre Thermal Measurement Density (g/cm³) Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	1.7217	0.0110	0.64	1.7180	1.7457	1.7041
IG-110	1.7779	0.0069	0.39	1.7802	1.7918	1.7591
IG-430	1.8132	0.0062	0.34	1.8141	1.8264	1.7974
NBG-17	1.8468	0.0216	1.17	1.8601	1.8675	1.8053
NBG-18	1.8720	0.0020	0.11	1.8720	1.8761	1.8673
PCEA	1.7769	0.0060	0.34	1.7758	1.7869	1.7665
Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	1.7153	0.0038	0.22	1.7156	1.7248	1.7082
IG-110	1.7784	0.0072	0.41	1.7804	1.7918	1.7633
IG-430	1.8148	0.0031	0.17	1.8157	1.8197	1.8087
NBG-17	1.8433	0.0237	1.28	1.8579	1.8661	1.8053
NBG-18	1.8722	0.0024	0.13	1.8725	1.8761	1.8656
PCEA	1.7812	0.0091	0.51	1.7773	1.7954	1.7720
With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	1.7283	0.0121	0.70	1.7292	1.7457	1.7041
IG-110	1.7775	0.0068	0.38	1.7801	1.7875	1.7629
IG-430	1.8127	0.0067	0.37	1.8133	1.8264	1.7974
NBG-17	1.8509	0.0181	0.98	1.8610	1.8675	1.8220
NBG-18	1.8719	0.0016	0.09	1.8718	1.8759	1.8686
PCEA	1.7756	0.0040	0.22	1.7755	1.7848	1.7669

Table B-5. Creep Coefficient of Thermal Expansion (1/K) at 100°C Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	3.18E-06	2.40E-07	7.54	3.12E-06	3.44E-06	2.90E-06
IG-110	3.87E-06	9.32E-08	2.41	3.84E-06	4.09E-06	3.70E-06
IG-430	4.16E-06	2.60E-07	6.26	4.24E-06	4.48E-06	3.74E-06
NBG-17	4.50E-06	1.36E-07	3.02	4.45E-06	4.86E-06	4.32E-06
NBG-18	4.85E-06	1.33E-07	2.75	4.85E-06	5.12E-06	4.55E-06
PCEA	3.92E-06	1.53E-07	3.89	3.89E-06	4.34E-06	3.69E-06
Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	3.71E-06	1.26E-07	3.41	3.71E-06	3.86E-06	3.57E-06
IG-110	3.82E-06	6.01E-08	1.57	3.81E-06	3.90E-06	3.76E-06
IG-430	3.63E-06	1.45E-07	4.00	3.63E-06	3.89E-06	3.49E-06
NBG-17	4.70E-06	1.01E-07	2.15	4.67E-06	4.86E-06	4.56E-06
NBG-18	4.76E-06	1.49E-07	3.12	4.74E-06	5.02E-06	4.55E-06
PCEA	4.05E-06	2.09E-07	5.17	4.09E-06	4.35E-06	3.69E-06
With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	3.09E-06	9.90E-08	3.20	3.12E-06	3.22E-06	2.90E-06
IG-110	3.88E-06	9.49E-08	2.45	3.86E-06	4.09E-06	3.70E-06
IG-430	4.25E-06	1.23E-07	2.90	4.28E-06	4.48E-06	3.97E-06
NBG-17	4.45E-06	9.95E-08	2.23	4.42E-06	4.71E-06	4.32E-06
NBG-18	4.88E-06	1.14E-07	2.35	4.88E-06	5.12E-06	4.70E-06
PCEA	3.87E-06	9.52E-08	2.46	3.87E-06	4.11E-06	3.74E-06

Table B-6. Creep Coefficient of Thermal Expansion (1/K) at 500°C Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	3.72E-06	2.30E-07	6.17	3.66E-06	3.86E-06	3.46E-06
IG-110	4.45E-06	8.61E-08	1.94	4.44E-06	4.64E-06	4.28E-06
IG-430	4.73E-06	2.25E-07	4.76	4.80E-06	5.01E-06	4.39E-06
NBG-17	5.06E-06	1.66E-07	3.27	5.09E-06	5.46E-06	4.78E-06
NBG-18	5.43E-06	8.72E-08	1.61	5.45E-06	5.58E-06	5.25E-06
PCEA	4.54E-06	1.39E-07	3.06	4.51E-06	4.77E-06	4.37E-06
Against Grain Specimens						
Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	4.25E-06	7.61E-08	1.79	4.23E-06	4.36E-06	4.19E-06
IG-110	4.38E-06	7.61E-08	1.74	4.38E-06	4.47E-06	4.29E-06
IG-430	4.27E-06	1.17E-07	2.74	4.25E-06	4.42E-06	4.11E-06
NBG-17	5.25E-06	1.51E-07	2.88	5.21E-06	5.46E-06	5.08E-06
NBG-18	5.36E-06	7.79E-08	1.45	5.36E-06	5.49E-06	5.26E-06
PCEA	4.69E-06	1.68E-07	3.57	4.77E-06	4.88E-06	4.42E-06
With Grain Specimens						
With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	3.63E-06	7.18E-08	1.98	3.65E-06	3.77E-06	3.46E-06
IG-110	4.45E-06	8.46E-08	1.90	4.44E-06	4.64E-06	4.28E-06
IG-430	4.82E-06	9.88E-08	2.05	4.81E-06	5.01E-06	4.62E-06
NBG-17	5.02E-06	1.41E-07	2.81	5.05E-06	5.21E-06	4.78E-06
NBG-18	5.45E-06	7.97E-08	1.46	5.48E-06	5.58E-06	5.25E-06
PCEA	4.49E-06	7.97E-08	1.77	4.50E-06	4.67E-06	4.37E-06

Table B-7. Creep Coefficient of Thermal Expansion (1/K) at 900°C Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	4.20E-06	2.27E-07	5.40	4.12E-06	4.37E-06	4.02E-06
IG-110	4.88E-06	8.59E-08	1.76	4.87E-06	5.04E-06	4.69E-06
IG-430	5.17E-06	2.28E-07	4.42	5.24E-06	5.50E-06	4.86E-06
NBG-17	5.53E-06	1.55E-07	2.80	5.58E-06	5.89E-06	5.26E-06
NBG-18	5.89E-06	7.29E-08	1.24	5.91E-06	6.03E-06	5.72E-06
PCEA	5.03E-06	1.31E-07	2.60	5.00E-06	5.23E-06	4.87E-06
Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	4.74E-06	6.13E-08	1.29	4.72E-06	4.82E-06	4.68E-06
IG-110	4.81E-06	5.88E-08	1.22	4.81E-06	4.87E-06	4.74E-06
IG-430	4.70E-06	1.03E-07	2.18	4.69E-06	4.86E-06	4.56E-06
NBG-17	5.71E-06	1.32E-07	2.32	5.65E-06	5.89E-06	5.57E-06
NBG-18	5.82E-06	6.06E-08	1.04	5.83E-06	5.89E-06	5.72E-06
PCEA	5.17E-06	1.68E-07	3.26	5.23E-06	5.40E-06	4.91E-06
With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	4.11E-06	5.95E-08	1.45	4.11E-06	4.26E-06	4.02E-06
IG-110	4.88E-06	8.54E-08	1.75	4.88E-06	5.04E-06	4.69E-06
IG-430	5.26E-06	1.02E-07	1.93	5.26E-06	5.47E-06	5.06E-06
NBG-17	5.49E-06	1.32E-07	2.41	5.54E-06	5.67E-06	5.26E-06
NBG-18	5.91E-06	6.16E-08	1.04	5.93E-06	6.03E-06	5.75E-06
PCEA	4.99E-06	7.08E-08	1.42	4.98E-06	5.16E-06	4.87E-06

Table B-8. Creep Modulus (GPa) by Sonic Resonance Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	9.66	0.76	7.83	9.83	10.46	8.74
IG-110	9.71	0.33	3.38	9.75	10.29	9.00
IG-430	9.59	0.52	5.43	9.50	10.31	8.98
NBG-17	11.26	0.46	4.11	11.52	11.82	10.46
NBG-18	12.09	0.25	2.10	12.13	12.63	11.53
PCEA	9.65	1.08	11.23	9.93	10.62	9.19
Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	8.01	0.13	1.64	8.03	8.15	7.83
IG-110	9.99	0.29	2.92	10.10	10.29	9.55
IG-430	10.64	0.22	2.07	10.69	10.89	10.38
NBG-17	11.16	0.03	0.29	11.16	11.20	11.12
NBG-18	12.42	0.10	0.84	12.43	12.63	12.25
PCEA	8.73	2.04	23.35	8.76	10.63	5.00
With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	9.94	0.30	3.07	9.87	10.46	9.49
IG-110	9.65	0.30	3.16	9.74	10.09	8.93
IG-430	9.39	0.23	2.43	9.39	9.80	8.98
NBG-17	11.28	0.51	4.51	11.56	11.82	10.46
NBG-18	11.99	0.19	1.59	12.02	12.35	11.53
PCEA	9.92	0.24	2.38	9.94	10.41	9.43

Table B-9. Creep Resistivity ($\mu\Omega\text{-m}$) Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	7.75	0.38	4.86	7.65	8.27	7.39
IG-110	11.21	0.40	3.60	11.08	12.33	10.61
IG-430	9.60	0.50	5.19	9.66	10.25	8.74
NBG-17	9.59	0.23	2.43	9.51	9.90	9.18
NBG-18	9.48	0.18	1.90	9.56	9.69	9.21
PCEA	7.62	0.34	4.45	7.51	7.79	7.34
Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	8.57	0.11	1.30	8.56	8.71	8.47
IG-110	10.98	0.32	2.88	11.09	11.43	10.61
IG-430	8.63	0.17	1.92	8.58	8.87	8.43
NBG-17	9.85	0.03	0.28	9.84	9.90	9.81
NBG-18	9.17	0.05	0.53	9.15	9.25	9.10
PCEA	8.02	0.51	6.39	8.29	8.59	7.38
With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	7.61	0.15	1.94	7.62	7.90	7.39
IG-110	11.25	0.41	3.63	11.07	12.35	10.71
IG-430	9.79	0.25	2.56	9.78	10.25	9.29
NBG-17	9.51	0.21	2.22	9.46	9.90	9.18
NBG-18	9.58	0.06	0.60	9.58	9.69	9.45
PCEA	7.50	0.07	1.00	7.51	7.64	7.34

Table B-10. Creep Young's Modulus (GPa) by Sonic Velocity.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	11.80	0.72	6.10	11.94	12.74	10.50
IG-110	10.87	0.38	3.46	10.91	11.83	10.13
IG-430	10.72	0.64	5.97	10.56	11.46	9.96
NBG-17	14.29	0.61	4.28	14.42	15.06	13.00
NBG-18	15.61	0.37	2.34	15.59	16.46	14.70
PCEA	12.30	0.58	4.70	12.47	12.96	11.68
Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	10.29	0.10	0.94	10.32	10.38	10.16
IG-110	11.20	0.45	3.97	11.19	11.95	10.58
IG-430	12.01	0.23	1.94	12.04	12.37	11.70
NBG-17	14.23	0.10	0.72	14.23	14.42	14.05
NBG-18	16.11	0.17	1.08	16.10	16.46	15.86
PCEA	11.76	0.97	8.24	11.19	12.96	10.65
With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	12.06	0.36	2.94	12.04	12.74	11.52
IG-110	10.81	0.33	3.08	10.83	11.29	10.13
IG-430	10.46	0.27	2.54	10.48	10.95	9.96
NBG-17	14.31	0.70	4.86	14.64	15.06	13.00
NBG-18	15.46	0.26	1.70	15.48	16.09	14.88
PCEA	12.47	0.17	1.40	12.50	12.85	12.10

Table B-11. Creep Shear Modulus (GPa) by Sonic Velocity.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	4.41	0.15	3.36	4.43	4.62	4.10
IG-110	4.35	0.14	3.32	4.37	4.53	4.06
IG-430	4.36	0.12	2.72	4.34	4.62	4.20
NBG-17	4.83	0.17	3.43	4.88	5.11	4.51
NBG-18	5.25	0.05	1.03	5.24	5.35	5.15
PCEA	4.53	0.13	2.95	4.57	4.78	4.26
Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	4.13	0.09	2.14	4.15	4.22	4.01
IG-110	4.39	0.14	3.19	4.38	4.52	4.12
IG-430	4.54	0.14	2.99	4.52	4.78	4.36
NBG-17	4.87	0.02	0.40	4.88	4.90	4.83
NBG-18	5.32	0.05	0.92	5.33	5.38	5.24
PCEA	4.47	0.20	4.43	4.38	4.78	4.26
With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
H451	4.46	0.09	2.01	4.47	4.62	4.29
IG-110	4.34	0.15	3.35	4.37	4.53	4.06
IG-430	4.33	0.08	1.76	4.32	4.50	4.20
NBG-17	4.81	0.19	3.87	4.89	5.11	4.51
NBG-18	5.23	0.03	0.67	5.23	5.32	5.15
PCEA	4.55	0.10	2.24	4.57	4.68	4.31

Table B-12a. Piggyback Pre Thermal Measurement Length (mm) Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114	6.330	0.007	0.11	6.330	6.341	6.314
A3 Matrix	6.325	0.009	0.14	6.323	6.331	6.317
BAN	6.329	0.007	0.11	6.330	6.338	6.323
H451	6.330	0.006	0.10	6.329	6.336	6.321
HLM	6.329	0.003	0.05	6.330	6.335	6.322
IG-110	6.347	0.004	0.06	6.346	6.353	6.340
IG-430	6.331	0.005	0.08	6.330	6.333	6.328
NBG-10	6.326	0.003	0.04	6.326	6.330	6.322
NBG-17	6.325	0.010	0.16	6.325	6.350	6.308
NBG-18	6.321	0.008	0.12	6.319	6.337	6.305
NBG-25	6.333	0.007	0.11	6.333	6.342	6.326
New Matrix	6.322	0.016	0.26	6.320	6.347	6.296
PCEA	6.340	0.012	0.20	6.339	6.349	6.330
PCIB	6.328	0.003	0.05	6.328	6.337	6.324
PGX	6.327	0.008	0.13	6.329	6.339	6.316
PPEA	6.328	0.004	0.06	6.328	6.334	6.321

Table B-12b. Piggyback Pre Thermal Measurement Length (mm) Summary Statistics.

Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114	6.330	0.007	0.11	6.330	6.341	6.314
A3 Matrix						
BAN						
H451	6.330	0.005	0.08	6.329	6.332	6.327
HLM						
IG-110						
IG-430						
NBG-10						
NBG-17	6.322	0.009	0.15	6.321	6.342	6.311
NBG-18	6.320	0.009	0.14	6.318	6.332	6.308
NBG-25						
New Matrix						
PCEA	6.346	0.010	0.15	6.340	6.363	6.335
PCIB						
PGX						
PPEA						

Table B-12c. Piggyback Pre Thermal Measurement Length (mm) Summary Statistics.

With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114						
A3 Matrix						
BAN	6.329	0.007	0.11	6.330	6.338	6.323
H451	6.330	0.007	0.12	6.329	6.340	6.317
HLM						
IG-110	6.347	0.004	0.06	6.346	6.353	6.340
IG-430	6.331	0.005	0.08	6.330	6.333	6.328
NBG-10						
NBG-17	6.329	0.010	0.16	6.330	6.345	6.315
NBG-18	6.324	0.005	0.07	6.325	6.330	6.315
NBG-25						
New Matrix						
PCEA	6.335	0.013	0.20	6.337	6.340	6.336
PCIB						
PGX	6.327	0.008	0.13	6.329	6.339	6.316
PPEA						

Table B-13a. Piggyback Pre Thermal Measurement Diameter (mm) Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114	12.726	0.005	0.04	12.726	12.735	12.713
A3 Matrix	12.720	0.006	0.05	12.719	12.729	12.713
BAN	12.721	0.005	0.04	12.722	12.734	12.710
H451	12.733	0.002	0.02	12.733	12.737	12.730
HLM	12.726	0.007	0.05	12.727	12.737	12.717
IG-110	12.734	0.002	0.01	12.735	12.738	12.731
IG-430	12.729	0.005	0.04	12.728	12.733	12.726
NBG-10	12.720	0.005	0.04	12.719	12.727	12.711
NBG-17	12.730	0.002	0.02	12.730	12.735	12.726
NBG-18	12.724	0.004	0.04	12.723	12.727	12.720
NBG-25	12.730	0.002	0.02	12.730	12.735	12.726
New Matrix	12.719	0.009	0.07	12.717	12.735	12.709
PCEA	12.733	0.005	0.04	12.733	12.744	12.726
PCIB	12.728	0.004	0.03	12.727	12.738	12.721
PGX	12.729	0.004	0.04	12.728	12.738	12.724
PPEA	12.728	0.005	0.04	12.729	12.741	12.721

Table B-13b. Piggyback Pre Thermal Measurement Diameter (mm) Summary Statistics.

Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114	12.726	0.005	0.04	12.726	12.735	12.713
A3 Matrix						
BAN						
H451	12.733	0.002	0.02	12.733	12.737	12.730
HLM						
IG-110						
IG-430						
NBG-10						
NBG-17	12.731	0.002	0.02	12.730	12.735	12.728
NBG-18	12.725	0.005	0.04	12.724	12.728	12.720
NBG-25						
New Matrix						
PCEA	12.733	0.005	0.04	12.734	12.742	12.726
PCIB						
PGX						
PPEA						

Table B-13c. Piggyback Pre Thermal Measurement Diameter (mm) Summary Statistics.

With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114						
A3 Matrix						
BAN	12.721	0.005	0.04	12.722	12.734	12.710
H451	12.733	0.001	0.01	12.732	12.735	12.731
HLM						
IG-110	12.734	0.002	0.01	12.735	12.738	12.731
IG-430	12.729	0.005	0.04	12.728	12.733	12.726
NBG-10						
NBG-17	12.730	0.003	0.02	12.730	12.734	12.726
NBG-18	12.722	0.001	0.01	12.722	12.725	12.721
NBG-25						
New Matrix						
PCEA	12.733	0.005	0.04	12.732	12.744	12.727
PCIB						
PGX	12.729	0.004	0.04	12.728	12.738	12.724
PPEA						

Table B-14a. Piggyback Pre Thermal Measurement Mass (g) Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114	1.462	0.01	0.49	1.461	1.472	1.454
A3 Matrix	1.143	0.03	2.74	1.135	1.205	1.090
BAN	1.475	0.01	0.61	1.473	1.498	1.460
H451	1.395	0.01	0.96	1.392	1.413	1.375
HLM	1.411	0.00	0.19	1.412	1.416	1.406
IG-110	1.433	0.00	0.32	1.433	1.441	1.424
IG-430	1.460	0.00	0.29	1.459	1.467	1.454
NBG-10	1.438	0.00	0.29	1.438	1.444	1.428
NBG-17	1.500	0.01	0.39	1.501	1.505	1.494
NBG-18	1.502	0.00	0.18	1.501	1.508	1.497
NBG-25	1.486	0.00	0.15	1.485	1.489	1.482
New Matrix	1.386	0.04	2.86	1.399	1.445	1.337
PCEA	1.427	0.00	0.30	1.426	1.436	1.418
PCIB	1.474	0.00	0.24	1.474	1.479	1.465
PGX	1.423	0.00	0.24	1.424	1.430	1.414
PPEA	1.476	0.00	0.15	1.476	1.482	1.472

Table B-14b. Piggyback Pre Thermal Measurement Mass (g) Summary Statistics.

Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114	1.462	0.01	0.49	1.461	1.472	1.454
A3 Matrix						
BAN						
H451	1.384	0.01	0.39	1.383	1.392	1.375
HLM						
IG-110						
IG-430						
NBG-10						
NBG-17	1.500	0.00	0.20	1.500	1.504	1.493
NBG-18	1.502	0.00	0.17	1.502	1.508	1.498
NBG-25						
New Matrix						
PCEA	1.428	0.00	0.32	1.427	1.436	1.421
PCIB						
PGX						
PPEA						

Table B-14c. Piggyback Pre Thermal Measurement Mass (g) Summary Statistics.

With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114						
A3 Matrix						
BAN	1.475	0.01	0.61	1.473	1.498	1.460
H451	1.408	0.00	0.18	1.408	1.413	1.405
HLM						
IG-110	1.433	0.00	0.32	1.433	1.441	1.424
IG-430	1.460	0.00	0.29	1.459	1.467	1.454
NBG-10						
NBG-17	1.500	0.01	0.63	1.503	1.505	1.496
NBG-18	1.500	0.00	0.15	1.500	1.504	1.497
NBG-25						
New Matrix						
PCEA	1.425	0.00	0.24	1.425	1.430	1.418
PCIB						
PGX	1.423	0.00	0.24	1.424	1.430	1.414
PPEA						

Table B-15a. Piggyback Pre Thermal Measurement Density (g/cm³) Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114	1.8164	0.0076	0.42	1.8168	1.8273	1.8062
A3 Matrix	1.4224	0.0384	2.70	1.4115	1.5000	1.3567
BAN	1.8341	0.0110	0.60	1.8313	1.8612	1.8127
H451	1.7307	0.0167	0.96	1.7260	1.7534	1.7060
HLM	1.7531	0.0037	0.21	1.7530	1.7591	1.7443
IG-110	1.7729	0.0057	0.32	1.7726	1.7827	1.7617
IG-430	1.8117	0.0062	0.34	1.8101	1.8237	1.8038
NBG-10	1.7884	0.0043	0.24	1.7877	1.7952	1.7810
NBG-17	1.8629	0.0063	0.34	1.8643	1.8705	1.8527
NBG-18	1.8683	0.0029	0.16	1.8685	1.8728	1.8619
NBG-25	1.8433	0.0023	0.12	1.8432	1.8481	1.8391
New Matrix	1.7255	0.0449	2.60	1.7370	1.7972	1.6736
PCEA	1.7673	0.0046	0.26	1.7670	1.7752	1.7584
PCIB	1.8302	0.0046	0.25	1.8300	1.8390	1.8207
PGX	1.7680	0.0032	0.18	1.7678	1.7732	1.7623
PPEA	1.8335	0.0033	0.18	1.8336	1.8395	1.8277

Table B-15b. Piggyback Pre Thermal Measurement Density (g/cm³) Summary Statistics.

Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114	1.8164	0.0076	0.42	1.8168	1.8273	1.8062
A3 Matrix						
BAN						
H451	1.7165	0.0068	0.40	1.7166	1.7262	1.7060
HLM						
IG-110						
IG-430						
NBG-10						
NBG-17	1.8634	0.0035	0.19	1.8641	1.8684	1.8569
NBG-18	1.8694	0.0023	0.12	1.8699	1.8728	1.8641
NBG-25						
New Matrix						
PCEA	1.7678	0.0055	0.31	1.7682	1.7752	1.7584
PCIB						
PGX						
PPEA						

Table B-15c. Piggyback Pre Thermal Measurement Density (g/cm³) Summary Statistics.

With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114						
A3 Matrix						
BAN	1.8341	0.0110	0.60	1.8313	1.8612	1.8127
H451	1.7476	0.0029	0.17	1.7472	1.7504	1.7447
HLM						
IG-110	1.7729	0.0057	0.32	1.7726	1.7827	1.7617
IG-430	1.8117	0.0062	0.34	1.8101	1.8237	1.8038
NBG-10						
NBG-17	1.8619	0.0100	0.54	1.8643	1.8705	1.8556
NBG-18	1.8659	0.0027	0.14	1.8657	1.8694	1.8619
NBG-25						
New Matrix						
PCEA	1.7668	0.0036	0.20	1.7663	1.7722	1.7611
PCIB						
PGX	1.7680	0.0032	0.18	1.7678	1.7732	1.7623
PPEA						

Table B-16a. Piggyback Diffusivity (mm²/sec) at 100°C Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114	65.45	1.00	1.53	65.65	66.84	63.95
A3 Matrix	10.99	0.73	6.68	10.91	12.13	9.82
BAN	99.77	2.35	2.35	100.09	104.32	94.70
H451	97.10	6.25	6.44	97.10	104.36	90.57
HLM	110.02	2.60	2.36	110.01	113.60	104.61
IG-110	72.02	1.10	1.53	71.93	73.87	70.06
IG-430	79.15	1.28	1.62	78.93	81.15	76.75
NBG-10	80.79	0.50	0.61	80.95	81.32	79.94
NBG-17	78.67	1.03	1.31	79.23	79.81	77.33
NBG-18	79.72	1.63	2.04	79.13	81.82	77.50
NBG-25	68.11	0.28	0.40	68.08	68.71	67.54
New Matrix	16.37	0.89	5.41	16.25	17.91	15.36
PCEA	98.13	3.85	3.92	99.92	101.60	91.75
PCIB	71.77	0.64	0.89	71.88	72.53	70.59
PGX	71.17	0.46	0.64	71.25	72.22	70.13
PPEA	82.60	0.56	0.68	82.62	83.32	81.46

Table B-16b. Piggyback Diffusivity (mm²/sec) at 100°C Summary Statistics.

Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114	65.45	1.00	1.53	65.65	66.84	63.95
A3 Matrix						
BAN						
H451	91.17	0.65	0.71	90.95	92.26	90.57
HLM						
IG-110						
IG-430						
NBG-10						
NBG-17	77.40	0.07	0.09	77.39	77.47	77.33
NBG-18	81.70	0.13	0.16	81.73	81.82	81.49
NBG-25						
New Matrix						
PCEA	91.51	0.36	0.39	91.60	91.81	91.11
PCIB						
PGX						
PPEA						

Table B-16c. Piggyback Diffusivity (mm²/sec) at 100°C Summary Statistics.

With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114						
A3 Matrix						
BAN	99.77	2.35	2.35	100.09	104.32	94.70
H451	103.04	0.96	0.94	102.91	104.36	101.94
HLM						
IG-110	72.02	1.10	1.53	71.93	73.87	70.06
IG-430	79.15	1.28	1.62	78.93	81.15	76.75
NBG-10						
NBG-17	79.30	0.49	0.62	79.39	79.81	78.69
NBG-18	78.61	0.68	0.87	78.93	79.43	77.50
NBG-25						
New Matrix						
PCEA	100.12	0.84	0.84	100.16	101.36	98.58
PCIB						
PGX	71.17	0.46	0.64	71.25	72.22	70.13
PPEA						

Table B-17a. Piggyback Diffusivity (mm²/sec) at 500°C Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114	27.10	0.29	1.06	27.15	27.57	26.60
A3 Matrix	4.59	0.39	8.44	4.50	5.24	3.93
BAN	35.15	0.85	2.43	35.29	36.56	33.64
H451	34.16	2.32	6.79	34.20	37.28	31.68
HLM	37.39	0.92	2.47	37.57	38.79	35.61
IG-110	27.96	0.44	1.58	27.97	28.56	27.10
IG-430	29.25	0.45	1.55	29.16	29.83	28.39
NBG-10	30.33	0.21	0.70	30.34	30.63	29.86
NBG-17	29.76	0.46	1.54	29.81	30.40	29.17
NBG-18	30.30	0.62	2.03	30.11	31.20	29.54
NBG-25	27.54	0.15	0.53	27.58	27.82	27.24
New Matrix	7.44	0.51	6.84	7.36	8.40	6.78
PCEA	35.63	1.48	4.14	36.31	36.80	33.18
PCIB	28.35	0.20	0.72	28.39	28.63	27.95
PGX	26.09	0.18	0.68	26.08	26.49	25.69
PPEA	31.53	0.18	0.58	31.56	31.87	31.19

Table B-17b. Piggyback Diffusivity (mm²/sec) at 500°C Summary Statistics.

Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114	27.10	0.29	1.06	27.15	27.57	26.60
A3 Matrix						
BAN						
H451	31.97	0.23	0.72	31.92	32.30	31.68
HLM						
IG-110						
IG-430						
NBG-10						
NBG-17	29.21	0.04	0.14	29.22	29.25	29.17
NBG-18	31.05	0.10	0.33	31.00	31.20	30.97
NBG-25						
New Matrix						
PCEA	33.08	0.22	0.66	33.15	33.25	32.84
PCIB						
PGX						
PPEA						

Table B-17c. Piggyback Diffusivity (mm²/sec) at 500°C Summary Statistics.

With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114						
A3 Matrix						
BAN	35.15	0.85	2.43	35.29	36.56	33.64
H451	36.36	0.46	1.26	36.17	36.63	36.10
HLM						
IG-110	27.96	0.44	1.58	27.97	28.56	27.10
IG-430	29.25	0.45	1.55	29.16	29.83	28.39
NBG-10						
NBG-17	30.04	0.25	0.82	30.06	30.40	29.72
NBG-18	29.88	0.26	0.85	29.97	30.17	29.54
NBG-25						
New Matrix						
PCEA	36.40	0.27	0.74	36.41	36.80	35.84
PCIB						
PGX	26.09	0.18	0.68	26.08	26.49	25.69
PPEA						

Table B-18a. Piggyback Diffusivity (mm²/sec) at 900°C Summary Statistics.

Combined Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114	17.91	0.18	1.00	17.93	18.22	17.43
A3 Matrix	3.09	0.27	8.63	3.06	3.53	2.45
BAN	21.86	0.52	2.37	21.97	22.67	21.07
H451	21.33	1.46	6.85	21.39	23.17	19.79
HLM	23.03	0.56	2.45	23.09	23.86	22.02
IG-110	18.08	0.26	1.44	18.08	18.45	17.61
IG-430	18.54	0.29	1.55	18.54	18.99	18.08
NBG-10	19.35	0.14	0.74	19.35	19.63	19.11
NBG-17	19.03	0.33	1.72	19.05	19.46	18.59
NBG-18	19.42	0.38	1.98	19.36	20.05	18.95
NBG-25	18.05	0.11	0.60	18.07	18.24	17.79
New Matrix	5.10	0.48	9.40	5.13	5.96	4.44
PCEA	22.34	0.90	4.01	22.75	23.09	20.86
PCIB	18.38	0.14	0.76	18.41	18.61	18.05
PGX	16.57	0.12	0.72	16.58	16.82	16.33
PPEA	20.24	0.14	0.71	20.25	20.50	19.96

Table B-18b. Piggyback Diffusivity (mm²/sec) at 900°C Summary Statistics.

Against Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114	17.91	0.18	1.00	17.93	18.22	17.43
A3 Matrix						
BAN						
H451	19.94	0.16	0.82	19.87	20.19	19.79
HLM						
IG-110						
IG-430						
NBG-10						
NBG-17	18.64	0.05	0.24	18.65	18.68	18.59
NBG-18	19.88	0.12	0.62	19.92	20.05	19.75
NBG-25						
New Matrix						
PCEA	20.79	0.12	0.56	20.80	20.91	20.68
PCIB						
PGX						
PPEA						

Table B-18c. Piggyback Diffusivity (mm²/sec) at 900°C Summary Statistics.

With Grain Specimens	Mean	Std Dev	CoV (%)	Median	Upper Limit	Lower Limit
2114						
A3 Matrix						
BAN	21.86	0.52	2.37	21.97	22.67	21.07
H451	22.71	0.23	1.01	22.61	22.91	22.58
HLM						
IG-110	18.08	0.26	1.44	18.08	18.45	17.61
IG-430	18.54	0.29	1.55	18.54	18.99	18.08
NBG-10						
NBG-17	19.23	0.18	0.94	19.26	19.46	18.98
NBG-18	19.17	0.18	0.92	19.18	19.37	18.95
NBG-25						
New Matrix						
PCEA	22.80	0.18	0.79	22.79	23.09	22.44
PCIB						
PGX	16.57	0.12	0.72	16.58	16.82	16.33
PPEA						

Appendix C

Raw Data

Graphite Grade:	H-451
Graphite Manufacturer:	SGL Carbon Company
Forming Process:	Extruded
Coke Particle Size:	Medium grain
Coke Type:	Petroleum coke
ASTM Class:	ENHP
Specimen Geometry:	Cylinder

Specimen ID #'s:

CW1 01
CW1 02
CW1 03
CW2 01
CW2 02
CW2 03
CW3 01
CW3 02
CW3 03
CW4 01
CW4 02
CW4 03
CW5 01
CW5 02
CW5 03
CW6 01
CW6 02
CW6 03
CW7 01
CW7 02
CW7 03
CW8 01
CW8 02
CW8 03
CW9 01
CW9 02
CW9 03
CW10 01
CW10 02
CW10 03
CW11 01
CW11 02
CW11 03
CW12 01
CW12 02
CW12 03
CW13 01
CW13 02
CW13 03
CA1 01
CA1 02
CA1 03

Specimen ID #'s:

CA1 04
CA2 01
CA2 02
CA2 03
CA2 04
CA2 01
CA2 02
CA2 03
CA2 04
CA3 01
CA3 02
CA3 03
CA3 04
CA4 01
CA4 02
CA4 03
CA4 04
CA5 01
CA5 02
CA5 03
CA5 04
CA6 01
CA6 02
CA6 03
CA6 04
CA7 01
CA7 02
CA7 03
CA7 04
CA8 01
CA8 02
CA8 03
CA8 04
CA9 01
CA9 02
CA9 03
CA9 04
CA10 01
CA10 02
CA10 03
CA10 04

Specimen Type	Specimen Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
C	CW11 01	W	25.385	25.386	25.384	25.386	12.740	12.740	12.744
C	CW1 02	W	25.355	25.353	25.359	25.360	12.729	12.731	12.729
C	CW3 03	W	25.393	25.393	25.393	25.393	12.733	12.736	12.735
C	CW10 02	W	25.385	25.385	25.386	25.384	12.736	12.738	12.740
C	CW12 02	W	25.388	25.387	25.386	25.388	12.737	12.740	12.743
C	CW1 01	W	25.361	25.360	25.361	25.360	12.728	12.730	12.730
C	CW9 02	W	25.388	25.386	25.386	25.386	12.739	12.738	12.742
C	CW6 03	W	25.374	25.377	25.377	25.375	12.734	12.734	12.736
C	CW9 01	W	25.370	25.369	25.371	25.372	12.743	12.738	12.739
C	CW6 02	W	25.379	25.380	25.375	25.379	12.740	12.741	12.738
C	CW7 03	W	25.375	25.375	25.375	25.374	12.733	12.733	12.733
C	CW12 03	W	25.387	25.386	25.386	25.386	12.745	12.742	12.738
C	CW5 03	W	25.366	25.368	25.366	25.367	12.738	12.742	12.741
C	CW7 02	W	25.375	25.374	25.374	25.376	12.736	12.738	12.738
C	CW7 01	W	25.372	25.374	25.375	25.372	12.741	12.739	12.738
C	CW8 01	W	25.375	25.376	25.375	25.375	12.737	12.738	12.735
C	CW13 03	W	25.388	25.388	25.387	25.388	12.740	12.739	12.741
C	CW10 01	W	25.387	25.389	25.389	25.387	12.740	12.742	12.744
C	CW11 02	W	25.388	25.388	25.389	25.389	12.749	12.745	12.742
C	CW1 03	W	25.367	25.368	25.366	25.366	12.742	12.742	12.741
C	CW3 01	W	25.377	25.379	25.379	25.378	12.735	12.735	12.737
C	CW13 02	W	25.390	25.390	25.390	25.389	12.738	12.738	12.742
C	CW2 01	W	25.378	25.379	25.376	25.378	12.742	12.743	12.742
C	CW4 02	W	25.382	25.382	25.377	25.380	12.739	12.739	12.740
C	CW12 01	W	25.390	25.390	25.390	25.390	12.741	12.744	12.745
C	CW3 02	W	25.390	25.389	25.388	25.389	12.739	12.738	12.737
C	CW8 03	W	25.374	25.374	25.376	25.376	12.740	12.741	12.739
C	CW11 03	W	25.389	25.389	25.390	25.391	12.740	12.741	12.744
C	CW6 01	W	25.388	25.388	25.387	25.387	12.750	12.747	12.746
C	CW2 03	W	25.388	25.389	25.389	25.387	12.744	12.740	12.742
C	CW5 01	W	25.396	25.394	25.396	25.397	12.745	12.745	12.747
C	CW5 02	W	25.382	25.381	25.382	25.382	12.745	12.746	12.747
C	CW10 03	W	25.389	25.388	25.389	25.390	12.744	12.741	12.741

Specimen Type	Specimen Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
C	CW9 03	W	25.389	25.390	25.388	25.387	12.744	12.740	12.739
C	CW4 03	W	25.393	25.393	25.390	25.392	12.742	12.742	12.742
C	CW4 01	W	25.396	25.398	25.395	25.397	12.743	12.742	12.741
C	CW13 01	W	25.389	25.388	25.388	25.389	12.742	12.743	12.747
C	CW2 02	W	25.390	25.390	25.388	25.390	12.742	12.743	12.743
C	CW8 02	W	25.377	25.376	25.377	25.376	12.740	12.738	12.739
C	CA6 03	A	25.390	25.390	25.393	25.392	12.734	12.732	12.732
C	CA2 04	A	25.390	25.389	25.390	25.391	12.745	12.746	12.752
C	CA1 04	A	25.391	25.388	25.387	25.390	12.740	12.740	12.743
C	CA7 04	A	25.394	25.395	25.393	25.393	12.734	12.732	12.734
C	CA8 03	A	25.395	25.394	25.395	25.395	12.735	12.734	12.731
C	CA1 03	A	25.389	25.388	25.388	25.389	12.736	12.741	12.742
C	CA8 01	A	25.396	25.394	25.395	25.395	12.737	12.737	12.738
C	CA10 02	A	25.392	25.393	25.395	25.396	12.737	12.737	12.739
C	CA6 02	A	25.391	25.391	25.393	25.392	12.733	12.734	12.735
C	CA4 04	A	25.389	25.391	25.388	25.389	12.750	12.748	12.743
C	CA3 03	A	25.387	25.387	25.387	25.389	12.745	12.747	12.748
C	CA4 01	A	25.386	25.388	25.384	25.385	12.741	12.740	12.743
C	CA8 02	A	25.392	25.395	25.393	25.395	12.730	12.731	12.732
C	CA5 04	A	25.391	25.389	25.390	25.391	12.736	12.733	12.736
C	CA7 03	A	25.396	25.397	25.396	25.393	12.736	12.735	12.732
C	CA4 03	A	25.388	25.388	25.388	25.387	12.743	12.745	12.747
C	CA3 01	A	25.387	25.387	25.389	25.388	12.742	12.743	12.745
C	CA9 03	A	25.396	25.396	25.396	25.395	12.733	12.734	12.734
C	CA3 02	A	25.388	25.387	25.387	25.386	12.744	12.743	12.745
C	CA6 01	A	25.391	25.393	25.390	25.391	12.733	12.737	12.739
C	CA2 02	A	25.389	25.388	25.387	25.387	12.739	12.738	12.737
C	CA10 03	A	25.395	25.394	25.395	25.395	12.741	12.742	12.737
C	CA9 02	A	25.394	25.396	25.395	25.394	12.739	12.740	12.741
C	CA7 01	A	25.393	25.395	25.393	25.395	12.738	12.735	12.736
C	CA3 04	A	25.387	25.389	25.385	25.389	12.748	12.750	12.745
C	CA10 04	A	25.394	25.394	25.394	25.393	12.738	12.737	12.733
C	CA9 04	A	25.394	25.396	25.398	25.396	12.738	12.736	12.737

Specimen Type	Specimen Number	Specimen Grain Orientation	Specimen Length Measurements, mm			
			L1	L2	L3	L4
C	CA1 01	A	25.389	25.391	25.389	25.389
C	CA8 04	A	25.394	25.395	25.396	25.396
C	CA5 01	A	25.388	25.389	25.389	25.390
C	CA2 03	A	25.386	25.387	25.388	25.387
C	CA1 02	A	25.386	25.388	25.390	25.388
C	CA10 01	A	25.396	25.396	25.395	25.394
C	CA5 02	A	25.389	25.390	25.390	25.392
C	CA4 02	A	25.386	25.387	25.387	25.387
C	CA6 04	A	25.393	25.393	25.391	25.391
C	CA9 01	A	25.395	25.395	25.395	25.396
C	CA2 01	A	25.388	25.390	25.390	25.389
C	CA5 03	A	25.389	25.389	25.390	25.389
C	CA7 02	A	25.391	25.392	25.392	25.393

Specimen	Outside Diameter Measurements, mm		
	D1	D2	D3
	12.745	12.741	12.740
	12.738	12.736	12.737
	12.738	12.743	12.739
	12.741	12.741	12.746
	12.740	12.739	12.742
	12.740	12.737	12.734
	12.741	12.735	12.733
	12.742	12.740	12.740
	12.735	12.734	12.734
	12.733	12.734	12.731
	12.739	12.735	12.735
	12.733	12.729	12.731
	12.737	12.737	12.736

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
CW11 01	12.744	12.740	12.741	12.743	12.744	3.090	3.080	3.090	3.090
CW1 02	12.728	12.732	12.733	12.734	12.735	3.100	3.100	3.090	3.110
CW3 03	12.734	12.737	12.734	12.733	12.732	3.080	3.080	3.100	3.110
CW10 02	12.740	12.738	12.739	12.741	12.744	3.100	3.100	3.090	3.090
CW12 02	12.745	12.737	12.740	12.744	12.744	3.100	3.100	3.100	3.100
CW1 01	12.729	12.735	12.734	12.732	12.733	3.100	3.090	3.090	3.090
CW9 02	12.744	12.736	12.735	12.740	12.738	3.100	3.100	3.100	3.100
CW6 03	12.738	12.736	12.737	12.739	12.741	3.090	3.100	3.080	3.080
CW9 01	12.739	12.740	12.741	12.739	12.738	3.090	3.090	3.090	3.110
CW6 02	12.736	12.740	12.737	12.735	12.734	3.100	3.090	3.090	3.090
CW7 03	12.734	12.735	12.734	12.733	12.734	3.090	3.090	3.080	3.090
CW12 03	12.735	12.747	12.740	12.738	12.736	3.100	3.110	3.090	3.100
CW5 03	12.740	12.739	12.742	12.743	12.744	3.100	3.110	3.090	3.090
CW7 02	12.736	12.734	12.737	12.739	12.738	3.100	3.100	3.100	3.100
CW7 01	12.736	12.739	12.736	12.733	12.732	3.090	3.080	3.090	3.080
CW8 01	12.733	12.740	12.738	12.737	12.737	3.110	3.100	3.120	3.110
CW13 03	12.744	12.738	12.739	12.742	12.748	3.090	3.110	3.100	3.090
CW10 01	12.743	12.738	12.740	12.743	12.742	3.110	3.100	3.090	3.100
CW11 02	12.740	12.750	12.747	12.742	12.739	3.080	3.070	3.080	3.100
CW1 03	12.740	12.743	12.742	12.741	12.738	3.090	3.080	3.100	3.100
CW3 01	12.737	12.736	12.737	12.738	12.736	3.090	3.090	3.080	3.090
CW13 02	12.746	12.738	12.739	12.743	12.747	3.070	3.080	3.100	3.100
CW2 01	12.743	12.741	12.741	12.740	12.740	3.120	3.110	3.090	3.090
CW4 02	12.740	12.742	12.743	12.742	12.744	3.110	3.100	3.100	3.080
CW12 01	12.749	12.742	12.744	12.745	12.751	3.080	3.090	3.070	3.100
CW3 02	12.736	12.736	12.734	12.733	12.734	3.080	3.090	3.090	3.100
CW8 03	12.740	12.742	12.739	12.741	12.739	3.090	3.090	3.090	3.080
CW11 03	12.747	12.737	12.738	12.742	12.745	3.110	3.100	3.100	3.100
CW6 01	12.743	12.747	12.745	12.744	12.744	3.080	3.080	3.080	3.080
CW2 03	12.738	12.743	12.742	12.740	12.739	3.080	3.090	3.090	3.100
CW5 01	12.747	12.744	12.746	12.747	12.746	3.090	3.090	3.090	3.080
CW5 02	12.749	12.746	12.747	12.750	12.749	3.090	3.100	3.070	3.100
CW10 03	12.741	12.743	12.739	12.739	12.739	3.070	3.090	3.110	3.100

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
CW9 03	12.738	12.741	12.737	12.739	12.738	3.080	3.070	3.090	3.080
CW4 03	12.741	12.742	12.743	12.743	12.743	3.080	3.080	3.100	3.090
CW4 01	12.740	12.745	12.743	12.743	12.742	3.090	3.070	3.090	3.090
CW13 01	12.750	12.742	12.743	12.747	12.750	3.100	3.090	3.080	3.090
CW2 02	12.742	12.737	12.739	12.742	12.743	3.070	3.080	3.080	3.080
CW8 02	12.738	12.743	12.740	12.740	12.739	3.090	3.090	3.080	3.100
CA6 03	12.735	12.735	12.734	12.736	12.739	3.080	3.090	3.080	3.110
CA2 04	12.753	12.742	12.744	12.746	12.751	3.090	3.120	3.090	3.100
CA1 04	12.744	12.735	12.736	12.738	12.744	3.080	3.090	3.100	3.110
CA7 04	12.735	12.735	12.728	12.733	12.733	3.100	3.110	3.100	3.090
CA8 03	12.738	12.737	12.734	12.734	12.741	3.080	3.090	3.080	3.090
CA1 03	12.744	12.736	12.739	12.741	12.743	3.100	3.100	3.070	3.070
CA8 01	12.744	12.735	12.731	12.729	12.739	3.090	3.110	3.110	3.100
CA10 02	12.741	12.737	12.740	12.740	12.742	3.100	3.100	3.100	3.110
CA6 02	12.736	12.739	12.733	12.733	12.734	3.080	3.100	3.100	3.100
CA4 04	12.742	12.748	12.747	12.746	12.745	3.100	3.100	3.100	3.110
CA3 03	12.749	12.745	12.748	12.748	12.751	3.090	3.110	3.110	3.090
CA4 01	12.748	12.744	12.746	12.745	12.750	3.090	3.110	3.090	3.100
CA8 02	12.736	12.734	12.737	12.738	12.740	3.100	3.120	3.100	3.110
CA5 04	12.741	12.738	12.736	12.739	12.742	3.080	3.080	3.090	3.090
CA7 03	12.733	12.733	12.736	12.733	12.734	3.100	3.090	3.090	3.080
CA4 03	12.755	12.742	12.741	12.742	12.749	3.090	3.090	3.110	3.100
CA3 01	12.748	12.743	12.744	12.746	12.746	3.100	3.090	3.100	3.090
CA9 03	12.733	12.736	12.733	12.732	12.734	3.100	3.100	3.100	3.090
CA3 02	12.746	12.745	12.745	12.746	12.748	3.090	3.100	3.080	3.110
CA6 01	12.744	12.738	12.737	12.740	12.744	3.080	3.100	3.090	3.090
CA2 02	12.740	12.738	12.740	12.741	12.743	3.090	3.100	3.080	3.100
CA10 03	12.736	12.739	12.736	12.739	12.735	3.080	3.070	3.100	3.100
CA9 02	12.746	12.736	12.739	12.738	12.742	3.090	3.090	3.090	3.110
CA7 01	12.736	12.736	12.735	12.737	12.737	3.090	3.100	3.100	3.100
CA3 04	12.742	12.754	12.752	12.748	12.745	3.090	3.090	3.100	3.100
CA10 04	12.731	12.738	12.736	12.735	12.728	3.100	3.100	3.090	3.100
CA9 04	12.739	12.740	12.738	12.737	12.738	3.110	3.110	3.100	3.110

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰
CA1 01	12.738	12.745	12.740	12.737	12.737
CA8 04	12.740	12.734	12.731	12.733	12.738
CA5 01	12.739	12.745	12.742	12.738	12.738
CA2 03	12.747	12.738	12.739	12.741	12.743
CA1 02	12.742	12.741	12.743	12.746	12.749
CA10 01	12.732	12.738	12.734	12.733	12.732
CA5 02	12.733	12.746	12.739	12.739	12.736
CA4 02	12.746	12.744	12.743	12.740	12.748
CA6 04	12.741	12.733	12.730	12.731	12.735
CA9 01	12.739	12.738	12.739	12.738	12.744
CA2 01	12.735	12.739	12.734	12.737	12.735
CA5 03	12.739	12.733	12.733	12.733	12.739
CA7 02	12.739	12.738	12.736	12.737	12.742

H1	H1'	H2	H2'
3.090	3.080	3.090	3.090
3.100	3.090	3.090	3.100
3.100	3.110	3.090	3.100
3.110	3.090	3.090	3.110
3.100	3.090	3.090	3.090
3.100	3.110	3.130	3.100
3.120	3.090	3.100	3.090
3.100	3.100	3.110	3.120
3.080	3.070	3.090	3.100
3.070	3.090	3.090	3.100
3.080	3.100	3.100	3.100
3.090	3.090	3.110	3.110
3.120	3.120	3.110	3.100

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
CW11 01	3.088		3.350	3.360	5.52031	JL	7/7/2009 12:39
CW1 02	3.100		3.280	3.300	5.49853	JL	7/7/2009 12:42
CW3 03	3.093		3.400	3.340	5.50485	JL	7/7/2009 12:46
CW10 02	3.095		3.330	3.400	5.50438	JL	7/7/2009 13:39
CW12 02	3.100		3.360	3.360	5.54305	JL	7/7/2009 13:44
CW1 01	3.093		3.280	3.210	5.49009	JL	7/7/2009 13:47
CW9 02	3.100		3.400	3.400	5.47055	JL	7/7/2009 13:50
CW6 03	3.088		3.320	3.390	5.55066	JL	7/7/2009 13:54
CW9 01	3.095		3.330	3.370	5.46874	JL	7/7/2009 14:53
CW6 02	3.093		3.350	3.360	5.55322	JL	7/7/2009 14:57
CW7 03	3.088		3.380	3.320	5.43694	JL	7/7/2009 15:00
CW12 03	3.100		3.390	3.330	5.56099	JL	7/7/2009 15:02
CW5 03	3.098		3.340	3.330	5.52747	JL	7/7/2009 15:06
CW7 02	3.100		3.340	3.380	5.44844	JL	7/7/2009 15:10
CW7 01	3.085		3.390	3.320	5.42350	JL	7/7/2009 15:14
CW8 01	3.110		3.350	3.350	5.43080	JL	7/7/2009 15:17
CW13 03	3.098		3.320	3.400	5.55974	jl	7/8/2009 7:41
CW10 01	3.100		3.330	3.320	5.50631	jl	7/8/2009 7:45
CW11 02	3.083		3.360	3.360	5.52784	jl	7/8/2009 8:44
CW1 03	3.093		3.360	3.320	5.50319	jl	7/8/2009 8:48
CW3 01	3.088		3.350	3.350	5.50054	jl	7/8/2009 10:00
CW13 02	3.088		3.360	3.370	5.55200	jl	7/8/2009 10:04
CW2 01	3.103		3.330	3.390	5.47580	jl	7/8/2009 10:25
CW4 02	3.098		3.370	3.350	5.53308	jl	7/8/2009 10:29
CW12 01	3.085		3.380	3.360	5.53877	jl	7/8/2009 10:33
CW3 02	3.090		3.370	3.350	5.49910	jl	7/8/2009 12:39
CW8 03	3.088		3.370	3.320	5.43682	jl	7/8/2009 12:42
CW11 03	3.103		3.340	3.400	5.51300	jl	7/8/2009 12:46
CW6 01	3.080		3.360	3.370	5.55059	jl	7/8/2009 12:49
CW2 03	3.090		3.350	3.370	5.47593	jl	7/8/2009 12:55
CW5 01	3.088		3.350	3.350	5.54748	jl	7/8/2009 12:57
CW5 02	3.090		3.350	3.360	5.53341	jl	7/8/2009 12:59
CW10 03	3.093		3.360	3.360	5.48980	jl	7/8/2009 13:02

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
CW9 03	3.080		3.350	3.330	5.47488	jl	7/8/2009 13:04
CW4 03	3.088		3.370	3.360	5.53506	jl	7/8/2009 13:08
CW4 01	3.085		3.380	3.340	5.53839	jl	7/8/2009 13:11
CW13 01	3.090		3.330	3.390	5.55830	jl	7/8/2009 13:13
CW2 02	3.078		3.330	3.390	5.48888	jl	7/8/2009 13:17
CW8 02	3.090		3.350	3.360	5.42917	jl	7/8/2009 13:21
CA6 03	3.090		3.370	3.370	5.47007	JL	7/8/2009 13:32
CA2 04	3.100		3.310	3.370	5.47040	JL	7/8/2009 13:37
CA1 04	3.095		3.300	3.360	5.45599	JL	7/8/2009 13:46
CA7 04	3.100		3.370	3.360	5.49111	jl	7/9/2009 8:37
CA8 03	3.085		3.370	3.330	5.48075	jl	7/9/2009 8:43
CA1 03	3.085		3.310	3.360	5.45721	jl	7/9/2009 8:46
CA8 01	3.103		3.350	3.400	5.45037	jl	7/9/2009 8:49
CA10 02	3.103		3.370	3.380	5.47288	jl	7/9/2009 8:54
CA6 02	3.095		3.360	3.340	5.45914	jl	7/9/2009 8:56
CA4 04	3.103		3.370	3.340	5.45166	jl	7/9/2009 8:58
CA3 03	3.100		3.310	3.330	5.47338	jl	7/9/2009 9:02
CA4 01	3.098		3.340	3.380	5.44608	jl	7/9/2009 9:04
CA8 02	3.108		3.350	3.400	5.46035	jl	7/9/2009 9:07
CA5 04	3.085		3.370	3.360	5.45638	jl	7/9/2009 9:10
CA7 03	3.090		3.370	3.370	5.46795	jl	7/9/2009 9:12
CA4 03	3.098		3.330	3.380	5.48212	jl	7/9/2009 9:49
CA3 01	3.095		3.330	3.340	5.46007	jl	7/9/2009 9:51
CA9 03	3.098		3.370	3.360	5.45266	jl	7/9/2009 9:56
CA3 02	3.095		3.310	3.360	5.47177	jl	7/9/2009 9:59
CA6 01	3.090		3.350	3.400	5.46911	jl	7/9/2009 10:05
CA2 02	3.093		3.330	3.340	5.44486	jl	7/9/2009 10:08
CA10 03	3.088		3.360	3.360	5.47391	jl	7/9/2009 10:10
CA9 02	3.095		3.340	3.310	5.46653	jl	7/9/2009 10:13
CA7 01	3.098		3.360	3.400	5.45559	jl	7/9/2009 10:16
CA3 04	3.095		3.370	3.310	5.47654	jl	7/9/2009 10:19
CA10 04	3.098		3.350	3.350	5.48656	jl	7/9/2009 10:22
CA9 04	3.108		3.370	3.360	5.47803	jl	7/9/2009 10:25

Specimen ID Number	Specimen Hole Diameter, mm	HD1	HD2	Specimen Hole Depth, mm	Specimen Mass, g	Measurements by:	Date: mm/dd/yr
CA1 01	3.088	3.370	3.330	3.350	5.46847	jl	7/9/2009 10:27
CA8 04	3.095	3.330	3.390	3.360	5.46349	jl	7/9/2009 10:30
CA5 01	3.100	3.390	3.340	3.365	5.47198	jl	7/9/2009 10:32
CA2 03	3.100	3.310	3.370	3.340	5.46530	jl	7/9/2009 10:36
CA1 02	3.093	3.360	3.330	3.345	5.44480	jl	7/9/2009 10:39
CA10 01	3.110	3.340	3.400	3.370	5.44847	jl	7/9/2009 10:42
CA5 02	3.100	3.370	3.360	3.365	5.46582	jl	7/9/2009 10:45
CA4 02	3.108	3.330	3.360	3.345	5.46219	jl	7/9/2009 10:50
CA6 04	3.085	3.300	3.400	3.350	5.47249	jl	7/9/2009 11:04
CA9 01	3.088	3.340	3.390	3.365	5.44404	jl	7/9/2009 11:07
CA2 01	3.095	3.350	3.360	3.355	5.46845	jl	7/9/2009 11:10
CA5 03	3.100	3.340	3.390	3.365	5.46013	jl	7/9/2009 11:13
CA7 02	3.113	3.340	3.290	3.315	5.46513	jl	7/9/2009 11:22

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
CW11 01	25.38525	12.74200	127.5161	0.025385	0.01274	5.0237E-08	0.0055
CW1 02	25.36675	12.73138	127.3035	0.025357	0.01273	4.9664E-08	0.0055
CW3 03	25.39300	12.73425	127.3610	0.025393	0.01273	5.0623E-08	0.0055
CW10 02	25.38500	12.73950	127.4661	0.025385	0.01274	5.0631E-08	0.0055
CW12 02	25.38725	12.74125	127.5011	0.025387	0.01274	5.0720E-08	0.0055
CW1 01	25.36050	12.73138	127.3035	0.025361	0.01273	4.8749E-08	0.0055
CW9 02	25.38650	12.73900	127.4561	0.025387	0.01274	5.1324E-08	0.0055
CW6 03	25.37575	12.73688	127.4136	0.025376	0.01274	5.0235E-08	0.0056
CW9 01	25.37050	12.73963	127.4686	0.025371	0.01274	5.0408E-08	0.0055
CW6 02	25.37825	12.73763	127.4286	0.025378	0.01274	5.0400E-08	0.0056
CW7 03	25.37475	12.73363	127.3485	0.025375	0.01273	5.0163E-08	0.0054
CW12 03	25.38625	12.74013	127.4786	0.025386	0.01274	5.0722E-08	0.0056
CW5 03	25.36675	12.74113	127.4986	0.025367	0.01274	5.0262E-08	0.0055
CW7 02	25.37475	12.73700	127.4161	0.025375	0.01274	5.0720E-08	0.0054
CW7 01	25.37325	12.73675	127.4111	0.025373	0.01274	5.0156E-08	0.0054
CW8 01	25.37525	12.73688	127.4136	0.025375	0.01274	5.0896E-08	0.0054
CW13 03	25.38775	12.74138	127.5036	0.025388	0.01274	5.0638E-08	0.0056
CW10 01	25.38800	12.74150	127.5061	0.025388	0.01274	5.0192E-08	0.0055
CW11 02	25.38850	12.74425	127.5612	0.025389	0.01274	5.0150E-08	0.0055
CW1 03	25.36675	12.74113	127.4986	0.025367	0.01274	5.0174E-08	0.0055
CW3 01	25.37825	12.73638	127.4036	0.025378	0.01274	5.0162E-08	0.0055
CW13 02	25.38975	12.74138	127.5036	0.025390	0.01274	5.0388E-08	0.0056
CW2 01	25.37775	12.74150	127.5061	0.025378	0.01274	5.0799E-08	0.0055
CW4 02	25.38025	12.74113	127.4986	0.025380	0.01274	5.0640E-08	0.0055
CW12 01	25.39000	12.74513	127.5787	0.025390	0.01275	5.0380E-08	0.0055
CW3 02	25.38900	12.73588	127.3936	0.025389	0.01274	5.0393E-08	0.0055
CW8 03	25.37500	12.74013	127.4786	0.025375	0.01274	5.0088E-08	0.0054
CW11 03	25.38975	12.74175	127.5111	0.025390	0.01274	5.0953E-08	0.0055
CW6 01	25.38750	12.74575	127.5912	0.025388	0.01275	5.0143E-08	0.0056
CW2 03	25.38825	12.74100	127.4961	0.025388	0.01274	5.0394E-08	0.0055
CW5 01	25.39575	12.74588	127.5937	0.025396	0.01275	5.0162E-08	0.0055
CW5 02	25.38175	12.74738	127.6237	0.025382	0.01275	5.0319E-08	0.0055
CW10 03	25.38900	12.74088	127.4936	0.025389	0.01274	5.0476E-08	0.0055

Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
0.025389	0.01274	4.9770E-08	0.0055
0.025392	0.01274	5.0387E-08	0.0055
0.025397	0.01274	5.0230E-08	0.0055
0.025389	0.01275	5.0392E-08	0.0056
0.025390	0.01274	4.9988E-08	0.0055
0.025377	0.01274	5.0319E-08	0.0054
0.025391	0.01273	5.0544E-08	0.0055
0.025390	0.01275	5.0417E-08	0.0055
0.025389	0.01274	5.0109E-08	0.0055
0.025394	0.01273	5.0796E-08	0.0055
0.025395	0.01274	5.0081E-08	0.0055
0.025389	0.01274	4.9855E-08	0.0055
0.025395	0.01274	5.1030E-08	0.0055
0.025394	0.01274	5.1029E-08	0.0055
0.025392	0.01273	5.0406E-08	0.0055
0.025389	0.01275	5.0726E-08	0.0055
0.025388	0.01275	5.0117E-08	0.0055
0.025386	0.01274	5.0638E-08	0.0054
0.025394	0.01273	5.1193E-08	0.0055
0.025390	0.01274	5.0305E-08	0.0055
0.025396	0.01273	5.0544E-08	0.0055
0.025388	0.01275	5.0565E-08	0.0055
0.025388	0.01274	5.0181E-08	0.0055
0.025396	0.01273	5.0714E-08	0.0055
0.025387	0.01275	5.0181E-08	0.0055
0.025391	0.01274	5.0619E-08	0.0055
0.025388	0.01274	5.0100E-08	0.0054
0.025395	0.01274	5.0313E-08	0.0055
0.025395	0.01274	5.0030E-08	0.0055
0.025394	0.01274	5.0941E-08	0.0055
0.025388	0.01275	5.0255E-08	0.0055
0.025394	0.01273	5.0488E-08	0.0055
0.025396	0.01274	5.1042E-08	0.0055

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²
CW9 03	25.38850	12.73950	127.4661
CW4 03	25.39200	12.74225	127.5211
CW4 01	25.39650	12.74238	127.5236
CW13 01	25.38850	12.74550	127.5862
CW2 02	25.38950	12.74138	127.5036
CW8 02	25.37650	12.73963	127.4686
CA6 03	25.39125	12.73463	127.3685
CA2 04	25.39000	12.74738	127.6237
CA1 04	25.38900	12.74000	127.4761
CA7 04	25.39375	12.73300	127.3360
CA8 03	25.39475	12.73550	127.3861
CA1 03	25.38850	12.74025	127.4811
CA8 01	25.39500	12.73625	127.4011
CA10 02	25.39400	12.73913	127.4586
CA6 02	25.39175	12.73463	127.3685
CA4 04	25.38925	12.74613	127.5987
CA3 03	25.38750	12.74763	127.6287
CA4 01	25.38575	12.74463	127.5687
CA8 02	25.39375	12.73475	127.3710
CA5 04	25.39025	12.73763	127.4286
CA7 03	25.39550	12.73400	127.3560
CA4 03	25.38775	12.74550	127.5862
CA3 01	25.38775	12.74463	127.5687
CA9 03	25.39575	12.73363	127.3485
CA3 02	25.38700	12.74525	127.5812
CA6 01	25.39125	12.73900	127.4561
CA2 02	25.38775	12.73950	127.4661
CA10 03	25.39475	12.73813	127.4386
CA9 02	25.39475	12.74013	127.4786
CA7 01	25.39400	12.73625	127.4011
CA3 04	25.38750	12.74800	127.6362
CA10 04	25.39375	12.73450	127.3660
CA9 04	25.39600	12.73788	127.4336

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²
CA1 01	25.38950	12.74038	127.4836
CA8 04	25.39525	12.73588	127.3936
CA5 01	25.38900	12.74025	127.4811
CA2 03	25.38700	12.74200	127.5161
CA1 02	25.38800	12.74275	127.5311
CA10 01	25.39525	12.73500	127.3761
CA5 02	25.39025	12.73775	127.4311
CA4 02	25.38675	12.74288	127.5336
CA6 04	25.39200	12.73413	127.3585
CA9 01	25.39525	12.73700	127.4161
CA2 01	25.38925	12.73613	127.3986
CA5 03	25.38925	12.73375	127.3510
CA7 02	25.39200	12.73775	127.4311

Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
0.025390	0.01274	5.0162E-08	0.0055
0.025395	0.01274	5.0557E-08	0.0055
0.025389	0.01274	5.0797E-08	0.0055
0.025387	0.01274	5.0418E-08	0.0055
0.025388	0.01274	5.0250E-08	0.0054
0.025395	0.01274	5.1202E-08	0.0054
0.025390	0.01274	5.0796E-08	0.0055
0.025387	0.01274	5.0740E-08	0.0055
0.025392	0.01273	5.0087E-08	0.0055
0.025395	0.01274	5.0389E-08	0.0054
0.025389	0.01274	5.0482E-08	0.0055
0.025389	0.01273	5.0799E-08	0.0055
0.025392	0.01274	5.0448E-08	0.0055

Specimen ID Number	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
CW11 01	1732.24723	1.7322	25.2	21.2	36.9
CW1 02	1730.00030	1.7300	25.2	21.2	37.1
CW3 03	1729.20538	1.7292	25.2	21.2	37.1
CW10 02	1728.16769	1.7282	25.1	21.1	37.1
CW12 02	1739.71538	1.7397	25.1	21.1	37.2
CW1 01	1726.58835	1.7266	25.1	21.1	37.1
CW9 02	1717.95434	1.7180	25.1	21.2	36.9
CW6 03	1743.85659	1.7439	25.1	21.2	36.9
CW9 01	1717.82038	1.7178	25.1	21	34.7
CW6 02	1744.36803	1.7444	25.1	21	34.3
CW7 03	1709.04468	1.7090	25.1	20.9	34.2
CW12 03	1745.72984	1.7457	25.1	21	33.9
CW5 03	1736.03476	1.7360	25.1	21	33.8
CW7 02	1712.03747	1.7120	25.1	21	33.5
CW7 01	1704.06878	1.7041	25.1	21	33.2
CW8 01	1706.58877	1.7066	25.1	21	33.1
CW13 03	1744.83864	1.7448	25.1	20.8	37.1
CW10 01	1727.77730	1.7278	25.1	20.9	37
CW11 02	1733.71480	1.7337	25.2	21.5	36
CW1 03	1728.36081	1.7284	25.2	21.5	35.7
CW3 01	1728.03583	1.7280	25.2	21.6	36
CW13 02	1742.13389	1.7421	25.2	21.6	36.2
CW2 01	1719.23632	1.7192	25.2	21.7	35.4
CW4 02	1737.06342	1.7371	25.2	21.8	35
CW12 01	1736.92190	1.7369	25.2	21.8	35.1
CW3 02	1727.10338	1.7271	25.2	21	38.3
CW8 03	1707.17879	1.7072	25.2	21.1	38.3
CW11 03	1730.09914	1.7301	25.2	21.1	38.2
CW6 01	1740.49955	1.7405	25.2	21.2	38
CW2 03	1718.47329	1.7185	25.2	21.2	38.1
CW5 01	1738.92658	1.7389	25.2	21.1	38.3
CW5 02	1735.15804	1.7352	25.2	21.2	38.6
CW10 03	1722.85287	1.7229	25.2	21.1	38.8

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
CW9 03	1718.20072	1.7182	25.2	21.2	38.6
CW4 03	1736.41895	1.7364	25.2	21.3	38.4
CW4 01	1737.03068	1.7370	25.2	21.3	38.5
CW13 01	1743.05343	1.7431	25.2	21.3	38.6
CW2 02	1722.12836	1.7221	25.2	21.2	38.9
CW8 02	1704.93363	1.7049	25.2	21.5	38.3
CA6 03	1718.25508	1.7183	25.2	21.3	39.1
CA2 04	1714.88627	1.7149	25.2	21.4	39.3
CA1 04	1712.28396	1.7123	25.2	21.6	38.5
CA7 04	1725.27571	1.7253	25.3	21.3	32.7
CA8 03	1720.87857	1.7209	25.3	21.3	32.8
CA1 03	1712.49610	1.7125	25.3	21.4	32.7
CA8 01	1711.62750	1.7116	25.3	21.5	32.7
CA10 02	1717.97689	1.7180	25.3	21.6	32.6
CA6 02	1714.71328	1.7147	25.3	21.5	32.9
CA4 04	1709.56910	1.7096	25.3	21.6	32.6
CA3 03	1715.76204	1.7158	25.3	21.7	32.4
CA4 01	1708.41974	1.7084	25.3	21.6	32.5
CA8 02	1715.34589	1.7153	25.3	21.7	32.4
CA5 04	1713.07502	1.7131	25.3	21.7	32.5
CA7 03	1717.46840	1.7175	25.3	21.8	31.8
CA4 03	1719.30867	1.7193	25.3	21.6	32.6
CA3 01	1712.42559	1.7124	25.3	21.7	32.6
CA9 03	1712.84283	1.7128	25.3	21.7	32.4
CA3 02	1715.97556	1.7160	25.3	21.7	32.5
CA6 01	1716.79535	1.7168	25.3	21.8	32
CA2 02	1709.00768	1.7090	25.3	21.7	32.4
CA10 03	1718.13646	1.7181	25.3	21.7	32.3
CA9 02	1715.12039	1.7151	25.3	21.8	32.4
CA7 01	1713.28738	1.7133	25.3	21.6	32.9
CA3 04	1716.72433	1.7167	25.3	21.7	32.8
CA10 04	1723.26667	1.7233	25.3	21.8	32.5
CA9 04	1719.80579	1.7198	25.3	21.6	32.8

Specimen ID Number	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
CA1 01	1716.09225	1.7161	25.3	21.7	32.3
CA8 04	1715.57847	1.7156	25.3	21.8	32.3
CA5 01	1717.60473	1.7176	25.3	21.8	32
CA2 03	1714.96267	1.7150	25.3	21.6	32.5
CA1 02	1708.16719	1.7082	25.3	21.5	32.3
CA10 01	1711.44747	1.7114	25.3	21.7	31.9
CA5 02	1716.26906	1.7163	25.3	21.7	32
CA4 02	1713.93771	1.7139	25.3	21.6	32.5
CA6 04	1718.85394	1.7189	25.3	21.4	32.6
CA9 01	1709.07425	1.7091	25.3	21.5	32.8
CA2 01	1717.43931	1.7174	25.3	21.4	32.6
CA5 03	1715.64694	1.7156	25.3	21.4	32.9
CA7 02	1715.74443	1.7157	25.3	21.6	33.6

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
CA9 01		41169	11/17/2009 15:03	100	77.89358	1.88E-04	3.65E-06	3.57E-06
				200	111.29136	5.62E-04	4.04E-06	3.66E-06
				300	143.83711	9.76E-04	4.39E-06	3.84E-06
				400	176.46317	1.44E-03	4.70E-06	4.06E-06
				500	209.28969	1.93E-03	4.97E-06	4.23E-06
				600	242.33544	2.44E-03	5.19E-06	4.37E-06
				700	275.57502	2.96E-03	5.38E-06	4.50E-06
				800	309.02499	3.50E-03	5.52E-06	4.62E-06
				900	342.62817	4.06E-03	5.62E-06	4.73E-06
				1000	376.3905	4.65E-03	5.68E-06	4.84E-06
CA9 02		41169	11/10/2009 8:42	100	78.34666	3.37E-04	3.62E-06	3.66E-06
				200	111.65295	7.07E-04	3.99E-06	3.71E-06
				300	144.14817	1.12E-03	4.32E-06	3.85E-06
				400	176.75269	1.57E-03	4.61E-06	4.04E-06
				500	209.57398	2.05E-03	4.88E-06	4.19E-06
				600	242.63091	2.55E-03	5.12E-06	4.33E-06
				700	275.89433	3.07E-03	5.32E-06	4.46E-06
				800	309.35594	3.60E-03	5.49E-06	4.57E-06
				900	342.97288	4.16E-03	5.63E-06	4.68E-06
				1000	376.7254	4.75E-03	5.74E-06	4.81E-06
CA9 03		47735	11/10/2009 8:41	100	81.06608	3.30E-04	3.82E-06	3.86E-06
				200	114.97986	7.24E-04	4.18E-06	3.91E-06
				300	147.76196	1.15E-03	4.51E-06	4.03E-06
				400	180.44116	1.63E-03	4.79E-06	4.23E-06
				500	213.23699	2.12E-03	5.03E-06	4.36E-06
				600	246.16443	2.63E-03	5.23E-06	4.50E-06
				700	279.26711	3.16E-03	5.40E-06	4.62E-06
				800	312.5732	3.71E-03	5.52E-06	4.73E-06
				900	346.05799	4.27E-03	5.60E-06	4.82E-06
				1000	379.76112	4.82E-03	5.64E-06	4.90E-06
CA9 04		47735	11/10/2009 16:56	100	81.03403	3.17E-04	3.66E-06	3.75E-06
				200	114.9799	6.97E-04	4.02E-06	3.80E-06
				300	147.79091	1.10E-03	4.35E-06	3.89E-06
				400	180.46319	1.56E-03	4.64E-06	4.08E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
CW1 01		41169	11/10/2009 17:07	500	213.24296	2.04E-03	4.90E-06	4.23E-06
				600	246.1971	2.55E-03	5.13E-06	4.37E-06
				700	279.29074	3.07E-03	5.32E-06	4.49E-06
				800	312.61679	3.60E-03	5.47E-06	4.60E-06
				900	346.12533	4.16E-03	5.59E-06	4.71E-06
				1000	379.80554	4.72E-03	5.67E-06	4.80E-06
				100	77.91446	2.78E-04	3.12E-06	3.12E-06
				200	111.26985	5.91E-04	3.47E-06	3.17E-06
				300	143.82531	9.48E-04	3.78E-06	3.31E-06
				400	176.45195	1.36E-03	4.06E-06	3.51E-06
CW1 02		47735	5/20/2010 16:29	500	209.26177	1.78E-03	4.31E-06	3.66E-06
				600	242.30268	2.22E-03	4.53E-06	3.79E-06
				700	275.55122	2.68E-03	4.71E-06	3.91E-06
				800	309.00173	3.15E-03	4.86E-06	4.01E-06
				900	342.60496	3.64E-03	4.98E-06	4.11E-06
				1000	376.34332	4.17E-03	5.06E-06	4.24E-06
				100	81.68703	2.66E-04	3.12E-06	3.09E-06
				200	115.7169	5.88E-04	3.50E-06	3.16E-06
				300	148.47159	9.50E-04	3.84E-06	3.32E-06
				400	181.07228	1.36E-03	4.13E-06	3.53E-06
CW1 03		47735	11/11/2009 7:39	500	213.69242	1.79E-03	4.38E-06	3.68E-06
				600	246.53277	2.23E-03	4.58E-06	3.82E-06
				700	279.53363	2.69E-03	4.74E-06	3.93E-06
				800	312.85664	3.18E-03	4.85E-06	4.05E-06
				900	346.41258	3.67E-03	4.91E-06	4.15E-06
				1000	380.10608	4.16E-03	4.94E-06	4.22E-06
				100	81.13672	2.67E-04	2.95E-06	3.05E-06
				200	115.05734	5.77E-04	3.34E-06	3.08E-06
				300	147.81785	9.16E-04	3.69E-06	3.19E-06
				400	180.49906	1.31E-03	3.99E-06	3.39E-06
500	213.2728	1.73E-03	4.26E-06	3.55E-06				
600	246.20307	2.16E-03	4.50E-06	3.69E-06				
700	279.28641	2.62E-03	4.69E-06	3.82E-06				
800	312.62054	3.10E-03	4.84E-06	3.94E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
CW2 01		47735	11/16/2009 8:08	900	346.10859	3.59E-03	4.95E-06	4.05E-06
				1000	379.79748	4.09E-03	5.02E-06	4.15E-06
				100	81.24213	2.82E-04	3.21E-06	3.21E-06
				200	115.11634	6.18E-04	3.59E-06	3.29E-06
				300	147.87517	9.86E-04	3.92E-06	3.43E-06
				400	180.54033	1.40E-03	4.22E-06	3.62E-06
				500	213.32486	1.84E-03	4.47E-06	3.77E-06
				600	246.26218	2.29E-03	4.69E-06	3.91E-06
				700	279.3516	2.77E-03	4.86E-06	4.04E-06
				800	312.66806	3.27E-03	5.00E-06	4.15E-06
CW2 02		41169	11/16/2009 7:46	900	346.21599	3.77E-03	5.09E-06	4.26E-06
				1000	379.8913	4.28E-03	5.15E-06	4.34E-06
				100	78.45711	2.80E-04	3.07E-06	3.12E-06
				200	111.7715	5.93E-04	3.45E-06	3.13E-06
				300	144.29209	9.50E-04	3.79E-06	3.29E-06
				400	176.90597	1.36E-03	4.09E-06	3.49E-06
				500	209.723	1.78E-03	4.34E-06	3.66E-06
				600	242.75854	2.23E-03	4.55E-06	3.79E-06
				700	276.0153	2.69E-03	4.72E-06	3.91E-06
				800	309.47007	3.16E-03	4.85E-06	4.01E-06
CW2 03		41169	11/16/2009 16:11	900	343.0926	3.65E-03	4.93E-06	4.11E-06
				1000	376.86469	4.17E-03	4.97E-06	4.23E-06
				100	78.34379	2.80E-04	3.28E-06	3.22E-06
				200	111.70411	6.16E-04	3.53E-06	3.30E-06
				300	144.24354	9.73E-04	3.78E-06	3.40E-06
				400	176.85798	1.37E-03	4.01E-06	3.55E-06
				500	209.67863	1.79E-03	4.22E-06	3.67E-06
				600	242.71716	2.22E-03	4.42E-06	3.79E-06
				700	275.95712	2.67E-03	4.61E-06	3.89E-06
				800	309.41278	3.13E-03	4.78E-06	3.99E-06
CW3 01		47735	11/16/2009 16:20	900	343.01156	3.62E-03	4.93E-06	4.08E-06
				1000	376.77037	4.14E-03	5.08E-06	4.20E-06
				100	81.14099	2.72E-04	3.16E-06	3.20E-06
				200	115.07678	6.02E-04	3.54E-06	3.26E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
CW9 01		47735	11/17/2009 15:03	300	147.86461	9.64E-04	3.88E-06	3.39E-06
				400	180.54646	1.38E-03	4.18E-06	3.58E-06
				500	213.33497	1.81E-03	4.43E-06	3.73E-06
				600	246.26228	2.26E-03	4.64E-06	3.87E-06
				700	279.36288	2.73E-03	4.81E-06	3.99E-06
				800	312.71393	3.22E-03	4.94E-06	4.11E-06
				900	346.20446	3.72E-03	5.02E-06	4.21E-06
				1000	379.90722	4.22E-03	5.06E-06	4.29E-06
				100	80.99905	1.13E-04	3.23E-06	3.07E-06
				200	115.02367	4.37E-04	3.51E-06	3.17E-06
300	147.81005	7.92E-04	3.77E-06	3.30E-06				
400	180.4728	1.20E-03	4.01E-06	3.50E-06				
500	213.2567	1.62E-03	4.22E-06	3.65E-06				
600	246.18537	2.05E-03	4.41E-06	3.76E-06				
700	279.28112	2.48E-03	4.58E-06	3.84E-06				
800	312.65162	2.95E-03	4.73E-06	3.95E-06				
900	346.14254	3.44E-03	4.86E-06	4.05E-06				
1000	379.82053	3.93E-03	4.96E-06	4.14E-06				
CW10 02		47735	11/11/2009 16:02	100	81.30588	2.73E-04	3.08E-06	3.17E-06
				200	115.28814	5.95E-04	3.45E-06	3.20E-06
				300	148.11055	9.49E-04	3.79E-06	3.32E-06
				400	180.8262	1.35E-03	4.08E-06	3.51E-06
				500	213.64073	1.77E-03	4.34E-06	3.65E-06
				600	246.59755	2.22E-03	4.56E-06	3.79E-06
				700	279.67027	2.68E-03	4.73E-06	3.91E-06
				800	313.0129	3.16E-03	4.87E-06	4.03E-06
				900	346.52157	3.66E-03	4.98E-06	4.13E-06
				1000	380.24161	4.15E-03	5.04E-06	4.22E-06
CW10 03		41169	11/12/2009 8:10	100	78.30628	2.82E-04	2.99E-06	3.12E-06
				200	111.64045	5.90E-04	3.37E-06	3.13E-06
				300	144.19039	9.32E-04	3.71E-06	3.23E-06
				400	176.8066	1.33E-03	4.01E-06	3.44E-06
				500	209.63079	1.75E-03	4.28E-06	3.59E-06
				600	242.68002	2.19E-03	4.49E-06	3.73E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
CW11 01		47735	5/20/2010 8:23	700	275.92395	2.65E-03	4.67E-06	3.85E-06
				800	309.40309	3.11E-03	4.81E-06	3.96E-06
				900	343.03453	3.60E-03	4.91E-06	4.06E-06
				1000	376.85052	4.12E-03	4.96E-06	4.17E-06
				100	81.39221	2.56E-04	3.03E-06	2.93E-06
				200	115.38257	5.71E-04	3.48E-06	3.06E-06
				300	148.11871	9.33E-04	3.87E-06	3.26E-06
				400	180.65748	1.35E-03	4.21E-06	3.50E-06
				500	213.26853	1.79E-03	4.47E-06	3.69E-06
				600	246.12144	2.24E-03	4.68E-06	3.83E-06
CW11 02		41169	11/12/2009 16:36	700	279.17781	2.71E-03	4.82E-06	3.95E-06
				800	312.47697	3.20E-03	4.91E-06	4.08E-06
				900	345.99255	3.70E-03	4.93E-06	4.18E-06
				1000	379.7353	4.19E-03	4.88E-06	4.25E-06
				100	78.37186	2.77E-04	3.14E-06	3.18E-06
				200	111.73787	5.97E-04	3.47E-06	3.19E-06
				300	144.27997	9.54E-04	3.77E-06	3.33E-06
				400	176.91074	1.36E-03	4.05E-06	3.51E-06
				500	209.74926	1.78E-03	4.30E-06	3.66E-06
				600	242.80372	2.22E-03	4.52E-06	3.79E-06
CW11 03		47735	11/12/2009 16:01	700	276.05218	2.68E-03	4.71E-06	3.90E-06
				800	309.51707	3.15E-03	4.88E-06	4.01E-06
				900	343.11499	3.65E-03	5.02E-06	4.12E-06
				1000	376.88524	4.17E-03	5.13E-06	4.24E-06
				100	81.02773	2.51E-04	3.02E-06	3.15E-06
				200	114.98302	5.73E-04	3.42E-06	3.19E-06
				300	147.77834	9.20E-04	3.77E-06	3.29E-06
				400	180.47433	1.32E-03	4.08E-06	3.47E-06
				500	213.27073	1.74E-03	4.35E-06	3.63E-06
				600	246.19125	2.19E-03	4.57E-06	3.78E-06
				700	279.29291	2.66E-03	4.74E-06	3.91E-06
				800	312.59724	3.14E-03	4.87E-06	4.03E-06
				900	346.0636	3.63E-03	4.96E-06	4.13E-06
				1000	379.78982	4.12E-03	5.00E-06	4.21E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
CW12 02		47735	3/16/2010 8:09	100	81.28497	2.56E-04	2.96E-06	2.93E-06
				200	115.26893	5.73E-04	3.40E-06	3.06E-06
				300	148.05145	9.21E-04	3.79E-06	3.21E-06
				400	180.67738	1.33E-03	4.12E-06	3.43E-06
				500	213.37389	1.76E-03	4.40E-06	3.62E-06
				600	246.28169	2.21E-03	4.63E-06	3.77E-06
				700	279.34835	2.68E-03	4.81E-06	3.90E-06
				800	312.64253	3.16E-03	4.93E-06	4.03E-06
				900	346.13129	3.67E-03	5.00E-06	4.14E-06
				1000	379.8114	4.16E-03	5.01E-06	4.23E-06
CW12 03		47735	11/13/2009 7:59	100	81.14731	2.44E-04	2.97E-06	2.90E-06
				200	115.06004	5.52E-04	3.36E-06	3.07E-06
				300	147.80177	9.03E-04	3.71E-06	3.16E-06
				400	180.51622	1.30E-03	4.03E-06	3.38E-06
				500	213.2924	1.72E-03	4.30E-06	3.54E-06
				600	246.23194	2.16E-03	4.55E-06	3.69E-06
				700	279.30244	2.62E-03	4.75E-06	3.82E-06
				800	312.60182	3.10E-03	4.91E-06	3.95E-06
				900	346.10131	3.61E-03	5.04E-06	4.08E-06
				1000	379.82385	4.11E-03	5.13E-06	4.18E-06
CW13 01		41169	11/14/2009 9:57	100	78.44438	2.94E-04	3.16E-06	3.22E-06
				200	111.76215	6.12E-04	3.49E-06	3.25E-06
				300	144.30661	9.70E-04	3.80E-06	3.37E-06
				400	176.92506	1.38E-03	4.08E-06	3.55E-06
				500	209.7555	1.80E-03	4.32E-06	3.69E-06
				600	242.80755	2.24E-03	4.53E-06	3.82E-06
				700	276.05699	2.70E-03	4.71E-06	3.93E-06
				800	309.52151	3.17E-03	4.86E-06	4.03E-06
				900	343.13201	3.66E-03	4.98E-06	4.13E-06
				1000	376.89681	4.20E-03	5.07E-06	4.25E-06
CW13 02		47735	11/14/2009 9:59	100	81.23122	2.77E-04	3.12E-06	3.18E-06
				200	115.14287	6.02E-04	3.50E-06	3.22E-06
				300	147.95271	9.61E-04	3.83E-06	3.35E-06
				400	180.60457	1.37E-03	4.13E-06	3.54E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
CW13 03		41169	11/15/2009 10:04	500	213.41171	1.79E-03	4.38E-06	3.69E-06
				600	246.32749	2.24E-03	4.59E-06	3.83E-06
				700	279.41154	2.71E-03	4.76E-06	3.95E-06
				800	312.75101	3.19E-03	4.88E-06	4.06E-06
				900	346.25186	3.69E-03	4.96E-06	4.16E-06
				1000	379.94809	4.18E-03	5.00E-06	4.24E-06
				100	77.99352	2.82E-04	3.09E-06	3.14E-06
				200	111.32855	5.96E-04	3.42E-06	3.15E-06
				300	143.86302	9.47E-04	3.73E-06	3.28E-06
				400	176.4745	1.35E-03	4.00E-06	3.46E-06
CW3 02		47735	7/23/2010 12:11	500	209.30611	1.76E-03	4.24E-06	3.61E-06
				600	242.36037	2.20E-03	4.46E-06	3.74E-06
				700	275.6014	2.65E-03	4.64E-06	3.85E-06
				800	309.05169	3.11E-03	4.79E-06	3.95E-06
				900	342.663	3.60E-03	4.91E-06	4.05E-06
				1000	376.41379	4.12E-03	5.01E-06	4.18E-06
				100	78.4125	2.70E-04	2.99E-06	3.05E-06
				200	111.87213	5.77E-04	3.36E-06	3.13E-06
				300	144.48275	9.19E-04	3.70E-06	3.23E-06
				400	177.1058	1.32E-03	4.01E-06	3.43E-06
CW3 03		47735	7/28/2010 8:51	500	209.91258	1.74E-03	4.28E-06	3.59E-06
				600	242.94666	2.18E-03	4.53E-06	3.73E-06
				700	276.14206	2.64E-03	4.75E-06	3.86E-06
				800	309.54346	3.12E-03	4.93E-06	3.98E-06
				900	343.10711	3.62E-03	5.09E-06	4.10E-06
				1000	376.85627	4.15E-03	5.21E-06	4.22E-06
				100	79.50556	2.53E-04	2.89E-06	3.06E-06
				200	112.92352	5.59E-04	3.30E-06	3.06E-06
				300	145.46242	8.93E-04	3.67E-06	3.16E-06
				400	178.08704	1.28E-03	4.00E-06	3.36E-06
500	210.9515	1.71E-03	4.28E-06	3.54E-06				
600	243.95854	2.15E-03	4.51E-06	3.69E-06				
700	277.16727	2.60E-03	4.70E-06	3.82E-06				
800	310.62442	3.08E-03	4.84E-06	3.93E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
CW4 01		47735	7/28/2010 21:01	900	344.24027	3.56E-03	4.93E-06	4.04E-06
				1000	378.01473	4.08E-03	4.98E-06	4.15E-06
				100	79.4635	2.55E-04	2.95E-06	3.04E-06
				200	112.89836	5.71E-04	3.37E-06	3.11E-06
				300	145.49511	9.10E-04	3.75E-06	3.21E-06
				400	178.12677	1.31E-03	4.07E-06	3.42E-06
				500	210.95594	1.74E-03	4.35E-06	3.60E-06
				600	243.991	2.18E-03	4.58E-06	3.75E-06
				700	277.20842	2.65E-03	4.75E-06	3.88E-06
				800	310.63028	3.13E-03	4.88E-06	4.00E-06
CW4 02		47735	7/29/2010 8:29	900	344.26614	3.62E-03	4.95E-06	4.10E-06
				1000	378.06409	4.12E-03	4.98E-06	4.20E-06
				100	79.59252	2.67E-04	2.86E-06	3.05E-06
				200	113.04503	5.74E-04	3.35E-06	3.06E-06
				300	145.62895	9.14E-04	3.77E-06	3.18E-06
				400	178.25649	1.31E-03	4.12E-06	3.40E-06
				500	211.06105	1.75E-03	4.39E-06	3.60E-06
				600	244.05641	2.20E-03	4.59E-06	3.76E-06
				700	277.26129	2.67E-03	4.73E-06	3.89E-06
				800	310.68717	3.14E-03	4.79E-06	4.00E-06
CW4 03		47735	7/29/2010 20:32	900	344.29522	3.61E-03	4.85E-06	4.07E-06
				1000	378.02263	4.11E-03	4.93E-06	4.17E-06
				100	78.92328	2.42E-04	2.71E-06	2.90E-06
				200	112.36475	5.37E-04	3.19E-06	2.93E-06
				300	144.97552	8.56E-04	3.61E-06	3.02E-06
				400	177.61726	1.24E-03	3.98E-06	3.25E-06
				500	210.46392	1.67E-03	4.29E-06	3.46E-06
				600	243.51474	2.11E-03	4.55E-06	3.62E-06
				700	276.725	2.58E-03	4.76E-06	3.77E-06
				800	310.1721	3.06E-03	4.91E-06	3.91E-06
CW5 01		47735	7/30/2010 22:43	900	343.76621	3.55E-03	5.00E-06	4.02E-06
				1000	377.52315	4.07E-03	5.04E-06	4.14E-06
				100	79.264	2.62E-04	3.08E-06	3.15E-06
				200	112.70856	5.87E-04	3.50E-06	3.21E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
CW5 03		47735	7/30/2010 9:52	300	145.27815	9.43E-04	3.87E-06	3.34E-06
				400	177.83749	1.36E-03	4.19E-06	3.54E-06
				500	210.60904	1.80E-03	4.46E-06	3.72E-06
				600	243.59159	2.25E-03	4.68E-06	3.87E-06
				700	276.75903	2.72E-03	4.85E-06	3.99E-06
				800	310.17982	3.21E-03	4.97E-06	4.11E-06
				900	343.73699	3.71E-03	5.04E-06	4.21E-06
				1000	377.4772	4.23E-03	5.06E-06	4.31E-06
				100	79.52221	2.55E-04	2.87E-06	3.02E-06
				200	112.93948	5.60E-04	3.30E-06	3.03E-06
				300	145.50578	8.94E-04	3.68E-06	3.15E-06
				400	178.10874	1.29E-03	4.02E-06	3.35E-06
				500	210.90289	1.71E-03	4.30E-06	3.54E-06
				600	243.93167	2.15E-03	4.53E-06	3.69E-06
				700	277.15982	2.61E-03	4.72E-06	3.82E-06
				800	310.59058	3.09E-03	4.85E-06	3.94E-06
900	344.18021	3.58E-03	4.94E-06	4.05E-06				
1000	377.94217	4.09E-03	4.97E-06	4.16E-06				

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
CA9 01	25.395	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CA9 02	25.395	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CA9 03	25.396	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CA9 04	25.396	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
CW1 01	25.36	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW1 02	25.357	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW1 03	25.367	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
CW2 01	25.378	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW2 02	25.39	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW2 03	25.388	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW3 01	25.378	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
CW9 01	25.37	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW10 02	25.385	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW10 03	25.389	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
CW11 01	25.385	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW11 02	25.389	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW11 03	25.39	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
CW12 02	25.387	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW12 03	25.386	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW13 01	25.389	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW13 02	25.39	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
CW13 03	25.388	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW3 02	25.389	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW3 03	25.393	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
CW4 01	25.396	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW4 02	25.38	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW4 03	25.392	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
CW5 01	25.396	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
CW5 03	25.367	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen Number	CA9 01	CA9 02	CA9 03	CA9 04	CW1 01	CW1 02
Measured By	41169	41169	47735	47735	41169	47735
Measured Date	11/17/09 3:03 PM	11/10/09 8:42 AM	11/10/09 8:41 AM	11/10/09 4:56 PM	11/10/09 5:07 PM	5/20/10 4:29 PM
Initial Sample Length (L ₀ , mm)	25.395	25.395	25.396	25.396	25.36	25.357
Linear Thermal Expansion Temperature °C						
100	1.88E-04	3.37E-04	3.30E-04	3.17E-04	2.78E-04	2.66E-04
200	5.62E-04	7.07E-04	7.24E-04	6.97E-04	5.91E-04	5.88E-04
300	9.76E-04	1.12E-03	1.15E-03	1.10E-03	9.48E-04	9.50E-04
400	1.44E-03	1.57E-03	1.63E-03	1.56E-03	1.36E-03	1.36E-03
500	1.93E-03	2.05E-03	2.12E-03	2.04E-03	1.78E-03	1.79E-03
600	2.44E-03	2.55E-03	2.63E-03	2.55E-03	2.22E-03	2.23E-03
700	2.96E-03	3.07E-03	3.16E-03	3.07E-03	2.68E-03	2.69E-03
800	3.50E-03	3.60E-03	3.71E-03	3.60E-03	3.15E-03	3.18E-03
900	4.06E-03	4.16E-03	4.27E-03	4.16E-03	3.64E-03	3.67E-03
1000	4.65E-03	4.75E-03	4.82E-03	4.72E-03	4.17E-03	4.16E-03
Instantaneous CTE (1/K) Temperature °C						
100	3.65E-06	3.62E-06	3.82E-06	3.66E-06	3.12E-06	3.12E-06
200	4.04E-06	3.99E-06	4.18E-06	4.02E-06	3.47E-06	3.50E-06
300	4.39E-06	4.32E-06	4.51E-06	4.35E-06	3.78E-06	3.84E-06
400	4.70E-06	4.61E-06	4.79E-06	4.64E-06	4.06E-06	4.13E-06
500	4.97E-06	4.88E-06	5.03E-06	4.90E-06	4.31E-06	4.38E-06
600	5.19E-06	5.12E-06	5.23E-06	5.13E-06	4.53E-06	4.58E-06
700	5.38E-06	5.32E-06	5.40E-06	5.32E-06	4.71E-06	4.74E-06
800	5.52E-06	5.49E-06	5.52E-06	5.47E-06	4.86E-06	4.85E-06
900	5.62E-06	5.63E-06	5.60E-06	5.59E-06	4.98E-06	4.91E-06
1000	5.68E-06	5.74E-06	5.64E-06	5.67E-06	5.06E-06	4.94E-06
Mean CTE (1/K) Temperature °C						
100	3.57E-06	3.66E-06	3.86E-06	3.75E-06	3.12E-06	3.09E-06
200	3.66E-06	3.71E-06	3.91E-06	3.80E-06	3.17E-06	3.16E-06
300	3.84E-06	3.85E-06	4.03E-06	3.89E-06	3.31E-06	3.32E-06
400	4.06E-06	4.04E-06	4.23E-06	4.08E-06	3.51E-06	3.53E-06
500	4.23E-06	4.19E-06	4.36E-06	4.23E-06	3.66E-06	3.68E-06
600	4.37E-06	4.33E-06	4.50E-06	4.37E-06	3.79E-06	3.82E-06
700	4.50E-06	4.46E-06	4.62E-06	4.49E-06	3.91E-06	3.93E-06
800	4.62E-06	4.57E-06	4.73E-06	4.60E-06	4.01E-06	4.05E-06
900	4.73E-06	4.68E-06	4.82E-06	4.71E-06	4.11E-06	4.15E-06
1000	4.84E-06	4.81E-06	4.90E-06	4.80E-06	4.24E-06	4.22E-06

Specimen Number	CW1 03	CW2 01	CW2 02	CW2 03	CW3 01	CW9 01
Measured By	47735	47735	41169	41169	47735	47735
Measured Date	11/11/09 7:39 AM	11/16/09 8:08 AM	11/16/09 7:46 AM	11/16/09 4:11 PM	11/16/09 4:20 PM	11/17/09 3:03 PM
Initial Sample Length (L ₀ , mm)	25.367	25.378	25.39	25.388	25.378	25.37

Linear Thermal Expansion

Temperature °C	2.67E-04	2.82E-04	2.80E-04	2.80E-04	2.72E-04	1.13E-04
100	5.77E-04	6.18E-04	5.93E-04	6.16E-04	6.02E-04	4.37E-04
200	9.16E-04	9.86E-04	9.50E-04	9.73E-04	9.64E-04	7.92E-04
300	1.31E-03	1.40E-03	1.36E-03	1.37E-03	1.38E-03	1.20E-03
400	1.73E-03	1.84E-03	1.78E-03	1.79E-03	1.81E-03	1.62E-03
500	2.16E-03	2.29E-03	2.23E-03	2.22E-03	2.26E-03	2.05E-03
600	2.62E-03	2.77E-03	2.69E-03	2.67E-03	2.73E-03	2.48E-03
700	3.10E-03	3.27E-03	3.16E-03	3.13E-03	3.22E-03	2.95E-03
800	3.59E-03	3.77E-03	3.65E-03	3.62E-03	3.72E-03	3.44E-03
900	4.09E-03	4.28E-03	4.17E-03	4.14E-03	4.22E-03	3.93E-03
1000						

Instantaneous CTE (1/K)

Temperature °C	2.95E-06	3.21E-06	3.07E-06	3.28E-06	3.16E-06	3.23E-06
100	3.34E-06	3.59E-06	3.45E-06	3.53E-06	3.54E-06	3.51E-06
200	3.69E-06	3.92E-06	3.79E-06	3.78E-06	3.88E-06	3.77E-06
300	3.99E-06	4.22E-06	4.09E-06	4.01E-06	4.18E-06	4.01E-06
400	4.26E-06	4.47E-06	4.34E-06	4.22E-06	4.43E-06	4.22E-06
500	4.50E-06	4.69E-06	4.55E-06	4.42E-06	4.64E-06	4.41E-06
600	4.69E-06	4.86E-06	4.72E-06	4.61E-06	4.81E-06	4.58E-06
700	4.84E-06	5.00E-06	4.85E-06	4.78E-06	4.94E-06	4.73E-06
800	4.95E-06	5.09E-06	4.93E-06	4.93E-06	5.02E-06	4.86E-06
900	5.02E-06	5.15E-06	4.97E-06	5.08E-06	5.06E-06	4.96E-06
1000						

Mean CTE (1/K)

Temperature °C	3.05E-06	3.21E-06	3.12E-06	3.22E-06	3.20E-06	3.07E-06
100	3.08E-06	3.29E-06	3.13E-06	3.30E-06	3.26E-06	3.17E-06
200	3.19E-06	3.43E-06	3.29E-06	3.40E-06	3.39E-06	3.30E-06
300	3.39E-06	3.62E-06	3.49E-06	3.55E-06	3.58E-06	3.50E-06
400	3.55E-06	3.77E-06	3.66E-06	3.67E-06	3.73E-06	3.65E-06
500	3.69E-06	3.91E-06	3.79E-06	3.79E-06	3.87E-06	3.76E-06
600	3.82E-06	4.04E-06	3.91E-06	3.89E-06	3.99E-06	3.84E-06
700	3.94E-06	4.15E-06	4.01E-06	3.99E-06	4.11E-06	3.95E-06
800	4.05E-06	4.26E-06	4.11E-06	4.08E-06	4.21E-06	4.05E-06
900	4.15E-06	4.34E-06	4.23E-06	4.20E-06	4.29E-06	4.14E-06
1000						

Specimen Number	CW10 02	CW10 03	CW11 01	CW11 02	CW11 03	CW12 02
Measured By	47735	41169	47735	41169	47735	47735
Measured Date	11/11/09 4:02 PM	11/12/09 8:10 AM	5/20/10 8:23 AM	11/12/09 4:36 PM	11/12/09 4:01 PM	3/16/10 8:09 AM
Initial Sample Length (L ₀ , mm)	25.385	25.389	25.385	25.389	25.39	25.387

Linear Thermal Expansion

Temperature °C	100	200	300	400	500	600	700	800	900	1000
	2.73E-04	2.82E-04	2.56E-04	2.77E-04	2.51E-04	2.56E-04	2.77E-04	2.51E-04	2.56E-04	2.56E-04
	5.95E-04	5.90E-04	5.71E-04	5.97E-04	5.73E-04	5.73E-04	5.97E-04	5.73E-04	5.73E-04	5.73E-04
	9.49E-04	9.32E-04	9.33E-04	9.54E-04	9.20E-04	9.21E-04	9.54E-04	9.20E-04	9.21E-04	9.21E-04
	1.35E-03	1.33E-03	1.35E-03	1.36E-03	1.32E-03	1.33E-03	1.36E-03	1.32E-03	1.33E-03	1.33E-03
	1.77E-03	1.75E-03	1.79E-03	1.78E-03	1.74E-03	1.76E-03	1.78E-03	1.74E-03	1.76E-03	1.76E-03
	2.22E-03	2.19E-03	2.24E-03	2.22E-03	2.19E-03	2.21E-03	2.22E-03	2.19E-03	2.21E-03	2.21E-03
	2.68E-03	2.65E-03	2.71E-03	2.68E-03	2.66E-03	2.68E-03	2.68E-03	2.66E-03	2.68E-03	2.68E-03
	3.16E-03	3.11E-03	3.20E-03	3.15E-03	3.14E-03	3.16E-03	3.15E-03	3.14E-03	3.16E-03	3.16E-03
	3.66E-03	3.60E-03	3.70E-03	3.65E-03	3.63E-03	3.67E-03	3.65E-03	3.63E-03	3.67E-03	3.67E-03
	4.15E-03	4.12E-03	4.19E-03	4.17E-03	4.12E-03	4.16E-03	4.17E-03	4.12E-03	4.16E-03	4.16E-03

Instantaneous CTE (1/K)

Temperature °C	100	200	300	400	500	600	700	800	900	1000
	3.08E-06	2.99E-06	3.03E-06	3.14E-06	3.02E-06	2.96E-06	3.14E-06	3.02E-06	3.03E-06	3.03E-06
	3.45E-06	3.37E-06	3.48E-06	3.47E-06	3.42E-06	3.40E-06	3.47E-06	3.42E-06	3.48E-06	3.48E-06
	3.79E-06	3.71E-06	3.87E-06	3.77E-06	3.77E-06	3.79E-06	3.77E-06	3.77E-06	3.87E-06	3.87E-06
	4.08E-06	4.01E-06	4.21E-06	4.05E-06	4.08E-06	4.12E-06	4.05E-06	4.08E-06	4.21E-06	4.21E-06
	4.34E-06	4.28E-06	4.47E-06	4.30E-06	4.35E-06	4.40E-06	4.30E-06	4.35E-06	4.47E-06	4.40E-06
	4.56E-06	4.49E-06	4.68E-06	4.52E-06	4.57E-06	4.63E-06	4.52E-06	4.57E-06	4.68E-06	4.63E-06
	4.73E-06	4.67E-06	4.82E-06	4.71E-06	4.74E-06	4.81E-06	4.71E-06	4.74E-06	4.82E-06	4.81E-06
	4.87E-06	4.81E-06	4.91E-06	4.88E-06	4.87E-06	4.93E-06	4.88E-06	4.87E-06	4.91E-06	4.93E-06
	4.98E-06	4.91E-06	4.93E-06	4.92E-06	4.96E-06	5.00E-06	4.92E-06	4.96E-06	4.93E-06	5.00E-06
	5.04E-06	4.96E-06	4.88E-06	5.13E-06	5.00E-06	5.01E-06	5.13E-06	5.00E-06	4.88E-06	5.01E-06

Mean CTE (1/K)

Temperature °C	100	200	300	400	500	600	700	800	900	1000
	3.17E-06	3.12E-06	2.93E-06	3.18E-06	3.15E-06	2.93E-06	3.17E-06	3.15E-06	3.17E-06	3.17E-06
	3.20E-06	3.13E-06	3.06E-06	3.19E-06	3.19E-06	3.06E-06	3.20E-06	3.19E-06	3.20E-06	3.20E-06
	3.32E-06	3.23E-06	3.26E-06	3.33E-06	3.29E-06	3.26E-06	3.32E-06	3.29E-06	3.32E-06	3.32E-06
	3.51E-06	3.44E-06	3.50E-06	3.51E-06	3.47E-06	3.50E-06	3.51E-06	3.47E-06	3.51E-06	3.51E-06
	3.65E-06	3.59E-06	3.69E-06	3.66E-06	3.63E-06	3.69E-06	3.66E-06	3.63E-06	3.65E-06	3.65E-06
	3.79E-06	3.73E-06	3.83E-06	3.79E-06	3.78E-06	3.83E-06	3.79E-06	3.78E-06	3.79E-06	3.79E-06
	3.91E-06	3.85E-06	3.95E-06	3.90E-06	3.91E-06	3.95E-06	3.90E-06	3.91E-06	3.91E-06	3.91E-06
	4.03E-06	3.96E-06	4.08E-06	4.01E-06	4.03E-06	4.08E-06	4.01E-06	4.03E-06	4.03E-06	4.03E-06
	4.13E-06	4.06E-06	4.18E-06	4.12E-06	4.13E-06	4.18E-06	4.12E-06	4.13E-06	4.13E-06	4.13E-06
	4.22E-06	4.17E-06	4.25E-06	4.24E-06	4.21E-06	4.25E-06	4.24E-06	4.21E-06	4.22E-06	4.23E-06

Specimen Number	CW12 03	CW13 01	CW13 02	CW13 03	CW3 02	CW3 03
Measured By	47735	41169	47735	41169	47735	47735
Measured Date	11/13/09 7:59 AM	11/14/09 9:57 AM	11/14/09 9:59 AM	11/15/09 10:04 AM	7/23/10 12:11 PM	7/28/10 8:51 AM
Initial Sample Length (L₀, mm)	25.386	25.389	25.39	25.388	25.389	25.393

Linear Thermal Expansion

Temperature °C	2.44E-04	2.94E-04	2.77E-04	2.82E-04	2.70E-04	2.53E-04
100	5.52E-04	6.12E-04	6.02E-04	5.96E-04	5.77E-04	5.59E-04
200	9.03E-04	9.70E-04	9.61E-04	9.47E-04	9.19E-04	8.93E-04
300	1.30E-03	1.38E-03	1.37E-03	1.35E-03	1.32E-03	1.28E-03
400	1.72E-03	1.80E-03	1.79E-03	1.76E-03	1.74E-03	1.71E-03
500	2.16E-03	2.24E-03	2.24E-03	2.20E-03	2.18E-03	2.15E-03
600	2.62E-03	2.70E-03	2.71E-03	2.65E-03	2.64E-03	2.60E-03
700	3.10E-03	3.17E-03	3.19E-03	3.11E-03	3.12E-03	3.08E-03
800	3.61E-03	3.66E-03	3.69E-03	3.60E-03	3.62E-03	3.56E-03
900	4.11E-03	4.20E-03	4.18E-03	4.12E-03	4.15E-03	4.08E-03
1000						

Instantaneous CTE (1/K)

Temperature °C	2.97E-06	3.16E-06	3.12E-06	3.09E-06	2.99E-06	2.89E-06
100	3.36E-06	3.49E-06	3.50E-06	3.42E-06	3.36E-06	3.30E-06
200	3.71E-06	3.80E-06	3.83E-06	3.73E-06	3.70E-06	3.67E-06
300	4.03E-06	4.08E-06	4.13E-06	4.00E-06	4.01E-06	4.00E-06
400	4.30E-06	4.32E-06	4.38E-06	4.24E-06	4.28E-06	4.28E-06
500	4.55E-06	4.53E-06	4.59E-06	4.46E-06	4.53E-06	4.51E-06
600	4.75E-06	4.71E-06	4.76E-06	4.64E-06	4.75E-06	4.70E-06
700	4.91E-06	4.86E-06	4.88E-06	4.79E-06	4.93E-06	4.84E-06
800	5.04E-06	4.98E-06	4.96E-06	4.91E-06	5.09E-06	4.93E-06
900	5.13E-06	5.07E-06	5.00E-06	5.01E-06	5.21E-06	4.98E-06
1000						

Mean CTE (1/K)

Temperature °C	2.90E-06	3.22E-06	3.18E-06	3.14E-06	3.05E-06	3.06E-06
100	3.07E-06	3.25E-06	3.22E-06	3.15E-06	3.13E-06	3.06E-06
200	3.16E-06	3.37E-06	3.35E-06	3.28E-06	3.23E-06	3.16E-06
300	3.38E-06	3.55E-06	3.54E-06	3.46E-06	3.43E-06	3.36E-06
400	3.54E-06	3.69E-06	3.69E-06	3.61E-06	3.59E-06	3.54E-06
500	3.69E-06	3.82E-06	3.83E-06	3.74E-06	3.73E-06	3.69E-06
600	3.82E-06	3.93E-06	3.95E-06	3.85E-06	3.86E-06	3.82E-06
700	3.95E-06	4.03E-06	4.06E-06	3.95E-06	3.98E-06	3.93E-06
800	4.08E-06	4.13E-06	4.16E-06	4.05E-06	4.10E-06	4.04E-06
900	4.18E-06	4.25E-06	4.24E-06	4.18E-06	4.22E-06	4.15E-06
1000						

Specimen Number	CW4 01	CW4 02	CW4 03	CW5 01	CW5 03
Measured By	47735	47735	47735	47735	47735
Measured Date	7/28/10 9:01 PM	7/29/10 8:29 AM	7/29/10 8:32 PM	7/30/10 10:43 PM	7/30/10 9:52 AM
Initial Sample Length (L ₀ , mm)	25.396	25.38	25.392	25.396	25.367
Linear Thermal Expansion					
Temperature °C					
100	2.55E-04	2.67E-04	2.42E-04	2.62E-04	2.55E-04
200	5.71E-04	5.74E-04	5.37E-04	5.87E-04	5.60E-04
300	9.10E-04	9.14E-04	8.56E-04	9.43E-04	8.94E-04
400	1.31E-03	1.31E-03	1.24E-03	1.36E-03	1.29E-03
500	1.74E-03	1.75E-03	1.67E-03	1.80E-03	1.71E-03
600	2.18E-03	2.20E-03	2.11E-03	2.25E-03	2.15E-03
700	2.65E-03	2.67E-03	2.58E-03	2.72E-03	2.61E-03
800	3.13E-03	3.14E-03	3.06E-03	3.21E-03	3.09E-03
900	3.62E-03	3.61E-03	3.55E-03	3.71E-03	3.58E-03
1000	4.12E-03	4.11E-03	4.07E-03	4.23E-03	4.09E-03
Instantaneous CTE (1/K)					
Temperature °C					
100	2.95E-06	2.86E-06	2.71E-06	3.08E-06	2.87E-06
200	3.37E-06	3.35E-06	3.19E-06	3.50E-06	3.30E-06
300	3.75E-06	3.77E-06	3.61E-06	3.87E-06	3.68E-06
400	4.07E-06	4.12E-06	3.98E-06	4.19E-06	4.02E-06
500	4.35E-06	4.39E-06	4.29E-06	4.46E-06	4.30E-06
600	4.58E-06	4.59E-06	4.55E-06	4.68E-06	4.53E-06
700	4.75E-06	4.73E-06	4.76E-06	4.85E-06	4.72E-06
800	4.88E-06	4.79E-06	4.91E-06	4.97E-06	4.85E-06
900	4.95E-06	4.85E-06	5.00E-06	5.04E-06	4.94E-06
1000	4.98E-06	4.93E-06	5.04E-06	5.06E-06	4.97E-06
Mean CTE (1/K)					
Temperature °C					
100	3.04E-06	3.05E-06	2.90E-06	3.15E-06	3.02E-06
200	3.11E-06	3.06E-06	2.93E-06	3.21E-06	3.03E-06
300	3.21E-06	3.18E-06	3.02E-06	3.34E-06	3.15E-06
400	3.42E-06	3.40E-06	3.25E-06	3.54E-06	3.35E-06
500	3.60E-06	3.60E-06	3.46E-06	3.72E-06	3.54E-06
600	3.75E-06	3.76E-06	3.62E-06	3.87E-06	3.69E-06
700	3.88E-06	3.89E-06	3.77E-06	3.99E-06	3.82E-06
800	4.00E-06	4.00E-06	3.91E-06	4.11E-06	3.94E-06
900	4.10E-06	4.07E-06	4.02E-06	4.21E-06	4.05E-06
1000	4.20E-06	4.17E-06	4.14E-06	4.31E-06	4.16E-06

Specimen number	CW1 01	CW1 02	CW1 03	CA9 01
Specimen group standard deviation	7.42E+08			
Environmental Conditions				
Temperature (°C)	22.6	22.9	23.3	22.1
Barometric Pressure (in of Hg)	25.2	25.2	25.2	25.5
Humidity (%)	15.8	17	16.4	13.6
Sampling Plan Layout				
Instrument	100% sampling			
ASTM	Grindosonic MK5i			
#strikes:	C 747 - 93 Reapproved	90		32
Comments:	2005 Using Equation 5 & 6 in ASTM C 1259 - 08			

Specimen number	CW10 02	CW10 03	CW11 01	CW11 02	CW11 03
Date and Time	2/5/2010 10:22	2/5/2010 10:25	1/12/2010 11:36	1/12/2010 11:39	1/12/2010 11:43
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.5044	5.4898	5.5203	5.5278	5.5130
length of specimen (mm)	25.38500	25.38900	25.38525	25.38850	25.38975
diameter of specimen (mm)	12.73950	12.74088	12.74200	12.74425	12.74175
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	29162 29160 29150 29159 29156 29161 29163 29149 29148 29155	29126 29132 29116 29118 29164 29115 29124 29159 29133 29131	29594 29605 29571 29563 29585 29588 29534 29458 29451 29453	29489 29516 29514 29501 29412 29457 29451 29467 29347 29428	29201 29111 29088 29100 29109 29074 29094 29095 29229 29048
average resonant frequency (Hz)	29156	29132	29540	29458	29115
standard deviation (Hz)	6	17	63	52	56
correction factor for rod	2.113544081	2.113442855	2.113924252	2.1140233	2.113522665
modulus of elasticity (Pa)	9.87E+09	9.83E+09	1.02E+10	1.01E+10	9.85E+09
T _r correction factor	2.287520887	2.287393082	2.288000894	2.288125956	2.287493848
calculation of individual terms	0.030973308 0.325547595 2.276500914	0.030967159 0.325482968 2.276374203	0.030996407 0.325790378 2.276976812	0.031002426 0.325853649 2.277100805	0.030972007 0.325533922 2.276474107
resultant T _r	2.113544081	2.113442855	2.113924252	2.1140233	2.113522665
modulus of elasticity (Pa)	9.87E+09	9.83E+09	1.02E+10	1.01E+10	9.85E+09
Average modulus for specimen group					

Specimen number	CW10 02	CW10 03	CW11 01	CW11 02	CW11 03
Specimen group standard deviation					
Environmental Conditions					
Temperature (°C)	22.6	22.6	21	21	21
Barometric Pressure (in of Hg)	25.2	25.2	25.4	25.4	25.3
Humidity (%)	16.9	16.9	11.3	11.4	11.4
Sampling Plan Layout					
Instrument					
ASTM					
#strikes:	12				
Comments:		27			

Specimen number	CW12 02	CW12 03	CW13 01	CW13 02	CW13 03
Date and Time	1/12/2010 14:03	1/12/2010 14:06	1/12/2010 14:10	2/5/2010 10:21	1/12/2010 14:17
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.5431	5.5610	5.5583	5.5520	5.5597
length of specimen (mm)	25.38725	25.38625	25.38850	25.38975	25.38775
diameter of specimen (mm)	12.74125	12.74013	12.74550	12.74138	12.74138
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	29467 29514 29487 29580 29572 29538 29466 29467 29531 29545	29446 29511 29377 29420 29444 29427 29409 29391 29402 29393	29925 29939 29935 29908 29891 29866 29866 29870 29857 29864	29838 29851 29821 29837 29838 29841 29826 29827 29839 29828	29932 29937 29863 29782 29767 29739 29753 29739 29758 29832
average resonant frequency (Hz)	29517	29422	29892	29835	29810
standard deviation (Hz)	43	39	32	9	77
correction factor for rod	2.113643465	2.11354371	2.114223433	2.113462643	2.113623305
modulus of elasticity (Pa)	1.02E+10	1.02E+10	1.05E+10	1.04E+10	1.04E+10
T _r correction factor	2.287646369	2.287520419	2.288378657	2.287418065	2.287620914
calculation of individual terms	0.030979345 0.325611054 2.276625322	0.030973285 0.325547359 2.276500451	0.031014591 0.325981511 2.277351342	0.030968361 0.325495601 2.276398973	0.03097812 0.325598181 2.276600085
resultant T _r	2.113643465	2.11354371	2.114223433	2.113462643	2.113623305
modulus of elasticity (Pa)	1.02E+10	1.02E+10	1.05E+10	1.04E+10	1.04E+10
Average modulus for specimen group					

Specimen number	CW12 02	CW12 03	CW13 01	CW13 02	CW13 03
Specimen group standard deviation					
Environmental Conditions					
Temperature (°C)	21.7	21.8	21.8	22.5	21.8
Barometric Pressure (in of Hg)	25.3	25.3	25.3	25.2	25.3
Humidity (%)	13.4	13.6	13.6	16.9	13.7
Sampling Plan Layout Instrument ASTM					
#strikes: Comments:				23	

Specimen number	CW2 01	CW2 02	CW2 03	CW3 01	CW3 02
Date and Time	1/12/2010 14:23	2/5/2010 10:16	1/12/2010 14:37	2/5/2010 10:18	2/5/2010 10:00
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.4758	5.4889	5.4759	5.5005	5.4991
length of specimen (mm)	25.37775	25.38950	25.38825	25.37825	25.38900
diameter of specimen (mm)	12.74150	12.74138	12.74100	12.73638	12.73588
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28852 28832 28833 28827 28831 28860 28840 28844 28850 28824	28617 28634 28655 28646 28621 28661 28630 28627 28625 28635	28861 28811 28828 28837 28841 28834 28855 28857 28846 28684	28931 28952 28924 28947 28942 28938 28933 28933 28938 28934	28807 28729 28877 28720 28758 28758 28694 28708 28770 28713
average resonant frequency (Hz)	28839	28635	28825	28937	28753
standard deviation (Hz)	12	15	52	8	55
correction factor for rod	2.114447166	2.113482724	2.113523109	2.113586117	2.112642667
modulus of elasticity (Pa)	9.59E+09	9.49E+09	9.59E+09	9.72E+09	9.60E+09
T _r correction factor	2.288661162	2.287443419	2.287494408	2.287573961	2.286382837
calculation of individual terms	0.031028194 0.326124484 2.27763143	0.030969581 0.325508421 2.276424109	0.030972034 0.325534205 2.276474662	0.030975861 0.325574435 2.276553534	0.030918577 0.324972341 2.275372605
resultant T _r	2.114447166	2.113482724	2.113523109	2.113586117	2.112642667
modulus of elasticity (Pa)	9.59E+09	9.49E+09	9.59E+09	9.72E+09	9.60E+09
Average modulus for specimen group					

Specimen number	CW2 01	CW2 02	CW2 03	CW3 01	CW3 02
Specimen group standard deviation					
Environmental Conditions					
Temperature (°C)	21.8	22.4	21.6	22.5	22.4
Barometric Pressure (in of Hg)	25.3	25.2	25.3	25.2	25.2
Humidity (%)	13.7	16.9	14	16.9	16.6
Sampling Plan Layout					
Instrument					
ASTM					
#strikes:		61		15	33
Comments:					

Specimen number	CW3 03	CW4 01	CW4 02	CW4 03	CW5 01
Date and Time	2/5/2010 10:06	1/13/2010 9:29	1/13/2010 9:32	1/13/2010 9:35	2/5/2010 10:09
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.5049	5.5384	5.5331	5.5351	5.5475
length of specimen (mm)	25.39300	25.39650	25.38025	25.39200	25.39575
diameter of specimen (mm)	12.73425	12.74238	12.74113	12.74225	12.74588
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28752 28744 28763 28793 28786 28794 28792 28794 28800 28790	29564 29632 29597 29585 29583 29547 29559 29515 29593 29580	29556 29540 29564 29544 29558 29544 29536 29529 29533 29514	29263 29328 29294 29281 29472 29294 29314 29269 29212 29196	29438 29475 29494 29516 29526 29497 29489 29492 29497 29459
average resonant frequency (Hz)	28781	29576	29542	29292	29488
standard deviation (Hz)	20	32	15	75	26
correction factor for rod	2.11206173	2.113080655	2.11418606	2.113421973	2.113700926
modulus of elasticity (Pa)	9.63E+09	1.02E+10	1.02E+10	1.00E+10	1.02E+10
T _r correction factor	2.285649456	2.28693579	2.288331466	2.287366717	2.287718918
calculation of individual terms	0.030883333 0.324601906 2.274645501	0.030945163 0.32525178 2.275920825	0.031012319 0.325957631 2.277304556	0.03096589 0.325469636 2.276348064	0.030982836 0.325647747 2.276697251
resultant T _r	2.11206173	2.113080655	2.11418606	2.113421973	2.113700926
modulus of elasticity (Pa)	9.63E+09	1.02E+10	1.02E+10	1.00E+10	1.02E+10
Average modulus for specimen group					

Specimen number	CW3 03	CW4 01	CW4 02	CW4 03	CW5 01
Specimen group standard deviation					
Environmental Conditions					
Temperature (°C)	22.4	21.2	21.2	21.2	22.5
Barometric Pressure (in of Hg)	25.2	25.2	25.2	25.2	25.2
Humidity (%)	16.6	12.8	13	12.9	16.7
Sampling Plan Layout					
Instrument					
ASTM					
#strikes:	51				
Comments:					21

Specimen number	CA9 02	CA9 03	CA9 04
Date and Time	1/13/2010 9:52	1/13/2010 10:01	1/13/2010 10:30
Operator	41169	41169	41169
Sample location			
mass of specimen (g)	5.4665	5.4527	5.4780
length of specimen (mm)	25.39475	25.39575	25.39600
diameter of specimen (mm)	12.74013	12.73363	12.73788
Poisson's ratio	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	26385 26562 27072 26929 26300 26544 25257 25757 26949 26039	26931 26480 26843 25853 25731 25797 25654 27824 26076 26714	27412 25993 26096 27320 26625 26248 27429 25496 26781 26027
average resonant frequency (Hz)	26379	26390	26543
standard deviation (Hz)	571	698	680
correction factor for rod	2.112861145	2.111741224	2.112400899
modulus of elasticity (Pa)	8.03E+09	8.03E+09	8.15E+09
T ₁ correction factor	2.286658659	2.285244867	2.286077621
calculation of individual terms	0.030931837 0.325111715 2.275646066	0.030863898 0.324397636 2.274244375	0.030903907 0.324818149 2.275070001
resultant T ₁	2.112861145	2.111741224	2.112400899
modulus of elasticity (Pa)	8.03E+09	8.03E+09	8.15E+09
Average modulus for specimen group			

Specimen number	CA9 02	CA9 03	CA9 04
Specimen group standard deviation			
Environmental Conditions			
Temperature (°C)	21.3	21.4	21.4
Barometric Pressure (in of Hg)	25.2	25.2	25.2
Humidity (%)	12.9	12.9	13
Sampling Plan Layout			
Instrument			
ASTM			
#strikes:			
Comments:			

Specimen ID Number	Operator S#	Test Date	Initial Specimen Mass (g)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Average Resonant Frequency (Hz)	Flexural Dynamic Young's Modulus (GPa)	Room Temperature (Deg C)
CW1 01	41169	1/13/2010 15:02	5.49009	25.3605	12.731375	29073.3	9.7864	22.6
CW1 02	41169	2/5/2010 10:41	5.49853	25.35675	12.731375	28737.9	9.5737	22.9
CW1 03	41169	2/5/2010 10:32	5.50319	25.36675	12.741125	28919.5	9.6886	23.3
CA9 01	41169	1/11/2010 14:41	5.44404	25.39525	12.737	26100.6	7.8326	22.1
CW10 02	41169	2/5/2010 10:22	5.50438	25.385	12.7395	29156.3	9.8683	22.6
CW10 03	41169	2/5/2010 10:25	5.4898	25.389	12.740875	29131.8	9.8255	22.6
CW11 01	41169	1/12/2010 11:36	5.52031	25.38525	12.742	29540.2	10.1533	21
CW11 02	41169	1/12/2010 11:39	5.52784	25.3885	12.74425	29458.2	10.1080	21
CW11 03	41169	1/12/2010 11:43	5.513	25.38975	12.74175	29114.9	9.8542	21
CW12 02	41169	1/12/2010 14:03	5.54305	25.38725	12.74125	29516.7	10.1824	21.7
CW12 03	41169	1/12/2010 14:06	5.56099	25.38625	12.740125	29422	10.1518	21.8
CW13 01	41169	1/12/2010 14:10	5.5583	25.3885	12.7455	29892.1	10.4622	21.8
CW13 02	41169	2/5/2010 10:21	5.552	25.38975	12.741375	29834.6	10.4215	22.5
CW13 03	41169	1/12/2010 14:17	5.55974	25.38775	12.741375	29810.2	10.4173	21.8
CW2 01	41169	1/12/2010 14:23	5.4758	25.37775	12.7415	28839.3	9.5946	21.8
CW2 02	41169	2/5/2010 10:16	5.48888	25.3895	12.741375	28635.1	9.4910	22.4
CW2 03	41169	1/12/2010 14:37	5.47593	25.38825	12.741	28825.4	9.5948	21.6
CW3 01	41169	2/5/2010 10:18	5.50054	25.37825	12.736375	28937.2	9.7157	22.5
CW3 02	41169	2/5/2010 10:00	5.4991	25.389	12.735875	28753.4	9.5996	22.4
CW3 03	41169	2/5/2010 10:06	5.50485	25.393	12.73425	28780.8	9.6348	22.4
CW4 01	41169	1/13/2010 9:29	5.53839	25.3965	12.742375	29575.5	10.2192	21.2
CW4 02	41169	1/13/2010 9:32	5.53308	25.38025	12.741125	29541.8	10.1760	21.2
CW4 03	41169	1/13/2010 9:35	5.53506	25.392	12.74225	29292.3	10.0151	21.2
CW5 01	41169	2/5/2010 10:09	5.54748	25.39575	12.745875	29488.3	10.1667	22.5
CA9 02	41169	1/13/2010 9:52	5.46653	25.39475	12.740125	26379.4	8.0276	21.3
CA9 03	41169	1/13/2010 10:01	5.45266	25.39575	12.733625	26390.3	8.0269	21.4
CA9 04	41169	1/13/2010 10:30	5.47803	25.396	12.737875	26542.7	8.1496	21.4

Specimen ID Number	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
CW1 01	25.2	15.8	With Grain
CW1 02	25.2	17	With Grain
CW1 03	25.2	16.4	With Grain
CA9 01	25.5	13.6	Against Grain
CW10 02	25.2	16.9	With Grain
CW10 03	25.2	16.9	With Grain
CW11 01	25.4	11.3	With Grain
CW11 02	25.4	11.4	With Grain
CW11 03	25.3	11.4	With Grain
CW12 02	25.3	13.4	With Grain
CW12 03	25.3	13.6	With Grain
CW13 01	25.3	13.6	With Grain
CW13 02	25.2	16.9	With Grain
CW13 03	25.3	13.7	With Grain
CW2 01	25.3	13.7	With Grain
CW2 02	25.2	16.9	With Grain
CW2 03	25.3	14	With Grain
CW3 01	25.2	16.9	With Grain
CW3 02	25.2	16.6	With Grain
CW3 03	25.2	16.6	With Grain
CW4 01	25.2	12.8	With Grain
CW4 02	25.2	13	With Grain
CW4 03	25.2	12.9	With Grain
CW5 01	25.2	16.7	With Grain
CA9 02	25.2	12.9	Against Grain
CA9 03	25.2	12.9	Against Grain
CA9 04	25.2	13	Against Grain

Specimen Number	CW1 01	CW1 02	CW1 03	CW2 01	CW2 02
Date and Time	2/19/2010 8:45	2/19/2010 8:53	2/19/2010 8:58	2/19/2010 9:04	2/19/2010 9:10
Operator	41169	41169	41169	41169	41169
Sample Location					
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:					
Forward current:					
Voltage readings, mV	0.003193 0.002960 0.003050 0.003116	0.002848 0.003238 0.003561 0.003113	0.002516 0.003801 0.00341 0.002717	0.002585 0.002966 0.002854 0.002674	0.003006 0.003139 0.003507 0.003424
Resistance readings, Ω	0.000798 0.000740 0.000762 0.000779	0.000712 0.000809 0.00089 0.000778	0.000629 0.00095 0.000852 0.000679	0.000646 0.000741 0.000714 0.000669	0.000765 0.000785 0.000877 0.000856
Reverse current:					
Voltage readings, mV	-0.003189 -0.003237 -0.002919 -0.002981	-0.002758 -0.002986 -0.003187 -0.002862	-0.002919 -0.002481 -0.003442 -0.003043	-0.00327 -0.003077 -0.00376 -0.003561	-0.002408 -0.002947 -0.003102 -0.002984
Resistance readings, Ω	0.000797 0.000809 0.000730 0.000745	0.00069 0.000746 0.000797 0.000715	0.00073 0.00062 0.000861 0.000761	0.000817 0.000769 0.00094 0.00089	0.000602 0.000737 0.000775 0.000746
End-for-end orientation:					
Reverse current:					
Voltage readings, mV	0.003735 0.002825 0.003308 0.003643	0.003219 0.003646 0.00316 0.00273	0.003824 0.003491 0.003637 0.002734	0.003832 0.00333 0.003137 0.002997	0.002986 0.003072 0.003438 0.002903

Specimen Number	CW1 01	CW1 02	CW1 03	CW2 01	CW2 02
Resistance readings, Ω	0.000934 0.000706 0.000827 0.000911	0.000805 0.000911 0.00079 0.000683	0.000956 0.000873 0.000909 0.000683	0.000958 0.000832 0.000784 0.000749	0.000746 0.000768 0.000859 0.000726
Forward current:					
Voltage readings, mV	-0.003328 -0.003259 -0.002824 -0.002877	-0.002496 -0.002829 -0.003601 -0.003034	-0.002246 -0.002506 -0.002339 -0.003489	-0.001966 -0.003038 -0.003699 -0.003023	-0.002511 -0.00302 -0.003539 -0.003239
Resistance readings, Ω	0.000832 0.000815 0.000706 0.000719	0.000624 0.000707 0.0009 0.000759	0.000561 0.000627 0.000585 0.000872	0.000491 0.00076 0.000925 0.000756	0.000628 0.000755 0.000885 0.00081
Average voltage, mV	0.003153	0.003079	0.003037	0.003111	0.003080
Average resistance, $R=V/I$ (m Ω)	0.788125	0.769750	0.759250	0.777563	0.770000
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7
Average area, A mm ² *	127.3035	127.3035	127.4986	127.5061	127.5036
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	7.90	7.72	7.62	7.81	7.73
Environmental Conditions					
Temperature (Deg C)	21.900	21.900	22.000	22.000	22.000
Barometric Pressure (In Hg)	25.200	25.200	25.200	25.200	25.200
Humidity (%)	7.300	7.300	7.300	7.400	7.400

Specimen Number	CW1 01	CW1 02	CW1 03	CW2 01	CW2 02
Other Test Information					
Specimen Orientation	horizontal				
Method of Measuring Resistance	voltmeter				
Probe Location	location				
Instruments	Keithley Model 2182 Nanovoltmeter				
ASTM	Keithley Model 6220 DC Current Source				
Comments:	C 611 - 98 Reapproved 2005				

Specimen Number	CW3 01	CW3 02	CW3 03	CW4 01	CW4 02
Date and Time	2/19/2010 9:24	2/19/2010 9:42	2/19/2010 9:46	2/19/2010 9:50	2/19/2010 9:54
Operator	41169	41169	41169	41169	41169
Sample Location					
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:					
Forward current:					
Voltage readings, mV	0.002931 0.002998 0.003994 0.002557	0.00271 0.002874 0.003427 0.003037	0.002765 0.003448 0.0032 0.00266	0.002671 0.002487 0.003374 0.002729	0.002643 0.002817 0.003167 0.00281
Resistance readings, Ω	0.000733 0.00075 0.000998 0.000639	0.000677 0.000719 0.000857 0.000759	0.000691 0.000862 0.0008 0.000665	0.000668 0.000622 0.000844 0.000682	0.000661 0.000704 0.000792 0.000702
Reverse current:					
Voltage readings, mV	-0.002581 -0.002984 -0.002567 -0.003554	-0.002885 -0.003315 -0.003461 -0.003196	-0.002878 -0.002539 -0.003405 -0.003573	-0.002782 -0.003468 -0.00282 -0.003243	-0.002867 -0.003225 -0.003352 -0.003077
Resistance readings, Ω	0.000645 0.000746 0.000642 0.000889	0.000721 0.000829 0.000865 0.000799	0.00072 0.000635 0.000851 0.000893	0.000696 0.000867 0.000705 0.000811	0.000717 0.000806 0.000838 0.000769
End-for-end orientation:					
Reverse current:					
Voltage readings, mV	0.002689 0.003218 0.002908 0.002704	0.002768 0.003061 0.00345 0.003099	0.002654 0.002629 0.003331 0.002884	0.00266 0.002951 0.003221 0.002759	0.002693 0.002671 0.002782 0.002598

Specimen Number	CW3 01	CW3 02	CW3 03	CW4 01	CW4 02
Resistance readings, Ω	0.000672 0.000805 0.000727 0.000676	0.000692 0.000765 0.000863 0.000775	0.000663 0.000657 0.000833 0.000721	0.000665 0.000738 0.000805 0.000669	0.000673 0.000668 0.000695 0.000649
Forward current: Voltage readings, mV	-0.002818 -0.002858 -0.003906 -0.00345	-0.002916 -0.003021 -0.0032 -0.003188	-0.00298 -0.00339 -0.003048 -0.003232	-0.002912 -0.003001 -0.003247 -0.003226	-0.002766 -0.003188 -0.003655 -0.003392
Resistance readings, Ω	0.000704 0.000714 0.000977 0.000863	0.000729 0.000755 0.0008 0.000797	0.000745 0.000848 0.000762 0.000808	0.000728 0.00075 0.000812 0.000807	0.000692 0.000797 0.000914 0.000848
Average voltage, mV	0.003045	0.003101	0.003039	0.002972	0.002981
Average resistance, $R=V/I$ (m Ω)	0.761250	0.775125	0.759625	0.743125	0.745313
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7
Average area, A mm ² *	127.4036	127.3936	127.3610	127.5236	127.4986
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	7.64	7.78	7.62	7.46	7.48
Environmental Conditions					
Temperature (Deg C)	22.100	22.200	22.200	22.200	22.300
Barometric Pressure (in Hg)	25.200	25.200	25.200	25.200	25.200
Humidity (%)	7.500	7.500	7.700	7.700	7.800

Specimen Number	CW4 03	CW5 01	CA9 01	CA9 02	CA9 03
Date and Time	2/19/2010 9:59 41169	2/19/2010 10:02 41169	2/19/2010 10:07 41169	2/19/2010 10:11 41169	2/19/2010 10:15 41169
Operator					
Sample Location					
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:					
Forward current:					
Voltage readings, mV	0.00277 0.003054 0.003121 0.002889	0.002931 0.003129 0.003212 0.002991	0.003022 0.003255 0.0031 0.003213	0.003165 0.003262 0.003598 0.003148	0.003307 0.003332 0.003431 0.003305
Resistance readings, Ω	0.000692 0.000764 0.00078 0.000722	0.000733 0.000782 0.000803 0.000748	0.000756 0.000814 0.000775 0.000803	0.000791 0.000816 0.000899 0.000787	0.000827 0.000833 0.000858 0.000826
Reverse current:					
Voltage readings, mV	-0.002825 -0.002987 -0.003232 -0.00317	-0.002829 -0.002834 -0.003255 -0.003274	-0.00351 -0.003672 -0.003988 -0.003745	-0.003346 -0.003519 -0.003602 -0.003675	-0.00333 -0.003537 -0.003608 -0.0037
Resistance readings, Ω	0.000706 0.000747 0.000808 0.000793	0.000707 0.000709 0.000814 0.000819	0.000878 0.000918 0.000997 0.000936	0.000836 0.00088 0.0009 0.000919	0.000833 0.000884 0.000902 0.000925
End-for-end orientation:					
Reverse current:					
Voltage readings, mV	0.00264 0.003006 0.003181 0.002581	0.002629 0.003285 0.003335 0.002948	0.003099 0.00285 0.003271 0.003303	0.002838 0.003307 0.003504 0.003173	0.003129 0.00322 0.0037 0.003192

Specimen Number	CW4 03	CW5 01	CA9 01	CA9 02	CA9 03
Resistance readings, Ω	0.00066 0.000751 0.000795 0.000645	0.000657 0.000821 0.000834 0.000737	0.000775 0.000712 0.000818 0.000826	0.000709 0.000827 0.000876 0.000793	0.000782 0.000805 0.000925 0.000798
Forward current: Voltage readings, mV	-0.003214 -0.002986 -0.002966 -0.003436	-0.002999 -0.002515 -0.003333 -0.003208	-0.003834 -0.004043 -0.003834 -0.00385	-0.003668 -0.003448 -0.003259 -0.003705	-0.003499 -0.00351 -0.003461 -0.003688
Resistance readings, Ω	0.000804 0.000747 0.000741 0.000859	0.00075 0.000629 0.000833 0.000802	0.000958 0.001011 0.000958 0.000962	0.000917 0.000862 0.000815 0.000926	0.000875 0.000877 0.000865 0.000922
Average voltage, mV	0.003004	0.003044	0.003474	0.003389	0.003434
Average resistance, $R=V/I$ (m Ω)	0.750875	0.761125	0.868563	0.847063	0.858563
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7
Average area, A mm ² *	127.5211	127.5937	127.4161	127.4786	127.3485
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	7.54	7.65	8.71	8.50	8.61
Environmental Conditions					
Temperature (Deg C)	22.300	22.400	22.400	22.400	22.400
Barometric Pressure (in Hg)	25.200	25.200	25.200	25.200	25.200
Humidity (%)	7.800	7.800	7.900	8.000	8.000

Specimen Number	CA9 04	CW10 02	CW10 03	CW11 01	CW11 02
Date and Time	2/19/2010 10:19	2/19/2010 10:23	2/19/2010 10:26	2/19/2010 11:08	2/19/2010 11:56
Operator	41169	41169	41169	41169	41169
Sample Location					
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:					
Forward current:					
Voltage readings, mV	0.003059	0.002761	0.003011	0.003133	0.002801
	0.003088	0.002739	0.002927	0.003146	0.003639
	0.003454	0.003027	0.003153	0.003318	0.003153
	0.003199	0.002721	0.002932	0.003158	0.003457
Resistance readings, Ω					
	0.000765	0.00069	0.000753	0.000783	0.0007
	0.000772	0.000685	0.000732	0.000786	0.00091
	0.000863	0.000757	0.000788	0.00083	0.000788
	0.0008	0.00068	0.000733	0.00079	0.000864
Reverse current:					
Voltage readings, mV	-0.003494	-0.003109	-0.003177	-0.002579	-0.002932
	-0.003555	-0.00321	-0.003112	-0.002702	-0.002404
	-0.003462	-0.003363	-0.003159	-0.00318	-0.002762
	-0.003598	-0.003384	-0.003245	-0.003006	-0.002586
Resistance readings, Ω					
	0.000874	0.000777	0.000794	0.000645	0.000733
	0.000889	0.000803	0.000778	0.000675	0.000601
	0.000866	0.000841	0.00079	0.000795	0.00069
	0.000899	0.000846	0.000811	0.000751	0.000646
End-for-end orientation:					
Reverse current:					
Voltage readings, mV	0.003086	0.002924	0.002799	0.002878	0.00303
	0.002997	0.002769	0.002946	0.003091	0.003452
	0.002755	0.003046	0.002813	0.003347	0.00346
	0.002964	0.003029	0.002845	0.003086	0.002967

Specimen Number	CA9 04	CW10 02	CW10 03	CW11 01	CW11 02
Resistance readings, Ω	0.000771 0.000749 0.000689 0.000741	0.000731 0.000692 0.000762 0.000757	0.0007 0.000737 0.000703 0.000711	0.00072 0.000773 0.000837 0.000771	0.000758 0.000863 0.000865 0.000742
Forward current:					
Voltage readings, mV	-0.003454 -0.003778 -0.004132 -0.003931	-0.003423 -0.003294 -0.002874 -0.003297	-0.003277 -0.003171 -0.003672 -0.003496	-0.002753 -0.00274 -0.00301 -0.003068	-0.002925 -0.00259 -0.00253 -0.002618
Resistance readings, Ω	0.000864 0.000945 0.001033 0.000983	0.000856 0.000823 0.000718 0.000824	0.000819 0.000793 0.000918 0.000874	0.000688 0.000685 0.000753 0.000767	0.000731 0.000647 0.000633 0.000654
Average voltage, mV	0.003375	0.003061	0.003108	0.003012	0.002957
Average resistance, $R=V/I$ ($m\Omega$)	0.843938	0.765125	0.777125	0.753063	0.739063
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2 *	127.4336	127.4661	127.4936	127.5161	127.5612
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	8.47	7.68	7.80	7.56	7.42
Environmental Conditions					
Temperature (Deg C)	22.400	22.400	22.400	22.100	22.100
Barometric Pressure (in Hg)	25.200	25.200	25.200	25.200	25.100
Humidity (%)	8.000	8.100	8.100	8.700	9.200

Specimen Number	CW11 03	CW12 02	CW12 03	CW13 01	CW13 02
Date and Time	2/19/2010 12:00	2/19/2010 12:04	2/19/2010 12:08	2/19/2010 12:12	2/19/2010 12:16
Operator	41169	41169	41169	41169	41169
Sample Location					
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:					
Forward current:					
Voltage readings, mV	0.003455	0.002991	0.002648	0.002571	0.002891
	0.003335	0.002942	0.002704	0.002984	0.003099
	0.00338	0.002979	0.002979	0.002859	0.002936
	0.003208	0.003054	0.002964	0.002942	0.002848
Resistance readings, Ω					
	0.000864	0.000748	0.000662	0.000643	0.000723
	0.000834	0.000736	0.000676	0.000746	0.000775
	0.000845	0.000745	0.000745	0.000715	0.000734
	0.000802	0.000763	0.000741	0.000736	0.000712
Reverse current:					
Voltage readings, mV	-0.002746	-0.002917	-0.003298	-0.003226	-0.003168
	-0.002852	-0.002993	-0.003115	-0.003067	-0.002967
	-0.002654	-0.002905	-0.002974	-0.002653	-0.002959
	-0.002864	-0.002953	-0.00294	-0.002984	-0.003071
Resistance readings, Ω					
	0.000687	0.000729	0.000825	0.000806	0.000792
	0.000713	0.000748	0.000779	0.000767	0.000742
	0.000663	0.000726	0.000744	0.000663	0.00074
	0.000716	0.000738	0.000735	0.000746	0.000768
End-for-end orientation:					
Reverse current:					
Voltage readings, mV	0.003448	0.002906	0.002994	0.002636	0.002968
	0.003394	0.002853	0.002999	0.003092	0.003009
	0.003091	0.002913	0.002898	0.002972	0.002862
	0.003331	0.00304	0.002949	0.002993	0.002922

Specimen Number	CW11 03	CW12 02	CW12 03	CW13 01	CW13 02
Resistance readings, Ω	0.000862 0.000849 0.000773 0.000833	0.000726 0.000713 0.000728 0.00076	0.000748 0.00075 0.000724 0.000737	0.000659 0.000773 0.000743 0.000748	0.000742 0.000752 0.000715 0.00073
Forward current: Voltage readings, mV	-0.00283 -0.002709 -0.002915 -0.002757	-0.003424 -0.003225 -0.002736 -0.002845	-0.002855 -0.003037 -0.00287 -0.002914	-0.003326 -0.002974 -0.002917 -0.002858	-0.003142 -0.002905 -0.00283 -0.002935
Resistance readings, Ω	0.000708 0.000677 0.000729 0.000689	0.000856 0.000806 0.000684 0.000711	0.000714 0.000759 0.000717 0.000729	0.000831 0.000744 0.000729 0.000714	0.000786 0.000726 0.000708 0.000734
Average voltage, mV	0.003061	0.002980	0.002946	0.002941	0.002970
Average resistance, $R=V/I$ (m Ω)	0.765250	0.744813	0.736563	0.735188	0.742438
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7
Average area, A mm ² *	127.5111	127.5011	127.4786	127.5862	127.5036
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	7.68	7.48	7.39	7.39	7.45
Environmental Conditions					
Temperature (Deg C)	22.200	22.300	22.300	22.300	22.400
Barometric Pressure (in Hg)	25.100	25.100	25.100	25.100	25.100
Humidity (%)	9.400	9.500	9.500	9.700	9.700

Specimen Number	CW13 03	CW2 03
Date and Time	2/19/2010 12:19	3/19/2010 13:19
Operator	41169	41169
Sample Location		
Applied current, I (mA)	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000
ID Orientation:		
Forward current:		
Voltage readings, mV	0.002935 0.002879 0.002825 0.002889	0.003505 0.003392 0.003044 0.003041
Resistance readings, Ω	0.000734 0.00072 0.000706 0.000722	0.000876 0.000848 0.000761 0.00076
Reverse current:		
Voltage readings, mV	-0.003173 -0.003185 -0.002953 -0.002958	-0.003186 -0.00319 -0.002667 -0.002723
Resistance readings, Ω	0.000793 0.000796 0.000738 0.000739	0.000797 0.000798 0.000667 0.000681
End-for-end orientation:		
Reverse current:		
Voltage readings, mV	0.002895 0.003063 0.002853 0.002891	0.003378 0.003347 0.003114 0.003026

Specimen Number	CW13 03	CW2 03
Resistance readings, Ω	0.000724 0.000766 0.000713 0.000723	0.000845 0.000837 0.000779 0.000757
Forward current: Voltage readings, mV	-0.003327 -0.0031 -0.002894 -0.002827	-0.003085 -0.003104 -0.002815 -0.002728
Resistance readings, Ω	0.000832 0.000775 0.000723 0.000707	0.000771 0.000776 0.000704 0.000682
Average voltage, mV	0.002978	0.003084
Average resistance, $R=V/I$ ($m\Omega$)	0.744438	0.771188
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7
Average area, A mm^2 *	127.5036	127.4961
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	7.47	7.74
Environmental Conditions		
Temperature (Deg C)	22.400	22.400
Barometric Pressure (in Hg)	25.100	25.400
Humidity (%)	9.700	11.800

Specimen ID Number	Operator #	Test Date	Applied Current (mA)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Measured Potential (mV)	Resistance (mΩ)
CW1 01	41169	2/19/2010 8:45	4	25.361	12.731	0.003153	0.788
CW1 02	41169	2/19/2010 8:53	4	25.357	12.731	0.003079	0.770
CW1 03	41169	2/19/2010 8:58	4	25.367	12.741	0.003037	0.759
CW2 01	41169	2/19/2010 9:04	4	25.378	12.742	0.003111	0.778
CW2 02	41169	2/19/2010 9:10	4	25.390	12.741	0.003080	0.770
CW3 01	41169	2/19/2010 9:24	4	25.378	12.736	0.003045	0.761
CW3 02	41169	2/19/2010 9:42	4	25.389	12.736	0.003101	0.775
CW3 03	41169	2/19/2010 9:46	4	25.393	12.734	0.003039	0.760
CW4 01	41169	2/19/2010 9:50	4	25.397	12.742	0.002972	0.743
CW4 02	41169	2/19/2010 9:54	4	25.380	12.741	0.002981	0.745
CW4 03	41169	2/19/2010 9:59	4	25.392	12.742	0.003004	0.751
CW5 01	41169	2/19/2010 10:02	4	25.396	12.746	0.003044	0.761
CA9 01	41169	2/19/2010 10:07	4	25.395	12.737	0.003474	0.869
CA9 02	41169	2/19/2010 10:11	4	25.395	12.740	0.003389	0.847
CA9 03	41169	2/19/2010 10:15	4	25.396	12.734	0.003434	0.859
CA9 04	41169	2/19/2010 10:19	4	25.396	12.738	0.003375	0.844
CW10 02	41169	2/19/2010 10:23	4	25.385	12.740	0.003061	0.765
CW10 03	41169	2/19/2010 10:26	4	25.389	12.741	0.003108	0.777
CW11 01	41169	2/19/2010 11:08	4	25.385	12.742	0.003012	0.753
CW11 02	41169	2/19/2010 11:56	4	25.389	12.744	0.002957	0.739
CW11 03	41169	2/19/2010 12:00	4	25.390	12.742	0.003061	0.765
CW12 02	41169	2/19/2010 12:04	4	25.387	12.741	0.002980	0.745
CW12 03	41169	2/19/2010 12:08	4	25.386	12.740	0.002946	0.737
CW13 01	41169	2/19/2010 12:12	4	25.389	12.746	0.002941	0.735
CW13 02	41169	2/19/2010 12:16	4	25.390	12.741	0.002970	0.742
CW13 03	41169	2/19/2010 12:19	4	25.388	12.741	0.002978	0.744
CW2 03	41169	3/19/2010 13:19	4	25.388	12.741	0.003084	0.771

Specimen ID Number	Resistivity ($\mu\Omega\text{m}$)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
CW1 01	7.900	21.9	25.2	7.3	With Grain
CW1 02	7.716	21.9	25.2	7.3	With Grain
CW1 03	7.622	22	25.2	7.3	With Grain
CW2 01	7.807	22	25.2	7.4	With Grain
CW2 02	7.731	22	25.2	7.4	With Grain
CW3 01	7.637	22.1	25.2	7.5	With Grain
CW3 02	7.775	22.2	25.2	7.5	With Grain
CW3 03	7.618	22.2	25.2	7.7	With Grain
CW4 01	7.462	22.2	25.2	7.7	With Grain
CW4 02	7.482	22.3	25.2	7.8	With Grain
CW4 03	7.540	22.3	25.2	7.8	With Grain
CW5 01	7.647	22.4	25.2	7.8	With Grain
CA9 01	8.714	22.4	25.2	7.9	Against Grain
CA9 02	8.503	22.4	25.2	8	Against Grain
CA9 03	8.609	22.4	25.2	8	Against Grain
CA9 04	8.468	22.4	25.2	8	Against Grain
CW10 02	7.679	22.4	25.2	8.1	With Grain
CW10 03	7.801	22.4	25.2	8.1	With Grain
CW11 01	7.561	22.1	25.2	8.7	With Grain
CW11 02	7.423	22.1	25.1	9.2	With Grain
CW11 03	7.683	22.2	25.1	9.4	With Grain
CW12 02	7.478	22.3	25.1	9.5	With Grain
CW12 03	7.393	22.3	25.1	9.5	With Grain
CW13 01	7.386	22.3	25.1	9.7	With Grain
CW13 02	7.454	22.4	25.1	9.7	With Grain
CW13 03	7.474	22.4	25.1	9.7	With Grain
CW2 03	7.742	22.4	25.4	11.8	With Grain

Specimen ID Number	Date and Time	Operator	Specimen Location	Initial Specimen Length, m	Initial Specimen Density, ρ kg/m ³	Longitudinal Traverse Time, s	Shear Traverse Time, s	Longitudinal Zero Correction, s
CA9 01	2/16/2010 9:33	41169		0.025395	1709.0743	1.054E-05	1.636E-05	2.040E-07
CA9 02	2/16/2010 9:33	41169		0.025395	1715.1204	1.064E-05	1.650E-05	2.040E-07
CA9 03	2/16/2010 9:36	41169		0.025396	1712.8428	1.055E-05	1.655E-05	2.040E-07
CA9 04	2/16/2010 9:37	41169		0.025396	1719.8058	1.054E-05	1.683E-05	2.040E-07
CW1 02	2/16/2010 9:38	41169		0.025357	1730.0003	9.780E-06	1.599E-05	2.040E-07
CW1 03	2/16/2010 9:29	41169		0.025367	1728.3608	9.860E-06	1.605E-05	2.040E-07
CW10 02	2/16/2010 9:39	41169		0.025385	1728.1677	9.820E-06	1.622E-05	2.040E-07
CW10 03	2/16/2010 9:40	41169		0.025389	1722.8529	9.850E-06	1.597E-05	2.040E-07
CW11 01	2/16/2010 9:09	41169		0.025385	1732.2472	9.560E-06	1.613E-05	1.950E-07
CW11 02	2/16/2010 9:18	41169		0.025389	1733.7148	9.910E-06	1.611E-05	1.850E-07
CW11 03	2/16/2010 9:20	41169		0.02539	1730.0991	9.880E-06	1.594E-05	1.850E-07
CW12 02	2/16/2010 9:44	41169		0.025387	1739.7154	9.860E-06	1.589E-05	1.850E-07
CW12 03	2/16/2010 9:44	41169		0.025386	1745.7298	9.840E-06	1.599E-05	1.850E-07
CW13 01	2/16/2010 9:41	41169		0.025389	1743.0534	9.580E-06	1.579E-05	1.900E-07
CW13 02	2/16/2010 9:42	41169		0.02539	1742.1339	9.620E-06	1.588E-05	1.900E-07
CW13 03	2/16/2010 9:43	41169		0.025388	1744.8386	9.710E-06	1.594E-05	1.900E-07
CW2 01	2/16/2010 9:31	41169		0.025378	1719.2363	9.840E-06	1.612E-05	1.900E-07
CW2 02	2/16/2010 9:30	41169		0.025389	1722.1284	1.000E-05	1.607E-05	1.900E-07
CW2 03	2/16/2010 9:29	41169		0.025388	1718.4733	9.990E-06	1.603E-05	1.900E-07
CW3 01	2/16/2010 9:28	41169		0.025378	1728.0358	9.970E-06	1.627E-05	1.900E-07
CW3 02	2/16/2010 9:27	41169		0.025389	1727.1034	1.002E-05	1.607E-05	1.900E-07
CW3 03	2/16/2010 9:26	41169		0.025393	1729.2054	9.880E-06	1.633E-05	1.900E-07
CW4 01	2/16/2010 9:24	41169		0.025396	1737.0307	9.730E-06	1.580E-05	1.900E-07
CW4 02	2/16/2010 9:23	41169		0.02538	1737.0634	9.810E-06	1.602E-05	1.900E-07
CW4 03	2/16/2010 9:22	41169		0.025392	1736.4189	9.730E-06	1.602E-05	1.900E-07
CW5 01	2/16/2010 9:21	41169		0.025396	1738.9266	9.740E-06	1.590E-05	1.900E-07
CW1 01	2/16/2010 9:02	41169		0.025361	1726.5884	9.750E-06	1.592E-05	1.950E-07

Specimen ID Number	Shear Zero Correction, s	Longitudinal Sonic Velocity (m/s)	Shear Sonic Velocities, (m/s)	Longitudinal Dynamic Young's Modulus (GPa)	Shear Dynamic Young's Modulus (GPa)	Poisson's Ratio $\mu = (1 - [2(v_s/v_l)^2]) / (2 - [2(v_s/v_l)^2])$
CA9 01	2.000E-07	2.457E+03	1.571E+03	10.3170	4.2206	1.538E-01
CA9 02	2.000E-07	2.433E+03	1.558E+03	10.1560	4.1631	1.527E-01
CA9 03	2.000E-07	2.455E+03	1.553E+03	10.3206	4.1325	1.661E-01
CA9 04	2.000E-07	2.457E+03	1.527E+03	10.3826	4.0107	1.853E-01
CW1 02	2.000E-07	2.648E+03	1.606E+03	12.1304	4.4615	2.091E-01
CW1 03	2.000E-07	2.627E+03	1.600E+03	11.9283	4.4270	2.049E-01
CW10 02	2.000E-07	2.640E+03	1.585E+03	12.0435	4.3393	2.184E-01
CW10 03	2.000E-07	2.632E+03	1.610E+03	11.9356	4.4656	2.011E-01
CW11 01	2.000E-07	2.711E+03	1.594E+03	12.7277	4.3988	2.359E-01
CW11 02	2.000E-07	2.611E+03	1.596E+03	11.8165	4.4150	2.018E-01
CW11 03	2.000E-07	2.619E+03	1.613E+03	11.8659	4.5018	1.943E-01
CW12 02	2.000E-07	2.624E+03	1.618E+03	11.9784	4.5547	1.932E-01
CW12 03	2.000E-07	2.629E+03	1.608E+03	12.0687	4.5123	2.014E-01
CW13 01	2.000E-07	2.704E+03	1.629E+03	12.7430	4.6228	2.153E-01
CW13 02	2.000E-07	2.692E+03	1.619E+03	12.6294	4.5679	2.167E-01
CW13 03	2.000E-07	2.667E+03	1.613E+03	12.4090	4.5394	2.116E-01
CW2 01	2.000E-07	2.630E+03	1.594E+03	11.8904	4.3688	2.096E-01
CW2 02	2.000E-07	2.588E+03	1.600E+03	11.5350	4.4076	1.908E-01
CW2 03	2.000E-07	2.591E+03	1.604E+03	11.5331	4.4202	1.893E-01
CW3 01	2.000E-07	2.595E+03	1.579E+03	11.6356	4.3096	2.059E-01
CW3 02	2.000E-07	2.583E+03	1.600E+03	11.5213	4.4203	1.888E-01
CW3 03	2.000E-07	2.621E+03	1.574E+03	11.8748	4.2855	2.177E-01
CW4 01	2.000E-07	2.662E+03	1.628E+03	12.3095	4.6035	2.013E-01
CW4 02	2.000E-07	2.638E+03	1.604E+03	12.0906	4.4708	2.066E-01
CW4 03	2.000E-07	2.662E+03	1.605E+03	12.3013	4.4734	2.143E-01
CW5 01	2.000E-07	2.659E+03	1.618E+03	12.2972	4.5500	2.063E-01
CW1 01	2.000E-07	2.654E+03	1.613E+03	12.1635	4.4938	2.070E-01

Specimen ID Number	Elastic Modulus, [GPa] $E = \rho v_l^2 [(1 + \mu)(1 - 2\mu)] / (1 - \mu)$	Environmental Conditions (longitudinal)			Environmental Conditions (shear)		
		Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)
CA9 01	9.7398	21.7	25.2	11	21.4	25.4	18.8
CA9 02	9.5973	21.9	25.2	11.1	21.4	25.4	18.8
CA9 03	9.6377	21.8	25.2	11.1	21.4	25.4	18.8
CA9 04	9.5077	21.8	25.2	11.1	21.4	25.4	18.8
CW1 02	10.7889	21.9	25.2	11.1	21.4	25.4	18.8
CW1 03	10.6684	21.9	25.2	11.1	21.4	25.4	18.8
CW10 02	10.5738	21.9	25.2	11.1	21.4	25.4	18.8
CW10 03	10.7272	21.9	25.2	11.1	21.4	25.4	18.8
CW11 01	10.8732	21.4	25.4	18.9	21.3	25.4	18.9
CW11 02	10.6114	21.3	25.2	10.7	21.4	25.4	18.8
CW11 03	10.7534	21.3	25.2	10.7	21.4	25.4	18.8
CW12 02	10.8696	21.3	25.2	10.7	21.4	25.4	18.8
CW12 03	10.8424	21.3	25.2	10.8	21.4	25.4	18.8
CW13 01	11.2367	20.1	25.2	12.8	21.4	25.4	18.8
CW13 02	11.1154	20.1	25.2	12.9	21.4	25.4	18.8
CW13 03	10.9998	20.2	25.2	12.9	21.4	25.4	18.8
CW2 01	10.5689	20.1	25.2	12.8	21.4	25.4	18.8
CW2 02	10.4972	20.2	25.2	12.8	21.4	25.4	18.8
CW2 03	10.5137	20.2	25.2	12.8	21.4	25.4	18.8
CW3 01	10.3936	20.2	25.2	12.8	21.4	25.4	18.8
CW3 02	10.5094	20.2	25.2	12.9	21.4	25.4	18.8
CW3 03	10.4367	20.2	25.2	12.8	21.4	25.4	18.8
CW4 01	11.0604	20.2	25.2	12.8	21.4	25.4	18.8
CW4 02	10.7892	20.2	25.2	12.8	21.4	25.4	18.8
CW4 03	10.8638	20.2	25.2	12.8	21.4	25.4	18.8
CW5 01	10.9778	20.2	25.2	12.7	21.4	25.4	18.8
CW1 01	10.8485	21.3	25.4	18.8	21.3	25.4	18.8

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	CW2 03	W	25.383	25.384	25.383	25.382	12.747	12.741	12.744
	CW2 02	W	25.384	25.385	25.385	25.386	12.744	12.743	12.738
	CW2 01	W	25.372	25.377	25.373	25.373	12.737	12.738	12.738
	CW13 03	W	25.385	25.383	25.386	25.388	12.739	12.738	12.740
	CW3 01	W	25.375	25.376	25.375	25.375	12.732	12.732	12.736
	CW3 03	W	25.390	25.392	25.391	25.391	12.740	12.735	12.736
	CW4 01	W	25.396	25.397	25.394	25.395	12.737	12.737	12.738
	CW3 02	W	25.385	25.384	25.382	25.385	12.734	12.734	12.738
	CW1 03	W	25.358	25.362	25.353	25.356	12.742	12.740	12.744
	CW1 02	W	25.353	25.350	25.357	25.355	12.736	12.737	12.730
	CW1 01	W	25.362	25.361	25.360	25.361	12.737	12.734	12.727
	CW10 02	W	25.385	25.386	25.387	25.384	12.737	12.737	12.737
	CW11 03	W	25.383	25.383	25.385	25.386	12.740	12.737	12.742
	CW11 02	W	25.383	25.386	25.386	25.384	12.747	12.746	12.741
	CW11 01	W	25.381	25.384	25.382	25.382	12.741	12.740	12.744
	CW10 03	W	25.386	25.385	25.385	25.387	12.746	12.739	12.741
	CW13 02	W	25.387	25.385	25.385	25.387	12.737	12.738	12.741
	CW13 01	W	25.389	25.386	25.389	25.388	12.741	12.740	12.745
	CW12 02	W	25.387	25.384	25.384	25.386	12.739	12.739	12.741
	CW12 03	W	25.382	25.388	25.384	25.386	12.745	12.736	12.737
	CW4 03	W	25.388	25.386	25.388	25.386	12.744	12.742	12.741
	CW4 02	W	25.375	25.375	25.378	25.376	12.741	12.738	12.738
	CW5 03	W	25.367	25.365	25.365	25.365	12.741	12.740	12.740
	CW5 01	W	25.392	25.392	25.395	25.392	12.741	12.740	12.740

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
CW2 03	12.744	12.745	12.738	12.738	12.739	3.090	3.090	3.090	3.090
CW2 02	12.738	12.735	12.735	12.734	12.735	0.000	0.000	0.000	0.000
CW2 01	12.737	12.738	12.740	12.739	12.740	0.000	0.000	0.000	0.000
CW13 03	12.749	12.736	12.736	12.740	12.747	0.000	0.000	0.000	0.000
CW3 01	12.739	12.732	12.735	12.734	12.735	0.000	0.000	0.000	0.000
CW3 03	12.735	12.739	12.735	12.740	12.739	0.000	0.000	0.000	0.000
CW4 01	12.738	12.742	12.739	12.739	12.738	0.000	0.000	0.000	0.000
CW3 02	12.738	12.740	12.736	12.740	12.739	0.000	0.000	0.000	0.000
CW1 03	12.745	12.743	12.741	12.751	12.746	0.000	0.000	0.000	0.000
CW1 02	12.732	12.739	12.739	12.733	12.734	0.000	0.000	0.000	0.000
CW1 01	12.730	12.736	12.731	12.731	12.733	0.000	0.000	0.000	0.000
CW10 02	12.740	12.740	12.740	12.734	12.738	0.000	0.000	0.000	0.000
CW11 03	12.747	12.739	12.738	12.742	12.750	0.000	0.000	0.000	0.000
CW11 02	12.742	12.742	12.742	12.736	12.736	0.000	0.000	0.000	0.000
CW11 01	12.746	12.739	12.740	12.743	12.742	0.000	0.000	0.000	0.000
CW10 03	12.738	12.748	12.739	12.738	12.740	0.000	0.000	0.000	0.000
CW13 02	12.745	12.736	12.735	12.743	12.746	0.000	0.000	0.000	0.000
CW13 01	12.745	12.738	12.740	12.742	12.743	0.000	0.000	0.000	0.000
CW12 02	12.742	12.735	12.735	12.740	12.741	0.000	0.000	0.000	0.000
CW12 03	12.734	12.749	12.737	12.740	12.741	0.000	0.000	0.000	0.000
CW4 03	12.743	12.747	12.742	12.743	12.745	0.000	0.000	0.000	0.000
CW4 02	12.741	12.737	12.737	12.739	12.741	0.000	0.000	0.000	0.000
CW5 03	12.743	12.744	12.742	12.742	12.746	0.000	0.000	0.000	0.000
CW5 01	12.741	12.742	12.740	12.741	12.743	0.000	0.000	0.000	0.000

Specimen ID Number	Final Hole Diameter, mm		Final Hole Depth, mm		Final Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
CW2 03	3.090	3.370	3.380	3.380	5.47426	41169	12/2/2010 13:46
CW2 02	0.000	0.000	0.000	0.000	5.48481	41169	12/2/2010 14:38
CW2 01	0.000	0.000	0.000	0.000	5.47175	41169	12/2/2010 15:25
CW13 03	0.000	0.000	0.000	0.000	5.55780	41169	12/2/2010 15:38
CW3 01	0.000	0.000	0.000	0.000	5.49677	41169	12/3/2010 10:13
CW3 03	0.000	0.000	0.000	0.000	5.49853	41169	12/3/2010 10:17
CW4 01	0.000	0.000	0.000	0.000	5.53522	41169	12/3/2010 11:03
CW3 02	0.000	0.000	0.000	0.000	5.49647	41169	12/3/2010 11:30
CW1 03	0.000	0.000	0.000	0.000	5.50091	41169	12/3/2010 13:38
CW1 02	0.000	0.000	0.000	0.000	5.49378	41169	12/3/2010 13:59
CW1 01	0.000	0.000	0.000	0.000	5.48927	41169	12/3/2010 15:25
CW10 02	0.000	0.000	0.000	0.000	5.50249	41169	12/4/2010 7:33
CW11 03	0.000	0.000	0.000	0.000	5.51185	41169	12/4/2010 8:45
CW11 02	0.000	0.000	0.000	0.000	5.52798	41169	12/4/2010 9:12
CW11 01	0.000	0.000	0.000	0.000	5.51520	41169	12/4/2010 9:45
CW10 03	0.000	0.000	0.000	0.000	5.48940	41169	12/4/2010 10:01
CW13 02	0.000	0.000	0.000	0.000	5.54929	41169	12/4/2010 11:25
CW13 01	0.000	0.000	0.000	0.000	5.56650	41169	12/4/2010 13:06
CW12 02	0.000	0.000	0.000	0.000	5.53997	41169	12/4/2010 13:15
CW12 03	0.000	0.000	0.000	0.000	5.55988	41169	12/4/2010 13:30
CW4 03	0.000	0.000	0.000	0.000	5.53080	47735	12/4/2010 13:31
CW4 02	0.000	0.000	0.000	0.000	5.53006	47735	12/4/2010 14:17
CW5 03	0.000	0.000	0.000	0.000	5.52599	41169	12/4/2010 14:47
CW5 01	0.000	0.000	0.000	0.000	5.54209	41169	12/4/2010 15:02

Specimen ID Number	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m	Total Hole Volume m ³	Final Specimen Mass kg
CW2 03	25.38300	12.74200	127.5161	0.025383	0.01274	5.0694E-08	0.0055
CW2 02	25.38500	12.73775	127.4311	0.025385	0.01274	0.0000E+00	0.0055
CW2 01	25.37375	12.73838	127.4436	0.025374	0.01274	0.0000E+00	0.0055
CW13 03	25.38550	12.74063	127.4886	0.025386	0.01274	0.0000E+00	0.0056
CW3 01	25.37525	12.73438	127.3635	0.025375	0.01273	0.0000E+00	0.0055
CW3 03	25.39100	12.73738	127.4236	0.025391	0.01274	0.0000E+00	0.0055
CW4 01	25.39550	12.73850	127.4461	0.025396	0.01274	0.0000E+00	0.0055
CW3 02	25.38400	12.73738	127.4236	0.025384	0.01274	0.0000E+00	0.0055
CW1 03	25.35725	12.74400	127.5562	0.025357	0.01274	0.0000E+00	0.0055
CW1 02	25.35375	12.73500	127.3761	0.025354	0.01274	0.0000E+00	0.0055
CW1 01	25.36100	12.73238	127.3235	0.025361	0.01273	0.0000E+00	0.0055
CW10 02	25.38550	12.73788	127.4336	0.025386	0.01274	0.0000E+00	0.0055
CW11 03	25.38425	12.74188	127.5136	0.025384	0.01274	0.0000E+00	0.0055
CW11 02	25.38475	12.74150	127.5061	0.025385	0.01274	0.0000E+00	0.0055
CW11 01	25.38225	12.74188	127.5136	0.025382	0.01274	0.0000E+00	0.0055
CW10 03	25.38575	12.74113	127.4986	0.025386	0.01274	0.0000E+00	0.0055
CW13 02	25.38600	12.74013	127.4786	0.025386	0.01274	0.0000E+00	0.0055
CW13 01	25.38800	12.74175	127.5111	0.025388	0.01274	0.0000E+00	0.0056
CW12 02	25.38525	12.73900	127.4561	0.025385	0.01274	0.0000E+00	0.0055
CW12 03	25.38500	12.73988	127.4736	0.025385	0.01274	0.0000E+00	0.0056
CW4 03	25.38700	12.74338	127.5436	0.025387	0.01274	0.0000E+00	0.0055
CW4 02	25.37600	12.73900	127.4561	0.025376	0.01274	0.0000E+00	0.0055
CW5 03	25.36550	12.74225	127.5211	0.025366	0.01274	0.0000E+00	0.0055
CW5 01	25.39275	12.74100	127.4961	0.025393	0.01274	0.0000E+00	0.0055

Specimen ID Number	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
CW2 03	25.2	24.1	16.6
CW2 02	25.2	23.7	17.2
CW2 01	25.2	23.8	17.4
CW13 03	25.2	24	17.2
CW3 01	25.3	23.1	20.6
CW3 03	25.3	23.1	20.6
CW4 01	25.3	23.2	20.3
CW3 02	25.3	23.2	20.2
CW1 03	25.3	22.7	19.9
CW1 02	25.3	22.8	19.6
CW1 01	25.3	22.7	19.8
CW10 02	25.4	22.2	13.3
CW11 03	25.4	22.3	13
CW11 02	25.4	22.4	13
CW11 01	25.4	22.4	12.8
CW10 03	25.4	22.3	12.9
CW13 02	25.4	22.1	13.1
CW13 01	25.4	22.4	13.8
CW12 02	25.4	22.4	13.9
CW12 03	25.4	22.4	14
CW4 03	25.4	22.1	17.2
CW4 02	25.4	22.2	17.4
CW5 03	25.4	22.7	14.7
CW5 01	25.4	22.9	14.6

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Graphite Grade: IG-110
Graphite Manufacturer: Toyo Tanso
Forming Process: Isostatic-molded
Coke Particle Size: Fine grain
Coke Type: Petroleum coke filler, pitch binder
ASTM Class: INHP
Specimen Geometry: Cylinder

Specimen ID #'s:

EA1 01
EA1 02
EA2 01
EA2 02
EA3 01
EA3 02
EA4 01
EA4 02
EA5 01
EA5 02
EA6 01
EA6 02
EA7 01
EA7 02
EA8 01
EA8 02
EA9 01
EA9 02
EA10 01
EA10 02
EA11 01
EA11 02
EA12 01
EA12 02
EA13 01
EA13 02
EA14 01
EA14 02
EA15 01
EA15 02
EA16 01
EA16 02
EA17 01
EA17 02
EW01 01
EW01 02
EW01 03
EW01 04
EW02 01
EW02 02
EW02 03
EW02 04

Specimen ID #'s:

EW03 01
EW03 02
EW03 03
EW03 04
EW04 01
EW04 02
EW04 03
EW04 04
EW05 01
EW05 02
EW05 03
EW05 04
EW06 01
EW06 02
EW06 03
EW06 04
EW07 01
EW07 02
EW07 03
EW07 04
EW08 01
EW08 02
EW08 03
EW08 04
EW09 01
EW09 02
EW09 03
EW09 04
EW10 01
EW10 02
EW10 03
EW10 04
EW11 01
EW11 02
EW11 03
EW11 04
EW12 01
EW12 02
EW12 03
EW12 04
EW13 01
EW13 02
EW13 03
EW13 04

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	EA4 02	A	25.378	25.381	25.382	25.380	12.737	12.737	12.735
	EA11 01	A	25.386	25.385	25.386	25.385	12.730	12.729	12.730
	EA12 02	A	25.387	25.386	25.387	25.386	12.734	12.731	12.729
	EA5 02	A	25.380	25.382	25.383	25.382	12.739	12.738	12.736
	EA6 01	A	25.383	25.383	25.382	25.384	12.736	12.736	12.738
	EA10 01	A	25.386	25.387	25.387	25.387	12.737	12.737	12.735
	EA9 01	A	25.386	25.386	25.386	25.387	12.737	12.737	12.738
	EA15 02	A	25.387	25.389	25.387	25.388	12.734	12.733	12.737
	EA7 02	A	25.382	25.382	25.384	25.384	12.743	12.742	12.741
	EA3 01	A	25.382	25.384	25.383	25.383	12.731	12.729	12.731
	EA5 01	A	25.380	25.381	25.382	25.382	12.735	12.735	12.735
	EA10 02	A	25.385	25.386	25.385	25.385	12.730	12.729	12.728
	EA2 01	A	25.380	25.379	25.382	25.382	12.730	12.729	12.731
	EA14 02	A	25.387	25.386	25.386	25.387	12.735	12.737	12.738
	EA12 01	A	25.387	25.388	25.388	25.387	12.734	12.734	12.732
	EA17 02	A	25.386	25.386	25.384	25.387	12.734	12.733	12.732
	EA16 01	A	25.386	25.387	25.386	25.385	12.731	12.730	12.730
	EA1 02	A	25.389	25.388	25.388	25.388	12.740	12.739	12.739
	EA8 01	A	25.382	25.382	25.383	25.383	12.740	12.739	12.740
	EA13 01	A	25.388	25.386	25.386	25.385	12.731	12.732	12.731
	EA7 01	A	25.380	25.381	25.382	25.381	12.733	12.735	12.734
	EA15 01	A	25.387	25.386	25.385	25.387	12.737	12.735	12.735
	EA4 01	A	25.355	25.355	25.355	25.355	12.734	12.732	12.733
	EA17 01	A	25.386	25.385	25.386	25.385	12.737	12.736	12.733
	EA3 02	A	25.382	25.381	25.380	25.379	12.733	12.734	12.734
	EA1 01	A	25.365	25.365	25.366	25.365	12.736	12.734	12.734
	EA11 02	A	25.386	25.387	25.385	25.385	12.732	12.730	12.732
	EA9 02	A	25.384	25.383	25.385	25.385	12.736	12.735	12.737
	EA16 02	A	25.383	25.383	25.385	25.385	12.732	12.732	12.732
	EA6 02	A	25.382	25.382	25.382	25.382	12.741	12.740	12.741
	EA2 02	A	25.388	25.389	25.388	25.387	12.740	12.739	12.737
	EA13 02	A	25.384	25.386	25.386	25.386	12.737	12.735	12.736
	EA8 02	A	25.382	25.383	25.380	25.382	12.737	12.736	12.737

Specimen Type	Specimen Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	EA14 01	A	25.386	25.386	25.386	25.386	12.735	12.736	12.735
	EW07 03	W	25.390	25.387	25.387	25.389	12.729	12.730	12.727
	EW13 04	W	25.386	25.387	25.385	25.385	12.733	12.731	12.731
	EW08 03	W	25.377	25.382	25.380	25.376	12.734	12.735	12.735
	EW05 02	W	25.376	25.377	25.378	25.376	12.738	12.738	12.740
	EW03 04	W	25.373	25.372	25.375	25.375	12.735	12.734	12.733
	EW01 04	W	25.400	25.400	25.399	25.400	12.737	12.736	12.735
	EW03 03	W	25.374	25.375	25.375	25.375	12.735	12.733	12.732
	EW10 02	W	25.380	25.381	25.381	25.380	12.734	12.735	12.735
	EW11 04	W	25.379	25.379	25.380	25.380	12.734	12.734	12.734
	EW08 02	W	25.377	25.378	25.378	25.378	12.732	12.732	12.734
	EW09 03	W	25.375	25.375	25.376	25.375	12.733	12.733	12.733
	EW10 03	W	25.378	25.379	25.379	25.379	12.732	12.730	12.730
	EW05 04	W	25.375	25.375	25.376	25.376	12.740	12.739	12.739
	EW10 04	W	25.378	25.379	25.377	25.379	12.734	12.734	12.734
	EW11 01	W	25.380	25.379	25.380	25.381	12.737	12.736	12.734
	EW04 04	W	25.376	25.376	25.375	25.375	12.733	12.732	12.732
	EW05 01	W	25.377	25.379	25.379	25.378	12.734	12.734	12.735
	EW09 04	W	25.377	25.377	25.378	25.377	12.735	12.736	12.736
	EW04 03	W	25.376	25.374	25.375	25.377	12.734	12.735	12.735
	EW11 02	W	25.379	25.378	25.379	25.378	12.733	12.732	12.730
	EW10 01	W	25.356	25.355	25.356	25.357	12.734	12.734	12.734
	EW13 02	W	25.381	25.381	25.382	25.381	12.736	12.735	12.734
	EW08 04	W	25.375	25.377	25.377	25.376	12.731	12.732	12.732
	EW13 03	W	25.382	25.382	25.382	25.384	12.735	12.735	12.735
	EW12 03	W	25.380	25.381	25.381	25.380	12.734	12.731	12.731
	EW06 04	W	25.375	25.376	25.377	25.376	12.735	12.735	12.738
	EW04 02	W	25.374	25.374	25.374	25.374	12.735	12.735	12.736
	EW01 01	W	25.348	25.350	25.347	25.347	12.730	12.730	12.730
	EW12 02	W	25.378	25.378	25.380	25.379	12.731	12.730	12.730
	EW06 01	W	25.378	25.379	25.378	25.376	12.739	12.740	12.740
	EW06 03	W	25.365	25.366	25.365	25.366	12.737	12.737	12.738
	EW01 02	W	25.384	25.384	25.384	25.385	12.738	12.736	12.737
	EW13 01	W	25.383	25.382	25.381	25.382	12.729	12.731	12.729

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	EW03 01	W	25.376	25.376	25.379	25.378	12.733	12.733	12.736
	EW09 01	W	25.356	25.356	25.357	25.356	12.731	12.731	12.730
	EW09 02	W	25.378	25.378	25.379	25.378	12.738	12.737	12.738
	EW02 04	W	25.373	25.372	25.372	25.370	12.732	12.731	12.730
	EW05 03	W	25.378	25.376	25.376	25.376	12.730	12.733	12.732
	EW02 02	W	25.381	25.380	25.381	25.380	12.737	12.737	12.737
	EW08 01	W	25.355	25.355	25.352	25.353	12.727	12.726	12.726
	EW12 04	W	25.383	25.381	25.382	25.382	12.730	12.730	12.730
	EW07 01	W	25.369	25.370	25.369	25.370	12.737	12.736	12.737
	EW12 01	W	25.382	25.381	25.382	25.382	12.736	12.736	12.734
	EW01 03	W	25.358	25.356	25.354	25.358	12.734	12.734	12.735
	EW02 01	W	25.389	25.388	25.388	25.388	12.735	12.734	12.735
	EW11 03	W	25.382	25.380	25.380	25.381	12.732	12.733	12.733
	EW04 01	W	25.375	25.376	25.376	25.376	12.734	12.732	12.730
	EW03 02	W	25.374	25.376	25.375	25.373	12.734	12.733	12.731
	EW07 04	W	25.377	25.377	25.379	25.376	12.734	12.732	12.733
	EW02 03	W	25.372	25.370	25.372	25.371	12.733	12.733	12.733
	EW07 02	W	25.379	25.379	25.378	25.378	12.733	12.735	12.735
	EW06 02	W	25.376	25.375	25.377	25.377	12.737	12.736	12.735

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	EW03 01	W	25.376	25.376	25.379	25.378	12.733	12.733	12.736
	EW09 01	W	25.356	25.356	25.357	25.356	12.731	12.731	12.730
	EW09 02	W	25.378	25.378	25.379	25.378	12.738	12.737	12.738
	EW02 04	W	25.373	25.372	25.372	25.370	12.732	12.731	12.730
	EW05 03	W	25.378	25.376	25.376	25.376	12.730	12.733	12.732
	EW02 02	W	25.381	25.380	25.381	25.380	12.737	12.737	12.737
	EW08 01	W	25.355	25.355	25.352	25.353	12.727	12.726	12.726
	EW12 04	W	25.383	25.381	25.382	25.382	12.730	12.730	12.730
	EW07 01	W	25.369	25.370	25.369	25.370	12.737	12.736	12.737
	EW12 01	W	25.382	25.381	25.382	25.382	12.736	12.736	12.734
	EW01 03	W	25.358	25.356	25.354	25.358	12.734	12.734	12.735
	EW02 01	W	25.389	25.388	25.388	25.388	12.735	12.734	12.735
	EW11 03	W	25.382	25.380	25.380	25.381	12.732	12.733	12.733
	EW04 01	W	25.375	25.376	25.376	25.376	12.734	12.732	12.730
	EW03 02	W	25.374	25.376	25.375	25.373	12.734	12.733	12.731
	EW07 04	W	25.377	25.377	25.379	25.376	12.734	12.732	12.733
	EW02 03	W	25.372	25.370	25.372	25.371	12.733	12.733	12.733
	EW07 02	W	25.379	25.379	25.378	25.378	12.733	12.735	12.735
	EW06 02	W	25.376	25.375	25.377	25.377	12.737	12.736	12.735

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
EA4 02	12.736	12.735	12.733	12.734	12.733	3.140	3.140	3.150	3.150
EA11 01	12.729	12.730	12.730	12.730	12.731	3.160	3.140	3.160	3.150
EA12 02	12.728	12.731	12.731	12.731	12.729	3.120	3.130	3.140	3.140
EA5 02	12.735	12.739	12.739	12.739	12.739	3.130	3.140	3.110	3.130
EA6 01	12.738	12.736	12.738	12.737	12.738	3.120	3.150	3.140	3.150
EA10 01	12.736	12.739	12.739	12.741	12.741	3.120	3.130	3.130	3.120
EA9 01	12.738	12.735	12.736	12.737	12.736	3.150	3.150	3.140	3.160
EA15 02	12.739	12.736	12.735	12.735	12.737	3.140	3.140	3.150	3.140
EA7 02	12.740	12.740	12.740	12.739	12.738	3.150	3.140	3.150	3.150
EA3 01	12.729	12.733	12.731	12.730	12.731	3.150	3.160	3.160	3.150
EA5 01	12.735	12.734	12.735	12.736	12.736	3.150	3.160	3.150	3.150
EA10 02	12.728	12.730	12.730	12.731	12.731	3.140	3.150	3.140	3.150
EA2 01	12.731	12.733	12.734	12.733	12.733	3.150	3.150	3.150	3.140
EA14 02	12.739	12.735	12.735	12.735	12.737	3.130	3.140	3.140	3.150
EA12 01	12.733	12.730	12.731	12.732	12.732	3.150	3.150	3.150	3.150
EA17 02	12.732	12.735	12.736	12.733	12.734	3.150	3.150	3.160	3.150
EA16 01	12.732	12.733	12.732	12.734	12.736	3.150	3.150	3.150	3.150
EA1 02	12.735	12.737	12.738	12.739	12.737	3.170	3.170	3.150	3.140
EA8 01	12.738	12.740	12.741	12.739	12.739	3.150	3.140	3.160	3.150
EA13 01	12.732	12.729	12.730	12.729	12.728	3.160	3.150	3.160	3.150
EA7 01	12.734	12.736	12.737	12.736	12.735	3.130	3.150	3.160	3.170
EA15 01	12.734	12.738	12.736	12.735	12.737	3.130	3.130	3.150	3.150
EA4 01	12.732	12.736	12.735	12.736	12.737	3.140	3.140	3.150	3.150
EA17 01	12.734	12.732	12.731	12.732	12.731	3.150	3.150	3.160	3.150
EA3 02	12.734	12.731	12.734	12.732	12.732	3.150	3.150	3.140	3.150
EA1 01	12.733	12.739	12.736	12.737	12.738	3.170	3.160	3.140	3.150
EA11 02	12.731	12.731	12.728	12.728	12.727	3.140	3.140	3.150	3.150
EA9 02	12.738	12.738	12.737	12.737	12.736	3.140	3.150	3.150	3.150
EA16 02	12.732	12.733	12.732	12.732	12.731	3.130	3.140	3.150	3.150
EA6 02	12.740	12.735	12.736	12.738	12.737	3.130	3.140	3.130	3.150
EA2 02	12.737	12.739	12.737	12.738	12.738	3.150	3.150	3.150	3.160
EA13 02	12.735	12.735	12.734	12.733	12.732	3.140	3.150	3.150	3.150
EA8 02	12.735	12.734	12.735	12.735	12.734	3.160	3.160	3.150	3.140

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
EA14 01	12.734	12.734	12.735	12.734	12.735	3.150	3.150	3.150	3.150
EW07 03	12.728	12.727	12.729	12.728	12.726	3.080	3.100	3.070	3.080
EW13 04	12.729	12.730	12.732	12.731	12.731	3.120	3.130	3.150	3.140
EW08 03	12.736	12.734	12.735	12.734	12.734	3.140	3.160	3.140	3.150
EW05 02	12.740	12.737	12.737	12.738	12.738	3.130	3.130	3.140	3.140
EW03 04	12.735	12.736	12.737	12.737	12.738	3.160	3.160	3.150	3.150
EW01 04	12.734	12.736	12.736	12.735	12.734	3.150	3.150	3.140	3.140
EW03 03	12.732	12.739	12.738	12.738	12.737	3.150	3.160	3.150	3.150
EW10 02	12.736	12.736	12.735	12.736	12.737	3.150	3.130	3.130	3.140
EW11 04	12.735	12.739	12.738	12.739	12.739	3.130	3.140	3.140	3.150
EW08 02	12.733	12.734	12.734	12.736	12.735	3.150	3.150	3.160	3.160
EW09 03	12.732	12.736	12.737	12.737	12.736	3.100	3.110	3.110	3.100
EW10 03	12.728	12.730	12.730	12.729	12.727	3.080	3.080	3.110	3.100
EW05 04	12.737	12.738	12.739	12.739	12.739	3.160	3.160	3.160	3.160
EW10 04	12.734	12.736	12.736	12.736	12.735	3.150	3.160	3.150	3.140
EW11 01	12.736	12.734	12.734	12.735	12.734	3.140	3.150	3.160	3.170
EW04 04	12.733	12.736	12.735	12.734	12.733	3.160	3.160	3.160	3.170
EW05 01	12.736	12.738	12.737	12.737	12.736	3.150	3.160	3.160	3.160
EW09 04	12.735	12.738	12.737	12.735	12.735	3.150	3.160	3.160	3.150
EW04 03	12.735	12.735	12.734	12.734	12.734	3.150	3.140	3.120	3.160
EW11 02	12.728	12.735	12.736	12.735	12.733	3.150	3.150	3.160	3.160
EW10 01	12.734	12.734	12.736	12.736	12.735	3.110	3.100	3.100	3.100
EW13 02	12.733	12.734	12.734	12.735	12.734	3.140	3.140	3.150	3.140
EW08 04	12.730	12.733	12.734	12.734	12.735	3.110	3.110	3.080	3.110
EW13 03	12.737	12.734	12.734	12.732	12.732	3.140	3.150	3.140	3.140
EW12 03	12.730	12.735	12.733	12.733	12.733	3.170	3.150	3.160	3.140
EW06 04	12.737	12.739	12.738	12.738	12.740	3.170	3.150	3.160	3.150
EW04 02	12.735	12.733	12.734	12.733	12.734	3.140	3.140	3.150	3.160
EW01 01	12.731	12.733	12.732	12.734	12.732	3.150	3.150	3.140	3.150
EW12 02	12.728	12.733	12.733	12.732	12.731	3.140	3.150	3.160	3.160
EW06 01	12.741	12.737	12.738	12.738	12.739	3.140	3.150	3.160	3.150
EW06 03	12.737	12.735	12.735	12.735	12.737	3.090	3.110	3.100	3.100
EW01 02	12.736	12.738	12.739	12.738	12.738	3.100	3.090	3.090	3.090
EW13 01	12.726	12.733	12.733	12.732	12.730	3.130	3.120	3.150	3.150

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
EW03 01	12.734	12.735	12.736	12.735	12.737	3.150	3.150	3.160	3.160
EW09 01	12.732	12.730	12.729	12.731	12.732	3.100	3.090	3.090	3.090
EW09 02	12.739	12.733	12.733	12.730	12.730	3.170	3.150	3.160	3.170
EW02 04	12.730	12.728	12.730	12.730	12.731	3.160	3.160	3.160	3.160
EW05 03	12.733	12.734	12.733	12.733	12.733	3.120	3.130	3.120	3.140
EW02 02	12.736	12.736	12.736	12.736	12.738	3.150	3.150	3.160	3.150
EW08 01	12.725	12.730	12.729	12.728	12.729	3.090	3.090	3.100	3.090
EW12 04	12.732	12.730	12.729	12.728	12.731	3.120	3.130	3.140	3.150
EW07 01	12.737	12.739	12.738	12.739	12.739	3.100	3.110	3.100	3.100
EW12 01	12.733	12.735	12.736	12.733	12.732	3.150	3.150	3.150	3.150
EW01 03	12.735	12.733	12.732	12.735	12.735	3.150	3.150	3.150	3.150
EW02 01	12.734	12.737	12.736	12.736	12.735	3.140	3.140	3.140	3.140
EW11 03	12.734	12.732	12.733	12.734	12.734	3.170	3.140	3.150	3.140
EW04 01	12.730	12.728	12.729	12.730	12.730	3.150	3.150	3.150	3.160
EW03 02	12.732	12.733	12.732	12.732	12.730	3.150	3.170	3.140	3.160
EW07 04	12.731	12.731	12.730	12.730	12.731	3.150	3.150	3.150	3.150
EW02 03	12.734	12.729	12.731	12.729	12.730	3.160	3.150	3.150	3.150
EW07 02	12.736	12.735	12.736	12.736	12.738	3.150	3.150	3.140	3.150
EW06 02	12.733	12.738	12.735	12.736	12.737	3.130	3.150	3.160	3.150

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
EA4 02	3.145		3.370	3.360	5.61773	JL	7/13/2009 10:24
EA11 01	3.153		3.360	3.360	5.66166	JL	7/13/2009 12:40
EA12 02	3.133		3.380	3.350	5.68130	JL	7/13/2009 12:43
EA5 02	3.128		3.380	3.380	5.68991	JL	7/13/2009 12:47
EA6 01	3.140		3.410	3.350	5.66560	JL	7/13/2009 12:50
EA10 01	3.125		3.360	3.410	5.66841	JL	7/13/2009 12:53
EA9 01	3.150		3.340	3.350	5.66514	JL	7/13/2009 12:55
EA15 02	3.143		3.380	3.390	5.70104	JL	7/13/2009 12:58
EA7 02	3.148		3.390	3.350	5.66086	JL	7/13/2009 13:01
EA3 01	3.155		3.380	3.360	5.64321	JL	7/13/2009 13:03
EA5 01	3.153		3.350	3.370	5.67599	JL	7/13/2009 13:06
EA10 02	3.145		3.420	3.340	5.67067	JL	7/13/2009 13:08
EA2 01	3.148		3.380	3.370	5.65051	JL	7/13/2009 13:12
EA14 02	3.140		3.360	3.410	5.60792	JL	7/13/2009 13:14
EA12 01	3.150		3.340	3.410	5.66937	JL	7/13/2009 13:17
EA17 02	3.153		3.360	3.430	5.64270	JL	7/13/2009 13:20
EA16 01	3.150		3.380	3.380	5.66980	JL	7/13/2009 13:23
EA1 02	3.158		3.320	3.340	5.67704	JL	7/13/2009 13:26
EA8 01	3.150		3.390	3.360	5.64020	JL	7/13/2009 15:26
EA13 01	3.155		3.360	3.350	5.66150	jl	7/14/2009 10:01
EA7 01	3.153		3.360	3.370	5.65876	jl	7/14/2009 10:05
EA15 01	3.140		3.420	3.350	5.67425	jl	7/14/2009 10:07
EA4 01	3.145		3.340	3.370	5.61520	jl	7/14/2009 14:17
EA17 01	3.153		3.380	3.350	5.64569	jl	7/14/2009 14:19
EA3 02	3.148		3.380	3.360	5.63129	jl	7/14/2009 14:22
EA1 01	3.155		3.360	3.340	5.67347	jl	7/14/2009 14:25
EA11 02	3.145		3.380	3.370	5.66142	jl	7/14/2009 14:28
EA9 02	3.148		3.370	3.370	5.66865	jl	7/14/2009 14:31
EA16 02	3.143		3.420	3.360	5.64788	jl	7/14/2009 14:33
EA6 02	3.138		3.410	3.350	5.64993	jl	7/14/2009 14:36
EA2 02	3.153		3.410	3.360	5.67107	jl	7/14/2009 14:38
EA13 02	3.148		3.420	3.350	5.66191	jl	7/14/2009 14:41
EA8 02	3.153		3.410	3.340	5.59085	jl	7/14/2009 14:44

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
EA14 01	3.150		3.350	3.350	5.64316	jl	7/14/2009 14:46
EW07 03	3.083		3.370	3.340	5.62619	jl	7/15/2009 14:04
EW13 04	3.135		3.360	3.360	5.67180	jl	7/15/2009 14:07
EW08 03	3.148		3.390	3.320	5.63208	jl	7/16/2009 7:45
EW05 02	3.135		3.340	3.380	5.67813	jl	7/16/2009 7:49
EW03 04	3.155		3.330	3.370	5.66985	jl	7/16/2009 7:51
EW01 04	3.145		3.330	3.390	5.68387	jl	7/16/2009 7:54
EW03 03	3.153		3.350	3.390	5.66055	jl	7/16/2009 7:58
EW10 02	3.138		3.410	3.320	5.62887	jl	7/16/2009 8:01
EW11 04	3.140		3.380	3.320	5.67029	jl	7/16/2009 8:04
EW08 02	3.155		3.390	3.320	5.61662	jl	7/16/2009 8:07
EW09 03	3.105		3.350	3.360	5.68642	jl	7/16/2009 8:10
EW10 03	3.093		3.370	3.350	5.66337	jl	7/16/2009 8:13
EW05 04	3.160		3.350	3.340	5.67217	jl	7/16/2009 8:16
EW10 04	3.150		3.360	3.360	5.65344	jl	7/16/2009 8:18
EW11 01	3.155		3.370	3.350	5.63173	jl	7/16/2009 8:56
EW04 04	3.163		3.360	3.360	5.66914	jl	7/16/2009 8:58
EW05 01	3.158		3.360	3.340	5.67696	jl	7/16/2009 9:03
EW09 04	3.155		3.390	3.330	5.63140	jl	7/16/2009 9:06
EW04 03	3.143		3.350	3.360	5.66435	jl	7/16/2009 9:09
EW11 02	3.155		3.340	3.350	5.65573	jl	7/16/2009 9:11
EW10 01	3.103		3.370	3.310	5.65861	jl	7/16/2009 9:13
EW13 02	3.143		3.350	3.360	5.61651	jl	7/16/2009 9:15
EW08 04	3.103		3.350	3.330	5.66198	jl	7/16/2009 9:18
EW13 03	3.143		3.350	3.350	5.62320	jl	7/16/2009 9:20
EW12 03	3.155		3.390	3.320	5.62746	jl	7/16/2009 9:23
EW06 04	3.158		3.360	3.320	5.67418	jl	7/16/2009 9:26
EW04 02	3.148		3.360	3.340	5.66301	jl	7/16/2009 9:28
EW01 01	3.148		3.340	3.270	5.65990	jl	7/16/2009 9:30
EW12 02	3.153		3.390	3.320	5.63481	jl	7/16/2009 9:33
EW06 01	3.150		3.340	3.350	5.64695	jl	7/16/2009 9:36
EW06 03	3.100		3.330	3.370	5.67993	jl	7/16/2009 9:39
EW01 02	3.093		3.340	3.360	5.67170	jl	7/16/2009 9:41
EW13 01	3.138		3.360	3.360	5.60389	jl	7/16/2009 9:43

Specimen ID Number	Specimen Hole Diameter, mm	Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
		HD1	HD2			
EW03 01	3.155	3.330	3.390	5.64582	jl	7/16/2009 9:45
EW09 01	3.093	3.350	3.350	5.66755	jl	7/16/2009 9:48
EW09 02	3.163	3.340	3.360	5.60831	jl	7/16/2009 9:50
EW02 04	3.160	3.350	3.320	5.66159	jl	7/16/2009 10:31
EW05 03	3.128	3.350	3.340	5.66843	jl	7/16/2009 10:36
EW02 02	3.153	3.390	3.380	5.66612	jl	7/16/2009 10:39
EW08 01	3.093	3.330	3.320	5.63012	jl	7/16/2009 10:41
EW12 04	3.135	3.330	3.390	5.65871	jl	7/16/2009 10:43
EW07 01	3.103	3.350	3.360	5.66305	jl	7/16/2009 10:46
EW12 01	3.150	3.320	3.360	5.64060	jl	7/16/2009 10:48
EW01 03	3.150	3.280	3.320	5.67972	jl	7/16/2009 10:50
EW02 01	3.140	3.320	3.370	5.65657	jl	7/16/2009 10:53
EW11 03	3.150	3.350	3.350	5.64336	jl	7/16/2009 10:55
EW04 01	3.153	3.370	3.360	5.66329	jl	7/16/2009 10:57
EW03 02	3.155	3.340	3.380	5.65356	jl	7/16/2009 11:10
EW07 04	3.150	3.390	3.320	5.60871	jl	7/16/2009 11:12
EW02 03	3.153	3.340	3.420	5.65233	jl	7/16/2009 11:16
EW07 02	3.148	3.390	3.310	5.61658	jl	7/16/2009 11:18
EW06 02	3.148	3.340	3.350	5.67409	jl	7/16/2009 11:21

Specimen Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg	Specimen Density kg/m ³
EA4 02	25.38025	12.73500	127.3761	0.025380	0.01274	5.2281E-08	0.0056	1766.27358
EA11 01	25.38550	12.72988	127.2736	0.025386	0.01273	5.2453E-08	0.0057	1781.26456
EA12 02	25.38650	12.73050	127.2860	0.025387	0.01273	5.1866E-08	0.0057	1786.86364
EA5 02	25.38175	12.73800	127.4361	0.025382	0.01274	5.1932E-08	0.0057	1787.80767
EA6 01	25.38300	12.73713	127.4186	0.025383	0.01274	5.2346E-08	0.0057	1780.56059
EA10 01	25.38675	12.73813	127.4386	0.025387	0.01274	5.1925E-08	0.0057	1780.65651
EA9 01	25.38625	12.73675	127.4111	0.025386	0.01274	5.2136E-08	0.0057	1780.17329
EA15 02	25.38775	12.73575	127.3911	0.025388	0.01274	5.2509E-08	0.0057	1791.84246
EA7 02	25.38300	12.74038	127.4836	0.025383	0.01274	5.2442E-08	0.0057	1778.20187
EA3 01	25.38300	12.73063	127.2885	0.025383	0.01273	5.2692E-08	0.0056	1775.55875
EA5 01	25.38125	12.73513	127.3786	0.025381	0.01274	5.2453E-08	0.0057	1784.58029
EA10 02	25.38525	12.72963	127.2686	0.025385	0.01273	5.2514E-08	0.0057	1784.22285
EA2 01	25.38075	12.73175	127.3110	0.025381	0.01273	5.2520E-08	0.0057	1777.60007
EA14 02	25.38650	12.73638	127.4036	0.025387	0.01274	5.2426E-08	0.0056	1762.44154
EA12 01	25.38750	12.73225	127.3210	0.025388	0.01273	5.2604E-08	0.0057	1782.95558
EA17 02	25.38575	12.73363	127.3485	0.025386	0.01273	5.3000E-08	0.0056	1774.52425
EA16 01	25.38600	12.73225	127.3210	0.025386	0.01273	5.2681E-08	0.0057	1783.24162
EA1 02	25.38825	12.73800	127.4361	0.025388	0.01274	5.2149E-08	0.0057	1783.42144
EA8 01	25.38250	12.73950	127.4661	0.025383	0.01274	5.2603E-08	0.0056	1772.08469
EA13 01	25.38625	12.73025	127.2810	0.025386	0.01273	5.2458E-08	0.0057	1781.05687
EA7 01	25.38100	12.73500	127.3761	0.025381	0.01274	5.2532E-08	0.0057	1779.26094
EA15 01	25.38625	12.73588	127.3936	0.025386	0.01274	5.2422E-08	0.0057	1783.44532
EA4 01	25.35500	12.73438	127.3635	0.025355	0.01273	5.2127E-08	0.0056	1767.35567
EA17 01	25.38550	12.73325	127.3410	0.025386	0.01273	5.2531E-08	0.0056	1775.32647
EA3 02	25.38050	12.73300	127.3360	0.025381	0.01273	5.2443E-08	0.0056	1771.17453
EA1 01	25.36525	12.73588	127.3936	0.025365	0.01274	5.2381E-08	0.0057	1784.67796
EA11 02	25.38575	12.72988	127.2736	0.025386	0.01273	5.2437E-08	0.0057	1781.16205
EA9 02	25.38425	12.73675	127.4111	0.025384	0.01274	5.2442E-08	0.0057	1781.59041
EA16 02	25.38400	12.73200	127.3160	0.025384	0.01273	5.2584E-08	0.0056	1776.50622
EA6 02	25.38200	12.73850	127.4461	0.025382	0.01274	5.2263E-08	0.0056	1775.27125
EA2 02	25.38800	12.73813	127.4386	0.025388	0.01274	5.2843E-08	0.0057	1781.91643
EA13 02	25.38550	12.73463	127.3685	0.025386	0.01273	5.2675E-08	0.0057	1780.11687
EA8 02	25.38175	12.73538	127.3836	0.025382	0.01274	5.2690E-08	0.0056	1757.83732

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg	Specimen Density kg/m ³
EA14 01	25.38600	12.73475	127.3710	0.025386	0.01273	5.2214E-08	0.0056	1773.89382
EW07 03	25.38825	12.72800	127.2361	0.025388	0.01273	5.0076E-08	0.0056	1769.11707
EW13 04	25.38575	12.73100	127.2960	0.025386	0.01273	5.1873E-08	0.0057	1783.79080
EW08 03	25.37875	12.73463	127.3685	0.025379	0.01273	5.2210E-08	0.0056	1770.95798
EW05 02	25.37675	12.73825	127.4411	0.025377	0.01274	5.1873E-08	0.0057	1784.35954
EW03 04	25.37375	12.73563	127.3886	0.025374	0.01274	5.2379E-08	0.0057	1783.00174
EW01 04	25.39975	12.73538	127.3836	0.025400	0.01274	5.2202E-08	0.0057	1785.52303
EW03 03	25.37475	12.73550	127.3861	0.025375	0.01274	5.2609E-08	0.0057	1780.16992
EW10 02	25.38050	12.73550	127.3861	0.025381	0.01274	5.2033E-08	0.0056	1769.47930
EW11 04	25.37950	12.73650	127.4061	0.025380	0.01274	5.1882E-08	0.0057	1782.20184
EW08 02	25.37775	12.73375	127.3510	0.025378	0.01273	5.2456E-08	0.0056	1766.55118
EW09 03	25.37525	12.73463	127.3685	0.025375	0.01273	5.0808E-08	0.0057	1787.50765
EW10 03	25.37875	12.72950	127.2661	0.025379	0.01273	5.0475E-08	0.0057	1781.28213
EW05 04	25.37550	12.73875	127.4511	0.025376	0.01274	5.2467E-08	0.0057	1782.76652
EW10 04	25.37825	12.73488	127.3736	0.025378	0.01273	5.2370E-08	0.0057	1777.72861
EW11 01	25.38000	12.73500	127.3761	0.025380	0.01274	5.2536E-08	0.0056	1770.83474
EW04 04	25.37550	12.73350	127.3460	0.025376	0.01273	5.2786E-08	0.0057	1783.48684
EW05 01	25.37825	12.73588	127.3936	0.025378	0.01274	5.2463E-08	0.0057	1784.89159
EW09 04	25.37725	12.73588	127.3936	0.025377	0.01274	5.2536E-08	0.0056	1770.67894
EW04 03	25.37550	12.73450	127.3660	0.025376	0.01273	5.2043E-08	0.0057	1781.27900
EW11 02	25.37850	12.73275	127.3310	0.025379	0.01273	5.2302E-08	0.0057	1778.99634
EW10 01	25.35600	12.73463	127.3685	0.025356	0.01273	5.0501E-08	0.0057	1779.96531
EW13 02	25.38125	12.73438	127.3635	0.025381	0.01273	5.2043E-08	0.0056	1765.86336
EW08 04	25.37625	12.73263	127.3285	0.025376	0.01273	5.0501E-08	0.0057	1780.14970
EW13 03	25.38250	12.73425	127.3610	0.025383	0.01273	5.1966E-08	0.0056	1767.87034
EW12 03	25.38050	12.73250	127.3260	0.025381	0.01273	5.2460E-08	0.0056	1770.12083
EW06 04	25.37600	12.73750	127.4261	0.025376	0.01274	5.2307E-08	0.0057	1783.62822
EW04 02	25.37400	12.73438	127.3635	0.025374	0.01273	5.2131E-08	0.0057	1781.04920
EW01 01	25.34800	12.73150	127.3060	0.025348	0.01273	5.1432E-08	0.0057	1782.35263
EW12 02	25.37875	12.73100	127.2960	0.025379	0.01273	5.2373E-08	0.0056	1772.93294
EW06 01	25.37775	12.73900	127.4561	0.025378	0.01274	5.2136E-08	0.0056	1774.42443
EW06 03	25.36550	12.73638	127.4036	0.025366	0.01274	5.0569E-08	0.0057	1785.53200
EW01 02	25.38425	12.73750	127.4261	0.025384	0.01274	5.0325E-08	0.0057	1781.15042
EW13 01	25.38200	12.73038	127.2835	0.025382	0.01273	5.1956E-08	0.0056	1762.91960

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg	Specimen Density kg/m ³
EW03 01	25.37725	12.73488	127.3736	0.025377	0.01273	5.2538E-08	0.0056	1775.49733
EW09 01	25.35625	12.73075	127.2910	0.025356	0.01273	5.0325E-08	0.0057	1783.76375
EW09 02	25.37825	12.73475	127.3710	0.025378	0.01273	5.2629E-08	0.0056	1763.71656
EW02 04	25.37175	12.73025	127.2810	0.025372	0.01273	5.2311E-08	0.0057	1782.03726
EW05 03	25.37650	12.73263	127.3285	0.025377	0.01273	5.1394E-08	0.0057	1782.66018
EW02 02	25.38050	12.73663	127.4086	0.025381	0.01274	5.2843E-08	0.0057	1781.32267
EW08 01	25.35375	12.72750	127.2261	0.025354	0.01273	4.9949E-08	0.0056	1772.87056
EW12 04	25.38200	12.73000	127.2761	0.025382	0.01273	5.1876E-08	0.0057	1780.22707
EW07 01	25.36950	12.73775	127.4311	0.025370	0.01274	5.0727E-08	0.0057	1779.63799
EW12 01	25.38175	12.73438	127.3635	0.025382	0.01273	5.2058E-08	0.0056	1773.41012
EW01 03	25.35650	12.73413	127.3585	0.025357	0.01273	5.1435E-08	0.0057	1787.23747
EW02 01	25.38825	12.73525	127.3811	0.025388	0.01274	5.1805E-08	0.0057	1777.57893
EW11 03	25.38075	12.73313	127.3385	0.025381	0.01273	5.2214E-08	0.0056	1774.79007
EW04 01	25.37575	12.73038	127.2835	0.025376	0.01273	5.2531E-08	0.0057	1782.37469
EW03 02	25.37450	12.73213	127.3185	0.025375	0.01273	5.2535E-08	0.0057	1778.90679
EW07 04	25.37725	12.73150	127.3060	0.025377	0.01273	5.2292E-08	0.0056	1764.64116
EW02 03	25.37125	12.73150	127.3060	0.025371	0.01273	5.2764E-08	0.0057	1779.05705
EW07 02	25.37850	12.73550	127.3861	0.025379	0.01274	5.2132E-08	0.0056	1765.81204
EW06 02	25.37625	12.73588	127.3936	0.025376	0.01274	5.2054E-08	0.0057	1783.90291

Specimen ID Number	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
EA4 02	1.7663	25.3	21.3	53.5
EA11 01	1.7813	25.3	22.3	48.1
EA12 02	1.7869	25.3	22.3	47.3
EA5 02	1.7878	25.3	22.4	46.2
EA6 01	1.7806	25.3	22.5	45.5
EA10 01	1.7807	25.3	22.5	45
EA9 01	1.7802	25.3	22.3	43.8
EA15 02	1.7918	25.3	22.1	43.4
EA7 02	1.7782	25.3	21.9	43.6
EA3 01	1.7756	25.3	21.9	43
EA5 01	1.7846	25.3	21.8	42.7
EA10 02	1.7842	25.3	21.7	42.5
EA2 01	1.7776	25.3	21.6	42.3
EA14 02	1.7624	25.3	21.6	42.2
EA12 01	1.7830	25.3	21.5	41.9
EA17 02	1.7745	25.3	21.6	41.3
EA16 01	1.7832	25.3	21.5	40.9
EA1 02	1.7834	25.3	21.5	40.9
EA8 01	1.7721	25.3	21.1	31.9
EA13 01	1.7811	25.4	20.6	36
EA7 01	1.7793	25.4	20.6	36
EA15 01	1.7834	25.4	20.6	35.9
EA4 01	1.7674	25.4	20.7	36.4
EA17 01	1.7753	25.4	20.7	36.4
EA3 02	1.7712	25.4	20.7	36.2
EA1 01	1.7847	25.4	20.7	36.4
EA11 02	1.7812	25.4	20.7	36.7
EA9 02	1.7816	25.4	20.7	36.7
EA16 02	1.7765	25.4	20.7	36.6
EA6 02	1.7753	25.4	20.7	37
EA2 02	1.7819	25.4	20.7	36.9
EA13 02	1.7801	25.4	20.8	36.5
EA8 02	1.7578	25.4	20.8	36.4

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
EA14 01	1.7739	25.4	20.8	36.3
EW07 03	1.7691	25.4	20.8	37.3
EW13 04	1.7838	25.4	20.8	37.3
EW08 03	1.7710	25.5	21	39.7
EW05 02	1.7844	25.5	21	39.7
EW03 04	1.7830	25.5	21.1	39.8
EW01 04	1.7855	25.5	21.1	39.8
EW03 03	1.7802	25.5	21.1	40
EW10 02	1.7695	25.5	21.1	40.2
EW11 04	1.7822	25.5	21.2	40.2
EW08 02	1.7666	25.5	21.2	40.3
EW09 03	1.7875	25.5	21.2	40.2
EW10 03	1.7813	25.5	21.2	40.4
EW05 04	1.7828	25.5	21.3	40.4
EW10 04	1.7777	25.5	21.3	40.6
EW11 01	1.7708	25.5	21.3	43.2
EW04 04	1.7835	25.5	21.4	43.6
EW05 01	1.7849	25.5	21.4	43.7
EW09 04	1.7707	25.5	21.3	44.2
EW04 03	1.7813	25.5	21.3	44.2
EW11 02	1.7790	25.5	21.3	44.2
EW10 01	1.7800	25.5	21.3	44.3
EW13 02	1.7659	25.5	21.4	44.1
EW08 04	1.7801	25.5	21.4	44.3
EW13 03	1.7679	25.5	21.4	44.5
EW12 03	1.7701	25.5	21.3	44.8
EW06 04	1.7836	25.5	21.3	45.1
EW04 02	1.7810	25.5	21.4	44.9
EW01 01	1.7824	25.5	21.4	45
EW12 02	1.7729	25.5	21.4	44.8
EW06 01	1.7744	25.5	21.4	44.7
EW06 03	1.7855	25.5	21.4	44.4
EW01 02	1.7812	25.5	21.4	44.3
EW13 01	1.7629	25.5	21.4	44.4

Specimen ID Number	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
EW03 01	1.7755	25.5	21.4	44.7
EW09 01	1.7838	25.5	21.4	44.8
EW09 02	1.7637	25.5	21.4	45
EW02 04	1.7820	25.5	21.5	44.6
EW05 03	1.7827	25.5	21.5	44.5
EW02 02	1.7813	25.5	21.5	44.8
EW08 01	1.7729	25.5	21.4	44.9
EW12 04	1.7802	25.5	21.5	45
EW07 01	1.7796	25.5	21.5	45.1
EW12 01	1.7734	25.5	21.5	45.2
EW01 03	1.7872	25.5	21.5	45.3
EW02 01	1.7776	25.5	21.5	45.3
EW11 03	1.7748	25.5	21.5	45.1
EW04 01	1.7824	25.5	21.5	44.7
EW03 02	1.7789	25.5	21.4	45.2
EW07 04	1.7646	25.5	21.4	45.1
EW02 03	1.7791	25.5	21.5	44.9
EW07 02	1.7658	25.5	21.5	45.2
EW06 02	1.7839	25.5	21.5	44.9

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
EA9 01		47735	2/4/2010 16:17	100	81.10974	3.19E-04	3.82E-06	3.80E-06
				200	115.11977	7.12E-04	4.19E-06	3.87E-06
				300	147.85937	1.14E-03	4.51E-06	4.03E-06
				400	180.46675	1.62E-03	4.78E-06	4.22E-06
				500	213.19455	2.11E-03	5.01E-06	4.36E-06
				600	246.07995	2.62E-03	5.19E-06	4.48E-06
				700	279.15184	3.14E-03	5.32E-06	4.59E-06
				800	312.46342	3.68E-03	5.40E-06	4.69E-06
				900	345.95266	4.22E-03	5.43E-06	4.78E-06
				1000	379.64874	4.76E-03	5.42E-06	4.84E-06
EA8 02		47735	2/4/2010 16:30	100	77.42393	3.23E-04	3.74E-06	3.81E-06
				200	110.7825	7.10E-04	4.19E-06	3.85E-06
				300	143.28475	1.14E-03	4.56E-06	4.01E-06
				400	175.82241	1.62E-03	4.87E-06	4.22E-06
				500	208.55631	2.13E-03	5.12E-06	4.39E-06
				600	241.52559	2.65E-03	5.31E-06	4.54E-06
				700	274.64982	3.18E-03	5.43E-06	4.66E-06
				800	308.06712	3.72E-03	5.49E-06	4.75E-06
				900	341.59159	4.27E-03	5.48E-06	4.84E-06
				1000	375.28736	4.83E-03	5.41E-06	4.91E-06
EA8 01		47735	2/4/2010 7:53	100	81.18034	3.36E-04	3.93E-06	3.90E-06
				200	115.1526	7.42E-04	4.31E-06	3.99E-06
				300	147.86831	1.18E-03	4.63E-06	4.14E-06
				400	180.46988	1.67E-03	4.89E-06	4.33E-06
				500	213.15362	2.17E-03	5.11E-06	4.47E-06
				600	246.03968	2.69E-03	5.27E-06	4.59E-06
				700	279.10281	3.22E-03	5.38E-06	4.70E-06
				800	312.42984	3.76E-03	5.43E-06	4.79E-06
				900	345.93208	4.31E-03	5.43E-06	4.87E-06
				1000	379.62826	4.84E-03	5.38E-06	4.92E-06
EA9 02		47735	2/5/2010 7:37	100	77.81471	3.30E-04	3.69E-06	3.76E-06
				200	111.15708	7.11E-04	4.09E-06	3.79E-06
				300	143.69745	1.13E-03	4.44E-06	3.94E-06
				400	176.23513	1.60E-03	4.74E-06	4.13E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
EW01 02		47735	2/5/2010 15:57	500	209.05525	2.09E-03	4.98E-06	4.29E-06
				600	241.99541	2.60E-03	5.18E-06	4.42E-06
				700	275.08733	3.12E-03	5.32E-06	4.55E-06
				800	308.51769	3.65E-03	5.42E-06	4.65E-06
				900	342.02384	4.20E-03	5.46E-06	4.74E-06
				1000	375.71941	4.75E-03	5.46E-06	4.82E-06
				100	81.11523	3.19E-04	3.77E-06	3.80E-06
				200	115.14784	7.09E-04	4.17E-06	3.85E-06
				300	147.90175	1.13E-03	4.52E-06	4.00E-06
				400	180.51886	1.61E-03	4.81E-06	4.21E-06
EW01 03		47735	2/8/2010 7:45	500	213.20164	2.11E-03	5.05E-06	4.36E-06
				600	246.09335	2.62E-03	5.24E-06	4.49E-06
				700	279.18817	3.15E-03	5.38E-06	4.61E-06
				800	312.51703	3.69E-03	5.46E-06	4.71E-06
				900	346.0159	4.25E-03	5.49E-06	4.81E-06
				1000	379.69268	4.79E-03	5.47E-06	4.87E-06
				100	77.47406	3.35E-04	3.78E-06	3.84E-06
				200	110.81981	7.24E-04	4.17E-06	3.88E-06
				300	143.30799	1.15E-03	4.50E-06	4.02E-06
				400	175.90073	1.62E-03	4.80E-06	4.20E-06
EW01 04		47735	6/9/2010 8:09	500	208.63202	2.12E-03	5.05E-06	4.37E-06
				600	241.59094	2.64E-03	5.26E-06	4.50E-06
				700	274.72684	3.17E-03	5.42E-06	4.62E-06
				800	308.11327	3.71E-03	5.54E-06	4.72E-06
				900	341.69206	4.27E-03	5.62E-06	4.82E-06
				1000	375.2859	4.85E-03	5.65E-06	4.92E-06
				100	81.31597	3.23E-04	3.91E-06	3.74E-06
				200	115.41079	7.25E-04	4.28E-06	3.89E-06
				300	148.0993	1.17E-03	4.59E-06	4.08E-06
				400	180.56097	1.65E-03	4.85E-06	4.28E-06
500	213.11168	2.14E-03	5.06E-06	4.42E-06				
600	245.91912	2.66E-03	5.21E-06	4.54E-06				
700	278.94366	3.18E-03	5.31E-06	4.64E-06				
800	312.19818	3.72E-03	5.36E-06	4.73E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
EW02 01		47735	2/8/2010 16:21	900	345.79415	4.26E-03	5.36E-06	4.81E-06
				1000	379.50427	4.78E-03	5.31E-06	4.85E-06
				100	77.89159	3.30E-04	3.87E-06	3.91E-06
				200	111.24233	7.24E-04	4.27E-06	3.93E-06
				300	143.77062	1.17E-03	4.61E-06	4.10E-06
				400	176.55469	1.65E-03	4.90E-06	4.29E-06
				500	209.31375	2.16E-03	5.14E-06	4.46E-06
				600	242.24689	2.68E-03	5.33E-06	4.60E-06
				700	275.3673	3.22E-03	5.46E-06	4.71E-06
				800	308.70762	3.76E-03	5.54E-06	4.80E-06
EW02 02		47735	2/8/2010 16:02	900	342.25032	4.32E-03	5.57E-06	4.89E-06
				1000	375.76391	4.90E-03	5.54E-06	4.98E-06
				100	81.09971	3.27E-04	3.65E-06	3.84E-06
				200	115.07671	7.14E-04	4.09E-06	3.87E-06
				300	147.86905	1.12E-03	4.47E-06	3.96E-06
				400	180.50206	1.59E-03	4.79E-06	4.16E-06
				500	213.21099	2.09E-03	5.06E-06	4.33E-06
				600	246.11529	2.61E-03	5.27E-06	4.48E-06
				700	279.20046	3.14E-03	5.43E-06	4.60E-06
				800	312.53892	3.69E-03	5.53E-06	4.72E-06
EW02 04		47735	2/9/2010 7:50	900	346.04958	4.25E-03	5.57E-06	4.81E-06
				1000	379.75587	4.80E-03	5.56E-06	4.88E-06
				100	81.18155	3.30E-04	3.83E-06	3.83E-06
				200	115.1023	7.26E-04	4.18E-06	3.90E-06
				300	147.86803	1.15E-03	4.50E-06	4.03E-06
				400	180.51172	1.62E-03	4.77E-06	4.21E-06
				500	213.2185	2.11E-03	5.00E-06	4.35E-06
				600	246.11177	2.62E-03	5.19E-06	4.48E-06
				700	279.20094	3.15E-03	5.34E-06	4.60E-06
				800	312.54435	3.69E-03	5.45E-06	4.70E-06
EW03 01		47735	2/10/2010 8:47	900	346.04007	4.24E-03	5.52E-06	4.79E-06
				1000	379.73265	4.79E-03	5.55E-06	4.86E-06
				100	76.86019	3.41E-04	3.96E-06	4.00E-06
				200	110.12803	7.43E-04	4.32E-06	4.02E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
EW03 02		47735	2/10/2010 8:50	300	142.60205	1.19E-03	4.64E-06	4.19E-06
				400	175.65047	1.68E-03	4.91E-06	4.37E-06
				500	208.48534	2.18E-03	5.15E-06	4.50E-06
				600	241.37805	2.71E-03	5.33E-06	4.63E-06
				700	274.35781	3.24E-03	5.48E-06	4.74E-06
				800	307.23134	3.80E-03	5.58E-06	4.84E-06
				900	340.56229	4.36E-03	5.63E-06	4.93E-06
				1000	374.0543	4.93E-03	5.65E-06	5.01E-06
				100	81.14185	3.31E-04	3.79E-06	3.84E-06
				200	115.12871	7.24E-04	4.20E-06	3.89E-06
EW03 03		47735	2/11/2010 7:50	300	147.86531	1.15E-03	4.55E-06	4.03E-06
				400	180.47575	1.63E-03	4.85E-06	4.24E-06
				500	213.19165	2.13E-03	5.08E-06	4.39E-06
				600	246.0972	2.65E-03	5.25E-06	4.52E-06
				700	279.16183	3.18E-03	5.36E-06	4.64E-06
				800	312.51883	3.72E-03	5.41E-06	4.73E-06
				900	346.04491	4.26E-03	5.40E-06	4.81E-06
				1000	379.72112	4.79E-03	5.34E-06	4.87E-06
				100	77.24642	3.44E-04	3.78E-06	3.91E-06
				200	110.50932	7.31E-04	4.21E-06	3.93E-06
EW03 04		47735	4/25/2010 12:14	300	142.99498	1.16E-03	4.57E-06	4.06E-06
				400	175.52792	1.64E-03	4.87E-06	4.26E-06
				500	208.18239	2.15E-03	5.10E-06	4.43E-06
				600	241.06564	2.67E-03	5.28E-06	4.56E-06
				700	274.15702	3.20E-03	5.40E-06	4.67E-06
				800	307.45544	3.74E-03	5.46E-06	4.76E-06
				900	340.93584	4.28E-03	5.46E-06	4.84E-06
				1000	374.58157	4.85E-03	5.39E-06	4.92E-06
				100	81.40105	3.30E-04	3.97E-06	3.84E-06
				200	115.38614	7.38E-04	4.32E-06	3.98E-06
300	148.11201	1.18E-03	4.63E-06	4.13E-06				
400	180.73368	1.67E-03	4.89E-06	4.32E-06				
500	213.40627	2.17E-03	5.12E-06	4.47E-06				
600	246.28887	2.69E-03	5.30E-06	4.60E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
EW04 01		47735	6/2/2010 11:44	700	279.39086	3.22E-03	5.44E-06	4.70E-06
				800	312.72179	3.77E-03	5.54E-06	4.80E-06
				900	346.24174	4.33E-03	5.60E-06	4.90E-06
				1000	379.94581	4.89E-03	5.61E-06	4.96E-06
				100	81.41414	3.23E-04	3.90E-06	3.73E-06
				200	115.47641	7.24E-04	4.28E-06	3.89E-06
				300	148.23904	1.16E-03	4.60E-06	4.07E-06
				400	180.7103	1.65E-03	4.88E-06	4.28E-06
				500	213.20939	2.15E-03	5.10E-06	4.43E-06
				600	246.03861	2.67E-03	5.27E-06	4.55E-06
EW04 02		47735	2/11/2010 16:14	700	279.04422	3.20E-03	5.40E-06	4.66E-06
				800	312.33968	3.74E-03	5.47E-06	4.76E-06
				900	345.83806	4.29E-03	5.49E-06	4.85E-06
				1000	379.54252	4.84E-03	5.46E-06	4.91E-06
				100	81.20492	3.16E-04	3.76E-06	3.77E-06
				200	115.17053	7.08E-04	4.15E-06	3.85E-06
				300	147.94433	1.13E-03	4.48E-06	3.99E-06
				400	180.57718	1.60E-03	4.77E-06	4.18E-06
				500	213.27245	2.09E-03	5.01E-06	4.33E-06
				600	246.16354	2.60E-03	5.19E-06	4.46E-06
EW05 01		47735	2/16/2010 15:40	700	279.26035	3.13E-03	5.33E-06	4.58E-06
				800	312.58944	3.67E-03	5.42E-06	4.68E-06
				900	346.08984	4.21E-03	5.46E-06	4.77E-06
				1000	379.76945	4.75E-03	5.45E-06	4.83E-06
				100	76.78891	3.18E-04	3.70E-06	3.78E-06
				200	110.12196	7.00E-04	4.17E-06	3.81E-06
				300	142.64408	1.13E-03	4.56E-06	4.00E-06
				400	175.16704	1.62E-03	4.89E-06	4.22E-06
				500	207.83089	2.12E-03	5.16E-06	4.39E-06
				600	240.69535	2.65E-03	5.36E-06	4.54E-06
700	273.75918	3.19E-03	5.50E-06	4.67E-06				
800	307.04865	3.74E-03	5.57E-06	4.77E-06				
900	340.5149	4.30E-03	5.57E-06	4.87E-06				
1000	374.12586	4.87E-03	5.51E-06	4.95E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
EW05 02		47735	4/22/2010 14:08	100	81.39833	3.27E-04	3.90E-06	3.81E-06
				200	115.36593	7.32E-04	4.26E-06	3.94E-06
				300	148.12408	1.17E-03	4.57E-06	4.09E-06
				400	180.73264	1.64E-03	4.82E-06	4.27E-06
				500	213.39116	2.14E-03	5.04E-06	4.41E-06
				600	246.259	2.65E-03	5.20E-06	4.53E-06
				700	279.33273	3.17E-03	5.31E-06	4.64E-06
				800	312.64877	3.71E-03	5.38E-06	4.73E-06
				900	346.16974	4.25E-03	5.40E-06	4.80E-06
				1000	379.874	4.79E-03	5.37E-06	4.86E-06
EW05 03		47735	2/16/2010 7:21	100	76.80273	3.49E-04	3.88E-06	3.95E-06
				200	110.07615	7.45E-04	4.24E-06	4.00E-06
				300	142.55306	1.18E-03	4.57E-06	4.13E-06
				400	175.1592	1.66E-03	4.85E-06	4.30E-06
				500	207.77548	2.16E-03	5.10E-06	4.45E-06
				600	240.62433	2.68E-03	5.30E-06	4.58E-06
				700	273.7089	3.22E-03	5.46E-06	4.70E-06
				800	307.03556	3.77E-03	5.58E-06	4.79E-06
				900	340.50011	4.33E-03	5.65E-06	4.89E-06
				1000	374.12983	4.91E-03	5.69E-06	4.98E-06
EW05 04		47735	2/16/2010 7:25	100	81.24829	3.29E-04	3.80E-06	3.82E-06
				200	115.23471	7.25E-04	4.21E-06	3.89E-06
				300	147.95204	1.16E-03	4.56E-06	4.04E-06
				400	180.60168	1.63E-03	4.86E-06	4.24E-06
				500	213.25061	2.14E-03	5.10E-06	4.40E-06
				600	246.08835	2.66E-03	5.28E-06	4.54E-06
				700	279.19613	3.19E-03	5.41E-06	4.65E-06
				800	312.51344	3.73E-03	5.48E-06	4.75E-06
				900	346.01329	4.29E-03	5.50E-06	4.84E-06
				1000	379.70691	4.83E-03	5.45E-06	4.90E-06
EW06 02		47735	2/17/2010 7:55	100	81.18409	3.32E-04	3.85E-06	3.86E-06
				200	115.10627	7.33E-04	4.24E-06	3.95E-06
				300	147.91016	1.17E-03	4.58E-06	4.09E-06
				400	180.55266	1.65E-03	4.87E-06	4.28E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
EW06 03		47735	2/17/2010 16:15	500	213.24766	2.15E-03	5.11E-06	4.42E-06
				600	246.13539	2.67E-03	5.30E-06	4.56E-06
				700	279.24752	3.20E-03	5.45E-06	4.68E-06
				800	312.54953	3.76E-03	5.54E-06	4.79E-06
				900	346.0527	4.32E-03	5.59E-06	4.88E-06
				1000	379.73399	4.86E-03	5.58E-06	4.94E-06
				100	76.79384	3.29E-04	3.87E-06	3.93E-06
				200	110.15777	7.25E-04	4.25E-06	3.95E-06
				300	142.67497	1.16E-03	4.58E-06	4.09E-06
				400	175.19149	1.64E-03	4.85E-06	4.28E-06
EW06 04		47735	2/17/2010 16:07	500	207.85625	2.14E-03	5.07E-06	4.43E-06
				600	240.71687	2.66E-03	5.24E-06	4.56E-06
				700	273.77336	3.19E-03	5.35E-06	4.67E-06
				800	307.06095	3.72E-03	5.41E-06	4.74E-06
				900	340.51177	4.26E-03	5.42E-06	4.82E-06
				1000	374.12807	4.82E-03	5.37E-06	4.91E-06
				100	81.17604	3.21E-04	3.80E-06	3.82E-06
				200	115.17735	7.12E-04	4.20E-06	3.87E-06
				300	147.9238	1.14E-03	4.54E-06	4.03E-06
				400	180.54971	1.62E-03	4.84E-06	4.23E-06
EW06 01		47735	2/17/2010 7:52	500	213.2526	2.12E-03	5.08E-06	4.39E-06
				600	246.14795	2.64E-03	5.28E-06	4.52E-06
				700	279.24034	3.17E-03	5.42E-06	4.64E-06
				800	312.57063	3.72E-03	5.51E-06	4.75E-06
				900	346.08057	4.27E-03	5.54E-06	4.84E-06
				1000	379.77286	4.82E-03	5.53E-06	4.90E-06
				100	76.83125	3.51E-04	4.03E-06	4.07E-06
				200	110.18343	7.63E-04	4.41E-06	4.11E-06
				300	142.7079	1.22E-03	4.73E-06	4.26E-06
				400	175.19666	1.71E-03	5.01E-06	4.45E-06
500	207.85979	2.23E-03	5.24E-06	4.59E-06				
600	240.69851	2.76E-03	5.43E-06	4.72E-06				
700	273.78066	3.31E-03	5.56E-06	4.83E-06				
800	307.04905	3.87E-03	5.65E-06	4.93E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
EW07 01		47735	2/18/2010 7:36	900	340.50503	4.43E-03	5.69E-06	5.01E-06
				1000	374.13089	5.02E-03	5.69E-06	5.10E-06
				100	76.84101	3.47E-04	3.99E-06	4.05E-06
				200	110.19857	7.56E-04	4.39E-06	4.08E-06
				300	142.69145	1.21E-03	4.73E-06	4.23E-06
				400	175.19138	1.71E-03	5.02E-06	4.43E-06
				500	208.05653	2.22E-03	5.26E-06	4.58E-06
				600	240.84843	2.76E-03	5.44E-06	4.71E-06
				700	273.76184	3.31E-03	5.57E-06	4.83E-06
				800	307.0448	3.86E-03	5.65E-06	4.92E-06
EW07 02		47735	4/23/2010 13:00	900	340.49607	4.43E-03	5.67E-06	5.00E-06
				1000	374.12839	5.01E-03	5.64E-06	5.09E-06
				100	81.45214	3.28E-04	3.86E-06	3.84E-06
				200	115.40019	7.28E-04	4.26E-06	3.93E-06
				300	148.11292	1.16E-03	4.60E-06	4.08E-06
				400	180.72601	1.65E-03	4.89E-06	4.29E-06
				500	213.36865	2.15E-03	5.13E-06	4.44E-06
				600	246.21607	2.67E-03	5.32E-06	4.57E-06
				700	279.32995	3.21E-03	5.46E-06	4.69E-06
				800	312.64716	3.76E-03	5.54E-06	4.80E-06
EW07 03		47735	3/10/2010 7:47	900	346.15135	4.32E-03	5.58E-06	4.89E-06
				1000	379.83576	4.87E-03	5.56E-06	4.95E-06
				100	77.43316	3.37E-04	3.86E-06	3.92E-06
				200	110.77845	7.32E-04	4.27E-06	3.95E-06
				300	143.25442	1.17E-03	4.63E-06	4.11E-06
				400	175.74131	1.66E-03	4.94E-06	4.32E-06
				500	208.38827	2.17E-03	5.19E-06	4.48E-06
				600	241.2463	2.70E-03	5.39E-06	4.62E-06
				700	274.31724	3.24E-03	5.54E-06	4.74E-06
				800	307.60701	3.80E-03	5.63E-06	4.84E-06
EW07 04		47735	3/10/2010 7:48	900	341.04697	4.36E-03	5.67E-06	4.94E-06
				1000	374.68149	4.95E-03	5.66E-06	5.03E-06
				100	81.28816	3.37E-04	3.95E-06	3.92E-06
				200	115.27165	7.42E-04	4.31E-06	3.99E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
EW08 01		47735	3/10/2010 16:27	300	148.04156	1.18E-03	4.63E-06	4.14E-06
				400	180.66238	1.67E-03	4.90E-06	4.34E-06
				500	213.34019	2.18E-03	5.13E-06	4.48E-06
				600	246.1893	2.70E-03	5.32E-06	4.61E-06
				700	279.27667	3.23E-03	5.46E-06	4.71E-06
				800	312.57893	3.78E-03	5.56E-06	4.82E-06
				900	346.07548	4.35E-03	5.61E-06	4.91E-06
				1000	379.7531	4.90E-03	5.62E-06	4.98E-06
				100	77.3438	3.34E-04	3.89E-06	3.95E-06
				200	110.69856	7.29E-04	4.31E-06	3.97E-06
300	143.21959	1.18E-03	4.67E-06	4.14E-06				
400	175.72033	1.67E-03	4.98E-06	4.36E-06				
500	208.3941	2.18E-03	5.22E-06	4.52E-06				
600	241.26417	2.72E-03	5.40E-06	4.66E-06				
700	274.33515	3.26E-03	5.53E-06	4.77E-06				
800	307.60786	3.81E-03	5.59E-06	4.86E-06				
900	341.06163	4.37E-03	5.60E-06	4.95E-06				
1000	374.66349	4.95E-03	5.55E-06	5.03E-06				
EW08 02		47735	3/10/2010 16:14	100	81.24149	3.28E-04	3.97E-06	3.92E-06
				200	115.24924	7.39E-04	4.34E-06	4.02E-06
				300	148.01361	1.18E-03	4.67E-06	4.17E-06
				400	180.62528	1.67E-03	4.95E-06	4.37E-06
				500	213.3047	2.18E-03	5.18E-06	4.51E-06
				600	246.18712	2.71E-03	5.36E-06	4.64E-06
				700	279.26912	3.25E-03	5.48E-06	4.75E-06
				800	312.60249	3.80E-03	5.56E-06	4.85E-06
				900	346.09151	4.36E-03	5.59E-06	4.94E-06
				1000	379.78152	4.91E-03	5.57E-06	5.00E-06
EW08 03		47735	6/7/2010 8:34	100	81.33417	3.44E-04	4.12E-06	4.01E-06
				200	115.43658	7.67E-04	4.49E-06	4.13E-06
				300	148.07584	1.23E-03	4.80E-06	4.31E-06
				400	180.60969	1.73E-03	5.06E-06	4.49E-06
				500	213.19982	2.25E-03	5.28E-06	4.64E-06
				600	245.99405	2.78E-03	5.44E-06	4.76E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
EW08 04		47735	3/11/2010 7:44	700	279.00852	3.33E-03	5.56E-06	4.87E-06
				800	312.32802	3.89E-03	5.62E-06	4.96E-06
				900	345.82849	4.46E-03	5.63E-06	5.04E-06
				1000	379.57199	5.02E-03	5.60E-06	5.10E-06
				100	81.42927	3.35E-04	3.87E-06	3.92E-06
				200	115.41597	7.40E-04	4.29E-06	3.99E-06
				300	148.15458	1.18E-03	4.66E-06	4.13E-06
				400	180.76333	1.67E-03	4.96E-06	4.33E-06
				500	213.43108	2.18E-03	5.21E-06	4.49E-06
				600	246.30952	2.71E-03	5.40E-06	4.63E-06
EW09 01		47735	6/3/2010 15:57	700	279.41006	3.25E-03	5.53E-06	4.75E-06
				800	312.73257	3.81E-03	5.60E-06	4.86E-06
				900	346.20788	4.37E-03	5.62E-06	4.95E-06
				1000	379.94075	4.93E-03	5.58E-06	5.01E-06
				100	81.80235	3.10E-04	4.00E-06	3.76E-06
				200	115.91435	7.18E-04	4.36E-06	3.89E-06
				300	148.60185	1.18E-03	4.67E-06	4.14E-06
				400	181.09354	1.67E-03	4.93E-06	4.34E-06
				500	213.64924	2.17E-03	5.15E-06	4.48E-06
				600	246.48584	2.69E-03	5.31E-06	4.60E-06
EW09 02		47735	3/12/2010 10:49	700	279.49078	3.22E-03	5.43E-06	4.71E-06
				800	312.83418	3.77E-03	5.50E-06	4.81E-06
				900	346.34501	4.33E-03	5.52E-06	4.90E-06
				1000	380.08429	4.87E-03	5.49E-06	4.95E-06
				100	77.44319	3.42E-04	3.93E-06	3.95E-06
				200	110.77831	7.44E-04	4.37E-06	3.99E-06
				300	143.24974	1.20E-03	4.74E-06	4.18E-06
				400	175.76044	1.70E-03	5.05E-06	4.40E-06
				500	208.41685	2.22E-03	5.30E-06	4.57E-06
				600	241.26419	2.76E-03	5.48E-06	4.71E-06
700	274.31848	3.31E-03	5.60E-06	4.82E-06				
800	307.58742	3.87E-03	5.66E-06	4.93E-06				
900	341.05279	4.43E-03	5.65E-06	5.01E-06				
1000	374.65691	5.01E-03	5.58E-06	5.09E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
EW04 03		47735	7/14/2010 9:24	100	81.85902	3.14E-04	3.86E-06	3.70E-06
				200	116.00626	7.20E-04	4.40E-06	3.90E-06
				300	148.65328	1.18E-03	4.84E-06	4.15E-06
				400	181.07042	1.69E-03	5.18E-06	4.40E-06
				500	213.62475	2.21E-03	5.43E-06	4.58E-06
				600	246.44738	2.77E-03	5.58E-06	4.74E-06
				700	279.42758	3.34E-03	5.63E-06	4.89E-06
				800	312.72841	3.89E-03	5.58E-06	4.96E-06
				900	346.24288	4.44E-03	5.44E-06	5.03E-06
				1000	379.98481	4.98E-03	5.20E-06	5.07E-06
EW04 04		47735	2/15/2010 7:48	100	81.22924	3.31E-04	3.86E-06	3.86E-06
				200	115.17546	7.35E-04	4.26E-06	3.96E-06
				300	147.93973	1.17E-03	4.61E-06	4.10E-06
				400	180.58196	1.65E-03	4.90E-06	4.29E-06
				500	213.26586	2.16E-03	5.13E-06	4.44E-06
				600	246.171	2.68E-03	5.31E-06	4.58E-06
				700	279.26698	3.21E-03	5.44E-06	4.69E-06
				800	312.588	3.76E-03	5.51E-06	4.80E-06
				900	346.09865	4.32E-03	5.53E-06	4.88E-06
				1000	379.78547	4.86E-03	5.49E-06	4.94E-06
EW02 03		47735	2/9/2010 7:47	100	76.84278	3.53E-04	3.87E-06	3.96E-06
				200	110.0803	7.52E-04	4.28E-06	3.99E-06
				300	142.53163	1.19E-03	4.62E-06	4.13E-06
				400	175.21795	1.68E-03	4.89E-06	4.32E-06
				500	207.87894	2.18E-03	5.11E-06	4.47E-06
				600	241.02672	2.70E-03	5.27E-06	4.59E-06
				700	274.11623	3.23E-03	5.36E-06	4.70E-06
				800	307.36844	3.76E-03	5.39E-06	4.78E-06
				900	340.78574	4.29E-03	5.36E-06	4.84E-06
				1000	374.42601	4.85E-03	5.26E-06	4.92E-06
EW09 03		47735	8/2/2010 17:43	100	79.46071	3.17E-04	3.75E-06	3.84E-06
				200	112.85481	7.13E-04	4.09E-06	3.91E-06
				300	145.39845	1.13E-03	4.41E-06	4.00E-06
				400	178.00038	1.58E-03	4.69E-06	4.12E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
EW10 01				500	210.80307	2.06E-03	4.94E-06	4.28E-06
				600	243.85545	2.58E-03	5.15E-06	4.42E-06
				700	277.07428	3.10E-03	5.34E-06	4.55E-06
				800	310.49811	3.64E-03	5.49E-06	4.66E-06
				900	344.07083	4.19E-03	5.61E-06	4.75E-06
				1000	377.81755	4.76E-03	5.70E-06	4.85E-06
				100	82.1057	3.29E-04	3.83E-06	3.86E-06
				200	116.08564	7.22E-04	4.19E-06	3.90E-06
EW09 04				300	148.86838	1.14E-03	4.50E-06	4.02E-06
				400	181.33554	1.62E-03	4.74E-06	4.21E-06
				500	213.80351	2.11E-03	4.94E-06	4.36E-06
				600	246.43401	2.61E-03	5.07E-06	4.47E-06
				700	279.2724	3.11E-03	5.15E-06	4.55E-06
				800	312.39766	3.63E-03	5.18E-06	4.63E-06
				900	345.76037	4.15E-03	5.14E-06	4.69E-06
				1000	379.37278	4.66E-03	5.05E-06	4.74E-06
				100	79.54117	3.39E-04	3.92E-06	4.09E-06
				200	112.98391	7.48E-04	4.36E-06	4.09E-06
				300	145.50497	1.19E-03	4.74E-06	4.20E-06
				400	178.05613	1.69E-03	5.06E-06	4.40E-06
500	210.81956	2.22E-03	5.32E-06	4.59E-06				
600	243.844	2.76E-03	5.51E-06	4.74E-06				
700	277.06022	3.31E-03	5.65E-06	4.85E-06				
800	310.5071	3.87E-03	5.72E-06	4.95E-06				
900	344.08299	4.45E-03	5.74E-06	5.04E-06				
1000	377.83956	5.04E-03	5.69E-06	5.13E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
EW10 02		47735	8/12/2010 15:34	100	81.58812	3.28E-04	4.01E-06	3.80E-06
				200	115.45805	7.44E-04	4.41E-06	4.00E-06
				300	147.94031	1.20E-03	4.75E-06	4.18E-06
				400	180.18448	1.70E-03	5.03E-06	4.40E-06
				500	212.60921	2.21E-03	5.26E-06	4.56E-06
				600	245.17288	2.75E-03	5.44E-06	4.69E-06
				700	277.95932	3.29E-03	5.55E-06	4.81E-06
				800	311.12544	3.85E-03	5.62E-06	4.91E-06
				900	344.48771	4.42E-03	5.62E-06	5.00E-06
				1000	378.10588	4.97E-03	5.57E-06	5.05E-06

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
EA9 01	25.386	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EA8 02	25.382	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EA8 01	25.383	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EA9 02	25.384	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
EW01 02	25.384	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW01 03	25.357	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW01 04	25.4	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
EW02 01	25.388	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW02 02	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW02 04	25.372	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW03 01	25.377	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
EW03 02	25.375	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW03 03	25.375	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW03 04	25.374	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
EW04 01	25.376	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW04 02	25.374	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW05 01	25.378	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
EW05 02	25.377	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW05 03	25.377	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW05 04	25.375	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW06 02	25.376	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
EW06 03	25.366	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW06 04	25.376	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW06 01	25.378	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
EW07 01	25.369	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW07 02	25.378	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW07 03	25.388	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW07 04	25.377	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
EW08 01	25.354	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW08 02	25.378	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW08 03	25.379	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
EW08 04	25.376	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW09 01	25.356	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW09 02	25.378	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
EW04 03	25.375	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW04 04	25.375	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW02 03	25.371	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW09 03	25.375	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
EW10 01	25.356	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
EW09 04	25.377	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
EW10 02	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen Number	EA9 01	EA8 02	EA8 01	EA9 02	EW01 02	EW01 03
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	2/4/10 4:17 PM	2/4/10 4:30 PM	2/4/10 7:53 AM	2/5/10 7:37 AM	2/5/10 3:57 PM	2/8/10 7:45 AM
Initial Sample Length (L0, mm)	25.386	25.382	25.383	25.384	25.384	25.357
Linear Thermal Expansion						
Temperature °C						
100	3.19E-04	3.23E-04	3.36E-04	3.30E-04	3.19E-04	3.35E-04
200	7.12E-04	7.10E-04	7.42E-04	7.11E-04	7.09E-04	7.24E-04
300	1.14E-03	1.14E-03	1.18E-03	1.13E-03	1.13E-03	1.15E-03
400	1.62E-03	1.62E-03	1.67E-03	1.60E-03	1.61E-03	1.62E-03
500	2.11E-03	2.13E-03	2.17E-03	2.09E-03	2.11E-03	2.12E-03
600	2.62E-03	2.65E-03	2.69E-03	2.60E-03	2.62E-03	2.64E-03
700	3.14E-03	3.18E-03	3.22E-03	3.12E-03	3.15E-03	3.17E-03
800	3.68E-03	3.72E-03	3.76E-03	3.65E-03	3.69E-03	3.71E-03
900	4.22E-03	4.27E-03	4.31E-03	4.20E-03	4.25E-03	4.27E-03
1000	4.76E-03	4.83E-03	4.84E-03	4.75E-03	4.79E-03	4.85E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	3.82E-06	3.74E-06	3.93E-06	3.69E-06	3.77E-06	3.78E-06
200	4.19E-06	4.19E-06	4.31E-06	4.09E-06	4.17E-06	4.17E-06
300	4.51E-06	4.56E-06	4.63E-06	4.44E-06	4.52E-06	4.50E-06
400	4.78E-06	4.87E-06	4.89E-06	4.74E-06	4.81E-06	4.80E-06
500	5.01E-06	5.12E-06	5.11E-06	4.98E-06	5.05E-06	5.05E-06
600	5.19E-06	5.31E-06	5.27E-06	5.18E-06	5.24E-06	5.26E-06
700	5.32E-06	5.43E-06	5.38E-06	5.32E-06	5.38E-06	5.42E-06
800	5.40E-06	5.49E-06	5.43E-06	5.42E-06	5.46E-06	5.54E-06
900	5.43E-06	5.48E-06	5.43E-06	5.46E-06	5.49E-06	5.62E-06
1000	5.42E-06	5.41E-06	5.38E-06	5.46E-06	5.47E-06	5.65E-06
Mean CTE (1/K)						
Temperature °C						
100	3.80E-06	3.81E-06	3.90E-06	3.76E-06	3.80E-06	3.84E-06
200	3.87E-06	3.85E-06	3.99E-06	3.79E-06	3.85E-06	3.88E-06
300	4.03E-06	4.01E-06	4.14E-06	3.94E-06	4.00E-06	4.02E-06
400	4.22E-06	4.22E-06	4.33E-06	4.13E-06	4.21E-06	4.20E-06
500	4.36E-06	4.39E-06	4.47E-06	4.29E-06	4.36E-06	4.37E-06
600	4.48E-06	4.54E-06	4.59E-06	4.42E-06	4.49E-06	4.50E-06
700	4.59E-06	4.66E-06	4.70E-06	4.55E-06	4.61E-06	4.62E-06
800	4.69E-06	4.75E-06	4.79E-06	4.65E-06	4.71E-06	4.72E-06
900	4.78E-06	4.84E-06	4.87E-06	4.74E-06	4.81E-06	4.82E-06
1000	4.84E-06	4.91E-06	4.92E-06	4.82E-06	4.87E-06	4.92E-06

Specimen Number	EW01 04	EW02 01	EW02 02	EW02 04	EW03 01	EW03 02
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	6/9/10 8:09 AM	2/8/10 4:21 PM	2/8/10 4:02 PM	2/9/10 7:50 AM	2/10/10 8:47 AM	2/10/10 8:50 AM
Initial Sample Length (L0, mm)	25.4	25.388	25.381	25.372	25.377	25.375
Linear Thermal Expansion Temperature °C						
100	3.23E-04	3.30E-04	3.27E-04	3.30E-04	3.41E-04	3.31E-04
200	7.25E-04	7.24E-04	7.14E-04	7.26E-04	7.43E-04	7.24E-04
300	1.17E-03	1.17E-03	1.12E-03	1.15E-03	1.19E-03	1.15E-03
400	1.65E-03	1.65E-03	1.59E-03	1.62E-03	1.68E-03	1.63E-03
500	2.14E-03	2.16E-03	2.09E-03	2.11E-03	2.18E-03	2.13E-03
600	2.66E-03	2.68E-03	2.61E-03	2.62E-03	2.71E-03	2.65E-03
700	3.18E-03	3.22E-03	3.14E-03	3.15E-03	3.24E-03	3.18E-03
800	3.72E-03	3.76E-03	3.69E-03	3.69E-03	3.80E-03	3.72E-03
900	4.26E-03	4.32E-03	4.25E-03	4.24E-03	4.36E-03	4.26E-03
1000	4.78E-03	4.90E-03	4.80E-03	4.79E-03	4.93E-03	4.79E-03
Instantaneous CTE (1/K) Temperature °C						
100	3.91E-06	3.87E-06	3.65E-06	3.83E-06	3.96E-06	3.79E-06
200	4.28E-06	4.27E-06	4.09E-06	4.18E-06	4.32E-06	4.20E-06
300	4.59E-06	4.61E-06	4.47E-06	4.50E-06	4.64E-06	4.55E-06
400	4.85E-06	4.90E-06	4.79E-06	4.77E-06	4.91E-06	4.85E-06
500	5.06E-06	5.14E-06	5.06E-06	5.00E-06	5.15E-06	5.08E-06
600	5.21E-06	5.33E-06	5.27E-06	5.19E-06	5.33E-06	5.25E-06
700	5.31E-06	5.46E-06	5.43E-06	5.34E-06	5.48E-06	5.36E-06
800	5.36E-06	5.54E-06	5.53E-06	5.45E-06	5.58E-06	5.41E-06
900	5.36E-06	5.57E-06	5.57E-06	5.52E-06	5.63E-06	5.40E-06
1000	5.31E-06	5.54E-06	5.56E-06	5.55E-06	5.65E-06	5.34E-06
Mean CTE (1/K) Temperature °C						
100	3.74E-06	3.91E-06	3.84E-06	3.83E-06	4.00E-06	3.84E-06
200	3.89E-06	3.93E-06	3.87E-06	3.90E-06	4.02E-06	3.89E-06
300	4.08E-06	4.10E-06	3.96E-06	4.03E-06	4.19E-06	4.03E-06
400	4.28E-06	4.29E-06	4.16E-06	4.21E-06	4.37E-06	4.24E-06
500	4.42E-06	4.46E-06	4.33E-06	4.35E-06	4.50E-06	4.39E-06
600	4.54E-06	4.60E-06	4.48E-06	4.48E-06	4.63E-06	4.52E-06
700	4.64E-06	4.71E-06	4.60E-06	4.60E-06	4.74E-06	4.64E-06
800	4.73E-06	4.80E-06	4.72E-06	4.70E-06	4.84E-06	4.73E-06
900	4.81E-06	4.89E-06	4.81E-06	4.79E-06	4.93E-06	4.81E-06
1000	4.85E-06	4.98E-06	4.88E-06	4.86E-06	5.01E-06	4.87E-06

Specimen Number	EW03 03	EW03 04	EW04 01	EW04 02	EW05 01	EW05 02
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	2/11/10 7:50 AM	4/25/10 12:14 PM	6/2/10 11:44 AM	2/11/10 4:14 PM	2/16/10 3:40 PM	4/22/10 2:08 PM
Initial Sample Length (L0, mm)	25.375	25.374	25.376	25.374	25.378	25.377
Linear Thermal Expansion						
Temperature °C						
100	3.44E-04	3.30E-04	3.23E-04	3.16E-04	3.18E-04	3.27E-04
200	7.31E-04	7.38E-04	7.24E-04	7.08E-04	7.00E-04	7.32E-04
300	1.16E-03	1.18E-03	1.16E-03	1.13E-03	1.13E-03	1.17E-03
400	1.64E-03	1.67E-03	1.65E-03	1.60E-03	1.62E-03	1.64E-03
500	2.15E-03	2.17E-03	2.15E-03	2.09E-03	2.12E-03	2.14E-03
600	2.67E-03	2.69E-03	2.67E-03	2.60E-03	2.65E-03	2.65E-03
700	3.20E-03	3.22E-03	3.20E-03	3.13E-03	3.19E-03	3.17E-03
800	3.74E-03	3.77E-03	3.74E-03	3.67E-03	3.74E-03	3.71E-03
900	4.28E-03	4.33E-03	4.29E-03	4.21E-03	4.30E-03	4.25E-03
1000	4.85E-03	4.89E-03	4.84E-03	4.75E-03	4.87E-03	4.79E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	3.78E-06	3.97E-06	3.90E-06	3.76E-06	3.70E-06	3.90E-06
200	4.21E-06	4.32E-06	4.28E-06	4.15E-06	4.17E-06	4.26E-06
300	4.57E-06	4.63E-06	4.60E-06	4.48E-06	4.56E-06	4.57E-06
400	4.87E-06	4.89E-06	4.88E-06	4.77E-06	4.89E-06	4.82E-06
500	5.10E-06	5.12E-06	5.10E-06	5.01E-06	5.16E-06	5.04E-06
600	5.28E-06	5.30E-06	5.27E-06	5.19E-06	5.36E-06	5.20E-06
700	5.40E-06	5.44E-06	5.40E-06	5.33E-06	5.50E-06	5.31E-06
800	5.46E-06	5.54E-06	5.47E-06	5.42E-06	5.57E-06	5.38E-06
900	5.46E-06	5.60E-06	5.49E-06	5.46E-06	5.57E-06	5.40E-06
1000	5.39E-06	5.61E-06	5.46E-06	5.45E-06	5.51E-06	5.37E-06
Mean CTE (1/K)						
Temperature °C						
100	3.91E-06	3.84E-06	3.73E-06	3.77E-06	3.78E-06	3.81E-06
200	3.93E-06	3.98E-06	3.89E-06	3.85E-06	3.81E-06	3.94E-06
300	4.06E-06	4.13E-06	4.07E-06	3.99E-06	4.00E-06	4.09E-06
400	4.26E-06	4.32E-06	4.28E-06	4.18E-06	4.22E-06	4.27E-06
500	4.43E-06	4.47E-06	4.43E-06	4.33E-06	4.39E-06	4.41E-06
600	4.56E-06	4.60E-06	4.55E-06	4.46E-06	4.54E-06	4.53E-06
700	4.67E-06	4.70E-06	4.66E-06	4.58E-06	4.67E-06	4.64E-06
800	4.76E-06	4.80E-06	4.76E-06	4.68E-06	4.77E-06	4.73E-06
900	4.84E-06	4.90E-06	4.85E-06	4.77E-06	4.87E-06	4.80E-06
1000	4.92E-06	4.96E-06	4.91E-06	4.83E-06	4.95E-06	4.86E-06

Specimen Number	EW05 03	EW05 04	EW06 02	EW06 03	EW06 04	EW06 01
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	2/16/10 7:21 AM	2/16/10 7:25 AM	2/17/10 7:55 AM	2/17/10 4:15 PM	2/17/10 4:07 PM	2/17/10 7:52 AM
Initial Sample Length (L0, mm)	25.377	25.375	25.376	25.366	25.376	25.378
Linear Thermal Expansion						
Temperature °C						
100	3.49E-04	3.29E-04	3.32E-04	3.29E-04	3.21E-04	3.51E-04
200	7.45E-04	7.25E-04	7.33E-04	7.25E-04	7.12E-04	7.63E-04
300	1.18E-03	1.16E-03	1.17E-03	1.16E-03	1.14E-03	1.22E-03
400	1.66E-03	1.63E-03	1.65E-03	1.64E-03	1.62E-03	1.71E-03
500	2.16E-03	2.14E-03	2.15E-03	2.14E-03	2.12E-03	2.23E-03
600	2.68E-03	2.66E-03	2.67E-03	2.66E-03	2.64E-03	2.76E-03
700	3.22E-03	3.19E-03	3.20E-03	3.19E-03	3.17E-03	3.31E-03
800	3.77E-03	3.73E-03	3.76E-03	3.72E-03	3.72E-03	3.87E-03
900	4.33E-03	4.29E-03	4.32E-03	4.26E-03	4.27E-03	4.43E-03
1000	4.91E-03	4.83E-03	4.86E-03	4.82E-03	4.82E-03	5.02E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	3.88E-06	3.80E-06	3.85E-06	3.87E-06	3.80E-06	4.03E-06
200	4.24E-06	4.21E-06	4.24E-06	4.25E-06	4.20E-06	4.41E-06
300	4.57E-06	4.56E-06	4.58E-06	4.58E-06	4.54E-06	4.73E-06
400	4.85E-06	4.86E-06	4.87E-06	4.85E-06	4.84E-06	5.01E-06
500	5.10E-06	5.10E-06	5.11E-06	5.07E-06	5.08E-06	5.24E-06
600	5.30E-06	5.28E-06	5.30E-06	5.24E-06	5.28E-06	5.43E-06
700	5.46E-06	5.41E-06	5.45E-06	5.35E-06	5.42E-06	5.56E-06
800	5.58E-06	5.48E-06	5.54E-06	5.41E-06	5.51E-06	5.65E-06
900	5.65E-06	5.50E-06	5.59E-06	5.42E-06	5.54E-06	5.69E-06
1000	5.69E-06	5.45E-06	5.58E-06	5.37E-06	5.53E-06	5.69E-06
Mean CTE (1/K)						
Temperature °C						
100	3.95E-06	3.82E-06	3.86E-06	3.93E-06	3.82E-06	4.07E-06
200	4.00E-06	3.89E-06	3.95E-06	3.95E-06	3.87E-06	4.11E-06
300	4.13E-06	4.04E-06	4.09E-06	4.09E-06	4.03E-06	4.26E-06
400	4.30E-06	4.24E-06	4.28E-06	4.28E-06	4.23E-06	4.45E-06
500	4.45E-06	4.40E-06	4.42E-06	4.43E-06	4.39E-06	4.59E-06
600	4.58E-06	4.54E-06	4.56E-06	4.56E-06	4.52E-06	4.72E-06
700	4.70E-06	4.65E-06	4.68E-06	4.67E-06	4.64E-06	4.83E-06
800	4.79E-06	4.75E-06	4.79E-06	4.74E-06	4.75E-06	4.93E-06
900	4.89E-06	4.84E-06	4.88E-06	4.82E-06	4.84E-06	5.01E-06
1000	4.98E-06	4.90E-06	4.94E-06	4.91E-06	4.90E-06	5.10E-06

Specimen Number	EW07 01	EW07 02	EW07 03	EW07 04	EW08 01	EW08 02
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	2/18/10 7:36 AM	4/23/10 1:00 PM	3/10/10 7:47 AM	3/10/10 7:48 AM	3/10/10 4:27 PM	3/10/10 4:14 PM
Initial Sample Length (L0, mm)	25.369	25.378	25.388	25.377	25.354	25.378
Linear Thermal Expansion Temperature °C						
100	3.47E-04	3.28E-04	3.37E-04	3.37E-04	3.34E-04	3.28E-04
200	7.56E-04	7.28E-04	7.32E-04	7.42E-04	7.29E-04	7.39E-04
300	1.21E-03	1.16E-03	1.17E-03	1.18E-03	1.18E-03	1.18E-03
400	1.71E-03	1.65E-03	1.66E-03	1.67E-03	1.67E-03	1.67E-03
500	2.22E-03	2.15E-03	2.17E-03	2.18E-03	2.18E-03	2.18E-03
600	2.76E-03	2.67E-03	2.70E-03	2.70E-03	2.72E-03	2.71E-03
700	3.31E-03	3.21E-03	3.24E-03	3.23E-03	3.26E-03	3.25E-03
800	3.86E-03	3.76E-03	3.80E-03	3.78E-03	3.81E-03	3.80E-03
900	4.43E-03	4.32E-03	4.36E-03	4.35E-03	4.37E-03	4.36E-03
1000	5.01E-03	4.87E-03	4.95E-03	4.90E-03	4.95E-03	4.91E-03
Instantaneous CTE (1/K) Temperature °C						
100	3.99E-06	3.86E-06	3.86E-06	3.95E-06	3.89E-06	3.97E-06
200	4.39E-06	4.26E-06	4.27E-06	4.31E-06	4.31E-06	4.34E-06
300	4.73E-06	4.60E-06	4.63E-06	4.63E-06	4.67E-06	4.67E-06
400	5.02E-06	4.89E-06	4.94E-06	4.90E-06	4.98E-06	4.95E-06
500	5.26E-06	5.13E-06	5.19E-06	5.13E-06	5.22E-06	5.18E-06
600	5.44E-06	5.32E-06	5.39E-06	5.32E-06	5.40E-06	5.36E-06
700	5.57E-06	5.46E-06	5.54E-06	5.46E-06	5.53E-06	5.48E-06
800	5.65E-06	5.54E-06	5.63E-06	5.56E-06	5.59E-06	5.56E-06
900	5.67E-06	5.58E-06	5.67E-06	5.61E-06	5.60E-06	5.59E-06
1000	5.64E-06	5.56E-06	5.66E-06	5.62E-06	5.55E-06	5.57E-06
Mean CTE (1/K) Temperature °C						
100	4.05E-06	3.84E-06	3.92E-06	3.92E-06	3.95E-06	3.92E-06
200	4.08E-06	3.93E-06	3.95E-06	3.99E-06	3.97E-06	4.02E-06
300	4.23E-06	4.08E-06	4.11E-06	4.14E-06	4.14E-06	4.17E-06
400	4.43E-06	4.29E-06	4.32E-06	4.34E-06	4.36E-06	4.37E-06
500	4.58E-06	4.44E-06	4.48E-06	4.48E-06	4.52E-06	4.51E-06
600	4.71E-06	4.57E-06	4.62E-06	4.61E-06	4.66E-06	4.64E-06
700	4.83E-06	4.69E-06	4.74E-06	4.71E-06	4.77E-06	4.75E-06
800	4.92E-06	4.80E-06	4.84E-06	4.82E-06	4.86E-06	4.85E-06
900	5.00E-06	4.89E-06	4.94E-06	4.91E-06	4.95E-06	4.94E-06
1000	5.09E-06	4.95E-06	5.03E-06	4.98E-06	5.03E-06	5.00E-06

Specimen Number	EW08 03	EW08 04	EW09 01	EW09 02	EW04 03	EW04 04
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	6/7/10 8:34 AM	3/11/10 7:44 AM	6/3/10 3:57 PM	3/12/10 10:49 AM	7/14/10 9:24 AM	2/15/10 7:48 AM
Initial Sample Length (L0, mm)	25.379	25.376	25.356	25.378	25.375	25.375
Linear Thermal Expansion						
Temperature °C						
100	3.44E-04	3.35E-04	3.10E-04	3.42E-04	3.14E-04	3.31E-04
200	7.67E-04	7.40E-04	7.18E-04	7.44E-04	7.20E-04	7.35E-04
300	1.23E-03	1.18E-03	1.18E-03	1.20E-03	1.18E-03	1.17E-03
400	1.73E-03	1.67E-03	1.67E-03	1.70E-03	1.69E-03	1.65E-03
500	2.25E-03	2.18E-03	2.17E-03	2.22E-03	2.21E-03	2.16E-03
600	2.78E-03	2.71E-03	2.69E-03	2.76E-03	2.77E-03	2.68E-03
700	3.33E-03	3.25E-03	3.22E-03	3.31E-03	3.34E-03	3.21E-03
800	3.89E-03	3.81E-03	3.77E-03	3.87E-03	3.89E-03	3.76E-03
900	4.46E-03	4.37E-03	4.33E-03	4.43E-03	4.44E-03	4.32E-03
1000	5.02E-03	4.93E-03	4.87E-03	5.01E-03	4.98E-03	4.86E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	4.12E-06	3.87E-06	4.00E-06	3.93E-06	3.86E-06	3.86E-06
200	4.49E-06	4.29E-06	4.36E-06	4.37E-06	4.40E-06	4.26E-06
300	4.80E-06	4.66E-06	4.67E-06	4.74E-06	4.84E-06	4.61E-06
400	5.06E-06	4.96E-06	4.93E-06	5.05E-06	5.18E-06	4.90E-06
500	5.28E-06	5.21E-06	5.15E-06	5.30E-06	5.43E-06	5.13E-06
600	5.44E-06	5.40E-06	5.31E-06	5.48E-06	5.58E-06	5.31E-06
700	5.56E-06	5.53E-06	5.43E-06	5.60E-06	5.63E-06	5.44E-06
800	5.62E-06	5.60E-06	5.50E-06	5.66E-06	5.58E-06	5.51E-06
900	5.63E-06	5.62E-06	5.52E-06	5.65E-06	5.44E-06	5.53E-06
1000	5.60E-06	5.58E-06	5.49E-06	5.58E-06	5.20E-06	5.49E-06
Mean CTE (1/K)						
Temperature °C						
100	4.01E-06	3.92E-06	3.76E-06	3.95E-06	3.70E-06	3.86E-06
200	4.13E-06	3.99E-06	3.89E-06	3.99E-06	3.90E-06	3.96E-06
300	4.31E-06	4.13E-06	4.14E-06	4.18E-06	4.15E-06	4.10E-06
400	4.49E-06	4.33E-06	4.34E-06	4.40E-06	4.40E-06	4.29E-06
500	4.64E-06	4.49E-06	4.48E-06	4.57E-06	4.58E-06	4.44E-06
600	4.76E-06	4.63E-06	4.60E-06	4.71E-06	4.74E-06	4.58E-06
700	4.87E-06	4.75E-06	4.71E-06	4.82E-06	4.89E-06	4.69E-06
800	4.96E-06	4.86E-06	4.81E-06	4.93E-06	4.96E-06	4.80E-06
900	5.04E-06	4.95E-06	4.90E-06	5.01E-06	5.03E-06	4.88E-06
1000	5.10E-06	5.01E-06	4.95E-06	5.09E-06	5.07E-06	4.94E-06

Specimen Number	EW02 03	EW09 03	EW10 01	EW09 04	EW10 02
Measured By	47735	47735	47735	47735	47735
Measured Date	2/9/10 7:47 AM	8/2/10 5:43 PM	8/2/10 8:11 AM	8/2/10 8:12 AM	8/12/10 3:34 PM
Initial Sample Length (L0, mm)	25.371	25.375	25.356	25.377	25.381
Linear Thermal Expansion Temperature °C					
100	3.53E-04	3.17E-04	3.29E-04	3.39E-04	3.28E-04
200	7.52E-04	7.13E-04	7.22E-04	7.48E-04	7.44E-04
300	1.19E-03	1.13E-03	1.14E-03	1.19E-03	1.20E-03
400	1.68E-03	1.58E-03	1.62E-03	1.69E-03	1.70E-03
500	2.18E-03	2.06E-03	2.11E-03	2.22E-03	2.21E-03
600	2.70E-03	2.58E-03	2.61E-03	2.76E-03	2.75E-03
700	3.23E-03	3.10E-03	3.11E-03	3.31E-03	3.29E-03
800	3.76E-03	3.64E-03	3.63E-03	3.87E-03	3.85E-03
900	4.29E-03	4.19E-03	4.15E-03	4.45E-03	4.42E-03
1000	4.85E-03	4.76E-03	4.66E-03	5.04E-03	4.97E-03
Instantaneous CTE (1/K) Temperature °C					
100	3.87E-06	3.75E-06	3.83E-06	3.92E-06	4.01E-06
200	4.28E-06	4.09E-06	4.19E-06	4.36E-06	4.41E-06
300	4.62E-06	4.41E-06	4.50E-06	4.74E-06	4.75E-06
400	4.89E-06	4.69E-06	4.74E-06	5.06E-06	5.03E-06
500	5.11E-06	4.94E-06	4.94E-06	5.32E-06	5.26E-06
600	5.27E-06	5.15E-06	5.07E-06	5.51E-06	5.44E-06
700	5.36E-06	5.34E-06	5.15E-06	5.65E-06	5.55E-06
800	5.39E-06	5.49E-06	5.18E-06	5.72E-06	5.62E-06
900	5.36E-06	5.61E-06	5.14E-06	5.74E-06	5.62E-06
1000	5.26E-06	5.70E-06	5.05E-06	5.69E-06	5.57E-06
Mean CTE (1/K) Temperature °C					
100	3.96E-06	3.84E-06	3.86E-06	4.09E-06	3.80E-06
200	3.99E-06	3.91E-06	3.90E-06	4.09E-06	4.00E-06
300	4.13E-06	4.00E-06	4.02E-06	4.20E-06	4.18E-06
400	4.32E-06	4.12E-06	4.21E-06	4.40E-06	4.40E-06
500	4.47E-06	4.28E-06	4.36E-06	4.59E-06	4.56E-06
600	4.59E-06	4.42E-06	4.47E-06	4.74E-06	4.69E-06
700	4.70E-06	4.55E-06	4.55E-06	4.85E-06	4.81E-06
800	4.78E-06	4.66E-06	4.63E-06	4.95E-06	4.91E-06
900	4.84E-06	4.75E-06	4.69E-06	5.04E-06	5.00E-06
1000	4.92E-06	4.85E-06	4.74E-06	5.13E-06	5.05E-06

Specimen number	EA8 01	EA8 02	EA9 01	EA9 02
Date and Time	2/2/2010 9:17	2/2/2010 9:20	2/2/2010 9:52	2/2/2010 10:00
Operator	41169	41169	41169	41169
Sample location				
mass of specimen (g)	5.6402	5.5909	5.6651	5.6687
length of specimen (mm)	25.38250	25.38175	25.38625	25.38425
diameter of specimen (mm)	12.73950	12.73538	12.73675	12.73675
Poisson's ratio	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28347 28344 28363 28330 28346 28317 28315 28342 28355 28336	28673 28643 28644 28652 28658 28647 28641 28636 28619 28626	28918 28925 28938 28914 28914 28925 28936 28941 28930 28910	29334 29355 29347 29329 29321 29310 29357 29323 29309 29303
average resonant frequency (Hz)	28340	28644	28925	29329
standard deviation (Hz)	15	15	11	19
correction factor for rod	2.113744966	2.11314479	2.113003478	2.113164098
modulus of elasticity (Pa)	9.55E+09	9.68E+09	1.00E+10	1.03E+10
T_1 correction factor	2.287774523	2.287016762	2.286838353	2.287041138
calculation of individual terms	0.030985512 0.325675871 2.27675238	0.030949057 0.325292711 2.276001104	0.030940477 0.325202531 2.275824222	0.03095023 0.325305033 2.276025272
resultant T_1	2.113744966	2.11314479	2.113003478	2.113164098
modulus of elasticity (Pa)	9.55E+09	9.68E+09	1.00E+10	1.03E+10
Average modulus for specimen group				
				9.71E+09

Specimen number	EA10 02	EW01 02	EW01 03	EW01 04	EW02 01	EW02 02
Date and Time	2/2/2010 10:02	2/2/2010 10:18	2/2/2010 10:33	2/2/2010 10:36	2/2/2010 10:40	2/2/2010 10:47
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.6707	5.6717	5.6797	5.6839	5.6566	5.6661
length of specimen (mm)	25.38525	25.38425	25.35650	25.39975	25.38825	25.38050
diameter of specimen (mm)	12.72963	12.73750	12.73413	12.73538	12.73525	12.73663
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	29208 29191 29171 29189 29174 29188 29183 29196 29199 29176	28540 28537 28531 28523 28530 28540 28522 28530 28506 28549	28977 28958 28979 28971 28973 28963 28965 28972 28965 28973	28968 28983 28985 28977 28977 28984 28977 28977 28979 29000	28812 28811 28812 28821 28801 28831 28811 28826 28806 28809	28719 28750 28749 28744 28743 28714 28719 28715 28715 28717
average resonant frequency (Hz)	29188	28531	28970	28981	28814	28729
standard deviation (Hz)	12	12	7	8	9	16
correction factor for rod	2.111943575	2.113284157	2.114975349	2.111700351	2.112602858	2.113445341
modulus of elasticity (Pa)	1.02E+10	9.74E+09	1.00E+10	1.01E+10	9.92E+09	9.87E+09
T_{11} correction factor	2.285500302	2.287192717	2.289328123	2.285193272	2.28633258	2.287396221
calculation of individual terms	0.030876167 0.324526593 2.274497623	0.03095752 0.325381662 2.276175553	0.03106032 0.32646215 2.278292682	0.03086142 0.324371592 2.274193222	0.030916161 0.32494695 2.275322779	0.03096731 0.325484555 2.276377315
resultant T_{11}	2.111943575	2.113284157	2.114975349	2.111700351	2.112602858	2.113445341
modulus of elasticity (Pa)	1.02E+10	9.74E+09	1.00E+10	1.01E+10	9.92E+09	9.87E+09
Average modulus for specimen group						

Specimen number	EA10 02	EW01 02	EW01 03	EW01 04	EW02 01	EW02 02
Specimen group standard deviation						
Environmental Conditions Temperature (°C) Barometric Pressure (in of Hg) Humidity (%)	21.9 25.2 12.8	21.8 25.2 12.9	21.9 25.2 13	22 25.2 12.9	21.9 25.2 13	21.8 25.2 13.1
Sampling Plan Layout Instrument ASTM						
# of Strikes Comments:	11	43	15	25	22	67

Specimen number	EW02 03	EW02 04	EW03 01	EW03 02	EW03 03	EW03 04
Date and Time	2/2/2010 10:54	2/2/2010 10:57	2/2/2010 13:17	2/2/2010 13:20	2/2/2010 13:28	2/2/2010 13:38
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.6523	5.6616	5.6458	5.6536	5.6606	5.6699
length of specimen (mm)	25.37125	25.37175	25.37725	25.37450	25.37475	25.37375
diameter of specimen (mm)	12.73150	12.73025	12.73488	12.73213	12.73550	12.73563
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28712 28716 28736 28727 28743 28752 28700 28755 28761 28749	28531 28518 28529 28528 28523 28515 28522 28530 28517 28501	28630 28614 28621 28646 28624 28608 28655 28627 28615 28641	28467 28473 28470 28488 28493 28468 28481 28466 28479 28479	28654 28606 28604 28615 28618 28634 28628 28622 28613 28615	28334 28340 28315 28332 28300 28305 28324 28343 28317 28300
average resonant frequency (Hz)	28735	28521	28628	28476	28621	28321
standard deviation (Hz)	21	9	15	9	15	16
correction factor for rod	2.113367962	2.113127579	2.113426275	2.113206877	2.113727304	2.11382772
modulus of elasticity (Pa)	9.85E+09	9.72E+09	9.76E+09	9.68E+09	9.78E+09	9.59E+09
T_{11} correction factor	2.287298525	2.286995032	2.287372148	2.287095148	2.287752224	2.287879009
calculation of individual terms	0.03096261 0.325435157 2.276280456	0.030948012 0.325281726 2.275979561	0.030966152 0.325472383 2.276353449	0.030952827 0.325332336 2.27607882	0.030984439 0.325664592 2.276730271	0.03099054 0.325728722 2.276855971
resultant T_{11}	2.113367962	2.113127579	2.113426275	2.113206877	2.113727304	2.11382772
modulus of elasticity (Pa)	9.85E+09	9.72E+09	9.76E+09	9.68E+09	9.78E+09	9.59E+09
Average modulus for specimen group						

Specimen number	EW02 03	EW02 04	EW03 01	EW03 02	EW03 03	EW03 04
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	21.7	21.7	22.4	22.5	22.5	22.6
Barometric Pressure (in of Hg)	25.2	25.2	25.2	25.2	25.2	25.2
Humidity (%)	13.1	13.2	13.6	13.6	13.7	13.7
Sampling Plan Layout Instrument ASTM						
# of Strikes Comments:	53	25	44	21	70	66

Specimen number	EW04 01	EW04 02	EW04 03	EW04 04	EW05 01	EW05 02
Date and Time	2/2/2010 13:41	2/2/2010 13:46	2/2/2010 13:58	2/2/2010 14:01	2/2/2010 14:04	2/2/2010 14:08
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.6633	5.6630	5.6644	5.6691	5.6770	5.6781
length of specimen (mm)	25.37575	25.37400	25.37550	25.37550	25.37825	25.37675
diameter of specimen (mm)	12.73038	12.73438	12.73450	12.73350	12.73588	12.73825
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28662 28659 28642 28648 28668 28649 28658 28634 28621 28672	28739 28706 28743 28743 28749 28737 28739 28743 28752 28713	28685 28652 28655 28679 28648 28675 28662 28653 28657 28665	28632 28616 28625 28629 28638 28620 28626 28625 28640 28625	28972 28961 28978 28982 28965 28974 28983 28976 28977 28965	28613 28613 28614 28629 28603 28592 28593 28622 28614 28619
average resonant frequency (Hz)	28651	28736	28663	28628	28973	28611
standard deviation (Hz)	16	15	13	7	7	12
correction factor for rod	2.112826239	2.113607405	2.11350686	2.113346714	2.113506049	2.114006985
modulus of elasticity (Pa)	9.82E+09	9.87E+09	9.82E+09	9.80E+09	1.01E+10	9.80E+09
T_{11} correction factor	2.286614591	2.287600839	2.287473893	2.287271698	2.287472868	2.288105356
calculation of individual terms	0.030929718 0.325089445 2.275602375	0.030977154 0.325588028 2.276580182	0.030971047 0.325523831 2.276454322	0.03096132 0.325421593 2.276253858	0.030970997 0.325523313 2.276453307	0.031001435 0.325843226 2.277080381
resultant T_{11}	2.112826239	2.113607405	2.11350686	2.113346714	2.113506049	2.114006985
modulus of elasticity (Pa)	9.82E+09	9.87E+09	9.82E+09	9.80E+09	1.01E+10	9.80E+09
Average modulus for specimen group						

Specimen number	EW04 01	EW04 02	EW04 03	EW04 04	EW05 01	EW05 02
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	22.6	22.7	22.7	22.6	22.6	22.6
Barometric Pressure (in of Hg)	25.2	25.2	25.2	25.2	25.2	25.2
Humidity (%)	13.7	13.7	13.7	13.8	13.9	13.9
Sampling Plan Layout Instrument ASTM						
# of Strikes Comments:	24	39	33	33	18	28

Specimen number	EW05 03	EW05 04	EW06 01	EW06 02	EW06 03	EW06 04
Date and Time	2/2/2010 14:24	2/2/2010 14:26	2/2/2010 14:34	2/2/2010 14:38	2/2/2010 14:52	2/2/2010 14:56
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.6684	5.6722	5.6470	5.6741	5.6799	5.6742
length of specimen (mm)	25.37650	25.37550	25.37775	25.37625	25.36550	25.37600
diameter of specimen (mm)	12.73263	12.73875	12.73900	12.73588	12.73638	12.73750
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28789 28781 28798 28793 28797 28794 28791 28781 28796 28792	28763 28751 28782 28766 28772 28785 28752 28758 28756 28759	28365 28371 28377 28369 28381 28351 28391 28398 28388 28378	28467 28473 28480 28471 28443 28454 28459 28460 28452 28451	28291 28283 28229 28222 28289 28275 28273 28246 28248 28294	28873 28900 28907 28922 28903 28895 28912 28907 28903 28908
average resonant frequency (Hz)	28791	28764	28377	28461	28265	28903
standard deviation (Hz)	6	12	14	12	27	13
correction factor for rod	2.113126249	2.114187589	2.114046712	2.11366679	2.114611513	2.113947155
modulus of elasticity (Pa)	9.92E+09	9.89E+09	9.59E+09	9.69E+09	9.56E+09	9.99E+09
T_{11} correction factor	2.286993353	2.288333397	2.288155518	2.287675818	2.288868687	2.288029812
calculation of individual terms	0.030947932 0.325280877 2.275977895	0.031012412 0.325958608 2.27730647	0.031003849 0.325868605 2.277130113	0.030980762 0.325625948 2.276654519	0.031038188 0.32622953 2.277837179	0.030997798 0.325805008 2.277005484
resultant T_{11}	2.113126249	2.114187589	2.114046712	2.11366679	2.114611513	2.113947155
modulus of elasticity (Pa)	9.92E+09	9.89E+09	9.59E+09	9.69E+09	9.56E+09	9.99E+09
Average modulus for specimen group						

Specimen number	EW05 03	EW05 04	EW06 01	EW06 02	EW06 03	EW06 04
Specimen group standard deviation						
Environmental Conditions Temperature (°C) Barometric Pressure (in of Hg) Humidity (%)	22.6 25.2 13.9	22.6 25.2 13.9	22.5 25.2 13.9	22.5 25.2 14.1	22.5 25.2 14.1	22.5 25.1 14.3
Sampling Plan Layout Instrument ASTM						
# of Strikes Comments:	28	22	68	28	150	32

Specimen number	EW07 01	EW07 02	EW07 03	EW07 04	EW08 01	EW08 02
Date and Time	2/2/2010 15:01	3/16/2010 12:39	3/16/2010 12:42	3/16/2010 12:47	3/16/2010 12:52	3/16/2010 12:56
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.6631	5.6166	5.6262	5.6087	5.6301	5.6166
length of specimen (mm)	25.36950	25.37850	25.38825	25.37725	25.35375	25.37775
diameter of specimen (mm)	12.73775	12.73550	12.72800	12.73150	12.72750	12.73375
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28245 28233 28226 28234 28215 28202 28221 28251 28235 28228	28237 28218 28205 28223 28210 28216 28211 28217 28202 28217	27954 27959 27960 27952 27939 27957 27949 27958 27932 27935	27494 27480 27501 27479 27512 27504 27442 27475 27494 27493	28016 28022 28020 28013 27984 27996 28049 28009 27978 28049	28117 28118 28132 28132 28153 28129 28106 28114 28115 28106
average resonant frequency (Hz)	28229	28216	27950	27487	28014	28122
standard deviation (Hz)	14	10	10	20	24	14
correction factor for rod	2.11451	2.11342591	2.111442998	2.112885875	2.114134474	2.113205957
modulus of elasticity (Pa)	9.51E+09	9.43E+09	9.30E+09	8.95E+09	9.32E+09	9.38E+09
T_{11} correction factor	2.288740504	2.287371688	2.284868415	2.286689879	2.288266331	2.287093986
calculation of individual terms	0.031032015 0.326164644 2.277710093	0.03096613 0.32547215 2.276352992	0.03084582 0.32420763 2.273871145	0.030933338 0.325127493 2.275677019	0.031009184 0.325924673 2.277239978	0.030952772 0.325331749 2.276077668
resultant T_{11}	2.11451	2.11342591	2.111442998	2.112885875	2.114134474	2.113205957
modulus of elasticity (Pa)	9.51E+09	9.43E+09	9.30E+09	8.95E+09	9.32E+09	9.38E+09
Average modulus for specimen group						

Specimen number	EW07 01	EW07 02	EW07 03	EW07 04	EW08 01	EW08 02
Specimen group standard deviation						
Environmental Conditions Temperature (°C) Barometric Pressure (in of Hg) Humidity (%)	22.4 25.2 14.4	23.3 25.6 18.8	23.3 25.6 18.6	23.3 25.6 18.6	23.3 25.6 18.7	23.3 25.6 18.9
Sampling Plan Layout Instrument ASTM						
# of Strikes Comments:	41	44	23	48	50	41

Specimen number	EW08 03	EW08 04	EW09 01	EW09 02	EA6 02	EA7 01
Date and Time	3/16/2010 12:58	3/16/2010 13:02	3/16/2010 13:06	3/16/2010 14:45	3/16/2010 14:50	3/16/2010 14:56
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.6321	5.6620	5.6676	5.6083	5.64993	5.65876
length of specimen (mm)	25.37875	25.37625	25.35625	25.37825	25.382	25.381
diameter of specimen (mm)	12.73463	12.73263	12.73075	12.73475	12.7385	12.735
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	27766 27774 27765 27756 27737 27762 27747 27755 27777 27763	27826 27810 27798 27793 27833 27815 27811 27824 27814 27887	28822 28806 28801 28784 28812 28794 28810 28795 28795 28832	27995 28040 28008 28011 27980 27976 27993 27990 27982 27973	29330 29313 29363 29321 29341 29328 29337 29337 29330 29337	28597 28596 28589 28589 28581 28592 28563 28565 28540 28577
average resonant frequency (Hz)	27760	27821	28805	27995	29334	28579
standard deviation (Hz)	12	26	14	20	13	18
correction factor for rod	2.113265717	2.113146334	2.114454314	2.113325905	2.113625028	2.113145001
modulus of elasticity (Pa)	9.16E+09	9.25E+09	9.92E+09	9.27E+09	1.03E+10	9.75E+09
T_{1r} correction factor	2.287169435	2.287018711	2.288670188	2.287245425	2.287623089	2.287017028
calculation of individual terms	0.0309564 0.325369891 2.276152471	0.030949151 0.325293696 2.276003037	0.031028629 0.326129053 2.277640379	0.030960056 0.32540831 2.27622781	0.030978225 0.32559928 2.276602242	0.03094907 0.325292845 2.276001368
resultant T_{1r}	2.113265717	2.113146334	2.114454314	2.113325905	2.113625028	2.113145001
modulus of elasticity (Pa)	9.16E+09	9.25E+09	9.92E+09	9.27E+09	1.03E+10	9.75E+09
Average modulus for specimen group						

Specimen number	EW08 03	EW08 04	EW09 01	EW09 02	EA6 02	EA7 01
Specimen group standard deviation						
Environmental Conditions Temperature (°C) Barometric Pressure (in of Hg) Humidity (%)	23.2 25.6 18.9	23.3 25.6 19	23.3 25.6 19	23 25.6 19.7	23 25.6 19.9	23 25.6 19.9
Sampling Plan Layout Instrument ASTM						
# of Strikes Comments:	11	36	23	72	50	56

Specimen number	EA7 02	EW09 03	EW09 04	EW10 01	EW10 02
Date and Time	3/16/2010 14:58	7/23/2010 12:56	7/23/2010 13:05	7/23/2010 13:08	7/23/2010 13:17
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.66086	5.68642	5.6314	5.65861	5.62887
length of specimen (mm)	25.383	25.37525	25.37725	25.356	25.3805
diameter of specimen (mm)	12.740375	12.734625	12.735875	12.734625	12.7355
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	29241 29234 29246 29260 29252 29247 29253 29236 29237 29221	28264 28302 28276 28232 28278 28265 28307 28260 28304 28296	27254 27204 27218 27228 27255 27195 27197 27215 27243 27213	28593 28542 28557 28571 28581 28540 28591 28628 28627 28618	28357 28301 28358 28363 28361 28384 28366 28259 28276 28400
average resonant frequency (Hz)	29243	28278	27222	28585	28343
standard deviation (Hz)	11	24	22	33	47
correction factor for rod	2.113844889	2.113546972	2.113586415	2.1150958	2.113265217
modulus of elasticity (Pa)	1.02E+10	9.59E+09	8.80E+09	9.74E+09	9.54E+09
T _{r1} correction factor	2.287900688	2.287524537	2.287574337	2.289480229	2.287168804
calculation of individual terms	0.030991584 0.325739688 2.276877465	0.030973483 0.325549441 2.276504533	0.030975879 0.325574625 2.276553907	0.031067649 0.326539182 2.278443486	0.03095637 0.325369572 2.276151845
resultant T _{r1}	2.113844889	2.113546972	2.113586415	2.1150958	2.113265217
modulus of elasticity (Pa)	1.02E+10	9.59E+09	8.80E+09	9.74E+09	9.54E+09
Average modulus for specimen group					

Specimen number	EA7 02	EW09 03	EW09 04	EW10 01	EW10 02
Specimen group standard deviation					
Environmental Conditions Temperature (°C) Barometric Pressure (in of Hg) Humidity (%)	23 25.6 19.9	21 25.3 42	21.1 25.3 42	21 25.3 42.2	21.1 25.3 41.9
Sampling Plan Layout Instrument ASTM					
# of Strikes Comments:	19	180	83	26	44

Specimen ID Number	Operator S#	Test Date	Initial Specimen Mass (g)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Average Resonant Frequency (Hz)	Flexural Dynamic Young's Modulus (GPa)	Room Temperature (Deg C)
EA8 01	41169	2/2/2010 9:17	5.6402	25.3825	12.7395	28339.5	9.5512	22
EA8 02	41169	2/2/2010 9:20	5.59085	25.38175	12.735375	28643.9	9.6811	22
EA9 01	41169	2/2/2010 9:52	5.66514	25.38625	12.73675	28925.1	10.0036	21.9
EA9 02	41169	2/2/2010 10:00	5.66865	25.38425	12.73675	29328.8	10.2895	21.8
EA10 02	41169	2/2/2010 10:02	5.67067	25.38525	12.729625	29187.5	10.2124	21.9
EW01 02	41169	2/2/2010 10:18	5.6717	25.38425	12.7375	28530.8	9.7407	21.8
EW01 03	41169	2/2/2010 10:33	5.67972	25.3565	12.734125	28969.6	10.0425	21.9
EW01 04	41169	2/2/2010 10:36	5.68387	25.39975	12.735375	28980.7	10.0895	22
EW02 01	41169	2/2/2010 10:40	5.65657	25.38825	12.73525	28814	9.9170	21.9
EW02 02	41169	2/2/2010 10:47	5.66612	25.3805	12.736625	28728.5	9.8655	21.8
EW02 03	41169	2/2/2010 10:54	5.65233	25.37125	12.7315	28735.1	9.8508	21.7
EW02 04	41169	2/2/2010 10:57	5.66159	25.37175	12.73025	28521.4	9.7240	21.7
EW03 01	41169	2/2/2010 13:17	5.64582	25.37725	12.734875	28628.1	9.7631	22.4
EW03 02	41169	2/2/2010 13:20	5.65356	25.3745	12.732125	28476.4	9.6774	22.5
EW03 03	41169	2/2/2010 13:28	5.66055	25.37475	12.7355	28620.9	9.7803	22.5
EW03 04	41169	2/2/2010 13:38	5.66985	25.37375	12.735625	28321	9.5910	22.6
EW04 01	41169	2/2/2010 13:41	5.66329	25.37575	12.730375	28651.3	9.8186	22.6
EW04 02	41169	2/2/2010 13:46	5.66301	25.374	12.734375	28736.4	9.8657	22.7
EW04 03	41169	2/2/2010 13:58	5.66435	25.3755	12.7345	28663.1	9.8186	22.7
EW04 04	41169	2/2/2010 14:01	5.66914	25.3755	12.7335	28627.6	9.8049	22.6
EW05 01	41169	2/2/2010 14:04	5.67696	25.37825	12.736875	28973.3	10.0536	22.6
EW05 02	41169	2/2/2010 14:08	5.67813	25.37675	12.73825	28611.2	9.7991	22.6
EW05 03	41169	2/2/2010 14:24	5.66843	25.3765	12.732625	28791.2	9.9190	22.6
EW05 04	41169	2/2/2010 14:26	5.67217	25.3755	12.73875	28764.4	9.8918	22.6
EW06 01	41169	2/2/2010 14:34	5.64695	25.37775	12.739	28376.9	9.5854	22.5
EW06 02	41169	2/2/2010 14:38	5.67409	25.37625	12.735875	28461	9.6947	22.5
EW06 03	41169	2/2/2010 14:52	5.67993	25.3655	12.736375	28265	9.5621	22.5
EW06 04	41169	2/2/2010 14:56	5.67418	25.376	12.7375	28903	9.9943	22.5
EW07 01	41169	2/2/2010 15:01	5.66305	25.3695	12.73775	28229	9.5093	22.4
EW07 02	41169	3/16/2010 12:39	5.61658	25.3785	12.7355	28215.6	9.4342	23.3
EW07 03	41169	3/16/2010 12:42	5.62619	25.38825	12.728	27949.5	9.2968	23.3
EW07 04	41169	3/16/2010 12:47	5.60871	25.37725	12.7315	27487.4	8.9486	23.3
EW08 01	41169	3/16/2010 12:52	5.63012	25.35375	12.7275	28013.6	9.3213	23.3
EW08 02	41169	3/16/2010 12:56	5.61662	25.37775	12.73375	28122.2	9.3753	23.3
EW08 03	41169	3/16/2010 12:58	5.63208	25.37875	12.734625	27760.2	9.1594	23.2
EW08 04	41169	3/16/2010 13:02	5.66198	25.37625	12.732625	27821.1	9.2511	23.3

Specimen ID Number	Operator S#	Test Date	Initial Specimen Mass (g)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Average Resonant Frequency (Hz)	Flexural Dynamic Young's Modulus (GPa)	Room Temperature (Deg C)
EW09 01	41169	3/16/2010 13:06	5.66755	25.35625	12.73075	28805.1	9.9153	23.3
EW09 02	41169	3/16/2010 14:45	5.60831	25.37825	12.73475	27994.8	9.2749	23
EA6 02	41169	3/16/2010 14:50	5.64993	25.382	12.7385	29333.7	10.2528	23
EA7 01	41169	3/16/2010 14:56	5.65876	25.381	12.735	28578.9	9.7545	23
EA7 02	41169	3/16/2010 14:58	5.66086	25.383	12.740375	29242.7	10.2053	23
EW09 03	41169	7/23/2010 12:56	5.68642	25.37525	12.734625	28278.4	9.5936	21
EW09 04	41169	7/23/2010 13:05	5.6314	25.37725	12.735875	27222.2	8.8031	21.1
EW10 01	41169	7/23/2010 13:08	5.65861	25.356	12.734625	28584.8	9.7396	21
EW10 02	41169	7/23/2010 13:17	5.62887	25.3805	12.7355	28342.5	9.5416	21.1

Specimen ID Number	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation	Specimen Comment
EA8 01	25.2	12.1	Against Grain	
EA8 02	25.2	12.1	Against Grain	
EA9 01	25.2	12.6	Against Grain	
EA9 02	25.2	12.7	Against Grain	
EA10 02	25.2	12.8	Against Grain	
EW01 02	25.2	12.9	With Grain	
EW01 03	25.2	13	With Grain	
EW01 04	25.2	12.9	With Grain	
EW02 01	25.2	13	With Grain	
EW02 02	25.2	13.1	With Grain	
EW02 03	25.2	13.1	With Grain	
EW02 04	25.2	13.2	With Grain	
EW03 01	25.2	13.6	With Grain	
EW03 02	25.2	13.6	With Grain	
EW03 03	25.2	13.7	With Grain	
EW03 04	25.2	13.7	With Grain	
EW04 01	25.2	13.7	With Grain	
EW04 02	25.2	13.7	With Grain	
EW04 03	25.2	13.7	With Grain	
EW04 04	25.2	13.8	With Grain	
EW05 01	25.2	13.9	With Grain	
EW05 02	25.2	13.9	With Grain	
EW05 03	25.2	13.9	With Grain	
EW05 04	25.2	13.9	With Grain	
EW06 01	25.2	13.9	With Grain	
EW06 02	25.2	14.1	With Grain	
EW06 03	25.2	14.1	With Grain	
EW06 04	25.1	14.3	With Grain	
EW07 01	25.2	14.4	With Grain	
EW07 02	25.6	18.8	With Grain	
EW07 03	25.6	18.6	With Grain	
EW07 04	25.6	18.6	With Grain	
EW08 01	25.6	18.7	With Grain	
EW08 02	25.6	18.9	With Grain	
EW08 03	25.6	18.9	With Grain	
EW08 04	25.6	19	With Grain	

Specimen ID Number	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation	Specimen Comment
EW09 01	25.6	19	With Grain	
EW09 02	25.6	19.7	With Grain	
EA6 02	25.6	19.9	Against Grain	
EA7 01	25.6	19.9	Against Grain	
EA7 02	25.6	19.9	Against Grain	
EW09 03	25.3	42	With Grain	
EW09 04	25.3	42	With Grain	
EW10 01	25.3	42.2	With Grain	
EW10 02	25.3	41.9	With Grain	

Specimen Number	EA6 02	EA7 01	EA7 02	EA8 01	EA8 02
Date and Time	3/8/2010 10:06	3/8/2010 10:08	3/8/2010 10:11	3/8/2010 10:15	3/8/2010 10:19
Operator	41169	41169	41169	41169	41169
Sample Location					
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:					
Forward current:					
Voltage readings, mV	0.004598 0.004549 0.004245 0.004202	0.004605 0.004638 0.004693 0.004452	0.004806 0.004613 0.00454 0.004202	0.005085 0.004936 0.004838 0.004931	0.005005 0.004754 0.004063 0.00399
Resistance readings, Ω	0.001149 0.001137 0.001061 0.001050	0.001151 0.00116 0.001173 0.001113	0.001202 0.001153 0.001135 0.001051	0.001271 0.001234 0.001209 0.001233	0.001251 0.001188 0.001016 0.000998
Reverse current:					
Voltage readings, mV	-0.004252 -0.004102 -0.003981 -0.004059	-0.004202 -0.004372 -0.004448 -0.004518	-0.003817 -0.004055 -0.003943 -0.00419	-0.004042 -0.004527 -0.004153 -0.003944	-0.00497 -0.004349 -0.003949 -0.004289
Resistance readings, Ω	0.001063 0.001026 0.000995 0.001015	0.00105 0.001093 0.00112 0.00113	0.000954 0.001014 0.000986 0.001048	0.00101 0.001132 0.001038 0.000986	0.001243 0.001087 0.000987 0.001072
End-for-end orientation:					
Reverse current:					
Voltage readings, mV	0.004805 0.004405 0.004061 0.004167	0.004746 0.004627 0.004701 0.004582	0.004544 0.004611 0.004267 0.004238	0.005113 0.004803 0.004822 0.00454	0.004789 0.004443 0.004271 0.004605

Specimen Number	EA6 02	EA7 01	EA7 02	EA8 01	EA8 02
Resistance readings, Ω	0.001201 0.001101 0.001015 0.001042	0.001187 0.001157 0.001175 0.001145	0.001136 0.001153 0.001067 0.001059	0.001278 0.001201 0.001206 0.001135	0.001197 0.001111 0.001068 0.001151
Forward current: Voltage readings, mV	-0.004446 -0.004169 -0.003876 -0.004142	-0.004257 -0.004456 -0.004216 -0.004155	-0.004306 -0.004134 -0.003904 -0.004136	-0.004503 -0.004436 -0.003798 -0.004415	-0.004516 -0.004409 -0.004239 -0.004274
Resistance readings, Ω	0.001111 0.001042 0.000969 0.001035	0.001064 0.001114 0.001054 0.001039	0.001076 0.001033 0.000976 0.001034	0.001126 0.001109 0.00095 0.001104	0.001129 0.001102 0.00106 0.001068
Average voltage, mV	0.004254	0.004479	0.004269	0.004555	0.004432
Average resistance, $R=V/I$ (m Ω)	1.063250	1.119813	1.067313	1.138875	1.108000
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7
Average area, A mm ²	127.4461	127.3761	127.4836	127.4661	127.3836
Resistivity, $\rho=(R \cdot A)/L$ ($\mu\Omega\text{m}$)	10.67	11.23	10.71	11.43	11.11
Environmental Conditions					
Temperature (Deg C)	23.000	23.000	23.000	23.000	22.900
Barometric Pressure (in Hg)	25.100	25.100	25.100	25.100	25.100
Humidity (%)	21.900	21.900	21.900	22.000	22.100

Specimen Number	EA6 02	EA7 01	EA7 02	EA8 01	EA8 02
Other Test Information					
Specimen Orientation	horizontal				
Method of Measuring Resistance	voltmeter				
Probe Location	location				
Instruments	Keithley Model 2182 Nanovoltmeter				
ASTM	Keithley Model 6220 DC Current Source C 611 - 98 Reapproved 2005				
Comments:					

Specimen Number	EA9 01	EA9 02	EW01 02	EW01 03	EW01 04	EW02 01
Date and Time	3/8/2010 10:22	3/8/2010 10:24	3/8/2010 14:57	3/8/2010 15:00	3/8/2010 15:02	3/8/2010 15:05
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.004793 0.004635 0.00427 0.00369	0.004648 0.004537 0.004359 0.004377	0.004774 0.004763 0.00448 0.004459	0.004535 0.004519 0.004343 0.004426	0.004373 0.004258 0.004189 0.004345	0.004661 0.004623 0.004371 0.004268
Resistance readings, Ω	0.001198 0.001159 0.001067 0.000923	0.001162 0.001134 0.00109 0.001094	0.001193 0.001191 0.00112 0.001115	0.001134 0.00113 0.001086 0.001106	0.001093 0.001064 0.001047 0.001086	0.001165 0.001156 0.001093 0.001067
Reverse current:						
Voltage readings, mV	-0.004349 -0.004323 -0.004503 -0.004777	-0.004063 -0.003975 -0.003895 -0.004034	-0.004332 -0.004196 -0.003966 -0.004133	-0.00434 -0.004181 -0.003997 -0.004168	-0.004044 -0.004158 -0.004376 -0.004297	-0.004308 -0.004388 -0.004226 -0.0044
Resistance readings, Ω	0.001087 0.001081 0.001126 0.001194	0.001016 0.000994 0.000974 0.001009	0.001083 0.001049 0.000991 0.001033	0.001085 0.001045 0.000999 0.001042	0.001011 0.00104 0.001094 0.001074	0.001077 0.001097 0.001057 0.0011
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004685 0.004636 0.004323 0.003798	0.004527 0.004465 0.004293 0.004008	0.00472 0.004649 0.00452 0.004491	0.004674 0.004628 0.004361 0.004394	0.004442 0.004397 0.004387 0.004263	0.004545 0.00448 0.004089 0.004168

Specimen Number	EA9 01	EA9 02	EW01 02	EW01 03	EW01 04	EW02 01
Resistance readings, Ω	0.001171 0.001159 0.001081 0.000949	0.001132 0.001116 0.001073 0.001002	0.001118 0.001162 0.001113 0.001123	0.001169 0.001157 0.00109 0.001098	0.001111 0.001099 0.001097 0.001066	0.001136 0.00112 0.001022 0.001042
Forward current:						
Voltage readings, mV	-0.004328 -0.004354 -0.004546 -0.004755	-0.00421 -0.004206 -0.003921 -0.00417	-0.004213 -0.004366 -0.004159 -0.004132	-0.004261 -0.004139 -0.003939 -0.003985	-0.00432 -0.004224 -0.0041 -0.004187	-0.004496 -0.004548 -0.004387 -0.004396
Resistance readings, Ω	0.001082 0.001088 0.001137 0.001189	0.001053 0.001052 0.00098 0.001043	0.001053 0.001091 0.00104 0.001033	0.001065 0.001035 0.000985 0.000996	0.00108 0.001056 0.001025 0.001047	0.001124 0.001137 0.001097 0.001099
Average voltage, mV	0.004423	0.004231	0.004397	0.004306	0.004273	0.004397
Average resistance, $R=V/I$ (m Ω)	1.105688	1.057750	1.099188	1.076375	1.068125	1.099313
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm ²	127.4111	127.4111	127.4261	127.3585	127.3836	127.3811
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	11.09	10.61	11.03	10.79	10.71	11.03
Environmental Conditions						
Temperature (Deg C)	22.900	22.900	23.500	23.500	23.400	23.400
Barometric Pressure (in Hg)	25.100	25.100	25.100	25.100	25.100	25.100
Humidity (%)	22.100	22.100	20.400	20.600	20.700	20.700

Specimen Number	EW02 02	EW02 03	EW02 04	EW03 01	EW03 02	EW03 03
Date and Time	3/9/2010 7:42	3/9/2010 7:45	3/9/2010 7:47	3/9/2010 7:50	3/9/2010 7:53	3/9/2010 7:57
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.004666 0.004577 0.0045 0.004421	0.004799 0.00472 0.004459 0.004519	0.004642 0.004628 0.004441 0.004307	0.004706 0.004836 0.004592 0.004242	0.004688 0.004704 0.00455 0.003894	0.004906 0.004993 0.004651 0.004587
Resistance readings, Ω	0.001167 0.001144 0.001125 0.001105	0.0012 0.00118 0.00115 0.00113	0.001161 0.001157 0.00111 0.001077	0.001177 0.001209 0.001148 0.00106	0.001172 0.001176 0.001137 0.000973	0.001226 0.001248 0.001163 0.001147
Reverse current:						
Voltage readings, mV	-0.004284 -0.004223 -0.004073 -0.004114	-0.004308 -0.004266 -0.004003 -0.004127	-0.004039 -0.004286 -0.004261 -0.004254	-0.004224 -0.004318 -0.004257 -0.004471	-0.004245 -0.004217 -0.004126 -0.004645	-0.004204 -0.003978 -0.003877 -0.004049
Resistance readings, Ω	0.001071 0.001056 0.001018 0.001029	0.001077 0.001067 0.001001 0.001032	0.00101 0.001071 0.001065 0.001064	0.001056 0.00108 0.001064 0.001118	0.001061 0.001054 0.001032 0.001161	0.001051 0.000995 0.000969 0.001012
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004795 0.004628 0.004316 0.004248	0.004828 0.004706 0.004449 0.004364	0.004609 0.004551 0.004269 0.004323	0.004553 0.004632 0.004541 0.004621	0.004974 0.004932 0.004732 0.004746	0.004844 0.004811 0.004128 0.004307

Specimen Number	EW02 02	EW02 03	EW02 04	EW03 01	EW03 02	EW03 03
Resistance readings, Ω	0.001199 0.001157 0.001079 0.001062	0.001207 0.001176 0.001112 0.001091	0.001152 0.001138 0.001067 0.001081	0.001138 0.001158 0.001135 0.001155	0.001243 0.001233 0.001183 0.001187	0.001211 0.001203 0.001032 0.001077
Forward current:						
Voltage readings, mV	-0.004181 -0.00432 -0.004232 -0.004205	-0.004279 -0.004201 -0.003998 -0.004243	-0.004306 -0.004273 -0.004532 -0.004296	-0.004409 -0.00427 -0.00412 -0.004264	-0.003939 -0.003929 -0.003913 -0.003972	-0.004106 -0.004194 -0.004635 -0.004373
Resistance readings, Ω	0.001045 0.00108 0.001058 0.001051	0.00107 0.00105 0.000999 0.001061	0.001077 0.001068 0.001133 0.001074	0.001102 0.001067 0.00103 0.001066	0.000985 0.000982 0.000978 0.000993	0.001026 0.001048 0.001159 0.001093
Average voltage, mV	0.004361	0.004392	0.004376	0.004441	0.004388	0.004415
Average resistance, $R=V/I$ ($m\Omega$)	1.090375	1.098000	1.094063	1.110188	1.096875	1.103750
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.4086	127.3060	127.2810	127.3736	127.3185	127.3861
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	10.94	11.01	10.96	11.13	11.00	11.07
Environmental Conditions						
Temperature (Deg C)	23.100	23.100	23.100	23.100	23.100	23.100
Barometric Pressure (in Hg)	25.000	25.000	25.000	25.000	25.000	25.000
Humidity (%)	21.000	20.900	20.700	20.700	20.700	20.600

Specimen Number	EW03 04	EW04 01	EW04 02	EW04 03	EW04 04	EW05 01
Date and Time	3/9/2010 7:59	3/9/2010 8:23	3/9/2010 8:26	3/9/2010 8:31	3/9/2010 8:35	3/9/2010 9:10
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.005082	0.004715	0.00474	0.004776	0.004887	0.004546
	0.005185	0.004556	0.004774	0.004617	0.004711	0.004562
	0.004801	0.004365	0.004569	0.003748	0.004415	0.004421
	0.004841	0.004398	0.004178	0.004011	0.004413	0.004474
Resistance readings, Ω	0.001271	0.001179	0.001185	0.001194	0.001222	0.001136
	0.001296	0.001139	0.001193	0.001154	0.001178	0.001141
	0.0012	0.001091	0.001142	0.000937	0.001104	0.001105
	0.00121	0.001099	0.001044	0.001003	0.001103	0.001119
Reverse current:						
Voltage readings, mV	-0.003968	-0.004249	-0.00429	-0.004173	-0.004205	-0.004134
	-0.003887	-0.004176	-0.004148	-0.004261	-0.004287	-0.0041
	-0.003931	-0.004169	-0.004079	-0.004796	-0.004015	-0.004086
	-0.003979	-0.004197	-0.004847	-0.004643	-0.004176	-0.004029
Resistance readings, Ω	0.000992	0.001062	0.001072	0.001043	0.001051	0.001033
	0.000972	0.001044	0.001037	0.001065	0.001072	0.001025
	0.000983	0.001042	0.00102	0.001199	0.001004	0.001022
	0.000995	0.001049	0.001212	0.001161	0.001044	0.001007
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.005008	0.004314	0.004749	0.005119	0.004677	0.004414
	0.004903	0.004466	0.004692	0.00501	0.004551	0.004419
	0.004792	0.004487	0.004596	0.004963	0.004145	0.004393
	0.004611	0.004585	0.004512	0.00479	0.004204	0.00449

Specimen Number	EW03 04	EW04 01	EW04 02	EW04 03	EW04 04	EW05 01
Resistance readings, Ω	0.001252 0.001226 0.001198 0.001153	0.001079 0.001117 0.001122 0.001146	0.001187 0.001173 0.001149 0.001128	0.00128 0.001253 0.001241 0.001198	0.001169 0.001138 0.001036 0.001051	0.001103 0.001105 0.001098 0.001123
Forward current:						
Voltage readings, mV	-0.004193 -0.003979 -0.003853 -0.004223	-0.004513 -0.004287 -0.004121 -0.004076	-0.004337 -0.004093 -0.003977 -0.004203	-0.00384 -0.003925 -0.003501 -0.003923	-0.004381 -0.004213 -0.00442 -0.004416	-0.004388 -0.004332 -0.00406 -0.004003
Resistance readings, Ω	0.001048 0.000995 0.000963 0.001056	0.001128 0.001072 0.00103 0.001019	0.001084 0.001023 0.000994 0.001051	0.00096 0.000981 0.000875 0.000981	0.001095 0.001053 0.001105 0.001104	0.001097 0.001083 0.001015 0.001001
Average voltage, mV	0.004452	0.004355	0.004424	0.004381	0.004382	0.004303
Average resistance, $R=V/I$ ($m\Omega$)	1.113125	1.088625	1.105875	1.095313	1.095563	1.075813
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.3886	127.2835	127.3635	127.3660	127.3460	127.3936
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	11.17	10.91	11.09	10.98	10.99	10.79
Environmental Conditions						
Temperature (Deg C)	23.200	23.100	23.100	23.100	23.100	22.900
Barometric Pressure (in Hg)	25.000	25.000	25.000	25.000	25.000	25.000
Humidity (%)	20.500	20.300	20.300	20.200	20.300	20.400

Specimen Number	EW05 02	EW05 03	EW05 04	EW06 01	EW06 02	EW06 03
Date and Time	3/9/2010 9:12	3/9/2010 9:15	3/9/2010 9:17	3/9/2010 9:20	3/9/2010 9:23	3/9/2010 9:25
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.004667 0.004602 0.004512 0.00452	0.004739 0.004667 0.00459 0.00446	0.004585 0.004633 0.004452 0.004464	0.004738 0.004582 0.00455 0.004247	0.004636 0.004534 0.004447 0.00443	0.004846 0.004797 0.004709 0.004586
Resistance readings, Ω	0.001167 0.00115 0.001128 0.00113	0.001185 0.001167 0.001148 0.001115	0.001146 0.001158 0.001113 0.001116	0.001185 0.001145 0.001137 0.001062	0.001159 0.001134 0.001112 0.001107	0.001212 0.001199 0.001177 0.001147
Reverse current:						
Voltage readings, mV	-0.004299 -0.004256 -0.004014 -0.004034	-0.004004 -0.004011 -0.004004 -0.004107	-0.004206 -0.004213 -0.004052 -0.004094	-0.004355 -0.0044 -0.004297 -0.00442	-0.004322 -0.004343 -0.004409 -0.004147	-0.004442 -0.004496 -0.004262 -0.00437
Resistance readings, Ω	0.001075 0.001064 0.001004 0.001008	0.001001 0.001003 0.001001 0.001027	0.001051 0.001053 0.001013 0.001024	0.001089 0.0011 0.001074 0.001105	0.00108 0.001086 0.001023 0.001037	0.001111 0.001124 0.001066 0.001092
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004727 0.00457 0.00452 0.004304	0.004696 0.004498 0.004604 0.004631	0.00457 0.004512 0.004432 0.004318	0.004769 0.004609 0.00466 0.004578	0.004368 0.004322 0.00445 0.004608	0.004932 0.004644 0.004606 0.004683

Specimen Number	EW05 02	EW05 03	EW05 04	EW06 01	EW06 02	EW06 03
Resistance readings, Ω	0.001182 0.001142 0.001113 0.001076	0.001174 0.001124 0.001151 0.001158	0.001142 0.001128 0.001108 0.001079	0.001192 0.001152 0.001165 0.001145	0.001092 0.00108 0.001112 0.001152	0.001233 0.001161 0.001151 0.001171
Forward current:						
Voltage readings, mV	-0.004228 -0.004195 -0.004096 -0.004515	-0.004172 -0.004147 -0.003807 -0.004059	-0.004207 -0.004246 -0.004045 -0.004263	-0.004329 -0.004402 -0.004142 -0.004156	-0.004447 -0.004386 -0.004277 -0.004233	-0.004581 -0.004443 -0.004245 -0.004381
Resistance readings, Ω	0.001057 0.001049 0.001024 0.001129	0.001043 0.001037 0.000952 0.001015	0.001052 0.001061 0.001011 0.001066	0.001082 0.001101 0.001035 0.001039	0.001112 0.001096 0.001069 0.001058	0.001145 0.001107 0.001061 0.001095
Average voltage, mV	0.004379	0.004325	0.004331	0.004452	0.004378	0.004563
Average resistance, $R=V/I$ (m Ω)	1.094688	1.081313	1.082563	1.113000	1.094313	1.140750
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm ²	127.4411	127.3285	127.4511	127.4561	127.3936	127.4036
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	10.98	10.84	10.86	11.17	10.98	11.44
Environmental Conditions						
Temperature (Deg C)	22.900	22.900	22.900	22.900	22.900	22.900
Barometric Pressure (in Hg)	25.000	25.000	25.000	25.000	25.000	25.000
Humidity (%)	20.500	20.500	20.500	20.600	20.500	20.500

Specimen Number	EW06 04	EW07 01	EW07 02	EW07 03	EW07 04	EW08 01
Date and Time	3/9/2010 9:28	3/9/2010 9:32	3/9/2010 10:09	3/9/2010 10:11	3/9/2010 10:14	3/9/2010 10:16
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.004536 0.004494 0.004363 0.004464	0.004805 0.004638 0.004609 0.004474	0.005008 0.004998 0.004717 0.004679	0.00478 0.005011 0.004669 0.004629	0.004965 0.005045 0.004848 0.004892	0.004788 0.004911 0.004899 0.004841
Resistance readings, Ω	0.001134 0.001124 0.001091 0.001116	0.001201 0.00116 0.001152 0.001119	0.001252 0.001249 0.001179 0.00117	0.001195 0.001253 0.001167 0.001157	0.001241 0.001261 0.001212 0.001223	0.001197 0.001228 0.001225 0.00121
Reverse current:						
Voltage readings, mV	-0.004337 -0.004249 -0.004141 -0.004233	-0.004488 -0.004342 -0.004216 -0.004532	-0.004582 -0.004595 -0.00426 -0.004211	-0.004656 -0.004743 -0.004521 -0.004323	-0.004686 -0.004731 -0.004767 -0.004628	-0.004525 -0.004667 -0.004626 -0.004612
Resistance readings, Ω	0.001084 0.001062 0.001035 0.001058	0.001122 0.001085 0.001054 0.001133	0.001145 0.001149 0.001065 0.001053	0.001164 0.001186 0.00113 0.001081	0.001172 0.001183 0.001192 0.001157	0.001131 0.001167 0.001157 0.001153
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004615 0.004548 0.00435 0.004058	0.004812 0.004409 0.004158 0.004272	0.004842 0.004816 0.004806 0.004887	0.005018 0.004925 0.004693 0.004767	0.004965 0.005058 0.004903 0.004884	0.004726 0.004882 0.004835 0.004643

Specimen Number	EW06 04	EW07 01	EW07 02	EW07 03	EW07 04	EW08 01
Resistance readings, Ω	0.001154 0.001137 0.001087 0.001015	0.001203 0.001102 0.00104 0.001068	0.001211 0.001204 0.001202 0.001222	0.001255 0.001231 0.001173 0.001192	0.001241 0.001264 0.001226 0.001221	0.001181 0.001221 0.001209 0.001161
Forward current:						
Voltage readings, mV	-0.004315 -0.00431 -0.004099 -0.004574	-0.004607 -0.005024 -0.004652 -0.004566	-0.004461 -0.004406 -0.004395 -0.004551	-0.004759 -0.004587 -0.004382 -0.004497	-0.00471 -0.004748 -0.004638 -0.004623	-0.004667 -0.004628 -0.00466 -0.00458
Resistance readings, Ω	0.001079 0.001078 0.001025 0.001144	0.001152 0.001256 0.001163 0.001141	0.001115 0.001102 0.001099 0.001138	0.00119 0.001147 0.001095 0.001124	0.001177 0.001187 0.00116 0.001156	0.001167 0.001157 0.001165 0.001145
Average voltage, mV	0.004355	0.004538	0.004638	0.004685	0.004818	0.004718
Average resistance, $R=V/I$ ($m\Omega$)	1.088938	1.134438	1.159688	1.171250	1.204563	1.179625
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.4261	127.4311	127.3861	127.2361	127.3060	127.2261
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	10.93	11.38	11.63	11.73	12.07	11.82
Environmental Conditions						
Temperature (Deg C)	22.900	22.900	22.800	22.800	22.800	22.800
Barometric Pressure (in Hg)	25.000	25.000	25.000	25.000	25.000	25.000
Humidity (%)	20.600	20.500	20.600	20.600	20.500	20.500

Specimen Number	EW08 02	EW08 03	EW08 04	EW09 01	EW09 02	EW09 03
Date and Time	3/9/2010 10:19	3/9/2010 10:21	3/9/2010 10:24	3/9/2010 10:28	3/9/2010 10:30	7/26/2010 10:41
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4	4	4
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.004867 0.004734 0.004077 0.004351	0.005013 0.004866 0.004767 0.004769	0.004849 0.004905 0.004791 0.004752	0.004547 0.004596 0.004224 0.004386	0.004848 0.004804 0.004608 0.004611	0.004807 0.004635 0.004353 0.004445
Resistance readings, Ω	0.001217 0.001183 0.001019 0.001088	0.001253 0.001216 0.001192 0.001192	0.001212 0.001226 0.001198 0.001188	0.001137 0.001149 0.001056 0.001096	0.001212 0.001201 0.001152 0.001153	0.001202 0.001159 0.001088 0.001112
Reverse current:						
Voltage readings, mV	-0.004564 -0.00467 -0.004822 -0.004715	-0.004724 -0.004623 -0.004504 -0.004552	-0.004616 -0.004692 -0.00458 -0.004546	-0.00438 -0.00441 -0.004362 -0.004192	-0.004702 -0.004522 -0.004519 -0.004594	-0.004416 -0.004557 -0.00501 -0.004641
Resistance readings, Ω	0.001141 0.001168 0.001205 0.001179	0.001181 0.001156 0.001126 0.001138	0.001154 0.001173 0.001145 0.001137	0.001095 0.001103 0.00109 0.001048	0.001175 0.00113 0.00113 0.001149	0.001104 0.001139 0.001253 0.00116
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004849 0.004887 0.004581 0.004673	0.004927 0.004915 0.00464 0.004837	0.00484 0.004747 0.004783 0.004795	0.00458 0.004588 0.004387 0.004556	0.004716 0.004755 0.004657 0.00456	0.004241 0.004259 0.004543 0.00452

Specimen Number	EW08 02	EW08 03	EW08 04	EW09 01	EW09 02	EW09 03
Resistance readings, Ω	0.001212 0.001222 0.001145 0.001168	0.001232 0.001229 0.00116 0.001209	0.00121 0.001187 0.001196 0.001199	0.001145 0.001147 0.001097 0.001139	0.001179 0.001189 0.001164 0.00114	0.00106 0.001065 0.001136 0.00113
Forward current:						
Voltage readings, mV	-0.004632 -0.004564 -0.004359 -0.004439	-0.004715 -0.004747 -0.004552 -0.004597	-0.00475 -0.004646 -0.004544 -0.00458	-0.004406 -0.004311 -0.004152 -0.004125	-0.004779 -0.004711 -0.004565 -0.004504	-0.004797 -0.00481 -0.005226 -0.005209
Resistance readings, Ω	0.001158 0.001141 0.00109 0.00111	0.001179 0.001187 0.001138 0.001149	0.001187 0.001162 0.001136 0.001145	0.001102 0.001078 0.001038 0.001031	0.001195 0.001178 0.001141 0.001126	0.001199 0.001202 0.001306 0.001302
Average voltage, mV	0.004612	0.004734	0.004714	0.004388	0.004653	0.004655
Average resistance, $R=V/I$ ($m\Omega$)	1.152875	1.183563	1.178438	1.096938	1.163375	1.163563
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.3510	127.3685	127.3285	127.2910	127.3710	127.3685
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	11.56	11.87	11.81	10.99	11.67	11.67
Environmental Conditions						
Temperature (Deg C)	22.800	22.900	22.900	22.9	23	21.2
Barometric Pressure (in Hg)	25.000	25.000	25.000	25	25	25.2
Humidity (%)	20.300	20.400	20.400	20.4	20.4	43.3

Specimen Number	EW09 04	EW10 01	EW10 02
Date and Time	7/26/2010 10:44	7/26/2010 10:48	7/26/2010 10:51
Operator	41169	41169	41169
Sample Location			
Applied current, I (mA)	4	4	4
Compl. Voltage (V)	2.5000	2.5000	2.5000
ID Orientation:			
Forward current:			
Voltage readings, mV	0.004637	0.004243	0.004472
	0.004474	0.004283	0.004755
	0.0044	0.004164	0.004658
	0.004647	0.004242	0.004573
Resistance readings, Ω			
	0.001159	0.001061	0.001118
	0.001118	0.001071	0.001189
	0.0011	0.001041	0.001164
	0.001162	0.001061	0.001143
Reverse current:			
Voltage readings, mV	-0.005274	-0.004913	-0.004696
	-0.005859	-0.004868	-0.004856
	-0.004958	-0.004529	-0.004496
	-0.004613	-0.004482	-0.004453
Resistance readings, Ω			
	0.001319	0.001228	0.001174
	0.001465	0.001217	0.001214
	0.00124	0.001132	0.001124
	0.001153	0.00112	0.001113
End-for-end orientation:			
Reverse current:			
Voltage readings, mV	0.004576	0.004215	0.004501
	0.004668	0.004413	0.004507
	0.004739	0.004306	0.004651
	0.004738	0.004296	0.004708

Specimen Number	EW09 04	EW10 01	EW10 02
Resistance readings, Ω	0.001144 0.001167 0.001185 0.001185	0.001054 0.001103 0.001076 0.001074	0.001125 0.001127 0.001163 0.001177
Forward current:			
Voltage readings, mV	-0.005311 -0.005641 -0.005116 -0.005123	-0.004815 -0.005026 -0.004574 -0.004383	-0.004568 -0.004569 -0.004903 -0.004603
Resistance readings, Ω	0.001328 0.00141 0.001279 0.001281	0.001204 0.001257 0.001144 0.001096	0.001142 0.001142 0.001226 0.001151
Average voltage, mV	0.004923	0.004485	0.004623
Average resistance, $R=V/I$ ($m\Omega$)	1.230938	1.121188	1.155750
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7
Average area, A mm^2	127.3936	127.3685	127.3861
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	12.35	11.24	11.59
Environmental Conditions			
Temperature (Deg C)	21.1	21.2	21.4
Barometric Pressure (in Hg)	25.2	25.2	25.2
Humidity (%)	43.4	43.2	42.9

Specimen ID Number	Operator S#	Test Date	Applied Current (mA)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Measured Potential (mV)	Resistance (mΩ)
EA6 02	41169	3/8/2010 10:06	4	25.382	12.739	0.004254	1.063
EA7 01	41169	3/8/2010 10:08	4	25.381	12.735	0.004479	1.120
EA7 02	41169	3/8/2010 10:11	4	25.383	12.740	0.004269	1.067
EA8 01	41169	3/8/2010 10:15	4	25.383	12.740	0.004555	1.139
EA8 02	41169	3/8/2010 10:19	4	25.382	12.735	0.004432	1.108
EA9 01	41169	3/8/2010 10:22	4	25.386	12.737	0.004423	1.106
EA9 02	41169	3/8/2010 10:24	4	25.384	12.737	0.004231	1.058
EW01 02	41169	3/8/2010 14:57	4	25.384	12.738	0.004397	1.099
EW01 03	41169	3/8/2010 15:00	4	25.357	12.734	0.004306	1.076
EW01 04	41169	3/8/2010 15:02	4	25.400	12.735	0.004273	1.068
EW02 01	41169	3/8/2010 15:05	4	25.388	12.735	0.004397	1.099
EW02 02	41169	3/9/2010 7:42	4	25.381	12.737	0.004361	1.090
EW02 03	41169	3/9/2010 7:45	4	25.371	12.732	0.004392	1.098
EW02 04	41169	3/9/2010 7:47	4	25.372	12.730	0.004376	1.094
EW03 01	41169	3/9/2010 7:50	4	25.377	12.735	0.004441	1.110
EW03 02	41169	3/9/2010 7:53	4	25.375	12.732	0.004388	1.097
EW03 03	41169	3/9/2010 7:57	4	25.375	12.736	0.004415	1.104
EW03 04	41169	3/9/2010 7:59	4	25.374	12.736	0.004452	1.113
EW04 01	41169	3/9/2010 8:23	4	25.376	12.730	0.004355	1.089
EW04 02	41169	3/9/2010 8:26	4	25.374	12.734	0.004424	1.106
EW04 03	41169	3/9/2010 8:31	4	25.376	12.735	0.004381	1.095
EW04 04	41169	3/9/2010 8:35	4	25.376	12.734	0.004382	1.096
EW05 01	41169	3/9/2010 9:10	4	25.378	12.736	0.004303	1.076
EW05 02	41169	3/9/2010 9:12	4	25.377	12.738	0.004379	1.095
EW05 03	41169	3/9/2010 9:15	4	25.377	12.733	0.004325	1.081
EW05 04	41169	3/9/2010 9:17	4	25.376	12.739	0.004331	1.083
EW06 01	41169	3/9/2010 9:20	4	25.378	12.739	0.004452	1.113
EW06 02	41169	3/9/2010 9:23	4	25.376	12.736	0.004378	1.094
EW06 03	41169	3/9/2010 9:25	4	25.366	12.736	0.004563	1.141
EW06 04	41169	3/9/2010 9:28	4	25.376	12.738	0.004355	1.089
EW07 01	41169	3/9/2010 9:32	4	25.370	12.738	0.004538	1.134
EW07 02	41169	3/9/2010 10:09	4	25.379	12.736	0.004638	1.160
EW07 03	41169	3/9/2010 10:11	4	25.388	12.728	0.004685	1.171
EW07 04	41169	3/9/2010 10:14	4	25.377	12.732	0.004818	1.205
EW08 01	41169	3/9/2010 10:16	4	25.354	12.728	0.004718	1.180
EW08 02	41169	3/9/2010 10:19	4	25.378	12.734	0.004612	1.153
EW08 03	41169	3/9/2010 10:21	4	25.379	12.735	0.004734	1.184

Specimen ID Number	Operator S#	Test Date	Applied Current (mA)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Measured Potential (mV)	Resistance (mΩ)
EW08 04	41169	3/9/2010 10:24	4	25.376	12.733	0.004714	1.178
EW09 01	41169	3/9/2010 10:28	4	25.356	12.731	0.004388	1.097
EW09 02	41169	3/9/2010 10:30	4	25.378	12.735	0.004653	1.163
EW09 03	41169	7/26/2010 10:41	4	25.375	12.735	0.004655	1.164
EW09 04	41169	7/26/2010 10:44	4	25.377	12.736	0.004923	1.231
EW10 01	41169	7/26/2010 10:48	4	25.366	12.735	0.004485	1.121
EW10 02	41169	7/26/2010 10:51	4	25.381	12.736	0.004623	1.156

Specimen ID Number	Resistivity ($\mu\Omega\text{m}$)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation	Specimen Comment
EA6 02	10.670	23	25.1	21.9	Against Grain	
EA7 01	11.231	23	25.1	21.9	Against Grain	
EA7 02	10.714	23	25.1	21.9	Against Grain	
EA8 01	11.431	23	25.1	22	Against Grain	
EA8 02	11.113	22.9	25.1	22.1	Against Grain	
EA9 01	11.093	22.9	25.1	22.1	Against Grain	
EA9 02	10.612	22.9	25.1	22.1	Against Grain	
EW01 02	11.029	23.5	25.1	20.4	With Grain	
EW01 03	10.794	23.5	25.1	20.6	With Grain	
EW01 04	10.714	23.4	25.1	20.7	With Grain	
EW02 01	11.026	23.4	25.1	20.7	With Grain	
EW02 02	10.939	23.1	25	21	With Grain	
EW02 03	11.006	23.1	25	20.9	With Grain	
EW02 04	10.965	23.1	25	20.7	With Grain	
EW03 01	11.135	23.1	25	20.7	With Grain	
EW03 02	10.996	23.1	25	20.7	With Grain	
EW03 03	11.071	23.1	25	20.6	With Grain	
EW03 04	11.165	23.2	25	20.5	With Grain	
EW04 01	10.911	23.1	25	20.3	With Grain	
EW04 02	11.090	23.1	25	20.3	With Grain	
EW04 03	10.985	23.1	25	20.2	With Grain	
EW04 04	10.985	23.1	25	20.3	With Grain	
EW05 01	10.791	22.9	25	20.4	With Grain	
EW05 02	10.985	22.9	25	20.5	With Grain	
EW05 03	10.841	22.9	25	20.5	With Grain	
EW05 04	10.864	22.9	25	20.5	With Grain	
EW06 01	11.170	22.9	25	20.6	With Grain	
EW06 02	10.977	22.9	25	20.5	With Grain	
EW06 03	11.444	22.9	25	20.5	With Grain	
EW06 04	10.926	22.9	25	20.6	With Grain	
EW07 01	11.383	22.9	25	20.5	With Grain	
EW07 02	11.632	22.8	25	20.6	With Grain	
EW07 03	11.734	22.8	25	20.6	With Grain	
EW07 04	12.075	22.8	25	20.5	With Grain	
EW08 01	11.817	22.8	25	20.5	With Grain	
EW08 02	11.561	22.8	25	20.3	With Grain	
EW08 03	11.870	22.9	25	20.4	With Grain	

Specimen ID Number	Resistivity ($\mu\Omega\text{m}$)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation	Specimen Comment
EW08 04	11.815	22.9	25	20.4	With Grain	
EW09 01	10.995	22.9	25	20.4	With Grain	
EW09 02	11.668	23	25	20.4	With Grain	
EW09 03	11.669	21.2	25.2	43.3	With Grain	
EW09 04	12.348	21.1	25.2	43.4	With Grain	
EW10 01	11.244	21.2	25.2	43.2	With Grain	
EW10 02	11.593	21.4	25.2	42.9	With Grain	

Specimen ID Number	Date and Time	Operator	Specimen Location	Initial Specimen Length, m	Initial Specimen Density, ρ kg/m ³	Longitudinal Traverse Time, s	Shear Traverse Time, s	Longitudinal Zero Correction, s	Shear Zero Correction, s
EA6 02	2/25/2010 10:36	41169		0.025382	1775.2712	1.035E-05	1.624E-05	2.400E-07	2.500E-07
EA7 01	2/25/2010 10:43	41169		0.025381	1779.2609	1.047E-05	1.648E-05	2.400E-07	2.500E-07
EA7 02	2/25/2010 10:47	41169		0.025383	1778.2019	1.023E-05	1.617E-05	2.400E-07	2.500E-07
EA8 01	2/25/2010 11:11	41169		0.025382	1772.0847	1.063E-05	1.640E-05	2.400E-07	2.500E-07
EA8 02	2/25/2010 11:12	41169		0.025382	1757.8373	1.042E-05	1.683E-05	2.400E-07	2.500E-07
EA9 01	2/25/2010 11:14	41169		0.025386	1780.1733	1.030E-05	1.651E-05	2.400E-07	2.500E-07
EA9 02	2/25/2010 11:16	41169		0.025384	1781.5904	1.004E-05	1.619E-05	2.400E-07	2.500E-07
EW07 01	3/1/2010 8:07	41169		0.025369	1779.638	1.063E-05	1.644E-05	2.100E-07	2.500E-07
EW07 02	3/1/2010 8:10	41169		0.025378	1765.812	1.066E-05	1.699E-05	2.100E-07	2.500E-07
EW07 03	3/1/2010 8:12	41169		0.025388	1769.1171	1.063E-05	1.651E-05	2.100E-07	2.500E-07
EW07 04	3/1/2010 8:14	41169		0.025377	1764.6412	1.080E-05	1.658E-05	2.100E-07	2.500E-07
EW08 01	3/1/2010 10:28	41169		0.025354	1772.8706	1.073E-05	1.624E-05	2.100E-07	2.500E-07
EW08 02	3/1/2010 10:30	41169		0.025378	1766.5512	1.061E-05	1.652E-05	2.100E-07	2.500E-07
EW08 03	3/1/2010 10:31	41169		0.025379	1770.958	1.078E-05	1.665E-05	2.100E-07	2.500E-07
EW08 04	3/1/2010 10:33	41169		0.025376	1780.1497	1.075E-05	1.686E-05	2.100E-07	2.500E-07
EW09 02	3/1/2010 10:34	41169		0.025378	1763.7166	1.071E-05	1.655E-05	2.100E-07	2.500E-07
EW09 01	3/1/2010 10:36	41169		0.025356	1783.7638	1.041E-05	1.634E-05	2.100E-07	2.500E-07
EW01 02	3/1/2010 10:38	41169		0.025384	1781.1504	1.042E-05	1.684E-05	2.100E-07	2.500E-07
EW01 03	3/1/2010 10:41	41169		0.025357	1787.2375	1.030E-05	1.619E-05	2.100E-07	2.500E-07
EW01 04	3/1/2010 10:42	41169		0.0254	1785.523	1.032E-05	1.630E-05	2.100E-07	2.500E-07
EW02 01	3/1/2010 13:14	41169		0.025388	1777.5789	1.030E-05	1.703E-05	2.100E-07	2.500E-07
EW02 02	3/1/2010 13:16	41169		0.025381	1781.3227	1.039E-05	1.679E-05	2.100E-07	2.500E-07
EW02 03	3/1/2010 13:18	41169		0.025371	1779.057	1.044E-05	1.691E-05	2.100E-07	2.500E-07
EW02 04	3/1/2010 13:28	41169		0.025372	1782.0373	1.047E-05	1.679E-05	2.100E-07	2.500E-07
EW03 01	3/1/2010 13:31	41169		0.025377	1775.4973	1.049E-05	1.627E-05	2.100E-07	2.500E-07
EW03 02	3/1/2010 13:33	41169		0.025375	1778.9068	1.054E-05	1.629E-05	2.100E-07	2.500E-07
EW03 03	3/1/2010 13:39	41169		0.025375	1780.1699	1.051E-05	1.615E-05	2.100E-07	2.500E-07
EW03 04	3/1/2010 13:41	41169		0.025374	1783.0017	1.051E-05	1.624E-05	2.100E-07	2.500E-07
EW04 01	3/1/2010 13:42	41169		0.025376	1782.3747	1.039E-05	1.617E-05	2.100E-07	2.500E-07
EW04 02	3/1/2010 13:43	41169		0.025374	1781.0492	1.042E-05	1.698E-05	2.100E-07	2.500E-07
EW04 03	3/1/2010 13:45	41169		0.025375	1781.279	1.047E-05	1.629E-05	2.100E-07	2.500E-07

Specimen ID Number	Date and Time	Operator	Specimen Location	Initial Specimen Length, m	Initial Specimen Density, ρ kg/m ³	Longitudinal Traverse Time, s	Shear Traverse Time, s	Longitudinal Zero Correction, s	Shear Zero Correction, s
EW04 04	3/1/2010 14:08	41169		0.025375	1783.4868	1.039E-05	1.630E-05	2.100E-07	2.500E-07
EW05 01	3/1/2010 14:09	41169		0.025378	1784.8916	1.037E-05	1.627E-05	2.100E-07	2.500E-07
EW05 02	3/1/2010 14:11	41169		0.025377	1784.3595	1.047E-05	1.653E-05	2.100E-07	2.500E-07
EW05 03	3/1/2010 14:13	41169		0.025376	1782.6602	1.035E-05	1.641E-05	2.100E-07	2.500E-07
EW05 04	3/1/2010 14:15	41169		0.025375	1782.7665	1.030E-05	1.675E-05	2.100E-07	2.500E-07
EW06 01	3/1/2010 14:17	41169		0.025378	1774.4244	1.051E-05	1.624E-05	2.100E-07	2.500E-07
EW06 02	3/1/2010 14:18	41169		0.025376	1783.9029	1.046E-05	1.624E-05	2.100E-07	2.500E-07
EW06 03	3/1/2010 14:20	41169		0.025365	1785.532	1.056E-05	1.682E-05	2.100E-07	2.500E-07
EW06 04	3/1/2010 14:21	41169		0.025376	1783.6282	1.035E-05	1.618E-05	2.100E-07	2.500E-07
EW10 01	7/26/2010 13:07	41169		0.025356	1779.9653	1.05E-05	1.646E-05	2.200E-07	3.000E-07
EW10 02	7/26/2010 13:11	41169		0.025381	1769.4793	1.06E-05	1.641E-05	2.200E-07	3.000E-07
EW09 04	7/26/2010 13:13	41169		0.025377	1770.6789	1.08E-05	1.672E-05	2.200E-07	3.000E-07
EW09 03	7/26/2010 13:16	41169		0.025375	1787.5076	1.05E-05	1.657E-05	2.200E-07	3.000E-07

Specimen ID Number	Longitudinal Sonic Velocity (m/s)	Shear Sonic Velocities, (m/s)	Longitudinal Dynamic Young's Modulus (GPa)	Shear Dynamic Young's Modulus (GPa)	Poisson's Ratio $\mu = \frac{1 - [2(v_s/v_l)^2]}{[2(v_s/v_l)^2]}$	Elastic Modulus, [GPa] $E = \rho v_l^2 \frac{1 + \mu}{1 - 2\mu}$
EA6 02	2.511E+03	1.587E+03	11.1896	4.4732	1.670E-01	10.4404
EA7 01	2.481E+03	1.564E+03	10.9523	4.3513	1.704E-01	10.1856
EA7 02	2.541E+03	1.594E+03	11.4798	4.5204	1.752E-01	10.6251
EA8 01	2.443E+03	1.572E+03	10.5756	4.3771	1.469E-01	10.0404
EA8 02	2.493E+03	1.531E+03	10.9279	4.1197	1.974E-01	9.8662
EA9 01	2.523E+03	1.561E+03	11.3359	4.3392	1.899E-01	10.3265
EA9 02	2.590E+03	1.592E+03	11.9530	4.5181	1.962E-01	10.8086
EW07 01	2.435E+03	1.567E+03	10.5488	4.3696	1.464E-01	10.0189
EW07 02	2.429E+03	1.516E+03	10.4142	4.0583	1.807E-01	9.5837
EW07 03	2.436E+03	1.561E+03	10.5021	4.3129	1.516E-01	9.9333
EW07 04	2.396E+03	1.554E+03	10.1332	4.2615	1.371E-01	9.6916
EW08 01	2.410E+03	1.586E+03	10.2977	4.4573	1.184E-01	9.9701
EW08 02	2.440E+03	1.560E+03	10.5190	4.2980	1.546E-01	9.9246
EW08 03	2.401E+03	1.548E+03	10.2096	4.2410	1.447E-01	9.7095
EW08 04	2.408E+03	1.528E+03	10.3186	4.1549	1.630E-01	9.6640
EW09 02	2.417E+03	1.557E+03	10.3030	4.2753	1.454E-01	9.7936
EW09 01	2.486E+03	1.576E+03	11.0230	4.4298	1.641E-01	10.3131
EW01 02	2.486E+03	1.530E+03	11.0095	4.1699	1.952E-01	9.9675
EW01 03	2.513E+03	1.591E+03	11.2874	4.5227	1.657E-01	10.5444
EW01 04	2.512E+03	1.583E+03	11.2702	4.4718	1.711E-01	10.4740
EW02 01	2.516E+03	1.513E+03	11.2539	4.0691	2.168E-01	9.9028
EW02 02	2.493E+03	1.535E+03	11.0730	4.1946	1.951E-01	10.0258
EW02 03	2.480E+03	1.523E+03	10.9424	4.1259	1.974E-01	9.8803
EW02 04	2.473E+03	1.534E+03	10.8976	4.1933	1.873E-01	9.9571
EW03 01	2.469E+03	1.584E+03	10.8197	4.4553	1.500E-01	10.2470
EW03 02	2.456E+03	1.582E+03	10.7341	4.4520	1.457E-01	10.2010
EW03 03	2.464E+03	1.596E+03	10.8044	4.5340	1.385E-01	10.3235
EW03 04	2.463E+03	1.587E+03	10.8207	4.4899	1.454E-01	10.2853
EW04 01	2.493E+03	1.594E+03	11.0752	4.5286	1.541E-01	10.4531
EW04 02	2.485E+03	1.517E+03	11.0002	4.0970	2.033E-01	9.8594
EW04 03	2.473E+03	1.582E+03	10.8956	4.4580	1.538E-01	10.2868

Specimen ID Number	Longitudinal Sonic Velocity (m/s)	Shear Sonic Velocities, (m/s)	Longitudinal Dynamic Young's Modulus (GPa)	Shear Dynamic Young's Modulus (GPa)	Poisson's Ratio $\mu = \frac{1 - [2(\nu_s/\nu_l)^2]}{[2(\nu_s/\nu_l)^2]}$	Elastic Modulus, [GPa] $E = \rho \nu_l^2 [(1 + \mu)(1 - 2\mu)/(1 - \mu)]$
EW04 04	2.493E+03	1.581E+03	11.0812	4.4579	1.635E-01	10.3733
EW05 01	2.498E+03	1.584E+03	11.1363	4.4792	1.636E-01	10.4238
EW05 02	2.473E+03	1.559E+03	10.9161	4.3356	1.706E-01	10.1503
EW05 03	2.503E+03	1.570E+03	11.1645	4.3957	1.753E-01	10.3326
EW05 04	2.515E+03	1.538E+03	11.2752	4.2164	2.013E-01	10.1306
EW06 01	2.464E+03	1.587E+03	10.7720	4.4697	1.454E-01	10.2391
EW06 02	2.476E+03	1.587E+03	10.9338	4.4928	1.512E-01	10.3446
EW06 03	2.451E+03	1.531E+03	10.7240	4.1840	1.801E-01	9.8753
EW06 04	2.503E+03	1.593E+03	11.1706	4.5260	1.594E-01	10.4951
EW10 01	2.467E+03	1.569E+03	10.8290	4.3822	1.601E-01	10.1678
EW10 02	2.457E+03	1.575E+03	10.6822	4.3921	1.509E-01	10.1095
EW09 04	2.401E+03	1.545E+03	10.2063	4.2294	1.462E-01	9.6953
EW09 03	2.461E+03	1.560E+03	10.8279	4.3480	1.645E-01	10.1264

Specimen ID Number	Environmental Conditions (longitudinal)			Environmental Conditions (shear)		
	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)
EA6 02	22.7	25.3	15.9	22.7	25.3	16
EA7 01	22.7	25.3	16	22.7	25.3	16
EA7 02	22.7	25.3	16	22.7	25.3	16
EA8 01	22.5	25.3	16.4	22.5	25.3	16.5
EA8 02	22.4	25.3	16.5	22.4	25.3	16.5
EA9 01	22.4	25.3	16.5	22.4	25.3	16.5
EA9 02	22.4	25.3	16.5	22.5	25.3	16.5
EW07 01	22.3	25.4	17.2	22.3	25.4	17.2
EW07 02	22.3	25.4	17.1	22.3	25.4	17.2
EW07 03	22.3	25.4	17.2	22.3	25.4	17.1
EW07 04	22.3	25.4	17.2	22.3	25.4	17.2
EW08 01	22.8	25.4	17.3	22.8	25.4	17.3
EW08 02	22.9	25.4	17.2	22.9	25.4	17.1
EW08 03	22.9	25.4	17.1	22.9	25.4	17.1
EW08 04	22.9	25.4	17.1	22.9	25.4	17.1
EW09 02	22.9	25.4	17.1	22.9	25.4	17
EW09 01	22.9	25.4	17.1	22.9	25.4	17.1
EW01 02	22.9	25.4	17	22.9	25.4	17
EW01 03	22.9	25.4	16.9	22.9	25.4	16.9
EW01 04	22.9	25.4	16.9	23	25.4	16.9
EW02 01	22.8	25.4	17.4	22.8	25.4	17.4
EW02 02	22.8	25.4	17.4	22.8	25.4	17.4
EW02 03	22.8	25.4	17.4	22.9	25.4	17.4
EW02 04	22.9	25.4	17.4	22.9	25.4	17.3
EW03 01	22.9	25.4	17.4	22.9	25.4	17.4
EW03 02	22.9	25.4	17.4	22.9	25.4	17.4
EW03 03	23	25.4	17.3	23	25.4	17.4
EW03 04	23	25.4	17.4	23	25.4	17.4
EW04 01	23	25.4	17.4	23	25.4	17.4
EW04 02	23	25.4	17.4	23	25.4	17.4
EW04 03	23	25.4	17.4	23	25.4	17.4

Specimen ID Number	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)
EW04 04	23	25.4	17.4	23.2	25.4	17.5
EW05 01	23.2	25.4	17.4	23.2	25.4	17.4
EW05 02	23.2	25.4	17.4	23.3	25.4	17.4
EW05 03	23.3	25.4	17.4	23.3	25.4	17.4
EW05 04	23.2	25.4	17.4	23.2	25.4	17.4
EW06 01	23.3	25.4	17.4	23.3	25.4	17.4
EW06 02	23.3	25.4	17.4	23.3	25.4	17.3
EW06 03	23.3	25.4	17.3	23.3	25.4	17.3
EW06 04	23.4	25.4	17.3	23.4	25.4	17.3
EW10 01	21.5	25.2	44.7	21.5	25.2	44.7
EW10 02	21.5	25.2	44.8	21.5	25.2	44.8
EW09 04	21.6	25.2	44.9	21.5	25.2	45.1
EW09 03	21.5	25.2	45.1	21.5	25.2	45.3

Specimen Type	Specimen Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	EW07 02	W	25.376	25.375	25.378	25.377	12.731	12.734	12.735
	EW06 04	W	25.374	25.374	25.374	25.374	12.735	12.737	12.739
	EW06 02	W	25.376	25.374	25.376	25.375	12.740	12.739	12.738
	EW06 01	W	25.380	25.379	25.376	25.378	12.737	12.735	12.734
	EW06 03	W	25.363	25.362	25.364	25.363	12.740	12.739	12.738
	EW07 01	W	25.370	25.370	25.370	25.369	12.738	12.739	12.739
	EW08 02	W	25.377	25.378	25.377	25.376	12.728	12.731	12.731
	EW08 01	W	25.353	25.354	25.351	25.351	12.726	12.727	12.727
	EW08 04	W	25.374	25.373	25.374	25.371	12.730	12.730	12.732
	EW08 03	W	25.373	25.374	25.372	25.373	12.733	12.735	12.738
	EW07 04	W	25.374	25.373	25.374	25.375	12.733	12.731	12.734
	EW07 03	W	25.388	25.385	25.384	25.388	12.734	12.729	12.731
	EW01 04	W	25.395	25.393	25.393	25.394	12.739	12.740	12.736
	EW01 02	W	25.380	25.379	25.381	25.380	12.736	12.738	12.741
	EW02 03	W	25.368	25.369	25.370	25.368	12.730	12.731	12.729
	EW02 01	W	25.388	25.387	25.389	25.386	12.734	12.735	12.733
	EW02 02	W	25.376	25.377	25.378	25.375	12.733	12.735	12.739
	EW02 04	W	25.375	25.370	25.372	25.371	12.734	12.734	12.736
	EW03 03	W	25.371	25.372	25.371	25.372	12.737	12.735	12.734
	EW04 01	W	25.376	25.374	25.378	25.374	12.733	12.733	12.733
	EW04 02	W	25.372	25.372	25.373	25.372	12.731	12.732	12.736
	EW03 01	W	25.376	25.375	25.377	25.376	12.735	12.735	12.734
	EW03 04	W	25.370	25.370	25.370	25.369	12.733	12.733	12.732
	EW03 02	W	25.373	25.375	25.375	25.372	12.736	12.735	12.736
	EW04 03	W	25.371	25.372	25.370	25.371	12.735	12.736	12.735
	EW04 04	W	25.373	25.375	25.374	25.373	12.738	12.735	12.731
	EW05 04	W	25.373	25.374	25.373	25.374	12.734	12.736	12.738
	EW05 01	W	25.380	25.379	25.378	25.379	12.731	12.732	12.730
	EW05 02	W	25.373	25.372	25.373	25.370	12.734	12.732	12.735
	EW05 03	W	25.376	25.377	25.374	25.375	12.734	12.731	12.734
	EW10 02	W	25.377	25.380	25.386	25.376	12.732	12.736	12.736
	EW10 01	W	25.354	25.356	25.357	25.355	12.734	12.736	12.731
	EW09 01	W	25.354	25.356	25.355	25.355	12.727	12.732	12.731
							12.726	12.728	12.727

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	EW09 04	W	25.374	25.374	25.377	25.372	12.736	12.734	12.733
	EA9 02	A	25.381	25.379	25.379	25.380	12.733	12.735	12.737
	EW09 02	W	25.377	25.377	25.378	25.378	12.734	12.732	12.734

Specimen ID Number	D4 ⁹⁰				D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰									
EW07 02	12.734	12.734	12.736	12.737	12.736	12.736	12.737	12.736	12.736	3.140	3.140	3.160	3.130
EW06 04	12.739	12.744	12.742	12.743	12.742	12.742	12.743	12.742	12.742	0.000	0.000	0.000	0.000
EW06 02	12.738	12.738	12.737	12.735	12.737	12.737	12.735	12.735	12.735	0.000	0.000	0.000	0.000
EW06 01	12.734	12.736	12.735	12.732	12.735	12.735	12.732	12.732	12.732	0.000	0.000	0.000	0.000
EW06 03	12.740	12.741	12.740	12.739	12.740	12.740	12.739	12.740	12.740	0.000	0.000	0.000	0.000
EW07 01	12.739	12.740	12.740	12.740	12.740	12.740	12.740	12.739	12.739	0.000	0.000	0.000	0.000
EW08 02	12.731	12.727	12.729	12.728	12.729	12.729	12.728	12.731	12.731	0.000	0.000	0.000	0.000
EW08 01	12.727	12.729	12.728	12.730	12.728	12.728	12.730	12.729	12.729	0.000	0.000	0.000	0.000
EW08 04	12.731	12.736	12.736	12.734	12.736	12.736	12.734	12.737	12.737	0.000	0.000	0.000	0.000
EW08 03	12.739	12.732	12.735	12.736	12.735	12.735	12.736	12.736	12.736	0.000	0.000	0.000	0.000
EW07 04	12.734	12.732	12.729	12.732	12.729	12.729	12.732	12.734	12.734	0.000	0.000	0.000	0.000
EW07 03	12.733	12.730	12.729	12.729	12.729	12.729	12.729	12.729	12.729	0.000	0.000	0.000	0.000
EW01 04	12.735	12.740	12.740	12.737	12.740	12.740	12.737	12.735	12.735	0.000	0.000	0.000	0.000
EW01 02	12.739	12.737	12.742	12.743	12.742	12.742	12.743	12.740	12.740	0.000	0.000	0.000	0.000
EW02 03	12.733	12.732	12.730	12.729	12.730	12.730	12.729	12.730	12.730	0.000	0.000	0.000	0.000
EW02 01	12.734	12.739	12.738	12.739	12.738	12.738	12.739	12.739	12.739	0.000	0.000	0.000	0.000
EW02 02	12.738	12.733	12.736	12.735	12.736	12.736	12.735	12.738	12.738	0.000	0.000	0.000	0.000
EW02 04	12.736	12.732	12.732	12.734	12.732	12.732	12.734	12.735	12.735	0.000	0.000	0.000	0.000
EW03 03	12.737	12.742	12.741	12.741	12.741	12.741	12.741	12.743	12.743	0.000	0.000	0.000	0.000
EW04 01	12.732	12.730	12.730	12.731	12.730	12.730	12.731	12.729	12.729	0.000	0.000	0.000	0.000
EW04 02	12.736	12.729	12.731	12.734	12.731	12.731	12.734	12.734	12.734	0.000	0.000	0.000	0.000
EW03 01	12.734	12.734	12.734	12.733	12.734	12.734	12.733	12.731	12.731	0.000	0.000	0.000	0.000
EW03 04	12.731	12.735	12.736	12.733	12.736	12.736	12.733	12.737	12.737	0.000	0.000	0.000	0.000
EW03 02	12.733	12.736	12.733	12.733	12.733	12.733	12.733	12.728	12.728	0.000	0.000	0.000	0.000
EW04 03	12.737	12.737	12.736	12.737	12.736	12.736	12.737	12.739	12.739	0.000	0.000	0.000	0.000
EW04 04	12.732	12.732	12.732	12.730	12.732	12.732	12.730	12.734	12.734	0.000	0.000	0.000	0.000
EW05 04	12.741	12.731	12.732	12.735	12.732	12.732	12.735	12.737	12.737	0.000	0.000	0.000	0.000
EW05 01	12.731	12.736	12.737	12.737	12.737	12.737	12.737	12.736	12.736	0.000	0.000	0.000	0.000
EW05 02	12.737	12.734	12.736	12.731	12.736	12.736	12.731	12.734	12.734	0.000	0.000	0.000	0.000
EW05 03	12.736	12.739	12.737	12.733	12.737	12.737	12.733	12.733	12.733	0.000	0.000	0.000	0.000
EW10 02	12.738	12.733	12.737	12.737	12.737	12.737	12.737	12.735	12.735	0.000	0.000	0.000	0.000
EW10 01	12.729	12.730	12.733	12.732	12.733	12.733	12.732	12.730	12.730	0.000	0.000	0.000	0.000
EW09 01	12.728	12.727	12.727	12.727	12.727	12.727	12.727	12.727	12.727	0.000	0.000	0.000	0.000

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
EW09 04	12.732	12.736	12.736	12.736	12.736	0.000	0.000	0.000	0.000
EA9 02	12.738	12.735	12.736	12.736	12.736	0.000	0.000	0.000	0.000
EW09 02	12.732	12.734	12.732	12.729	12.729	0.000	0.000	0.000	0.000

Specimen ID Number	Final Hole Diameter, mm		Final Hole Depth, mm		Final Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
EW07 02	3.143	3.380	3.320	3.350	5.61302	41169	12/2/2010 14:01
EW06 04	0.000	0.000	0.000	0.000	5.67211	41169	12/2/2010 14:24
EW06 02	0.000	0.000	0.000	0.000	5.67260	41169	12/2/2010 14:56
EW06 01	0.000	0.000	0.000	0.000	5.64696	41169	12/2/2010 14:31
EW06 03	0.000	0.000	0.000	0.000	5.67948	41169	12/3/2010 8:56
EW07 01	0.000	0.000	0.000	0.000	5.66209	41169	12/3/2010 9:07
EW08 02	0.000	0.000	0.000	0.000	5.61660	41169	12/3/2010 10:11
EW08 01	0.000	0.000	0.000	0.000	5.62908	41169	12/3/2010 10:41
EW08 04	0.000	0.000	0.000	0.000	5.65962	41169	12/3/2010 10:59
EW08 03	0.000	0.000	0.000	0.000	5.62858	41169	12/3/2010 11:08
EW07 04	0.000	0.000	0.000	0.000	5.60697	41169	12/3/2010 11:21
EW07 03	0.000	0.000	0.000	0.000	5.62533	41169	12/3/2010 11:32
EW01 04	0.000	0.000	0.000	0.000	5.67828	41169	12/3/2010 13:47
EW01 02	0.000	0.000	0.000	0.000	5.67001	41169	12/3/2010 14:21
EW02 03	0.000	0.000	0.000	0.000	5.65176	41169	12/3/2010 14:30
EW02 01	0.000	0.000	0.000	0.000	5.65536	41169	12/3/2010 15:21
EW02 02	0.000	0.000	0.000	0.000	5.66021	41169	12/3/2010 15:29
EW02 04	0.000	0.000	0.000	0.000	5.66014	41169	12/4/2010 7:39
EW03 03	0.000	0.000	0.000	0.000	5.66002	41169	12/4/2010 8:31
EW04 01	0.000	0.000	0.000	0.000	5.65892	41169	12/4/2010 8:36
EW04 02	0.000	0.000	0.000	0.000	5.66209	41169	12/4/2010 9:28
EW03 01	0.000	0.000	0.000	0.000	5.64522	41169	12/4/2010 9:35
EW03 04	0.000	0.000	0.000	0.000	5.66425	41169	12/4/2010 9:58
EW03 02	0.000	0.000	0.000	0.000	5.65187	41169	12/4/2010 10:08
EW04 03	0.000	0.000	0.000	0.000	5.66065	41169	12/4/2010 11:08
EW04 04	0.000	0.000	0.000	0.000	5.66864	41169	12/4/2010 11:18
EW05 04	0.000	0.000	0.000	0.000	5.67065	41169	12/4/2010 11:28
EW05 01	0.000	0.000	0.000	0.000	5.67626	41169	12/4/2010 12:43
EW05 02	0.000	0.000	0.000	0.000	5.67396	41169	12/4/2010 12:56
EW05 03	0.000	0.000	0.000	0.000	5.66797	41169	12/4/2010 13:28
EW10 02	0.000	0.000	0.000	0.000	5.62553	47735	12/4/2010 13:54
EW10 01	0.000	0.000	0.000	0.000	5.65554	47735	12/4/2010 13:58
EW09 01	0.000	0.000	0.000	0.000	5.66107	47735	12/4/2010 14:23

Specimen ID Number	Final Hole Diameter, mm	Final Hole Depth, mm		Final Specimen Mass, g	Measurements by:	Date: mm/dd/yr
		HD1	HD2			
EW09 04	0.000	0.000	0.000	5.62929	47735	12/4/2010 14:30
EA9 02	0.000	0.000	0.000	5.66527	41169	12/4/2010 15:05
EW09 02	0.000	0.000	0.000	5.60727	41169	12/4/2010 15:08

Specimen ID Number	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m	Total Hole Volume m ³	Final Specimen Mass kg
EW07 02	25.37650	12.73463	127.3685	0.025377	0.01273	5.1965E-08	0.0056
EW06 04	25.37400	12.74013	127.4786	0.025374	0.01274	0.0000E+00	0.0057
EW06 02	25.37525	12.73750	127.4261	0.025375	0.01274	0.0000E+00	0.0057
EW06 01	25.37825	12.73438	127.3635	0.025378	0.01273	0.0000E+00	0.0056
EW06 03	25.36300	12.73963	127.4686	0.025363	0.01274	0.0000E+00	0.0057
EW07 01	25.36975	12.73925	127.4611	0.025370	0.01274	0.0000E+00	0.0057
EW08 02	25.37700	12.72950	127.2661	0.025377	0.01273	0.0000E+00	0.0056
EW08 01	25.35225	12.72788	127.2336	0.025352	0.01273	0.0000E+00	0.0056
EW08 04	25.37300	12.73325	127.3410	0.025373	0.01273	0.0000E+00	0.0057
EW08 03	25.37300	12.73550	127.3861	0.025373	0.01274	0.0000E+00	0.0056
EW07 04	25.37400	12.73238	127.3235	0.025374	0.01273	0.0000E+00	0.0056
EW07 03	25.38625	12.73050	127.2860	0.025386	0.01273	0.0000E+00	0.0056
EW01 04	25.39375	12.73775	127.4311	0.025394	0.01274	0.0000E+00	0.0057
EW01 02	25.38000	12.73950	127.4661	0.025380	0.01274	0.0000E+00	0.0057
EW02 03	25.36875	12.73050	127.2860	0.025369	0.01273	0.0000E+00	0.0057
EW02 01	25.38750	12.73638	127.4036	0.025388	0.01274	0.0000E+00	0.0057
EW02 02	25.37650	12.73588	127.3936	0.025377	0.01274	0.0000E+00	0.0057
EW02 04	25.37200	12.73413	127.3585	0.025372	0.01273	0.0000E+00	0.0057
EW03 03	25.37150	12.73875	127.4511	0.025372	0.01274	0.0000E+00	0.0057
EW04 01	25.37550	12.73138	127.3035	0.025376	0.01273	0.0000E+00	0.0057
EW04 02	25.37225	12.73288	127.3335	0.025372	0.01273	0.0000E+00	0.0057
EW03 01	25.37600	12.73375	127.3510	0.025376	0.01273	0.0000E+00	0.0056
EW03 04	25.36975	12.73375	127.3510	0.025370	0.01273	0.0000E+00	0.0057
EW03 02	25.37375	12.73375	127.3510	0.025374	0.01273	0.0000E+00	0.0057
EW04 03	25.37100	12.73650	127.4061	0.025371	0.01274	0.0000E+00	0.0057
EW04 04	25.37375	12.73300	127.3360	0.025374	0.01273	0.0000E+00	0.0057
EW05 04	25.37350	12.73550	127.3861	0.025374	0.01274	0.0000E+00	0.0057
EW05 01	25.37900	12.73375	127.3510	0.025379	0.01273	0.0000E+00	0.0057
EW05 02	25.37200	12.73413	127.3585	0.025372	0.01273	0.0000E+00	0.0057
EW05 03	25.37550	12.73438	127.3635	0.025376	0.01273	0.0000E+00	0.0057
EW10 02	25.37975	12.73575	127.3911	0.025380	0.01274	0.0000E+00	0.0056
EW10 01	25.35550	12.73050	127.2860	0.025356	0.01273	0.0000E+00	0.0057
EW09 01	25.35500	12.72713	127.2186	0.025355	0.01273	0.0000E+00	0.0057

Specimen ID Number	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m	Total Hole Volume m ³	Final Specimen Mass kg
EW09 04	25.37425	12.73488	127.3736	0.025374	0.01273	0.0000E+00	0.0056
EA9 02	25.37975	12.73575	127.3911	0.025380	0.01274	0.0000E+00	0.0057
EW09 02	25.37750	12.73200	127.3160	0.025378	0.01273	0.0000E+00	0.0056

Specimen ID Number	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
EW07 02	25.2	24	16.7
EW06 04	25.2	24	16.8
EW06 02	25.2	23.6	17.3
EW06 01	25.2	23.8	17
EW06 03	25.2	23	21
EW07 01	25.2	23	20.9
EW08 02	25.3	23	20.7
EW08 01	25.3	23.2	20.4
EW08 04	25.3	23.3	20.2
EW08 03	25.3	23.2	20.2
EW07 04	25.3	23.2	20.2
EW07 03	25.3	23.3	20.1
EW01 04	25.3	22.7	19.7
EW01 02	25.3	22.8	19.4
EW02 03	25.3	22.9	19.4
EW02 01	25.3	22.6	20
EW02 02	25.3	22.6	19.8
EW02 04	25.4	22.3	13.2
EW03 03	25.4	22.2	13.1
EW04 01	25.4	22.3	13
EW04 02	25.4	22.3	13
EW03 01	25.4	22.4	12.9
EW03 04	25.4	22.4	12.8
EW03 02	25.4	22.2	12.9
EW04 03	25.4	21.9	13.1
EW04 04	25.4	22	13.1
EW05 04	25.4	22.1	13.1
EW05 01	25.4	22.5	13.5
EW05 02	25.4	22.2	13.8
EW05 03	25.4	22.4	14
EW10 02	25.4	22.2	17.3
EW10 01	25.4	22.2	17.3
EW09 01	25.4	22.2	17.4

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity
and Temperature Transmitter Model PTU301

Specimen ID Number	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
EW09 04	25.4	22.3	17.4
EA9 02	25.4	22.9	14.6
EW09 02	25.4	22.8	14.7

Graphite Grade: IG-430
Graphite Manufacturer: Toyo Tanso
Forming Process: Isostatic-molded
Coke Particle Size: Fine grain
Coke Type: Pitch coke
ASTM Class: INHP
Specimen Geometry: Cylinder

Specimen ID #'s:

FA1 01
FA1 02
FA2 01
FA2 02
FA3 01
FA3 02
FA4 01
FA4 02
FA5 01
FA5 02
FA6 01
FA6 02
FA7 01
FA7 02
FA8 01
FA8 02
FW01 01
FW01 02
FW01 03
FW01 04
FW02 01
FW02 02
FW02 03
FW02 04
FW03 01
FW03 02
FW03 03
FW03 04
FW04 01
FW04 02
FW04 03
FW04 04
FW05 01
FW05 02
FW05 03
FW05 04
FW06 01
FW06 02
FW06 03
FW06 04
FW07 01
FW07 02

Specimen ID #'s:

FW07 03
FW07 04
FW08 01
FW08 02
FW08 03
FW08 04
FW09 01
FW09 02
FW09 03
FW09 04
FW10 01
FW10 02
FW10 03
FW10 04
FW11 01
FW11 02
FW11 03
FW11 04
FW12 01
FW12 02
FW12 03
FW12 04
FW13 01
FW13 02
FW13 03
FW13 04
FW14 01
FW14 02
FW14 03
FW14 04
FW03 04A
FW03 02A
FA8 01A
FA8 02A
FA7 02A
FW04 03A
FW01 01A
FW07 03A
FW02 04A
FW06 04B
FW08 01A
FA6 02A
FW02 04B
FW06 04C
FW08 01B

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	FA7 02		25.384	25.384	25.384	25.384	12.733	12.731	12.732
	FA6 01		25.385	25.384	25.384	25.384	12.733	12.729	12.729
	FA5 02		25.383	25.385	25.384	25.383	12.732	12.732	12.733
	FA8 02		25.385	25.386	25.386	25.386	12.731	12.730	12.732
	FA2 02		25.383	25.382	25.384	25.382	12.732	12.732	12.733
	FA3 02		25.383	25.384	25.382	25.383	12.732	12.732	12.733
	FA8 01		25.386	25.385	25.386	25.386	12.730	12.729	12.731
	FA1 02		25.384	25.384	25.381	25.383	12.734	12.733	12.732
	FA6 02		25.385	25.387	25.383	25.383	12.732	12.731	12.732
	FA1 01		25.383	25.382	25.384	25.384	12.741	12.740	12.738
	FA4 02		25.384	25.383	25.383	25.384	12.729	12.729	12.733
	FA2 01		25.383	25.383	25.382	25.382	12.734	12.731	12.731
	FA7 01		25.385	25.386	25.385	25.386	12.732	12.731	12.732
	FA4 01		25.384	25.384	25.384	25.384	12.735	12.733	12.733
	FA3 01		25.384	25.384	25.384	25.383	12.735	12.735	12.731
	FA5 01		25.385	25.384	25.383	25.384	12.730	12.728	12.727
	FW12 03		25.384	25.384	25.385	25.384	12.733	12.732	12.732
	FW07 02		25.382	25.382	25.383	25.382	12.732	12.734	12.733
	FW02 02		25.379	25.379	25.379	25.379	12.728	12.724	12.725
	FW11 03		25.384	25.383	25.383	25.384	12.735	12.735	12.735
	FW09 04		25.383	25.383	25.382	25.382	12.735	12.732	12.733
	FW13 01		25.383	25.385	25.384	25.384	12.736	12.737	12.738
	FW09 03		25.382	25.383	25.381	25.381	12.729	12.729	12.730
	FW04 01		25.382	25.381	25.381	25.382	12.724	12.724	12.724
	FW03 03		25.381	25.381	25.380	25.380	12.726	12.725	12.727
	FW02 01		25.381	25.382	25.382	25.382	12.730	12.727	12.724
	FW07 03		25.381	25.381	25.382	25.381	12.734	12.732	12.732
	FW02 03		25.380	25.380	25.379	25.381	12.723	12.722	12.724
	FW09 01		25.383	25.381	25.382	25.384	12.739	12.735	12.733
	FW08 01		25.382	25.382	25.382	25.381	12.731	12.733	12.731
	FW07 04		25.382	25.381	25.382	25.382	12.740	12.736	12.737
	FW03 01		25.381	25.380	25.381	25.382	12.725	12.725	12.725
	FW12 01		25.385	25.382	25.385	25.385	12.733	12.733	12.734

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	FW10 04		25.381	25.381	25.381	25.381	12.728	12.730	12.731
	FW12 02		25.384	25.384	25.383	25.383	12.736	12.733	12.732
	FW11 01		25.384	25.383	25.385	25.383	12.736	12.734	12.734
	FW10 01		25.382	25.382	25.381	25.382	12.732	12.729	12.729
	FW06 04		25.381	25.382	25.381	25.382	12.734	12.732	12.732
	FW12 04		25.382	25.381	25.382	25.384	12.733	12.732	12.733
	FW07 01		25.381	25.382	25.383	25.383	12.733	12.733	12.734
	FW01 04		25.379	25.380	25.379	25.378	12.728	12.725	12.725
	FW06 03		25.381	25.382	25.381	25.381	12.733	12.732	12.732
	FW03 04		25.380	25.380	25.383	25.382	12.723	12.722	12.721
	FW10 02		25.380	25.382	25.381	25.382	12.736	12.730	12.730
	FW05 04		25.382	25.380	25.380	25.380	12.736	12.730	12.733
	FW08 03		25.382	25.381	25.382	25.383	12.732	12.731	12.732
	FW01 03		25.379	25.379	25.377	25.381	12.720	12.724	12.727
	FW14 01		25.383	25.384	25.384	25.384	12.736	12.738	12.739
	FW11 02		25.382	25.383	25.384	25.381	12.731	12.729	12.730
	FW08 02		25.383	25.382	25.383	25.380	12.732	12.729	12.729
	FW11 04		25.383	25.381	25.381	25.383	12.731	12.729	12.732
	FW04 03		25.381	25.380	25.382	25.380	12.726	12.726	12.728
	FW01 01		25.353	25.354	25.353	25.353	12.721	12.721	12.720
	FW13 04		25.383	25.383	25.382	25.383	12.734	12.735	12.734
	FW05 03		25.382	25.382	25.381	25.381	12.732	12.731	12.731
	FW14 03		25.382	25.381	25.383	25.382	12.739	12.738	12.739
	FW13 02		25.382	25.383	25.383	25.383	12.740	12.738	12.737
	FW10 03		25.381	25.381	25.381	25.382	12.733	12.732	12.731
	FW03 02		25.380	25.379	25.380	25.379	12.727	12.725	12.726
	FW13 03		25.383	25.382	25.382	25.382	12.741	12.738	12.737
	FW14 02		25.380	25.382	25.383	25.384	12.742	12.737	12.738
	FW05 02		25.379	25.380	25.380	25.380	12.731	12.728	12.728
	FW09 02		25.380	25.382	25.380	25.380	12.730	12.729	12.730
	FW06 01		25.382	25.380	25.382	25.382	12.732	12.730	12.734
	FW04 04		25.382	25.380	25.380	25.380	12.728	12.726	12.724
	FW02 04		25.380	25.380	25.379	25.380	12.726	12.729	12.728
	FW04 02		25.381	25.380	25.380	25.379	12.722	12.722	12.723

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	FW06 02		25.379	25.380	25.380	25.382	12.730	12.725	12.726
	FW08 04		25.382	25.381	25.383	25.383	12.732	12.733	12.731
	FW05 01		25.381	25.382	25.382	25.380	12.730	12.729	12.728
	FW14 04		25.380	25.382	25.383	25.381	12.738	12.737	12.737
	FW01 02		25.380	25.378	25.381	25.380	12.726	12.724	12.724
	FW03 04A		25.380	25.380	25.383	25.382	12.723	12.722	12.721
	FW03 02A		25.380	25.379	25.380	25.379	12.727	12.725	12.726

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
FA7 02	12.732	12.732	12.730	12.731	12.731	3.130	3.140	3.140	3.140
FA6 01	12.729	12.734	12.729	12.728	12.730	3.140	3.130	3.150	3.150
FA5 02	12.735	12.730	12.729	12.731	12.735	3.150	3.140	3.150	3.150
FA8 02	12.735	12.733	12.731	12.732	12.732	3.130	3.140	3.150	3.150
FA2 02	12.736	12.733	12.732	12.733	12.736	3.140	3.140	3.150	3.150
FA3 02	12.733	12.735	12.732	12.733	12.733	3.150	3.150	3.140	3.140
FA8 01	12.731	12.730	12.731	12.731	12.731	3.130	3.140	3.140	3.130
FA1 02	12.730	12.735	12.733	12.733	12.732	3.150	3.150	3.150	3.150
FA6 02	12.731	12.731	12.730	12.731	12.730	3.150	3.150	3.140	3.140
FA1 01	12.738	12.742	12.739	12.738	12.738	3.150	3.140	3.150	3.150
FA4 02	12.733	12.731	12.730	12.733	12.733	3.150	3.150	3.150	3.150
FA2 01	12.729	12.734	12.731	12.731	12.729	3.160	3.150	3.150	3.150
FA7 01	12.734	12.729	12.730	12.732	12.733	3.150	3.140	3.140	3.140
FA4 01	12.738	12.733	12.732	12.731	12.738	3.150	3.140	3.150	3.140
FA3 01	12.729	12.737	12.734	12.731	12.729	3.150	3.150	3.140	3.150
FA5 01	12.733	12.729	12.726	12.726	12.735	3.140	3.150	3.140	3.140
FW12 03	12.731	12.734	12.734	12.734	12.735	3.140	3.140	3.150	3.150
FW07 02	12.734	12.732	12.736	12.736	12.737	3.150	3.130	3.140	3.120
FW02 02	12.724	12.732	12.727	12.726	12.724	3.150	3.150	3.140	3.140
FW11 03	12.734	12.733	12.732	12.732	12.734	3.140	3.140	3.150	3.150
FW09 04	12.733	12.731	12.729	12.731	12.731	3.150	3.140	3.140	3.150
FW13 01	12.739	12.736	12.734	12.736	12.735	3.150	3.140	3.150	3.150
FW09 03	12.731	12.732	12.730	12.733	12.733	3.140	3.140	3.160	3.150
FW04 01	12.724	12.727	12.726	12.727	12.726	3.150	3.150	3.150	3.140
FW03 03	12.728	12.727	12.725	12.725	12.725	3.150	3.150	3.140	3.150
FW02 01	12.722	12.729	12.725	12.724	12.724	3.160	3.140	3.150	3.150
FW07 03	12.732	12.733	12.733	12.732	12.733	3.120	3.150	3.160	3.140
FW02 03	12.725	12.723	12.723	12.723	12.726	3.150	3.150	3.160	3.150
FW09 01	12.732	12.734	12.731	12.731	12.730	3.150	3.150	3.140	3.150
FW08 01	12.731	12.732	12.735	12.734	12.733	3.160	3.140	3.150	3.150
FW07 04	12.734	12.736	12.733	12.732	12.732	3.150	3.150	3.150	3.150
FW03 01	12.727	12.724	12.724	12.725	12.729	3.150	3.150	3.150	3.150
FW12 01	12.733	12.733	12.733	12.736	12.736	3.120	3.130	3.140	3.150

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
FW10 04	12.730	12.733	12.734	12.733	12.733	3.130	3.140	3.090	3.150
FW12 02	12.733	12.732	12.731	12.731	12.733	3.150	3.140	3.140	3.050
FW11 01	12.734	12.733	12.735	12.733	12.733	3.150	3.140	3.140	3.140
FW10 01	12.730	12.734	12.733	12.732	12.734	3.150	3.140	3.150	3.140
FW06 04	12.734	12.733	12.732	12.732	12.734	3.150	3.150	3.150	3.150
FW12 04	12.732	12.734	12.734	12.734	12.735	3.120	3.130	3.150	3.130
FW07 01	12.733	12.729	12.731	12.730	12.729	3.160	3.150	3.150	3.150
FW01 04	12.724	12.730	12.726	12.726	12.727	3.140	3.150	3.150	3.150
FW06 03	12.731	12.733	12.732	12.729	12.729	3.150	3.150	3.150	3.140
FW03 04	12.720	12.724	12.723	12.722	12.723	3.160	3.140	3.150	3.150
FW10 02	12.734	12.732	12.729	12.728	12.731	3.140	3.140	3.130	3.130
FW05 04	12.731	12.734	12.732	12.733	12.734	3.130	3.140	3.150	3.150
FW08 03	12.733	12.734	12.733	12.734	12.734	3.150	3.160	3.150	3.150
FW01 03	12.728	12.722	12.722	12.724	12.724	3.160	3.150	3.160	3.150
FW14 01	12.739	12.739	12.740	12.740	12.740	3.150	3.140	3.150	3.150
FW11 02	12.735	12.734	12.734	12.736	12.738	3.140	3.140	3.140	3.140
FW08 02	12.731	12.732	12.731	12.734	12.735	3.140	3.140	3.140	3.140
FW11 04	12.730	12.734	12.732	12.735	12.734	3.140	3.140	3.140	3.130
FW04 03	12.729	12.724	12.724	12.724	12.725	3.160	3.150	3.140	3.150
FW01 01	12.724	12.725	12.726	12.726	12.729	3.140	3.160	3.150	3.140
FW13 04	12.735	12.738	12.735	12.736	12.737	3.150	3.150	3.150	3.140
FW05 03	12.732	12.731	12.730	12.732	12.731	3.150	3.140	3.150	3.150
FW14 03	12.740	12.737	12.735	12.734	12.736	3.140	3.130	3.150	3.150
FW13 02	12.736	12.739	12.738	12.737	12.736	3.140	3.120	3.140	3.130
FW10 03	12.733	12.732	12.733	12.730	12.731	3.150	3.140	3.150	3.150
FW03 02	12.724	12.725	12.721	12.721	12.720	3.160	3.160	3.150	3.150
FW13 03	12.736	12.739	12.736	12.734	12.736	3.140	3.140	3.150	3.140
FW14 02	12.738	12.741	12.739	12.737	12.737	3.160	3.150	3.150	3.140
FW05 02	12.729	12.731	12.730	12.731	12.729	3.150	3.150	3.130	3.140
FW09 02	12.734	12.734	12.734	12.734	12.737	3.150	3.140	3.150	3.140
FW06 01	12.732	12.727	12.726	12.730	12.728	3.140	3.150	3.140	3.140
FW04 04	12.724	12.732	12.730	12.729	12.728	3.160	3.150	3.150	3.150
FW02 04	12.731	12.725	12.728	12.724	12.728	3.150	3.150	3.150	3.140
FW04 02	12.723	12.721	12.722	12.723	12.723	3.140	3.130	3.150	3.150

Specimen ID Number	D4 ⁹⁰				D3 ⁹⁰				D2 ⁹⁰				D1 ⁹⁰				D4				H1				H1'				H2				H2'			
	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'	H1	H1'	H2	H2'	H1	H1'	H2	H2'				
FW06 02	12.730	12.732	12.727	12.728	12.733	12.730	12.732	12.727	12.728	12.733	12.730	12.732	12.727	12.728	12.733	12.730	12.732	12.727	12.728	12.733	3.150	3.150	3.140	3.150	3.150	3.130	3.150	3.140	3.150	3.150	3.130	3.150	3.150			
FW08 04	12.731	12.731	12.731	12.732	12.731	12.731	12.731	12.732	12.731	12.731	12.731	12.731	12.731	12.732	12.731	12.731	12.731	12.731	12.732	12.731	12.731	3.150	3.130	3.150	3.150	3.150	3.130	3.150	3.150	3.150	3.150	3.130	3.150	3.150		
FW05 01	12.728	12.732	12.730	12.731	12.730	12.728	12.732	12.730	12.731	12.730	12.728	12.732	12.730	12.731	12.730	12.728	12.732	12.730	12.731	12.730	12.730	3.160	3.160	3.150	3.160	3.160	3.160	3.150	3.160	3.150	3.160	3.160	3.160	3.160		
FW14 04	12.737	12.738	12.738	12.737	12.738	12.737	12.738	12.737	12.737	12.738	12.737	12.738	12.737	12.737	12.738	12.737	12.738	12.737	12.737	12.738	12.737	3.130	3.150	3.140	3.160	3.160	3.150	3.140	3.160	3.160	3.150	3.160	3.160	3.160		
FW01 02	12.723	12.730	12.724	12.724	12.723	12.723	12.724	12.723	12.724	12.723	12.723	12.724	12.723	12.724	12.723	12.723	12.724	12.723	12.723	12.723	12.723	3.150	3.150	3.160	3.160	3.150	3.150	3.160	3.160	3.140	3.150	3.160	3.140	3.140		
FW03 04A	12.720	12.724	12.723	12.722	12.723	12.722	12.723	12.722	12.722	12.723	12.722	12.723	12.722	12.722	12.723	12.722	12.723	12.722	12.722	12.723	12.723	3.160	3.140	3.150	3.160	3.160	3.140	3.150	3.150	3.140	3.150	3.150	3.150	3.150		
FW03 02A	12.724	12.725	12.721	12.721	12.720	12.721	12.721	12.721	12.721	12.720	12.721	12.721	12.721	12.721	12.720	12.721	12.721	12.721	12.721	12.720	12.720	3.160	3.160	3.150	3.150	3.160	3.160	3.150	3.150	3.150	3.160	3.150	3.150	3.150	3.150	

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
FA7 02	3.138		3.370	3.360	5.76725	jl	7/20/2009 8:09
FA6 01	3.143		3.400	3.330	5.77092	jl	7/20/2009 8:13
FA5 02	3.148		3.330	3.400	5.75818	jl	7/20/2009 8:16
FA8 02	3.143		3.350	3.400	5.77398	jl	7/20/2009 8:19
FA2 02	3.145		3.330	3.400	5.75649	jl	7/20/2009 8:22
FA3 02	3.145		3.400	3.330	5.77517	jl	7/20/2009 8:24
FA8 01	3.135		3.370	3.370	5.78535	jl	7/20/2009 8:28
FA1 02	3.150		3.340	3.330	5.76139	jl	7/20/2009 8:30
FA6 02	3.145		3.370	3.350	5.75004	jl	7/20/2009 9:05
FA1 01	3.148		3.360	3.350	5.77894	jl	7/20/2009 9:08
FA4 02	3.150		3.350	3.370	5.76436	jl	7/20/2009 9:10
FA2 01	3.153		3.400	3.330	5.77498	jl	7/20/2009 9:13
FA7 01	3.143		3.340	3.400	5.77373	jl	7/20/2009 9:15
FA4 01	3.145		3.330	3.400	5.78487	jl	7/20/2009 9:17
FA3 01	3.148		3.400	3.330	5.77795	jl	7/20/2009 9:20
FA5 01	3.143		3.400	3.400	5.77318	jl	7/20/2009 9:24
FW12 03	3.145		3.320	3.390	5.80839	JL	7/21/2009 8:47
FW07 02	3.135		3.330	3.390	5.76803	JL	7/21/2009 8:54
FW02 02	3.145		3.390	3.320	5.77451	JL	7/21/2009 8:58
FW11 03	3.145		3.320	3.390	5.80875	JL	7/21/2009 9:01
FW09 04	3.145		3.370	3.320	5.75413	JL	7/21/2009 9:04
FW13 01	3.148		3.320	3.390	5.75269	JL	7/21/2009 9:06
FW09 03	3.148		3.370	3.350	5.75740	JL	7/21/2009 9:09
FW04 01	3.148		3.340	3.320	5.73809	JL	7/21/2009 9:11
FW03 03	3.148		3.360	3.320	5.74669	JL	7/21/2009 9:25
FW02 01	3.150		3.390	3.320	5.76543	JL	7/21/2009 9:28
FW07 03	3.143		3.330	3.370	5.77527	JL	7/21/2009 9:30
FW02 03	3.153		3.340	3.400	5.74257	JL	7/21/2009 9:33
FW09 01	3.148		3.390	3.330	5.74000	JL	7/21/2009 9:35
FW08 01	3.150		3.320	3.390	5.76050	JL	7/21/2009 9:38
FW07 04	3.150		3.390	3.330	5.72497	JL	7/21/2009 9:41
FW03 01	3.150		3.320	3.390	5.75400	JL	7/21/2009 9:43
FW12 01	3.135		3.390	3.340	5.76628	JL	7/21/2009 9:46

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
FW10 04	3.128	3.390	3.320	3.355	5.75341	JL	7/21/2009 9:48
FW12 02	3.120	3.390	3.320	3.355	5.77965	JL	7/21/2009 9:50
FW11 01	3.143	3.390	3.330	3.360	5.74443	JL	7/21/2009 9:53
FW10 01	3.145	3.350	3.360	3.355	5.77540	JL	7/21/2009 13:03
FW06 04	3.150	3.330	3.400	3.365	5.76512	JL	7/21/2009 13:06
FW12 04	3.133	3.370	3.350	3.360	5.77302	JL	7/21/2009 13:10
FW07 01	3.153	3.390	3.320	3.355	5.76771	JL	7/21/2009 13:12
FW01 04	3.148	3.390	3.370	3.380	5.75953	JL	7/21/2009 13:17
FW06 03	3.148	3.360	3.370	3.365	5.75814	JL	7/21/2009 13:20
FW03 04	3.150	3.320	3.400	3.360	5.70917	JL	7/21/2009 13:22
FW10 02	3.135	3.400	3.320	3.360	5.78411	JL	7/21/2009 13:28
FW05 04	3.143	3.400	3.330	3.365	5.73825	JL	7/21/2009 13:31
FW08 03	3.153	3.320	3.400	3.360	5.78913	JL	7/21/2009 13:33
FW01 03	3.155	3.340	3.360	3.350	5.75217	JL	7/21/2009 13:35
FW14 01	3.148	3.320	3.390	3.355	5.72104	JL	7/21/2009 13:38
FW11 02	3.140	3.340	3.400	3.370	5.78034	JL	7/21/2009 13:40
FW08 02	3.140	3.330	3.390	3.360	5.74967	JL	7/21/2009 13:43
FW11 04	3.138	3.390	3.330	3.360	5.77397	JL	7/21/2009 13:46
FW04 03	3.150	3.330	3.400	3.365	5.74329	JL	7/21/2009 13:48
FW01 01	3.148	3.310	3.370	3.340	5.74853	JL	7/21/2009 13:50
FW13 04	3.148	3.360	3.350	3.355	5.78647	JL	7/21/2009 13:53
FW05 03	3.148	3.340	3.370	3.355	5.77734	JL	7/21/2009 13:56
FW14 03	3.143	3.320	3.390	3.355	5.78879	JL	7/21/2009 13:58
FW13 02	3.133	3.400	3.330	3.365	5.74557	JL	7/21/2009 14:00
FW10 03	3.148	3.320	3.390	3.355	5.77267	JL	7/21/2009 14:02
FW03 02	3.155	3.390	3.320	3.355	5.77274	JL	7/21/2009 14:04
FW13 03	3.143	3.360	3.350	3.355	5.79441	JL	7/21/2009 14:06
FW14 02	3.150	3.390	3.320	3.355	5.77777	JL	7/21/2009 14:08
FW05 02	3.143	3.320	3.390	3.355	5.79714	jl	7/21/2009 14:50
FW09 02	3.145	3.320	3.390	3.355	5.74208	JL	7/21/2009 14:13
FW06 01	3.143	3.390	3.340	3.365	5.74722	JL	7/21/2009 14:24
FW04 04	3.153	3.390	3.320	3.355	5.74423	JL	7/21/2009 14:27
FW02 04	3.148	3.340	3.370	3.355	5.72145	JL	7/21/2009 14:29
FW04 02	3.143	3.390	3.340	3.365	5.76962	JL	7/21/2009 14:32

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
FW06 02	3.148	3.320	3.400	3.360	5.76731	JL	7/21/2009 14:35
FW08 04	3.145	3.320	3.370	3.345	5.74871	JL	7/21/2009 14:37
FW05 01	3.158	3.320	3.380	3.350	5.77202	JL	7/21/2009 14:40
FW14 04	3.145	3.330	3.390	3.360	5.78553	JL	7/21/2009 14:42
FW01 02	3.150	3.430	3.350	3.390	5.78583	JL	7/21/2009 14:44
FW03 04A	3.150	3.320	3.400	3.360	5.70917	JL	7/21/2009 13:22
FW03 02A	3.155	3.390	3.320	3.355	5.77274	JL	7/21/2009 14:04

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
FA7 02	25.38400	12.73150	127.3060	0.025384	0.01273	5.2032E-08	0.0058
FA6 01	25.38425	12.73013	127.2785	0.025384	0.01273	5.2196E-08	0.0058
FA5 02	25.38375	12.73213	127.3185	0.025384	0.01273	5.2365E-08	0.0058
FA8 02	25.38575	12.73200	127.3160	0.025386	0.01273	5.2355E-08	0.0058
FA2 02	25.38275	12.73338	127.3435	0.025383	0.01273	5.2283E-08	0.0058
FA3 02	25.38300	12.73288	127.3335	0.025383	0.01273	5.2283E-08	0.0058
FA8 01	25.38575	12.73050	127.2860	0.025386	0.01273	5.2027E-08	0.0058
FA1 02	25.38300	12.73275	127.3310	0.025383	0.01273	5.1980E-08	0.0058
FA6 02	25.38450	12.73100	127.2960	0.025385	0.01273	5.2204E-08	0.0058
FA1 01	25.38325	12.73925	127.4611	0.025383	0.01274	5.2209E-08	0.0058
FA4 02	25.38350	12.73138	127.3035	0.025384	0.01273	5.2370E-08	0.0058
FA2 01	25.38250	12.73125	127.3010	0.025383	0.01273	5.2532E-08	0.0058
FA7 01	25.38550	12.73163	127.3085	0.025386	0.01273	5.2275E-08	0.0058
FA4 01	25.38400	12.73413	127.3585	0.025384	0.01273	5.2281E-08	0.0058
FA3 01	25.38375	12.73263	127.3285	0.025384	0.01273	5.2365E-08	0.0058
FA5 01	25.38400	12.72925	127.2611	0.025384	0.01273	5.2741E-08	0.0058
FW12 03	25.38425	12.73313	127.3385	0.025384	0.01273	5.2128E-08	0.0058
FW07 02	25.38225	12.73425	127.3610	0.025382	0.01273	5.1871E-08	0.0058
FW02 02	25.37900	12.72625	127.2011	0.025379	0.01273	5.2128E-08	0.0058
FW11 03	25.38350	12.73375	127.3510	0.025384	0.01273	5.2128E-08	0.0058
FW09 04	25.38250	12.73188	127.3135	0.025383	0.01273	5.1971E-08	0.0058
FW13 01	25.38400	12.73638	127.4036	0.025384	0.01274	5.2210E-08	0.0058
FW09 03	25.38175	12.73088	127.2935	0.025382	0.01273	5.2286E-08	0.0058
FW04 01	25.38150	12.72525	127.1811	0.025382	0.01273	5.1820E-08	0.0057
FW03 03	25.38050	12.72600	127.1961	0.025381	0.01273	5.1976E-08	0.0057
FW02 01	25.38175	12.72563	127.1886	0.025382	0.01273	5.2292E-08	0.0058
FW07 03	25.38125	12.73263	127.3285	0.025381	0.01273	5.1967E-08	0.0058
FW02 03	25.38000	12.72363	127.1486	0.025380	0.01272	5.2610E-08	0.0057
FW09 01	25.38250	12.73313	127.3385	0.025383	0.01273	5.2287E-08	0.0057
FW08 01	25.38175	12.73250	127.3260	0.025382	0.01273	5.2292E-08	0.0058
FW07 04	25.38175	12.73500	127.3761	0.025382	0.01274	5.2370E-08	0.0057
FW03 01	25.38100	12.72550	127.1861	0.025381	0.01273	5.2292E-08	0.0058
FW12 01	25.38425	12.73388	127.3535	0.025384	0.01273	5.1947E-08	0.0058

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
FW10 04	25.38100	12.73150	127.3060	0.025381	0.01273	5.1550E-08	0.0058
FW12 02	25.38350	12.73263	127.3285	0.025384	0.01273	5.1312E-08	0.0058
FW11 01	25.38375	12.73400	127.3560	0.025384	0.01273	5.2121E-08	0.0057
FW10 01	25.38175	12.73163	127.3085	0.025382	0.01273	5.2126E-08	0.0058
FW06 04	25.38150	12.73288	127.3335	0.025382	0.01273	5.2448E-08	0.0058
FW12 04	25.38225	12.73338	127.3435	0.025382	0.01273	5.1789E-08	0.0058
FW07 01	25.38225	12.73150	127.3060	0.025382	0.01273	5.2376E-08	0.0058
FW01 04	25.37900	12.72638	127.2036	0.025379	0.01273	5.2598E-08	0.0058
FW06 03	25.38125	12.73138	127.3035	0.025381	0.01273	5.2364E-08	0.0058
FW03 04	25.38125	12.72225	127.1211	0.025381	0.01272	5.2370E-08	0.0057
FW10 02	25.38125	12.73125	127.3010	0.025381	0.01273	5.1874E-08	0.0058
FW05 04	25.38050	12.73288	127.3335	0.025381	0.01273	5.2196E-08	0.0057
FW08 03	25.38200	12.73288	127.3335	0.025382	0.01273	5.2452E-08	0.0058
FW01 03	25.37900	12.72388	127.1536	0.025379	0.01272	5.2380E-08	0.0058
FW14 01	25.38375	12.73888	127.4536	0.025384	0.01274	5.2210E-08	0.0057
FW11 02	25.38250	12.73338	127.3435	0.025383	0.01273	5.2193E-08	0.0058
FW08 02	25.38200	12.73163	127.3085	0.025382	0.01273	5.2038E-08	0.0057
FW11 04	25.38200	12.73213	127.3185	0.025382	0.01273	5.1956E-08	0.0058
FW04 03	25.38075	12.72575	127.1911	0.025381	0.01273	5.2446E-08	0.0057
FW01 01	25.35325	12.72400	127.1561	0.025353	0.01272	5.1975E-08	0.0057
FW13 04	25.38275	12.73550	127.3861	0.025383	0.01274	5.2209E-08	0.0058
FW05 03	25.38150	12.73125	127.3010	0.025382	0.01273	5.2209E-08	0.0058
FW14 03	25.38200	12.73725	127.4211	0.025382	0.01274	5.2046E-08	0.0058
FW13 02	25.38275	12.73763	127.4286	0.025383	0.01274	5.1866E-08	0.0057
FW10 03	25.38125	12.73188	127.3135	0.025381	0.01273	5.2210E-08	0.0058
FW03 02	25.37950	12.72363	127.1486	0.025380	0.01272	5.2460E-08	0.0058
FW13 03	25.38225	12.73713	127.4186	0.025382	0.01274	5.2043E-08	0.0058
FW14 02	25.38225	12.73863	127.4486	0.025382	0.01274	5.2294E-08	0.0058
FW05 02	25.37975	12.72963	127.2686	0.025380	0.01273	5.2041E-08	0.0058
FW09 02	25.38050	12.73275	127.3310	0.025381	0.01273	5.2126E-08	0.0057
FW06 01	25.38150	12.72988	127.2736	0.025382	0.01273	5.2199E-08	0.0057
FW04 04	25.38025	12.72763	127.2286	0.025380	0.01273	5.2376E-08	0.0057
FW02 04	25.38050	12.72738	127.2236	0.025381	0.01273	5.2208E-08	0.0057
FW04 02	25.38000	12.72238	127.1236	0.025380	0.01272	5.2197E-08	0.0058

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
FW06 02	25.38025	12.72888	127.2536	0.025380	0.01273	5.2286E-08	0.0058
FW08 04	25.38225	12.73150	127.3060	0.025382	0.01273	5.1972E-08	0.0057
FW05 01	25.38125	12.72975	127.2711	0.025381	0.01273	5.2462E-08	0.0058
FW14 04	25.38150	12.73750	127.4261	0.025382	0.01274	5.2205E-08	0.0058
FW01 02	25.37975	12.72475	127.1711	0.025380	0.01272	5.2837E-08	0.0058
FW03 04A	25.38125	12.72225	127.1211	0.025381	0.01272	5.2370E-08	0.0057
FW03 02A	25.37950	12.72363	127.1486	0.025380	0.01272	5.2460E-08	0.0058

Specimen ID Number	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
FA7 02	1813.88324	1.8139	25.4	21.1	46.4
FA6 01	1815.51140	1.8155	25.4	21.1	46.2
FA5 02	1811.05779	1.8111	25.4	21.1	46.2
FA8 02	1815.91237	1.8159	25.4	21.1	46.1
FA2 02	1810.19065	1.8102	25.4	21.1	45.5
FA3 02	1816.19157	1.8162	25.4	21.2	45.5
FA8 01	1819.73579	1.8197	25.4	21.1	45.9
FA1 02	1811.72148	1.8117	25.4	21.2	45.8
FA6 02	1808.67652	1.8087	25.4	21.3	45.5
FA1 01	1815.46823	1.8155	25.4	21.3	45.4
FA4 02	1813.23930	1.8132	25.4	21.3	45.3
FA2 01	1816.78160	1.8168	25.4	21.3	45.4
FA7 01	1815.91473	1.8159	25.4	21.3	45.4
FA4 01	1818.80515	1.8188	25.4	21.4	45.3
FA3 01	1817.13076	1.8171	25.4	21.4	45
FA5 01	1816.80606	1.8168	25.4	21.4	45.6
FW12 03	1826.38513	1.8264	25.3	21.1	40.8
FW07 02	1813.36739	1.8134	25.3	21.1	40.7
FW02 02	1818.10865	1.8181	25.3	21.2	40.1
FW11 03	1826.37094	1.8264	25.3	21.1	40.1
FW09 04	1809.72210	1.8097	25.3	21.1	39.6
FW13 01	1807.99737	1.8080	25.3	21.2	39.2
FW09 03	1811.27390	1.8113	25.3	21.2	38.8
FW04 01	1806.57447	1.8066	25.3	21.2	38.5
FW03 03	1809.22657	1.8092	25.3	21.2	37.7
FW02 01	1815.32487	1.8153	25.3	21.2	37.6
FW07 03	1816.24238	1.8162	25.3	21.3	37.6
FW02 03	1809.01287	1.8090	25.3	21.2	37.9
FW09 01	1805.09772	1.8051	25.3	21.2	37.9
FW08 01	1811.78219	1.8118	25.3	21.2	38
FW07 04	1799.93296	1.7999	25.3	21.2	37.9
FW03 01	1811.81657	1.8118	25.3	21.3	37.7
FW12 01	1812.82422	1.8128	25.3	21.3	37.7

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity
and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
FW10 04	1809.47350	1.8095	25.3	21.3	37.6
FW12 02	1817.08186	1.8171	25.3	21.2	37.7
FW11 01	1806.05386	1.8061	25.3	21.2	37.6
FW10 01	1816.62752	1.8166	25.3	21.1	35.7
FW06 04	1813.23374	1.8132	25.3	21	35
FW12 04	1815.14298	1.8151	25.3	21	34.9
FW07 01	1814.35111	1.8144	25.3	21	34.7
FW01 04	1813.62428	1.8136	25.3	21.1	33.9
FW06 03	1811.44289	1.8114	25.3	21.1	33.9
FW03 04	1798.66040	1.7987	25.3	21.1	33.6
FW10 02	1819.36855	1.8194	25.3	21.2	33.1
FW05 04	1804.71203	1.8047	25.3	21.2	33.5
FW08 03	1820.75131	1.8208	25.3	21.2	33.6
FW01 03	1811.90595	1.8119	25.3	21.3	33.4
FW14 01	1797.35093	1.7974	25.3	21.3	33.7
FW11 02	1817.65699	1.8177	25.3	21.3	33.8
FW08 02	1808.46600	1.8085	25.3	21.3	33.9
FW11 04	1815.91733	1.8159	25.3	21.3	34
FW04 03	1808.47794	1.8085	25.3	21.3	34.1
FW01 01	1812.36116	1.8124	25.3	21.4	34.2
FW13 04	1818.95862	1.8190	25.3	21.4	34.1
FW05 03	1817.41237	1.8174	25.3	21.4	34.1
FW14 03	1819.14116	1.8191	25.3	22.2	32
FW13 02	1805.29463	1.8053	25.3	21.7	33.3
FW10 03	1815.78055	1.8158	25.3	21.6	34.1
FW03 02	1818.46747	1.8185	25.3	21.5	33.8
FW13 03	1820.92365	1.8209	25.3	21.5	33.9
FW14 02	1815.40284	1.8154	25.3	21.4	33.6
FW05 02	1824.14540	1.8241	25.3	21.4	33.9
FW09 02	1805.91287	1.8059	25.3	21.3	33.7
FW06 01	1808.32844	1.8083	25.3	21.4	34.4
FW04 04	1808.22842	1.8082	25.3	21.4	34.2
FW02 04	1801.01656	1.8010	25.3	21.4	34.3
FW04 02	1817.66060	1.8177	25.3	21.4	34.1

Specimen ID Number	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
FW06 02	1815.07991	1.8151	25.3	21.4	34
FW08 04	1808.14459	1.8081	25.3	21.4	33.9
FW05 01	1816.33649	1.8163	25.3	21.4	34
FW14 04	1818.17154	1.8182	25.3	21.5	33.9
FW01 02	1822.46181	1.8225	25.3	21.4	34
FW03 04A	1798.66040	1.7987	25.3	21.1	33.6
FW03 02A	1818.46747	1.8185	25.3	21.5	33.8

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
FA5 02		47735	12/7/2009 8:43	100	81.14353	3.16E-04	3.70E-06	3.67E-06
				200	115.05401	6.98E-04	4.07E-06	3.75E-06
				300	147.81025	1.11E-03	4.40E-06	3.90E-06
				400	180.45423	1.58E-03	4.68E-06	4.09E-06
				500	213.19666	2.06E-03	4.91E-06	4.25E-06
				600	246.09777	2.56E-03	5.10E-06	4.38E-06
				700	279.18936	3.07E-03	5.25E-06	4.49E-06
				800	312.5189	3.60E-03	5.35E-06	4.59E-06
				900	346.02061	4.15E-03	5.41E-06	4.69E-06
				1000	379.71439	4.68E-03	5.42E-06	4.76E-06
FA6 01		47735	11/18/2009 8:11	100	81.23459	3.33E-04	3.85E-06	3.89E-06
				200	115.11091	7.34E-04	4.24E-06	3.96E-06
				300	147.8515	1.17E-03	4.57E-06	4.09E-06
				400	180.52086	1.65E-03	4.86E-06	4.28E-06
				500	213.25859	2.14E-03	5.09E-06	4.42E-06
				600	246.1655	2.66E-03	5.28E-06	4.54E-06
				700	279.26693	3.20E-03	5.42E-06	4.67E-06
				800	312.60281	3.75E-03	5.51E-06	4.78E-06
				900	346.10625	4.30E-03	5.55E-06	4.86E-06
				1000	379.85111	4.85E-03	5.54E-06	4.92E-06
FA7 01		41169	11/18/2009 16:18	100	77.96549	3.21E-04	3.87E-06	3.73E-06
				200	111.30782	7.14E-04	4.20E-06	3.84E-06
				300	143.8364	1.14E-03	4.49E-06	4.01E-06
				400	176.45533	1.62E-03	4.73E-06	4.19E-06
				500	209.28696	2.10E-03	4.92E-06	4.34E-06
				600	242.32499	2.61E-03	5.07E-06	4.45E-06
				700	275.56761	3.11E-03	5.18E-06	4.54E-06
				800	309.03177	3.62E-03	5.24E-06	4.61E-06
				900	342.64796	4.15E-03	5.26E-06	4.69E-06
				1000	376.42231	4.70E-03	5.23E-06	4.77E-06
FA7 02		47735	5/22/2010 12:25	100	81.41416	3.04E-04	3.55E-06	3.50E-06
				200	115.39244	6.75E-04	3.94E-06	3.61E-06
				300	148.10637	1.08E-03	4.28E-06	3.76E-06
				400	180.68821	1.53E-03	4.56E-06	3.96E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
FA8 01				500	213.28342	2.00E-03	4.80E-06	4.11E-06
				600	246.09834	2.49E-03	4.99E-06	4.24E-06
				700	279.14135	2.99E-03	5.13E-06	4.36E-06
				800	312.42764	3.51E-03	5.22E-06	4.47E-06
				900	345.94729	4.04E-03	5.26E-06	4.56E-06
				1000	379.67187	4.56E-03	5.25E-06	4.62E-06
				100	81.42255	3.11E-04	3.66E-06	3.63E-06
				200	115.41291	6.92E-04	4.06E-06	3.73E-06
				300	148.16461	1.10E-03	4.40E-06	3.87E-06
				400	180.75316	1.57E-03	4.70E-06	4.08E-06
FW01 01				500	213.4267	2.06E-03	4.95E-06	4.24E-06
				600	246.29639	2.57E-03	5.14E-06	4.39E-06
				700	279.3992	3.08E-03	5.29E-06	4.49E-06
				800	312.7646	3.61E-03	5.40E-06	4.60E-06
				900	346.24656	4.16E-03	5.45E-06	4.71E-06
				1000	379.97177	4.70E-03	5.45E-06	4.77E-06
				100	81.34108	3.44E-04	4.09E-06	4.05E-06
				200	115.37818	7.62E-04	4.51E-06	4.12E-06
				300	148.02181	1.23E-03	4.88E-06	4.31E-06
				400	180.61107	1.74E-03	5.18E-06	4.54E-06
FW01 02				500	213.23152	2.28E-03	5.43E-06	4.70E-06
				600	246.02569	2.83E-03	5.62E-06	4.84E-06
				700	279.05231	3.39E-03	5.75E-06	4.96E-06
				800	312.35219	3.97E-03	5.83E-06	5.07E-06
				900	345.85309	4.56E-03	5.85E-06	5.16E-06
				1000	379.54104	5.14E-03	5.81E-06	5.23E-06
				100	81.10103	3.63E-04	4.10E-06	4.29E-06
				200	115.02191	7.96E-04	4.56E-06	4.31E-06
				300	147.78821	1.26E-03	4.95E-06	4.44E-06
				400	180.45227	1.78E-03	5.27E-06	4.62E-06
500	213.21989	2.31E-03	5.52E-06	4.77E-06				
600	246.12087	2.88E-03	5.71E-06	4.93E-06				
700	279.18461	3.47E-03	5.83E-06	5.07E-06				
800	312.52121	4.04E-03	5.88E-06	5.16E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
FW01 03		41169	11/21/2009 9:08	900	346.03278	4.63E-03	5.86E-06	5.24E-06
				1000	379.72924	5.21E-03	5.78E-06	5.30E-06
				100	77.95028	3.42E-04	4.06E-06	3.97E-06
				200	111.28842	7.62E-04	4.44E-06	4.09E-06
				300	143.81736	1.22E-03	4.78E-06	4.26E-06
				400	176.43929	1.72E-03	5.08E-06	4.46E-06
				500	209.2565	2.24E-03	5.33E-06	4.62E-06
				600	242.30407	2.79E-03	5.54E-06	4.76E-06
				700	275.54581	3.35E-03	5.71E-06	4.89E-06
				800	309.00415	3.92E-03	5.83E-06	4.99E-06
FW01 04		47735	11/21/2009 9:11	900	342.61643	4.51E-03	5.91E-06	5.09E-06
				1000	376.37322	5.12E-03	5.95E-06	5.20E-06
				100	81.08481	3.72E-04	4.25E-06	4.27E-06
				200	115.01076	8.11E-04	4.61E-06	4.39E-06
				300	147.76202	1.28E-03	4.93E-06	4.49E-06
				400	180.42616	1.79E-03	5.21E-06	4.66E-06
				500	213.18541	2.33E-03	5.45E-06	4.80E-06
				600	246.10531	2.88E-03	5.66E-06	4.94E-06
				700	279.17733	3.46E-03	5.83E-06	5.05E-06
				800	312.49769	4.05E-03	5.96E-06	5.17E-06
FW02 01		41169	11/22/2009 9:46	900	346.01183	4.65E-03	6.05E-06	5.26E-06
				1000	379.71034	5.25E-03	6.10E-06	5.34E-06
				100	77.97206	3.78E-04	4.45E-06	4.38E-06
				200	111.28825	8.27E-04	4.78E-06	4.44E-06
				300	143.77679	1.32E-03	5.07E-06	4.60E-06
				400	176.34035	1.85E-03	5.33E-06	4.79E-06
				500	209.11929	2.40E-03	5.55E-06	4.93E-06
				600	242.12655	2.96E-03	5.73E-06	5.06E-06
				700	275.3576	3.54E-03	5.88E-06	5.16E-06
				800	308.8154	4.12E-03	6.00E-06	5.25E-06
FW02 03		41169	11/23/2009 7:23	900	342.44292	4.73E-03	6.07E-06	5.34E-06
				1000	376.22079	5.36E-03	6.12E-06	5.44E-06
				100	78.43317	3.59E-04	4.14E-06	4.12E-06
				200	111.72367	7.79E-04	4.49E-06	4.16E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
FW02 04				300	144.21157	1.24E-03	4.81E-06	4.31E-06
				400	176.74101	1.75E-03	5.08E-06	4.52E-06
				500	209.51329	2.27E-03	5.31E-06	4.67E-06
				600	242.52618	2.81E-03	5.50E-06	4.79E-06
				700	275.77065	3.36E-03	5.64E-06	4.90E-06
				800	309.24807	3.93E-03	5.74E-06	5.00E-06
				900	342.89316	4.50E-03	5.80E-06	5.09E-06
				1000	376.6803	5.11E-03	5.82E-06	5.18E-06
				100	82.01873	3.61E-04	4.41E-06	4.36E-06
				200	115.99378	8.10E-04	4.73E-06	4.43E-06
FW02 02				300	148.60873	1.29E-03	5.01E-06	4.58E-06
				400	181.24157	1.82E-03	5.25E-06	4.74E-06
				500	213.74034	2.35E-03	5.46E-06	4.87E-06
				600	246.49509	2.91E-03	5.63E-06	5.00E-06
				700	279.56435	3.48E-03	5.77E-06	5.09E-06
				800	312.83909	4.05E-03	5.87E-06	5.18E-06
				900	346.37283	4.65E-03	5.93E-06	5.26E-06
				1000	380.1363	5.25E-03	5.96E-06	5.35E-06
				100	81.12734	3.67E-04	4.20E-06	4.36E-06
				200	115.0509	8.09E-04	4.59E-06	4.39E-06
FW03 02				300	147.79793	1.27E-03	4.94E-06	4.48E-06
				400	180.46001	1.78E-03	5.25E-06	4.65E-06
				500	213.2234	2.32E-03	5.51E-06	4.80E-06
				600	246.14323	2.89E-03	5.72E-06	4.95E-06
				700	279.20654	3.47E-03	5.89E-06	5.08E-06
				800	312.53416	4.07E-03	6.01E-06	5.19E-06
				900	346.0237	4.67E-03	6.09E-06	5.29E-06
				1000	379.74307	5.28E-03	6.12E-06	5.36E-06
				100	76.98064	3.43E-04	4.09E-06	4.03E-06
				200	110.35145	7.55E-04	4.58E-06	4.12E-06
300	142.83006	1.24E-03	5.00E-06	4.37E-06				
400	175.34429	1.77E-03	5.35E-06	4.62E-06				
500	207.99317	2.32E-03	5.63E-06	4.81E-06				
600	240.83861	2.89E-03	5.84E-06	4.96E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
FW03 03		47735	11/24/2009 7:33	700	273.90041	3.48E-03	5.99E-06	5.09E-06
				800	307.17965	4.08E-03	6.06E-06	5.21E-06
				900	340.63004	4.68E-03	6.07E-06	5.31E-06
				1000	374.2446	5.32E-03	6.01E-06	5.41E-06
				100	78.31023	3.75E-04	4.28E-06	4.29E-06
				200	111.61778	8.07E-04	4.60E-06	4.31E-06
				300	144.14098	1.28E-03	4.88E-06	4.44E-06
				400	176.7456	1.79E-03	5.13E-06	4.62E-06
				500	209.57489	2.32E-03	5.35E-06	4.76E-06
				600	242.62267	2.86E-03	5.54E-06	4.88E-06
FW03 04		47735	3/15/2010 16:52	700	275.87541	3.42E-03	5.70E-06	4.98E-06
				800	309.38216	3.99E-03	5.82E-06	5.07E-06
				900	343.01358	4.58E-03	5.91E-06	5.17E-06
				1000	376.79759	5.19E-03	5.97E-06	5.26E-06
				100	81.6922	3.55E-04	4.30E-06	4.28E-06
				200	115.73332	7.97E-04	4.67E-06	4.36E-06
				300	148.49774	1.27E-03	5.00E-06	4.50E-06
				400	181.09537	1.80E-03	5.28E-06	4.70E-06
				500	213.75291	2.34E-03	5.52E-06	4.85E-06
				600	246.60704	2.90E-03	5.71E-06	4.98E-06
FW04 01		47735	11/24/2009 16:03	700	279.69006	3.48E-03	5.85E-06	5.09E-06
				800	312.9965	4.06E-03	5.94E-06	5.19E-06
				900	346.46525	4.66E-03	5.99E-06	5.29E-06
				1000	380.15761	5.26E-03	5.99E-06	5.36E-06
				100	78.2836	3.40E-04	4.14E-06	4.04E-06
				200	111.61309	7.63E-04	4.57E-06	4.15E-06
				300	144.16927	1.24E-03	4.94E-06	4.35E-06
				400	176.79911	1.76E-03	5.26E-06	4.58E-06
				500	209.62883	2.30E-03	5.52E-06	4.76E-06
				600	242.67275	2.86E-03	5.73E-06	4.91E-06
700	275.91768	3.44E-03	5.88E-06	5.04E-06				
800	309.40932	4.03E-03	5.97E-06	5.14E-06				
900	343.05243	4.63E-03	6.00E-06	5.24E-06				
1000	376.83281	5.25E-03	5.98E-06	5.34E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
FW04 02		47735	11/24/2009 15:49	100	81.08793	3.57E-04	4.34E-06	4.34E-06
				200	115.05377	8.02E-04	4.68E-06	4.40E-06
				300	147.83878	1.27E-03	4.98E-06	4.50E-06
				400	180.50425	1.79E-03	5.23E-06	4.69E-06
				500	213.24819	2.33E-03	5.43E-06	4.83E-06
				600	246.15994	2.89E-03	5.58E-06	4.97E-06
				700	279.22965	3.46E-03	5.68E-06	5.08E-06
				800	312.5419	3.99E-03	5.74E-06	5.10E-06
				900	346.03542	4.58E-03	5.75E-06	5.20E-06
				1000	379.73758	5.18E-03	5.71E-06	5.28E-06
FW04 03		47735	5/23/2010 8:57	100	81.39467	3.64E-04	4.41E-06	4.28E-06
				200	115.37122	8.12E-04	4.74E-06	4.39E-06
				300	148.10388	1.30E-03	5.02E-06	4.55E-06
				400	180.68	1.82E-03	5.27E-06	4.74E-06
				500	213.29042	2.36E-03	5.48E-06	4.88E-06
				600	246.11339	2.91E-03	5.64E-06	4.99E-06
				700	279.14598	3.48E-03	5.77E-06	5.08E-06
				800	312.42409	4.07E-03	5.87E-06	5.18E-06
				900	345.94087	4.66E-03	5.92E-06	5.27E-06
				1000	379.65945	5.25E-03	5.93E-06	5.33E-06
FW04 04		47735	11/30/2009 8:10	100	81.13929	3.56E-04	4.22E-06	4.19E-06
				200	115.02474	7.93E-04	4.59E-06	4.29E-06
				300	147.79395	1.26E-03	4.92E-06	4.43E-06
				400	180.43597	1.78E-03	5.20E-06	4.62E-06
				500	213.18775	2.31E-03	5.43E-06	4.76E-06
				600	246.09754	2.86E-03	5.62E-06	4.90E-06
				700	279.17798	3.43E-03	5.76E-06	5.01E-06
				800	312.49473	4.01E-03	5.85E-06	5.11E-06
				900	345.9826	4.60E-03	5.90E-06	5.20E-06
				1000	379.71338	5.19E-03	5.90E-06	5.27E-06
FW05 01		47735	11/30/2009 8:15	100	78.34561	3.82E-04	4.43E-06	4.42E-06
				200	111.65011	8.30E-04	4.77E-06	4.46E-06
				300	144.18224	1.32E-03	5.07E-06	4.61E-06
				400	176.77768	1.85E-03	5.33E-06	4.79E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
FW05 02				500	209.58698	2.40E-03	5.55E-06	4.93E-06
				600	242.63789	2.96E-03	5.73E-06	5.05E-06
				700	275.89745	3.54E-03	5.87E-06	5.16E-06
				800	309.38488	4.12E-03	5.98E-06	5.25E-06
				900	343.02746	4.72E-03	6.04E-06	5.34E-06
				1000	376.79503	5.35E-03	6.07E-06	5.43E-06
				100	81.92697	3.55E-04	4.32E-06	4.22E-06
				200	115.94138	7.97E-04	4.69E-06	4.33E-06
				300	148.66045	1.28E-03	5.01E-06	4.50E-06
				400	181.24302	1.80E-03	5.29E-06	4.70E-06
FW05 03				500	213.91593	2.35E-03	5.53E-06	4.85E-06
				600	246.76398	2.91E-03	5.72E-06	4.98E-06
				700	279.8713	3.48E-03	5.86E-06	5.09E-06
				800	313.25108	4.07E-03	5.96E-06	5.20E-06
				900	346.73398	4.68E-03	6.02E-06	5.30E-06
				1000	380.44259	5.28E-03	6.03E-06	5.37E-06
				100	81.53699	3.39E-04	4.14E-06	4.10E-06
				200	115.48361	7.67E-04	4.50E-06	4.20E-06
				300	148.26827	1.23E-03	4.81E-06	4.33E-06
				400	180.93001	1.73E-03	5.07E-06	4.51E-06
FW05 04				500	213.69518	2.25E-03	5.29E-06	4.65E-06
				600	246.60092	2.79E-03	5.46E-06	4.78E-06
				700	279.65681	3.34E-03	5.58E-06	4.89E-06
				800	313.02058	3.89E-03	5.66E-06	4.98E-06
				900	346.52753	4.47E-03	5.69E-06	5.06E-06
				1000	380.23083	5.03E-03	5.67E-06	5.12E-06
				100	77.88961	3.60E-04	4.44E-06	4.29E-06
				200	111.24276	8.10E-04	4.82E-06	4.40E-06
				300	143.7718	1.30E-03	5.15E-06	4.60E-06
				400	176.35099	1.85E-03	5.44E-06	4.82E-06
500	209.16416	2.41E-03	5.69E-06	4.98E-06				
600	242.22434	2.99E-03	5.90E-06	5.12E-06				
700	275.48679	3.58E-03	6.07E-06	5.24E-06				
800	308.96282	4.19E-03	6.19E-06	5.35E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
FW06 01		41169	11/17/2009 7:47	900	342.58908	4.81E-03	6.27E-06	5.45E-06
				1000	376.36618	5.47E-03	6.31E-06	5.57E-06
				100	78.05356	3.59E-04	4.08E-06	4.11E-06
				200	111.34595	7.77E-04	4.45E-06	4.15E-06
				300	143.85081	1.23E-03	4.78E-06	4.29E-06
				400	176.44269	1.73E-03	5.06E-06	4.48E-06
				500	209.26157	2.26E-03	5.29E-06	4.64E-06
				600	242.29921	2.79E-03	5.49E-06	4.76E-06
				700	275.55264	3.35E-03	5.64E-06	4.88E-06
				800	309.01341	3.91E-03	5.74E-06	4.98E-06
FW06 02		47735	11/17/2009 7:49	900	342.61721	4.49E-03	5.80E-06	5.07E-06
				1000	376.38202	5.09E-03	5.82E-06	5.16E-06
				100	81.14872	3.61E-04	4.30E-06	4.31E-06
				200	115.04721	8.00E-04	4.67E-06	4.35E-06
				300	147.78093	1.28E-03	4.99E-06	4.50E-06
				400	180.44365	1.80E-03	5.27E-06	4.70E-06
				500	213.18487	2.35E-03	5.51E-06	4.85E-06
				600	246.08438	2.89E-03	5.71E-06	4.96E-06
				700	279.16884	3.48E-03	5.87E-06	5.09E-06
				800	312.51612	4.07E-03	5.98E-06	5.20E-06
FW06 03		47735	12/1/2009 7:48	900	346.03206	4.68E-03	6.05E-06	5.30E-06
				1000	379.71289	5.28E-03	6.08E-06	5.37E-06
				100	81.13645	3.67E-04	4.21E-06	4.32E-06
				200	115.07566	8.07E-04	4.61E-06	4.36E-06
				300	147.83522	1.27E-03	4.96E-06	4.47E-06
				400	180.49454	1.79E-03	5.25E-06	4.66E-06
				500	213.27325	2.33E-03	5.49E-06	4.81E-06
				600	246.18618	2.89E-03	5.67E-06	4.94E-06
				700	279.25878	3.46E-03	5.80E-06	5.06E-06
				800	312.54556	4.05E-03	5.87E-06	5.16E-06
FW06 04		47735	4/28/2010 7:41	900	346.02274	4.64E-03	5.89E-06	5.25E-06
				1000	379.74815	5.22E-03	5.85E-06	5.30E-06
				100	81.70011	3.60E-04	4.21E-06	4.23E-06
				200	115.63645	8.03E-04	4.68E-06	4.34E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
FW07 01				300	148.39439	1.29E-03	5.10E-06	4.52E-06
				400	181.0033	1.82E-03	5.47E-06	4.72E-06
				500	213.66758	2.39E-03	5.79E-06	4.93E-06
				600	246.61947	2.97E-03	6.06E-06	5.08E-06
				700	279.75745	3.59E-03	6.28E-06	5.24E-06
				800	313.18254	4.22E-03	6.44E-06	5.39E-06
				900	346.70665	4.89E-03	6.56E-06	5.50E-06
				1000	380.48661	5.50E-03	6.62E-06	5.59E-06
				100	78.26055	3.64E-04	4.16E-06	4.21E-06
				200	111.5713	7.92E-04	4.59E-06	4.25E-06
FW07 02				300	144.09588	1.26E-03	4.95E-06	4.41E-06
				400	176.68299	1.78E-03	5.24E-06	4.62E-06
				500	209.5128	2.32E-03	5.48E-06	4.78E-06
				600	242.59365	2.88E-03	5.64E-06	4.91E-06
				700	275.88824	3.44E-03	5.75E-06	5.02E-06
				800	309.39061	4.02E-03	5.78E-06	5.12E-06
				900	343.02416	4.60E-03	5.76E-06	5.20E-06
				1000	376.8107	5.17E-03	5.67E-06	5.25E-06
				100	81.63259	3.62E-04	4.29E-06	4.30E-06
				200	115.52151	8.10E-04	4.67E-06	4.40E-06
FW07 03				300	148.25522	1.29E-03	5.01E-06	4.53E-06
				400	180.91544	1.81E-03	5.29E-06	4.70E-06
				500	213.64778	2.35E-03	5.52E-06	4.85E-06
				600	246.56974	2.91E-03	5.70E-06	4.98E-06
				700	279.6636	3.49E-03	5.84E-06	5.10E-06
				800	312.98119	4.08E-03	5.93E-06	5.20E-06
				900	346.45783	4.67E-03	5.97E-06	5.29E-06
				1000	380.17645	5.26E-03	5.96E-06	5.35E-06
				100	81.28954	3.54E-04	4.39E-06	4.30E-06
				200	115.29279	8.03E-04	4.76E-06	4.40E-06
300	148.03222	1.29E-03	5.09E-06	4.57E-06				
400	180.61806	1.83E-03	5.37E-06	4.78E-06				
500	213.23398	2.37E-03	5.60E-06	4.93E-06				
600	246.04049	2.94E-03	5.78E-06	5.05E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
FW07 04		47735	12/2/2009 15:58	700	279.04569	3.52E-03	5.92E-06	5.16E-06
				800	312.35191	4.12E-03	6.01E-06	5.27E-06
				900	345.84441	4.73E-03	6.05E-06	5.36E-06
				1000	379.57287	5.33E-03	6.05E-06	5.42E-06
				100	81.13321	3.57E-04	4.27E-06	4.35E-06
				200	115.06961	8.02E-04	4.65E-06	4.40E-06
				300	147.83335	1.27E-03	4.98E-06	4.52E-06
				400	180.49034	1.79E-03	5.26E-06	4.69E-06
				500	213.23678	2.33E-03	5.49E-06	4.83E-06
				600	246.13691	2.89E-03	5.67E-06	4.96E-06
FW08 01		47735	8/12/2010 15:30	700	279.20983	3.46E-03	5.80E-06	5.08E-06
				800	312.52186	4.05E-03	5.88E-06	5.18E-06
				900	346.04142	4.64E-03	5.91E-06	5.26E-06
				1000	379.74473	5.22E-03	5.89E-06	5.32E-06
				100	79.04201	3.77E-04	4.29E-06	4.44E-06
				200	112.44437	8.21E-04	4.70E-06	4.46E-06
				300	145.03611	1.30E-03	5.05E-06	4.57E-06
				400	177.68013	1.82E-03	5.34E-06	4.75E-06
				500	210.51621	2.38E-03	5.57E-06	4.91E-06
				600	243.58344	2.94E-03	5.75E-06	5.04E-06
FW08 02		47735	12/3/2009 7:48	700	276.81798	3.52E-03	5.86E-06	5.15E-06
				800	310.25798	4.11E-03	5.92E-06	5.24E-06
				900	343.86605	4.70E-03	5.92E-06	5.32E-06
				1000	377.67104	5.29E-03	5.87E-06	5.38E-06
				100	81.1664	3.83E-04	4.42E-06	4.48E-06
				200	115.09364	8.42E-04	4.82E-06	4.54E-06
				300	147.82543	1.33E-03	5.17E-06	4.68E-06
				400	180.47038	1.87E-03	5.46E-06	4.86E-06
				500	213.20487	2.43E-03	5.69E-06	5.01E-06
				600	246.11023	3.01E-03	5.86E-06	5.14E-06
700	279.20074	3.60E-03	5.98E-06	5.26E-06				
800	312.52837	4.20E-03	6.03E-06	5.36E-06				
900	346.04888	4.81E-03	6.03E-06	5.43E-06				
1000	379.75082	5.40E-03	5.97E-06	5.49E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
FW08 03		47735	12/8/2009 7:45	100	78.27959	3.57E-04	4.06E-06	4.17E-06
				200	111.53087	7.78E-04	4.54E-06	4.20E-06
				300	144.0435	1.25E-03	4.94E-06	4.37E-06
				400	176.65018	1.77E-03	5.27E-06	4.59E-06
				500	209.51721	2.31E-03	5.51E-06	4.76E-06
				600	242.56141	2.87E-03	5.68E-06	4.91E-06
				700	275.83666	3.45E-03	5.78E-06	5.04E-06
				800	309.34018	4.02E-03	5.79E-06	5.12E-06
				900	342.97716	4.58E-03	5.74E-06	5.18E-06
				1000	376.73946	5.20E-03	5.60E-06	5.28E-06
FW08 04		47735	12/7/2009 16:52	100	81.58979	3.48E-04	4.14E-06	4.22E-06
				200	115.50392	7.77E-04	4.51E-06	4.26E-06
				300	148.26932	1.23E-03	4.83E-06	4.37E-06
				400	180.91241	1.74E-03	5.11E-06	4.55E-06
				500	213.64076	2.26E-03	5.34E-06	4.69E-06
				600	246.52519	2.80E-03	5.54E-06	4.82E-06
				700	279.60545	3.37E-03	5.69E-06	4.94E-06
				800	312.9184	3.94E-03	5.79E-06	5.04E-06
				900	346.41063	4.53E-03	5.85E-06	5.13E-06
				1000	380.10467	5.11E-03	5.87E-06	5.20E-06
FW09 01		47735	12/8/2009 7:51	100	81.07057	3.52E-04	4.03E-06	4.10E-06
				200	114.98386	7.62E-04	4.51E-06	4.13E-06
				300	147.73413	1.23E-03	4.92E-06	4.32E-06
				400	180.40084	1.75E-03	5.26E-06	4.56E-06
				500	213.17271	2.29E-03	5.54E-06	4.74E-06
				600	246.02213	2.86E-03	5.75E-06	4.89E-06
				700	279.1095	3.43E-03	5.90E-06	5.02E-06
				800	312.43105	4.03E-03	5.98E-06	5.14E-06
				900	345.92021	4.63E-03	6.00E-06	5.24E-06
				1000	379.59598	5.23E-03	5.95E-06	5.32E-06
FW09 02		47735	12/9/2009 7:43	100	78.23455	3.66E-04	4.29E-06	4.24E-06
				200	111.4894	8.00E-04	4.64E-06	4.30E-06
				300	144.01041	1.28E-03	4.96E-06	4.46E-06
				400	176.61611	1.80E-03	5.24E-06	4.66E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
FW09 03				500	209.50659	2.34E-03	5.49E-06	4.82E-06
				600	242.59421	2.90E-03	5.70E-06	4.95E-06
				700	275.88083	3.47E-03	5.87E-06	5.07E-06
				800	309.36878	4.06E-03	6.01E-06	5.17E-06
				900	342.98524	4.67E-03	6.11E-06	5.27E-06
				1000	376.75506	5.31E-03	6.17E-06	5.39E-06
				100	78.2771	3.35E-04	4.29E-06	4.46E-06
				200	111.54332	7.84E-04	4.78E-06	4.49E-06
				300	144.02948	1.27E-03	5.18E-06	4.63E-06
				400	176.61422	1.81E-03	5.50E-06	4.83E-06
FW09 04				500	209.47137	2.37E-03	5.74E-06	5.00E-06
				600	242.53583	2.96E-03	5.90E-06	5.15E-06
				700	275.83425	3.56E-03	5.97E-06	5.27E-06
				800	309.33964	4.15E-03	5.97E-06	5.36E-06
				900	342.97416	4.73E-03	5.88E-06	5.41E-06
				1000	376.74614	5.34E-03	5.71E-06	5.48E-06
				100	81.68433	3.47E-04	4.22E-06	4.22E-06
				200	115.68141	7.86E-04	4.61E-06	4.31E-06
				300	148.45404	1.25E-03	4.95E-06	4.44E-06
				400	181.07066	1.77E-03	5.24E-06	4.64E-06
FW10 01				500	213.77008	2.31E-03	5.48E-06	4.80E-06
				600	246.64464	2.86E-03	5.67E-06	4.92E-06
				700	279.69748	3.44E-03	5.81E-06	5.04E-06
				800	312.97473	4.02E-03	5.90E-06	5.15E-06
				900	346.44079	4.62E-03	5.94E-06	5.24E-06
				1000	380.12406	5.21E-03	5.93E-06	5.30E-06
				100	77.87795	3.80E-04	4.15E-06	4.24E-06
				200	111.12911	8.03E-04	4.53E-06	4.26E-06
				300	143.63907	1.27E-03	4.87E-06	4.39E-06
				400	176.24843	1.78E-03	5.16E-06	4.58E-06
500	209.09596	2.31E-03	5.41E-06	4.73E-06				
600	242.15988	2.86E-03	5.62E-06	4.87E-06				
700	275.42379	3.43E-03	5.78E-06	5.00E-06				
800	308.90195	4.01E-03	5.89E-06	5.09E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
FW10 02		47735	12/10/2009 7:54	900	342.51395	4.60E-03	5.97E-06	5.18E-06
				1000	376.26072	5.22E-03	6.00E-06	5.29E-06
				100	81.2361	3.69E-04	4.35E-06	4.33E-06
				200	115.11361	8.20E-04	4.73E-06	4.43E-06
				300	147.87818	1.30E-03	5.05E-06	4.56E-06
				400	180.50747	1.83E-03	5.32E-06	4.75E-06
				500	213.23888	2.37E-03	5.54E-06	4.89E-06
				600	246.13478	2.93E-03	5.70E-06	5.02E-06
				700	279.18753	3.51E-03	5.80E-06	5.12E-06
				800	312.49285	4.09E-03	5.85E-06	5.22E-06
FA8 02		47735	5/21/2010 10:05	900	345.99417	4.68E-03	5.85E-06	5.29E-06
				1000	379.68711	5.26E-03	5.79E-06	5.34E-06
				100	81.82578	3.05E-04	3.55E-06	3.52E-06
				200	115.83784	6.71E-04	3.95E-06	3.60E-06
				300	148.55785	1.08E-03	4.30E-06	3.77E-06
				400	181.12023	1.53E-03	4.60E-06	3.98E-06
				500	213.70687	2.01E-03	4.84E-06	4.14E-06
				600	246.53687	2.50E-03	5.04E-06	4.27E-06
				700	279.56704	3.01E-03	5.18E-06	4.39E-06
				800	312.88632	3.53E-03	5.27E-06	4.50E-06
FW03 01		47735	3/19/2010 13:39	900	346.38997	4.07E-03	5.31E-06	4.59E-06
				1000	380.09776	4.59E-03	5.30E-06	4.66E-06
				100	77.41311	3.69E-04	4.30E-06	4.31E-06
				200	110.74811	8.09E-04	4.69E-06	4.36E-06
				300	143.22899	1.29E-03	5.04E-06	4.52E-06
				400	175.71375	1.82E-03	5.34E-06	4.72E-06
				500	208.37014	2.37E-03	5.58E-06	4.88E-06
				600	241.22107	2.94E-03	5.79E-06	5.02E-06
				700	274.29599	3.52E-03	5.94E-06	5.14E-06
				800	307.57603	4.12E-03	6.04E-06	5.25E-06
900	341.03029	4.72E-03	6.10E-06	5.34E-06				
1000	374.65597	5.35E-03	6.11E-06	5.44E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
FA6 02		47735	6/10/2010 14:38	100	81.5498	2.96E-04	3.76E-06	3.49E-06
				200	115.70027	6.83E-04	4.22E-06	3.70E-06
				300	148.32163	1.12E-03	4.60E-06	3.95E-06
				400	180.77335	1.61E-03	4.91E-06	4.19E-06
				500	213.30701	2.12E-03	5.13E-06	4.38E-06
				600	246.1024	2.64E-03	5.28E-06	4.52E-06
				700	279.09414	3.16E-03	5.35E-06	4.62E-06
				800	312.38625	3.69E-03	5.34E-06	4.71E-06
				900	345.89387	4.23E-03	5.26E-06	4.79E-06
				1000	379.64345	4.76E-03	5.09E-06	4.84E-06

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
FA5 02	25.384	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FA6 01	25.384	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FA7 01	25.386	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FA7 02	25.384	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
FA8 01	25.386	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW01 01	25.353	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW01 02	25.38	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
FW01 03	25.379	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW01 04	25.379	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW02 01	25.379	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW02 03	25.38	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
FW02 04	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW02 02	25.382	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW03 02	25.38	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
FW03 03	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW03 04	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW04 01	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
FW04 02	25.38	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW04 03	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW04 04	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW05 01	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
FW05 02	25.38	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW05 03	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW05 04	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
FW06 01	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW06 02	25.38	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW06 03	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW06 04	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
FW07 01	25.382	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW07 02	25.382	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW07 03	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
FW07 04	25.382	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW08 01	25.382	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW08 02	25.382	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
FW08 03	25.382	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW08 04	25.382	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW09 01	25.383	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW09 02	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
FW09 03	25.382	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW09 04	25.383	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW10 01	25.382	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
FW10 02	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FA8 02	25.386	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
FW03 01	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
FA6 02	25.384	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen Number	FA5 02	FA6 01	FA7 01	FA7 02	FA8 01	FW01 01
Measured By	47735	47735	41169	47735	47735	47735
Measured Date	12/7/09 8:43 AM	11/18/09 8:11 AM	11/18/09 4:18 PM	5/22/10 12:25 PM	4/26/10 8:07 AM	5/24/10 7:45 AM
Initial Sample Length (L ₀ , mm)	25.384	25.384	25.386	25.384	25.386	25.353
Linear Thermal Expansion Temperature °C						
100	3.16E-04	3.33E-04	3.21E-04	3.04E-04	3.11E-04	3.44E-04
200	6.98E-04	7.34E-04	7.14E-04	6.75E-04	6.92E-04	7.62E-04
300	1.11E-03	1.17E-03	1.14E-03	1.08E-03	1.10E-03	1.23E-03
400	1.58E-03	1.65E-03	1.62E-03	1.53E-03	1.57E-03	1.74E-03
500	2.06E-03	2.14E-03	2.10E-03	2.00E-03	2.06E-03	2.28E-03
600	2.56E-03	2.66E-03	2.61E-03	2.49E-03	2.57E-03	2.83E-03
700	3.07E-03	3.20E-03	3.11E-03	2.99E-03	3.08E-03	3.39E-03
800	3.60E-03	3.75E-03	3.62E-03	3.51E-03	3.61E-03	3.97E-03
900	4.15E-03	4.30E-03	4.15E-03	4.04E-03	4.16E-03	4.56E-03
1000	4.68E-03	4.85E-03	4.70E-03	4.56E-03	4.70E-03	5.14E-03
Instantaneous CTE (1/K) Temperature °C						
100	3.70E-06	3.85E-06	3.87E-06	3.55E-06	3.66E-06	4.09E-06
200	4.07E-06	4.24E-06	4.20E-06	3.94E-06	4.06E-06	4.51E-06
300	4.40E-06	4.57E-06	4.49E-06	4.28E-06	4.40E-06	4.88E-06
400	4.68E-06	4.86E-06	4.73E-06	4.56E-06	4.70E-06	5.18E-06
500	4.91E-06	5.09E-06	4.92E-06	4.80E-06	4.95E-06	5.43E-06
600	5.10E-06	5.28E-06	5.07E-06	4.99E-06	5.14E-06	5.62E-06
700	5.25E-06	5.42E-06	5.18E-06	5.13E-06	5.29E-06	5.75E-06
800	5.35E-06	5.51E-06	5.24E-06	5.22E-06	5.40E-06	5.83E-06
900	5.41E-06	5.55E-06	5.26E-06	5.26E-06	5.45E-06	5.85E-06
1000	5.42E-06	5.54E-06	5.23E-06	5.25E-06	5.45E-06	5.81E-06
Mean CTE (1/K) Temperature °C						
100	3.67E-06	3.89E-06	3.73E-06	3.50E-06	3.63E-06	4.05E-06
200	3.75E-06	3.96E-06	3.84E-06	3.61E-06	3.73E-06	4.12E-06
300	3.90E-06	4.09E-06	4.01E-06	3.76E-06	3.87E-06	4.31E-06
400	4.09E-06	4.28E-06	4.19E-06	3.96E-06	4.08E-06	4.54E-06
500	4.25E-06	4.42E-06	4.34E-06	4.11E-06	4.24E-06	4.70E-06
600	4.38E-06	4.54E-06	4.45E-06	4.24E-06	4.39E-06	4.84E-06
700	4.49E-06	4.67E-06	4.54E-06	4.36E-06	4.49E-06	4.96E-06
800	4.59E-06	4.78E-06	4.61E-06	4.47E-06	4.60E-06	5.07E-06
900	4.69E-06	4.86E-06	4.69E-06	4.56E-06	4.71E-06	5.16E-06
1000	4.76E-06	4.92E-06	4.77E-06	4.62E-06	4.77E-06	5.23E-06

Specimen Number	FW01 02	FW01 03	FW01 04	FW02 01	FW02 03	FW02 04
Measured By	47735	41169	47735	41169	41169	47735
Measured Date	11/20/09 9:50 AM	11/21/09 9:08 AM	11/21/09 9:11 AM	11/22/09 9:46 AM	11/23/09 7:23 AM	7/12/10 8:20 AM
Initial Sample Length (L ₀ , mm)	25.38	25.379	25.379	25.379	25.38	25.381
Linear Thermal Expansion Temperature °C						
100	3.63E-04	3.42E-04	3.72E-04	3.78E-04	3.59E-04	3.61E-04
200	7.96E-04	7.62E-04	8.11E-04	8.27E-04	7.79E-04	8.10E-04
300	1.26E-03	1.22E-03	1.28E-03	1.32E-03	1.24E-03	1.29E-03
400	1.78E-03	1.72E-03	1.79E-03	1.85E-03	1.75E-03	1.82E-03
500	2.31E-03	2.24E-03	2.33E-03	2.40E-03	2.27E-03	2.35E-03
600	2.88E-03	2.79E-03	2.88E-03	2.96E-03	2.81E-03	2.91E-03
700	3.47E-03	3.35E-03	3.46E-03	3.54E-03	3.36E-03	3.48E-03
800	4.04E-03	3.92E-03	4.05E-03	4.12E-03	3.93E-03	4.05E-03
900	4.63E-03	4.51E-03	4.65E-03	4.73E-03	4.50E-03	4.65E-03
1000	5.21E-03	5.12E-03	5.25E-03	5.36E-03	5.11E-03	5.25E-03
Instantaneous CTE (1/K) Temperature °C						
100	4.10E-06	4.06E-06	4.25E-06	4.45E-06	4.14E-06	4.41E-06
200	4.56E-06	4.44E-06	4.61E-06	4.78E-06	4.49E-06	4.73E-06
300	4.95E-06	4.78E-06	4.93E-06	5.07E-06	4.81E-06	5.01E-06
400	5.27E-06	5.08E-06	5.21E-06	5.33E-06	5.08E-06	5.25E-06
500	5.52E-06	5.33E-06	5.45E-06	5.55E-06	5.31E-06	5.46E-06
600	5.71E-06	5.54E-06	5.66E-06	5.73E-06	5.50E-06	5.63E-06
700	5.83E-06	5.71E-06	5.83E-06	5.88E-06	5.64E-06	5.77E-06
800	5.88E-06	5.83E-06	5.96E-06	6.00E-06	5.74E-06	5.87E-06
900	5.86E-06	5.91E-06	6.05E-06	6.07E-06	5.80E-06	5.93E-06
1000	5.78E-06	5.95E-06	6.10E-06	6.12E-06	5.82E-06	5.96E-06
Mean CTE (1/K) Temperature °C						
100	4.29E-06	3.97E-06	4.27E-06	4.38E-06	4.12E-06	4.36E-06
200	4.31E-06	4.09E-06	4.39E-06	4.44E-06	4.16E-06	4.43E-06
300	4.44E-06	4.26E-06	4.49E-06	4.60E-06	4.31E-06	4.58E-06
400	4.62E-06	4.46E-06	4.66E-06	4.79E-06	4.52E-06	4.74E-06
500	4.77E-06	4.62E-06	4.80E-06	4.93E-06	4.67E-06	4.87E-06
600	4.93E-06	4.76E-06	4.94E-06	5.06E-06	4.79E-06	5.00E-06
700	5.07E-06	4.89E-06	5.05E-06	5.16E-06	4.90E-06	5.09E-06
800	5.16E-06	4.99E-06	5.17E-06	5.25E-06	5.00E-06	5.18E-06
900	5.24E-06	5.09E-06	5.26E-06	5.34E-06	5.09E-06	5.26E-06
1000	5.30E-06	5.20E-06	5.34E-06	5.44E-06	5.18E-06	5.35E-06

Specimen Number	FW02 02	FW03 02	FW03 03	FW03 04	FW04 01	FW04 02
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	11/22/09 9:48 AM	3/15/10 5:19 PM	11/24/09 7:33 AM	3/15/10 4:52 PM	11/24/09 4:03 PM	11/24/09 3:49 PM
Initial Sample Length (L ₀ , mm)	25.382	25.38	25.381	25.381	25.381	25.38
Linear Thermal Expansion Temperature °C						
100	3.67E-04	3.43E-04	3.75E-04	3.55E-04	3.40E-04	3.57E-04
200	8.09E-04	7.55E-04	8.07E-04	7.97E-04	7.63E-04	8.02E-04
300	1.27E-03	1.24E-03	1.28E-03	1.27E-03	1.24E-03	1.27E-03
400	1.78E-03	1.77E-03	1.79E-03	1.80E-03	1.76E-03	1.79E-03
500	2.32E-03	2.32E-03	2.32E-03	2.34E-03	2.30E-03	2.33E-03
600	2.89E-03	2.89E-03	2.86E-03	2.90E-03	2.86E-03	2.89E-03
700	3.47E-03	3.48E-03	3.42E-03	3.48E-03	3.44E-03	3.46E-03
800	4.07E-03	4.08E-03	3.99E-03	4.06E-03	4.03E-03	3.99E-03
900	4.67E-03	4.68E-03	4.58E-03	4.66E-03	4.63E-03	4.58E-03
1000	5.28E-03	5.32E-03	5.19E-03	5.26E-03	5.25E-03	5.18E-03
Instantaneous CTE (1/K) Temperature °C						
100	4.20E-06	4.09E-06	4.28E-06	4.30E-06	4.14E-06	4.34E-06
200	4.59E-06	4.58E-06	4.60E-06	4.67E-06	4.57E-06	4.68E-06
300	4.94E-06	5.00E-06	4.88E-06	5.00E-06	4.94E-06	4.98E-06
400	5.25E-06	5.35E-06	5.13E-06	5.28E-06	5.26E-06	5.23E-06
500	5.51E-06	5.63E-06	5.35E-06	5.52E-06	5.52E-06	5.43E-06
600	5.72E-06	5.84E-06	5.54E-06	5.71E-06	5.73E-06	5.58E-06
700	5.89E-06	5.99E-06	5.70E-06	5.85E-06	5.88E-06	5.68E-06
800	6.01E-06	6.06E-06	5.82E-06	5.94E-06	5.97E-06	5.74E-06
900	6.09E-06	6.07E-06	5.91E-06	5.99E-06	6.00E-06	5.75E-06
1000	6.12E-06	6.01E-06	5.97E-06	5.99E-06	5.98E-06	5.71E-06
Mean CTE (1/K) Temperature °C						
100	4.36E-06	4.03E-06	4.29E-06	4.28E-06	4.04E-06	4.34E-06
200	4.39E-06	4.12E-06	4.31E-06	4.36E-06	4.15E-06	4.40E-06
300	4.48E-06	4.37E-06	4.44E-06	4.50E-06	4.35E-06	4.50E-06
400	4.65E-06	4.62E-06	4.62E-06	4.70E-06	4.58E-06	4.69E-06
500	4.80E-06	4.81E-06	4.76E-06	4.85E-06	4.76E-06	4.83E-06
600	4.95E-06	4.96E-06	4.88E-06	4.98E-06	4.91E-06	4.97E-06
700	5.08E-06	5.09E-06	4.98E-06	5.09E-06	5.04E-06	5.08E-06
800	5.19E-06	5.21E-06	5.07E-06	5.19E-06	5.14E-06	5.10E-06
900	5.29E-06	5.31E-06	5.17E-06	5.29E-06	5.24E-06	5.20E-06
1000	5.36E-06	5.41E-06	5.26E-06	5.36E-06	5.34E-06	5.28E-06

Specimen Number	FW04 03	FW04 04	FW05 01	FW05 02	FW05 03	FW05 04
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	5/23/10 8:57 AM	11/30/09 8:10 AM	11/30/09 8:15 AM	4/27/10 7:20 AM	11/30/09 4:27 PM	12/1/09 4:24 PM
Initial Sample Length (L ₀ , mm)	25.381	25.381	25.381	25.38	25.381	25.381
Linear Thermal Expansion Temperature °C						
100	3.64E-04	3.56E-04	3.82E-04	3.55E-04	3.39E-04	3.60E-04
200	8.12E-04	7.93E-04	8.30E-04	7.97E-04	7.67E-04	8.10E-04
300	1.30E-03	1.26E-03	1.32E-03	1.28E-03	1.23E-03	1.30E-03
400	1.82E-03	1.78E-03	1.85E-03	1.80E-03	1.73E-03	1.85E-03
500	2.36E-03	2.31E-03	2.40E-03	2.35E-03	2.25E-03	2.41E-03
600	2.91E-03	2.86E-03	2.96E-03	2.91E-03	2.79E-03	2.99E-03
700	3.48E-03	3.43E-03	3.54E-03	3.48E-03	3.34E-03	3.58E-03
800	4.07E-03	4.01E-03	4.12E-03	4.07E-03	3.89E-03	4.19E-03
900	4.66E-03	4.60E-03	4.72E-03	4.68E-03	4.47E-03	4.81E-03
1000	5.25E-03	5.19E-03	5.35E-03	5.28E-03	5.03E-03	5.47E-03
Instantaneous CTE (1/K) Temperature °C						
100	4.41E-06	4.22E-06	4.43E-06	4.32E-06	4.14E-06	4.44E-06
200	4.74E-06	4.59E-06	4.77E-06	4.69E-06	4.50E-06	4.82E-06
300	5.02E-06	4.92E-06	5.07E-06	5.01E-06	4.81E-06	5.15E-06
400	5.27E-06	5.20E-06	5.33E-06	5.29E-06	5.07E-06	5.44E-06
500	5.48E-06	5.43E-06	5.55E-06	5.53E-06	5.29E-06	5.69E-06
600	5.64E-06	5.62E-06	5.73E-06	5.72E-06	5.46E-06	5.90E-06
700	5.77E-06	5.76E-06	5.87E-06	5.86E-06	5.58E-06	6.07E-06
800	5.87E-06	5.85E-06	5.98E-06	5.96E-06	5.66E-06	6.19E-06
900	5.92E-06	5.90E-06	6.04E-06	6.02E-06	5.69E-06	6.27E-06
1000	5.93E-06	5.90E-06	6.07E-06	6.03E-06	5.67E-06	6.31E-06
Mean CTE (1/K) Temperature °C						
100	4.28E-06	4.19E-06	4.42E-06	4.22E-06	4.10E-06	4.29E-06
200	4.39E-06	4.29E-06	4.46E-06	4.33E-06	4.20E-06	4.40E-06
300	4.55E-06	4.43E-06	4.61E-06	4.50E-06	4.33E-06	4.60E-06
400	4.74E-06	4.62E-06	4.79E-06	4.70E-06	4.51E-06	4.82E-06
500	4.88E-06	4.76E-06	4.93E-06	4.85E-06	4.65E-06	4.98E-06
600	4.99E-06	4.90E-06	5.05E-06	4.98E-06	4.78E-06	5.12E-06
700	5.08E-06	5.01E-06	5.16E-06	5.09E-06	4.89E-06	5.24E-06
800	5.18E-06	5.11E-06	5.25E-06	5.20E-06	4.98E-06	5.35E-06
900	5.27E-06	5.20E-06	5.34E-06	5.30E-06	5.06E-06	5.45E-06
1000	5.33E-06	5.27E-06	5.43E-06	5.37E-06	5.12E-06	5.57E-06

Specimen Number	FW06 01	FW06 02	FW06 03	FW06 04	FW07 01	FW07 02
Measured By	41169	47735	47735	47735	47735	47735
Measured Date	11/17/09 7:47 AM	11/17/09 7:49 AM	12/1/09 7:48 AM	4/28/10 7:41 AM	12/2/09 7:54 AM	12/2/09 7:55 AM
Initial Sample Length (L ₀ , mm)	25.381	25.38	25.381	25.381	25.382	25.382
Linear Thermal Expansion Temperature °C						
100	3.59E-04	3.61E-04	3.67E-04	3.60E-04	3.64E-04	3.62E-04
200	7.77E-04	8.00E-04	8.07E-04	8.03E-04	7.92E-04	8.10E-04
300	1.23E-03	1.28E-03	1.27E-03	1.29E-03	1.26E-03	1.29E-03
400	1.73E-03	1.80E-03	1.79E-03	1.82E-03	1.78E-03	1.81E-03
500	2.26E-03	2.35E-03	2.33E-03	2.39E-03	2.32E-03	2.35E-03
600	2.79E-03	2.89E-03	2.89E-03	2.97E-03	2.88E-03	2.91E-03
700	3.35E-03	3.48E-03	3.46E-03	3.59E-03	3.44E-03	3.49E-03
800	3.91E-03	4.07E-03	4.05E-03	4.22E-03	4.02E-03	4.08E-03
900	4.49E-03	4.68E-03	4.64E-03	4.89E-03	4.60E-03	4.67E-03
1000	5.09E-03	5.28E-03	5.22E-03	5.50E-03	5.17E-03	5.26E-03
Instantaneous CTE (1/K) Temperature °C						
100	4.08E-06	4.30E-06	4.21E-06	4.21E-06	4.16E-06	4.29E-06
200	4.45E-06	4.67E-06	4.61E-06	4.68E-06	4.59E-06	4.67E-06
300	4.78E-06	4.99E-06	4.96E-06	5.10E-06	4.95E-06	5.01E-06
400	5.06E-06	5.27E-06	5.25E-06	5.47E-06	5.24E-06	5.29E-06
500	5.29E-06	5.51E-06	5.49E-06	5.79E-06	5.48E-06	5.52E-06
600	5.49E-06	5.71E-06	5.67E-06	6.06E-06	5.64E-06	5.70E-06
700	5.64E-06	5.87E-06	5.80E-06	6.28E-06	5.75E-06	5.84E-06
800	5.74E-06	5.98E-06	5.87E-06	6.44E-06	5.78E-06	5.93E-06
900	5.80E-06	6.05E-06	5.89E-06	6.56E-06	5.76E-06	5.97E-06
1000	5.82E-06	6.08E-06	5.85E-06	6.62E-06	5.67E-06	5.96E-06
Mean CTE (1/K) Temperature °C						
100	4.11E-06	4.31E-06	4.32E-06	4.23E-06	4.21E-06	4.30E-06
200	4.15E-06	4.35E-06	4.36E-06	4.34E-06	4.25E-06	4.40E-06
300	4.29E-06	4.50E-06	4.47E-06	4.52E-06	4.41E-06	4.53E-06
400	4.48E-06	4.70E-06	4.66E-06	4.72E-06	4.62E-06	4.70E-06
500	4.64E-06	4.85E-06	4.81E-06	4.93E-06	4.78E-06	4.85E-06
600	4.76E-06	4.96E-06	4.94E-06	5.08E-06	4.91E-06	4.98E-06
700	4.88E-06	5.09E-06	5.06E-06	5.24E-06	5.02E-06	5.10E-06
800	4.98E-06	5.20E-06	5.16E-06	5.39E-06	5.12E-06	5.20E-06
900	5.07E-06	5.30E-06	5.25E-06	5.50E-06	5.20E-06	5.29E-06
1000	5.16E-06	5.37E-06	5.30E-06	5.59E-06	5.25E-06	5.35E-06

Specimen Number	FW07 03	FW07 04	FW08 01	FW08 02	FW08 03	FW08 04
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	5/24/10 4:01 PM	12/2/09 3:58 PM	8/12/10 3:30 PM	12/3/09 7:48 AM	12/8/09 7:45 AM	12/7/09 4:52 PM
Initial Sample Length (L ₀ , mm)	25.381	25.382	25.382	25.382	25.382	25.382
Linear Thermal Expansion Temperature °C						
100	3.54E-04	3.57E-04	3.77E-04	3.83E-04	3.57E-04	3.48E-04
200	8.03E-04	8.02E-04	8.21E-04	8.42E-04	7.78E-04	7.77E-04
300	1.29E-03	1.27E-03	1.30E-03	1.33E-03	1.25E-03	1.23E-03
400	1.83E-03	1.79E-03	1.82E-03	1.87E-03	1.77E-03	1.74E-03
500	2.37E-03	2.33E-03	2.38E-03	2.43E-03	2.31E-03	2.26E-03
600	2.94E-03	2.89E-03	2.94E-03	3.01E-03	2.87E-03	2.80E-03
700	3.52E-03	3.46E-03	3.52E-03	3.60E-03	3.45E-03	3.37E-03
800	4.12E-03	4.05E-03	4.11E-03	4.20E-03	4.02E-03	3.94E-03
900	4.73E-03	4.64E-03	4.70E-03	4.81E-03	4.58E-03	4.53E-03
1000	5.33E-03	5.22E-03	5.29E-03	5.40E-03	5.20E-03	5.11E-03
Instantaneous CTE (1/K) Temperature °C						
100	4.39E-06	4.27E-06	4.29E-06	4.42E-06	4.06E-06	4.14E-06
200	4.76E-06	4.65E-06	4.70E-06	4.82E-06	4.54E-06	4.51E-06
300	5.09E-06	4.98E-06	5.05E-06	5.17E-06	4.94E-06	4.83E-06
400	5.37E-06	5.26E-06	5.34E-06	5.46E-06	5.27E-06	5.11E-06
500	5.60E-06	5.49E-06	5.57E-06	5.69E-06	5.51E-06	5.34E-06
600	5.78E-06	5.67E-06	5.75E-06	5.86E-06	5.68E-06	5.54E-06
700	5.92E-06	5.80E-06	5.86E-06	5.98E-06	5.78E-06	5.69E-06
800	6.01E-06	5.88E-06	5.92E-06	6.03E-06	5.79E-06	5.79E-06
900	6.05E-06	5.91E-06	5.92E-06	6.03E-06	5.74E-06	5.85E-06
1000	6.05E-06	5.89E-06	5.87E-06	5.97E-06	5.60E-06	5.87E-06
Mean CTE (1/K) Temperature °C						
100	4.30E-06	4.35E-06	4.44E-06	4.48E-06	4.17E-06	4.22E-06
200	4.40E-06	4.40E-06	4.46E-06	4.54E-06	4.20E-06	4.26E-06
300	4.57E-06	4.52E-06	4.57E-06	4.68E-06	4.37E-06	4.37E-06
400	4.78E-06	4.69E-06	4.75E-06	4.86E-06	4.59E-06	4.55E-06
500	4.93E-06	4.83E-06	4.91E-06	5.01E-06	4.76E-06	4.69E-06
600	5.05E-06	4.96E-06	5.04E-06	5.14E-06	4.91E-06	4.82E-06
700	5.16E-06	5.08E-06	5.15E-06	5.26E-06	5.04E-06	4.94E-06
800	5.27E-06	5.18E-06	5.24E-06	5.36E-06	5.12E-06	5.04E-06
900	5.36E-06	5.26E-06	5.32E-06	5.43E-06	5.18E-06	5.13E-06
1000	5.42E-06	5.32E-06	5.38E-06	5.49E-06	5.28E-06	5.20E-06

Specimen Number	FW09 01	FW09 02	FW09 03	FW09 04	FW10 01	FW10 02
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	12/8/09 7:51 AM	12/9/09 7:43 AM	12/9/09 3:33 PM	12/9/09 2:18 PM	12/10/09 7:53 AM	12/10/09 7:54 AM
Initial Sample Length (L ₀ , mm)	25.383	25.381	25.382	25.383	25.382	25.381
Linear Thermal Expansion						
Temperature °C						
100	3.52E-04	3.66E-04	3.35E-04	3.47E-04	3.80E-04	3.69E-04
200	7.62E-04	8.00E-04	7.84E-04	7.86E-04	8.03E-04	8.20E-04
300	1.23E-03	1.28E-03	1.27E-03	1.25E-03	1.27E-03	1.30E-03
400	1.75E-03	1.80E-03	1.81E-03	1.77E-03	1.78E-03	1.83E-03
500	2.29E-03	2.34E-03	2.37E-03	2.31E-03	2.31E-03	2.37E-03
600	2.86E-03	2.90E-03	2.96E-03	2.86E-03	2.86E-03	2.93E-03
700	3.43E-03	3.47E-03	3.56E-03	3.44E-03	3.43E-03	3.51E-03
800	4.03E-03	4.06E-03	4.15E-03	4.02E-03	4.01E-03	4.09E-03
900	4.63E-03	4.67E-03	4.73E-03	4.62E-03	4.60E-03	4.68E-03
1000	5.23E-03	5.31E-03	5.34E-03	5.21E-03	5.22E-03	5.26E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	4.03E-06	4.29E-06	4.29E-06	4.22E-06	4.15E-06	4.35E-06
200	4.51E-06	4.64E-06	4.78E-06	4.61E-06	4.53E-06	4.73E-06
300	4.92E-06	4.96E-06	5.18E-06	4.95E-06	4.87E-06	5.05E-06
400	5.26E-06	5.24E-06	5.50E-06	5.24E-06	5.16E-06	5.32E-06
500	5.54E-06	5.49E-06	5.74E-06	5.48E-06	5.41E-06	5.54E-06
600	5.75E-06	5.70E-06	5.90E-06	5.67E-06	5.62E-06	5.70E-06
700	5.90E-06	5.87E-06	5.97E-06	5.81E-06	5.78E-06	5.80E-06
800	5.98E-06	6.01E-06	5.97E-06	5.90E-06	5.89E-06	5.85E-06
900	6.00E-06	6.11E-06	5.88E-06	5.94E-06	5.97E-06	5.85E-06
1000	5.95E-06	6.17E-06	5.71E-06	5.93E-06	6.00E-06	5.79E-06
Mean CTE (1/K)						
Temperature °C						
100	4.10E-06	4.24E-06	4.46E-06	4.22E-06	4.24E-06	4.33E-06
200	4.13E-06	4.30E-06	4.49E-06	4.31E-06	4.26E-06	4.43E-06
300	4.32E-06	4.46E-06	4.63E-06	4.44E-06	4.39E-06	4.56E-06
400	4.56E-06	4.66E-06	4.83E-06	4.64E-06	4.58E-06	4.75E-06
500	4.74E-06	4.82E-06	5.00E-06	4.80E-06	4.73E-06	4.89E-06
600	4.89E-06	4.95E-06	5.15E-06	4.92E-06	4.87E-06	5.02E-06
700	5.02E-06	5.07E-06	5.27E-06	5.04E-06	5.00E-06	5.12E-06
800	5.14E-06	5.17E-06	5.36E-06	5.15E-06	5.09E-06	5.22E-06
900	5.24E-06	5.27E-06	5.41E-06	5.24E-06	5.18E-06	5.29E-06
1000	5.32E-06	5.39E-06	5.48E-06	5.30E-06	5.29E-06	5.34E-06

Specimen Number	FA8 02	FW03 01	FA6 02
Measured By	47735	47735	47735
Measured Date	5/21/10 10:05 AM	3/19/10 1:39 PM	6/10/10 2:38 PM
Initial Sample Length (L ₀ , mm)	25.386	25.381	25.384
Linear Thermal Expansion Temperature °C			
100	3.05E-04	3.69E-04	2.96E-04
200	6.71E-04	8.09E-04	6.83E-04
300	1.08E-03	1.29E-03	1.12E-03
400	1.53E-03	1.82E-03	1.61E-03
500	2.01E-03	2.37E-03	2.12E-03
600	2.50E-03	2.94E-03	2.64E-03
700	3.01E-03	3.52E-03	3.16E-03
800	3.53E-03	4.12E-03	3.69E-03
900	4.07E-03	4.72E-03	4.23E-03
1000	4.59E-03	5.35E-03	4.76E-03
Instantaneous CTE (1/K) Temperature °C			
100	3.55E-06	4.30E-06	3.76E-06
200	3.95E-06	4.69E-06	4.22E-06
300	4.30E-06	5.04E-06	4.60E-06
400	4.60E-06	5.34E-06	4.91E-06
500	4.84E-06	5.58E-06	5.13E-06
600	5.04E-06	5.79E-06	5.28E-06
700	5.18E-06	5.94E-06	5.35E-06
800	5.27E-06	6.04E-06	5.34E-06
900	5.31E-06	6.10E-06	5.26E-06
1000	5.30E-06	6.11E-06	5.09E-06
Mean CTE (1/K) Temperature °C			
100	3.52E-06	4.31E-06	3.49E-06
200	3.60E-06	4.36E-06	3.70E-06
300	3.77E-06	4.52E-06	3.95E-06
400	3.98E-06	4.72E-06	4.19E-06
500	4.14E-06	4.88E-06	4.38E-06
600	4.27E-06	5.02E-06	4.52E-06
700	4.39E-06	5.14E-06	4.62E-06
800	4.50E-06	5.25E-06	4.71E-06
900	4.59E-06	5.34E-06	4.79E-06
1000	4.66E-06	5.44E-06	4.84E-06

Specimen number	FW06 01	FA6 01	FA6 02	FA7 01
Specimen group standard deviation	5.14E+08			
Environmental Conditions				
Temperature (°C)	22.3	22.4	22.6	22.9
Barometric Pressure (in of Hg)	24.8	25.2	25.2	25.5
Humidity (%)	15.5	15.3	15.4	19.2
Sampling Plan Layout Instrument ASTM	100% sampling Grindosonic MK5i C 747 - 93 Reapproved 2005 Using Equation 5 & 6 in ASTM C 1259 - 08			
Comments:				

Specimen number	FA7 02	FA8 01	FA8 02	FW01 01	FW01 02
Date and Time	1/14/2010 15:08	1/14/2010 15:14	1/14/2010 15:20	1/18/2010 9:05	1/18/2010 9:09
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.7673	5.7854	5.7740	5.7485	5.7858
length of specimen (mm)	25.38400	25.38575	25.38575	25.35325	25.37975
diameter of specimen (mm)	12.73150	12.73050	12.73200	12.72400	12.72475
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	29862 29950 29853 29871 29933 29920 29911 29883 29870 29872	29763 29715 29712 29731 29772 29696 29748 29741 29751 29762	29873 29802 29819 29798 29808 29820 29824 29821 29871 29810	28272 28246 28292 28229 28241 28260 28210 28273 28208 28296	27696 27737 27670 27697 27711 27669 27692 27705 27689 27683
average resonant frequency (Hz)	29893	29739	29825	28253	27695
standard deviation (Hz)	33	25	26	31	20
correction factor for rod	2.112343903	2.112043455	2.112283462	2.113613615	2.111604817
modulus of elasticity (Pa)	1.09E+10	1.08E+10	1.09E+10	9.69E+09	9.39E+09
T ₁ correction factor	2.286005669	2.285626386	2.285929368	2.28760868	2.285072678
calculation of individual terms	0.030900449 0.324781805 2.274998665	0.030882224 0.324590257 2.274622629	0.030896782 0.324743266 2.274923017	0.030977532 0.325591993 2.276587955	0.030855629 0.324310721 2.274073659
resultant T ₁	2.112343903	2.112043455	2.112283462	2.113613615	2.111604817
modulus of elasticity (Pa)	1.09E+10	1.08E+10	1.09E+10	9.69E+09	9.39E+09
Average Modulus for specimen group					

Specimen number	FA7 02	FA8 01	FA8 02	FW01 01	FW01 02
Specimen group standard deviation					
Environmental Conditions					
Temperature (°C)	22.9	22.9	22.9	22.1	22.2
Barometric Pressure (in of Hg)	25.5	25.5	25.5	25.1	25.1
Humidity (%)	19.2	19.1	19.1	16.1	16.1
Sampling Plan Layout Instrument ASTM					
Comments:					

Specimen number	FW01 03	FW01 04	FW02 01	FW02 02	FW02 03
Date and Time	1/18/2010 9:12	1/18/2010 9:20	1/18/2010 11:04	1/18/2010 11:11	1/18/2010 11:22
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.7522	5.7595	5.7654	5.7745	5.7426
length of specimen (mm)	25.37900	25.37900	25.38175	25.37900	25.38000
diameter of specimen (mm)	12.72388	12.72638	12.72563	12.72625	12.72363
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28240 28251 28235 28216 28196 28221 28190 28224 28200 28219	27542 27532 27567 27573 27524 27592 27513 27570 27545 27496	27794 27756 27749 27777 27745 27744 27733 27720 27720 27739	27678 27721 27680 27669 27657 27684 27693 27692 27669 27651	28251 28239 28249 28232 28244 28235 28267 28227 28215 28224
average resonant frequency (Hz)	28219	27545	27748	27679	28238
standard deviation (Hz)	20	30	23	20	15
correction factor for rod	2.111524976	2.111925029	2.111584378	2.111905024	2.11140476
modulus of elasticity (Pa)	9.69E+09	9.24E+09	9.39E+09	9.36E+09	9.69E+09
T ₁ correction factor	2.284971895	2.28547689	2.285046877	2.285451637	2.284820148
calculation of individual terms	0.030850789 0.324259854 2.273973739	0.030875043 0.324514773 2.274474412	0.03085439 0.324297698 2.27404808	0.03087383 0.324502023 2.274449376	0.030843503 0.324183273 2.273823291
resultant T ₁	2.111524976	2.111925029	2.111584378	2.111905024	2.11140476
modulus of elasticity (Pa)	9.69E+09	9.24E+09	9.39E+09	9.36E+09	9.69E+09
Average Modulus for specimen group					

Specimen number	FW01 03	FW01 04	FW02 01	FW02 02	FW02 03
Specimen group standard deviation					
Environmental Conditions					
Temperature (°C)	22.2	22.1	22.3	22.3	22.3
Barometric Pressure (in of Hg)	25.1	25.1	25	25	25
Humidity (%)	16.2	16.2	18.3	18.3	18.4
Sampling Plan Layout Instrument ASTM					
Comments:					

Specimen number	FW02 04	FW03 01	FW03 02	FW03 03	FW03 04
Date and Time	1/18/2010 12:27	1/18/2010 12:34	1/18/2010 12:41	1/18/2010 12:45	1/18/2010 12:52
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.7215	5.7540	5.7727	5.7467	5.7092
length of specimen (mm)	25.38050	25.38100	25.37950	25.38050	25.38125
diameter of specimen (mm)	12.72738	12.72550	12.72363	12.72600	12.72225
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	27379 27300 27352 27343 27344 27329 27310 27311 27302 27300	28093 28105 28104 28085 28088 28062 28053 28067 28043 28039	27585 27586 27588 27580 27571 27555 27560 27623 27637 27621	27995 28013 28024 28036 28014 28008 28002 28005 28011 27990	27505 27578 27540 27582 27531 27548 27534 27514 27522 27527
average resonant frequency (Hz)	27327	28074	27591	28010	27538
standard deviation (Hz)	27	24	28	13	25
correction factor for rod	2.111964686	2.111624542	2.111444866	2.111744659	2.11108454
modulus of elasticity (Pa)	9.03E+09	9.59E+09	9.30E+09	9.54E+09	9.17E+09
T ₁ correction factor	2.285526951	2.285097577	2.284870773	2.285249203	2.284415949
calculation of individual terms	0.030877447 0.324540049 2.274524045	0.030856824 0.324323288 2.274098346	0.030845934 0.32420882 2.273873483	0.030864106 0.324399825 2.274248674	0.0308241 0.323979331 2.273422552
resultant T ₁	2.111964686	2.111624542	2.111444866	2.111744659	2.11108454
modulus of elasticity (Pa)	9.03E+09	9.59E+09	9.30E+09	9.54E+09	9.17E+09
Average Modulus for specimen group					

Specimen number	FW02 04	FW03 01	FW03 02	FW03 03	FW03 04
Specimen group standard deviation					
Environmental Conditions					
Temperature (°C)	22.1	22.2	22.3	22.4	22.4
Barometric Pressure (in of Hg)	25	25	25	25	25
Humidity (%)	19.7	19.5	19.6	19.5	19.5
Sampling Plan Layout Instrument ASTM					
Comments:					

Specimen number	FW04 01	FW04 02	FW04 03	FW04 04	FW05 01
Date and Time	1/18/2010 13:32	1/18/2010 13:37	1/18/2010 14:04	1/19/2010 8:36	1/19/2010 9:30
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.7381	5.7696	5.7433	5.7442	5.7720
length of specimen (mm)	25.38150	25.38000	25.38075	25.38025	25.38125
diameter of specimen (mm)	12.72525	12.72238	12.72575	12.72763	12.72975
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	27441 27470 27416 27422 27447 27501 27539 27482 27563 27566	27673 27669 27659 27692 27673 27657 27673 27679 27669 27697	27729 27725 27729 27713 27712 27707 27749 27744 27700 27743	28008 28027 28028 28027 28013 28031 28038 28023 28033 28023	27766 27764 27783 27789 27798 27789 27779 27782 27795 27796
average resonant frequency (Hz)	27485	27674	27725	28025	27784
standard deviation (Hz)	56	13	17	9	12
correction factor for rod	2.111544434	2.111204774	2.1116846	2.112024755	2.112284572
modulus of elasticity (Pa)	9.17E+09	9.35E+09	9.34E+09	9.54E+09	9.42E+09
T ₁ correction factor	2.284996456	2.284567713	2.285173388	2.285602781	2.285930769
calculation of individual terms	0.030851968 0.32427225 2.27399809	0.030831384 0.324055897 2.273573017	0.030860465 0.324361555 2.274173508	0.03088109 0.324578337 2.274599225	0.030896849 0.324743974 2.274924406
resultant T ₁	2.111544434	2.111204774	2.1116846	2.112024755	2.112284572
modulus of elasticity (Pa)	9.17E+09	9.35E+09	9.34E+09	9.54E+09	9.42E+09
Average Modulus for specimen group					

Specimen number	FW04 01	FW04 02	FW04 03	FW04 04	FW05 01
Specimen group standard deviation					
Environmental Conditions					
Temperature (°C)	22.7	22.7	22.6	22	22.2
Barometric Pressure (in of Hg)	25	25	25	24.8	24.8
Humidity (%)	19.5	19.6	20	22	22
Sampling Plan Layout Instrument ASTM					
Comments:					

Specimen number	FW05 02	FW05 03	FW06 03	FW06 02	FW06 04
Date and Time	1/19/2010 10:26	2/5/2010 9:54	1/19/2010 14:51	1/20/2010 14:21	1/20/2010 14:29
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.7971	5.7773	5.7581	5.7673	5.7651
length of specimen (mm)	25.37975	25.38150	25.38125	25.38025	25.38150
diameter of specimen (mm)	12.72963	12.73125	12.73138	12.72888	12.73288
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	27889 27858 27885 27900 27900 27863 27885 27888 27868 27841	28015 28015 28021 28006 28027 28012 28011 28006 28018 28017	27968 27997 27978 27967 27966 27927 27933 27915 27970 27906	27315 27304 27328 27324 27320 27292 27298 27294 27313 27286	27845 27847 27840 27840 27839 27843 27833 27840 27837 27844
average resonant frequency (Hz)	27878	28015	27953	27307	27841
standard deviation (Hz)	19	6	30	15	4
correction factor for rod	2.112384976	2.112504574	2.112544651	2.112224802	2.112764671
modulus of elasticity (Pa)	9.52E+09	9.58E+09	9.50E+09	9.09E+09	9.44E+09
T ₁ correction factor	2.286057519	2.286208502	2.286259098	2.285855315	2.286536863
calculation of individual terms	0.03090294 0.324807995 2.275050071	0.030910197 0.324884265 2.275199762	0.030912629 0.324909825 2.275249925	0.030893224 0.324705866 2.274849598	0.030925981 0.325050168 2.275525313
resultant T ₁	2.112384976	2.112504574	2.112544651	2.112224802	2.112764671
modulus of elasticity (Pa)	9.52E+09	9.58E+09	9.50E+09	9.09E+09	9.44E+09
Average Modulus for specimen group					

Specimen number	FW05 02	FW05 03	FW06 03	FW06 02	FW06 04
Specimen group standard deviation					
Environmental Conditions					
Temperature (°C)	22.3	22.3	23	23.2	23.1
Barometric Pressure (in of Hg)	24.9	25.2	24.8	24.8	24.8
Humidity (%)	21.1	16.6	18.9	19.4	19.3
Sampling Plan Layout Instrument ASTM					
Comments:					

Specimen number	FW07 01	FW07 03	FW07 04	FW08 01	FW08 02
Date and Time	1/20/2010 14:49	1/20/2010 14:53	1/20/2010 14:56	1/21/2010 8:27	1/21/2010 8:37
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.7677	5.7753	5.7250	5.7605	5.7497
length of specimen (mm)	25.38225	25.38125	25.38175	25.38175	25.38200
diameter of specimen (mm)	12.73150	12.73263	12.73500	12.73250	12.73163
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28041 28057 28046 28078 28053 28080 28015 28011 28073 28060	27752 27735 27757 27760 27755 27770 27745 27737 27719 27726	27370 27362 27390 27415 27367 27376 27388 27387 27372 27388	27706 27676 27682 27687 27678 27669 27627 27652 27649 27643	27177 27199 27204 27209 27189 27186 27193 27187 27183 27177
average resonant frequency (Hz)	28051	27746	27382	27667	27190
standard deviation (Hz)	24	16	15	24	11
correction factor for rod	2.112484376	2.112744729	2.113084757	2.112684573	2.112524452
modulus of elasticity (Pa)	9.59E+09	9.39E+09	9.06E+09	9.31E+09	8.98E+09
T ₁ correction factor	2.286183004	2.286511687	2.286940969	2.286435742	2.286233598
calculation of individual terms	0.030908971 0.324871384 2.275174483	0.030924771 0.325037446 2.275500352	0.030945412 0.325254399 2.27592596	0.03092112 0.324999072 2.275425057	0.030911403 0.324896942 2.275224643
resultant T ₁	2.112484376	2.112744729	2.113084757	2.112684573	2.112524452
modulus of elasticity (Pa)	9.59E+09	9.39E+09	9.06E+09	9.31E+09	8.98E+09
Average Modulus for specimen group					

Specimen number	FW07 01	FW07 03	FW07 04	FW08 01	FW08 02
Specimen group standard deviation					
Environmental Conditions					
Temperature (°C)	23.2	23.2	23.2	22.8	22.7
Barometric Pressure (in of Hg)	24.8	24.8	24.8	24.7	24.7
Humidity (%)	19.2	19.2	19.2	18.6	18.7
Sampling Plan Layout Instrument ASTM					
Comments:					

Specimen number	FW08 03	FW08 04	FW09 01	FW09 02	FW09 03
Date and Time	1/21/2010 8:43	1/21/2010 8:45	1/21/2010 9:28	1/21/2010 9:48	1/21/2010 9:59
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.7891	5.7487	5.7400	5.7421	5.7574
length of specimen (mm)	25.38200	25.38225	25.38250	25.38050	25.38175
diameter of specimen (mm)	12.73288	12.73150	12.73313	12.73275	12.730875
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	27963 27998 27948 27995 27961 27955 27913 27932 27926 27916	28087 28111 28096 28097 28096 28113 28131 28122 28081 28115	27538 27595 27575 27575 27557 27552 27598 27597 27589 27539	27271 27236 27243 27267 27217 27250 27225 27254 27247 27298	27211 27257 27238 27218 27208 27215 27214 27201 27207 27201
average resonant frequency (Hz)	27951	28105	27572	27251	27217
standard deviation (Hz)	30	16	24	24	18
correction factor for rod	2.112724523	2.112484376	2.112724391	2.112824966	2.112424485
modulus of elasticity (Pa)	9.55E+09	9.59E+09	9.21E+09	9.00E+09	9.01E+09
T ₁ correction factor	2.286486177	2.286183004	2.28648601	2.286612983	2.286107397
calculation of individual terms	0.030923544 0.325024556 2.27547506	0.030908971 0.324871384 2.275174483	0.030923536 0.325024471 2.275474895	0.030929641 0.325088633 2.275600781	0.030905338 0.32483319 2.275099522
resultant T ₁	2.112724523	2.112484376	2.112724391	2.112824966	2.112424485
modulus of elasticity (Pa)	9.55E+09	9.59E+09	9.21E+09	9.00E+09	9.01E+09
Average Modulus for specimen group					

Specimen number	FW08 03	FW08 04	FW09 01	FW09 02	FW09 03
Specimen group standard deviation					
Environmental Conditions					
Temperature (°C)	22.7	22.7	22.7	22.7	22.7
Barometric Pressure (in of Hg)	24.7	24.7	24.7	24.7	24.7
Humidity (%)	18.7	18.7	18.6	18.8	18.8
Sampling Plan Layout Instrument ASTM					
Comments:					

Specimen number	FW09 04	FW10 01	FA5 02	FW05 04
Date and Time	1/21/2010 12:06	1/21/2010 12:10	2/8/2010 9:23	2/8/2010 9:33
Operator	41169	41169	41169	41169
Sample location				
mass of specimen (g)	5.75413	5.7754	5.75818	5.73825
length of specimen (mm)	25.3825	25.38175	25.38375	25.3805
diameter of specimen (mm)	12.731875	12.731625	12.732125	12.732875
Poisson's ratio	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28119 28056 28092 28106 28077 28086 28047 28084 28036 28058	28139 28138 28135 28134 28112 28122 28143 28116 28105 28114	29352 29353 29373 29375 29367 29357 29351 29357 29350 29355	27466 27482 27471 27486 27503 27488 27475 27475 27477 27472
average resonant frequency (Hz)	28076	28126	29359	27480
standard deviation (Hz)	27	14	9	11
correction factor for rod	2.112524324	2.112544523	2.11246399	2.112844975
modulus of elasticity (Pa)	9.58E+09	9.65E+09	1.05E+10	9.15E+09
T ₁ correction factor	2.286233436	2.286258935	2.286157268	2.286638245
calculation of individual terms	0.030911395 0.324896861 2.275224483	0.030912621 0.324909743 2.275249764	0.030907734 0.324858383 2.275148967	0.030930856 0.325101399 2.275625827
resultant T ₁	2.112524324	2.112544523	2.11246399	2.112844975
modulus of elasticity (Pa)	9.58E+09	9.65E+09	1.05E+10	9.15E+09
Average Modulus for specimen group				

Specimen number	FW09 04	FW10 01	FA5 02	FW05 04
Specimen group standard deviation				
Environmental Conditions				
Temperature (°C)	22.8	22.8	21.8	21.8
Barometric Pressure (in of Hg)	24.7	24.7	25.2	25.2
Humidity (%)	19.3	19.3	6.5	6.6
Sampling Plan Layout Instrument ASTM				
Comments:				

Specimen ID Number	Operator S#	Test Date	Initial Specimen Mass (g)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Average Resonant Frequency (Hz)
FW06 01	41169	1/20/2010 8:29	5.74722	25.3815	12.729875	28408.4
FA6 01	41169	1/13/2010 14:10	5.77092	25.38425	12.730125	29195.8
FA6 02	41169	1/13/2010 14:40	5.75004	25.3845	12.731	29666.6
FA7 01	41169	1/14/2010 15:04	5.77373	25.3855	12.731625	29166.4
FA7 02	41169	1/14/2010 15:08	5.76725	25.384	12.7315	29892.5
FA8 01	41169	1/14/2010 15:14	5.78535	25.38575	12.7305	29739.1
FA8 02	41169	1/14/2010 15:20	5.77398	25.38575	12.732	29824.6
FW01 01	41169	1/18/2010 9:05	5.74853	25.35325	12.724	28252.7
FW01 02	41169	1/18/2010 9:09	5.78583	25.37975	12.72475	27694.9
FW01 03	41169	1/18/2010 9:12	5.75217	25.379	12.723875	28219.2
FW01 04	41169	1/18/2010 9:20	5.75953	25.379	12.726375	27545.4
FW02 01	41169	1/18/2010 11:04	5.76543	25.38175	12.725625	27747.7
FW02 02	41169	1/18/2010 11:11	5.77451	25.379	12.72625	27679.4
FW02 03	41169	1/18/2010 11:22	5.74257	25.38	12.723625	28238.3
FW02 04	41169	1/18/2010 12:27	5.72145	25.3805	12.727375	27327
FW03 01	41169	1/18/2010 12:34	5.754	25.381	12.7255	28073.9
FW03 02	41169	1/18/2010 12:41	5.77274	25.3795	12.723625	27590.6
FW03 03	41169	1/18/2010 12:45	5.74669	25.3805	12.726	28009.8
FW03 04	41169	1/18/2010 12:52	5.70917	25.38125	12.72225	27538.1
FW04 01	41169	1/18/2010 13:32	5.73809	25.3815	12.72525	27484.7
FW04 02	41169	1/18/2010 13:37	5.76962	25.38	12.722375	27674.1
FW04 03	41169	1/18/2010 14:04	5.74329	25.38075	12.72575	27725.1
FW04 04	41169	1/19/2010 8:36	5.74423	25.38025	12.727625	28025.1
FW05 01	41169	1/19/2010 9:30	5.77202	25.38125	12.72975	27784.1
FW05 02	41169	1/19/2010 10:26	5.79714	25.37975	12.729625	27877.7
FW05 03	41169	2/5/2010 9:54	5.77734	25.3815	12.73125	28014.8
FW06 03	41169	1/19/2010 14:51	5.75814	25.38125	12.731375	27952.7
FW06 02	41169	1/20/2010 14:21	5.76731	25.38025	12.728875	27307.4
FW06 04	41169	1/20/2010 14:29	5.76512	25.3815	12.732875	27840.8
FW07 01	41169	1/20/2010 14:49	5.76771	25.38225	12.7315	28051.4
FW07 03	41169	1/20/2010 14:53	5.77527	25.38125	12.732625	27745.6
FW07 04	41169	1/20/2010 14:56	5.72497	25.38175	12.735	27381.5
FW08 01	41169	1/21/2010 8:27	5.7605	25.38175	12.7325	27666.9
FW08 02	41169	1/21/2010 8:37	5.74967	25.382	12.731625	27190.4
FW08 03	41169	1/21/2010 8:43	5.78913	25.382	12.732875	27950.7
FW08 04	41169	1/21/2010 8:45	5.74871	25.38225	12.7315	28104.9
FW09 01	41169	1/21/2010 9:28	5.74	25.3825	12.733125	27571.5

Specimen ID Number	Operator S#	Test Date	Initial Specimen Mass (g)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Average Resonant Frequency (Hz)
FW09 02	41169	1/21/2010 9:48	5.74208	25.3805	12.73275	27250.8
FW09 03	41169	1/21/2010 9:59	5.7574	25.38175	12.730875	27217
FW09 04	41169	1/21/2010 12:06	5.75413	25.3825	12.731875	28076.1
FW10 01	41169	1/21/2010 12:10	5.7754	25.38175	12.731625	28125.8
FA5 02	41169	2/8/2010 9:23	5.75818	25.38375	12.732125	29359
FW05 04	41169	2/8/2010 9:33	5.73825	25.3805	12.732875	27479.5

Specimen ID Number	Flexural Dynamic Young's Modulus (GPa)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
FW06 01	9.8015	22.3	24.8	15.5	With Grain
FA6 01	10.3968	22.4	25.2	15.3	Against Grain
FA6 02	10.6939	22.6	25.2	15.4	Against Grain
FA7 01	10.3782	22.9	25.5	19.2	Against Grain
FA7 02	10.8882	22.9	25.5	19.2	Against Grain
FA8 01	10.8146	22.9	25.5	19.1	Against Grain
FA8 02	10.8516	22.9	25.5	19.1	Against Grain
FW01 01	9.6882	22.1	25.1	16.1	With Grain
FW01 02	9.3881	22.2	25.1	16.1	With Grain
FW01 03	9.6917	22.2	25.1	16.2	With Grain
FW01 04	9.2407	22.1	25.1	16.2	With Grain
FW02 01	9.3902	22.3	25	18.3	With Grain
FW02 02	9.3553	22.3	25	18.3	With Grain
FW02 03	9.6899	22.3	25	18.4	With Grain
FW02 04	9.0335	22.1	25	19.7	With Grain
FW03 01	9.5930	22.2	25	19.5	With Grain
FW03 02	9.2987	22.3	25	19.6	With Grain
FW03 03	9.5356	22.4	25	19.5	With Grain
FW03 04	9.1657	22.4	25	19.5	With Grain
FW04 01	9.1700	22.7	25	19.5	With Grain
FW04 02	9.3532	22.7	25	19.6	With Grain
FW04 03	9.3379	22.6	25	20	With Grain
FW04 04	9.5380	22	24.8	22	With Grain
FW05 01	9.4160	22.2	24.8	22	With Grain
FW05 02	9.5200	22.3	24.9	21.1	With Grain
FW05 03	9.5786	22.3	25.2	16.6	With Grain
FW06 03	9.5040	23	24.8	18.9	With Grain
FW06 02	9.0894	23.2	24.8	19.4	With Grain
FW06 04	9.4363	23.1	24.8	19.3	With Grain
FW07 01	9.5877	23.2	24.8	19.2	With Grain
FW07 03	9.3888	23.2	24.8	19.2	With Grain
FW07 04	9.0596	23.2	24.8	19.2	With Grain
FW08 01	9.3124	22.8	24.7	18.6	With Grain
FW08 02	8.9795	22.7	24.7	18.7	With Grain
FW08 03	9.5510	22.7	24.7	18.7	With Grain
FW08 04	9.5926	22.7	24.7	18.7	With Grain
FW09 01	9.2145	22.7	24.7	18.6	With Grain

Specimen ID Number	Flexural Dynamic Young's Modulus (GPa)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
FW09 02	9.0040	22.7	24.7	18.8	With Grain
FW09 03	9.0106	22.7	24.7	18.8	With Grain
FW09 04	9.5813	22.8	24.7	19.3	With Grain
FW10 01	9.6508	22.8	24.7	19.3	With Grain
FA5 02	10.4847	21.8	25.2	6.5	Against Grain
FW05 04	9.1494	21.8	25.2	6.6	With Grain

Specimen Number	FA5 02	FA6 01	FA7 02	FA7 01	FA8 01
Date and Time	2/19/2010 12:32	2/19/2010 12:36	2/19/2010 12:40	2/19/2010 12:43	2/19/2010 12:47
Operator	41169	41169	41169	41169	41169
Sample Location					
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:					
Forward current:					
Voltage readings, mV	0.003274 0.003650 0.003313 0.003408	0.00378 0.003502 0.003326 0.003517	0.003478 0.003368 0.003299 0.003193	0.003627 0.003571 0.003403 0.003525	0.003558 0.003497 0.003181 0.003488
Resistance readings, Ω	0.000819 0.000913 0.000828 0.000852	0.000945 0.000875 0.000832 0.000879	0.00087 0.000842 0.000825 0.000798	0.000907 0.000893 0.000851 0.000881	0.00089 0.000874 0.000795 0.000872
Reverse current:					
Voltage readings, mV	-0.004013 -0.003514 -0.003482 -0.003279	-0.003588 -0.003681 -0.003554 -0.003565	-0.003168 -0.003516 -0.003612 -0.003502	-0.003627 -0.00355 -0.003485 -0.003492	-0.003675 -0.003294 -0.003339 -0.003491
Resistance readings, Ω	0.001003 0.000879 0.000871 0.000820	0.000897 0.00092 0.000889 0.000891	0.000792 0.000879 0.000903 0.000876	0.000907 0.000888 0.000871 0.000873	0.000919 0.000823 0.000835 0.000873
End-for-end orientation:					
Reverse current:					
Voltage readings, mV	0.003504 0.003367 0.003476 0.003647	0.003463 0.003376 0.003158 0.00331	0.003599 0.003265 0.002829 0.00322	0.003346 0.003291 0.003193 0.00335	0.00324 0.003164 0.00323 0.003244

Specimen Number	FA5 02	FA6 01	FA7 02	FA7 01	FA8 01
Resistance readings, Ω	0.000876 0.000842 0.000869 0.000912	0.000866 0.000844 0.00079 0.000827	0.0009 0.000816 0.000707 0.000805	0.000836 0.000823 0.000798 0.000837	0.00081 0.000791 0.000807 0.000811
Forward current:					
Voltage readings, mV	-0.003304 -0.003466 -0.003560 -0.003552	-0.00344 -0.003497 -0.003613 -0.003546	-0.003895 -0.00348 -0.003085 -0.003308	-0.003962 -0.003913 -0.003687 -0.003631	-0.003713 -0.003502 -0.003513 -0.003666
Resistance readings, Ω	0.000826 0.000867 0.000890 0.000888	0.00086 0.000874 0.000903 0.000886	0.000974 0.00087 0.000771 0.000827	0.00099 0.000978 0.000922 0.000908	0.000928 0.000876 0.000878 0.000916
Average voltage, mV	0.003488	0.003495	0.003364	0.003541	0.003425
Average resistance, $R=V/I$ ($m\Omega$)	0.872188	0.873625	0.840938	0.885188	0.856125
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.3185	127.2785	127.3060	127.3085	127.2860
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	8.74	8.76	8.43	8.87	8.58
Environmental Conditions					
Temperature (Deg C)	22.500	22.500	22.500	22.600	22.600
Barometric Pressure (in Hg)	25.100	25.100	25.100	25.100	25.100
Humidity (%)	9.700	9.700	9.700	9.800	9.700

Specimen Number	FA5 02	FA6 01	FA7 02	FA7 01	FA8 01
Other Test Information					
Specimen Orientation	horizontal				
Method of Measuring Resistance	voltmeter				
Probe Location	center				
Instruments	Keithley Model 2182 Nanovoltmeter				
ASTM	Keithley Model 6220 DC Current Source C 611 - 98 Reapproved 2005				
Comments:					

Specimen Number	FA8 02	FW01 01	FW01 02	FW01 04	FW01 03	FW02 01
Date and Time	2/19/2010 12:50	2/19/2010 12:54	2/19/2010 12:58	2/19/2010 13:01	2/19/2010 13:09	2/19/2010 13:18
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.00315 0.003283 0.003413 0.003062	0.003748 0.003739 0.003804 0.00382	0.004078 0.003949 0.00373 0.003945	0.004068 0.003907 0.003773 0.003829	0.004041 0.00389 0.003583 0.003822	0.004069 0.004068 0.004028 0.004082
Resistance readings, Ω	0.000787 0.000821 0.000853 0.000766	0.000937 0.000935 0.000951 0.000955	0.00102 0.000987 0.000933 0.000986	0.001017 0.000977 0.000943 0.000957	0.00101 0.000973 0.000896 0.000956	0.001017 0.001017 0.001007 0.00102
Reverse current:						
Voltage readings, mV	-0.003638 -0.003651 -0.003245 -0.00353	-0.003936 -0.003935 -0.003539 -0.003851	-0.004255 -0.004224 -0.003921 -0.003851	-0.0043 -0.004163 -0.004085 -0.004124	-0.004011 -0.00381 -0.003815 -0.003774	-0.004269 -0.003668 -0.003572 -0.003771
Resistance readings, Ω	0.000909 0.000913 0.000811 0.000882	0.000984 0.000984 0.000885 0.000963	0.001064 0.001056 0.00098 0.000963	0.001075 0.001041 0.001021 0.001031	0.001003 0.000952 0.000954 0.000943	0.001067 0.000917 0.000893 0.000943
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003258 0.003144 0.003133 0.003346	0.003605 0.003653 0.003611 0.003582	0.004041 0.003733 0.003718 0.003845	0.003866 0.003915 0.003846 0.003887	0.004048 0.003905 0.003576 0.003746	0.004011 0.003891 0.003787 0.003938

Specimen Number	FA8 02	FW01 01	FW01 02	FW01 04	FW01 03	FW02 01
Resistance readings, Ω	0.000814 0.000786 0.000783 0.000837	0.000901 0.000913 0.000903 0.000895	0.00101 0.000933 0.00093 0.000961	0.000967 0.000979 0.000961 0.000972	0.001012 0.000976 0.000894 0.000936	0.001003 0.000973 0.000947 0.000985
Forward current:						
Voltage readings, mV	-0.003786 -0.003673 -0.003508 -0.003422	-0.004143 -0.004313 -0.003899 -0.003831	-0.004219 -0.004285 -0.004033 -0.004013	-0.004341 -0.004201 -0.004064 -0.004156	-0.004016 -0.003782 -0.003656 -0.003725	-0.004239 -0.004091 -0.003599 -0.003883
Resistance readings, Ω	0.000947 0.000918 0.000877 0.000856	0.001036 0.001078 0.000975 0.000958	0.001055 0.001071 0.001008 0.001003	0.001085 0.00105 0.001016 0.001039	0.001004 0.000946 0.000914 0.000931	0.00106 0.001023 0.0009 0.000957
Average voltage, mV	0.003390	0.003813	0.003990	0.004033	0.003825	0.003932
Average resistance, $R=V/I$ ($m\Omega$)	0.847500	0.953313	0.997500	1.008188	0.956250	0.983063
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.3160	127.1561	127.1711	127.2036	127.1536	127.1886
Resistivity, $p=(R^*A)/L$ ($\mu\Omega m$)	8.50	9.54	9.99	10.10	9.57	9.85
Environmental Conditions						
Temperature (Deg C)	22.600	22.600	22.600	22.600	22.600	22.600
Barometric Pressure (in Hg)	25.100	25.100	25.100	25.100	25.100	25.100
Humidity (%)	9.600	9.600	9.500	9.500	9.500	9.600

Specimen Number	FW02 02	FW02 03	FW02 04	FW03 01	FW03 02	FW03 03
Date and Time	2/22/2010 9:25	2/22/2010 9:32	2/22/2010 14:58	2/22/2010 15:11	2/23/2010 9:26	2/23/2010 9:36
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003845	0.003811	0.004006	0.003812	0.003868	0.004087
	0.004711	0.003834	0.003915	0.003552	0.003961	0.004178
	0.00374	0.003693	0.004045	0.003386	0.003911	0.003512
	0.003715	0.003658	0.004131	0.003442	0.003917	0.003602
Resistance readings, Ω						
	0.000961	0.000953	0.001001	0.000953	0.000967	0.001022
	0.001178	0.000959	0.000979	0.000888	0.00099	0.001045
	0.000935	0.000923	0.001011	0.000847	0.000978	0.000878
	0.000929	0.000915	0.001033	0.000861	0.000979	0.0009
Reverse current:						
Voltage readings, mV	-0.004168	-0.003868	-0.004316	-0.003891	-0.003677	-0.003528
	-0.003261	-0.003736	-0.004167	-0.003941	-0.004122	-0.003894
	-0.003903	-0.003765	-0.003999	-0.004169	-0.004359	-0.004014
	-0.004115	-0.003913	-0.004091	-0.004258	-0.003474	-0.003818
Resistance readings, Ω						
	0.001042	0.000967	0.001079	0.000973	0.000919	0.000882
	0.000815	0.000934	0.001042	0.000985	0.00103	0.000974
	0.000976	0.000941	0.001	0.001042	0.00109	0.001003
	0.001029	0.000978	0.001023	0.001064	0.000868	0.000954
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.00351	0.003645	0.003822	0.003894	0.003813	0.003964
	0.003785	0.003871	0.004148	0.003619	0.004027	0.003792
	0.003549	0.003874	0.004226	0.003289	0.004151	0.003319
	0.0034	0.00378	0.00414	0.003355	0.004081	0.004257

Specimen Number	FW02 02	FW02 03	FW02 04	FW03 01	FW03 02	FW03 03
Resistance readings, Ω	0.000877 0.000946 0.000887 0.00085	0.000911 0.000968 0.000968 0.000945	0.000956 0.001037 0.001057 0.001035	0.000974 0.000905 0.000822 0.000839	0.000953 0.001007 0.001038 0.00102	0.000991 0.000948 0.00083 0.001064
Forward current:						
Voltage readings, mV	-0.004183 -0.004321 -0.00451 -0.004181	-0.0038 -0.003547 -0.003955 -0.003861	-0.004467 -0.003905 -0.00405 -0.004025	-0.003693 -0.003818 -0.004232 -0.00431	-0.003794 -0.004031 -0.003884 -0.003837	-0.003567 -0.00447 -0.004458 -0.003287
Resistance readings, Ω	0.001046 0.00108 0.001127 0.001045	0.00095 0.000887 0.000989 0.000965	0.001117 0.000976 0.001013 0.001006	0.000923 0.000955 0.001058 0.001077	0.000948 0.001008 0.000971 0.000959	0.000892 0.001117 0.001115 0.000822
Average voltage, mV	0.003931	0.003788	0.004091	0.003791	0.003932	0.003859
Average resistance, $R=V/I$ ($m\Omega$)	0.982688	0.947063	1.022813	0.947875	0.982813	0.964813
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.2011	127.1486	127.2236	127.1861	127.1486	127.1961
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.84	9.48	10.25	9.49	9.84	9.66
Environmental Conditions						
Temperature (Deg C)	21.800	21.800	21.900	22.500	21.500	21.800
Barometric Pressure (in Hg)	25.300	25.300	25.300	25.400	25.500	25.500
Humidity (%)	5.400	5.400	5.700	8.500	5.400	5.800

Specimen Number	FW04 01	FW04 02	FW03 04	FW04 04	FW05 01	FW05 03
Date and Time	2/23/2010 9:41	2/23/2010 9:45	2/23/2010 9:52	2/23/2010 9:56	2/23/2010 10:01	2/23/2010 10:06
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003922	0.003137	0.003702	0.003704	0.003855	0.003374
	0.004098	0.003705	0.004089	0.003958	0.003906	0.003402
	0.004226	0.003869	0.004194	0.004017	0.003633	0.003072
	0.004009	0.003861	0.004098	0.003489	0.003966	0.003425
Resistance readings, Ω						
	0.000981	0.000784	0.000925	0.000926	0.000964	0.000844
	0.001024	0.000926	0.001022	0.000989	0.000977	0.000851
	0.001057	0.000967	0.001049	0.001004	0.000908	0.000768
	0.001002	0.000965	0.001025	0.000872	0.000991	0.000856
Reverse current:						
Voltage readings, mV	-0.003894	-0.004432	-0.004071	-0.003639	-0.003887	-0.004074
	-0.003902	-0.004207	-0.004106	-0.003842	-0.004051	-0.004348
	-0.003914	-0.004063	-0.004004	-0.003959	-0.003916	-0.004455
	-0.004017	-0.003894	-0.003874	-0.003936	-0.003656	-0.004113
Resistance readings, Ω						
	0.000973	0.001108	0.001018	0.00091	0.000972	0.001018
	0.000976	0.001052	0.001027	0.000961	0.001013	0.001087
	0.000978	0.001016	0.001001	0.00099	0.000979	0.001137
	0.001004	0.000973	0.000969	0.000984	0.000914	0.001028
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004129	0.003679	0.003754	0.003707	0.003867	0.003836
	0.003976	0.00372	0.004052	0.003799	0.004161	0.003509
	0.003314	0.003458	0.003939	0.003844	0.003656	0.003562
	0.003676	0.003797	0.003926	0.003688	0.0036	0.003914

Specimen Number	FW04 01	FW04 02	FW03 04	FW04 04	FW05 01	FW05 03
Resistance readings, Ω	0.001032 0.000994 0.000828 0.000919	0.00092 0.00093 0.000865 0.000949	0.000938 0.001013 0.000985 0.000982	0.000927 0.00095 0.000961 0.000922	0.000967 0.00104 0.000914 0.0009	0.000959 0.000877 0.00089 0.000978
Forward current:						
Voltage readings, mV	-0.004013 -0.003965 -0.004519 -0.004381	-0.004403 -0.004272 -0.004056 -0.003984	-0.004091 -0.004108 -0.004045 -0.003953	-0.003754 -0.003739 -0.003629 -0.003889	-0.003929 -0.003946 -0.003977 -0.00388	-0.004119 -0.004308 -0.004188 -0.003927
Resistance readings, Ω	0.001003 0.000991 0.00113 0.001095	0.001101 0.001068 0.001014 0.000996	0.001023 0.001027 0.001011 0.000988	0.000939 0.000935 0.000907 0.000972	0.000982 0.000987 0.000994 0.00097	0.00103 0.001077 0.001047 0.000982
Average voltage, mV	0.003997	0.003909	0.004000	0.003787	0.003868	0.003858
Average resistance, $R=V/I$ ($m\Omega$)	0.999188	0.977125	1.000188	0.946813	0.967000	0.964313
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.1811	127.1236	127.1211	127.2286	127.2711	127.3010
Resistivity, $p=(R^*A)/L$ ($\mu\Omega m$)	10.01	9.78	10.01	9.49	9.69	9.67
Environmental Conditions						
Temperature (Deg C)	21.700	21.700	21.600	21.600	21.600	21.600
Barometric Pressure (in Hg)	25.500	25.500	25.500	25.500	25.500	25.500
Humidity (%)	5.800	5.900	5.900	6.000	6.100	6.100

Specimen Number	FW06 01	FW06 02	FW06 03	FW06 04	FW07 01	FW07 03
Date and Time	2/23/2010 10:10	2/23/2010 10:14	2/23/2010 10:18	2/23/2010 10:23	2/23/2010 10:28	2/23/2010 10:32
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003879 0.003563 0.003666 0.003547	0.004312 0.004316 0.004341 0.004284	0.004044 0.00398 0.003823 0.003896	0.004045 0.004053 0.004019 0.003995	0.003977 0.003966 0.004019 0.003826	0.004008 0.00404 0.003809 0.00391
Resistance readings, Ω	0.00097 0.000891 0.000917 0.000887	0.001078 0.001079 0.001085 0.001071	0.001011 0.000995 0.000956 0.000974	0.001011 0.001013 0.001005 0.000999	0.000994 0.000991 0.001005 0.000957	0.001002 0.00101 0.000952 0.000977
Reverse current:						
Voltage readings, mV	-0.003599 -0.003898 -0.003636 -0.003795	-0.003705 -0.003766 -0.003965 -0.003713	-0.003722 -0.003672 -0.003844 -0.003847	-0.003678 -0.003652 -0.003712 -0.00375	-0.003667 -0.003799 -0.003653 -0.003669	-0.003945 -0.003879 -0.004002 -0.003845
Resistance readings, Ω	0.0009 0.000975 0.000909 0.000949	0.000926 0.000942 0.000991 0.000928	0.000931 0.000918 0.000961 0.000962	0.00092 0.000913 0.000928 0.000938	0.000917 0.00095 0.000913 0.000917	0.000986 0.00097 0.001001 0.000961
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.00372 0.003628 0.003655 0.003803	0.004214 0.004118 0.004291 0.004041	0.00398 0.003986 0.003852 0.003761	0.004131 0.004247 0.004138 0.004057	0.004109 0.004 0.003773 0.003834	0.003766 0.003977 0.0039 0.003736

Specimen Number	FW06 01	FW06 02	FW06 03	FW06 04	FW07 01	FW07 03
Resistance readings, Ω	0.00093 0.000907 0.000914 0.000951	0.001054 0.00103 0.001073 0.00101	0.000995 0.000997 0.000963 0.00094	0.001033 0.001062 0.001034 0.001014	0.001027 0.001 0.000943 0.000959	0.000942 0.000994 0.000975 0.000934
Forward current:						
Voltage readings, mV	-0.003879 -0.003752 -0.003625 -0.003674	-0.003786 -0.003884 -0.003991 -0.004065	-0.003772 -0.003727 -0.003785 -0.003872	-0.003692 -0.003641 -0.003538 -0.003509	-0.003587 -0.003779 -0.00386 -0.003664	-0.003997 -0.004035 -0.003944 -0.003989
Resistance readings, Ω	0.00097 0.000938 0.000906 0.000919	0.000947 0.000971 0.000998 0.001016	0.000943 0.000932 0.000946 0.000968	0.000923 0.00091 0.000884 0.000877	0.000897 0.000945 0.000965 0.000916	0.000999 0.001009 0.000986 0.000997
Average voltage, mV	0.003707	0.004050	0.003848	0.003866	0.003824	0.003924
Average resistance, $R=V/I$ ($m\Omega$)	0.927063	1.012438	0.962000	0.966500	0.956000	0.980938
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.2736	127.2536	127.3035	127.3335	127.3060	127.3285
Resistivity, $p=(R^*A)/L$ ($\mu\Omega m$)	9.29	10.14	9.64	9.69	9.58	9.83
Environmental Conditions						
Temperature (Deg C)	21.600	21.700	21.700	21.700	21.700	22.400
Barometric Pressure (in Hg)	25.500	25.500	25.500	25.500	25.500	25.500
Humidity (%)	6.400	6.600	6.600	6.600	6.500	6.500

Specimen Number	FW07 04	FW08 01	FW08 02	FW08 04	FW09 01	FW09 02
Date and Time	2/23/2010 10:37	2/23/2010 10:42	2/23/2010 10:47	2/23/2010 10:50	2/23/2010 10:53	2/23/2010 10:56
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.004043 0.004002 0.004019 0.003987	0.004047 0.003906 0.003753 0.003761	0.004015 0.003993 0.004072 0.004148	0.003856 0.003734 0.003611 0.003772	0.003969 0.00382 0.003914 0.004001	0.003868 0.004014 0.003982 0.003755
Resistance readings, Ω	0.001011 0.001001 0.001005 0.000997	0.001012 0.000977 0.000938 0.00094	0.001004 0.000998 0.001018 0.001037	0.000964 0.000933 0.000903 0.000943	0.000992 0.000955 0.000978 0.001	0.000967 0.001004 0.000995 0.000939
Reverse current:						
Voltage readings, mV	-0.00401 -0.00407 -0.004227 -0.003936	-0.003858 -0.003916 -0.00412 -0.004119	-0.004276 -0.004071 -0.003993 -0.004161	-0.003974 -0.003901 -0.003895 -0.003858	-0.003891 -0.004034 -0.004104 -0.003955	-0.00415 -0.004242 -0.004315 -0.004156
Resistance readings, Ω	0.001002 0.001018 0.001057 0.000984	0.000964 0.000979 0.00103 0.00103	0.001069 0.001018 0.000998 0.00104	0.000993 0.000975 0.000974 0.000965	0.000973 0.001008 0.001026 0.000989	0.001038 0.001061 0.001079 0.001039
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.00401 0.00418 0.004065 0.00407	0.003905 0.003888 0.004076 0.003636	0.004043 0.00387 0.003626 0.003897	0.003847 0.003779 0.003954 0.003908	0.003828 0.003881 0.004003 0.00399	0.003982 0.003832 0.003879 0.00403

Specimen Number	FW07 04	FW08 01	FW08 02	FW08 04	FW09 01	FW09 02
Resistance readings, Ω	0.001003 0.001045 0.001016 0.001018	0.000976 0.000972 0.001019 0.000909	0.001011 0.000968 0.000907 0.000974	0.000962 0.000945 0.000989 0.000977	0.000957 0.00097 0.001001 0.000998	0.000995 0.000958 0.00097 0.001007
Forward current:						
Voltage readings, mV	-0.003974 -0.003744 -0.004053 -0.004042	-0.004177 -0.004078 -0.003917 -0.004059	-0.003924 -0.003879 -0.003792 -0.004039	-0.003857 -0.003763 -0.003641 -0.003791	-0.004058 -0.003852 -0.004031 -0.004066	-0.004238 -0.003998 -0.004215 -0.004217
Resistance readings, Ω	0.000994 0.000936 0.001013 0.00101	0.001044 0.001019 0.000979 0.001015	0.000981 0.00097 0.000948 0.00101	0.000964 0.000941 0.00091 0.000948	0.001014 0.000963 0.001008 0.001016	0.001059 0.000999 0.001054 0.001054
Average voltage, mV	0.004027	0.003951	0.003987	0.003821	0.003962	0.004055
Average resistance, $R=V/I$ ($m\Omega$)	1.006875	0.987688	0.996938	0.955375	0.990500	1.013625
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.3761	127.3260	127.3085	127.3060	127.3385	127.3310
Resistivity, $p=(R^*A)/L$ ($\mu\Omega m$)	10.10	9.90	9.99	9.58	9.93	10.16
Environmental Conditions						
Temperature (Deg C)	21.900	21.700	21.700	21.600	21.700	21.700
Barometric Pressure (in Hg)	25.500	25.500	25.500	25.500	25.500	25.500
Humidity (%)	6.700	6.700	6.600	6.600	6.600	6.600

Specimen Number	FW09 03	FW09 04	FW10 01	FW05 02	FW05 04	FW08 03
Date and Time	2/23/2010 11:02	2/23/2010 11:05	2/23/2010 11:09	3/19/2010 12:59	3/19/2010 13:02	3/19/2010 13:05
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4	4	4
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.004053 0.00401 0.004182 0.004097	0.004018 0.003829 0.003822 0.003928	0.003963 0.003873 0.003626 0.003717	0.003523 0.004004 0.003804 0.003796	0.004187 0.004193 0.003849 0.003904	0.004131 0.00413 0.00366 0.003656
Resistance readings, Ω	0.001013 0.001002 0.001045 0.001024	0.001004 0.000957 0.000956 0.000982	0.000991 0.000968 0.000907 0.000929	0.000881 0.001001 0.000951 0.000949	0.001047 0.001048 0.000962 0.000976	0.001033 0.001032 0.000915 0.000914
Reverse current:						
Voltage readings, mV	-0.003784 -0.003951 -0.004663 -0.004132	-0.003829 -0.003671 -0.003631 -0.003647	-0.003945 -0.003824 -0.003591 -0.003736	-0.003936 -0.004286 -0.003564 -0.00354	-0.004053 -0.004063 -0.00377 -0.00377	-0.004003 -0.004064 -0.003565 -0.003648
Resistance readings, Ω	0.000946 0.000988 0.001166 0.001033	0.000957 0.000918 0.000908 0.000912	0.000986 0.000956 0.000898 0.000934	0.000984 0.001071 0.000891 0.000885	0.001013 0.001016 0.000943 0.000942	0.001001 0.001016 0.000891 0.000912
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004003 0.003973 0.004082 0.003837	0.004009 0.003763 0.00374 0.003902	0.003602 0.003717 0.00393 0.003823	0.004101 0.004106 0.003896 0.003877	0.004322 0.004494 0.004217 0.003777	0.004222 0.004005 0.003624 0.003631

Specimen Number	FW09 03	FW09 04	FW10 01	FW05 02	FW05 04	FW08 03
Resistance readings, Ω	0.001001 0.000993 0.001021 0.000959	0.001002 0.000941 0.000935 0.000976	0.0009 0.000929 0.000983 0.000956	0.001025 0.001026 0.000974 0.000969	0.00108 0.001123 0.001054 0.000944	0.001056 0.001001 0.000906 0.000908
Forward current:						
Voltage readings, mV	-0.003951 -0.004186 -0.00436 -0.004137	-0.003914 -0.003752 -0.003748 -0.00376	-0.003696 -0.003705 -0.003851 -0.003755	-0.003884 -0.003857 -0.003678 -0.003708	-0.004016 -0.003681 -0.003708 -0.003715	-0.004089 -0.003976 -0.003535 -0.003715
Resistance readings, Ω	0.000988 0.001047 0.00109 0.001034	0.000978 0.000938 0.000937 0.00094	0.000924 0.000926 0.000963 0.000939	0.000971 0.000964 0.000919 0.000927	0.001004 0.00092 0.000927 0.000929	0.001022 0.000994 0.000884 0.000929
Average voltage, mV	0.004088	0.003810	0.003772	0.003848	0.003982	0.003853
Average resistance, $R=V/I$ ($m\Omega$)	1.021875	0.952563	0.943063	0.961750	0.995500	0.963375
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.2935	127.3135	127.3085	127.2686	127.3335	127.3335
Resistivity, $p=(R^*A)/L$ ($\mu\Omega m$)	10.24	9.55	9.45	9.64	9.98	9.66
Environmental Conditions						
Temperature (Deg C)	21.700	21.600	21.600	22.4	22.5	22.4
Barometric Pressure (in Hg)	25.500	25.500	25.500	25.4	25.4	25.3
Humidity (%)	6.800	6.800	6.800	11.9	11.9	11.9

Specimen Number	FA6 02
Date and Time	3/19/2010 13:14
Operator	41169
Sample Location	
Applied current, I (mA)	4
Compl. Voltage (V)	2.5000
ID Orientation:	
Forward current:	
Voltage readings, mV	0.003801
	0.003651
	0.003345
	0.003491
Resistance readings, Ω	
	0.00095
	0.000913
	0.000836
	0.000873
Reverse current:	
Voltage readings, mV	-0.003347
	-0.003398
	-0.003034
	-0.003032
Resistance readings, Ω	
	0.000837
	0.00085
	0.000759
	0.000758
End-for-end orientation:	
Reverse current:	
Voltage readings, mV	0.00362
	0.003725
	0.003389
	0.0033

Specimen Number	FA6 02
Resistance readings, Ω	0.000905 0.000931 0.000847 0.000825
Forward current:	
Voltage readings, mV	-0.003444 -0.003553 -0.003101 -0.003068
Resistance readings, Ω	0.000861 0.000888 0.000775 0.000767
Average voltage, mV	0.003394
Average resistance, $R=V/I$ ($m\Omega$)	0.848438
Potential Contact Distance, L (mm) (Gage Length)	12.7
Average area, A, mm^2	127.2960
Resistivity, $\rho=(R \cdot A)/L$ ($\mu\Omega m$)	8.50
Environmental Conditions	
Temperature (Deg C)	22.4
Barometric Pressure (in Hg)	25.3
Humidity (%)	11.8

Specimen ID Number	Operator S#	Test Date	Applied Current (mA)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Measured Potential (mV)
FA5 02	41169	2/19/2010 12:32	4	25.384	12.732	0.003488
FA6 01	41169	2/19/2010 12:36	4	25.384	12.730	0.003495
FA7 02	41169	2/19/2010 12:40	4	25.384	12.732	0.003364
FA7 01	41169	2/19/2010 12:43	4	25.386	12.732	0.003541
FA8 01	41169	2/19/2010 12:47	4	25.386	12.731	0.003425
FA8 02	41169	2/19/2010 12:50	4	25.386	12.732	0.003390
FW01 01	41169	2/19/2010 12:54	4	25.353	12.724	0.003813
FW01 02	41169	2/19/2010 12:58	4	25.380	12.725	0.003990
FW01 04	41169	2/19/2010 13:01	4	25.379	12.726	0.004033
FW01 03	41169	2/19/2010 13:09	4	25.379	12.724	0.003825
FW02 01	41169	2/19/2010 13:18	4	25.382	12.726	0.003932
FW02 02	41169	2/22/2010 9:25	4	25.379	12.726	0.003931
FW02 03	41169	2/22/2010 9:32	4	25.380	12.724	0.003788
FW02 04	41169	2/22/2010 14:58	4	25.381	12.727	0.004091
FW03 01	41169	2/22/2010 15:11	4	25.381	12.726	0.003791
FW03 02	41169	2/23/2010 9:26	4	25.380	12.724	0.003932
FW03 03	41169	2/23/2010 9:36	4	25.381	12.726	0.003859
FW04 01	41169	2/23/2010 9:41	4	25.382	12.725	0.003997
FW04 02	41169	2/23/2010 9:45	4	25.380	12.722	0.003909
FW03 04	41169	2/23/2010 9:52	4	25.381	12.722	0.004000
FW04 04	41169	2/23/2010 9:56	4	25.380	12.728	0.003787
FW05 01	41169	2/23/2010 10:01	4	25.381	12.730	0.003868
FW05 03	41169	2/23/2010 10:06	4	25.382	12.731	0.003858
FW06 01	41169	2/23/2010 10:10	4	25.382	12.730	0.003707
FW06 02	41169	2/23/2010 10:14	4	25.380	12.729	0.004050
FW06 03	41169	2/23/2010 10:18	4	25.381	12.731	0.003848
FW06 04	41169	2/23/2010 10:23	4	25.382	12.733	0.003866
FW07 01	41169	2/23/2010 10:28	4	25.382	12.732	0.003824
FW07 03	41169	2/23/2010 10:32	4	25.381	12.733	0.003924
FW07 04	41169	2/23/2010 10:37	4	25.382	12.735	0.004027
FW08 01	41169	2/23/2010 10:42	4	25.382	12.733	0.003951
FW08 02	41169	2/23/2010 10:47	4	25.382	12.732	0.003987
FW08 04	41169	2/23/2010 10:50	4	25.382	12.732	0.003821
FW09 01	41169	2/23/2010 10:53	4	25.383	12.733	0.003962
FW09 02	41169	2/23/2010 10:56	4	25.381	12.733	0.004055
FW09 03	41169	2/23/2010 11:02	4	25.382	12.731	0.004088
FW09 04	41169	2/23/2010 11:05	4	25.383	12.732	0.003810

Specimen ID Number	Operator S#	Test Date	Applied Current (mA)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Measured Potential (mV)
FW10 01	41169	2/23/2010 11:09	4	25.382	12.732	0.003772
FW05 02	41169	3/19/2010 12:59	4	25.380	12.730	0.003848
FW05 04	41169	3/19/2010 13:02	4	25.381	12.733	0.003982
FW08 03	41169	3/19/2010 13:05	4	25.382	12.733	0.003853
FA6 02	41169	3/19/2010 13:14	4	25.385	12.731	0.003394

Specimen ID Number	Resistance (mΩ)	Resistivity (μΩm)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
FA5 02	0.872	8.744	22.5	25.1	9.7	Against Grain
FA6 01	0.874	8.755	22.5	25.1	9.7	Against Grain
FA7 02	0.841	8.430	22.5	25.1	9.7	Against Grain
FA7 01	0.885	8.873	22.6	25.1	9.8	Against Grain
FA8 01	0.856	8.581	22.6	25.1	9.7	Against Grain
FA8 02	0.848	8.496	22.6	25.1	9.6	Against Grain
FW01 01	0.953	9.545	22.6	25.1	9.6	With Grain
FW01 02	0.998	9.988	22.6	25.1	9.5	With Grain
FW01 04	1.008	10.098	22.6	25.1	9.5	With Grain
FW01 03	0.956	9.574	22.6	25.1	9.5	With Grain
FW02 01	0.983	9.845	22.6	25.1	9.6	With Grain
FW02 02	0.983	9.842	21.8	25.3	5.4	With Grain
FW02 03	0.947	9.482	21.8	25.3	5.4	With Grain
FW02 04	1.023	10.246	21.9	25.3	5.7	With Grain
FW03 01	0.948	9.493	22.5	25.4	8.5	With Grain
FW03 02	0.983	9.840	21.5	25.5	5.4	With Grain
FW03 03	0.965	9.663	21.8	25.5	5.8	With Grain
FW04 01	0.999	10.006	21.7	25.5	5.8	With Grain
FW04 02	0.977	9.781	21.7	25.5	5.9	With Grain
FW03 04	1.000	10.011	21.6	25.5	5.9	With Grain
FW04 04	0.947	9.485	21.6	25.5	6	With Grain
FW05 01	0.967	9.691	21.6	25.5	6.1	With Grain
FW05 03	0.964	9.666	21.6	25.5	6.1	With Grain
FW06 01	0.927	9.291	21.6	25.5	6.4	With Grain
FW06 02	1.012	10.145	21.7	25.5	6.6	With Grain
FW06 03	0.962	9.643	21.7	25.5	6.6	With Grain
FW06 04	0.967	9.690	21.7	25.5	6.6	With Grain
FW07 01	0.956	9.583	21.7	25.5	6.5	With Grain
FW07 03	0.981	9.835	22.4	25.5	6.5	With Grain
FW07 04	1.007	10.099	21.9	25.5	6.7	With Grain
FW08 01	0.988	9.902	21.7	25.5	6.7	With Grain
FW08 02	0.997	9.994	21.7	25.5	6.6	With Grain
FW08 04	0.955	9.577	21.6	25.5	6.6	With Grain
FW09 01	0.991	9.931	21.7	25.5	6.6	With Grain
FW09 02	1.014	10.163	21.7	25.5	6.6	With Grain
FW09 03	1.022	10.242	21.7	25.5	6.8	With Grain
FW09 04	0.953	9.549	21.6	25.5	6.8	With Grain

Specimen ID Number	Resistance (mΩ)	Resistivity (μΩm)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
FW10 01	0.943	9.454	21.6	25.5	6.8	With Grain
FW05 02	0.962	9.638	22.4	25.4	11.9	With Grain
FW05 04	0.996	9.981	22.5	25.4	11.9	With Grain
FW08 03	0.963	9.659	22.4	25.3	11.9	With Grain
FA6 02	0.848	8.504	22.4	25.3	11.8	Against Grain

Specimen ID Number	Date and Time	Operator	Specimen Location	Initial			Longitudinal Traverse Time, s	Shear Traverse Time, s	Longitudinal Zero Correction, s	Shear Zero Correction, s
				Initial Specimen Length, m	Initial Specimen Density, ρ kg/m ³	Initial Specimen Density, ρ kg/m ³				
FW07 01	2/16/2010 14:01	41169		0.025382	1814.3511	1.066E-05	1.632E-05	1.970E-07	2.000E-07	
FW07 03	2/16/2010 14:03	41169		0.025381	1816.2424	1.086E-05	1.654E-05	1.970E-07	2.000E-07	
FW07 04	2/16/2010 14:06	41169		0.025382	1799.933	1.092E-05	1.672E-05	1.970E-07	2.000E-07	
FW08 01	2/16/2010 14:08	41169		0.025382	1811.7822	1.080E-05	1.687E-05	1.970E-07	2.000E-07	
FW08 02	2/16/2010 14:15	41169		0.025382	1808.466	1.091E-05	1.676E-05	1.970E-07	2.000E-07	
FW08 03	2/16/2010 14:16	41169		0.025382	1820.7513	1.080E-05	1.654E-05	1.970E-07	2.000E-07	
FW08 04	2/16/2010 14:19	41169		0.025382	1808.1446	1.062E-05	1.683E-05	1.970E-07	2.000E-07	
FW09 01	2/16/2010 14:21	41169		0.025382	1805.0977	1.097E-05	1.671E-05	1.970E-07	2.000E-07	
FW09 02	2/16/2010 14:23	41169		0.025381	1805.9129	1.092E-05	1.671E-05	1.970E-07	2.000E-07	
FW09 03	2/16/2010 14:25	41169		0.025382	1811.2739	1.102E-05	1.684E-05	1.970E-07	2.000E-07	
FW09 04	2/16/2010 14:27	41169		0.025382	1809.7221	1.068E-05	1.658E-05	1.970E-07	2.000E-07	
FW10 01	2/16/2010 14:31	41169		0.025382	1816.6275	1.066E-05	1.676E-05	1.970E-07	2.000E-07	
FW05 01	2/16/2010 14:56	41169		0.025381	1816.3365	1.073E-05	1.667E-05	1.970E-07	2.000E-07	
FW05 02	2/16/2010 14:58	41169		0.02538	1824.1454	1.072E-05	1.643E-05	1.970E-07	2.000E-07	
FW05 03	2/16/2010 15:00	41169		0.025382	1817.4124	1.063E-05	1.663E-05	1.970E-07	2.000E-07	
FW05 04	2/16/2010 15:02	41169		0.025381	1804.712	1.092E-05	1.659E-05	1.970E-07	2.000E-07	
FW06 01	2/16/2010 15:03	41169		0.025382	1808.3284	1.051E-05	1.644E-05	1.970E-07	2.000E-07	
FW06 02	2/16/2010 15:05	41169		0.02538	1815.0799	1.090E-05	1.667E-05	1.970E-07	2.000E-07	
FW06 03	2/16/2010 15:07	41169		0.025381	1811.4429	1.075E-05	1.659E-05	1.970E-07	2.000E-07	
FW06 04	2/16/2010 15:08	41169		0.025382	1813.2337	1.075E-05	1.664E-05	1.970E-07	2.000E-07	
FW03 01	2/16/2010 15:10	41169		0.025381	1811.8166	1.071E-05	1.664E-05	1.970E-07	2.000E-07	
FW03 02	2/16/2010 15:12	41169		0.025379	1818.4675	1.073E-05	1.653E-05	1.970E-07	2.000E-07	
FW03 03	2/16/2010 15:14	41169		0.025381	1809.2266	1.061E-05	1.641E-05	1.970E-07	2.000E-07	
FA8 01	2/17/2010 8:14	41169		0.025386	1819.7358	1.004E-05	1.635E-05	2.000E-07	2.000E-07	
FA8 02	2/17/2010 8:16	41169		0.025386	1815.9124	1.002E-05	1.585E-05	2.000E-07	2.000E-07	
FA7 01	2/17/2010 8:18	41169		0.025385	1815.9147	1.020E-05	1.619E-05	2.000E-07	2.000E-07	
FA7 02	2/17/2010 8:20	41169		0.025384	1813.8832	9.920E-06	1.611E-05	2.000E-07	2.000E-07	
FA6 01	2/17/2010 8:31	41169		0.025384	1815.5114	1.018E-05	1.628E-05	2.000E-07	2.000E-07	
FA6 02	2/17/2010 8:33	41169		0.025385	1808.6765	1.004E-05	1.655E-05	2.000E-07	2.000E-07	
FA5 02	2/17/2010 8:47	41169		0.025384	1811.0578	1.008E-05	1.643E-05	2.000E-07	2.000E-07	
FW01 02	2/17/2010 8:49	41169		0.02538	1822.4618	1.071E-05	1.676E-05	2.000E-07	2.000E-07	

Specimen ID Number	Date and Time	Operator	Specimen Location	Initial Specimen Length, m	Initial Specimen Density, ρ kg/m ³	Longitudinal Traverse Time, s	Shear Traverse Time, s	Longitudinal Zero Correction, s	Shear Zero Correction, s
FW01 03	2/17/2010 8:51	41169		0.025379	1811.906	1.059E-05	1.665E-05	2.000E-07	2.000E-07
FW01 04	2/17/2010 8:52	41169		0.025379	1813.6243	1.087E-05	1.684E-05	2.000E-07	2.000E-07
FW01 01	2/17/2010 8:54	41169		0.025353	1812.3612	1.061E-05	1.655E-05	2.000E-07	2.000E-07
FW02 01	2/17/2010 8:55	41169		0.025382	1815.3249	1.080E-05	1.661E-05	2.000E-07	2.000E-07
FW02 02	2/17/2010 8:58	41169		0.025379	1818.1087	1.078E-05	1.654E-05	2.000E-07	2.000E-07
FW02 03	2/17/2010 9:00	41169		0.02538	1809.0129	1.056E-05	1.641E-05	2.000E-07	2.000E-07
FW02 04	2/17/2010 9:01	41169		0.025381	1801.0166	1.097E-05	1.681E-05	2.000E-07	2.000E-07
FW03 04	2/17/2010 9:04	41169		0.025381	1798.6604	1.083E-05	1.664E-05	2.000E-07	2.000E-07
FW04 01	2/17/2010 9:05	41169		0.025382	1806.5745	1.081E-05	1.667E-05	2.000E-07	2.000E-07
FW04 02	2/17/2010 9:07	41169		0.02538	1817.6606	1.08E-05	1.655E-05	2.000E-07	2.000E-07
FW04 04	2/17/2010 9:09	41169		0.02538	1808.2284	1.07E-05	1.652E-05	2.000E-07	2.000E-07

Specimen ID Number	Longitudinal Sonic Velocity (m/s)	Shear Sonic Velocities, (m/s)	Longitudinal Dynamic Young's Modulus (GPa)	Shear Dynamic Young's Modulus (GPa)	Poisson's Ratio $\mu = (1 - \frac{[2(v_s v_l)^2]}{2-[2(v_s v_l)^2]})$
FW07 01	2.426E+03	1.575E+03	10.6773	4.4982	1.360E-01
FW07 03	2.380E+03	1.553E+03	10.2904	4.3821	1.292E-01
FW07 04	2.367E+03	1.536E+03	10.0850	4.2490	1.360E-01
FW08 01	2.394E+03	1.523E+03	10.3825	4.2004	1.603E-01
FW08 02	2.369E+03	1.533E+03	10.1517	4.2486	1.401E-01
FW08 03	2.394E+03	1.553E+03	10.4339	4.3934	1.363E-01
FW08 04	2.435E+03	1.526E+03	10.7226	4.2121	1.765E-01
FW09 01	2.356E+03	1.537E+03	10.0203	4.2664	1.293E-01
FW09 02	2.367E+03	1.537E+03	10.1177	4.2680	1.352E-01
FW09 03	2.345E+03	1.525E+03	9.9619	4.2143	1.334E-01
FW09 04	2.421E+03	1.550E+03	10.6094	4.3455	1.531E-01
FW10 01	2.426E+03	1.533E+03	10.6907	4.2677	1.678E-01
FW05 01	2.410E+03	1.541E+03	10.5465	4.3135	1.540E-01
FW05 02	2.412E+03	1.564E+03	10.6112	4.4607	1.374E-01
FW05 03	2.433E+03	1.545E+03	10.7569	4.3374	1.622E-01
FW05 04	2.367E+03	1.549E+03	10.1110	4.3278	1.258E-01
FW06 01	2.461E+03	1.563E+03	10.9537	4.4173	1.621E-01
FW06 02	2.371E+03	1.541E+03	10.2063	4.3101	1.345E-01
FW06 03	2.405E+03	1.549E+03	10.4783	4.3439	1.459E-01
FW06 04	2.405E+03	1.544E+03	10.4895	4.3222	1.496E-01
FW03 01	2.414E+03	1.544E+03	10.5604	4.3185	1.541E-01
FW03 02	2.409E+03	1.554E+03	10.5572	4.3922	1.438E-01
FW03 03	2.437E+03	1.566E+03	10.7488	4.4355	1.487E-01
FA8 01	2.580E+03	1.572E+03	12.1117	4.4963	2.048E-01
FA8 02	2.585E+03	1.622E+03	12.1356	4.7781	1.753E-01
FA7 01	2.539E+03	1.588E+03	11.7017	4.5767	1.788E-01
FA7 02	2.612E+03	1.595E+03	12.3708	4.6173	2.022E-01
FA6 01	2.543E+03	1.579E+03	11.7451	4.5243	1.867E-01
FA6 02	2.580E+03	1.553E+03	12.0372	4.3599	2.160E-01
FA5 02	2.569E+03	1.564E+03	11.9547	4.4301	2.056E-01
FW01 02	2.415E+03	1.533E+03	10.6276	4.2808	1.628E-01

Specimen ID Number	Longitudinal Sonic Velocity (m/s)	Shear Sonic Velocities, (m/s)	Longitudinal Dynamic Young's Modulus (GPa)	Shear Dynamic Young's Modulus (GPa)	Poisson's Ratio $\mu = \frac{1 - [2(v_s/v_l)^2]}{[2(v_s/v_l)^2]}$
FW01 03	2.443E+03	1.543E+03	10.8107	4.3127	1.681E-01
FW01 04	2.379E+03	1.525E+03	10.2605	4.2188	1.509E-01
FW01 01	2.435E+03	1.551E+03	10.7498	4.3578	1.591E-01
FW02 01	2.395E+03	1.547E+03	10.4086	4.3430	1.420E-01
FW02 02	2.399E+03	1.553E+03	10.4616	4.3860	1.391E-01
FW02 03	2.450E+03	1.566E+03	10.8569	4.4346	1.547E-01
FW02 04	2.357E+03	1.528E+03	10.0024	4.2053	1.373E-01
FW03 04	2.388E+03	1.544E+03	10.2542	4.2871	1.408E-01
FW04 01	2.392E+03	1.541E+03	10.3390	4.2906	1.453E-01
FW04 02	2.399E+03	1.552E+03	10.4598	4.3799	1.398E-01
FW04 04	2.422E+03	1.555E+03	10.6051	4.3732	1.491E-01

Specimen ID Number	Elastic Modulus, [GPa] $E = \rho v_l^2 [(1+\mu)(1-2\mu)/(1-\mu)]$	Environmental Conditions (longitudinal)			Environmental Conditions (shear)		
		Room Temperature (Deg C)	Atmospheric Pressure (in Hg)	Room Humidity (%)	Room Temperature (Deg C)	Atmospheric Pressure (in Hg)	Room Humidity (%)
FW07 01	10.2201	21.7	25.4	18.9	21.7	25.4	18.9
FW07 03	9.8962	21.7	25.4	18.9	21.7	25.4	18.9
FW07 04	9.6534	21.7	25.4	18.9	21.7	25.4	19
FW08 01	9.7472	21.7	25.4	19	21.7	25.4	19
FW08 02	9.6879	21.7	25.4	19.1	21.7	25.4	19.1
FW08 03	9.9847	21.7	25.4	19.1	21.6	25.4	19.1
FW08 04	9.9112	21.6	25.4	19.2	21.6	25.4	19.2
FW09 01	9.6357	21.6	25.4	19.2	21.6	25.4	19.2
FW09 02	9.6900	21.6	25.4	19.2	21.6	25.4	19.2
FW09 03	9.5529	21.6	25.4	19.2	21.6	25.4	19.3
FW09 04	10.0218	21.6	25.4	19.3	21.6	25.4	19.3
FW10 01	9.9675	21.6	25.4	19.3	21.6	25.4	19.3
FW05 01	9.9554	21.6	25.4	19.3	21.6	25.4	19.3
FW05 02	10.1470	21.6	25.4	19.3	21.6	25.4	19.3
FW05 03	10.0816	21.6	25.4	19.3	21.6	25.4	19.3
FW05 04	9.7447	21.6	25.4	19.3	21.6	25.4	19.3
FW06 01	10.2667	21.6	25.4	19.2	21.6	25.4	19.2
FW06 02	9.7797	21.6	25.4	19.2	21.6	25.4	19.2
FW06 03	9.9557	21.6	25.4	19.2	21.6	25.4	19.2
FW06 04	9.9374	21.7	25.4	19.2	21.7	25.4	19.1
FW03 01	9.9676	21.6	25.4	19.2	21.7	25.4	19.1
FW03 02	10.0474	21.6	25.4	19.2	21.7	25.4	19.1
FW03 03	10.1903	21.7	25.4	19.1	21.7	25.4	19.1
FA8 01	10.8341	21.2	25.4	19.8	21.2	25.4	19.8
FA8 02	11.2313	21.2	25.4	19.7	21.2	25.4	19.7
FA7 01	10.7903	21.2	25.4	19.7	21.2	25.4	19.7
FA7 02	11.1023	21.2	25.4	19.8	21.2	25.4	19.7
FA6 01	10.7381	21.2	25.4	19.8	21.2	25.4	19.8
FA6 02	10.6038	21.2	25.4	19.8	21.2	25.4	19.8
FA5 02	10.6821	21.2	25.4	19.8	21.2	25.4	19.8
FW01 02	9.9550	21.3	25.4	19.8	21.3	25.4	19.8

Specimen ID Number	Elastic Modulus, [GPa] $E = \rho v_l^2 [(1 + \mu)(1 - 2\mu)] / (1 - \mu)$	Room Temperature (Deg C)	Atmospheric Pressure (in Hg)	Room Humidity (%)	Room Temperature (Deg C)	Atmospheric Pressure (in Hg)	Room Humidity (%)
FW01 03	10.0758	21.3	25.4	19.8	21.3	25.4	19.8
FW01 04	9.7105	21.3	25.4	19.8	21.3	25.4	19.8
FW01 01	10.1025	21.3	25.4	19.8	21.3	25.4	19.8
FW02 01	9.9194	21.3	25.4	19.8	21.3	25.4	19.8
FW02 02	9.9917	21.2	25.4	19.8	21.2	25.4	19.8
FW02 03	10.2418	21.2	25.4	19.8	21.2	25.4	19.8
FW02 04	9.5653	21.2	25.4	19.8	21.3	25.4	19.8
FW03 04	9.7812	21.3	25.4	19.8	21.3	25.4	19.8
FW04 01	9.8281	21.3	25.4	19.8	21.2	25.4	19.9
FW04 02	9.9844	21.2	25.4	19.9	21.2	25.4	19.9
FW04 04	10.0507	21.3	25.4	19.9	21.3	25.4	19.8

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	FW06 04	W	25.370	25.371	25.370	25.370	12.727	12.728	12.726
	FW06 02	W	25.377	25.376	25.377	25.377	12.730	12.726	12.723
	FW07 01	W	25.379	25.379	25.379	25.378	12.729	12.729	12.728
	FW06 03	W	25.377	25.378	25.374	25.375	12.730	12.728	12.727
	FW08 01	W	25.379	25.380	25.378	25.377	12.729	12.727	12.730
	FW09 01	W	25.380	25.377	25.379	25.381	12.734	12.732	12.730
	FW08 04	W	25.376	25.377	25.377	25.377	12.732	12.734	12.733
	FW07 04	W	25.377	25.377	25.376	25.379	12.733	12.732	12.733
	FW08 03	W	25.375	25.375	25.377	25.375	12.732	12.731	12.730
	FW07 03	W	25.376	25.375	25.375	25.376	12.731	12.732	12.732
	FW08 02	W	25.376	25.376	25.377	25.376	12.732	12.735	12.734
	FW09 02	W	25.377	25.378	25.377	25.376	12.730	12.731	12.731
	FW02 02	W	25.374	25.376	25.375	25.377	12.727	12.722	12.722
	FW01 02	W	25.376	25.375	25.377	25.377	12.728	12.722	12.723
	FW02 01	W	25.379	25.378	25.378	25.379	12.726	12.724	12.721
	FW02 03	W	25.376	25.376	25.377	25.375	12.722	12.721	12.723
	FW01 01	W	25.347	25.346	25.348	25.347	12.719	12.720	12.719
	FW01 03	W	25.375	25.375	25.375	25.376	12.722	12.724	12.726
	FW02 04	W	25.374	25.372	25.374	25.372	12.724	12.725	12.725
	FW01 04	W	25.384	25.375	25.373	25.387	12.729	12.721	12.725
	FW03 04	W	25.374	25.375	25.377	25.376	12.722	12.721	12.721
	FW03 01	W	25.378	25.377	25.378	25.379	12.723	12.721	12.723
	FW03 02	W	25.375	25.375	25.376	25.376	12.722	12.718	12.721
	FW03 03	W	25.377	25.377	25.376	25.375	12.725	12.720	12.723
	FW05 01	W	25.379	25.380	25.378	25.377	12.728	12.727	12.727
	FW05 02	W	25.376	25.376	25.378	25.376	12.730	12.729	12.728
	FW04 02	W	25.378	25.375	25.379	25.378	12.721	12.720	12.723
	FW05 04	W	25.376	25.375	25.373	25.375	12.726	12.724	12.726
	FW04 04	W	25.374	25.376	25.374	25.374	12.724	12.722	12.721
	FW05 03	W	25.373	25.375	25.375	25.374	12.727	12.725	12.728
	FW04 01	W	25.378	25.378	25.378	25.380	12.720	12.719	12.718
	FW06 01	W	25.382	25.379	25.378	25.381	12.726	12.724	12.727
	FW09 04	W	25.372	25.378	25.375	25.377	12.729	12.729	12.726

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm			Final Outside Diameter Measurements, mm			
			L1	L2	L3	L4	D1	D2	D3
	FW09 03	W	25.376	25.379	25.377	25.376	12.728	12.726	12.729
	FW10 02	W	25.375	25.379	25.378	25.376	12.729	12.726	12.726
	FW10 01	W	25.378	25.379	25.379	25.379	12.729	12.729	12.725

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm			Final Outside Diameter Measurements, mm			
			L1	L2	L3	L4	D1	D2	D3
	FW09 03	W	25.376	25.379	25.377	25.376	12.728	12.726	12.729
	FW10 02	W	25.375	25.379	25.378	25.376	12.729	12.726	12.726
	FW10 01	W	25.378	25.379	25.379	25.379	12.729	12.729	12.725

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
FW06 04	12.729	12.726	12.729	12.726	12.728	3.120	3.130	3.110	3.120
FW06 02	12.733	12.729	12.725	12.724	12.727	0.000	0.000	0.000	0.000
FW07 01	12.732	12.730	12.729	12.729	12.729	0.000	0.000	0.000	0.000
FW06 03	12.730	12.730	12.731	12.729	12.732	0.000	0.000	0.000	0.000
FW08 01	12.730	12.730	12.730	12.731	12.731	0.000	0.000	0.000	0.000
FW09 01	12.730	12.731	12.728	12.728	12.728	0.000	0.000	0.000	0.000
FW08 04	12.735	12.731	12.733	12.733	12.734	0.000	0.000	0.000	0.000
FW07 04	12.730	12.736	12.731	12.732	12.731	0.000	0.000	0.000	0.000
FW08 03	12.733	12.734	12.732	12.731	12.733	0.000	0.000	0.000	0.000
FW07 03	12.734	12.734	12.734	12.732	12.736	0.000	0.000	0.000	0.000
FW08 02	12.734	12.731	12.728	12.728	12.729	0.000	0.000	0.000	0.000
FW09 02	12.723	12.729	12.728	12.729	12.731	0.000	0.000	0.000	0.000
FW02 02	12.723	12.731	12.724	12.725	12.725	0.000	0.000	0.000	0.000
FW01 02	12.723	12.721	12.718	12.719	12.719	0.000	0.000	0.000	0.000
FW02 01	12.719	12.731	12.727	12.723	12.722	0.000	0.000	0.000	0.000
FW02 03	12.725	12.723	12.719	12.723	12.724	0.000	0.000	0.000	0.000
FW01 01	12.720	12.725	12.724	12.724	12.727	0.000	0.000	0.000	0.000
FW01 03	12.729	12.718	12.718	12.721	12.721	0.000	0.000	0.000	0.000
FW02 04	12.731	12.721	12.722	12.721	12.726	0.000	0.000	0.000	0.000
FW01 04	12.721	12.731	12.721	12.726	12.725	0.000	0.000	0.000	0.000
FW03 04	12.722	12.727	12.727	12.725	12.730	0.000	0.000	0.000	0.000
FW03 01	12.726	12.723	12.721	12.724	12.727	0.000	0.000	0.000	0.000
FW03 02	12.721	12.725	12.719	12.720	12.720	0.000	0.000	0.000	0.000
FW03 03	12.720	12.726	12.724	12.723	12.725	0.000	0.000	0.000	0.000
FW05 01	12.727	12.732	12.729	12.728	12.730	0.000	0.000	0.000	0.000
FW05 02	12.727	12.734	12.733	12.736	12.735	0.000	0.000	0.000	0.000
FW04 02	12.724	12.720	12.720	12.721	12.723	0.000	0.000	0.000	0.000
FW05 04	12.726	12.730	12.725	12.727	12.730	0.000	0.000	0.000	0.000
FW04 04	12.720	12.728	12.725	12.727	12.727	0.000	0.000	0.000	0.000
FW05 03	12.730	12.729	12.729	12.729	12.732	0.000	0.000	0.000	0.000
FW04 01	12.720	12.722	12.722	12.723	12.724	0.000	0.000	0.000	0.000
FW06 01	12.730	12.731	12.729	12.732	12.732	0.000	0.000	0.000	0.000
FW09 04	12.726	12.728	12.730	12.726	12.728	0.000	0.000	0.000	0.000

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
FW09 03	12.730	12.726	12.725	12.729	12.731	0.000	0.000	0.000	0.000
FW10 02	12.731	12.734	12.728	12.730	12.733	0.000	0.000	0.000	0.000
FW10 01	12.727	12.729	12.728	12.727	12.725	0.000	0.000	0.000	0.000

Specimen ID Number	Final Hole Diameter, mm		Final Hole Depth, mm		Final Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
FW06 04	3.120	3.320	3.390	3.355	5.75389	41169	12/2/2010 13:54
FW06 02	0.000	0.000	0.000	0.000	5.76575	41169	12/2/2010 14:53
FW07 01	0.000	0.000	0.000	0.000	5.76516	41169	12/2/2010 15:21
FW06 03	0.000	0.000	0.000	0.000	5.75635	41169	12/2/2010 15:31
FW08 01	0.000	0.000	0.000	0.000	5.75675	41169	12/3/2010 10:45
FW09 01	0.000	0.000	0.000	0.000	5.73846	41169	12/3/2010 11:17
FW08 04	0.000	0.000	0.000	0.000	5.74738	41169	12/3/2010 11:19
FW07 04	0.000	0.000	0.000	0.000	5.72363	41169	12/3/2010 11:23
FW08 03	0.000	0.000	0.000	0.000	5.78826	41169	12/3/2010 11:27
FW07 03	0.000	0.000	0.000	0.000	5.77145	41169	12/3/2010 11:29
FW08 02	0.000	0.000	0.000	0.000	5.74645	41169	12/3/2010 11:36
FW09 02	0.000	0.000	0.000	0.000	5.74104	41169	12/3/2010 11:38
FW02 02	0.000	0.000	0.000	0.000	5.77295	41169	12/3/2010 14:06
FW01 02	0.000	0.000	0.000	0.000	5.78475	41169	12/3/2010 14:10
FW02 01	0.000	0.000	0.000	0.000	5.76431	41169	12/3/2010 14:28
FW02 03	0.000	0.000	0.000	0.000	5.74178	41169	12/3/2010 15:23
FW01 01	0.000	0.000	0.000	0.000	5.74425	41169	12/3/2010 15:27
FW01 03	0.000	0.000	0.000	0.000	5.75175	41169	12/3/2010 15:31
FW02 04	0.000	0.000	0.000	0.000	5.71472	41169	12/3/2010 15:32
FW01 04	0.000	0.000	0.000	0.000	5.75752	41169	12/4/2010 7:31
FW03 04	0.000	0.000	0.000	0.000	5.70484	41169	12/4/2010 9:06
FW03 01	0.000	0.000	0.000	0.000	5.75191	41169	12/4/2010 9:49
FW03 02	0.000	0.000	0.000	0.000	5.76919	41169	12/4/2010 10:04
FW03 03	0.000	0.000	0.000	0.000	5.74628	41169	12/4/2010 10:09
FW05 01	0.000	0.000	0.000	0.000	5.77158	41169	12/4/2010 11:10
FW05 02	0.000	0.000	0.000	0.000	5.79711	41169	12/4/2010 11:12
FW04 02	0.000	0.000	0.000	0.000	5.76729	41169	12/4/2010 11:16
FW05 04	0.000	0.000	0.000	0.000	5.73752	41169	12/4/2010 11:19
FW04 04	0.000	0.000	0.000	0.000	5.74130	41169	12/4/2010 11:30
FW05 03	0.000	0.000	0.000	0.000	5.77479	41169	12/4/2010 12:54
FW04 01	0.000	0.000	0.000	0.000	5.73655	41169	12/4/2010 12:59
FW06 01	0.000	0.000	0.000	0.000	5.74699	41169	12/4/2010 13:22
FW09 04	0.000	0.000	0.000	0.000	5.75257	47735	12/4/2010 14:14

Specimen ID Number	Final Hole Diameter, mm	HD1	HD2	Final Hole Depth, mm	Final Specimen Mass, g	Measurements by:	Date: mm/dd/yr
FW09 03	0.000	0.000	0.000	0.000	5.75611	41169	12/4/2010 14:51
FW10 02	0.000	0.000	0.000	0.000	5.78266	41169	12/4/2010 15:00
FW10 01	0.000	0.000	0.000	0.000	5.77579	41169	12/4/2010 15:07

Specimen ID Number	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m	Total Hole Volume m ³	Final Specimen Mass kg
FW06 04	25.37025	12.72738	127.2236	0.025370	0.01273	5.1299E-08	0.0058
FW06 02	25.37675	12.72713	127.2186	0.025377	0.01273	0.0000E+00	0.0058
FW07 01	25.37875	12.72938	127.2636	0.025379	0.01273	0.0000E+00	0.0058
FW06 03	25.37600	12.72963	127.2686	0.025376	0.01273	0.0000E+00	0.0058
FW08 01	25.37850	12.72975	127.2711	0.025379	0.01273	0.0000E+00	0.0058
FW09 01	25.37925	12.73013	127.2785	0.025379	0.01273	0.0000E+00	0.0057
FW08 04	25.37675	12.73313	127.3385	0.025377	0.01273	0.0000E+00	0.0057
FW07 04	25.37725	12.73225	127.3210	0.025377	0.01273	0.0000E+00	0.0057
FW08 03	25.37550	12.73200	127.3160	0.025376	0.01273	0.0000E+00	0.0058
FW07 03	25.37550	12.73313	127.3385	0.025376	0.01273	0.0000E+00	0.0058
FW08 02	25.37625	12.73138	127.3035	0.025376	0.01273	0.0000E+00	0.0057
FW09 02	25.37700	12.73038	127.2835	0.025377	0.01273	0.0000E+00	0.0057
FW02 02	25.37550	12.72488	127.1736	0.025376	0.01272	0.0000E+00	0.0058
FW01 02	25.37625	12.72163	127.1086	0.025376	0.01272	0.0000E+00	0.0058
FW02 01	25.37850	12.72413	127.1586	0.025379	0.01272	0.0000E+00	0.0058
FW02 03	25.37600	12.72250	127.1261	0.025376	0.01272	0.0000E+00	0.0057
FW01 01	25.34700	12.72225	127.1211	0.025347	0.01272	0.0000E+00	0.0057
FW01 03	25.37525	12.72238	127.1236	0.025375	0.01272	0.0000E+00	0.0058
FW02 04	25.37300	12.72438	127.1636	0.025373	0.01272	0.0000E+00	0.0057
FW01 04	25.37975	12.72488	127.1736	0.025380	0.01272	0.0000E+00	0.0058
FW03 04	25.37550	12.72438	127.1636	0.025376	0.01272	0.0000E+00	0.0057
FW03 01	25.37800	12.72350	127.1461	0.025378	0.01272	0.0000E+00	0.0058
FW03 02	25.37550	12.72075	127.0912	0.025376	0.01272	0.0000E+00	0.0058
FW03 03	25.37625	12.72325	127.1411	0.025376	0.01272	0.0000E+00	0.0057
FW05 01	25.37850	12.72850	127.2461	0.025379	0.01273	0.0000E+00	0.0058
FW05 02	25.37650	12.73150	127.3060	0.025377	0.01273	0.0000E+00	0.0058
FW04 02	25.37750	12.72150	127.1061	0.025378	0.01272	0.0000E+00	0.0058
FW05 04	25.37475	12.72675	127.2111	0.025375	0.01273	0.0000E+00	0.0057
FW04 04	25.37450	12.72425	127.1611	0.025375	0.01272	0.0000E+00	0.0057
FW05 03	25.37425	12.72863	127.2486	0.025374	0.01273	0.0000E+00	0.0058
FW04 01	25.37850	12.72100	127.0961	0.025379	0.01272	0.0000E+00	0.0057
FW06 01	25.38000	12.72888	127.2536	0.025380	0.01273	0.0000E+00	0.0057
FW09 04	25.37550	12.72775	127.2311	0.025376	0.01273	0.0000E+00	0.0058

Specimen ID Number	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m	Total Hole Volume m ³	Final Specimen Mass kg
FW09 03	25.37700	12.72800	127.2361	0.025377	0.01273	0.0000E+00	0.0058
FW10 02	25.37700	12.72963	127.2686	0.025377	0.01273	0.0000E+00	0.0058
FW10 01	25.37875	12.72738	127.2236	0.025379	0.01273	0.0000E+00	0.0058

Specimen ID Number	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
FW06 04	25.2	24.1	16.6
FW06 02	25.2	23.7	17.3
FW07 01	25.2	23.7	17.3
FW06 03	25.2	23.9	17.4
FW08 01	25.3	23.3	20.3
FW09 01	25.3	23.3	20.1
FW08 04	25.3	23.2	20.2
FW07 04	25.3	23.2	20.2
FW08 03	25.3	23.2	20.2
FW07 03	25.3	23.2	20.2
FW08 02	25.3	23.2	20.1
FW09 02	25.3	23.2	20.1
FW02 02	25.3	22.9	19.5
FW01 02	25.3	22.8	19.5
FW02 01	25.3	22.8	19.5
FW02 03	25.3	22.6	19.9
FW01 01	25.3	22.6	19.8
FW01 03	25.3	22.7	19.7
FW02 04	25.3	22.7	19.6
FW01 04	25.4	22.2	13.4
FW03 04	25.4	22.5	12.9
FW03 01	25.4	22.4	12.8
FW03 02	25.4	22.2	12.9
FW03 03	25.4	22.2	12.9
FW05 01	25.4	21.9	13.1
FW05 02	25.4	21.9	13.1
FW04 02	25.4	22	13.1
FW05 04	25.4	22	13.1
FW04 04	25.4	22.1	13.2
FW05 03	25.4	22.2	13.8
FW04 01	25.4	22.3	13.8
FW06 01	25.4	22.5	13.9
FW09 04	25.4	22.2	17.4

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
FW09 03	25.4	22.7	14.7
FW10 02	25.4	22.8	14.7
FW10 01	25.4	22.9	14.7

Graphite Grade: NBG-17
Graphite Manufacturer: SGL Carbon Company
Forming Process: Vibration molded
Coke Particle Size: Medium grain
Coke Type: Pitch coke filler, pitch binder
ASTM Class: MNHP
Specimen Geometry: Cylinder

Specimen ID #'s:

AL1 01
AL1 02
AL1 03
AL2 01
AL2 02
AL2 03
AL3 01
AL3 02
AL3 03
AL4 01
AL4 02
AL4 03
AL5 01
AL5 02
AL5 03
AL6 01
AL6 02
AL6 03
AL7 01
AL7 02
AL7 03
AL8 01
AL8 02
AL8 03
AL9 01
AL9 02
AL9 03
AL10 01
AL10 02
AL10 03
AL11 01
AL11 02
AL11 03
AL12 01
AL12 02
AL12 03
AL13 01
AL13 02
AL13 03
AP1 01
AP1 02
AP1 03

Specimen ID #'s:

AP2 01
AP2 02
AP2 03
AP3 01
AP3 02
AP3 03
AP4 01
AP4 02
AP4 03
AP5 01
AP5 02
AP5 03
AP6 01
AP6 02
AP6 03
AW1 01
AW1 02
AW1 03
AW10 01
AW10 02
AW10 03
AW11 01
AW11 02
AW11 03
AW12 01
AW12 02
AW12 03
AW13 01
AW13 02
AW13 03
AW14 01
AW14 02
AW14 03
AW15 01
AW15 02
AW15 03
AW16 01
AW16 02
AW16 03
AW2 01
AW2 02
AW2 03
AW3 01
AW3 02
AW3 03
AW4 01
AW4 02
AW4 03
AW5 01
AW5 02
AW5 03

Specimen ID #'s:

AW6 01

AW6 02

AW6 03

AW7 01

AW7 02

AW7 03

AW8 01

AW8 02

AW8 03

AW9 01

AW9 02

AW9 03

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	AL5 03	L	25.379	25.380	25.381	25.382	12.733	12.732	12.730
	AL6 03	L	25.384	25.383	25.383	25.383	12.734	12.732	12.732
	AL3 03	L	25.376	25.377	25.379	25.378	12.731	12.731	12.728
	AL2 01	L	25.376	25.378	25.379	25.377	12.729	12.727	12.726
	AL9 01	L	25.376	25.375	25.378	25.379	12.732	12.732	12.732
	AL1 03	L	25.376	25.375	25.378	25.379	12.727	12.724	12.723
	AL8 01	L	25.374	25.376	25.376	25.377	12.731	12.728	12.726
	AL5 01	L	25.380	25.382	25.379	25.382	12.733	12.730	12.731
	AL11 03	L	25.378	25.380	25.384	25.382	12.732	12.733	12.731
	AL6 02	L	25.381	25.381	25.382	25.383	12.732	12.732	12.730
	AL12 03	L	25.380	25.380	25.381	25.381	12.733	12.735	12.734
	AL3 01	L	25.380	25.380	25.380	25.379	12.726	12.723	12.724
	AL11 01	L	25.380	25.378	25.380	25.381	12.735	12.737	12.735
	AL9 03	L	25.377	25.376	25.375	25.378	12.732	12.734	12.731
	AL8 02	L	25.376	25.377	25.374	25.376	12.734	12.732	12.730
	AL1 02	L	25.375	25.378	25.373	25.375	12.728	12.727	12.726
	AL6 01	L	25.383	25.382	25.384	25.384	12.734	12.732	12.731
	AW16 01	W	25.374	25.376	25.377	25.375	12.729	12.728	12.727
	AW14 03	W	25.370	25.371	25.371	25.371	12.734	12.736	12.734
	AW4 01	W	25.378	25.376	25.375	25.377	12.728	12.726	12.726
	AW9 02	W	25.378	25.380	25.378	25.380	12.733	12.730	12.728
	AW6 01	W	25.379	25.379	25.379	25.378	12.725	12.724	12.723
	AW10 03	W	25.382	25.379	25.381	25.377	12.724	12.726	12.724
	AW6 03	W	25.375	25.379	25.377	25.377	12.721	12.724	12.723
	AW7 02	W	25.378	25.378	25.377	25.375	12.722	12.722	12.724
	AW1 01	W	25.370	25.372	25.374	25.372	12.736	12.735	12.733
	AW12 03	W	25.360	25.359	25.360	25.359	12.731	12.729	12.727
	AW8 03	W	25.378	25.379	25.379	25.379	12.733	12.735	12.733
	AW15 02	W	25.376	25.373	25.374	25.376	12.737	12.736	12.734
	AW12 01	W	25.386	25.388	25.387	25.387	12.735	12.731	12.730
	AW5 03	W	25.381	25.378	25.379	25.378	12.727	12.730	12.730
	AW11 03	W	25.383	25.386	25.386	25.385	12.733	12.733	12.732
	AW3 01	W	25.378	25.377	25.381	25.381	12.733	12.732	12.730

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	AW9 03	W	25.380	25.381	25.379	25.378	12.725	12.724	12.723
	AW6 02	W	25.380	25.379	25.381	25.379	12.724	12.725	12.723
	AW5 02	W	25.376	25.379	25.378	25.379	12.732	12.732	12.730
	AW9 01	W	25.380	25.381	25.383	25.383	12.734	12.731	12.730
	AW11 01	W	25.384	25.383	25.384	25.384	12.733	12.731	12.729
	AW1 02	W	25.375	25.374	25.374	25.376	12.733	12.732	12.733
	AW10 01	W	25.382	25.383	25.382	25.381	12.730	12.729	12.726
	AW15 01	W	25.375	25.374	25.376	25.375	12.735	12.735	12.733
	AW8 02	W	25.377	25.378	25.379	25.377	12.731	12.730	12.729
	AW7 01	W	25.379	25.382	25.381	25.381	12.728	12.726	12.726
	AW14 01	W	25.372	25.374	25.373	25.374	12.737	12.735	12.735
	AW4 03	W	25.378	25.378	25.377	25.378	12.729	12.730	12.729
	AW8 01	W	25.378	25.379	25.382	25.382	12.730	12.729	12.728
	AW3 02	W	25.375	25.377	25.377	25.374	12.727	12.727	12.727
	AW7 03	W	25.379	25.378	25.380	25.380	12.725	12.725	12.723
	AW4 02	W	25.376	25.377	25.378	25.376	12.733	12.731	12.729
	AW14 02	W	25.373	25.373	25.373	25.373	12.735	12.735	12.733
	AW13 02	W	25.374	25.372	25.375	25.373	12.739	12.739	12.734
	AW16 03	W	25.376	25.377	25.376	25.375	12.732	12.731	12.730
	AW13 01	W	25.373	25.374	25.372	25.374	12.735	12.734	12.733
	AW15 03	W	25.375	25.376	25.375	25.373	12.737	12.736	12.734
	AW5 01	W	25.380	25.378	25.381	25.382	12.729	12.731	12.728
	AW10 02	W	25.380	25.383	25.380	25.380	12.728	12.728	12.727
	AW12 02	W	25.382	25.382	25.383	25.384	12.732	12.732	12.728
	AW1 03	W	25.372	25.372	25.374	25.374	12.726	12.728	12.730
	AW11 02	W	25.380	25.380	25.379	25.381	12.729	12.727	12.726
	AW2 03	W	25.374	25.374	25.373	25.374	12.726	12.726	12.728
	AW13 03	W	25.369	25.370	25.370	25.369	12.735	12.736	12.734
	AW16 02	W	25.371	25.375	25.375	25.373	12.731	12.729	12.729
	AW2 01	W	25.374	25.375	25.376	25.374	12.729	12.726	12.727
	AW2 02	W	25.372	25.373	25.374	25.373	12.728	12.727	12.725
	AW3 03	W	25.375	25.374	25.373	25.374	12.730	12.730	12.731
	AP5 01	P	25.368	25.369	25.370	25.369	12.732	12.731	12.731
	AP1 02	P	25.372	25.373	25.374	25.374	12.733	12.733	12.731

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	AP2 02	P	25.365	25.364	25.366	25.365	12.738	12.741	12.740
	AP5 02	P	25.367	25.366	25.366	25.365	12.734	12.734	12.734
	AP1 01	P	25.398	25.399	25.398	25.397	12.729	12.730	12.730
	AP5 03	P	25.368	25.367	25.367	25.369	12.732	12.736	12.735
	AP2 03	P	25.380	25.381	25.379	25.380	12.736	12.736	12.735
	AP4 01	P	25.381	25.382	25.382	25.381	12.730	12.730	12.730
	AP2 01	P	25.378	25.380	25.380	25.380	12.729	12.729	12.728
	AP3 03	P	25.379	25.379	25.379	25.379	12.741	12.741	12.738
	AP6 03	P	25.369	25.371	25.370	25.371	12.743	12.743	12.743
	AP4 02	P	25.367	25.368	25.368	25.369	12.732	12.735	12.733
	AP6 01	P	25.370	25.370	25.369	25.371	12.736	12.736	12.736
	AP3 01	P	25.383	25.382	25.382	25.382	12.742	12.740	12.739
	AP1 03	P	25.378	25.380	25.381	25.379	12.733	12.732	12.731
	AP6 02	P	25.370	25.371	25.370	25.371	12.738	12.740	12.740
	AP4 03	P	25.367	25.368	25.368	25.369	12.733	12.733	12.733
	AP3 02	P	25.383	25.383	25.380	25.380	12.742	12.742	12.740
	AL9 02	L	25.376	25.375	25.374	25.376	12.731	12.730	12.729
	AL13 01	L	25.379	25.381	25.380	25.382	12.733	12.735	12.736
	AL7 03	L	25.373	25.375	25.373	25.372	12.732	12.734	12.734
	AL4 02	L	25.367	25.366	25.368	25.368	12.731	12.730	12.728
	AL13 03	L	25.383	25.382	25.384	25.380	12.737	12.737	12.736
	AL10 03	L	25.378	25.379	25.379	25.377	12.736	12.736	12.734
	AL8 03	L	25.371	25.374	25.374	25.373	12.733	12.732	12.731
	AL13 02	L	25.378	25.381	25.381	25.382	12.738	12.738	12.738
	AL2 03	L	25.376	25.375	25.374	25.373	12.727	12.725	12.723
	AL10 01	L	25.376	25.378	25.376	25.377	12.729	12.732	12.733
	AL12 02	L	25.379	25.380	25.379	25.378	12.732	12.734	12.733
	AL5 02	L	25.378	25.378	25.379	25.377	12.730	12.730	12.727
	AL10 02	L	25.374	25.377	25.376	25.376	12.734	12.734	12.734
	AL3 02	L	25.377	25.377	25.378	25.377	12.730	12.728	12.726
	AL7 02	L	25.381	25.379	25.382	25.381	12.733	12.734	12.731
	AL11 02	L	25.379	25.378	25.377	25.379	12.733	12.736	12.736
	AL7 01	L	25.382	25.382	25.381	25.382	12.737	12.734	12.733
	AL2 02	L	25.375	25.376	25.377	25.376	12.723	12.722	12.721

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	AL12 01	L	25.381	25.381	25.381	25.383	12.734	12.733	12.734
	AL4 03	L	25.381	25.380	25.381	25.378	12.731	12.731	12.729
	AL4 01	L	25.379	25.380	25.380	25.378	12.732	12.730	12.728
	AL1 01	L	25.366	25.366	25.368	25.365	12.726	12.725	12.722

Specimen ID Number	D4 ⁹⁰								H1	H1'	H2	H2'
	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	D4 ⁹⁰	D4 ⁹⁰	D4 ⁹⁰				
AL5 03	12.728	12.737	12.733	12.732	12.730	12.730	12.730	12.730	3.150	3.150	3.180	3.190
AL6 03	12.728	12.738	12.737	12.735	12.731	12.731	12.731	12.731	3.150	3.160	3.180	3.180
AL3 03	12.726	12.730	12.731	12.727	12.725	12.725	12.725	12.725	3.160	3.160	3.180	3.190
AL2 01	12.722	12.728	12.724	12.724	12.724	12.724	12.724	12.724	3.170	3.150	3.170	3.170
AL9 01	12.731	12.734	12.732	12.731	12.730	12.730	12.730	12.730	3.170	3.150	3.180	3.170
AL1 03	12.721	12.730	12.729	12.728	12.728	12.728	12.728	12.728	3.150	3.160	3.180	3.180
AL8 01	12.724	12.732	12.728	12.728	12.730	12.728	12.728	12.728	3.180	3.180	3.160	3.180
AL5 01	12.726	12.731	12.730	12.728	12.731	12.730	12.728	12.726	3.150	3.160	3.170	3.170
AL11 03	12.733	12.731	12.732	12.732	12.732	12.732	12.732	12.731	3.150	3.150	3.180	3.170
AL6 02	12.727	12.736	12.735	12.731	12.735	12.735	12.731	12.729	3.170	3.150	3.170	3.170
AL12 03	12.735	12.735	12.736	12.736	12.735	12.736	12.736	12.735	3.150	3.150	3.180	3.180
AL3 01	12.721	12.730	12.728	12.727	12.728	12.728	12.727	12.726	3.150	3.150	3.180	3.180
AL11 01	12.736	12.734	12.735	12.736	12.735	12.735	12.736	12.734	3.170	3.150	3.180	3.180
AL9 03	12.731	12.732	12.733	12.729	12.733	12.733	12.729	12.729	3.150	3.150	3.180	3.180
AL8 02	12.728	12.732	12.729	12.728	12.729	12.729	12.728	12.727	3.160	3.160	3.180	3.190
AL1 02	12.724	12.725	12.726	12.722	12.725	12.726	12.722	12.722	3.150	3.150	3.180	3.180
AL6 01	12.725	12.734	12.732	12.731	12.732	12.732	12.731	12.727	3.150	3.150	3.170	3.180
AW16 01	12.724	12.733	12.731	12.729	12.731	12.731	12.729	12.722	3.150	3.150	3.190	3.180
AW14 03	12.731	12.736	12.735	12.734	12.735	12.735	12.734	12.730	3.150	3.150	3.180	3.170
AW4 01	12.722	12.730	12.728	12.728	12.728	12.728	12.728	12.726	3.170	3.170	3.180	3.190
AW9 02	12.727	12.736	12.735	12.733	12.735	12.733	12.733	12.732	3.150	3.150	3.180	3.180
AW6 01	12.720	12.724	12.722	12.721	12.722	12.722	12.721	12.719	3.160	3.150	3.170	3.170
AW10 03	12.723	12.729	12.727	12.727	12.727	12.727	12.727	12.723	3.150	3.160	3.180	3.150
AW6 03	12.719	12.722	12.722	12.721	12.722	12.722	12.721	12.719	3.170	3.160	3.170	3.170
AW7 02	12.725	12.721	12.722	12.725	12.722	12.722	12.725	12.725	3.170	3.180	3.160	3.150
AW1 01	12.732	12.733	12.732	12.731	12.732	12.732	12.731	12.729	3.150	3.150	3.170	3.170
AW12 03	12.725	12.735	12.732	12.730	12.732	12.732	12.730	12.729	3.160	3.150	3.180	3.180
AW8 03	12.729	12.732	12.731	12.729	12.731	12.729	12.729	12.726	3.160	3.160	3.170	3.180
AW15 02	12.732	12.740	12.739	12.738	12.739	12.738	12.738	12.734	3.150	3.150	3.180	3.180
AW12 01	12.728	12.732	12.730	12.728	12.730	12.728	12.728	12.726	3.150	3.170	3.180	3.180
AW5 03	12.732	12.724	12.728	12.729	12.728	12.728	12.729	12.730	3.180	3.180	3.160	3.160
AW11 03	12.728	12.735	12.734	12.732	12.734	12.732	12.732	12.728	3.150	3.150	3.170	3.180
AW3 01	12.728	12.729	12.729	12.728	12.729	12.729	12.728	12.724	3.150	3.170	3.180	3.170

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
AW9 03	12.721	12.728	12.727	12.726	12.723	3.160	3.170	3.170	3.190
AW6 02	12.721	12.728	12.728	12.725	12.723	3.150	3.150	3.170	3.170
AW5 02	12.725	12.731	12.729	12.728	12.726	3.160	3.150	3.170	3.160
AW9 01	12.728	12.736	12.736	12.734	12.731	3.150	3.150	3.170	3.170
AW11 01	12.726	12.729	12.727	12.726	12.724	3.160	3.150	3.170	3.160
AW1 02	12.730	12.731	12.731	12.730	12.728	3.160	3.160	3.180	3.180
AW10 01	12.725	12.729	12.727	12.724	12.722	3.150	3.150	3.180	3.160
AW15 01	12.732	12.738	12.735	12.734	12.732	3.150	3.150	3.180	3.180
AW8 02	12.725	12.732	12.731	12.730	12.728	3.160	3.160	3.180	3.170
AW7 01	12.722	12.724	12.723	12.721	12.720	3.170	3.180	3.190	3.170
AW14 01	12.731	12.739	12.738	12.735	12.732	3.170	3.160	3.190	3.160
AW4 03	12.725	12.731	12.730	12.727	12.725	3.170	3.160	3.190	3.180
AW8 01	12.725	12.729	12.727	12.725	12.723	3.150	3.150	3.180	3.170
AW3 02	12.725	12.732	12.731	12.729	12.726	3.170	3.160	3.180	3.170
AW7 03	12.720	12.727	12.727	12.723	12.720	3.170	3.150	3.180	3.180
AW4 02	12.726	12.728	12.728	12.727	12.726	3.160	3.160	3.190	3.180
AW14 02	12.729	12.739	12.738	12.736	12.733	3.150	3.150	3.170	3.170
AW13 02	12.732	12.735	12.733	12.733	12.729	3.150	3.160	3.180	3.180
AW16 03	12.726	12.735	12.734	12.733	12.729	3.150	3.170	3.180	3.170
AW13 01	12.730	12.736	12.733	12.732	12.728	3.150	3.150	3.180	3.180
AW15 03	12.732	12.740	12.739	12.736	12.733	3.170	3.150	3.180	3.180
AW5 01	12.725	12.729	12.729	12.729	12.726	3.150	3.160	3.180	3.180
AW10 02	12.722	12.730	12.726	12.725	12.722	3.160	3.150	3.190	3.190
AW12 02	12.726	12.731	12.729	12.727	12.724	3.150	3.150	3.180	3.170
AW1 03	12.729	12.727	12.727	12.730	12.729	3.170	3.180	3.150	3.150
AW11 02	12.723	12.731	12.730	12.729	12.725	3.150	3.160	3.170	3.170
AW2 03	12.729	12.727	12.729	12.730	12.733	3.180	3.180	3.150	3.160
AW13 03	12.731	12.738	12.735	12.735	12.732	3.150	3.160	3.170	3.170
AW16 02	12.725	12.730	12.729	12.727	12.725	3.150	3.160	3.170	3.170
AW2 01	12.723	12.728	12.727	12.725	12.721	3.150	3.170	3.170	3.170
AW2 02	12.724	12.728	12.728	12.728	12.726	3.160	3.150	3.180	3.180
AW3 03	12.727	12.726	12.727	12.727	12.724	3.150	3.160	3.160	3.170
AP5 01	12.729	12.734	12.734	12.733	12.731	3.220	3.210	3.170	3.170
AP1 02	12.729	12.730	12.730	12.729	12.727	3.220	3.190	3.190	3.180

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰				
						H1	H1'	H2	H2'
AP2 02	12.738	12.738	12.738	12.738	12.736	3.240	3.240	3.170	3.180
AP5 02	12.731	12.734	12.734	12.735	12.729	3.220	3.230	3.180	3.190
AP1 01	12.731	12.728	12.730	12.732	12.732	3.220	3.190	3.200	3.200
AP5 03	12.734	12.734	12.734	12.732	12.730	3.210	3.220	3.160	3.180
AP2 03	12.733	12.739	12.738	12.735	12.734	3.220	3.220	3.170	3.170
AP4 01	12.728	12.728	12.729	12.728	12.726	3.230	3.220	3.170	3.180
AP2 01	12.726	12.731	12.731	12.729	12.728	3.230	3.210	3.180	3.180
AP3 03	12.736	12.740	12.741	12.740	12.738	3.210	3.220	3.160	3.170
AP6 03	12.738	12.745	12.746	12.744	12.742	3.220	3.220	3.170	3.180
AP4 02	12.731	12.732	12.733	12.732	12.729	3.210	3.200	3.170	3.160
AP6 01	12.735	12.738	12.738	12.738	12.737	3.220	3.220	3.180	3.170
AP3 01	12.737	12.739	12.738	12.736	12.735	3.210	3.200	3.160	3.170
AP1 03	12.730	12.731	12.731	12.731	12.729	3.230	3.210	3.180	3.180
AP6 02	12.737	12.740	12.743	12.741	12.738	3.210	3.220	3.170	3.160
AP4 03	12.731	12.734	12.734	12.731	12.729	3.210	3.220	3.170	3.160
AP3 02	12.738	12.742	12.740	12.738	12.737	3.220	3.220	3.170	3.180
AL9 02	12.729	12.732	12.731	12.730	12.729	3.150	3.150	3.180	3.170
AL13 01	12.736	12.733	12.734	12.734	12.734	3.150	3.150	3.180	3.180
AL7 03	12.729	12.733	12.734	12.733	12.730	3.150	3.160	3.160	3.170
AL4 02	12.725	12.730	12.729	12.727	12.726	3.140	3.140	3.170	3.170
AL13 03	12.734	12.738	12.737	12.739	12.738	3.150	3.150	3.150	3.180
AL10 03	12.734	12.733	12.732	12.733	12.731	3.150	3.150	3.180	3.170
AL8 03	12.727	12.730	12.728	12.728	12.727	3.160	3.160	3.180	3.170
AL13 02	12.737	12.736	12.735	12.735	12.734	3.150	3.160	3.180	3.170
AL2 03	12.721	12.724	12.723	12.722	12.719	3.150	3.150	3.180	3.190
AL10 01	12.730	12.732	12.733	12.733	12.733	3.150	3.150	3.180	3.180
AL12 02	12.731	12.731	12.732	12.732	12.731	3.150	3.160	3.170	3.180
AL5 02	12.724	12.732	12.730	12.728	12.725	3.160	3.150	3.180	3.180
AL10 02	12.732	12.731	12.732	12.734	12.730	3.150	3.150	3.180	3.170
AL3 02	12.724	12.729	12.727	12.727	12.725	3.150	3.170	3.180	3.180
AL7 02	12.729	12.735	12.735	12.732	12.730	3.150	3.170	3.180	3.190
AL11 02	12.734	12.735	12.735	12.736	12.735	3.140	3.160	3.190	3.170
AL7 01	12.730	12.734	12.732	12.731	12.730	3.160	3.160	3.180	3.190
AL2 02	12.719	12.728	12.726	12.725	12.720	3.150	3.150	3.170	3.170

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
AL5 03	3.168	3.370	3.370	3.370	5.75639	JL	6/22/2009 13:23
AL6 03	3.168	3.360	3.370	3.365	5.73975	JL	6/22/2009 13:27
AL3 03	3.173	3.360	3.360	3.360	5.77566	JL	6/22/2009 13:30
AL2 01	3.165	3.360	3.360	3.360	5.76260	JL	6/22/2009 14:24
AL9 01	3.168	3.360	3.360	3.360	5.91106	JL	6/22/2009 14:27
AL1 03	3.168	3.360	3.360	3.360	5.75601	JL	6/22/2009 14:31
AL8 01	3.175	3.360	3.360	3.360	5.90036	JL	6/22/2009 14:34
AL5 01	3.163	3.370	3.370	3.370	5.75427	JL	6/22/2009 14:37
AL11 03	3.163	3.360	3.360	3.360	5.90286	JL	6/22/2009 14:42
AL6 02	3.165	3.370	3.370	3.370	5.74842	JL	6/22/2009 14:44
AL12 03	3.165	3.360	3.370	3.365	5.89940	JL	6/22/2009 14:48
AL3 01	3.165	3.370	3.370	3.370	5.76753	JL	6/22/2009 14:50
AL11 01	3.170	3.360	3.370	3.365	5.90328	JL	6/22/2009 14:54
AL9 03	3.165	3.360	3.360	3.360	5.91378	JL	6/22/2009 15:04
AL8 02	3.173	3.370	3.360	3.365	5.91700	JL	6/22/2009 15:07
AL1 02	3.165	3.360	3.360	3.360	5.76477	JL	6/22/2009 15:10
AL6 01	3.163	3.350	3.360	3.355	5.74431	JL	6/22/2009 15:13
AW16 01	3.168	3.370	3.360	3.365	5.80901	jl	6/9/2009 8:30
AW14 03	3.163	3.370	3.360	3.365	5.92529	jl	6/9/2009 8:35
AW4 01	3.178	3.360	3.340	3.350	5.78871	jl	6/9/2009 8:40
AW9 02	3.165	3.370	3.350	3.360	5.91402	jl	6/9/2009 8:48
AW6 01	3.163	3.360	3.340	3.350	5.78877	jl	6/9/2009 8:58
AW10 03	3.160	3.370	3.350	3.360	5.92145	jl	6/9/2009 9:05
AW6 03	3.168	3.360	3.350	3.355	5.92399	jl	6/9/2009 9:09
AW7 02	3.165	3.350	3.370	3.360	5.90903	jl	6/9/2009 9:15
AW1 01	3.160	3.310	3.340	3.325	5.80789	jl	6/9/2009 9:48
AW12 03	3.168	3.340	3.340	3.340	5.92055	jl	6/9/2009 9:55
AW8 03	3.168	3.370	3.360	3.365	5.92615	jl	6/9/2009 10:00
AW15 02	3.165	3.360	3.360	3.360	5.92526	jl	6/9/2009 10:06
AW12 01	3.170	3.360	3.350	3.355	5.81111	jl	6/9/2009 10:12
AW5 03	3.170	3.350	3.370	3.360	5.92589	jl	6/9/2009 10:16
AW11 03	3.163	3.370	3.350	3.360	5.92431	jl	6/9/2009 10:21
AW3 01	3.168	3.360	3.350	3.355	5.78829	jl	6/9/2009 10:36

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
AW9 03	3.173	3.370	3.350	3.360	5.92029	jl	6/9/2009 10:41
AW6 02	3.160	3.360	3.350	3.355	5.90889	JL	6/9/2009 13:28
AW5 02	3.160	3.360	3.350	3.355	5.90611	JL	6/9/2009 13:33
AW9 01	3.160	3.360	3.350	3.355	5.80797	JL	6/9/2009 13:38
AW11 01	3.160	3.370	3.350	3.360	5.80322	JL	6/9/2009 13:42
AW1 02	3.170	3.350	3.350	3.350	5.90997	JL	6/9/2009 13:47
AW10 01	3.160	3.370	3.340	3.355	5.80227	JL	6/9/2009 13:52
AW15 01	3.165	3.360	3.360	3.360	5.81201	JL	6/9/2009 14:00
AW8 02	3.168	3.370	3.340	3.355	5.91449	JL	6/9/2009 14:05
AW7 01	3.178	3.370	3.350	3.360	5.80170	JL	6/9/2009 14:10
AW14 01	3.170	3.340	3.360	3.350	5.80061	JL	6/9/2009 14:14
AW4 03	3.175	3.370	3.350	3.360	5.92505	JL	6/9/2009 14:19
AW8 01	3.163	3.370	3.350	3.360	5.79587	JL	6/9/2009 14:40
AW3 02	3.170	3.350	3.340	3.345	5.90875	JL	6/9/2009 14:45
AW7 03	3.170	3.370	3.350	3.360	5.91823	JL	6/9/2009 14:49
AW4 02	3.173	3.360	3.350	3.355	5.90722	JL	6/9/2009 14:52
AW14 02	3.160	3.360	3.350	3.355	5.92187	JL	6/9/2009 14:56
AW13 02	3.168	3.360	3.360	3.360	5.91739	JL	6/9/2009 15:00
AW16 03	3.168	3.360	3.360	3.360	5.92625	JL	6/9/2009 15:05
AW13 01	3.165	3.360	3.370	3.365	5.79810	JL	6/9/2009 15:08
AW15 03	3.170	3.360	3.360	3.360	5.93477	JL	6/9/2009 15:16
AW5 01	3.168	3.360	3.350	3.355	5.78876	JL	6/9/2009 15:20
AW10 02	3.173	3.370	3.350	3.360	5.90520	JL	6/9/2009 15:24
AW12 02	3.163	3.370	3.360	3.365	5.91122	jl	6/10/2009 9:38
AW1 03	3.163	3.340	3.350	3.345	5.93092	jl	6/10/2009 9:42
AW11 02	3.163	3.370	3.360	3.365	5.91182	jl	6/10/2009 9:48
AW2 03	3.168	3.350	3.350	3.350	5.92958	jl	6/10/2009 9:53
AW13 03	3.163	3.350	3.350	3.350	5.93250	jl	6/10/2009 11:00
AW16 02	3.163	3.370	3.360	3.365	5.91792	jl	6/10/2009 11:04
AW2 01	3.165	3.350	3.340	3.345	5.79157	jl	6/10/2009 11:08
AW2 02	3.168	3.350	3.340	3.345	5.90845	jl	6/10/2009 11:12
AW3 03	3.160	3.360	3.340	3.350	5.93016	jl	6/10/2009 11:16
AP5 01	3.193	3.360	3.330	3.345	5.91564	jl	6/10/2009 11:31
AP1 02	3.195	3.340	3.310	3.325	5.92319	jl	6/10/2009 11:35

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
AP2 02	3.208	3.330	3.320	3.325	5.93005	jl	6/10/2009 11:41
AP5 02	3.205	3.360	3.340	3.350	5.91941	jl	6/11/2009 12:58
AP1 01	3.203	3.370	3.370	3.370	5.91649	jl	6/11/2009 13:02
AP5 03	3.193	3.350	3.330	3.340	5.91856	jl	6/12/2009 11:07
AP2 03	3.195	3.340	3.330	3.335	5.93359	jl	6/12/2009 11:13
AP4 01	3.200	3.330	3.340	3.335	5.91295	jl	6/12/2009 11:34
AP2 01	3.200	3.340	3.330	3.335	5.91297	jl	6/12/2009 11:40
AP3 03	3.190	3.330	3.330	3.330	5.93076	jl	6/12/2009 11:44
AP6 03	3.198	3.350	3.340	3.345	5.93044	jl	6/15/2009 8:02
AP4 02	3.185	3.310	3.330	3.320	5.91991	jl	6/15/2009 8:07
AP6 01	3.198	3.350	3.340	3.345	5.92294	jl	6/15/2009 8:12
AP3 01	3.185	3.360	3.340	3.350	5.92865	jl	6/15/2009 8:16
AP1 03	3.200	3.350	3.330	3.340	5.92300	jl	6/15/2009 8:21
AP6 02	3.190	3.340	3.330	3.335	5.92580	jl	6/15/2009 9:38
AP4 03	3.190	3.350	3.330	3.340	5.92259	jl	6/15/2009 9:42
AP3 02	3.198	3.330	3.330	3.330	5.92448	jl	6/15/2009 9:48
AL9 02	3.163	3.360	3.370	3.365	5.91240	jl	6/24/2009 14:53
AL13 01	3.165	3.370	3.370	3.370	5.91616	jl	6/24/2009 14:59
AL7 03	3.160	3.360	3.380	3.370	5.74492	jl	6/24/2009 15:06
AL4 02	3.155	3.360	3.360	3.360	5.76776	jl	6/24/2009 15:10
AL13 03	3.158	3.370	3.360	3.365	5.92281	jl	6/24/2009 15:14
AL10 03	3.163	3.360	3.370	3.365	5.90025	jl	6/24/2009 15:18
AL8 03	3.168	3.360	3.370	3.365	5.90721	jl	6/24/2009 15:21
AL13 02	3.165	3.370	3.370	3.370	5.92002	jl	6/24/2009 15:24
AL2 03	3.168	3.360	3.360	3.360	5.76786	jl	6/24/2009 15:28
AL10 01	3.165	3.360	3.370	3.365	5.89366	jl	6/24/2009 15:31
AL12 02	3.165	3.370	3.380	3.375	5.90598	jl	6/24/2009 15:35
AL5 02	3.168	3.370	3.360	3.365	5.76854	jl	6/24/2009 15:38
AL10 02	3.163	3.360	3.360	3.360	5.89765	jl	6/24/2009 15:43
AL3 02	3.170	3.360	3.360	3.360	5.77153	jl	6/24/2009 15:46
AL7 02	3.173	3.370	3.360	3.365	5.74486	jl	6/24/2009 15:49
AL11 02	3.165	3.370	3.380	3.375	5.90396	jl	6/24/2009 15:52
AL7 01	3.173	3.390	3.360	3.375	5.74392	jl	6/29/2009 8:16
AL2 02	3.160	3.360	3.350	3.355	5.76208	jl	6/29/2009 8:19

Specimen ID Number	Specimen Hole Diameter, mm	Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
		HD1	HD2			
AL12 01	3.165	3.370	3.370	5.90554	jl	6/29/2009 9:58
AL4 03	3.173	3.360	3.360	5.76689	jl	6/29/2009 10:00
AL4 01	3.165	3.370	3.350	5.76090	jl	6/29/2009 10:03
AL1 01	3.168	3.350	3.360	5.75496	jl	6/29/2009 10:06

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
AL5 03	25.38050	12.73188	127.3135	0.025381	0.01273	5.3112E-08	0.0058
AL6 03	25.38325	12.73338	127.3435	0.025383	0.01273	5.3033E-08	0.0057
AL3 03	25.37750	12.72863	127.2486	0.025378	0.01273	5.3121E-08	0.0058
AL2 01	25.37750	12.72513	127.1786	0.025378	0.01273	5.2870E-08	0.0058
AL9 01	25.37700	12.73175	127.3110	0.025377	0.01273	5.2954E-08	0.0059
AL1 03	25.37700	12.72550	127.1861	0.025377	0.01273	5.2954E-08	0.0058
AL8 01	25.37575	12.72800	127.2361	0.025376	0.01273	5.3204E-08	0.0059
AL5 01	25.38075	12.72938	127.2636	0.025381	0.01273	5.2944E-08	0.0058
AL11 03	25.38100	12.73188	127.3135	0.025381	0.01273	5.2787E-08	0.0059
AL6 02	25.38175	12.73150	127.3060	0.025382	0.01273	5.3027E-08	0.0057
AL12 03	25.38050	12.73488	127.3736	0.025381	0.01273	5.2950E-08	0.0059
AL3 01	25.37975	12.72563	127.1886	0.025380	0.01273	5.3028E-08	0.0058
AL11 01	25.37975	12.73525	127.3811	0.025380	0.01274	5.3117E-08	0.0059
AL9 03	25.37650	12.73138	127.3035	0.025377	0.01273	5.2871E-08	0.0059
AL8 02	25.37575	12.73000	127.2761	0.025376	0.01273	5.3200E-08	0.0059
AL1 02	25.37525	12.72500	127.1761	0.025375	0.01273	5.2871E-08	0.0058
AL6 01	25.38325	12.73075	127.2910	0.025383	0.01273	5.2709E-08	0.0057
AW16 01	25.37550	12.72788	127.2336	0.025376	0.01273	5.3033E-08	0.0058
AW14 03	25.37075	12.73375	127.3510	0.025371	0.01273	5.2865E-08	0.0059
AW4 01	25.37650	12.72675	127.2111	0.025377	0.01273	5.3129E-08	0.0058
AW9 02	25.37900	12.73175	127.3110	0.025379	0.01273	5.2869E-08	0.0059
AW6 01	25.37875	12.72225	127.1211	0.025379	0.01272	5.2629E-08	0.0058
AW10 03	25.37975	12.72538	127.1836	0.025380	0.01273	5.2702E-08	0.0059
AW6 03	25.37700	12.72138	127.1036	0.025377	0.01272	5.2874E-08	0.0059
AW7 02	25.37700	12.72325	127.1411	0.025377	0.01272	5.2869E-08	0.0059
AW1 01	25.37200	12.73263	127.3285	0.025372	0.01273	5.2156E-08	0.0058
AW12 03	25.35950	12.72975	127.2711	0.025360	0.01273	5.2639E-08	0.0059
AW8 03	25.37875	12.73100	127.2960	0.025379	0.01273	5.3032E-08	0.0059
AW15 02	25.37475	12.73625	127.4011	0.025375	0.01274	5.2871E-08	0.0059
AW12 01	25.38700	12.73000	127.2761	0.025387	0.01273	5.2958E-08	0.0058
AW5 03	25.37900	12.72875	127.2511	0.025379	0.01273	5.3036E-08	0.0059
AW11 03	25.38500	12.73188	127.3135	0.025385	0.01273	5.2786E-08	0.0059
AW3 01	25.37925	12.72913	127.2586	0.025379	0.01273	5.2874E-08	0.0058

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
AW9 03	25.37950	12.72463	127.1686	0.025380	0.01272	5.3120E-08	0.0059
AW6 02	25.37975	12.72463	127.1686	0.025380	0.01272	5.2624E-08	0.0059
AW5 02	25.37800	12.72913	127.2586	0.025378	0.01273	5.2624E-08	0.0059
AW9 01	25.38175	12.73250	127.3260	0.025382	0.01273	5.2624E-08	0.0058
AW11 01	25.38375	12.72813	127.2386	0.025384	0.01273	5.2702E-08	0.0058
AW1 02	25.37475	12.73100	127.2960	0.025375	0.01273	5.2880E-08	0.0059
AW10 01	25.38200	12.72650	127.2061	0.025382	0.01273	5.2623E-08	0.0058
AW15 01	25.37500	12.73425	127.3610	0.025375	0.01273	5.2871E-08	0.0058
AW8 02	25.37775	12.72950	127.2661	0.025378	0.01273	5.2874E-08	0.0059
AW7 01	25.38075	12.72375	127.1511	0.025381	0.01272	5.3288E-08	0.0058
AW14 01	25.37325	12.73525	127.3811	0.025373	0.01274	5.2880E-08	0.0058
AW4 03	25.37775	12.72825	127.2411	0.025378	0.01273	5.3204E-08	0.0059
AW8 01	25.38025	12.72700	127.2161	0.025380	0.01273	5.2786E-08	0.0058
AW3 02	25.37575	12.72800	127.2361	0.025376	0.01273	5.2800E-08	0.0059
AW7 03	25.37925	12.72375	127.1511	0.025379	0.01272	5.3036E-08	0.0059
AW4 02	25.37675	12.72850	127.2461	0.025377	0.01273	5.3042E-08	0.0059
AW14 02	25.37300	12.73475	127.3710	0.025373	0.01273	5.2624E-08	0.0059
AW13 02	25.37350	12.73425	127.3610	0.025374	0.01273	5.2954E-08	0.0059
AW16 03	25.37600	12.73125	127.3010	0.025376	0.01273	5.2954E-08	0.0059
AW13 01	25.37325	12.73263	127.3285	0.025373	0.01273	5.2950E-08	0.0058
AW15 03	25.37475	12.73588	127.3936	0.025375	0.01274	5.3037E-08	0.0059
AW5 01	25.38025	12.72825	127.2411	0.025380	0.01273	5.2875E-08	0.0058
AW10 02	25.38075	12.72600	127.1961	0.025381	0.01273	5.3120E-08	0.0059
AW12 02	25.38275	12.72863	127.2486	0.025383	0.01273	5.2865E-08	0.0059
AW1 03	25.37300	12.72825	127.2411	0.025373	0.01273	5.2551E-08	0.0059
AW11 02	25.38000	12.72750	127.2261	0.025380	0.01273	5.2865E-08	0.0059
AW2 03	25.37375	12.72850	127.2461	0.025374	0.01273	5.2796E-08	0.0059
AW13 03	25.36950	12.73450	127.3660	0.025370	0.01273	5.2629E-08	0.0059
AW16 02	25.37350	12.72813	127.2386	0.025374	0.01273	5.2865E-08	0.0059
AW2 01	25.37475	12.72575	127.1911	0.025375	0.01273	5.2634E-08	0.0058
AW2 02	25.37300	12.72675	127.2111	0.025373	0.01273	5.2717E-08	0.0059
AW3 03	25.37400	12.72775	127.2311	0.025374	0.01273	5.2546E-08	0.0059
AP5 01	25.36900	12.73188	127.3135	0.025369	0.01273	5.3558E-08	0.0059
AP1 02	25.37325	12.73025	127.2810	0.025373	0.01273	5.3317E-08	0.0059

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
AP2 02	25.36500	12.73838	127.4436	0.025365	0.01274	5.3741E-08	0.0059
AP5 02	25.36600	12.73313	127.3385	0.025366	0.01273	5.4057E-08	0.0059
AP1 01	25.39800	12.73025	127.2810	0.025398	0.01273	5.4291E-08	0.0059
AP5 03	25.36775	12.73338	127.3435	0.025368	0.01273	5.3477E-08	0.0059
AP2 03	25.38000	12.73575	127.3911	0.025380	0.01274	5.3480E-08	0.0059
AP4 01	25.38150	12.72863	127.2486	0.025382	0.01273	5.3645E-08	0.0059
AP2 01	25.37950	12.72888	127.2536	0.025380	0.01273	5.3646E-08	0.0059
AP3 03	25.37900	12.73938	127.4636	0.025379	0.01274	5.3232E-08	0.0059
AP6 03	25.37025	12.74300	127.5361	0.025370	0.01274	5.3724E-08	0.0059
AP4 02	25.36800	12.73213	127.3185	0.025368	0.01273	5.2903E-08	0.0059
AP6 01	25.37000	12.73675	127.4111	0.025370	0.01274	5.3724E-08	0.0059
AP3 01	25.38225	12.73825	127.4411	0.025382	0.01274	5.3385E-08	0.0059
AP1 03	25.37950	12.73100	127.2960	0.025380	0.01273	5.3728E-08	0.0059
AP6 02	25.37050	12.73963	127.4686	0.025371	0.01274	5.3313E-08	0.0059
AP4 03	25.36800	12.73225	127.3210	0.025368	0.01273	5.3394E-08	0.0059
AP3 02	25.38150	12.73988	127.4736	0.025382	0.01274	5.3482E-08	0.0059
AL9 02	25.37525	12.73013	127.2785	0.025375	0.01273	5.2866E-08	0.0059
AL13 01	25.38050	12.73438	127.3635	0.025381	0.01273	5.3028E-08	0.0059
AL7 03	25.37325	12.73238	127.3235	0.025373	0.01273	5.2860E-08	0.0057
AL4 02	25.36725	12.72825	127.2411	0.025367	0.01273	5.2537E-08	0.0058
AL13 03	25.38225	12.73700	127.4161	0.025382	0.01274	5.2698E-08	0.0059
AL10 03	25.37825	12.73363	127.3485	0.025378	0.01273	5.2866E-08	0.0059
AL8 03	25.37300	12.72950	127.2661	0.025373	0.01273	5.3033E-08	0.0059
AL13 02	25.38050	12.73638	127.4036	0.025381	0.01274	5.3028E-08	0.0059
AL2 03	25.37450	12.72300	127.1361	0.025375	0.01272	5.2955E-08	0.0058
AL10 01	25.37675	12.73188	127.3135	0.025377	0.01273	5.2950E-08	0.0059
AL12 02	25.37900	12.73200	127.3160	0.025379	0.01273	5.3107E-08	0.0059
AL5 02	25.37800	12.72825	127.2411	0.025378	0.01273	5.3032E-08	0.0058
AL10 02	25.37575	12.73263	127.3285	0.025376	0.01273	5.2787E-08	0.0059
AL3 02	25.37725	12.72700	127.2161	0.025377	0.01273	5.3037E-08	0.0058
AL7 02	25.38075	12.73238	127.3235	0.025381	0.01273	5.3200E-08	0.0057
AL11 02	25.37825	12.73500	127.3761	0.025378	0.01274	5.3108E-08	0.0059
AL7 01	25.38175	12.73263	127.3285	0.025382	0.01273	5.3357E-08	0.0057
AL2 02	25.37600	12.72300	127.1361	0.025376	0.01272	5.2624E-08	0.0058

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
AL12 01	25.38150	12.73238	127.3235	0.025382	0.01273	5.3029E-08	0.0059
AL4 03	25.38000	12.73150	127.3060	0.025380	0.01273	5.3121E-08	0.0058
AL4 01	25.37925	12.72850	127.2461	0.025379	0.01273	5.2869E-08	0.0058
AL1 01	25.36625	12.72313	127.1386	0.025366	0.01272	5.2877E-08	0.0058

Specimen ID Number	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
AL5 03	1811.22841	1.8112	25.3	20.6	32.2
AL6 03	1805.31639	1.8053	25.3	20.7	31.9
AL3 03	1818.45895	1.8185	25.3	20.7	31.7
AL2 01	1815.21807	1.8152	25.3	20.6	30.7
AL9 01	1860.09971	1.8601	25.3	20.6	30.8
AL1 03	1813.11802	1.8131	25.3	20.6	30.6
AL8 01	1858.08495	1.8581	25.3	20.6	31.2
AL5 01	1811.17009	1.8112	25.3	20.6	30.5
AL11 03	1857.08734	1.8571	25.3	20.7	29.4
AL6 02	1808.68990	1.8087	25.3	20.6	29.6
AL12 03	1855.24234	1.8552	25.3	20.6	29.8
AL3 01	1816.55278	1.8166	25.3	20.6	30
AL11 01	1856.50436	1.8565	25.3	20.7	30.2
AL9 03	1861.05597	1.8611	25.3	20.7	29.9
AL8 02	1862.72709	1.8627	25.3	20.7	29.4
AL1 02	1816.10220	1.8161	25.3	20.7	29.1
AL6 01	1807.32375	1.8073	25.3	20.7	29.5
AW16 01	1829.27386	1.8293	25.2	18.4	44.2
AW14 03	1864.39707	1.8644	25.2	18.6	44.1
AW4 01	1823.19124	1.8232	25.2	18.8	43.6
AW9 02	1860.83279	1.8608	25.2	18.9	43.5
AW6 01	1824.06961	1.8241	25.2	18.9	43.7
AW10 03	1864.91485	1.8649	25.2	18.9	43.4
AW6 03	1867.21462	1.8672	25.2	19.1	43.3
AW7 02	1861.93823	1.8619	25.16	19.3	42.9
AW1 01	1827.28606	1.8273	25.2	19.3	43.4
AW12 03	1864.80396	1.8648	25.2	19.3	43.3
AW8 03	1864.98692	1.8650	25.2	19.4	43.4
AW15 02	1863.34842	1.8633	25.2	19.5	43.2
AW12 01	1828.42854	1.8284	25.2	19.6	43.2
AW5 03	1865.55938	1.8656	25.2	19.7	43.1
AW11 03	1863.53638	1.8635	25.2	19.8	43.4
AW3 01	1822.02049	1.8220	25.2	19.8	43.7

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity
and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
AW9 03	1865.03702	1.8650	25.2	19.8	43.5
AW6 02	1861.13645	1.8611	25.1	19.8	38.5
AW5 02	1859.05423	1.8591	25.1	19.8	38.3
AW9 01	1826.90346	1.8269	25.1	19.8	38.5
AW11 01	1826.58379	1.8266	25.1	19.8	38.4
AW1 02	1860.10384	1.8601	25.1	19.9	38.1
AW10 01	1826.84151	1.8268	25.1	19.9	38.3
AW15 01	1828.29948	1.8283	25.1	19.9	38
AW8 02	1861.74526	1.8617	25.1	19.9	38
AW7 01	1827.93895	1.8279	25.1	20	38.2
AW14 01	1824.55499	1.8246	25.1	20	38.2
AW4 03	1865.63571	1.8656	25.1	20	38.3
AW8 01	1824.90192	1.8249	25.1	19.7	38.4
AW3 02	1860.49008	1.8605	25.1	19.6	38.4
AW7 03	1864.61829	1.8646	25.1	19.6	38.3
AW4 02	1859.92681	1.8599	25.1	19.6	37.7
AW14 02	1862.71455	1.8627	25.1	19.6	37.1
AW13 02	1861.60974	1.8616	25.1	19.9	36.4
AW16 03	1865.10336	1.8651	25.1	20	36.7
AW13 01	1824.57063	1.8246	25.1	20.2	36.3
AW15 03	1866.54856	1.8665	25.1	20.3	35.5
AW5 01	1822.35030	1.8224	25.1	20.3	35.1
AW10 02	1859.78166	1.8598	25.1	20.4	34.9
AW12 02	1860.59827	1.8606	25.1	21	45.1
AW1 03	1867.45538	1.8675	25.1	21	45
AW11 02	1861.32642	1.8613	25.1	21	44.9
AW2 03	1867.04725	1.8670	25.1	21.1	44.1
AW13 03	1866.39734	1.8664	25.1	21.2	43.7
AW16 02	1863.54618	1.8635	25.1	21.3	43.5
AW2 01	1824.22666	1.8242	25.1	21.3	43.4
AW2 02	1860.92358	1.8609	25.1	21.3	43.4
AW3 03	1867.28735	1.8673	25.1	21.4	43.7
AP5 01	1862.45515	1.8625	25.1	21.4	44.4
AP1 02	1864.85720	1.8649	25.1	21.3	44.3

Specimen ID Number	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
AP2 02	1865.46105	1.8655	25.1	21.3	44.7
AP5 02	1863.78685	1.8638	25.1	21.1	38.7
AP1 01	1861.47212	1.8615	25.1	21.1	38.8
AP5 03	1862.97382	1.8630	25.3	21.1	42.8
AP2 03	1866.08214	1.8661	25.3	21.4	40.5
AP4 01	1861.69331	1.8617	25.3	21.5	40
AP2 01	1861.77506	1.8618	25.3	21.5	38.9
AP3 03	1864.04208	1.8640	25.3	21.5	39.1
AP6 03	1863.80484	1.8638	25.2	21.2	40.1
AP4 02	1863.41513	1.8634	25.2	21.3	39.8
AP6 01	1863.32460	1.8633	25.2	21.4	39.8
AP3 01	1863.56044	1.8636	25.2	21.4	39.6
AP1 03	1864.34789	1.8643	25.19	21.5	39.5
AP6 02	1863.09079	1.8631	25.2	21.4	39.7
AP4 03	1864.51003	1.8645	25.2	21.5	40.2
AP3 02	1861.87946	1.8619	25.2	21.5	39.7
AL9 02	1861.08364	1.8611	25.29	21.1	41.7
AL13 01	1860.70717	1.8607	25.29	21.2	40.4
AL7 03	1807.85667	1.8079	25.29	21.4	39.8
AL4 02	1816.49234	1.8165	25.29	21.4	39.3
AL13 03	1861.69415	1.8617	25.29	21.5	38.7
AL10 03	1855.99821	1.8560	25.29	21.6	38.2
AL8 03	1859.90074	1.8599	25.29	21.6	38
AL13 02	1861.32634	1.8613	25.29	21.6	37.7
AL2 03	1817.75922	1.8178	25.29	21.6	37.8
AL10 01	1854.60392	1.8546	25.29	21.6	37.9
AL12 02	1858.36762	1.8584	25.28	21.6	38.2
AL5 02	1816.23868	1.8162	25.28	21.6	38.2
AL10 02	1855.61622	1.8556	25.28	21.6	38.2
AL3 02	1817.60058	1.8176	25.28	21.6	38.1
AL7 02	1807.48777	1.8075	25.28	21.6	38.2
AL11 02	1856.89856	1.8569	25.28	21.6	38.2
AL7 01	1807.13665	1.8071	25.3	20.9	44.6
AL2 02	1815.63941	1.8156	25.3	21	44.7

Specimen ID Number	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
AL12 01	1857.88645	1.8579	25.3	21.2	51
AL4 03	1814.68232	1.8147	25.3	21.2	51.2
AL4 01	1813.57696	1.8136	25.3	21.1	51.4
AL1 01	1814.21266	1.8142	25.3	21.1	51.5

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
AP4 02		47735	12/10/2009 16:04	100	78.27314	3.78E-04	4.46E-06	4.56E-06
				200	111.5193	8.40E-04	4.87E-06	4.60E-06
				300	144.05718	1.34E-03	5.24E-06	4.73E-06
				400	176.66644	1.88E-03	5.55E-06	4.92E-06
				500	209.50483	2.45E-03	5.82E-06	5.08E-06
				600	242.58324	3.05E-03	6.03E-06	5.24E-06
				700	275.88817	3.66E-03	6.19E-06	5.37E-06
				800	309.37817	4.28E-03	6.30E-06	5.47E-06
				900	343.01455	4.91E-03	6.37E-06	5.57E-06
				1000	376.78772	5.56E-03	6.38E-06	5.66E-06
AP4 03		47735	12/11/2009 8:44	100	81.75586	3.97E-04	4.80E-06	4.69E-06
				200	115.63571	8.91E-04	5.16E-06	4.82E-06
				300	148.35813	1.42E-03	5.49E-06	4.98E-06
				400	180.99364	1.99E-03	5.77E-06	5.18E-06
				500	213.73351	2.58E-03	6.03E-06	5.33E-06
				600	246.62983	3.19E-03	6.25E-06	5.47E-06
				700	279.69913	3.82E-03	6.43E-06	5.59E-06
				800	313.02834	4.48E-03	6.58E-06	5.71E-06
				900	346.51607	5.14E-03	6.69E-06	5.82E-06
				1000	380.19155	5.81E-03	6.77E-06	5.91E-06
AP5 01		47735	12/11/2009 8:43	100	78.19285	4.12E-04	4.93E-06	4.83E-06
				200	111.43866	9.12E-04	5.28E-06	4.92E-06
				300	143.88839	1.45E-03	5.59E-06	5.09E-06
				400	176.42519	2.04E-03	5.87E-06	5.29E-06
				500	209.21318	2.64E-03	6.10E-06	5.44E-06
				600	242.25022	3.26E-03	6.29E-06	5.57E-06
				700	275.5102	3.89E-03	6.45E-06	5.68E-06
				800	309.00821	4.54E-03	6.56E-06	5.78E-06
				900	342.63811	5.19E-03	6.64E-06	5.87E-06
				1000	376.40049	5.89E-03	6.67E-06	5.98E-06
AP5 02		47735	12/14/2009 7:47	100	78.25904	4.00E-04	4.60E-06	4.67E-06
				200	111.56602	8.71E-04	4.95E-06	4.70E-06
				300	144.11138	1.37E-03	5.28E-06	4.81E-06
				400	176.74349	1.92E-03	5.57E-06	5.00E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
AP5 03		47735	12/14/2009 15:01	500	209.59318	2.50E-03	5.82E-06	5.15E-06
				600	242.7013	3.09E-03	6.04E-06	5.29E-06
				700	275.99606	3.70E-03	6.23E-06	5.41E-06
				800	309.4801	4.33E-03	6.38E-06	5.52E-06
				900	343.10394	4.98E-03	6.50E-06	5.63E-06
				1000	376.86265	5.64E-03	6.59E-06	5.73E-06
				100	81.66965	3.82E-04	4.73E-06	4.68E-06
				200	115.60342	8.75E-04	5.10E-06	4.82E-06
				300	148.35872	1.39E-03	5.42E-06	4.94E-06
				400	180.98798	1.95E-03	5.69E-06	5.11E-06
AP6 01		47735	12/15/2009 7:42	500	213.72577	2.53E-03	5.91E-06	5.26E-06
				600	246.63927	3.14E-03	6.09E-06	5.39E-06
				700	279.71276	3.75E-03	6.22E-06	5.50E-06
				800	313.0156	4.38E-03	6.31E-06	5.60E-06
				900	346.48517	5.01E-03	6.35E-06	5.68E-06
				1000	380.17452	5.65E-03	6.34E-06	5.75E-06
				100	77.84649	4.19E-04	4.93E-06	4.86E-06
				200	111.11277	9.19E-04	5.30E-06	4.94E-06
				300	143.66303	1.46E-03	5.61E-06	5.10E-06
				400	176.29803	2.05E-03	5.89E-06	5.31E-06
AP6 02		47735	12/15/2009 7:44	500	209.13398	2.65E-03	6.12E-06	5.46E-06
				600	242.23272	3.27E-03	6.31E-06	5.59E-06
				700	275.51897	3.90E-03	6.46E-06	5.70E-06
				800	309.00134	4.55E-03	6.56E-06	5.80E-06
				900	342.61556	5.21E-03	6.62E-06	5.89E-06
				1000	376.37712	5.89E-03	6.64E-06	5.98E-06
				100	81.23305	3.93E-04	4.58E-06	4.65E-06
				200	115.16102	8.67E-04	4.93E-06	4.70E-06
				300	147.91728	1.36E-03	5.25E-06	4.80E-06
				400	180.56114	1.91E-03	5.54E-06	4.98E-06
500	213.30089	2.48E-03	5.79E-06	5.12E-06				
600	246.18836	3.07E-03	6.02E-06	5.26E-06				
700	279.26465	3.68E-03	6.21E-06	5.38E-06				
800	312.58159	4.31E-03	6.38E-06	5.50E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
AP6 03		47735	12/15/2009 15:57	900	346.05934	4.96E-03	6.51E-06	5.61E-06
				1000	379.72255	5.61E-03	6.61E-06	5.70E-06
				100	77.96671	3.86E-04	4.61E-06	4.64E-06
				200	111.26342	8.54E-04	4.94E-06	4.66E-06
				300	143.76117	1.36E-03	5.24E-06	4.79E-06
				400	176.35001	1.91E-03	5.52E-06	4.97E-06
				500	209.18354	2.47E-03	5.77E-06	5.12E-06
				600	242.253	3.06E-03	5.99E-06	5.25E-06
				700	275.53178	3.67E-03	6.19E-06	5.37E-06
				800	309.01504	4.29E-03	6.36E-06	5.48E-06
AW1 01		47735	12/15/2009 15:47	900	342.62824	4.93E-03	6.51E-06	5.59E-06
				1000	376.38673	5.60E-03	6.63E-06	5.70E-06
				100	81.14232	3.77E-04	4.65E-06	4.61E-06
				200	115.11364	8.60E-04	5.01E-06	4.74E-06
				300	147.87134	1.37E-03	5.33E-06	4.86E-06
				400	180.51777	1.92E-03	5.62E-06	5.03E-06
				500	213.23864	2.50E-03	5.87E-06	5.18E-06
				600	246.12839	3.09E-03	6.09E-06	5.32E-06
				700	279.22011	3.71E-03	6.26E-06	5.45E-06
				800	312.51623	4.35E-03	6.40E-06	5.56E-06
AW1 02		47735	12/16/2009 8:03	900	346.00827	5.00E-03	6.51E-06	5.67E-06
				1000	379.67343	5.64E-03	6.57E-06	5.74E-06
				100	77.88259	3.78E-04	4.23E-06	4.37E-06
				200	111.17851	8.16E-04	4.59E-06	4.38E-06
				300	143.71087	1.28E-03	4.93E-06	4.48E-06
				400	176.34466	1.80E-03	5.23E-06	4.66E-06
				500	209.19547	2.33E-03	5.51E-06	4.81E-06
				600	242.27269	2.90E-03	5.76E-06	4.95E-06
				700	275.52553	3.49E-03	5.98E-06	5.09E-06
				800	309.00822	4.09E-03	6.17E-06	5.21E-06
AW1 03		47735	4/21/2010 8:52	900	342.62165	4.72E-03	6.34E-06	5.33E-06
				1000	376.37054	5.36E-03	6.47E-06	5.45E-06
				100	77.59758	3.81E-04	4.64E-06	4.52E-06
				200	110.93984	8.51E-04	5.03E-06	4.62E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
AW2 01				300	143.41724	1.37E-03	5.37E-06	4.82E-06
				400	175.8888	1.93E-03	5.66E-06	5.04E-06
				500	208.55245	2.51E-03	5.91E-06	5.20E-06
				600	241.38848	3.12E-03	6.11E-06	5.34E-06
				700	274.41615	3.73E-03	6.26E-06	5.46E-06
				800	307.68576	4.35E-03	6.36E-06	5.56E-06
				900	341.13155	4.99E-03	6.42E-06	5.65E-06
				1000	374.72714	5.67E-03	6.43E-06	5.76E-06
				100	77.7831	3.91E-04	4.65E-06	4.67E-06
				200	111.11676	8.60E-04	4.99E-06	4.70E-06
AW2 02				300	143.67765	1.37E-03	5.31E-06	4.85E-06
				400	176.32082	1.93E-03	5.59E-06	5.03E-06
				500	209.18249	2.50E-03	5.85E-06	5.19E-06
				600	242.25737	3.10E-03	6.07E-06	5.32E-06
				700	275.53285	3.71E-03	6.26E-06	5.44E-06
				800	309.01555	4.34E-03	6.42E-06	5.55E-06
				900	342.63414	4.99E-03	6.55E-06	5.65E-06
				1000	376.38959	5.67E-03	6.64E-06	5.77E-06
				100	81.18588	3.57E-04	4.28E-06	4.35E-06
				200	115.15396	8.01E-04	4.63E-06	4.40E-06
AW2 03				300	147.92534	1.27E-03	4.95E-06	4.50E-06
				400	180.56195	1.79E-03	5.25E-06	4.69E-06
				500	213.30651	2.33E-03	5.51E-06	4.83E-06
				600	246.21444	2.89E-03	5.74E-06	4.97E-06
				700	279.28077	3.47E-03	5.94E-06	5.09E-06
				800	312.60743	4.08E-03	6.11E-06	5.22E-06
				900	346.10037	4.70E-03	6.25E-06	5.33E-06
				1000	379.77305	5.32E-03	6.37E-06	5.42E-06
				100	81.39518	3.62E-04	4.48E-06	4.41E-06
				200	115.38654	8.21E-04	4.88E-06	4.51E-06
300	148.13785	1.32E-03	5.22E-06	4.69E-06				
400	180.72293	1.87E-03	5.51E-06	4.90E-06				
500	213.41081	2.43E-03	5.75E-06	5.05E-06				
600	246.23067	3.02E-03	5.94E-06	5.19E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
AW3 01		47735	12/17/2009 7:51	700	279.29556	3.62E-03	6.07E-06	5.30E-06
				800	312.63483	4.22E-03	6.14E-06	5.40E-06
				900	346.11869	4.84E-03	6.17E-06	5.50E-06
				1000	379.84189	5.46E-03	6.14E-06	5.56E-06
				100	81.21774	3.83E-04	4.57E-06	4.54E-06
				200	115.16977	8.54E-04	4.97E-06	4.63E-06
				300	147.88675	1.36E-03	5.32E-06	4.79E-06
				400	180.50568	1.92E-03	5.63E-06	4.99E-06
				500	213.24744	2.50E-03	5.88E-06	5.16E-06
				600	246.1584	3.09E-03	6.09E-06	5.30E-06
AW3 02		47735	5/19/2010 17:00	700	279.21001	3.71E-03	6.24E-06	5.42E-06
				800	312.50952	4.34E-03	6.35E-06	5.53E-06
				900	345.99651	4.98E-03	6.40E-06	5.64E-06
				1000	379.67711	5.62E-03	6.41E-06	5.71E-06
				100	81.31727	3.68E-04	4.61E-06	4.46E-06
				200	115.32376	8.42E-04	4.99E-06	4.61E-06
				300	148.05379	1.35E-03	5.32E-06	4.79E-06
				400	180.63086	1.91E-03	5.60E-06	4.99E-06
				500	213.23059	2.48E-03	5.83E-06	5.14E-06
				600	246.02241	3.07E-03	6.01E-06	5.27E-06
AW3 03		47735	12/21/2009 14:01	700	279.06675	3.67E-03	6.15E-06	5.39E-06
				800	312.35026	4.30E-03	6.23E-06	5.49E-06
				900	345.84362	4.92E-03	6.26E-06	5.58E-06
				1000	379.55994	5.55E-03	6.25E-06	5.65E-06
				100	81.18361	3.77E-04	4.35E-06	4.46E-06
				200	115.12025	8.26E-04	4.69E-06	4.48E-06
				300	147.86384	1.30E-03	5.00E-06	4.57E-06
				400	180.51603	1.82E-03	5.29E-06	4.74E-06
				500	213.24142	2.36E-03	5.54E-06	4.88E-06
				600	246.13925	2.93E-03	5.77E-06	5.02E-06
700	279.19622	3.52E-03	5.98E-06	5.14E-06				
800	312.499	4.13E-03	6.15E-06	5.26E-06				
900	345.97805	4.75E-03	6.30E-06	5.38E-06				
1000	379.68377	5.38E-03	6.43E-06	5.47E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
AW10 01		47735	12/22/2009 9:22	100	77.73484	3.94E-04	4.67E-06	4.61E-06
				200	111.04996	8.68E-04	5.02E-06	4.68E-06
				300	143.5689	1.38E-03	5.33E-06	4.84E-06
				400	176.16572	1.94E-03	5.60E-06	5.04E-06
				500	209.02341	2.51E-03	5.83E-06	5.18E-06
				600	242.11742	3.11E-03	6.02E-06	5.31E-06
				700	275.42226	3.71E-03	6.18E-06	5.42E-06
				800	308.94036	4.33E-03	6.29E-06	5.52E-06
				900	342.57068	4.96E-03	6.37E-06	5.61E-06
				1000	376.33463	5.63E-03	6.42E-06	5.71E-06
AW11 03		47735	1/4/2010 9:18	100	81.22726	3.66E-04	4.32E-06	4.35E-06
				200	115.15821	8.15E-04	4.69E-06	4.43E-06
				300	147.91571	1.29E-03	5.02E-06	4.54E-06
				400	180.54804	1.81E-03	5.32E-06	4.73E-06
				500	213.26554	2.36E-03	5.58E-06	4.88E-06
				600	246.17211	2.93E-03	5.80E-06	5.02E-06
				700	279.23036	3.52E-03	6.00E-06	5.15E-06
				800	312.52119	4.13E-03	6.16E-06	5.27E-06
				900	346.02584	4.75E-03	6.28E-06	5.38E-06
				1000	379.68175	5.38E-03	6.37E-06	5.47E-06
AW10 02		47735	12/22/2009 9:24	100	81.25304	3.76E-04	4.33E-06	4.45E-06
				200	115.16125	8.26E-04	4.68E-06	4.48E-06
				300	147.91416	1.30E-03	4.99E-06	4.57E-06
				400	180.56519	1.82E-03	5.28E-06	4.74E-06
				500	213.31797	2.36E-03	5.53E-06	4.87E-06
				600	246.21385	2.92E-03	5.75E-06	5.01E-06
				700	279.27526	3.51E-03	5.94E-06	5.13E-06
				800	312.60717	4.11E-03	6.10E-06	5.25E-06
				900	346.08792	4.73E-03	6.22E-06	5.35E-06
				1000	379.7456	5.35E-03	6.32E-06	5.44E-06
AW10 03		47735	5/17/2010 8:54	100	81.3989	3.68E-04	4.41E-06	4.36E-06
				200	115.3777	8.29E-04	4.87E-06	4.50E-06
				300	148.11536	1.33E-03	5.25E-06	4.67E-06
				400	180.66108	1.88E-03	5.57E-06	4.89E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
AW11 01		47735	12/23/2009 8:26	500	213.29897	2.45E-03	5.82E-06	5.05E-06
				600	246.10062	3.04E-03	6.01E-06	5.21E-06
				700	279.13821	3.65E-03	6.13E-06	5.33E-06
				800	312.41961	4.26E-03	6.18E-06	5.44E-06
				900	345.90017	4.88E-03	6.17E-06	5.52E-06
				1000	379.62576	5.50E-03	6.08E-06	5.59E-06
				100	81.70605	3.81E-04	4.52E-06	4.52E-06
				200	115.62668	8.43E-04	4.92E-06	4.58E-06
				300	148.35982	1.35E-03	5.27E-06	4.74E-06
				400	180.99197	1.90E-03	5.57E-06	4.95E-06
AW11 02		47735	4/21/2010 9:42	500	213.71987	2.47E-03	5.83E-06	5.11E-06
				600	246.63239	3.07E-03	6.04E-06	5.25E-06
				700	279.70147	3.67E-03	6.20E-06	5.37E-06
				800	313.00036	4.30E-03	6.32E-06	5.48E-06
				900	346.48574	4.94E-03	6.39E-06	5.59E-06
				1000	380.16773	5.58E-03	6.42E-06	5.67E-06
				100	81.92998	3.62E-04	4.49E-06	4.38E-06
				200	115.90253	8.25E-04	4.88E-06	4.52E-06
				300	148.64178	1.32E-03	5.22E-06	4.69E-06
				400	181.25199	1.87E-03	5.52E-06	4.89E-06
AW12 01		47735	1/5/2010 8:16	500	213.91445	2.44E-03	5.76E-06	5.05E-06
				600	246.75966	3.02E-03	5.96E-06	5.19E-06
				700	279.83582	3.62E-03	6.10E-06	5.31E-06
				800	313.15729	4.24E-03	6.20E-06	5.42E-06
				900	346.67702	4.86E-03	6.25E-06	5.51E-06
				1000	380.38824	5.49E-03	6.25E-06	5.59E-06
				100	77.8015	3.75E-04	4.56E-06	4.42E-06
				200	111.0953	8.39E-04	4.96E-06	4.54E-06
				300	143.55338	1.35E-03	5.32E-06	4.75E-06
				400	176.11867	1.91E-03	5.63E-06	4.97E-06
500	208.90633	2.49E-03	5.89E-06	5.15E-06				
600	241.92485	3.09E-03	6.11E-06	5.29E-06				
700	275.21044	3.70E-03	6.28E-06	5.41E-06				
800	308.69481	4.33E-03	6.40E-06	5.53E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
AW12 02		47735	5/19/2010 8:28	900	342.34812	4.98E-03	6.48E-06	5.63E-06
				1000	376.13704	5.65E-03	6.51E-06	5.74E-06
				100	81.37077	3.77E-04	4.60E-06	4.44E-06
				200	115.3449	8.50E-04	4.98E-06	4.60E-06
				300	148.08367	1.36E-03	5.32E-06	4.79E-06
				400	180.64566	1.92E-03	5.60E-06	4.99E-06
				500	213.24454	2.49E-03	5.83E-06	5.14E-06
				600	246.07299	3.08E-03	6.01E-06	5.27E-06
				700	279.15357	3.68E-03	6.14E-06	5.38E-06
				800	312.41457	4.30E-03	6.22E-06	5.49E-06
AW12 03		47735	1/5/2010 16:42	900	345.9045	4.93E-03	6.25E-06	5.58E-06
				1000	379.61508	5.55E-03	6.22E-06	5.64E-06
				100	77.92596	3.72E-04	4.31E-06	4.46E-06
				200	111.21812	8.22E-04	4.68E-06	4.48E-06
				300	143.75552	1.29E-03	5.01E-06	4.57E-06
				400	176.37162	1.81E-03	5.30E-06	4.73E-06
				500	209.22452	2.36E-03	5.55E-06	4.88E-06
				600	242.2897	2.93E-03	5.76E-06	5.02E-06
				700	275.54496	3.52E-03	5.93E-06	5.15E-06
				800	309.0261	4.12E-03	6.06E-06	5.26E-06
AW13 01		47735	1/5/2010 16:30	900	342.64915	4.71E-03	6.15E-06	5.34E-06
				1000	376.41167	5.36E-03	6.20E-06	5.45E-06
				100	81.13413	3.72E-04	4.54E-06	4.53E-06
				200	115.1067	8.39E-04	4.92E-06	4.61E-06
				300	147.89876	1.34E-03	5.26E-06	4.75E-06
				400	180.5733	1.89E-03	5.56E-06	4.95E-06
				500	213.32709	2.46E-03	5.81E-06	5.11E-06
				600	246.23799	3.05E-03	6.02E-06	5.25E-06
				700	279.29026	3.66E-03	6.18E-06	5.37E-06
				800	312.60707	4.28E-03	6.30E-06	5.48E-06
AW14 01		47735	5/14/2010 9:19	900	346.09879	4.92E-03	6.38E-06	5.58E-06
				1000	379.77576	5.56E-03	6.41E-06	5.66E-06
				100	81.42366	3.67E-04	4.43E-06	4.37E-06
				200	115.42373	8.24E-04	4.89E-06	4.49E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
AW14 02		47735	1/6/2010 16:02	300	148.11538	1.33E-03	5.29E-06	4.68E-06
				400	180.67877	1.89E-03	5.62E-06	4.92E-06
				500	213.31879	2.46E-03	5.90E-06	5.09E-06
				600	246.11676	3.06E-03	6.11E-06	5.25E-06
				700	279.15256	3.68E-03	6.26E-06	5.38E-06
				800	312.46277	4.31E-03	6.35E-06	5.50E-06
				900	345.97615	4.95E-03	6.38E-06	5.61E-06
				1000	379.68312	5.59E-03	6.35E-06	5.68E-06
				100	81.19578	3.64E-04	4.34E-06	4.42E-06
				200	115.15368	8.15E-04	4.69E-06	4.47E-06
AW14 03		47735	1/7/2010 7:35	300	147.90564	1.29E-03	5.02E-06	4.56E-06
				400	180.53988	1.81E-03	5.30E-06	4.74E-06
				500	213.25984	2.36E-03	5.56E-06	4.88E-06
				600	246.17107	2.92E-03	5.79E-06	5.02E-06
				700	279.2162	3.51E-03	5.98E-06	5.15E-06
				800	312.52787	4.12E-03	6.14E-06	5.27E-06
				900	346.03935	4.74E-03	6.26E-06	5.38E-06
				1000	379.70593	5.36E-03	6.36E-06	5.46E-06
				100	78.13815	3.80E-04	4.30E-06	4.39E-06
				200	111.44047	8.23E-04	4.67E-06	4.41E-06
AW15 01		47735	1/7/2010 7:42	300	143.92318	1.29E-03	5.00E-06	4.51E-06
				400	176.50212	1.82E-03	5.28E-06	4.71E-06
				500	209.29908	2.37E-03	5.53E-06	4.87E-06
				600	242.3335	2.93E-03	5.74E-06	5.00E-06
				700	275.58332	3.51E-03	5.90E-06	5.12E-06
				800	309.05441	4.10E-03	6.03E-06	5.21E-06
				900	342.67869	4.71E-03	6.12E-06	5.32E-06
				1000	376.46074	5.34E-03	6.16E-06	5.42E-06
				100	81.27736	3.83E-04	4.62E-06	4.55E-06
				200	115.19231	8.53E-04	4.96E-06	4.64E-06
300	147.90313	1.36E-03	5.27E-06	4.79E-06				
400	180.53017	1.91E-03	5.54E-06	4.98E-06				
500	213.23319	2.48E-03	5.78E-06	5.13E-06				
600	246.13223	3.07E-03	5.98E-06	5.26E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
AW15 02		47735	1/7/2010 15:50	700	279.19071	3.66E-03	6.15E-06	5.35E-06
				800	312.50906	4.29E-03	6.28E-06	5.47E-06
				900	345.99206	4.93E-03	6.38E-06	5.58E-06
				1000	379.70174	5.57E-03	6.44E-06	5.66E-06
				100	78.01244	3.61E-04	4.31E-06	4.32E-06
				200	111.33386	8.03E-04	4.65E-06	4.38E-06
				300	143.85162	1.28E-03	4.96E-06	4.50E-06
				400	176.42898	1.79E-03	5.24E-06	4.68E-06
				500	209.23652	2.33E-03	5.49E-06	4.83E-06
				600	242.27777	2.89E-03	5.70E-06	4.96E-06
AW15 03		47735	1/7/2010 15:48	700	275.53791	3.47E-03	5.89E-06	5.08E-06
				800	309.01957	4.07E-03	6.05E-06	5.19E-06
				900	342.64458	4.68E-03	6.18E-06	5.30E-06
				1000	376.41946	5.31E-03	6.28E-06	5.40E-06
				100	81.60929	3.61E-04	4.32E-06	4.40E-06
				200	115.60317	8.03E-04	4.63E-06	4.41E-06
				300	148.34505	1.27E-03	4.92E-06	4.50E-06
				400	180.97623	1.78E-03	5.18E-06	4.67E-06
				500	213.7088	2.32E-03	5.42E-06	4.80E-06
				600	246.5817	2.88E-03	5.64E-06	4.94E-06
AW16 03		47735	1/8/2010 16:16	700	279.65722	3.44E-03	5.83E-06	5.05E-06
				800	312.94402	4.03E-03	5.99E-06	5.15E-06
				900	346.41691	4.64E-03	6.13E-06	5.26E-06
				1000	380.10079	5.26E-03	6.25E-06	5.36E-06
				100	78.34165	3.68E-04	4.40E-06	4.39E-06
				200	111.59598	8.17E-04	4.72E-06	4.45E-06
				300	144.07318	1.29E-03	5.02E-06	4.57E-06
				400	176.64243	1.82E-03	5.29E-06	4.75E-06
				500	209.49518	2.37E-03	5.54E-06	4.90E-06
				600	242.57362	2.93E-03	5.76E-06	5.02E-06
700	275.85601	3.51E-03	5.95E-06	5.14E-06				
800	309.35376	4.11E-03	6.12E-06	5.25E-06				
900	342.9917	4.73E-03	6.26E-06	5.36E-06				
1000	376.77082	5.38E-03	6.38E-06	5.47E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
AW4 01		47735	1/8/2010 16:10	100	81.18379	3.63E-04	4.46E-06	4.41E-06
				200	115.16041	8.27E-04	4.86E-06	4.54E-06
				300	147.90083	1.32E-03	5.22E-06	4.69E-06
				400	180.51544	1.87E-03	5.53E-06	4.89E-06
				500	213.21788	2.44E-03	5.80E-06	5.05E-06
				600	246.12074	3.03E-03	6.02E-06	5.20E-06
				700	279.20695	3.63E-03	6.19E-06	5.33E-06
				800	312.52966	4.26E-03	6.32E-06	5.45E-06
				900	346.01548	4.90E-03	6.40E-06	5.56E-06
				1000	379.69956	5.54E-03	6.44E-06	5.64E-06
AW4 02		47735	1/11/2010 7:54	100	77.94184	3.80E-04	4.34E-06	4.39E-06
				200	111.22708	8.24E-04	4.69E-06	4.42E-06
				300	143.71435	1.30E-03	5.00E-06	4.54E-06
				400	176.27727	1.82E-03	5.28E-06	4.72E-06
				500	209.09672	2.37E-03	5.53E-06	4.88E-06
				600	242.16681	2.93E-03	5.75E-06	5.00E-06
				700	275.44616	3.51E-03	5.93E-06	5.12E-06
				800	308.96767	4.11E-03	6.07E-06	5.23E-06
				900	342.60268	4.72E-03	6.19E-06	5.34E-06
				1000	376.3951	5.36E-03	6.27E-06	5.44E-06
AW4 03		47735	5/13/2010 8:41	100	81.56175	3.69E-04	4.56E-06	4.38E-06
				200	115.55973	8.39E-04	4.96E-06	4.56E-06
				300	148.31163	1.35E-03	5.30E-06	4.75E-06
				400	180.93989	1.90E-03	5.60E-06	4.96E-06
				500	213.63712	2.48E-03	5.84E-06	5.12E-06
				600	246.4982	3.07E-03	6.03E-06	5.26E-06
				700	279.62519	3.68E-03	6.17E-06	5.38E-06
				800	312.94661	4.30E-03	6.26E-06	5.49E-06
				900	346.47265	4.93E-03	6.30E-06	5.58E-06
				1000	380.21704	5.56E-03	6.29E-06	5.65E-06
AW5 01		47735	1/11/2010 16:38	100	77.79163	3.86E-04	4.68E-06	4.65E-06
				200	111.05429	8.60E-04	5.02E-06	4.70E-06
				300	143.53947	1.37E-03	5.32E-06	4.85E-06
				400	176.12312	1.93E-03	5.59E-06	5.04E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
AW5 02		47735	1/12/2010 7:39	500	208.94732	2.51E-03	5.83E-06	5.19E-06
				600	242.03709	3.10E-03	6.02E-06	5.31E-06
				700	275.338	3.70E-03	6.19E-06	5.42E-06
				800	308.86753	4.32E-03	6.31E-06	5.52E-06
				900	342.53772	4.96E-03	6.41E-06	5.62E-06
				1000	376.3535	5.62E-03	6.46E-06	5.72E-06
				100	77.7858	3.95E-04	4.33E-06	4.45E-06
				200	111.00353	8.40E-04	4.69E-06	4.47E-06
				300	143.49801	1.32E-03	5.02E-06	4.58E-06
				400	176.09492	1.84E-03	5.30E-06	4.75E-06
AW5 03		47735	1/12/2010 15:50	500	208.94133	2.39E-03	5.55E-06	4.90E-06
				600	242.04399	2.95E-03	5.76E-06	5.03E-06
				700	275.34436	3.53E-03	5.93E-06	5.15E-06
				800	308.88097	4.13E-03	6.07E-06	5.25E-06
				900	342.57348	4.75E-03	6.17E-06	5.35E-06
				1000	376.38951	5.37E-03	6.23E-06	5.44E-06
				100	81.10831	3.65E-04	4.51E-06	4.43E-06
				200	115.09003	8.29E-04	4.88E-06	4.55E-06
				300	147.85983	1.33E-03	5.21E-06	4.71E-06
				400	180.49281	1.87E-03	5.50E-06	4.90E-06
AW6 01		47735	1/12/2010 15:58	500	213.24426	2.44E-03	5.76E-06	5.05E-06
				600	246.13767	3.02E-03	5.97E-06	5.19E-06
				700	279.21144	3.63E-03	6.15E-06	5.32E-06
				800	312.5381	4.25E-03	6.28E-06	5.43E-06
				900	346.03718	4.89E-03	6.38E-06	5.54E-06
				1000	379.72513	5.52E-03	6.44E-06	5.62E-06
				100	77.62314	3.91E-04	4.70E-06	4.71E-06
				200	110.8743	8.65E-04	5.04E-06	4.74E-06
				300	143.41291	1.39E-03	5.34E-06	4.90E-06
				400	176.05543	1.94E-03	5.61E-06	5.07E-06
500	208.93559	2.52E-03	5.85E-06	5.21E-06				
600	242.0574	3.11E-03	6.05E-06	5.33E-06				
700	275.37538	3.72E-03	6.21E-06	5.45E-06				
800	308.90533	4.35E-03	6.34E-06	5.56E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
AW13 02		47735	5/18/2010 17:16	900	342.58913	4.99E-03	6.43E-06	5.65E-06
				1000	376.4218	5.64E-03	6.49E-06	5.74E-06
				100	81.75924	3.60E-04	4.50E-06	4.35E-06
				200	115.81842	8.24E-04	4.90E-06	4.51E-06
				300	148.56759	1.33E-03	5.26E-06	4.69E-06
				400	181.13396	1.88E-03	5.56E-06	4.91E-06
				500	213.73811	2.45E-03	5.81E-06	5.07E-06
				600	246.58848	3.04E-03	6.02E-06	5.22E-06
				700	279.5932	3.64E-03	6.17E-06	5.34E-06
				800	312.85295	4.27E-03	6.28E-06	5.45E-06
AW13 03		47735	5/17/2010 17:20	900	346.36256	4.90E-03	6.33E-06	5.56E-06
				1000	380.02737	5.53E-03	6.34E-06	5.63E-06
				100	81.77216	3.61E-04	4.44E-06	4.37E-06
				200	115.79007	8.23E-04	4.88E-06	4.50E-06
				300	148.50633	1.32E-03	5.24E-06	4.67E-06
				400	181.10115	1.87E-03	5.55E-06	4.89E-06
				500	213.72452	2.44E-03	5.78E-06	5.05E-06
				600	246.53749	3.02E-03	5.96E-06	5.19E-06
				700	279.56418	3.63E-03	6.06E-06	5.32E-06
				800	312.8845	4.23E-03	6.10E-06	5.41E-06
AW16 01		47735	1/8/2010 7:52	900	346.38057	4.84E-03	6.08E-06	5.49E-06
				1000	380.04603	5.46E-03	5.99E-06	5.56E-06
				100	78.5534	3.91E-04	4.65E-06	4.54E-06
				200	111.82215	8.63E-04	5.02E-06	4.64E-06
				300	144.30366	1.38E-03	5.34E-06	4.81E-06
				400	176.86854	1.94E-03	5.62E-06	5.02E-06
				500	209.68897	2.52E-03	5.85E-06	5.18E-06
				600	242.73705	3.11E-03	6.04E-06	5.31E-06
				700	275.99687	3.72E-03	6.17E-06	5.42E-06
				800	309.49788	4.33E-03	6.27E-06	5.51E-06
900	343.12954	4.96E-03	6.31E-06	5.60E-06				
1000	376.91897	5.62E-03	6.31E-06	5.70E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
AW16 02		47735	1/8/2010 7:53	100	81.24376	3.72E-04	4.21E-06	4.37E-06
				200	115.14413	8.10E-04	4.57E-06	4.38E-06
				300	147.88069	1.27E-03	4.90E-06	4.46E-06
				400	180.50848	1.78E-03	5.19E-06	4.64E-06
				500	213.24507	2.32E-03	5.46E-06	4.78E-06
				600	246.14437	2.87E-03	5.69E-06	4.91E-06
				700	279.21253	3.45E-03	5.90E-06	5.05E-06
				800	312.51728	4.06E-03	6.07E-06	5.17E-06
				900	345.98173	4.67E-03	6.21E-06	5.28E-06
				1000	379.69036	5.29E-03	6.32E-06	5.37E-06

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
AP4 02	25.368	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AP4 03	25.368	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AP5 01	25.369	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AP5 02	25.366	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
AP5 03	25.368	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AP6 01	25.37	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AP6 02	25.37	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
AP6 03	25.37	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW1 01	25.372	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW1 02	25.375	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW1 03	25.373	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
AW2 01	25.375	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW2 02	25.375	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW2 03	25.374	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
AW3 01	25.379	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW3 02	25.376	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW3 03	25.374	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
AW10 01	25.382	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW11 03	25.385	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW10 02	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW10 03	25.38	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
AW11 01	25.384	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW11 02	25.373	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW12 01	25.387	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
AW12 02	25.383	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW12 03	25.36	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW13 01	25.373	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW14 01	25.373	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
AW14 02	25.373	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW14 03	25.371	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW15 01	25.375	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
AW15 02	25.375	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW15 03	25.375	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW16 03	25.376	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
AW4 01	25.377	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW4 02	25.377	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW4 03	25.378	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW5 01	25.38	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
AW5 02	25.378	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW5 03	25.379	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW6 01	25.379	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
AW13 02	25.373	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW13 03	25.369	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
AW16 01	25.375	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
AW16 02	25.373	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen Number	AP4 02	AP4 03	AP5 01	AP5 02	AP5 03	AP6 01
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	12/10/09 4:04 PM	12/11/09 8:44 AM	12/11/09 8:43 AM	12/14/09 7:47 AM	12/14/09 3:01 PM	12/15/09 7:42 AM
Initial Sample Length (L0, mm)	25.368	25.368	25.369	25.366	25.368	25.37
Linear Thermal Expansion Temperature °C						
100	3.78E-04	3.97E-04	4.12E-04	4.00E-04	3.82E-04	4.19E-04
200	8.40E-04	8.91E-04	9.12E-04	8.71E-04	8.75E-04	9.19E-04
300	1.34E-03	1.42E-03	1.45E-03	1.37E-03	1.39E-03	1.46E-03
400	1.88E-03	1.99E-03	2.04E-03	1.92E-03	1.95E-03	2.05E-03
500	2.45E-03	2.58E-03	2.64E-03	2.50E-03	2.53E-03	2.65E-03
600	3.05E-03	3.19E-03	3.26E-03	3.09E-03	3.14E-03	3.27E-03
700	3.66E-03	3.82E-03	3.89E-03	3.70E-03	3.75E-03	3.90E-03
800	4.28E-03	4.48E-03	4.54E-03	4.33E-03	4.38E-03	4.55E-03
900	4.91E-03	5.14E-03	5.19E-03	4.98E-03	5.01E-03	5.21E-03
1000	5.56E-03	5.81E-03	5.89E-03	5.64E-03	5.65E-03	5.89E-03
Instantaneous CTE (1/K) Temperature °C						
100	4.46E-06	4.80E-06	4.93E-06	4.60E-06	4.73E-06	4.93E-06
200	4.87E-06	5.16E-06	5.28E-06	4.95E-06	5.10E-06	5.30E-06
300	5.24E-06	5.49E-06	5.59E-06	5.28E-06	5.42E-06	5.61E-06
400	5.55E-06	5.77E-06	5.87E-06	5.57E-06	5.69E-06	5.89E-06
500	5.82E-06	6.03E-06	6.10E-06	5.82E-06	5.91E-06	6.12E-06
600	6.03E-06	6.25E-06	6.29E-06	6.04E-06	6.09E-06	6.31E-06
700	6.19E-06	6.43E-06	6.45E-06	6.23E-06	6.22E-06	6.46E-06
800	6.30E-06	6.58E-06	6.56E-06	6.38E-06	6.31E-06	6.56E-06
900	6.37E-06	6.69E-06	6.64E-06	6.50E-06	6.35E-06	6.62E-06
1000	6.38E-06	6.77E-06	6.67E-06	6.59E-06	6.34E-06	6.64E-06
Mean CTE (1/K) Temperature °C						
100	4.56E-06	4.69E-06	4.83E-06	4.67E-06	4.68E-06	4.86E-06
200	4.60E-06	4.82E-06	4.92E-06	4.70E-06	4.82E-06	4.94E-06
300	4.73E-06	4.98E-06	5.09E-06	4.81E-06	4.94E-06	5.10E-06
400	4.92E-06	5.18E-06	5.29E-06	5.00E-06	5.11E-06	5.31E-06
500	5.08E-06	5.33E-06	5.44E-06	5.15E-06	5.26E-06	5.46E-06
600	5.24E-06	5.47E-06	5.57E-06	5.29E-06	5.39E-06	5.59E-06
700	5.37E-06	5.59E-06	5.68E-06	5.41E-06	5.50E-06	5.70E-06
800	5.47E-06	5.71E-06	5.78E-06	5.52E-06	5.60E-06	5.80E-06
900	5.57E-06	5.82E-06	5.87E-06	5.63E-06	5.68E-06	5.89E-06
1000	5.66E-06	5.91E-06	5.98E-06	5.73E-06	5.75E-06	5.98E-06

Specimen Number	AP6 02	AP6 03	AW1 01	AW1 02	AW1 03	AW2 01
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	12/15/09 7:44 AM	12/15/09 3:57 PM	12/15/09 3:47 PM	12/16/09 8:03 AM	4/21/10 8:52 AM	12/16/09 4:18 PM
Initial Sample Length (L0, mm)	25.37	25.37	25.372	25.375	25.373	25.375
Linear Thermal Expansion Temperature °C						
100	3.93E-04	3.86E-04	3.77E-04	3.78E-04	3.81E-04	3.91E-04
200	8.67E-04	8.54E-04	8.60E-04	8.16E-04	8.51E-04	8.60E-04
300	1.36E-03	1.36E-03	1.37E-03	1.28E-03	1.37E-03	1.37E-03
400	1.91E-03	1.91E-03	1.92E-03	1.80E-03	1.93E-03	1.93E-03
500	2.48E-03	2.47E-03	2.50E-03	2.33E-03	2.51E-03	2.50E-03
600	3.07E-03	3.06E-03	3.09E-03	2.90E-03	3.12E-03	3.10E-03
700	3.68E-03	3.67E-03	3.71E-03	3.49E-03	3.73E-03	3.71E-03
800	4.31E-03	4.29E-03	4.35E-03	4.09E-03	4.35E-03	4.34E-03
900	4.96E-03	4.93E-03	5.00E-03	4.72E-03	4.99E-03	4.99E-03
1000	5.61E-03	5.60E-03	5.64E-03	5.36E-03	5.67E-03	5.67E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	4.58E-06	4.61E-06	4.65E-06	4.23E-06	4.64E-06	4.65E-06
200	4.93E-06	4.94E-06	5.01E-06	4.59E-06	5.03E-06	4.99E-06
300	5.25E-06	5.24E-06	5.33E-06	4.93E-06	5.37E-06	5.31E-06
400	5.54E-06	5.52E-06	5.62E-06	5.23E-06	5.66E-06	5.59E-06
500	5.79E-06	5.77E-06	5.87E-06	5.51E-06	5.91E-06	5.85E-06
600	6.02E-06	5.99E-06	6.09E-06	5.76E-06	6.11E-06	6.07E-06
700	6.21E-06	6.19E-06	6.26E-06	5.98E-06	6.26E-06	6.26E-06
800	6.38E-06	6.36E-06	6.40E-06	6.17E-06	6.36E-06	6.42E-06
900	6.51E-06	6.51E-06	6.51E-06	6.34E-06	6.42E-06	6.55E-06
1000	6.61E-06	6.63E-06	6.57E-06	6.47E-06	6.43E-06	6.64E-06
Mean CTE (1/K)						
Temperature °C						
100	4.65E-06	4.64E-06	4.61E-06	4.37E-06	4.52E-06	4.67E-06
200	4.70E-06	4.66E-06	4.74E-06	4.38E-06	4.62E-06	4.70E-06
300	4.80E-06	4.79E-06	4.86E-06	4.48E-06	4.82E-06	4.85E-06
400	4.98E-06	4.97E-06	5.03E-06	4.66E-06	5.04E-06	5.03E-06
500	5.12E-06	5.12E-06	5.18E-06	4.81E-06	5.20E-06	5.19E-06
600	5.26E-06	5.25E-06	5.32E-06	4.95E-06	5.34E-06	5.32E-06
700	5.38E-06	5.37E-06	5.45E-06	5.09E-06	5.46E-06	5.44E-06
800	5.50E-06	5.48E-06	5.56E-06	5.21E-06	5.56E-06	5.55E-06
900	5.61E-06	5.59E-06	5.67E-06	5.33E-06	5.65E-06	5.65E-06
1000	5.70E-06	5.70E-06	5.74E-06	5.45E-06	5.76E-06	5.77E-06

Specimen Number	AW2 02	AW2 03	AW3 01	AW3 02	AW3 03	AW10 01
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	12/16/09 4:10 PM	5/13/10 5:22 PM	12/17/09 7:51 AM	5/19/10 5:00 PM	12/21/09 2:01 PM	12/22/09 9:22 AM
Initial Sample Length (L0, mm)	25.375	25.374	25.379	25.376	25.374	25.382
Linear Thermal Expansion Temperature °C						
100	3.57E-04	3.62E-04	3.83E-04	3.68E-04	3.77E-04	3.94E-04
200	8.01E-04	8.21E-04	8.54E-04	8.42E-04	8.26E-04	8.68E-04
300	1.27E-03	1.32E-03	1.36E-03	1.35E-03	1.30E-03	1.38E-03
400	1.79E-03	1.87E-03	1.92E-03	1.91E-03	1.82E-03	1.94E-03
500	2.33E-03	2.43E-03	2.50E-03	2.48E-03	2.36E-03	2.51E-03
600	2.89E-03	3.02E-03	3.09E-03	3.07E-03	2.93E-03	3.11E-03
700	3.47E-03	3.62E-03	3.71E-03	3.67E-03	3.52E-03	3.71E-03
800	4.08E-03	4.22E-03	4.34E-03	4.30E-03	4.13E-03	4.33E-03
900	4.70E-03	4.84E-03	4.98E-03	4.92E-03	4.75E-03	4.96E-03
1000	5.32E-03	5.46E-03	5.62E-03	5.55E-03	5.38E-03	5.63E-03
Instantaneous CTE (1/K) Temperature °C						
100	4.28E-06	4.48E-06	4.57E-06	4.61E-06	4.35E-06	4.67E-06
200	4.63E-06	4.88E-06	4.97E-06	4.99E-06	4.69E-06	5.02E-06
300	4.95E-06	5.22E-06	5.32E-06	5.32E-06	5.00E-06	5.33E-06
400	5.25E-06	5.51E-06	5.63E-06	5.60E-06	5.29E-06	5.60E-06
500	5.51E-06	5.75E-06	5.88E-06	5.83E-06	5.54E-06	5.83E-06
600	5.74E-06	5.94E-06	6.09E-06	6.01E-06	5.77E-06	6.02E-06
700	5.94E-06	6.07E-06	6.24E-06	6.15E-06	5.98E-06	6.18E-06
800	6.11E-06	6.14E-06	6.35E-06	6.23E-06	6.15E-06	6.29E-06
900	6.25E-06	6.17E-06	6.40E-06	6.26E-06	6.30E-06	6.37E-06
1000	6.37E-06	6.14E-06	6.41E-06	6.25E-06	6.43E-06	6.42E-06
Mean CTE (1/K) Temperature °C						
100	4.35E-06	4.41E-06	4.54E-06	4.46E-06	4.46E-06	4.61E-06
200	4.40E-06	4.51E-06	4.63E-06	4.61E-06	4.48E-06	4.68E-06
300	4.50E-06	4.69E-06	4.79E-06	4.79E-06	4.57E-06	4.84E-06
400	4.69E-06	4.90E-06	4.99E-06	4.99E-06	4.74E-06	5.04E-06
500	4.83E-06	5.05E-06	5.16E-06	5.14E-06	4.88E-06	5.18E-06
600	4.97E-06	5.19E-06	5.30E-06	5.27E-06	5.02E-06	5.31E-06
700	5.09E-06	5.30E-06	5.42E-06	5.39E-06	5.14E-06	5.42E-06
800	5.22E-06	5.40E-06	5.53E-06	5.49E-06	5.26E-06	5.52E-06
900	5.33E-06	5.50E-06	5.64E-06	5.58E-06	5.38E-06	5.61E-06
1000	5.42E-06	5.56E-06	5.71E-06	5.65E-06	5.47E-06	5.71E-06

Specimen Number	AW11 01	AW11 02	AW11 03	AW10 02	AW10 03	AW11 01	AW11 02	AW12 01
Measured By	47735	47735	47735	47735	47735	47735	47735	47735
Measured Date	1/4/10 9:18 AM	12/22/09 9:24 AM	1/4/10 9:18 AM	12/22/09 9:24 AM	5/17/10 8:54 AM	12/23/09 8:26 AM	4/21/10 9:42 AM	1/5/10 8:16 AM
Initial Sample Length (L0, mm)	25.385	25.381	25.385	25.381	25.38	25.384	25.373	25.387
Linear Thermal Expansion Temperature °C								
100	3.66E-04	3.76E-04	3.66E-04	3.76E-04	3.68E-04	3.81E-04	3.62E-04	3.75E-04
200	8.15E-04	8.26E-04	8.15E-04	8.26E-04	8.29E-04	8.43E-04	8.25E-04	8.39E-04
300	1.29E-03	1.30E-03	1.29E-03	1.30E-03	1.33E-03	1.35E-03	1.32E-03	1.35E-03
400	1.81E-03	1.82E-03	1.81E-03	1.82E-03	1.88E-03	1.90E-03	1.87E-03	1.91E-03
500	2.36E-03	2.36E-03	2.36E-03	2.36E-03	2.45E-03	2.47E-03	2.44E-03	2.49E-03
600	2.93E-03	2.92E-03	2.93E-03	2.92E-03	3.04E-03	3.07E-03	3.02E-03	3.09E-03
700	3.52E-03	3.51E-03	3.52E-03	3.51E-03	3.65E-03	3.67E-03	3.62E-03	3.70E-03
800	4.13E-03	4.11E-03	4.13E-03	4.11E-03	4.26E-03	4.30E-03	4.24E-03	4.33E-03
900	4.75E-03	4.73E-03	4.75E-03	4.73E-03	4.88E-03	4.94E-03	4.86E-03	4.98E-03
1000	5.38E-03	5.35E-03	5.38E-03	5.35E-03	5.50E-03	5.58E-03	5.49E-03	5.65E-03
Instantaneous CTE (1/K)								
Temperature °C								
100	4.32E-06	4.33E-06	4.32E-06	4.33E-06	4.41E-06	4.52E-06	4.49E-06	4.56E-06
200	4.69E-06	4.68E-06	4.69E-06	4.68E-06	4.87E-06	4.92E-06	4.88E-06	4.96E-06
300	5.02E-06	4.99E-06	5.02E-06	4.99E-06	5.25E-06	5.27E-06	5.22E-06	5.32E-06
400	5.32E-06	5.28E-06	5.32E-06	5.28E-06	5.57E-06	5.57E-06	5.52E-06	5.63E-06
500	5.58E-06	5.53E-06	5.58E-06	5.53E-06	5.82E-06	5.83E-06	5.76E-06	5.89E-06
600	5.80E-06	5.75E-06	5.80E-06	5.75E-06	6.01E-06	6.04E-06	5.96E-06	6.11E-06
700	6.00E-06	5.94E-06	6.00E-06	5.94E-06	6.13E-06	6.20E-06	6.10E-06	6.28E-06
800	6.16E-06	6.10E-06	6.16E-06	6.10E-06	6.18E-06	6.32E-06	6.20E-06	6.40E-06
900	6.28E-06	6.22E-06	6.28E-06	6.22E-06	6.17E-06	6.39E-06	6.25E-06	6.48E-06
1000	6.37E-06	6.32E-06	6.37E-06	6.32E-06	6.08E-06	6.42E-06	6.25E-06	6.51E-06
Mean CTE (1/K)								
Temperature °C								
100	4.35E-06	4.45E-06	4.35E-06	4.45E-06	4.36E-06	4.52E-06	4.38E-06	4.42E-06
200	4.43E-06	4.48E-06	4.43E-06	4.48E-06	4.50E-06	4.58E-06	4.52E-06	4.54E-06
300	4.54E-06	4.57E-06	4.54E-06	4.57E-06	4.67E-06	4.74E-06	4.69E-06	4.75E-06
400	4.73E-06	4.74E-06	4.73E-06	4.74E-06	4.89E-06	4.95E-06	4.89E-06	4.97E-06
500	4.88E-06	4.87E-06	4.88E-06	4.87E-06	5.05E-06	5.11E-06	5.05E-06	5.15E-06
600	5.02E-06	5.01E-06	5.02E-06	5.01E-06	5.21E-06	5.25E-06	5.19E-06	5.29E-06
700	5.15E-06	5.13E-06	5.15E-06	5.13E-06	5.33E-06	5.37E-06	5.31E-06	5.41E-06
800	5.27E-06	5.25E-06	5.27E-06	5.25E-06	5.44E-06	5.48E-06	5.42E-06	5.53E-06
900	5.38E-06	5.35E-06	5.38E-06	5.35E-06	5.52E-06	5.59E-06	5.51E-06	5.63E-06
1000	5.47E-06	5.44E-06	5.47E-06	5.44E-06	5.59E-06	5.67E-06	5.59E-06	5.74E-06

Specimen Number	AW12 02	AW12 03	AW13 01	AW14 01	AW14 02	AW14 03
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	5/19/10 8:28 AM	1/5/10 4:42 PM	1/5/10 4:30 PM	5/14/10 9:19 AM	1/6/10 4:02 PM	1/7/10 7:35 AM
Initial Sample Length (L0, mm)	25.383	25.36	25.373	25.373	25.373	25.371
Linear Thermal Expansion Temperature °C						
100	3.77E-04	3.72E-04	3.72E-04	3.67E-04	3.64E-04	3.80E-04
200	8.50E-04	8.22E-04	8.39E-04	8.24E-04	8.15E-04	8.23E-04
300	1.36E-03	1.29E-03	1.34E-03	1.33E-03	1.29E-03	1.29E-03
400	1.92E-03	1.81E-03	1.89E-03	1.89E-03	1.81E-03	1.82E-03
500	2.49E-03	2.36E-03	2.46E-03	2.46E-03	2.36E-03	2.37E-03
600	3.08E-03	2.93E-03	3.05E-03	3.06E-03	2.92E-03	2.93E-03
700	3.68E-03	3.52E-03	3.66E-03	3.68E-03	3.51E-03	3.51E-03
800	4.30E-03	4.12E-03	4.28E-03	4.31E-03	4.12E-03	4.10E-03
900	4.93E-03	4.71E-03	4.92E-03	4.95E-03	4.74E-03	4.71E-03
1000	5.55E-03	5.36E-03	5.56E-03	5.59E-03	5.36E-03	5.34E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	4.60E-06	4.31E-06	4.54E-06	4.43E-06	4.34E-06	4.30E-06
200	4.98E-06	4.68E-06	4.92E-06	4.89E-06	4.69E-06	4.67E-06
300	5.32E-06	5.01E-06	5.26E-06	5.29E-06	5.02E-06	5.00E-06
400	5.60E-06	5.30E-06	5.56E-06	5.62E-06	5.30E-06	5.28E-06
500	5.83E-06	5.55E-06	5.81E-06	5.90E-06	5.56E-06	5.53E-06
600	6.01E-06	5.76E-06	6.02E-06	6.11E-06	5.79E-06	5.74E-06
700	6.14E-06	5.93E-06	6.18E-06	6.26E-06	5.98E-06	5.90E-06
800	6.22E-06	6.06E-06	6.30E-06	6.35E-06	6.14E-06	6.03E-06
900	6.25E-06	6.15E-06	6.38E-06	6.38E-06	6.26E-06	6.12E-06
1000	6.22E-06	6.20E-06	6.41E-06	6.35E-06	6.36E-06	6.16E-06
Mean CTE (1/K)						
Temperature °C						
100	4.44E-06	4.46E-06	4.53E-06	4.37E-06	4.42E-06	4.39E-06
200	4.60E-06	4.48E-06	4.61E-06	4.49E-06	4.47E-06	4.41E-06
300	4.79E-06	4.57E-06	4.75E-06	4.68E-06	4.56E-06	4.51E-06
400	4.99E-06	4.73E-06	4.95E-06	4.92E-06	4.74E-06	4.71E-06
500	5.14E-06	4.88E-06	5.11E-06	5.09E-06	4.88E-06	4.87E-06
600	5.27E-06	5.02E-06	5.25E-06	5.25E-06	5.02E-06	5.00E-06
700	5.38E-06	5.15E-06	5.37E-06	5.38E-06	5.15E-06	5.12E-06
800	5.49E-06	5.26E-06	5.48E-06	5.50E-06	5.27E-06	5.21E-06
900	5.58E-06	5.34E-06	5.58E-06	5.61E-06	5.38E-06	5.32E-06
1000	5.64E-06	5.45E-06	5.66E-06	5.68E-06	5.46E-06	5.42E-06

Specimen Number	AW15 01	AW15 02	AW15 03	AW16 03	AW4 01	AW4 02
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	1/7/10 7:42 AM	1/7/10 3:50 PM	1/7/10 3:48 PM	1/8/10 4:16 PM	1/8/10 4:10 PM	1/11/10 7:54 AM
Initial Sample Length (L0, mm)	25.375	25.375	25.375	25.376	25.377	25.377
Linear Thermal Expansion Temperature °C						
100	3.83E-04	3.61E-04	3.61E-04	3.68E-04	3.63E-04	3.80E-04
200	8.53E-04	8.03E-04	8.03E-04	8.17E-04	8.27E-04	8.24E-04
300	1.36E-03	1.28E-03	1.27E-03	1.29E-03	1.32E-03	1.30E-03
400	1.91E-03	1.79E-03	1.78E-03	1.82E-03	1.87E-03	1.82E-03
500	2.48E-03	2.33E-03	2.32E-03	2.37E-03	2.44E-03	2.37E-03
600	3.07E-03	2.89E-03	2.88E-03	2.93E-03	3.03E-03	2.93E-03
700	3.66E-03	3.47E-03	3.44E-03	3.51E-03	3.63E-03	3.51E-03
800	4.29E-03	4.07E-03	4.03E-03	4.11E-03	4.26E-03	4.11E-03
900	4.93E-03	4.68E-03	4.64E-03	4.73E-03	4.90E-03	4.72E-03
1000	5.57E-03	5.31E-03	5.26E-03	5.38E-03	5.54E-03	5.36E-03
Instantaneous CTE (1/K) Temperature °C						
100	4.62E-06	4.31E-06	4.32E-06	4.40E-06	4.46E-06	4.34E-06
200	4.96E-06	4.65E-06	4.63E-06	4.72E-06	4.86E-06	4.69E-06
300	5.27E-06	4.96E-06	4.92E-06	5.02E-06	5.22E-06	5.00E-06
400	5.54E-06	5.24E-06	5.18E-06	5.29E-06	5.53E-06	5.28E-06
500	5.78E-06	5.49E-06	5.42E-06	5.54E-06	5.80E-06	5.53E-06
600	5.98E-06	5.70E-06	5.64E-06	5.76E-06	6.02E-06	5.75E-06
700	6.15E-06	5.89E-06	5.83E-06	5.95E-06	6.19E-06	5.93E-06
800	6.28E-06	6.05E-06	5.99E-06	6.12E-06	6.32E-06	6.07E-06
900	6.38E-06	6.18E-06	6.13E-06	6.26E-06	6.40E-06	6.19E-06
1000	6.44E-06	6.28E-06	6.25E-06	6.38E-06	6.44E-06	6.27E-06
Mean CTE (1/K) Temperature °C						
100	4.55E-06	4.32E-06	4.40E-06	4.39E-06	4.41E-06	4.39E-06
200	4.64E-06	4.38E-06	4.41E-06	4.45E-06	4.54E-06	4.42E-06
300	4.79E-06	4.50E-06	4.50E-06	4.57E-06	4.69E-06	4.54E-06
400	4.98E-06	4.68E-06	4.67E-06	4.75E-06	4.89E-06	4.72E-06
500	5.13E-06	4.83E-06	4.80E-06	4.90E-06	5.05E-06	4.88E-06
600	5.26E-06	4.96E-06	4.94E-06	5.02E-06	5.20E-06	5.00E-06
700	5.35E-06	5.08E-06	5.05E-06	5.14E-06	5.33E-06	5.12E-06
800	5.47E-06	5.19E-06	5.15E-06	5.25E-06	5.45E-06	5.23E-06
900	5.58E-06	5.30E-06	5.26E-06	5.36E-06	5.56E-06	5.34E-06
1000	5.66E-06	5.40E-06	5.36E-06	5.47E-06	5.64E-06	5.44E-06

Specimen Number	AW4 03	AW5 01	AW5 02	AW5 03	AW6 01	AW13 02
Measured By	47735	47735	47735	47735	47735	47735
Measured Date	5/13/10 8:41 AM	1/11/10 4:38 PM	1/12/10 7:39 AM	1/12/10 3:50 PM	1/12/10 3:58 PM	5/18/10 5:16 PM
Initial Sample Length (L0, mm)	25.378	25.38	25.378	25.379	25.379	25.373
Linear Thermal Expansion						
Temperature °C						
100	3.69E-04	3.86E-04	3.95E-04	3.65E-04	3.91E-04	3.60E-04
200	8.39E-04	8.60E-04	8.40E-04	8.29E-04	8.65E-04	8.24E-04
300	1.35E-03	1.37E-03	1.32E-03	1.33E-03	1.39E-03	1.33E-03
400	1.90E-03	1.93E-03	1.84E-03	1.87E-03	1.94E-03	1.88E-03
500	2.48E-03	2.51E-03	2.39E-03	2.44E-03	2.52E-03	2.45E-03
600	3.07E-03	3.10E-03	2.95E-03	3.02E-03	3.11E-03	3.04E-03
700	3.68E-03	3.70E-03	3.53E-03	3.63E-03	3.72E-03	3.64E-03
800	4.30E-03	4.32E-03	4.13E-03	4.25E-03	4.35E-03	4.27E-03
900	4.93E-03	4.96E-03	4.75E-03	4.89E-03	4.99E-03	4.90E-03
1000	5.56E-03	5.62E-03	5.37E-03	5.52E-03	5.64E-03	5.53E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	4.56E-06	4.68E-06	4.33E-06	4.51E-06	4.70E-06	4.50E-06
200	4.96E-06	5.02E-06	4.69E-06	4.88E-06	5.04E-06	4.90E-06
300	5.30E-06	5.32E-06	5.02E-06	5.21E-06	5.34E-06	5.26E-06
400	5.60E-06	5.59E-06	5.30E-06	5.50E-06	5.61E-06	5.56E-06
500	5.84E-06	5.83E-06	5.55E-06	5.76E-06	5.85E-06	5.81E-06
600	6.03E-06	6.02E-06	5.76E-06	5.97E-06	6.05E-06	6.02E-06
700	6.17E-06	6.19E-06	5.93E-06	6.15E-06	6.21E-06	6.17E-06
800	6.26E-06	6.31E-06	6.07E-06	6.28E-06	6.34E-06	6.28E-06
900	6.30E-06	6.41E-06	6.17E-06	6.38E-06	6.43E-06	6.33E-06
1000	6.29E-06	6.46E-06	6.23E-06	6.44E-06	6.49E-06	6.34E-06
Mean CTE (1/K)						
Temperature °C						
100	4.38E-06	4.65E-06	4.45E-06	4.43E-06	4.71E-06	4.35E-06
200	4.56E-06	4.70E-06	4.47E-06	4.55E-06	4.74E-06	4.51E-06
300	4.75E-06	4.85E-06	4.58E-06	4.71E-06	4.90E-06	4.69E-06
400	4.96E-06	5.04E-06	4.75E-06	4.90E-06	5.07E-06	4.91E-06
500	5.12E-06	5.19E-06	4.90E-06	5.05E-06	5.21E-06	5.07E-06
600	5.26E-06	5.31E-06	5.03E-06	5.19E-06	5.33E-06	5.22E-06
700	5.38E-06	5.42E-06	5.15E-06	5.32E-06	5.45E-06	5.34E-06
800	5.49E-06	5.52E-06	5.25E-06	5.43E-06	5.56E-06	5.45E-06
900	5.58E-06	5.62E-06	5.35E-06	5.54E-06	5.65E-06	5.56E-06
1000	5.65E-06	5.72E-06	5.44E-06	5.62E-06	5.74E-06	5.63E-06

Specimen Number	AW13 03	AW16 01	AW16 02
Measured By	47735	47735	47735
Measured Date	5/17/10 5:20 PM	1/8/10 7:52 AM	1/8/10 7:53 AM
Initial Sample Length (L0, mm)	25.369	25.375	25.373
Linear Thermal Expansion			
Temperature °C			
100	3.61E-04	3.91E-04	3.72E-04
200	8.23E-04	8.63E-04	8.10E-04
300	1.32E-03	1.38E-03	1.27E-03
400	1.87E-03	1.94E-03	1.78E-03
500	2.44E-03	2.52E-03	2.32E-03
600	3.02E-03	3.11E-03	2.87E-03
700	3.63E-03	3.72E-03	3.45E-03
800	4.23E-03	4.33E-03	4.06E-03
900	4.84E-03	4.96E-03	4.67E-03
1000	5.46E-03	5.62E-03	5.29E-03
Instantaneous CTE (1/K)			
Temperature °C			
100	4.44E-06	4.65E-06	4.21E-06
200	4.88E-06	5.02E-06	4.57E-06
300	5.24E-06	5.34E-06	4.90E-06
400	5.55E-06	5.62E-06	5.19E-06
500	5.78E-06	5.85E-06	5.46E-06
600	5.96E-06	6.04E-06	5.69E-06
700	6.06E-06	6.17E-06	5.90E-06
800	6.10E-06	6.27E-06	6.07E-06
900	6.08E-06	6.31E-06	6.21E-06
1000	5.99E-06	6.31E-06	6.32E-06
Mean CTE (1/K)			
Temperature °C			
100	4.37E-06	4.54E-06	4.37E-06
200	4.50E-06	4.64E-06	4.38E-06
300	4.67E-06	4.81E-06	4.46E-06
400	4.89E-06	5.02E-06	4.64E-06
500	5.05E-06	5.18E-06	4.78E-06
600	5.19E-06	5.31E-06	4.91E-06
700	5.32E-06	5.42E-06	5.05E-06
800	5.41E-06	5.51E-06	5.17E-06
900	5.49E-06	5.60E-06	5.28E-06
1000	5.56E-06	5.70E-06	5.37E-06

Specimen number	AP4 02	AP4 03	AP5 01	AP5 02
Date and Time	1/21/2010 12:23	1/21/2010 12:32	1/21/2010 12:42	1/21/2010 12:50
Operator	41169	41169	41169	41169
Sample location				
mass of specimen (g)	5.9199	5.9226	5.9156	5.9194
length of specimen (mm)	25.36800	25.36800	25.36900	25.36600
diameter of specimen (mm)	12.73213	12.73225	12.73188	12.73313
Poisson's ratio	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	29859 29892 29806 29857 29891 29881 29844 29830 29834 29817	29900 29890 29928 29900 29947 29934 29952 29975 29978 29941	29830 29891 29879 29867 29875 29864 29826 29846 29816 29812	29874 29878 29836 29878 29861 29892 29831 29848 29839 29876
average resonant frequency (Hz)	29851	29935	29851	29861
standard deviation (Hz)	30	31	28	21
correction factor for rod	2.113729355	2.113749382	2.1136089	2.114050431
modulus of elasticity (Pa)	1.11E+10	1.12E+10	1.11E+10	1.11E+10
T _{r1} correction factor	2.287754813	2.287780099	2.287602727	2.288160213
calculation of individual terms	0.030984564 0.325665902 2.276732838	0.03098578 0.325678691 2.276757908	0.030977245 0.325588983 2.276582054	0.031004075 0.325870981 2.277134769
resultant T _{r1}	2.113729355	2.113749382	2.1136089	2.114050431
modulus of elasticity (Pa)	1.11E+10	1.12E+10	1.11E+10	1.11E+10
Average Modulus for specimen group		1.12E+10		

Specimen number	AP5 03	AP6 01	AP6 02	AP6 03	AW1 01
Date and Time	1/21/2010 12:54	1/21/2010 13:03	1/21/2010 13:29	1/21/2010 13:34	1/21/2010 13:40
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.9186	5.9229	5.9258	5.9304	5.8079
length of specimen (mm)	25.36775	25.37000	25.37050	25.37025	25.37200
diameter of specimen (mm)	12.73338	12.73675	12.73963	12.74300	12.73263
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	29942 29939 29942 29930 29920 29950 29943 29902 29888 29911	29821 29865 29874 29870 29887 29885 29834 29849 29832 29827	29936 29961 29902 29922 29924 29922 29942 29926 29913 29914	29942 29942 29959 29962 29978 29941 29959 29925 29913 29961	29478 29524 29473 29502 29484 29485 29486 29480 29460 29457
average resonant frequency (Hz)	29927	29854	29926	29948	29483
standard deviation (Hz)	21	25	17	19	19
correction factor for rod	2.113949734	2.114309533	2.114730009	2.115291057	2.113487871
modulus of elasticity (Pa)	1.12E+10	1.11E+10	1.12E+10	1.12E+10	1.07E+10
T _r correction factor	2.288033068	2.288487373	2.289018316	2.289726802	2.287449918
calculation of individual terms	0.030997955 0.325806655 2.277008712	0.031019826 0.326036527 2.277459128	0.031045395 0.326305281 2.277985527	0.031079532 0.326664075 2.278687949	0.030969893 0.325511707 2.276430553
resultant T _r	2.113949734	2.114309533	2.114730009	2.115291057	2.113487871
modulus of elasticity (Pa)	1.12E+10	1.11E+10	1.12E+10	1.12E+10	1.07E+10
Average Modulus for specimen group					

Specimen number	AP5 03	AP6 01	AP6 02	AP6 03	AW1 01
Specimen group standard deviation					
Environmental Conditions					
Temperature (°C)	23	23	23.1	23.1	23.1
Barometric Pressure (in of Hg)	24.6	24.6	24.6	24.6	24.6
Humidity (%)	18.9	18.8	18.9	18.9	18.9
Sampling Plan Layout					
Instrument					
ASTM					
# of Strikes					
Comments:					

Specimen number	AW1 02	AW1 03	AW10 01	AW11 01	AW11 03	AW12 01
Date and Time	1/21/2010 14:00	1/21/2010 14:09	1/21/2010 8:55	1/27/2010 8:58	1/28/2010 13:51	1/28/2010 13:53
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.9100	5.9309	5.8023	5.8032	5.9243	5.8111
length of specimen (mm)	25.37475	25.37300	25.38200	25.38375	25.38500	25.38700
diameter of specimen (mm)	12.73100	12.72825	12.72650	12.72813	12.73188	12.73000
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	30362 30407 30395 30413 30417 30404 30331 30334 30356 30412	30527 30469 30491 30465 30503 30511 30483 30552 30503 30552	29453 29485 29416 29489 29466 29449 29441 29504 29455 29458	29394 29457 29459 29373 29393 29406 29407 29387 29460 29365	30563 30539 30530 30570 30551 30561 30553 30562 30550 30539	29405 29402 29407 29401 29404 29410 29410 29402 29393 29403
average resonant frequency (Hz)	30383	30506	29462	29410	30552	29404
standard deviation (Hz)	34	31	26	36	13	5
correction factor for rod	2.113006642	2.112706885	2.111704321	2.111823924	2.112323652	2.111863176
modulus of elasticity (Pa)	1.15E+10	1.17E+10	1.07E+10	1.06E+10	1.17E+10	1.06E+10
T ₁ correction factor	2.286842348	2.28646391	2.285198283	2.285349261	2.285980103	2.285398811
calculation of individual terms	0.03094067 0.325204551 2.275828183	0.030922474 0.325013305 2.275452984	0.030861661 0.324374121 2.274198189	0.030868912 0.324450337 2.274347876	0.03089922 0.324768892 2.274973318	0.030871292 0.324475352 2.274397001
resultant T ₁	2.113006642	2.112706885	2.111704321	2.111823924	2.112323652	2.111863176
modulus of elasticity (Pa)	1.15E+10	1.17E+10	1.07E+10	1.06E+10	1.17E+10	1.06E+10
Average Modulus for specimen group						

Specimen number	AW1 02	AW1 03	AW10 01	AW11 01	AW11 03	AW12 01
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	23.2	23.2	21.4	21.4	21.9	21.9
Barometric Pressure (in of Hg)	24.6	24.6	24.4	25.3	25.4	25.4
Humidity (%)	19	18.6	16.6	20.8	14	13.9
Sampling Plan Layout						
Instrument						
ASTM						
# of Strikes				55	13	16
Comments:						

Specimen number	AW12 02	AW12 03	AW13 01	AW13 02	AW13 03	AW14 01
Date and Time	1/28/2010 13:56	1/28/2010 13:58	1/28/2010 14:01	1/28/2010 14:03	1/28/2010 14:05	1/28/2010 14:09
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.9112	5.9206	5.7981	5.9174	5.9325	5.8006
length of specimen (mm)	25.38275	25.35950	25.37325	25.37350	25.36950	25.37325
diameter of specimen (mm)	12.72863	12.72975	12.73263	12.73425	12.73450	12.73525
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	30380 30388 30404 30378 30379 30384 30404 30390 30384 30376	30678 30660 30675 30669 30677 30685 30685 30680 30673 30664	29464 29439 29449 29451 29462 29454 29447 29443 29451 29453	30450 30447 30451 30439 30446 30440 30448 30453 30434 30442	30608 30610 30606 30601 30601 30614 30598 30599 30594 30597	29562 29569 29574 29589 29545 29549 29572 29575 29559 29565
average resonant frequency (Hz)	30387	30675	29451	30445	30603	29566
standard deviation (Hz)	10	8	8	6	6	13
correction factor for rod	2.111984161	2.114032455	2.113387403	2.113627575	2.113989241	2.11380785
modulus of elasticity (Pa)	1.15E+10	1.18E+10	1.06E+10	1.16E+10	1.17E+10	1.07E+10
T _r correction factor	2.285551536	2.288137515	2.28732307	2.287626306	2.288082951	2.287853922
calculation of individual terms	0.030878628 0.324552462 2.274548419	0.031002983 0.325859497 2.277112265	0.030963791 0.325447567 2.27630479	0.03097838 0.325600907 2.276605431	0.031000356 0.325831891 2.277058168	0.030989333 0.325716032 2.276831099
resultant T _r	2.111984161	2.114032455	2.113387403	2.113627575	2.113989241	2.11380785
modulus of elasticity (Pa)	1.15E+10	1.18E+10	1.06E+10	1.16E+10	1.17E+10	1.07E+10
Average Modulus for specimen group						

Specimen number	AW12 02	AW12 03	AW13 01	AW13 02	AW13 03	AW14 01
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	21.9	21.9	22	22	22	22
Barometric Pressure (in of Hg)	25.4	25.4	25.4	25.4	25.4	25.4
Humidity (%)	13.8	13.9	13.8	13.8	13.9	13.8
Sampling Plan Layout						
Instrument						
ASTM						
# of Strikes	18	11	11	19	12	19
Comments:						

Specimen number	AW14 02	AW14 03	AW15 01	AW15 02	AW15 03	AW16 01
Date and Time	1/28/2010 14:12	1/28/2010 14:15	1/28/2010 14:41	1/28/2010 14:43	1/28/2010 14:46	1/28/2010 14:48
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.9219	5.9253	5.8120	5.9253	5.9348	5.8090
length of specimen (mm)	25.37300	25.37075	25.37500	25.37475	25.37475	25.37550
diameter of specimen (mm)	12.73475	12.73375	12.73425	12.73625	12.73588	12.72788
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	30564 30564 30555 30576 30589 30556 30534 30574 30574 30598	30609 30621 30611 30605 30604 30609 30597 30616 30587 30589	29625 29618 29599 29626 29598 29604 29594 29589 29592 29600	30424 30424 30417 30425 30427 30420 30420 30421 30422 30412	30484 30505 30483 30495 30495 30513 30497 30491 30514 30495	29504 29506 29519 29513 29496 29511 29507 29509 29499 29491
average resonant frequency (Hz)	30568	30605	29605	30421	30497	29506
standard deviation (Hz)	18	11	14	4	11	8
correction factor for rod	2.113747859	2.113768568	2.113507007	2.113847434	2.113787368	2.112446073
modulus of elasticity (Pa)	1.17E+10	1.17E+10	1.07E+10	1.16E+10	1.16E+10	1.07E+10
T _r correction factor	2.287778176	2.287804324	2.287474079	2.287903901	2.287828061	2.286134649
calculation of individual terms	0.030985688 0.325677718 2.276756001	0.030986946 0.325690944 2.276781926	0.030971056 0.325523925 2.276454507	0.030991738 0.325741313 2.27688065	0.030988088 0.325702951 2.276805459	0.030906647 0.324846957 2.275126542
resultant T _r	2.113747859	2.113768568	2.113507007	2.113847434	2.113787368	2.112446073
modulus of elasticity (Pa)	1.17E+10	1.17E+10	1.07E+10	1.16E+10	1.16E+10	1.07E+10
Average Modulus for specimen group						

Specimen number	AW14 02	AW14 03	AW15 01	AW15 02	AW15 03	AW16 01
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	22	22	22	22	22	22
Barometric Pressure (in of Hg)	25.4	25.4	25.4	25.4	25.4	25.4
Humidity (%)	13.8	13.8	13.5	13.5	13.4	13.4
Sampling Plan Layout						
Instrument						
ASTM						
# of Strikes	25	23	11	13	18	12
Comments:						

Specimen number	AW16 02	AW16 03	AW2 01	AW2 02	AW2 03	AW3 01
Date and Time	1/28/2010 14:50	1/28/2010 14:53	1/28/2010 14:56	1/28/2010 14:58	1/28/2010 15:00	2/1/2010 9:48
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.9179	5.9263	5.7916	5.9085	5.9296	5.7883
length of specimen (mm)	25.37350	25.37600	25.37475	25.37300	25.37375	25.37925
diameter of specimen (mm)	12.72813	12.73125	12.72575	12.72675	12.72850	12.72913
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	30472 30477 30481 30467 30468 30467 30471 30466 30484 30459	30496 30501 30496 30500 30489 30498 30480 30485 30505 30507	29486 29485 29489 29485 29493 29503 29494 29475 29486 29488	30541 30536 30551 30531 30525 30543 30525 30560 30540 30530	30633 30624 30622 30637 30600 30620 30614 30612 30610 30606	29254 29230 29277 29244 29211 29211 29249 29234 29238 29265
average resonant frequency (Hz)	30471	30496	29488	30538	30618	29241
standard deviation (Hz)	8	9	7	11	12	21
correction factor for rod	2.112646711	2.112946255	2.112166118	2.112466719	2.112686674	2.112345086
modulus of elasticity (Pa)	1.16E+10	1.16E+10	1.06E+10	1.16E+10	1.17E+10	1.05E+10
T _r correction factor	2.286387943	2.286766109	2.285781233	2.286160713	2.286438394	2.286007162
calculation of individual terms	0.030918822	0.030937004	0.030889664	0.0309079	0.030921247	0.03090052
	0.324974921	0.325166018	0.324668452	0.324860123	0.325000412	0.324782559
resultant T _r	2.275377667	2.275752596	2.27477615	2.275152382	2.275427686	2.275000146
modulus of elasticity (Pa)	2.112646711	2.112946255	2.112166118	2.112466719	2.112686674	2.112345086
Average Modulus for specimen group	1.16E+10	1.16E+10	1.06E+10	1.16E+10	1.17E+10	1.05E+10

Specimen number	AW16 02	AW16 03	AW2 01	AW2 02	AW2 03	AW3 01
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	22.1	22.1	22.1	22.1	22.1	22.4
Barometric Pressure (in of Hg)	25.4	25.4	25.4	25.4	25.4	25.2
Humidity (%)	13.4	13.2	13.2	13.3	13.1	16.1
Sampling Plan Layout						
Instrument						
ASTM						
# of Strikes	14	26	11	13	18	23
Comments:						

Specimen number	AW3 02	AW3 03	AW4 01	AW4 02	AW4 03	AW5 01
Date and Time	2/1/2010 10:04	2/1/2010 10:07	2/1/2010 10:34	2/1/2010 10:38	2/1/2010 10:41	2/1/2010 10:44
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.9088	5.9302	5.7887	5.9072	5.9251	5.78876
length of specimen (mm)	25.37575	25.37400	25.37650	25.37675	25.37775	25.38025
diameter of specimen (mm)	12.72800	12.72775	12.72675	12.72850	12.72825	12.72825
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	30341 30328 30322 30323 30326 30325 30347 30335 30336 30322	30719 30718 30714 30712 30717 30717 30709 30710 30712 30717	29237 29245 29222 29258 29253 29251 29236 29262 29237 29251	30400 30382 30387 30383 30389 30392 30391 30396 30392 30383	30542 30546 30546 30555 30550 30558 30550 30554 30544 30558	29309 29327 29304 29337 29307 29326 29330 29313 29326 29317
average resonant frequency (Hz)	30331	30715	29245	30390	30550	29320
standard deviation (Hz)	9	4	12	6	6	11
correction factor for rod	2.11244601	2.112546515	2.112185702	2.112445757	2.112325452	2.112124777
modulus of elasticity (Pa)	1.15E+10	1.18E+10	1.05E+10	1.15E+10	1.17E+10	1.05E+10
T _r correction factor	2.28613457	2.28626145	2.285805956	2.28613425	2.285982375	2.285729045
calculation of individual terms	0.030906644 0.324846916 2.275126462	0.030912742 0.324911013 2.275252257	0.030890852 0.324680937 2.274800661	0.030906628 0.324846755 2.275126146	0.030899329 0.32477004 2.274975571	0.030887157 0.324642097 2.274724409
resultant T _r	2.11244601	2.112546515	2.112185702	2.112445757	2.112325452	2.112124777
modulus of elasticity (Pa)	1.15E+10	1.18E+10	1.05E+10	1.15E+10	1.17E+10	1.05E+10
Average Modulus for specimen group						

Specimen number	AW3 02	AW3 03	AW4 01	AW4 02	AW4 03	AW5 01
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	22.4	22.5	22.5	22.7	22.5	22.4
Barometric Pressure (in of Hg)	25.2	25.2	25.2	25.2	25.2	25.3
Humidity (%)	15.9	15.9	15.8	15.8	15.9	16
Sampling Plan Layout						
Instrument						
ASTM						
# of Strikes	15	21	28	28	13	15
Comments:						

Specimen number	AW5 02	AW5 03	AW6 01	AW10 02	AW10 03	AW11 02
Date and Time	2/1/2010 10:47	2/1/2010 10:49	2/1/2010 10:53	3/19/2010 12:28	3/19/2010 12:31	3/19/2010 12:35
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.90611	5.92589	5.78877	5.9052	5.92145	5.91182
length of specimen (mm)	25.378	25.379	25.37875	25.38075	25.37975	25.38
diameter of specimen (mm)	12.729125	12.72875	12.72225	12.726	12.725375	12.7275
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	30455 30441 30428 30412 30420 30434 30443 30447 30427 30415	30632 30621 30637 30633 30647 30628 30653 30617 30619 30608	29278 29283 29263 29275 29273 29246 29279 29285 29291 29273	30442 30456 30513 30490 30444 30512 30465 30445 30444 30419	30625 30621 30641 30606 30600 30622 30653 30636 30587 30607	30409 30456 30398 30400 30401 30416 30402 30448 30451 30428
average resonant frequency (Hz)	30432	30630	29275	30463	30620	30421
standard deviation (Hz)	14	14	13			
correction factor for rod	2.11244544	2.112305134	2.111285026	2.111724602	2.111704824	2.112024815
modulus of elasticity (Pa)	1.16E+10	1.17E+10	1.05E+10	1.16E+10	1.17E+10	1.16E+10
T _r correction factor	2.286133851	2.285956727	2.284669011	2.285223884	2.285198918	2.285602855
calculation of individual terms	0.030906609 0.324846553 2.27512575	0.030898097 0.324757085 2.274950142	0.030836247 0.324107008 2.273673448	0.03086289 0.324387044 2.274223571	0.030861691 0.324374442 2.274198819	0.030881094 0.324578375 2.274599299
resultant T _r	2.11244544	2.112305134	2.111285026	2.111724602	2.111704824	2.112024815
modulus of elasticity (Pa)	1.16E+10	1.17E+10	1.05E+10	1.16E+10	1.17E+10	1.16E+10
Average Modulus for specimen group						

Specimen number	AW5 02	AW5 03	AW6 01	AW10 02	AW10 03	AW11 02
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	22.4	22.4	22.4	22.6	22.6	22.6
Barometric Pressure (in of Hg)	25.3	25.3	25.3	25.4	25.4	25.4
Humidity (%)	16	16	16	11.9	11.8	11.9
Sampling Plan Layout						
Instrument						
ASTM						
# of Strikes	19	19	28	27	25	34
Comments:						

Specimen ID Number	Operator S#	Test Date	Initial Specimen Mass (g)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Average Resonant Frequency (Hz)
AP4 02	41169	1/21/2010 12:23	5.91991	25.368	12.732125	29851.1
AP4 03	41169	1/21/2010 12:32	5.92259	25.368	12.73225	29934.5
AP5 01	41169	1/21/2010 12:42	5.91564	25.369	12.731875	29850.6
AP5 02	41169	1/21/2010 12:50	5.91941	25.366	12.733125	29861.3
AP5 03	41169	1/21/2010 12:54	5.91856	25.36775	12.733375	29926.7
AP6 01	41169	1/21/2010 13:03	5.92294	25.37	12.73675	29854.4
AP6 02	41169	1/21/2010 13:29	5.9258	25.3705	12.739625	29926.2
AP6 03	41169	1/21/2010 13:34	5.93044	25.37025	12.743	29948.2
AW1 01	41169	1/21/2010 13:40	5.80789	25.372	12.732625	29482.9
AW1 02	41169	1/21/2010 14:00	5.90997	25.37475	12.731	30383.1
AW1 03	41169	1/21/2010 14:09	5.93092	25.373	12.72825	30505.6
AW10 01	41169	1/21/2010 8:55	5.80227	25.382	12.7265	29461.6
AW11 01	41169	1/27/2010 8:58	5.80322	25.38375	12.728125	29410.1
AW11 03	41169	1/28/2010 13:51	5.92431	25.385	12.731875	30551.8
AW12 01	41169	1/28/2010 13:53	5.81111	25.387	12.73	29403.7
AW12 02	41169	1/28/2010 13:56	5.91122	25.38275	12.728625	30386.7
AW12 03	41169	1/28/2010 13:58	5.92055	25.3595	12.72975	30674.6
AW13 01	41169	1/28/2010 14:01	5.7981	25.37325	12.732625	29451.3
AW13 02	41169	1/28/2010 14:03	5.91739	25.3735	12.73425	30445
AW13 03	41169	1/28/2010 14:05	5.9325	25.3695	12.7345	30602.8
AW14 01	41169	1/28/2010 14:09	5.80061	25.37325	12.73525	29565.9
AW14 02	41169	1/28/2010 14:12	5.92187	25.373	12.73475	30568.4
AW14 03	41169	1/28/2010 14:15	5.92529	25.37075	12.73375	30604.8
AW15 01	41169	1/28/2010 14:41	5.81201	25.375	12.73425	29604.5
AW15 02	41169	1/28/2010 14:43	5.92526	25.37475	12.73625	30421.2
AW15 03	41169	1/28/2010 14:46	5.93477	25.37475	12.735875	30497.2
AW16 01	41169	1/28/2010 14:48	5.80901	25.3755	12.727875	29505.5
AW16 02	41169	1/28/2010 14:50	5.91792	25.3735	12.728125	30471.2
AW16 03	41169	1/28/2010 14:53	5.92625	25.376	12.73125	30495.7
AW2 01	41169	1/28/2010 14:56	5.79157	25.37475	12.72575	29488.4
AW2 02	41169	1/28/2010 14:58	5.90845	25.373	12.72675	30538.2
AW2 03	41169	1/28/2010 15:00	5.92958	25.37375	12.7285	30617.8
AW3 01	41169	2/1/2010 9:48	5.78829	25.37925	12.729125	29241.3
AW3 02	41169	2/1/2010 10:04	5.90875	25.37575	12.728	30330.5
AW3 03	41169	2/1/2010 10:07	5.93016	25.374	12.72775	30714.5
AW4 01	41169	2/1/2010 10:34	5.78871	25.3765	12.72675	29245.2
AW4 02	41169	2/1/2010 10:38	5.90722	25.37675	12.7285	30389.5

Specimen ID Number	Operator S#	Test Date	Initial Specimen Mass (g)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Average Resonant Frequency (Hz)
AW4 03	41169	2/1/2010 10:41	5.92505	25.37775	12.72825	30550.3
AW5 01	41169	2/1/2010 10:44	5.78876	25.38025	12.72825	29319.6
AW5 02	41169	2/1/2010 10:47	5.90611	25.378	12.729125	30432.2
AW5 03	41169	2/1/2010 10:49	5.92589	25.379	12.72875	30629.5
AW6 01	41169	2/1/2010 10:53	5.78877	25.37875	12.72225	29274.6
AW10 02	41169	3/19/2010 12:28	5.9052	25.38075	12.726	30463
AW10 03	41169	3/19/2010 12:31	5.92145	25.37975	12.725375	30619.8
AW11 02	41169	3/19/2010 12:35	5.91182	25.38	12.7275	30420.9

Specimen ID Number	Flexural Dynamic Young's Modulus (GPa)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
AP4 02	11.1295	22.8	24.7	19.3	Against Grain
AP4 03	11.1965	22.9	24.7	19.3	Against Grain
AP5 01	11.1226	23	24.7	19.2	Against Grain
AP5 02	11.1317	23	24.7	19.3	Against Grain
AP5 03	11.1798	23	24.6	18.9	Against Grain
AP6 01	11.1272	23	24.6	18.8	Against Grain
AP6 02	11.1789	23.1	24.6	18.9	Against Grain
AP6 03	11.1949	23.1	24.6	18.9	Against Grain
AW1 01	10.6533	23.1	24.6	18.9	With Grain
AW1 02	11.5197	23.2	24.6	19	With Grain
AW1 03	11.6599	23.2	24.6	18.6	With Grain
AW10 01	10.6517	21.4	24.4	16.6	With Grain
AW11 01	10.6136	21.4	25.3	20.8	With Grain
AW11 03	11.6834	21.9	25.4	14	With Grain
AW12 01	10.6215	21.9	25.4	13.9	With Grain
AW12 02	11.5388	21.9	25.4	13.8	With Grain
AW12 03	11.7519	21.9	25.4	13.9	With Grain
AW13 01	10.6137	22	25.4	13.8	With Grain
AW13 02	11.5711	22	25.4	13.8	With Grain
AW13 03	11.7167	22	25.4	13.9	With Grain
AW14 01	10.6944	22	25.4	13.8	With Grain
AW14 02	11.6720	22	25.4	13.8	With Grain
AW14 03	11.7073	22	25.4	13.8	With Grain
AW15 01	10.7474	22	25.4	13.5	With Grain
AW15 02	11.5640	22	25.4	13.5	With Grain
AW15 03	11.6415	22	25.4	13.4	With Grain
AW16 01	10.6868	22	25.4	13.4	With Grain
AW16 02	11.6090	22.1	25.4	13.4	With Grain
AW16 03	11.6377	22.1	25.4	13.2	With Grain
AW2 01	10.6471	22.1	25.4	13.2	With Grain
AW2 02	11.6448	22.1	25.4	13.3	With Grain
AW2 03	11.7432	22.1	25.4	13.1	With Grain
AW3 01	10.4589	22.4	25.2	16.1	With Grain
AW3 02	11.4866	22.4	25.2	15.9	With Grain
AW3 03	11.8210	22.5	25.2	15.9	With Grain
AW4 01	10.4661	22.5	25.2	15.8	With Grain
AW4 02	11.5279	22.7	25.2	15.8	With Grain

Specimen ID Number	Flexural Dynamic Young's Modulus (GPa)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
AW4 03	11.6870	22.5	25.2	15.9	With Grain
AW5 01	10.5189	22.4	25.3	16	With Grain
AW5 02	11.5576	22.4	25.3	16	With Grain
AW5 03	11.7491	22.4	25.3	16	With Grain
AW6 01	10.5004	22.4	25.3	16	With Grain
AW10 02	11.5904	22.6	25.4	11.9	With Grain
AW10 03	11.7430	22.6	25.4	11.8	With Grain
AW11 02	11.5665	22.6	25.4	11.9	With Grain

Specimen Number	AP2 02	AP2 03	AP3 01	AP3 02	AP3 03
Date and Time	2/23/2010 14:00	2/23/2010 14:03	2/23/2010 14:07	2/23/2010 14:11	2/23/2010 14:19
Operator	41169	41169	41169	41169	41169
Sample Location					
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:					
Forward current:					
Voltage readings, mV	0.004252	0.004227	0.004074	0.004061	0.003933
	0.004159	0.004271	0.004137	0.004162	0.003895
	0.004105	0.0041	0.004037	0.00406	0.003963
	0.004036	0.004047	0.004035	0.004	0.003877
Resistance readings, Ω	0.001063	0.001057	0.001018	0.001015	0.000983
	0.001040	0.001068	0.001034	0.00104	0.000974
	0.001026	0.001025	0.001009	0.001015	0.000991
	0.001009	0.001012	0.001009	0.001	0.000969
Reverse current:					
Voltage readings, mV	-0.003683	-0.003635	-0.003664	-0.003853	-0.00371
	-0.003708	-0.003807	-0.003745	-0.003921	-0.003783
	-0.003638	-0.003741	-0.003847	-0.003824	-0.004035
	-0.003579	-0.003639	-0.003766	-0.003749	-0.004059
Resistance readings, Ω	0.000921	0.000909	0.000916	0.000963	0.000928
	0.000927	0.000952	0.000936	0.00098	0.000946
	0.000910	0.000935	0.000962	0.000956	0.001009
	0.000895	0.00091	0.000942	0.000937	0.001015
End-for-end orientation:					
Reverse current:					
Voltage readings, mV	0.004119	0.004107	0.004108	0.00398	0.003871
	0.004118	0.004185	0.004102	0.003829	0.004115
	0.004164	0.004129	0.004091	0.004038	0.003736
	0.004124	0.004067	0.003894	0.004106	0.003707

Specimen Number	AP2 02	AP2 03	AP3 01	AP3 02	AP3 03
Resistance readings, Ω	0.001030 0.001029 0.001041 0.001031	0.001027 0.001046 0.001032 0.001017	0.001027 0.001025 0.001023 0.000973	0.000995 0.000957 0.00101 0.001027	0.000968 0.001029 0.000934 0.000927
Forward current: Voltage readings, mV	-0.003759 -0.003639 -0.003735 -0.003749	-0.003637 -0.003715 -0.003815 -0.00379	-0.003753 -0.00384 -0.003837 -0.003726	-0.003824 -0.003985 -0.00389 -0.003768	-0.003724 -0.003906 -0.00429 -0.004105
Resistance readings, Ω	0.000940 0.000910 0.000934 0.000937	0.000909 0.000929 0.000954 0.000948	0.000938 0.00096 0.000959 0.000931	0.000956 0.000996 0.000972 0.000942	0.000931 0.000976 0.001072 0.001026
Average voltage, mV	0.003910	0.003932	0.003916	0.003941	0.003919
Average resistance, $R=V/I$ ($m\Omega$)	0.977688	0.983125	0.978875	0.985063	0.979875
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.4436	127.3911	127.4411	127.4736	127.4636
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.81	9.86	9.82	9.89	9.83
Environmental Conditions					
Temperature (Deg C)	22.400	22.400	22.400	22.400	22.300
Barometric Pressure (in Hg)	25.400	25.400	25.400	25.400	25.400
Humidity (%)	8.500	8.600	8.600	8.600	8.600

Specimen Number	AP2 02	AP2 03	AP3 01	AP3 02	AP3 03
Other Test Information					
Specimen Orientation	horizontal				
Method of Measuring Resistance	voltmeter				
Probe Location	location				
Instruments	Keithley Model 2182 Nanovoltmeter				
ASTM	Keithley Model 6220 DC Current Source				
Comments:	C 611 - 98 Reapproved 2005				

Specimen Number	AP4 01	AP4 02	AP4 03	AP5 01	AP5 03	AP6 01
Date and Time	2/23/2010 14:23	2/23/2010 14:26	2/23/2010 14:30	2/23/2010 14:37	2/23/2010 14:42	2/23/2010 14:44
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.00413 0.004118 0.004247 0.004134	0.003973 0.00392 0.003791 0.004029	0.004205 0.004176 0.003995 0.003932	0.003733 0.003774 0.003913 0.003669	0.00404 0.003907 0.003934 0.003984	0.004104 0.003904 0.003835 0.003916
Resistance readings, Ω	0.001032 0.00103 0.001062 0.001033	0.000993 0.00098 0.000948 0.001007	0.001051 0.001044 0.000999 0.000983	0.000933 0.000943 0.000978 0.000917	0.00101 0.000977 0.000984 0.000996	0.001026 0.000976 0.000959 0.000979
Reverse current:						
Voltage readings, mV	-0.003528 -0.003537 -0.00391 -0.003963	-0.003723 -0.00401 -0.004086 -0.003923	-0.003753 -0.003683 -0.004011 -0.003946	-0.003804 -0.003925 -0.00414 -0.004331	-0.003619 -0.004041 -0.003905 -0.003694	-0.003791 -0.003884 -0.003919 -0.003865
Resistance readings, Ω	0.000882 0.000884 0.000977 0.000991	0.000931 0.001003 0.001021 0.000981	0.000938 0.000921 0.001003 0.000986	0.000951 0.000981 0.001035 0.001083	0.000905 0.00101 0.000976 0.000924	0.000948 0.000971 0.00098 0.000966
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003996 0.003841 0.003855 0.003924	0.004077 0.003964 0.004029 0.003951	0.003895 0.003568 0.003784 0.003675	0.003611 0.00394 0.003801 0.003819	0.004073 0.004031 0.004036 0.00385	0.003711 0.003492 0.003337 0.003648

Specimen Number	AP4 01	AP4 02	AP4 03	AP5 01	AP5 03	AP6 01
Resistance readings, Ω	0.000999 0.00096 0.000964 0.000981	0.001019 0.000991 0.001007 0.000988	0.000974 0.000892 0.000946 0.000919	0.000903 0.000985 0.00095 0.000955	0.001018 0.001008 0.001009 0.000962	0.000928 0.000873 0.000834 0.000912
Forward current:						
Voltage readings, mV	-0.003862 -0.004054 -0.004042 -0.004003	-0.003579 -0.003874 -0.004089 -0.00389	-0.003802 -0.004201 -0.004319 -0.004248	-0.004202 -0.004135 -0.004211 -0.003911	-0.003684 -0.004112 -0.004028 -0.003802	-0.004113 -0.004499 -0.004501 -0.004179
Resistance readings, Ω	0.000965 0.001013 0.001011 0.001001	0.000895 0.000969 0.001022 0.000972	0.000951 0.00105 0.00108 0.001062	0.001051 0.001034 0.001053 0.000978	0.000921 0.001028 0.001007 0.00095	0.001028 0.001125 0.001125 0.001045
Average voltage, mV	0.003947	0.003932	0.003950	0.003932	0.003921	0.003919
Average resistance, $R=V/I$ (m Ω)	0.986563	0.982938	0.987438	0.983125	0.980313	0.979688
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm ²	127.2486	127.3185	127.3210	127.3135	127.3435	127.4111
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.88	9.85	9.90	9.86	9.83	9.83
Environmental Conditions						
Temperature (Deg C)	22.300	22.300	22.200	22.200	22.100	22.100
Barometric Pressure (in Hg)	25.400	25.400	25.400	25.400	25.400	25.400
Humidity (%)	8.800	8.800	8.900	8.900	9.100	9.100

Specimen Number	AP6 02	AP6 03	AW1 01	AW1 02	AW1 03	AW2 01
Date and Time	2/23/2010 14:48	2/23/2010 14:52	2/23/2010 15:12	2/23/2010 15:17	2/24/2010 11:16	2/24/2010 11:21
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.00389 0.004004 0.003738 0.003526	0.004231 0.004057 0.003819 0.004018	0.004084 0.004066 0.003936 0.00405	0.004284 0.004083 0.004348 0.00422	0.003648 0.003478 0.003597 0.003826	0.003781 0.003712 0.003676 0.003897
Resistance readings, Ω	0.000972 0.001001 0.000935 0.000882	0.001058 0.001014 0.000955 0.001005	0.001021 0.001016 0.000984 0.001013	0.001071 0.001021 0.001087 0.001055	0.000912 0.000869 0.000899 0.000957	0.000945 0.000928 0.000919 0.000974
Reverse current:						
Voltage readings, mV	-0.003696 -0.003995 -0.004283 -0.004129	-0.0035 -0.003624 -0.00422 -0.004047	-0.003685 -0.003636 -0.003931 -0.00385	-0.003323 -0.003352 -0.003249 -0.003283	-0.003812 -0.003827 -0.003942 -0.003738	-0.003912 -0.004011 -0.004138 -0.003976
Resistance readings, Ω	0.000924 0.000999 0.001071 0.001032	0.000875 0.000906 0.001055 0.001012	0.000921 0.000909 0.000983 0.000962	0.000831 0.000838 0.000812 0.000821	0.000953 0.000957 0.000986 0.000934	0.000978 0.001003 0.001035 0.000994
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.00391 0.004135 0.004186 0.003836	0.004066 0.004263 0.004155 0.004245	0.003949 0.003871 0.003266 0.003775	0.003885 0.003898 0.003831 0.003516	0.003706 0.003548 0.003722 0.003643	0.003802 0.003889 0.003847 0.003751

Specimen Number	AP6 02	AP6 03	AW1 01	AW1 02	AW1 03	AW2 01
Resistance readings, Ω	0.000977 0.001034 0.001047 0.000959	0.001016 0.001066 0.001039 0.001061	0.000987 0.000968 0.000817 0.000944	0.000971 0.000975 0.000958 0.000879	0.000927 0.000887 0.00093 0.000911	0.00095 0.000972 0.000962 0.000938
Forward current:						
Voltage readings, mV	-0.00383 -0.003768 -0.003887 -0.003915	-0.003651 -0.003527 -0.003683 -0.003494	-0.003961 -0.004043 -0.004521 -0.003964	-0.003439 -0.003573 -0.003913 -0.004107	-0.003653 -0.003842 -0.003755 -0.003794	-0.004028 -0.003898 -0.003953 -0.004103
Resistance readings, Ω	0.000958 0.000942 0.000972 0.000979	0.000913 0.000882 0.000921 0.000873	0.00099 0.001011 0.00113 0.000991	0.00086 0.000893 0.000978 0.001027	0.000913 0.00096 0.000939 0.000948	0.001007 0.000975 0.000988 0.001026
Average voltage, mV	0.003921	0.003913	0.003912	0.003769	0.003721	0.003898
Average resistance, $R=V/I$ (m Ω)	0.980250	0.978188	0.977938	0.942313	0.930125	0.974625
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm ²	127.4686	127.5361	127.3285	127.2960	127.2411	127.1911
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.84	9.82	9.80	9.45	9.32	9.76
Environmental Conditions						
Temperature (Deg C)	22.100	22.100	22.000	21.900	22.300	22.300
Barometric Pressure (in Hg)	25.400	25.400	25.400	25.400	25.200	25.200
Humidity (%)	9.100	9.200	9.400	9.500	9.900	9.900

Specimen Number	AW2 02	AW2 03	AW3 01	AW3 02	AW3 03	AW4 01
Date and Time	2/24/2010 11:24	2/24/2010 11:27	2/24/2010 11:31	2/24/2010 11:34	2/24/2010 11:38	2/24/2010 12:58
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.004007 0.003866 0.003778 0.003753	0.003656 0.003505 0.003842 0.003532	0.003516 0.003778 0.004326 0.004019	0.003928 0.003628 0.00397 0.004137	0.003825 0.003822 0.003734 0.003385	0.004432 0.004321 0.004497 0.004239
Resistance readings, Ω	0.001002 0.000967 0.000944 0.000938	0.000914 0.000876 0.00096 0.000883	0.000879 0.000944 0.001082 0.001005	0.000982 0.000907 0.000993 0.001034	0.000956 0.000956 0.000933 0.000846	0.001108 0.00108 0.001124 0.00106
Reverse current:						
Voltage readings, mV	-0.003403 -0.003637 -0.003732 -0.003699	-0.003665 -0.003794 -0.003869 -0.00382	-0.004211 -0.003942 -0.00375 -0.003805	-0.003586 -0.003648 -0.003556 -0.003385	-0.00357 -0.003497 -0.003801 -0.004149	-0.003486 -0.003482 -0.003527 -0.003628
Resistance readings, Ω	0.000851 0.000909 0.000933 0.000925	0.000916 0.000949 0.000967 0.000955	0.001053 0.000985 0.000937 0.000951	0.000896 0.000912 0.000889 0.000846	0.000893 0.000874 0.00095 0.001037	0.000872 0.000871 0.000882 0.000907
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003509 0.003842 0.003864 0.003892	0.003552 0.003668 0.00383 0.003379	0.004163 0.004138 0.003861 0.003892	0.003712 0.003853 0.003817 0.003625	0.003711 0.003698 0.003557 0.003652	0.004117 0.004194 0.004154 0.004001

Specimen Number	AW2 02	AW2 03	AW3 01	AW3 02	AW3 03	AW4 01
Resistance readings, Ω	0.000877 0.00096 0.000966 0.000973	0.000888 0.000917 0.000957 0.000845	0.001041 0.001035 0.000965 0.000973	0.000928 0.000963 0.000954 0.000906	0.000928 0.000925 0.000889 0.000913	0.001029 0.001049 0.001039 0.001
Forward current:						
Voltage readings, mV	-0.003723 -0.003509 -0.003785 -0.003664	-0.003749 -0.003587 -0.003756 -0.00393	-0.003822 -0.003699 -0.003865 -0.003875	-0.003877 -0.003589 -0.003566 -0.003844	-0.003662 -0.003699 -0.004013 -0.003653	-0.003727 -0.003686 -0.003606 -0.003791
Resistance readings, Ω	0.000931 0.000877 0.000946 0.000916	0.000937 0.000897 0.000939 0.000982	0.000955 0.000925 0.000966 0.000969	0.000969 0.000897 0.000892 0.000961	0.000916 0.000925 0.001003 0.000913	0.000932 0.000921 0.000902 0.000948
Average voltage, mV	0.003729	0.003696	0.003916	0.003733	0.003714	0.003931
Average resistance, $R=V/I$ (m Ω)	0.932188	0.923875	0.979063	0.933063	0.928563	0.982750
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm ²	127.2111	127.2461	127.2586	127.2361	127.2311	127.2111
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.34	9.26	9.81	9.35	9.30	9.84
Environmental Conditions						
Temperature (Deg C)	22.300	22.400	22.400	22.400	22.400	22.100
Barometric Pressure (in Hg)	25.200	25.200	25.200	25.200	25.200	25.200
Humidity (%)	9.900	9.900	9.900	10.000	10.000	11.200

Specimen Number	AW4 02	AW4 03	AW5 01	AW5 02	AW5 03	AW6 01
Date and Time	2/24/2010 13:05	2/24/2010 13:08	2/24/2010 13:12	2/24/2010 13:15	2/24/2010 13:17	2/24/2010 13:23
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003901 0.004075 0.004038 0.003971	0.003899 0.00388 0.003869 0.003995	0.003906 0.004227 0.004058 0.003983	0.00387 0.003812 0.003912 0.003963	0.003874 0.003731 0.003854 0.003877	0.004096 0.004 0.004126 0.00407
Resistance readings, Ω	0.000975 0.001019 0.001009 0.000993	0.000975 0.00097 0.000967 0.000999	0.000977 0.001057 0.001015 0.000996	0.000968 0.000953 0.000978 0.000991	0.000969 0.000933 0.000963 0.000969	0.001024 0.001 0.001031 0.001017
Reverse current:						
Voltage readings, mV	-0.003523 -0.003534 -0.003689 -0.003575	-0.003351 -0.003494 -0.003796 -0.003647	-0.003971 -0.003731 -0.003849 -0.003821	-0.003571 -0.003672 -0.003624 -0.003589	-0.003622 -0.003612 -0.003694 -0.003761	-0.0038 -0.003756 -0.00386 -0.004
Resistance readings, Ω	0.000881 0.000883 0.000922 0.000894	0.000838 0.000874 0.000949 0.000912	0.000993 0.000933 0.000962 0.000955	0.000893 0.000918 0.000906 0.000897	0.000905 0.000903 0.000924 0.00094	0.00095 0.000939 0.000965 0.001
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004016 0.004038 0.004032 0.003945	0.003956 0.003892 0.003927 0.003894	0.004127 0.004061 0.004107 0.004181	0.00391 0.003785 0.003839 0.003909	0.003889 0.003921 0.003738 0.003897	0.003965 0.003978 0.004085 0.00392

Specimen Number	AW4 02	AW4 03	AW5 01	AW5 02	AW5 03	AW6 01
Resistance readings, Ω	0.001004 0.001009 0.001008 0.000986	0.000989 0.000973 0.000982 0.000973	0.001032 0.001015 0.001027 0.001045	0.000977 0.000946 0.00096 0.000977	0.000972 0.00098 0.000934 0.000974	0.000991 0.000994 0.001021 0.00098
Forward current:						
Voltage readings, mV	-0.003574 -0.00353 -0.003573 -0.003548	-0.003481 -0.003649 -0.003785 -0.003474	-0.003651 -0.003627 -0.003911 -0.003885	-0.003658 -0.003728 -0.003684 -0.003625	-0.003531 -0.003641 -0.00376 -0.003418	-0.003881 -0.003989 -0.003976 -0.003809
Resistance readings, Ω	0.000894 0.000882 0.000893 0.000887	0.00087 0.000912 0.000946 0.000869	0.000913 0.000907 0.000978 0.000971	0.000915 0.000932 0.000921 0.000906	0.000883 0.00091 0.00094 0.000854	0.00097 0.000997 0.000994 0.000952
Average voltage, mV	0.003785	0.003749	0.003944	0.003759	0.003739	0.003957
Average resistance, $R=V/I$ (m Ω)	0.946188	0.937375	0.986000	0.939875	0.934563	0.989063
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm ²	127.2461	127.2411	127.2411	127.2586	127.2511	127.1211
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.48	9.39	9.88	9.42	9.36	9.90
Environmental Conditions						
Temperature (Deg C)	22.200	22.100	22.200	22.200	22.200	22.200
Barometric Pressure (in Hg)	25.100	25.100	25.100	25.100	25.100	25.100
Humidity (%)	11.400	11.400	11.500	11.500	11.500	11.500

Specimen Number	AW6 02	AW6 03	AW7 01	AW7 02	AW7 03	AW8 01
Date and Time	2/24/2010 13:44	2/24/2010 13:47	2/24/2010 13:50	2/24/2010 13:53	2/24/2010 14:00	2/24/2010 14:03
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.004013 0.004035 0.004067 0.004024	0.003877 0.003961 0.004226 0.003815	0.004092 0.004205 0.004197 0.004104	0.003982 0.00409 0.003958 0.0039	0.003944 0.003884 0.003909 0.003945	0.004124 0.004181 0.00414 0.004131
Resistance readings, Ω	0.001003 0.001009 0.001017 0.001006	0.000969 0.00099 0.001056 0.000954	0.001023 0.001051 0.001049 0.001026	0.000995 0.001023 0.000989 0.000975	0.000986 0.000971 0.000977 0.000986	0.001031 0.001045 0.001035 0.001033
Reverse current:						
Voltage readings, mV	-0.003542 -0.003476 -0.00349 -0.00347	-0.003485 -0.003573 -0.00364 -0.003566	-0.003707 -0.003754 -0.003745 -0.003539	-0.003601 -0.003684 -0.003658 -0.003538	-0.003532 -0.003591 -0.003662 -0.003604	-0.003708 -0.003826 -0.003707 -0.003703
Resistance readings, Ω	0.000886 0.000869 0.000873 0.000867	0.000871 0.000893 0.00091 0.000891	0.000927 0.000938 0.000936 0.000885	0.0009 0.000921 0.000914 0.000884	0.000883 0.000898 0.000916 0.000901	0.000927 0.000956 0.000927 0.000926
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004273 0.004069 0.004132 0.003972	0.003968 0.004061 0.004144 0.003914	0.004184 0.004072 0.004221 0.003982	0.003846 0.00406 0.003989 0.003938	0.004055 0.004068 0.004035 0.003934	0.004137 0.004167 0.004091 0.003949

Specimen Number	AW6 02	AW6 03	AW7 01	AW7 02	AW7 03	AW8 01
Resistance readings, Ω	0.001068 0.001017 0.001033 0.000993	0.000992 0.001015 0.001036 0.000979	0.001046 0.001018 0.001055 0.000996	0.000961 0.001015 0.000997 0.000985	0.001014 0.001017 0.001009 0.000983	0.001034 0.001042 0.001023 0.000987
Forward current:						
Voltage readings, mV	-0.003471 -0.003455 -0.003683 -0.0036	-0.003356 -0.003488 -0.003597 -0.003477	-0.003282 -0.003762 -0.003744 -0.00364	-0.003672 -0.003619 -0.003572 -0.003579	-0.003545 -0.003643 -0.0035 -0.00335	-0.003785 -0.003766 -0.003742 -0.00364
Resistance readings, Ω	0.000868 0.000864 0.000921 0.0009	0.000839 0.000872 0.000899 0.000869	0.00082 0.00094 0.000936 0.00091	0.000918 0.000905 0.000893 0.000895	0.000886 0.000911 0.000875 0.000838	0.000946 0.000942 0.000935 0.00091
Average voltage, mV	0.003798	0.003759	0.003889	0.003793	0.003763	0.003925
Average resistance, $R=V/I$ (m Ω)	0.949625	0.939688	0.972250	0.948125	0.940688	0.981188
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm ²	127.1686	127.1036	127.1511	127.1411	127.1511	127.2161
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.51	9.40	9.73	9.49	9.42	9.83
Environmental Conditions						
Temperature (Deg C)	22.200	22.200	22.200	22.200	22.200	22.300
Barometric Pressure (in Hg)	25.100	25.100	25.100	25.100	25.100	25.100
Humidity (%)	11.800	12.000	12.000	12.200	12.400	12.400

Specimen Number	AW8 02	AW8 03	AW9 01	AW9 02	AW10 01	AW10 02
Date and Time	2/24/2010 14:06	2/24/2010 14:09	2/24/2010 14:12	2/24/2010 14:16	2/24/2010 14:19	2/24/2010 15:11
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003987 0.004055 0.003923 0.003731	0.003851 0.003936 0.003944 0.003826	0.004031 0.004023 0.004052 0.003965	0.003804 0.003978 0.004009 0.003822	0.004016 0.003973 0.004081 0.004087	0.004199 0.004195 0.004092 0.004022
Resistance readings, Ω	0.000997 0.001014 0.000981 0.000933	0.000963 0.000984 0.000986 0.000956	0.001008 0.001006 0.001013 0.000991	0.000951 0.000995 0.001002 0.000955	0.001004 0.000993 0.00102 0.001022	0.00105 0.001049 0.001023 0.001006
Reverse current:						
Voltage readings, mV	-0.003678 -0.003756 -0.003601 -0.003649	-0.003642 -0.003624 -0.003632 -0.003567	-0.003767 -0.003817 -0.003793 -0.003688	-0.003614 -0.003729 -0.003772 -0.003635	-0.003733 -0.003701 -0.00391 -0.003917	-0.003439 -0.003446 -0.003381 -0.00346
Resistance readings, Ω	0.00092 0.000939 0.0009 0.000912	0.000911 0.000906 0.000908 0.000892	0.000942 0.000954 0.000948 0.000922	0.000904 0.000932 0.000943 0.000909	0.000933 0.000925 0.000977 0.000979	0.00086 0.000861 0.000845 0.000865
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003917 0.004009 0.003964 0.003949	0.00391 0.003879 0.004067 0.003779	0.004022 0.004121 0.004143 0.004037	0.003896 0.003935 0.00384 0.003785	0.004019 0.004044 0.004071 0.003936	0.004144 0.004084 0.004297 0.00406

Specimen Number	AW8 02	AW8 03	AW9 01	AW9 02	AW10 01	AW10 02
Resistance readings, Ω	0.000979 0.001002 0.000991 0.000987	0.000978 0.00097 0.001017 0.000945	0.001005 0.00103 0.001036 0.001009	0.000974 0.000984 0.00096 0.000946	0.001005 0.001011 0.001018 0.000984	0.001036 0.001021 0.001074 0.001015
Forward current:						
Voltage readings, mV	-0.00345 -0.003714 -0.003549 -0.00347	-0.00361 -0.003664 -0.003584 -0.003582	-0.003762 -0.003818 -0.003725 -0.00372	-0.003672 -0.00371 -0.003756 -0.003687	-0.003744 -0.003911 -0.003756 -0.003697	-0.003466 -0.003551 -0.003258 -0.003421
Resistance readings, Ω	0.000863 0.000928 0.000887 0.000868	0.000903 0.000916 0.000896 0.000895	0.000941 0.000955 0.000931 0.00093	0.000918 0.000928 0.000939 0.000922	0.000936 0.000978 0.000939 0.000924	0.000867 0.000888 0.000814 0.000855
Average voltage, mV	0.003775	0.003756	0.003905	0.003790	0.003912	0.003782
Average resistance, $R=V/I$ (m Ω)	0.943813	0.939125	0.976313	0.947625	0.978000	0.945563
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm ²	127.2661	127.2960	127.3260	127.3110	127.2061	127.1961
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.46	9.41	9.79	9.50	9.80	9.47
Environmental Conditions						
Temperature (Deg C)	22.300	22.300	22.300	22.2	22.3	22.4
Barometric Pressure (in Hg)	25.100	25.100	25.100	25.1	25.1	25.1
Humidity (%)	12.500	12.700	12.800	12.8	12.9	14.2

Specimen Number	AW10 03	AW11 01	AW11 02	AW11 03	AW12 01	AW12 02
Date and Time	2/24/2010 15:14	2/24/2010 15:19	2/24/2010 15:22	2/24/2010 15:25	2/25/2010 8:40	2/25/2010 8:48
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003966 0.003859 0.003869 0.003856	0.003819 0.003918 0.003999 0.004052	0.003947 0.003919 0.003931 0.003888	0.003725 0.00397 0.00377 0.003822	0.004179 0.004152 0.003914 0.003648	0.003478 0.00352 0.003178 0.003488
Resistance readings, Ω	0.000992 0.000965 0.000967 0.000964	0.000955 0.000979 0.001 0.001013	0.000987 0.00098 0.000983 0.000972	0.000931 0.000993 0.000943 0.000955	0.001045 0.001038 0.000979 0.000912	0.00087 0.00088 0.000795 0.000872
Reverse current:						
Voltage readings, mV	-0.003467 -0.003666 -0.003801 -0.003509	-0.003934 -0.003998 -0.003883 -0.003756	-0.003635 -0.003639 -0.003582 -0.003599	-0.003655 -0.00366 -0.004155 -0.003802	-0.0038 -0.003511 -0.003736 -0.004185	-0.003999 -0.003737 -0.004153 -0.003968
Resistance readings, Ω	0.000867 0.000917 0.00095 0.000877	0.000984 0.000999 0.000971 0.000939	0.000909 0.00091 0.000895 0.0009	0.000914 0.000915 0.001039 0.00095	0.00095 0.000878 0.000934 0.001046	0.001 0.000934 0.001038 0.000992
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004049 0.003999 0.004014 0.003911	0.004183 0.004039 0.004079 0.004172	0.004193 0.004117 0.004101 0.003971	0.004052 0.004132 0.003935 0.003928	0.003811 0.003667 0.003831 0.003924	0.00354 0.003436 0.003425 0.003525

Specimen Number	AW10 03	AW11 01	AW11 02	AW11 03	AW12 01	AW12 02
Resistance readings, Ω	0.001012 0.001 0.001003 0.000978	0.001046 0.00101 0.00102 0.001043	0.001048 0.001029 0.001025 0.000993	0.001013 0.001033 0.000984 0.000982	0.000953 0.000917 0.000958 0.000981	0.000885 0.000859 0.000856 0.000881
Forward current:						
Voltage readings, mV	-0.003376 -0.003603 -0.003539 -0.003547	-0.003672 -0.003605 -0.003741 -0.003674	-0.003489 -0.003587 -0.003256 -0.003558	-0.003335 -0.003503 -0.003925 -0.003369	-0.00432 -0.004116 -0.003888 -0.003804	-0.003647 -0.003666 -0.003827 -0.004044
Resistance readings, Ω	0.000844 0.000901 0.000885 0.000887	0.000918 0.000901 0.000935 0.000919	0.000872 0.000897 0.000814 0.000889	0.000834 0.000876 0.000981 0.000842	0.00108 0.001029 0.000972 0.000951	0.000912 0.000917 0.000957 0.001011
Average voltage, mV	0.003752	0.003908	0.003776	0.003796	0.003905	0.003664
Average resistance, $R=V/I$ (m Ω)	0.938063	0.977000	0.943938	0.949063	0.976438	0.916188
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm ²	127.1836	127.2386	127.2261	127.3135	127.2761	127.2486
Resistivity, $\rho=(R*A)/L$ ($\mu\Omega m$)	9.39	9.79	9.46	9.51	9.79	9.18
Environmental Conditions						
Temperature (Deg C)	22.4	22.4	22.5	22.5	22.3	22.4
Barometric Pressure (in Hg)	25.1	25.1	25.1	25.1	25.3	25.3
Humidity (%)	14.2	14.2	14.2	14.2	16.2	16.1

Specimen Number	AW12 03	AW13 01	AW13 02	AW13 03	AW14 01	AW14 02
Date and Time	2/25/2010 8:52	2/25/2010 8:57	2/25/2010 9:04	2/25/2010 9:23	2/25/2010 9:26	2/25/2010 9:29
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003641 0.003434 0.003434 0.003681	0.003818 0.003964 0.003639 0.00384	0.003313 0.003341 0.003365 0.003457	0.003909 0.003986 0.003819 0.003827	0.004088 0.004037 0.004106 0.00388	0.003982 0.003825 0.003636 0.003855
Resistance readings, Ω	0.00091 0.000859 0.000858 0.00092	0.000955 0.000991 0.00091 0.00096	0.000828 0.000835 0.000841 0.000864	0.000977 0.000996 0.000955 0.000957	0.001022 0.001009 0.001027 0.00097	0.000996 0.000956 0.000909 0.000964
Reverse current:						
Voltage readings, mV	-0.003521 -0.003704 -0.003796 -0.0039	-0.003755 -0.003962 -0.004409 -0.00378	-0.004386 -0.003792 -0.003936 -0.004121	-0.003533 -0.003437 -0.003723 -0.003612	-0.003535 -0.00354 -0.003695 -0.004042	-0.003462 -0.003393 -0.003813 -0.003719
Resistance readings, Ω	0.00088 0.000926 0.000949 0.000975	0.000939 0.000991 0.001102 0.000945	0.001096 0.000948 0.000984 0.00103	0.000883 0.000859 0.000931 0.000903	0.000884 0.000885 0.000924 0.001011	0.000865 0.000848 0.000953 0.00093
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003552 0.003569 0.003643 0.003756	0.003812 0.003615 0.00349 0.003183	0.003765 0.003679 0.003573 0.0035	0.003852 0.00381 0.003743 0.003934	0.004117 0.004098 0.003921 0.003952	0.003925 0.003961 0.003929 0.003836

Specimen Number	AW12 03	AW13 01	AW13 02	AW13 03	AW14 01	AW14 02
Resistance readings, Ω	0.000888 0.000892 0.000911 0.000939	0.000953 0.000904 0.000872 0.000796	0.000941 0.00092 0.000893 0.000875	0.000963 0.000953 0.000936 0.000983	0.001029 0.001025 0.00098 0.000988	0.000981 0.00099 0.000982 0.000959
Forward current:						
Voltage readings, mV	-0.003607 -0.00352 -0.004035 -0.003842	-0.003803 -0.004096 -0.00387 -0.004053	-0.003592 -0.003808 -0.003785 -0.003719	-0.00372 -0.003645 -0.003592 -0.003571	-0.003756 -0.003676 -0.003858 -0.00385	-0.003475 -0.003566 -0.003586 -0.003611
Resistance readings, Ω	0.000902 0.00088 0.001009 0.00096	0.000951 0.001024 0.000967 0.001013	0.000898 0.000952 0.000946 0.00093	0.00093 0.000911 0.000898 0.000893	0.000939 0.000919 0.000964 0.000963	0.000869 0.000892 0.000896 0.000903
Average voltage, mV	0.003665	0.003818	0.003696	0.003732	0.003884	0.003723
Average resistance, $R=V/I$ (m Ω)	0.916125	0.954563	0.923813	0.933000	0.971188	0.930813
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm ²	127.2711	127.3285	127.3610	127.3660	127.3811	127.3710
Resistivity, $\rho=(R*A)/L$ ($\mu\Omega m$)	9.18	9.57	9.26	9.36	9.74	9.34
Environmental Conditions						
Temperature (Deg C)	22.4	22.5	22.5	22.5	22.5	22.6
Barometric Pressure (in Hg)	25.3	25.3	25.3	25.3	25.3	25.3
Humidity (%)	16	16	15.9	15.8	15.8	15.8

Specimen Number	AW14 03	AW15 01	AW15 02	AW15 03	AW16 01	AW16 02
Date and Time	2/25/2010 9:31	2/25/2010 9:35	2/25/2010 9:37	2/25/2010 9:40	2/25/2010 9:43	2/25/2010 9:46
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003862 0.003914 0.003669 0.003804	0.004046 0.003965 0.003915 0.003872	0.003769 0.003818 0.003641 0.003696	0.0037 0.003625 0.003895 0.003879	0.004006 0.003885 0.003939 0.003993	0.003547 0.003708 0.003877 0.003852
Resistance readings, Ω	0.000965 0.000979 0.000917 0.000951	0.001012 0.000991 0.000979 0.000968	0.000942 0.000955 0.00091 0.000924	0.000925 0.000906 0.000974 0.00097	0.001002 0.000971 0.000985 0.000998	0.000887 0.000927 0.000969 0.000963
Reverse current:						
Voltage readings, mV	-0.003475 -0.003549 -0.003661 -0.003575	-0.003611 -0.003678 -0.004062 -0.004066	-0.003568 -0.003729 -0.003818 -0.003886	-0.003679 -0.003746 -0.003762 -0.003769	-0.003797 -0.003899 -0.003633 -0.003704	-0.003736 -0.003514 -0.003535 -0.003808
Resistance readings, Ω	0.000869 0.000887 0.000915 0.000894	0.000903 0.00092 0.001015 0.001016	0.000892 0.000932 0.000955 0.000971	0.00092 0.000937 0.00094 0.000942	0.000949 0.000975 0.000908 0.000926	0.000934 0.000878 0.000884 0.000952
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003862 0.00384 0.00394 0.004099	0.004079 0.004197 0.00394 0.003812	0.003877 0.003905 0.003842 0.003644	0.003525 0.003601 0.003735 0.004005	0.00403 0.004013 0.004049 0.003922	0.003833 0.003637 0.003901 0.004029

Specimen Number	AW14 03	AW15 01	AW15 02	AW15 03	AW16 01	AW16 02
Resistance readings, Ω	0.000966 0.00096 0.000985 0.001025	0.00102 0.001049 0.000985 0.000953	0.000969 0.000976 0.00096 0.000911	0.000881 0.0009 0.000934 0.001001	0.001007 0.001003 0.001012 0.000981	0.000958 0.000909 0.000975 0.001007
Forward current:						
Voltage readings, mV	-0.003523 -0.003552 -0.003449 -0.003419	-0.003708 -0.003528 -0.003733 -0.003802	-0.003509 -0.003579 -0.003794 -0.003779	-0.003918 -0.003872 -0.003828 -0.003534	-0.003669 -0.003789 -0.003905 -0.003854	-0.003595 -0.003767 -0.003619 -0.003506
Resistance readings, Ω	0.000881 0.000888 0.000862 0.000855	0.000927 0.000882 0.000933 0.00095	0.000877 0.000895 0.000948 0.000945	0.00098 0.000968 0.000957 0.000884	0.000917 0.000947 0.000976 0.000963	0.000899 0.000942 0.000905 0.000877
Average voltage, mV	0.003700	0.003876	0.003741	0.003755	0.003880	0.003717
Average resistance, $R=V/I$ (m Ω)	0.924938	0.968938	0.935125	0.938688	0.970000	0.929125
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm ²	127.3510	127.3610	127.4011	127.3936	127.2336	127.2386
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.27	9.72	9.38	9.42	9.72	9.31
Environmental Conditions						
Temperature (Deg C)	22.6	22.6	22.6	22.6	22.6	22.6
Barometric Pressure (in Hg)	25.3	25.3	25.3	25.3	25.3	25.3
Humidity (%)	15.8	15.7	15.8	15.8	15.8	15.8

Specimen Number	AW16 03
Date and Time	2/25/2010 9:49
Operator	41169
Sample Location	
Applied current, I (mA)	4.0000
Compl. Voltage (V)	2.5000
ID Orientation:	
Forward current:	
Voltage readings, mV	0.003902
	0.00375
	0.003803
	0.003822
Resistance readings, Ω	
	0.000975
	0.000938
	0.000951
	0.000956
Reverse current:	
Voltage readings, mV	-0.003382
	-0.003539
	-0.003497
	-0.003828
Resistance readings, Ω	
	0.000845
	0.000885
	0.000874
	0.000957
End-for-end orientation:	
Reverse current:	
Voltage readings, mV	0.003931
	0.003906
	0.003903
	0.003856

Specimen Number	AW16 03
Resistance readings, Ω	0.000983 0.000976 0.000976 0.000964
Forward current:	
Voltage readings, mV	-0.00344 -0.003511 -0.003591 -0.003703
Resistance readings, Ω	0.00086 0.000878 0.000898 0.000926
Average voltage, mV	0.003710
Average resistance, $R=V/I$ ($m\Omega$)	0.927625
Potential Contact Distance, L (mm) (Gage Length)	12.7
Average area, A mm^2	127.3010
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.30
Environmental Conditions	
Temperature (Deg C)	22.7
Barometric Pressure (in Hg)	25.3
Humidity (%)	15.7

Specimen ID Number	Operator S#	Test Date	Applied Current (mA)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Measured Potential (mV)
AP2 02	41169	2/23/2010 14:00	4	25.365	12.738	0.003910
AP2 03	41169	2/23/2010 14:03	4	25.380	12.736	0.003932
AP3 01	41169	2/23/2010 14:07	4	25.382	12.738	0.003916
AP3 02	41169	2/23/2010 14:11	4	25.382	12.740	0.003941
AP3 03	41169	2/23/2010 14:19	4	25.379	12.739	0.003919
AP4 01	41169	2/23/2010 14:23	4	25.382	12.729	0.003947
AP4 02	41169	2/23/2010 14:26	4	25.368	12.732	0.003932
AP4 03	41169	2/23/2010 14:30	4	25.368	12.732	0.003950
AP5 01	41169	2/23/2010 14:37	4	25.369	12.732	0.003932
AP5 03	41169	2/23/2010 14:42	4	25.368	12.733	0.003921
AP6 01	41169	2/23/2010 14:44	4	25.370	12.737	0.003919
AP6 02	41169	2/23/2010 14:48	4	25.371	12.740	0.003921
AP6 03	41169	2/23/2010 14:52	4	25.370	12.743	0.003913
AW1 01	41169	2/23/2010 15:12	4	25.372	12.733	0.003912
AW1 02	41169	2/23/2010 15:17	4	25.375	12.731	0.003769
AW1 03	41169	2/24/2010 11:16	4	25.373	12.728	0.003721
AW2 01	41169	2/24/2010 11:21	4	25.375	12.726	0.003898
AW2 02	41169	2/24/2010 11:24	4	25.373	12.727	0.003729
AW2 03	41169	2/24/2010 11:27	4	25.374	12.729	0.003696
AW3 01	41169	2/24/2010 11:31	4	25.379	12.729	0.003916
AW3 02	41169	2/24/2010 11:34	4	25.376	12.728	0.003733
AW3 03	41169	2/24/2010 11:38	4	25.374	12.728	0.003714
AW4 01	41169	2/24/2010 12:58	4	25.377	12.727	0.003931
AW4 02	41169	2/24/2010 13:05	4	25.377	12.729	0.003785
AW4 03	41169	2/24/2010 13:08	4	25.378	12.728	0.003749
AW5 01	41169	2/24/2010 13:12	4	25.380	12.728	0.003944
AW5 02	41169	2/24/2010 13:15	4	25.378	12.729	0.003759
AW5 03	41169	2/24/2010 13:17	4	25.379	12.729	0.003739
AW6 01	41169	2/24/2010 13:23	4	25.379	12.722	0.003957
AW6 02	41169	2/24/2010 13:44	4	25.380	12.725	0.003798
AW6 03	41169	2/24/2010 13:47	4	25.377	12.721	0.003759
AW7 01	41169	2/24/2010 13:50	4	25.381	12.724	0.003889
AW7 02	41169	2/24/2010 13:53	4	25.377	12.723	0.003793
AW7 03	41169	2/24/2010 14:00	4	25.379	12.724	0.003763
AW8 01	41169	2/24/2010 14:03	4	25.380	12.727	0.003925
AW8 02	41169	2/24/2010 14:06	4	25.378	12.730	0.003775
AW8 03	41169	2/24/2010 14:09	4	25.379	12.731	0.003756

Specimen ID Number	Operator S#	Test Date	Applied Current (mA)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Measured Potential (mV)
AW9 01	41169	2/24/2010 14:12	4	25.382	12.733	0.003905
AW9 02	41169	2/24/2010 14:16	4	25.379	12.732	0.003790
AW10 01	41169	2/24/2010 14:19	4	25.382	12.727	0.003912
AW10 02	41169	2/24/2010 15:11	4	25.381	12.726	0.003782
AW10 03	41169	2/24/2010 15:14	4	25.380	12.725	0.003752
AW11 01	41169	2/24/2010 15:19	4	25.384	12.728	0.003908
AW11 02	41169	2/24/2010 15:22	4	25.380	12.728	0.003776
AW11 03	41169	2/24/2010 15:25	4	25.385	12.732	0.003796
AW12 01	41169	2/25/2010 8:40	4	25.387	12.730	0.003905
AW12 02	41169	2/25/2010 8:48	4	25.383	12.729	0.003664
AW12 03	41169	2/25/2010 8:52	4	25.360	12.730	0.003665
AW13 01	41169	2/25/2010 8:57	4	25.373	12.733	0.003818
AW13 02	41169	2/25/2010 9:04	4	25.374	12.734	0.003696
AW13 03	41169	2/25/2010 9:23	4	25.370	12.735	0.003732
AW14 01	41169	2/25/2010 9:26	4	25.373	12.735	0.003884
AW14 02	41169	2/25/2010 9:29	4	25.373	12.735	0.003723
AW14 03	41169	2/25/2010 9:31	4	25.371	12.734	0.003700
AW15 01	41169	2/25/2010 9:35	4	25.375	12.734	0.003876
AW15 02	41169	2/25/2010 9:37	4	25.375	12.736	0.003741
AW15 03	41169	2/25/2010 9:40	4	25.375	12.736	0.003755
AW16 01	41169	2/25/2010 9:43	4	25.376	12.728	0.003880
AW16 02	41169	2/25/2010 9:46	4	25.374	12.728	0.003717
AW16 03	41169	2/25/2010 9:49	4	25.376	12.731	0.003710

Specimen ID Number	Resistance (mΩ)	Resistivity (μΩm)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
AP2 02	0.978	9.811	22.4	25.4	8.5	Against Grain
AP2 03	0.983	9.862	22.4	25.4	8.6	Against Grain
AP3 01	0.979	9.823	22.4	25.4	8.6	Against Grain
AP3 02	0.985	9.887	22.4	25.4	8.6	Against Grain
AP3 03	0.980	9.835	22.3	25.4	8.6	Against Grain
AP4 01	0.987	9.885	22.3	25.4	8.8	Against Grain
AP4 02	0.983	9.854	22.3	25.4	8.8	Against Grain
AP4 03	0.987	9.899	22.2	25.4	8.9	Against Grain
AP5 01	0.983	9.856	22.2	25.4	8.9	Against Grain
AP5 03	0.980	9.830	22.1	25.4	9.1	Against Grain
AP6 01	0.980	9.829	22.1	25.4	9.1	Against Grain
AP6 02	0.980	9.839	22.1	25.4	9.1	Against Grain
AP6 03	0.978	9.823	22.1	25.4	9.2	Against Grain
AW1 01	0.978	9.805	22	25.4	9.4	With Grain
AW1 02	0.942	9.445	21.9	25.4	9.5	With Grain
AW1 03	0.930	9.319	22.3	25.2	9.9	With Grain
AW2 01	0.975	9.761	22.3	25.2	9.9	With Grain
AW2 02	0.932	9.337	22.3	25.2	9.9	With Grain
AW2 03	0.924	9.257	22.4	25.2	9.9	With Grain
AW3 01	0.979	9.811	22.4	25.2	9.9	With Grain
AW3 02	0.933	9.348	22.4	25.2	10	With Grain
AW3 03	0.929	9.303	22.4	25.2	10	With Grain
AW4 01	0.983	9.844	22.1	25.2	11.2	With Grain
AW4 02	0.946	9.480	22.2	25.1	11.4	With Grain
AW4 03	0.937	9.392	22.1	25.1	11.4	With Grain
AW5 01	0.986	9.879	22.2	25.1	11.5	With Grain
AW5 02	0.940	9.418	22.2	25.1	11.5	With Grain
AW5 03	0.935	9.364	22.2	25.1	11.5	With Grain
AW6 01	0.989	9.900	22.2	25.1	11.5	With Grain
AW6 02	0.950	9.509	22.2	25.1	11.8	With Grain
AW6 03	0.940	9.405	22.2	25.1	12	With Grain
AW7 01	0.972	9.734	22.2	25.1	12	With Grain
AW7 02	0.948	9.492	22.2	25.1	12.2	With Grain
AW7 03	0.941	9.418	22.2	25.1	12.4	With Grain
AW8 01	0.981	9.829	22.3	25.1	12.4	With Grain
AW8 02	0.944	9.458	22.3	25.1	12.5	With Grain
AW8 03	0.939	9.413	22.3	25.1	12.7	With Grain

Specimen ID Number	Resistance (mΩ)	Resistivity (μΩm)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
AW9 01	0.976	9.788	22.3	25.1	12.8	With Grain
AW9 02	0.948	9.499	22.2	25.1	12.8	With Grain
AW10 01	0.978	9.796	22.3	25.1	12.9	With Grain
AW10 02	0.946	9.470	22.4	25.1	14.2	With Grain
AW10 03	0.938	9.394	22.4	25.1	14.2	With Grain
AW11 01	0.977	9.788	22.4	25.1	14.2	With Grain
AW11 02	0.944	9.456	22.5	25.1	14.2	With Grain
AW11 03	0.949	9.514	22.5	25.1	14.2	With Grain
AW12 01	0.976	9.786	22.3	25.3	16.2	With Grain
AW12 02	0.916	9.180	22.4	25.3	16.1	With Grain
AW12 03	0.916	9.181	22.4	25.3	16	With Grain
AW13 01	0.955	9.570	22.5	25.3	16	With Grain
AW13 02	0.924	9.264	22.5	25.3	15.9	With Grain
AW13 03	0.933	9.357	22.5	25.3	15.8	With Grain
AW14 01	0.971	9.741	22.5	25.3	15.8	With Grain
AW14 02	0.931	9.335	22.6	25.3	15.8	With Grain
AW14 03	0.925	9.275	22.6	25.3	15.8	With Grain
AW15 01	0.969	9.717	22.6	25.3	15.7	With Grain
AW15 02	0.935	9.381	22.6	25.3	15.8	With Grain
AW15 03	0.939	9.416	22.6	25.3	15.8	With Grain
AW16 01	0.970	9.718	22.6	25.3	15.8	With Grain
AW16 02	0.929	9.309	22.6	25.3	15.8	With Grain
AW16 03	0.928	9.298	22.7	25.3	15.7	With Grain

Specimen ID Number	Date and Time	Operator	Specimen Location	Initial Specimen Length, m	Initial Specimen Density, ρ kg/m ³	Longitudinal Traverse Time, s	Shear Traverse Time, s	Longitudinal Zero Correction, s
AP2 02	2/17/2010 10:15	41169		0.025365	1865.461	9.410E-06	1.588E-05	2.000E-07
AP2 03	2/17/2010 10:17	41169		0.02538	1866.0821	9.410E-06	1.588E-05	2.000E-07
AP3 01	2/17/2010 10:19	41169		0.025382	1863.5604	9.340E-06	1.586E-05	2.000E-07
AP3 02	2/17/2010 10:20	41169		0.025382	1861.8795	9.410E-06	1.596E-05	2.000E-07
AP3 03	2/17/2010 10:22	41169		0.025379	1864.0421	9.410E-06	1.591E-05	2.000E-07
AP4 01	2/17/2010 10:24	41169		0.025382	1861.6933	9.320E-06	1.588E-05	2.000E-07
AP4 02	2/17/2010 10:25	41169		0.025368	1863.4151	9.440E-06	1.589E-05	2.000E-07
AP4 03	2/17/2010 10:27	41169		0.025368	1864.51	9.340E-06	1.585E-05	2.000E-07
AP5 01	2/17/2010 10:28	41169		0.025369	1862.4552	9.390E-06	1.591E-05	2.000E-07
AP5 02	2/17/2010 10:30	41169		0.025366	1863.7869	9.370E-06	1.588E-05	2.000E-07
AP5 03	2/17/2010 10:34	41169		0.025368	1862.9738	9.370E-06	1.588E-05	2.000E-07
AP6 01	2/17/2010 10:36	41169		0.02537	1863.3246	9.370E-06	1.593E-05	2.000E-07
AP6 02	2/17/2010 10:38	41169		0.025371	1863.0908	9.390E-06	1.586E-05	2.000E-07
AP6 03	2/17/2010 10:39	41169		0.02537	1863.8048	9.370E-06	1.588E-05	2.000E-07
AW1 01	2/17/2010 10:41	41169		0.025372	1827.2861	9.490E-06	1.634E-05	2.000E-07
AW1 02	2/17/2010 10:43	41169		0.025375	1860.1038	9.290E-06	1.591E-05	2.000E-07
AW1 03	2/17/2010 10:46	41169		0.025373	1867.4554	9.200E-06	1.567E-05	2.000E-07
AW2 01	2/17/2010 10:48	41169		0.025375	1824.2267	9.600E-06	1.631E-05	2.000E-07
AW2 02	2/17/2010 10:50	41169		0.025373	1860.9236	9.210E-06	1.586E-05	2.000E-07
AW2 03	2/17/2010 10:51	41169		0.025374	1867.0472	9.200E-06	1.576E-05	2.000E-07
AW3 01	2/17/2010 12:13	41169		0.025379	1822.0205	9.700E-06	1.629E-05	2.000E-07
AW3 02	2/17/2010 12:17	41169		0.025376	1860.4901	9.250E-06	1.576E-05	2.000E-07
AW3 03	2/17/2010 12:18	41169		0.025374	1867.2873	9.200E-06	1.585E-05	2.000E-07
AW4 01	2/17/2010 12:20	41169		0.025376	1823.1912	9.630E-06	1.618E-05	2.000E-07
AW4 02	2/17/2010 12:22	41169		0.025377	1859.9268	9.270E-06	1.586E-05	2.000E-07
AW4 03	2/17/2010 12:24	41169		0.025378	1865.6357	9.240E-06	1.581E-05	2.000E-07
AW5 01	2/17/2010 12:25	41169		0.02538	1822.3503	9.650E-06	1.634E-05	2.000E-07
AW5 02	2/17/2010 12:27	41169		0.025378	1859.0542	9.250E-06	1.575E-05	2.000E-07
AW5 03	2/17/2010 12:28	41169		0.025379	1865.5594	9.170E-06	1.568E-05	2.000E-07
AW6 01	2/18/2010 9:04	41169		0.025379	1824.0696	9.600E-06	1.605E-05	1.900E-07
AW6 02	2/17/2010 12:31	41169		0.02538	1861.1365	9.320E-06	1.593E-05	2.000E-07

Specimen ID Number	Date and Time	Operator	Specimen Location	Initial Specimen Length, m	Initial Specimen Density, ρ kg/m ³	Longitudinal Traverse Time, s	Shear Traverse Time, s	Longitudinal Zero Correction, s
AW6 03	2/17/2010 12:33	41169		0.025377	1867.2146	9.270E-06	1.584E-05	2.000E-07
AW7 01	2/17/2010 12:34	41169		0.025381	1827.9389	9.560E-06	1.622E-05	2.000E-07
AW7 02	2/17/2010 12:36	41169		0.025377	1861.9382	9.250E-06	1.581E-05	2.000E-07
AW7 03	2/17/2010 12:50	41169		0.025379	1864.6183	9.220E-06	1.574E-05	2.000E-07
AW8 01	2/17/2010 12:57	41169		0.02538	1824.9019	9.580E-06	1.634E-05	2.000E-07
AW8 02	2/17/2010 13:06	41169		0.025378	1861.7453	9.220E-06	1.585E-05	2.000E-07
AW8 03	2/17/2010 13:08	41169		0.025379	1864.9869	9.170E-06	1.588E-05	2.000E-07
AW9 01	2/17/2010 13:10	41169		0.025382	1826.9035	9.510E-06	1.615E-05	2.000E-07
AW9 02	2/17/2010 13:11	41169		0.025379	1860.8328	9.200E-06	1.593E-05	2.000E-07
AW10 01	2/17/2010 13:13	41169		0.025382	1826.8415	9.60E-06	1.624E-05	2.000E-07
AW10 02	2/18/2010 9:09	41169		0.025381	1859.7817	9.27E-06	1.576E-05	1.900E-07
AW10 03	2/17/2010 13:16	41169		0.02538	1864.9149	9.13E-06	1.571E-05	2.000E-07
AW11 01	2/17/2010 13:17	41169		0.025384	1826.5838	9.56E-06	1.636E-05	2.000E-07
AW11 02	2/17/2010 13:19	41169		0.02538	1861.3264	9.21E-06	1.591E-05	2.000E-07
AW11 03	2/17/2010 13:20	41169		0.025385	1863.5364	9.17E-06	1.578E-05	2.000E-07
AW12 01	2/17/2010 13:22	41169		0.025387	1828.4285	9.56E-06	1.619E-05	2.000E-07
AW12 02	2/17/2010 13:23	41169		0.025383	1860.5983	9.22E-06	1.579E-05	2.000E-07
AW12 03	2/18/2010 9:07	41169		0.02536	1864.804	9.13E-06	1.552E-05	1.900E-07
AW13 01	2/18/2010 9:06	41169		0.025373	1824.5706	9.63E-06	1.624E-05	1.900E-07
AW13 02	2/17/2010 13:29	41169		0.025374	1861.6097	9.13E-06	1.575E-05	2.000E-07
AW13 03	2/17/2010 13:30	41169		0.025369	1866.3973	9.20E-06	1.567E-05	2.000E-07
AW14 01	2/17/2010 13:32	41169		0.025373	1824.555	9.53E-06	1.631E-05	2.000E-07
AW14 02	2/17/2010 13:33	41169		0.025373	1862.7146	9.22E-06	1.576E-05	2.000E-07
AW14 03	2/17/2010 13:35	41169		0.025371	1864.3971	9.15E-06	1.586E-05	2.000E-07
AW15 01	2/17/2010 13:37	41169		0.025375	1828.2995	9.51E-06	1.615E-05	2.000E-07
AW15 02	2/17/2010 13:41	41169		0.025375	1863.3484	9.22E-06	1.574E-05	2.000E-07
AW15 03	2/17/2010 13:42	41169		0.025375	1866.5486	9.20E-06	1.584E-05	2.000E-07
AW16 01	2/17/2010 13:44	41169		0.025375	1829.2739	9.46E-06	1.623E-05	2.000E-07
AW16 02	2/17/2010 13:45	41169		0.025374	1863.5462	9.13E-06	1.591E-05	2.000E-07
AW16 03	2/17/2010 13:47	41169		0.025376	1865.1034	9.15E-06	1.567E-05	2.000E-07

Specimen ID Number	Shear Zero Correction, s	Longitudinal Sonic Velocity (m/s)	Shear Sonic Velocities, (m/s)	Longitudinal Dynamic Young's Modulus (GPa)	Shear Dynamic Young's Modulus (GPa)	Poisson's Ratio $\mu = \frac{1 - [2(\nu_s/\nu_l)^2]}{[2(\nu_s/\nu_l)^2]}$
AP2 02	2.000E-07	2.754E+03	1.618E+03	14.1494	4.8816	2.366E-01
AP2 03	2.000E-07	2.756E+03	1.619E+03	14.1708	4.8890	2.366E-01
AP3 01	2.000E-07	2.777E+03	1.621E+03	14.3715	4.8957	2.417E-01
AP3 02	2.000E-07	2.756E+03	1.611E+03	14.1411	4.8294	2.407E-01
AP3 03	2.000E-07	2.756E+03	1.615E+03	14.1542	4.8647	2.382E-01
AP4 01	2.000E-07	2.783E+03	1.619E+03	14.4202	4.8783	2.444E-01
AP4 02	2.000E-07	2.745E+03	1.617E+03	14.0455	4.8712	2.345E-01
AP4 03	2.000E-07	2.775E+03	1.621E+03	14.3630	4.8990	2.412E-01
AP5 01	2.000E-07	2.761E+03	1.615E+03	14.1926	4.8567	2.399E-01
AP5 02	2.000E-07	2.766E+03	1.618E+03	14.2614	4.8776	2.401E-01
AP5 03	2.000E-07	2.766E+03	1.618E+03	14.2574	4.8763	2.401E-01
AP6 01	2.000E-07	2.767E+03	1.613E+03	14.2623	4.8470	2.426E-01
AP6 02	2.000E-07	2.761E+03	1.620E+03	14.1997	4.8902	2.374E-01
AP6 03	2.000E-07	2.767E+03	1.618E+03	14.2660	4.8792	2.401E-01
AW1 01	2.000E-07	2.731E+03	1.572E+03	13.6296	4.5155	2.523E-01
AW1 02	2.000E-07	2.792E+03	1.615E+03	14.4951	4.8529	2.484E-01
AW1 03	2.000E-07	2.819E+03	1.640E+03	14.8426	5.0236	2.442E-01
AW2 01	2.000E-07	2.699E+03	1.575E+03	13.2934	4.5258	2.419E-01
AW2 02	2.000E-07	2.816E+03	1.620E+03	14.7578	4.8853	2.526E-01
AW2 03	2.000E-07	2.819E+03	1.631E+03	14.8405	4.9649	2.486E-01
AW3 01	2.000E-07	2.671E+03	1.577E+03	13.0033	4.5330	2.324E-01
AW3 02	2.000E-07	2.804E+03	1.631E+03	14.6277	4.9483	2.444E-01
AW3 03	2.000E-07	2.819E+03	1.621E+03	14.8424	4.9086	2.529E-01
AW4 01	2.000E-07	2.691E+03	1.588E+03	13.2025	4.5975	2.329E-01
AW4 02	2.000E-07	2.798E+03	1.620E+03	14.5600	4.8842	2.476E-01
AW4 03	2.000E-07	2.807E+03	1.626E+03	14.7030	4.9310	2.477E-01
AW5 01	2.000E-07	2.686E+03	1.572E+03	13.1447	4.5062	2.392E-01
AW5 02	2.000E-07	2.804E+03	1.632E+03	14.6187	4.9516	2.439E-01
AW5 03	2.000E-07	2.829E+03	1.639E+03	14.9339	5.0144	2.472E-01
AW6 01	2.000E-07	2.697E+03	1.601E+03	13.2682	4.6766	2.278E-01
AW6 02	2.000E-07	2.783E+03	1.613E+03	14.4136	4.8451	2.468E-01

Specimen ID Number	Shear Zero Correction, s	Longitudinal Sonic Velocity (m/s)	Shear Sonic Velocities, (m/s)	Longitudinal Dynamic Young's Modulus (GPa)	Shear Dynamic Young's Modulus (GPa)	Poisson's Ratio $\mu = (1 - [2(\nu_s \nu_l)^2]) / (2 - [\nu_s / \nu_l]^2)$
AW6 03	2.000E-07	2.798E+03	1.623E+03	14.6171	4.9159	2.466E-01
AW7 01	2.000E-07	2.712E+03	1.584E+03	13.4409	4.5883	2.408E-01
AW7 02	2.000E-07	2.804E+03	1.626E+03	14.6403	4.9208	2.469E-01
AW7 03	2.000E-07	2.814E+03	1.633E+03	14.7613	4.9732	2.460E-01
AW8 01	2.000E-07	2.706E+03	1.572E+03	13.3603	4.5125	2.450E-01
AW8 02	2.000E-07	2.814E+03	1.622E+03	14.7374	4.8956	2.513E-01
AW8 03	2.000E-07	2.829E+03	1.619E+03	14.9293	4.8858	2.568E-01
AW9 01	2.000E-07	2.726E+03	1.591E+03	13.5790	4.6264	2.416E-01
AW9 02	2.000E-07	2.820E+03	1.613E+03	14.7969	4.8439	2.567E-01
AW10 01	2.000E-07	2.700E+03	1.582E+03	13.3198	4.5745	2.385E-01
AW10 02	2.000E-07	2.795E+03	1.631E+03	14.5314	4.9483	2.418E-01
AW10 03	2.000E-07	2.842E+03	1.636E+03	15.0640	4.9937	2.521E-01
AW11 01	2.000E-07	2.712E+03	1.571E+03	13.4341	4.5069	2.476E-01
AW11 02	2.000E-07	2.817E+03	1.616E+03	14.7692	4.8580	2.549E-01
AW11 03	2.000E-07	2.830E+03	1.629E+03	14.9248	4.9472	2.521E-01
AW12 01	2.000E-07	2.712E+03	1.588E+03	13.4508	4.6090	2.394E-01
AW12 02	2.000E-07	2.814E+03	1.628E+03	14.7342	4.9323	2.484E-01
AW12 03	2.000E-07	2.837E+03	1.655E+03	15.0057	5.1099	2.418E-01
AW13 01	2.000E-07	2.688E+03	1.582E+03	13.1814	4.5656	2.350E-01
AW13 02	2.000E-07	2.841E+03	1.632E+03	15.0302	4.9568	2.540E-01
AW13 03	2.000E-07	2.819E+03	1.640E+03	14.8295	5.0191	2.442E-01
AW14 01	2.000E-07	2.720E+03	1.575E+03	13.4939	4.5259	2.477E-01
AW14 02	2.000E-07	2.813E+03	1.631E+03	14.7393	4.9530	2.469E-01
AW14 03	2.000E-07	2.835E+03	1.620E+03	14.9819	4.8936	2.575E-01
AW15 01	2.000E-07	2.726E+03	1.591E+03	13.5819	4.6274	2.416E-01
AW15 02	2.000E-07	2.813E+03	1.633E+03	14.7466	4.9683	2.460E-01
AW15 03	2.000E-07	2.819E+03	1.622E+03	14.8377	4.9134	2.525E-01
AW16 01	2.000E-07	2.740E+03	1.583E+03	13.7363	4.5838	2.496E-01
AW16 02	2.000E-07	2.841E+03	1.615E+03	15.0458	4.8614	2.613E-01
AW16 03	2.000E-07	2.835E+03	1.640E+03	14.9935	5.0184	2.485E-01

Specimen ID Number	Elastic Modulus, [GPa] $E = \rho v_p^2 [(1+\mu)(1-2\mu)/(1-\mu)]$	Environmental Conditions (longitudinal)			Environmental Conditions (shear)		
		Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)
AP2 02	12.0735	21.4	25.4	20.1	21.4	25.4	20.1
AP2 03	12.0919	21.4	25.4	20.1	21.4	25.4	20.1
AP3 01	12.1577	21.4	25.4	20.1	21.4	25.4	20.1
AP3 02	11.9835	21.4	25.4	20.1	21.3	25.4	20.2
AP3 03	12.0465	21.4	25.4	20.1	21.4	25.4	20.2
AP4 01	12.1408	21.4	25.4	20.2	21.4	25.4	20.2
AP4 02	12.0272	21.4	25.4	20.2	21.4	25.4	20.2
AP4 03	12.1611	21.4	25.4	20.2	21.4	25.4	20.2
AP5 01	12.0435	21.4	25.4	20.2	21.4	25.4	20.2
AP5 02	12.0975	22.7	25.4	18.6	22.3	25.4	19.1
AP5 03	12.0941	21.8	25.4	19.7	21.7	25.4	19.9
AP6 01	12.0458	21.6	25.4	20	21.6	25.4	20
AP6 02	12.1018	21.5	25.4	20.1	21.5	25.4	20.1
AP6 03	12.1014	21.5	25.4	20.2	21.5	25.4	20.2
AW1 01	11.3094	21.4	25.4	20.2	21.4	25.4	20.2
AW1 02	12.1162	21.5	25.4	20.2	21.5	25.4	20.2
AW1 03	12.5006	21.4	25.4	20.2	21.5	25.4	20.2
AW2 01	11.2413	21.5	25.4	20.2	21.5	25.4	20.2
AW2 02	12.2384	21.5	25.4	20.2	21.4	25.4	20.2
AW2 03	12.3987	21.4	25.4	20.2	21.4	25.4	20.2
AW3 01	11.1732	21.7	25.4	20	21.7	25.4	20
AW3 02	12.3152	21.7	25.4	20	21.7	25.4	20
AW3 03	12.3004	21.7	25.4	19.9	21.7	25.4	19.9
AW4 01	11.3362	21.7	25.4	19.9	21.7	25.4	19.9
AW4 02	12.1871	21.7	25.4	19.9	21.8	25.4	19.9
AW4 03	12.3048	21.8	25.4	19.9	21.8	25.4	19.9
AW5 01	11.1679	21.8	25.4	19.8	21.8	25.4	19.8
AW5 02	12.3186	21.8	25.4	19.8	21.8	25.4	19.8
AW5 03	12.5083	21.8	25.4	19.8	21.8	25.4	19.8
AW6 01	11.4842	22.1	25.3	13	22.1	25.3	13
AW6 02	12.0820	21.9	25.4	19.8	21.8	25.4	19.8

Specimen ID Number	Elastic Modulus, [GPa] $E=ρv_l^2[(1+μ)(1-2μ)/(1-μ)]$	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)
AW6 03	12.2566	21.8	25.4	19.8	21.8	25.4	19.8
AW7 01	11.3868	21.9	25.4	19.8	21.9	25.4	19.8
AW7 02	12.2712	21.9	25.4	19.8	21.9	25.4	19.8
AW7 03	12.3928	21.9	25.4	19.8	21.9	25.4	19.6
AW8 01	11.2360	21.8	25.4	19.7	21.7	25.4	19.6
AW8 02	12.2516	21.8	25.4	19.5	21.8	25.4	19.5
AW8 03	12.2806	21.8	25.3	19.5	21.7	25.3	19.5
AW9 01	11.4885	21.7	25.3	19.5	21.7	25.3	19.5
AW9 02	12.1744	21.7	25.3	19.5	21.7	25.3	19.5
AW10 01	11.3307	21.7	25.3	19.5	21.7	25.3	19.5
AW10 02	12.2899	22.2	25.3	13	22.2	25.3	13
AW10 03	12.5047	21.7	25.3	19.5	21.7	25.3	19.5
AW11 01	11.2454	21.7	25.3	19.5	21.7	25.3	19.5
AW11 02	12.1928	21.7	25.3	19.4	21.7	25.3	19.5
AW11 03	12.3886	21.7	25.3	19.5	21.7	25.3	19.5
AW12 01	11.4244	21.7	25.3	19.5	21.7	25.3	19.5
AW12 02	12.3149	21.7	25.3	19.5	21.7	25.3	19.4
AW12 03	12.6911	22.1	25.3	13	22.2	25.3	13
AW13 01	11.2774	22.1	25.3	13.1	22.1	25.3	13.1
AW13 02	12.4314	21.7	25.3	19.5	21.7	25.3	19.5
AW13 03	12.4896	21.7	25.3	19.5	21.7	25.3	19.5
AW14 01	11.2937	21.7	25.3	19.4	21.7	25.3	19.5
AW14 02	12.3523	21.7	25.3	19.4	21.7	25.3	19.4
AW14 03	12.3071	21.7	25.3	19.4	21.7	25.3	19.4
AW15 01	11.4909	21.7	25.3	19.4	21.7	25.3	19.4
AW15 02	12.3805	21.8	25.3	19.7	21.8	25.3	19.5
AW15 03	12.3075	21.8	25.3	19.5	21.8	25.3	19.4
AW16 01	11.4557	21.7	25.3	19.5	21.7	25.3	19.5
AW16 02	12.2638	21.7	25.3	19.5	21.7	25.3	19.5
AW16 03	12.5305	21.7	25.3	19.5	21.7	25.3	19.5

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	AW12 02	W	25.371	25.370	25.371	25.372	12.733	12.736	12.732
	AP5 02	P	25.361	25.361	25.361	25.362	12.737	12.739	12.738
	AP5 01	P	25.365	25.366	25.367	25.367	12.731	12.730	12.729
	AW12 03	W	25.352	25.352	25.349	25.352	12.734	12.735	12.733
	AW11 03	W	25.376	25.375	25.375	25.373	12.733	12.734	12.731
	AW12 01	W	25.381	25.382	25.381	25.382	12.734	12.732	12.729
	AW13 01	W	25.369	25.369	25.368	25.367	12.732	12.729	12.728
	AW13 02	W	25.359	25.362	25.361	25.359	12.740	12.742	12.739
	AW1 02	W	25.364	25.364	25.365	25.365	12.734	12.737	12.737
	AW1 01	W	25.368	25.368	25.371	25.369	12.736	12.735	12.733
	AP4 03	P	25.360	25.361	25.360	25.360	12.729	12.733	12.734
	AW10 01	W	25.378	25.379	25.377	25.378	12.728	12.722	12.721
	AW1 03	W	25.364	25.364	25.365	25.364	12.729	12.732	12.734
	AW10 02	W	25.371	25.371	25.372	25.371	12.725	12.727	12.724
	AP4 02	P	25.358	25.361	25.360	25.358	12.739	12.740	12.739
	AW10 03	W	25.369	25.372	25.371	25.369	12.728	12.727	12.727
	AW11 02	W	25.372	25.373	25.373	25.372	12.731	12.733	12.732
	AW11 01	W	25.380	25.379	25.380	25.379	12.730	12.729	12.726
	AP5 03	P	25.360	25.360	25.361	25.360	12.736	12.739	12.742
	AW14 03	W	25.362	25.365	25.364	25.362	12.734	12.737	12.739
	AW14 01	W	25.366	25.368	25.367	25.365	12.726	12.730	12.731
	AW13 03	W	25.361	25.361	25.360	25.360	12.737	12.740	12.737
	AP6 01	P	25.370	25.368	25.367	25.369	12.736	12.733	12.734
	AW14 02	W	25.363	25.362	25.362	25.363	12.737	12.738	12.734

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
AW12 02	12.729	12.733	12.736	12.732	12.729	0.000	0.000	0.000	0.000
AP5 02	12.734	12.740	12.739	12.738	12.735	0.000	0.000	0.000	0.000
AP5 01	12.729	12.734	12.732	12.732	12.730	0.000	0.000	0.000	0.000
AW12 03	12.730	12.739	12.737	12.738	12.734	0.000	0.000	0.000	0.000
AW11 03	12.727	12.734	12.736	12.733	12.728	0.000	0.000	0.000	0.000
AW12 01	12.726	12.730	12.729	12.725	12.724	0.000	0.000	0.000	0.000
AW13 01	12.726	12.735	12.733	12.729	12.726	0.000	0.000	0.000	0.000
AW13 02	12.735	12.735	12.735	12.733	12.730	0.000	0.000	0.000	0.000
AW1 02	12.733	12.730	12.733	12.732	12.730	0.000	0.000	0.000	0.000
AW1 01	12.731	12.738	12.734	12.734	12.733	0.000	0.000	0.000	0.000
AP4 03	12.730	12.732	12.733	12.732	12.728	0.000	0.000	0.000	0.000
AW10 01	12.720	12.728	12.725	12.719	12.721	0.000	0.000	0.000	0.000
AW1 03	12.730	12.727	12.727	12.729	12.728	0.000	0.000	0.000	0.000
AW10 02	12.723	12.731	12.730	12.730	12.726	0.000	0.000	0.000	0.000
AP4 02	12.733	12.735	12.736	12.733	12.731	0.000	0.000	0.000	0.000
AW10 03	12.722	12.731	12.729	12.728	12.726	0.000	0.000	0.000	0.000
AW11 02	12.728	12.732	12.733	12.730	12.726	0.000	0.000	0.000	0.000
AW11 01	12.724	12.729	12.727	12.725	12.723	0.000	0.000	0.000	0.000
AP5 03	12.742	12.733	12.738	12.740	12.739	0.000	0.000	0.000	0.000
AW14 03	12.739	12.733	12.736	12.738	12.740	0.000	0.000	0.000	0.000
AW14 01	12.733	12.727	12.731	12.733	12.735	0.000	0.000	0.000	0.000
AW13 03	12.732	12.739	12.738	12.736	12.732	0.000	0.000	0.000	0.000
AP6 01	12.733	12.738	12.737	12.736	12.731	0.000	0.000	0.000	0.000
AW14 02	12.732	12.739	12.739	12.736	12.731	0.000	0.000	0.000	0.000

Specimen ID Number	Final Hole Diameter, mm		Final Hole Depth, mm		Final Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
AW12 02	0.000	0.000	0.000	0.000	5.90312	41169	12/2/2010 14:08
AP5 02	0.000	0.000	0.000	0.000	5.91852	41169	12/2/2010 15:12
AP5 01	0.000	0.000	0.000	0.000	5.91493	41169	12/2/2010 15:37
AW12 03	0.000	0.000	0.000	0.000	5.91915	41169	12/3/2010 8:50
AW11 03	0.000	0.000	0.000	0.000	5.92223	41169	12/3/2010 8:55
AW12 01	0.000	0.000	0.000	0.000	5.80982	41169	12/3/2010 9:00
AW13 01	0.000	0.000	0.000	0.000	5.79563	41169	12/3/2010 10:07
AW13 02	0.000	0.000	0.000	0.000	5.91387	41169	12/3/2010 10:43
AW1 02	0.000	0.000	0.000	0.000	5.90952	41169	12/3/2010 14:32
AW1 01	0.000	0.000	0.000	0.000	5.80787	41169	12/3/2010 15:19
AP4 03	0.000	0.000	0.000	0.000	5.92009	41169	12/4/2010 8:47
AW10 01	0.000	0.000	0.000	0.000	5.80172	41169	12/4/2010 9:32
AW1 03	0.000	0.000	0.000	0.000	5.93092	41169	12/4/2010 9:34
AW10 02	0.000	0.000	0.000	0.000	5.90234	41169	12/4/2010 9:42
AP4 02	0.000	0.000	0.000	0.000	5.91897	41169	12/4/2010 9:59
AW10 03	0.000	0.000	0.000	0.000	5.91731	41169	12/4/2010 10:14
AW11 02	0.000	0.000	0.000	0.000	5.90883	41169	12/4/2010 13:18
AW11 01	0.000	0.000	0.000	0.000	5.80136	41169	12/4/2010 13:24
AP5 03	0.000	0.000	0.000	0.000	5.91680	47735	12/4/2010 13:39
AW14 03	0.000	0.000	0.000	0.000	5.92450	47735	12/4/2010 13:42
AW14 01	0.000	0.000	0.000	0.000	5.79609	47735	12/4/2010 14:27
AW13 03	0.000	0.000	0.000	0.000	5.92896	41169	12/4/2010 14:49
AP6 01	0.000	0.000	0.000	0.000	5.92244	41169	12/4/2010 14:58
AW14 02	0.000	0.000	0.000	0.000	5.92007	41169	12/4/2010 15:10

Specimen ID Number	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m	Total Hole Volume m ³	Final Specimen Mass kg
AW12 02	25.37100	12.73250	127.3260	0.025371	0.01273	0.0000E+00	0.0059
AP5 02	25.36125	12.73750	127.4261	0.025361	0.01274	0.0000E+00	0.0059
AP5 01	25.36625	12.73088	127.2935	0.025366	0.01273	0.0000E+00	0.0059
AW12 03	25.35125	12.73500	127.3761	0.025351	0.01274	0.0000E+00	0.0059
AW11 03	25.37475	12.73200	127.3160	0.025375	0.01273	0.0000E+00	0.0059
AW12 01	25.38150	12.72863	127.2486	0.025382	0.01273	0.0000E+00	0.0058
AW13 01	25.36825	12.72975	127.2711	0.025368	0.01273	0.0000E+00	0.0058
AW13 02	25.36025	12.73613	127.3986	0.025360	0.01274	0.0000E+00	0.0059
AW1 02	25.36450	12.73325	127.3410	0.025365	0.01273	0.0000E+00	0.0059
AW1 01	25.36900	12.73425	127.3610	0.025369	0.01273	0.0000E+00	0.0058
AP4 03	25.36025	12.73138	127.3035	0.025360	0.01273	0.0000E+00	0.0059
AW10 01	25.37800	12.72300	127.1361	0.025378	0.01272	0.0000E+00	0.0058
AW1 03	25.36425	12.72950	127.2661	0.025364	0.01273	0.0000E+00	0.0059
AW10 02	25.37125	12.72700	127.2161	0.025371	0.01273	0.0000E+00	0.0059
AP4 02	25.35925	12.73575	127.3911	0.025359	0.01274	0.0000E+00	0.0059
AW10 03	25.37025	12.72725	127.2211	0.025370	0.01273	0.0000E+00	0.0059
AW11 02	25.37250	12.73063	127.2885	0.025373	0.01273	0.0000E+00	0.0059
AW11 01	25.37950	12.72663	127.2086	0.025380	0.01273	0.0000E+00	0.0058
AP5 03	25.36025	12.73863	127.4486	0.025360	0.01274	0.0000E+00	0.0059
AW14 03	25.36325	12.73700	127.4161	0.025363	0.01274	0.0000E+00	0.0059
AW14 01	25.36650	12.73075	127.2910	0.025367	0.01273	0.0000E+00	0.0058
AW13 03	25.36050	12.73638	127.4036	0.025361	0.01274	0.0000E+00	0.0059
AP6 01	25.36850	12.73475	127.3710	0.025369	0.01273	0.0000E+00	0.0059
AW14 02	25.36250	12.73575	127.3911	0.025363	0.01274	0.0000E+00	0.0059

Specimen ID Number	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
AW12 02	25.2	23.9	17
AP5 02	25.2	23.7	17.3
AP5 01	25.2	24	17.2
AW12 03	25.2	22.9	21.1
AW11 03	25.2	22.8	21.1
AW12 01	25.2	23	21
AW13 01	25.3	22.9	20.8
AW13 02	25.3	23.2	20.4
AW1 02	25.3	22.8	19.4
AW1 01	25.3	22.6	20
AP4 03	25.4	22.3	13
AW10 01	25.4	22.3	13
AW1 03	25.4	22.3	13
AW10 02	25.4	22.5	12.8
AP4 02	25.4	22.3	12.9
AW10 03	25.4	22.2	12.9
AW11 02	25.4	22.4	13.9
AW11 01	25.4	22.4	13.9
AP5 03	25.4	22.2	17.2
AW14 03	25.4	22.2	17.3
AW14 01	25.4	22.3	17.4
AW13 03	25.4	22.7	14.7
AP6 01	25.4	22.8	14.7
AW14 02	25.4	22.9	14.7

Graphite Grade: NBG-18
Graphite Manufacturer: SGL Carbon Company
Forming Process: Vibration molded
Coke Particle Size: Medium grain
Coke Type: Pitch coke filler, pitch binder
ASTM Class: MNHP
Specimen Geometry: Cylinder

Specimen ID #'s:

BP1 01
BP1 02
BP1 03
BP2 01
BP2 02
BP2 03
BP3 01
BP3 02
BP3 03
BP4 01
BP4 02
BP4 03
BP5 01
BP5 02
BP5 03
BP6 01
BP6 02
BP6 03
BW1 01
BW1 02
BW1 03
BW2 01
BW2 02
BW2 03
BW3 01
BW3 02
BW3 03
BW4 01
BW4 02
BW4 03
BW5 01
BW5 02
BW5 03
BW6 01
BW6 02
BW6 03
BW7 01
BW7 02
BW7 03
BW8 01
BW8 02
BW8 03

Specimen ID #'s:

BW9 01
BW9 02
BW9 03
BW10 01
BW10 02
BW10 03
BW11 01
BW11 02
BW11 03
BW12 01
BW12 02
BW12 03
BW13 01
BW13 02
BW13 03
BW14 01
BW14 02
BW14 03
BW15 01
BW15 02
BW15 03
BW16 01
BW16 02
BW16 03
BL1 01
BL1 02
BL1 03
BL2 01
BL2 02
BL2 03
BL3 01
BL3 02
BL3 03
BL4 01
BL4 02
BL4 03
BL5 01
BL5 02
BL5 03
BL6 01
BL6 02
BL6 03
BL7 01
BL7 02
BL7 03
BL8 01
BL8 02
BL8 03
BL9 01
BL9 02
BL9 03

Specimen ID #'s:

BL10 01

BL10 02

BL10 03

BL11 01

BL11 02

BL11 03

BL12 01

BL12 02

BL12 03

BL13 01

BL13 02

BL13 03

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	BP3 02	P	25.358	25.356	25.357	25.356	12.723	12.720	12.718
	BP5 01	P	25.354	25.355	25.357	25.354	12.725	12.728	12.727
	BP6 02	P	25.356	25.356	25.358	25.357	12.720	12.723	12.722
	BP2 02	P	25.381	25.379	25.382	25.380	12.723	12.724	12.721
	BP5 03	P	25.356	25.357	25.357	25.358	12.721	12.720	12.723
	BP4 02	P	25.357	25.358	25.357	25.357	12.723	12.721	12.721
	BP4 01	P	25.362	25.363	25.362	25.360	12.729	12.733	12.727
	BP6 03	P	25.365	25.363	25.360	25.361	12.731	12.727	12.725
	BP3 01	P	25.360	25.361	25.361	25.361	12.720	12.719	12.721
	BP2 03	P	25.363	25.360	25.362	25.361	12.722	12.722	12.721
	BP5 02	P	25.354	25.356	25.354	25.355	12.722	12.721	12.723
	BP1 01	P	25.372	25.371	25.371	25.375	12.721	12.719	12.720
	BP3 03	P	25.359	25.358	25.359	25.358	12.725	12.726	12.723
	BP6 01	P	25.357	25.354	25.355	25.355	12.729	12.730	12.731
	BP1 03	P	25.383	25.383	25.383	25.382	12.723	12.724	12.723
	BP1 02	P	25.380	25.382	25.379	25.379	12.725	12.724	12.724
	BP4 03	P	25.363	25.364	25.361	25.363	12.724	12.723	12.724
	BP2 01	P	25.382	25.382	25.383	25.383	12.724	12.722	12.724
	BW12 01	W	25.367	25.374	25.369	25.367	12.725	12.725	12.724
	BW12 02	W	25.370	25.369	25.368	25.371	12.728	12.730	12.728
	BW15 03	W	25.369	25.367	25.369	25.368	12.730	12.730	12.729
	BW2 01	W	25.366	25.364	25.365	25.365	12.728	12.728	12.729
	BW3 01	W	25.364	25.366	25.365	25.365	12.724	12.723	12.722
	BW2 02	W	25.365	25.365	25.363	25.364	12.726	12.725	12.727
	BW14 03	W	25.367	25.369	25.368	25.368	12.730	12.731	12.729
	BW16 03	W	25.369	25.367	25.367	25.369	12.735	12.734	12.735
	BW5 02	W	25.370	25.370	25.369	25.368	12.731	12.731	12.729
	BW11 01	W	25.371	25.371	25.372	25.371	12.726	12.727	12.726
	BW14 01	W	25.369	25.369	25.368	25.369	12.737	12.736	12.736
	BW9 03	W	25.369	25.368	25.369	25.370	12.732	12.731	12.730
	BW6 02	W	25.368	25.367	25.368	25.367	12.731	12.730	12.728
	BW4 03	W	25.367	25.366	25.367	25.366	12.728	12.730	12.729
	BW11 03	W	25.367	25.368	25.370	25.370	12.730	12.730	12.732

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	BW10 01	W	25.368	25.367	25.369	25.367	12.732	12.730	12.729
	BW12 03	W	25.367	25.367	25.367	25.369	12.726	12.728	12.725
	BW11 02	W	25.368	25.369	25.370	25.369	12.724	12.726	12.727
	BW1 02	W	25.361	25.364	25.363	25.359	12.735	12.733	12.732
	BW10 02	W	25.369	25.370	25.371	25.370	12.731	12.729	12.731
	BW15 02	W	25.368	25.369	25.367	25.368	12.730	12.732	12.734
	BW10 03	W	25.371	25.370	25.368	25.371	12.731	12.732	12.731
	BW3 02	W	25.365	25.366	25.366	25.364	12.725	12.726	12.728
	BW15 01	W	25.364	25.367	25.366	25.368	12.733	12.730	12.732
	BW6 03	W	25.367	25.367	25.366	25.368	12.728	12.728	12.727
	BW16 02	W	25.365	25.365	25.365	25.368	12.733	12.733	12.736
	BW7 03	W	25.369	25.368	25.369	25.368	12.732	12.732	12.729
	BW3 03	W	25.367	25.365	25.365	25.365	12.724	12.726	12.726
	BW9 01	W	25.367	25.367	25.367	25.365	12.731	12.730	12.731
	BW1 01	W	25.363	25.364	25.365	25.363	12.735	12.734	12.733
	BW14 02	W	25.369	25.369	25.371	25.369	12.733	12.731	12.731
	BW6 01	W	25.368	25.369	25.368	25.370	12.724	12.725	12.725
	BW4 01	W	25.365	25.364	25.365	25.366	12.730	12.729	12.726
	BW9 02	W	25.368	25.369	25.368	25.368	12.732	12.729	12.731
	BW8 03	W	25.365	25.366	25.368	25.366	12.729	12.729	12.730
	BW4 02	W	25.366	25.366	25.368	25.365	12.730	12.730	12.731
	BW16 01	W	25.367	25.368	25.369	25.368	12.735	12.736	12.738
	BW13 01	W	25.368	25.369	25.370	25.369	12.734	12.733	12.733
	BW1 03	W	25.365	25.366	25.364	25.363	12.723	12.725	12.723
	BW7 02	W	25.366	25.367	25.367	25.367	12.734	12.732	12.731
	BW8 02	W	25.370	25.369	25.368	25.369	12.727	12.730	12.730
	BW2 03	W	25.363	25.364	25.364	25.363	12.729	12.730	12.729
	BW13 02	W	25.367	25.367	25.368	25.369	12.731	12.731	12.731
	BW5 03	W	25.365	25.368	25.366	25.368	12.727	12.727	12.726
	BW5 01	W	25.368	25.368	25.368	25.368	12.726	12.728	12.727
	BW8 01	W	25.370	25.368	25.370	25.368	12.729	12.731	12.731
	BW13 03	W	25.367	25.367	25.367	25.366	12.730	12.729	12.731
	BW7 01	W	25.370	25.370	25.370	25.369	12.727	12.728	12.727
	BL3 03	L	25.360	25.362	25.363	25.361	12.723	12.727	12.728

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	BL8 03	L	25.366	25.367	25.365	25.363	12.726	12.726	12.726
	BL12 03	L	25.363	25.364	25.366	25.365	12.732	12.732	12.732
	BL9 03	L	25.362	25.360	25.360	25.361	12.729	12.730	12.726
	BL10 02	L	25.361	25.361	25.361	25.360	12.731	12.731	12.732
	BL10 01	L	25.363	25.363	25.361	25.363	12.728	12.727	12.730
	BL5 03	L	25.362	25.360	25.360	25.360	12.729	12.729	12.726
	BL6 03	L	25.357	25.357	25.357	25.356	12.730	12.733	12.736
	BL6 01	L	25.358	25.359	25.359	25.360	12.731	12.731	12.727
	BL12 02	L	25.357	25.360	25.356	25.358	12.732	12.728	12.731
	BL10 03	L	25.363	25.364	25.366	25.365	12.730	12.733	12.733
	BL7 03	L	25.362	25.361	25.361	25.361	12.730	12.733	12.733
	BL13 01	L	25.364	25.366	25.365	25.362	12.737	12.735	12.732
	BL2 03	L	25.354	25.355	25.355	25.354	12.728	12.728	12.730
	BL11 02	L	25.362	25.361	25.364	25.362	12.734	12.736	12.734
	BL2 02	L	25.357	25.357	25.357	25.356	12.726	12.729	12.726
	BL2 01	L	25.357	25.358	25.356	25.358	12.732	12.730	12.732
	BL5 02	L	25.363	25.364	25.365	25.364	12.735	12.735	12.736
	BL8 02	L	25.367	25.367	25.367	25.367	12.735	12.734	12.734
	BL11 01	L	25.371	25.371	25.372	25.370	12.738	12.739	12.739
	BL12 01	L	25.371	25.372	25.372	25.373	12.738	12.736	12.739
	BL1 01	L	25.362	25.365	25.364	25.362	12.735	12.735	12.735
	BL7 02	L	25.365	25.367	25.365	25.364	12.738	12.735	12.736
	BL1 02	L	25.358	25.361	25.362	25.360	12.732	12.735	12.732
	BL11 03	L	25.368	25.370	25.368	25.368	12.741	12.741	12.742
	BL4 01	L	25.361	25.363	25.365	25.361	12.743	12.743	12.743
	BL13 03	L	25.370	25.370	25.370	25.372	12.736	12.737	12.736
	BL4 03	L	25.363	25.362	25.364	25.363	12.735	12.732	12.734
	BL5 01	L	25.362	25.364	25.362	25.364	12.733	12.736	12.736
	BL9 01	L	25.366	25.368	25.367	25.369	12.733	12.733	12.736
	BL6 02	L	25.364	25.366	25.365	25.365	12.740	12.736	12.740
	BL13 02	L	25.369	25.367	25.367	25.367	12.738	12.742	12.739
	BL1 03	L	25.365	25.367	25.364	25.365	12.731	12.732	12.731
	BL8 01	L	25.365	25.365	25.365	25.365	12.736	12.736	12.736
	BL3 01	L	25.362	25.363	25.364	25.363	12.740	12.739	12.741

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	BL9 02	L	25.365	25.365	25.364	25.363	12.736	12.736	12.735
	BL7 01	L	25.367	25.367	25.365	25.366	12.738	12.734	12.735
	BL4 02	L	25.363	25.362	25.362	25.364	12.741	12.738	12.740

Specimen ID Number	D4 ⁹⁰				D3 ⁹⁰				D2 ⁹⁰				D1 ⁹⁰				D4 ⁹⁰				H1				H1'				H2				H2'			
	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'	H1	H1'	H2	H2'	H1	H1'	H2	H2'	H1	H1'	H2	H2'			
BP3 02	12.719	12.723	12.723	12.723	12.723	12.723	12.723	12.723	12.720	12.723	12.723	12.720	12.720	12.723	12.723	12.720	3.120	3.130	3.140	3.140	3.120	3.130	3.140	3.140	3.120	3.130	3.140	3.140	3.140	3.140	3.140					
BP5 01	12.728	12.726	12.727	12.726	12.726	12.727	12.726	12.728	12.728	12.727	12.726	12.728	12.728	12.726	12.727	12.728	3.120	3.120	3.130	3.130	3.120	3.130	3.130	3.130	3.120	3.130	3.140	3.140	3.140	3.140	3.140					
BP6 02	12.722	12.723	12.725	12.724	12.725	12.725	12.724	12.724	12.725	12.725	12.724	12.725	12.725	12.724	12.725	12.725	3.120	3.130	3.130	3.130	3.120	3.130	3.130	3.130	3.120	3.130	3.140	3.140	3.140	3.140	3.140					
BP2 02	12.721	12.727	12.728	12.722	12.725	12.728	12.722	12.722	12.722	12.728	12.722	12.722	12.722	12.722	12.722	12.722	3.130	3.140	3.120	3.120	3.130	3.140	3.140	3.140	3.120	3.130	3.140	3.140	3.140	3.140	3.120					
BP5 03	12.717	12.725	12.725	12.727	12.725	12.725	12.727	12.727	12.729	12.725	12.727	12.729	12.729	12.727	12.729	12.729	3.110	3.140	3.140	3.140	3.110	3.140	3.140	3.140	3.120	3.130	3.140	3.140	3.140	3.140	3.140					
BP4 02	12.721	12.723	12.726	12.722	12.723	12.726	12.722	12.722	12.725	12.726	12.722	12.725	12.725	12.722	12.725	12.725	3.130	3.130	3.140	3.140	3.130	3.130	3.140	3.140	3.120	3.130	3.140	3.140	3.140	3.140	3.150					
BP4 01	12.726	12.722	12.724	12.722	12.724	12.724	12.724	12.724	12.722	12.724	12.724	12.727	12.727	12.724	12.724	12.727	3.140	3.140	3.120	3.120	3.140	3.140	3.140	3.140	3.120	3.130	3.140	3.140	3.140	3.140	3.140					
BP6 03	12.724	12.720	12.723	12.726	12.723	12.723	12.726	12.726	12.723	12.723	12.726	12.723	12.723	12.723	12.723	12.723	3.130	3.140	3.130	3.130	3.130	3.140	3.140	3.140	3.130	3.130	3.140	3.140	3.140	3.140	3.150					
BP3 01	12.724	12.724	12.724	12.724	12.724	12.724	12.724	12.724	12.724	12.724	12.724	12.724	12.724	12.724	12.724	12.724	3.120	3.140	3.140	3.140	3.120	3.140	3.140	3.140	3.130	3.130	3.140	3.140	3.140	3.140	3.140					
BP2 03	12.721	12.722	12.721	12.722	12.722	12.722	12.722	12.722	12.722	12.722	12.722	12.722	12.722	12.722	12.722	12.722	3.130	3.130	3.120	3.120	3.130	3.130	3.130	3.130	3.120	3.130	3.140	3.140	3.140	3.140	3.140					
BP5 02	12.724	12.726	12.724	12.726	12.724	12.724	12.724	12.724	12.726	12.724	12.724	12.726	12.726	12.724	12.724	12.726	3.130	3.140	3.140	3.140	3.130	3.140	3.140	3.140	3.120	3.130	3.140	3.140	3.140	3.140	3.150					
BP1 01	12.719	12.718	12.719	12.719	12.719	12.719	12.719	12.719	12.718	12.719	12.719	12.718	12.718	12.719	12.719	12.718	3.140	3.130	3.140	3.140	3.140	3.130	3.140	3.140	3.120	3.130	3.140	3.140	3.140	3.140	3.150					
BP3 03	12.724	12.726	12.727	12.727	12.727	12.727	12.727	12.727	12.726	12.727	12.727	12.727	12.727	12.727	12.727	12.727	3.120	3.120	3.120	3.120	3.120	3.120	3.120	3.120	3.120	3.120	3.120	3.120	3.120	3.120	3.130					
BP6 01	12.732	12.727	12.728	12.728	12.728	12.728	12.728	12.728	12.728	12.728	12.728	12.728	12.728	12.728	12.728	12.728	3.130	3.130	3.120	3.120	3.130	3.130	3.130	3.130	3.120	3.130	3.140	3.140	3.140	3.140	3.140					
BP1 03	12.725	12.725	12.725	12.725	12.725	12.725	12.725	12.725	12.725	12.725	12.725	12.725	12.725	12.725	12.725	12.725	3.140	3.150	3.140	3.140	3.140	3.150	3.150	3.150	3.120	3.130	3.140	3.140	3.140	3.140	3.140					
BP1 02	12.722	12.726	12.726	12.726	12.726	12.726	12.726	12.726	12.726	12.726	12.726	12.726	12.726	12.726	12.726	12.726	3.140	3.140	3.140	3.140	3.140	3.140	3.140	3.140	3.120	3.130	3.140	3.140	3.140	3.140	3.140					
BP4 03	12.726	12.723	12.724	12.727	12.723	12.724	12.727	12.723	12.723	12.724	12.727	12.723	12.723	12.723	12.723	12.723	3.140	3.130	3.130	3.130	3.140	3.130	3.130	3.130	3.120	3.130	3.140	3.140	3.140	3.140	3.140					
BP2 01	12.723	12.723	12.723	12.723	12.723	12.723	12.723	12.723	12.723	12.723	12.723	12.723	12.723	12.723	12.723	12.723	3.120	3.130	3.130	3.130	3.120	3.130	3.130	3.130	3.120	3.130	3.140	3.140	3.140	3.140	3.140					
BW12 01	12.724	12.728	12.726	12.726	12.726	12.726	12.726	12.726	12.728	12.726	12.726	12.727	12.727	12.726	12.726	12.727	3.070	3.080	3.080	3.080	3.070	3.080	3.080	3.080	3.120	3.120	3.120	3.120	3.120	3.120	3.120					
BW12 02	12.730	12.727	12.728	12.728	12.728	12.728	12.728	12.728	12.728	12.728	12.728	12.728	12.728	12.728	12.728	12.728	3.100	3.120	3.100	3.100	3.100	3.120	3.120	3.100	3.100	3.100	3.100	3.100	3.100	3.100	3.100					
BW15 03	12.730	12.733	12.734	12.734	12.734	12.734	12.734	12.734	12.733	12.734	12.736	12.734	12.734	12.734	12.734	12.734	3.080	3.090	3.090	3.090	3.080	3.090	3.090	3.090	3.100	3.100	3.100	3.100	3.100	3.100	3.110					
BW2 01	12.730	12.725	12.723	12.723	12.723	12.723	12.723	12.723	12.725	12.723	12.726	12.725	12.725	12.723	12.723	12.725	3.120	3.140	3.120	3.120	3.120	3.140	3.140	3.120	3.120	3.110	3.110	3.110	3.110	3.110	3.130					
BW3 01	12.722	12.727	12.728	12.727	12.728	12.728	12.727	12.727	12.727	12.728	12.727	12.727	12.727	12.727	12.727	12.727	3.130	3.120	3.110	3.110	3.130	3.120	3.120	3.110	3.110	3.110	3.110	3.110	3.110	3.110	3.110					
BW2 02	12.725	12.725	12.724	12.724	12.724	12.724	12.724	12.724	12.725	12.724	12.726	12.725	12.725	12.724	12.724	12.726	3.110	3.120	3.110	3.110	3.110	3.120	3.120	3.090	3.090	3.110	3.110	3.110	3.110	3.110	3.110					
BW14 03	12.729	12.731	12.731	12.731	12.731	12.731	12.731	12.731	12.731	12.731	12.732	12.731	12.731	12.731	12.731	12.731	3.080	3.100	3.080	3.080	3.080	3.100	3.100	3.090	3.090	3.090	3.090	3.090	3.090	3.090	3.090					
BW16 03	12.733	12.735	12.734	12.734	12.734	12.734	12.734	12.734	12.735	12.734	12.735	12.734	12.734	12.734	12.734	12.734	3.080	3.090	3.090	3.090	3.080	3.090	3.090	3.100	3.100	3.100	3.100	3.100	3.100	3.100	3.080					
BW5 02	12.728	12.724	12.726	12.726	12.726	12.726	12.726	12.726	12.724	12.726	12.726	12.726	12.726	12.726	12.726	12.726	3.100	3.110	3.100	3.100	3.100	3.110	3.110	3.100	3.100	3.100	3.100	3.100	3.100	3.110	3.110					
BW11 01	12.726	12.723	12.725	12.727	12.723	12.725	12.727	12.723	12.723	12.725	12.726	12.723	12.723	12.723	12.723	12.726	3.100	3.100	3.100	3.100	3.100	3.110	3.110	3.100	3.100	3.100	3.100	3.100	3.100	3.100	3.110					
BW14 01	12.731	12.737	12.735	12.733	12.735	12.735	12.733	12.733	12.737	12.735	12.733	12.732	12.732	12.733	12.732	12.732	3.100	3.100	3.100	3.100	3.100	3.100	3.100	3.100	3.100	3.100	3.100	3.100	3.100	3.100	3.090					
BW9 03	12.730	12.730	12.731	12.730	12.730	12.730	12.730	12.730	12.730	12.730	12.730	12.730	12.730	12.730	12.730	12.730	3.070	3.090	3.070	3.070	3.070	3.090	3.090	3.100	3.100	3.100	3.100	3.100	3.100	3.100	3.110					
BW6 02	12.727	12.727	12.728	12.728	12.728	12.728	12.728	12.728	12.727	12.728	12.728	12.728	12.728	12.728	12.728	12.728	3.100	3.110	3.100	3.100	3.100	3.110	3.110	3.100	3.100	3.100	3.100	3.100	3.100	3.100	3.110					
BW4 03	12.728	12.728	12.727	12.727	12.727	12.727	12.727	12.727	12.728	12.727	12.727	12.727	12.727	12.727	12.727	12.727	3.120	3.110	3.120	3.120	3.120	3.110	3.110	3.110	3.100	3.100	3.100	3.100	3.100	3.100	3.110					
BW11 03	12.732	12.726	12.725	12.727	12.726	12.725	12.727	12.723	12.726	12.725	12.727	12.723	12.723	12.723	12.723	12.726	3.090	3.110	3.110	3.110	3.120	3.110	3.110	3.100	3.100	3.100	3.100	3.100	3.100	3.110	3.120					

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
BW10 01	12.731	12.733	12.731	12.732	12.729	3.120	3.110	3.120	3.110
BW12 03	12.725	12.728	12.729	12.731	12.729	3.100	3.100	3.100	3.110
BW11 02	12.727	12.724	12.723	12.726	12.725	3.090	3.100	3.090	3.090
BW1 02	12.731	12.734	12.732	12.731	12.731	3.120	3.110	3.120	3.110
BW10 02	12.731	12.732	12.732	12.734	12.732	3.080	3.100	3.100	3.090
BW15 02	12.736	12.732	12.733	12.736	12.738	3.100	3.090	3.100	3.100
BW10 03	12.732	12.736	12.736	12.736	12.735	3.100	3.110	3.100	3.100
BW3 02	12.729	12.730	12.730	12.727	12.730	3.110	3.110	3.100	3.110
BW15 01	12.730	12.731	12.732	12.733	12.731	3.080	3.090	3.100	3.100
BW6 03	12.729	12.727	12.728	12.728	12.726	3.120	3.100	3.110	3.090
BW16 02	12.738	12.735	12.735	12.737	12.736	3.100	3.090	3.090	3.100
BW7 03	12.731	12.729	12.729	12.729	12.729	3.100	3.100	3.110	3.080
BW3 03	12.726	12.730	12.729	12.729	12.729	3.100	3.100	3.100	3.110
BW9 01	12.732	12.732	12.733	12.736	12.736	3.090	3.100	3.080	3.090
BW1 01	12.733	12.733	12.733	12.733	12.736	3.100	3.130	3.110	3.120
BW14 02	12.728	12.729	12.728	12.726	12.727	3.100	3.080	3.080	3.090
BW6 01	12.728	12.731	12.729	12.729	12.730	3.100	3.110	3.100	3.090
BW4 01	12.725	12.724	12.726	12.726	12.724	3.110	3.120	3.110	3.100
BW9 02	12.728	12.733	12.731	12.730	12.730	3.090	3.090	3.070	3.090
BW8 03	12.732	12.727	12.727	12.730	12.729	3.080	3.080	3.090	3.090
BW4 02	12.731	12.728	12.728	12.730	12.729	3.120	3.100	3.100	3.090
BW16 01	12.737	12.734	12.734	12.735	12.736	3.080	3.080	3.090	3.080
BW13 01	12.731	12.727	12.729	12.728	12.730	3.110	3.100	3.090	3.110
BW1 03	12.725	12.727	12.726	12.729	12.729	3.100	3.100	3.110	3.110
BW7 02	12.731	12.729	12.728	12.729	12.727	3.120	3.100	3.100	3.120
BW8 02	12.729	12.727	12.726	12.728	12.728	3.110	3.090	3.090	3.100
BW2 03	12.728	12.730	12.729	12.729	12.728	3.110	3.120	3.100	3.130
BW13 02	12.730	12.730	12.730	12.730	12.728	3.110	3.080	3.090	3.110
BW5 03	12.724	12.727	12.730	12.729	12.730	3.110	3.100	3.120	3.110
BW5 01	12.727	12.726	12.725	12.726	12.725	3.090	3.100	3.090	3.120
BW8 01	12.732	12.731	12.729	12.727	12.726	3.080	3.090	3.090	3.090
BW13 03	12.730	12.728	12.727	12.728	12.728	3.100	3.080	3.100	3.110
BW7 01	12.729	12.727	12.728	12.729	12.726	3.100	3.110	3.120	3.120
BL3 03	12.732	12.732	12.729	12.731	12.731	3.130	3.130	3.120	3.130

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
BL8 03	12.728	12.733	12.730	12.733	12.732	3.120	3.110	3.120	3.110
BL12 03	12.730	12.731	12.732	12.732	12.731	3.110	3.120	3.090	3.120
BL9 03	12.726	12.733	12.732	12.735	12.735	3.120	3.120	3.120	3.110
BL10 02	12.731	12.728	12.728	12.728	12.727	3.110	3.130	3.110	3.110
BL10 01	12.732	12.733	12.729	12.730	12.729	3.110	3.110	3.110	3.110
BL5 03	12.726	12.730	12.732	12.732	12.732	3.120	3.130	3.100	3.110
BL6 03	12.736	12.729	12.729	12.730	12.727	3.120	3.130	3.130	3.130
BL6 01	12.728	12.731	12.732	12.731	12.731	3.090	3.110	3.100	3.120
BL12 02	12.731	12.726	12.728	12.727	12.730	3.140	3.130	3.140	3.140
BL10 03	12.733	12.733	12.733	12.733	12.734	3.120	3.100	3.110	3.120
BL7 03	12.729	12.730	12.729	12.729	12.730	3.110	3.120	3.110	3.120
BL13 01	12.734	12.731	12.732	12.733	12.733	3.110	3.110	3.110	3.110
BL2 03	12.730	12.725	12.727	12.727	12.726	3.120	3.120	3.130	3.110
BL11 02	12.735	12.732	12.731	12.733	12.732	3.090	3.100	3.100	3.130
BL2 02	12.729	12.726	12.727	12.728	12.729	3.120	3.130	3.130	3.130
BL2 01	12.730	12.735	12.734	12.731	12.733	3.130	3.130	3.120	3.120
BL5 02	12.736	12.736	12.735	12.734	12.736	3.120	3.110	3.120	3.120
BL8 02	12.734	12.737	12.736	12.737	12.735	3.120	3.130	3.110	3.110
BL11 01	12.738	12.738	12.738	12.736	12.735	3.110	3.110	3.100	3.110
BL12 01	12.738	12.737	12.736	12.736	12.737	3.090	3.090	3.110	3.120
BL1 01	12.735	12.735	12.735	12.736	12.734	3.120	3.130	3.130	3.110
BL7 02	12.736	12.737	12.737	12.736	12.736	3.130	3.120	3.110	3.120
BL1 02	12.730	12.728	12.731	12.732	12.731	3.120	3.120	3.130	3.130
BL11 03	12.739	12.738	12.740	12.739	12.737	3.100	3.100	3.100	3.130
BL4 01	12.745	12.743	12.744	12.744	12.744	3.130	3.130	3.130	3.130
BL13 03	12.737	12.739	12.739	12.741	12.739	3.110	3.120	3.110	3.120
BL4 03	12.734	12.736	12.735	12.735	12.735	3.120	3.110	3.110	3.130
BL5 01	12.736	12.735	12.735	12.733	12.732	3.120	3.120	3.120	3.120
BL9 01	12.735	12.738	12.737	12.737	12.736	3.120	3.110	3.100	3.110
BL6 02	12.736	12.737	12.736	12.738	12.736	3.110	3.120	3.100	3.130
BL13 02	12.738	12.739	12.740	12.742	12.739	3.090	3.110	3.110	3.120
BL1 03	12.730	12.733	12.734	12.734	12.735	3.120	3.130	3.130	3.140
BL8 01	12.735	12.736	12.737	12.734	12.737	3.130	3.130	3.120	3.130
BL3 01	12.742	12.737	12.737	12.736	12.734	3.130	3.130	3.130	3.130

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
BP3 02	3.133	3.360	3.360	3.360	5.93421	JL	6/30/2009 13:46
BP5 01	3.128	3.330	3.390	3.360	5.93892	JL	6/30/2009 13:49
BP6 02	3.130	3.350	3.360	3.355	5.94763	JL	6/30/2009 13:53
BP2 02	3.128	3.340	3.380	3.360	5.94529	JL	6/30/2009 14:18
BP5 03	3.133	3.360	3.360	3.360	5.94743	JL	6/30/2009 14:20
BP4 02	3.138	3.330	3.390	3.360	5.94497	JL	6/30/2009 14:23
BP4 01	3.135	3.390	3.330	3.360	5.93294	JL	6/30/2009 14:26
BP6 03	3.138	3.410	3.340	3.375	5.95222	JL	6/30/2009 15:03
BP3 01	3.133	3.350	3.360	3.355	5.92916	JL	6/30/2009 15:06
BP2 03	3.130	3.370	3.370	3.370	5.94265	JL	6/30/2009 15:09
BP5 02	3.140	3.350	3.340	3.345	5.94774	JL	6/30/2009 15:12
BP1 01	3.140	3.330	3.400	3.365	5.94087	jl	7/1/2009 9:19
BP3 03	3.123	3.390	3.320	3.355	5.94214	jl	7/1/2009 9:22
BP6 01	3.130	3.350	3.350	3.350	5.92988	jl	7/1/2009 9:25
BP1 03	3.138	3.340	3.370	3.355	5.95063	jl	7/1/2009 9:30
BP1 02	3.138	3.400	3.340	3.370	5.94314	jl	7/1/2009 9:32
BP4 03	3.135	3.350	3.350	3.350	5.94398	jl	7/1/2009 9:36
BP2 01	3.128	3.330	3.380	3.355	5.94698	jl	7/1/2009 9:39
BW12 01	3.088	3.330	3.350	3.340	5.95678	jl	7/1/2009 10:47
BW12 02	3.105	3.340	3.340	3.340	5.94344	jl	7/1/2009 10:52
BW15 03	3.095	3.330	3.380	3.355	5.94420	jl	7/1/2009 10:54
BW2 01	3.125	3.340	3.410	3.375	5.94288	jl	7/1/2009 10:57
BW3 01	3.118	3.330	3.340	3.335	5.94699	jl	7/1/2009 11:12
BW2 02	3.108	3.370	3.320	3.345	5.94368	jl	7/1/2009 11:15
BW14 03	3.090	3.340	3.350	3.345	5.95527	jl	7/1/2009 11:18
BW16 03	3.088	3.360	3.350	3.355	5.94857	jl	7/1/2009 11:21
BW5 02	3.105	3.370	3.310	3.340	5.95231	jl	7/1/2009 11:24
BW11 01	3.105	3.370	3.320	3.345	5.95850	jl	7/1/2009 14:09
BW14 01	3.098	3.350	3.350	3.350	5.94341	jl	7/1/2009 14:12
BW9 03	3.093	3.330	3.340	3.335	5.94806	jl	7/1/2009 14:15
BW6 02	3.105	3.330	3.360	3.345	5.94451	jl	7/1/2009 14:17
BW4 03	3.110	3.340	3.340	3.340	5.93859	jl	7/1/2009 14:20
BW11 03	3.108	3.330	3.340	3.335	5.95231	jl	7/1/2009 14:22

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
BW10 01	3.115	3.320	3.360	3.340	5.95242	jl	7/1/2009 14:25
BW12 03	3.103	3.330	3.340	3.335	5.94841	jl	7/1/2009 14:28
BW11 02	3.093	3.370	3.310	3.340	5.94322	jl	7/1/2009 14:31
BW1 02	3.115	3.330	3.340	3.335	5.95395	jl	7/1/2009 14:34
BW10 02	3.093	3.340	3.330	3.335	5.95207	jl	7/1/2009 14:36
BW15 02	3.098	3.330	3.370	3.350	5.95627	jl	7/1/2009 14:09
BW10 03	3.103	3.330	3.330	3.330	5.95051	jl	7/1/2009 14:12
BW3 02	3.108	3.330	3.340	3.335	5.94233	jl	7/1/2009 14:15
BW15 01	3.093	3.380	3.330	3.355	5.94871	jl	7/1/2009 14:17
BW6 03	3.105	3.330	3.340	3.335	5.94205	jl	7/1/2009 14:20
BW16 02	3.095	3.350	3.360	3.355	5.96106	jl	7/1/2009 14:22
BW7 03	3.098	3.340	3.340	3.340	5.93934	jl	7/1/2009 14:25
BW3 03	3.103	3.340	3.340	3.340	5.94802	jl	7/1/2009 14:28
BW9 01	3.090	3.330	3.340	3.335	5.95012	jl	7/1/2009 14:31
BW1 01	3.115	3.340	3.330	3.335	5.95144	jl	7/1/2009 14:34
BW14 02	3.088	3.360	3.350	3.355	5.95908	jl	7/1/2009 14:36
BW6 01	3.100	3.340	3.330	3.335	5.95138	jl	7/2/2009 8:56
BW4 01	3.110	3.360	3.320	3.340	5.94222	jl	7/2/2009 8:59
BW9 02	3.085	3.370	3.340	3.355	5.95169	jl	7/2/2009 9:02
BW8 03	3.085	3.390	3.320	3.355	5.94763	jl	7/2/2009 9:04
BW4 02	3.103	3.360	3.340	3.350	5.94241	jl	7/2/2009 9:10
BW16 01	3.083	3.340	3.360	3.350	5.95556	jl	7/2/2009 9:17
BW13 01	3.103	3.380	3.330	3.355	5.94660	jl	7/2/2009 9:20
BW1 03	3.105	3.370	3.330	3.350	5.94162	jl	7/2/2009 9:23
BW7 02	3.110	3.360	3.340	3.350	5.94666	jl	7/2/2009 9:26
BW8 02	3.098	3.340	3.330	3.335	5.94900	jl	7/2/2009 9:29
BW2 03	3.115	3.370	3.330	3.350	5.94176	jl	7/2/2009 9:32
BW13 02	3.098	3.360	3.340	3.350	5.95041	jl	7/2/2009 9:34
BW5 03	3.110	3.350	3.340	3.345	5.94287	jl	7/2/2009 9:36
BW5 01	3.100	3.330	3.360	3.345	5.94539	jl	7/2/2009 9:39
BW8 01	3.088	3.350	3.340	3.345	5.95875	jl	7/2/2009 9:41
BW13 03	3.098	3.360	3.360	3.360	5.94513	jl	7/2/2009 9:43
BW7 01	3.113	3.340	3.330	3.335	5.95109	jl	7/2/2009 9:46
BL3 03	3.128	3.320	3.320	3.320	5.94956	JL	7/2/2009 13:02

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
BL8 03	3.115	3.330	3.330	3.330	5.95268	JL	7/2/2009 13:06
BL12 03	3.110	3.350	3.390	3.370	5.95619	JL	7/2/2009 13:11
BL9 03	3.118	3.310	3.360	3.335	5.94924	JL	7/2/2009 13:16
BL10 02	3.115	3.330	3.330	3.330	5.94017	JL	7/2/2009 13:20
BL10 01	3.110	3.310	3.360	3.335	5.94798	JL	7/2/2009 13:22
BL5 03	3.115	3.330	3.380	3.355	5.95595	JL	7/2/2009 13:26
BL6 03	3.128	3.320	3.370	3.345	5.95550	JL	7/2/2009 13:29
BL6 01	3.105	3.300	3.320	3.310	5.95565	JL	7/2/2009 13:32
BL12 02	3.138	3.390	3.360	3.375	5.94246	JL	7/2/2009 13:34
BL10 03	3.113	3.350	3.330	3.340	5.95745	JL	7/2/2009 13:37
BL7 03	3.115	3.340	3.350	3.345	5.95925	JL	7/2/2009 13:39
BL13 01	3.110	3.340	3.360	3.350	5.96433	JL	7/2/2009 13:42
BL2 03	3.120	3.350	3.320	3.335	5.93543	JL	7/2/2009 14:47
BL11 02	3.105	3.320	3.330	3.325	5.95522	JL	7/2/2009 14:51
BL2 02	3.128	3.380	3.320	3.350	5.94242	JL	7/2/2009 15:09
BL2 01	3.125	3.330	3.330	3.330	5.94208	JL	7/2/2009 15:14
BL5 02	3.118	3.330	3.330	3.330	5.95111	jl	7/6/2009 9:05
BL8 02	3.118	3.360	3.310	3.335	5.95382	jl	7/6/2009 9:09
BL11 01	3.108	3.360	3.310	3.335	5.94863	jl	7/6/2009 9:12
BL12 01	3.103	3.340	3.330	3.335	5.95913	jl	7/6/2009 9:15
BL1 01	3.123	3.390	3.320	3.355	5.93142	jl	7/6/2009 9:17
BL7 02	3.120	3.370	3.310	3.340	5.96186	jl	7/6/2009 9:21
BL1 02	3.125	3.360	3.350	3.355	5.93732	jl	7/6/2009 10:35
BL11 03	3.108	3.330	3.330	3.330	5.95024	jl	7/6/2009 10:38
BL4 01	3.130	3.310	3.340	3.325	5.94795	jl	7/6/2009 10:41
BL13 03	3.115	3.330	3.370	3.350	5.95872	jl	7/6/2009 10:44
BL4 03	3.118	3.340	3.360	3.350	5.95428	jl	7/6/2009 10:46
BL5 01	3.120	3.330	3.400	3.365	5.95478	jl	7/6/2009 10:49
BL9 01	3.110	3.360	3.310	3.335	5.94633	jl	7/6/2009 10:52
BL6 02	3.115	3.370	3.380	3.375	5.95775	jl	7/6/2009 10:55
BL13 02	3.108	3.330	3.340	3.335	5.96478	jl	7/6/2009 11:12
BL1 03	3.130	3.380	3.320	3.350	5.93987	jl	7/6/2009 11:00
BL8 01	3.128	3.340	3.320	3.330	5.94860	jl	7/6/2009 11:09
BL3 01	3.130	3.330	3.320	3.325	5.94887	jl	7/6/2009 11:15

Specimen ID Number	Specimen Hole Diameter, mm	HD1	HD2	Specimen Hole Depth, mm	Specimen Mass, g	Measurements by:	Date: mm/dd/yr
BL9 02	3.113	3.330	3.330	3.330	5.95013	jl	7/6/2009 11:17
BL7 01	3.120	3.320	3.350	3.335	5.96491	jl	7/6/2009 11:20
BL4 02	3.118	3.350	3.300	3.325	5.95584	jl	7/6/2009 11:24

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
BP3 02	25.35675	12.72113	127.0986	0.025357	0.01272	5.1790E-08	0.0059
BP5 01	25.35500	12.72688	127.2136	0.025355	0.01273	5.1627E-08	0.0059
BP6 02	25.35675	12.72300	127.1361	0.025357	0.01272	5.1630E-08	0.0059
BP2 02	25.38050	12.72350	127.1461	0.025381	0.01272	5.1623E-08	0.0059
BP5 03	25.35700	12.72338	127.1436	0.025357	0.01272	5.1790E-08	0.0059
BP4 02	25.35725	12.72275	127.1311	0.025357	0.01272	5.1957E-08	0.0059
BP4 01	25.36175	12.72650	127.2061	0.025362	0.01273	5.1874E-08	0.0059
BP6 03	25.36225	12.72488	127.1736	0.025362	0.01272	5.2186E-08	0.0060
BP3 01	25.36075	12.72225	127.1211	0.025361	0.01272	5.1713E-08	0.0059
BP2 03	25.36150	12.72188	127.1136	0.025362	0.01272	5.1861E-08	0.0059
BP5 02	25.35475	12.72338	127.1436	0.025355	0.01272	5.1805E-08	0.0059
BP1 01	25.37225	12.71913	127.0587	0.025372	0.01272	5.2117E-08	0.0059
BP3 03	25.35850	12.72513	127.1786	0.025359	0.01273	5.1382E-08	0.0059
BP6 01	25.35525	12.72950	127.2661	0.025355	0.01273	5.1553E-08	0.0059
BP1 03	25.38275	12.72438	127.1636	0.025383	0.01272	5.1877E-08	0.0060
BP1 02	25.38000	12.72425	127.1611	0.025380	0.01272	5.2110E-08	0.0059
BP4 03	25.36275	12.72463	127.1686	0.025363	0.01272	5.1718E-08	0.0059
BP2 01	25.38250	12.72325	127.1411	0.025383	0.01272	5.1548E-08	0.0059
BW12 01	25.36925	12.72575	127.1911	0.025369	0.01273	5.0015E-08	0.0060
BW12 02	25.36950	12.72875	127.2511	0.025370	0.01273	5.0581E-08	0.0059
BW15 03	25.36825	12.73200	127.3160	0.025368	0.01273	5.0485E-08	0.0059
BW2 01	25.36500	12.72675	127.2111	0.025365	0.01273	5.1770E-08	0.0059
BW3 01	25.36500	12.72500	127.1761	0.025365	0.01273	5.0913E-08	0.0059
BW2 02	25.36425	12.72588	127.1936	0.025364	0.01273	5.0741E-08	0.0059
BW14 03	25.36800	12.73075	127.2910	0.025368	0.01273	5.0169E-08	0.0060
BW16 03	25.36800	12.73438	127.3635	0.025368	0.01273	5.0237E-08	0.0059
BW5 02	25.36925	12.72775	127.2311	0.025369	0.01273	5.0581E-08	0.0060
BW11 01	25.37125	12.72575	127.1911	0.025371	0.01273	5.0656E-08	0.0060
BW14 01	25.36875	12.73463	127.3685	0.025369	0.01273	5.0488E-08	0.0059
BW9 03	25.36900	12.73038	127.2835	0.025369	0.01273	5.0101E-08	0.0059
BW6 02	25.36750	12.72838	127.2436	0.025368	0.01273	5.0657E-08	0.0059
BW4 03	25.36650	12.72763	127.2286	0.025367	0.01273	5.0744E-08	0.0059
BW11 03	25.36875	12.72850	127.2461	0.025369	0.01273	5.0588E-08	0.0060

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
BW10 01	25.36775	12.73088	127.2935	0.025368	0.01273	5.0908E-08	0.0060
BW12 03	25.36750	12.72763	127.2286	0.025368	0.01273	5.0424E-08	0.0059
BW11 02	25.36900	12.72525	127.1811	0.025369	0.01273	5.0176E-08	0.0059
BW1 02	25.36175	12.73238	127.3235	0.025362	0.01273	5.0831E-08	0.0060
BW10 02	25.37000	12.73150	127.3060	0.025370	0.01273	5.0100E-08	0.0060
BW15 02	25.36800	12.73388	127.3535	0.025368	0.01273	5.0488E-08	0.0060
BW10 03	25.37000	12.73363	127.3485	0.025370	0.01273	5.0349E-08	0.0060
BW3 02	25.36525	12.72813	127.2386	0.025365	0.01273	5.0587E-08	0.0059
BW15 01	25.36625	12.73150	127.3060	0.025366	0.01273	5.0399E-08	0.0059
BW6 03	25.36700	12.72763	127.2286	0.025367	0.01273	5.0505E-08	0.0059
BW16 02	25.36575	12.73538	127.3836	0.025366	0.01274	5.0482E-08	0.0060
BW7 03	25.36850	12.73000	127.2761	0.025369	0.01273	5.0337E-08	0.0059
BW3 03	25.36550	12.72738	127.2236	0.025366	0.01273	5.0500E-08	0.0059
BW9 01	25.36650	12.73263	127.3285	0.025367	0.01273	5.0019E-08	0.0060
BW1 01	25.36375	12.73375	127.3510	0.025364	0.01273	5.0831E-08	0.0060
BW14 02	25.36950	12.72913	127.2586	0.025370	0.01273	5.0237E-08	0.0060
BW6 01	25.36875	12.72763	127.2286	0.025369	0.01273	5.0343E-08	0.0060
BW4 01	25.36500	12.72625	127.2011	0.025365	0.01273	5.0745E-08	0.0059
BW9 02	25.36825	12.73050	127.2860	0.025368	0.01273	5.0157E-08	0.0060
BW8 03	25.36625	12.72913	127.2586	0.025366	0.01273	5.0154E-08	0.0059
BW4 02	25.36625	12.72963	127.2686	0.025366	0.01273	5.0652E-08	0.0059
BW16 01	25.36800	12.73563	127.3886	0.025368	0.01274	5.0000E-08	0.0060
BW13 01	25.36900	12.73063	127.2885	0.025369	0.01273	5.0727E-08	0.0059
BW1 03	25.36450	12.72588	127.1936	0.025365	0.01273	5.0732E-08	0.0059
BW7 02	25.36675	12.73013	127.2785	0.025367	0.01273	5.0896E-08	0.0059
BW8 02	25.36900	12.72813	127.2386	0.025369	0.01273	5.0262E-08	0.0059
BW2 03	25.36350	12.72900	127.2561	0.025364	0.01273	5.1060E-08	0.0059
BW13 02	25.36775	12.73013	127.2785	0.025368	0.01273	5.0488E-08	0.0060
BW5 03	25.36675	12.72750	127.2261	0.025367	0.01273	5.0820E-08	0.0059
BW5 01	25.36800	12.72625	127.2011	0.025368	0.01273	5.0495E-08	0.0059
BW8 01	25.36900	12.72950	127.2661	0.025369	0.01273	5.0087E-08	0.0060
BW13 03	25.36675	12.72888	127.2536	0.025367	0.01273	5.0639E-08	0.0059
BW7 01	25.36975	12.72763	127.2286	0.025370	0.01273	5.0750E-08	0.0060
BL3 03	25.36150	12.72913	127.2586	0.025362	0.01273	5.1010E-08	0.0059

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
BL8 03	25.36525	12.72925	127.2611	0.025365	0.01273	5.0755E-08	0.0060
BL12 03	25.36450	12.73150	127.3060	0.025365	0.01273	5.1199E-08	0.0060
BL9 03	25.36075	12.73075	127.2910	0.025361	0.01273	5.0912E-08	0.0059
BL10 02	25.36075	12.72950	127.2661	0.025361	0.01273	5.0755E-08	0.0059
BL10 01	25.36250	12.72975	127.2711	0.025363	0.01273	5.0668E-08	0.0059
BL5 03	25.36050	12.72950	127.2661	0.025361	0.01273	5.1134E-08	0.0060
BL6 03	25.35675	12.73125	127.3010	0.025357	0.01273	5.1394E-08	0.0060
BL6 01	25.35900	12.73025	127.2810	0.025359	0.01273	5.0128E-08	0.0060
BL12 02	25.35775	12.72913	127.2586	0.025358	0.01273	5.2187E-08	0.0059
BL10 03	25.36450	12.73275	127.3310	0.025365	0.01273	5.0826E-08	0.0060
BL7 03	25.36125	12.73038	127.2835	0.025361	0.01273	5.0984E-08	0.0060
BL13 01	25.36425	12.73338	127.3435	0.025364	0.01273	5.0896E-08	0.0060
BL2 03	25.35450	12.72763	127.2286	0.025355	0.01273	5.0995E-08	0.0059
BL11 02	25.36225	12.73338	127.3435	0.025362	0.01273	5.0355E-08	0.0060
BL2 02	25.35675	12.72750	127.2261	0.025357	0.01273	5.1470E-08	0.0059
BL2 01	25.35725	12.73213	127.3185	0.025357	0.01273	5.1082E-08	0.0059
BL5 02	25.36400	12.73538	127.3836	0.025364	0.01274	5.0837E-08	0.0060
BL8 02	25.36700	12.73525	127.3811	0.025367	0.01274	5.0915E-08	0.0060
BL11 01	25.37100	12.73763	127.4286	0.025371	0.01274	5.0588E-08	0.0059
BL12 01	25.37200	12.73713	127.4186	0.025372	0.01274	5.0424E-08	0.0060
BL1 01	25.36325	12.73500	127.3761	0.025363	0.01274	5.1384E-08	0.0059
BL7 02	25.36525	12.73638	127.4036	0.025365	0.01274	5.1073E-08	0.0060
BL1 02	25.36025	12.73138	127.3035	0.025360	0.01273	5.1465E-08	0.0059
BL11 03	25.36850	12.73963	127.4686	0.025369	0.01274	5.0511E-08	0.0060
BL4 01	25.36250	12.74363	127.5486	0.025363	0.01274	5.1168E-08	0.0059
BL13 03	25.37050	12.73800	127.4361	0.025371	0.01274	5.1060E-08	0.0060
BL4 03	25.36300	12.73450	127.3660	0.025363	0.01273	5.1142E-08	0.0060
BL5 01	25.36300	12.73450	127.3660	0.025363	0.01273	5.1453E-08	0.0060
BL9 01	25.36750	12.73563	127.3886	0.025368	0.01274	5.0670E-08	0.0059
BL6 02	25.36500	12.73738	127.4236	0.025365	0.01274	5.1441E-08	0.0060
BL13 02	25.36750	12.73963	127.4686	0.025368	0.01274	5.0588E-08	0.0060
BL1 03	25.36525	12.73250	127.3260	0.025365	0.01273	5.1552E-08	0.0059
BL8 01	25.36500	12.73588	127.3936	0.025365	0.01274	5.1164E-08	0.0059
BL3 01	25.36300	12.73825	127.4411	0.025363	0.01274	5.1168E-08	0.0059

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
BL9 02	25.36425	12.73538	127.3836	0.025364	0.01274	5.0674E-08	0.0060
BL7 01	25.36625	12.73463	127.3685	0.025366	0.01273	5.0995E-08	0.0060
BL4 02	25.36275	12.73963	127.4686	0.025363	0.01274	5.0761E-08	0.0060

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg
BL9 02	25.36425	12.73538	127.3836	0.025364	0.01274	5.0674E-08	0.0060
BL7 01	25.36625	12.73463	127.3685	0.025366	0.01273	5.0995E-08	0.0060
BL4 02	25.36275	12.73963	127.4686	0.025363	0.01274	5.0761E-08	0.0060

Specimen ID Number	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
BP3 02	1871.38908	1.8714	25.2	21.4	45.3
BP5 01	1871.19001	1.8712	25.2	21.5	45.1
BP6 02	1874.96507	1.8750	25.2	21.5	45.3
BP2 02	1872.29127	1.8723	25.2	21.7	44.2
BP5 03	1874.86518	1.8749	25.2	21.9	43.7
BP4 02	1874.35714	1.8744	25.2	21.9	43.8
BP4 01	1869.05762	1.8691	25.2	21.9	43.5
BP6 03	1875.76518	1.8758	25.2	22	42.8
BP3 01	1869.11530	1.8691	25.2	21.9	43.2
BP2 03	1873.51135	1.8735	25.2	21.9	43.2
BP5 02	1875.14121	1.8751	25.2	22	42.7
BP1 01	1873.11790	1.8731	25.3	21.3	52.4
BP3 03	1872.32076	1.8723	25.3	21.2	52.8
BP6 01	1867.49662	1.8675	25.3	21.4	52.5
BP1 03	1873.69191	1.8737	25.3	21.4	52.5
BP1 02	1871.71461	1.8717	25.3	21.5	52.4
BP4 03	1872.92934	1.8729	25.3	21.5	51.9
BP2 01	1872.70408	1.8727	25.3	21.4	51.5
BW12 01	1875.13088	1.8751	25.3	21.3	53
BW12 02	1870.35066	1.8704	25.3	21.3	52.3
BW15 03	1869.65646	1.8697	25.3	21.3	52.4
BW2 01	1871.80946	1.8718	25.3	21.4	52.1
BW3 01	1873.12166	1.8731	25.3	21.4	52.1
BW2 02	1871.77227	1.8718	25.3	21.4	52.6
BW14 03	1873.34463	1.8733	25.3	21.4	51.9
BW16 03	1870.19530	1.8702	25.3	21.4	52.1
BW5 02	1873.45969	1.8735	25.3	21.5	51.7
BW11 01	1875.90071	1.8759	25.3	21.2	50.1
BW14 01	1868.58967	1.8686	25.3	21.2	50
BW9 03	1871.07385	1.8711	25.3	21.2	49.9
BW6 02	1870.99372	1.8710	25.3	21.2	49.9
BW4 03	1869.48057	1.8695	25.3	21.2	49.9
BW11 03	1873.27662	1.8733	25.3	21.2	49.7

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
BW10 01	1872.86480	1.8729	25.3	21.3	49.5
BW12 03	1872.30831	1.8723	25.3	21.3	49
BW11 02	1871.12515	1.8711	25.3	21.3	48.7
BW1 02	1873.30302	1.8733	25.3	21.3	48.6
BW10 02	1871.92334	1.8719	25.3	21.3	48.6
BW15 02	1872.91345	1.8729	25.3	21.3	48.6
BW10 03	1870.94482	1.8709	25.3	21.3	48.6
BW3 02	1870.50946	1.8705	25.3	21.4	48.4
BW15 01	1871.32356	1.8713	25.3	21.3	48.4
BW6 03	1870.39161	1.8704	25.3	21.3	48.2
BW16 02	1874.13599	1.8741	25.3	21.4	47.9
BW7 03	1868.61882	1.8686	25.3	21.4	47.9
BW3 03	1872.45473	1.8725	25.3	21.4	47.2
BW9 01	1871.18875	1.8712	25.3	21.4	46.6
BW1 01	1871.95247	1.8720	25.3	21.4	46.5
BW14 02	1874.95727	1.8750	25.3	21.4	46.1
BW6 01	1873.10162	1.8731	25.3	21.4	52.6
BW4 01	1871.14699	1.8711	25.3	21.4	52.3
BW9 02	1872.26743	1.8723	25.3	21.5	51.9
BW8 03	1871.54931	1.8715	25.3	21.5	51.9
BW4 02	1870.05033	1.8701	25.3	21.5	51.2
BW16 01	1871.88022	1.8719	25.3	21.5	51.6
BW13 01	1870.90845	1.8709	25.3	21.6	51.7
BW1 03	1871.09958	1.8711	25.3	21.6	51.9
BW7 02	1871.34474	1.8713	25.3	21.7	51.8
BW8 02	1872.13643	1.8721	25.3	21.7	51.8
BW2 03	1870.47849	1.8705	25.3	21.8	51.4
BW13 02	1872.20914	1.8722	25.3	21.8	51.6
BW5 03	1870.89112	1.8709	25.3	21.7	51.8
BW5 01	1871.77259	1.8718	25.3	21.8	51.9
BW8 01	1874.69031	1.8747	25.3	21.8	51.7
BW13 03	1871.08508	1.8711	25.3	21.8	51.5
BW7 01	1873.17491	1.8732	25.3	21.9	51.1
BL3 03	1873.01699	1.8730	25.3	21.7	48.2

Specimen ID Number	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
BL8 03	1873.53021	1.8735	25.3	21.7	48.2
BL12 03	1874.27999	1.8743	25.3	21.6	48.2
BL9 03	1872.42940	1.8724	25.3	21.6	47.8
BL10 02	1869.85535	1.8699	25.3	21.6	47.7
BL10 01	1872.05658	1.8721	25.3	21.6	47.6
BL5 03	1875.06507	1.8751	25.3	21.6	47.2
BL6 03	1874.83490	1.8748	25.3	21.6	46.9
BL6 01	1874.26482	1.8743	25.3	21.6	46.9
BL12 02	1871.75645	1.8718	25.3	21.6	46.7
BL10 03	1874.08225	1.8741	25.3	21.7	46.7
BL7 03	1875.69672	1.8757	25.3	21.7	46.6
BL13 01	1876.11982	1.8761	25.3	21.7	46.8
BL2 03	1869.53163	1.8695	25.3	21.5	45.6
BL11 02	1873.08545	1.8731	25.3	21.6	45.1
BL2 02	1871.88210	1.8719	25.3	21.6	44.2
BL2 01	1870.12735	1.8701	25.3	21.7	44.2
BL5 02	1871.34778	1.8713	25.2	21.5	52.2
BL8 02	1872.05850	1.8721	25.2	21.5	51.7
BL11 01	1869.22608	1.8692	25.2	21.5	51.6
BL12 01	1872.50388	1.8725	25.2	21.5	52.9
BL1 01	1865.64473	1.8656	25.2	21.5	53
BL7 02	1874.47433	1.8745	25.2	21.7	52.3
BL1 02	1868.85375	1.8689	25.1	21.8	50
BL11 03	1869.27802	1.8693	25.1	21.8	49.7
BL4 01	1868.20132	1.8682	25.1	21.8	49.8
BL13 03	1872.60012	1.8726	25.2	21.8	49.7
BL4 03	1872.86103	1.8729	25.1	21.9	49.3
BL5 01	1873.20162	1.8732	25.2	21.9	49.7
BL9 01	1869.40984	1.8694	25.2	21.9	49.8
BL6 02	1873.11889	1.8731	25.2	21.9	49.9
BL13 02	1873.96570	1.8740	25.2	21.9	52.6
BL1 03	1868.99718	1.8690	25.2	21.8	51.3
BL8 01	1870.52663	1.8705	25.2	21.8	52.9
BL3 01	1870.05537	1.8701	25.2	22	51.9

Specimen ID Number	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
BL9 02	1870.92518	1.8709	25.2	21.9	51.9
BL7 01	1875.83585	1.8758	25.2	22	51.5
BL4 02	1871.61500	1.8716	25.2	22	51.1

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BP4 02		wds	1/13/2010 7:44	100	77.7459	4.05E-04	4.74E-06	4.76E-06
				200	110.94984	8.87E-04	5.08E-06	4.79E-06
				300	143.4687	1.40E-03	5.39E-06	4.93E-06
				400	176.08261	1.97E-03	5.67E-06	5.11E-06
				500	208.94011	2.55E-03	5.92E-06	5.26E-06
				600	242.04518	3.15E-03	6.13E-06	5.39E-06
				700	275.35467	3.77E-03	6.32E-06	5.51E-06
				800	308.88242	4.41E-03	6.48E-06	5.62E-06
				900	342.54621	5.06E-03	6.60E-06	5.72E-06
				1000	376.36969	5.74E-03	6.69E-06	5.83E-06
BP4 03		wds	7/15/2010 7:42	100	78.32466	3.94E-04	4.71E-06	4.84E-06
				200	111.71155	8.81E-04	5.13E-06	4.86E-06
				300	144.20608	1.40E-03	5.51E-06	4.98E-06
				400	176.75639	1.98E-03	5.83E-06	5.19E-06
				500	209.51676	2.58E-03	6.10E-06	5.36E-06
				600	242.49942	3.20E-03	6.33E-06	5.50E-06
				700	275.67446	3.84E-03	6.50E-06	5.64E-06
				800	309.0977	4.50E-03	6.63E-06	5.76E-06
				900	342.67445	5.16E-03	6.70E-06	5.86E-06
				1000	376.42745	5.84E-03	6.73E-06	5.95E-06
BP5 01		wds	1/13/2010 16:15	100	77.94158	4.03E-04	4.86E-06	4.86E-06
				200	111.21196	8.95E-04	5.19E-06	4.91E-06
				300	143.77911	1.42E-03	5.50E-06	5.05E-06
				400	176.44112	2.00E-03	5.77E-06	5.23E-06
				500	209.33508	2.59E-03	6.01E-06	5.37E-06
				600	242.46616	3.20E-03	6.22E-06	5.50E-06
				700	275.80508	3.83E-03	6.39E-06	5.61E-06
				800	309.33411	4.47E-03	6.53E-06	5.72E-06
				900	343.00028	5.13E-03	6.64E-06	5.82E-06
				1000	376.84025	5.81E-03	6.71E-06	5.92E-06
BP5 02		wds	5/28/2010 7:51	100	78.51006	4.11E-04	4.95E-06	4.95E-06
				200	111.89713	9.15E-04	5.32E-06	5.00E-06
				300	144.40034	1.46E-03	5.64E-06	5.15E-06
				400	176.97642	2.05E-03	5.91E-06	5.35E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BP6 02		wds	1/14/2010 16:26	500	209.76957	2.65E-03	6.13E-06	5.49E-06
				600	242.80453	3.27E-03	6.29E-06	5.62E-06
				700	276.04902	3.90E-03	6.41E-06	5.72E-06
				800	309.51139	4.54E-03	6.47E-06	5.80E-06
				900	343.1291	5.20E-03	6.49E-06	5.89E-06
				1000	376.88716	5.84E-03	6.45E-06	5.94E-06
				100	77.34835	4.03E-04	4.82E-06	4.82E-06
				200	110.61095	8.92E-04	5.15E-06	4.89E-06
				300	143.20856	1.41E-03	5.45E-06	5.01E-06
				400	175.87894	1.98E-03	5.72E-06	5.19E-06
BP6 03		wds	7/15/2010 7:44	500	208.78354	2.57E-03	5.96E-06	5.33E-06
				600	241.93087	3.18E-03	6.17E-06	5.46E-06
				700	275.27115	3.80E-03	6.35E-06	5.57E-06
				800	308.81718	4.44E-03	6.49E-06	5.67E-06
				900	342.49082	5.09E-03	6.61E-06	5.78E-06
				1000	376.30937	5.77E-03	6.70E-06	5.88E-06
				100	81.99837	4.04E-04	4.75E-06	4.73E-06
				200	116.03951	8.90E-04	5.12E-06	4.80E-06
				300	148.73255	1.41E-03	5.44E-06	4.95E-06
				400	181.18068	1.98E-03	5.74E-06	5.14E-06
BW1 01		wds	1/18/2010 7:45	500	213.71731	2.57E-03	5.99E-06	5.29E-06
				600	246.43244	3.18E-03	6.21E-06	5.44E-06
				700	279.48704	3.81E-03	6.39E-06	5.56E-06
				800	312.76709	4.45E-03	6.53E-06	5.67E-06
				900	346.28323	5.11E-03	6.64E-06	5.78E-06
				1000	380.0293	5.79E-03	6.71E-06	5.88E-06
				100	77.41781	4.30E-04	5.04E-06	5.00E-06
				200	110.68128	9.37E-04	5.36E-06	5.04E-06
				300	143.25468	1.48E-03	5.65E-06	5.19E-06
				400	175.93844	2.07E-03	5.91E-06	5.38E-06
500	208.83923	2.68E-03	6.14E-06	5.52E-06				
600	241.96289	3.30E-03	6.33E-06	5.65E-06				
700	275.27805	3.94E-03	6.50E-06	5.75E-06				
800	308.819	4.59E-03	6.64E-06	5.84E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BW1 02		wds	1/18/2010 7:49	900	342.46779	5.26E-03	6.74E-06	5.95E-06
				1000	376.23746	5.96E-03	6.82E-06	6.05E-06
				100	81.25322	3.91E-04	4.77E-06	4.70E-06
				200	115.1708	8.87E-04	5.19E-06	4.82E-06
				300	147.91386	1.42E-03	5.55E-06	4.99E-06
				400	180.55132	2.00E-03	5.85E-06	5.20E-06
				500	213.25923	2.59E-03	6.09E-06	5.36E-06
				600	246.15015	3.21E-03	6.28E-06	5.50E-06
				700	279.23512	3.84E-03	6.41E-06	5.62E-06
				800	312.55853	4.49E-03	6.49E-06	5.73E-06
BP5 03		wds	1/18/2010 16:34	900	346.0435	5.15E-03	6.50E-06	5.83E-06
				1000	379.66191	5.78E-03	6.46E-06	5.88E-06
				100	77.45412	4.16E-04	4.96E-06	5.02E-06
				200	110.72956	9.19E-04	5.25E-06	5.05E-06
				300	143.28847	1.45E-03	5.52E-06	5.14E-06
				400	175.94241	2.02E-03	5.77E-06	5.30E-06
				500	208.82951	2.61E-03	5.99E-06	5.42E-06
				600	241.94442	3.22E-03	6.20E-06	5.54E-06
				700	275.27843	3.85E-03	6.38E-06	5.65E-06
				800	308.80904	4.49E-03	6.54E-06	5.75E-06
BP6 01		wds	5/28/2010 8:39	900	342.47674	5.15E-03	6.67E-06	5.84E-06
				1000	376.26598	5.84E-03	6.79E-06	5.94E-06
				100	81.42593	3.87E-04	5.01E-06	4.73E-06
				200	115.45876	9.00E-04	5.36E-06	4.95E-06
				300	148.18757	1.45E-03	5.65E-06	5.15E-06
				400	180.66617	2.04E-03	5.91E-06	5.34E-06
				500	213.24782	2.64E-03	6.12E-06	5.48E-06
				600	246.08079	3.25E-03	6.28E-06	5.60E-06
				700	279.09478	3.88E-03	6.40E-06	5.70E-06
				800	312.42954	4.53E-03	6.47E-06	5.80E-06
BW11 01		wds	1/20/2010 7:36	900	345.92031	5.19E-03	6.50E-06	5.88E-06
				1000	379.62188	5.83E-03	6.49E-06	5.94E-06
				100	77.8728	4.36E-04	5.04E-06	5.05E-06
				200	111.11938	9.46E-04	5.39E-06	5.08E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BW11 02		wds	1/20/2010 7:39	300	143.70318	1.49E-03	5.69E-06	5.22E-06
				400	176.36841	2.09E-03	5.96E-06	5.42E-06
				500	209.29257	2.70E-03	6.19E-06	5.56E-06
				600	242.44377	3.33E-03	6.37E-06	5.68E-06
				700	275.77628	3.97E-03	6.52E-06	5.79E-06
				800	309.31123	4.62E-03	6.63E-06	5.88E-06
				900	342.98301	5.29E-03	6.69E-06	5.98E-06
				1000	376.79757	5.97E-03	6.72E-06	6.06E-06
				100	81.10916	4.10E-04	4.83E-06	4.89E-06
				200	115.07776	9.11E-04	5.22E-06	4.95E-06
BW11 03		wds	1/20/2010 16:46	300	147.83866	1.44E-03	5.57E-06	5.08E-06
				400	180.4729	2.02E-03	5.87E-06	5.26E-06
				500	213.18502	2.62E-03	6.12E-06	5.41E-06
				600	246.09583	3.24E-03	6.32E-06	5.56E-06
				700	279.15408	3.88E-03	6.48E-06	5.68E-06
				800	312.47483	4.54E-03	6.59E-06	5.79E-06
				900	345.98057	5.20E-03	6.65E-06	5.89E-06
				1000	379.68757	5.86E-03	6.66E-06	5.96E-06
				100	77.4627	4.01E-04	4.80E-06	4.79E-06
				200	110.72738	8.88E-04	5.19E-06	4.85E-06
BW12 02		wds	1/21/2010 7:45	300	143.2877	1.42E-03	5.54E-06	5.01E-06
				400	175.94606	2.00E-03	5.84E-06	5.22E-06
				500	208.82236	2.60E-03	6.10E-06	5.39E-06
				600	241.94235	3.22E-03	6.31E-06	5.53E-06
				700	275.27092	3.86E-03	6.47E-06	5.65E-06
				800	308.79843	4.50E-03	6.59E-06	5.75E-06
				900	342.46979	5.17E-03	6.66E-06	5.85E-06
				1000	376.28076	5.85E-03	6.69E-06	5.96E-06
				100	77.57395	4.12E-04	4.89E-06	4.88E-06
				200	110.8271	9.08E-04	5.29E-06	4.94E-06
300	143.35511	1.45E-03	5.65E-06	5.11E-06				
400	175.99336	2.04E-03	5.95E-06	5.33E-06				
500	208.86581	2.66E-03	6.20E-06	5.49E-06				
600	241.9879	3.28E-03	6.41E-06	5.63E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BW12 03		wds	1/21/2010 7:46	700	275.30744	3.93E-03	6.57E-06	5.75E-06
				800	308.81791	4.58E-03	6.67E-06	5.85E-06
				900	342.49969	5.26E-03	6.73E-06	5.95E-06
				1000	376.30506	5.95E-03	6.74E-06	6.05E-06
				100	81.58498	4.03E-04	4.71E-06	4.76E-06
				200	115.5811	8.88E-04	5.06E-06	4.81E-06
				300	148.33234	1.40E-03	5.38E-06	4.94E-06
				400	180.96719	1.97E-03	5.67E-06	5.12E-06
				500	213.67501	2.54E-03	5.92E-06	5.25E-06
				600	246.59965	3.14E-03	6.15E-06	5.38E-06
BW13 01		wds	1/21/2010 16:30	700	279.68265	3.77E-03	6.33E-06	5.51E-06
				800	313.02383	4.42E-03	6.49E-06	5.63E-06
				900	346.49315	5.07E-03	6.62E-06	5.74E-06
				1000	380.19229	5.72E-03	6.71E-06	5.81E-06
				100	77.83212	4.17E-04	5.02E-06	5.04E-06
				200	111.11293	9.26E-04	5.36E-06	5.08E-06
				300	143.70161	1.47E-03	5.67E-06	5.21E-06
				400	176.37046	2.06E-03	5.95E-06	5.40E-06
				500	209.26653	2.67E-03	6.19E-06	5.55E-06
				600	242.40286	3.30E-03	6.40E-06	5.67E-06
BW13 02		wds	5/27/2010 8:11	700	275.72493	3.95E-03	6.58E-06	5.79E-06
				800	309.26175	4.61E-03	6.73E-06	5.89E-06
				900	342.93682	5.29E-03	6.84E-06	6.00E-06
				1000	376.73571	5.99E-03	6.93E-06	6.11E-06
				100	81.39837	4.17E-04	5.05E-06	4.96E-06
				200	115.41172	9.35E-04	5.38E-06	5.09E-06
				300	148.11204	1.48E-03	5.68E-06	5.21E-06
				400	180.68013	2.07E-03	5.94E-06	5.40E-06
				500	213.25514	2.68E-03	6.17E-06	5.54E-06
				600	246.08456	3.30E-03	6.37E-06	5.66E-06
700	279.09224	3.95E-03	6.54E-06	5.77E-06				
800	312.40164	4.61E-03	6.67E-06	5.88E-06				
900	345.89403	5.29E-03	6.77E-06	5.98E-06				
1000	379.60666	5.96E-03	6.84E-06	6.06E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BW13 03		wds	1/22/2010 7:40	100	77.42976	4.15E-04	4.81E-06	4.86E-06
				200	110.71384	9.05E-04	5.16E-06	4.89E-06
				300	143.28692	1.43E-03	5.48E-06	5.02E-06
				400	175.95963	2.00E-03	5.76E-06	5.21E-06
				500	208.86258	2.59E-03	6.02E-06	5.35E-06
				600	242.00222	3.21E-03	6.25E-06	5.48E-06
				700	275.33757	3.84E-03	6.45E-06	5.61E-06
				800	308.86499	4.49E-03	6.61E-06	5.72E-06
				900	342.5372	5.16E-03	6.75E-06	5.83E-06
				1000	376.33436	5.85E-03	6.86E-06	5.95E-06
BW14 01		wds	1/22/2010 7:43	100	81.16108	4.11E-04	4.94E-06	4.89E-06
				200	115.10438	9.18E-04	5.31E-06	5.00E-06
				300	147.85403	1.46E-03	5.63E-06	5.14E-06
				400	180.47581	2.04E-03	5.91E-06	5.33E-06
				500	213.16172	2.65E-03	6.15E-06	5.48E-06
				600	246.06879	3.27E-03	6.35E-06	5.61E-06
				700	279.1495	3.91E-03	6.51E-06	5.73E-06
				800	312.43329	4.57E-03	6.62E-06	5.84E-06
				900	345.94235	5.24E-03	6.69E-06	5.94E-06
				1000	379.65078	5.91E-03	6.73E-06	6.01E-06
BW14 02		wds	1/22/2010 16:18	100	77.36498	4.13E-04	4.97E-06	5.01E-06
				200	110.64671	9.19E-04	5.31E-06	5.04E-06
				300	143.26268	1.46E-03	5.62E-06	5.17E-06
				400	175.9601	2.04E-03	5.89E-06	5.35E-06
				500	208.85857	2.65E-03	6.12E-06	5.49E-06
				600	241.97419	3.27E-03	6.32E-06	5.61E-06
				700	275.29553	3.91E-03	6.49E-06	5.73E-06
				800	308.81591	4.56E-03	6.63E-06	5.83E-06
				900	342.47085	5.23E-03	6.73E-06	5.93E-06
				1000	376.26143	5.92E-03	6.80E-06	6.02E-06
BW14 03		wds	1/22/2010 16:02	100	81.09206	3.89E-04	4.80E-06	4.73E-06
				200	115.10192	8.83E-04	5.20E-06	4.85E-06
				300	147.88721	1.41E-03	5.55E-06	5.00E-06
				400	180.51208	1.99E-03	5.86E-06	5.22E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BW15 01		wds	1/25/2010 7:32	500	213.22547	2.60E-03	6.12E-06	5.39E-06
				600	246.13669	3.22E-03	6.33E-06	5.53E-06
				700	279.2289	3.85E-03	6.49E-06	5.65E-06
				800	312.52986	4.51E-03	6.61E-06	5.77E-06
				900	346.05167	5.18E-03	6.68E-06	5.87E-06
				1000	379.73045	5.84E-03	6.70E-06	5.95E-06
				100	77.97348	4.30E-04	4.91E-06	4.85E-06
				200	111.25647	9.25E-04	5.29E-06	4.93E-06
				300	143.80904	1.47E-03	5.62E-06	5.10E-06
				400	176.46146	2.05E-03	5.91E-06	5.31E-06
BW15 02		wds	1/25/2010 7:36	500	209.33591	2.67E-03	6.17E-06	5.47E-06
				600	242.45216	3.29E-03	6.38E-06	5.60E-06
				700	275.76115	3.93E-03	6.55E-06	5.72E-06
				800	309.27458	4.59E-03	6.69E-06	5.84E-06
				900	342.9268	5.26E-03	6.78E-06	5.94E-06
				1000	376.73377	5.96E-03	6.83E-06	6.05E-06
				100	81.59756	3.94E-04	4.67E-06	4.70E-06
				200	115.54143	8.76E-04	5.12E-06	4.77E-06
				300	148.28721	1.40E-03	5.51E-06	4.93E-06
				400	180.91798	1.98E-03	5.84E-06	5.16E-06
BW15 03		wds	1/25/2010 16:17	500	213.60919	2.58E-03	6.12E-06	5.33E-06
				600	246.49793	3.20E-03	6.33E-06	5.49E-06
				700	279.55733	3.84E-03	6.48E-06	5.62E-06
				800	312.88455	4.49E-03	6.57E-06	5.73E-06
				900	346.39063	5.15E-03	6.61E-06	5.84E-06
				1000	380.06525	5.81E-03	6.58E-06	5.91E-06
				100	77.28768	4.02E-04	4.95E-06	4.89E-06
				200	110.5682	9.03E-04	5.32E-06	4.95E-06
				300	143.07693	1.45E-03	5.65E-06	5.12E-06
				400	175.59909	2.04E-03	5.92E-06	5.33E-06
500	208.30288	2.65E-03	6.15E-06	5.50E-06				
600	241.23428	3.27E-03	6.34E-06	5.62E-06				
700	274.38813	3.91E-03	6.47E-06	5.73E-06				
800	307.76887	4.55E-03	6.56E-06	5.82E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BW16 01		wds	1/25/2010 15:47	900	341.32273	5.21E-03	6.60E-06	5.91E-06
				1000	375.01195	5.90E-03	6.60E-06	6.00E-06
				100	81.14754	3.93E-04	4.93E-06	4.76E-06
				200	115.13752	8.95E-04	5.32E-06	4.90E-06
				300	147.90221	1.44E-03	5.66E-06	5.10E-06
				400	180.54725	2.04E-03	5.95E-06	5.33E-06
				500	213.22923	2.65E-03	6.18E-06	5.49E-06
				600	246.1521	3.27E-03	6.36E-06	5.61E-06
				700	279.22804	3.90E-03	6.49E-06	5.72E-06
				800	312.52421	4.56E-03	6.57E-06	5.83E-06
BW16 02		wds	1/26/2010 7:37	900	346.01379	5.23E-03	6.59E-06	5.93E-06
				1000	379.70715	5.88E-03	6.56E-06	5.98E-06
				100	76.8906	4.38E-04	5.00E-06	5.02E-06
				200	110.14895	9.45E-04	5.33E-06	5.05E-06
				300	142.67587	1.49E-03	5.63E-06	5.18E-06
				400	175.23306	2.07E-03	5.90E-06	5.37E-06
				500	207.96361	2.68E-03	6.14E-06	5.51E-06
				600	240.90975	3.30E-03	6.35E-06	5.64E-06
				700	274.05592	3.94E-03	6.52E-06	5.75E-06
				800	307.42998	4.60E-03	6.67E-06	5.85E-06
BW16 03		wds	1/26/2010 7:40	900	340.94619	5.27E-03	6.78E-06	5.95E-06
				1000	374.61728	5.97E-03	6.86E-06	6.06E-06
				100	81.58836	4.10E-04	4.88E-06	4.89E-06
				200	115.53716	9.13E-04	5.26E-06	4.97E-06
				300	148.32312	1.45E-03	5.60E-06	5.10E-06
				400	180.91846	2.03E-03	5.89E-06	5.30E-06
				500	213.59648	2.63E-03	6.14E-06	5.45E-06
				600	246.51774	3.26E-03	6.35E-06	5.58E-06
				700	279.58163	3.90E-03	6.51E-06	5.70E-06
				800	312.88329	4.56E-03	6.62E-06	5.82E-06
BW2 01		wds	1/26/2010 16:02	900	346.36268	5.23E-03	6.69E-06	5.92E-06
				1000	380.06128	5.89E-03	6.72E-06	5.99E-06
				100	76.91205	4.13E-04	5.04E-06	5.02E-06
				200	110.18541	9.22E-04	5.38E-06	5.06E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BW2 02		wds	1/26/2010 15:52	300	142.69067	1.47E-03	5.68E-06	5.21E-06
				400	175.23088	2.06E-03	5.94E-06	5.40E-06
				500	207.96151	2.67E-03	6.17E-06	5.55E-06
				600	240.92532	3.30E-03	6.35E-06	5.67E-06
				700	274.10314	3.94E-03	6.49E-06	5.77E-06
				800	307.51428	4.58E-03	6.60E-06	5.86E-06
				900	341.05192	5.25E-03	6.66E-06	5.95E-06
				1000	374.73537	5.94E-03	6.68E-06	6.05E-06
				100	81.10774	3.94E-04	4.82E-06	4.82E-06
				200	115.11556	8.93E-04	5.22E-06	4.91E-06
300	147.86969	1.42E-03	5.57E-06	5.05E-06				
400	180.50206	2.00E-03	5.87E-06	5.25E-06				
500	213.20252	2.60E-03	6.12E-06	5.41E-06				
600	246.1065	3.23E-03	6.32E-06	5.55E-06				
700	279.1728	3.86E-03	6.48E-06	5.67E-06				
800	312.45466	4.52E-03	6.58E-06	5.78E-06				
900	345.94218	5.18E-03	6.64E-06	5.88E-06				
1000	379.63767	5.84E-03	6.64E-06	5.95E-06				
BW2 03		wds	1/27/2010 7:39	100	77.01232	4.32E-04	4.98E-06	5.04E-06
				200	110.24534	9.38E-04	5.33E-06	5.06E-06
				300	142.72463	1.48E-03	5.64E-06	5.19E-06
				400	175.22963	2.07E-03	5.92E-06	5.37E-06
				500	207.93911	2.68E-03	6.16E-06	5.52E-06
				600	240.87485	3.30E-03	6.37E-06	5.65E-06
				700	274.01625	3.95E-03	6.54E-06	5.76E-06
				800	307.38349	4.60E-03	6.68E-06	5.87E-06
				900	340.90226	5.28E-03	6.78E-06	5.96E-06
				1000	374.56284	5.97E-03	6.85E-06	6.06E-06
BW3 01		wds	1/27/2010 13:52	100	81.14758	3.93E-04	4.84E-06	4.77E-06
				200	115.14893	8.94E-04	5.27E-06	4.91E-06
				300	147.88384	1.43E-03	5.64E-06	5.08E-06
				400	180.49707	2.02E-03	5.95E-06	5.29E-06
				500	213.19428	2.63E-03	6.21E-06	5.45E-06
				600	246.1017	3.26E-03	6.40E-06	5.60E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BW3 03		wds	6/1/2010 18:17	700	279.17351	3.90E-03	6.53E-06	5.72E-06
				800	312.47775	4.56E-03	6.60E-06	5.83E-06
				900	345.95593	5.23E-03	6.62E-06	5.93E-06
				1000	379.65523	5.88E-03	6.57E-06	5.99E-06
				100	81.46065	3.81E-04	4.98E-06	4.83E-06
				200	115.51723	8.84E-04	5.36E-06	4.96E-06
				300	148.17506	1.44E-03	5.69E-06	5.11E-06
				400	180.70179	2.04E-03	5.97E-06	5.34E-06
				500	213.28934	2.65E-03	6.20E-06	5.49E-06
				600	246.11536	3.27E-03	6.38E-06	5.62E-06
BW4 01		wds	2/2/2010 16:52	700	279.17184	3.90E-03	6.51E-06	5.73E-06
				800	312.43647	4.57E-03	6.59E-06	5.84E-06
				900	345.91279	5.24E-03	6.62E-06	5.94E-06
				1000	379.6502	5.88E-03	6.61E-06	5.99E-06
				100	77.8752	4.04E-04	4.97E-06	4.89E-06
				200	111.21894	9.07E-04	5.34E-06	4.97E-06
				300	143.70928	1.45E-03	5.67E-06	5.15E-06
				400	176.26941	2.05E-03	5.95E-06	5.35E-06
				500	208.95979	2.66E-03	6.19E-06	5.51E-06
				600	241.90596	3.29E-03	6.38E-06	5.65E-06
BW3 02		wds	2/2/2010 8:14	700	275.05712	3.92E-03	6.52E-06	5.75E-06
				800	308.43697	4.58E-03	6.62E-06	5.85E-06
				900	341.99155	5.25E-03	6.68E-06	5.95E-06
				1000	375.6925	5.93E-03	6.69E-06	6.04E-06
				100	77.62222	4.18E-04	4.96E-06	5.00E-06
				200	110.89976	9.22E-04	5.32E-06	5.02E-06
				300	143.46141	1.47E-03	5.65E-06	5.17E-06
				400	176.05868	2.06E-03	5.94E-06	5.36E-06
				500	208.85514	2.67E-03	6.19E-06	5.52E-06
				600	241.84317	3.29E-03	6.40E-06	5.65E-06
700	275.03676	3.94E-03	6.58E-06	5.77E-06				
800	308.4268	4.60E-03	6.71E-06	5.88E-06				
900	341.97587	5.28E-03	6.80E-06	5.98E-06				
1000	375.68689	5.98E-03	6.86E-06	6.08E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BW5 01		wds	2/3/2010 7:46	100	81.18955	4.02E-04	4.84E-06	4.77E-06
				200	115.19972	9.00E-04	5.25E-06	4.89E-06
				300	147.92794	1.44E-03	5.61E-06	5.06E-06
				400	180.57455	2.02E-03	5.92E-06	5.27E-06
				500	213.26563	2.63E-03	6.18E-06	5.44E-06
				600	246.17847	3.26E-03	6.39E-06	5.58E-06
				700	279.23219	3.90E-03	6.54E-06	5.71E-06
				800	312.6037	4.56E-03	6.65E-06	5.82E-06
				900	346.06935	5.24E-03	6.70E-06	5.93E-06
				1000	379.77607	5.90E-03	6.70E-06	6.00E-06
BW5 02		wds	2/3/2010 16:25	100	77.29778	4.03E-04	4.90E-06	4.89E-06
				200	110.65096	9.03E-04	5.28E-06	4.95E-06
				300	143.16681	1.44E-03	5.62E-06	5.11E-06
				400	175.73778	2.03E-03	5.90E-06	5.31E-06
				500	208.48438	2.63E-03	6.14E-06	5.46E-06
				600	241.45599	3.26E-03	6.33E-06	5.60E-06
				700	274.63257	3.89E-03	6.48E-06	5.71E-06
				800	308.01428	4.54E-03	6.58E-06	5.81E-06
				900	341.57276	5.21E-03	6.63E-06	5.91E-06
				1000	375.29491	5.87E-03	6.64E-06	5.98E-06
BW5 03		wds	2/3/2010 16:08	100	81.65841	3.86E-04	4.68E-06	4.70E-06
				200	115.67244	8.75E-04	5.10E-06	4.81E-06
				300	148.4135	1.39E-03	5.47E-06	4.93E-06
				400	181.03962	1.96E-03	5.79E-06	5.14E-06
				500	213.71262	2.56E-03	6.06E-06	5.31E-06
				600	246.61557	3.17E-03	6.27E-06	5.46E-06
				700	279.71833	3.81E-03	6.44E-06	5.58E-06
				800	313.04662	4.46E-03	6.55E-06	5.71E-06
				900	346.56099	5.12E-03	6.60E-06	5.81E-06
				1000	380.25013	5.77E-03	6.61E-06	5.87E-06
BW4 03		wds	2/3/2010 7:42	100	77.33798	4.14E-04	4.94E-06	4.93E-06
				200	110.59938	9.17E-04	5.31E-06	4.98E-06
				300	143.11546	1.46E-03	5.64E-06	5.15E-06
				400	175.65702	2.05E-03	5.92E-06	5.34E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BW4 02		wds	2/2/2010 16:34	500	208.43823	2.65E-03	6.16E-06	5.49E-06
				600	241.41907	3.28E-03	6.36E-06	5.62E-06
				700	274.59684	3.92E-03	6.52E-06	5.74E-06
				800	307.98177	4.58E-03	6.64E-06	5.84E-06
				900	341.52663	5.24E-03	6.71E-06	5.94E-06
				1000	375.24319	5.93E-03	6.74E-06	6.03E-06
				100	81.18346	3.92E-04	4.91E-06	4.77E-06
				200	115.18433	8.98E-04	5.27E-06	4.93E-06
				300	147.94536	1.43E-03	5.60E-06	5.08E-06
				400	180.56773	2.02E-03	5.89E-06	5.29E-06
BW6 01		wds	2/4/2010 7:49	500	213.29085	2.62E-03	6.15E-06	5.44E-06
				600	246.21495	3.25E-03	6.38E-06	5.58E-06
				700	279.3105	3.89E-03	6.57E-06	5.70E-06
				800	312.60974	4.56E-03	6.73E-06	5.83E-06
				900	346.1387	5.24E-03	6.86E-06	5.95E-06
				1000	379.85357	5.92E-03	6.95E-06	6.03E-06
				100	77.87792	4.28E-04	4.92E-06	4.85E-06
				200	111.1848	9.29E-04	5.31E-06	4.94E-06
				300	143.6777	1.47E-03	5.64E-06	5.11E-06
				400	176.25175	2.06E-03	5.93E-06	5.32E-06
BW10 02		wds	5/27/2010 16:54	500	208.9601	2.67E-03	6.18E-06	5.48E-06
				600	241.89751	3.30E-03	6.38E-06	5.62E-06
				700	275.06126	3.94E-03	6.53E-06	5.74E-06
				800	308.45501	4.59E-03	6.64E-06	5.84E-06
				900	342.02729	5.26E-03	6.70E-06	5.93E-06
				1000	375.73316	5.95E-03	6.72E-06	6.03E-06
				100	78.4752	4.20E-04	4.93E-06	5.12E-06
				200	111.86964	9.34E-04	5.35E-06	5.13E-06
				300	144.3817	1.47E-03	5.72E-06	5.21E-06
				400	176.95229	2.07E-03	6.02E-06	5.41E-06
				500	209.75233	2.69E-03	6.27E-06	5.58E-06
				600	242.76745	3.32E-03	6.46E-06	5.71E-06
				700	275.97147	3.97E-03	6.60E-06	5.83E-06
				800	309.41179	4.64E-03	6.67E-06	5.94E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BW10 03		wds	1/19/2010 15:49	900	343.039	5.31E-03	6.69E-06	6.03E-06
				1000	376.81056	5.96E-03	6.65E-06	6.08E-06
				100	81.04598	3.98E-04	4.81E-06	4.87E-06
				200	115.0355	8.95E-04	5.18E-06	4.92E-06
				300	147.84415	1.42E-03	5.51E-06	5.04E-06
				400	180.48041	1.99E-03	5.80E-06	5.23E-06
				500	213.20126	2.59E-03	6.05E-06	5.37E-06
				600	246.09803	3.20E-03	6.26E-06	5.51E-06
				700	279.16899	3.84E-03	6.42E-06	5.63E-06
				800	312.48789	4.49E-03	6.54E-06	5.74E-06
BW10 01		wds	1/19/2010 7:35	900	346.00181	5.15E-03	6.62E-06	5.84E-06
				1000	379.69471	5.80E-03	6.66E-06	5.91E-06
				100	81.14504	4.01E-04	4.68E-06	4.76E-06
				200	115.12324	8.83E-04	5.09E-06	4.81E-06
				300	147.85126	1.40E-03	5.45E-06	4.94E-06
				400	180.48869	1.97E-03	5.77E-06	5.14E-06
				500	213.19295	2.56E-03	6.03E-06	5.30E-06
				600	246.07278	3.18E-03	6.25E-06	5.45E-06
				700	279.14812	3.81E-03	6.43E-06	5.57E-06
				800	312.46792	4.46E-03	6.55E-06	5.69E-06
BW1 03		wds	1/19/2010 7:31	900	345.95458	5.12E-03	6.63E-06	5.80E-06
				1000	379.66885	5.78E-03	6.66E-06	5.88E-06
				100	77.53063	4.38E-04	4.96E-06	5.02E-06
				200	110.75169	9.42E-04	5.31E-06	5.04E-06
				300	143.28811	1.48E-03	5.62E-06	5.17E-06
				400	175.92965	2.07E-03	5.90E-06	5.35E-06
				500	208.81327	2.67E-03	6.14E-06	5.50E-06
				600	241.93758	3.30E-03	6.35E-06	5.62E-06
				700	275.2726	3.94E-03	6.53E-06	5.74E-06
				800	308.79184	4.59E-03	6.67E-06	5.85E-06
BW12 01		wds	1/20/2010 16:07	900	342.44701	5.27E-03	6.78E-06	5.95E-06
				1000	376.24081	5.96E-03	6.86E-06	6.05E-06
				100	81.46279	3.96E-04	4.86E-06	4.82E-06
				200	115.45402	8.94E-04	5.21E-06	4.91E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BP3 01		wds	8/3/2010 8:10	300	148.24792	1.42E-03	5.53E-06	5.05E-06
				400	180.89769	2.00E-03	5.82E-06	5.24E-06
				500	213.60282	2.60E-03	6.06E-06	5.39E-06
				600	246.49913	3.21E-03	6.27E-06	5.52E-06
				700	279.57683	3.84E-03	6.45E-06	5.64E-06
				800	312.92543	4.50E-03	6.59E-06	5.76E-06
				900	346.42765	5.17E-03	6.69E-06	5.86E-06
				1000	380.12271	5.83E-03	6.76E-06	5.94E-06
				100	79.09605	3.79E-04	4.61E-06	4.65E-06
				200	112.53133	8.62E-04	5.10E-06	4.75E-06
BP3 02		wds	8/5/2010 20:36	300	145.06138	1.38E-03	5.51E-06	5.12E-06
				400	177.6549	1.95E-03	5.85E-06	5.31E-06
				500	210.45101	2.55E-03	6.11E-06	5.47E-06
				600	243.44644	3.18E-03	6.29E-06	5.60E-06
				700	276.65068	3.81E-03	6.39E-06	5.70E-06
				800	310.08174	4.46E-03	6.42E-06	5.77E-06
				900	343.68264	5.08E-03	6.37E-06	5.85E-06
				1000	377.42867	5.74E-03	6.24E-06	5.85E-06
				100	78.98462	3.66E-04	4.67E-06	4.58E-06
				200	112.40644	8.48E-04	5.08E-06	4.71E-06
300	144.98666	1.36E-03	5.43E-06	4.87E-06				
400	177.60898	1.93E-03	5.74E-06	5.09E-06				
500	210.41829	2.53E-03	5.99E-06	5.27E-06				
600	243.48801	3.14E-03	6.20E-06	5.41E-06				
700	276.71195	3.76E-03	6.36E-06	5.53E-06				
800	310.15313	4.40E-03	6.48E-06	5.64E-06				
900	343.74019	5.05E-03	6.54E-06	5.74E-06				
1000	377.54732	5.73E-03	6.56E-06	5.85E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
BP3 03		wds	8/6/2010 6:42	100	80.83438	3.90E-04	4.75E-06	4.59E-06
				200	115.00743	8.80E-04	5.18E-06	4.76E-06
				300	147.68281	1.41E-03	5.55E-06	4.96E-06
				400	180.12695	2.00E-03	5.87E-06	5.19E-06
				500	212.60938	2.60E-03	6.14E-06	5.36E-06
				600	245.2327	3.22E-03	6.36E-06	5.51E-06
				700	278.07591	3.86E-03	6.52E-06	5.64E-06
				800	311.20831	4.52E-03	6.62E-06	5.76E-06
				900	344.56204	5.19E-03	6.68E-06	5.87E-06
				1000	378.1133	5.85E-03	6.68E-06	5.95E-06
BP4 01		wds	8/11/2010 7:51	100	82.12725	3.92E-04	4.89E-06	4.55E-06
				200	115.89053	8.95E-04	5.29E-06	4.82E-06
				300	148.33939	1.44E-03	5.64E-06	5.04E-06
				400	180.63741	2.03E-03	5.93E-06	5.27E-06
				500	213.06138	2.63E-03	6.16E-06	5.43E-06
				600	245.63634	3.26E-03	6.34E-06	5.57E-06
				700	278.45754	3.89E-03	6.47E-06	5.68E-06
				800	311.57921	4.54E-03	6.54E-06	5.79E-06
				900	344.92852	5.21E-03	6.56E-06	5.89E-06
				1000	378.4996	5.85E-03	6.52E-06	5.94E-06

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BP4 02	25.357	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BP4 03	25.363	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BP5 01	25.355	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BP5 02	25.355	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BP6 02	25.357	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BP6 03	25.362	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW1 01	25.364	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BW1 02	25.362	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BP5 03	25.357	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BP6 01	25.355	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW11 01	25.371	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BW11 02	25.369	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW11 03	25.369	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW12 02	25.369	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BW12 03	25.367	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW13 01	25.369	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW13 02	25.368	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BW13 03	25.367	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW14 01	25.369	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW14 02	25.369	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW14 03	25.368	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BW15 01	25.366	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW15 02	25.368	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW15 03	25.368	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BW16 01	25.368	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW16 02	25.366	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW16 03	25.368	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW2 01	25.365	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BW2 02	25.364	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW2 03	25.363	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW3 01	25.365	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BW3 03	25.366	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW4 01	25.365	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW3 02	25.365	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BW5 01	25.368	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW5 02	25.369	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW5 03	25.367	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW4 03	25.366	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BW4 02	25.366	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW6 01	25.369	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW10 02	25.37	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BW10 03	25.37	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW10 01	25.368	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW1 03	25.364	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BW12 01	25.369	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BP3 01	25.361	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BP3 02	25.357	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM
BP3 03	25.358	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06
BP4 01	25.362	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06

Specimen Number	BP4 02	BP4 03	BP5 01	BP5 02	BP6 02	BP6 03
Measured By						
Measured Date	1/13/10 7:44 AM	7/15/10 7:42 AM	1/13/10 4:15 PM	5/28/10 7:51 AM	1/14/10 4:26 PM	7/15/10 7:44 AM
Initial Sample Length (L0, mm)	25.357	25.363	25.355	25.355	25.357	25.362
Linear Thermal Expansion						
Temperature °C						
100	4.05E-04	3.94E-04	4.03E-04	4.11E-04	4.03E-04	4.04E-04
200	8.87E-04	8.81E-04	8.95E-04	9.15E-04	8.92E-04	8.90E-04
300	1.40E-03	1.40E-03	1.42E-03	1.46E-03	1.41E-03	1.41E-03
400	1.97E-03	1.98E-03	2.00E-03	2.05E-03	1.98E-03	1.98E-03
500	2.56E-03	2.58E-03	2.59E-03	2.65E-03	2.57E-03	2.57E-03
600	3.15E-03	3.20E-03	3.20E-03	3.27E-03	3.18E-03	3.18E-03
700	3.77E-03	3.84E-03	3.83E-03	3.90E-03	3.80E-03	3.81E-03
800	4.41E-03	4.50E-03	4.47E-03	4.54E-03	4.44E-03	4.45E-03
900	5.06E-03	5.16E-03	5.13E-03	5.20E-03	5.09E-03	5.11E-03
1000	5.74E-03	5.84E-03	5.81E-03	5.84E-03	5.77E-03	5.79E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	4.74E-06	4.71E-06	4.86E-06	4.95E-06	4.82E-06	4.75E-06
200	5.08E-06	5.13E-06	5.19E-06	5.32E-06	5.15E-06	5.12E-06
300	5.39E-06	5.51E-06	5.50E-06	5.64E-06	5.45E-06	5.44E-06
400	5.67E-06	5.83E-06	5.77E-06	5.91E-06	5.72E-06	5.74E-06
500	5.92E-06	6.10E-06	6.01E-06	6.13E-06	5.96E-06	5.99E-06
600	6.13E-06	6.33E-06	6.22E-06	6.29E-06	6.17E-06	6.21E-06
700	6.32E-06	6.50E-06	6.39E-06	6.41E-06	6.35E-06	6.39E-06
800	6.48E-06	6.63E-06	6.53E-06	6.47E-06	6.49E-06	6.53E-06
900	6.60E-06	6.70E-06	6.64E-06	6.49E-06	6.61E-06	6.64E-06
1000	6.69E-06	6.73E-06	6.71E-06	6.45E-06	6.70E-06	6.71E-06
Mean CTE (1/K)						
Temperature °C						
100	4.76E-06	4.84E-06	4.86E-06	4.95E-06	4.82E-06	4.73E-06
200	4.79E-06	4.86E-06	4.91E-06	5.00E-06	4.89E-06	4.80E-06
300	4.93E-06	4.98E-06	5.05E-06	5.15E-06	5.01E-06	4.95E-06
400	5.11E-06	5.19E-06	5.23E-06	5.35E-06	5.19E-06	5.14E-06
500	5.26E-06	5.36E-06	5.37E-06	5.49E-06	5.33E-06	5.29E-06
600	5.39E-06	5.50E-06	5.50E-06	5.62E-06	5.46E-06	5.44E-06
700	5.51E-06	5.64E-06	5.61E-06	5.72E-06	5.57E-06	5.56E-06
800	5.62E-06	5.76E-06	5.72E-06	5.80E-06	5.67E-06	5.67E-06
900	5.72E-06	5.86E-06	5.82E-06	5.89E-06	5.78E-06	5.78E-06
1000	5.83E-06	5.95E-06	5.92E-06	5.94E-06	5.88E-06	5.88E-06

Specimen Number	BW1 01 wds 1/18/10 7:45 AM 25.364	BW1 02 wds 1/18/10 7:49 AM 25.362	BP5 03 wds 1/18/10 4:34 PM 25.357	BP6 01 wds 5/28/10 8:39 AM 25.355	BW11 01 wds 1/20/10 7:36 AM 25.371	BW11 02 wds 1/20/10 7:39 AM 25.369
Linear Thermal Expansion						
Temperature °C						
100	4.30E-04	3.91E-04	4.16E-04	3.87E-04	4.36E-04	4.10E-04
200	9.37E-04	8.87E-04	9.19E-04	9.00E-04	9.46E-04	9.11E-04
300	1.48E-03	1.42E-03	1.45E-03	1.45E-03	1.49E-03	1.44E-03
400	2.07E-03	2.00E-03	2.02E-03	2.04E-03	2.09E-03	2.02E-03
500	2.68E-03	2.59E-03	2.61E-03	2.64E-03	2.70E-03	2.62E-03
600	3.30E-03	3.21E-03	3.22E-03	3.25E-03	3.33E-03	3.24E-03
700	3.94E-03	3.84E-03	3.85E-03	3.88E-03	3.97E-03	3.88E-03
800	4.59E-03	4.49E-03	4.49E-03	4.53E-03	4.62E-03	4.54E-03
900	5.26E-03	5.15E-03	5.15E-03	5.19E-03	5.29E-03	5.20E-03
1000	5.96E-03	5.78E-03	5.84E-03	5.83E-03	5.97E-03	5.86E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	5.04E-06	4.77E-06	4.96E-06	5.01E-06	5.04E-06	4.83E-06
200	5.36E-06	5.19E-06	5.25E-06	5.36E-06	5.39E-06	5.22E-06
300	5.65E-06	5.55E-06	5.52E-06	5.65E-06	5.69E-06	5.57E-06
400	5.91E-06	5.85E-06	5.77E-06	5.91E-06	5.96E-06	5.87E-06
500	6.14E-06	6.09E-06	5.99E-06	6.12E-06	6.19E-06	6.12E-06
600	6.33E-06	6.28E-06	6.20E-06	6.28E-06	6.37E-06	6.32E-06
700	6.50E-06	6.41E-06	6.38E-06	6.40E-06	6.52E-06	6.48E-06
800	6.64E-06	6.49E-06	6.54E-06	6.47E-06	6.63E-06	6.59E-06
900	6.74E-06	6.50E-06	6.67E-06	6.50E-06	6.69E-06	6.65E-06
1000	6.82E-06	6.46E-06	6.79E-06	6.49E-06	6.72E-06	6.66E-06
Mean CTE (1/K)						
Temperature °C						
100	5.00E-06	4.70E-06	5.02E-06	4.73E-06	5.05E-06	4.89E-06
200	5.04E-06	4.82E-06	5.05E-06	4.95E-06	5.08E-06	4.95E-06
300	5.19E-06	4.99E-06	5.14E-06	5.15E-06	5.22E-06	5.08E-06
400	5.38E-06	5.20E-06	5.30E-06	5.34E-06	5.42E-06	5.26E-06
500	5.52E-06	5.36E-06	5.42E-06	5.48E-06	5.56E-06	5.41E-06
600	5.65E-06	5.50E-06	5.54E-06	5.60E-06	5.68E-06	5.56E-06
700	5.75E-06	5.62E-06	5.65E-06	5.70E-06	5.79E-06	5.68E-06
800	5.84E-06	5.73E-06	5.75E-06	5.80E-06	5.88E-06	5.79E-06
900	5.95E-06	5.83E-06	5.84E-06	5.88E-06	5.98E-06	5.89E-06
1000	6.05E-06	5.88E-06	5.94E-06	5.94E-06	6.06E-06	5.96E-06

Specimen Number	BW11 03	BW12 02	BW12 03	BW13 01	BW13 02	BW13 03
Measured By						
Measured Date	1/20/10 4:46 PM	1/21/10 7:45 AM	1/21/10 7:46 AM	1/21/10 4:30 PM	5/27/10 8:11 AM	1/22/10 7:40 AM
Initial Sample Length (L0, mm)	25.369	25.369	25.367	25.369	25.368	25.367
Linear Thermal Expansion						
Temperature °C						
100	4.01E-04	4.12E-04	4.03E-04	4.17E-04	4.17E-04	4.15E-04
200	8.88E-04	9.08E-04	8.88E-04	9.26E-04	9.35E-04	9.05E-04
300	1.42E-03	1.45E-03	1.40E-03	1.47E-03	1.48E-03	1.43E-03
400	2.00E-03	2.04E-03	1.97E-03	2.06E-03	2.07E-03	2.00E-03
500	2.60E-03	2.66E-03	2.54E-03	2.67E-03	2.68E-03	2.59E-03
600	3.22E-03	3.28E-03	3.14E-03	3.30E-03	3.30E-03	3.21E-03
700	3.86E-03	3.93E-03	3.77E-03	3.95E-03	3.95E-03	3.84E-03
800	4.50E-03	4.58E-03	4.42E-03	4.61E-03	4.61E-03	4.49E-03
900	5.17E-03	5.26E-03	5.07E-03	5.29E-03	5.29E-03	5.16E-03
1000	5.85E-03	5.95E-03	5.72E-03	5.99E-03	5.96E-03	5.85E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	4.80E-06	4.89E-06	4.71E-06	5.02E-06	5.05E-06	4.81E-06
200	5.19E-06	5.29E-06	5.06E-06	5.36E-06	5.38E-06	5.16E-06
300	5.54E-06	5.65E-06	5.38E-06	5.67E-06	5.68E-06	5.48E-06
400	5.84E-06	5.95E-06	5.67E-06	5.95E-06	5.94E-06	5.76E-06
500	6.10E-06	6.20E-06	5.92E-06	6.19E-06	6.17E-06	6.02E-06
600	6.31E-06	6.41E-06	6.15E-06	6.40E-06	6.37E-06	6.25E-06
700	6.47E-06	6.57E-06	6.33E-06	6.58E-06	6.54E-06	6.45E-06
800	6.59E-06	6.67E-06	6.49E-06	6.73E-06	6.67E-06	6.61E-06
900	6.66E-06	6.73E-06	6.62E-06	6.84E-06	6.77E-06	6.75E-06
1000	6.69E-06	6.74E-06	6.71E-06	6.93E-06	6.84E-06	6.86E-06
Mean CTE (1/K)						
Temperature °C						
100	4.79E-06	4.88E-06	4.76E-06	5.04E-06	4.96E-06	4.86E-06
200	4.85E-06	4.94E-06	4.81E-06	5.08E-06	5.09E-06	4.89E-06
300	5.01E-06	5.11E-06	4.94E-06	5.21E-06	5.21E-06	5.02E-06
400	5.22E-06	5.33E-06	5.12E-06	5.40E-06	5.40E-06	5.21E-06
500	5.39E-06	5.49E-06	5.25E-06	5.55E-06	5.54E-06	5.35E-06
600	5.53E-06	5.63E-06	5.38E-06	5.67E-06	5.66E-06	5.48E-06
700	5.65E-06	5.75E-06	5.51E-06	5.79E-06	5.77E-06	5.61E-06
800	5.75E-06	5.85E-06	5.63E-06	5.89E-06	5.88E-06	5.72E-06
900	5.85E-06	5.95E-06	5.74E-06	6.00E-06	5.98E-06	5.83E-06
1000	5.96E-06	6.05E-06	5.81E-06	6.11E-06	6.06E-06	5.95E-06

Specimen Number	BW14 01	BW14 02	BW14 03	BW15 01	BW15 02	BW15 03
Measured By						
Measured Date	1/22/10 7:43 AM	1/22/10 4:18 PM	1/22/10 4:02 PM	1/25/10 7:32 AM	1/25/10 7:36 AM	1/25/10 4:17 PM
Initial Sample Length (L0, mm)	25.369	25.369	25.368	25.366	25.368	25.368
Linear Thermal Expansion						
Temperature °C						
100	4.11E-04	4.13E-04	3.89E-04	4.30E-04	3.94E-04	4.02E-04
200	9.18E-04	9.19E-04	8.83E-04	9.25E-04	8.76E-04	9.03E-04
300	1.46E-03	1.46E-03	1.41E-03	1.47E-03	1.40E-03	1.45E-03
400	2.04E-03	2.04E-03	1.99E-03	2.05E-03	1.98E-03	2.04E-03
500	2.65E-03	2.65E-03	2.60E-03	2.67E-03	2.58E-03	2.65E-03
600	3.27E-03	3.27E-03	3.22E-03	3.29E-03	3.20E-03	3.27E-03
700	3.91E-03	3.91E-03	3.85E-03	3.93E-03	3.84E-03	3.91E-03
800	4.57E-03	4.56E-03	4.51E-03	4.59E-03	4.49E-03	4.55E-03
900	5.24E-03	5.23E-03	5.18E-03	5.26E-03	5.15E-03	5.21E-03
1000	5.91E-03	5.92E-03	5.84E-03	5.96E-03	5.81E-03	5.90E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	4.94E-06	4.97E-06	4.80E-06	4.91E-06	4.67E-06	4.95E-06
200	5.31E-06	5.31E-06	5.20E-06	5.29E-06	5.12E-06	5.32E-06
300	5.63E-06	5.62E-06	5.55E-06	5.62E-06	5.51E-06	5.65E-06
400	5.91E-06	5.89E-06	5.86E-06	5.91E-06	5.84E-06	5.92E-06
500	6.15E-06	6.12E-06	6.12E-06	6.17E-06	6.12E-06	6.15E-06
600	6.35E-06	6.32E-06	6.33E-06	6.38E-06	6.33E-06	6.34E-06
700	6.51E-06	6.49E-06	6.49E-06	6.55E-06	6.48E-06	6.47E-06
800	6.62E-06	6.63E-06	6.61E-06	6.69E-06	6.57E-06	6.56E-06
900	6.69E-06	6.73E-06	6.68E-06	6.78E-06	6.61E-06	6.60E-06
1000	6.73E-06	6.80E-06	6.70E-06	6.83E-06	6.58E-06	6.60E-06
Mean CTE (1/K)						
Temperature °C						
100	4.89E-06	5.01E-06	4.73E-06	4.85E-06	4.70E-06	4.89E-06
200	5.00E-06	5.04E-06	4.85E-06	4.93E-06	4.77E-06	4.95E-06
300	5.14E-06	5.17E-06	5.00E-06	5.10E-06	4.93E-06	5.12E-06
400	5.33E-06	5.35E-06	5.22E-06	5.31E-06	5.16E-06	5.33E-06
500	5.48E-06	5.49E-06	5.39E-06	5.47E-06	5.33E-06	5.50E-06
600	5.61E-06	5.61E-06	5.53E-06	5.60E-06	5.49E-06	5.62E-06
700	5.73E-06	5.73E-06	5.65E-06	5.72E-06	5.62E-06	5.73E-06
800	5.84E-06	5.83E-06	5.77E-06	5.84E-06	5.73E-06	5.82E-06
900	5.94E-06	5.93E-06	5.87E-06	5.94E-06	5.84E-06	5.91E-06
1000	6.01E-06	6.02E-06	5.95E-06	6.05E-06	5.91E-06	6.00E-06

Specimen Number	BW16 01	BW16 02	BW16 03	BW2 01	BW2 02	BW2 03
Measured By	1/25/10 3:47 PM	1/26/10 7:37 AM	1/26/10 7:40 AM	1/26/10 4:02 PM	1/26/10 3:52 PM	1/27/10 7:39 AM
Measured Date	25.368	25.366	25.368	25.365	25.364	25.363
Initial Sample Length (L0, mm)						
Linear Thermal Expansion						
Temperature °C						
100	3.93E-04	4.38E-04	4.10E-04	4.13E-04	3.94E-04	4.32E-04
200	8.95E-04	9.45E-04	9.13E-04	9.22E-04	8.93E-04	9.38E-04
300	1.44E-03	1.49E-03	1.45E-03	1.47E-03	1.42E-03	1.48E-03
400	2.04E-03	2.07E-03	2.03E-03	2.06E-03	2.00E-03	2.07E-03
500	2.65E-03	2.68E-03	2.63E-03	2.67E-03	2.60E-03	2.68E-03
600	3.27E-03	3.30E-03	3.26E-03	3.30E-03	3.23E-03	3.30E-03
700	3.90E-03	3.94E-03	3.90E-03	3.94E-03	3.86E-03	3.95E-03
800	4.56E-03	4.60E-03	4.56E-03	4.58E-03	4.52E-03	4.60E-03
900	5.23E-03	5.27E-03	5.23E-03	5.25E-03	5.18E-03	5.28E-03
1000	5.88E-03	5.97E-03	5.89E-03	5.94E-03	5.84E-03	5.97E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	4.93E-06	5.00E-06	4.88E-06	5.04E-06	4.82E-06	4.98E-06
200	5.32E-06	5.33E-06	5.26E-06	5.38E-06	5.22E-06	5.33E-06
300	5.66E-06	5.63E-06	5.60E-06	5.68E-06	5.57E-06	5.64E-06
400	5.95E-06	5.90E-06	5.89E-06	5.94E-06	5.87E-06	5.92E-06
500	6.18E-06	6.14E-06	6.14E-06	6.17E-06	6.12E-06	6.16E-06
600	6.36E-06	6.35E-06	6.35E-06	6.35E-06	6.32E-06	6.37E-06
700	6.49E-06	6.52E-06	6.51E-06	6.49E-06	6.48E-06	6.54E-06
800	6.57E-06	6.67E-06	6.62E-06	6.60E-06	6.58E-06	6.68E-06
900	6.59E-06	6.78E-06	6.69E-06	6.66E-06	6.64E-06	6.78E-06
1000	6.56E-06	6.86E-06	6.72E-06	6.68E-06	6.64E-06	6.85E-06
Mean CTE (1/K)						
Temperature °C						
100	4.76E-06	5.02E-06	4.89E-06	5.02E-06	4.82E-06	5.04E-06
200	4.90E-06	5.05E-06	4.97E-06	5.06E-06	4.91E-06	5.06E-06
300	5.10E-06	5.18E-06	5.10E-06	5.21E-06	5.05E-06	5.19E-06
400	5.33E-06	5.37E-06	5.30E-06	5.40E-06	5.25E-06	5.37E-06
500	5.49E-06	5.51E-06	5.45E-06	5.55E-06	5.41E-06	5.52E-06
600	5.61E-06	5.64E-06	5.58E-06	5.67E-06	5.55E-06	5.65E-06
700	5.72E-06	5.75E-06	5.70E-06	5.77E-06	5.67E-06	5.76E-06
800	5.83E-06	5.85E-06	5.82E-06	5.86E-06	5.78E-06	5.87E-06
900	5.93E-06	5.95E-06	5.92E-06	5.95E-06	5.88E-06	5.96E-06
1000	5.98E-06	6.06E-06	5.99E-06	6.05E-06	5.95E-06	6.06E-06

Specimen Number	BW3 01	BW3 03	BW4 01	BW3 02	BW5 01	BW5 02	BW5 03
Measured By							
Measured Date	1/27/10 1:52 PM	6/1/10 6:17 PM	2/2/10 4:52 PM	2/2/10 8:14 AM	2/3/10 7:46 AM	2/3/10 4:25 PM	2/3/10 4:08 PM
Initial Sample Length (L0, mm)	25.365	25.366	25.365	25.365	25.368	25.369	25.367
Linear Thermal Expansion							
Temperature °C							
100	3.93E-04	3.81E-04	4.04E-04	4.18E-04	4.02E-04	4.03E-04	3.86E-04
200	8.94E-04	8.84E-04	9.07E-04	9.22E-04	9.00E-04	9.03E-04	8.75E-04
300	1.43E-03	1.44E-03	1.45E-03	1.47E-03	1.44E-03	1.44E-03	1.39E-03
400	2.02E-03	2.04E-03	2.05E-03	2.06E-03	2.02E-03	2.03E-03	1.96E-03
500	2.63E-03	2.65E-03	2.66E-03	2.67E-03	2.63E-03	2.63E-03	2.56E-03
600	3.26E-03	3.27E-03	3.29E-03	3.29E-03	3.26E-03	3.26E-03	3.17E-03
700	3.90E-03	3.90E-03	3.92E-03	3.94E-03	3.90E-03	3.89E-03	3.81E-03
800	4.56E-03	4.57E-03	4.58E-03	4.60E-03	4.56E-03	4.54E-03	4.46E-03
900	5.23E-03	5.24E-03	5.25E-03	5.28E-03	5.24E-03	5.21E-03	5.12E-03
1000	5.88E-03	5.88E-03	5.93E-03	5.98E-03	5.90E-03	5.87E-03	5.77E-03
Instantaneous CTE (1/K)							
Temperature °C							
100	4.84E-06	4.98E-06	4.97E-06	4.96E-06	4.84E-06	4.90E-06	4.68E-06
200	5.27E-06	5.36E-06	5.34E-06	5.32E-06	5.25E-06	5.28E-06	5.10E-06
300	5.64E-06	5.69E-06	5.67E-06	5.65E-06	5.61E-06	5.62E-06	5.47E-06
400	5.95E-06	5.97E-06	5.95E-06	5.94E-06	5.92E-06	5.90E-06	5.79E-06
500	6.21E-06	6.20E-06	6.19E-06	6.19E-06	6.18E-06	6.14E-06	6.06E-06
600	6.40E-06	6.38E-06	6.38E-06	6.40E-06	6.39E-06	6.33E-06	6.27E-06
700	6.53E-06	6.51E-06	6.52E-06	6.58E-06	6.54E-06	6.48E-06	6.44E-06
800	6.60E-06	6.59E-06	6.62E-06	6.71E-06	6.65E-06	6.58E-06	6.55E-06
900	6.62E-06	6.62E-06	6.68E-06	6.80E-06	6.70E-06	6.63E-06	6.60E-06
1000	6.57E-06	6.61E-06	6.69E-06	6.86E-06	6.70E-06	6.64E-06	6.61E-06
Mean CTE (1/K)							
Temperature °C							
100	4.77E-06	4.83E-06	4.89E-06	5.00E-06	4.77E-06	4.89E-06	4.70E-06
200	4.91E-06	4.96E-06	4.97E-06	5.02E-06	4.89E-06	4.95E-06	4.81E-06
300	5.08E-06	5.11E-06	5.15E-06	5.17E-06	5.06E-06	5.11E-06	4.93E-06
400	5.29E-06	5.34E-06	5.35E-06	5.36E-06	5.27E-06	5.31E-06	5.14E-06
500	5.45E-06	5.49E-06	5.51E-06	5.52E-06	5.44E-06	5.46E-06	5.31E-06
600	5.60E-06	5.62E-06	5.65E-06	5.65E-06	5.58E-06	5.60E-06	5.46E-06
700	5.72E-06	5.73E-06	5.75E-06	5.77E-06	5.71E-06	5.71E-06	5.58E-06
800	5.83E-06	5.84E-06	5.85E-06	5.88E-06	5.82E-06	5.81E-06	5.71E-06
900	5.93E-06	5.94E-06	5.95E-06	5.98E-06	5.93E-06	5.91E-06	5.81E-06
1000	5.99E-06	5.99E-06	6.04E-06	6.08E-06	6.00E-06	5.98E-06	5.87E-06

Specimen Number	BW4 03	BW4 02	BW6 01	BW10 02	BW10 03	BW10 01
Measured By	wds	wds	wds	wds	wds	wds
Measured Date	2/3/10 7:42 AM	2/2/10 4:34 PM	2/4/10 7:49 AM	5/27/10 4:54 PM	1/19/10 3:49 PM	1/19/10 7:35 AM
Initial Sample Length (L0, mm)	25.366	25.366	25.369	25.37	25.37	25.368
Linear Thermal Expansion						
Temperature °C						
100	4.14E-04	3.92E-04	4.28E-04	4.20E-04	3.98E-04	4.01E-04
200	9.17E-04	8.98E-04	9.29E-04	9.34E-04	8.95E-04	8.83E-04
300	1.46E-03	1.43E-03	1.47E-03	1.47E-03	1.42E-03	1.40E-03
400	2.05E-03	2.02E-03	2.06E-03	2.07E-03	1.99E-03	1.97E-03
500	2.65E-03	2.62E-03	2.67E-03	2.69E-03	2.59E-03	2.56E-03
600	3.28E-03	3.25E-03	3.30E-03	3.32E-03	3.20E-03	3.18E-03
700	3.92E-03	3.89E-03	3.94E-03	3.97E-03	3.84E-03	3.81E-03
800	4.58E-03	4.56E-03	4.59E-03	4.64E-03	4.49E-03	4.46E-03
900	5.24E-03	5.24E-03	5.26E-03	5.31E-03	5.15E-03	5.12E-03
1000	5.93E-03	5.92E-03	5.95E-03	5.96E-03	5.80E-03	5.78E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	4.94E-06	4.91E-06	4.92E-06	4.93E-06	4.81E-06	4.68E-06
200	5.31E-06	5.27E-06	5.31E-06	5.35E-06	5.18E-06	5.09E-06
300	5.64E-06	5.60E-06	5.64E-06	5.72E-06	5.51E-06	5.45E-06
400	5.92E-06	5.89E-06	5.93E-06	6.02E-06	5.80E-06	5.77E-06
500	6.16E-06	6.15E-06	6.18E-06	6.27E-06	6.05E-06	6.03E-06
600	6.36E-06	6.38E-06	6.38E-06	6.46E-06	6.26E-06	6.25E-06
700	6.52E-06	6.57E-06	6.53E-06	6.60E-06	6.42E-06	6.43E-06
800	6.64E-06	6.73E-06	6.64E-06	6.67E-06	6.54E-06	6.55E-06
900	6.71E-06	6.86E-06	6.70E-06	6.69E-06	6.62E-06	6.63E-06
1000	6.74E-06	6.95E-06	6.72E-06	6.65E-06	6.66E-06	6.66E-06
Mean CTE (1/K)						
Temperature °C						
100	4.93E-06	4.77E-06	4.85E-06	5.12E-06	4.87E-06	4.76E-06
200	4.98E-06	4.93E-06	4.94E-06	5.13E-06	4.92E-06	4.81E-06
300	5.15E-06	5.08E-06	5.11E-06	5.21E-06	5.04E-06	4.94E-06
400	5.34E-06	5.29E-06	5.32E-06	5.41E-06	5.23E-06	5.14E-06
500	5.49E-06	5.44E-06	5.48E-06	5.58E-06	5.37E-06	5.30E-06
600	5.62E-06	5.58E-06	5.62E-06	5.71E-06	5.51E-06	5.45E-06
700	5.74E-06	5.70E-06	5.74E-06	5.83E-06	5.63E-06	5.57E-06
800	5.84E-06	5.83E-06	5.84E-06	5.94E-06	5.74E-06	5.69E-06
900	5.94E-06	5.95E-06	5.93E-06	6.03E-06	5.84E-06	5.80E-06
1000	6.03E-06	6.03E-06	6.03E-06	6.08E-06	5.91E-06	5.88E-06

Specimen Number	BW12 01	BP3 01	BP3 02	BP3 03	BP4 01
Measured By	wds	wds	wds	wds	wds
Measured Date	1/20/10 4:07 PM	8/3/10 8:10 AM	8/5/10 8:36 PM	8/6/10 6:42 AM	8/11/10 7:51 AM
Initial Sample Length (L0, mm)	25.369	25.361	25.357	25.358	25.362
Linear Thermal Expansion					
Temperature °C					
100	4.38E-04	3.79E-04	3.66E-04	3.90E-04	3.92E-04
200	9.42E-04	8.62E-04	8.48E-04	8.80E-04	8.95E-04
300	1.48E-03	1.38E-03	1.36E-03	1.41E-03	1.44E-03
400	2.07E-03	1.95E-03	1.93E-03	2.00E-03	2.03E-03
500	2.67E-03	2.55E-03	2.53E-03	2.60E-03	2.63E-03
600	3.30E-03	3.18E-03	3.14E-03	3.22E-03	3.26E-03
700	3.94E-03	3.81E-03	3.76E-03	3.86E-03	3.89E-03
800	4.59E-03	4.46E-03	4.40E-03	4.52E-03	4.54E-03
900	5.27E-03	5.08E-03	5.05E-03	5.19E-03	5.21E-03
1000	5.96E-03	5.74E-03	5.73E-03	5.85E-03	5.85E-03
Instantaneous CTE (1/K)					
Temperature °C					
100	4.96E-06	4.61E-06	4.67E-06	4.75E-06	4.89E-06
200	5.31E-06	5.10E-06	5.08E-06	5.18E-06	5.29E-06
300	5.62E-06	5.51E-06	5.43E-06	5.55E-06	5.64E-06
400	5.90E-06	5.85E-06	5.74E-06	5.87E-06	5.93E-06
500	6.14E-06	6.11E-06	5.99E-06	6.14E-06	6.16E-06
600	6.35E-06	6.29E-06	6.20E-06	6.36E-06	6.34E-06
700	6.53E-06	6.39E-06	6.36E-06	6.52E-06	6.47E-06
800	6.67E-06	6.42E-06	6.48E-06	6.62E-06	6.54E-06
900	6.78E-06	6.37E-06	6.54E-06	6.68E-06	6.56E-06
1000	6.86E-06	6.24E-06	6.56E-06	6.68E-06	6.52E-06
Mean CTE (1/K)					
Temperature °C					
100	5.02E-06	4.65E-06	4.58E-06	4.59E-06	4.55E-06
200	5.04E-06	4.75E-06	4.71E-06	4.76E-06	4.82E-06
300	5.17E-06	4.91E-06	4.87E-06	4.96E-06	5.04E-06
400	5.35E-06	5.12E-06	5.09E-06	5.19E-06	5.27E-06
500	5.50E-06	5.31E-06	5.27E-06	5.36E-06	5.43E-06
600	5.62E-06	5.47E-06	5.41E-06	5.51E-06	5.57E-06
700	5.74E-06	5.60E-06	5.53E-06	5.64E-06	5.68E-06
800	5.85E-06	5.70E-06	5.64E-06	5.76E-06	5.79E-06
900	5.95E-06	5.77E-06	5.74E-06	5.87E-06	5.89E-06
1000	6.05E-06	5.85E-06	5.85E-06	5.95E-06	5.94E-06

Specimen number	BW1 01	BW1 02	BW1 03	BP6 01
Specimen group standard deviation				
Environmental Conditions				
Temperature (°C)	24.4	24.4	21.6	24.4
Barometric Pressure (in of Hg)	25.2	25.2	25.3	25.2
Humidity (%)	17.1	17.3	15.1	17.5
Sampling Plan Layout				
Instrument				
ASTM				
# of Strikes		17		18
Comments:	2.58E+08			
	100% sampling Grindosonic MK5i C 747 - 93 Reapproved 2005 Using Equation 5 & 6 in ASTM C 1259 - 08 Specimen ID # BP6 02: Sample has a small hole in it			

Specimen number	BP6 02	BP6 03	BW11 01	BW11 02	BW10 01	BW10 02
Date and Time	4/19/2010 8:30	4/19/2010 8:35	4/19/2010 8:25	1/28/2010 13:48	2/1/2010 12:57	2/1/2010 13:00
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.9476	5.9522	5.9585	5.9432	5.9524	5.9521
length of specimen (mm)	25.35675	25.36225	25.37125	25.36900	25.36775	25.37000
diameter of specimen (mm)	12.72300	12.72488	12.72575	12.72525	12.73088	12.73150
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	31704 31702 31704 31705 31703 31715 31697 31713 31698 31700	31484 31520 31549 31518 31515 31497 31514 31511 31526 31512	30740 30719 30710 30720 30719 30738 30724 30721 30725 30709	30325 30304 30302 30289 30305 30294 30303 30299 30303 30310	30686 30708 30695 30711 30698 30676 30708 30697 30698 30675	31155 31125 31123 31135 31143 31116 31136 31141 31153 31134
average resonant frequency (Hz)	31704	31515	30723	30303	30695	31136
standard deviation (Hz)	6	17	10	10	13	13
correction factor for rod	2.113171845	2.113030111	2.112447149	2.112547801	2.113549198	2.113468437
modulus of elasticity (Pa)	1.26E+10	1.25E+10	1.19E+10	1.15E+10	1.18E+10	1.22E+10
T ₁ correction factor	2.287050919	2.286871977	2.286136008	2.286263074	2.287527347	2.287425381
calculation of individual terms	0.0309507	0.030942094	0.030906713	0.03091282	0.030973618	0.030968713
	0.325309977	0.325219526	0.324847643	0.324911834	0.325550862	0.3254993
resultant T ₁	2.276034969	2.275857558	2.275127888	2.275253867	2.276507319	2.276406226
modulus of elasticity (Pa)	2.113171845	2.113030111	2.112447149	2.112547801	2.113549198	2.113468437
Average modulus for specimen group	1.26E+10	1.25E+10	1.19E+10	1.15E+10	1.18E+10	1.22E+10

Specimen number	BP6 02	BP6 03	BW11 01	BW11 02	BW10 01	BW10 02
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	24.4	24.4	24.4	21.8	22.5	22.5
Barometric Pressure (in of Hg)	25.2	25.2	25.2	25.3	25.2	25.2
Humidity (%)	17.5	17.6	17.4	20.4	16.7	16.7
Sampling Plan Layout						
Instrument						
ASTM						
# of Strikes	11	44	14	144	20	16
Comments:						

Specimen number	BW10 03	BP4 02	BP5 01	BP4 03	BP5 02	BP5 03
Date and Time	2/1/2010 13:02	2/1/2010 13:08	2/1/2010 13:11	2/1/2010 13:14	2/1/2010 13:16	2/1/2010 13:19
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.9505	5.9450	5.9389	5.9440	5.9477	5.9474
length of specimen (mm)	25.37000	25.35725	25.35500	25.36275	25.35475	25.35700
diameter of specimen (mm)	12.73363	12.72275	12.72688	12.72463	12.72338	12.72338
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	31094 31078 31096 31089 31081 31102 31089 31094 31071 31080	31447 31440 31470 31467 31473 31486 31431 31443 31444 31454	31521 31511 31506 31493 31508 31514 31522 31504 31497 31492	31467 31467 31455 31474 31441 31469 31437 31443 31441 31433	31489 31491 31467 31488 31479 31461 31464 31459 31476 31448	31567 31580 31568 31585 31566 31582 31571 31568 31567 31563
average resonant frequency (Hz)	31087	31456	31507	31453	31472	31572
standard deviation (Hz)	10	18	11	15	15	8
correction factor for rod	2.113808848	2.113091582	2.113933684	2.112949872	2.113392778	2.113211837
modulus of elasticity (Pa)	1.21E+10	1.24E+10	1.24E+10	1.24E+10	1.24E+10	1.25E+10
T ₁ correction factor	2.287855182	2.286949586	2.288012803	2.286770676	2.287329857	2.28710141
calculation of individual terms	0.030989394	0.030945827	0.03099698	0.030937223	0.030964117	0.030953129
	0.325716669	0.325258754	0.325796403	0.325168326	0.325450999	0.325335501
resultant T ₁	2.276832348	2.275934503	2.27698862	2.275757125	2.276311519	2.276085028
modulus of elasticity (Pa)	2.113808848	2.113091582	2.113933684	2.112949872	2.113392778	2.113211837
Average modulus for specimen group	1.21E+10	1.24E+10	1.24E+10	1.24E+10	1.24E+10	1.25E+10

Specimen number	BW10 03	BP4 02	BP5 01	BP4 03	BP5 02	BP5 03
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	22.5	22.5	22.6	22.6	22.6	22.6
Barometric Pressure (in of Hg)	25.2	25.2	25.2	25.2	25.2	25.2
Humidity (%)	16.8	16.8	16.8	16.8	16.8	16.8
Sampling Plan Layout						
Instrument						
ASTM						
# of Strikes	14	39	12	20	14	21
Comments:						

Specimen number	BW12 01	BW12 02	BW12 03	BW13 01	BW13 02	BW13 03
Date and Time	2/1/2010 13:22	2/1/2010 13:24	2/1/2010 13:26	2/1/2010 13:28	2/1/2010 13:30	2/1/2010 13:32
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.9568	5.9434	5.9484	5.9466	5.9504	5.9451
length of specimen (mm)	25.36925	25.36950	25.36750	25.36900	25.36775	25.36675
diameter of specimen (mm)	12.72575	12.72875	12.72763	12.73063	12.73013	12.72888
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	30563 30558 30549 30557 30556 30560 30546 30559 30574 30554	30965 30964 30964 30964 30956 30949 30955 30969 30962 30964	31160 31154 31150 31177 31166 31161 31160 31179 31154 31147	30611 30604 30605 30607 30592 30604 30598 30603 30593 30595	31101 31094 31104 31120 31085 31105 31104 31094 31106 31099	31035 31041 31021 31042 31011 31009 31030 31035 31021 31006
average resonant frequency (Hz)	30558	30961	31161	30601	31101	31025
standard deviation (Hz)	8	6	11	6	9	13
correction factor for rod	2.112607787	2.113068148	2.113048682	2.11340866	2.113429048	2.113309192
modulus of elasticity (Pa)	1.18E+10	1.20E+10	1.22E+10	1.18E+10	1.21E+10	1.21E+10
T ₁ correction factor	2.286338802	2.286919999	2.286895423	2.287349909	2.28737565	2.287224325
calculation of individual terms	0.03091646 0.324950093 2.275328947	0.030944404 0.325243799 2.27590517	0.030943222 0.325231377 2.275880804	0.030965082 0.325461138 2.276331399	0.03096632 0.325474154 2.276356921	0.030959041 0.325397642 2.276206891
resultant T ₁	2.112607787	2.113068148	2.113048682	2.11340866	2.113429048	2.113309192
modulus of elasticity (Pa)	1.18E+10	1.20E+10	1.22E+10	1.18E+10	1.21E+10	1.21E+10
Average modulus for specimen group						

Specimen number	BW12 01	BW12 02	BW12 03	BW13 01	BW13 02	BW13 03
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	22.6	22.6	22.6	22.7	22.7	22.7
Barometric Pressure (in of Hg)	25.2	25.2	25.2	25.2	25.2	25.2
Humidity (%)	16.8	16.8	16.8	16.8	16.7	16.7
Sampling Plan Layout						
Instrument						
ASTM						
# of Strikes	12	11	14	13	14	13
Comments:						

Specimen number	BW14 01	BW14 02	BW14 03	BW15 01	BW15 02	BW15 03
Date and Time	2/1/2010 13:40	2/1/2010 13:43	2/1/2010 13:46	2/1/2010 13:49	2/1/2010 13:54	2/1/2010 13:56
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.9434	5.9591	5.9553	5.9487	5.9563	5.9442
length of specimen (mm)	25.36875	25.36950	25.36800	25.36625	25.36800	25.36825
diameter of specimen (mm)	12.73463	12.72913	12.73075	12.73150	12.73388	12.73200
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	30647 30646 30641 30666 30648 30646 30648 30639 30648 30645	31339 31324 31353 31330 31314 31351 31346 31358 31322 31311	31153 31136 31145 31127 31126 31115 31111 31126 31140 31120	30613 30603 30604 30611 30611 30592 30598 30607 30593 30615	31183 31210 31200 31177 31197 31173 31178 31189 31192 31181	31162 31138 31150 31137 31153 31133 31154 31148 31146 31139
average resonant frequency (Hz)	30647	31335	31130	30605	31188	31146
standard deviation (Hz)	7	17	13	8	12	9
correction factor for rod	2.114069589	2.113128209	2.113509073	2.113769943	2.114009741	2.113689227
modulus of elasticity (Pa)	1.18E+10	1.24E+10	1.22E+10	1.18E+10	1.22E+10	1.22E+10
T ₁ correction factor	2.288184403	2.286995828	2.287476687	2.28780606	2.288108835	2.287704147
calculation of individual terms	0.03100524	0.030948051	0.030971181	0.03098703	0.031001602	0.030982125
	0.325883219	0.325282129	0.325525244	0.325691822	0.325844987	0.325640276
resultant T ₁	2.277158751	2.275980349	2.276457093	2.276783647	2.27708383	2.276682606
modulus of elasticity (Pa)	2.114069589	2.113128209	2.113509073	2.113769943	2.114009741	2.113689227
Average modulus for specimen group	1.18E+10	1.24E+10	1.22E+10	1.18E+10	1.22E+10	1.22E+10

Specimen number	BW14 01	BW14 02	BW14 03	BW15 01	BW15 02	BW15 03
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	22.8	22.8	22.8	22.8	22.8	22.8
Barometric Pressure (in of Hg)	25.2	25.2	25.2	25.2	25.2	25.2
Humidity (%)	16.5	16.6	16.6	16.6	16.6	16.5
Sampling Plan Layout						
Instrument						
ASTM						
# of Strikes	21	24	22	20	45	14
Comments:						

Specimen number	BW16 01	BW16 02	BW16 03	BW2 01	BW2 02	BW2 03
Date and Time	2/1/2010 13:58	2/1/2010 14:00	2/1/2010 14:03	2/1/2010 14:55	2/1/2010 14:57	2/1/2010 15:01
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.9556	5.9611	5.9486	5.9429	5.9437	5.9418
length of specimen (mm)	25.36800	25.36575	25.36800	25.36500	25.36425	25.36350
diameter of specimen (mm)	12.73563	12.73538	12.73438	12.72675	12.72588	12.72900
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	30787 30772 30768 30763 30768 30778 30758 30762 30756 30754	31169 31187 31166 31163 31171 31151 31160 31150 31160 31150	31125 31134 31120 31111 31122 31121 31126 31115 31107 31110	30696 30706 30712 30693 30699 30710 30709 30700 30737 30700	31056 31031 31041 31044 31038 31018 31035 31019 31022 31027	31121 31129 31132 31109 31117 31124 31126 31115 31119 31122
average resonant frequency (Hz)	30767	31163	31119	30706	31033	31121
standard deviation (Hz)	10	11	8	13	12	7
correction factor for rod	2.114290156	2.11443112	2.114089856	2.113109446	2.113029558	2.113590517
modulus of elasticity (Pa)	1.19E+10	1.22E+10	1.21E+10	1.18E+10	1.21E+10	1.21E+10
T ₁ correction factor	2.288462906	2.288640902	2.288209993	2.286972139	2.286871279	2.287579516
calculation of individual terms	0.031018648 0.326024145 2.27743487	0.031027218 0.326114229 2.277611343	0.031006472 0.325896167 2.277184123	0.030946911 0.325270154 2.275956863	0.030942061 0.325219173 2.275856867	0.030976129 0.325577244 2.276559042
resultant T ₁	2.114290156	2.11443112	2.114089856	2.113109446	2.113029558	2.113590517
modulus of elasticity (Pa)	1.19E+10	1.22E+10	1.21E+10	1.18E+10	1.21E+10	1.21E+10
Average modulus for specimen group						

Specimen number	BW16 01	BW16 02	BW16 03	BW2 01	BW2 02	BW2 03
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	22.8	22.8	22.8	23	23.1	23.1
Barometric Pressure (in of Hg)	25.2	25.2	25.2	25.2	25.2	25.2
Humidity (%)	16.5	16.5	16.5	16.1	15.9	15.8
Sampling Plan Layout						
Instrument						
ASTM						
# of Strikes	13	16	21	20	13	21
Comments:						

Specimen number	BW3 01	BW3 02	BW3 03	BW4 01	BW4 02	BW4 03
Date and Time	2/1/2010 15:03	2/1/2010 15:07	2/1/2010 15:09	2/1/2010 15:16	2/1/2010 15:19	2/1/2010 15:24
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.9470	5.9423	5.9480	5.9422	5.94241	5.93859
length of specimen (mm)	25.36500	25.36525	25.36550	25.36500	25.36625	25.3665
diameter of specimen (mm)	12.72500	12.72813	12.72738	12.72625	12.729625	12.727625
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	30742 30750 30755 30746 30752 30749 30741 30740 30730 30732	30835 30846 30839 30851 30863 30847 30846 30873 30850 30864	30932 30939 30944 30955 30934 30929 30947 30933 30926 30932	30603 30601 30600 30595 30597 30597 30574 30570 30569 30575	30829 30819 30811 30814 30821 30809 30823 30819 30824 30808	30927 30904 30934 30914 30932 30956 30953 30927 30934 30901
average resonant frequency (Hz)	30744	30851	30937	30588	30818	30928
standard deviation (Hz)	8	12	9	14	7	18
correction factor for rod	2.112829123	2.113309623	2.113169378	2.113029351	2.113469538	2.11312905
modulus of elasticity (Pa)	1.19E+10	1.19E+10	1.20E+10	1.17E+10	1.19E+10	1.20E+10
T ₁ correction factor	2.286618232	2.287224869	2.287047805	2.286871018	2.287426771	2.286996889
calculation of individual terms	0.030929893	0.030959067	0.03095055	0.030942048	0.03096878	0.030948102
resultant T ₁	0.325091285	0.325397917	0.325308403	0.325219041	0.325500003	0.325282665
modulus of elasticity (Pa)	2.275605985	2.27620743	2.276031881	2.275856607	2.276407604	2.275981402
Average modulus for specimen group	2.112829123	2.113309623	2.113169378	2.113029351	2.113469538	2.11312905
modulus of elasticity (Pa)	1.19E+10	1.19E+10	1.20E+10	1.17E+10	1.19E+10	1.20E+10

Specimen number	BW3 01	BW3 02	BW3 03	BW4 01	BW4 02	BW4 03
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	23.1	23	23	22.9	23	23
Barometric Pressure (in of Hg)	25.2	25.2	25.2	25.2	25.2	25.2
Humidity (%)	15.8	15.9	15.9	15.9	15.9	15.8
Sampling Plan Layout						
Instrument						
ASTM						
# of Strikes	13	31	21	22	18	43
Comments:						

Specimen number	BW5 01	BW5 02	BW5 03	BW6 01	BW11 03	BP3 01
Date and Time	2/1/2010 15:30	2/1/2010 15:33	2/1/2010 15:35	2/1/2010 15:39	2/1/2010 15:42	7/23/2010 14:14
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.94539	5.95231	5.94287	5.95138	5.95231	5.92916
length of specimen (mm)	25.368	25.36925	25.36675	25.36875	25.36875	25.36075
diameter of specimen (mm)	12.72625	12.72775	12.7275	12.727625	12.7285	12.72225
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	30597 30596 30591 30593 30603 30605 30583 30581 30589 30602	30873 30881 30855 30873 30858 30874 30858 30867 30870 30874	31009 31021 31013 31000 31027 31021 31006 31025 31012 31009	30584 30586 30576 30563 30560 30570 30556 30557 30572 30552	31168 31175 31166 31167 31174 31165 31173 31171 31162 31179	31464 31424 31464 31465 31514 31454 31452 31430 31460 31456
average resonant frequency (Hz)	30594	30868	31014	30568	31170	31458
standard deviation (Hz)	8	9	9	12	5	
correction factor for rod	2.112788279	2.112928078	2.113088934	2.112948234	2.113088377	2.112730139
modulus of elasticity (Pa)	1.18E+10	1.20E+10	1.21E+10	1.17E+10	1.22E+10	1.24E+10
T ₁ correction factor	2.286566667	2.286743161	2.286946243	2.286768607	2.286945539	2.286493267
calculation of individual terms	0.030927414 0.325065228 2.275554862	0.0309359 0.32515442 2.275729844	0.030945666 0.325257064 2.275931188	0.030937124 0.325167281 2.275755073	0.030945632 0.325256709 2.275930491	0.030923885 0.325028138 2.27548209
resultant T ₁	2.112788279	2.112928078	2.113088934	2.112948234	2.113088377	2.112730139
modulus of elasticity (Pa)	1.18E+10	1.20E+10	1.21E+10	1.17E+10	1.22E+10	1.24E+10
Average modulus for specimen group						

Specimen number	BW5 01	BW5 02	BW5 03	BW6 01	BW11 03	BP3 01
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	22.9	22.9	22.9	22.9	22.8	21.6
Barometric Pressure (in of Hg)	25.2	25.2	25.2	25.2	25.2	25.3
Humidity (%)	15.9	15.8	15.8	15.8	15.8	39.7
Sampling Plan Layout						
Instrument						
ASTM						
# of Strikes	54	24	14	25	13	57
Comments:						

Specimen number	BP3 02	BP3 03	BP4 01
Date and Time	7/23/2010 14:17	7/23/2010 14:20	7/23/2010 14:22
Operator	41169	41169	41169
Sample location			
mass of specimen (g)	5.93421	5.94214	5.93294
length of specimen (mm)	25.35675	25.3585	25.36175
diameter of specimen (mm)	12.721125	12.725125	12.7265
Poisson's ratio	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	31241 31273 31223 31225 31232 31267 31266 31274 31262 31263	31379 31343 31328 31329 31326 31366 31385 31328 31380 31378	31430 31408 31412 31410 31430 31418 31418 31436 31426 31428
average resonant frequency (Hz)			
standard deviation (Hz)	2.112871395	2.113371657	2.113330657
correction factor for rod			
modulus of elasticity (Pa)	1.22E+10	1.23E+10	1.24E+10
T _r correction factor	2.2866716	2.28730319	2.287251426
calculation of individual terms	0.030932459 0.325118255 2.275658896	0.030962834 0.325437516 2.27628508	0.030960344 0.325411344 2.27623376
resultant T _r	2.112871395	2.113371657	2.113330657
modulus of elasticity (Pa)	1.22E+10	1.23E+10	1.24E+10
Average modulus for specimen group			

Specimen number	BP3 02	BP3 03	BP4 01
Specimen group standard deviation			
Environmental Conditions			
Temperature (°C)	21.7	21.6	21.5
Barometric Pressure (in of Hg)	25.3	25.3	25.3
Humidity (%)	39.4	39.4	39.5
Sampling Plan Layout			
Instrument			
ASTM			
# of Strikes	35	24	15
Comments:			

Specimen ID Number	Operator S#	Test Date	Initial Specimen Mass (g)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Average Resonant Frequency (Hz)
BW1 01	41169	4/19/2010 8:21	5.95144	25.36375	12.73375	30658
BW1 02	41169	4/19/2010 8:23	5.95395	25.36175	12.732375	31131.6
BW1 03	41169	1/25/2010 14:23	5.94162	25.3645	12.725875	31040.4
BP6 01	41169	4/19/2010 8:27	5.92988	25.35525	12.7295	31329.2
BP6 02	41169	4/19/2010 8:30	5.94763	25.35675	12.723	31704.1
BP6 03	41169	4/19/2010 8:35	5.95222	25.36225	12.724875	31514.6
BW11 01	41169	4/19/2010 8:25	5.9585	25.37125	12.72575	30722.5
BW11 02	41169	1/28/2010 13:48	5.94322	25.369	12.72525	30303.4
BW10 01	41169	2/1/2010 12:57	5.95242	25.36775	12.730875	30695.2
BW10 02	41169	2/1/2010 13:00	5.95207	25.37	12.7315	31136.1
BW10 03	41169	2/1/2010 13:02	5.95051	25.37	12.733625	31087.4
BP4 02	41169	2/1/2010 13:08	5.94497	25.35725	12.72275	31455.5
BP5 01	41169	2/1/2010 13:11	5.93892	25.355	12.726875	31506.8
BP4 03	41169	2/1/2010 13:14	5.94398	25.36275	12.724625	31452.7
BP5 02	41169	2/1/2010 13:16	5.94774	25.35475	12.723375	31472.2
BP5 03	41169	2/1/2010 13:19	5.94743	25.357	12.723375	31571.7
BW12 01	41169	2/1/2010 13:22	5.95678	25.36925	12.72575	30557.6
BW12 02	41169	2/1/2010 13:24	5.94344	25.3695	12.72875	30961.2
BW12 03	41169	2/1/2010 13:26	5.94841	25.3675	12.727625	31160.8
BW13 01	41169	2/1/2010 13:28	5.9466	25.369	12.730625	30601.2
BW13 02	41169	2/1/2010 13:30	5.95041	25.36775	12.730125	31101.2
BW13 03	41169	2/1/2010 13:32	5.94513	25.36675	12.728875	31025.1
BW14 01	41169	2/1/2010 13:40	5.94341	25.36875	12.734625	30647.4
BW14 02	41169	2/1/2010 13:43	5.95908	25.3695	12.729125	31334.8
BW14 03	41169	2/1/2010 13:46	5.95527	25.368	12.73075	31129.9
BW15 01	41169	2/1/2010 13:49	5.94871	25.36625	12.7315	30604.7
BW15 02	41169	2/1/2010 13:54	5.95627	25.368	12.733875	31188
BW15 03	41169	2/1/2010 13:56	5.9442	25.36825	12.732	31146
BW16 01	41169	2/1/2010 13:58	5.95556	25.368	12.735625	30766.6
BW16 02	41169	2/1/2010 14:00	5.96106	25.36575	12.735375	31162.7
BW16 03	41169	2/1/2010 14:03	5.94857	25.368	12.734375	31119.1
BW2 01	41169	2/1/2010 14:55	5.94288	25.365	12.72675	30706.2
BW2 02	41169	2/1/2010 14:57	5.94368	25.36425	12.725875	31033.1
BW2 03	41169	2/1/2010 15:01	5.94176	25.3635	12.729	31121.4
BW3 01	41169	2/1/2010 15:03	5.94699	25.365	12.725	30743.7
BW3 02	41169	2/1/2010 15:07	5.94233	25.36525	12.728125	30851.4
BW3 03	41169	2/1/2010 15:09	5.94802	25.3655	12.727375	30937.1

Specimen ID Number	Operator S#	Test Date	Initial Specimen Mass (g)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Average Resonant Frequency (Hz)
BW4 01	41169	2/1/2010 15:16	5.94222	25.365	12.72625	30588.1
BW4 02	41169	2/1/2010 15:19	5.94241	25.36625	12.729625	30817.7
BW4 03	41169	2/1/2010 15:24	5.93859	25.3665	12.727625	30928.2
BW5 01	41169	2/1/2010 15:30	5.94539	25.368	12.72625	30594
BW5 02	41169	2/1/2010 15:33	5.95231	25.36925	12.72775	30868.3
BW5 03	41169	2/1/2010 15:35	5.94287	25.36675	12.7275	31014.3
BW6 01	41169	2/1/2010 15:39	5.95138	25.36875	12.727625	30567.6
BW11 03	41169	2/1/2010 15:42	5.95231	25.36875	12.7285	31170
BP3 01	41169	7/23/2010 14:14	5.92916	25.36075	12.72225	31458.3
BP3 02	41169	7/23/2010 14:17	5.93421	25.35675	12.721125	31252.6
BP3 03	41169	7/23/2010 14:20	5.94214	25.3585	12.725125	31354.2
BP4 01	41169	7/23/2010 14:22	5.93294	25.36175	12.7265	31421.6

Specimen ID Number	Flexural Dynamic Young's Modulus (GPa)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
BW1 01	11.7932	24.4	25.2	17.1	With Grain
BW1 02	12.1676	24.4	25.2	17.3	With Grain
BW1 03	12.0927	21.6	25.3	15.1	With Grain
BP6 01	12.2747	24.4	25.2	17.5	Against Grain
BP6 02	12.6289	24.4	25.2	17.5	Against Grain
BP6 03	12.4880	24.4	25.2	17.6	Against Grain
BW11 01	11.8867	24.4	25.2	17.4	With Grain
BW11 02	11.5343	21.8	25.3	20.4	With Grain
BW10 01	11.8357	22.5	25.2	16.7	With Grain
BW10 02	12.1778	22.5	25.2	16.7	With Grain
BW10 03	12.1304	22.5	25.2	16.8	With Grain
BP4 02	12.4273	22.5	25.2	16.8	Against Grain
BP5 01	12.4407	22.6	25.2	16.8	Against Grain
BP4 03	12.4230	22.6	25.2	16.8	Against Grain
BP5 02	12.4420	22.6	25.2	16.8	Against Grain
BP5 03	12.5224	22.6	25.2	16.8	Against Grain
BW12 01	11.7542	22.6	25.2	16.8	With Grain
BW12 02	12.0314	22.6	25.2	16.8	With Grain
BW12 03	12.1985	22.6	25.2	16.8	With Grain
BW13 01	11.7537	22.7	25.2	16.8	With Grain
BW13 02	12.1490	22.7	25.2	16.7	With Grain
BW13 03	12.0815	22.7	25.2	16.7	With Grain
BW14 01	11.7714	22.8	25.2	16.5	With Grain
BW14 02	12.3548	22.8	25.2	16.6	With Grain
BW14 03	12.1798	22.8	25.2	16.6	With Grain
BW15 01	11.7555	22.8	25.2	16.6	With Grain
BW15 02	12.2182	22.8	25.2	16.6	With Grain
BW15 03	12.1663	22.8	25.2	16.5	With Grain
BW16 01	11.8839	22.8	25.2	16.5	With Grain
BW16 02	12.2016	22.8	25.2	16.5	With Grain
BW16 03	12.1471	22.8	25.2	16.5	With Grain
BW2 01	11.8342	23	25.2	16.5	With Grain
BW2 02	12.0910	23.1	25.2	16.1	With Grain
BW2 03	12.1462	23.1	25.2	15.9	With Grain
BW3 01	11.8763	23.1	25.2	15.8	With Grain
BW3 02	11.9416	23	25.2	15.8	With Grain
BW3 03	12.0220	23	25.2	15.9	With Grain

Specimen ID Number	Flexural Dynamic Young's Modulus (GPa)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
BW4 01	11.7435	22.9	25.2	15.9	With Grain
BW4 02	11.9124	23	25.2	15.9	With Grain
BW4 03	11.9963	23	25.2	15.8	With Grain
BW5 01	11.7571	22.9	25.2	15.9	With Grain
BW5 02	11.9797	22.9	25.2	15.8	With Grain
BW5 03	12.0724	22.9	25.2	15.8	With Grain
BW6 01	11.7455	22.9	25.2	15.8	With Grain
BW11 03	12.2124	22.8	25.2	15.8	With Grain
BP3 01	12.4015	21.6	25.3	39.7	Against Grain
BP3 02	12.2496	21.7	25.3	39.4	Against Grain
BP3 03	12.3358	21.6	25.3	39.4	Against Grain
BP4 01	12.3689	21.5	25.3	39.5	Against Grain

Specimen Number	BW1 01	BW1 02	BW1 03	BW2 01	BW2 02
Date and Time	3/9/2010 15:20	3/9/2010 15:23	3/9/2010 15:25	3/11/2010 7:54	3/11/2010 7:57
Operator	41169	41169	41169	41169	41169
Sample Location					
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:					
Forward current:					
Voltage readings, mV	0.004348	0.004362	0.004111	0.003973	0.003747
	0.004437	0.004321	0.003987	0.004254	0.003825
	0.004018	0.003801	0.003955	0.003966	0.00391
	0.003955	0.003783	0.00405	0.003858	0.004025
Resistance readings, Ω	0.001087	0.001091	0.001028	0.000993	0.000937
	0.001109	0.00108	0.000997	0.001064	0.000956
	0.001004	0.00095	0.000989	0.000992	0.000978
	0.000989	0.000946	0.001012	0.000964	0.001006
Reverse current:					
Voltage readings, mV	-0.003397	-0.003391	-0.003517	-0.003656	-0.003875
	-0.003236	-0.003588	-0.003416	-0.00341	-0.003726
	-0.003647	-0.003548	-0.003619	-0.003802	-0.003839
	-0.003672	-0.003803	-0.003636	-0.00368	-0.003711
Resistance readings, Ω	0.000849	0.000848	0.000879	0.000914	0.000969
	0.000809	0.000897	0.000854	0.000852	0.000932
	0.000912	0.000887	0.000905	0.000951	0.00096
	0.000918	0.000951	0.000909	0.00092	0.000928
End-for-end orientation:					
Reverse current:					
Voltage readings, mV	0.004236	0.004363	0.003991	0.003939	0.003897
	0.004304	0.003972	0.00402	0.003971	0.004026
	0.004249	0.00408	0.004081	0.003999	0.003995
	0.004055	0.004489	0.004051	0.003858	0.003991

Specimen Number	BW1 01	BW1 02	BW1 03	BW2 01	BW2 02
Resistance readings, Ω	0.001059 0.001076 0.001062 0.001014	0.001091 0.000993 0.00102 0.001122	0.000998 0.001005 0.00102 0.001013	0.000985 0.000993 0.001 0.000965	0.000974 0.001007 0.000999 0.000998
Forward current:					
Voltage readings, mV	-0.003455 -0.003463 -0.003476 -0.003634	-0.003302 -0.00352 -0.003306 -0.003237	-0.003635 -0.00354 -0.003498 -0.003613	-0.00363 -0.003585 -0.003708 -0.003839	-0.003367 -0.003656 -0.003818 -0.003746
Resistance readings, Ω	0.000864 0.000866 0.000869 0.000908	0.000826 0.00088 0.000827 0.000809	0.000909 0.000885 0.000874 0.000903	0.000907 0.000896 0.000927 0.00096	0.000842 0.000914 0.000954 0.000937
Average voltage, mV	0.003849	0.003804	0.003795	0.003821	0.003822
Average resistance, $R=V/I$ ($m\Omega$)	0.962188	0.951125	0.948750	0.955188	0.955688
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.3510	127.3235	127.1936	127.2111	127.1936
Resistivity, $p=(R^*A)/L$ ($\mu\Omega m$)	9.65	9.54	9.50	9.57	9.57
Environmental Conditions					
Temperature (Deg C)	23.100	23.100	23.200	22.100	22.100
Barometric Pressure (in Hg)	25.000	25.000	25.000	25.300	25.300
Humidity (%)	16.900	17.000	16.900	13.300	13.400

Specimen Number	BW1 01	BW1 02	BW1 03	BW2 01	BW2 02
Other Test Information					
Specimen Orientation	horizontal				
Method of Measuring Resistance	voltmeter				
Probe Location	location				
Instruments	Keithley Model 2182 Nanovoltmeter				
ASTM	Keithley Model 6220 DC Current Source				
Comments:	C 611 - 98 Reapproved 2005				

Specimen Number	BW2 03	BW3 01	BW3 02	BW3 03	BW4 01	BW4 02
Date and Time	3/11/2010 8:09	3/11/2010 8:14	3/11/2010 8:16	3/11/2010 8:19	3/11/2010 8:24	3/11/2010 8:27
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003964 0.003954 0.00406 0.003958	0.00396 0.003885 0.004019 0.003959	0.00419 0.004131 0.003603 0.003842	0.004062 0.004133 0.003925 0.003454	0.004153 0.004062 0.003458 0.003358	0.004053 0.003786 0.003838 0.00374
Resistance readings, Ω	0.000991 0.000988 0.001015 0.000989	0.00099 0.000971 0.001005 0.00099	0.001047 0.001033 0.000901 0.00096	0.001016 0.001033 0.000981 0.000864	0.001038 0.001015 0.000864 0.000839	0.001013 0.000947 0.00096 0.000935
Reverse current:						
Voltage readings, mV	-0.003516 -0.003555 -0.0037 -0.003558	-0.003625 -0.003601 -0.003759 -0.003754	-0.003409 -0.003817 -0.004068 -0.003681	-0.003523 -0.003517 -0.003615 -0.004145	-0.0036 -0.003716 -0.004249 -0.004192	-0.003692 -0.003966 -0.003656 -0.003551
Resistance readings, Ω	0.000879 0.000889 0.000925 0.00089	0.000906 0.0009 0.00094 0.000939	0.000852 0.000954 0.001017 0.00092	0.000881 0.000879 0.000904 0.001036	0.0009 0.000929 0.001062 0.001048	0.000923 0.000992 0.000914 0.000888
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003975 0.003843 0.003944 0.003945	0.003852 0.003993 0.003993 0.003605	0.004167 0.004165 0.004094 0.003987	0.003919 0.004062 0.004091 0.004046	0.004146 0.004099 0.003844 0.003908	0.004019 0.004031 0.00383 0.003831

Specimen Number	BW2 03	BW3 01	BW3 02	BW3 03	BW4 01	BW4 02
Resistance readings, Ω	0.000994 0.000961 0.000986 0.000986	0.000963 0.000998 0.000998 0.000901	0.001042 0.001041 0.001023 0.000997	0.00098 0.001015 0.001023 0.001011	0.001037 0.001025 0.000961 0.000977	0.001005 0.001008 0.000957 0.000958
Forward current:						
Voltage readings, mV	-0.003643 -0.003612 -0.003732 -0.003661	-0.003649 -0.00373 -0.003892 -0.00403	-0.003404 -0.003529 -0.003559 -0.003633	-0.003535 -0.003629 -0.003535 -0.003517	-0.003613 -0.003684 -0.003807 -0.003629	-0.003722 -0.003679 -0.003734 -0.003691
Resistance readings, Ω	0.000911 0.000903 0.000933 0.000915	0.000912 0.000932 0.000973 0.001008	0.000851 0.000882 0.00089 0.000908	0.000884 0.000907 0.000884 0.000879	0.000903 0.000921 0.000952 0.000907	0.000931 0.00092 0.000933 0.000923
Average voltage, mV	0.003789	0.003832	0.003830	0.003794	0.003845	0.003801
Average resistance, $R=V/I$ ($m\Omega$)	0.947188	0.957875	0.957375	0.948563	0.961125	0.950438
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.2561	127.1761	127.2386	127.2236	127.2011	127.2686
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.49	9.59	9.59	9.50	9.63	9.52
Environmental Conditions						
Temperature (Deg C)	22.000	22.000	22.000	22.000	22.000	22.000
Barometric Pressure (in Hg)	25.300	25.300	25.300	25.300	25.300	25.300
Humidity (%)	13.600	13.600	13.600	13.600	13.700	13.800

Specimen Number	BW4 03	BW5 01	BW5 02	BW5 03	BW6 01	BW6 02
Date and Time	3/11/2010 8:31	3/11/2010 8:33	3/11/2010 8:36	3/11/2010 8:38	3/11/2010 8:45	3/11/2010 9:30
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.0039 0.00393 0.003971 0.003412	0.004017 0.004011 0.003947 0.003734	0.004082 0.00395 0.003961 0.004043	0.003904 0.003944 0.003737 0.003812	0.003922 0.003758 0.003861 0.003591	0.00385 0.003741 0.004118 0.004116
Resistance readings, Ω	0.000975 0.000983 0.000993 0.000853	0.001004 0.001003 0.000987 0.000934	0.00102 0.000987 0.00099 0.001011	0.000976 0.000986 0.000934 0.000953	0.00098 0.000939 0.000965 0.000898	0.000962 0.000935 0.001029 0.001029
Reverse current:						
Voltage readings, mV	-0.003774 -0.00378 -0.003688 -0.004091	-0.003681 -0.003633 -0.003854 -0.004063	-0.00362 -0.003644 -0.00366 -0.003698	-0.003724 -0.003683 -0.003942 -0.003873	-0.003815 -0.003837 -0.004043 -0.004086	-0.003736 -0.003686 -0.003563 -0.00367
Resistance readings, Ω	0.000943 0.000945 0.000922 0.001023	0.00092 0.000908 0.000963 0.001016	0.000905 0.000911 0.000915 0.000924	0.000931 0.000921 0.000986 0.000968	0.000954 0.000959 0.001011 0.001022	0.000934 0.000922 0.000891 0.000918
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004121 0.00415 0.004158 0.004006	0.004075 0.004048 0.004157 0.00409	0.003948 0.003936 0.003961 0.003933	0.003905 0.003939 0.003923 0.003833	0.00378 0.003738 0.003969 0.00374	0.004043 0.003979 0.004071 0.004033

Specimen Number	BW4 03	BW5 01	BW5 02	BW5 03	BW6 01	BW6 02
Resistance readings, Ω	0.00103 0.001038 0.00104 0.001002	0.001019 0.001012 0.001039 0.001022	0.000987 0.000984 0.00099 0.000983	0.000976 0.000985 0.000981 0.000958	0.000945 0.000934 0.000992 0.000935	0.001011 0.000995 0.001018 0.001008
Forward current:						
Voltage readings, mV	-0.003458 -0.003512 -0.003586 -0.003611	-0.003541 -0.003679 -0.003767 -0.003617	-0.003669 -0.003664 -0.00365 -0.003784	-0.003706 -0.003734 -0.003798 -0.003696	-0.003821 -0.00379 -0.003829 -0.004	-0.003675 -0.00368 -0.003643 -0.003615
Resistance readings, Ω	0.000865 0.000878 0.000896 0.000903	0.000885 0.00092 0.000942 0.000904	0.000917 0.000916 0.000913 0.000946	0.000926 0.000933 0.00095 0.000924	0.000955 0.000948 0.000957 0.001	0.000919 0.00092 0.000911 0.000904
Average voltage, mV	0.003822	0.003870	0.003825	0.003822	0.003849	0.003826
Average resistance, $R=V/I$ ($m\Omega$)	0.955563	0.967375	0.956188	0.955500	0.962125	0.956625
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.2286	127.2011	127.2311	127.2261	127.2286	127.2436
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.57	9.69	9.58	9.57	9.64	9.58
Environmental Conditions						
Temperature (Deg C)	21.900	22.000	22.000	22.000	22.000	21.800
Barometric Pressure (in Hg)	25.300	25.300	25.300	25.300	25.300	25.300
Humidity (%)	13.800	13.800	13.800	13.800	13.800	14.200

Specimen Number	BW6 03	BW7 01	BW7 02	BW7 03	BW8 01	BW8 02
Date and Time	3/11/2010 9:32	3/11/2010 9:35	3/11/2010 9:48	3/11/2010 9:49	3/11/2010 9:52	3/11/2010 9:54
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.00391 0.004065 0.003965 0.003951	0.003905 0.003899 0.004006 0.003979	0.003965 0.003961 0.004041 0.004041	0.003861 0.003883 0.004065 0.003897	0.003843 0.00391 0.00406 0.004088	0.003894 0.004039 0.004062 0.004005
Resistance readings, Ω	0.000977 0.001016 0.000991 0.000988	0.000976 0.000975 0.001001 0.000995	0.000991 0.00099 0.00101 0.00101	0.000965 0.000971 0.001016 0.000974	0.000961 0.000977 0.001015 0.001022	0.000974 0.00101 0.001015 0.001001
Reverse current:						
Voltage readings, mV	-0.0038 -0.003567 -0.003713 -0.003717	-0.003632 -0.00363 -0.003761 -0.003738	-0.003614 -0.003663 -0.003785 -0.003633	-0.003627 -0.003664 -0.003895 -0.003752	-0.003625 -0.003607 -0.003739 -0.003762	-0.003534 -0.003636 -0.003684 -0.003649
Resistance readings, Ω	0.00095 0.000892 0.000928 0.000929	0.000908 0.000907 0.00094 0.000934	0.000903 0.000916 0.000946 0.000908	0.000907 0.000916 0.000974 0.000938	0.000906 0.000902 0.000935 0.00094	0.000884 0.000909 0.000921 0.000912
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004003 0.003939 0.003932 0.003954	0.003947 0.003938 0.003402 0.003787	0.003864 0.003835 0.00391 0.003956	0.003858 0.003813 0.00391 0.003765	0.003852 0.00392 0.003823 0.003738	0.003705 0.003857 0.004151 0.00392

Specimen Number	BW6 03	BW7 01	BW7 02	BW7 03	BW8 01	BW8 02
Resistance readings, Ω	0.001001 0.000985 0.000983 0.000989	0.000987 0.000985 0.00085 0.000947	0.000966 0.000959 0.000978 0.000989	0.000964 0.000953 0.000977 0.000941	0.000963 0.00098 0.000956 0.000934	0.000926 0.000964 0.001038 0.00098
Forward current:						
Voltage readings, mV	-0.003764 -0.003699 -0.003681 -0.003711	-0.003659 -0.003563 -0.004211 -0.00396	-0.003655 -0.003676 -0.003818 -0.003774	-0.003668 -0.003771 -0.003835 -0.003906	-0.003715 -0.003706 -0.003849 -0.003854	-0.003737 -0.003743 -0.003881 -0.003623
Resistance readings, Ω	0.000941 0.000925 0.00092 0.000928	0.000915 0.000891 0.001053 0.00099	0.000914 0.000919 0.000955 0.000943	0.000917 0.000943 0.000959 0.000976	0.000929 0.000927 0.000962 0.000963	0.000934 0.000936 0.00097 0.000906
Average voltage, mV	0.003836	0.003814	0.003824	0.003823	0.003818	0.003820
Average resistance, $R=V/I$ ($m\Omega$)	0.958938	0.953375	0.956063	0.955688	0.954500	0.955000
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.2286	127.2286	127.2785	127.2761	127.2661	127.2386
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.61	9.55	9.58	9.58	9.56	9.57
Environmental Conditions						
Temperature (Deg C)	21.800	21.800	21.800	21.800	21.800	21.900
Barometric Pressure (in Hg)	25.300	25.300	25.300	25.300	25.300	25.300
Humidity (%)	14.200	14.200	14.200	14.300	14.300	14.300

Specimen Number	BW 03	BP2 02	BP2 03	BP3 01	BP3 02	BP3 03
Date and Time	3/11/2010 9:56	3/11/2010 10:15	3/11/2010 10:17	3/11/2010 10:19	3/11/2010 10:23	3/11/2010 10:26
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003974	0.004247	0.003948	0.00385	0.003634	0.003773
	0.003879	0.003982	0.004053	0.003847	0.004095	0.003763
	0.003964	0.003867	0.00378	0.003791	0.003977	0.003326
	0.003935	0.003616	0.00366	0.003803	0.003401	0.003211
Resistance readings, Ω	0.000993	0.001062	0.000987	0.000963	0.000909	0.000943
	0.00097	0.000995	0.001013	0.000962	0.001024	0.000941
	0.000991	0.000967	0.000945	0.000948	0.000994	0.000831
	0.000984	0.000904	0.000915	0.000951	0.00085	0.000803
Reverse current:						
Voltage readings, mV	-0.003622	-0.002977	-0.003333	-0.003467	-0.003589	-0.003633
	-0.003673	-0.003459	-0.003278	-0.003401	-0.003158	-0.003548
	-0.003797	-0.003472	-0.003632	-0.003601	-0.003602	-0.004018
	-0.003803	-0.003639	-0.003605	-0.003771	-0.004042	-0.004094
Resistance readings, Ω	0.000906	0.000744	0.000833	0.000867	0.000897	0.000908
	0.000918	0.000865	0.000819	0.00085	0.00079	0.000887
	0.000949	0.000868	0.000908	0.0009	0.000901	0.001004
	0.000951	0.00091	0.000901	0.000943	0.00101	0.001024
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003849	0.004007	0.003902	0.00384	0.003662	0.003846
	0.003848	0.003783	0.003915	0.004016	0.003726	0.003881
	0.003973	0.003775	0.003769	0.003896	0.003614	0.003777
	0.003937	0.003791	0.003743	0.003602	0.003716	0.003537

Specimen Number	BW8 03	BP2 02	BP2 03	BP3 01	BP3 02	BP3 03
Resistance readings, Ω	0.000962 0.000962 0.000993 0.000984	0.001002 0.000946 0.000944 0.000948	0.000975 0.000979 0.000942 0.000936	0.00096 0.001004 0.000974 0.0009	0.000915 0.000932 0.000904 0.000929	0.000962 0.00097 0.000944 0.000884
Forward current:						
Voltage readings, mV	-0.003703 -0.003722 -0.003798 -0.003734	-0.003316 -0.003454 -0.003575 -0.003532	-0.003426 -0.003452 -0.003563 -0.003644	-0.003525 -0.003512 -0.003465 -0.003778	-0.003616 -0.003463 -0.003803 -0.00355	-0.003522 -0.003516 -0.003794 -0.003715
Resistance readings, Ω	0.000926 0.00093 0.000949 0.000934	0.000829 0.000864 0.000894 0.000883	0.000856 0.000863 0.000891 0.000911	0.000881 0.000878 0.000866 0.000944	0.000904 0.000866 0.000951 0.000887	0.00088 0.000879 0.000948 0.000929
Average voltage, mV	0.003826	0.003656	0.003669	0.003698	0.003666	0.003685
Average resistance, $R=V/I$ ($m\Omega$)	0.956375	0.914063	0.917125	0.924438	0.916438	0.921063
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.2586	127.1461	127.1136	127.1211	127.0986	127.1786
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.58	9.15	9.18	9.25	9.17	9.22
Environmental Conditions						
Temperature (Deg C)	21.800	21.900	22.000	22.000	22.000	22.100
Barometric Pressure (in Hg)	25.300	25.300	25.300	25.300	25.300	25.300
Humidity (%)	14.400	14.400	14.400	14.400	14.300	14.300

Specimen Number	BP4 01	BP4 02	BP4 03	BP5 01	BP5 02	BP5 03
Date and Time	3/11/2010 10:31	3/11/2010 10:33	3/11/2010 10:36	3/11/2010 10:38	3/11/2010 10:42	3/11/2010 10:44
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003575 0.003599 0.003668 0.003549	0.003552 0.003591 0.003626 0.003739	0.003504 0.003615 0.003704 0.003588	0.003739 0.003695 0.003703 0.003788	0.003524 0.003693 0.00374 0.003617	0.003598 0.003685 0.003733 0.003616
Resistance readings, Ω	0.000894 0.0009 0.00092 0.000887	0.000888 0.000898 0.000906 0.000935	0.000876 0.000904 0.000926 0.000897	0.000935 0.000924 0.000926 0.000947	0.000881 0.000923 0.000935 0.000904	0.0009 0.000921 0.000933 0.000904
Reverse current:						
Voltage readings, mV	-0.003703 -0.003667 -0.00342 -0.003729	-0.003683 -0.003669 -0.003729 -0.00358	-0.003618 -0.003769 -0.003775 -0.003679	-0.003611 -0.003553 -0.003533 -0.003584	-0.003781 -0.003651 -0.003608 -0.003689	-0.003682 -0.003657 -0.003669 -0.003531
Resistance readings, Ω	0.000926 0.000917 0.000855 0.000932	0.000921 0.000917 0.000932 0.000895	0.000904 0.000942 0.000944 0.00092	0.000903 0.000888 0.000883 0.000896	0.000945 0.000913 0.000902 0.000922	0.000921 0.000914 0.000917 0.000883
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.00374 0.003582 0.003353 0.003526	0.003612 0.00368 0.003753 0.003701	0.00376 0.003659 0.003667 0.003679	0.003683 0.003598 0.003656 0.003583	0.00388 0.003778 0.0037 0.003735	0.00363 0.003627 0.003551 0.003458

Specimen Number	BP4 01	BP4 02	BP4 03	BP5 01	BP5 02	BP5 03
Resistance readings, Ω	0.000935 0.000896 0.000838 0.000882	0.000903 0.00092 0.000938 0.000925	0.00094 0.000915 0.000917 0.00092	0.000921 0.0009 0.000914 0.000896	0.00097 0.000945 0.000925 0.000934	0.000907 0.000907 0.000888 0.000865
Forward current:						
Voltage readings, mV	-0.003712 -0.003728 -0.003846 -0.003708	-0.003569 -0.003593 -0.003762 -0.003581	-0.003569 -0.003639 -0.003668 -0.003615	-0.003549 -0.003742 -0.003821 -0.003654	-0.0036 -0.003592 -0.003719 -0.003584	-0.003601 -0.003648 -0.003848 -0.003741
Resistance readings, Ω	0.000928 0.000932 0.000961 0.000927	0.000892 0.000898 0.000941 0.000895	0.000892 0.00091 0.000917 0.000904	0.000887 0.000935 0.000955 0.000913	0.0009 0.000898 0.00093 0.000896	0.0009 0.000912 0.000962 0.000935
Average voltage, mV	0.003632	0.003651	0.003657	0.003656	0.003681	0.003642
Average resistance, $R=V/I$ ($m\Omega$)	0.908125	0.912750	0.914250	0.913938	0.920188	0.910563
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.2061	127.1311	127.1686	127.2136	127.1436	127.1436
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.10	9.14	9.15	9.15	9.21	9.12
Environmental Conditions						
Temperature (Deg C)	22.100	22.100	22.100	22.100	22.100	22.100
Barometric Pressure (in Hg)	25.300	25.300	25.300	25.300	25.300	25.300
Humidity (%)	14.200	14.200	14.200	14.200	14.200	14.200

Specimen Number	BP6 01	BP6 02	BP6 03	BW9 01	BW9 02	BW9 03
Date and Time	3/11/2010 10:46	3/11/2010 10:49	3/11/2010 10:51	3/15/2010 13:13	3/15/2010 13:17	3/15/2010 13:19
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003717 0.00374 0.003721 0.003702	0.003644 0.003664 0.003761 0.00365	0.003508 0.003638 0.003757 0.003671	0.004079 0.004064 0.00388 0.003801	0.00371 0.003967 0.003833 0.003739	0.004149 0.004186 0.003943 0.003935
Resistance readings, Ω	0.000929 0.000935 0.00093 0.000925	0.000911 0.000916 0.00094 0.000913	0.000877 0.00091 0.000939 0.000918	0.00102 0.001016 0.00097 0.00095	0.000927 0.000992 0.000958 0.000935	0.001037 0.001047 0.000986 0.000984
Reverse current:						
Voltage readings, mV	-0.00364 -0.003625 -0.003712 -0.003661	-0.00363 -0.003646 -0.003665 -0.003639	-0.003674 -0.003557 -0.00375 -0.003697	-0.00384 -0.003936 -0.003631 -0.003472	-0.003834 -0.003984 -0.003658 -0.003541	-0.003624 -0.003702 -0.003495 -0.003348
Resistance readings, Ω	0.00091 0.000906 0.000928 0.000915	0.000908 0.000911 0.000916 0.00091	0.000919 0.000889 0.000938 0.000924	0.00096 0.000984 0.000908 0.000868	0.000959 0.000996 0.000914 0.000885	0.000906 0.000925 0.000874 0.000837
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003612 0.003693 0.003735 0.003842	0.003671 0.003727 0.003739 0.003685	0.003665 0.003669 0.003677 0.00364	0.004059 0.004233 0.003937 0.003913	0.004087 0.004235 0.003982 0.003934	0.004189 0.004223 0.00399 0.004

Specimen Number	BP6 01	BP6 02	BP6 03	BW9 01	BW9 02	BW9 03
Resistance readings, Ω	0.000903 0.000923 0.000934 0.00096	0.000918 0.000932 0.000935 0.000921	0.000916 0.000917 0.000919 0.00091	0.001015 0.001058 0.000984 0.000978	0.001022 0.001059 0.000995 0.000984	0.001047 0.001056 0.000997 0.001
Forward current:						
Voltage readings, mV	-0.003713 -0.003572 -0.003726 -0.003625	-0.003511 -0.003492 -0.003576 -0.0036	-0.003658 -0.003643 -0.003668 -0.003571	-0.003748 -0.003783 -0.003567 -0.003464	-0.003649 -0.003711 -0.00344 -0.003391	-0.003711 -0.00355 -0.003318 -0.003382
Resistance readings, Ω	0.000928 0.000893 0.000932 0.000906	0.000878 0.000873 0.000894 0.0009	0.000914 0.000911 0.000917 0.000893	0.000937 0.000946 0.000892 0.000866	0.000912 0.000928 0.00086 0.000848	0.000928 0.000888 0.00083 0.000845
Average voltage, mV	0.003690	0.003644	0.003653	0.003838	0.003793	0.003797
Average resistance, $R=V/I$ ($m\Omega$)	0.922313	0.911000	0.913188	0.959500	0.948375	0.949188
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.2661	127.1361	127.1736	127.3285	127.2860	127.2835
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.24	9.12	9.14	9.62	9.51	9.51
Environmental Conditions						
Temperature (Deg C)	22.200	22.200	22.200	22.2	22.2	22.2
Barometric Pressure (in Hg)	25.300	25.300	25.300	25.6	25.6	25.6
Humidity (%)	14.200	14.200	14.200	19.6	19.7	19.8

Specimen Number	BW10 01	BW10 02	BW10 03	BW11 01	BW11 02	BW11 03
Date and Time	3/15/2010 13:22	3/15/2010 13:25	3/15/2010 13:28	3/15/2010 13:31	3/15/2010 13:33	3/15/2010 13:36
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.0043 0.004319 0.004172 0.003994	0.004301 0.004283 0.004254 0.004142	0.004171 0.004395 0.004031 0.004038	0.004303 0.004414 0.004203 0.004087	0.004084 0.004306 0.004042 0.00363	0.004193 0.004345 0.003209 0.003561
Resistance readings, Ω	0.001075 0.00108 0.001043 0.000998	0.001075 0.001071 0.001064 0.001036	0.001043 0.001099 0.001008 0.00101	0.001076 0.001104 0.001051 0.001022	0.001021 0.001077 0.00101 0.000907	0.001048 0.001086 0.000802 0.00089
Reverse current:						
Voltage readings, mV	-0.003469 -0.003595 -0.003386 -0.003528	-0.003459 -0.003457 -0.00323 -0.003163	-0.003544 -0.00362 -0.003406 -0.003358	-0.00345 -0.003513 -0.00333 -0.003264	-0.0036 -0.003524 -0.003534 -0.003788	-0.003434 -0.003475 -0.004127 -0.00362
Resistance readings, Ω	0.000867 0.000899 0.000846 0.000882	0.000865 0.000864 0.000808 0.000791	0.000886 0.000905 0.000852 0.000839	0.000863 0.000878 0.000832 0.000816	0.0009 0.000881 0.000884 0.000947	0.000859 0.000869 0.001032 0.000905
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004371 0.004284 0.004208 0.004083	0.004293 0.00434 0.004088 0.004104	0.004229 0.004292 0.003812 0.003385	0.004391 0.004295 0.004134 0.004224	0.004235 0.004427 0.004129 0.004059	0.004464 0.004597 0.004378 0.004373

Specimen Number	BW10 01	BW10 02	BW10 03	BW11 01	BW11 02	BW11 03
Resistance readings, Ω	0.001093 0.001071 0.001052 0.001021	0.001073 0.001085 0.001022 0.001026	0.001057 0.001073 0.000953 0.000846	0.001098 0.001074 0.001034 0.001056	0.001059 0.001107 0.001032 0.001015	0.001116 0.001149 0.001094 0.001093
Forward current:						
Voltage readings, mV	-0.003481 -0.003522 -0.003242 -0.003349	-0.003461 -0.003489 -0.003446 -0.003333	-0.003453 -0.003526 -0.003784 -0.003903	-0.003456 -0.003524 -0.003467 -0.003374	-0.003456 -0.003598 -0.003451 -0.003318	-0.003232 -0.003272 -0.003049 -0.002895
Resistance readings, Ω	0.00087 0.00088 0.00081 0.000837	0.000865 0.000872 0.000861 0.000833	0.000863 0.000881 0.000946 0.000976	0.000864 0.000881 0.000867 0.000843	0.000864 0.0009 0.000863 0.00083	0.000808 0.000818 0.000762 0.000724
Average voltage, mV	0.003831	0.003803	0.003809	0.003839	0.003824	0.003764
Average resistance, $R=V/I$ (m Ω)	0.957750	0.950688	0.952313	0.959938	0.956063	0.940938
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm ²	127.2935	127.3060	127.3485	127.1911	127.1811	127.2461
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.60	9.53	9.55	9.61	9.57	9.43
Environmental Conditions						
Temperature (Deg C)	22.3	22.3	22.3	22.3	22.4	22.4
Barometric Pressure (in Hg)	25.6	25.6	25.6	25.6	25.6	25.6
Humidity (%)	19.8	19.8	19.9	19.9	20.1	20.1

Specimen Number	BW12 01	BW12 02	BW12 03	BW13 01	BW13 02	BW13 03
Date and Time	3/15/2010 13:39	3/15/2010 13:41	3/15/2010 13:44	3/15/2010 13:46	3/15/2010 13:48	3/15/2010 13:51
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.004465	0.004286	0.00396	0.004177	0.004042	0.004152
	0.004494	0.003995	0.004246	0.004195	0.004346	0.004274
	0.00418	0.004167	0.004197	0.004118	0.00404	0.004132
	0.00396	0.004114	0.003951	0.003932	0.00388	0.004021
Resistance readings, Ω	0.001116	0.001072	0.00099	0.001044	0.00101	0.001038
	0.001123	0.000999	0.001061	0.001049	0.001087	0.001068
	0.001045	0.001042	0.001049	0.001029	0.00101	0.001033
	0.00099	0.001029	0.000988	0.000983	0.00097	0.001005
Reverse current:						
Voltage readings, mV	-0.003365	-0.003493	-0.003861	-0.003639	-0.00358	-0.003578
	-0.003394	-0.003533	-0.003653	-0.003797	-0.00363	-0.003489
	-0.003423	-0.003536	-0.003339	-0.003537	-0.00345	-0.003418
	-0.003445	-0.003571	-0.003453	-0.003464	-0.00345	-0.003409
Resistance readings, Ω	0.000841	0.000873	0.000965	0.00091	0.000895	0.000894
	0.000849	0.000883	0.000913	0.000949	0.000907	0.000872
	0.000856	0.000884	0.000835	0.000884	0.000862	0.000855
	0.000861	0.000893	0.000863	0.000866	0.000862	0.000852
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004449	0.004275	0.004246	0.004118	0.004134	0.004247
	0.004462	0.004318	0.00428	0.004301	0.004175	0.004201
	0.00422	0.003847	0.003766	0.004093	0.003909	0.003941
	0.004179	0.004017	0.003729	0.004138	0.003881	0.003999

Specimen Number	BW12 01	BW12 02	BW12 03	BW13 01	BW13 02	BW13 03
Resistance readings, Ω	0.001112 0.001115 0.001055 0.001045	0.001069 0.001079 0.000962 0.001004	0.001062 0.00107 0.000941 0.000932	0.001029 0.001075 0.001023 0.001035	0.001034 0.001044 0.000977 0.00097	0.001062 0.00105 0.000985 0.001
Forward current:						
Voltage readings, mV	-0.003482 -0.00347 -0.003332 -0.003343	-0.003545 -0.003515 -0.003699 -0.003336	-0.003592 -0.003698 -0.003785 -0.003553	-0.003769 -0.003612 -0.003498 -0.003416	-0.003566 -0.003601 -0.003605 -0.003465	-0.003556 -0.003615 -0.003564 -0.003476
Resistance readings, Ω	0.000871 0.000868 0.000833 0.000836	0.000886 0.000879 0.000925 0.00084	0.000898 0.000925 0.000946 0.000888	0.000942 0.000903 0.000875 0.000854	0.000891 0.0009 0.000901 0.000866	0.000889 0.000904 0.000891 0.000869
Average voltage, mV	0.003854	0.003829	0.003832	0.003863	0.003797	0.003817
Average resistance, $R=V/I$ ($m\Omega$)	0.963500	0.957438	0.957875	0.965625	0.949125	0.954188
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.1911	127.2511	127.2286	127.2885	127.2785	127.2536
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.65	9.59	9.60	9.68	9.51	9.56
Environmental Conditions						
Temperature (Deg C)	22.4	22.3	22.3	22.3	22.3	22.3
Barometric Pressure (in Hg)	25.6	25.6	25.6	25.6	25.6	25.6
Humidity (%)	20.2	20.2	20.3	20.3	20.3	20.3

Specimen Number	BW14 01	BW14 02	BW14 03	BW15 01	BW15 02	BW15 03
Date and Time	3/15/2010 13:53	3/15/2010 13:56	3/15/2010 13:59	3/15/2010 14:02	3/15/2010 14:04	3/15/2010 14:08
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.004139 0.0043 0.004211 0.003999	0.004038 0.004241 0.003921 0.003892	0.004159 0.004372 0.002891 0.003634	0.004496 0.00453 0.004286 0.004301	0.004376 0.004351 0.00409 0.004198	0.004136 0.004036 0.004007 0.003102
Resistance readings, Ω	0.001035 0.001075 0.001053 0.001	0.00101 0.00106 0.00098 0.000973	0.00104 0.001093 0.000723 0.000909	0.001124 0.001133 0.001071 0.001075	0.001094 0.001088 0.001023 0.001049	0.001034 0.001009 0.001002 0.000776
Reverse current:						
Voltage readings, mV	-0.003514 -0.003703 -0.003516 -0.003533	-0.003554 -0.003525 -0.003538 -0.003512	-0.003675 -0.003537 -0.004506 -0.003697	-0.003251 -0.003337 -0.003379 -0.003271	-0.003393 -0.00341 -0.003316 -0.003209	-0.003623 -0.003824 -0.003408 -0.004478
Resistance readings, Ω	0.000879 0.000926 0.000879 0.000883	0.000888 0.000881 0.000885 0.000878	0.000919 0.000884 0.001126 0.000924	0.000813 0.000834 0.000845 0.000818	0.000848 0.000853 0.000829 0.000802	0.000906 0.000956 0.000852 0.00112
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.004246 0.004319 0.004175 0.004047	0.003934 0.00412 0.003769 0.003426	0.004463 0.004649 0.00436 0.003944	0.004389 0.004525 0.00349 0.003928	0.004266 0.004255 0.004007 0.003987	0.003718 0.003975 0.003008 0.00331

Specimen Number	BW14 01	BW14 02	BW14 03	BW15 01	BW15 02	BW15 03
Resistance readings, Ω	0.001061 0.00108 0.001044 0.001012	0.000984 0.00103 0.000942 0.000857	0.001116 0.001162 0.00109 0.000986	0.001097 0.001131 0.000872 0.000982	0.001066 0.001064 0.001002 0.000997	0.00093 0.000994 0.000752 0.000827
Forward current:						
Voltage readings, mV	-0.003639 -0.003695 -0.003427 -0.003274	-0.003625 -0.003775 -0.003656 -0.003752	-0.00339 -0.00323 -0.00314 -0.003589	-0.003382 -0.003512 -0.004111 -0.00348	-0.003498 -0.003559 -0.003432 -0.003502	-0.004044 -0.003988 -0.0042 -0.004137
Resistance readings, Ω	0.00091 0.000924 0.000857 0.000818	0.000906 0.000944 0.000914 0.000938	0.000847 0.000808 0.000785 0.000897	0.000845 0.000878 0.001028 0.00087	0.000875 0.00089 0.000858 0.000875	0.001011 0.000997 0.00105 0.001034
Average voltage, mV	0.003859	0.003767	0.003827	0.003854	0.003803	0.003812
Average resistance, $R=V/I$ ($m\Omega$)	0.964750	0.941875	0.956813	0.963500	0.950813	0.953125
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2	127.3685	127.2586	127.2910	127.3060	127.3535	127.3160
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.68	9.44	9.59	9.66	9.53	9.55
Environmental Conditions						
Temperature (Deg C)	22.3	22.3	22.4	22.4	22.4	22.5
Barometric Pressure (in Hg)	25.6	25.6	25.6	25.6	25.6	25.6
Humidity (%)	20.3	20.4	20.3	20.4	20.4	20.3

Specimen Number	BW16 01	BW16 02	BW16 03
Date and Time	3/15/2010 14:10	3/15/2010 14:12	3/15/2010 14:15
Operator	41169	41169	41169
Sample Location			
Applied current, I (mA)	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000
ID Orientation:			
Forward current:			
Voltage readings, mV	0.004754	0.004654	0.004527
	0.004505	0.004354	0.004107
	0.004432	0.003915	0.004154
	0.003847	0.004116	0.00389
Resistance readings, Ω	0.001189	0.001163	0.001132
	0.001126	0.001089	0.001027
	0.001108	0.000979	0.001039
	0.000962	0.001029	0.000972
Reverse current:			
Voltage readings, mV	-0.003053	-0.003174	-0.003315
	-0.003342	-0.003603	-0.003714
	-0.003192	-0.003513	-0.003366
	-0.003972	-0.003152	-0.003569
Resistance readings, Ω	0.000763	0.000794	0.000829
	0.000835	0.000901	0.000929
	0.000798	0.000878	0.000842
	0.000993	0.000788	0.000892
End-for-end orientation:			
Reverse current:			
Voltage readings, mV	0.004104	0.004339	0.004147
	0.004469	0.004309	0.004294
	0.003574	0.004116	0.004191
	0.003955	0.004021	0.003692

Specimen Number	BW16 01	BW16 02	BW16 03
Resistance readings, Ω	0.001026 0.001117 0.000893 0.000989	0.001085 0.001077 0.001029 0.001005	0.001037 0.001074 0.001048 0.000923
Forward current:			
Voltage readings, mV	-0.003649 -0.003512 -0.003824 -0.003457	-0.00347 -0.003587 -0.003293 -0.003354	-0.003507 -0.003598 -0.003429 -0.003701
Resistance readings, Ω	0.000912 0.000878 0.000956 0.000864	0.000867 0.000897 0.000823 0.000839	0.000877 0.0009 0.000857 0.000925
Average voltage, mV	0.003853	0.003811	0.003825
Average resistance, $R=V/I$ ($m\Omega$)	0.963063	0.952688	0.956438
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7
Average area, A mm^2	127.3886	127.3836	127.3635
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	9.66	9.56	9.59
Environmental Conditions			
Temperature (Deg C)	22.5	22.5	22.6
Barometric Pressure (in Hg)	25.6	25.6	25.6
Humidity (%)	20.3	20.2	20.2

Specimen ID Number	Operator S#	Test Date	Applied Current (mA)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Measured Potential (mV)
BW1 01	41169	3/9/2010 15:20	4	25.364	12.734	0.003849
BW1 02	41169	3/9/2010 15:23	4	25.362	12.732	0.003804
BW1 03	41169	3/9/2010 15:25	4	25.365	12.726	0.003795
BW2 01	41169	3/11/2010 7:54	4	25.365	12.727	0.003821
BW2 02	41169	3/11/2010 7:57	4	25.364	12.726	0.003822
BW2 03	41169	3/11/2010 8:09	4	25.364	12.729	0.003789
BW3 01	41169	3/11/2010 8:14	4	25.365	12.725	0.003832
BW3 02	41169	3/11/2010 8:16	4	25.365	12.728	0.003830
BW3 03	41169	3/11/2010 8:19	4	25.366	12.727	0.003794
BW4 01	41169	3/11/2010 8:24	4	25.365	12.726	0.003845
BW4 02	41169	3/11/2010 8:27	4	25.366	12.730	0.003801
BW4 03	41169	3/11/2010 8:31	4	25.367	12.728	0.003822
BW5 01	41169	3/11/2010 8:33	4	25.368	12.726	0.003870
BW5 02	41169	3/11/2010 8:36	4	25.369	12.728	0.003825
BW5 03	41169	3/11/2010 8:38	4	25.367	12.728	0.003822
BW6 01	41169	3/11/2010 8:45	4	25.369	12.728	0.003849
BW6 02	41169	3/11/2010 9:30	4	25.368	12.728	0.003826
BW6 03	41169	3/11/2010 9:32	4	25.367	12.728	0.003836
BW7 01	41169	3/11/2010 9:35	4	25.370	12.728	0.003814
BW7 02	41169	3/11/2010 9:48	4	25.367	12.730	0.003824
BW7 03	41169	3/11/2010 9:49	4	25.369	12.730	0.003823
BW8 01	41169	3/11/2010 9:52	4	25.369	12.730	0.003818
BW8 02	41169	3/11/2010 9:54	4	25.369	12.728	0.003820
BW8 03	41169	3/11/2010 9:56	4	25.366	12.729	0.003826
BP2 02	41169	3/11/2010 10:15	4	25.381	12.724	0.003656
BP2 03	41169	3/11/2010 10:17	4	25.362	12.722	0.003669
BP3 01	41169	3/11/2010 10:19	4	25.361	12.722	0.003698
BP3 02	41169	3/11/2010 10:23	4	25.357	12.721	0.003666
BP3 03	41169	3/11/2010 10:26	4	25.359	12.725	0.003685
BP4 01	41169	3/11/2010 10:31	4	25.362	12.727	0.003632
BP4 02	41169	3/11/2010 10:33	4	25.357	12.723	0.003651
BP4 03	41169	3/11/2010 10:36	4	25.363	12.725	0.003657
BP5 01	41169	3/11/2010 10:38	4	25.355	12.727	0.003656
BP5 02	41169	3/11/2010 10:42	4	25.355	12.723	0.003681
BP5 03	41169	3/11/2010 10:44	4	25.357	12.723	0.003642
BP6 01	41169	3/11/2010 10:46	4	25.355	12.730	0.003690
BP6 02	41169	3/11/2010 10:49	4	25.357	12.723	0.003644

Specimen ID Number	Operator S#	Test Date	Applied Current (mA)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Measured Potential (mV)
BP6 03	41169	3/11/2010 10:51	4	25.362	12.725	0.003653
BW9 01	41169	3/15/2010 13:13	4	25.367	12.733	0.003838
BW9 02	41169	3/15/2010 13:17	4	25.368	12.731	0.003793
BW9 03	41169	3/15/2010 13:19	4	25.369	12.730	0.003797
BW10 01	41169	3/15/2010 13:22	4	25.368	12.731	0.003831
BW10 02	41169	3/15/2010 13:25	4	25.370	12.732	0.003803
BW10 03	41169	3/15/2010 13:28	4	25.370	12.734	0.003809
BW11 01	41169	3/15/2010 13:31	4	25.371	12.726	0.003839
BW11 02	41169	3/15/2010 13:33	4	25.369	12.725	0.003824
BW11 03	41169	3/15/2010 13:36	4	25.369	12.729	0.003764
BW12 01	41169	3/15/2010 13:39	4	25.369	12.726	0.003854
BW12 02	41169	3/15/2010 13:41	4	25.370	12.729	0.003829
BW12 03	41169	3/15/2010 13:44	4	25.368	12.728	0.003832
BW13 01	41169	3/15/2010 13:46	4	25.369	12.731	0.003863
BW13 02	41169	3/15/2010 13:48	4	25.368	12.730	0.003797
BW13 03	41169	3/15/2010 13:51	4	25.367	12.729	0.003817
BW14 01	41169	3/15/2010 13:53	4	25.369	12.735	0.003859
BW14 02	41169	3/15/2010 13:56	4	25.370	12.729	0.003767
BW14 03	41169	3/15/2010 13:59	4	25.368	12.731	0.003827
BW15 01	41169	3/15/2010 14:02	4	25.366	12.732	0.003854
BW15 02	41169	3/15/2010 14:04	4	25.368	12.734	0.003803
BW15 03	41169	3/15/2010 14:08	4	25.368	12.732	0.003812
BW16 01	41169	3/15/2010 14:10	4	25.368	12.736	0.003853
BW16 02	41169	3/15/2010 14:12	4	25.366	12.735	0.003811
BW16 03	41169	3/15/2010 14:15	4	25.368	12.734	0.003825

Specimen ID Number	Resistance (mΩ)	Resistivity (μΩm)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
BW1 01	0.962	9.648	23.1	25	16.9	With Grain
BW1 02	0.951	9.535	23.1	25	17	With Grain
BW1 03	0.949	9.502	23.2	25	16.9	With Grain
BW2 01	0.955	9.568	22.1	25.3	13.3	With Grain
BW2 02	0.956	9.571	22.1	25.3	13.4	With Grain
BW2 03	0.947	9.491	22	25.3	13.6	With Grain
BW3 01	0.958	9.592	22	25.3	13.6	With Grain
BW3 02	0.957	9.592	22	25.3	13.6	With Grain
BW3 03	0.949	9.502	22	25.3	13.6	With Grain
BW4 01	0.961	9.626	22	25.3	13.7	With Grain
BW4 02	0.950	9.524	22	25.3	13.8	With Grain
BW4 03	0.956	9.573	21.9	25.3	13.8	With Grain
BW5 01	0.967	9.689	22	25.3	13.8	With Grain
BW5 02	0.956	9.579	22	25.3	13.8	With Grain
BW5 03	0.956	9.572	22	25.3	13.8	With Grain
BW6 01	0.962	9.639	22	25.3	13.8	With Grain
BW6 02	0.957	9.585	21.8	25.3	14.2	With Grain
BW6 03	0.959	9.607	21.8	25.3	14.2	With Grain
BW7 01	0.953	9.551	21.8	25.3	14.2	With Grain
BW7 02	0.956	9.582	21.8	25.3	14.2	With Grain
BW7 03	0.956	9.578	21.8	25.3	14.3	With Grain
BW8 01	0.955	9.565	21.8	25.3	14.3	With Grain
BW8 02	0.955	9.568	21.9	25.3	14.3	With Grain
BW8 03	0.956	9.583	21.8	25.3	14.4	With Grain
BP2 02	0.914	9.151	21.9	25.3	14.4	Against Grain
BP2 03	0.917	9.179	22	25.3	14.4	Against Grain
BP3 01	0.924	9.253	22	25.3	14.4	Against Grain
BP3 02	0.916	9.171	22	25.3	14.3	Against Grain
BP3 03	0.921	9.224	22.1	25.3	14.3	Against Grain
BP4 01	0.908	9.096	22.1	25.3	14.2	Against Grain
BP4 02	0.913	9.137	22.1	25.3	14.2	Against Grain
BP4 03	0.914	9.155	22.1	25.3	14.2	Against Grain
BP5 01	0.914	9.155	22.1	25.3	14.2	Against Grain
BP5 02	0.920	9.212	22.1	25.3	14.2	Against Grain
BP5 03	0.911	9.116	22.1	25.3	14.2	Against Grain
BP6 01	0.922	9.242	22.2	25.3	14.2	Against Grain
BP6 02	0.911	9.120	22.2	25.3	14.2	Against Grain

Specimen ID Number	Resistance (mΩ)	Resistivity (μΩm)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
BP6 03	0.913	9.144	22.2	25.3	14.2	Against Grain
BW9 01	0.960	9.620	22.2	25.6	19.6	With Grain
BW9 02	0.948	9.505	22.2	25.6	19.7	With Grain
BW9 03	0.949	9.513	22.2	25.6	19.8	With Grain
BW10 01	0.958	9.600	22.3	25.6	19.8	With Grain
BW10 02	0.951	9.530	22.3	25.6	19.8	With Grain
BW10 03	0.952	9.549	22.3	25.6	19.9	With Grain
BW11 01	0.960	9.614	22.3	25.6	19.9	With Grain
BW11 02	0.956	9.574	22.4	25.6	20.1	With Grain
BW11 03	0.941	9.428	22.4	25.6	20.1	With Grain
BW12 01	0.964	9.649	22.4	25.6	20.2	With Grain
BW12 02	0.957	9.593	22.3	25.6	20.2	With Grain
BW12 03	0.958	9.596	22.3	25.6	20.3	With Grain
BW13 01	0.966	9.678	22.3	25.6	20.3	With Grain
BW13 02	0.949	9.512	22.3	25.6	20.3	With Grain
BW13 03	0.954	9.561	22.3	25.6	20.3	With Grain
BW14 01	0.965	9.675	22.3	25.6	20.3	With Grain
BW14 02	0.942	9.438	22.3	25.6	20.4	With Grain
BW14 03	0.957	9.590	22.4	25.6	20.3	With Grain
BW15 01	0.964	9.658	22.4	25.6	20.4	With Grain
BW15 02	0.951	9.535	22.4	25.6	20.4	With Grain
BW15 03	0.953	9.555	22.5	25.6	20.3	With Grain
BW16 01	0.963	9.660	22.5	25.6	20.3	With Grain
BW16 02	0.953	9.556	22.5	25.6	20.2	With Grain
BW16 03	0.956	9.592	22.6	25.6	20.2	With Grain

Specimen ID Number	Date and Time	Operator	Specimen Location	Initial Specimen Length, m	Initial Specimen Density, ρ kg/m ³	Longitudinal Traverse Time, s	Shear Traverse Time, s	Longitudinal Zero Correction, s	Shear Zero Correction, s
BP2 02	3/2/2010 8:14	41169		0.025381	1872.2913	8.890E-06	1.526E-05	1.700E-07	1.900E-07
BP2 03	3/2/2010 8:16	41169		0.025361	1873.5113	8.840E-06	1.521E-05	1.700E-07	1.900E-07
BP3 01	3/2/2010 8:18	41169		0.025361	1869.1153	8.860E-06	1.520E-05	1.700E-07	1.900E-07
BP3 02	3/2/2010 8:20	41169		0.025357	1871.3891	8.860E-06	1.540E-05	1.700E-07	1.900E-07
BP3 03	3/2/2010 8:22	41169		0.025358	1872.3208	8.840E-06	1.524E-05	1.700E-07	1.900E-07
BP4 01	3/2/2010 8:23	41169		0.025362	1869.0576	8.740E-06	1.519E-05	1.700E-07	1.900E-07
BP4 02	3/2/2010 8:25	41169		0.025357	1874.3571	8.820E-06	1.519E-05	1.700E-07	1.900E-07
BP4 03	3/2/2010 8:27	41169		0.025363	1872.9293	8.820E-06	1.533E-05	1.700E-07	1.900E-07
BP5 01	3/2/2010 8:28	41169		0.025355	1871.19	8.720E-06	1.517E-05	1.700E-07	1.900E-07
BP5 02	3/2/2010 8:30	41169		0.025355	1875.1412	8.790E-06	1.532E-05	1.700E-07	1.900E-07
BP5 03	3/2/2010 8:31	41169		0.025357	1874.8652	8.820E-06	1.524E-05	1.700E-07	1.900E-07
BP6 01	3/2/2010 8:33	41169		0.025355	1867.4966	8.840E-06	1.522E-05	1.700E-07	1.900E-07
BP6 02	3/2/2010 8:35	41169		0.025357	1874.9651	8.790E-06	1.517E-05	1.700E-07	1.900E-07
BP6 03	3/2/2010 8:36	41169		0.025362	1875.7652	8.790E-06	1.517E-05	1.700E-07	1.900E-07
BW1 01	3/3/2010 8:12	41169		0.025364	1871.9525	9.130E-06	1.538E-05	8.000E-08	2.000E-07
BW1 02	3/3/2010 8:13	41169		0.025362	1873.303	8.980E-06	1.530E-05	8.000E-08	2.000E-07
BW1 03	3/3/2010 8:15	41169		0.025365	1871.0996	9.010E-06	1.536E-05	8.000E-08	2.000E-07
BW10 01	3/3/2010 8:16	41169		0.025368	1872.8648	9.100E-06	1.545E-05	8.000E-08	2.000E-07
BW10 02	3/3/2010 8:18	41169		0.02537	1871.9233	9.030E-06	1.531E-05	8.000E-08	2.000E-07
BW10 03	3/3/2010 8:19	41169		0.02537	1870.9448	8.980E-06	1.538E-05	8.000E-08	2.000E-07
BW11 01	3/3/2010 10:27	41169		0.025371	1875.9007	9.030E-06	1.543E-05	1.900E-07	2.000E-07
BW11 02	3/3/2010 10:29	41169		0.025369	1871.1252	9.010E-06	1.536E-05	1.900E-07	2.000E-07
BW11 03	3/3/2010 10:31	41169		0.025369	1873.2766	8.960E-06	1.533E-05	1.900E-07	2.000E-07
BW12 01	3/3/2010 10:32	41169		0.025369	1875.1309	9.030E-06	1.538E-05	1.900E-07	2.000E-07
BW12 02	3/3/2010 10:34	41169		0.025369	1870.3507	8.960E-06	1.533E-05	1.900E-07	2.000E-07
BW12 03	3/3/2010 10:35	41169		0.025368	1872.3083	8.980E-06	1.532E-05	1.900E-07	2.000E-07
BW13 01	3/3/2010 10:37	41169		0.025369	1870.9084	9.050E-06	1.545E-05	1.900E-07	2.000E-07
BW13 02	3/3/2010 10:39	41169		0.025368	1872.2091	8.960E-06	1.534E-05	1.900E-07	2.000E-07
BW13 03	3/3/2010 10:40	41169		0.025367	1871.0851	8.980E-06	1.536E-05	1.900E-07	2.000E-07
BW14 01	3/3/2010 10:42	41169		0.025369	1868.5897	9.130E-06	1.539E-05	1.900E-07	2.000E-07
BW14 02	3/3/2010 10:44	41169		0.025369	1874.9573	9.080E-06	1.533E-05	1.900E-07	2.000E-07

Specimen ID Number	Date and Time	Operator	Specimen Location	Initial Specimen Length, m	Initial Specimen Density, ρ kg/m ³	Longitudinal Traverse Time, s	Shear Traverse Time, s	Longitudinal Zero Correction, s	Shear Zero Correction, s
BW14 03	3/3/2010 10:46	41169		0.025368	1873.3446	8.930E-06	1.524E-05	1.900E-07	2.000E-07
BW15 01	3/3/2010 10:47	41169		0.025366	1871.3236	9.080E-06	1.538E-05	1.900E-07	2.000E-07
BW15 02	3/3/2010 10:49	41169		0.025368	1872.9134	8.980E-06	1.540E-05	1.900E-07	2.000E-07
BW15 03	3/3/2010 10:50	41169		0.025368	1869.6565	8.980E-06	1.542E-05	1.900E-07	2.000E-07
BW16 01	3/3/2010 10:53	41169		0.025368	1871.8802	9.050E-06	1.539E-05	1.900E-07	2.000E-07
BW16 02	3/3/2010 10:54	41169		0.025366	1874.136	8.930E-06	1.538E-05	1.900E-07	2.000E-07
BW16 03	3/3/2010 10:55	41169		0.025368	1870.1953	9.010E-06	1.540E-05	1.900E-07	2.000E-07
BW2 01	3/3/2010 12:17	41169		0.025365	1871.8095	9.030E-06	1.538E-05	1.900E-07	2.000E-07
BW2 02	3/3/2010 12:19	41169		0.025364	1871.7723	8.980E-06	1.533E-05	1.900E-07	2.000E-07
BW2 03	3/3/2010 12:21	41169		0.025364	1870.4785	8.96E-06	1.538E-05	1.900E-07	2.000E-07
BW3 01	3/3/2010 12:22	41169		0.025365	1873.1217	8.98E-06	1.545E-05	1.900E-07	2.000E-07
BW3 02	3/3/2010 12:24	41169		0.025365	1870.5095	9.01E-06	1.537E-05	1.900E-07	2.000E-07
BW3 03	3/3/2010 12:26	41169		0.025365	1872.4547	9.03E-06	1.540E-05	1.900E-07	2.000E-07
BW4 01	3/3/2010 12:27	41169		0.025365	1871.147	9.03E-06	1.537E-05	1.900E-07	2.000E-07
BW4 02	3/3/2010 12:28	41169		0.025366	1870.0503	8.98E-06	1.533E-05	1.900E-07	2.000E-07
BW4 03	3/3/2010 12:29	41169		0.025367	1869.4806	8.96E-06	1.538E-05	1.900E-07	2.000E-07
BW5 01	3/3/2010 12:31	41169		0.025368	1871.7726	9.05E-06	1.550E-05	1.900E-07	2.000E-07
BW5 02	3/3/2010 12:32	41169		0.025369	1873.4597	8.96E-06	1.537E-05	1.900E-07	2.000E-07
BW5 03	3/3/2010 12:34	41169		0.025367	1870.8911	8.93E-06	1.536E-05	1.900E-07	2.000E-07
BW6 01	3/3/2010 12:36	41169		0.025369	1873.1016	9.08E-06	1.540E-05	1.900E-07	2.000E-07
BW6 02	3/3/2010 12:37	41169		0.025368	1870.9937	9.00E-06	1.548E-05	1.900E-07	2.000E-07
BW6 03	3/3/2010 12:39	41169		0.025367	1870.3916	8.84E-06	1.532E-05	1.900E-07	2.000E-07
BW7 01	3/3/2010 12:41	41169		0.02537	1873.1749	9.01E-06	1.549E-05	1.900E-07	2.000E-07
BW7 02	3/3/2010 12:42	41169		0.025367	1871.3447	8.97E-06	1.540E-05	1.900E-07	2.000E-07
BW7 03	3/3/2010 12:44	41169		0.025368	1868.6188	8.91E-06	1.539E-05	1.900E-07	2.000E-07
BW8 01	3/3/2010 12:45	41169		0.025369	1874.6903	8.96E-06	1.544E-05	1.900E-07	2.000E-07
BW8 02	3/3/2010 12:47	41169		0.025369	1872.1364	9.08E-06	1.534E-05	1.900E-07	2.000E-07
BW8 03	3/3/2010 12:48	41169		0.025366	1871.5493	8.91E-06	1.541E-05	1.900E-07	2.000E-07
BW9 01	3/3/2010 12:50	41169		0.025367	1871.1887	9.05E-06	1.538E-05	1.900E-07	2.000E-07
BW9 02	3/3/2010 12:51	41169		0.025368	1872.2674	9.05E-06	1.533E-05	1.900E-07	2.000E-07
BW9 03	3/3/2010 12:53	41169		0.025369	1871.0739	9.01E-06	1.539E-05	1.900E-07	2.000E-07

Specimen ID Number	Longitudinal Sonic Velocity (m/s)	Shear Sonic Velocities, (m/s)	Longitudinal Dynamic Young's Modulus (GPa)	Shear Dynamic Young's Modulus (GPa)	Poisson's Ratio $\mu = (1 - [2(v_s/v_l)^2]) / (2 - [2(v_s/v_l)^2])$
BP2 02	2.911E+03	1.684E+03	15.8620	5.3109	2.483E-01
BP2 03	2.925E+03	1.688E+03	16.0306	5.3413	2.502E-01
BP3 01	2.918E+03	1.690E+03	15.9195	5.3359	2.479E-01
BP3 02	2.918E+03	1.667E+03	15.9338	5.2012	2.577E-01
BP3 03	2.925E+03	1.685E+03	16.0167	5.3154	2.516E-01
BP4 01	2.959E+03	1.691E+03	16.3692	5.3433	2.577E-01
BP4 02	2.931E+03	1.690E+03	16.1070	5.3563	2.509E-01
BP4 03	2.932E+03	1.675E+03	16.1024	5.2562	2.577E-01
BP5 01	2.965E+03	1.693E+03	16.4556	5.3607	2.584E-01
BP5 02	2.941E+03	1.676E+03	16.2236	5.2660	2.597E-01
BP5 03	2.931E+03	1.685E+03	16.1114	5.3222	2.534E-01
BP6 01	2.924E+03	1.687E+03	15.9716	5.3146	2.507E-01
BP6 02	2.942E+03	1.693E+03	16.2246	5.3724	2.525E-01
BP6 03	2.942E+03	1.693E+03	16.2379	5.3768	2.525E-01
BW1 01	2.803E+03	1.671E+03	14.7039	5.2262	2.243E-01
BW1 02	2.850E+03	1.680E+03	15.2123	5.2847	2.338E-01
BW1 03	2.840E+03	1.673E+03	15.0961	5.2380	2.343E-01
BW10 01	2.812E+03	1.663E+03	14.8138	5.1825	2.310E-01
BW10 02	2.835E+03	1.679E+03	15.0412	5.2772	2.298E-01
BW10 03	2.851E+03	1.671E+03	15.2027	5.2259	2.381E-01
BW11 01	2.870E+03	1.666E+03	15.4519	5.2058	2.460E-01
BW11 02	2.876E+03	1.673E+03	15.4801	5.2398	2.442E-01
BW11 03	2.893E+03	1.677E+03	15.6751	5.2666	2.470E-01
BW12 01	2.870E+03	1.671E+03	15.4431	5.2371	2.434E-01
BW12 02	2.893E+03	1.677E+03	15.6506	5.2584	2.470E-01
BW12 03	2.886E+03	1.678E+03	15.5945	5.2704	2.448E-01
BW13 01	2.863E+03	1.664E+03	15.3388	5.1775	2.452E-01
BW13 02	2.893E+03	1.676E+03	15.6649	5.2562	2.475E-01
BW13 03	2.886E+03	1.673E+03	15.5831	5.2388	2.468E-01
BW14 01	2.838E+03	1.670E+03	15.0469	5.2120	2.350E-01
BW14 02	2.854E+03	1.677E+03	15.2684	5.2713	2.364E-01

Specimen ID Number	Longitudinal Sonic Velocity (m/s)	Shear Sonic Velocities, (m/s)	Longitudinal Dynamic Young's Modulus (GPa)	Shear Dynamic Young's Modulus (GPa)	Poisson's Ratio $\mu = (1 - \frac{[2(v_s/v_l)^2]}{2 - [2(v_s/v_l)^2]})$
BW14 03	2.903E+03	1.687E+03	15.7822	5.3296	2.451E-01
BW15 01	2.853E+03	1.671E+03	15.2352	5.2253	2.390E-01
BW15 02	2.886E+03	1.669E+03	15.5996	5.2168	2.488E-01
BW15 03	2.886E+03	1.667E+03	15.5724	5.1940	2.498E-01
BW16 01	2.863E+03	1.670E+03	15.3456	5.2208	2.422E-01
BW16 02	2.902E+03	1.671E+03	15.7864	5.2331	2.521E-01
BW16 03	2.876E+03	1.669E+03	15.4711	5.2092	2.462E-01
BW2 01	2.869E+03	1.671E+03	15.4109	5.2262	2.434E-01
BW2 02	2.886E+03	1.676E+03	15.5851	5.2603	2.453E-01
BW2 03	2.892E+03	1.671E+03	15.6455	5.2221	2.495E-01
BW3 01	2.886E+03	1.663E+03	15.5976	5.1820	2.512E-01
BW3 02	2.876E+03	1.672E+03	15.4701	5.2295	2.447E-01
BW3 03	2.869E+03	1.669E+03	15.4162	5.2143	2.444E-01
BW4 01	2.869E+03	1.672E+03	15.4054	5.2313	2.429E-01
BW4 02	2.886E+03	1.677E+03	15.5733	5.2563	2.453E-01
BW4 03	2.892E+03	1.671E+03	15.6408	5.2205	2.495E-01
BW5 01	2.863E+03	1.658E+03	15.3447	5.1457	2.477E-01
BW5 02	2.893E+03	1.672E+03	15.6766	5.2394	2.490E-01
BW5 03	2.902E+03	1.673E+03	15.7603	5.2383	2.511E-01
BW6 01	2.854E+03	1.669E+03	15.2533	5.2177	2.400E-01
BW6 02	2.879E+03	1.660E+03	15.5129	5.1570	2.510E-01
BW6 03	2.933E+03	1.678E+03	16.0856	5.2646	2.567E-01
BW7 01	2.876E+03	1.659E+03	15.4982	5.1571	2.507E-01
BW7 02	2.889E+03	1.669E+03	15.6208	5.2120	2.496E-01
BW7 03	2.909E+03	1.670E+03	15.8147	5.2117	2.542E-01
BW8 01	2.893E+03	1.665E+03	15.6869	5.1948	2.524E-01
BW8 02	2.854E+03	1.676E+03	15.2455	5.2564	2.369E-01
BW8 03	2.909E+03	1.668E+03	15.8370	5.2053	2.552E-01
BW9 01	2.863E+03	1.671E+03	15.3387	5.2253	2.417E-01
BW9 02	2.863E+03	1.677E+03	15.3487	5.2634	2.391E-01
BW9 03	2.876E+03	1.670E+03	15.4796	5.2189	2.457E-01

Specimen ID Number	Elastic Modulus, [GPa] $E = \rho v_l^2 [(1+\mu)(1-2\mu)/(1-\mu)]$	Environmental Conditions (Longitudinal)			Environmental Conditions (shear)		
		Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)
BP2 02	13.2594	22.6	25.3	12.1	22.7	25.3	12.1
BP2 03	13.3550	22.7	25.3	12.1	22.7	25.3	12.1
BP3 01	13.3175	22.7	25.3	12.1	22.7	25.3	12.1
BP3 02	13.0830	22.7	25.3	12.1	22.7	25.3	12.1
BP3 03	13.3060	22.6	25.3	12.1	22.7	25.3	12.1
BP4 01	13.4404	22.6	25.3	12.1	22.7	25.3	12.1
BP4 02	13.4003	22.7	25.3	12.1	22.7	25.3	12.1
BP4 03	13.2214	22.7	25.3	12.1	22.7	25.3	12.1
BP5 01	13.4920	22.7	25.3	12.1	22.7	25.3	12.1
BP5 02	13.2673	22.7	25.3	12.2	22.7	25.3	12.1
BP5 03	13.3413	22.7	25.3	12.1	22.7	25.3	12.1
BP6 01	13.2934	22.7	25.3	12.1	22.7	25.3	12.2
BP6 02	13.4575	22.7	25.3	12.1	22.7	25.3	12.1
BP6 03	13.4686	22.7	25.3	12.1	22.7	25.3	12.1
BW1 01	12.7968	22.6	25.1	22.7	22.6	25.1	22.7
BW1 02	13.0409	22.6	25.1	22.7	22.6	25.1	22.7
BW1 03	12.9309	22.6	25.1	22.7	22.6	25.1	22.7
BW10 01	12.7588	22.6	25.1	22.7	22.6	25.1	22.7
BW10 02	12.9793	22.6	25.1	22.7	22.6	25.1	22.8
BW10 03	12.9403	22.6	25.1	22.8	22.6	25.1	22.8
BW11 01	12.9724	23.1	25.1	22.3	23.1	25.1	22.3
BW11 02	13.0382	23.1	25.1	22.2	23.1	25.1	22.2
BW11 03	13.1350	23.1	25.1	22.2	23.1	25.1	22.2
BW12 01	13.0240	23.1	25.1	22.2	23.1	25.1	22.2
BW12 02	13.1144	23.1	25.1	22.2	23.1	25.1	22.1
BW12 03	13.1207	23.1	25.1	22.1	23.1	25.1	22.1
BW13 01	12.8944	23.1	25.1	22.1	23.1	25.1	22.1
BW13 02	13.1144	23.1	25.1	22.1	23.1	25.1	22.1
BW13 03	13.0633	23.1	25.1	22.1	23.1	25.1	22.1
BW14 01	12.8739	23.1	25.1	22.1	23.1	25.1	22.1
BW14 02	13.0345	23.2	25.1	22.1	23.1	25.1	22.1

Specimen ID Number	Elastic Modulus, [GPa] $E = \rho v_l^2 [(1+\mu)(1-2\mu)/(1-\mu)]$	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)
BW14 03	13.2713	23.1	25.1	22.1	23.1	25.1	22.1
BW15 01	12.9482	23.2	25.1	22.1	23.2	25.1	22.1
BW15 02	13.0292	23.2	25.1	22.1	23.2	25.1	22.1
BW15 03	12.9827	23.2	25.1	22.1	23.2	25.1	22.1
BW16 01	12.9703	23.2	25.1	22.1	23.2	25.1	22.1
BW16 02	13.1044	23.2	25.1	22.1	23.2	25.1	22.1
BW16 03	12.9833	23.2	25.1	22.1	23.2	25.1	22.1
BW2 01	12.9968	23	25.1	22.9	23	25.1	22.9
BW2 02	13.1009	23	25.1	22.8	23	25.1	22.9
BW2 03	13.0500	23	25.1	22.9	23	25.1	22.8
BW3 01	12.9678	23	25.1	22.8	23	25.1	22.8
BW3 02	13.0179	23	25.1	22.8	23	25.1	22.8
BW3 03	12.9778	23	25.1	22.8	23	25.1	22.8
BW4 01	13.0040	23.1	25.1	22.8	23	25.1	22.8
BW4 02	13.0909	23	25.1	22.8	23.1	25.1	22.8
BW4 03	13.0461	23.1	25.1	22.7	23.1	25.1	22.7
BW5 01	12.8409	23.1	25.1	22.7	23.1	25.1	22.7
BW5 02	13.0880	23.1	25.1	22.7	23	25.1	22.7
BW5 03	13.1070	23.1	25.1	22.7	23.1	25.1	22.7
BW6 01	12.9404	23.1	25.1	22.7	23.1	25.1	22.7
BW6 02	12.9030	23.1	25.1	22.7	23.1	25.1	22.7
BW6 03	13.2325	23.1	25.1	22.7	23.1	25.1	22.7
BW7 01	12.8994	23.1	25.1	22.7	23	25.1	22.8
BW7 02	13.0262	23	25.1	22.8	23	25.1	22.8
BW7 03	13.0733	23	25.1	22.8	23	25.1	22.8
BW8 01	13.0123	23	25.1	22.8	23	25.1	22.8
BW8 02	13.0033	23	25.1	22.8	23	25.1	22.7
BW8 03	13.0674	23	25.1	22.7	23	25.1	22.7
BW9 01	12.9762	23	25.1	22.7	23	25.1	22.8
BW9 02	13.0432	23	25.1	22.8	23	25.1	22.8
BW9 03	13.0023	23	25.1	22.7	23	25.1	22.7

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	BW16 02	W	25.365	25.362	25.362	25.365	12.733	12.731	12.732
	BP5 03	P	25.353	25.354	25.354	25.352	12.722	12.723	12.722
	BW16 01	W	25.365	25.367	25.366	25.365	12.731	12.732	12.735
	BP6 02	P	25.358	25.352	25.354	25.354	12.729	12.732	12.728
	BP6 03	P	25.358	25.357	25.356	25.356	12.728	12.726	12.727
	BW15 03	W	25.365	25.365	25.364	25.365	12.732	12.732	12.733
	BP6 01	P	25.351	25.349	25.349	25.350	12.722	12.722	12.724
	BW16 03	W	25.367	25.364	25.364	25.364	12.736	12.735	12.734
	BW4 01	W	25.365	25.363	25.363	25.362	12.726	12.727	12.727
	BW2 02	W	25.360	25.360	25.360	25.358	12.727	12.727	12.726
	BW4 02	W	25.361	25.360	25.361	25.362	12.725	12.725	12.727
	BW2 03	W	25.362	25.361	25.361	25.361	12.727	12.725	12.728
	BW3 02	W	25.361	25.364	25.364	25.361	12.726	12.727	12.728
	BW3 01	W	25.364	25.362	25.362	25.363	12.725	12.724	12.727
	BW2 01	W	25.361	25.360	25.360	25.360	12.723	12.726	12.728
	BW3 03	W	25.357	25.357	25.356	25.356	12.725	12.729	12.725
	BW11 01	W	25.368	25.368	25.369	25.370	12.729	12.727	12.728
	BW1 03	W	25.360	25.358	25.359	25.360	12.723	12.721	12.724
	BW1 01	W	25.360	25.360	25.363	25.360	12.734	12.730	12.731
	BW1 02	W	25.366	25.360	25.356	25.365	12.734	12.736	12.733
	BW10 03	W	25.368	25.364	25.362	25.367	12.729	12.732	12.733
	BW11 02	W	25.364	25.366	25.366	25.365	12.723	12.726	12.729
	BW10 01	W	25.366	25.366	25.366	25.365	12.731	12.727	12.730
	BW10 02	W	25.368	25.366	25.367	25.368	12.731	12.731	12.732
	BP5 02	P	25.340	25.340	25.338	25.342	12.714	12.715	12.718
	BW12 03	W	25.363	25.365	25.367	25.367	12.729	12.730	12.731
	BW12 01	W	25.364	25.369	25.365	25.364	12.723	12.724	12.723
	BW12 02	W	25.369	25.366	25.367	25.367	12.730	12.731	12.731
	BW11 03	W	25.365	25.366	25.364	25.365	12.723	12.725	12.723
	BP4 03	P	25.358	25.356	25.356	25.357	12.728	12.730	12.727
	BP4 02	P	25.354	25.356	25.352	25.355	12.730	12.728	12.725
	BP5 01	P	25.354	25.354	25.354	25.355	12.724	12.723	12.726
	BW13 02	W	25.364	25.364	25.364	25.363	12.728	12.729	12.730

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	BW13 01	W	25.366	25.366	25.368	25.365	12.727	12.727	12.727
	BW14 01	W	25.366	25.366	25.366	25.366	12.734	12.729	12.732
	BW15 01	W	25.366	25.366	25.365	25.367	12.732	12.732	12.731
	BW13 03	W	25.362	25.364	25.364	25.363	12.731	12.730	12.732
	BW14 02	W	25.365	25.366	25.366	25.364	12.729	12.727	12.728
	BW15 02	W	25.365	25.363	25.363	25.364	12.732	12.732	12.732
	BW14 03	W	25.363	25.365	25.361	25.362	12.731	12.734	12.731
	BW5 03	W	25.362	25.363	25.363	25.364	12.722	12.724	12.725
	BP3 03	P	25.349	25.352	25.352	25.352	12.728	12.730	12.731
	BW4 03	W	25.360	25.362	25.364	25.363	12.729	12.727	12.725
	BW5 01	W	25.363	25.365	25.365	25.362	12.723	12.724	12.725
	BP3 01	P	25.361	25.360	25.360	25.361	12.722	12.723	12.724
	BP4 01	P	25.361	25.361	25.360	25.361	12.729	12.728	12.727
	BP3 02	P	25.356	25.352	25.354	25.354	12.724	12.724	12.724
	BW5 02	W	25.366	25.365	25.366	25.365	12.725	12.724	12.728

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
BW16 02	12.732	12.734	12.731	12.733	12.733	0.000	0.000	0.000	0.000
BP5 03	12.724	12.726	12.726	12.730	12.730	0.000	0.000	0.000	0.000
BW16 01	12.738	12.733	12.732	12.732	12.727	0.000	0.000	0.000	0.000
BP6 02	12.726	12.726	12.726	12.726	12.728	0.000	0.000	0.000	0.000
BP6 03	12.727	12.727	12.724	12.726	12.724	0.000	0.000	0.000	0.000
BW15 03	12.735	12.736	12.736	12.735	12.739	0.000	0.000	0.000	0.000
BP6 01	12.723	12.724	12.725	12.723	12.726	0.000	0.000	0.000	0.000
BW16 03	12.734	12.735	12.733	12.735	12.733	0.000	0.000	0.000	0.000
BW4 01	12.728	12.723	12.725	12.725	12.724	0.000	0.000	0.000	0.000
BW2 02	12.728	12.731	12.727	12.725	12.728	0.000	0.000	0.000	0.000
BW4 02	12.724	12.727	12.725	12.727	12.726	0.000	0.000	0.000	0.000
BW2 03	12.730	12.725	12.725	12.724	12.727	0.000	0.000	0.000	0.000
BW3 02	12.728	12.725	12.723	12.723	12.722	0.000	0.000	0.000	0.000
BW3 01	12.728	12.729	12.727	12.727	12.727	0.000	0.000	0.000	0.000
BW2 01	12.724	12.729	12.728	12.725	12.728	0.000	0.000	0.000	0.000
BW3 03	12.724	12.721	12.720	12.722	12.721	0.000	0.000	0.000	0.000
BW11 01	12.725	12.723	12.723	12.724	12.726	0.000	0.000	0.000	0.000
BW1 03	12.726	12.728	12.727	12.727	12.727	0.000	0.000	0.000	0.000
BW1 01	12.730	12.735	12.734	12.734	12.732	0.000	0.000	0.000	0.000
BW1 02	12.732	12.730	12.731	12.729	12.727	0.000	0.000	0.000	0.000
BW10 03	12.733	12.732	12.731	12.731	12.732	0.000	0.000	0.000	0.000
BW11 02	12.727	12.719	12.723	12.725	12.728	0.000	0.000	0.000	0.000
BW10 01	12.729	12.735	12.734	12.736	12.738	0.000	0.000	0.000	0.000
BW10 02	12.729	12.733	12.731	12.731	12.734	0.000	0.000	0.000	0.000
BP5 02	12.715	12.704	12.715	12.717	12.714	0.000	0.000	0.000	0.000
BW12 03	12.734	12.727	12.726	12.726	12.726	0.000	0.000	0.000	0.000
BW12 01	12.726	12.730	12.730	12.730	12.729	0.000	0.000	0.000	0.000
BW12 02	12.734	12.731	12.730	12.727	12.726	0.000	0.000	0.000	0.000
BW11 03	12.724	12.727	12.729	12.728	12.732	0.000	0.000	0.000	0.000
BP4 03	12.730	12.723	12.725	12.726	12.725	0.000	0.000	0.000	0.000
BP4 02	12.724	12.723	12.724	12.722	12.727	0.000	0.000	0.000	0.000
BP5 01	12.723	12.730	12.726	12.727	12.722	0.000	0.000	0.000	0.000
BW13 02	12.727	12.726	12.723	12.727	12.724	0.000	0.000	0.000	0.000

Specimen ID Number	D ⁹⁰				D4 ⁹⁰	H1'				H2	H2'
	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰		D4 ⁹⁰	H1	H1'	H2		
BW13 01	12.726	12.725	12.726	12.727	12.725	0.000	0.000	0.000	0.000	0.000	
BW14 01	12.732	12.731	12.731	12.731	12.727	0.000	0.000	0.000	0.000	0.000	
BW15 01	12.727	12.734	12.733	12.733	12.731	0.000	0.000	0.000	0.000	0.000	
BW13 03	12.729	12.729	12.727	12.728	12.729	0.000	0.000	0.000	0.000	0.000	
BW14 02	12.729	12.728	12.729	12.727	12.729	0.000	0.000	0.000	0.000	0.000	
BW15 02	12.732	12.731	12.731	12.732	12.729	0.000	0.000	0.000	0.000	0.000	
BW14 03	12.731	12.730	12.733	12.732	12.729	0.000	0.000	0.000	0.000	0.000	
BW5 03	12.727	12.728	12.728	12.729	12.728	0.000	0.000	0.000	0.000	0.000	
BP3 03	12.728	12.719	12.721	12.720	12.724	0.000	0.000	0.000	0.000	0.000	
BW4 03	12.725	12.725	12.724	12.724	12.725	0.000	0.000	0.000	0.000	0.000	
BW5 01	12.726	12.727	12.727	12.723	12.723	0.000	0.000	0.000	0.000	0.000	
BP3 01	12.726	12.721	12.722	12.722	12.722	0.000	0.000	0.000	0.000	0.000	
BP4 01	12.727	12.724	12.722	12.721	12.723	0.000	0.000	0.000	0.000	0.000	
BP3 02	12.723	12.723	12.720	12.718	12.720	0.000	0.000	0.000	0.000	0.000	
BW5 02	12.724	12.722	12.719	12.726	12.726	0.000	0.000	0.000	0.000	0.000	

Specimen ID Number	Final Hole Diameter, mm		Final Hole Depth, mm		Final Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
BW16 02	0.000	0.000	0.000	0.000	5.95987	41169	12/2/2010 14:26
BP5 03	0.000	0.000	0.000	0.000	5.94571	41169	12/2/2010 15:05
BW16 01	0.000	0.000	0.000	0.000	5.95375	41169	12/2/2010 15:23
BP6 02	0.000	0.000	0.000	0.000	5.94616	41169	12/2/2010 15:32
BP6 03	0.000	0.000	0.000	0.000	5.94721	41169	12/2/2010 15:41
BW15 03	0.000	0.000	0.000	0.000	5.94338	41169	12/2/2010 15:44
BP6 01	0.000	0.000	0.000	0.000	5.92448	41169	12/2/2010 15:46
BW16 03	0.000	0.000	0.000	0.000	5.94650	41169	12/3/2010 9:05
BW4 01	0.000	0.000	0.000	0.000	5.94106	41169	12/3/2010 10:19
BW2 02	0.000	0.000	0.000	0.000	5.94194	41169	12/3/2010 10:47
BW4 02	0.000	0.000	0.000	0.000	5.94087	41169	12/3/2010 11:02
BW2 03	0.000	0.000	0.000	0.000	5.94066	41169	12/3/2010 11:15
BW3 02	0.000	0.000	0.000	0.000	5.94229	41169	12/3/2010 11:25
BW3 01	0.000	0.000	0.000	0.000	5.94502	41169	12/3/2010 11:34
BW2 01	0.000	0.000	0.000	0.000	5.94161	41169	12/3/2010 11:39
BW3 03	0.000	0.000	0.000	0.000	5.94065	41169	12/3/2010 11:50
BW11 01	0.000	0.000	0.000	0.000	5.95722	41169	12/3/2010 13:41
BW1 03	0.000	0.000	0.000	0.000	5.94023	41169	12/3/2010 14:02
BW1 01	0.000	0.000	0.000	0.000	5.94994	41169	12/3/2010 14:04
BW1 02	0.000	0.000	0.000	0.000	5.95191	41169	12/3/2010 14:08
BW10 03	0.000	0.000	0.000	0.000	5.95097	41169	12/3/2010 14:27
BW11 02	0.000	0.000	0.000	0.000	5.94185	41169	12/4/2010 7:29
BW10 01	0.000	0.000	0.000	0.000	5.95050	41169	12/4/2010 7:35
BW10 02	0.000	0.000	0.000	0.000	5.95202	41169	12/4/2010 7:42
BP5 02	0.000	0.000	0.000	0.000	5.91961	41169	12/4/2010 8:33
BW12 03	0.000	0.000	0.000	0.000	5.94650	41169	12/4/2010 8:37
BW12 01	0.000	0.000	0.000	0.000	5.95512	41169	12/4/2010 8:54
BW12 02	0.000	0.000	0.000	0.000	5.94237	41169	12/4/2010 9:10
BW11 03	0.000	0.000	0.000	0.000	5.95106	41169	12/4/2010 9:30
BP4 03	0.000	0.000	0.000	0.000	5.93992	41169	12/4/2010 9:44
BP4 02	0.000	0.000	0.000	0.000	5.94373	41169	12/4/2010 9:51
BP5 01	0.000	0.000	0.000	0.000	5.93731	41169	12/4/2010 9:55
BW13 02	0.000	0.000	0.000	0.000	5.94609	41169	12/4/2010 11:14

Specimen ID Number	Final Hole Diameter, mm	Final Hole Depth, mm		Final Specimen Mass, g	Measurements by:	Date: mm/dd/yr
		HD1	HD2			
BW13 01	0.000	0.000	0.000	5.94541	41169	12/4/2010 12:46
BW14 01	0.000	0.000	0.000	5.94146	41169	12/4/2010 12:49
BW15 01	0.000	0.000	0.000	5.94712	41169	12/4/2010 12:50
BW13 03	0.000	0.000	0.000	5.94427	41169	12/4/2010 13:05
BW14 02	0.000	0.000	0.000	5.95811	41169	12/4/2010 13:11
BW15 02	0.000	0.000	0.000	5.95384	41169	12/4/2010 13:16
BW14 03	0.000	0.000	0.000	5.95347	41169	12/4/2010 13:20
BW5 03	0.000	0.000	0.000	5.94117	47735	12/4/2010 13:35
BP3 03	0.000	0.000	0.000	5.93800	47735	12/4/2010 13:51
BW4 03	0.000	0.000	0.000	5.93761	47735	12/4/2010 14:01
BW5 01	0.000	0.000	0.000	5.94340	47735	12/4/2010 14:04
BP3 01	0.000	0.000	0.000	5.92781	41169	12/4/2010 14:43
BP4 01	0.000	0.000	0.000	5.93029	41169	12/4/2010 14:45
BP3 02	0.000	0.000	0.000	5.93136	41169	12/4/2010 14:53
BW5 02	0.000	0.000	0.000	5.95090	41169	12/4/2010 14:55

Specimen ID Number	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m	Total Hole Volume m ³	Final Specimen Mass kg
BW16 02	25.36350	12.73238	127.3235	0.025364	0.01273	0.0000E+00	0.0060
BP5 03	25.35325	12.72538	127.1836	0.025353	0.01273	0.0000E+00	0.0059
BW16 01	25.36575	12.73250	127.3260	0.025366	0.01273	0.0000E+00	0.0060
BP6 02	25.35450	12.72763	127.2286	0.025355	0.01273	0.0000E+00	0.0059
BP6 03	25.35675	12.72613	127.1986	0.025357	0.01273	0.0000E+00	0.0059
BW15 03	25.36475	12.73475	127.3710	0.025365	0.01273	0.0000E+00	0.0059
BP6 01	25.34975	12.72363	127.1486	0.025350	0.01272	0.0000E+00	0.0059
BW16 03	25.36500	12.73438	127.3635	0.025365	0.01273	0.0000E+00	0.0059
BW4 01	25.36325	12.72563	127.1886	0.025363	0.01273	0.0000E+00	0.0059
BW2 02	25.35950	12.72738	127.2236	0.025360	0.01273	0.0000E+00	0.0059
BW4 02	25.36100	12.72575	127.1911	0.025361	0.01273	0.0000E+00	0.0059
BW2 03	25.36100	12.72638	127.2036	0.025361	0.01273	0.0000E+00	0.0059
BW3 02	25.36225	12.72525	127.1811	0.025362	0.01273	0.0000E+00	0.0059
BW3 01	25.36275	12.72675	127.2111	0.025363	0.01273	0.0000E+00	0.0059
BW2 01	25.36100	12.72638	127.2036	0.025361	0.01273	0.0000E+00	0.0059
BW3 03	25.35650	12.72338	127.1436	0.025357	0.01272	0.0000E+00	0.0059
BW11 01	25.36875	12.72563	127.1886	0.025369	0.01273	0.0000E+00	0.0060
BW1 03	25.35925	12.72538	127.1836	0.025359	0.01273	0.0000E+00	0.0059
BW1 01	25.36075	12.73250	127.3260	0.025361	0.01273	0.0000E+00	0.0059
BW1 02	25.36175	12.73150	127.3060	0.025362	0.01273	0.0000E+00	0.0060
BW10 03	25.36525	12.73163	127.3085	0.025365	0.01273	0.0000E+00	0.0060
BW11 02	25.36525	12.72500	127.1761	0.025365	0.01273	0.0000E+00	0.0059
BW10 01	25.36625	12.73250	127.3260	0.025366	0.01273	0.0000E+00	0.0060
BW10 02	25.36725	12.73150	127.3060	0.025367	0.01273	0.0000E+00	0.0060
BP5 02	25.34000	12.71400	126.9563	0.025340	0.01271	0.0000E+00	0.0059
BW12 03	25.36550	12.72863	127.2486	0.025366	0.01273	0.0000E+00	0.0059
BW12 01	25.36550	12.72688	127.2136	0.025366	0.01273	0.0000E+00	0.0060
BW12 02	25.36725	12.73000	127.2761	0.025367	0.01273	0.0000E+00	0.0059
BW11 03	25.36500	12.72638	127.2036	0.025365	0.01273	0.0000E+00	0.0060
BP4 03	25.35675	12.72675	127.2111	0.025357	0.01273	0.0000E+00	0.0059
BP4 02	25.35425	12.72538	127.1836	0.025354	0.01273	0.0000E+00	0.0059
BP5 01	25.35425	12.72513	127.1786	0.025354	0.01273	0.0000E+00	0.0059
BW13 02	25.36375	12.72638	127.2036	0.025364	0.01273	0.0000E+00	0.0059

Specimen ID Number	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m	Total Hole Volume m ³	Final Specimen Mass kg
BW13 01	25.36625	12.72625	127.2011	0.025366	0.01273	0.0000E+00	0.0059
BW14 01	25.36600	12.73088	127.2935	0.025366	0.01273	0.0000E+00	0.0059
BW15 01	25.36600	12.73163	127.3085	0.025366	0.01273	0.0000E+00	0.0059
BW13 03	25.36325	12.72938	127.2636	0.025363	0.01273	0.0000E+00	0.0059
BW14 02	25.36525	12.72825	127.2411	0.025365	0.01273	0.0000E+00	0.0060
BW15 02	25.36375	12.73138	127.3035	0.025364	0.01273	0.0000E+00	0.0060
BW14 03	25.36275	12.73213	127.3185	0.025363	0.01273	0.0000E+00	0.0060
BW5 03	25.36300	12.72638	127.2036	0.025363	0.01273	0.0000E+00	0.0059
BP3 03	25.35125	12.72513	127.1786	0.025351	0.01273	0.0000E+00	0.0059
BW4 03	25.36225	12.72550	127.1861	0.025362	0.01273	0.0000E+00	0.0059
BW5 01	25.36375	12.72475	127.1711	0.025364	0.01272	0.0000E+00	0.0059
BP3 01	25.36050	12.72275	127.1311	0.025361	0.01272	0.0000E+00	0.0059
BP4 01	25.36075	12.72513	127.1786	0.025361	0.01273	0.0000E+00	0.0059
BP3 02	25.35400	12.72200	127.1161	0.025354	0.01272	0.0000E+00	0.0059
BW5 02	25.36550	12.72425	127.1611	0.025366	0.01272	0.0000E+00	0.0060

Specimen ID Number	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
BW16 02	25.2	24	16.9
BP5 03	25.2	23.7	17.3
BW16 01	25.2	23.8	17.2
BP6 02	25.2	23.9	17.3
BP6 03	25.2	24.1	17.1
BW15 03	25.2	24.1	17.1
BP6 01	25.2	24.2	16.9
BW16 03	25.2	23	20.9
BW4 01	25.3	23.1	20.6
BW2 02	25.3	23.3	20.3
BW4 02	25.3	23.2	20.3
BW2 03	25.3	23.3	20.2
BW3 02	25.3	23.2	20.2
BW3 01	25.3	23.2	20.1
BW2 01	25.3	23.1	20.1
BW3 03	25.3	23.3	19.9
BW11 01	25.3	22.7	19.9
BW1 03	25.3	22.8	19.5
BW1 01	25.3	22.8	19.5
BW1 02	25.3	22.9	19.5
BW10 03	25.3	22.8	19.5
BW11 02	25.4	22.1	13.4
BW10 01	25.4	22.2	13.3
BW10 02	25.4	22.4	13.1
BP5 02	25.4	22.3	13.1
BW12 03	25.4	22.4	13
BW12 01	25.4	22.5	12.9
BW12 02	25.4	22.5	12.9
BW11 03	25.4	22.3	13
BP4 03	25.4	22.5	12.8
BP4 02	25.4	22.5	12.8
BP5 01	25.4	22.5	12.7
BW13 02	25.4	22	13.1

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity
and Temperature Transmitter Model PTU301

Specimen ID Number	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
BW13 01	25.4	22.4	13.6
BW14 01	25.4	22.3	13.6
BW15 01	25.4	22.3	13.7
BW13 03	25.4	22.3	13.8
BW14 02	25.4	22.4	13.8
BW15 02	25.4	22.4	13.9
BW14 03	25.4	22.4	13.9
BW5 03	25.4	22.2	17.2
BP3 03	25.4	22.2	17.3
BW4 03	25.4	22.2	17.3
BW5 01	25.4	22.2	17.3
BP3 01	25.4	22.6	14.7
BP4 01	25.4	22.6	14.7
BP3 02	25.4	22.7	14.7
BW5 02	25.4	22.8	14.7

Graphite Grade: PCEA
Graphite Manufacturer: Graftech International
Forming Process: Extruded
Coke Particle Size: Medium grain
Coke Type: Pitch coke filler, pitch binder
ASTM Class: ENHP
Specimen Geometry: Cylinder

Specimen ID #'s:

DA4 02
DA6 03
DA6 01
DA5 03
DA6 02
DA2 03
DA2 02
DA7 02
DA4 01
DA4 03
DA5 01
DA1 02
DA3 03
DA2 01
DA3 02
DA5 02
DA1 01
DA1 03
DA7 01
DA3 01
DA7 03
DW5 02
DW6 03
DW4 04
DW17 03
DW8 02
DW9 01
DW14 01
DW5 01
DW10 03
DW1 04
DW2 01
DW9 02
DW1 03
DW12 01
DW15 04
DW11 04
DW8 03
DW10 04
DW13 04
DW7 04
DW15 03

Specimen ID #'s:

DW3 03
DW14 02
DW12 03
DW1 02
DW6 02
DW7 02
DW4 02
DW7 01
DW12 02
DW2 04
DW5 04
DW10 01
DW17 04
DW10 02
DW13 01
DW9 03
DW9 04
DW1 01
DW2 03
DW16 03
DW14 03
DW3 02
DW14 04
DW17 02
DW11 03
DW16 02
DW17 01
DW3 01
DW16 04
DW13 02
DW8 01
DW15 01
DW4 03
DW11 01
DW5 03
DW16 01
DW6 01
DW11 02
DW4 01
DW7 03
DW3 04
DW6 04
DW13 03
DW8 04
DW15 02
DW12 04
DW2 02

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	DA4 02	A	25.385	25.380	25.380	25.385	12.749	12.746	12.745
	DA6 03	A	25.397	25.401	25.399	25.398	12.747	12.747	12.747
	DA6 01	A	25.393	25.392	25.391	25.394	12.749	12.746	12.746
	DA5 03	A	25.391	25.390	25.390	25.390	12.746	12.747	12.747
	DA6 02	A	25.394	25.398	25.397	25.394	12.737	12.741	12.744
	DA2 03	A	25.399	25.398	25.396	25.399	12.746	12.747	12.748
	DA2 02	A	25.388	25.391	25.390	25.389	12.749	12.749	12.749
	DA7 02	A	25.397	25.398	25.398	25.401	12.751	12.754	12.754
	DA4 01	A	25.397	25.397	25.401	25.399	12.744	12.742	12.740
	DA4 03	A	25.372	25.375	25.373	25.375	12.737	12.738	12.742
	DA5 01	A	25.391	25.391	25.392	25.392	12.743	12.746	12.745
	DA1 02	A	25.384	25.385	25.387	25.386	12.751	12.751	12.749
	DA3 03	A	25.398	25.398	25.395	25.397	12.736	12.736	12.739
	DA2 01	A	25.398	25.397	25.399	25.398	12.744	12.745	12.749
	DA3 02	A	25.397	25.396	25.398	25.397	12.745	12.743	12.746
	DA5 02	A	25.386	25.383	25.384	25.386	12.742	12.743	12.744
	DA1 01	A	25.389	25.388	25.386	25.387	12.745	12.743	12.744
	DA1 03	A	25.386	25.388	25.388	25.387	12.750	12.750	12.751
	DA7 01	A	25.397	25.397	25.397	25.396	12.746	12.746	12.745
	DA3 01	A	25.402	25.403	25.404	25.404	12.748	12.748	12.749
	DA7 03	A	25.395	25.396	25.396	25.395	12.747	12.748	12.747
	DW5 02	W	25.371	25.370	25.369	25.369	12.744	12.744	12.742
	DW6 03	W	25.371	25.371	25.371	25.371	12.748	12.748	12.748
	DW4 04	W	25.369	25.370	25.372	25.372	12.737	12.739	12.741
	DW17 03	W	25.402	25.400	25.400	25.400	12.747	12.745	12.744
	DW8 02	W	25.368	25.368	25.369	25.371	12.739	12.736	12.732
	DW9 01	W	25.371	25.372	25.371	25.372	12.737	12.737	12.740
	DW14 01	W	25.374	25.373	25.375	25.376	12.739	12.741	12.741
	DW5 01	W	25.370	25.369	25.370	25.369	12.737	12.733	12.732
	DW10 03	W	25.368	25.371	25.372	25.372	12.734	12.733	12.727
	DW1 04	W	25.403	25.405	25.406	25.405	12.717	12.718	12.722
	DW2 01	W	25.383	25.382	25.380	25.383	12.725	12.728	12.730
	DW9 02	W	25.368	25.368	25.368	25.368	12.741	12.737	12.733

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	DW1 03	W	25.402	25.400	25.402	25.401	12.726	12.726	12.722
	DW12 01	W	25.372	25.372	25.373	25.372	12.735	12.732	12.725
	DW15 04	W	25.393	25.394	25.394	25.394	12.742	12.745	12.746
	DW11 04	W	25.369	25.371	25.371	25.371	12.733	12.733	12.727
	DW8 03	W	25.373	25.373	25.373	25.373	12.737	12.734	12.729
	DW10 04	W	25.371	25.370	25.370	25.369	12.735	12.731	12.727
	DW13 04	W	25.371	25.371	25.373	25.372	12.726	12.732	12.737
	DW7 04	W	25.369	25.371	25.368	25.369	12.737	12.739	12.738
	DW15 03	W	25.387	25.386	25.387	25.386	12.739	12.738	12.739
	DW3 03	W	25.365	25.367	25.367	25.366	12.720	12.727	12.731
	DW14 02	W	25.374	25.373	25.373	25.372	12.738	12.735	12.730
	DW12 03	W	25.371	25.371	25.372	25.371	12.733	12.735	12.741
	DW1 02	W	25.393	25.391	25.390	25.391	12.727	12.727	12.721
	DW6 02	W	25.371	25.370	25.370	25.370	12.740	12.739	12.736
	DW7 02	W	25.370	25.368	25.368	25.367	12.733	12.735	12.736
	DW4 02	W	25.370	25.370	25.370	25.368	12.734	12.737	12.739
	DW7 01	W	25.368	25.369	25.370	25.368	12.744	12.741	12.738
	DW12 02	W	25.371	25.370	25.371	25.372	12.735	12.731	12.726
	DW2 04	W	25.369	25.364	25.365	25.366	12.719	12.721	12.727
	DW5 04	W	25.371	25.370	25.371	25.369	12.719	12.725	12.728
	DW10 01	W	25.373	25.372	25.370	25.370	12.743	12.745	12.742
	DW17 04	W	25.387	25.386	25.385	25.388	12.745	12.741	12.737
	DW10 02	W	25.369	25.371	25.372	25.370	12.736	12.734	12.732
	DW13 01	W	25.372	25.372	25.373	25.372	12.739	12.738	12.737
	DW9 03	W	25.374	25.373	25.372	25.370	12.744	12.739	12.734
	DW9 04	W	25.371	25.371	25.371	25.372	12.741	12.739	12.740
	DW1 01	W	25.378	25.378	25.377	25.376	12.717	12.719	12.722
	DW2 03	W	25.368	25.369	25.371	25.364	12.731	12.736	12.736
	DW16 03	W	25.381	25.381	25.380	25.380	12.738	12.740	12.740
	DW14 03	W	25.374	25.373	25.373	25.374	12.728	12.732	12.737
	DW3 02	W	25.365	25.365	25.366	25.366	12.734	12.727	12.724
	DW14 04	W	25.374	25.374	25.372	25.376	12.724	12.729	12.734
	DW17 02	W	25.397	25.395	25.397	25.397	12.728	12.739	12.742
	DW11 03	W	25.371	25.372	25.375	25.374	12.735	12.736	12.737

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	DW16 02	W	25.392	25.390	25.390	25.391	12.734	12.738	12.739
	DW17 01	W	25.401	25.400	25.399	25.400	12.736	12.738	12.741
	DW3 01	W	25.364	25.366	25.365	25.366	12.732	12.729	12.725
	DW16 04	W	25.385	25.384	25.386	25.385	12.749	12.748	12.746
	DW13 02	W	25.374	25.374	25.373	25.372	12.723	12.727	12.732
	DW8 01	W	25.371	25.370	25.371	25.371	12.738	12.734	12.731
	DW15 01	W	25.345	25.343	25.343	25.341	12.757	12.759	12.762
	DW4 03	W	25.368	25.370	25.370	25.370	12.736	12.740	12.740
	DW11 01	W	25.370	25.371	25.371	25.372	12.739	12.738	12.740
	DW5 03	W	25.369	25.369	25.369	25.370	12.716	12.726	12.733
	DW16 01	W	25.384	25.384	25.383	25.383	12.740	12.739	12.736
	DW6 01	W	25.372	25.371	25.372	25.372	12.729	12.734	12.738
	DW11 02	W	25.372	25.371	25.370	25.370	12.735	12.734	12.729
	DW4 01	W	25.371	25.369	25.368	25.369	12.733	12.737	12.741
	DW7 03	W	25.369	25.368	25.368	25.369	12.737	12.735	12.733
	DW3 04	W	25.368	25.369	25.366	25.366	12.723	12.731	12.733
	DW6 04	W	25.375	25.370	25.371	25.370	12.742	12.743	12.745
	DW13 03	W	25.373	25.373	25.374	25.374	12.740	12.734	12.728
	DW8 04	W	25.369	25.369	25.371	25.370	12.735	12.732	12.728
	DW15 02	W	25.389	25.390	25.391	25.389	12.726	12.729	12.732
	DW12 04	W	25.371	25.370	25.371	25.371	12.724	12.730	12.736
	DW2 02	W	25.364	25.364	25.363	25.365	12.718	12.725	12.730

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
DA4 02	12.746	12.749	12.747	12.748	12.745	3.040	3.030	3.050	3.060
DA6 03	12.748	12.742	12.744	12.746	12.748	3.040	3.060	3.070	3.030
DA6 01	12.748	12.748	12.746	12.743	12.740	3.080	3.080	3.050	3.050
DA5 03	12.747	12.747	12.745	12.741	12.740	3.080	3.050	3.070	3.050
DA6 02	12.745	12.747	12.748	12.748	12.747	3.050	3.040	3.050	3.060
DA2 03	12.748	12.746	12.747	12.749	12.749	3.060	3.030	3.050	3.040
DA2 02	12.749	12.746	12.746	12.746	12.748	3.070	3.050	3.060	3.040
DA7 02	12.757	12.750	12.749	12.748	12.746	3.080	3.070	3.080	3.060
DA4 01	12.737	12.745	12.743	12.742	12.739	3.080	3.060	3.060	3.050
DA4 03	12.743	12.742	12.745	12.746	12.747	3.070	3.070	3.070	3.080
DA5 01	12.746	12.737	12.739	12.741	12.744	3.070	3.070	3.070	3.070
DA1 02	12.750	12.748	12.748	12.747	12.746	3.080	3.050	3.060	3.070
DA3 03	12.741	12.736	12.740	12.742	12.742	3.040	3.050	3.050	3.080
DA2 01	12.748	12.739	12.742	12.745	12.747	3.030	3.070	3.090	3.070
DA3 02	12.745	12.746	12.747	12.747	12.749	3.060	3.070	3.080	3.070
DA5 02	12.745	12.742	12.744	12.747	12.747	3.080	3.040	3.080	3.040
DA1 01	12.745	12.744	12.741	12.739	12.737	3.040	3.070	3.080	3.090
DA1 03	12.750	12.748	12.748	12.748	12.748	3.060	3.050	3.070	3.060
DA7 01	12.746	12.749	12.748	12.749	12.750	3.080	3.060	3.080	3.060
DA3 01	12.751	12.751	12.751	12.752	12.753	3.070	3.060	3.070	3.060
DA7 03	12.749	12.752	12.752	12.750	12.752	3.060	3.060	3.070	3.070
DW5 02	12.735	12.739	12.737	12.735	12.724	3.110	3.080	3.050	3.070
DW6 03	12.745	12.740	12.742	12.740	12.738	3.070	3.060	3.060	3.060
DW4 04	12.741	12.732	12.734	12.734	12.735	3.060	3.080	3.070	3.070
DW17 03	12.745	12.750	12.750	12.749	12.744	3.080	3.070	3.080	3.080
DW8 02	12.731	12.737	12.733	12.730	12.733	3.060	3.070	3.090	3.070
DW9 01	12.743	12.741	12.745	12.746	12.746	3.100	3.100	3.070	3.090
DW14 01	12.743	12.737	12.737	12.736	12.735	3.080	3.070	3.060	3.060
DW5 01	12.728	12.736	12.729	12.724	12.720	3.060	3.050	3.060	3.060
DW10 03	12.722	12.737	12.735	12.732	12.729	3.070	3.070	3.070	3.040
DW1 04	12.726	12.716	12.723	12.726	12.729	3.090	3.060	3.100	3.100
DW2 01	12.731	12.728	12.729	12.733	12.732	3.070	3.060	3.100	3.070
DW9 02	12.735	12.741	12.741	12.738	12.738	3.090	3.080	3.080	3.080

Specimen ID Number	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'
DW1 03	12.720	12.726	12.724	12.722	12.715	3.100	3.100	3.070	3.050
DW12 01	12.718	12.736	12.733	12.729	12.724	3.070	3.070	3.080	3.050
DW15 04	12.746	12.744	12.745	12.747	12.746	3.080	3.080	3.080	3.080
DW11 04	12.720	12.737	12.733	12.731	12.724	3.080	3.050	3.080	3.100
DW8 03	12.721	12.736	12.735	12.729	12.723	3.090	3.050	3.070	3.070
DW10 04	12.720	12.736	12.732	12.726	12.721	3.080	3.080	3.100	3.090
DW13 04	12.739	12.724	12.729	12.735	12.738	3.100	3.100	3.090	3.080
DW7 04	12.739	12.734	12.735	12.738	12.739	3.100	3.070	3.090	3.070
DW15 03	12.735	12.738	12.734	12.725	12.722	3.070	3.070	3.090	3.080
DW3 03	12.734	12.720	12.725	12.731	12.733	3.100	3.090	3.090	3.090
DW14 02	12.724	12.737	12.734	12.728	12.721	3.090	3.080	3.090	3.080
DW12 03	12.739	12.735	12.735	12.738	12.740	3.080	3.070	3.090	3.080
DW1 02	12.715	12.730	12.727	12.723	12.719	3.090	3.080	3.090	3.100
DW6 02	12.729	12.743	12.742	12.740	12.737	3.090	3.090	3.080	3.070
DW7 02	12.735	12.720	12.724	12.731	12.733	3.080	3.050	3.060	3.090
DW4 02	12.740	12.732	12.736	12.739	12.740	3.070	3.080	3.080	3.080
DW7 01	12.733	12.743	12.738	12.734	12.727	3.090	3.080	3.060	3.060
DW12 02	12.717	12.735	12.733	12.728	12.721	3.090	3.100	3.080	3.080
DW2 04	12.730	12.718	12.723	12.730	12.732	3.070	3.110	3.080	3.100
DW5 04	12.734	12.732	12.734	12.736	12.736	3.080	3.090	3.090	3.100
DW10 01	12.737	12.742	12.737	12.735	12.729	3.060	3.070	3.080	3.080
DW17 04	12.732	12.746	12.742	12.736	12.732	3.060	3.060	3.060	3.060
DW10 02	12.728	12.736	12.735	12.734	12.731	3.100	3.090	3.080	3.090
DW13 01	12.732	12.738	12.734	12.730	12.725	3.080	3.080	3.090	3.090
DW9 03	12.733	12.741	12.737	12.732	12.732	3.100	3.090	3.080	3.090
DW9 04	12.743	12.742	12.742	12.745	12.745	3.090	3.090	3.080	3.080
DW1 01	12.725	12.712	12.716	12.719	12.722	3.060	3.090	3.080	3.110
DW2 03	12.736	12.730	12.732	12.733	12.735	3.050	3.080	3.100	3.080
DW16 03	12.741	12.738	12.739	12.740	12.741	3.060	3.070	3.070	3.070
DW14 03	12.739	12.729	12.733	12.737	12.739	3.080	3.090	3.090	3.090
DW3 02	12.717	12.733	12.729	12.725	12.719	3.090	3.100	3.080	3.080
DW14 04	12.737	12.733	12.737	12.737	12.740	3.090	3.090	3.070	3.080
DW17 02	12.744	12.735	12.738	12.744	12.746	3.090	3.090	3.080	3.100
DW11 03	12.737	12.724	12.731	12.735	12.737	3.090	3.080	3.070	3.070

Specimen ID Number	D ⁹⁰							H1	H1'	H2	H2'
	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰				
DW16 02	12.740	12.737	12.738	12.739	12.741	12.739	12.741	3.070	3.070	3.060	3.070
DW17 01	12.741	12.735	12.737	12.738	12.739	12.738	12.739	3.070	3.080	3.090	3.090
DW3 01	12.719	12.733	12.728	12.722	12.715	12.722	12.715	3.070	3.090	3.070	3.070
DW16 04	12.744	12.745	12.744	12.745	12.744	12.745	12.744	3.050	3.060	3.040	3.060
DW13 02	12.736	12.725	12.730	12.736	12.738	12.736	12.738	3.090	3.080	3.070	3.070
DW8 01	12.726	12.736	12.734	12.727	12.723	12.727	12.723	3.070	3.080	3.070	3.080
DW15 01	12.761	12.760	12.756	12.760	12.760	12.760	12.760	3.060	3.070	3.080	3.060
DW4 03	12.740	12.734	12.737	12.739	12.740	12.739	12.740	3.080	3.100	3.070	3.080
DW11 01	12.740	12.738	12.737	12.739	12.737	12.739	12.737	3.090	3.060	3.080	3.080
DW5 03	12.734	12.727	12.733	12.737	12.740	12.737	12.740	3.070	3.050	3.090	3.090
DW16 01	12.736	12.736	12.735	12.734	12.735	12.734	12.735	3.040	3.060	3.040	3.050
DW6 01	12.741	12.723	12.729	12.734	12.740	12.734	12.740	3.100	3.080	3.080	3.070
DW11 02	12.726	12.734	12.731	12.727	12.720	12.727	12.720	3.070	3.080	3.080	3.070
DW4 01	12.740	12.728	12.732	12.736	12.738	12.736	12.738	3.080	3.080	3.060	3.080
DW7 03	12.724	12.737	12.735	12.735	12.733	12.735	12.733	3.080	3.080	3.070	3.060
DW3 04	12.735	12.727	12.730	12.737	12.738	12.737	12.738	3.070	3.100	3.080	3.080
DW6 04	12.746	12.724	12.730	12.736	12.739	12.736	12.739	3.070	3.070	3.070	3.080
DW13 03	12.722	12.740	12.734	12.731	12.722	12.731	12.722	3.070	3.070	3.080	3.070
DW8 04	12.718	12.740	12.735	12.729	12.725	12.729	12.725	3.080	3.060	3.090	3.090
DW15 02	12.734	12.719	12.722	12.725	12.730	12.725	12.730	3.080	3.080	3.080	3.080
DW12 04	12.738	12.729	12.735	12.738	12.739	12.738	12.739	3.090	3.080	3.080	3.080
DW2 02	12.732	12.718	12.722	12.728	12.730	12.728	12.730	3.100	3.090	3.090	3.100

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
DA4 02	3.045		3.410	3.360	5.66446	jl	5/19/2009 14:32
DA6 03	3.050		3.420	3.360	5.72701	jl	5/19/2009 15:07
DA6 01	3.065		3.390	3.370	5.66956	jl	5/19/2009 15:13
DA5 03	3.063		3.340	3.400	5.72569	jl	5/19/2009 15:18
DA6 02	3.050		3.380	3.370	5.65655	jl	5/20/2009 10:26
DA2 03	3.045		3.400	3.340	5.72276	jl	5/20/2009 10:32
DA2 02	3.055		3.360	3.340	5.67196	jl	5/20/2009 11:00
DA7 02	3.073		3.360	3.380	5.66861	jl	5/20/2009 11:05
DA4 01	3.063		3.350	3.400	5.65244	jl	5/20/2009 11:10
DA4 03	3.073		3.370	3.320	5.72064	jl	5/20/2009 11:15
DA5 01	3.070		3.400	3.360	5.67649	jl	5/20/2009 11:20
DA1 02	3.065		3.340	3.340	5.65812	jl	5/20/2009 11:26
DA3 03	3.055		3.410	3.340	5.71548	jl	5/20/2009 12:39
DA2 01	3.065		3.390	3.340	5.65356	jl	5/20/2009 12:43
DA3 02	3.070		3.360	3.360	5.65520	jl	5/20/2009 12:49
DA5 02	3.060		3.360	3.380	5.67318	jl	5/20/2009 12:56
DA1 01	3.070		3.340	3.360	5.67114	jl	5/20/2009 13:03
DA1 03	3.060		3.360	3.360	5.70174	jl	5/20/2009 13:10
DA7 01	3.070		3.370	3.360	5.72635	jl	5/20/2009 13:16
DA3 01	3.065		3.370	3.360	5.66194	jl	5/20/2009 13:20
DA7 03	3.065		3.330	3.400	5.66181	jl	5/20/2009 13:27
DW5 02	3.078		3.360	3.360	5.64478	jl	5/26/2009 8:35
DW6 03	3.063		3.330	3.370	5.65648	jl	5/26/2009 15:07
DW4 04	3.070		3.380	3.350	5.66834	jl	5/26/2009 15:14
DW17 03	3.078		3.360	3.410	5.66372	jl	5/26/2009 15:21
DW8 02	3.073		3.330	3.340	5.64505	jl	5/26/2009 15:29
DW9 01	3.090		3.350	3.350	5.63752	jl	5/26/2009 15:47
DW14 01	3.068		3.360	3.360	5.66491	jl	5/26/2009 15:58
DW5 01	3.058		3.320	3.370	5.65383	jl	5/28/2009 8:00
DW10 03	3.063		3.380	3.360	5.64551	jl	5/28/2009 8:09
DW1 04	3.088		3.390	3.320	5.65520	jl	5/28/2009 8:15
DW2 01	3.075		3.390	3.320	5.64464	jl	5/28/2009 8:20
DW9 02	3.083		3.320	3.380	5.62231	jl	5/28/2009 8:33

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
DW1 03	3.080	3.320	3.400	3.360	5.65772	jl	5/28/2009 8:47
DW12 01	3.068	3.320	3.390	3.355	5.64984	jl	6/1/2009 7:35
DW15 04	3.080	3.400	3.350	3.375	5.70733	jl	6/1/2009 7:47
DW11 04	3.078	3.330	3.380	3.355	5.64861	jl	6/1/2009 7:54
DW8 03	3.070	3.350	3.380	3.365	5.65672	jl	6/1/2009 8:00
DW10 04	3.088	3.350	3.350	3.350	5.64791	jl	6/1/2009 8:05
DW13 04	3.093	3.390	3.330	3.360	5.65462	jl	6/1/2009 8:10
DW7 04	3.083	3.370	3.340	3.355	5.65123	jl	6/1/2009 8:15
DW15 03	3.078	3.340	3.400	3.370	5.65831	jl	6/1/2009 8:21
DW3 03	3.093	3.350	3.330	3.340	5.63569	jl	6/1/2009 8:51
DW14 02	3.085	3.350	3.370	3.360	5.65820	jl	6/1/2009 8:57
DW12 03	3.080	3.380	3.320	3.350	5.66045	jl	6/1/2009 9:01
DW1 02	3.090	3.310	3.360	3.335	5.64469	jl	6/1/2009 9:09
DW6 02	3.083	3.330	3.350	3.340	5.64854	jl	6/1/2009 9:13
DW7 02	3.070	3.350	3.350	3.350	5.63929	jl	6/1/2009 9:18
DW4 02	3.078	3.380	3.320	3.350	5.65991	jl	6/1/2009 9:22
DW7 01	3.073	3.340	3.350	3.345	5.64240	jl	6/1/2009 9:53
DW12 02	3.088	3.330	3.390	3.360	5.65386	jl	6/1/2009 9:58
DW2 04	3.090	3.340	3.300	3.320	5.61700	jl	6/1/2009 10:04
DW5 04	3.090	3.360	3.330	3.345	5.65253	jl	6/1/2009 10:09
DW10 01	3.073	3.310	3.380	3.345	5.64936	jl	6/1/2009 10:16
DW17 04	3.065	3.330	3.400	3.365	5.67606	jl	6/1/2009 10:21
DW10 02	3.090	3.320	3.390	3.355	5.64361	jl	6/1/2009 10:26
DW13 01	3.085	3.330	3.390	3.360	5.64100	jl	6/1/2009 10:33
DW9 03	3.090	3.320	3.380	3.350	5.62465	jl	6/1/2009 10:38
DW9 04	3.085	3.380	3.310	3.345	5.63050	jl	6/1/2009 10:44
DW1 01	3.085	3.310	3.260	3.285	5.64260	jl	6/1/2009 11:02
DW2 03	3.078	3.330	3.340	3.335	5.62154	jl	6/1/2009 11:08
DW16 03	3.068	3.360	3.340	3.350	5.64844	jl	6/1/2009 11:15
DW14 03	3.088	3.390	3.350	3.370	5.64283	jl	6/1/2009 11:23
DW3 02	3.088	3.340	3.350	3.345	5.63341	jl	6/1/2009 11:28
DW14 04	3.083	3.360	3.330	3.345	5.64186	jl	6/1/2009 12:46
DW17 02	3.090	3.380	3.370	3.375	5.66145	jl	6/1/2009 12:51
DW11 03	3.078	3.380	3.330	3.355	5.64898	jl	6/1/2009 12:57

Specimen ID Number	Specimen Hole Diameter, mm		Specimen Hole Depth, mm		Specimen Mass, g	Measurements by:	Date: mm/dd/yr
	HD1	HD2	HD1	HD2			
DW16 02	3.068	3.370	3.370	3.370	5.64007	jl	6/1/2009 13:02
DW17 01	3.083	3.380	3.380	3.380	5.65547	jl	6/1/2009 13:06
DW3 01	3.075	3.370	3.370	3.335	5.63038	jl	6/1/2009 13:20
DW16 04	3.053	3.320	3.380	3.350	5.66303	jl	6/1/2009 14:06
DW13 02	3.078	3.360	3.360	3.360	5.64970	jl	6/1/2009 14:49
DW8 01	3.075	3.340	3.370	3.355	5.65288	jl	6/1/2009 14:54
DW15 01	3.068	3.280	3.490	3.385	5.67874	jl	6/1/2009 15:00
DW4 03	3.083	3.370	3.320	3.345	5.66859	jl	6/1/2009 15:04
DW11 01	3.078	3.380	3.340	3.360	5.64892	jl	6/1/2009 15:11
DW5 03	3.075	3.380	3.320	3.350	5.64224	jl	6/1/2009 15:22
DW16 01	3.048	3.320	3.390	3.355	5.64727	jl	6/1/2009 15:28
DW6 01	3.083	3.380	3.320	3.350	5.64483	jl	6/1/2009 15:32
DW11 02	3.075	3.350	3.360	3.355	5.65063	jl	6/1/2009 15:38
DW4 01	3.075	3.350	3.320	3.335	5.65167	jl	6/2/2009 11:06
DW7 03	3.073	3.310	3.380	3.345	5.64315	jl	6/2/2009 11:11
DW3 04	3.083	3.340	3.340	3.340	5.62761	jl	6/2/2009 11:19
DW6 04	3.073	3.380	3.320	3.350	5.65952	jl	6/2/2009 13:54
DW13 03	3.073	3.340	3.390	3.365	5.65331	jl	6/2/2009 14:01
DW8 04	3.080	3.350	3.360	3.355	5.65600	jl	6/2/2009 14:09
DW15 02	3.080	3.400	3.350	3.375	5.65199	jl	6/2/2009 14:15
DW12 04	3.083	3.360	3.350	3.355	5.67269	jl	6/2/2009 14:21
DW2 02	3.095	3.360	3.300	3.330	5.62024	jl	6/2/2009 14:27

Specimen Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg	Specimen Density kg/m ³
DA4 02	25.38250	12.74688	127.6137	0.025383	0.01275	4.9299E-08	0.0057	1775.77287
DA6 03	25.39875	12.74613	127.5987	0.025399	0.01275	4.9536E-08	0.0057	1794.56314
DA6 01	25.39250	12.74575	127.5912	0.025393	0.01275	4.9879E-08	0.0057	1777.30276
DA5 03	25.39025	12.74500	127.5762	0.025390	0.01275	4.9647E-08	0.0057	1795.14403
DA6 02	25.39575	12.74463	127.5687	0.025396	0.01274	4.9317E-08	0.0057	1772.99899
DA2 03	25.39800	12.74750	127.6262	0.025398	0.01275	4.9082E-08	0.0057	1792.63760
DA2 02	25.38950	12.74775	127.6312	0.025390	0.01275	4.9113E-08	0.0057	1777.27471
DA7 02	25.39850	12.75113	127.6988	0.025399	0.01275	4.9973E-08	0.0057	1775.10959
DA4 01	25.39850	12.74150	127.5061	0.025399	0.01274	4.9720E-08	0.0057	1772.62283
DA4 03	25.37375	12.74250	127.5261	0.025374	0.01274	4.9601E-08	0.0057	1795.43466
DA5 01	25.39150	12.74263	127.5286	0.025392	0.01274	5.0040E-08	0.0057	1780.52244
DA1 02	25.38550	12.74875	127.6513	0.025386	0.01275	4.9286E-08	0.0057	1773.03584
DA3 03	25.39700	12.73900	127.4561	0.025397	0.01274	4.9476E-08	0.0057	1793.07689
DA2 01	25.39800	12.74488	127.5737	0.025398	0.01274	4.9653E-08	0.0057	1772.01861
DA3 02	25.39700	12.74600	127.5962	0.025397	0.01275	4.9744E-08	0.0057	1772.33612
DA5 02	25.38475	12.74425	127.5612	0.025385	0.01274	4.9567E-08	0.0057	1779.24007
DA1 01	25.38750	12.74225	127.5211	0.025388	0.01274	4.9598E-08	0.0057	1778.98894
DA1 03	25.38725	12.74913	127.6588	0.025387	0.01275	4.9420E-08	0.0057	1786.54767
DA7 01	25.39675	12.74738	127.6237	0.025397	0.01275	4.9817E-08	0.0057	1794.30079
DA3 01	25.40325	12.75038	127.6838	0.025403	0.01275	4.9655E-08	0.0057	1772.71991
DA7 03	25.39550	12.74963	127.6688	0.025396	0.01275	4.9657E-08	0.0057	1773.44147
DW5 02	25.36975	12.73750	127.4261	0.025370	0.01274	4.9988E-08	0.0056	1773.53814
DW6 03	25.37100	12.74363	127.5486	0.025371	0.01274	4.9353E-08	0.0057	1775.03652
DW4 04	25.37075	12.73663	127.4086	0.025371	0.01274	4.9817E-08	0.0057	1781.02206
DW17 03	25.40050	12.74675	127.6112	0.025401	0.01275	5.0359E-08	0.0057	1774.88822
DW8 02	25.36900	12.73388	127.3535	0.025369	0.01273	4.9454E-08	0.0056	1774.40421
DW9 01	25.37150	12.74188	127.5136	0.025372	0.01274	5.0244E-08	0.0056	1770.04005
DW14 01	25.37450	12.73863	127.4486	0.025375	0.01274	4.9663E-08	0.0057	1779.02320
DW5 01	25.36950	12.72988	127.2736	0.025370	0.01273	4.9120E-08	0.0057	1778.07555
DW10 03	25.37075	12.73113	127.2985	0.025371	0.01273	4.9649E-08	0.0056	1775.31171
DW1 04	25.40475	12.72213	127.1186	0.025405	0.01272	5.0234E-08	0.0057	1778.82174
DW2 01	25.38200	12.72950	127.2661	0.025382	0.01273	4.9828E-08	0.0056	1774.79933
DW9 02	25.36800	12.73800	127.4361	0.025368	0.01274	4.9999E-08	0.0056	1766.46729

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg	Specimen Density kg/m ³
DW1 03	25.40125	12.72263	127.1286	0.025401	0.01272	5.0062E-08	0.0057	1779.62539
DW12 01	25.37225	12.72900	127.2561	0.025372	0.01273	4.9588E-08	0.0056	1777.13489
DW15 04	25.39375	12.74513	127.5787	0.025394	0.01275	5.0292E-08	0.0057	1789.46298
DW11 04	25.37050	12.72975	127.2711	0.025371	0.01273	4.9916E-08	0.0056	1776.84342
DW8 03	25.37300	12.73050	127.2860	0.025373	0.01273	4.9817E-08	0.0057	1778.94826
DW10 04	25.37000	12.72850	127.2461	0.025370	0.01273	5.0163E-08	0.0056	1777.15105
DW13 04	25.37175	12.73250	127.3260	0.025372	0.01273	5.0478E-08	0.0057	1778.17856
DW7 04	25.36925	12.73738	127.4236	0.025369	0.01274	5.0075E-08	0.0057	1775.68399
DW15 03	25.38650	12.73375	127.3510	0.025387	0.01273	5.0138E-08	0.0057	1777.74430
DW3 03	25.36625	12.72763	127.2286	0.025366	0.01273	5.0175E-08	0.0056	1773.82686
DW14 02	25.37300	12.73088	127.2935	0.025373	0.01273	5.0231E-08	0.0057	1779.53848
DW12 03	25.37125	12.73700	127.4161	0.025371	0.01274	4.9918E-08	0.0057	1778.45702
DW1 02	25.39125	12.72363	127.1486	0.025391	0.01272	5.0020E-08	0.0056	1775.92986
DW6 02	25.37025	12.73825	127.4411	0.025370	0.01274	4.9850E-08	0.0056	1774.39480
DW7 02	25.36825	12.73088	127.2935	0.025368	0.01273	4.9596E-08	0.0056	1773.57413
DW4 02	25.36950	12.73713	127.4186	0.025370	0.01274	4.9837E-08	0.0057	1778.33159
DW7 01	25.36875	12.73725	127.4211	0.025369	0.01274	4.9602E-08	0.0056	1772.71696
DW12 02	25.37100	12.72825	127.2411	0.025371	0.01273	5.0310E-08	0.0057	1779.10562
DW2 04	25.36600	12.72500	127.1761	0.025366	0.01273	4.9794E-08	0.0056	1768.49057
DW5 04	25.37025	12.73050	127.2860	0.025370	0.01273	5.0168E-08	0.0057	1778.02236
DW10 01	25.37125	12.73875	127.4511	0.025371	0.01274	4.9605E-08	0.0056	1774.30303
DW17 04	25.38650	12.73888	127.4536	0.025387	0.01274	4.9657E-08	0.0057	1781.59490
DW10 02	25.37050	12.73325	127.3410	0.025371	0.01273	5.0317E-08	0.0056	1774.50312
DW13 01	25.37225	12.73413	127.3585	0.025372	0.01273	5.0232E-08	0.0056	1773.26334
DW9 03	25.37225	12.73650	127.4061	0.025372	0.01274	5.0242E-08	0.0056	1767.45950
DW9 04	25.37125	12.74213	127.5186	0.025371	0.01274	5.0008E-08	0.0056	1767.65225
DW1 01	25.37725	12.71900	127.0562	0.025377	0.01272	4.9108E-08	0.0056	1777.06867
DW2 03	25.36800	12.73363	127.3485	0.025368	0.01273	4.9616E-08	0.0056	1767.24545
DW16 03	25.38050	12.73963	127.4686	0.025381	0.01274	4.9514E-08	0.0056	1773.05975
DW14 03	25.37350	12.73425	127.3610	0.025374	0.01273	5.0461E-08	0.0056	1773.84223
DW3 02	25.36550	12.72600	127.1961	0.025366	0.01273	5.0087E-08	0.0056	1773.57360
DW14 04	25.37400	12.73388	127.3535	0.025374	0.01273	4.9927E-08	0.0056	1773.30989
DW17 02	25.39650	12.73950	127.4661	0.025397	0.01274	5.0619E-08	0.0057	1776.65744
DW11 03	25.37300	12.73400	127.3560	0.025373	0.01273	4.9915E-08	0.0056	1775.57659

Specimen ID Number	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Total Hole Volume m ³	Specimen Mass kg	Specimen Density kg/m ³
DW16 02	25.39075	12.73825	127.4411	0.025391	0.01274	4.9810E-08	0.0056	1770.25896
DW17 01	25.40000	12.73813	127.4386	0.025400	0.01274	5.0448E-08	0.0057	1774.82661
DW3 01	25.36525	12.72538	127.1836	0.025365	0.01273	4.9533E-08	0.0056	1772.50467
DW16 04	25.38500	12.74563	127.5887	0.025385	0.01275	4.9031E-08	0.0057	1775.35148
DW13 02	25.37325	12.73088	127.2935	0.025373	0.01273	4.9987E-08	0.0056	1776.71126
DW8 01	25.37075	12.73113	127.2985	0.025371	0.01273	4.9831E-08	0.0057	1777.73123
DW15 01	25.34300	12.75938	127.8641	0.025343	0.01276	5.0035E-08	0.0057	1779.93171
DW4 03	25.36950	12.73825	127.4411	0.025370	0.01274	4.9928E-08	0.0057	1780.78981
DW1 01	25.37100	12.73850	127.4461	0.025371	0.01274	4.9986E-08	0.0056	1774.46591
DW5 03	25.36925	12.73075	127.2910	0.025369	0.01273	4.9754E-08	0.0056	1774.55466
DW16 01	25.38350	12.73638	127.4036	0.025384	0.01274	4.8943E-08	0.0056	1773.08043
DW6 01	25.37175	12.73350	127.3460	0.025372	0.01273	5.0003E-08	0.0056	1774.55161
DW11 02	25.37075	12.72950	127.2661	0.025371	0.01273	4.9831E-08	0.0057	1777.48448
DW4 01	25.36925	12.73563	127.3886	0.025369	0.01274	4.9535E-08	0.0057	1776.01658
DW7 03	25.36850	12.73363	127.3485	0.025369	0.01273	4.9600E-08	0.0056	1773.99431
DW3 04	25.36725	12.73175	127.3110	0.025367	0.01273	4.9851E-08	0.0056	1769.86664
DW6 04	25.37150	12.73813	127.4386	0.025372	0.01274	4.9676E-08	0.0057	1777.69279
DW13 03	25.37350	12.73138	127.3035	0.025374	0.01273	4.9899E-08	0.0057	1777.63781
DW8 04	25.36975	12.73025	127.2810	0.025370	0.01273	4.9995E-08	0.0057	1779.12332
DW15 02	25.38975	12.72713	127.2186	0.025390	0.01273	5.0292E-08	0.0057	1777.49170
DW12 04	25.37075	12.73363	127.3485	0.025371	0.01273	5.0075E-08	0.0057	1783.38626
DW2 02	25.36400	12.72538	127.1836	0.025364	0.01273	5.0106E-08	0.0056	1769.72016

Specimen ID Number	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
DA4 02	1.7758	25.1	24.8	20.6
DA6 03	1.7946	25.1	24.8	21.2
DA6 01	1.7773	25.1	24.8	21.1
DA5 03	1.7951	25.1	24.8	21.1
DA6 02	1.7730	25.2	24.3	21.5
DA2 03	1.7926	25.2	24.3	21.4
DA2 02	1.7773	25.2	24.3	21.2
DA7 02	1.7751	25.2	24.3	20.9
DA4 01	1.7726	25.2	24.3	20.8
DA4 03	1.7954	25.2	24.3	20.4
DA5 01	1.7805	25.2	24.3	20.4
DA1 02	1.7730	25.2	24.4	20.3
DA3 03	1.7931	25.2	24.4	20.1
DA2 01	1.7720	25.2	24.4	20
DA3 02	1.7723	25.2	24.4	19.8
DA5 02	1.7792	25.2	24.2	19.6
DA1 01	1.7790	25.2	24.2	19.5
DA1 03	1.7865	25.2	24.2	19.4
DA7 01	1.7943	25.2	24.2	19.3
DA3 01	1.7727	25.2	24.2	19.3
DA7 03	1.7734	25.2	24.2	19
DW5 02	1.7735	25.3	19.8	39.3
DW6 03	1.7750	25.3	20.1	32.1
DW4 04	1.7810	25.2	20.1	32.2
DW17 03	1.7749	25.2	20.2	31.9
DW8 02	1.7744	25.2	20.4	31
DW9 01	1.7700	25.2	20.5	30.9
DW14 01	1.7790	25.2	20.5	31.1
DW5 01	1.7781	25.3	20.5	34.8
DW10 03	1.7753	25.3	20.5	35.1
DW1 04	1.7788	25.3	20.6	35.2
DW2 01	1.7748	25.3	20.7	35.2
DW9 02	1.7665	25.4	20.8	35.2

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
DW1 03	1.7796	25.4	20.5	36.8
DW12 01	1.7771	25.2	20.5	52.6
DW15 04	1.7895	25.2	20.6	52.5
DW11 04	1.7768	25.2	20.6	52.4
DW8 03	1.7789	25.2	20.7	52.4
DW10 04	1.7772	25.2	20.7	52.3
DW13 04	1.7782	25.2	20.7	52.1
DW7 04	1.7757	25.2	20.8	51.6
DW15 03	1.7777	25.2	20.8	51.2
DW3 03	1.7738	25.2	20.9	49.4
DW14 02	1.7795	25.2	21	49.3
DW12 03	1.7785	25.2	21	49
DW1 02	1.7759	25.2	21	49
DW6 02	1.7744	25.2	21	48.9
DW7 02	1.7736	25.2	21.1	48.8
DW4 02	1.7783	25.2	21.1	48.9
DW7 01	1.7727	25.2	21.1	49.7
DW12 02	1.7791	25.2	21.1	49.8
DW2 04	1.7685	25.2	21	49.9
DW5 04	1.7780	25.2	21	50
DW10 01	1.7743	25.2	21	50.3
DW17 04	1.7816	25.2	21	50.4
DW10 02	1.7745	25.2	21	50.4
DW13 01	1.7733	25.2	21	50.8
DW9 03	1.7675	25.2	21	51
DW9 04	1.7677	25.2	21	50.8
DW1 01	1.7771	25.2	21	50.4
DW2 03	1.7672	25.2	21	50.2
DW16 03	1.7731	25.2	21.1	50.4
DW14 03	1.7738	25.2	21.1	50.8
DW3 02	1.7736	25.2	21.1	50.9
DW14 04	1.7733	25.2	21.8	50
DW17 02	1.7767	25.2	21.9	49.7
DW11 03	1.7756	25.2	21.8	50.1

Specimen ID Number	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
DW16 02	1.7703	25.2	21.6	50.3
DW17 01	1.7748	25.2	21.5	50.9
DW3 01	1.7725	25.2	21.4	50.2
DW16 04	1.7754	25.2	21.3	48.6
DW13 02	1.7767	25.2	21.3	48.3
DW8 01	1.7777	25.2	21.3	48
DW15 01	1.7799	25.2	21.2	48
DW4 03	1.7808	25.2	21.2	47.9
DW11 01	1.7745	25.2	21.2	47.8
DW5 03	1.7746	25.2	21.3	47.7
DW16 01	1.7731	25.2	21.3	47.7
DW6 01	1.7746	25.2	21.3	47.7
DW11 02	1.7775	25.2	21.3	48
DW4 01	1.7760	25.3	20.2	52.2
DW7 03	1.7740	25.3	20.2	52.3
DW3 04	1.7699	25.3	20.3	52.3
DW6 04	1.7777	25.3	20.6	53.2
DW13 03	1.7776	25.3	20.7	52.8
DW8 04	1.7791	25.3	20.8	52.9
DW15 02	1.7775	25.3	20.8	53.1
DW12 04	1.7834	25.3	20.8	53.4
DW2 02	1.7697	25.3	20.9	53.4

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DA4 02		wds	2/18/2010 17:04	100	76.84139	3.61E-04	4.22E-06	4.25E-06
				200	110.18756	7.92E-04	4.62E-06	4.33E-06
				300	142.70782	1.27E-03	4.97E-06	4.47E-06
				400	175.19761	1.79E-03	5.28E-06	4.67E-06
				500	207.87184	2.33E-03	5.54E-06	4.83E-06
				600	240.71364	2.90E-03	5.77E-06	4.98E-06
				700	273.77367	3.48E-03	5.94E-06	5.10E-06
				800	307.05426	4.08E-03	6.07E-06	5.21E-06
				900	340.53206	4.69E-03	6.16E-06	5.31E-06
				1000	374.14514	5.33E-03	6.20E-06	5.42E-06
DA4 03		wds	2/18/2010 16:13	100	81.15152	3.30E-04	3.93E-06	3.94E-06
				200	115.15257	7.37E-04	4.30E-06	4.02E-06
				300	147.92963	1.18E-03	4.63E-06	4.14E-06
				400	180.58739	1.66E-03	4.91E-06	4.33E-06
				500	213.26525	2.17E-03	5.16E-06	4.48E-06
				600	246.16363	2.69E-03	5.37E-06	4.61E-06
				700	279.25133	3.23E-03	5.54E-06	4.73E-06
				800	312.58282	3.80E-03	5.67E-06	4.85E-06
				900	346.10854	4.37E-03	5.76E-06	4.95E-06
				1000	379.78674	4.94E-03	5.81E-06	5.03E-06
DA5 01		wds	2/19/2010 7:50	100	77.27055	3.70E-04	4.26E-06	4.24E-06
				200	110.54758	8.01E-04	4.67E-06	4.32E-06
				300	143.01929	1.28E-03	5.04E-06	4.50E-06
				400	175.51475	1.82E-03	5.34E-06	4.72E-06
				500	208.19971	2.37E-03	5.60E-06	4.88E-06
				600	241.09696	2.94E-03	5.80E-06	5.03E-06
				700	274.21796	3.52E-03	5.95E-06	5.14E-06
				800	307.5212	4.11E-03	6.05E-06	5.24E-06
				900	340.98579	4.72E-03	6.09E-06	5.34E-06
				1000	374.59861	5.35E-03	6.08E-06	5.44E-06
DA5 02		wds	2/19/2010 7:54	100	81.28877	3.60E-04	4.26E-06	4.23E-06
				200	115.24511	8.01E-04	4.63E-06	4.33E-06
				300	147.96939	1.27E-03	4.96E-06	4.47E-06
				400	180.53439	1.79E-03	5.25E-06	4.67E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DA5 03		wds	2/19/2010 16:16	500	213.22214	2.33E-03	5.51E-06	4.81E-06
				600	246.10141	2.89E-03	5.72E-06	4.94E-06
				700	279.22829	3.47E-03	5.90E-06	5.07E-06
				800	312.53553	4.07E-03	6.04E-06	5.19E-06
				900	346.03759	4.68E-03	6.14E-06	5.30E-06
				1000	379.75021	5.28E-03	6.20E-06	5.37E-06
				100	76.74856	3.41E-04	3.95E-06	4.02E-06
				200	110.08337	7.46E-04	4.33E-06	4.07E-06
				300	142.58964	1.19E-03	4.67E-06	4.20E-06
				400	175.12496	1.68E-03	4.98E-06	4.39E-06
DA6 01		wds	5/26/2010 16:52	500	207.79573	2.20E-03	5.24E-06	4.55E-06
				600	240.69186	2.73E-03	5.46E-06	4.69E-06
				700	273.78462	3.28E-03	5.64E-06	4.81E-06
				800	307.0959	3.85E-03	5.78E-06	4.92E-06
				900	340.56619	4.43E-03	5.88E-06	5.02E-06
				1000	374.19252	5.04E-03	5.93E-06	5.13E-06
				100	78.57032	3.69E-04	4.30E-06	4.35E-06
				200	111.94917	8.10E-04	4.66E-06	4.42E-06
				300	144.464	1.28E-03	4.98E-06	4.53E-06
				400	177.05224	1.81E-03	5.26E-06	4.72E-06
DA6 02		wds	5/26/2010 16:37	500	209.86714	2.35E-03	5.49E-06	4.86E-06
				600	242.90322	2.90E-03	5.68E-06	4.98E-06
				700	276.13995	3.48E-03	5.83E-06	5.09E-06
				800	309.60659	4.06E-03	5.94E-06	5.19E-06
				900	343.23123	4.66E-03	6.00E-06	5.28E-06
				1000	377.01186	5.27E-03	6.03E-06	5.36E-06
				100	81.27208	3.44E-04	4.23E-06	4.14E-06
				200	115.30786	7.85E-04	4.65E-06	4.28E-06
				300	148.05697	1.26E-03	5.03E-06	4.47E-06
				400	180.62017	1.79E-03	5.36E-06	4.68E-06
500	213.24147	2.34E-03	5.64E-06	4.85E-06				
600	246.033	2.91E-03	5.87E-06	5.00E-06				
700	279.03331	3.51E-03	6.06E-06	5.14E-06				
800	312.32573	4.13E-03	6.20E-06	5.27E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DA7 01		wds	2/22/2010 8:11	900	345.8014	4.76E-03	6.30E-06	5.40E-06
				1000	379.54877	5.37E-03	6.34E-06	5.47E-06
				100	81.74247	3.36E-04	3.97E-06	3.91E-06
				200	115.70063	7.47E-04	4.34E-06	4.03E-06
				300	148.40354	1.19E-03	4.66E-06	4.17E-06
				400	180.98253	1.68E-03	4.95E-06	4.37E-06
				500	213.66162	2.19E-03	5.21E-06	4.51E-06
				600	246.56727	2.72E-03	5.42E-06	4.65E-06
				700	279.67791	3.27E-03	5.60E-06	4.77E-06
				800	312.99913	3.84E-03	5.74E-06	4.89E-06
DW1 01		wds	2/22/2010 16:47	900	346.5048	4.42E-03	5.85E-06	5.00E-06
				1000	380.21331	5.00E-03	5.92E-06	5.08E-06
				100	77.36866	3.24E-04	3.80E-06	3.76E-06
				200	110.68538	7.15E-04	4.20E-06	3.88E-06
				300	143.20293	1.15E-03	4.56E-06	4.04E-06
				400	175.6973	1.63E-03	4.87E-06	4.25E-06
				500	208.35136	2.13E-03	5.15E-06	4.41E-06
				600	241.21496	2.66E-03	5.37E-06	4.56E-06
				700	274.28691	3.20E-03	5.56E-06	4.69E-06
				800	307.57913	3.76E-03	5.70E-06	4.80E-06
DW1 02		wds	2/22/2010 16:37	900	341.05251	4.34E-03	5.80E-06	4.91E-06
				1000	374.66796	4.94E-03	5.86E-06	5.03E-06
				100	81.22266	3.18E-04	3.79E-06	3.80E-06
				200	115.21387	7.15E-04	4.20E-06	3.89E-06
				300	147.96668	1.14E-03	4.56E-06	4.03E-06
				400	180.5518	1.62E-03	4.88E-06	4.24E-06
				500	213.2223	2.13E-03	5.14E-06	4.40E-06
				600	246.12496	2.65E-03	5.35E-06	4.55E-06
				700	279.22723	3.19E-03	5.52E-06	4.67E-06
				800	312.57676	3.75E-03	5.63E-06	4.79E-06
DW10 01		wds	2/23/2010 7:49	900	346.09737	4.32E-03	5.70E-06	4.90E-06
				1000	379.82613	4.88E-03	5.72E-06	4.97E-06
				100	77.34484	3.21E-04	3.74E-06	3.74E-06
				200	110.70157	7.08E-04	4.24E-06	3.85E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DW10 02		wds	2/23/2010 7:52	300	143.20481	1.15E-03	4.68E-06	4.03E-06
				400	175.69236	1.65E-03	5.04E-06	4.29E-06
				500	208.34823	2.17E-03	5.34E-06	4.48E-06
				600	241.20703	2.71E-03	5.56E-06	4.64E-06
				700	274.27483	3.28E-03	5.71E-06	4.78E-06
				800	307.57595	3.85E-03	5.79E-06	4.90E-06
				900	341.0277	4.43E-03	5.80E-06	5.01E-06
				1000	374.62953	5.03E-03	5.74E-06	5.11E-06
				100	81.30182	3.32E-04	3.93E-06	3.87E-06
				200	115.25464	7.40E-04	4.32E-06	3.99E-06
300	147.98259	1.18E-03	4.67E-06	4.15E-06				
400	180.58206	1.67E-03	4.97E-06	4.35E-06				
500	213.2681	2.19E-03	5.22E-06	4.51E-06				
600	246.14105	2.72E-03	5.43E-06	4.65E-06				
700	279.23405	3.26E-03	5.59E-06	4.77E-06				
800	312.55472	3.83E-03	5.70E-06	4.88E-06				
900	346.09872	4.41E-03	5.76E-06	4.98E-06				
1000	379.79245	4.98E-03	5.78E-06	5.06E-06				
DW10 03		wds	2/23/2010 16:20	100	76.89463	3.33E-04	3.90E-06	3.90E-06
				200	110.24379	7.34E-04	4.32E-06	3.99E-06
				300	142.76623	1.18E-03	4.68E-06	4.16E-06
				400	175.26223	1.67E-03	4.99E-06	4.36E-06
				500	207.91158	2.19E-03	5.26E-06	4.53E-06
				600	240.77949	2.72E-03	5.47E-06	4.67E-06
				700	273.83633	3.28E-03	5.64E-06	4.80E-06
				800	307.12312	3.85E-03	5.76E-06	4.91E-06
				900	340.59334	4.43E-03	5.83E-06	5.01E-06
				1000	374.21856	5.02E-03	5.85E-06	5.11E-06
DW10 04		wds	2/23/2010 16:05	100	81.26632	3.19E-04	3.82E-06	3.80E-06
				200	115.24882	7.14E-04	4.21E-06	3.88E-06
				300	148.03011	1.15E-03	4.55E-06	4.04E-06
				400	180.68897	1.63E-03	4.86E-06	4.24E-06
				500	213.42288	2.13E-03	5.12E-06	4.40E-06
				600	246.33642	2.65E-03	5.34E-06	4.54E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DW11 01		wds	2/24/2010 7:45	700	279.43592	3.19E-03	5.51E-06	4.66E-06
				800	312.84425	3.75E-03	5.65E-06	4.78E-06
				900	346.35217	4.32E-03	5.74E-06	4.89E-06
				1000	380.07137	4.89E-03	5.79E-06	4.97E-06
				100	76.85338	3.52E-04	3.89E-06	4.02E-06
				200	110.13881	7.50E-04	4.30E-06	4.06E-06
				300	142.60992	1.19E-03	4.67E-06	4.18E-06
				400	175.10631	1.68E-03	5.00E-06	4.38E-06
				500	207.77873	2.20E-03	5.27E-06	4.55E-06
				600	240.6673	2.74E-03	5.50E-06	4.69E-06
DW11 02		wds	2/24/2010 7:51	700	273.76958	3.30E-03	5.68E-06	4.82E-06
				800	307.07856	3.87E-03	5.81E-06	4.93E-06
				900	340.56636	4.45E-03	5.89E-06	5.04E-06
				1000	374.18587	5.06E-03	5.93E-06	5.14E-06
				100	81.27031	3.26E-04	3.72E-06	3.80E-06
				200	115.24989	7.20E-04	4.16E-06	3.88E-06
				300	147.97129	1.14E-03	4.55E-06	4.01E-06
				400	180.60938	1.62E-03	4.88E-06	4.21E-06
				500	213.31022	2.12E-03	5.17E-06	4.38E-06
				600	246.19467	2.65E-03	5.39E-06	4.54E-06
DW11 03		wds	2/24/2010 16:24	700	279.26662	3.20E-03	5.57E-06	4.68E-06
				800	312.6354	3.77E-03	5.69E-06	4.81E-06
				900	346.16051	4.34E-03	5.76E-06	4.91E-06
				1000	379.84551	4.91E-03	5.78E-06	4.99E-06
				100	76.74411	3.41E-04	3.92E-06	3.96E-06
				200	110.03008	7.43E-04	4.31E-06	4.04E-06
				300	142.51689	1.18E-03	4.65E-06	4.17E-06
				400	175.05049	1.67E-03	4.95E-06	4.36E-06
				500	207.74115	2.18E-03	5.20E-06	4.52E-06
				600	240.63836	2.72E-03	5.42E-06	4.66E-06
700	273.7457	3.27E-03	5.59E-06	4.78E-06				
800	307.06826	3.82E-03	5.71E-06	4.88E-06				
900	340.55317	4.40E-03	5.80E-06	4.98E-06				
1000	374.19861	5.00E-03	5.84E-06	5.09E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DW11 04		wds	2/24/2010 16:08	100	81.25112	3.18E-04	3.82E-06	3.79E-06
				200	115.26553	7.15E-04	4.24E-06	3.89E-06
				300	148.00604	1.15E-03	4.61E-06	4.06E-06
				400	180.65277	1.64E-03	4.94E-06	4.28E-06
				500	213.35366	2.15E-03	5.21E-06	4.45E-06
				600	246.25626	2.68E-03	5.44E-06	4.59E-06
				700	279.32909	3.23E-03	5.61E-06	4.73E-06
				800	312.67457	3.80E-03	5.74E-06	4.85E-06
				900	346.17277	4.38E-03	5.82E-06	4.96E-06
				1000	379.87466	4.96E-03	5.84E-06	5.04E-06
DW12 01		wds	2/25/2010 7:46	100	76.80035	3.48E-04	3.98E-06	4.03E-06
				200	110.09378	7.57E-04	4.40E-06	4.09E-06
				300	142.59753	1.21E-03	4.76E-06	4.24E-06
				400	175.09868	1.71E-03	5.08E-06	4.45E-06
				500	207.76111	2.24E-03	5.35E-06	4.62E-06
				600	240.67327	2.78E-03	5.56E-06	4.76E-06
				700	273.78591	3.34E-03	5.72E-06	4.89E-06
				800	307.09655	3.92E-03	5.84E-06	4.99E-06
				900	340.56096	4.50E-03	5.90E-06	5.09E-06
				1000	374.20409	5.11E-03	5.91E-06	5.20E-06
DW12 02		wds	2/25/2010 7:50	100	81.28335	3.32E-04	3.91E-06	3.85E-06
				200	115.24377	7.37E-04	4.30E-06	3.96E-06
				300	148.01281	1.18E-03	4.64E-06	4.12E-06
				400	180.62381	1.67E-03	4.94E-06	4.32E-06
				500	213.31964	2.17E-03	5.19E-06	4.48E-06
				600	246.23457	2.70E-03	5.41E-06	4.61E-06
				700	279.32173	3.25E-03	5.58E-06	4.74E-06
				800	312.61449	3.81E-03	5.71E-06	4.86E-06
				900	346.10868	4.39E-03	5.79E-06	4.97E-06
				1000	379.80054	4.97E-03	5.84E-06	5.04E-06
DW12 03		wds	3/1/2010 7:52	100	76.88622	3.40E-04	3.87E-06	3.87E-06
				200	110.19489	7.39E-04	4.28E-06	3.97E-06
				300	142.71415	1.18E-03	4.65E-06	4.12E-06
				400	175.21755	1.67E-03	4.96E-06	4.33E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DW12 04		wds	3/1/2010 7:55	500	207.86061	2.18E-03	5.23E-06	4.50E-06
				600	240.73385	2.72E-03	5.45E-06	4.64E-06
				700	273.8086	3.27E-03	5.62E-06	4.77E-06
				800	307.09648	3.83E-03	5.75E-06	4.88E-06
				900	340.57821	4.41E-03	5.82E-06	4.98E-06
				1000	374.20429	5.01E-03	5.85E-06	5.09E-06
				100	81.29175	3.29E-04	3.85E-06	3.82E-06
				200	115.2776	7.29E-04	4.28E-06	3.92E-06
				300	148.02818	1.17E-03	4.65E-06	4.09E-06
				400	180.63956	1.66E-03	4.96E-06	4.31E-06
DW13 02		wds	3/1/2010 16:13	500	213.33515	2.17E-03	5.22E-06	4.47E-06
				600	246.22882	2.70E-03	5.43E-06	4.62E-06
				700	279.3083	3.25E-03	5.58E-06	4.74E-06
				800	312.627	3.81E-03	5.67E-06	4.86E-06
				900	346.15597	4.39E-03	5.71E-06	4.96E-06
				1000	379.83125	4.95E-03	5.69E-06	5.03E-06
				100	81.2109	3.32E-04	4.15E-06	3.97E-06
				200	115.24062	7.56E-04	4.45E-06	4.12E-06
				300	148.008	1.22E-03	4.72E-06	4.29E-06
				400	180.62783	1.71E-03	4.97E-06	4.45E-06
DW13 01		wds	3/2/2010 7:52	500	213.3317	2.21E-03	5.19E-06	4.58E-06
				600	246.20167	2.74E-03	5.39E-06	4.70E-06
				700	279.28274	3.29E-03	5.56E-06	4.81E-06
				800	312.64671	3.86E-03	5.71E-06	4.92E-06
				900	346.1466	4.44E-03	5.83E-06	5.02E-06
				1000	379.85068	5.01E-03	5.93E-06	5.10E-06
				100	76.81691	3.24E-04	3.79E-06	3.78E-06
				200	110.18332	7.13E-04	4.25E-06	3.86E-06
				300	142.71038	1.16E-03	4.65E-06	4.06E-06
				400	175.21917	1.65E-03	4.99E-06	4.29E-06
500	207.89743	2.17E-03	5.29E-06	4.48E-06				
600	240.76527	2.71E-03	5.53E-06	4.64E-06				
700	273.83279	3.27E-03	5.71E-06	4.78E-06				
800	307.11253	3.84E-03	5.85E-06	4.90E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DW13 03		wds	3/2/2010 7:54	900	340.56512	4.43E-03	5.93E-06	5.01E-06
				1000	374.19818	5.05E-03	5.95E-06	5.13E-06
				100	81.74105	3.34E-04	3.90E-06	3.84E-06
				200	115.71995	7.38E-04	4.29E-06	3.95E-06
				300	148.4858	1.18E-03	4.63E-06	4.10E-06
				400	181.09644	1.66E-03	4.93E-06	4.31E-06
				500	213.79458	2.17E-03	5.18E-06	4.47E-06
				600	246.68004	2.70E-03	5.38E-06	4.60E-06
				700	279.76544	3.24E-03	5.53E-06	4.72E-06
				800	313.08336	3.80E-03	5.63E-06	4.84E-06
DW13 04		wds	3/2/2010 16:42	900	346.59304	4.37E-03	5.69E-06	4.93E-06
				1000	380.2841	4.93E-03	5.70E-06	5.01E-06
				100	77.35006	3.18E-04	3.68E-06	3.78E-06
				200	110.70345	6.99E-04	4.16E-06	3.84E-06
				300	143.19449	1.13E-03	4.57E-06	3.98E-06
				400	175.70008	1.62E-03	4.92E-06	4.21E-06
				500	208.35524	2.13E-03	5.20E-06	4.40E-06
				600	241.20867	2.66E-03	5.42E-06	4.55E-06
				700	274.27521	3.20E-03	5.58E-06	4.69E-06
				800	307.57584	3.76E-03	5.68E-06	4.81E-06
DW14 01		wds	3/2/2010 16:13	900	341.02775	4.33E-03	5.71E-06	4.91E-06
				1000	374.66724	4.92E-03	5.68E-06	5.01E-06
				100	81.66456	3.27E-04	3.86E-06	3.91E-06
				200	115.67763	7.31E-04	4.28E-06	3.98E-06
				300	148.43784	1.17E-03	4.64E-06	4.13E-06
				400	181.0463	1.66E-03	4.95E-06	4.32E-06
				500	213.7554	2.16E-03	5.22E-06	4.48E-06
				600	246.61595	2.70E-03	5.44E-06	4.63E-06
				700	279.70403	3.25E-03	5.61E-06	4.76E-06
				800	313.03775	3.82E-03	5.74E-06	4.88E-06
DW14 02		wds	3/3/2010 7:32	900	346.52432	4.40E-03	5.81E-06	4.99E-06
				1000	380.20031	4.97E-03	5.84E-06	5.06E-06
				100	77.41791	3.48E-04	4.03E-06	4.02E-06
				200	110.7478	7.61E-04	4.43E-06	4.11E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DW14 03		wds	3/3/2010 7:33	300	143.23442	1.22E-03	4.78E-06	4.27E-06
				400	175.70507	1.72E-03	5.09E-06	4.47E-06
				500	208.36779	2.25E-03	5.36E-06	4.64E-06
				600	241.21799	2.79E-03	5.59E-06	4.78E-06
				700	274.2803	3.36E-03	5.78E-06	4.91E-06
				800	307.57711	3.94E-03	5.92E-06	5.03E-06
				900	341.05236	4.54E-03	6.02E-06	5.14E-06
				1000	374.67349	5.16E-03	6.08E-06	5.24E-06
				100	81.28286	3.28E-04	3.77E-06	3.82E-06
				200	115.29461	7.26E-04	4.19E-06	3.91E-06
DW14 04		wds	3/3/2010 16:37	300	148.05985	1.15E-03	4.57E-06	4.03E-06
				400	180.67324	1.63E-03	4.89E-06	4.23E-06
				500	213.37122	2.14E-03	5.16E-06	4.40E-06
				600	246.23761	2.66E-03	5.39E-06	4.55E-06
				700	279.3048	3.21E-03	5.57E-06	4.69E-06
				800	312.63591	3.78E-03	5.69E-06	4.81E-06
				900	346.13184	4.35E-03	5.77E-06	4.92E-06
				1000	379.80968	4.92E-03	5.79E-06	5.00E-06
				100	76.90537	3.28E-04	3.77E-06	3.77E-06
				200	110.26709	7.14E-04	4.22E-06	3.88E-06
DW15 02		wds	3/3/2010 16:14	300	142.74869	1.15E-03	4.61E-06	4.04E-06
				400	175.23613	1.64E-03	4.94E-06	4.28E-06
				500	207.8997	2.15E-03	5.22E-06	4.45E-06
				600	240.76397	2.68E-03	5.44E-06	4.60E-06
				700	273.82512	3.23E-03	5.61E-06	4.73E-06
				800	307.12409	3.80E-03	5.72E-06	4.84E-06
				900	340.58506	4.37E-03	5.78E-06	4.95E-06
				1000	374.21271	4.97E-03	5.78E-06	5.05E-06
				100	81.20218	3.20E-04	3.75E-06	3.81E-06
				200	115.23335	7.12E-04	4.17E-06	3.87E-06
300	148.0292	1.14E-03	4.53E-06	4.01E-06				
400	180.65338	1.61E-03	4.84E-06	4.21E-06				
500	213.35257	2.11E-03	5.11E-06	4.37E-06				
600	246.23596	2.63E-03	5.32E-06	4.51E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DW15 03		wds	3/4/2010 7:32	700	279.30834	3.17E-03	5.49E-06	4.64E-06
				800	312.63051	3.73E-03	5.61E-06	4.76E-06
				900	346.15092	4.30E-03	5.68E-06	4.87E-06
				1000	379.81262	4.86E-03	5.70E-06	4.94E-06
				100	76.82818	3.49E-04	3.89E-06	3.98E-06
				200	110.15608	7.52E-04	4.29E-06	4.02E-06
				300	142.67578	1.19E-03	4.64E-06	4.15E-06
				400	175.1911	1.68E-03	4.94E-06	4.34E-06
				500	207.86776	2.19E-03	5.20E-06	4.50E-06
				600	240.76036	2.72E-03	5.41E-06	4.64E-06
DW15 04		wds	3/4/2010 7:36	700	273.83763	3.27E-03	5.57E-06	4.77E-06
				800	307.13704	3.83E-03	5.68E-06	4.87E-06
				900	340.57719	4.40E-03	5.75E-06	4.97E-06
				1000	374.2032	4.98E-03	5.76E-06	5.06E-06
				100	81.3025	3.34E-04	3.93E-06	3.91E-06
				200	115.30057	7.42E-04	4.36E-06	4.00E-06
				300	148.05497	1.19E-03	4.74E-06	4.18E-06
				400	180.68265	1.69E-03	5.06E-06	4.40E-06
				500	213.37706	2.21E-03	5.33E-06	4.56E-06
				600	246.26047	2.75E-03	5.54E-06	4.71E-06
DW16 01		wds	3/4/2010 16:13	700	279.35823	3.31E-03	5.70E-06	4.84E-06
				800	312.67419	3.89E-03	5.80E-06	4.96E-06
				900	346.16247	4.48E-03	5.85E-06	5.06E-06
				1000	379.81339	5.06E-03	5.84E-06	5.14E-06
				100	76.87039	3.50E-04	4.10E-06	4.11E-06
				200	110.22774	7.68E-04	4.50E-06	4.20E-06
				300	142.75813	1.23E-03	4.84E-06	4.35E-06
				400	175.25275	1.74E-03	5.15E-06	4.55E-06
				500	207.90389	2.27E-03	5.40E-06	4.71E-06
				600	240.7716	2.82E-03	5.60E-06	4.84E-06
				700	273.8348	3.39E-03	5.76E-06	4.96E-06
				800	307.11828	3.96E-03	5.87E-06	5.06E-06
				900	340.57656	4.56E-03	5.93E-06	5.16E-06
				1000	374.19124	5.16E-03	5.94E-06	5.26E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DW16 02		wds	3/5/2010 7:38	100	81.25293	3.28E-04	3.83E-06	3.82E-06
				200	115.24802	7.28E-04	4.28E-06	3.92E-06
				300	148.01027	1.17E-03	4.68E-06	4.09E-06
				400	180.63764	1.66E-03	5.02E-06	4.32E-06
				500	213.34772	2.18E-03	5.31E-06	4.50E-06
				600	246.24695	2.72E-03	5.54E-06	4.66E-06
				700	279.32687	3.28E-03	5.71E-06	4.80E-06
				800	312.64817	3.86E-03	5.83E-06	4.92E-06
				900	346.16266	4.45E-03	5.90E-06	5.03E-06
				1000	379.84273	5.04E-03	5.91E-06	5.12E-06
DW16 03		wds	3/5/2010 7:38	100	76.99498	3.42E-04	3.88E-06	3.91E-06
				200	110.31218	7.40E-04	4.28E-06	3.99E-06
				300	142.82622	1.18E-03	4.64E-06	4.14E-06
				400	175.31488	1.67E-03	4.95E-06	4.34E-06
				500	207.96233	2.18E-03	5.22E-06	4.50E-06
				600	240.83151	2.71E-03	5.44E-06	4.64E-06
				700	273.86556	3.27E-03	5.62E-06	4.77E-06
				800	307.15292	3.83E-03	5.76E-06	4.88E-06
				900	340.61878	4.41E-03	5.84E-06	4.99E-06
				1000	374.25234	5.01E-03	5.89E-06	5.09E-06
DW16 04		wds	3/5/2010 16:53	100	77.38858	3.33E-04	3.89E-06	3.88E-06
				200	110.7822	7.32E-04	4.30E-06	3.98E-06
				300	143.31738	1.17E-03	4.66E-06	4.14E-06
				400	175.8222	1.67E-03	4.98E-06	4.35E-06
				500	208.45366	2.18E-03	5.25E-06	4.51E-06
				600	241.28014	2.72E-03	5.48E-06	4.66E-06
				700	274.36286	3.27E-03	5.66E-06	4.79E-06
				800	307.62627	3.84E-03	5.80E-06	4.90E-06
				900	341.07169	4.43E-03	5.89E-06	5.01E-06
				1000	374.66826	5.04E-03	5.94E-06	5.12E-06
DW17 01		wds	3/5/2010 16:08	100	81.69537	3.17E-04	3.80E-06	3.75E-06
				200	115.75252	7.13E-04	4.25E-06	3.87E-06
				300	148.53701	1.15E-03	4.64E-06	4.04E-06
				400	181.15829	1.64E-03	4.97E-06	4.27E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DW17 02		wds	3/8/2010 8:07	500	213.85192	2.16E-03	5.25E-06	4.46E-06
				600	246.75047	2.69E-03	5.46E-06	4.61E-06
				700	279.8189	3.24E-03	5.62E-06	4.74E-06
				800	313.15056	3.81E-03	5.72E-06	4.86E-06
				900	346.6362	4.39E-03	5.76E-06	4.96E-06
				1000	380.32951	4.96E-03	5.74E-06	5.04E-06
				100	77.39103	3.44E-04	3.93E-06	3.98E-06
				200	110.7479	7.49E-04	4.32E-06	4.05E-06
				300	143.24297	1.19E-03	4.68E-06	4.18E-06
				400	175.73291	1.68E-03	4.99E-06	4.38E-06
DW17 04		wds	3/8/2010 8:08	500	208.39509	2.20E-03	5.25E-06	4.54E-06
				600	241.26202	2.74E-03	5.48E-06	4.68E-06
				700	274.31868	3.29E-03	5.66E-06	4.81E-06
				800	307.60328	3.86E-03	5.80E-06	4.92E-06
				900	341.06575	4.44E-03	5.90E-06	5.03E-06
				1000	374.66765	5.06E-03	5.96E-06	5.14E-06
				100	81.36351	3.26E-04	3.80E-06	3.78E-06
				200	115.36352	7.21E-04	4.20E-06	3.87E-06
				300	148.10396	1.15E-03	4.55E-06	4.02E-06
				400	180.68977	1.63E-03	4.85E-06	4.23E-06
DW2 01		wds	3/8/2010 17:06	500	213.358	2.13E-03	5.12E-06	4.39E-06
				600	246.2446	2.65E-03	5.33E-06	4.53E-06
				700	279.34034	3.19E-03	5.51E-06	4.66E-06
				800	312.67516	3.75E-03	5.63E-06	4.78E-06
				900	346.19041	4.32E-03	5.72E-06	4.88E-06
				1000	379.87148	4.89E-03	5.75E-06	4.96E-06
				100	76.92639	3.36E-04	3.91E-06	3.93E-06
				200	110.29779	7.37E-04	4.34E-06	4.01E-06
				300	142.79444	1.19E-03	4.71E-06	4.18E-06
				400	175.28982	1.68E-03	5.03E-06	4.39E-06
500	207.9585	2.20E-03	5.29E-06	4.56E-06				
600	240.8196	2.74E-03	5.50E-06	4.70E-06				
700	273.89134	3.30E-03	5.66E-06	4.83E-06				
800	307.16625	3.86E-03	5.76E-06	4.93E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DW2 02		wds	3/8/2010 16:36	900	340.61884	4.44E-03	5.81E-06	5.03E-06
				1000	374.22233	5.04E-03	5.81E-06	5.13E-06
				100	81.28012	3.25E-04	3.96E-06	3.88E-06
				200	115.30428	7.34E-04	4.34E-06	3.99E-06
				300	148.08953	1.18E-03	4.67E-06	4.15E-06
				400	180.70188	1.67E-03	4.97E-06	4.36E-06
				500	213.37332	2.18E-03	5.23E-06	4.52E-06
				600	246.27052	2.71E-03	5.44E-06	4.65E-06
				700	279.36737	3.26E-03	5.61E-06	4.77E-06
				800	312.69682	3.83E-03	5.74E-06	4.90E-06
DW2 03		wds	3/9/2010 7:35	900	346.20775	4.42E-03	5.83E-06	5.00E-06
				1000	379.88532	5.00E-03	5.88E-06	5.08E-06
				100	77.4141	3.42E-04	3.92E-06	3.91E-06
				200	110.75346	7.42E-04	4.31E-06	4.00E-06
				300	143.23975	1.19E-03	4.66E-06	4.16E-06
				400	175.75234	1.68E-03	4.97E-06	4.36E-06
				500	208.41688	2.19E-03	5.24E-06	4.52E-06
				600	241.27688	2.72E-03	5.46E-06	4.66E-06
				700	274.32935	3.28E-03	5.65E-06	4.79E-06
				800	307.61097	3.85E-03	5.79E-06	4.91E-06
DW2 04		wds	3/9/2010 7:35	900	341.05583	4.43E-03	5.89E-06	5.01E-06
				1000	374.68325	5.04E-03	5.94E-06	5.12E-06
				100	81.33079	3.23E-04	3.73E-06	3.77E-06
				200	115.36046	7.17E-04	4.16E-06	3.87E-06
				300	148.10286	1.14E-03	4.54E-06	3.98E-06
				400	180.70826	1.62E-03	4.87E-06	4.20E-06
				500	213.37487	2.12E-03	5.15E-06	4.38E-06
				600	246.26072	2.65E-03	5.37E-06	4.53E-06
				700	279.34048	3.19E-03	5.55E-06	4.66E-06
				800	312.66579	3.75E-03	5.68E-06	4.79E-06
DW3 01		wds	3/9/2010 16:45	900	346.13833	4.33E-03	5.76E-06	4.90E-06
				1000	379.82337	4.90E-03	5.78E-06	4.98E-06
				100	76.88005	3.38E-04	4.03E-06	4.03E-06
				200	110.27115	7.50E-04	4.44E-06	4.08E-06

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DA2 02		wds	8/10/2010 8:12	300	142.80336	1.21E-03	4.79E-06	4.26E-06
				400	175.30556	1.71E-03	5.10E-06	4.47E-06
				500	207.96335	2.24E-03	5.37E-06	4.64E-06
				600	240.81312	2.79E-03	5.59E-06	4.78E-06
				700	273.87877	3.35E-03	5.76E-06	4.91E-06
				800	307.15941	3.93E-03	5.89E-06	5.02E-06
				900	340.63211	4.52E-03	5.97E-06	5.12E-06
				1000	374.23423	5.14E-03	6.00E-06	5.23E-06
				100	80.84648	3.45E-04	4.19E-06	4.09E-06
				200	114.93301	7.75E-04	4.63E-06	4.20E-06
DA3 02		wds	8/9/2010 16:50	300	147.86222	1.25E-03	5.00E-06	4.40E-06
				400	180.15969	1.78E-03	5.32E-06	4.64E-06
				500	212.54672	2.33E-03	5.57E-06	4.82E-06
				600	245.17699	2.90E-03	5.76E-06	4.96E-06
				700	278.01973	3.47E-03	5.89E-06	5.07E-06
				800	311.12914	4.06E-03	5.96E-06	5.18E-06
				900	344.47086	4.67E-03	5.96E-06	5.28E-06
				1000	378.05231	5.26E-03	5.91E-06	5.35E-06
				100	79.61645	3.39E-04	4.21E-06	4.17E-06
				200	113.00552	7.75E-04	4.59E-06	4.28E-06
DA2 03A		wds	8/10/2010 16:29	300	145.59313	1.24E-03	4.92E-06	4.40E-06
				400	178.21999	1.76E-03	5.21E-06	4.60E-06
				500	211.02488	2.29E-03	5.46E-06	4.77E-06
				600	244.05783	2.85E-03	5.67E-06	4.91E-06
				700	277.29251	3.42E-03	5.83E-06	5.03E-06
				800	310.74993	4.01E-03	5.96E-06	5.13E-06
				900	344.33486	4.61E-03	6.04E-06	5.23E-06
				1000	378.11063	5.24E-03	6.08E-06	5.34E-06
				100	81.53486	3.11E-04	4.00E-06	3.69E-06
				200	115.47394	7.23E-04	4.41E-06	3.92E-06
300	147.79416	1.18E-03	4.76E-06	4.16E-06				
400	180.10294	1.68E-03	5.06E-06	4.38E-06				
500	212.5152	2.20E-03	5.29E-06	4.55E-06				
600	245.1436	2.74E-03	5.47E-06	4.69E-06				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Temperature °C	Time (min)	Linear Thermal Expansion	Instantaneous CTE at X °C (1/K)	Mean CTE at X °C (1/K)
DA2 03B		wds	8/9/2010 16:25	700	277.98474	3.28E-03	5.59E-06	4.80E-06
				800	311.13421	3.85E-03	5.64E-06	4.91E-06
				900	344.50121	4.42E-03	5.64E-06	5.00E-06
				1000	378.00002	4.98E-03	5.59E-06	5.06E-06
				100	80.83247	3.27E-04	4.10E-06	3.85E-06
				200	115.34233	7.45E-04	4.51E-06	4.04E-06
				300	147.80538	1.21E-03	4.87E-06	4.27E-06
				400	180.10728	1.73E-03	5.17E-06	4.51E-06
				500	212.57144	2.26E-03	5.41E-06	4.66E-06
				600	245.16151	2.81E-03	5.61E-06	4.81E-06
				700	278.03033	3.37E-03	5.74E-06	4.93E-06
				800	311.14254	3.95E-03	5.83E-06	5.04E-06
				900	344.51491	4.54E-03	5.86E-06	5.14E-06
				1000	378.05813	5.12E-03	5.84E-06	5.21E-06
DA3 03		wds	8/11/2010 7:44	100	79.82964	3.11E-04	3.81E-06	3.73E-06
				200	113.17225	7.09E-04	4.22E-06	3.87E-06
				300	145.68318	1.14E-03	4.58E-06	4.01E-06
				400	178.298	1.62E-03	4.90E-06	4.23E-06
				500	211.124	2.13E-03	5.17E-06	4.42E-06
				600	244.17806	2.66E-03	5.39E-06	4.57E-06
				700	277.45534	3.20E-03	5.57E-06	4.69E-06
				800	310.93716	3.76E-03	5.70E-06	4.81E-06
				900	344.5528	4.34E-03	5.78E-06	4.91E-06
				1000	378.34883	4.94E-03	5.81E-06	5.03E-06

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DA4 02	25.383	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DA4 03	25.374	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DA5 01	25.392	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DA5 02	25.374	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L_0 , mm)	Reference Temperature (T_0 , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DA5 03	25.39	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DA6 01	25.392	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DA6 02	25.396	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DA7 01	25.397	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW1 01	25.377	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW1 02	25.391	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW10 01	25.371	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DW10 02	25.37	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW10 03	25.371	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW10 04	25.37	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DW11 01	25.371	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW11 02	25.371	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW11 03	25.373	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DW11 04	25.37	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW12 01	25.372	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW12 02	25.371	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW12 03	25.371	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DW12 04	25.371	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW13 02	25.373	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW13 01	25.372	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DW13 03	25.373	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW13 04	25.372	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW14 01	25.375	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW14 02	25.373	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DW14 03	25.373	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW14 04	25.374	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW15 02	25.39	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DW15 03	25.387	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW15 04	25.394	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW16 01	25.384	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DW16 02	25.391	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW16 03	25.381	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW16 04	25.385	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW17 01	25.4	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DW17 02	25.396	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW17 04	25.387	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW2 01	25.382	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DW2 02	25.364	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW2 03	25.368	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW2 04	25.366	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DW3 01	25.365	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DA2 02	25.398	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DA3 02	25.397	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DA2 03A	25.398	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen ID Number	Initial Specimen Length (L ₀ , mm)	Reference Temperature (T ₀ , °C)	Instrument	Measurement Mode	Purge Gas	Flow Rate (ml/min)	ASTM	Specimen Comment
DA2 03B	25.398	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	
DA3 03	25.397	20 °C	NETZSCH DIL 402 C	Standard Expansion	He	60	E 228-06	

Specimen Number	DA4 02	DA4 03	DA5 01	DA5 02	DA5 03	DA6 01
Measured By						
Measured Date	2/18/10 5:04 PM	2/18/10 4:13 PM	2/19/10 7:50 AM	2/19/10 7:54 AM	2/19/10 4:16 PM	5/26/10 4:52 PM
Initial Sample Length (L0, mm)	25.383	25.374	25.392	25.374	25.39	25.392
Linear Thermal Expansion						
Temperature °C						
100	3.61E-04	3.30E-04	3.70E-04	3.60E-04	3.41E-04	3.69E-04
200	7.92E-04	7.37E-04	8.01E-04	8.01E-04	7.46E-04	8.10E-04
300	1.27E-03	1.18E-03	1.28E-03	1.27E-03	1.19E-03	1.28E-03
400	1.79E-03	1.66E-03	1.82E-03	1.79E-03	1.68E-03	1.81E-03
500	2.33E-03	2.17E-03	2.37E-03	2.33E-03	2.20E-03	2.35E-03
600	2.90E-03	2.69E-03	2.94E-03	2.89E-03	2.73E-03	2.90E-03
700	3.48E-03	3.23E-03	3.52E-03	3.47E-03	3.28E-03	3.48E-03
800	4.08E-03	3.80E-03	4.11E-03	4.07E-03	3.85E-03	4.06E-03
900	4.69E-03	4.37E-03	4.72E-03	4.68E-03	4.43E-03	4.66E-03
1000	5.33E-03	4.94E-03	5.35E-03	5.28E-03	5.04E-03	5.27E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	4.22E-06	3.93E-06	4.26E-06	4.26E-06	3.95E-06	4.30E-06
200	4.62E-06	4.30E-06	4.67E-06	4.63E-06	4.33E-06	4.66E-06
300	4.97E-06	4.63E-06	5.04E-06	4.96E-06	4.67E-06	4.98E-06
400	5.28E-06	4.91E-06	5.34E-06	5.25E-06	4.98E-06	5.26E-06
500	5.54E-06	5.16E-06	5.60E-06	5.51E-06	5.24E-06	5.49E-06
600	5.77E-06	5.37E-06	5.80E-06	5.72E-06	5.46E-06	5.68E-06
700	5.94E-06	5.54E-06	5.95E-06	5.90E-06	5.64E-06	5.83E-06
800	6.07E-06	5.67E-06	6.05E-06	6.04E-06	5.78E-06	5.94E-06
900	6.16E-06	5.76E-06	6.09E-06	6.14E-06	5.88E-06	6.00E-06
1000	6.20E-06	5.81E-06	6.08E-06	6.20E-06	5.93E-06	6.03E-06
Mean CTE (1/K)						
Temperature °C						
100	4.25E-06	3.94E-06	4.24E-06	4.23E-06	4.02E-06	4.35E-06
200	4.33E-06	4.02E-06	4.32E-06	4.33E-06	4.07E-06	4.42E-06
300	4.47E-06	4.14E-06	4.50E-06	4.47E-06	4.20E-06	4.53E-06
400	4.67E-06	4.33E-06	4.72E-06	4.67E-06	4.39E-06	4.72E-06
500	4.83E-06	4.48E-06	4.88E-06	4.81E-06	4.55E-06	4.86E-06
600	4.98E-06	4.61E-06	5.03E-06	4.94E-06	4.69E-06	4.98E-06
700	5.10E-06	4.73E-06	5.14E-06	5.07E-06	4.81E-06	5.09E-06
800	5.21E-06	4.85E-06	5.24E-06	5.19E-06	4.92E-06	5.19E-06
900	5.31E-06	4.95E-06	5.34E-06	5.30E-06	5.02E-06	5.28E-06
1000	5.42E-06	5.03E-06	5.44E-06	5.37E-06	5.13E-06	5.36E-06

Specimen Number	DA6 02	DA7 01	DW1 01	DW1 02	DW10 01	DW10 02
Measured By	wsds	wsds	wsds	wsds	wsds	wsds
Measured Date	5/26/10 4:37 PM	2/22/10 8:11 AM	2/22/10 4:47 PM	2/22/10 4:37 PM	2/23/10 7:49 AM	2/23/10 7:52 AM
Initial Sample Length (L0, mm)	25.396	25.397	25.377	25.391	25.371	25.37
Linear Thermal Expansion						
Temperature °C						
100	3.44E-04	3.36E-04	3.24E-04	3.18E-04	3.21E-04	3.32E-04
200	7.85E-04	7.47E-04	7.15E-04	7.15E-04	7.08E-04	7.40E-04
300	1.26E-03	1.19E-03	1.15E-03	1.14E-03	1.15E-03	1.18E-03
400	1.79E-03	1.68E-03	1.63E-03	1.62E-03	1.65E-03	1.67E-03
500	2.34E-03	2.19E-03	2.13E-03	2.13E-03	2.17E-03	2.19E-03
600	2.91E-03	2.72E-03	2.66E-03	2.65E-03	2.71E-03	2.72E-03
700	3.51E-03	3.27E-03	3.20E-03	3.19E-03	3.28E-03	3.26E-03
800	4.13E-03	3.84E-03	3.76E-03	3.75E-03	3.85E-03	3.83E-03
900	4.76E-03	4.42E-03	4.34E-03	4.32E-03	4.43E-03	4.41E-03
1000	5.37E-03	5.00E-03	4.94E-03	4.88E-03	5.03E-03	4.98E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	4.23E-06	3.97E-06	3.80E-06	3.79E-06	3.74E-06	3.93E-06
200	4.65E-06	4.34E-06	4.20E-06	4.20E-06	4.24E-06	4.32E-06
300	5.03E-06	4.66E-06	4.56E-06	4.56E-06	4.68E-06	4.67E-06
400	5.36E-06	4.95E-06	4.87E-06	4.88E-06	5.04E-06	4.97E-06
500	5.64E-06	5.21E-06	5.15E-06	5.14E-06	5.34E-06	5.22E-06
600	5.87E-06	5.42E-06	5.37E-06	5.35E-06	5.56E-06	5.43E-06
700	6.06E-06	5.60E-06	5.56E-06	5.52E-06	5.71E-06	5.59E-06
800	6.20E-06	5.74E-06	5.70E-06	5.63E-06	5.79E-06	5.70E-06
900	6.30E-06	5.85E-06	5.80E-06	5.70E-06	5.80E-06	5.76E-06
1000	6.34E-06	5.92E-06	5.86E-06	5.72E-06	5.74E-06	5.78E-06
Mean CTE (1/K)						
Temperature °C						
100	4.14E-06	3.91E-06	3.76E-06	3.80E-06	3.74E-06	3.87E-06
200	4.28E-06	4.03E-06	3.88E-06	3.89E-06	3.85E-06	3.99E-06
300	4.47E-06	4.17E-06	4.04E-06	4.03E-06	4.03E-06	4.15E-06
400	4.68E-06	4.37E-06	4.25E-06	4.24E-06	4.29E-06	4.35E-06
500	4.85E-06	4.51E-06	4.41E-06	4.40E-06	4.48E-06	4.51E-06
600	5.00E-06	4.65E-06	4.56E-06	4.55E-06	4.64E-06	4.65E-06
700	5.14E-06	4.77E-06	4.69E-06	4.67E-06	4.78E-06	4.77E-06
800	5.27E-06	4.89E-06	4.80E-06	4.79E-06	4.90E-06	4.88E-06
900	5.40E-06	5.00E-06	4.91E-06	4.90E-06	5.01E-06	4.98E-06
1000	5.47E-06	5.08E-06	5.03E-06	4.97E-06	5.11E-06	5.06E-06

Specimen Number	DW10 04	DW11 01	DW11 02	DW11 03	DW11 04
Measured By					
Measured Date	2/23/10 4:20 PM	2/24/10 7:45 AM	2/24/10 7:51 AM	2/24/10 4:24 PM	2/24/10 4:08 PM
Initial Sample Length (L0, mm)	25.371	25.371	25.371	25.373	25.37
Linear Thermal Expansion					
Temperature °C					
100	3.33E-04	3.52E-04	3.26E-04	3.41E-04	3.18E-04
200	7.34E-04	7.50E-04	7.20E-04	7.43E-04	7.15E-04
300	1.18E-03	1.19E-03	1.14E-03	1.18E-03	1.15E-03
400	1.67E-03	1.68E-03	1.62E-03	1.67E-03	1.64E-03
500	2.19E-03	2.20E-03	2.12E-03	2.18E-03	2.15E-03
600	2.72E-03	2.74E-03	2.65E-03	2.72E-03	2.68E-03
700	3.28E-03	3.30E-03	3.20E-03	3.27E-03	3.23E-03
800	3.85E-03	3.87E-03	3.77E-03	3.82E-03	3.80E-03
900	4.43E-03	4.45E-03	4.34E-03	4.40E-03	4.38E-03
1000	5.02E-03	5.06E-03	4.91E-03	5.00E-03	4.96E-03
Instantaneous CTE (1/K)					
Temperature °C					
100	3.90E-06	3.89E-06	3.72E-06	3.92E-06	3.82E-06
200	4.32E-06	4.30E-06	4.16E-06	4.31E-06	4.24E-06
300	4.68E-06	4.67E-06	4.55E-06	4.65E-06	4.61E-06
400	4.99E-06	5.00E-06	4.88E-06	4.95E-06	4.94E-06
500	5.26E-06	5.27E-06	5.17E-06	5.20E-06	5.21E-06
600	5.47E-06	5.50E-06	5.39E-06	5.42E-06	5.44E-06
700	5.64E-06	5.68E-06	5.57E-06	5.59E-06	5.61E-06
800	5.76E-06	5.81E-06	5.69E-06	5.71E-06	5.74E-06
900	5.83E-06	5.89E-06	5.76E-06	5.80E-06	5.82E-06
1000	5.85E-06	5.93E-06	5.78E-06	5.84E-06	5.84E-06
Mean CTE (1/K)					
Temperature °C					
100	3.90E-06	4.02E-06	3.80E-06	3.96E-06	3.79E-06
200	3.99E-06	4.06E-06	3.88E-06	4.04E-06	3.89E-06
300	4.16E-06	4.18E-06	4.01E-06	4.17E-06	4.06E-06
400	4.36E-06	4.38E-06	4.21E-06	4.36E-06	4.28E-06
500	4.53E-06	4.55E-06	4.38E-06	4.52E-06	4.45E-06
600	4.67E-06	4.69E-06	4.54E-06	4.66E-06	4.59E-06
700	4.80E-06	4.82E-06	4.68E-06	4.78E-06	4.73E-06
800	4.91E-06	4.93E-06	4.81E-06	4.88E-06	4.85E-06
900	5.01E-06	5.04E-06	4.91E-06	4.98E-06	4.96E-06
1000	5.11E-06	5.14E-06	4.99E-06	5.09E-06	5.04E-06

Specimen Number	DW12 01	DW12 02	DW12 03	DW12 04	DW13 02	DW13 01
Measured By						
Measured Date	2/25/10 7:46 AM	2/25/10 7:50 AM	3/1/10 7:52 AM	3/1/10 7:55 AM	3/1/10 4:13 PM	3/2/10 7:52 AM
Initial Sample Length (L0, mm)	25.372	25.371	25.371	25.371	25.373	25.372
Linear Thermal Expansion						
Temperature °C						
100	3.48E-04	3.32E-04	3.40E-04	3.29E-04	3.32E-04	3.24E-04
200	7.57E-04	7.37E-04	7.39E-04	7.29E-04	7.56E-04	7.13E-04
300	1.21E-03	1.18E-03	1.18E-03	1.17E-03	1.22E-03	1.16E-03
400	1.71E-03	1.67E-03	1.67E-03	1.66E-03	1.71E-03	1.65E-03
500	2.24E-03	2.17E-03	2.18E-03	2.17E-03	2.21E-03	2.17E-03
600	2.78E-03	2.70E-03	2.72E-03	2.70E-03	2.74E-03	2.71E-03
700	3.34E-03	3.25E-03	3.27E-03	3.25E-03	3.29E-03	3.27E-03
800	3.92E-03	3.81E-03	3.83E-03	3.81E-03	3.86E-03	3.84E-03
900	4.50E-03	4.39E-03	4.41E-03	4.39E-03	4.44E-03	4.43E-03
1000	5.11E-03	4.97E-03	5.01E-03	4.95E-03	5.01E-03	5.05E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	3.98E-06	3.91E-06	3.87E-06	3.85E-06	4.15E-06	3.79E-06
200	4.40E-06	4.30E-06	4.28E-06	4.28E-06	4.45E-06	4.25E-06
300	4.76E-06	4.64E-06	4.65E-06	4.65E-06	4.72E-06	4.65E-06
400	5.08E-06	4.94E-06	4.96E-06	4.96E-06	4.97E-06	4.99E-06
500	5.35E-06	5.19E-06	5.23E-06	5.22E-06	5.19E-06	5.29E-06
600	5.56E-06	5.41E-06	5.45E-06	5.43E-06	5.39E-06	5.53E-06
700	5.72E-06	5.58E-06	5.62E-06	5.58E-06	5.56E-06	5.71E-06
800	5.84E-06	5.71E-06	5.75E-06	5.67E-06	5.71E-06	5.85E-06
900	5.90E-06	5.79E-06	5.82E-06	5.71E-06	5.83E-06	5.93E-06
1000	5.91E-06	5.84E-06	5.85E-06	5.69E-06	5.93E-06	5.95E-06
Mean CTE (1/K)						
Temperature °C						
100	4.03E-06	3.85E-06	3.87E-06	3.82E-06	3.97E-06	3.78E-06
200	4.09E-06	3.96E-06	3.97E-06	3.92E-06	4.12E-06	3.86E-06
300	4.24E-06	4.12E-06	4.12E-06	4.09E-06	4.29E-06	4.06E-06
400	4.45E-06	4.32E-06	4.33E-06	4.31E-06	4.45E-06	4.29E-06
500	4.62E-06	4.48E-06	4.50E-06	4.47E-06	4.58E-06	4.48E-06
600	4.76E-06	4.61E-06	4.64E-06	4.62E-06	4.70E-06	4.64E-06
700	4.89E-06	4.74E-06	4.77E-06	4.74E-06	4.81E-06	4.78E-06
800	4.99E-06	4.86E-06	4.88E-06	4.86E-06	4.92E-06	4.90E-06
900	5.09E-06	4.97E-06	4.98E-06	4.96E-06	5.02E-06	5.01E-06
1000	5.20E-06	5.04E-06	5.09E-06	5.03E-06	5.10E-06	5.13E-06

Specimen Number	DW13 03	DW13 04	DW14 01	DW14 02	DW14 03	DW14 04
Measured By						
Measured Date	3/2/10 7:54 AM	3/2/10 4:42 PM	3/2/10 4:13 PM	3/3/10 7:32 AM	3/3/10 7:33 AM	3/3/10 4:37 PM
Initial Sample Length (L0, mm)	25.373	25.372	25.375	25.373	25.373	25.374
Linear Thermal Expansion Temperature °C						
100	3.34E-04	3.18E-04	3.27E-04	3.48E-04	3.28E-04	3.28E-04
200	7.38E-04	6.99E-04	7.31E-04	7.61E-04	7.26E-04	7.14E-04
300	1.18E-03	1.13E-03	1.17E-03	1.22E-03	1.15E-03	1.15E-03
400	1.66E-03	1.62E-03	1.66E-03	1.72E-03	1.63E-03	1.64E-03
500	2.17E-03	2.13E-03	2.16E-03	2.25E-03	2.14E-03	2.15E-03
600	2.70E-03	2.66E-03	2.70E-03	2.79E-03	2.66E-03	2.68E-03
700	3.24E-03	3.20E-03	3.25E-03	3.36E-03	3.21E-03	3.23E-03
800	3.80E-03	3.76E-03	3.82E-03	3.94E-03	3.78E-03	3.80E-03
900	4.37E-03	4.33E-03	4.40E-03	4.54E-03	4.35E-03	4.37E-03
1000	4.93E-03	4.92E-03	4.97E-03	5.16E-03	4.92E-03	4.97E-03
Instantaneous CTE (1/K) Temperature °C						
100	3.90E-06	3.68E-06	3.86E-06	4.03E-06	3.77E-06	3.77E-06
200	4.29E-06	4.16E-06	4.28E-06	4.43E-06	4.19E-06	4.22E-06
300	4.63E-06	4.57E-06	4.64E-06	4.78E-06	4.57E-06	4.61E-06
400	4.93E-06	4.92E-06	4.95E-06	5.09E-06	4.89E-06	4.94E-06
500	5.18E-06	5.20E-06	5.22E-06	5.36E-06	5.16E-06	5.22E-06
600	5.38E-06	5.42E-06	5.44E-06	5.59E-06	5.39E-06	5.44E-06
700	5.53E-06	5.58E-06	5.61E-06	5.78E-06	5.57E-06	5.61E-06
800	5.63E-06	5.68E-06	5.74E-06	5.92E-06	5.69E-06	5.72E-06
900	5.69E-06	5.71E-06	5.81E-06	6.02E-06	5.77E-06	5.78E-06
1000	5.70E-06	5.68E-06	5.84E-06	6.08E-06	5.79E-06	5.78E-06
Mean CTE (1/K) Temperature °C						
100	3.84E-06	3.78E-06	3.91E-06	4.02E-06	3.82E-06	3.77E-06
200	3.95E-06	3.84E-06	3.98E-06	4.11E-06	3.91E-06	3.88E-06
300	4.10E-06	3.98E-06	4.13E-06	4.27E-06	4.03E-06	4.04E-06
400	4.31E-06	4.21E-06	4.32E-06	4.47E-06	4.23E-06	4.28E-06
500	4.47E-06	4.40E-06	4.48E-06	4.64E-06	4.40E-06	4.45E-06
600	4.60E-06	4.55E-06	4.63E-06	4.78E-06	4.55E-06	4.60E-06
700	4.72E-06	4.69E-06	4.76E-06	4.91E-06	4.69E-06	4.73E-06
800	4.84E-06	4.81E-06	4.88E-06	5.03E-06	4.81E-06	4.84E-06
900	4.93E-06	4.91E-06	4.99E-06	5.14E-06	4.92E-06	4.95E-06
1000	5.01E-06	5.01E-06	5.06E-06	5.24E-06	5.00E-06	5.05E-06

Specimen Number	DW15 02	DW15 03	DW15 04	DW16 01	DW16 02	DW16 03
Measured By						
Measured Date	3/3/10 4:14 PM	3/4/10 7:32 AM	3/4/10 7:36 AM	3/4/10 4:13 PM	3/5/10 7:38 AM	3/5/10 7:38 AM
Initial Sample Length (L0, mm)	25.39	25.387	25.394	25.384	25.391	25.381
Linear Thermal Expansion Temperature °C						
100	3.20E-04	3.49E-04	3.34E-04	3.50E-04	3.28E-04	3.42E-04
200	7.12E-04	7.52E-04	7.42E-04	7.68E-04	7.28E-04	7.40E-04
300	1.14E-03	1.19E-03	1.19E-03	1.23E-03	1.17E-03	1.18E-03
400	1.61E-03	1.68E-03	1.69E-03	1.74E-03	1.66E-03	1.67E-03
500	2.11E-03	2.19E-03	2.21E-03	2.27E-03	2.18E-03	2.18E-03
600	2.63E-03	2.72E-03	2.75E-03	2.82E-03	2.72E-03	2.71E-03
700	3.17E-03	3.27E-03	3.31E-03	3.39E-03	3.28E-03	3.27E-03
800	3.73E-03	3.83E-03	3.89E-03	3.96E-03	3.86E-03	3.83E-03
900	4.30E-03	4.40E-03	4.48E-03	4.56E-03	4.45E-03	4.41E-03
1000	4.86E-03	4.98E-03	5.06E-03	5.16E-03	5.04E-03	5.01E-03
Instantaneous CTE (1/K) Temperature °C						
100	3.75E-06	3.89E-06	3.93E-06	4.10E-06	3.83E-06	3.88E-06
200	4.17E-06	4.29E-06	4.36E-06	4.50E-06	4.28E-06	4.28E-06
300	4.53E-06	4.64E-06	4.74E-06	4.84E-06	4.68E-06	4.64E-06
400	4.84E-06	4.94E-06	5.06E-06	5.15E-06	5.02E-06	4.95E-06
500	5.11E-06	5.20E-06	5.33E-06	5.40E-06	5.31E-06	5.22E-06
600	5.32E-06	5.41E-06	5.54E-06	5.60E-06	5.54E-06	5.44E-06
700	5.49E-06	5.57E-06	5.70E-06	5.76E-06	5.71E-06	5.62E-06
800	5.61E-06	5.68E-06	5.80E-06	5.87E-06	5.83E-06	5.76E-06
900	5.68E-06	5.75E-06	5.85E-06	5.93E-06	5.90E-06	5.84E-06
1000	5.70E-06	5.76E-06	5.84E-06	5.94E-06	5.91E-06	5.89E-06
Mean CTE (1/K) Temperature °C						
100	3.81E-06	3.98E-06	3.91E-06	4.11E-06	3.82E-06	3.91E-06
200	3.87E-06	4.02E-06	4.00E-06	4.20E-06	3.92E-06	3.99E-06
300	4.01E-06	4.15E-06	4.18E-06	4.35E-06	4.09E-06	4.14E-06
400	4.21E-06	4.34E-06	4.40E-06	4.55E-06	4.32E-06	4.34E-06
500	4.37E-06	4.50E-06	4.56E-06	4.71E-06	4.50E-06	4.50E-06
600	4.51E-06	4.64E-06	4.71E-06	4.84E-06	4.66E-06	4.64E-06
700	4.64E-06	4.77E-06	4.84E-06	4.96E-06	4.80E-06	4.77E-06
800	4.76E-06	4.87E-06	4.96E-06	5.06E-06	4.92E-06	4.88E-06
900	4.87E-06	4.97E-06	5.06E-06	5.16E-06	5.03E-06	4.99E-06
1000	4.94E-06	5.06E-06	5.14E-06	5.26E-06	5.12E-06	5.09E-06

Specimen Number	DW16 04 wds 3/5/10 4:53 PM 25.385	DW17 01 wds 3/5/10 4:08 PM 25.4	DW17 02 wds 3/8/10 8:07 AM 25.396	DW17 04 wds 3/8/10 8:08 AM 25.387	DW2 01 wds 3/8/10 5:06 PM 25.382	DW2 02 wds 3/8/10 4:36 PM 25.364
Linear Thermal Expansion Temperature °C						
100	3.33E-04	3.17E-04	3.44E-04	3.26E-04	3.36E-04	3.25E-04
200	7.32E-04	7.13E-04	7.49E-04	7.21E-04	7.37E-04	7.34E-04
300	1.17E-03	1.15E-03	1.19E-03	1.15E-03	1.19E-03	1.18E-03
400	1.67E-03	1.64E-03	1.68E-03	1.63E-03	1.68E-03	1.67E-03
500	2.18E-03	2.16E-03	2.20E-03	2.13E-03	2.20E-03	2.18E-03
600	2.72E-03	2.69E-03	2.74E-03	2.65E-03	2.74E-03	2.71E-03
700	3.27E-03	3.24E-03	3.29E-03	3.19E-03	3.30E-03	3.26E-03
800	3.84E-03	3.81E-03	3.86E-03	3.75E-03	3.86E-03	3.83E-03
900	4.43E-03	4.39E-03	4.44E-03	4.32E-03	4.44E-03	4.42E-03
1000	5.04E-03	4.96E-03	5.06E-03	4.89E-03	5.04E-03	5.00E-03
Instantaneous CTE (1/K) Temperature °C						
100	3.89E-06	3.80E-06	3.93E-06	3.80E-06	3.91E-06	3.96E-06
200	4.30E-06	4.25E-06	4.32E-06	4.20E-06	4.34E-06	4.34E-06
300	4.66E-06	4.64E-06	4.68E-06	4.55E-06	4.71E-06	4.67E-06
400	4.98E-06	4.97E-06	4.99E-06	4.85E-06	5.03E-06	4.97E-06
500	5.25E-06	5.25E-06	5.25E-06	5.12E-06	5.29E-06	5.23E-06
600	5.48E-06	5.46E-06	5.48E-06	5.33E-06	5.50E-06	5.44E-06
700	5.66E-06	5.62E-06	5.66E-06	5.51E-06	5.66E-06	5.61E-06
800	5.80E-06	5.72E-06	5.80E-06	5.63E-06	5.76E-06	5.74E-06
900	5.89E-06	5.76E-06	5.90E-06	5.72E-06	5.81E-06	5.83E-06
1000	5.94E-06	5.74E-06	5.96E-06	5.75E-06	5.81E-06	5.88E-06
Mean CTE (1/K) Temperature °C						
100	3.88E-06	3.75E-06	3.98E-06	3.78E-06	3.93E-06	3.88E-06
200	3.98E-06	3.87E-06	4.05E-06	3.87E-06	4.01E-06	3.99E-06
300	4.14E-06	4.04E-06	4.18E-06	4.02E-06	4.18E-06	4.15E-06
400	4.35E-06	4.27E-06	4.38E-06	4.23E-06	4.39E-06	4.36E-06
500	4.51E-06	4.46E-06	4.54E-06	4.39E-06	4.56E-06	4.52E-06
600	4.66E-06	4.61E-06	4.68E-06	4.53E-06	4.70E-06	4.65E-06
700	4.79E-06	4.74E-06	4.81E-06	4.66E-06	4.83E-06	4.77E-06
800	4.90E-06	4.86E-06	4.92E-06	4.78E-06	4.93E-06	4.90E-06
900	5.01E-06	4.96E-06	5.03E-06	4.88E-06	5.03E-06	5.00E-06
1000	5.12E-06	5.04E-06	5.14E-06	4.96E-06	5.13E-06	5.08E-06

Specimen Number	DW2 03	DW2 04	DW3 01	DA2 02	DA3 02	DA2 03A
Measured By						
Measured Date	3/9/10 7:35 AM	3/9/10 7:35 AM	3/9/10 4:45 PM	8/10/10 8:12 AM	8/9/10 4:50 PM	8/10/10 4:29 PM
Initial Sample Length (L0, mm)	25.368	25.366	25.365	25.398	25.397	25.398
Linear Thermal Expansion						
Temperature °C						
100	3.42E-04	3.23E-04	3.38E-04	3.45E-04	3.39E-04	3.11E-04
200	7.42E-04	7.17E-04	7.50E-04	7.75E-04	7.75E-04	7.23E-04
300	1.19E-03	1.14E-03	1.21E-03	1.25E-03	1.24E-03	1.18E-03
400	1.68E-03	1.62E-03	1.71E-03	1.78E-03	1.76E-03	1.68E-03
500	2.19E-03	2.12E-03	2.24E-03	2.33E-03	2.29E-03	2.20E-03
600	2.72E-03	2.65E-03	2.79E-03	2.90E-03	2.85E-03	2.74E-03
700	3.28E-03	3.19E-03	3.35E-03	3.47E-03	3.42E-03	3.28E-03
800	3.85E-03	3.75E-03	3.93E-03	4.06E-03	4.01E-03	3.85E-03
900	4.43E-03	4.33E-03	4.52E-03	4.67E-03	4.61E-03	4.42E-03
1000	5.04E-03	4.90E-03	5.14E-03	5.26E-03	5.24E-03	4.98E-03
Instantaneous CTE (1/K)						
Temperature °C						
100	3.92E-06	3.73E-06	4.03E-06	4.19E-06	4.21E-06	4.00E-06
200	4.31E-06	4.16E-06	4.44E-06	4.63E-06	4.59E-06	4.41E-06
300	4.66E-06	4.54E-06	4.79E-06	5.00E-06	4.92E-06	4.76E-06
400	4.97E-06	4.87E-06	5.10E-06	5.32E-06	5.21E-06	5.06E-06
500	5.24E-06	5.15E-06	5.37E-06	5.57E-06	5.46E-06	5.29E-06
600	5.46E-06	5.37E-06	5.59E-06	5.76E-06	5.67E-06	5.47E-06
700	5.65E-06	5.55E-06	5.76E-06	5.89E-06	5.83E-06	5.59E-06
800	5.79E-06	5.68E-06	5.89E-06	5.96E-06	5.96E-06	5.64E-06
900	5.89E-06	5.76E-06	5.97E-06	5.96E-06	6.04E-06	5.64E-06
1000	5.94E-06	5.78E-06	6.00E-06	5.91E-06	6.08E-06	5.59E-06
Mean CTE (1/K)						
Temperature °C						
100	3.91E-06	3.77E-06	4.03E-06	4.09E-06	4.17E-06	3.69E-06
200	4.00E-06	3.87E-06	4.08E-06	4.20E-06	4.28E-06	3.92E-06
300	4.16E-06	3.98E-06	4.26E-06	4.40E-06	4.40E-06	4.16E-06
400	4.36E-06	4.20E-06	4.47E-06	4.64E-06	4.60E-06	4.38E-06
500	4.52E-06	4.38E-06	4.64E-06	4.82E-06	4.77E-06	4.55E-06
600	4.66E-06	4.53E-06	4.78E-06	4.96E-06	4.91E-06	4.69E-06
700	4.79E-06	4.66E-06	4.91E-06	5.07E-06	5.03E-06	4.80E-06
800	4.91E-06	4.79E-06	5.02E-06	5.18E-06	5.13E-06	4.91E-06
900	5.01E-06	4.90E-06	5.12E-06	5.28E-06	5.23E-06	5.00E-06
1000	5.12E-06	4.98E-06	5.23E-06	5.35E-06	5.34E-06	5.06E-06

Specimen Number	DA2 03B	DA3 03
Measured By	wds	wds
Measured Date	8/9/10 4:25 PM	8/11/10 7:44 AM
Initial Sample Length (L0, mm)	25.398	25.397
Linear Thermal Expansion Temperature °C		
100	3.27E-04	3.11E-04
200	7.45E-04	7.09E-04
300	1.21E-03	1.14E-03
400	1.73E-03	1.62E-03
500	2.26E-03	2.13E-03
600	2.81E-03	2.66E-03
700	3.37E-03	3.20E-03
800	3.95E-03	3.76E-03
900	4.54E-03	4.34E-03
1000	5.12E-03	4.94E-03
Instantaneous CTE (1/K) Temperature °C		
100	4.10E-06	3.81E-06
200	4.51E-06	4.22E-06
300	4.87E-06	4.58E-06
400	5.17E-06	4.90E-06
500	5.41E-06	5.17E-06
600	5.61E-06	5.39E-06
700	5.74E-06	5.57E-06
800	5.83E-06	5.70E-06
900	5.86E-06	5.78E-06
1000	5.84E-06	5.81E-06
Mean CTE (1/K) Temperature °C		
100	3.85E-06	3.73E-06
200	4.04E-06	3.87E-06
300	4.27E-06	4.01E-06
400	4.51E-06	4.23E-06
500	4.66E-06	4.42E-06
600	4.81E-06	4.57E-06
700	4.93E-06	4.69E-06
800	5.04E-06	4.81E-06
900	5.14E-06	4.91E-06
1000	5.21E-06	5.03E-06

Specimen number	DW17 01	DW17 02	DW17 03	DW17 04
Date and Time	2/3/2010 12:42	2/3/2010 12:47	1/8/2010 10:26	2/3/2010 12:54
Operator	41169	41169	41169	41169
Sample location				
mass of specimen (g)	5.6555	5.6615	5.6637	5.6761
length of specimen (mm)	25.40000	25.39650	25.40050	25.38650
diameter of specimen (mm)	12.73813	12.73950	12.74675	12.73888
Poisson's ratio	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28305 28148 28120 28172 28148 28137 28161 28277 28147 28092	28785 28782 28786 28783 28748 28782 28733 28737 28746 28713	28500 28500 28500 28400 28600 28600 28600 28600 28600 28600	28197 28150 28212 28277 28172 28194 28286 28177 28222 28169
average resonant frequency (Hz)	28171	28760	28550	28206
standard deviation (Hz)	67	27	71	45
correction factor for rod	2.112120033	2.112620716	2.113459493	2.11332353
modulus of elasticity (Pa)	9.48E+09	9.88E+09	9.73E+09	9.53E+09
T ₁ correction factor	2.285723056	2.286355125	2.287414089	2.287242428
calculation of individual terms	0.030886869 0.324639072 2.274718471	0.030917245 0.32495834 2.27534513	0.030968169 0.32549359 2.27639503	0.030959912 0.325406794 2.276224838
resultant T ₁	2.112120033	2.112620716	2.113459493	2.11332353
modulus of elasticity (Pa)	9.48E+09	9.88E+09	9.73E+09	9.53E+09
Average Modulus for specimen group				
				9.91E+09

Specimen number	DW17 01	DW17 02	DW17 03	DW17 04
Specimen group standard deviation				
Environmental Conditions				
Temperature (°C)	22.7	22.7	19.8	22.7
Barometric Pressure (in of Hg)	25.1	25.1	25.6	25.1
Humidity (%)	14.8	14.8	4.5	15.1
Sampling Plan Layout				
Instrument				
ASTM				
# of Strikes		33		71
Comments:	Specimen ID # DA5 01: Against the grain creep samples are very difficult to get a consistent frequency.			
	Specimen ID # DA4 02: Difficult to get repeatable numbers			
	Specimen ID # DW17 02: Note: PCEA graphite is very difficult to repeat numbers on all the samples, both with and against the grain.			
	Specimen ID # DA6 01: Very difficult to get repeatable numbers as the amount of strikes would indicate.			

Specimen number	DW16 03	DW16 04	DW16 02	DW16 01	DW15 04
Date and Time	2/3/2010 13:05	2/3/2010 13:08	2/3/2010 13:01	2/3/2010 12:58	2/4/2010 10:09
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.6484	5.6630	5.6401	5.6473	5.7073
length of specimen (mm)	25.38050	25.38500	25.39075	25.38350	25.39375
diameter of specimen (mm)	12.73963	12.74563	12.73825	12.73638	12.74513
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	29014 29019 29012 29031 29003 28991 29003 29005 29013 29009	28978 29006 28982 28958 28994 28972 28971 28963 28972 28970	28983 28971 28975 29008 29003 28970 28987 29018 28971 29027	29179 29196 29208 29237 29174 29192 29164 29172 29151 29171	29654 29672 29695 29697 29695 29712 29690 29674 29670 29655
average resonant frequency (Hz)	29010	28977	28991	29184	29681
standard deviation (Hz)	11	14	21	25	19
correction factor for rod	2.113925731	2.114524833	2.112882225	2.113164309	2.113741543
modulus of elasticity (Pa)	1.00E+10	1.00E+10	1.00E+10	1.02E+10	1.06E+10
T ₁ correction factor	2.288002762	2.288759234	2.286685272	2.287041405	2.287770202
calculation of individual terms	0.030996496 0.325791323 2.276978665	0.031032917 0.326174124 2.277728662	0.030933117 0.325125164 2.275672451	0.030950243 0.325305168 2.276025536	0.030985304 0.325673685 2.276748095
resultant T ₁	2.113925731	2.114524833	2.112882225	2.113164309	2.113741543
modulus of elasticity (Pa)	1.00E+10	1.00E+10	1.00E+10	1.02E+10	1.06E+10
Average Modulus for specimen group					

Specimen number Specimen group standard deviation	DW16 03	DW16 04	DW16 02	DW16 01	DW15 04
Environmental Conditions Temperature (°C) Barometric Pressure (in of Hg) Humidity (%)	22.4 25.1 15.7	22.4 25.1 15.9	22.4 25.1 15.6	22.5 25.1 15.4	22.1 25.1 17.7
Sampling Plan Layout Instrument ASTM					
# of Strikes Comments:	31	13	29	17	34

Specimen number	DW15 03	DW15 02	DW15 01	DW14 03	DW14 01
Date and Time	2/4/2010 10:05	2/4/2010 10:01	2/4/2010 9:55	2/4/2010 10:28	2/4/2010 10:12
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.6583	5.6520	5.6787	5.6428	5.6649
length of specimen (mm)	25.38650	25.38975	25.34300	25.37350	25.37450
diameter of specimen (mm)	12.73375	12.72713	12.75938	12.73425	12.73863
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28958 28961 28966 28974 28953 28944 28936 28955 28973 28977	29021 29035 29015 29026 29009 28993 29014 28995 28999 29020	29297 29299 29303 29303 29299 29315 29306 29335 29321 29326	27845 27792 27768 27809 27826 27806 27829 27794 27832 27789	29035 29040 29030 29058 29037 29029 29010 29053 29051 29024
average resonant frequency (Hz)	28960	29013	29310	27809	29037
standard deviation (Hz)	13	14	13	24	15
correction factor for rod	2.112503297	2.111182795	2.120119345	2.113627575	2.114247986
modulus of elasticity (Pa)	1.00E+10	1.01E+10	1.02E+10	9.21E+09	1.01E+10
T ₁ correction factor	2.28620689	2.28453997	2.295825758	2.287626306	2.288409659
calculation of individual terms	0.030910119 0.32488345 2.275198164	0.030830052 0.3240419 2.273545511	0.031374169 0.329760887 2.284734703	0.03097838 0.325600907 2.276605431	0.031016084 0.325997199 2.277382079
resultant T ₁	2.112503297	2.111182795	2.120119345	2.113627575	2.114247986
modulus of elasticity (Pa)	1.00E+10	1.01E+10	1.02E+10	9.21E+09	1.01E+10
Average Modulus for specimen group					

Specimen number Specimen group standard deviation	DW15 03	DW15 02	DW15 01	DW14 03	DW14 01
Environmental Conditions Temperature (°C) Barometric Pressure (in of Hg) Humidity (%)	22.1 25.1 17.8	22.1 25.1 17.9	22.1 25.1 18.1	22.3 25.1 17.6	22.1 25.1 17.7
Sampling Plan Layout Instrument ASTM					
# of Strikes Comments:	39	43	40	74	21

Specimen number	DW13 04	DW13 03	DW13 02	DW13 01	DW12 04
Date and Time	2/4/2010 13:01	2/4/2010 12:58	2/4/2010 12:56	2/4/2010 12:54	2/4/2010 13:11
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.6546	5.6533	5.6497	5.6410	5.6727
length of specimen (mm)	25.37175	25.37350	25.37325	25.37225	25.37075
diameter of specimen (mm)	12.73250	12.73138	12.73088	12.73413	12.73363
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28767 28750 28758 28789 28775 28775 28782 28793 28751 28799	28806 28810 28810 28822 28804 28812 28807 28821 28807 28835	28875 28881 28872 28857 28835 28845 28851 28857 28846 28853	28832 28858 28844 28880 28878 28848 28849 28873 28838 28891	29144 29116 29156 29140 29114 29125 29124 29128 29112 29131
average resonant frequency (Hz)	28774	28813	28857	28859	29129
standard deviation (Hz)	17	10	15	20	14
correction factor for rod	2.113487945	2.113167124	2.113107141	2.113708041	2.113748544
modulus of elasticity (Pa)	9.88E+09	9.91E+09	9.93E+09	9.91E+09	1.02E+10
T ₁ correction factor	2.287450011	2.287044959	2.286969229	2.287727901	2.287779041
calculation of individual terms	0.030969898 0.325511754 2.276430645	0.030950413 0.325306964 2.27602906	0.030946771 0.325268683 2.275953978	0.030983269 0.32565229 2.276706157	0.030985729 0.325678156 2.276756859
resultant T ₁	2.113487945	2.113167124	2.113107141	2.113708041	2.113748544
modulus of elasticity (Pa)	9.88E+09	9.91E+09	9.93E+09	9.91E+09	1.02E+10
Average Modulus for specimen group					

Specimen number Specimen group standard deviation	DW13 04	DW13 03	DW13 02	DW13 01	DW12 04
Environmental Conditions Temperature (°C) Barometric Pressure (in of Hg) Humidity (%)	22.1 25.1 18	22.1 25.1 18.1	22 25.1 18.1	21.9 25.1 18.1	22.1 25.1 17.9
Sampling Plan Layout Instrument ASTM					
# of Strikes Comments:	16	14	14	62	21

Specimen number	DW12 03	DW12 02	DW12 01	DW11 04	DW11 03
Date and Time	2/4/2010 13:09	2/4/2010 13:06	2/4/2010 13:04	2/4/2010 13:24	2/4/2010 13:22
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.6605	5.6539	5.6498	5.6486	5.6490
length of specimen (mm)	25.37125	25.37100	25.37225	25.37050	25.37300
diameter of specimen (mm)	12.73700	12.72825	12.72900	12.72975	12.73400
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	29243 29250 29202 29223 29214 29221 29220 29248 29223 29209	29138 29104 29107 29103 29128 29113 29112 29100 29125 29123	29179 29196 29181 29206 29193 29207 29225 29209 29212 29201	28890 28866 28881 28876 28878 28905 28891 28877 28900 28880	28926 28929 28902 28927 28909 28900 28927 28932 28902 28907
average resonant frequency (Hz)	29225	29115	29201	28884	28916
standard deviation (Hz)	16	13	14	12	13
correction factor for rod	2.11424904	2.112867548	2.112887227	2.113147949	2.113627725
modulus of elasticity (Pa)	1.02E+10	1.01E+10	1.02E+10	9.95E+09	9.96E+09
T ₁ correction factor	2.28841099	2.286666742	2.286691587	2.28702075	2.287626495
calculation of individual terms	0.031016148 0.325997873 2.277383399	0.030932226 0.3251158 2.27565408	0.03093342 0.325128356 2.275678713	0.030949249 0.325294727 2.276005058	0.030978389 0.325601003 2.276605619
resultant T ₁	2.11424904	2.112867548	2.112887227	2.113147949	2.113627725
modulus of elasticity (Pa)	1.02E+10	1.01E+10	1.02E+10	9.95E+09	9.96E+09
Average Modulus for specimen group					

Specimen number Specimen group standard deviation	DW12 03	DW12 02	DW12 01	DW11 04	DW11 03
Environmental Conditions Temperature (°C) Barometric Pressure (in of Hg) Humidity (%)	22.1 25.1 18	22.1 25.1 18	22.1 25.1 18	22.3 25.1 17.9	22.2 25.1 17.9
Sampling Plan Layout Instrument ASTM					
# of Strikes Comments:	20	20	13	12	36

Specimen number	DW11 02	DW11 01	DW10 04	DW10 03	DW10 02
Date and Time	2/4/2010 13:19	2/4/2010 13:14	2/4/2010 14:27	2/4/2010 13:36	2/4/2010 13:34
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.6506	5.6489	5.6479	5.6455	5.6436
length of specimen (mm)	25.37075	25.37100	25.37000	25.37075	25.37050
diameter of specimen (mm)	12.72950	12.73850	12.72850	12.73113	12.73325
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	29007 28996 29000 29001 29009 28993 29015 29012 29013 28979	28964 28969 28968 28987 28994 28993 28955 28960 28965 28973	28732 28790 28780 28767 28736 28734 28786 28738 28751 28743	28940 28921 28945 28948 28925 28936 28915 28910 28934 28936	28635 28667 28631 28676 28672 28670 28669 28649 28652 28653
average resonant frequency (Hz)	29003	28973	28756	28931	28657
standard deviation (Hz)	11	14	23	13	16
correction factor for rod	2.11308782	2.114509498	2.112987931	2.113348086	2.113708571
modulus of elasticity (Pa)	1.00E+10	9.99E+09	9.86E+09	9.97E+09	9.78E+09
T ₁ correction factor	2.286944836	2.28873987	2.286818725	2.28727343	2.287728571
calculation of individual terms	0.030945598 0.325256353 2.275929794	0.031031984 0.326164323 2.277709464	0.030939534 0.325192611 2.275804762	0.030961403 0.325422469 2.276255575	0.030983301 0.325652629 2.276706821
resultant T ₁	2.11308782	2.114509498	2.112987931	2.113348086	2.113708571
modulus of elasticity (Pa)	1.00E+10	9.99E+09	9.86E+09	9.97E+09	9.78E+09
Average Modulus for specimen group					

Specimen number Specimen group standard deviation	DW11 02	DW11 01	DW10 04	DW10 03	DW10 02
Environmental Conditions Temperature (°C) Barometric Pressure (in of Hg) Humidity (%)	22.2 25.1 17.9	22.2 25.1 17.9	22.4 25.1 17.7	22.3 25.1 17.8	22.3 25.1 17.8
Sampling Plan Layout Instrument ASTM					
# of Strikes Comments:	44	19	37	15	30

Specimen number	DW10 01	DW14 02	DW14 04	DW1 01	DW1 02
Date and Time	2/4/2010 13:31	2/4/2010 10:20	2/4/2010 12:48	2/4/2010 14:36	2/4/2010 14:38
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.6494	5.6582	5.6419	5.6426	5.6447
length of specimen (mm)	25.37125	25.37300	25.37400	25.37725	25.39125
diameter of specimen (mm)	12.73875	12.73088	12.73388	12.71900	12.72363
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28806 28817 28843 28838 28794 28834 28842 28833 28809 28849	28875 28899 28873 28834 28856 28862 28856 28867 28873 28890	28701 28631 28692 28706 28709 28739 28700 28722 28719 28661	28705 28613 28621 28652 28586 28634 28658 28707 28658 28660	28528 28510 28528 28530 28530 28531 28502 28530 28534 28512
average resonant frequency (Hz)	28827	28869	28698	28649	28524
standard deviation (Hz)	19	18	31	38	11
correction factor for rod	2.114529444	2.113127229	2.113527323	2.110885353	2.110502956
modulus of elasticity (Pa)	9.89E+09	9.96E+09	9.80E+09	9.81E+09	9.73E+09
T ₁ correction factor	2.288765057	2.28699459	2.287499728	2.284164532	2.28368188
calculation of individual terms	0.031033197 0.326177072 2.277734435	0.030947991 0.325281503 2.275979122	0.03097229 0.325536895 2.276479937	0.030812033 0.32385251 2.273173287	0.030788876 0.323609116 2.272694766
resultant T ₁	2.114529444	2.113127229	2.113527323	2.110885353	2.110502956
modulus of elasticity (Pa)	9.89E+09	9.96E+09	9.80E+09	9.81E+09	9.73E+09
Average Modulus for specimen group					

Specimen number Specimen group standard deviation	DW10 01	DW14 02	DW14 04	DW1 01	DW1 02
Environmental Conditions Temperature (°C) Barometric Pressure (in of Hg) Humidity (%)	22.3 25.1 17.8	22.2 25.1 17.7	21.9 25.1 18.1	22.5 25.1 17.6	22.6 25.1 17.4
Sampling Plan Layout Instrument ASTM					
# of Strikes Comments:	40	77	127	83	21

Specimen number	DA7 01	DA5 02	DA5 03	DA6 01	DA6 02
Date and Time	2/4/2010 14:44	2/5/2010 8:44	2/5/2010 8:48	2/5/2010 7:55	2/5/2010 8:03
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.7264	5.6732	5.7257	5.6696	5.65655
length of specimen (mm)	25.39675	25.38475	25.39025	25.39250	25.39575
diameter of specimen (mm)	12.74738	12.74425	12.74500	12.74575	12.744625
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	29628 29666 29694 29680 29620 29705 29681 29666 29689 29654	26499 26502 27103 27018 27039 27014 26714 27008 26627 27015	29670 29680 29680 29689 29694 29676 29719 29683 29679 29681	26420 26154 27117 27143 27143 27187 27140 27114 27167 26561	26819 26879 27009 26975 26997 25904 24840 26977 27014 26982
average resonant frequency (Hz)	29668	26854	29685	26915	26640
standard deviation (Hz)	28	240	14	383	716
correction factor for rod	2.113860657	2.114324732	2.114002738	2.113942003	2.11350089
modulus of elasticity (Pa)	1.06E+10	8.62E+09	1.06E+10	8.65E+09	8.46E+09
T ₁ correction factor	2.287920597	2.288506565	2.288099993	2.288023307	2.287466355
calculation of individual terms	0.030992542 0.325749758 2.276897203	0.03102075 0.32604624 2.277478156	0.031001176 0.325840513 2.277075064	0.030997485 0.325801717 2.276999034	0.030970684 0.325520019 2.276446849
resultant T ₁	2.113860657	2.114324732	2.114002738	2.113942003	2.11350089
modulus of elasticity (Pa)	1.06E+10	8.62E+09	1.06E+10	8.65E+09	8.46E+09
Average Modulus for specimen group					

Specimen number Specimen group standard deviation	DA7 01	DA5 02	DA5 03	DA6 01	DA6 02
Environmental Conditions Temperature (°C) Barometric Pressure (in of Hg) Humidity (%)	22.6 25.1 17.4	22 25.2 15.6	22 25.2 15.6	21.8 25.1 15.4	21.7 25.1 15.5
Sampling Plan Layout Instrument ASTM					
# of Strikes Comments:	43	62	11	105	103

Specimen number	DW2 01	DW2 02	DW2 03	DW3 01	DA5 01
Date and Time	2/3/2010 9:25	1/14/2010 13:59	1/11/2010 13:27	2/3/2010 8:24	2/5/2010 9:01
Operator	41169	41169	41169	41169	41169
Sample location					
mass of specimen (g)	5.64464	5.62024	5.62154	5.63038	5.67649
length of specimen (mm)	25.382	25.364	25.368	25.36525	25.3915
diameter of specimen (mm)	12.7295	12.725375	12.733625	12.725375	12.742625
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	28729 28752 28844 28900 28362 28694 28864 28304 28347 28322	28554 28659 28686 28640 28523 28629 28582 28610 28539 28535	28681 28772 28784 28586 28495 28555 28586 28597 28609 28516	28888 28901 28903 28902 28899 28915 28927 28897 28887 28886	27574 27128 27130 27032 27137 27011 27183 27174 27196 27473
average resonant frequency (Hz)	28612	28596	28618	28901	27204
standard deviation (Hz)	248	57	98	13	181
correction factor for rod	2.112184367	2.112969555	2.113969684	2.1128691	2.113522148
modulus of elasticity (Pa)	9.77E+09	9.71E+09	9.71E+09	9.94E+09	8.86E+09
T ₁ correction factor	2.28580427	2.286795525	2.288058258	2.286668702	2.287493195
calculation of individual terms	0.030890771 0.324680086 2.27479899	0.030938418 0.325180885 2.275781761	0.030999168 0.325819398 2.277033686	0.03093232 0.32511679 2.275656023	0.030971975 0.325533592 2.27647346
resultant T ₁	2.112184367	2.112969555	2.113969684	2.1128691	2.113522148
modulus of elasticity (Pa)	9.77E+09	9.71E+09	9.71E+09	9.94E+09	8.86E+09
Average Modulus for specimen group					

Specimen number Specimen group standard deviation	DW2 01	DW2 02	DW2 03	DW3 01	DA5 01
Environmental Conditions Temperature (°C) Barometric Pressure (in of Hg) Humidity (%)	21.5 25.1 13.4	22.9 25.5 19.8	21.6 25.5 12.3	21.9 25.1 12.4	22.1 25.2 15.8
Sampling Plan Layout Instrument ASTM					
# of Strikes Comments:	45			46	112

Specimen number	DA4 03	DA4 02	DW5 01	DW4 02	DW2 04	DA2 03
Date and Time	2/5/2010 9:13	2/5/2010 9:10	1/14/2010 14:12	1/14/2010 14:16	2/3/2010 9:20	7/23/2010 14:27
Operator	41169	41169	41169	41169	41169	41169
Sample location						
mass of specimen (g)	5.72064	5.66446	5.65383	5.65991	5.617	5.72276
length of specimen (mm)	25.37375	25.3825	25.3695	25.3695	25.366	25.398
diameter of specimen (mm)	12.7425	12.746875	12.729875	12.737125	12.725	12.7475
Poisson's ratio	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	29429 29408 29414 29394 29401 29437 29426 29437 29395 29418	23047 25639 24727 24273 24759 25636 24143 25612 24357 24771	28857 28891 28927 28886 28815 28683 28814 28816 28800 28800	29160 29143 29100 29175 29105 29209 29094 29073 29113 29130	28563 27384 28716 28791 27593 28797 28461 28500 27812 28475	29530 29556 29573 29557 29576 29597 29565 29559 29546 29554
average resonant frequency (Hz)	29416	24696	28829	29130	28309	29561
standard deviation (Hz)	16	812	68	42	517	
correction factor for rod	2.114929195	2.114926122	2.113248337	2.114409846	2.112748771	2.113780257
modulus of elasticity (Pa)	1.04E+10	7.27E+09	9.92E+09	1.01E+10	9.51E+09	1.05E+10
T ₁ correction factor	2.289269841	2.289265961	2.287147492	2.288614039	2.286516789	2.287819082
calculation of individual terms	0.031057512 0.326432636 2.278234899	0.031057325 0.326430672 2.278231052	0.030955345 0.325358798 2.276130715	0.031025925 0.326100633 2.27758471	0.030925016 0.325040024 2.275505411	0.030987656 0.325698409 2.276796557
resultant T ₁	2.114929195	2.114926122	2.113248337	2.114409846	2.112748771	2.113780257
modulus of elasticity (Pa)	1.04E+10	7.27E+09	9.92E+09	1.01E+10	9.51E+09	1.05E+10
Average Modulus for specimen group						

Specimen number	DA4 03	DA4 02	DW5 01	DW4 02	DW2 04	DA2 03
Specimen group standard deviation						
Environmental Conditions						
Temperature (°C)	22.2	22.1	22.9	22.9	22	21.5
Barometric Pressure (in of Hg)	25.2	25.2	25.5	25.5	25.1	25.3
Humidity (%)	15.9	15.9	19.4	19.4	12.4	39.6
Sampling Plan Layout						
Instrument						
ASTM						
# of Strikes	18	96			128	45
Comments:						

Specimen number	DA2 02	DA3 02	DA3 03
Date and Time	7/23/2010 14:36	7/23/2010 14:40	7/23/2010 14:44
Operator	41169	41169	41169
Sample location			
mass of specimen (g)	5.67196	5.6552	5.71548
length of specimen (mm)	25.3895	25.397	25.397
diameter of specimen (mm)	12.74775	12.746	12.739
Poisson's ratio	0.1667	0.1667	0.1667
frequency data (specimen number oriented up in fixture)	20868 20765 21892 20064 22030 21124 20030 20639 19019 20924	20819 20367 20633 20469 20422 20740 20189 20137 20339 20772	29573 29554 29563 29611 29565 29585 29588 29549 29581 29610
average resonant frequency (Hz)	20736	20489	29578
standard deviation (Hz)	2.11450331	2.113620536	2.112500617
correction factor for rod			
modulus of elasticity (Pa)	5.13E+09	5.00E+09	1.06E+10
T ₁ correction factor	2.288732056	2.287617418	2.286203508
calculation of individual terms	0.031031608 0.326160368 2.277701717	0.030977952 0.325596412 2.276596619	0.030909957 0.324881742 2.275194811
resultant T ₁	2.11450331	2.113620536	2.112500617
modulus of elasticity (Pa)	5.13E+09	5.00E+09	1.06E+10
Average Modulus for specimen group			

Specimen number	DA2 02	DA3 02	DA3 03
Specimen group standard deviation			
Environmental Conditions			
Temperature (°C)	21.5	21.6	21.6
Barometric Pressure (in of Hg)	25.3	25.3	25.3
Humidity (%)	39.2	38.7	38.5
Sampling Plan Layout			
Instrument			
ASTM			
# of Strikes	94	55	39
Comments:			

Specimen ID Number	Operator #	Test Date	Initial Specimen Mass (g)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Average Resonant Frequency (Hz)	Flexural Dynamic Young's Modulus (GPa)
DW17 01	41169	2/3/2010 12:42	5.65547	25.4	12.738125	28170.7	9.4797
DW17 02	41169	2/3/2010 12:47	5.66145	25.3965	12.7395	28759.5	9.8846
DW17 03	41169	1/8/2010 10:26	5.66372	25.4005	12.74675	28550	9.7313
DW17 04	41169	2/3/2010 12:54	5.67606	25.3865	12.738875	28205.6	9.5258
DW16 03	41169	2/3/2010 13:05	5.64844	25.3805	12.739625	29010	10.0213
DW16 04	41169	2/3/2010 13:08	5.66303	25.385	12.745625	28976.6	10.0133
DW16 02	41169	2/3/2010 13:01	5.64007	25.39075	12.73825	28991.3	10.0050
DW16 01	41169	2/3/2010 12:58	5.64727	25.3835	12.736375	29184.4	10.1503
DW15 04	41169	2/4/2010 10:09	5.70733	25.39375	12.745125	29681.4	10.5972
DW15 03	41169	2/4/2010 10:05	5.65831	25.3865	12.73375	28959.7	10.0228
DW15 02	41169	2/4/2010 10:01	5.65199	25.38975	12.727125	29012.7	10.0668
DW15 01	41169	2/4/2010 9:55	5.67874	25.343	12.759375	29310.4	10.2058
DW14 03	41169	2/4/2010 10:28	5.64283	25.3735	12.73425	27809	9.2062
DW14 01	41169	2/4/2010 10:12	5.66491	25.3745	12.738625	29036.7	10.0665
DW13 04	41169	2/4/2010 13:01	5.65462	25.37175	12.7325	28773.9	9.8794
DW13 03	41169	2/4/2010 12:58	5.65331	25.3735	12.731375	28813.4	9.9083
DW13 02	41169	2/4/2010 12:56	5.6497	25.37325	12.730875	28857.2	9.9331
DW13 01	41169	2/4/2010 12:54	5.641	25.37225	12.734125	28859.1	9.9106
DW12 04	41169	2/4/2010 13:11	5.67269	25.37075	12.733625	29129	10.1536
DW12 03	41169	2/4/2010 13:09	5.66045	25.37125	12.737	29225.3	10.1910
DW12 02	41169	2/4/2010 13:06	5.65386	25.371	12.72825	29115.3	10.1235
DW12 01	41169	2/4/2010 13:04	5.64984	25.37225	12.729	29200.9	10.1751
DW11 04	41169	2/4/2010 13:24	5.64861	25.3705	12.72975	28884.4	9.9504
DW11 03	41169	2/4/2010 13:22	5.64898	25.373	12.734	28916.1	9.9648
DW11 02	41169	2/4/2010 13:19	5.65063	25.37075	12.7295	29002.5	10.0363
DW11 01	41169	2/4/2010 13:14	5.64892	25.371	12.7385	28972.8	9.9915
DW10 04	41169	2/4/2010 14:27	5.64791	25.37	12.7285	28755.7	9.8632
DW10 03	41169	2/4/2010 13:36	5.64551	25.37075	12.731125	28931	9.9740
DW10 02	41169	2/4/2010 13:34	5.64361	25.3705	12.73325	28657.4	9.7778
DW10 01	41169	2/4/2010 13:31	5.64936	25.37125	12.73875	28826.5	9.8912
DW14 02	41169	2/4/2010 10:20	5.6582	25.373	12.730875	28868.5	9.9556
DW14 04	41169	2/4/2010 12:48	5.64186	25.374	12.733875	28698	9.8038
DW1 01	41169	2/4/2010 14:36	5.6426	25.37725	12.719	28649.4	9.8092
DW1 02	41169	2/4/2010 14:38	5.64469	25.39125	12.723625	28523.5	9.7269
DA7 01	41169	2/4/2010 14:44	5.72635	25.39675	12.747375	29668.3	10.6200

Specimen ID Number	Operator S#	Test Date	Initial Specimen Mass (g)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Average Resonant Frequency (Hz)	Flexural Dynamic Young's Modulus (GPa)
DA5 02	41169	2/5/2010 8:44	5.67318	25.38475	12.74425	26853.9	8.6181
DA5 03	41169	2/5/2010 8:48	5.72569	25.39025	12.745	29685.1	10.6313
DA6 01	41169	2/5/2010 7:55	5.66956	25.3925	12.74575	26914.6	8.6538
DA6 02	41169	2/5/2010 8:03	5.65655	25.39575	12.744625	26639.6	8.4629
DW2 01	41169	2/3/2010 9:25	5.64464	25.382	12.7295	28611.8	9.7662
DW2 02	41169	1/14/2010 13:59	5.62024	25.364	12.725375	28595.7	9.7086
DW2 03	41169	1/11/2010 13:27	5.62154	25.368	12.733625	28618.1	9.7100
DW3 01	41169	2/3/2010 8:24	5.63038	25.36525	12.725375	28900.5	9.9355
DA5 01	41169	2/5/2010 9:01	5.67649	25.3915	12.742625	27203.8	8.8575
DA4 03	41169	2/5/2010 9:13	5.72064	25.37375	12.7425	29415.9	10.4226
DA4 02	41169	2/5/2010 9:10	5.66446	25.3825	12.746875	24696.4	7.2718
DW5 01	41169	1/14/2010 14:12	5.65383	25.3695	12.729875	28828.9	9.9203
DW4 02	41169	1/14/2010 14:16	5.65991	25.3695	12.737125	29130.2	10.1221
DW2 04	41169	2/3/2010 9:20	5.617	25.366	12.725	28309.2	9.5119
DA2 03	41169	7/23/2010 14:27	5.72276	25.398	12.7475	29561.3	10.5377
DA2 02	41169	7/23/2010 14:36	5.67196	25.3895	12.74775	20735.5	5.1349
DA3 02	41169	7/23/2010 14:40	5.6552	25.397	12.746	20488.7	5.0037
DA3 03	41169	7/23/2010 14:44	5.71548	25.397	12.739	29577.9	10.5566

Specimen ID Number	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation	Specimen Comment
DW17 01	22.7	25.1	14.8	With Grain	PCEA graphite is very difficult to repeat numbers on all the samples, both with and against the grain.
DW17 02	22.7	25.1	14.8	With Grain	
DW17 03	19.8	25.6	4.5	With Grain	
DW17 04	22.7	25.1	15.1	With Grain	
DW16 03	22.4	25.1	15.7	With Grain	
DW16 04	22.4	25.1	15.9	With Grain	
DW16 02	22.4	25.1	15.6	With Grain	
DW16 01	22.5	25.1	15.4	With Grain	
DW15 04	22.1	25.1	17.7	With Grain	
DW15 03	22.1	25.1	17.8	With Grain	
DW15 02	22.1	25.1	17.9	With Grain	
DW15 01	22.1	25.1	18.1	With Grain	
DW14 03	22.3	25.1	17.6	With Grain	
DW14 01	22.1	25.1	17.7	With Grain	
DW13 04	22.1	25.1	18	With Grain	
DW13 03	22.1	25.1	18.1	With Grain	
DW13 02	22	25.1	18.1	With Grain	
DW13 01	21.9	25.1	18.1	With Grain	
DW12 04	22.1	25.1	17.9	With Grain	
DW12 03	22.1	25.1	18	With Grain	
DW12 02	22.1	25.1	18	With Grain	
DW12 01	22.1	25.1	18	With Grain	
DW11 04	22.3	25.1	17.9	With Grain	
DW11 03	22.2	25.1	17.9	With Grain	
DW11 02	22.2	25.1	17.9	With Grain	
DW11 01	22.2	25.1	17.9	With Grain	
DW10 04	22.4	25.1	17.7	With Grain	
DW10 03	22.3	25.1	17.8	With Grain	
DW10 02	22.3	25.1	17.8	With Grain	
DW10 01	22.3	25.1	17.8	With Grain	
DW14 02	22.2	25.1	17.7	With Grain	
DW14 04	21.9	25.1	18.1	With Grain	
DW1 01	22.5	25.1	17.6	With Grain	
DW1 02	22.6	25.1	17.4	With Grain	
DA7 01	22.6	25.1	17.4	Against Grain	

Specimen ID Number	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation	Specimen Comment	
DA5 02	22	25.2	15.6	Against Grain	Very difficult to get repeatable numbers as the amount of strikes would indicate.	
DA5 03	22	25.2	15.6	Against Grain		
DA6 01	21.8	25.1	15.4	Against Grain		
DA6 02	21.7	25.1	15.5	Against Grain		
DW2 01	21.5	25.1	13.4	With Grain		
DW2 02	22.9	25.5	19.8	With Grain		
DW2 03	21.6	25.5	12.3	With Grain		
DW3 01	21.9	25.1	12.4	With Grain		
DA5 01	22.1	25.2	15.8	Against Grain		Against the grain creep samples are very difficult to get a consistent frequency.
DA4 03	22.2	25.2	15.9	Against Grain		
DA4 02	22.1	25.2	15.9	Against Grain		Difficult to get repeatable numbers
DW5 01	22.9	25.5	19.4	With Grain		
DW4 02	22.9	25.5	19.4	With Grain		
DW2 04	22	25.1	12.4	With Grain		
DA2 03	21.5	25.3	39.6	Against Grain		
DA2 02	21.5	25.3	39.2	Against Grain		
DA3 02	21.6	25.3	38.7	Against Grain		
DA3 03	21.6	25.3	38.5	Against Grain		

Specimen Number	DW10 03	DW10 04	DW11 01	DW11 02	DW11 03
Date and Time	3/5/2010 10:10	3/5/2010 10:13	3/5/2010 12:37	3/5/2010 12:40	3/5/2010 12:43
Operator	41169	41169	41169	41169	41169
Sample Location					
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:					
Forward current:					
Voltage readings, mV	0.003034 0.003139 0.003169 0.003184	0.003112 0.003104 0.003065 0.003052	0.003306 0.003246 0.003163 0.003222	0.003154 0.003264 0.003144 0.003265	0.003179 0.003175 0.003167 0.003097
Resistance readings, Ω	0.000759 0.000785 0.000792 0.000796	0.000778 0.000776 0.000766 0.000763	0.000827 0.000811 0.000791 0.000805	0.000788 0.000816 0.000786 0.000816	0.000795 0.000794 0.000792 0.000774
Reverse current:					
Voltage readings, mV	-0.002808 -0.00285 -0.002898 -0.002744	-0.002748 -0.002891 -0.002827 -0.002811	-0.002653 -0.002783 -0.002841 -0.002845	-0.002561 -0.002692 -0.003031 -0.002822	-0.002688 -0.002763 -0.002971 -0.003003
Resistance readings, Ω	0.000702 0.000712 0.000724 0.000686	0.000687 0.000723 0.000707 0.000703	0.000663 0.000696 0.00071 0.000711	0.00064 0.000673 0.000758 0.000705	0.000672 0.000691 0.000743 0.000751
End-for-end orientation:					
Reverse current:					
Voltage readings, mV	0.003177 0.002997 0.002993 0.002982	0.003146 0.003112 0.003148 0.003182	0.003358 0.003227 0.00314 0.003244	0.003181 0.003112 0.003187 0.003149	0.003093 0.003058 0.003146 0.003191

Specimen Number	DW10 03	DW10 04	DW11 01	DW11 02	DW11 03
Resistance readings, Ω	0.000794 0.000749 0.000748 0.000746	0.000787 0.000778 0.000787 0.000795	0.00084 0.000807 0.000785 0.000811	0.000795 0.000778 0.000797 0.000787	0.000773 0.000765 0.000786 0.000798
Forward current:					
Voltage readings, mV	-0.002858 -0.003011 -0.002823 -0.002811	-0.002673 -0.002945 -0.002837 -0.00279	-0.002569 -0.002855 -0.002911 -0.002816	-0.002785 -0.002938 -0.00284 -0.002849	-0.002784 -0.002797 -0.002995 -0.003009
Resistance readings, Ω	0.000714 0.000753 0.000706 0.000703	0.000668 0.000736 0.000709 0.000698	0.000642 0.000714 0.000728 0.000704	0.000696 0.000735 0.00071 0.000712	0.000696 0.000699 0.000749 0.000752
Average voltage, mV	0.002967	0.002965	0.003011	0.002998	0.003007
Average resistance, $R=V/I$ ($m\Omega$)	0.741813	0.741313	0.752813	0.749500	0.751875
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2 *	127.2985	127.2461	127.4461	127.2661	127.3560
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	7.44	7.43	7.55	7.51	7.54
Environmental Conditions					
Temperature (Deg C)	23.400	23.500	23.200	23.200	23.200
Barometric Pressure (in Hg)	25.200	25.200	25.200	25.200	25.200
Humidity (%)	20.600	20.600	20.800	20.900	20.800

Specimen Number	DW10 03	DW10 04	DW11 01	DW11 02	DW11 03
Other Test Information					
Specimen Orientation					
Method of Measuring Resistance					
Probe Location					
Instruments	Keithley Model 2182 Nanovoltmeter				
ASTM	Keithley Model 6220 DC Current Source C 611 - 98 Reapproved 2005				
Comments:					

Specimen Number	DW11 04	DW12 01	DW12 02	DW12 03	DW12 04	DW13 01
Date and Time	3/5/2010 12:46	3/5/2010 12:49	3/5/2010 12:52	3/5/2010 12:57	3/5/2010 12:59	3/5/2010 13:02
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003007 0.003177 0.003168 0.003126	0.003015 0.003104 0.003123 0.003131	0.003173 0.003049 0.003093 0.003184	0.002967 0.002981 0.002929 0.003048	0.003003 0.002962 0.003053 0.003111	0.003043 0.003036 0.002968 0.002836
Resistance readings, Ω	0.000752 0.000794 0.000792 0.000782	0.000754 0.000776 0.000781 0.000783	0.000793 0.000762 0.000773 0.000796	0.000742 0.000745 0.000732 0.000762	0.000751 0.00074 0.000763 0.000778	0.000761 0.000759 0.000742 0.000709
Reverse current:						
Voltage readings, mV	-0.002756 -0.002766 -0.002889 -0.002857	-0.002819 -0.00289 -0.003109 -0.003047	-0.002721 -0.002951 -0.003003 -0.002817	-0.002445 -0.002961 -0.003065 -0.002933	-0.002975 -0.002856 -0.002888 -0.002969	-0.003006 -0.003014 -0.003091 -0.003044
Resistance readings, Ω	0.000689 0.000691 0.000722 0.000714	0.000705 0.000723 0.000777 0.000762	0.00068 0.000738 0.000751 0.000704	0.000611 0.00074 0.000766 0.000733	0.000744 0.000714 0.000722 0.000742	0.000751 0.000754 0.000773 0.000761
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.002965 0.002995 0.003139 0.003039	0.003166 0.003143 0.003194 0.003169	0.002977 0.003196 0.002862 0.002604	0.002938 0.003002 0.002912 0.002852	0.002952 0.003151 0.003061 0.002839	0.003059 0.003087 0.003142 0.002968

Specimen Number	DW11 04	DW12 01	DW12 02	DW12 03	DW12 04	DW13 01
Resistance readings, Ω	0.000741 0.000749 0.000785 0.00076	0.000792 0.000786 0.000798 0.000792	0.000744 0.000799 0.000716 0.000651	0.000735 0.00075 0.000728 0.000713	0.000738 0.000788 0.000765 0.00071	0.000765 0.000772 0.000786 0.000742
Forward current:						
Voltage readings, mV	-0.002869 -0.00298 -0.002902 -0.002846	-0.002758 -0.002918 -0.002963 -0.003088	-0.003106 -0.003041 -0.003084 -0.003199	-0.003032 -0.002986 -0.003055 -0.003023	-0.002902 -0.003025 -0.002917 -0.002959	-0.002904 -0.002803 -0.002953 -0.00304
Resistance readings, Ω	0.000717 0.000745 0.000726 0.000712	0.00069 0.000729 0.000741 0.000772	0.000776 0.00076 0.000771 0.0008	0.000758 0.000746 0.000764 0.000756	0.000726 0.000756 0.000729 0.00074	0.000726 0.000701 0.000738 0.00076
Average voltage, mV	0.002968	0.003040	0.003004	0.002946	0.002976	0.003000
Average resistance, $R=V/I$ ($m\Omega$)	0.741938	0.760063	0.750875	0.736313	0.744125	0.750000
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2 *	127.2711	127.2561	127.2411	127.4161	127.3485	127.3585
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	7.44	7.62	7.52	7.39	7.46	7.52
Environmental Conditions						
Temperature (Deg C)	23.200	23.200	23.200	23.300	23.200	23.200
Barometric Pressure (in Hg)	25.200	25.200	25.200	25.200	25.200	25.200
Humidity (%)	20.800	20.800	20.800	20.800	20.800	20.900

Specimen Number	DW13 02	DW13 03	DW13 04	DW14 01	DW14 02	DW14 03
Date and Time	3/5/2010 13:06	3/5/2010 13:09	3/5/2010 13:12	3/5/2010 13:31	3/5/2010 13:33	3/5/2010 13:36
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003072	0.00309	0.002929	0.003004	0.002958	0.002988
	0.002822	0.003098	0.003037	0.003051	0.002896	0.003048
	0.002938	0.002989	0.002973	0.00306	0.002989	0.003001
	0.002944	0.00292	0.002938	0.002834	0.002863	0.002829
Resistance readings, Ω	0.000768	0.000772	0.000732	0.000751	0.000739	0.000747
	0.000706	0.000775	0.000759	0.000763	0.000724	0.000762
	0.000735	0.000747	0.000743	0.000765	0.000747	0.00075
	0.000736	0.00073	0.000734	0.000708	0.000716	0.000707
Reverse current:						
Voltage readings, mV	-0.002933	-0.002874	-0.002923	-0.002982	-0.003013	-0.003059
	-0.003152	-0.002952	-0.002949	-0.002602	-0.003036	-0.00304
	-0.002854	-0.002877	-0.002882	-0.003006	-0.003121	-0.003029
	-0.002894	-0.002898	-0.002816	-0.003163	-0.003036	-0.003034
Resistance readings, Ω	0.000733	0.000718	0.000731	0.000746	0.000753	0.000765
	0.000788	0.000738	0.000737	0.000651	0.000759	0.00076
	0.000714	0.000719	0.000721	0.000752	0.00078	0.000757
	0.000724	0.000724	0.000704	0.000791	0.000759	0.000758
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003119	0.003045	0.003011	0.002834	0.00295	0.002989
	0.003083	0.00308	0.003009	0.002938	0.002902	0.00305
	0.002894	0.002883	0.00291	0.002997	0.002949	0.002908
	0.00314	0.00286	0.002982	0.002986	0.002984	0.002711

Specimen Number	DW13 02	DW13 03	DW13 04	DW14 01	DW14 02	DW14 03
Resistance readings, Ω	0.00078 0.000771 0.000724 0.000785	0.000761 0.00077 0.000721 0.000715	0.000753 0.000752 0.000727 0.000745	0.000709 0.000735 0.000749 0.000746	0.000737 0.000726 0.000737 0.000746	0.000747 0.000763 0.000727 0.000678
Forward current:						
Voltage readings, mV	-0.002893 -0.002832 -0.002987 -0.002763	-0.002893 -0.002864 -0.003008 -0.002974	-0.002854 -0.00303 -0.002939 -0.002802	-0.003114 -0.00305 -0.003042 -0.002933	-0.003079 -0.003151 -0.003073 -0.002933	-0.003099 -0.003052 -0.002978 -0.003116
Resistance readings, Ω	0.000723 0.000708 0.000747 0.000691	0.000723 0.000716 0.000752 0.000744	0.000713 0.000757 0.000735 0.0007	0.000778 0.000763 0.000761 0.000733	0.00077 0.000788 0.000768 0.000733	0.000775 0.000763 0.000745 0.000779
Average voltage, mV	0.002958	0.002957	0.002937	0.002975	0.002996	0.002996
Average resistance, $R=V/I$ ($m\Omega$)	0.739563	0.739063	0.733938	0.743813	0.748875	0.748938
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2 *	127.2935	127.3035	127.3260	127.4486	127.2935	127.3610
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	7.41	7.41	7.36	7.46	7.51	7.51
Environmental Conditions						
Temperature (Deg C)	23.200	23.200	23.200	23.200	23.400	23.400
Barometric Pressure (in Hg)	25.200	25.200	25.200	25.200	25.200	25.200
Humidity (%)	20.900	20.800	20.800	20.900	20.700	20.700

Specimen Number	DW14 04	DW15 02	DA4 02	DA4 03	DA5 01	DA5 02
Date and Time	3/8/2010 8:23	3/8/2010 8:26	3/8/2010 8:30	3/8/2010 9:02	3/8/2010 9:04	3/8/2010 9:08
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003086 0.00304 0.002844 0.002752	0.003074 0.003 0.003075 0.002704	0.003605 0.00363 0.003355 0.003319	0.003421 0.002998 0.003488 0.003208	0.003546 0.00372 0.003885 0.002702	0.003867 0.003748 0.003655 0.003198
Resistance readings, Ω	0.000771 0.00076 0.000711 0.000688	0.000768 0.00075 0.000769 0.000676	0.000901 0.000907 0.000839 0.00083	0.000855 0.000749 0.000872 0.000802	0.000887 0.00093 0.000971 0.000675	0.000967 0.000937 0.000914 0.0008
Reverse current:						
Voltage readings, mV	-0.002825 -0.003131 -0.002865 -0.002908	-0.002956 -0.003062 -0.002798 -0.003002	-0.0032 -0.003348 -0.003339 -0.003315	-0.002438 -0.002931 -0.002683 -0.002594	-0.003113 -0.003053 -0.003157 -0.003624	-0.002897 -0.002953 -0.002909 -0.003335
Resistance readings, Ω	0.000706 0.000783 0.000716 0.000727	0.000739 0.000765 0.000699 0.00075	0.0008 0.000837 0.000835 0.000829	0.000609 0.000733 0.000671 0.000649	0.000778 0.000763 0.000789 0.000906	0.000724 0.000738 0.000727 0.000834
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003215 0.003185 0.003141 0.002832	0.003191 0.003079 0.00287 0.002718	0.003525 0.003686 0.003753 0.003185	0.003266 0.003452 0.002996 0.003137	0.003551 0.003838 0.003697 0.003486	0.003502 0.003649 0.003844 0.003308

Specimen Number	DW14 04	DW15 02	DA4 02	DA4 03	DA5 01	DA5 02
Resistance readings, Ω	0.000804 0.000796 0.000785 0.000708	0.000798 0.00077 0.000717 0.00068	0.000881 0.000922 0.000938 0.000796	0.000816 0.000863 0.000749 0.000784	0.000888 0.00096 0.000924 0.000872	0.000876 0.000912 0.000961 0.000827
Forward current:						
Voltage readings, mV	-0.002765 -0.002985 -0.002813 -0.002989	-0.003173 -0.003123 -0.002805 -0.003001	-0.003182 -0.003289 -0.002964 -0.003228	-0.002659 -0.002791 -0.002943 -0.002674	-0.003175 -0.002959 -0.002945 -0.003016	-0.003176 -0.003168 -0.002882 -0.002977
Resistance readings, Ω	0.000691 0.000746 0.000703 0.000747	0.000793 0.000781 0.000701 0.00075	0.000796 0.000822 0.000741 0.000807	0.000665 0.000698 0.000736 0.000668	0.000794 0.00074 0.000736 0.000754	0.000794 0.000792 0.00072 0.000744
Average voltage, mV	0.002961	0.002977	0.003370	0.002980	0.003342	0.003317
Average resistance, $R=V/I$ ($m\Omega$)	0.740125	0.744125	0.842563	0.744938	0.835438	0.829188
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2 *	127.3535	127.2186	127.6137	127.5261	127.5286	127.5612
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	7.42	7.45	8.47	7.48	8.39	8.33
Environmental Conditions						
Temperature (Deg C)	22.900	22.900	22.900	23.000	23.000	23.000
Barometric Pressure (in Hg)	25.100	25.100	25.100	25.100	25.100	25.100
Humidity (%)	21.600	21.600	21.600	21.700	21.700	21.700

Specimen Number	DA5 03	DA6 01	DA6 02	DA7 01	DW2 01	DW2 02
Date and Time	3/8/2010 9:10	3/8/2010 9:13	3/8/2010 9:16	3/8/2010 9:19	3/18/2010 9:37	3/18/2010 9:45
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003252	0.003442	0.003742	0.003127	0.003284	0.003139
	0.003229	0.003593	0.003739	0.003229	0.003639	0.003475
	0.00312	0.003246	0.00375	0.003036	0.003358	0.00304
	0.002669	0.003202	0.003489	0.002382	0.003051	0.002881
Resistance readings, Ω						
	0.000813	0.00086	0.000936	0.000782	0.000821	0.000785
	0.000807	0.000898	0.000935	0.000807	0.00091	0.000869
	0.00078	0.000811	0.000937	0.000759	0.000839	0.00076
	0.000667	0.0008	0.000872	0.000595	0.000763	0.00072
Reverse current:						
Voltage readings, mV	-0.002739	-0.003182	-0.00304	-0.002692	-0.002748	-0.002988
	-0.002811	-0.003089	-0.003025	-0.00283	-0.002503	-0.00285
	-0.002724	-0.003206	-0.002968	-0.002822	-0.002548	-0.003
	-0.002951	-0.003227	-0.003064	-0.003524	-0.002738	-0.00293
Resistance readings, Ω						
	0.000685	0.000795	0.00076	0.000673	0.000687	0.000747
	0.000703	0.000772	0.000756	0.000707	0.000626	0.000713
	0.000681	0.000801	0.000742	0.000705	0.000637	0.00075
	0.000738	0.000807	0.000766	0.000881	0.000685	0.000732
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003129	0.003429	0.003552	0.002885	0.003262	0.003142
	0.003323	0.003534	0.003079	0.003157	0.003174	0.003379
	0.003191	0.002595	0.003446	0.002844	0.003021	0.003131
	0.002988	0.003137	0.003294	0.002891	0.002933	0.00287

Specimen Number	DA5 03	DA6 01	DA6 02	DA7 01	DW2 01	DW2 02
Resistance readings, Ω	0.000782 0.000831 0.000798 0.000747	0.000857 0.000884 0.000649 0.000784	0.000888 0.00077 0.000861 0.000823	0.000721 0.000789 0.000711 0.000723	0.000816 0.000794 0.000755 0.000733	0.000785 0.000845 0.000783 0.000717
Forward current:						
Voltage readings, mV	-0.00283 -0.002814 -0.002568 -0.002658	-0.003253 -0.003265 -0.003821 -0.003343	-0.003153 -0.003501 -0.003248 -0.003274	-0.002985 -0.002867 -0.002903 -0.002876	-0.002952 -0.003112 -0.002751 -0.002874	-0.002817 -0.002869 -0.00296 -0.002888
Resistance readings, Ω	0.000708 0.000704 0.000642 0.000665	0.000813 0.000816 0.000955 0.000836	0.000788 0.000875 0.000812 0.000819	0.000746 0.000717 0.000726 0.000719	0.000738 0.000778 0.000688 0.000719	0.000704 0.000717 0.00074 0.000722
Average voltage, mV	0.002937	0.003285	0.003335	0.002941	0.002997	0.003022
Average resistance, $R=V/I$ ($m\Omega$)	0.734438	0.821125	0.833750	0.735063	0.749313	0.755563
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2 *	127.5762	127.5912	127.5687	127.6237	127.2661	127.1836
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	7.38	8.25	8.37	7.39	7.51	7.57
Environmental Conditions						
Temperature (Deg C)	23.000	23.000	23.000	23.000	22.800	22.900
Barometric Pressure (in Hg)	25.100	25.100	25.100	25.100	25.300	25.300
Humidity (%)	21.700	21.700	21.700	21.700	20.700	20.300

Specimen Number	DW2 03	DW2 04	DW3 01	DW15 03	DW15 04	DW16 01
Date and Time	3/18/2010 9:49	3/18/2010 9:52	3/18/2010 9:55	3/18/2010 9:59	3/18/2010 10:02	3/18/2010 10:05
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003296 0.003495 0.003058 0.002892	0.00336 0.003271 0.003063 0.003273	0.003203 0.00328 0.002951 0.002963	0.003134 0.00312 0.003073 0.002949	0.003027 0.003136 0.002881 0.002871	0.003276 0.00327 0.002862 0.002986
Resistance readings, Ω	0.000824 0.000874 0.000765 0.000723	0.00084 0.000818 0.000766 0.000818	0.000801 0.00082 0.000738 0.000741	0.000783 0.00078 0.000768 0.000737	0.000757 0.000784 0.00072 0.000718	0.000819 0.000818 0.000715 0.000747
Reverse current:						
Voltage readings, mV	-0.00295 -0.002966 -0.002825 -0.002954	-0.002834 -0.002866 -0.002873 -0.002579	-0.003028 -0.003089 -0.003012 -0.002836	-0.00303 -0.003077 -0.002724 -0.00274	-0.003077 -0.003124 -0.00293 -0.002761	-0.002971 -0.002997 -0.003033 -0.002902
Resistance readings, Ω	0.000738 0.000742 0.000706 0.000739	0.000708 0.000717 0.000718 0.000645	0.000757 0.000772 0.000753 0.000709	0.000758 0.000769 0.000681 0.000685	0.000769 0.000781 0.000733 0.00069	0.000743 0.000749 0.000758 0.000726
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003136 0.003279 0.002889 0.002918	0.003276 0.003514 0.003059 0.003033	0.003152 0.003367 0.002957 0.002862	0.003077 0.003181 0.002891 0.002747	0.003217 0.003139 0.0029 0.002661	0.003145 0.003344 0.002992 0.002868

Specimen Number	DW2 03	DW2 04	DW3 01	DW15 03	DW15 04	DW16 01
Resistance readings, Ω	0.000784 0.00082 0.000722 0.000729	0.000819 0.000879 0.000765 0.000758	0.000788 0.000842 0.000739 0.000716	0.000769 0.000795 0.000723 0.000687	0.000804 0.000785 0.000725 0.000665	0.000786 0.000836 0.000748 0.000717
Forward current:						
Voltage readings, mV	-0.003119 -0.002778 -0.002898 -0.002958	-0.002872 -0.002873 -0.00285 -0.002638	-0.003126 -0.003024 -0.002954 -0.002972	-0.003089 -0.002804 -0.00285 -0.002903	-0.002919 -0.002992 -0.002835 -0.003263	-0.003108 -0.003133 -0.002858 -0.002848
Resistance readings, Ω	0.00078 0.000694 0.000724 0.000739	0.000718 0.000718 0.000713 0.000666	0.000782 0.000756 0.000738 0.000743	0.000772 0.000701 0.000713 0.000726	0.00073 0.000748 0.000709 0.000816	0.000777 0.000783 0.000714 0.000712
Average voltage, mV	0.003026	0.003015	0.003049	0.002962	0.002983	0.003037
Average resistance, $R=V/I$ ($m\Omega$)	0.756438	0.753750	0.762188	0.740438	0.745875	0.759250
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2 *	127.3485	127.1761	127.1836	127.3510	127.5787	127.4036
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	7.59	7.55	7.63	7.42	7.49	7.62
Environmental Conditions						
Temperature (Deg C)	22.900	22.800	22.800	22.800	22.800	22.800
Barometric Pressure (in Hg)	25.300	25.300	25.300	25.300	25.300	25.300
Humidity (%)	20.000	19.900	20.000	19.800	19.800	19.700

Specimen Number	DW16 02	DW16 03	DW16 04	DW17 01	DW17 04	DW17 02
Date and Time	3/18/2010 10:55	3/18/2010 10:57	3/18/2010 11:00	3/18/2010 11:04	3/18/2010 11:46	3/19/2010 12:50
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4.0000	4	4	4	4	4
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003163 0.003142 0.003297 0.003242	0.003487 0.003261 0.003195 0.003229	0.003428 0.003176 0.003292 0.003309	0.003261 0.003294 0.003102 0.003137	0.003184 0.003131 0.002916 0.002798	0.00333 0.00349 0.002894 0.002914
Resistance readings, Ω	0.000791 0.000785 0.000824 0.000811	0.000872 0.000815 0.000799 0.000807	0.000857 0.000794 0.000823 0.000827	0.000815 0.000824 0.000776 0.000784	0.000796 0.000783 0.000729 0.000699	0.000832 0.000873 0.000724 0.000728
Reverse current:						
Voltage readings, mV	-0.002939 -0.003153 -0.00282 -0.00266	-0.002897 -0.002794 -0.002632 -0.002749	-0.002754 -0.003119 -0.002465 -0.002408	-0.002927 -0.002931 -0.002724 -0.002708	-0.002883 -0.002992 -0.002749 -0.002704	-0.002981 -0.002739 -0.002614 -0.002708
Resistance readings, Ω	0.000735 0.000788 0.000705 0.000665	0.000724 0.000698 0.000658 0.000687	0.000688 0.00078 0.000616 0.000602	0.000732 0.000733 0.000681 0.000677	0.000721 0.000748 0.000687 0.000676	0.000745 0.000685 0.000653 0.000677
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003386 0.003363 0.00319 0.002992	0.003359 0.003428 0.00324 0.003066	0.003493 0.003316 0.00278 0.002568	0.00331 0.003208 0.002993 0.003036	0.003057 0.003038 0.002938 0.002963	0.003356 0.003356 0.003069 0.002989

Specimen Number	DW16 02	DW16 03	DW16 04	DW17 01	DW17 04	DW17 02
Resistance readings, Ω	0.000847 0.000841 0.000797 0.000748	0.00084 0.000857 0.00081 0.000767	0.000873 0.000829 0.000695 0.000642	0.000828 0.000802 0.000748 0.000759	0.000764 0.000759 0.000734 0.000741	0.000839 0.000839 0.000767 0.000747
Forward current:						
Voltage readings, mV	-0.002831 -0.002858 -0.002781 -0.002881	-0.002771 -0.002826 -0.002634 -0.00278	-0.00267 -0.002849 -0.003009 -0.003246	-0.002975 -0.002878 -0.002864 -0.002921	-0.00296 -0.002849 -0.002826 -0.002813	-0.002968 -0.00296 -0.002624 -0.002716
Resistance readings, Ω	0.000708 0.000714 0.000695 0.00072	0.000693 0.000706 0.000659 0.000695	0.000668 0.000712 0.000752 0.000812	0.000744 0.00072 0.000716 0.00073	0.00074 0.000712 0.000707 0.000703	0.000742 0.00074 0.000656 0.000679
Average voltage, mV	0.003044	0.003022	0.002993	0.003017	0.002925	0.002982
Average resistance, $R=V/I$ ($m\Omega$)	0.760875	0.755438	0.748125	0.754313	0.731188	0.745375
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2 *	127.4411	127.4686	127.5887	127.4386	127.4536	127.4661
Resistivity, $p=(R*A)/L$ ($\mu\Omega m$)	7.64	7.58	7.52	7.57	7.34	7.48
Environmental Conditions						
Temperature (Deg C)	22.800	22.8	22.8	22.8	22.6	22.5
Barometric Pressure (in Hg)	25.300	25.3	25.3	25.3	25.3	25.4
Humidity (%)	19.400	19.2	19	18.7	17.2	12

Specimen Number	DW1 01	DW1 02	DA2 02	DA2 03	DA3 02	DA3 03
Date and Time	3/22/2010 7:57	3/22/2010 7:59	7/26/2010 10:54	7/26/2010 10:58	7/26/2010 11:00	7/26/2010 11:04
Operator	41169	41169	41169	41169	41169	41169
Sample Location						
Applied current, I (mA)	4	4	4	4	4	4
Compl. Voltage (V)	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
ID Orientation:						
Forward current:						
Voltage readings, mV	0.003314 0.003385 0.003263 0.003121	0.003257 0.00329 0.002823 0.002869	0.003335 0.003461 0.003484 0.003414	0.002695 0.002912 0.003079 0.003216	0.003331 0.003283 0.003607 0.003414	0.002983 0.003067 0.003224 0.003162
Resistance readings, Ω	0.000829 0.000846 0.000816 0.00078	0.000814 0.000823 0.000706 0.000717	0.000834 0.000865 0.000871 0.000853	0.000674 0.000728 0.00077 0.000804	0.000833 0.000821 0.000902 0.000854	0.000746 0.000767 0.000806 0.000791
Reverse current:						
Voltage readings, mV	-0.00275 -0.0029 -0.002746 -0.002561	-0.002835 -0.002913 -0.003072 -0.002898	-0.003545 -0.003443 -0.003687 -0.003218	-0.003165 -0.00324 -0.002863 -0.002586	-0.003255 -0.003691 -0.003422 -0.003269	-0.002939 -0.003132 -0.002618 -0.002606
Resistance readings, Ω	0.000688 0.000725 0.000686 0.00064	0.000709 0.000728 0.000768 0.000725	0.000886 0.000861 0.000922 0.000805	0.000791 0.00081 0.000716 0.000646	0.000814 0.000923 0.000855 0.000817	0.000735 0.000783 0.000654 0.000652
End-for-end orientation:						
Reverse current:						
Voltage readings, mV	0.003281 0.003354 0.003142 0.002976	0.003198 0.003384 0.002973 0.003182	0.003335 0.003511 0.003405 0.003661	0.002917 0.003258 0.003173 0.003279	0.003363 0.003517 0.003598 0.003473	0.002914 0.003062 0.00316 0.003092

Specimen Number	DW1 01	DW1 02	DA2 02	DA2 03	DA3 02	DA3 03
Resistance readings, Ω	0.00082 0.000839 0.000785 0.000744	0.0008 0.000846 0.000743 0.000796	0.000834 0.000878 0.000851 0.000915	0.000729 0.000815 0.000793 0.00082	0.000841 0.000879 0.000899 0.000868	0.000728 0.000766 0.00079 0.000773
Forward current:						
Voltage readings, mV	-0.002853 -0.002974 -0.00276 -0.002758	-0.002868 -0.002833 -0.00304 -0.002435	-0.00355 -0.003627 -0.003174 -0.002848	-0.002875 -0.003177 -0.002918 -0.002677	-0.003277 -0.003494 -0.003276 -0.003276	-0.002911 -0.003117 -0.002876 -0.002655
Resistance readings, Ω	0.000713 0.000744 0.00069 0.000689	0.000717 0.000708 0.00076 0.000609	0.000887 0.000907 0.000794 0.000712	0.000719 0.000794 0.00073 0.000669	0.000819 0.000874 0.000819 0.000819	0.000728 0.000779 0.000719 0.000664
Average voltage, mV	0.003009	0.002992	0.003419	0.003002	0.003409	0.002970
Average resistance, $R=V/I$ ($m\Omega$)	0.752125	0.748063	0.854688	0.750500	0.852313	0.742563
Potential Contact Distance, L (mm) (Gage Length)	12.7	12.7	12.7	12.7	12.7	12.7
Average area, A mm^2 *	127.0562	127.1486	127.6312	127.6262	127.5962	127.4561
Resistivity, $p=(R^*A)/L$ ($\mu\Omega m$)	7.52	7.49	8.59	7.54	8.56	7.45
Environmental Conditions						
Temperature (Deg C)	22.1	22.1	21.3	21.3	21.2	21.2
Barometric Pressure (in Hg)	25.2	25.2	25.2	25.2	25.2	25.2
Humidity (%)	21.3	21.3	43	43.1	43	43.2

Specimen ID Number	Operator S#	Test Date	Applied Current (mA)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Measured Potential (mV)
DW10 01	41169	3/5/2010 10:03	4	25.371	12.739	0.002979
DW10 02	41169	3/5/2010 10:07	4	25.371	12.733	0.002981
DW10 03	41169	3/5/2010 10:10	4	25.371	12.731	0.002967
DW10 04	41169	3/5/2010 10:13	4	25.370	12.729	0.002965
DW11 01	41169	3/5/2010 12:37	4	25.371	12.739	0.003011
DW11 02	41169	3/5/2010 12:40	4	25.371	12.730	0.002998
DW11 03	41169	3/5/2010 12:43	4	25.373	12.734	0.003007
DW11 04	41169	3/5/2010 12:46	4	25.371	12.730	0.002968
DW12 01	41169	3/5/2010 12:49	4	25.372	12.729	0.003040
DW12 02	41169	3/5/2010 12:52	4	25.371	12.728	0.003004
DW12 03	41169	3/5/2010 12:57	4	25.371	12.737	0.002946
DW12 04	41169	3/5/2010 12:59	4	25.371	12.734	0.002976
DW13 01	41169	3/5/2010 13:02	4	25.372	12.734	0.003000
DW13 02	41169	3/5/2010 13:06	4	25.373	12.731	0.002958
DW13 03	41169	3/5/2010 13:09	4	25.374	12.731	0.002957
DW13 04	41169	3/5/2010 13:12	4	25.372	12.733	0.002937
DW14 01	41169	3/5/2010 13:31	4	25.375	12.739	0.002975
DW14 02	41169	3/5/2010 13:33	4	25.373	12.731	0.002996
DW14 03	41169	3/5/2010 13:36	4	25.374	12.734	0.002996
DW14 04	41169	3/8/2010 8:23	4	25.374	12.734	0.002961
DW15 02	41169	3/8/2010 8:26	4	25.390	12.727	0.002977
DA4 02	41169	3/8/2010 8:30	4	25.383	12.747	0.003370
DA4 03	41169	3/8/2010 9:02	4	25.374	12.743	0.002980
DA5 01	41169	3/8/2010 9:04	4	25.392	12.743	0.003342
DA5 02	41169	3/8/2010 9:08	4	25.385	12.744	0.003317
DA5 03	41169	3/8/2010 9:10	4	25.390	12.745	0.002937
DA6 01	41169	3/8/2010 9:13	4	25.393	12.746	0.003285
DA6 02	41169	3/8/2010 9:16	4	25.396	12.745	0.003335
DA7 01	41169	3/8/2010 9:19	4	25.397	12.747	0.002941
DW2 01	41169	3/18/2010 9:37	4	25.382	12.730	0.002997
DW2 02	41169	3/18/2010 9:45	4	25.364	12.725	0.003022
DW2 03	41169	3/18/2010 9:49	4	25.368	12.734	0.003026
DW2 04	41169	3/18/2010 9:52	4	25.366	12.725	0.003015
DW3 01	41169	3/18/2010 9:55	4	25.365	12.725	0.003049
DW15 03	41169	3/18/2010 9:59	4	25.387	12.734	0.002962
DW15 04	41169	3/18/2010 10:02	4	25.394	12.745	0.002983
DW16 01	41169	3/18/2010 10:05	4	25.384	12.736	0.003037

Specimen ID Number	Operator S#	Test Date	Applied Current (mA)	Initial Specimen Length (mm)	Initial Specimen Diameter (mm)	Measured Potential (mV)
DW16 02	41169	3/18/2010 10:55	4	25.391	12.738	0.003044
DW16 03	41169	3/18/2010 10:57	4	25.381	12.740	0.003022
DW16 04	41169	3/18/2010 11:00	4	25.385	12.746	0.002993
DW17 01	41169	3/18/2010 11:04	4	25.400	12.738	0.003017
DW17 04	41169	3/18/2010 11:46	4	25.387	12.739	0.002925
DW17 02	41169	3/19/2010 12:50	4	25.397	12.740	0.002982
DW1 01	41169	3/22/2010 7:57	4	25.377	12.719	0.003009
DW1 02	41169	3/22/2010 7:59	4	25.391	12.724	0.002992
DA2 02	41169	7/26/2010 10:54	4	25.390	12.748	0.003419
DA2 03	41169	7/26/2010 10:58	4	25.398	12.748	0.003002
DA3 02	41169	7/26/2010 11:00	4	25.397	12.746	0.003409
DA3 03	41169	7/26/2010 11:04	4	25.397	12.739	0.002970

Specimen ID Number	Resistance (mΩ)	Resistivity (μΩm)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
DW10 01	0.745	7.473	23.4	25.2	20.7	With Grain
DW10 02	0.745	7.472	23.4	25.2	20.6	With Grain
DW10 03	0.742	7.436	23.4	25.2	20.6	With Grain
DW10 04	0.741	7.427	23.5	25.2	20.6	With Grain
DW11 01	0.753	7.555	23.2	25.2	20.8	With Grain
DW11 02	0.750	7.511	23.2	25.2	20.9	With Grain
DW11 03	0.752	7.540	23.2	25.2	20.8	With Grain
DW11 04	0.742	7.435	23.2	25.2	20.8	With Grain
DW12 01	0.760	7.616	23.2	25.2	20.8	With Grain
DW12 02	0.751	7.523	23.2	25.2	20.8	With Grain
DW12 03	0.736	7.387	23.3	25.2	20.8	With Grain
DW12 04	0.744	7.462	23.2	25.2	20.8	With Grain
DW13 01	0.750	7.521	23.2	25.2	20.9	With Grain
DW13 02	0.740	7.413	23.2	25.2	20.9	With Grain
DW13 03	0.739	7.408	23.2	25.2	20.8	With Grain
DW13 04	0.734	7.358	23.2	25.2	20.8	With Grain
DW14 01	0.744	7.464	23.2	25.2	20.9	With Grain
DW14 02	0.749	7.506	23.4	25.2	20.7	With Grain
DW14 03	0.749	7.511	23.4	25.2	20.7	With Grain
DW14 04	0.740	7.422	22.9	25.1	21.6	With Grain
DW15 02	0.744	7.454	22.9	25.1	21.6	With Grain
DA4 02	0.843	8.466	22.9	25.1	21.6	Against Grain
DA4 03	0.745	7.480	23	25.1	21.7	Against Grain
DA5 01	0.835	8.389	23	25.1	21.7	Against Grain
DA5 02	0.829	8.329	23	25.1	21.7	Against Grain
DA5 03	0.734	7.378	23	25.1	21.7	Against Grain
DA6 01	0.821	8.249	23	25.1	21.7	Against Grain
DA6 02	0.834	8.375	23	25.1	21.7	Against Grain
DA7 01	0.735	7.387	23	25.1	21.7	Against Grain
DW2 01	0.749	7.509	22.8	25.3	20.7	With Grain
DW2 02	0.756	7.567	22.9	25.3	20.3	With Grain
DW2 03	0.756	7.585	22.9	25.3	20	With Grain
DW2 04	0.754	7.548	22.8	25.3	19.9	With Grain
DW3 01	0.762	7.633	22.8	25.3	20	With Grain
DW15 03	0.740	7.425	22.8	25.3	19.8	With Grain
DW15 04	0.746	7.493	22.8	25.3	19.8	With Grain
DW16 01	0.759	7.617	22.8	25.3	19.7	With Grain

Specimen ID Number	Resistance (mΩ)	Resistivity (μΩm)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Grain Orientation
DW16 02	0.761	7.635	22.8	25.3	19.4	With Grain
DW16 03	0.755	7.582	22.8	25.3	19.2	With Grain
DW16 04	0.748	7.516	22.8	25.3	19	With Grain
DW17 01	0.754	7.569	22.8	25.3	18.7	With Grain
DW17 04	0.731	7.338	22.6	25.3	17.2	With Grain
DW17 02	0.745	7.481	22.5	25.4	12	With Grain
DW1 01	0.752	7.525	22.1	25.2	21.3	With Grain
DW1 02	0.748	7.489	22.1	25.2	21.3	With Grain
DA2 02	0.855	8.589	21.3	25.2	43	Against Grain
DA2 03	0.751	7.542	21.3	25.2	43.1	Against Grain
DA3 02	0.852	8.563	21.2	25.2	43	Against Grain
DA3 03	0.743	7.452	21.2	25.2	43.2	Against Grain

Specimen ID Number	Date and Time	Operator	Specimen Location	Initial Specimen Length, m	Initial Specimen Density, ρ kg/m ³	Longitudinal Traverse Time, s	Shear Traverse Time, s	Longitudinal Zero Correction, s	Shear Zero Correction, s
DA4 02	3/4/2010 8:23	41169		0.025382	1775.7729	1.037E-05	1.635E-05	2.000E-07	2.100E-07
DA4 03	3/4/2010 8:25	41169		0.025374	1795.4347	9.680E-06	1.586E-05	2.000E-07	2.100E-07
DA5 01	3/4/2010 8:27	41169		0.025392	1780.5224	1.030E-05	1.648E-05	2.000E-07	2.100E-07
DA5 02	3/4/2010 8:29	41169		0.025385	1779.2401	1.044E-05	1.642E-05	2.000E-07	2.100E-07
DA5 03	3/4/2010 8:31	41169		0.02539	1795.144	9.680E-06	1.627E-05	2.000E-07	2.100E-07
DA6 01	3/4/2010 8:33	41169		0.025392	1777.3028	1.035E-05	1.648E-05	2.000E-07	2.100E-07
DA6 02	3/4/2010 8:34	41169		0.025396	1772.999	1.035E-05	1.656E-05	2.000E-07	2.100E-07
DA7 01	3/4/2010 8:36	41169		0.025397	1794.3008	9.650E-06	1.596E-05	2.000E-07	2.100E-07
DW10 02	3/4/2010 8:38	41169		0.025371	1774.5031	9.770E-06	1.611E-05	2.000E-07	2.100E-07
DW10 01	3/4/2010 8:39	41169		0.025371	1774.303	9.800E-06	1.635E-05	2.000E-07	2.100E-07
DW10 03	3/4/2010 8:51	41169		0.025371	1775.3117	9.700E-06	1.600E-05	2.000E-07	2.100E-07
DW10 04	3/4/2010 8:53	41169		0.02537	1777.1511	9.880E-06	1.593E-05	2.000E-07	2.100E-07
DW11 01	3/4/2010 8:54	41169		0.025371	1774.4659	9.700E-06	1.634E-05	2.000E-07	2.100E-07
DW11 02	3/4/2010 8:56	41169		0.025371	1777.4845	9.800E-06	1.593E-05	2.000E-07	2.100E-07
DW11 04	3/4/2010 8:57	41169		0.025371	1776.8434	9.700E-06	1.597E-05	2.000E-07	2.100E-07
DW11 03	3/4/2010 8:59	41169		0.025373	1775.5766	9.630E-06	1.601E-05	2.000E-07	2.100E-07
DW12 01	3/4/2010 9:00	41169		0.025372	1777.1349	9.680E-06	1.588E-05	2.000E-07	2.100E-07
DW12 02	3/4/2010 9:03	41169		0.025371	1779.1056	9.720E-06	1.593E-05	2.000E-07	2.100E-07
DW12 03	3/4/2010 9:04	41169		0.025371	1778.457	9.820E-06	1.617E-05	2.000E-07	2.100E-07
DW12 04	3/4/2010 9:42	41169		0.025371	1783.3863	9.720E-06	1.594E-05	2.000E-07	2.100E-07
DW13 01	3/4/2010 9:44	41169		0.025372	1773.2633	9.870E-06	1.601E-05	2.000E-07	2.100E-07
DW13 02	3/4/2010 9:47	41169		0.025373	1776.7113	9.840E-06	1.640E-05	2.000E-07	2.100E-07
DW13 03	3/4/2010 9:49	41169		0.025374	1777.6378	9.870E-06	1.611E-05	2.000E-07	2.100E-07
DW13 04	3/4/2010 9:50	41169		0.025372	1778.1786	9.770E-06	1.644E-05	2.000E-07	2.100E-07
DW14 01	3/4/2010 9:52	41169		0.025375	1779.0232	9.770E-06	1.605E-05	2.000E-07	2.100E-07
DW14 02	3/4/2010 9:53	41169		0.025373	1779.5385	9.820E-06	1.616E-05	2.000E-07	2.100E-07
DW14 03	3/4/2010 9:55	41169		0.025374	1773.8422	9.840E-06	1.601E-05	2.000E-07	2.100E-07
DW14 04	3/4/2010 9:56	41169		0.025374	1773.3099	9.770E-06	1.608E-05	2.000E-07	2.100E-07
DW15 02	3/4/2010 9:58	41169		0.02539	1777.4917	9.800E-06	1.598E-05	2.000E-07	2.100E-07
DW3 01	4/19/2010 9:03	41169		0.025365	1772.5047	9.710E-06	1.599E-05	2.200E-07	5.000E-08
DW2 01	3/17/2010 8:15	41169		0.025382	1774.7993	9.750E-06	1.588E-05	1.900E-07	2.500E-07

Specimen ID Number	Date and Time	Operator	Specimen Location	Initial Specimen Length, m	Initial Specimen Density, ρ kg/m ³	Longitudinal Traverse Time, s	Shear Traverse Time, s	Longitudinal Zero Correction, s	Shear Zero Correction, s
DW2 02	3/17/2010 8:17	41169		0.025364	1769.7202	9.890E-06	1.660E-05	1.900E-07	2.500E-07
DW2 03	3/17/2010 8:19	41169		0.025368	1767.2455	9.790E-06	1.599E-05	1.900E-07	2.500E-07
DW2 04	3/17/2010 8:21	41169		0.025366	1768.4906	9.820E-06	1.596E-05	1.900E-07	2.500E-07
DW15 03	3/17/2010 8:24	41169		0.025386	1777.7443	9.840E-06	1.636E-05	1.900E-07	2.500E-07
DW15 04	3/17/2010 8:26	41169		0.025394	1789.463	9.800E-06	1.601E-05	1.900E-07	2.500E-07
DW16 01	3/17/2010 8:28	41169		0.025383	1773.0804	9.720E-06	1.596E-05	1.900E-07	2.500E-07
DW16 02	3/17/2010 8:32	41169		0.025391	1770.259	9.840E-06	1.596E-05	1.900E-07	2.500E-07
DW16 03	3/17/2010 8:34	41169		0.025381	1773.0597	9.750E-06	1.631E-05	1.900E-07	2.500E-07
DW16 04	3/17/2010 8:37	41169		0.025385	1775.3515	9.740E-06	1.593E-05	1.900E-07	2.500E-07
DW17 01	3/17/2010 8:38	41169		0.0254	1774.8266	9.70E-06	1.617E-05	1.900E-07	2.500E-07
DW17 02	3/17/2010 8:42	41169		0.025396	1776.6574	9.72E-06	1.600E-05	1.900E-07	2.500E-07
DW17 04	3/17/2010 8:44	41169		0.025386	1781.5949	9.80E-06	1.601E-05	1.900E-07	2.500E-07
DW1 01	4/19/2010 9:01	41169		0.025377	1777.0687	9.75E-06	1.591E-05	2.200E-07	5.000E-08
DW1 02	3/22/2010 8:45	41169		0.025391	1775.9299	9.75E-06	1.617E-05	2.200E-07	2.300E-07
DA3 03	7/26/2010 12:53	41169		0.025397	1793.0769	9.72E-06	1.586E-05	2.200E-07	3.000E-07
DA2 03	7/26/2010 12:57	41169		0.025398	1792.6376	9.77E-06	1.591E-05	2.200E-07	3.000E-07
DA2 02	7/26/2010 13:01	41169		0.025389	1777.2747	1.05E-05	1.670E-05	2.200E-07	3.000E-07
DA3 02	7/26/2010 13:04	41169		0.025397	1772.3361	1.06E-05	1.658E-05	2.200E-07	3.000E-07

Specimen ID Number	Longitudinal Sonic Velocity (m/s)	Shear Sonic Velocities, (m/s)	Longitudinal Dynamic Young's Modulus (GPa)	Shear Dynamic Young's Modulus (GPa)	Poisson's Ratio $\mu = (1 - [2(v_s/v_l)^2]) / (2 - [2(v_s/v_l)^2])$
DA4 02	2.496E+03	1.573E+03	11.0611	4.3917	1.708E-01
DA4 03	2.677E+03	1.621E+03	12.8627	4.7197	2.102E-01
DA5 01	2.514E+03	1.561E+03	11.2538	4.3368	1.865E-01
DA5 02	2.479E+03	1.566E+03	10.9342	4.3634	1.680E-01
DA5 03	2.678E+03	1.581E+03	12.8768	4.4868	2.326E-01
DA6 01	2.502E+03	1.561E+03	11.1230	4.3289	1.814E-01
DA6 02	2.502E+03	1.553E+03	11.0996	4.2776	1.865E-01
DA7 01	2.688E+03	1.613E+03	12.9597	4.6655	2.188E-01
DW10 02	2.651E+03	1.596E+03	12.4718	4.5181	2.160E-01
DW10 01	2.643E+03	1.572E+03	12.3925	4.3843	2.263E-01
DW10 03	2.671E+03	1.607E+03	12.6620	4.5834	2.163E-01
DW10 04	2.621E+03	1.614E+03	12.2072	4.6287	1.946E-01
DW11 01	2.671E+03	1.573E+03	12.6560	4.3901	2.344E-01
DW11 02	2.643E+03	1.614E+03	12.4148	4.6299	2.026E-01
DW11 04	2.671E+03	1.610E+03	12.6729	4.6048	2.146E-01
DW11 03	2.691E+03	1.606E+03	12.8546	4.5790	2.233E-01
DW12 01	2.676E+03	1.619E+03	12.7296	4.6590	2.114E-01
DW12 02	2.665E+03	1.614E+03	12.6358	4.6342	2.104E-01
DW12 03	2.637E+03	1.590E+03	12.3700	4.4942	2.147E-01
DW12 04	2.665E+03	1.613E+03	12.6662	4.6394	2.110E-01
DW13 01	2.624E+03	1.606E+03	12.2076	4.5727	2.005E-01
DW13 02	2.632E+03	1.567E+03	12.3085	4.3638	2.254E-01
DW13 03	2.624E+03	1.596E+03	12.2396	4.5272	2.065E-01
DW13 04	2.651E+03	1.563E+03	12.4986	4.3456	2.335E-01
DW14 01	2.652E+03	1.602E+03	12.5075	4.5654	2.126E-01
DW14 02	2.638E+03	1.591E+03	12.3794	4.5033	2.141E-01
DW14 03	2.632E+03	1.606E+03	12.2896	4.5749	2.035E-01
DW14 04	2.651E+03	1.599E+03	12.4663	4.5332	2.143E-01
DW15 02	2.645E+03	1.610E+03	12.4334	4.6075	2.056E-01
DW3 01	2.673E+03	1.591E+03	12.6627	4.4883	2.255E-01
DW2 01	2.655E+03	1.624E+03	12.5108	4.6804	2.011E-01

Specimen ID Number	Longitudinal Sonic Velocity (m/s)	Shear Sonic Velocities, (m/s)	Longitudinal Dynamic Young's Modulus (GPa)	Shear Dynamic Young's Modulus (GPa)	Poisson's Ratio $\mu = (1 - [2(v_s/v_l)^2]) / (2 - [2(v_s/v_l)^2])$
DW2 02	2.615E+03	1.551E+03	12.1003	4.2590	2.284E-01
DW2 03	2.643E+03	1.612E+03	12.3403	4.5905	2.038E-01
DW2 04	2.634E+03	1.615E+03	12.2703	4.6106	1.990E-01
DW15 03	2.631E+03	1.576E+03	12.3028	4.4144	2.202E-01
DW15 04	2.642E+03	1.611E+03	12.4951	4.6459	2.040E-01
DW16 01	2.663E+03	1.616E+03	12.5785	4.6287	2.089E-01
DW16 02	2.631E+03	1.616E+03	12.2558	4.6243	1.970E-01
DW16 03	2.655E+03	1.580E+03	12.4976	4.4284	2.256E-01
DW16 04	2.658E+03	1.619E+03	12.5439	4.6531	2.052E-01
DW17 01	2.671E+03	1.595E+03	12.6608	4.5179	2.226E-01
DW17 02	2.665E+03	1.612E+03	12.6168	4.6193	2.112E-01
DW17 04	2.642E+03	1.611E+03	12.4323	4.6226	2.040E-01
DW1 01	2.663E+03	1.600E+03	12.6008	4.5497	2.175E-01
DW1 02	2.664E+03	1.593E+03	12.6066	4.5062	2.219E-01
DA3 03	2.673E+03	1.632E+03	12.8149	4.7769	2.029E-01
DA2 03	2.659E+03	1.627E+03	12.6790	4.7455	2.009E-01
DA2 02	2.463E+03	1.548E+03	10.7778	4.2595	1.733E-01
DA3 02	2.451E+03	1.560E+03	10.6510	4.3132	1.597E-01

Environmental Conditions (longitudinal)				Environmental Conditions (shear)			
Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Room Temperature (Deg C)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Room Humidity (%)
22.7	25	17.9	22.7	22.7	25	17.9	17.9
22.7	25	17.9	22.7	22.7	25	17.9	17.9
22.7	25	17.9	22.7	22.7	25	17.9	17.9
22.7	25	17.9	22.7	22.7	25	17.9	17.9
22.7	25	17.9	22.7	22.7	25	17.9	17.9
22.7	25	17.9	22.7	22.7	25	17.9	17.9
22.8	25	17.8	22.7	22.7	25	17.8	17.8
22.7	25	17.9	22.7	22.7	25	17.8	17.8
22.8	25	17.8	22.8	22.8	25	17.8	17.8
22.7	25	17.9	22.8	22.8	25	17.9	17.9
22.8	25	17.9	22.8	22.8	25	17.9	17.9
22.8	25	17.9	22.8	22.8	25	17.9	17.9
22.8	25	17.9	22.8	22.8	25	17.9	17.9
22.8	25	17.9	22.8	22.8	25	17.9	17.9
22.8	25	17.9	22.8	22.8	25	17.9	17.9
22.8	25	18	22.8	22.8	25	18	18
22.8	25	18.2	22.8	22.8	25	18.2	18.2
22.9	25	18.1	22.9	22.9	25	18.2	18.2
22.8	25	18.2	22.8	22.8	25	18.2	18.2
22.8	25	18.2	22.8	22.8	25	18.2	18.2
22.8	25	18.3	22.8	22.8	25	18.3	18.3
22.8	25	18.3	22.8	22.8	25	18.3	18.3
22.8	25	18.3	22.8	22.8	25	18.3	18.3
22.8	25	18.4	22.8	22.8	25	18.4	18.4
22.8	25	18.4	22.8	22.8	25	18.4	18.4
22.8	25	18.5	22.8	22.8	25	18.5	18.5
24.5	25.2	18.6	24.5	24.5	25.2	18.6	18.5
22.2	25.5	17	22.2	22.2	25.5	17	17

Specimen ID Number	Elastic Modulus, [GPa] $E = \rho v_l^2 [(1 + \mu)(1 - 2\mu)/(1 - \mu)]$
DA4 02	10.2832
DA4 03	11.4236
DA5 01	10.2913
DA5 02	10.1926
DA5 03	11.0609
DA6 01	10.2286
DA6 02	10.1507
DA7 01	11.3722
DW10 02	10.9878
DW10 01	10.7525
DW10 03	11.1498
DW10 04	11.0590
DW11 01	10.8387
DW11 02	11.1362
DW11 04	11.1863
DW11 03	11.2034
DW12 01	11.2874
DW12 02	11.2186
DW12 03	10.9181
DW12 04	11.2367
DW13 01	10.9793
DW13 02	10.6945
DW13 03	10.9241
DW13 04	10.7205
DW14 01	11.0719
DW14 02	10.9351
DW14 03	11.0117
DW14 04	11.0093
DW15 02	11.1099
DW3 01	11.0005
DW2 01	11.2436

Specimen ID Number	Elastic Modulus, [GPa] $E = \rho v_L^2 [(1+\mu)(1-2\mu)/(1-\mu)]$	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)	Room Temperature (Deg C)	Atmospheric Pressure (in of Hg)	Room Humidity (%)
DW2 02	10.4637	22.2	25.5	17	22.2	25.5	17
DW2 03	11.0524	22.2	25.5	17	22.2	25.5	17
DW2 04	11.0565	22.2	25.5	17	22.2	25.5	17
DW15 03	10.7728	22.2	25.5	17	22.2	25.5	17
DW15 04	11.1878	22.2	25.5	17	22.3	25.5	17
DW16 01	11.1911	22.3	25.5	17.1	22.3	25.5	17.1
DW16 02	11.0708	22.3	25.5	17	22.3	25.5	17.1
DW16 03	10.8549	22.3	25.5	17	22.3	25.5	17.1
DW16 04	11.2155	22.4	25.5	17	22.4	25.5	17.1
DW17 01	11.0471	22.4	25.5	17	22.4	25.5	17
DW17 02	11.1898	22.4	25.5	17	22.4	25.5	17
DW17 04	11.1316	22.4	25.5	17	22.4	25.5	17
DW1 01	11.0780	24.4	25.2	18.4	24.5	25.2	18.4
DW1 02	11.0118	22.2	25.2	21.5	22.2	25.2	21.5
DA3 03	11.4918	21.4	25.2	44.3	21.4	25.2	44.5
DA2 03	11.3980	21.4	25.2	44.5	21.4	25.2	44.7
DA2 02	9.9950	21.4	25.2	44.8	21.4	25.2	44.7
DA3 02	10.0043	21.4	25.2	44.8	21.5	25.2	44.6

Specimen Type	Specimen Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	DW15 03	W	25.388	25.386	25.384	25.388	12.743	12.742	12.738
	DW15 02	W	25.383	25.385	25.385	25.386	12.720	12.724	12.730
	DW14 04	W	25.372	25.374	25.377	25.371	12.725	12.731	12.736
	DA7 01	W	25.394	25.397	25.395	25.397	12.741	12.746	12.749
	DA5 03	W	25.389	25.390	25.389	25.388	12.748	12.749	12.747
	DW14 03	W	25.376	25.379	25.376	25.376	12.732	12.735	12.738
	DA6 01	A	25.394	25.392	25.392	25.394	12.749	12.749	12.749
	DA6 02	A	25.393	25.394	25.393	25.393	12.739	12.743	12.747
	DW16 04	W	25.384	25.381	25.382	25.383	12.751	12.748	12.745
	DW17 02	W	25.398	25.396	25.395	25.396	12.735	12.743	12.748
	DW16 01	W	25.383	25.384	25.383	25.383	12.740	12.734	12.727
	DW16 02	W	25.389	25.386	25.389	25.387	12.734	12.735	12.735
	DW16 03	W	25.380	25.380	25.382	25.382	12.728	12.733	12.735
	DW17 04	W	25.384	25.382	25.382	25.383	12.747	12.743	12.738
	DW17 01	W	25.402	25.402	25.403	25.403	12.729	12.733	12.735
	DW15 04	W	25.392	25.394	25.392	25.391	12.728	12.734	12.738
	DW11 01	W	25.371	25.372	25.372	25.370	12.738	12.740	12.741
	DW1 01	W	25.372	25.370	25.372	25.371	12.727	12.731	12.734
	DW10 04	W	25.369	25.370	25.367	25.368	12.736	12.732	12.725
	DW10 02	W	25.368	25.369	25.372	25.369	12.733	12.730	12.725
	DW11 02	W	25.368	25.370	25.368	25.368	12.739	12.738	12.730
	DW10 01	W	25.370	25.373	25.370	25.371	12.743	12.742	12.741
	DW1 02	W	25.390	25.386	25.388	25.389	12.737	12.733	12.725
	DW10 03	W	25.371	25.371	25.372	25.372	12.737	12.734	12.730
	DA5 01	A	25.393	25.391	25.392	25.393	12.739	12.738	12.742
	DW11 03	W	25.369	25.372	25.369	25.368	12.727	12.729	12.735
	DW12 01	W	25.373	25.373	25.374	25.373	12.737	12.735	12.728
	DW12 02	W	25.368	25.368	25.372	25.368	12.743	12.740	12.736
	DW11 04	W	25.369	25.368	25.367	25.366	12.745	12.740	12.736
	DA4 02	A	25.379	25.378	25.378	25.379	12.749	12.749	12.747
	DA5 02	A	25.384	25.383	25.384	25.383	12.747	12.746	12.748
	DA4 03	A	25.371	25.373	25.371	25.371	12.739	12.742	12.745
	DW13 02	W	25.378	25.381	25.374	25.370	12.734	12.737	12.740

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D2	D3
	DW13 01	W	25.378	25.374	25.373	25.372	12.739	12.734	12.735
	DW13 03	W	25.373	25.372	25.371	25.373	12.743	12.739	12.736
	DW14 02	W	25.372	25.372	25.373	25.371	12.743	12.735	12.731
	DW12 03	W	25.368	25.369	25.368	25.367	12.728	12.730	12.737
	DW14 01	W	25.371	25.374	25.373	25.373	12.740	12.738	12.737
	DW13 04	W	25.371	25.373	25.372	25.370	12.727	12.733	12.737
	DW12 04	W	25.374	25.376	25.378	25.374	12.731	12.733	12.736
	DW2 04	W	25.361	25.362	25.365	25.362	12.733	12.732	12.726
	DW2 02	W	25.376	25.364	25.369	25.377	12.731	12.728	12.724
	DA3 02	A	25.393	25.395	25.398	25.395	12.750	12.750	12.748
	DA2 03	A	25.394	25.394	25.395	25.393	12.749	12.748	12.748
	DA2 02	A	25.385	25.386	25.388	25.386	12.750	12.751	12.749
	DW2 03	W	25.361	25.362	25.362	25.362	12.735	12.736	12.739
	DA3 03	A	25.400	25.397	25.400	25.402	12.737	12.739	12.741
	DW2 01	W	25.382	25.381	25.380	25.381	12.718	12.722	12.728

Specimen ID Number										
	D4	D1 ⁹⁰	D2 ⁹⁰	D3 ⁹⁰	D4 ⁹⁰	H1	H1'	H2	H2'	
DW15 03	12.737	12.739	12.733	12.730	12.730	0.000	0.000	0.000	0.000	
DW15 02	12.732	12.718	12.721	12.729	12.732	0.000	0.000	0.000	0.000	
DW14 04	12.741	12.727	12.732	12.737	12.740	0.000	0.000	0.000	0.000	
DA7 01	12.748	12.744	12.747	12.750	12.750	0.000	0.000	0.000	0.000	
DA5 03	12.744	12.751	12.751	12.749	12.749	0.000	0.000	0.000	0.000	
DW14 03	12.741	12.726	12.731	12.738	12.742	0.000	0.000	0.000	0.000	
DA6 01	12.749	12.747	12.745	12.742	12.738	0.000	0.000	0.000	0.000	
DA6 02	12.747	12.746	12.749	12.751	12.750	0.000	0.000	0.000	0.000	
DW16 04	12.747	12.750	12.746	12.747	12.747	0.000	0.000	0.000	0.000	
DW17 02	12.750	12.734	12.739	12.742	12.747	0.000	0.000	0.000	0.000	
DW16 01	12.723	12.738	12.737	12.735	12.731	0.000	0.000	0.000	0.000	
DW16 02	12.737	12.736	12.739	12.745	12.745	0.000	0.000	0.000	0.000	
DW16 03	12.740	12.742	12.741	12.743	12.745	0.000	0.000	0.000	0.000	
DW17 04	12.736	12.749	12.744	12.736	12.735	0.000	0.000	0.000	0.000	
DW17 01	12.737	12.729	12.734	12.736	12.737	0.000	0.000	0.000	0.000	
DW15 04	12.741	12.736	12.741	12.744	12.742	0.000	0.000	0.000	0.000	
DW11 01	12.740	12.724	12.730	12.735	12.734	0.000	0.000	0.000	0.000	
DW1 01	12.735	12.728	12.733	12.737	12.735	0.000	0.000	0.000	0.000	
DW10 04	12.723	12.737	12.730	12.724	12.720	0.000	0.000	0.000	0.000	
DW10 02	12.717	12.739	12.739	12.738	12.737	0.000	0.000	0.000	0.000	
DW11 02	12.727	12.742	12.738	12.732	12.728	0.000	0.000	0.000	0.000	
DW10 01	12.738	12.746	12.742	12.739	12.737	0.000	0.000	0.000	0.000	
DW1 02	12.720	12.734	12.731	12.733	12.725	0.000	0.000	0.000	0.000	
DW10 03	12.730	12.739	12.732	12.728	12.724	0.000	0.000	0.000	0.000	
DA5 01	12.746	12.745	12.742	12.741	12.748	0.000	0.000	0.000	0.000	
DW11 03	12.739	12.731	12.732	12.738	12.743	0.000	0.000	0.000	0.000	
DW12 01	12.722	12.739	12.737	12.737	12.732	0.000	0.000	0.000	0.000	
DW12 02	12.734	12.742	12.741	12.733	12.726	0.000	0.000	0.000	0.000	
DW11 04	12.736	12.740	12.736	12.731	12.727	0.000	0.000	0.000	0.000	
DA4 02	12.746	12.747	12.744	12.739	12.735	0.000	0.000	0.000	0.000	
DA5 02	12.750	12.747	12.750	12.750	12.752	0.000	0.000	0.000	0.000	
DA4 03	12.744	12.743	12.743	12.746	12.749	0.000	0.000	0.000	0.000	
DW13 02	12.745	12.732	12.735	12.740	12.742	0.000	0.000	0.000	0.000	

Specimen ID Number	D4 ⁹⁰				D3 ⁹⁰	D2 ⁹⁰	D1 ⁹⁰	H1	H1'	H2	H2'
	D4	D1 ⁹⁰	D2 ⁹⁰	D4 ⁹⁰							
DW13 01	12.734	12.736	12.731	12.729	12.732	12.731	12.736	0.000	0.000	0.000	0.000
DW13 03	12.740	12.740	12.734	12.724	12.728	12.734	12.740	0.000	0.000	0.000	0.000
DW14 02	12.723	12.742	12.737	12.732	12.734	12.737	12.742	0.000	0.000	0.000	0.000
DW12 03	12.742	12.728	12.731	12.739	12.734	12.731	12.728	0.000	0.000	0.000	0.000
DW14 01	12.739	12.739	12.733	12.725	12.729	12.733	12.739	0.000	0.000	0.000	0.000
DW13 04	12.741	12.734	12.736	12.741	12.740	12.736	12.734	0.000	0.000	0.000	0.000
DW12 04	12.738	12.739	12.736	12.742	12.740	12.736	12.739	0.000	0.000	0.000	0.000
DW2 04	12.723	12.737	12.735	12.732	12.731	12.735	12.737	0.000	0.000	0.000	0.000
DW2 02	12.719	12.732	12.730	12.717	12.723	12.730	12.732	0.000	0.000	0.000	0.000
DA3 02	12.747	12.750	12.751	12.750	12.751	12.751	12.750	0.000	0.000	0.000	0.000
DA2 03	12.748	12.746	12.745	12.744	12.744	12.745	12.746	0.000	0.000	0.000	0.000
DA2 02	12.744	12.749	12.750	12.745	12.747	12.750	12.749	0.000	0.000	0.000	0.000
DW2 03	12.737	12.729	12.731	12.736	12.732	12.731	12.729	0.000	0.000	0.000	0.000
DA3 03	12.745	12.744	12.743	12.742	12.745	12.743	12.744	0.000	0.000	0.000	0.000
DW2 01	12.733	12.719	12.723	12.728	12.724	12.723	12.719	0.000	0.000	0.000	0.000

Specimen ID Number	Final Hole Diameter, mm	Final Hole Depth, mm		Final Specimen Mass, g	Measurements by:	Date: mm/dd/yr
		HD1	HD2			
DW15 03	0.000	0.000	0.000	5.65699	41169	12/2/2010 14:35
DW15 02	0.000	0.000	0.000	5.64898	41169	12/2/2010 14:58
DW14 04	0.000	0.000	0.000	5.64125	41169	12/2/2010 15:28
DA7 01	0.000	0.000	0.000	5.72445	41169	12/2/2010 15:49
DA5 03	0.000	0.000	0.000	5.72498	41169	12/2/2010 15:50
DW14 03	0.000	0.000	0.000	5.64055	41169	12/3/2010 8:58
DA6 01	0.000	0.000	0.000	5.66396	41169	12/3/2010 9:02
DA6 02	0.000	0.000	0.000	5.64923	41169	12/3/2010 9:09
DW16 04	0.000	0.000	0.000	5.65904	41169	12/3/2010 10:15
DW17 02	0.000	0.000	0.000	5.65714	41169	12/3/2010 10:49
DW16 01	0.000	0.000	0.000	5.64339	41169	12/3/2010 10:53
DW16 02	0.000	0.000	0.000	5.63576	41169	12/3/2010 10:55
DW16 03	0.000	0.000	0.000	5.64623	41169	12/3/2010 11:05
DW17 04	0.000	0.000	0.000	5.67190	41169	12/3/2010 11:13
DW17 01	0.000	0.000	0.000	5.65258	41169	12/3/2010 11:42
DW15 04	0.000	0.000	0.000	5.70481	41169	12/3/2010 11:52
DW11 01	0.000	0.000	0.000	5.64820	41169	12/3/2010 13:51
DW1 01	0.000	0.000	0.000	5.63806	41169	12/3/2010 13:55
DW10 04	0.000	0.000	0.000	5.64606	41169	12/3/2010 14:12
DW10 02	0.000	0.000	0.000	5.64159	41169	12/3/2010 14:18
DW11 02	0.000	0.000	0.000	5.64875	41169	12/3/2010 14:22
DW10 01	0.000	0.000	0.000	5.64841	41169	12/3/2010 14:25
DW1 02	0.000	0.000	0.000	5.64083	41169	12/4/2010 7:37
DW10 03	0.000	0.000	0.000	5.64405	41169	12/4/2010 7:41
DA5 01	0.000	0.000	0.000	5.67417	41169	12/4/2010 8:50
DW11 03	0.000	0.000	0.000	5.64812	41169	12/4/2010 8:51
DW12 01	0.000	0.000	0.000	5.64794	41169	12/4/2010 9:08
DW12 02	0.000	0.000	0.000	5.65239	41169	12/4/2010 9:40
DW11 04	0.000	0.000	0.000	5.64522	41169	12/4/2010 9:47
DA4 02	0.000	0.000	0.000	5.66277	41169	12/4/2010 9:53
DA5 02	0.000	0.000	0.000	5.67088	41169	12/4/2010 10:06
DA4 03	0.000	0.000	0.000	5.71875	41169	12/4/2010 10:11
DW13 02	0.000	0.000	0.000	5.65042	41169	12/4/2010 11:21

Specimen ID Number	Final Hole Diameter, mm	Final Hole Depth, mm			Final Specimen Mass, g	Measurements by:	Date:
		HD1	HD2				
DW13 01	0.000	0.000	0.000	0.000	41169	12/4/2010 12:52	
DW13 03	0.000	0.000	0.000	0.000	41169	12/4/2010 12:58	
DW14 02	0.000	0.000	0.000	0.000	41169	12/4/2010 13:01	
DW12 03	0.000	0.000	0.000	0.000	41169	12/4/2010 13:03	
DW14 01	0.000	0.000	0.000	0.000	41169	12/4/2010 13:09	
DW13 04	0.000	0.000	0.000	0.000	41169	12/4/2010 13:12	
DW12 04	0.000	0.000	0.000	0.000	41169	12/4/2010 13:26	
DW2 04	0.000	0.000	0.000	0.000	47735	12/4/2010 13:28	
DW2 02	0.000	0.000	0.000	0.000	47735	12/4/2010 14:08	
DA3 02	0.000	0.000	0.000	0.000	47735	12/4/2010 14:12	
DA2 03	0.000	0.000	0.000	0.000	47735	12/4/2010 14:20	
DA2 02	0.000	0.000	0.000	0.000	47735	12/4/2010 14:34	
DW2 03	0.000	0.000	0.000	0.000	41169	12/4/2010 14:40	
DA3 03	0.000	0.000	0.000	0.000	41169	12/4/2010 14:56	
DW2 01	0.000	0.000	0.000	0.000	41169	12/4/2010 15:03	

Specimen ID Number	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m	Total Hole Volume m ³	Final Specimen Mass kg
DW15 03	25.38650	12.73650	127.4061	0.025387	0.01274	0.0000E+00	0.0057
DW15 02	25.38475	12.72575	127.1911	0.025385	0.01273	0.0000E+00	0.0056
DW14 04	25.37350	12.73363	127.3485	0.025374	0.01273	0.0000E+00	0.0056
DA7 01	25.39575	12.74688	127.6137	0.025396	0.01275	0.0000E+00	0.0057
DA5 03	25.38900	12.74850	127.6462	0.025389	0.01275	0.0000E+00	0.0057
DW14 03	25.37675	12.73538	127.3836	0.025377	0.01274	0.0000E+00	0.0056
DA6 01	25.39300	12.74600	127.5962	0.025393	0.01275	0.0000E+00	0.0057
DA6 02	25.39325	12.74650	127.6062	0.025393	0.01275	0.0000E+00	0.0056
DW16 04	25.38250	12.74763	127.6287	0.025383	0.01275	0.0000E+00	0.0057
DW17 02	25.39625	12.74225	127.5211	0.025396	0.01274	0.0000E+00	0.0057
DW16 01	25.38325	12.73313	127.3385	0.025383	0.01273	0.0000E+00	0.0056
DW16 02	25.38775	12.73825	127.4411	0.025388	0.01274	0.0000E+00	0.0056
DW16 03	25.38100	12.73838	127.4436	0.025381	0.01274	0.0000E+00	0.0056
DW17 04	25.38275	12.74100	127.4961	0.025383	0.01274	0.0000E+00	0.0057
DW17 01	25.40250	12.73375	127.3510	0.025403	0.01273	0.0000E+00	0.0057
DW15 04	25.39225	12.73800	127.4361	0.025392	0.01274	0.0000E+00	0.0057
DW11 01	25.37125	12.73525	127.3811	0.025371	0.01274	0.0000E+00	0.0056
DW1 01	25.37125	12.73250	127.3260	0.025371	0.01273	0.0000E+00	0.0056
DW10 04	25.36850	12.72838	127.2436	0.025369	0.01273	0.0000E+00	0.0056
DW10 02	25.36950	12.73225	127.3210	0.025370	0.01273	0.0000E+00	0.0056
DW11 02	25.36850	12.73425	127.3610	0.025369	0.01273	0.0000E+00	0.0056
DW10 01	25.37100	12.74100	127.4961	0.025371	0.01274	0.0000E+00	0.0056
DW1 02	25.38825	12.72975	127.2711	0.025388	0.01273	0.0000E+00	0.0056
DW10 03	25.37150	12.73175	127.3110	0.025372	0.01273	0.0000E+00	0.0056
DA5 01	25.39225	12.74263	127.5286	0.025392	0.01274	0.0000E+00	0.0057
DW11 03	25.36950	12.73425	127.3610	0.025370	0.01273	0.0000E+00	0.0056
DW12 01	25.37325	12.73338	127.3435	0.025373	0.01273	0.0000E+00	0.0056
DW12 02	25.36900	12.73688	127.4136	0.025369	0.01274	0.0000E+00	0.0057
DW11 04	25.36750	12.73638	127.4036	0.025368	0.01274	0.0000E+00	0.0056
DA4 02	25.37850	12.74450	127.5662	0.025379	0.01274	0.0000E+00	0.0057
DA5 02	25.38350	12.74875	127.6513	0.025384	0.01275	0.0000E+00	0.0057
DA4 03	25.37150	12.74388	127.5536	0.025372	0.01274	0.0000E+00	0.0057
DW13 02	25.37575	12.73813	127.4386	0.025376	0.01274	0.0000E+00	0.0057

Specimen ID Number	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m	Total Hole Volume m ³	Final Specimen Mass kg
DW13 01	25.37425	12.73375	127.3510	0.025374	0.01273	0.0000E+00	0.0056
DW13 03	25.37225	12.73550	127.3861	0.025372	0.01274	0.0000E+00	0.0057
DW14 02	25.37200	12.73463	127.3685	0.025372	0.01273	0.0000E+00	0.0057
DW12 03	25.36800	12.73363	127.3485	0.025368	0.01273	0.0000E+00	0.0057
DW14 01	25.37275	12.73500	127.3761	0.025373	0.01274	0.0000E+00	0.0057
DW13 04	25.37150	12.73613	127.3986	0.025372	0.01274	0.0000E+00	0.0057
DW12 04	25.37550	12.73688	127.4136	0.025376	0.01274	0.0000E+00	0.0057
DW2 04	25.36250	12.73113	127.2985	0.025363	0.01273	0.0000E+00	0.0056
DW2 02	25.37150	12.72550	127.1861	0.025372	0.01273	0.0000E+00	0.0056
DA3 02	25.39525	12.74963	127.6688	0.025395	0.01275	0.0000E+00	0.0057
DA2 03	25.39400	12.74650	127.6062	0.025394	0.01275	0.0000E+00	0.0057
DA2 02	25.38625	12.74813	127.6387	0.025386	0.01275	0.0000E+00	0.0057
DW2 03	25.36175	12.73438	127.3635	0.025362	0.01273	0.0000E+00	0.0056
DA3 03	25.39975	12.74200	127.5161	0.025400	0.01274	0.0000E+00	0.0057
DW2 01	25.38100	12.72438	127.1636	0.025381	0.01272	0.0000E+00	0.0056

Specimen ID Number	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
DW15 03	25.2	23.8	17.1
DW15 02	25.2	23.6	17.3
DW14 04	25.2	23.8	17.3
DA7 01	25.2	24.1	16.9
DA5 03	25.2	24.1	16.9
DW14 03	25.2	23	20.9
DA6 01	25.2	23.1	20.8
DA6 02	25.2	23	20.8
DW16 04	25.3	23.1	20.5
DW17 02	25.3	23.4	20.2
DW16 01	25.3	23.2	20.3
DW16 02	25.3	23.3	20.3
DW16 03	25.3	23.2	20.3
DW17 04	25.3	23.3	20.2
DW17 01	25.3	23.1	20.1
DW15 04	25.3	23.3	19.8
DW11 01	25.3	22.8	19.6
DW1 01	25.3	22.8	19.6
DW10 04	25.3	22.8	19.5
DW10 02	25.3	22.8	19.5
DW11 02	25.3	22.9	19.4
DW10 01	25.3	22.8	19.4
DW1 02	25.4	22.3	13.2
DW10 03	25.4	22.4	13.1
DA5 01	25.4	22.4	13
DW11 03	25.4	22.4	12.9
DW12 01	25.4	22.5	12.9
DW12 02	25.4	22.4	12.9
DW11 04	25.4	22.4	12.8
DA4 02	25.4	22.5	12.8
DA5 02	25.4	22.2	12.9
DA4 03	25.4	22.1	13
DW13 02	25.4	22.1	13.1

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
DW13 01	25.4	22.2	13.7
DW13 03	25.4	22.3	13.8
DW14 02	25.4	22.3	13.8
DW12 03	25.4	22.3	13.8
DW14 01	25.4	22.4	13.8
DW13 04	25.4	22.4	13.8
DW12 04	25.4	22.4	14
DW2 04	25.4	22.1	17.2
DW2 02	25.4	22.2	17.4
DA3 02	25.4	22.2	17.4
DA2 03	25.4	22.3	17.4
DA2 02	25.4	22.3	17.4
DW2 03	25.4	22.5	14.8
DA3 03	25.4	22.8	14.6
DW2 01	25.4	22.8	14.7

Graphite Grade: 2114
Graphite Manufacturer: Mersen (Carbone Lorraine USA)
Forming Process: Isostatic-molded
Coke Particle Size: Fine grain
Coke Type: Pitch coke filler, pitch binder
ASTM Class: INHP
Specimen Geometry: Cylinder

Specimen ID #'s:

TP01
TP02
TP03
TP04
TP05
TP06
TP07
TP08
TP09
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TP38
TP39
TP40
TP41
TP42

Specimen ID #'s:

TP43

TP44

TP45

TP46

TP47

TP48

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	TP21	P	6.328	6.328	6.326	6.327	12.720	12.719
	TP14	P	6.326	6.327	6.329	6.328	12.727	12.728
	TP03	P	6.324	6.324	6.324	6.323	12.725	12.723
	TP17	P	6.329	6.329	6.328	6.328	12.728	12.731
	TP13	P	6.331	6.331	6.330	6.328	12.727	12.729
	TP10	P	6.330	6.330	6.327	6.328	12.724	12.726
	TP11	P	6.330	6.328	6.329	6.329	12.726	12.726
	TP06	P	6.320	6.320	6.320	6.319	12.728	12.728
	TP23	P	6.328	6.327	6.327	6.327	12.719	12.719
	TP12	P	6.330	6.330	6.329	6.330	12.728	12.726
	TP04	P	6.317	6.322	6.319	6.321	12.726	12.725
	TP08	P	6.316	6.317	6.317	6.315	12.728	12.730
	TP18	P	6.330	6.329	6.330	6.329	12.731	12.731
	TP15	P	6.329	6.330	6.330	6.328	12.729	12.730
	TP05	P	6.321	6.319	6.320	6.321	12.727	12.727
	TP07	P	6.314	6.314	6.315	6.313	12.730	12.728
	TP02	P	6.325	6.326	6.325	6.323	12.724	12.726
	TP19	P	6.330	6.331	6.330	6.330	12.720	12.719
	TP22	P	6.330	6.332	6.329	6.331	12.720	12.722
	TP01	P	6.316	6.316	6.315	6.316	12.725	12.726
	TP24	P	6.333	6.331	6.332	6.332	12.719	12.720
	TP16	P	6.331	6.330	6.329	6.330	12.728	12.730
	TP20	P	6.330	6.331	6.330	6.329	12.721	12.719
	TP09	P	6.328	6.328	6.328	6.327	12.722	12.724
	TP25	P	6.328	6.334	6.332	6.33	12.728	12.732
	TP26	P	6.321	6.325	6.326	6.327	12.708	12.71
	TP27	P	6.323	6.327	6.32	6.323	12.734	12.735
	TP28	P	6.318	6.328	6.323	6.324	12.723	12.72
	TP29	P	6.326	6.327	6.323	6.328	12.722	12.723
	TP30	P	6.325	6.322	6.323	6.328	12.721	12.722
	TP31	P	6.326	6.327	6.332	6.325	12.724	12.724
	TP32	P	6.336	6.34	6.34	6.334	12.724	12.725
	TP33	P	6.334	6.338	6.335	6.338	12.722	12.721

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	TP34	P	6.334	6.337	6.341	6.336	12.723	12.722
	TP35	P	6.337	6.331	6.34	6.336	12.724	12.724
	TP36	P	6.334	6.338	6.331	6.331	12.719	12.724
	TP37	P	6.335	6.34	6.336	6.334	12.726	12.725
	TP38	P	6.334	6.339	6.34	6.339	12.725	12.726
	TP39	P	6.335	6.339	6.336	6.336	12.725	12.724
	TP40	P	6.336	6.332	6.336	6.334	12.728	12.725
	TP41	P	6.338	6.339	6.341	6.338	12.727	12.729
	TP42	P	6.339	6.339	6.334	6.334	12.731	12.731
	TP43	P	6.341	6.342	6.338	6.342	12.729	12.729
	TP44	P	6.335	6.341	6.341	6.337	12.73	12.732
	TP45	P	6.338	6.338	6.337	6.334	12.733	12.731
	TP46	P	6.342	6.341	6.339	6.343	12.731	12.731
	TP47	P	6.338	6.34	6.339	6.339	12.731	12.731
	TP48	P	6.341	6.344	6.338	6.342	12.733	12.733

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
TP21	1.45419	jl	8/7/2009 10:54	6.32725	12.71950	127.0662	0.006327	0.01272
TP14	1.45402	jl	8/7/2009 10:56	6.32750	12.72750	127.2261	0.006328	0.01273
TP03	1.45949	jl	8/7/2009 10:58	6.32375	12.72400	127.1561	0.006324	0.01272
TP17	1.45736	jl	8/7/2009 11:00	6.32850	12.72950	127.2661	0.006329	0.01273
TP13	1.45509	jl	8/7/2009 11:02	6.33000	12.72800	127.2361	0.006330	0.01273
TP10	1.45485	jl	8/10/2009 8:44	6.32875	12.72500	127.1761	0.006329	0.01273
TP11	1.45475	jl	8/10/2009 8:46	6.32900	12.72600	127.1961	0.006329	0.01273
TP06	1.45408	jl	8/10/2009 8:48	6.31975	12.72800	127.2361	0.006320	0.01273
TP23	1.45618	jl	8/10/2009 8:49	6.32725	12.71900	127.0562	0.006327	0.01272
TP12	1.45477	jl	8/10/2009 8:51	6.32975	12.72700	127.2161	0.006330	0.01273
TP04	1.45635	jl	8/10/2009 8:52	6.31975	12.72550	127.1861	0.006320	0.01273
TP08	1.45379	jl	8/10/2009 8:54	6.31625	12.72900	127.2561	0.006316	0.01273
TP18	1.45646	jl	8/10/2009 8:55	6.32950	12.73100	127.2960	0.006330	0.01273
TP15	1.45574	jl	8/10/2009 8:57	6.32925	12.72950	127.2661	0.006329	0.01273
TP05	1.45522	jl	8/10/2009 8:58	6.32025	12.72700	127.2161	0.006320	0.01273
TP07	1.45372	jl	8/10/2009 8:59	6.31400	12.72900	127.2561	0.006314	0.01273
TP02	1.45949	jl	8/10/2009 9:00	6.32475	12.72500	127.1761	0.006325	0.01273
TP19	1.45440	jl	8/10/2009 9:02	6.33025	12.71950	127.0662	0.006330	0.01272
TP22	1.45599	jl	8/10/2009 9:03	6.33050	12.72100	127.0961	0.006331	0.01272
TP01	1.45693	jl	8/10/2009 9:05	6.31575	12.72550	127.1861	0.006316	0.01273
TP24	1.45679	jl	8/10/2009 9:06	6.33200	12.71950	127.0662	0.006332	0.01272
TP16	1.45681	jl	8/10/2009 9:08	6.33000	12.72900	127.2561	0.006330	0.01273
TP20	1.45376	jl	8/10/2009 9:09	6.33000	12.72000	127.0762	0.006330	0.01272
TP09	1.45383	jl	8/10/2009 9:10	6.32775	12.72300	127.1361	0.006328	0.01272
TP25	1.46537	41169	6/25/2010 10:18	6.33100	12.73000	127.2761	0.006331	0.01273
TP26	1.46203	41169	6/25/2010 10:22	6.32475	12.70900	126.8565	0.006325	0.01271
TP27	1.46917	41169	6/25/2010 10:23	6.32325	12.73450	127.3660	0.006323	0.01273
TP28	1.46864	41169	6/25/2010 10:25	6.32325	12.72150	127.1061	0.006323	0.01272
TP29	1.46886	41169	6/25/2010 10:27	6.32600	12.72250	127.1261	0.006326	0.01272
TP30	1.46825	41169	6/25/2010 10:29	6.32450	12.72150	127.1061	0.006325	0.01272
TP31	1.46863	41169	6/25/2010 10:31	6.32750	12.72400	127.1561	0.006328	0.01272
TP32	1.47043	41169	6/25/2010 10:32	6.33750	12.72450	127.1661	0.006338	0.01272
TP33	1.47079	41169	6/25/2010 10:34	6.33625	12.72150	127.1061	0.006336	0.01272

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
TP34	1.4702	41169	6/25/2010 10:35	6.33700	12.72250	127.1261	0.006337	0.01272
TP35	1.46894	41169	6/28/2010 7:44	6.33600	12.72400	127.1561	0.006336	0.01272
TP36	1.46829	41169	6/28/2010 7:45	6.33350	12.72150	127.1061	0.006334	0.01272
TP37	1.46994	41169	6/28/2010 11:07	6.33625	12.72550	127.1861	0.006336	0.01273
TP38	1.46966	41169	6/28/2010 11:10	6.33800	12.72550	127.1861	0.006338	0.01273
TP39	1.46991	41169	6/28/2010 11:12	6.33650	12.72450	127.1661	0.006337	0.01272
TP40	1.47066	41169	6/28/2010 11:13	6.33450	12.72650	127.2061	0.006335	0.01273
TP41	1.47142	41169	6/28/2010 11:14	6.33900	12.72800	127.2361	0.006339	0.01273
TP42	1.47006	41169	6/28/2010 11:16	6.33650	12.73100	127.2960	0.006337	0.01273
TP43	1.46958	41169	6/28/2010 11:17	6.34075	12.72900	127.2561	0.006341	0.01273
TP44	1.46898	41169	6/28/2010 11:19	6.33850	12.73100	127.2960	0.006339	0.01273
TP45	1.46885	41169	6/28/2010 11:20	6.33675	12.73200	127.3160	0.006337	0.01273
TP46	1.47002	41169	6/28/2010 11:21	6.34125	12.73100	127.2960	0.006341	0.01273
TP47	1.47093	41169	6/28/2010 11:22	6.33900	12.73100	127.2960	0.006339	0.01273
TP48	1.47226	41169	6/28/2010 11:24	6.34125	12.73300	127.3360	0.006341	0.01273

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
TP21	0.0015	1808.74023	1.8087	25.2	24.2	29.4
TP14	0.0015	1806.18459	1.8062	25.2	24.2	29.3
TP03	0.0015	1815.05266	1.8151	25.2	24.3	29.3
TP17	0.0015	1809.47876	1.8095	25.2	24.3	29.2
TP13	0.0015	1806.65793	1.8067	25.2	24.3	29.2
TP10	0.0015	1807.56871	1.8076	25.5	23.4	31.1
TP11	0.0015	1807.08904	1.8071	25.5	23.4	31
TP06	0.0015	1808.33208	1.8083	25.5	23.4	31
TP23	0.0015	1811.35782	1.8114	25.5	23.4	31
TP12	0.0015	1806.61582	1.8066	25.5	23.4	30.9
TP04	0.0015	1811.86681	1.8119	25.5	23.4	30.9
TP08	0.0015	1808.68906	1.8087	25.5	23.5	30.8
TP18	0.0015	1807.64956	1.8076	25.5	23.5	30.9
TP15	0.0015	1807.25316	1.8073	25.5	23.5	30.9
TP05	0.0015	1809.89103	1.8099	25.5	23.5	30.8
TP07	0.0015	1809.24647	1.8092	25.5	23.5	30.9
TP02	0.0015	1814.48046	1.8145	25.5	23.5	30.8
TP19	0.0015	1808.14412	1.8081	25.5	23.5	30.8
TP22	0.0015	1809.62252	1.8096	25.5	23.4	31
TP01	0.0015	1813.73638	1.8137	25.5	23.5	31
TP24	0.0015	1810.61488	1.8106	25.5	23.5	30.9
TP16	0.0015	1808.50931	1.8085	25.5	23.5	31
TP20	0.0015	1807.27775	1.8073	25.5	23.5	31
TP09	0.0015	1807.15489	1.8072	25.5	23.5	30.9
TP25	0.0015	1818.56276	1.8186	25.3	24.3	36.3
TP26	0.0015	1822.21778	1.8222	25.3	24.3	36.2
TP27	0.0015	1824.22340	1.8242	25.3	24.3	36.3
TP28	0.0015	1827.29419	1.8273	25.3	24.3	36.4
TP29	0.0015	1826.48629	1.8265	25.3	24.4	36.4
TP30	0.0015	1826.44789	1.8264	25.3	24.3	36.4
TP31	0.0015	1825.33693	1.8253	25.3	24.3	36.5
TP32	0.0015	1824.54697	1.8245	25.3	24.3	36.5
TP33	0.0015	1826.21472	1.8262	25.3	24.3	36.5

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
TP34	0.0015	1824.97917	1.8250	25.3	24.4	36.4
TP35	0.0015	1823.27294	1.8233	25.3	24.3	28.9
TP36	0.0015	1823.90217	1.8239	25.3	24.3	28.9
TP37	0.0015	1824.01209	1.8240	25.3	24.5	32.3
TP38	0.0015	1823.16111	1.8232	25.3	24.6	32.5
TP39	0.0015	1824.18958	1.8242	25.3	24.6	32.2
TP40	0.0015	1825.12282	1.8251	25.3	24.6	32.2
TP41	0.0015	1824.33961	1.8243	25.3	24.6	32.1
TP42	0.0015	1822.51329	1.8225	25.3	24.6	32.2
TP43	0.0015	1821.26922	1.8213	25.3	24.6	32.1
TP44	0.0015	1820.59972	1.8206	25.3	24.6	32.1
TP45	0.0015	1820.65531	1.8207	25.3	24.7	32.2
TP46	0.0015	1821.09856	1.8211	25.3	24.7	32.2
TP47	0.0015	1822.87268	1.8229	25.3	24.7	32.2
TP48	0.0015	1823.30061	1.8233	25.3	24.7	32.2

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
TP04		41169	1/14/2010 8:42	26.700	0.200	85.186	85.200	85.161
				101.200	0.300	65.540	65.641	65.717
				198.700	0.500	49.184	48.821	48.847
				301.600	0.200	38.152	38.318	38.270
				401.600	0.300	31.648	31.679	31.679
				501.600	0.200	27.083	26.985	27.141
				601.700	0.200	23.720	23.694	23.772
				701.700	0.100	21.320	21.282	21.227
				801.200	0.100	19.520	19.189	19.354
				900.900	0.100	17.734	17.689	17.843
TP05		41169	1/14/2010 8:42	1000.900	0.100	16.439	16.574	16.421
				26.300	0.100	85.731	84.522	86.217
				101.100	0.200	65.878	65.849	65.661
				200.500	0.100	48.940	48.996	48.849
				300.800	0.100	38.245	38.159	38.454
				401.000	0.100	31.703	31.673	31.637
				501.000	0.100	27.068	27.073	27.232
				601.100	0.100	23.771	23.813	23.804
				701.300	0.100	21.291	21.333	21.348
				801.000	0.100	19.297	19.346	19.499
TP06		41169	1/14/2010 8:42	900.800	0.100	17.832	17.954	17.861
				1000.900	0.100	16.517	16.546	16.540
				25.900	0.100	86.062	85.983	84.851
				100.700	0.200	65.712	65.978	66.172
				200.700	0.000	48.885	48.975	48.812
				300.900	0.100	38.484	38.462	38.392
				401.000	0.100	31.705	31.730	31.848
				501.000	0.100	27.181	27.087	27.231
				601.000	0.100	23.868	23.832	23.707
				701.100	0.100	21.441	21.441	21.336
TP01		41169	1/14/2010 8:35	800.900	0.100	19.397	19.431	19.422
				900.800	0.100	18.130	17.876	17.866
				1000.800	0.100	16.616	16.637	16.626
				26.700	0.200	86.165	85.206	85.584

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
TP02		41169	1/14/2010 8:35	100.200	0.200	66.313	66.472	66.464
				199.100	0.100	49.129	49.220	49.042
				300.800	0.400	38.312	38.565	38.532
				401.100	0.500	31.694	31.711	31.688
				501.700	0.500	27.203	27.133	27.151
				600.900	0.300	23.935	23.856	23.897
				700.100	0.400	21.340	21.333	21.464
				799.600	0.100	19.438	19.414	19.407
				899.400	0.100	17.868	17.786	17.843
				999.400	0.100	16.653	16.527	16.534
TP03		41169	1/14/2010 8:35	26.100	0.200	85.702	86.267	84.964
				100.000	0.200	65.882	66.005	66.322
				199.100	0.000	48.882	49.215	49.159
				299.700	0.100	38.254	38.347	38.523
				399.900	0.200	31.524	31.566	31.599
				500.400	0.300	26.957	26.942	27.120
				600.100	0.200	23.646	23.667	23.815
				699.700	0.100	21.358	21.245	21.303
				799.500	0.100	19.263	19.325	19.360
				899.500	0.100	17.839	17.779	17.730
TP07		41169	1/18/2010 8:05	999.500	0.100	16.629	16.538	16.605
				25.600	0.200	87.070	85.595	86.522
				99.300	0.200	66.374	66.393	66.544
				199.100	0.000	48.987	49.164	49.062
				299.200	0.000	38.566	38.356	38.522
				399.400	0.100	31.566	31.716	31.595
				499.600	0.100	27.010	27.006	27.061
				599.500	0.100	23.671	23.809	23.772
				699.300	0.000	21.295	21.261	21.305
				799.100	0.000	19.364	19.240	19.289
899.100	0.000	17.825	17.772	17.768				
999.100	0.000	16.547	16.476	16.526				
26.700	0.200	85.021	85.217	86.196				
100.300	0.200	65.997	66.206	65.938				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
TP08		41169	1/18/2010 8:05	199.100	0.100	48.934	48.934	48.918
				300.800	0.400	38.210	38.229	38.286
				401.100	0.500	31.491	31.603	31.612
				501.700	0.500	27.024	26.917	26.897
				600.900	0.300	23.722	23.785	23.786
				700.000	0.200	21.249	21.211	21.206
				799.700	0.100	19.259	19.312	19.330
				899.400	0.100	17.788	17.718	17.724
				999.400	0.100	16.461	16.483	16.459
				26.100	0.200	85.266	84.377	85.243
TP09		41169	1/18/2010 8:05	100.100	0.200	65.853	66.117	66.032
				199.200	0.000	48.926	48.856	48.865
				299.700	0.100	38.302	38.351	38.251
				400.000	0.200	31.535	31.563	31.534
				500.400	0.300	26.853	26.899	26.888
				600.100	0.200	23.718	23.639	23.779
				699.700	0.200	21.159	21.197	21.320
				799.600	0.100	19.416	19.304	19.234
				899.500	0.100	17.699	17.721	17.819
				999.500	0.100	16.565	16.484	16.655
TP10		41169	1/18/2010 8:11	25.600	0.200	83.282	85.975	85.337
				99.400	0.200	65.799	65.774	65.901
				199.100	0.000	48.992	48.761	48.753
				299.300	0.000	38.235	38.365	38.408
				399.400	0.100	31.566	31.607	31.604
				499.600	0.100	27.001	27.008	27.008
				599.500	0.100	23.709	23.627	23.762
				699.300	0.100	21.295	21.279	21.273
				799.200	0.000	19.330	19.218	19.300
				899.100	0.000	17.881	17.802	17.767
999.100	0.000	16.612	16.554	16.399				
26.700	0.100	84.421	84.395	85.788				
101.300	0.200	65.265	65.313	65.392				
200.500	0.100	48.336	48.293	48.590				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
TP11		41169	1/18/2010 8:11	301.500	0.200	37.973	38.083	37.987
				401.600	0.200	31.356	31.483	31.527
				501.600	0.200	26.891	26.945	26.986
				601.700	0.200	23.600	23.683	23.546
				701.700	0.100	21.087	21.181	21.131
				801.200	0.200	19.217	19.200	19.229
				900.900	0.100	17.575	17.752	17.654
				1000.800	0.000	16.434	16.412	16.263
				26.300	0.100	85.129	84.620	84.599
				101.300	0.200	65.036	65.342	65.462
TP12		41169	1/18/2010 8:11	200.600	0.000	48.410	48.664	48.639
				300.800	0.100	38.222	38.025	38.032
				401.000	0.100	31.484	31.560	31.471
				501.000	0.100	26.927	27.052	26.989
				601.200	0.200	23.772	23.755	23.690
				701.300	0.100	21.269	21.273	21.253
				801.000	0.100	19.332	19.359	19.449
				900.800	0.100	17.816	17.700	17.928
				1000.800	0.100	16.505	16.759	16.596
				25.800	0.200	85.526	85.270	85.217
TP13		41169	1/19/2010 8:05	101.100	0.200	65.244	65.358	65.505
				200.700	0.000	48.520	48.514	48.524
				300.800	0.100	38.282	38.237	38.085
				401.000	0.100	31.603	31.595	31.552
				501.000	0.100	26.892	27.042	26.980
				601.000	0.100	23.769	23.689	23.759
				701.100	0.100	21.249	21.242	21.279
				800.900	0.100	19.425	19.355	19.441
				900.700	0.100	17.951	17.833	17.881
				1000.700	0.100	16.673	16.676	16.540
26.700	0.100	84.909	84.888	85.012				
101.300	0.200	65.558	65.392	65.355				
200.400	0.200	48.492	48.432	48.482				
301.400	0.300	38.031	38.166	38.011				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
TP14		41169	1/19/2010 8:05	401.500	0.300	31.432	31.582	31.596
				501.600	0.200	26.931	26.923	27.017
				601.600	0.200	23.695	23.706	23.674
				701.600	0.100	21.202	21.213	21.331
				801.000	0.100	19.298	19.339	19.343
				900.700	0.100	17.870	17.747	17.776
				1000.500	0.100	16.488	16.374	16.509
				26.300	0.200	84.206	84.567	85.174
				101.300	0.200	64.610	64.717	64.980
				200.400	0.000	48.263	48.184	48.272
				300.600	0.100	37.988	37.977	37.998
				400.700	0.200	31.276	31.271	31.483
				501.000	0.100	26.849	26.802	26.906
				601.000	0.100	23.653	23.625	23.678
701.200	0.100	21.106	21.178	21.257				
TP15		41169	1/19/2010 8:05	800.800	0.100	19.310	19.300	19.219
				900.600	0.100	17.623	17.693	17.772
				1000.400	0.100	16.409	16.348	16.362
				25.800	0.200	85.745	85.213	85.340
				101.000	0.200	65.658	65.631	65.890
				200.600	0.000	48.730	49.029	48.658
				300.600	0.100	38.462	38.419	38.386
				400.700	0.200	31.736	31.731	31.843
				501.000	0.100	27.188	27.164	27.222
				601.000	0.100	23.805	23.769	23.893
				701.000	0.100	21.431	21.294	21.485
				800.800	0.100	19.561	19.459	19.275
				900.600	0.100	17.922	17.971	17.909
				1000.400	0.100	16.647	16.782	16.487
TP16		41169	1/19/2010 7:56	26.700	0.200	84.737	85.989	84.232
				100.300	0.200	65.736	65.791	65.769
				199.200	0.100	48.650	48.666	48.794
				300.900	0.400	38.211	38.069	38.114
				401.100	0.500	31.542	31.474	31.523

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
TP17		41169	1/19/2010 7:56	501.700	0.500	26.941	27.027	26.893
				600.900	0.300	23.757	23.723	23.694
				700.000	0.200	21.183	21.270	21.337
				799.600	0.100	19.345	19.309	19.329
				899.400	0.100	17.688	17.769	17.785
				999.400	0.100	16.529	16.323	16.384
				26.100	0.200	85.473	85.864	84.882
				100.100	0.200	66.077	66.245	65.985
				199.200	0.000	49.137	49.030	49.088
				299.700	0.100	38.497	38.597	38.518
TP18		41169	1/19/2010 7:56	399.900	0.200	31.811	31.699	31.926
				500.400	0.300	27.202	27.233	27.264
				600.100	0.300	23.831	23.953	23.865
				699.700	0.200	21.490	21.583	21.473
				799.500	0.100	19.453	19.593	19.540
				899.500	0.100	17.925	17.880	17.928
				999.600	0.100	16.668	16.630	16.607
				25.600	0.200	85.490	86.057	86.013
				99.500	0.200	66.318	66.429	66.425
				199.100	0.000	49.139	49.166	49.159
TP19		41169	1/21/2010 9:50	299.300	0.000	38.524	38.595	38.655
				399.400	0.100	31.800	31.961	31.822
				499.600	0.100	27.242	27.262	27.200
				599.500	0.100	24.089	23.954	23.928
				699.300	0.100	21.529	21.489	21.474
				799.100	0.000	19.626	19.478	19.451
				899.100	0.000	17.958	18.048	18.007
				999.000	0.000	16.705	16.555	16.599
				26.700	0.200	86.097	85.905	85.230
				100.300	0.200	66.693	66.605	66.716
199.200	0.100	49.535	49.612	49.463				
300.800	0.400	38.708	38.867	38.981				
401.100	0.500	32.000	32.076	32.149				
501.700	0.500	27.495	27.447	27.534				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
TP20		41169	1/21/2010 9:50	600.900	0.300	24.119	24.102	24.134
				700.300	0.200	21.672	21.675	21.641
				799.800	0.200	19.772	19.754	19.729
				899.500	0.100	18.024	18.058	18.054
				999.300	0.100	16.641	16.840	16.789
				26.200	0.200	86.965	86.787	87.309
				100.100	0.200	66.463	67.004	66.910
				199.200	0.000	49.767	49.717	49.715
				299.700	0.100	38.870	38.926	39.009
				399.900	0.200	32.224	32.249	32.180
TP21		41169	1/21/2010 9:50	500.400	0.300	27.469	27.623	27.632
				600.100	0.200	24.205	24.136	24.263
				700.000	0.200	21.684	21.719	21.701
				799.600	0.100	19.812	19.809	19.820
				899.600	0.100	18.201	18.208	18.243
				999.500	0.100	16.977	16.849	17.013
				25.600	0.200	86.629	86.242	86.751
				99.400	0.200	66.706	66.948	66.856
				199.100	0.000	49.517	49.414	49.510
				299.300	0.100	38.839	38.990	38.979
TP22		41169	1/27/2010 8:03	399.400	0.100	32.087	32.118	32.126
				499.600	0.100	27.466	27.430	27.440
				599.500	0.100	24.197	24.136	24.250
				699.400	0.100	21.665	21.591	21.684
				799.200	0.100	19.900	19.701	19.682
				899.100	0.000	18.073	18.012	18.176
				999.100	0.000	16.856	16.751	16.866
				26.700	0.100	84.451	83.588	84.712
				101.300	0.300	65.192	65.292	65.073
				198.900	0.500	48.640	48.570	48.743
301.600	0.200	37.988	38.123	38.110				
401.600	0.200	31.541	31.647	31.512				
501.600	0.200	26.976	26.999	26.947				
601.600	0.200	23.717	23.777	23.706				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
TP23		41169	1/27/2010 8:03	701.700	0.100	21.214	21.301	21.241
				801.300	0.200	19.427	19.297	19.411
				901.000	0.100	17.850	17.990	17.899
				1000.900	0.100	16.429	16.596	16.481
				26.200	0.200	84.691	83.942	85.071
				101.500	0.200	65.005	65.128	65.202
				200.500	0.100	48.571	48.500	48.510
				301.000	0.200	38.126	38.226	38.094
				401.100	0.200	31.595	31.601	31.506
				501.200	0.200	27.083	27.006	27.163
TP24		41169	1/27/2010 8:03	601.200	0.200	23.778	23.894	23.719
				701.300	0.200	21.298	21.404	21.330
				801.000	0.100	19.443	19.315	19.457
				900.900	0.100	17.890	17.992	17.891
				1000.900	0.100	16.622	16.771	16.647
				25.800	0.200	83.415	84.202	83.213
				101.000	0.200	64.628	64.973	64.735
				200.700	0.000	48.344	48.331	48.340
				300.800	0.100	37.969	37.896	38.139
				401.000	0.100	31.319	31.424	31.348
TP28		41169	6/27/2010 9:37	501.000	0.100	26.803	26.877	26.883
				601.000	0.100	23.591	23.602	23.642
				701.000	0.100	21.164	21.165	21.251
				800.900	0.100	19.247	19.280	19.287
				900.800	0.100	17.757	17.858	17.764
				1000.700	0.100	16.369	16.669	16.637
				25.400	1.400	83.664	83.273	82.563
				100.400	0.200	64.193	64.362	64.191
				199.200	0.000	48.270	48.252	48.129
				300.800	0.400	37.800	37.875	37.877
401.100	0.500	31.369	31.343	31.331				
501.700	0.500	26.990	27.020	26.997				
600.900	0.300	23.664	23.776	23.782				
700.100	0.400	21.304	21.304	21.268				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
TP29		41169	6/27/2010 9:37	799.800	0.200	19.548	19.453	19.362
				899.500	0.100	17.741	18.108	17.842
				999.400	0.100	16.763	16.525	16.492
				26.900	0.100	83.942	82.309	83.524
				100.200	0.300	64.761	64.497	64.766
				199.200	0.000	48.377	48.404	48.730
				299.700	0.100	38.085	38.195	38.198
				399.900	0.200	31.546	31.548	31.680
				500.400	0.300	27.083	27.108	27.247
				600.100	0.300	23.929	23.921	23.843
TP30		41169	6/27/2010 9:37	699.700	0.200	21.410	21.410	21.420
				799.600	0.100	19.624	19.588	19.513
				899.600	0.100	18.001	18.030	18.075
				999.500	0.100	16.795	16.723	16.709
				26.700	0.100	83.384	82.983	82.977
				99.500	0.200	65.062	65.356	65.092
				199.100	0.000	48.811	48.863	48.866
				299.300	0.000	38.370	38.453	38.410
				399.400	0.100	31.822	31.802	31.729
				499.600	0.100	27.200	27.217	27.313
TP25		41169	6/27/2010 9:26	599.500	0.100	23.970	23.969	23.946
				699.300	0.000	21.597	21.590	21.582
				799.200	0.000	19.625	19.628	19.585
				899.100	0.000	18.049	18.049	17.940
				999.100	0.000	16.757	16.768	16.728
				25.800	1.800	80.801	79.875	79.460
				101.200	0.300	62.231	61.827	61.898
				200.500	0.100	46.443	46.336	46.531
				301.600	0.300	36.652	36.701	36.688
				401.500	0.300	30.484	30.372	30.448
501.600	0.200	26.093	26.125	26.080				
601.600	0.200	22.922	23.022	23.020				
701.800	0.200	20.605	20.728	20.746				
801.300	0.200	18.819	18.818	18.810				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
TP26		41169	6/27/2010 9:26	901.000	0.100	17.420	17.386	17.518
				1000.800	0.100	16.172	16.021	16.157
				26.500	0.100	79.508	79.845	79.687
				101.300	0.200	61.709	61.975	61.860
				200.600	0.000	46.362	46.291	46.395
				300.700	0.100	36.633	36.641	36.536
				400.900	0.100	30.447	30.457	30.401
				500.900	0.100	26.136	26.060	26.210
				601.000	0.100	22.940	22.977	22.959
				701.200	0.100	20.699	20.665	20.607
TP27		41169	6/27/2010 9:26	800.900	0.100	18.793	18.824	18.782
				900.700	0.100	17.343	17.388	17.355
				1000.600	0.000	16.106	16.129	16.178
				26.100	0.200	81.267	81.492	79.971
				101.000	0.200	63.026	63.416	63.349
				200.700	0.100	47.208	47.373	47.375
				300.700	0.100	37.447	37.357	37.335
				401.000	0.100	30.858	30.956	30.925
				501.000	0.100	26.542	26.667	26.626
				601.000	0.100	23.464	23.405	23.463
TP31		41169	6/28/2010 8:18	701.100	0.100	21.053	21.052	21.115
				800.900	0.100	19.169	19.190	19.104
				900.800	0.100	17.602	17.563	17.717
				1000.700	0.100	16.316	16.442	16.486
				27	0.3	83.769	83.791	83.102
				101.4	0.3	64.806	64.732	64.471
				200.5	0.1	48.169	48.196	48.314
				301.5	0.2	37.935	37.901	37.877
				401.6	0.2	31.57	31.41	31.605
				501.6	0.2	27.018	26.974	27.054
601.6	0.2	23.719	23.847	23.801				
701.8	0.1	21.339	21.362	21.368				
801.3	0.2	19.496	19.588	19.384				
900.9	0.1	17.904	18.018	17.923				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
TP32		41169	6/28/2010 8:18	1000.9	0.1	16.762	16.919	16.817
				26.6	0.1	83.139	83.978	83.574
				101.4	0.2	64.494	64.303	65.019
				200.6	0	48.384	48.388	48.26
				300.9	0.1	38.066	38.202	38.102
				401	0.1	31.636	31.599	31.546
				501	0.1	27.081	27.134	27.156
				601.1	0.1	23.797	23.856	23.797
				701.3	0.2	21.432	21.401	21.341
				800.9	0.1	19.544	19.48	19.491
TP33		41169	6/28/2010 8:18	900.7	0	17.911	18.074	18.071
				1000.7	0	16.67	16.772	16.552
				26.2	0.1	83.848	84.009	83.867
				101.1	0.2	64.888	65.118	65.082
				200.7	0	48.564	48.559	48.362
				300.9	0.1	38.139	38.219	38.364
				401.1	0.1	31.655	31.782	31.583
				501	0.1	27.038	27.154	27.054
				601	0.1	23.958	23.794	23.857
				701.1	0.1	21.408	21.378	21.352
TP34		41169	6/28/2010 8:29	800.9	0.1	19.523	19.464	19.508
				900.7	0.1	17.923	17.928	17.975
				1000.7	0.1	16.795	16.35	16.56
				25.8	1.9	84.978	83.889	84.039
				100.5	0.1	65.871	65.744	65.78
				199.2	0.1	48.938	48.927	48.984
				300.7	0.4	38.601	38.584	38.64
				401.1	0.5	31.844	31.944	31.956
				501	0.4	27.338	27.347	27.379
				600.9	0.3	24.045	24.052	24.011
700.4	0.2	21.54	21.566	21.623				
799.8	0.2	19.56	19.655	19.483				
899.5	0.1	18.003	18.231	18.016				
999.4	0.1	16.709	16.742	16.75				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
TP35		41169	6/28/2010 8:29	26.7	0.1	85.249	84.722	84.798
				100.1	0.3	65.607	65.941	65.867
				199.2	0	49.23	49.3	49.274
				299.6	0.1	38.703	38.599	38.679
				399.9	0.2	31.962	31.946	31.973
				500	0.2	27.39	27.496	27.409
				600.1	0.2	24.177	24.212	24.129
				700	0.2	21.84	21.768	21.582
				799.6	0.1	19.66	19.672	19.733
				899.5	0.1	18.226	18.209	18.15
TP36		41169	6/28/2010 8:29	999.6	0.1	16.928	17.098	16.873
				26.4	0.1	84.853	85.027	84.12
				99.5	0.2	65.459	65.694	65.832
				199.1	0	49.058	49.128	48.969
				299.2	0	38.711	38.638	38.698
				399.4	0.1	31.867	31.933	31.912
				499.4	0.1	27.293	27.324	27.317
				599.5	0.1	24.051	24.092	24.131
				699.4	0.1	21.533	21.527	21.559
				799.2	0	19.599	19.718	19.569
TP37		41169	6/29/2010 9:10	899.1	0	18.049	18	18.088
				999	0	16.823	16.541	16.844
				24.3	0.6	85.513	84.125	84.889
				100.5	0.1	65.871	65.557	65.951
				199.1	0.1	49.098	49.119	49.069
				300.8	0.4	38.33	38.419	38.431
				401.1	0.5	31.817	31.779	31.894
				501.6	0.5	27.185	27.189	27.258
				600.9	0.3	23.931	24.038	24.018
				700.3	0.2	21.599	21.545	21.5
TP38		41169	6/29/2010 9:10	799.7	0.1	19.59	19.686	19.602
				899.5	0.1	18.073	18.044	18.027
				999.4	0.1	16.686	16.644	16.642
				26.1	0.5	85.442	84.587	83.575

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm^2/sec)	Diffusivity Shot 2 (mm^2/sec)	Diffusivity Shot 3 (mm^2/sec)
TP39		41169	6/29/2010 9:10	100.2	0.2	65.84	65.849	65.825
				199.2	0	49.219	49.366	49.37
				299.7	0.1	38.647	38.804	38.699
				399.9	0.2	32.035	31.969	32.057
				500.4	0.3	27.492	27.563	27.529
				600.1	0.2	24.187	24.192	24.273
				700	0.2	21.597	21.646	21.684
				799.6	0.1	19.739	19.84	19.697
				899.5	0.1	18.137	18.194	18.318
				999.5	0.1	16.783	17.002	16.847
				27	0.1	84.536	85.439	84.938
				99.4	0.2	66.057	66.178	66.017
TP40		41169	6/29/2010 8:55	199.1	0	49.32	49.219	49.281
				299.3	0	38.703	38.722	38.726
				399.4	0.1	31.955	32.004	32.088
				499.6	0.1	27.473	27.489	27.423
				599.4	0.1	24.162	24.049	24.122
				699.4	0.1	21.657	21.689	21.709
				799.2	0	19.739	19.619	19.655
				899.1	0	18.136	18.144	18.157
				999.1	0	16.691	16.783	16.826
				25.8	1.9	86.185	85.12	86.357
				101.3	0.2	65.674	65.347	65.458
				200.5	0.1	48.916	48.926	48.787
TP41		41169	6/29/2010 8:55	301.6	0.2	38.326	38.32	38.398
				401.6	0.2	31.837	31.782	31.754
				501.6	0.2	27.123	27.221	27.212
				601.6	0.2	23.928	23.991	23.902
				701.7	0.2	21.453	21.522	21.447
				801.4	0.2	19.659	19.478	19.58
				901	0.1	17.977	18.181	18.037
				1001.1	0.1	16.734	16.678	16.599
				26.5	0.1	84.443	83.176	84.883
				101	0.2	65.266	65.781	65.573

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
TP42		41169	6/29/2010 8:55	200.5	0.1	48.721	48.825	48.592
				300.7	0	38.396	38.257	38.38
				400.8	0	31.744	31.673	31.802
				500.9	0.1	27.078	27.296	27.262
				600.9	0.1	23.821	23.898	23.91
				701	0.1	21.423	21.403	21.469
				800.8	0.1	19.47	19.493	19.6
				900.6	0	18.004	18.053	17.805
				1000.7	0.1	16.657	16.673	16.591
				26.2	0.1	85.427	84.844	85.025
				101.1	0.1	65.349	65.515	65.423
				200.7	0.1	48.803	48.673	48.79
TP46		41169	6/30/2010 8:22	300.9	0.1	38.433	38.473	38.337
				401.1	0.2	31.764	31.659	31.718
				501	0.1	27.213	27.164	27.201
				601	0.1	23.906	23.903	23.766
				701	0.1	21.506	21.376	21.343
				800.8	0.1	19.399	19.482	19.45
				900.7	0.1	17.811	17.868	17.883
				1000.7	0.1	16.772	16.605	16.685
				25.7	2	85.6	82.868	85.359
				100.5	0.2	66.001	65.823	66.146
				199.1	0.1	49.231	49.328	49.365
				300.8	0.4	38.502	38.524	38.682
TP47		41169	6/30/2010 8:22	401.1	0.5	31.797	31.916	31.875
				501.7	0.5	27.344	27.319	27.279
				600.9	0.3	24.026	23.945	24.089
				700.1	0.4	21.483	21.574	21.577
				799.8	0.2	19.602	19.607	19.532
				899.5	0.1	17.894	18.019	17.974
				999.4	0.1	16.665	16.704	16.641
				26.6	0.1	85.381	86.328	85.217
				100.2	0.2	66.175	65.783	65.997
				199.2	0	49.163	49.237	49.258

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
TP48		41169	6/30/2010 8:22	299.7	0.1	38.544	38.668	38.807
				400	0.2	31.799	31.88	32.007
				500.5	0.3	27.264	27.273	27.302
				600.1	0.2	23.975	23.997	23.97
				699.8	0.2	21.61	21.453	21.578
				799.6	0.1	19.62	19.684	19.648
				899.6	0.1	18.015	18.096	18.076
				999.6	0.1	16.877	16.839	16.935
				26.3	0.1	85.202	84.275	85.467
				99.5	0.2	66.289	66.282	66.725
				199.1	0	49.463	49.496	49.585
				299.3	0	38.769	38.864	38.757
TP43		41169	6/30/2010 8:29	399.4	0.1	32.056	31.968	32.072
				499.6	0.1	27.343	27.373	27.415
				599.4	0.1	24.248	24.148	24.153
				699.3	0	21.583	21.689	21.59
				799.2	0	19.599	19.563	19.675
				899.1	0	18.064	18.145	18.073
				999.1	0	16.948	16.843	16.656
				26.7	0.1	84.73	85.197	85.527
				101.2	0.3	65.559	65.505	65.155
				200.3	0.1	48.804	48.695	48.951
				301.6	0.2	38.39	38.305	38.421
				401.6	0.2	31.741	31.815	31.793
TP44		41169	6/30/2010 8:29	501.6	0.2	27.166	27.166	27.186
				601.7	0.2	23.869	24.177	23.893
				701.7	0.1	21.407	21.377	21.429
				801.3	0.2	19.662	19.497	19.524
				900.9	0.1	17.998	17.953	17.98
				1001	0.1	16.778	16.706	16.684
				26.3	0.2	85.05	84.8	85.405
				101.4	0.1	65.542	65.555	65.636
				200.5	0.1	48.998	49	48.877
				301	0.2	38.378	38.579	38.521

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm^2/sec)	Diffusivity Shot 2 (mm^2/sec)	Diffusivity Shot 3 (mm^2/sec)	
TP45				401.1	0.2	31.774	31.859	31.747	
				501.1	0.2	27.23	27.194	27.227	
				601.2	0.2	23.996	23.95	23.9	
				701.3	0.2	21.464	21.513	21.496	
				800.8	0.1	19.653	19.726	19.482	
				900.6	0	18.09	18.049	17.929	
				1000.7	0.1	16.735	16.569	16.842	
			41169	6/30/2010 8:29	25.9	0.1	85.553	83.571	84.889
					101	0.2	65.474	65.613	65.511
					200.6	0.1	48.797	48.824	48.767
					300.8	0.1	38.521	38.407	38.552
					401	0.1	31.717	31.729	31.715
					501	0.1	27.106	27.273	27.147
					601	0.1	23.825	23.908	23.866
				701.1	0.1	21.494	21.546	21.484	
				800.9	0.1	19.516	19.582	19.598	
				900.7	0.1	18.096	17.92	17.791	
				1000.7	0.1	16.759	16.831	16.781	

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP04	85.182	0.020		6.32	InSb	12.7	100	Ar	E 1461-07
	65.633	0.089							
	48.951	0.202							
	38.247	0.085							
	31.669	0.018							
	27.070	0.079							
	23.729	0.040							
	21.276	0.047							
	19.354	0.166							
	17.755	0.079							
TP05	16.478	0.084		6.32	InSb	12.7	100	Ar	E 1461-07
	85.490	0.873							
	65.796	0.118							
	48.928	0.074							
	38.286	0.152							
	31.671	0.033							
	27.124	0.093							
	23.796	0.022							
	21.324	0.030							
	19.381	0.105							
TP06	17.882	0.064		6.32	InSb	12.7	100	Ar	E 1461-07
	16.534	0.015							
	85.632	0.678							
	65.954	0.231							
	48.891	0.082							
	38.446	0.048							
	31.761	0.076							
	27.166	0.073							
	23.802	0.085							
	21.406	0.061							
TP01	19.417	0.018		6.32	InSb	12.7	100	Ar	E 1461-07
	17.957	0.150							
	16.626	0.011							
	85.652	0.483							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP02	66.416	0.090							
	49.130	0.089							
	38.470	0.138							
	31.698	0.012							
	27.162	0.036							
	23.896	0.040							
	21.379	0.074							
	19.420	0.016							
	17.832	0.042							
	16.571	0.071							
	85.644	0.653		6.32	InSb	12.7	100	Ar	E 1461-07
	66.070	0.227							
	49.085	0.178							
	38.375	0.137							
31.563	0.038								
27.006	0.099								
23.709	0.092								
21.302	0.057								
19.316	0.049								
17.783	0.055								
16.591	0.047								
TP03	86.396	0.746		6.32	InSb	12.7	100	Ar	E 1461-07
	66.437	0.093							
	49.071	0.089							
	38.481	0.111							
	31.626	0.080							
	27.026	0.031							
	23.751	0.071							
21.287	0.023								
19.298	0.062								
17.788	0.032								
16.516	0.036								
TP07	85.478	0.629		6.32	InSb	12.7	100	Ar	E 1461-07
	66.047	0.141							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP08	48.929	0.009							
	38.242	0.040							
	31.569	0.067							
	26.946	0.068							
	23.764	0.037							
	21.222	0.024							
	19.300	0.037							
	17.743	0.039							
	16.468	0.013							
	84.962	0.507		6.32	InSb	12.7	100	Ar	E 1461-07
TP09	66.001	0.135							
	48.882	0.038							
	38.301	0.050							
	31.544	0.016							
	26.880	0.024							
	23.712	0.070							
	21.225	0.084							
	19.318	0.092							
	17.746	0.064							
	16.568	0.086							
TP10	84.865	1.407		6.32	InSb	12.7	100	Ar	E 1461-07
	65.825	0.067							
	48.835	0.136							
	38.336	0.090							
	31.592	0.023							
	27.006	0.004							
	23.699	0.068							
	21.282	0.011							
	19.283	0.058							
	17.817	0.058							
TP10	16.522	0.110							
	84.868	0.797		6.32	InSb	12.7	100	Ar	E 1461-07
	65.323	0.064							
	48.406	0.161							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP11	38.014	0.060							
	31.455	0.089							
	26.941	0.048							
	23.610	0.069							
	21.133	0.047							
	19.215	0.015							
	17.660	0.089							
	16.370	0.093							
	84.783	0.300		6.32	InSb	12.7	100	Ar	E 1461-07
	65.280	0.220							
	48.571	0.140							
	38.093	0.112							
	31.505	0.048							
	26.989	0.063							
23.739	0.043								
21.265	0.011								
19.380	0.061								
17.815	0.114								
16.620	0.129								
TP12	85.338	0.165		6.32	InSb	12.7	100	Ar	E 1461-07
	65.369	0.131							
	48.519	0.005							
	38.201	0.103							
	31.583	0.027							
	26.971	0.075							
	23.739	0.044							
	21.257	0.020							
	19.407	0.046							
	17.888	0.059							
	16.630	0.078							
	84.936	0.066							
	65.435	0.108							
	48.469	0.032							
38.069	0.084								
TP13	38.014	0.060							
	31.455	0.089							
	26.941	0.048							
	23.610	0.069							
	21.133	0.047							
	19.215	0.015							
	17.660	0.089							
	16.370	0.093							
	84.783	0.300		6.32	InSb	12.7	100	Ar	E 1461-07
	65.280	0.220							
	48.571	0.140							
	38.093	0.112							
	31.505	0.048							
	26.989	0.063							
23.739	0.043								
21.265	0.011								
19.380	0.061								
17.815	0.114								
16.620	0.129								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP14	31.537	0.091							
	26.957	0.052							
	23.692	0.016							
	21.249	0.072							
	19.327	0.025							
	17.798	0.064							
	16.457	0.073							
	84.649	0.489		6.32	InSb	12.7	100	Ar	E 1461-07
	64.769	0.190							
	48.240	0.048							
	37.988	0.011							
	31.343	0.121							
	26.852	0.052							
23.652	0.027								
21.180	0.076								
19.276	0.050								
17.696	0.075								
16.373	0.032								
TP15	85.433	0.278		6.32	InSb	12.7	100	Ar	E 1461-07
	65.726	0.142							
	48.806	0.197							
	38.422	0.038							
	31.770	0.063							
	27.191	0.029							
TP16	23.822	0.064							
	21.403	0.098							
	19.432	0.145							
	17.934	0.033							
	16.639	0.148							
	84.986	0.905		6.32	InSb	12.7	100	Ar	E 1461-07
	65.765	0.028							
48.703	0.079								
38.131	0.073								
	31.513	0.035							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP17	26.954	0.068		6.32	InSb	12.7	100	Ar	E 1461-07
	23.725	0.032							
	21.263	0.077							
	19.328	0.018							
	17.747	0.052							
	16.412	0.106							
	85.406	0.494							
	66.102	0.132							
	49.085	0.054							
	38.537	0.053							
	31.812	0.114							
	27.233	0.031							
	23.883	0.063							
	21.515	0.059							
	19.529	0.071							
	17.911	0.027							
	16.635	0.031							
TP18	85.853	0.315		6.32	InSb	12.7	100	Ar	E 1461-07
	66.391	0.063							
	49.155	0.014							
	38.591	0.066							
	31.861	0.087							
	27.235	0.032							
	23.990	0.086							
	21.497	0.028							
	19.518	0.094							
	18.004	0.045							
TP19	16.620	0.077		6.32	InSb	12.7	100	Ar	E 1461-07
	85.744	0.455							
	66.671	0.059							
	49.537	0.075							
	38.852	0.137							
	32.075	0.075							
	27.492	0.044							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP20	24.118	0.016							
	21.663	0.019							
	19.752	0.022							
	18.045	0.019							
	16.757	0.103		6.32	InSb	12.7	100	Ar	E 1461-07
	87.020	0.265							
	66.792	0.289							
	49.733	0.029							
	38.935	0.070							
	32.218	0.035							
	27.575	0.092							
	24.201	0.064							
	21.701	0.018							
	19.814	0.006							
18.217	0.023								
16.946	0.086								
TP21	86.541	0.266		6.32	InSb	12.7	100	Ar	E 1461-07
	66.837	0.122							
	49.480	0.058							
	38.936	0.084							
	32.110	0.021							
	27.445	0.019							
	24.194	0.057							
	21.647	0.049							
	19.761	0.121							
	18.087	0.083							
	16.824	0.064							
	84.250	0.588		6.32	InSb	12.7	100	Ar	E 1461-07
	65.186	0.110							
	48.651	0.087							
38.074	0.074								
31.567	0.071								
26.974	0.026								
23.733	0.038								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP23	21.252	0.045		6.32	InSb	12.7	100	Ar	E 1461-07
	19.378	0.071							
	17.913	0.071							
	16.502	0.085							
	84.568	0.574							
	65.112	0.100							
	48.527	0.038							
	38.149	0.069							
	31.567	0.053							
	27.084	0.079							
TP24	23.797	0.089		6.32	InSb	12.7	100	Ar	E 1461-07
	21.344	0.054							
	19.405	0.078							
	17.924	0.059							
	16.680	0.080							
	83.610	0.523							
	64.779	0.177							
	48.338	0.007							
	38.001	0.125							
	31.364	0.054							
TP28	26.854	0.045		6.32	InSb	12.7	100	Ar	E 1461-07
	23.612	0.027							
	21.193	0.050							
	19.271	0.021							
	17.793	0.056							
	16.558	0.165							
	83.167	0.558							
	64.249	0.098							
	48.217	0.077							
	37.851	0.044							
31.348	0.019								
27.002	0.016								
23.741	0.066								
21.304	0.036								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP29	19.454	0.093		6.32	InSb	12.7	100	Ar	E 1461-07
	17.897	0.190							
	16.593	0.148							
	83.258	0.848							
	64.675	0.154							
	48.504	0.196							
	38.159	0.064							
	31.591	0.077							
	27.146	0.088							
	23.898	0.048							
TP30	21.413	0.006		6.32	InSb	12.7	100	Ar	E 1461-07
	19.575	0.057							
	18.035	0.037							
	16.742	0.046							
	83.115	0.233							
	65.170	0.162							
	48.847	0.031							
	38.411	0.042							
	31.784	0.049							
	27.243	0.061							
TP25	23.962	0.014		6.32	InSb	12.7	100	Ar	E 1461-07
	21.590	0.008							
	19.613	0.024							
	18.013	0.063							
	16.751	0.021							
	80.045	0.687							
	61.985	0.216							
	46.437	0.098							
	36.680	0.025							
	30.435	0.057							
26.099	0.023								
22.988	0.057								
20.693	0.077								
18.816	0.005								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP26	17.441	0.069		6.32	InSb	12.7	100	Ar	E 1461-07
	16.117	0.083							
	79.680	0.169							
	61.848	0.133							
	46.349	0.053							
	36.603	0.058							
	30.435	0.030							
	26.135	0.075							
	22.959	0.019							
	20.657	0.047							
	18.800	0.022							
	17.362	0.023							
	16.138	0.037							
TP27	80.910	0.821		6.32	InSb	12.7	100	Ar	E 1461-07
	63.264	0.209							
	47.319	0.096							
	37.380	0.059							
	30.913	0.050							
	26.612	0.064							
	23.444	0.034							
	21.073	0.036							
	19.154	0.045							
	17.627	0.080							
	16.415	0.088							
	83.554	0.392							
	64.670	0.176							
48.226	0.077								
TP31	37.904	0.029		6.32	InSb	12.7	100	Ar	E 1461-07
	31.528	0.104							
	27.015	0.040							
	23.789	0.065							
	21.356	0.015							
	19.489	0.102							
	17.948	0.061							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP32	16.833	0.080		6.32	InSb	12.7	100	Ar	E 1461-07
	83.564	0.420							
	64.605	0.371							
	48.344	0.073							
	38.123	0.070							
	31.594	0.045							
	27.124	0.039							
	23.817	0.034							
	21.391	0.046							
	19.505	0.034							
TP33	18.019	0.093		6.32	InSb	12.7	100	Ar	E 1461-07
	16.665	0.110							
	83.908	0.088							
	65.029	0.124							
	48.495	0.115							
	38.241	0.114							
	31.673	0.101							
	27.082	0.063							
	23.870	0.083							
	21.379	0.028							
TP34	19.498	0.031		6.32	InSb	12.7	100	Ar	E 1461-07
	17.942	0.029							
	16.568	0.223							
	84.302	0.590							
	65.798	0.065							
	48.950	0.030							
	38.608	0.029							
	31.915	0.061							
	27.355	0.022							
	24.036	0.022							
21.576	0.042								
19.566	0.086								
18.083	0.128								
16.734	0.022								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP35	84.923	0.285		6.32	InSb	12.7	100	Ar	E 1461-07
	65.805	0.175							
	49.268	0.035							
	38.660	0.054							
	31.960	0.014							
	27.432	0.057							
	24.173	0.042							
	21.730	0.133							
	19.688	0.039							
	18.195	0.040							
	16.966	0.117							
	84.667	0.481							
	65.662	0.189							
49.052	0.080								
38.682	0.039								
31.904	0.034								
27.311	0.016								
24.091	0.040								
21.540	0.017								
19.629	0.079								
18.046	0.044								
16.736	0.169								
TP37	84.842	0.695		6.32	InSb	12.7	100	Ar	E 1461-07
	65.793	0.208							
	49.095	0.025							
	38.393	0.055							
	31.830	0.059							
27.211	0.041								
23.996	0.057								
21.548	0.050								
19.626	0.052								
18.048	0.023								
16.657	0.025								
TP38	84.535	0.935		6.32	InSb	12.7	100	Ar	E 1461-07

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP39	65.838	0.012							
	49.318	0.086							
	38.717	0.080							
	32.020	0.046							
	27.528	0.036							
	24.217	0.048							
	21.642	0.044							
	19.759	0.074							
	18.216	0.093							
	16.877	0.113							
	84.971	0.452		6.32	InSb	12.7	100	Ar	E 1461-07
	66.084	0.084							
	49.273	0.051							
38.717	0.012								
32.016	0.067								
27.462	0.034								
24.111	0.057								
21.685	0.026								
19.671	0.062								
18.146	0.011								
16.767	0.069								
85.887	0.670		6.32	InSb	12.7	100	Ar	E 1461-07	
65.493	0.166								
48.876	0.078								
38.348	0.043								
31.791	0.042								
27.185	0.054								
23.940	0.046								
21.474	0.042								
19.572	0.091								
18.065	0.105								
16.670	0.068								
84.167	0.886		6.32	InSb	12.7	100	Ar	E 1461-07	
65.540	0.259								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP42	48.713	0.117							
	38.344	0.076							
	31.740	0.065							
	27.212	0.117							
	23.876	0.048							
	21.432	0.034							
	19.521	0.069							
	17.954	0.131							
	16.640	0.043							
	85.099	0.298		6.32	InSb	12.7	100	Ar	E 1461-07
	65.429	0.083							
	48.755	0.072							
	38.414	0.070							
	31.714	0.053							
27.193	0.026								
23.858	0.080								
21.408	0.086								
19.444	0.042								
17.854	0.038								
16.687	0.084								
84.609	1.513		6.32	InSb	12.7	100	Ar	E 1461-07	
65.990	0.162								
49.308	0.069								
38.569	0.098								
31.863	0.060								
27.314	0.033								
24.020	0.072								
21.545	0.053								
19.580	0.042								
17.962	0.063								
16.670	0.032								
85.642	0.600		6.32	InSb	12.7	100	Ar	E 1461-07	
65.985	0.196								
49.219	0.050								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP48	38.673	0.132		6.32	InSb	12.7	100	Ar	E 1461-07
	31.895	0.105							
	27.280	0.020							
	23.981	0.014							
	21.547	0.083							
	19.651	0.032							
	18.062	0.042							
	16.884	0.048							
	84.981	0.626							
	66.432	0.254							
	49.515	0.063							
	38.797	0.059							
	32.032	0.056							
	27.377	0.036							
24.183	0.056								
21.621	0.059								
19.612	0.057								
18.094	0.044								
16.816	0.148								
TP43	85.151	0.400		6.32	InSb	12.7	100	Ar	E 1461-07
	65.406	0.219							
	48.817	0.128							
	38.372	0.060							
	31.783	0.038							
	27.173	0.012							
	23.980	0.171							
	21.404	0.026							
	19.561	0.089							
	17.977	0.023							
	16.723	0.049							
	85.085	0.304							
	65.578	0.051							
	48.958	0.070							
38.493	0.103								
TP44	38.673	0.132		6.32	InSb	12.7	100	Ar	E 1461-07
	31.895	0.105							
	27.280	0.020							
	23.981	0.014							
	21.547	0.083							
	19.651	0.032							
	18.062	0.042							
	16.884	0.048							
	84.981	0.626							
	66.432	0.254							
	49.515	0.063							
	38.797	0.059							
	32.032	0.056							
	27.377	0.036							
24.183	0.056								
21.621	0.059								
19.612	0.057								
18.094	0.044								
16.816	0.148								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
TP45	31.793	0.058		6.32	InSb	12.7	100	Ar	E 1461-07
	27.217	0.020							
	23.949	0.048							
	21.491	0.025							
	19.620	0.125							
	18.023	0.084							
	16.715	0.138							
	84.671	1.009							
	65.533	0.072							
	48.796	0.029							
	38.493	0.076							
	31.720	0.008							
	27.175	0.087							
	23.866	0.042							
21.508	0.033								
19.565	0.043								
17.936	0.153								
16.790	0.037								

Specimen Number	TP04	TP05	TP06	TP01	TP02	TP03	TP07
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	1/14/10 8:42 AM	1/14/10 8:42 AM	1/14/10 8:42 AM	1/14/10 8:35 AM	1/14/10 8:35 AM	1/14/10 8:35 AM	1/18/10 8:05 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	85.1823	85.4900	85.6320	85.6517	85.6443	86.3957	85.4780
100	65.6327	65.7960	65.9540	66.4163	66.0697	66.4370	66.0470
200	48.9507	48.9283	48.8907	49.1303	49.0853	49.0710	48.9287
300	38.2467	38.2860	38.4460	38.4697	38.3747	38.4813	38.2417
400	31.6687	31.6710	31.7610	31.6977	31.5630	31.6257	31.5687
500	27.0697	27.1243	27.1663	27.1623	27.0063	27.0257	26.9460
600	23.7287	23.7960	23.8023	23.8960	23.7093	23.7507	23.7643
700	21.2763	21.3240	21.4060	21.3790	21.3020	21.2870	21.2220
800	19.3543	19.3807	19.4167	19.4197	19.3160	19.2977	19.3003
900	17.7553	17.8823	17.9573	17.8323	17.7827	17.7883	17.7433
1000	16.4780	16.5343	16.6263	16.5713	16.5907	16.5163	16.4677

Specimen Number	TP08	TP09	TP10	TP11	TP12	TP13	TP14
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	1/18/10 8:05 AM	1/18/10 8:05 AM	1/18/10 8:11 AM	1/18/10 8:11 AM	1/18/10 8:11 AM	1/19/10 8:05 AM	1/19/10 8:05 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	84.9620	84.8647	84.8680	84.7827	85.3377	84.9363	84.6490
100	66.0007	65.8247	65.3233	65.2800	65.3690	65.4350	64.7690
200	48.8823	48.8353	48.4063	48.5710	48.5193	48.4687	48.2397
300	38.3013	38.3360	38.0143	38.0930	38.2013	38.0693	37.9877
400	31.5440	31.5923	31.4553	31.5050	31.5833	31.5367	31.3433
500	26.8800	27.0057	26.9407	26.9893	26.9713	26.9570	26.8523
600	23.7120	23.6993	23.6097	23.7390	23.7390	23.6917	23.6520
700	21.2253	21.2823	21.1330	21.2650	21.2567	21.2487	21.1803
800	19.3180	19.2827	19.2153	19.3800	19.4070	19.3267	19.2763
900	17.7463	17.8167	17.6603	17.8147	17.8883	17.7977	17.6960
1000	16.5680	16.5217	16.3697	16.6200	16.6297	16.4570	16.3730

Specimen Number	TP15	TP16	TP17	TP18	TP19	TP20	TP21
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	1/19/10 8:05 AM	1/19/10 7:56 AM	1/19/10 7:56 AM	1/19/10 7:56 AM	1/21/10 9:50 AM	1/21/10 9:50 AM	1/21/10 9:50 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	85.4327	84.9860	85.4063	85.8533	85.7440	87.0203	86.5407
100	65.7263	65.7653	66.1023	66.3907	66.6713	66.7923	66.8367
200	48.8057	48.7033	49.0850	49.1547	49.5367	49.7330	49.4803
300	38.4223	38.1313	38.5373	38.5913	38.8520	38.9350	38.9360
400	31.7700	31.5130	31.8120	31.8610	32.0750	32.2177	32.1103
500	27.1913	26.9537	27.2330	27.2347	27.4920	27.5747	27.4453
600	23.8223	23.7247	23.8830	23.9903	24.1183	24.2013	24.1943
700	21.4033	21.2633	21.5153	21.4973	21.6627	21.7013	21.6467
800	19.4317	19.3277	19.5287	19.5183	19.7517	19.8137	19.7610
900	17.9340	17.7473	17.9110	18.0043	18.0453	18.2173	18.0870
1000	16.6387	16.4120	16.6350	16.6197	16.7567	16.9463	16.8243

Specimen Number	TP22	TP23	TP24	TP28	TP29	TP30	TP25
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	1/27/10 8:03 AM	1/27/10 8:03 AM	1/27/10 8:03 AM	6/27/10 9:37 AM	6/27/10 9:37 AM	6/27/10 9:37 AM	6/27/10 9:26 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	84.2503	84.5680	83.6100	83.1667	83.2583	83.1147	80.0453
100	65.1857	65.1117	64.7787	64.2487	64.6747	65.1700	61.9853
200	48.6510	48.5270	48.3383	48.2170	48.5037	48.8467	46.4367
300	38.0737	38.1487	38.0013	37.8507	38.1593	38.4110	36.6803
400	31.5667	31.5673	31.3637	31.3477	31.5913	31.7843	30.4347
500	26.9740	27.0840	26.8543	27.0023	27.1460	27.2433	26.0993
600	23.7333	23.7970	23.6117	23.7407	23.8977	23.9617	22.9880
700	21.2520	21.3440	21.1933	21.3037	21.4133	21.5897	20.6930
800	19.3783	19.4050	19.2713	19.4543	19.5750	19.6127	18.8157
900	17.9130	17.9243	17.7930	17.8970	18.0353	18.0127	17.4413
1000	16.5020	16.6800	16.5583	16.5933	16.7423	16.7510	16.1167

Specimen Number	TP26	TP27	TP31	TP32	TP33	TP34	TP35
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	6/27/10 9:26 AM	6/27/10 9:26 AM	6/28/10 8:18 AM	6/28/10 8:18 AM	6/28/10 8:18 AM	6/28/10 8:29 AM	6/28/10 8:29 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	79.6800	80.9100	83.5540	83.5637	83.9080	84.3020	84.9230
100	61.8480	63.2637	64.6697	64.6053	65.0293	65.7983	65.8050
200	46.3493	47.3187	48.2263	48.3440	48.4950	48.9497	49.2680
300	36.6033	37.3797	37.9043	38.1233	38.2407	38.6083	38.6603
400	30.4350	30.9130	31.5283	31.5937	31.6733	31.9147	31.9603
500	26.1353	26.6117	27.0153	27.1237	27.0820	27.3547	27.4317
600	22.9587	23.4440	23.7890	23.8167	23.8697	24.0360	24.1727
700	20.6570	21.0733	21.3563	21.3913	21.3793	21.5763	21.7300
800	18.7997	19.1543	19.4893	19.5050	19.4983	19.5660	19.6883
900	17.3620	17.6273	17.9483	18.0187	17.9420	18.0833	18.1950
1000	16.1377	16.4147	16.8327	16.6647	16.5683	16.7337	16.9663

Specimen Number	TP36	TP37	TP38	TP39	TP40	TP41	TP42
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	6/28/10 8:29 AM	6/29/10 9:10 AM	6/29/10 9:10 AM	6/29/10 9:10 AM	6/29/10 8:55 AM	6/29/10 8:55 AM	6/29/10 8:55 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	84.6667	84.8423	84.5347	84.9710	85.8873	84.1673	85.0987
100	65.6617	65.7930	65.8380	66.0840	65.4930	65.5400	65.4290
200	49.0517	49.0953	49.3183	49.2733	48.8763	48.7127	48.7553
300	38.6823	38.3933	38.7167	38.7170	38.3480	38.3443	38.4143
400	31.9040	31.8300	32.0203	32.0157	31.7910	31.7397	31.7137
500	27.3113	27.2107	27.5280	27.4617	27.1853	27.2120	27.1927
600	24.0913	23.9957	24.2173	24.1110	23.9403	23.8763	23.8583
700	21.5397	21.5480	21.6423	21.6850	21.4740	21.4317	21.4083
800	19.6287	19.6260	19.7587	19.6710	19.5723	19.5210	19.4437
900	18.0457	18.0480	18.2163	18.1457	18.0650	17.9540	17.8540
1000	16.7360	16.6573	16.8773	16.7667	16.6703	16.6403	16.6873

Specimen Number	TP46	TP47	TP48	TP43	TP44	TP45
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	6/30/10 8:22 AM	6/30/10 8:22 AM	6/30/10 8:22 AM	6/30/10 8:29 AM	6/30/10 8:29 AM	6/30/10 8:29 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	84.6090	85.6420	84.9813	85.1513	85.0850	84.6710
100	65.9900	65.9850	66.4320	65.4063	65.5777	65.5327
200	49.3080	49.2193	49.5147	48.8167	48.9583	48.7960
300	38.5693	38.6730	38.7967	38.3720	38.4927	38.4933
400	31.8627	31.8953	32.0320	31.7830	31.7933	31.7203
500	27.3140	27.2797	27.3770	27.1727	27.2170	27.1753
600	24.0200	23.9807	24.1830	23.9797	23.9487	23.8663
700	21.5447	21.5470	21.6207	21.4043	21.4910	21.5080
800	19.5803	19.6507	19.6123	19.5610	19.6203	19.5653
900	17.9623	18.0623	18.0940	17.9770	18.0227	17.9357
1000	16.6700	16.8837	16.8157	16.7227	16.7153	16.7903

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	TP15	P	6.323	6.326	6.325	6.326	12.728	12.727	1.45535
	TP16	P	6.327	6.328	6.328	6.328	12.727	12.730	1.45659
	TP17	P	6.324	6.326	6.325	6.326	12.731	12.730	1.45707
	TP13	P	6.329	6.328	6.326	6.329	12.729	12.726	1.45486
	TP23	P	6.324	6.324	6.323	6.325	12.719	12.717	1.45575
	TP14	P	6.325	6.324	6.326	6.326	12.728	12.724	1.45364
	TP21	P	6.322	6.324	6.323	6.320	12.716	12.716	1.44365
	TP22	P	6.330	6.331	6.330	6.329	12.721	12.720	1.45574
	TP18	P	6.330	6.325	6.327	6.330	12.731	12.734	1.45628
	TP19	P	6.322	6.322	6.320	6.320	12.712	12.714	1.44388
	TP24	P	6.332	6.331	6.332	6.332	12.720	12.721	1.45650
	TP12	P	6.330	6.328	6.329	6.329	12.728	12.727	1.45446
	TP26	P	6.323	6.325	6.321	6.324	12.709	12.708	1.46183
	TP27	P	6.320	6.326	6.326	6.326	12.732	12.733	1.46888
	TP20	P	6.322	6.323	6.321	6.321	12.712	12.713	1.44281
	TP25	P	6.328	6.331	6.332	6.332	12.729	12.730	1.46500
	TP01	P	6.316	6.315	6.314	6.314	12.725	12.725	1.45670
	TP03	P	6.324	6.324	6.324	6.323	12.725	12.725	1.45928
	TP02	P	6.328	6.327	6.324	6.326	12.723	12.727	1.45920
	TP04	P	6.320	6.321	6.319	6.320	12.727	12.727	1.45600
	TP05	P	6.319	6.317	6.319	6.319	12.728	12.725	1.45496
	TP06	P	6.318	6.317	6.317	6.318	12.728	12.729	1.45384
	TP07	P	6.313	6.313	6.314	6.313	12.731	12.730	1.45361
	TP11	P	6.329	6.328	6.329	6.328	12.724	12.727	1.45439
	TP10	P	6.33	6.33	6.328	6.329	12.725	12.729	1.45453
	TP09	P	6.326	6.326	6.326	6.327	12.724	12.726	1.45355
	TP08	P	6.314	6.316	6.315	6.314	12.729	12.731	1.45356

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
TP15	47735	12/2/2010 15:55	6.32500	12.72750	127.2261	0.006325	0.01273
TP16	47735	12/2/2010 16:08	6.32775	12.72850	127.2461	0.006328	0.01273
TP17	47735	12/2/2010 16:11	6.32525	12.73050	127.2860	0.006325	0.01273
TP13	47735	12/2/2010 16:17	6.32800	12.72750	127.2261	0.006328	0.01273
TP23	47735	12/2/2010 16:25	6.32400	12.71800	127.0362	0.006324	0.01272
TP14	47735	12/2/2010 16:31	6.32525	12.72600	127.1961	0.006325	0.01273
TP21	41169	12/3/2010 9:11	6.32225	12.71600	126.9963	0.006322	0.01272
TP22	41169	12/3/2010 13:21	6.33000	12.72050	127.0862	0.006330	0.01272
TP18	41169	12/4/2010 8:06	6.32800	12.73250	127.3260	0.006328	0.01273
TP19	41169	12/4/2010 10:35	6.32100	12.71300	126.9363	0.006321	0.01271
TP24	41169	12/4/2010 13:34	6.33175	12.72050	127.0862	0.006332	0.01272
TP12	41169	12/4/2010 13:37	6.32900	12.72750	127.2261	0.006329	0.01273
TP26	41169	12/4/2010 13:46	6.32325	12.70850	126.8465	0.006323	0.01271
TP27	41169	12/4/2010 13:55	6.32450	12.73250	127.3260	0.006325	0.01273
TP20	41169	12/4/2010 13:57	6.32175	12.71250	126.9264	0.006322	0.01271
TP25	41169	12/4/2010 14:01	6.33075	12.72950	127.2661	0.006331	0.01273
TP01	41169	12/6/2010 9:34	6.31475	12.72500	127.1761	0.006315	0.01273
TP03	41169	12/6/2010 10:39	6.32375	12.72500	127.1761	0.006324	0.01273
TP02	41169	12/6/2010 11:12	6.32625	12.72500	127.1761	0.006326	0.01273
TP04	41169	12/6/2010 11:13	6.32000	12.72700	127.2161	0.006320	0.01273
TP05	41169	12/6/2010 13:04	6.31850	12.72650	127.2061	0.006319	0.01273
TP06	41169	12/6/2010 13:12	6.31750	12.72850	127.2461	0.006318	0.01273
TP07	41169	12/6/2010 13:36	6.31325	12.73050	127.2860	0.006313	0.01273
TP11	41169	12/7/2010 8:23	6.32850	12.72550	127.1861	0.006329	0.01273
TP10	41169	12/7/2010 8:52	6.32925	12.72700	127.2161	0.006329	0.01273
TP09	41169	12/7/2010 9:49	6.32625	12.72500	127.1761	0.006326	0.01273
TP08	41169	12/7/2010 10:32	6.31475	12.73000	127.2761	0.006315	0.01273

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
TP15	0.0015	25.2	22.8	17.8
TP16	0.0015	25.2	22.8	17.8
TP17	0.0015	25.2	22.8	17.8
TP13	0.0015	25.2	22.8	17.8
TP23	0.0015	25.2	22.8	17.7
TP14	0.0015	25.2	23	17.8
TP21	0.0014	25.2	23	20.9
TP22	0.0015	25.3	22.6	20.1
TP18	0.0015	25.4	22.4	13.1
TP19	0.0014	25.4	22.1	12.8
TP24	0.0015	25.4	22.5	14
TP12	0.0015	25.4	22.5	14
TP26	0.0015	25.4	22.5	14.1
TP27	0.0015	25.4	22.5	14.3
TP20	0.0014	25.4	22.5	14.3
TP25	0.0015	25.4	22.5	14.3
TP01	0.0015	25.3	22.2	16.4
TP03	0.0015	25.3	22.6	17.9
TP02	0.0015	25.3	23	18.8
TP04	0.0015	25.3	23	18.8
TP05	0.0015	25.3	22.3	21.5
TP06	0.0015	25.3	22.4	21.5
TP07	0.0015	25.3	22.8	21.1
TP11	0.0015	25.6	22.4	21.7
TP10	0.0015	25.6	22.5	21.7
TP09	0.0015	25.6	22.9	21.3
TP08	0.0015	25.6	22.4	21.9

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity
and Temperature Transmitter Model PTU301

Graphite Grade: A3 MATRIX
Graphite Manufacturer: ORNL
Forming Process: Unknown
Coke Particle Size: Unknown
Coke Type: Unknown
ASTM Class: Unknown
Specimen Geometry: Cylinder

Specimen ID #'s:

H461
H462
H471
H472
H481
H482
H491
H492
H501
H502
H511
H512
H521
H522
H531
H532
H541
H542
H551
H552
H561
H562
H571
H572
H581
H582
H591
H592
H601
H602

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm			Specimen Outside Diameter Measurements, mm		
			L1	L2	L3	L4	D1	D1 ⁹⁰
	H591		6.323	6.322	6.324	6.325	12.719	12.718
	H532		6.339	6.337	6.335	6.338	12.722	12.725
	H512		6.337	6.338	6.338	6.335	12.723	12.724
	H492		6.326	6.326	6.326	6.326	12.721	12.719
	H561		6.323	6.321	6.322	6.323	12.712	12.714
	H531		6.310	6.308	6.311	6.311	12.723	12.721
	H501		6.323	6.322	6.323	6.321	12.718	12.721
	H502		6.323	6.325	6.326	6.326	12.721	12.721
	H541		6.321	6.323	6.321	6.321	12.717	12.720
	H472		6.324	6.324	6.323	6.322	12.727	12.725
	H562		6.324	6.325	6.324	6.325	12.718	12.717
	H581		6.322	6.324	6.321	6.323	12.719	12.718
	H511		6.297	6.298	6.298	6.298	12.724	12.721
	H461		6.338	6.339	6.340	6.338	12.739	12.739
	H471		6.337	6.339	6.337	6.339	12.737	12.740
	H482		6.326	6.323	6.325	6.325	12.719	12.719
	H481		6.325	6.326	6.322	6.323	12.723	12.725
	H572		6.322	6.323	6.323	6.321	12.718	12.717
	H582		6.322	6.324	6.323	6.324	12.715	12.716
	H552		6.322	6.323	6.325	6.322	12.718	12.717
	H602		6.324	6.324	6.322	6.323	12.714	12.716
	H522		6.340	6.337	6.338	6.339	12.719	12.718
	H491		6.324	6.324	6.324	6.323	12.721	12.720
	H521		6.339	6.338	6.339	6.339	12.718	12.717
	H462		6.333	6.335	6.336	6.334	12.717	12.718
	H601		6.323	6.324	6.324	6.322	12.716	12.717
	H542		6.324	6.321	6.323	6.323	12.717	12.719
	H592		6.325	6.325	6.321	6.326	12.712	12.715
	H571		6.323	6.322	6.323	6.322	12.716	12.717
	H551		6.320	6.320	6.321	6.320	12.715	12.717

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
H591	1.12954	jl	8/10/2009 9:29	6.32350	12.71850	127.0462	0.006324	0.01272
H532	1.16866	jl	8/10/2009 9:32	6.33725	12.72350	127.1461	0.006337	0.01272
H512	1.13834	jl	8/10/2009 9:33	6.33700	12.72350	127.1461	0.006337	0.01272
H492	1.17442	jl	8/10/2009 10:06	6.32600	12.72000	127.0762	0.006326	0.01272
H561	1.13097	jl	8/10/2009 10:07	6.32225	12.71300	126.9363	0.006322	0.01271
H531	1.12767	jl	8/10/2009 10:10	6.31000	12.72200	127.1161	0.006310	0.01272
H501	1.08986	jl	8/10/2009 10:12	6.32225	12.71950	127.0662	0.006322	0.01272
H502	1.13217	jl	8/10/2009 10:13	6.32500	12.72100	127.0961	0.006325	0.01272
H541	1.09133	jl	8/10/2009 10:15	6.32150	12.71850	127.0462	0.006322	0.01272
H472	1.13719	jl	8/10/2009 10:16	6.32325	12.72600	127.1961	0.006323	0.01273
H562	1.17350	jl	8/10/2009 10:17	6.32450	12.71750	127.0262	0.006325	0.01272
H581	1.13129	jl	8/10/2009 10:19	6.32250	12.71850	127.0462	0.006323	0.01272
H511	1.09633	jl	8/10/2009 10:20	6.29775	12.72250	127.1261	0.006298	0.01272
H461	1.18179	jl	8/10/2009 10:22	6.33875	12.73900	127.4561	0.006339	0.01274
H471	1.10468	jl	8/10/2009 10:24	6.33800	12.73850	127.4461	0.006338	0.01274
H482	1.13243	jl	8/10/2009 10:26	6.32475	12.71900	127.0562	0.006325	0.01272
H481	1.09557	jl	8/10/2009 10:28	6.32400	12.72400	127.1561	0.006324	0.01272
H572	1.17148	jl	8/10/2009 10:29	6.32225	12.71750	127.0262	0.006322	0.01272
H582	1.16884	jl	8/10/2009 10:31	6.32325	12.71550	126.9863	0.006323	0.01272
H552	1.16782	jl	8/10/2009 10:33	6.32300	12.71750	127.0262	0.006323	0.01272
H602	1.15947	jl	8/10/2009 10:34	6.32325	12.71500	126.9763	0.006323	0.01272
H522	1.16968	jl	8/10/2009 10:36	6.33850	12.71850	127.0462	0.006339	0.01272
H491	1.20546	jl	8/10/2009 10:38	6.32375	12.72050	127.0862	0.006324	0.01272
H521	1.20327	jl	8/10/2009 10:40	6.33875	12.71750	127.0262	0.006339	0.01272
H462	1.13750	jl	8/10/2009 10:41	6.33450	12.71750	127.0262	0.006335	0.01272
H601	1.12322	jl	8/10/2009 10:43	6.32325	12.71650	127.0062	0.006323	0.01272
H542	1.13152	jl	8/10/2009 10:45	6.32275	12.71800	127.0362	0.006323	0.01272
H592	1.16596	jl	8/10/2009 10:47	6.32425	12.71350	126.9463	0.006324	0.01271
H571	1.13240	jl	8/10/2009 10:50	6.32250	12.71650	127.0062	0.006323	0.01272
H551	1.12936	jl	8/10/2009 10:52	6.32025	12.71600	126.9963	0.006320	0.01272

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
H591	0.0011	1405.99062	1.4060	25.5	23.5	31.6
H532	0.0012	1450.38824	1.4504	25.5	23.5	31.7
H512	0.0011	1412.81475	1.4128	25.5	23.5	31.6
H492	0.0012	1460.93249	1.4609	25.5	23.5	31.8
H561	0.0011	1409.26753	1.4093	25.5	23.4	32
H531	0.0011	1405.89214	1.4059	25.5	23.6	31.8
H501	0.0011	1356.65396	1.3567	25.5	23.5	31.9
H502	0.0011	1408.37636	1.4084	25.5	23.5	31.9
H541	0.0011	1358.85864	1.3589	25.5	23.4	31.9
H472	0.0011	1413.90086	1.4139	25.5	23.4	32
H562	0.0012	1460.70839	1.4607	25.5	23.5	31.9
H581	0.0011	1408.39165	1.4084	25.5	23.5	31.8
H511	0.0011	1369.37086	1.3694	25.5	23.5	32
H461	0.0012	1462.77029	1.4628	25.5	23.6	31.8
H471	0.0011	1367.59591	1.3676	25.5	23.5	31.9
H482	0.0011	1409.19855	1.4092	25.5	23.5	31.8
H481	0.0011	1362.42018	1.3624	25.5	23.5	31.9
H572	0.0012	1458.71295	1.4587	25.5	23.6	31.7
H582	0.0012	1455.65329	1.4557	25.5	23.5	31.8
H552	0.0012	1453.98308	1.4540	25.5	23.5	31.9
H602	0.0012	1444.09762	1.4441	25.5	23.5	31.8
H522	0.0012	1452.50923	1.4525	25.5	23.5	31.9
H491	0.0012	1499.96065	1.5000	25.5	23.5	31.8
H521	0.0012	1494.39736	1.4944	25.5	23.5	31.9
H462	0.0011	1413.66235	1.4137	25.5	23.6	31.7
H601	0.0011	1398.61893	1.3986	25.5	23.5	31.8
H542	0.0011	1408.73304	1.4087	25.5	23.6	31.6
H592	0.0012	1452.29381	1.4523	25.5	23.5	31.6
H571	0.0011	1410.21701	1.4102	25.5	23.5	31.7
H551	0.0011	1407.04253	1.4070	25.5	23.5	31.8

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
H472		41169	11/18/2009 8:49	25.800	0.300	15.437	15.243	15.635
				100.100	0.200	11.887	11.865	11.912
				199.100	0.100	8.938	9.048	8.974
				300.700	0.400	7.176	7.221	7.208
				401.100	0.500	6.108	5.895	5.881
				501.700	0.500	5.326	5.039	4.974
				600.700	0.400	4.649	4.408	4.425
				699.900	0.200	4.032	4.075	4.017
				799.500	0.100	3.639	3.665	3.642
				899.400	0.100	3.443	3.425	3.355
H482		41169	11/18/2009 8:49	999.300	0.100	3.192	3.055	3.188
				23.400	0.100	14.517	14.375	14.377
				99.500	0.200	10.836	10.923	10.949
				199.100	0.000	8.198	8.239	8.248
				299.300	0.100	6.626	6.512	6.530
				399.400	0.100	5.487	5.308	5.265
				499.700	0.200	4.562	4.483	4.442
				599.400	0.100	3.983	3.919	3.925
				699.300	0.000	3.614	3.566	3.559
				799.200	0.000	3.384	3.278	3.261
H461		41169	11/18/2009 8:56	899.200	0.000	3.069	3.024	3.166
				999.100	0.000	2.920	2.961	2.999
				26.100	0.200	15.545	15.451	15.634
				101.300	0.200	11.891	11.943	11.902
				198.800	0.500	9.012	9.054	9.013
				301.600	0.200	7.225	7.247	7.238
				401.600	0.200	6.185	5.965	5.901
				501.600	0.200	5.189	5.117	5.040
				601.700	0.200	4.537	4.503	4.455
				701.500	0.200	4.017	3.992	4.068
H462		41169	11/18/2009 8:56	801.100	0.100	3.786	3.694	3.683
				900.800	0.100	3.504	3.458	3.498
				1000.800	0.100	3.174	3.268	3.095
				25.000	0.200	13.690	13.897	13.862

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
H471				101.200	0.200	10.509	10.602	10.541
				200.500	0.100	7.988	8.007	7.987
				300.900	0.100	6.444	6.306	6.266
				401.000	0.100	5.288	5.083	5.050
				501.000	0.100	4.381	4.294	4.279
				601.100	0.100	3.877	3.839	3.788
				701.100	0.100	3.487	3.441	3.476
				800.900	0.100	3.251	3.196	3.107
				900.700	0.100	2.810	2.894	2.840
				1000.700	0.000	2.860	2.732	2.830
H491		41169	11/18/2009 8:56	24.100	0.100	13.490	13.436	13.224
				101.100	0.200	10.216	10.223	10.239
				200.800	0.100	7.741	7.768	7.746
				300.800	0.100	6.239	6.084	6.026
				401.000	0.100	5.125	4.953	4.901
				501.000	0.100	4.341	4.252	4.207
				601.000	0.200	3.840	3.736	3.746
				700.900	0.100	3.398	3.460	3.393
				800.900	0.100	3.124	3.122	3.192
				900.600	0.100	2.985	2.860	2.939
H492		41169	11/19/2009 8:08	1000.700	0.100	2.912	2.841	2.804
				26.200	0.200	15.939	15.978	16.024
				101.300	0.200	12.098	12.062	12.096
				198.800	0.500	9.159	9.155	9.138
				301.600	0.200	7.280	7.317	7.345
				401.600	0.200	6.233	6.055	6.004
				501.600	0.200	5.225	5.100	5.096
				601.700	0.200	4.606	4.474	4.509
				701.600	0.200	4.069	4.078	4.090
				801.300	0.200	3.772	3.751	3.725
H492				900.900	0.100	3.650	3.455	3.499
				1000.800	0.100	3.213	3.066	3.263
			11/19/2009 8:08	25.200	0.100	14.414	14.478	14.308
				101.200	0.200	10.876	10.914	10.950

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
H501		41169	11/19/2009 8:08	200.500	0.100	8.255	8.285	8.254
				300.800	0.100	6.646	6.533	6.521
				401.000	0.100	5.510	5.292	5.229
				501.100	0.100	4.615	4.485	4.447
				601.100	0.100	4.093	3.901	3.981
				701.200	0.100	3.680	3.630	3.622
				800.900	0.100	3.406	3.282	3.292
				900.800	0.100	3.085	3.009	2.962
				1000.700	0.100	2.740	2.865	2.899
				24.400	0.100	13.456	13.551	13.690
				100.900	0.100	10.369	10.400	10.411
				200.700	0.100	7.825	7.887	7.884
				300.900	0.100	6.344	6.231	6.190
				401.000	0.100	5.251	5.078	5.062
H502		41169	11/19/2009 8:02	501.000	0.100	4.459	4.341	4.300
				601.100	0.100	3.927	3.899	3.864
				701.000	0.100	3.524	3.557	3.600
				800.800	0.100	3.317	3.267	3.197
				900.700	0.100	3.036	3.079	3.062
				1000.700	0.100	2.846	2.996	2.785
				25.900	0.200	15.645	15.627	15.952
				100.200	0.200	12.149	12.080	12.147
				199.000	0.200	9.199	9.085	9.127
				300.700	0.400	7.357	7.351	7.369
				401.100	0.500	6.255	6.054	6.014
				501.700	0.500	5.451	5.119	5.147
				600.900	0.300	4.781	4.582	4.554
				699.900	0.200	4.134	4.150	4.144
799.500	0.100	3.725	3.772	3.750				
H512		41169	11/19/2009 8:02	899.400	0.100	3.525	3.412	3.433
				999.400	0.100	3.036	3.107	3.057
				24.700	0.200	15.541	15.019	15.452
				99.900	0.200	11.744	11.779	11.821
				199.100	0.000	8.983	8.926	8.875

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
H521		41169	11/19/2009 8:02	299.500	0.100	7.203	7.184	7.200
				399.900	0.200	6.157	5.886	5.834
				500.300	0.300	5.205	5.043	4.995
				600.000	0.200	4.557	4.456	4.466
				699.600	0.100	4.044	4.033	4.039
				799.400	0.100	3.850	3.776	3.672
				899.400	0.100	3.369	3.450	3.497
				999.400	0.100	3.271	3.145	3.340
				23.700	0.100	15.138	15.183	15.472
				99.500	0.200	11.627	11.688	11.715
				199.200	0.100	8.827	8.804	8.828
				299.300	0.100	7.059	7.057	7.053
				399.500	0.100	5.950	5.744	5.685
				499.700	0.100	5.058	4.883	4.887
				599.500	0.100	4.362	4.298	4.307
699.300	0.100	3.997	3.909	3.886				
799.200	0.000	3.701	3.553	3.630				
899.100	0.000	3.381	3.309	3.335				
999.100	0.000	2.990	3.107	3.114				
H571		41169	11/21/2009 9:33	26.000	0.200	12.948	12.994	12.823
				100.200	0.200	9.799	9.826	9.844
				199.100	0.100	7.402	7.479	7.471
				300.800	0.400	5.963	5.734	5.696
				401.100	0.500	4.782	4.630	4.578
				500.900	0.400	4.010	3.901	3.877
				600.800	0.300	3.624	3.422	3.445
				699.900	0.100	3.109	3.128	3.051
				799.500	0.100	2.707	2.745	2.805
				899.400	0.100	2.493	2.434	2.409
				999.300	0.000	2.161	2.340	2.206
				24.800	0.200	14.404	14.485	14.568
				100.000	0.200	11.036	11.042	11.063
				199.200	0.000	8.319	8.345	8.311
				299.600	0.100	6.672	6.610	6.574
H572		41169	11/21/2009 9:33	24.800	0.200	14.404	14.485	14.568
				100.000	0.200	11.036	11.042	11.063
				199.200	0.000	8.319	8.345	8.311
299.600	0.100	6.672	6.610	6.574				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
H581		41169	11/21/2009 9:33	399.900	0.200	5.549	5.344	5.288
				499.900	0.200	4.620	4.531	4.525
				600.000	0.200	4.094	4.049	4.027
				699.600	0.100	3.645	3.633	3.674
				799.500	0.100	3.300	3.305	3.366
				899.400	0.100	2.936	3.038	3.092
				999.400	0.100	3.050	2.934	2.766
				23.900	0.100	13.047	12.983	12.403
				99.400	0.200	9.848	9.902	9.834
				199.200	0.100	7.397	7.456	7.390
H522		41169	11/20/2009 10:05	299.300	0.100	5.992	5.769	5.717
				399.500	0.100	4.796	4.676	4.634
				499.500	0.100	4.075	3.973	3.952
				599.500	0.100	3.625	3.526	3.500
				699.300	0.100	3.285	3.222	3.248
				799.200	0.000	3.096	2.916	2.840
				899.200	0.000	2.794	2.735	2.804
				999.200	0.100	2.839	2.578	2.696
				25.900	0.200	15.328	15.004	15.399
				100.100	0.200	11.697	11.680	11.691
H531		41169	11/20/2009 10:05	199.100	0.100	8.857	8.863	8.826
				300.700	0.400	7.073	7.100	7.109
				401.200	0.500	6.006	5.795	5.751
				501.600	0.400	4.985	4.917	4.875
				600.800	0.300	4.512	4.346	4.329
				699.900	0.200	3.954	3.880	3.915
				799.500	0.100	3.630	3.602	3.547
				899.400	0.100	3.345	3.259	3.204
				999.300	0.100	2.985	3.042	2.942
				24.700	0.200	14.213	14.120	14.342
100.000	0.200	10.970	11.014	11.024				
199.200	0.000	8.302	8.288	8.278				
299.600	0.100	6.682	6.626	6.598				
399.900	0.200	5.572	5.399	5.345				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
H532		41169	11/20/2009 10:05	500.400	0.300	4.738	4.590	4.550
				600.000	0.200	4.094	4.038	4.025
				699.600	0.100	3.591	3.754	3.665
				799.400	0.100	3.390	3.318	3.370
				899.400	0.100	3.025	3.127	3.147
				999.400	0.100	3.044	2.697	3.012
				23.800	0.100	15.123	14.817	15.214
				99.400	0.200	11.434	11.518	11.513
				199.100	0.000	8.639	8.653	8.681
				299.200	0.100	7.014	6.971	6.983
H552		41169	11/21/2009 9:41	399.400	0.100	5.891	5.665	5.629
				499.700	0.200	4.941	4.805	4.804
				599.500	0.100	4.300	4.233	4.166
				699.300	0.100	3.945	3.844	3.811
				799.200	0.000	3.696	3.551	3.565
				899.200	0.000	3.301	3.315	3.208
				999.100	0.000	3.102	2.988	2.962
				26.200	0.200	14.172	14.164	14.263
				101.200	0.300	10.839	10.878	10.803
				200.400	0.100	8.195	8.203	8.163
H561		41169	11/21/2009 9:41	301.600	0.200	6.578	6.478	6.428
				401.600	0.200	5.405	5.222	5.172
				501.600	0.200	4.526	4.398	4.391
				601.700	0.200	3.908	3.852	3.905
				701.500	0.200	3.278	3.549	3.534
				801.100	0.100	3.161	3.279	3.256
				900.900	0.100	2.981	2.904	3.070
				1000.800	0.100	2.809	2.699	2.830
				25.300	0.100	12.904	13.204	13.224
				101.300	0.200	10.100	10.166	10.127
200.500	0.000	7.650	7.695	7.678				
300.800	0.100	6.197	6.000	5.957				
400.900	0.100	5.044	4.891	4.855				
501.000	0.100	4.280	4.118	4.180				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
H562		41169	11/21/2009 9:41	601.100	0.100	3.719	3.732	3.683
				701.000	0.100	3.447	3.330	3.346
				800.800	0.100	3.122	3.061	3.073
				900.700	0.100	2.826	2.955	2.684
				1000.700	0.100	2.777	2.557	2.478
				24.600	0.100	13.605	13.735	13.782
				101.000	0.100	10.416	10.404	10.379
				200.600	0.000	7.898	7.888	7.878
				300.800	0.100	6.340	6.188	6.131
				401.100	0.100	5.143	5.021	4.977
H542		41169	11/20/2009 10:12	501.000	0.100	4.394	4.232	4.218
				601.000	0.100	3.799	3.752	3.753
				701.000	0.100	3.455	3.407	3.409
				800.900	0.100	3.160	3.101	3.199
				900.800	0.100	2.953	2.975	2.961
				1000.700	0.100	2.752	2.846	2.727
				25.200	0.100	14.439	14.405	14.372
				101.100	0.100	10.919	10.911	10.991
				200.400	0.000	8.295	8.297	8.248
				300.500	0.000	6.697	6.583	6.587
H551		41169	11/20/2009 10:12	400.700	0.100	5.533	5.304	5.295
				500.500	0.100	4.627	4.449	4.439
				600.600	0.100	4.018	3.978	3.947
				700.600	0.100	3.610	3.588	3.591
				800.300	0.100	3.372	3.219	3.230
				900.000	0.000	3.084	3.009	3.085
				999.900	0.100	2.972	2.911	2.791
				24.400	0.100	13.894	14.066	14.076
				101.100	0.200	10.625	10.645	10.626
				200.600	0.100	8.065	8.043	8.062
300.700	0.100	6.469	6.350	6.323				
400.900	0.200	5.371	5.187	5.167				
500.600	0.200	4.519	4.426	4.396				
600.600	0.100	4.044	3.921	3.916				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
H541		41169	11/20/2009 10:12	700.500	0.100	3.548	3.586	3.564
				800.400	0.100	3.287	3.294	3.371
				900.100	0.100	3.166	2.980	3.144
				999.900	0.100	2.892	2.966	2.981
				26.200	0.200	12.929	12.807	12.862
				101.200	0.200	9.886	9.842	9.870
				200.300	0.200	7.440	7.489	7.428
				301.400	0.300	6.051	5.838	5.778
				401.500	0.300	4.863	4.709	4.677
				501.400	0.300	4.068	4.037	3.997
H592		41169	2/1/2010 8:36	601.400	0.300	3.620	3.599	3.575
				701.100	0.200	3.398	3.245	3.264
				800.700	0.200	3.048	2.929	2.932
				900.200	0.100	2.616	2.825	2.623
				1000.200	0.100	2.492	2.569	2.675
				26.100	0.200	15.705	15.840	15.910
				100.300	0.100	12.100	12.078	12.099
				199.000	0.200	9.170	9.089	9.175
				300.800	0.400	7.300	7.285	7.291
				401.100	0.500	6.149	5.948	5.937
H601		41169	2/1/2010 8:36	501.700	0.400	5.323	5.089	4.999
				600.800	0.300	4.609	4.428	4.426
				700.000	0.400	4.100	3.909	3.963
				799.600	0.100	3.641	3.649	3.533
				899.400	0.100	3.215	3.339	3.203
				999.200	0.000	2.843	2.908	2.959
				25.100	0.100	13.490	13.555	13.496
				100.100	0.200	10.431	10.380	10.447
				199.200	0.000	7.885	7.862	7.888
				299.700	0.100	6.352	6.194	6.179
400.000	0.200	5.212	5.027	5.009				
500.400	0.300	4.332	4.272	4.275				
600.100	0.200	3.816	3.830	3.764				
699.700	0.200	3.467	3.486	3.447				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
H602		41169	2/1/2010 8:36	799.500	0.100	3.138	3.208	3.172
				899.500	0.100	2.763	2.955	2.875
				999.500	0.100	2.779	2.826	2.628
				24.300	0.100	13.926	13.885	13.975
				99.300	0.200	10.612	10.578	10.640
				199.100	0.000	8.048	7.975	8.030
				299.300	0.000	6.476	6.292	6.308
				399.400	0.100	5.299	5.109	5.083
				499.600	0.100	4.457	4.319	4.323
				599.400	0.100	3.828	3.793	3.838
H582		41169	2/1/2010 8:46	699.200	0.000	3.489	3.488	3.527
				799.100	0.000	3.222	3.246	3.218
				899.000	0.000	2.837	2.862	2.909
				999.000	0.000	2.980	2.819	2.772
				26.300	0.200	15.225	15.165	15.181
				101.000	0.200	11.735	11.651	11.649
				199.900	0.200	8.797	8.786	8.790
				301.600	0.200	7.072	7.068	7.048
				401.600	0.200	6.052	5.828	5.803
				501.600	0.200	5.029	4.952	4.922
601.700	0.200	4.475	4.355	4.361				
701.600	0.200	4.077	3.983	4.036				
801.400	0.300	3.756	3.702	3.687				
900.900	0.100	3.374	3.401	3.356				
1000.900	0.100	3.124	3.224	2.984				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
H591		41169	2/1/2010 8:46	25.400	0.100	13.933	14.078	13.992
				101.100	0.100	10.641	10.697	10.697
				200.600	0.000	8.083	8.056	8.070
				300.800	0.100	6.502	6.380	6.339
				400.900	0.100	5.399	5.182	5.146
				501.000	0.100	4.549	4.449	4.429
				601.000	0.100	4.023	3.881	3.952
				701.100	0.100	3.578	3.573	3.618
				800.900	0.100	3.283	3.222	3.274
				900.700	0.000	3.062	2.967	3.115
				1000.700	0.000	3.004	2.755	2.713

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
H472	15.438	0.196		6.323	InSb	12.7	100	Ar	E 1461-07
	11.888	0.024							
	8.987	0.056							
	7.202	0.023							
	5.961	0.127							
	5.113	0.187							
	4.494	0.135							
	4.041	0.030							
	3.649	0.014							
	3.408	0.046							
3.145	0.078								
H482	14.423	0.081		6.323	InSb	12.7	100	Ar	E 1461-07
	10.903	0.059							
	8.228	0.027							
	6.556	0.061							
	5.353	0.118							
	4.496	0.061							
	3.942	0.035							
	3.580	0.030							
	3.308	0.067							
	3.086	0.073							
2.960	0.040								
H461	15.543	0.092		6.323	InSb	12.7	100	Ar	E 1461-07
	11.912	0.027							
	9.026	0.024							
	7.237	0.011							
	6.017	0.149							
	5.115	0.075							
	4.498	0.041							
	4.026	0.039							
	3.721	0.057							
	3.487	0.025							
3.179	0.087								
H462	13.816	0.111		6.323	InSb	12.7	100	Ar	E 1461-07

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
H471	10.551	0.047							
	7.994	0.011							
	6.339	0.093							
	5.140	0.129							
	4.318	0.055							
	3.835	0.045							
	3.468	0.024							
	3.185	0.073							
	2.848	0.043							
	2.807	0.067							
	13.383	0.141		6.323	InSb	12.7	100	Ar	E 1461-07
	10.226	0.012							
	7.752	0.014							
	6.116	0.110							
4.993	0.117								
4.267	0.068								
3.774	0.057								
3.417	0.037								
3.146	0.040								
2.928	0.063								
2.852	0.055								
15.980	0.043		6.323	InSb	12.7	100	Ar	E 1461-07	
12.085	0.020								
9.151	0.011								
7.314	0.033								
6.097	0.120								
5.140	0.073								
4.530	0.068								
4.079	0.011								
3.749	0.024								
3.535	0.102								
3.181	0.102								
14.400	0.086		6.323	InSb	12.7	100	Ar	E 1461-07	
10.913	0.037								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
H501	8.265	0.018							
	6.567	0.069							
	5.344	0.147							
	4.516	0.088							
	3.992	0.096							
	3.644	0.031							
	3.327	0.069							
	3.019	0.062							
	2.835	0.084							
	13.566	0.118		6.323	InSb	12.7	100	Ar	E 1461-07
	10.393	0.022							
	7.865	0.035							
	6.255	0.080							
5.130	0.105								
4.367	0.083								
3.897	0.032								
3.560	0.038								
3.260	0.060								
3.059	0.022								
2.876	0.109								
H502	15.741	0.183		6.323	InSb	12.7	100	Ar	E 1461-07
	12.125	0.039							
	9.137	0.058							
	7.359	0.009							
	6.108	0.129							
	5.239	0.184							
	4.639	0.124							
4.143	0.008								
3.749	0.024								
3.457	0.060								
3.067	0.036								
H512	15.337	0.279		6.323	InSb	12.7	100	Ar	E 1461-07
	11.781	0.039							
	8.928	0.054							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
H521	7.196	0.010							
	5.959	0.173							
	5.081	0.110							
	4.493	0.056							
	4.039	0.006							
	3.766	0.089							
	3.439	0.065							
	3.252	0.099							
	15.264	0.181		6.323	InSb	12.7	100	Ar	E 1461-07
	11.677	0.045							
	8.820	0.014							
	7.056	0.003							
	5.793	0.139							
4.943	0.100								
4.322	0.035								
3.931	0.059								
3.628	0.074								
3.342	0.036								
3.070	0.070								
H571	12.922	0.088		6.323	InSb	12.7	100	Ar	E 1461-07
	9.823	0.023							
	7.451	0.042							
	5.798	0.144							
	4.663	0.106							
3.929	0.071								
3.497	0.111								
3.096	0.040								
2.752	0.049								
2.445	0.043								
2.236	0.093								
H572	14.486	0.082		6.323	InSb	12.7	100	Ar	E 1461-07
	11.047	0.014							
	8.325	0.018							
	6.619	0.050							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
H581	5.394	0.137							
	4.559	0.053							
	4.057	0.034							
	3.651	0.021							
	3.324	0.037							
	3.022	0.079							
	2.917	0.143							
	12.811	0.355		6.323	InSb	12.7	100	Ar	E 1461-07
	9.861	0.036							
	7.414	0.036							
	5.826	0.146							
	4.702	0.084							
	4.000	0.066							
3.550	0.066								
3.252	0.032								
2.951	0.131								
2.778	0.037								
2.704	0.131								
15.244	0.211		6.323	InSb	12.7	100	Ar	E 1461-07	
11.689	0.009								
8.849	0.020								
7.094	0.019								
5.851	0.136								
4.926	0.056								
4.396	0.101								
3.916	0.037								
3.593	0.042								
3.269	0.071								
2.990	0.050								
14.225	0.111		6.323	InSb	12.7	100	Ar	E 1461-07	
11.003	0.029								
8.289	0.012								
6.635	0.043								
5.439	0.119								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
H532	4.626	0.099							
	4.052	0.037							
	3.670	0.082							
	3.359	0.037							
	3.100	0.065							
	2.918	0.192							
	15.051	0.208		6.323	InSb	12.7	100	Ar	E 1461-07
	11.488	0.047							
	8.658	0.021							
	6.989	0.022							
H552	5.728	0.142							
	4.850	0.079							
	4.233	0.067							
	3.867	0.070							
	3.604	0.080							
	3.275	0.058							
	3.017	0.074							
	14.200	0.055		6.323	InSb	12.7	100	Ar	E 1461-07
	10.840	0.038							
	8.187	0.021							
H561	6.495	0.076							
	5.266	0.123							
	4.438	0.076							
	3.888	0.032							
	3.454	0.152							
	3.232	0.063							
	2.985	0.083							
	2.779	0.070							
	13.111	0.179		6.323	InSb	12.7	100	Ar	E 1461-07
	10.131	0.033							
7.674	0.023								
6.051	0.128								
4.930	0.100								
4.193	0.082								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
H562	3.711	0.025		6.323	InSb	12.7	100	Ar	E 1461-07
	3.374	0.063							
	3.085	0.032							
	2.822	0.136							
	2.604	0.155							
	13.707	0.092							
	10.400	0.019							
	7.888	0.010							
	6.220	0.108							
	5.047	0.086							
H542	4.281	0.098		6.323	InSb	12.7	100	Ar	E 1461-07
	3.768	0.027							
	3.424	0.027							
	3.153	0.049							
	2.963	0.011							
	2.775	0.063							
	14.405	0.034							
	10.940	0.044							
	8.280	0.028							
	6.622	0.065							
H551	5.377	0.135		6.323	InSb	12.7	100	Ar	E 1461-07
	4.505	0.106							
	3.981	0.036							
	3.596	0.012							
	3.274	0.085							
	3.059	0.044							
	2.891	0.092							
	14.012	0.102							
	10.632	0.011							
	8.057	0.012							
6.381	0.078								
5.242	0.112								
4.447	0.064								
3.960	0.073								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
H541	3.566	0.019		6.323	InSb	12.7	100	Ar	E 1461-07
	3.317	0.047							
	3.097	0.102							
	2.946	0.048							
	12.866	0.061							
	9.866	0.022							
	7.452	0.032							
	5.889	0.143							
	4.750	0.099							
	4.034	0.036							
H592	3.598	0.023		6.323	InSb	12.7	100	Ar	E 1461-07
	3.302	0.083							
	2.970	0.068							
	2.688	0.119							
	2.579	0.092							
	15.818	0.104							
	12.092	0.012							
	9.145	0.048							
	7.292	0.008							
	6.011	0.119							
H601	5.137	0.167		6.323	InSb	12.7	100	Ar	E 1461-07
	4.488	0.105							
	3.991	0.098							
	3.608	0.065							
	3.252	0.075							
	2.903	0.058							
	13.514	0.036							
	10.419	0.035							
	7.878	0.014							
	6.242	0.096							
	5.083	0.112							
	4.293	0.034							
	3.803	0.035							
	3.467	0.020							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
H602	3.173	0.035		6.323	InSb	12.7	100	Ar	E 1461-07
	2.864	0.096							
	2.744	0.103							
	13.929	0.045							
	10.610	0.031							
	8.018	0.038							
	6.359	0.102							
	5.164	0.118							
	4.366	0.079							
	3.820	0.024							
	3.501	0.022							
	3.229	0.015							
	2.869	0.037							
	2.857	0.109							
H582	15.190	0.031		6.323	InSb	12.7	100	Ar	E 1461-07
	11.678	0.049							
	8.791	0.006							
	7.063	0.013							
	5.894	0.137							
	4.968	0.055							
	4.397	0.068							
	4.032	0.047							
3.715	0.036								
3.377	0.023								
3.111	0.121								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
H591	14.001	0.073		6.323	InSb	12.7	100	Ar	E 1461-07
	10.678	0.032							
	8.070	0.014							
	6.407	0.085							
	5.242	0.137							
	4.476	0.064							
	3.952	0.071							
	3.590	0.025							
	3.260	0.033							
	3.048	0.075							
	2.824	0.157							

Specimen Number	H472	H482	H461	H462	H471	H491
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/18/09 8:49 AM	11/18/09 8:49 AM	11/18/09 8:56 AM	11/18/09 8:56 AM	11/18/09 8:56 AM	11/19/09 8:08 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	15.4383	14.4230	15.5433	13.8163	13.3833	15.9803
100	11.8880	10.9027	11.9120	10.5507	10.2260	12.0853
200	8.9867	8.2283	9.0263	7.9940	7.7517	9.1507
300	7.2017	6.5560	7.2367	6.3387	6.1163	7.3140
400	5.9613	5.3533	6.0170	5.1403	4.9930	6.0973
500	5.1130	4.4957	5.1153	4.3180	4.2667	5.1403
600	4.4940	3.9423	4.4983	3.8347	3.7740	4.5297
700	4.0413	3.5797	4.0257	3.4680	3.4170	4.0790
800	3.6487	3.3077	3.7210	3.1847	3.1460	3.7493
900	3.4077	3.0863	3.4867	2.8480	2.9280	3.5347
1000	3.1450	2.9600	3.1790	2.8073	2.8523	3.1807

Specimen Number	H492	H501	H502	H512	H521	H571
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/19/09 8:08 AM	11/19/09 8:08 AM	11/19/09 8:02 AM	11/19/09 8:02 AM	11/19/09 8:02 AM	11/21/09 9:33 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	14.4000	13.5657	15.7413	15.3373	15.2643	12.9217
100	10.9133	10.3933	12.1253	11.7813	11.6767	9.8230
200	8.2647	7.8653	9.1370	8.9280	8.8197	7.4507
300	6.5667	6.2550	7.3590	7.1957	7.0563	5.7977
400	5.3437	5.1303	6.1077	5.9590	5.7930	4.6633
500	4.5157	4.3667	5.2390	5.0810	4.9427	3.9293
600	3.9917	3.8967	4.6390	4.4930	4.3223	3.4970
700	3.6440	3.5603	4.1427	4.0387	3.9307	3.0960
800	3.3267	3.2603	3.7490	3.7660	3.6280	2.7523
900	3.0187	3.0590	3.4567	3.4387	3.3417	2.4453
1000	2.8347	2.8757	3.0667	3.2520	3.0703	2.2357

Specimen Number	H572	H581	H522	H531	H532	H552
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/21/09 9:33 AM	11/21/09 9:33 AM	11/20/09 10:05 AM	11/20/09 10:05 AM	11/20/09 10:05 AM	11/21/09 9:41 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	14.4857	12.8110	15.2437	14.2250	15.0513	14.1997
100	11.0470	9.8613	11.6893	11.0027	11.4883	10.8400
200	8.3250	7.4143	8.8487	8.2893	8.6577	8.1870
300	6.6187	5.8260	7.0940	6.6353	6.9893	6.4947
400	5.3937	4.7020	5.8507	5.4387	5.7283	5.2663
500	4.5587	4.0000	4.9257	4.6260	4.8500	4.4383
600	4.0567	3.5503	4.3957	4.0523	4.2330	3.8883
700	3.6507	3.2517	3.9163	3.6700	3.8667	3.4537
800	3.3237	2.9507	3.5930	3.3593	3.6040	3.2320
900	3.0220	2.7777	3.2693	3.0997	3.2747	2.9850
1000	2.9167	2.7043	2.9897	2.9177	3.0173	2.7793

Specimen Number	H561	H562	H542	H551	H541	H592
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/21/09 9:41 AM	11/21/09 9:41 AM	11/20/09 10:12 AM	11/20/09 10:12 AM	11/20/09 10:12 AM	2/1/10 8:36 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	13.1107	13.7073	14.4053	14.0120	12.8660	15.8183
100	10.1310	10.3997	10.9403	10.6320	9.8660	12.0923
200	7.6743	7.8880	8.2800	8.0567	7.4523	9.1447
300	6.0513	6.2197	6.6223	6.3807	5.8890	7.2920
400	4.9300	5.0470	5.3773	5.2417	4.7497	6.0113
500	4.1927	4.2813	4.5050	4.4470	4.0340	5.1370
600	3.7113	3.7680	3.9810	3.9603	3.5980	4.4877
700	3.3743	3.4237	3.5963	3.5660	3.3023	3.9907
800	3.0853	3.1533	3.2737	3.3173	2.9697	3.6077
900	2.8217	2.9630	3.0593	3.0967	2.6880	3.2523
1000	2.6040	2.7750	2.8913	2.9463	2.5787	2.9033

Specimen Number	H601	H602	H582	H591
Measured By	41169	41169	41169	41169
Measured Date	2/1/10 8:36 AM	2/1/10 8:36 AM	2/1/10 8:46 AM	2/1/10 8:46 AM
Diffusivity (mm ² /sec)				
Temperature °C				
25	13.5137	13.9287	15.1903	14.0010
100	10.4193	10.6100	11.6783	10.6783
200	7.8783	8.0177	8.7910	8.0697
300	6.2417	6.3587	7.0627	6.4070
400	5.0827	5.1637	5.8943	5.2423
500	4.2930	4.3663	4.9677	4.4757
600	3.8033	3.8197	4.3970	3.9520
700	3.4667	3.5013	4.0320	3.5897
800	3.1727	3.2287	3.7150	3.2597
900	2.8643	2.8693	3.3770	3.0480
1000	2.7443	2.8570	3.1107	2.8240

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	H591		6.321	6.321	6.323	6.324	12.718	12.719	1.12866
	H581		6.323	6.325	6.323	6.323	12.720	12.720	1.13059
	H582		6.322	6.323	6.324	6.322	12.715	12.714	1.16811
	H562		6.325	6.326	6.324	6.322	12.719	12.719	1.17291
	H571		6.324	6.324	6.323	6.322	12.717	12.719	1.13185
	H572		6.322	6.324	6.323	6.321	12.720	12.720	1.17109
	H482		6.325	6.321	6.324	6.324	12.718	12.719	1.13163
	H472		6.323	6.324	6.324	6.322	12.727	12.727	1.13648
	H491		6.324	6.324	6.326	6.325	12.721	12.722	1.20487
	H521		6.338	6.338	6.338	6.338	12.718	12.719	1.20252
	H512		6.336	6.336	6.337	6.335	12.726	12.725	1.13774

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
H591	47735	12/2/2010 15:46	6.32225	12.71850	127.0462	0.006322	0.01272
H581	41169	12/3/2010 9:13	6.32350	12.72000	127.0762	0.006324	0.01272
H582	41169	12/3/2010 13:32	6.32275	12.71450	126.9663	0.006323	0.01271
H562	41169	12/4/2010 7:46	6.32425	12.71900	127.0562	0.006324	0.01272
H571	41169	12/4/2010 10:31	6.32325	12.71800	127.0362	0.006323	0.01272
H572	41169	12/4/2010 13:54	6.32250	12.72000	127.0762	0.006323	0.01272
H482	41169	12/6/2010 10:54	6.32350	12.71850	127.0462	0.006324	0.01272
H472	41169	12/6/2010 11:06	6.32325	12.72700	127.2161	0.006323	0.01273
H491	41169	12/6/2010 13:59	6.32475	12.72150	127.1061	0.006325	0.01272
H521	41169	12/7/2010 9:43	6.33800	12.71850	127.0462	0.006338	0.01272
H512	41169	12/7/2010 9:47	6.33600	12.72550	127.1861	0.006336	0.01273

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
H591	0.0011	25.2	22.8	17.8
H581	0.0011	25.2	23.1	20.8
H582	0.0012	25.3	22.6	20
H562	0.0012	25.4	22.3	13.1
H571	0.0011	25.4	22.1	12.9
H572	0.0012	25.4	22.5	14.3
H482	0.0011	25.3	22.8	18.2
H472	0.0011	25.3	22.8	18.7
H491	0.0012	25.3	23	21.1
H521	0.0012	25.6	22.7	21.7
H512	0.0011	25.6	23	21.3

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity
and Temperature Transmitter Model PTU301

Graphite Grade: BAN
Graphite Manufacturer: Graftech International
Forming Process: Extruded
Coke Particle Size: Medium grain
Coke Type: Petroleum (needle) coke
ASTM Class: ENHP
Specimen Geometry: Cylinder

Specimen ID #'s:

RW1 01
RW1 02
RW1 03
RW1 04
RW1 05
RW1 06
RW1 07
RW1 08
RW1 09
RW1 10
RW2 01
RW2 02
RW2 03
RW2 04
RW2 05
RW2 06
RW2 07
RW2 08
RW2 09
RW2 10
RW4 01
RW4 02
RW4 03
RW4 04
RW4 05
RW4 06
RW4 07
RW4 08
RW4 09
RW4 10
RW5 01
RW5 02
RW5 03
RW5 04
RW5 05
RW5 06
RW5 07
RW5 08
RW5 09
RW5 10
RW6 01
RW6 02

Specimen ID #'s:

RW6 03

RW6 04

RW6 05

RW6 06

RW6 07

RW6 08

RW6 09

RW6 10

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	RW5 10	W	6.332	6.335	6.336	6.322	12.724	12.722	1.46423
	RW2 04	W	6.332	6.332	6.330	6.328	12.718	12.718	1.47120
	RW2 09	W	6.327	6.328	6.331	6.327	12.716	12.714	1.46864
	RW2 03	W	6.333	6.331	6.333	6.332	12.717	12.715	1.46824
	RW2 06	W	6.329	6.327	6.328	6.328	12.713	12.714	1.46783
	RW2 08	W	6.330	6.328	6.329	6.328	12.715	12.712	1.46805
	RW1 10	W	6.329	6.329	6.328	6.328	12.718	12.719	1.46995
	RW1 08	W	6.329	6.330	6.329	6.328	12.719	12.720	1.47333
	RW1 05	W	6.328	6.329	6.328	6.328	12.721	12.720	1.47255
	RW1 07	W	6.330	6.329	6.329	6.330	12.719	12.722	1.47141
	RW1 01	W	6.295	6.297	6.298	6.298	12.731	12.733	1.46995
	RW2 07	W	6.330	6.329	6.330	6.329	12.715	12.716	1.46679
	RW2 02	W	6.329	6.330	6.331	6.330	12.718	12.716	1.47143
	RW2 01	W	6.334	6.333	6.333	6.333	12.713	12.715	1.46756
	RW1 02	W	6.313	6.313	6.311	6.312	12.724	12.722	1.47142
	RW1 03	W	6.344	6.343	6.343	6.339	12.719	12.721	1.47719
	RW1 04	W	6.342	6.343	6.343	6.343	12.720	12.719	1.47648
	RW1 09	W	6.332	6.329	6.330	6.332	12.719	12.718	1.47208
	RW2 10	W	6.329	6.329	6.327	6.328	12.713	12.715	1.47052
	RW1 06	W	6.329	6.330	6.330	6.327	12.718	12.719	1.47196
	RW6 10	W	6.326	6.334	6.337	6.327	12.724	12.725	1.46335
	RW6 09	W	6.324	6.334	6.337	6.332	12.724	12.725	1.46114
	RW6 08	W	6.333	6.338	6.328	6.336	12.727	12.724	1.47096
	RW6 07	W	6.326	6.327	6.328	6.331	12.727	12.726	1.46721
	RW6 06	W	6.325	6.335	6.336	6.325	12.725	12.726	1.4726
	RW6 05	W	6.326	6.337	6.328	6.338	12.728	12.727	1.47576
	RW6 01	W	6.325	6.334	6.323	6.326	12.724	12.725	1.49433
	RW6 04	W	6.329	6.332	6.327	6.33	12.721	12.724	1.47825
	RW6 02	W	6.323	6.326	6.323	6.333	12.724	12.725	1.48789
	RW6 03	W	6.33	6.325	6.334	6.327	12.72	12.722	1.47135
	RW5 01	W	6.328	6.331	6.327	6.329	12.724	12.723	1.49683
	RW5 02	W	6.329	6.332	6.333	6.331	12.722	12.723	1.4872
	RW5 03	W	6.324	6.325	6.33	6.325	12.722	12.724	1.48112

Specimen Type	Specimen Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm		Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	RW5 04	W	6.329	6.335	6.322	6.328	12.72	12.723	1.47918
	RW5 05	W	6.335	6.328	6.328	6.335	12.725	12.723	1.47438
	RW5 06	W	6.335	6.332	6.332	6.333	12.721	12.724	1.47564
	RW5 07	W	6.33	6.329	6.333	6.33	12.722	12.726	1.4715
	RW5 08	W	6.327	6.331	6.329	6.333	12.723	12.725	1.47075
	RW5 09	W	6.332	6.338	6.333	6.334	12.725	12.726	1.46036
	RW4 01	W	6.337	6.338	6.341	6.341	12.74	12.739	1.50535
	RW4 02	W	6.316	6.309	6.315	6.306	12.711	12.709	1.48476
	RW4 03	W	6.313	6.32	6.315	6.314	12.716	12.714	1.4826
	RW4 04	W	6.325	6.328	6.332	6.329	12.728	12.727	1.48364
	RW4 05	W	6.327	6.335	6.338	6.333	12.72	12.723	1.48404
	RW4 06	W	6.338	6.333	6.335	6.332	12.726	12.724	1.48409
	RW4 07	W	6.337	6.334	6.33	6.336	12.72	12.722	1.48249
	RW4 08	W	6.332	6.329	6.336	6.333	12.72	12.723	1.48046
	RW4 09	W	6.332	6.325	6.33	6.331	12.723	12.722	1.48126
	RW4 10	W	6.329	6.329	6.333	6.331	12.721	12.723	1.47953

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Specimen Mass kg	Specimen Density kg/m ³
RW5 10	41169	6/23/2010 8:48	6.33125	12.72300	127.1361	0.006331	0.01272	0.0015	1819.07624
RW2 04	ji	8/7/2009 8:52	6.33050	12.71800	127.0362	0.006331	0.01272	0.0015	1829.38949
RW2 09	ji	8/7/2009 8:54	6.32825	12.71500	126.9763	0.006328	0.01272	0.0015	1827.71769
RW2 03	ji	8/7/2009 8:55	6.33225	12.71600	126.9963	0.006332	0.01272	0.0015	1825.77846
RW2 06	ji	8/7/2009 9:01	6.32800	12.71350	126.9463	0.006328	0.01271	0.0015	1827.21290
RW2 08	ji	8/7/2009 9:13	6.32875	12.71350	126.9463	0.006329	0.01271	0.0015	1827.27020
RW1 10	ji	8/7/2009 9:14	6.32850	12.71850	127.0462	0.006329	0.01272	0.0015	1828.26905
RW1 08	ji	8/7/2009 9:16	6.32900	12.71950	127.0662	0.006329	0.01272	0.0015	1832.04010
RW1 05	ji	8/7/2009 9:17	6.32825	12.72050	127.0862	0.006328	0.01272	0.0015	1830.99929
RW1 07	ji	8/7/2009 9:19	6.32950	12.72050	127.0862	0.006330	0.01272	0.0015	1829.22047
RW1 01	ji	8/7/2009 9:20	6.29700	12.73200	127.3160	0.006297	0.01273	0.0015	1833.52032
RW2 07	ji	8/7/2009 9:22	6.32950	12.71550	126.9863	0.006330	0.01272	0.0015	1824.91134
RW2 02	ji	8/7/2009 9:23	6.33000	12.71700	127.0162	0.006330	0.01272	0.0015	1830.10780
RW2 01	ji	8/7/2009 9:24	6.33325	12.71400	126.9563	0.006333	0.01271	0.0015	1825.21882
RW1 02	ji	8/7/2009 9:26	6.31225	12.72300	127.1361	0.006312	0.01272	0.0015	1833.51103
RW1 03	ji	8/7/2009 9:28	6.34225	12.72000	127.0762	0.006342	0.01272	0.0015	1832.85833
RW1 04	ji	8/7/2009 9:30	6.34275	12.71950	127.0662	0.006343	0.01272	0.0015	1831.97699
RW1 09	ji	8/7/2009 9:31	6.33075	12.71850	127.0462	0.006331	0.01272	0.0015	1830.26754
RW2 10	ji	8/7/2009 9:32	6.32825	12.71400	126.9563	0.006328	0.01271	0.0015	1830.34523
RW1 06	ji	8/7/2009 9:34	6.32900	12.71850	127.0462	0.006329	0.01272	0.0015	1830.62438
RW6 10	41169	6/22/2010 13:46	6.33100	12.72450	127.1661	0.006331	0.01272	0.0015	1817.62616
RW6 09	41169	6/22/2010 13:50	6.33175	12.72450	127.1661	0.006332	0.01272	0.0015	1814.66615
RW6 08	41169	6/22/2010 13:53	6.33375	12.72550	127.1861	0.006334	0.01273	0.0015	1825.99824
RW6 07	41169	6/22/2010 13:55	6.32800	12.72650	127.2061	0.006328	0.01273	0.0015	1822.71162
RW6 06	41169	6/22/2010 13:56	6.33025	12.72550	127.1861	0.006330	0.01273	0.0015	1829.04480
RW6 05	41169	6/22/2010 13:58	6.33225	12.72750	127.2261	0.006332	0.01273	0.0015	1831.81491
RW6 01	41169	6/23/2010 7:42	6.32700	12.72450	127.1661	0.006327	0.01272	0.0015	1857.27985
RW6 04	41169	6/23/2010 10:56	6.32950	12.72250	127.1261	0.006330	0.01272	0.0015	1837.14605
RW6 02	41169	6/23/2010 11:01	6.32625	12.72450	127.1661	0.006326	0.01272	0.0015	1849.49491
RW6 03	41169	6/23/2010 11:19	6.32900	12.72100	127.0961	0.006329	0.01272	0.0015	1829.14659
RW5 01	41169	6/23/2010 11:28	6.32875	12.72350	127.1461	0.006329	0.01272	0.0015	1860.16500
RW5 02	41169	6/23/2010 11:30	6.33125	12.72250	127.1261	0.006331	0.01272	0.0015	1847.75810
RW5 03	41169	6/23/2010 13:09	6.32600	12.72300	127.1361	0.006326	0.01272	0.0015	1841.58650

Specimen ID Number	Measurements by:	Date:	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m	Specimen Mass kg	Specimen Density kg/m ³
RW5 04	41169	6/23/2010 13:11	6.32850	12.72150	127.1061	0.006329	0.01272	0.0015	1838.88138
RW5 05	41169	6/23/2010 13:13	6.33150	12.72400	127.1561	0.006332	0.01272	0.0015	1831.32582
RW5 06	41169	6/23/2010 13:14	6.33300	12.72250	127.1261	0.006333	0.01272	0.0015	1832.88886
RW5 07	41169	6/23/2010 13:16	6.33050	12.72400	127.1561	0.006331	0.01272	0.0015	1828.03729
RW5 08	41169	6/23/2010 13:17	6.33000	12.72400	127.1561	0.006330	0.01272	0.0015	1827.24989
RW5 09	41169	6/23/2010 13:19	6.33425	12.72550	127.1861	0.006334	0.01273	0.0015	1812.69667
RW4 01	41169	6/25/2010 7:52	6.33925	12.73950	127.4661	0.006339	0.01274	0.0015	1862.96613
RW4 02	41169	6/25/2010 8:02	6.31150	12.71000	126.8764	0.006312	0.01271	0.0015	1854.14071
RW4 03	41169	6/25/2010 8:05	6.31550	12.71500	126.9763	0.006316	0.01272	0.0015	1848.81581
RW4 04	41169	6/25/2010 8:07	6.32850	12.72750	127.2261	0.006329	0.01273	0.0015	1842.68736
RW4 05	41169	6/25/2010 8:09	6.33325	12.72150	127.1061	0.006333	0.01272	0.0015	1843.53951
RW4 06	41169	6/25/2010 8:11	6.33450	12.72500	127.1761	0.006335	0.01273	0.0015	1842.22400
RW4 07	41169	6/25/2010 8:13	6.33425	12.72100	127.0961	0.006334	0.01272	0.0015	1841.46804
RW4 08	41169	6/25/2010 8:14	6.33250	12.72150	127.1061	0.006333	0.01272	0.0015	1839.31009
RW4 09	41169	6/25/2010 8:17	6.32950	12.72250	127.1261	0.006330	0.01272	0.0015	1840.88683
RW4 10	41169	6/25/2010 8:18	6.33050	12.72200	127.1161	0.006331	0.01272	0.0015	1838.59087

Specimen ID Number	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %	Instruments:Sartorius Balance Model ME 235P, Mitutoyo Micrometer Model 121-155, Mitutoyo Caliper Model CD-6" CSX, Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301
RW5 10	1.8191	25.5	22.2	33.8	Comments sample has pits on one side, grain structure is not consistent
RW2 04	1.8294	25.2	24.1	29.7	
RW2 09	1.8277	25.2	24.1	29.8	
RW2 03	1.8258	25.2	24.1	29.7	
RW2 06	1.8272	25.2	24.1	29.9	
RW2 08	1.8273	25.2	24.2	29.8	
RW1 10	1.8283	25.2	24.2	29.9	
RW1 08	1.8320	25.2	24.2	29.7	
RW1 05	1.8310	25.2	24.1	29.9	
RW1 07	1.8292	25.2	24.2	29.9	
RW1 01	1.8335	25.2	24.2	29.8	
RW2 07	1.8249	25.2	24.2	29.9	
RW2 02	1.8301	25.2	24.2	29.7	
RW2 01	1.8252	25.2	24.2	29.7	
RW1 02	1.8335	25.2	24.3	29.7	
RW1 03	1.8329	25.2	24.3	29.6	
RW1 04	1.8320	25.2	24.3	29.8	
RW1 09	1.8303	25.2	24.3	29.9	
RW2 10	1.8303	25.2	24.2	30	
RW1 06	1.8306	25.2	24.2	30	
RW6 10	1.8176	25.4	22.8	30.8	
RW6 09	1.8147	25.4	22.8	30.7	
RW6 08	1.8260	25.4	22.8	30.7	
RW6 07	1.8227	25.4	22.9	30.7	
RW6 06	1.8290	25.4	22.9	30.6	
RW6 05	1.8318	25.4	22.9	30.4	
RW6 01	1.8573	25.4	22	31.8	
RW6 04	1.8371	25.4	22.2	32.2	
RW6 02	1.8495	25.4	22	32.1	
RW6 03	1.8291	25.4	21.7	33	
RW5 01	1.8602	25.4	22.8	30.7	
RW5 02	1.8478	25.4	22.5	31.1	
RW5 03	1.8416	25.4	22.1	28.5	

sample has a fracture on side

Specimen ID Number	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %	Instruments:Sartorius Balance Model ME 235P, Mitutoyo Micrometer Model 121-155, Mitutoyo Caliper Model CD-6" CSX, Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301
RW5 04	1.8389	25.4	22.2	28.2	
RW5 05	1.8313	25.4	22.2	28.2	
RW5 06	1.8329	25.4	22.2	28.4	
RW5 07	1.8280	25.4	22.2	28.2	
RW5 08	1.8272	25.4	22.2	28.1	
RW5 09	1.8127	25.4	22.3	28.1	
RW4 01	1.8630	25.2	24.2	32.2	
RW4 02	1.8541	25.2	24.3	32.1	
RW4 03	1.8488	25.2	24.3	31.9	
RW4 04	1.8427	25.2	24.3	32	
RW4 05	1.8435	25.2	24.3	32	
RW4 06	1.8422	25.2	24.4	32	
RW4 07	1.8415	25.2	24.3	32	
RW4 08	1.8393	25.2	24.4	31.9	
RW4 09	1.8409	25.2	24.4	32.2	
RW4 10	1.8386	25.2	24.4	31.9	

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
RW1 05		41169	11/22/2009 10:10	26.300	0.200	140.204	139.479	141.710
				100.100	0.200	100.483	100.458	100.465
				199.200	0.100	69.969	70.159	70.080
				300.600	0.400	52.485	52.716	52.698
				401.100	0.500	41.940	42.080	42.138
				501.700	0.500	35.315	35.484	35.374
				600.900	0.300	30.610	30.473	30.420
				699.900	0.200	26.925	26.883	26.937
				799.500	0.100	24.229	24.249	24.169
				899.400	0.100	21.985	22.032	22.137
RW1 06		41169	11/22/2009 10:10	999.300	0.000	20.045	20.184	20.159
				25.400	0.200	140.539	139.359	140.386
				100.100	0.200	100.140	100.710	100.816
				199.200	0.000	70.334	70.063	70.189
				299.700	0.200	52.685	52.710	52.721
				399.900	0.200	42.221	42.404	42.156
				500.400	0.300	35.373	35.446	35.396
				600.100	0.200	30.591	30.663	30.678
				699.700	0.100	26.931	26.918	26.995
				799.500	0.100	24.143	24.249	24.225
RW1 07		41169	11/22/2009 10:10	899.500	0.100	22.022	22.006	22.075
				999.500	0.100	20.199	20.355	20.248
				24.600	0.200	139.461	140.102	139.839
				99.500	0.200	99.303	100.054	100.310
				199.100	0.000	69.583	69.544	69.559
				299.300	0.000	52.434	52.384	52.415
				399.400	0.100	41.761	42.104	41.948
				499.700	0.200	34.976	35.104	35.072
				599.500	0.100	30.271	30.304	30.267
				699.300	0.100	26.723	26.832	26.784
RW1 02		41169	11/22/2009 10:17	799.200	0.000	24.012	24.085	23.892
				899.200	0.000	21.961	21.814	21.761
				999.200	0.000	20.111	20.165	19.867
				26.500	0.200	137.186	138.354	139.509

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
RW1 03				101.300	0.200	99.797	99.554	100.031
				200.400	0.100	69.371	69.524	69.580
				301.600	0.200	52.172	52.306	52.129
				401.600	0.200	41.902	41.917	41.942
				501.600	0.200	35.134	35.215	34.985
				601.700	0.200	30.325	30.275	30.469
				701.600	0.300	26.693	26.704	26.663
				801.300	0.200	24.085	23.948	23.903
				900.900	0.100	22.005	21.616	21.833
				1001.000	0.100	19.966	20.051	20.016
RW1 04		41169	11/22/2009 10:17	25.700	0.200	141.738	138.053	141.183
				101.000	0.200	100.396	100.621	100.955
				200.500	0.000	70.009	70.317	70.184
				300.800	0.100	52.794	53.105	52.957
				400.800	0.100	42.484	42.535	42.314
				500.900	0.100	35.570	35.472	35.506
				601.100	0.100	30.729	30.691	30.813
				701.000	0.100	27.051	27.026	27.159
				800.900	0.100	24.330	24.387	24.448
				900.700	0.100	22.071	22.041	22.070
RW2 01				1000.800	0.100	20.518	20.375	20.370
				25.000	0.100	141.179	140.633	138.709
		41169	11/22/2009 10:17	101.000	0.100	99.982	100.090	100.601
				200.700	0.100	70.095	69.676	69.778
				300.900	0.100	52.763	52.880	52.799
				401.000	0.100	42.345	42.286	42.308
				500.900	0.100	35.430	35.387	35.434
				601.000	0.100	30.516	30.576	30.640
				700.900	0.100	27.050	26.955	27.055
				800.900	0.100	24.276	24.445	24.245
RW2 01				900.700	0.100	21.998	22.133	22.041
				1000.700	0.100	20.258	20.046	20.432
		41169	11/23/2009 8:16	26.400	0.200	137.389	137.857	137.870
				100.200	0.200	100.046	100.210	100.016

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
RW2 02		41169	11/23/2009 8:16	199.200	0.100	69.755	69.869	69.822
				300.700	0.400	52.072	52.334	52.235
				401.100	0.500	41.848	42.068	42.000
				501.700	0.500	35.181	35.159	35.259
				600.900	0.300	30.473	30.493	30.345
				700.000	0.200	26.852	26.889	27.060
				799.500	0.100	24.001	24.063	24.103
				899.400	0.100	21.880	21.889	21.831
				999.400	0.000	20.058	20.083	19.971
				25.400	0.200	138.160	139.439	140.397
RW2 03		41169	11/23/2009 8:16	100.100	0.200	99.615	99.132	99.758
				199.200	0.000	69.336	69.523	69.671
				299.600	0.100	52.232	52.439	52.296
				399.700	0.200	41.864	41.797	41.922
				500.400	0.300	34.920	35.190	35.104
				600.100	0.200	30.187	30.265	30.246
				699.700	0.100	26.799	26.690	26.719
				799.500	0.100	23.936	24.023	23.937
				899.500	0.100	21.773	21.659	21.830
				999.500	0.100	20.205	20.080	20.005
RW1 08		41169	11/23/2009 8:25	24.600	0.200	138.062	135.846	139.037
				99.500	0.200	97.887	98.844	99.192
				199.100	0.000	69.098	68.890	69.192
				299.200	0.000	52.177	52.091	51.935
				399.300	0.100	41.857	41.707	41.829
				499.600	0.200	34.904	35.067	35.061
				599.500	0.100	30.079	30.139	30.336
				699.300	0.100	26.666	26.624	26.804
				799.200	0.000	24.001	23.927	23.943
				899.200	0.000	21.796	21.844	21.748
999.100	0.000	19.990	19.967	20.057				
26.500	0.200	138.404	139.644	140.808				
101.300	0.200	100.175	99.902	100.175				
200.400	0.100	69.991	69.919	70.009				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
RW1 09		41169	11/23/2009 8:25	301.400	0.300	52.551	52.693	52.627
				401.300	0.400	42.139	42.420	42.456
				501.700	0.400	35.362	35.418	35.366
				601.100	0.200	30.509	30.658	30.495
				700.400	0.200	27.024	27.005	26.995
				799.900	0.200	24.164	24.356	24.207
				899.700	0.100	21.882	22.081	22.081
				999.500	0.100	20.231	20.245	20.730
				25.700	0.100	140.141	139.808	140.200
				101.100	0.100	99.423	99.178	99.651
RW1 10		41169	11/23/2009 8:25	200.300	0.000	69.232	69.341	69.467
				300.300	0.100	52.304	52.263	52.242
				400.300	0.100	41.905	42.045	42.046
				500.500	0.200	34.982	35.021	35.077
				600.200	0.200	30.400	30.176	30.330
				699.900	0.100	26.760	26.662	26.708
				799.500	0.100	23.989	23.918	24.016
				899.500	0.000	21.811	21.667	21.879
				999.300	0.100	20.006	20.084	20.076
				25.000	0.200	140.261	139.232	137.519
RW2 07		41169	11/24/2009 8:05	101.100	0.200	99.254	99.931	99.437
				200.500	0.100	69.172	69.383	69.518
				300.400	0.000	52.299	52.520	52.322
				400.400	0.100	42.134	42.091	42.151
				500.400	0.200	35.240	35.203	35.201
				600.100	0.100	30.414	30.498	30.402
				699.800	0.100	26.863	26.819	26.974
				799.500	0.100	24.150	24.123	24.172
				899.500	0.100	22.034	22.013	22.091
				999.200	0.100	19.990	20.104	20.322
26.400	0.200	138.772	136.362	136.905				
101.200	0.200	98.756	98.934	98.779				
200.500	0.100	69.051	69.104	68.761				
301.600	0.200	51.790	51.884	51.984				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
RW2 08		41169	11/24/2009 8:05	401.600	0.200	41.715	41.566	41.810
				501.600	0.200	34.888	34.765	34.912
				601.700	0.200	30.166	30.091	30.082
				701.800	0.200	26.661	26.548	26.659
				801.300	0.200	23.845	23.901	23.785
				900.900	0.100	21.658	21.627	21.548
				1000.900	0.100	20.308	19.875	19.943
				25.700	0.200	137.895	138.694	136.643
				100.900	0.100	98.382	98.560	98.655
				200.500	0.100	68.730	68.826	68.783
RW2 09		41169	11/24/2009 8:05	300.600	0.000	51.646	51.743	51.854
				400.700	0.000	41.532	41.736	41.629
				500.800	0.000	34.808	34.776	34.842
				600.900	0.000	30.061	30.065	29.986
				701.100	0.100	26.462	26.492	26.484
				800.800	0.100	23.811	23.955	23.984
				900.600	0.000	21.830	21.666	21.649
				1000.700	0.000	20.011	20.011	19.850
				24.900	0.100	139.090	137.273	137.095
				101.000	0.100	98.158	98.302	98.522
RW2 04		41169	11/24/2009 7:57	200.700	0.100	68.675	68.706	68.709
				300.900	0.100	51.717	51.950	51.699
				401.100	0.200	41.324	41.521	41.281
				501.000	0.100	34.511	34.819	34.701
				601.000	0.100	29.853	29.793	29.770
				701.100	0.100	26.322	26.332	26.337
				800.900	0.100	23.682	23.689	23.744
				900.800	0.100	21.393	21.682	21.464
				1000.800	0.100	19.796	19.548	19.597
				26.300	0.200	137.109	137.021	138.527
100.200	0.200	99.406	99.014	99.264				
199.200	0.100	69.489	69.711	69.233				
300.800	0.400	51.897	51.979	52.231				
401.100	0.500	41.561	41.582	41.863				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)	
RW2 05				501.700	0.600	34.900	34.905	35.004	
				600.900	0.400	30.146	30.227	30.236	
				700.100	0.400	26.552	26.661	26.721	
				799.700	0.100	24.130	23.944	23.911	
				899.400	0.100	21.690	21.738	21.732	
				999.400	0.100	19.931	20.039	19.989	
			41169	11/24/2009 7:57	25.400	0.200	138.963	138.796	139.409
					100.000	0.200	99.657	99.838	100.003
					199.100	0.000	69.574	69.768	69.892
					299.600	0.100	52.500	52.550	52.397
RW2 06				399.600	0.100	41.888	41.994	41.881	
				500.300	0.300	35.205	35.311	35.173	
				600.000	0.200	30.378	30.306	30.311	
				699.600	0.100	26.776	26.833	26.836	
				799.500	0.100	23.961	24.098	23.986	
				899.300	0.100	21.928	21.981	21.898	
				999.400	0.100	20.066	19.994	19.963	
			41169	11/24/2009 7:57	24.600	0.200	135.574	133.805	135.739
					99.500	0.200	96.750	96.933	96.365
					199.100	0.000	67.571	67.454	67.353
RW2 10				299.400	0.100	50.767	51.085	50.897	
				399.300	0.100	40.672	40.850	40.735	
				499.700	0.200	34.186	34.288	34.101	
				599.500	0.100	29.460	29.581	29.536	
				699.300	0.100	26.142	26.036	26.101	
				799.300	0.100	23.268	23.501	23.330	
				899.200	0.100	21.210	21.199	21.085	
				999.200	0.000	19.564	19.531	19.624	
			41169	1/21/2010 8:01	26.600	0.100	137.381	138.530	138.519
					100.900	0.100	98.848	98.360	98.662
				200.500	0.100	68.499	68.476	68.582	
				301.600	0.200	51.586	51.651	51.523	
				401.600	0.200	41.466	41.439	41.644	
				501.600	0.200	34.712	34.875	34.737	

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
RW6 05		41169	6/22/2010 14:30	601.600	0.200	30.081	30.164	30.242
				701.900	0.200	26.507	26.562	26.421
				801.500	0.200	23.872	23.870	23.961
				901.100	0.100	21.934	21.837	21.575
				1001.000	0.200	20.145	19.911	20.104
				26.300	0.400	137.236	139.726	140.076
				101.300	0.200	100.696	100.160	100.356
				200.300	0.100	69.632	69.930	69.869
				301.400	0.300	52.398	52.490	52.735
				401.400	0.300	42.211	42.306	42.208
RW6 06		41169	6/22/2010 14:30	501.500	0.300	35.336	35.399	35.314
				601.500	0.200	30.641	30.545	30.660
				700.900	0.200	27.037	27.050	26.892
				800.400	0.200	24.179	24.199	24.196
				900.000	0.100	22.043	22.064	22.063
				999.900	0.100	20.261	20.168	20.376
				25.200	0.200	138.847	137.806	137.784
				101.100	0.100	97.973	98.437	98.928
				200.300	0.000	68.928	68.891	68.719
				300.400	0.000	51.975	51.799	51.865
RW6 07		41169	6/22/2010 14:30	400.300	0.100	41.720	41.683	41.875
				500.400	0.100	34.922	34.931	34.895
				600.500	0.100	30.223	30.147	30.208
				700.200	0.100	26.632	26.720	26.617
				799.900	0.000	23.973	23.986	23.971
				899.600	0.000	21.841	21.804	21.766
				999.600	0.000	19.924	19.663	20.414
				24.600	0.100	135.878	136.197	135.162
				101.200	0.100	96.179	96.644	96.753
				200.500	0.100	67.436	67.569	67.493
300.600	0.100	50.768	50.847	50.761				
400.700	0.200	40.489	40.745	40.738				
500.500	0.100	34.053	34.052	34.140				
600.500	0.200	29.424	29.471	29.353				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
RW6 10		41169	7/22/2010 14:29	700.200	0.100	25.976	26.071	26.146
				800.100	0.100	23.412	23.346	23.382
				899.800	0.100	21.315	21.155	21.438
				999.700	0.100	19.269	19.445	19.407
				26.500	0.200	132.882	132.799	131.717
				100.500	0.300	95.485	95.365	95.444
				200.300	0.100	66.226	66.143	66.115
				301.500	0.300	49.710	49.881	49.825
				401.600	0.300	39.761	39.740	39.858
				501.600	0.300	33.369	33.225	33.306
RW6 08		41169	6/22/2010 14:44	601.600	0.200	28.841	28.804	28.858
				701.800	0.200	25.330	25.373	25.295
				801.200	0.200	22.690	22.869	22.716
				900.800	0.100	20.700	20.926	20.880
				1000.800	0.100	19.374	19.118	19.040
				26.600	0.100	135.603	135.871	135.590
				99.400	0.200	97.178	97.627	97.642
				199.100	0.000	67.891	67.960	67.974
				299.300	0.000	51.032	50.951	51.099
				399.400	0.100	40.758	40.892	40.802
RW6 09		41169	6/22/2010 14:44	499.500	0.100	34.096	34.304	34.260
				599.500	0.100	29.424	29.601	29.502
				699.400	0.100	25.921	25.983	25.988
				799.200	0.000	23.396	23.381	23.373
				899.100	0.000	21.113	21.368	21.232
				999.100	0.000	19.453	19.317	19.593
				27.000	0.200	132.418	131.963	133.540
				100.100	0.200	95.545	95.535	95.115
				199.200	0.000	66.913	67.205	66.989
				299.700	0.100	50.386	50.297	50.354
400.000	0.200	40.194	40.349	40.367				
500.200	0.300	33.530	33.614	33.683				
600.100	0.200	28.954	29.074	29.024				
700.000	0.200	25.586	25.632	25.652				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
RW6 04		41169	6/23/2010 11:44	799.600	0.100	23.078	23.050	22.934
				899.500	0.100	20.850	20.793	20.894
				999.600	0.100	19.133	19.379	19.298
				26.500	0.200	140.397	139.740	138.883
				101.300	0.200	100.276	100.672	100.287
				200.400	0.100	70.044	70.083	70.126
				301.400	0.300	52.461	52.736	52.797
				401.600	0.200	42.387	42.487	42.528
				501.500	0.300	35.496	35.597	35.481
				601.600	0.200	30.688	30.676	30.571
RW5 01		41169	6/23/2010 11:44	701.800	0.200	27.008	27.042	27.093
				801.200	0.300	24.268	24.176	24.335
				900.800	0.200	22.018	21.944	22.326
				1000.700	0.100	20.283	20.180	20.072
				25.700	0.100	141.761	141.777	142.056
				101.000	0.200	100.733	101.255	101.538
				200.400	0.100	70.551	70.517	70.357
				300.300	0.000	53.237	53.296	53.242
				400.700	0.000	42.726	42.644	42.717
				500.600	0.100	35.697	35.862	35.838
RW5 02		41169	6/23/2010 11:44	600.800	0.000	30.809	30.873	31.002
				701.000	0.100	27.137	27.287	27.491
				800.600	0.100	24.319	24.439	24.467
				900.300	0.000	22.230	22.160	22.295
				1000.300	0.000	20.417	20.486	20.445
				25.000	0.100	140.507	139.882	142.672
				101.100	0.100	100.982	101.314	101.507
				200.600	0.100	70.757	70.500	70.747
				300.600	0.100	53.395	53.415	53.292
				401.000	0.100	42.648	42.683	42.619
500.700	0.100	35.875	35.826	35.795				
600.900	0.100	30.779	30.875	30.820				
700.900	0.100	27.283	27.239	27.139				
800.700	0.100	24.376	24.418	24.445				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
RW6 01		41169	6/23/2010 11:32	900.500	0.100	22.333	22.181	22.252
				1000.400	0.100	20.407	20.316	20.344
				26.600	0.100	143.649	142.012	140.805
				100.400	0.200	103.427	103.203	103.467
				199.200	0.100	71.906	71.862	71.708
				300.800	0.400	53.907	53.910	54.139
				401.200	0.500	43.291	43.277	43.365
				501.700	0.500	36.163	36.246	36.230
				600.900	0.300	31.295	31.378	31.433
				700.300	0.200	27.604	27.637	27.659
RW6 02		41169	6/23/2010 11:32	799.800	0.200	24.728	24.721	24.855
				899.400	0.100	22.399	22.372	22.747
				999.300	0.100	20.487	20.615	20.565
				26.100	0.100	142.498	140.806	140.123
				100.100	0.300	101.594	102.186	101.984
				199.200	0.000	71.226	71.274	70.918
				299.700	0.100	53.353	53.404	53.393
				400.000	0.200	42.650	42.714	42.615
				500.400	0.300	35.702	35.792	35.659
				600.200	0.300	30.839	30.909	30.832
RW6 03		41169	6/23/2010 11:32	700.000	0.200	27.195	27.146	27.475
				799.700	0.100	24.478	24.366	24.550
				899.500	0.100	22.268	22.362	22.253
				999.600	0.100	20.318	20.488	20.374
				25.6	0.1	138.743	140.162	140.759
				99.4	0.2	100.18	100.491	100.401
				199.1	0	69.919	69.901	69.907
				299.2	0	52.701	52.567	52.605
				399.4	0.1	42.179	42.166	42.197
				499.6	0.1	35.277	35.247	35.243
599.5	0.1	30.446	30.516	30.362				
699.4	0.1	26.819	26.796	27.001				
799.2	0	24.076	24.052	24.204				
899.1	0	21.872	21.944	21.889				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
RW5 08		41169	6/24/2010 13:30	999.1	0	20.181	19.993	20.303
				25.9	0.1	138.97	140.744	139.187
				99.3	0.2	100.416	100.955	101.053
				199.1	0	70.105	70.015	69.996
				299.2	0	52.901	52.654	52.684
				399.4	0.1	42.194	42.212	42.362
				499.7	0.1	35.344	35.566	35.451
				599.4	0.1	30.551	30.597	30.636
				699.3	0	26.962	26.887	26.912
				799.2	0.1	24.157	24.223	24.015
RW5 07		41169	6/24/2010 13:30	899.1	0	21.828	22.043	21.932
				999.1	0	20.307	20.488	20.325
				26.4	0.1	137.478	135.939	136.523
				100.1	0.3	97.313	97.743	98.069
				199.2	0	67.907	68.015	67.911
				299.5	0.1	51.07	51.22	51.191
				400	0.2	40.664	40.645	40.866
				500.5	0.3	34.121	34.143	34.101
				600.2	0.3	29.386	29.426	29.369
				699.8	0.2	25.864	25.93	25.863
RW4 08		41169	6/26/2010 9:39	799.7	0.1	23.211	23.341	23.417
				899.5	0.1	21.195	21.267	20.993
				999.6	0.1	19.304	19.38	19.383
				26.1	1.3	143.577	143.137	142.228
				100.4	0.2	102.178	102.174	101.552
				199.1	0.1	71.047	71.326	71.294
				300.8	0.4	53.565	53.259	53.376
				401.1	0.5	42.798	42.885	43.011
				501.2	0.4	35.847	35.959	36.014
				600.8	0.3	30.964	30.951	30.89
700.1	0.4	27.381	27.228	27.44				
799.7	0.3	24.701	24.58	24.492				
899.5	0.1	22.276	22.371	22.196				
999.3	0.1	20.435	20.569	20.456				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
RW4 01		41169	6/25/2010 8:48	25.7	0.2	142.118	146.105	145.743
				99.4	0.2	104.089	104.29	104.579
				199.1	0	72.738	72.714	72.449
				299.3	0	54.493	54.55	54.479
				399.4	0.1	43.704	43.745	43.687
				499.6	0.1	36.687	36.525	36.477
				599.4	0.1	31.631	31.574	31.506
				699.4	0.1	27.926	27.892	27.82
				799.2	0.1	24.858	24.883	24.983
				899.1	0	22.598	22.736	22.671
RW5 10		41169	6/25/2010 8:48	999.1	0	20.777	20.963	20.822
				26.3	0.1	136.703	135.869	135.853
				100.1	0.2	97.941	97.738	98.089
				199.3	0	68.358	68.413	68.66
				299.7	0.1	51.448	51.379	51.424
				399.9	0.2	41.074	41.056	41.146
				500.4	0.3	34.414	34.506	34.45
				600.1	0.3	29.646	29.548	30.006
				700	0.2	26.206	26.234	26.261
				799.6	0.1	23.569	23.805	23.542
RW5 09		41169	6/25/2010 8:48	899.5	0.1	21.51	21.516	21.508
				999.5	0.1	19.814	19.816	19.807
				26.8	0.1	126.508	126.32	125.169
				100.5	0.1	91.328	90.571	90.94
				199.1	0.1	63.402	63.417	63.371
				300.9	0.4	47.492	47.456	47.704
				400.9	0.5	37.94	38.099	38.025
				501.7	0.5	31.842	31.835	31.75
				600.9	0.3	27.454	27.348	27.315
				700.4	0.2	24.19	24.101	24.283
RW4 09		41169	6/26/2010 9:39	799.8	0.3	21.882	21.695	21.761
				899.5	0.1	19.748	19.761	19.758
				999.3	0.1	18.148	18.053	18.172
				26.5	0.1	141.557	143.28	142.753

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
				100.1	0.3	102.513	102.959	103.087
				199.2	0	71.75	71.678	71.598
				299.7	0.1	53.895	53.807	53.699
				400	0.3	42.979	43.062	43.308
				500.1	0.3	36.106	36.093	36.189
				600	0.2	31.14	31.11	31.295
				699.7	0.2	27.375	27.488	27.511
				799.5	0.1	24.64	24.648	24.845
				899.5	0.1	22.477	22.554	22.489
				999.5	0.1	20.703	20.595	20.659
RW4 10		41169	6/26/2010 9:39	26.1	0.1	141.917	138.941	142.296
				99.4	0.2	102.044	102.517	102.647
				199.1	0	71.078	71.406	71.022
				299.3	0	53.456	53.463	53.579
				399.4	0.1	42.764	42.804	43.006
				499.5	0.1	35.837	35.784	36.004
				599.4	0.1	30.857	30.939	30.848
				699.3	0	27.328	27.368	27.355
				799.2	0	24.556	24.415	24.338
				899.1	0	22.234	22.146	22.269
				999.1	0	20.581	20.322	20.272
RW4 02		41169	6/25/2010 9:01	26.8	0.1	144.201	143.808	143.653
				101.3	0.2	103.097	103.167	103.057
				200.5	0.1	71.815	71.831	71.544
				301.5	0.3	53.993	54.054	54.1
				401.6	0.3	43.252	43.381	43.446
				501.6	0.2	36.284	36.297	36.414
				601.7	0.2	31.202	31.322	31.437
				701.6	0.3	27.65	27.573	27.602
				801.3	0.2	24.807	24.945	24.938
				900.9	0.1	22.655	22.549	22.568
				1000.9	0.1	20.699	20.81	20.775
RW4 03		41169	6/25/2010 9:01	26.1	0.2	143.581	145.413	139.968
				101.2	0.2	103.021	102.583	102.691

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
RW4 04		41169	6/25/2010 9:01	200.5	0	71.805	71.767	71.943
				300.7	0.1	54.281	54.219	54.126
				400.9	0.1	43.392	43.438	43.422
				501	0.1	36.518	36.425	36.563
				601	0.1	31.481	31.551	31.38
				701	0.1	27.734	27.807	27.756
				800.9	0.1	24.975	24.806	24.91
				900.7	0	22.574	22.602	22.596
				1000.7	0	20.87	20.52	20.836
				25.5	0.1	142.895	142.89	141.944
RW4 05		41169	6/26/2010 9:48	101.1	0.2	101.83	101.934	101.712
				200.7	0.1	71.121	71.103	71.263
				300.7	0.1	53.49	53.43	53.452
				401	0.1	42.79	42.744	43.045
				500.9	0.1	35.904	35.771	35.871
				601	0.1	30.791	30.944	30.76
				700.9	0.1	27.192	27.197	27.411
				800.8	0.1	24.525	24.408	24.377
				900.7	0.1	22.297	22.218	22.219
				1000.7	0.1	20.329	20.244	20.523
RW4 06		41169	6/26/2010 9:48	25.3	0.2	141.658	142.376	141.985
				100.5	0.1	101.133	102.393	101.94
				200.3	0.1	70.77	70.438	70.636
				300.3	0.1	53.25	53.13	53.374
				400.5	0.1	42.688	42.924	42.907
				500.5	0.1	35.767	35.803	35.705
				600.5	0	30.849	30.944	30.889
				700.6	0	27.297	27.362	27.309
				800.6	0	24.505	24.411	24.348
				900.6	0	22.255	22.179	22.199
1000.6	0	20.423	20.386	20.452				
26.6	0.1	139.16	139.206	139.072				
101.3	0.2	100.375	100.068	99.97				
200.5	0.1	69.746	69.778	69.769				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
RW4 07		41169	6/26/2010 9:48	301.6	0.2	52.469	52.53	52.453
				401.6	0.2	42.213	42.209	42.238
				501.6	0.2	35.229	35.424	35.229
				601.6	0.2	30.444	30.597	30.593
				701.7	0.2	26.97	27.072	27.068
				801.5	0.3	24.225	24.133	24.151
				901.3	0.2	21.92	22.042	22.018
				1001.1	0.2	20.39	20.436	20.292
				25.9	0.2	140.371	140.126	140.198
				101.6	0.2	99.931	100.554	100.569
RW5 03		41169	6/24/2010 13:16	200.7	0	70.011	70.294	70.128
				301.1	0.1	52.805	52.959	53.017
				401.3	0.2	42.307	42.383	42.485
				501.2	0.2	35.393	35.582	35.489
				601.3	0.2	30.594	30.587	30.665
				701.3	0.2	27.016	26.951	26.981
				801.1	0.2	24.221	24.177	24.003
				901	0.1	21.956	21.988	21.966
				1000.9	0.1	20.25	20.187	20.206
				26.6	0.1	141.207	140.976	141.154
RW5 04		41169	6/24/2010 13:16	101.4	0.2	101.229	101.631	100.943
				200.5	0.1	70.385	70.381	70.617
				301.6	0.2	52.988	52.884	52.862
				401.6	0.2	42.532	42.639	42.683
				501.6	0.2	35.539	35.759	35.567
				601.7	0.2	30.774	30.864	30.782
				701.8	0.1	27.241	27.165	27.174
				801.3	0.2	24.412	24.313	24.387
				901	0.1	22.042	22.045	22.173
				1000.9	0.1	20.441	20.361	20.475
RW5 04		41169	6/24/2010 13:16	25.9	0.1	141.208	140.434	141.462
				101.4	0.2	100.157	100.572	100.47
				200.7	0.1	70.111	70.291	70.128
				300.8	0.1	52.801	53.021	53.063

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
RW5 05		41169	6/24/2010 13:16	401	0.1	42.315	42.449	42.619
				501.1	0.1	35.692	35.508	35.635
				601.1	0.1	30.823	30.765	30.802
				701.3	0.2	27.099	27.022	27.147
				800.9	0.1	24.391	24.369	24.361
				900.8	0.1	22.155	22.109	22.13
				1000.7	0	20.445	20.416	20.287
				25.4	0.1	140.05	140.349	140.953
				101.1	0.2	99.495	99.861	100.326
				200.7	0	69.69	69.659	69.505
RW5 06		41169	7/1/2010 9:23	300.8	0.1	52.663	52.519	52.624
				401.1	0.1	42.205	42.087	42.164
				501	0.1	35.41	35.471	35.32
				601	0.1	30.444	30.617	30.411
				701.1	0.1	26.925	26.917	26.911
				800.9	0.1	24.146	24.052	24.162
				900.8	0.1	21.948	22.112	22.05
				1000.7	0.1	20.408	20.051	20.246
				25.9	0.6	136.215	135.117	135.65
				99.8	0.3	97.365	97.273	97.32
				198.9	0.2	67.866	67.699	67.972
				300.7	0.4	50.828	50.664	50.691
				401.2	0.5	40.58	40.709	40.755
				501.8	0.6	34.07	34.084	34.207
				601.3	0.3	29.58	29.455	29.423
				700.3	0.2	25.994	26.065	26.072
				799.8	0.1	23.462	23.46	23.348
				899.6	0.1	21.255	21.607	21.291
				999.4	0.1	19.558	19.521	19.674

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
RW1 05	140.464	1.138		6.328	InSb	12.7	100	Ar	E 1461-07
	100.469	0.013							
	70.069	0.095							
	52.633	0.128							
	42.053	0.102							
	35.391	0.086							
	30.501	0.098							
	26.915	0.028							
	24.216	0.042							
	22.051	0.078							
20.129	0.074								
RW1 06	140.095	0.642		6.328	InSb	12.7	100	Ar	E 1461-07
	100.555	0.364							
	70.195	0.136							
	52.705	0.018							
	42.260	0.129							
	35.405	0.037							
	30.644	0.047							
	26.948	0.041							
	24.206	0.056							
	22.034	0.036							
20.267	0.080								
RW1 07	139.801	0.322		6.328	InSb	12.7	100	Ar	E 1461-07
	99.889	0.523							
	69.562	0.020							
	52.411	0.025							
	41.938	0.172							
	35.051	0.067							
	30.281	0.020							
	26.780	0.055							
	23.996	0.097							
	21.845	0.104							
20.048	0.159								
RW1 02	138.350	1.162		6.328	InSb	12.7	100	Ar	E 1461-07

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
RW1 03	99.794	0.239							
	69.492	0.108							
	52.202	0.092							
	41.920	0.020							
	35.111	0.117							
	30.356	0.101							
	26.687	0.021							
	23.979	0.095							
	21.818	0.195							
	20.011	0.043							
	140.325	1.987		6.328	InSb	12.7	100	Ar	E 1461-07
	100.657	0.281							
	70.170	0.154							
52.952	0.156								
42.444	0.116								
35.516	0.050								
30.744	0.062								
27.079	0.071								
24.388	0.059								
22.061	0.017								
20.421	0.084								
RW1 04	140.174	1.297		6.328	InSb	12.7	100	Ar	E 1461-07
	100.224	0.331							
	69.850	0.219							
	52.814	0.060							
	42.313	0.030							
	35.417	0.026							
	30.577	0.062							
	27.020	0.056							
	24.322	0.108							
	22.057	0.069							
RW2 01	20.245	0.193							
	137.705	0.274		6.328	InSb	12.7	100	Ar	E 1461-07
	100.091	0.104							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
	69.815	0.057							
	52.214	0.132							
	41.972	0.113							
	35.200	0.053							
	30.437	0.080							
	26.934	0.111							
	24.056	0.051							
	21.867	0.031							
	20.037	0.059							
RW2 02	139.332	1.122		6.328	InSb	12.7	100	Ar	E 1461-07
	99.502	0.328							
	69.510	0.168							
	52.322	0.106							
	41.861	0.063							
	35.071	0.138							
	30.233	0.041							
	26.736	0.056							
	23.965	0.050							
	21.754	0.087							
	20.097	0.101							
RW2 03	137.648	1.635		6.328	InSb	12.7	100	Ar	E 1461-07
	98.641	0.676							
	69.060	0.155							
	52.068	0.123							
	41.798	0.080							
	35.011	0.092							
	30.185	0.134							
	26.698	0.094							
	23.957	0.039							
	21.796	0.048							
	20.005	0.047							
RW1 08	139.619	1.202		6.328	InSb	12.7	100	Ar	E 1461-07
	100.084	0.158							
	69.973	0.048							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
RW1 09	52.624	0.071							
	42.338	0.174							
	35.382	0.031							
	30.554	0.090							
	27.008	0.015							
	24.242	0.101							
	22.015	0.115							
	20.402	0.284							
	140.050	0.211		6.328	InSb	12.7	100	Ar	E 1461-07
	99.417	0.237							
69.347	0.118								
52.270	0.032								
41.999	0.081								
35.027	0.048								
30.302	0.115								
26.710	0.049								
23.974	0.051								
21.786	0.108								
20.055	0.043								
139.004	1.385		6.328	InSb	12.7	100	Ar	E 1461-07	
99.541	0.350								
69.358	0.174								
52.380	0.122								
42.125	0.031								
35.215	0.022								
30.438	0.052								
26.885	0.080								
24.148	0.025								
22.046	0.040								
20.139	0.169								
137.346	1.264		6.328	InSb	12.7	100	Ar	E 1461-07	
98.823	0.097								
68.972	0.185								
51.886	0.097								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
	41.697	0.123							
	34.855	0.079							
	30.113	0.046							
	26.623	0.065							
	23.844	0.058							
	21.611	0.057							
	20.042	0.233							
RW2 08	137.744	1.034		6.328	InSb	12.7	100	Ar	E 1461-07
	98.532	0.139							
	68.780	0.048							
	51.748	0.104							
	41.632	0.102							
	34.809	0.033							
	30.037	0.045							
	26.479	0.016							
	23.917	0.093							
	21.715	0.100							
	19.957	0.093							
RW2 09	137.819	1.104		6.328	InSb	12.7	100	Ar	E 1461-07
	98.327	0.183							
	68.697	0.019							
	51.789	0.140							
	41.375	0.128							
	34.677	0.155							
	29.805	0.043							
	26.330	0.008							
	23.705	0.034							
	21.513	0.151							
	19.647	0.131							
RW2 04	137.552	0.845		6.328	InSb	12.7	100	Ar	E 1461-07
	99.228	0.198							
	69.478	0.239							
	52.036	0.174							
	41.669	0.169							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
RW2 05	34.936	0.059							
	30.203	0.050							
	26.645	0.086							
	23.995	0.118							
	21.720	0.026							
	19.986	0.054							
	139.056	0.317		6.328	InSb	12.7	100	Ar	E 1461-07
	99.833	0.173							
	69.745	0.160							
	52.482	0.078							
	41.921	0.063							
	35.230	0.072							
	30.332	0.040							
	26.815	0.034							
24.015	0.073								
21.936	0.042								
20.008	0.053								
RW2 06	135.039	1.072		6.328	InSb	12.7	100	Ar	E 1461-07
	96.683	0.290							
	67.459	0.109							
	50.916	0.160							
	40.752	0.090							
	34.192	0.094							
	29.526	0.061							
	26.093	0.053							
	23.366	0.121							
	21.165	0.069							
	19.573	0.047							
	138.143	0.660		6.328	InSb	12.7	100	Ar	E 1461-07
	98.623	0.246							
	68.519	0.056							
51.587	0.064								
41.516	0.111								
34.775	0.088								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
RW6 05	30.162	0.081							
	26.497	0.071							
	23.901	0.052							
	21.782	0.186							
	20.053	0.125							
	139.013	1.549		6.328	InSb	12.7	100	Ar	E 1461-07
	100.404	0.271							
	69.810	0.157							
	52.541	0.174							
	42.242	0.056							
35.350	0.044								
30.615	0.062								
26.993	0.088								
24.191	0.011								
22.057	0.012								
20.268	0.104								
RW6 06	138.146	0.607		6.328	InSb	12.7	100	Ar	E 1461-07
	98.446	0.478							
	68.846	0.112							
	51.880	0.089							
	41.759	0.102							
	34.916	0.019							
	30.193	0.040							
	26.656	0.056							
	23.977	0.008							
	21.804	0.038							
RW6 07	20.000	0.381							
	135.746	0.530		6.328	InSb	12.7	100	Ar	E 1461-07
	96.525	0.305							
	67.499	0.067							
	50.792	0.048							
	40.657	0.146							
	34.082	0.051							
29.416	0.059								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
RW6 10	26.064	0.085		6.328	InSb	12.7	100	Ar	E 1461-07
	23.380	0.033							
	21.303	0.142							
	19.374	0.093							
	132.466	0.650							
	95.431	0.061							
	66.161	0.058							
	49.805	0.087							
	39.786	0.063							
	33.300	0.072							
28.834	0.028								
25.333	0.039								
22.758	0.097								
20.835	0.119								
19.177	0.175								
RW6 08	135.688	0.159		6.328	InSb	12.7	100	Ar	E 1461-07
	97.482	0.264							
	67.942	0.044							
	51.027	0.074							
	40.817	0.068							
	34.220	0.110							
	29.509	0.089							
	25.964	0.037							
	23.383	0.012							
	21.238	0.128							
19.454	0.138								
RW6 09	132.640	0.812		6.328	InSb	12.7	100	Ar	E 1461-07
	95.398	0.245							
	67.036	0.151							
	50.346	0.045							
	40.303	0.095							
	33.609	0.077							
	29.017	0.060							
	25.623	0.034							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
RW6 04	23.021	0.076							
	20.846	0.051							
	19.270	0.125							
	139.673	0.759		6.328	InSb	12.7	100	Ar	E 1461-07
	100.412	0.226							
	70.084	0.041							
	52.665	0.179							
	42.467	0.073							
	35.525	0.063							
	30.645	0.064							
RW5 01	27.048	0.043							
	24.260	0.080							
	22.096	0.203							
	20.178	0.106							
	141.865	0.166		6.328	InSb	12.7	100	Ar	E 1461-07
	101.175	0.408							
	70.475	0.104							
	53.258	0.033							
	42.696	0.045							
	35.799	0.089							
RW5 02	30.895	0.098							
	27.305	0.178							
	24.408	0.079							
	22.228	0.068							
	20.449	0.035							
	141.020	1.464		6.328	InSb	12.7	100	Ar	E 1461-07
	101.268	0.266							
	70.668	0.146							
	53.367	0.066							
	42.650	0.032							
35.832	0.040								
30.825	0.048								
27.220	0.074								
24.413	0.035								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
RW6 01	22.255	0.076		6.328	InSb	12.7	100	Ar	E 1461-07
	20.356	0.047							
	142.155	1.427							
	103.366	0.142							
	71.825	0.104							
	53.985	0.133							
	43.311	0.047							
	36.213	0.044							
	31.369	0.069							
	27.633	0.028							
RW6 02	24.768	0.075		6.328	InSb	12.7	100	Ar	E 1461-07
	22.506	0.209							
	20.556	0.065							
	141.142	1.223							
	101.921	0.301							
	71.139	0.193							
	53.383	0.027							
	42.660	0.050							
	35.718	0.068							
	30.860	0.043							
RW6 03	27.272	0.178		6.328	InSb	12.7	100	Ar	E 1461-07
	24.465	0.093							
	22.294	0.059							
	20.393	0.087							
	139.888	1.036							
	100.357	0.160							
	69.909	0.009							
	52.624	0.069							
	42.181	0.016							
	35.256	0.019							
30.441	0.077								
26.872	0.112								
24.111	0.082								
21.902	0.038								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
RW5 08	20.159	0.156		6.328	InSb	12.7	100	Ar	E 1461-07
	139.634	0.968							
	100.808	0.343							
	70.039	0.058							
	52.746	0.135							
	42.256	0.092							
	35.450	0.106							
	30.595	0.043							
	26.920	0.038							
	24.132	0.106							
21.934	0.108								
20.373	0.100								
RW5 07	136.647	0.777		6.328	InSb	12.7	100	Ar	E 1461-07
	97.708	0.379							
	67.944	0.061							
	51.160	0.080							
	40.725	0.122							
	34.122	0.021							
	29.394	0.029							
	25.886	0.038							
	23.323	0.104							
	21.152	0.142							
19.356	0.045								
RW4 08	142.981	0.688		6.328	InSb	12.7	100	Ar	E 1461-07
	101.968	0.360							
	71.222	0.153							
	53.400	0.154							
	42.898	0.107							
	35.940	0.085							
	30.935	0.040							
	27.350	0.109							
	24.591	0.105							
	22.281	0.088							
20.487	0.072								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
RW4 01	144.655	2.205		6.328	InSb	12.7	100	Ar	E 1461-07
	104.319	0.246							
	72.634	0.160							
	54.507	0.038							
	43.712	0.030							
	36.563	0.110							
	31.570	0.063							
	27.879	0.054							
	24.908	0.066							
	22.668	0.069							
RW5 10	20.854	0.097		6.328	InSb	12.7	100	Ar	E 1461-07
	136.142	0.486							
	97.923	0.176							
	68.477	0.161							
	51.417	0.035							
	41.092	0.048							
	34.457	0.046							
	29.733	0.241							
	26.234	0.028							
	23.639	0.145							
RW5 09	21.511	0.004		6.328	InSb	12.7	100	Ar	E 1461-07
	19.812	0.005							
	125.999	0.725							
	90.946	0.379							
	63.397	0.023							
	47.551	0.134							
	38.021	0.080							
	31.809	0.051							
	27.372	0.073							
	24.191	0.091							
RW4 09	21.779	0.095		6.328	InSb	12.7	100	Ar	E 1461-07
	19.756	0.007							
	18.124	0.063							
	142.530	0.883							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
RW4 10	102.853	0.301							
	71.675	0.076							
	53.800	0.098							
	43.116	0.171							
	36.129	0.052							
	31.182	0.099							
	27.458	0.073							
	24.711	0.116							
	22.507	0.041							
	20.652	0.054							
RW4 02	141.051	1.837		6.328	InSb	12.7	100	Ar	E 1461-07
	102.403	0.317							
	71.169	0.207							
	53.499	0.069							
	42.858	0.130							
	35.875	0.115							
	30.881	0.050							
	27.350	0.020							
	24.436	0.111							
	22.216	0.063							
RW4 03	20.392	0.166							
	143.887	0.282		6.328	InSb	12.7	100	Ar	E 1461-07
	103.107	0.056							
	71.730	0.161							
	54.049	0.054							
	43.360	0.099							
	36.332	0.072							
	31.320	0.118							
	27.608	0.039							
	24.897	0.078							
RW4 03	22.591	0.057							
	20.761	0.057							
	142.987	2.771		6.328	InSb	12.7	100	Ar	E 1461-07
	102.765	0.228							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
	71.838	0.093							
	54.209	0.078							
	43.417	0.023							
	36.502	0.070							
	31.471	0.086							
	27.766	0.037							
	24.897	0.085							
	22.591	0.015							
	20.742	0.193							
RW4 04	142.576	0.548		6.328	InSb	12.7	100	Ar	E 1461-07
	101.825	0.111							
	71.162	0.088							
	53.457	0.030							
	42.860	0.162							
	35.849	0.069							
	30.832	0.099							
	27.267	0.125							
	24.437	0.078							
	22.245	0.045							
	20.365	0.143							
RW4 05	142.006	0.359		6.328	InSb	12.7	100	Ar	E 1461-07
	101.822	0.638							
	70.615	0.167							
	53.251	0.122							
	42.840	0.132							
	35.758	0.050							
	30.894	0.048							
	27.323	0.035							
	24.421	0.079							
	22.211	0.039							
	20.420	0.033							
RW4 06	139.146	0.068		6.328	InSb	12.7	100	Ar	E 1461-07
	100.138	0.211							
	69.764	0.017							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
RW4 07	52.484	0.041							
	42.220	0.016							
	35.294	0.113							
	30.545	0.087							
	27.037	0.058							
	24.170	0.049							
	21.993	0.065							
	20.373	0.074							
	140.232	0.126		6.328	InSb	12.7	100	Ar	E 1461-07
	100.351	0.364							
	70.144	0.142							
	52.927	0.110							
	42.392	0.089							
	35.488	0.095							
30.615	0.043								
26.983	0.033								
24.134	0.115								
21.970	0.016								
20.214	0.032								
141.112	0.121		6.328	InSb	12.7	100	Ar	E 1461-07	
101.268	0.346								
70.461	0.135								
52.911	0.067								
42.618	0.078								
35.622	0.120								
30.807	0.050								
27.193	0.042								
24.371	0.051								
22.087	0.075								
20.426	0.059								
141.035	0.535		6.328	InSb	12.7	100	Ar	E 1461-07	
100.400	0.216								
70.177	0.099								
52.962	0.141								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
	42.461	0.152							
	35.612	0.094							
	30.797	0.029							
	27.089	0.063							
	24.374	0.016							
	22.131	0.023							
	20.383	0.084							
RW5 05	140.451	0.460		6.328	InSb	12.7	100	Ar	E 1461-07
	99.894	0.416							
	69.618	0.099							
	52.602	0.074							
	42.152	0.060							
	35.400	0.076							
	30.491	0.111							
	26.918	0.007							
	24.120	0.059							
	22.037	0.083							
	20.235	0.179							
RW5 06	135.661	0.549		6.328	InSb	12.7	100	Ar	E 1461-07
	97.319	0.046							
	67.846	0.138							
	50.728	0.088							
	40.681	0.091							
	34.120	0.075							
	29.486	0.083							
	26.044	0.043							
	23.423	0.065							
	21.384	0.194							
	19.584	0.080							

Specimen Number	RW1 05	RW1 06	RW1 07	RW1 02	RW1 03	RW1 04
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/22/09 10:10 AM	11/22/09 10:10 AM	11/22/09 10:10 AM	11/22/09 10:17 AM	11/22/09 10:17 AM	11/22/09 10:17 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	140.4643	140.0947	139.8007	138.3497	140.3247	140.1737
100	100.4687	100.5553	99.8890	99.7940	100.6573	100.2243
200	70.0693	70.1953	69.5620	69.4917	70.1700	69.8497
300	52.6330	52.7053	52.4110	52.2023	52.9520	52.8140
400	42.0527	42.2603	41.9377	41.9203	42.4443	42.3130
500	35.3910	35.4050	35.0507	35.1113	35.5160	35.4170
600	30.5010	30.6440	30.2807	30.3563	30.7443	30.5773
700	26.9150	26.9480	26.7797	26.6867	27.0787	27.0200
800	24.2157	24.2057	23.9963	23.9787	24.3883	24.3220
900	22.0513	22.0343	21.8453	21.8180	22.0607	22.0573
1000	20.1293	20.2673	20.0477	20.0110	20.4210	20.2453

Specimen Number	RW2 01	RW2 02	RW2 03	RW1 08	RW1 09	RW1 10
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/23/09 8:16 AM	11/23/09 8:16 AM	11/23/09 8:16 AM	11/23/09 8:25 AM	11/23/09 8:25 AM	11/23/09 8:25 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	137.7053	139.3320	137.6483	139.6187	140.0497	139.0040
100	100.0907	99.5017	98.6410	100.0840	99.4173	99.5407
200	69.8153	69.5100	69.0600	69.9730	69.3467	69.3577
300	52.2137	52.3223	52.0677	52.6237	52.2697	52.3803
400	41.9720	41.8610	41.7977	42.3383	41.9987	42.1253
500	35.1997	35.0713	35.0107	35.3820	35.0267	35.2147
600	30.4370	30.2327	30.1847	30.5540	30.3020	30.4380
700	26.9337	26.7360	26.6980	27.0080	26.7100	26.8853
800	24.0557	23.9653	23.9570	24.2423	23.9743	24.1483
900	21.8667	21.7540	21.7960	22.0147	21.7857	22.0460
1000	20.0373	20.0967	20.0047	20.4020	20.0553	20.1387

Specimen Number	RW2 07	RW2 08	RW2 09	RW2 04	RW2 05	RW2 06
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/24/09 8:05 AM	11/24/09 8:05 AM	11/24/09 8:05 AM	11/24/09 7:57 AM	11/24/09 7:57 AM	11/24/09 7:57 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	137.3463	137.7440	137.8193	137.5523	139.0560	135.0393
100	98.8230	98.5323	98.3273	99.2280	99.8327	96.6827
200	68.9720	68.7797	68.6967	69.4777	69.7447	67.4593
300	51.8860	51.7477	51.7887	52.0357	52.4823	50.9163
400	41.6970	41.6323	41.3753	41.6687	41.9210	40.7523
500	34.8550	34.8087	34.6770	34.9363	35.2297	34.1917
600	30.1130	30.0373	29.8053	30.2030	30.3317	29.5257
700	26.6227	26.4793	26.3303	26.6447	26.8150	26.0930
800	23.8437	23.9167	23.7050	23.9950	24.0150	23.3663
900	21.6110	21.7150	21.5130	21.7200	21.9357	21.1647
1000	20.0420	19.9573	19.6470	19.9863	20.0077	19.5730

Specimen Number	RW2 10	RW6 05	RW6 06	RW6 07	RW6 10	RW6 08	RW6 09
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	1/21/10 8:01 AM	6/22/10 2:30 PM	6/22/10 2:30 PM	6/22/10 2:30 PM	7/22/10 2:29 PM	6/22/10 2:44 PM	6/22/10 2:44 PM
Diffusivity (mm ² /sec)							
Temperature °C							
25	138.1433	139.0127	138.1457	135.7457	132.4660	135.6880	132.6403
100	98.6233	100.4040	98.4460	96.5253	95.4313	97.4823	95.3983
200	68.5190	69.8103	68.8460	67.4993	66.1613	67.9417	67.0357
300	51.5867	52.5410	51.8797	50.7920	49.8053	51.0273	50.3457
400	41.5163	42.2417	41.7593	40.6573	39.7863	40.8173	40.3033
500	34.7747	35.3497	34.9160	34.0817	33.3000	34.2200	33.6090
600	30.1623	30.6153	30.1927	29.4160	28.8343	29.5090	29.0173
700	26.4967	26.9930	26.6563	26.0643	25.3327	25.9640	25.6233
800	23.9010	24.1913	23.9767	23.3800	22.7583	23.3833	23.0207
900	21.7820	22.0567	21.8037	21.3027	20.8353	21.2377	20.8457
1000	20.0533	20.2683	20.0003	19.3737	19.1773	19.4543	19.2700

Specimen Number	RW6 04	RW5 01	RW5 02	RW6 01	RW6 02	RW6 03
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	6/23/10 11:44 AM	6/23/10 11:44 AM	6/23/10 11:44 AM	6/23/10 11:32 AM	6/23/10 11:32 AM	6/23/10 11:32 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	139.6733	141.8647	141.0203	142.1553	141.1423	139.8880
100	100.4117	101.1753	101.2677	103.3657	101.9213	100.3573
200	70.0843	70.4750	70.6680	71.8253	71.1393	69.9090
300	52.6647	53.2583	53.3673	53.9853	53.3833	52.6243
400	42.4673	42.6957	42.6500	43.3110	42.6597	42.1807
500	35.5247	35.7990	35.8320	36.2130	35.7177	35.2557
600	30.6450	30.8947	30.8247	31.3687	30.8600	30.4413
700	27.0477	27.3050	27.2203	27.6333	27.2720	26.8720
800	24.2597	24.4083	24.4130	24.7680	24.4647	24.1107
900	22.0960	22.2283	22.2553	22.5060	22.2943	21.9017
1000	20.1783	20.4493	20.3557	20.5557	20.3933	20.1590

Specimen Number	RW5 08	RW5 07	RW4 08	RW4 01	RW5 10	RW5 09	RW4 09
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	6/24/10 1:30 PM	6/24/10 1:30 PM	6/26/10 9:39 AM	6/25/10 8:48 AM	6/25/10 8:48 AM	6/25/10 8:48 AM	6/26/10 9:39 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	139.6337	136.6467	142.9807	144.6553	136.1417	125.9990	142.5300
100	100.8080	97.7083	101.9680	104.3193	97.9227	90.9463	102.8530
200	70.0387	67.9443	71.2223	72.6337	68.4770	63.3967	71.6753
300	52.7463	51.1603	53.4000	54.5073	51.4170	47.5507	53.8003
400	42.2560	40.7250	42.8980	43.7120	41.0920	38.0213	43.1163
500	35.4503	34.1217	35.9400	36.5630	34.4567	31.8090	36.1293
600	30.5947	29.3937	30.9350	31.5703	29.7333	27.3723	31.1817
700	26.9203	25.8857	27.3497	27.8793	26.2337	24.1913	27.4580
800	24.1317	23.3230	24.5910	24.9080	23.6387	21.7793	24.7110
900	21.9343	21.1517	22.2810	22.6683	21.5113	19.7557	22.5067
1000	20.3733	19.3557	20.4867	20.8540	19.8123	18.1243	20.6523

Specimen Number	RW4 10	RW4 02	RW4 03	RW4 04	RW4 05	RW4 06	RW4 07
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	6/26/10 9:39 AM	6/25/10 9:01 AM	6/25/10 9:01 AM	6/25/10 9:01 AM	6/26/10 9:48 AM	6/26/10 9:48 AM	6/26/10 9:48 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	141.0513	143.8873	142.9873	142.5763	142.0063	139.1460	140.2317
100	102.4027	103.1070	102.7650	101.8253	101.8220	100.1377	100.3513
200	71.1687	71.7300	71.8383	71.1623	70.6147	69.7643	70.1443
300	53.4993	54.0490	54.2087	53.4573	53.2513	52.4840	52.9270
400	42.8580	43.3597	43.4173	42.8597	42.8397	42.2200	42.3917
500	35.8750	36.3317	36.5020	35.8487	35.7583	35.2940	35.4880
600	30.8813	31.3203	31.4707	30.8317	30.8940	30.5447	30.6153
700	27.3503	27.6083	27.7657	27.2667	27.3227	27.0367	26.9827
800	24.4363	24.8967	24.8970	24.4367	24.4213	24.1697	24.1337
900	22.2163	22.5907	22.5907	22.2447	22.2110	21.9933	21.9700
1000	20.3917	20.7613	20.7420	20.3653	20.4203	20.3727	20.2143

Specimen Number	RW5 03	RW5 04	RW5 05	RW5 06
Measured By	41169	41169	41169	41169
Measured Date	6/24/10 1:16 PM	6/24/10 1:16 PM	6/24/10 1:16 PM	7/11/10 9:23 AM
Diffusivity (mm ² /sec)				
Temperature °C				
25	141.1123	141.0347	140.4507	135.6607
100	101.2677	100.3997	99.8940	97.3193
200	70.4610	70.1767	69.6180	67.8457
300	52.9113	52.9617	52.6020	50.7277
400	42.6180	42.4610	42.1520	40.6813
500	35.6217	35.6117	35.4003	34.1203
600	30.8067	30.7967	30.4907	29.4860
700	27.1933	27.0893	26.9177	26.0437
800	24.3707	24.3737	24.1200	23.4233
900	22.0867	22.1313	22.0367	21.3843
1000	20.4257	20.3827	20.2350	19.5843

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	RW4 02	W	6.317	6.311	6.315	6.312	12.711	12.711	1.48434
	RW4 04	W	6.323	6.328	6.328	6.326	12.730	12.730	1.48323
	RW4 03	W	6.315	6.315	6.315	6.316	12.722	12.721	1.48216
	RW2 09	W	6.329	6.330	6.331	6.328	12.719	12.718	1.46817
	RW2 10	W	6.330	6.329	6.328	6.327	12.721	12.718	1.46981
	RW4 01	W	6.336	6.339	6.344	6.345	12.740	12.743	1.50510
	RW1 03	W	6.343	6.343	6.343	6.344	12.723	12.723	1.47672
	RW1 05	W	6.328	6.328	6.328	6.327	12.721	12.719	1.47219
	RW1 04	W	6.343	6.341	6.342	6.343	12.721	12.720	1.47617
	RW1 02	W	6.313	6.314	6.313	6.312	12.726	12.728	1.47100
	RW1 06	W	6.327	6.329	6.329	6.330	12.721	12.725	1.47164
	RW1 07	W	6.330	6.329	6.328	6.330	12.724	12.724	1.47098
	RW1 08	W	6.330	6.329	6.330	6.328	12.720	12.723	1.47296
	RW2 02	W	6.332	6.331	6.331	6.331	12.718	12.717	1.47097
	RW1 10	W	6.328	6.329	6.329	6.328	12.722	12.722	1.46950
	RW1 09	W	6.331	6.330	6.329	6.330	12.721	12.723	1.47165
	RW2 01	W	6.333	6.334	6.333	6.334	12.717	12.718	1.46717

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
RW4 02	41169	12/2/2010 14:21	6.31375	12.71100	126.8964	0.006314	0.01271
RW4 04	47735	12/2/2010 16:13	6.32625	12.73000	127.2761	0.006326	0.01273
RW4 03	41169	12/3/2010 13:20	6.31525	12.72150	127.1061	0.006315	0.01272
RW2 09	41169	12/4/2010 8:03	6.32950	12.71850	127.0462	0.006330	0.01272
RW2 10	41169	12/4/2010 10:17	6.32850	12.71950	127.0662	0.006329	0.01272
RW4 01	41169	12/4/2010 14:05	6.34100	12.74150	127.5061	0.006341	0.01274
RW1 03	41169	12/6/2010 9:45	6.34325	12.72300	127.1361	0.006343	0.01272
RW1 05	41169	12/6/2010 9:47	6.32775	12.72000	127.0762	0.006328	0.01272
RW1 04	41169	12/6/2010 9:55	6.34225	12.72050	127.0862	0.006342	0.01272
RW1 02	41169	12/6/2010 11:09	6.31300	12.72700	127.2161	0.006313	0.01273
RW1 06	41169	12/6/2010 13:27	6.32875	12.72300	127.1361	0.006329	0.01272
RW1 07	41169	12/6/2010 13:33	6.32925	12.72400	127.1561	0.006329	0.01272
RW1 08	41169	12/6/2010 14:02	6.32925	12.72150	127.1061	0.006329	0.01272
RW2 02	41169	12/7/2010 8:22	6.33125	12.71750	127.0262	0.006331	0.01272
RW1 10	41169	12/7/2010 8:40	6.32850	12.72200	127.1161	0.006329	0.01272
RW1 09	41169	12/7/2010 9:46	6.33000	12.72200	127.1161	0.006330	0.01272
RW2 01	41169	12/7/2010 10:23	6.33350	12.71750	127.0262	0.006334	0.01272

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
RW4 02	0.0015	25.2	24	16.9
RW4 04	0.0015	25.2	22.8	17.8
RW4 03	0.0015	25.3	22.6	20.1
RW2 09	0.0015	25.4	22.2	13.2
RW2 10	0.0015	25.4	22.2	12.9
RW4 01	0.0015	25.4	22.7	14.2
RW1 03	0.0015	25.3	22.4	16.4
RW1 05	0.0015	25.3	22.3	16.4
RW1 04	0.0015	25.3	22.4	16.6
RW1 02	0.0015	25.3	22.9	18.9
RW1 06	0.0015	25.3	22.7	21.2
RW1 07	0.0015	25.3	22.8	21.2
RW1 08	0.0015	25.3	23	21.1
RW2 02	0.0015	25.6	22.4	21.8
RW1 10	0.0015	25.6	22.5	21.8
RW1 09	0.0015	25.6	22.9	21.4
RW2 01	0.0015	25.6	22.7	21.5

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity
and Temperature Transmitter Model PTU301

Graphite Grade: H-451
Graphite Manufacturer: SGL Carbon Company
Forming Process: Extruded
Coke Particle Size: Medium grain
Coke Type: Petroleum coke
ASTM Class: ENHP
Specimen Geometry: Cylinder

Specimen ID #'s:

CA11 01
CA11 02
CA11 03
CA11 04
CA11 05
CA11 06
CA11 07
CA11 08
CA11 09
CA11 10
CA11 11
CA11 12
CW14 01
CW14 02
CW14 03
CW14 04
CW14 05
CW14 06
CW14 07
CW14 08
CW14 09
CW14 10

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	CA11 01	A	6.346	6.344	6.345	6.345	12.730	12.731
	CA11 06	A	6.328	6.329	6.328	6.329	12.735	12.737
	CA11 12	A	6.328	6.332	6.329	6.328	12.731	12.735
	CW14 01	W	6.337	6.337	6.334	6.335	12.731	12.731
	CA11 03	A	6.328	6.329	6.329	6.329	12.736	12.735
	CA11 10	A	6.327	6.326	6.327	6.327	12.729	12.732
	CW14 10	W	6.325	6.326	6.325	6.326	12.732	12.732
	CA11 02	A	6.328	6.329	6.328	6.329	12.736	12.736
	CA11 08	A	6.328	6.328	6.331	6.329	12.731	12.733
	CA11 07	A	6.328	6.330	6.330	6.329	12.733	12.732
	CW14 08	W	6.326	6.328	6.325	6.327	12.730	12.732
	CW14 06	W	6.321	6.323	6.324	6.322	12.732	12.732
	CA11 11	A	6.327	6.326	6.326	6.328	12.731	12.729
	CW14 07	W	6.316	6.318	6.318	6.315	12.732	12.732
	CA11 09	A	6.327	6.329	6.322	6.330	12.733	12.734
	CA11 05	A	6.327	6.330	6.329	6.330	12.738	12.733
	CW14 04	W	6.332	6.332	6.332	6.331	12.732	12.733
	CW14 02	W	6.340	6.340	6.340	6.339	12.736	12.734
	CA11 04	A	6.329	6.328	6.328	6.327	12.736	12.737
	CW14 03	W	6.331	6.332	6.328	6.331	12.734	12.733
	CW14 05	W	6.340	6.342	6.339	6.338	12.733	12.733
	CW14 09	W	6.327	6.328	6.327	6.328	12.734	12.733

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
CA11 01	1.38026	JL	7/7/2009 10:43	6.34500	12.73050	127.2860	0.006345	0.01273
CA11 06	1.37546	JL	7/7/2009 10:45	6.32850	12.73600	127.3961	0.006329	0.01274
CA11 12	1.39060	JL	7/7/2009 10:46	6.32925	12.73300	127.3360	0.006329	0.01273
CW14 01	1.40466	JL	7/7/2009 10:49	6.33575	12.73100	127.2960	0.006336	0.01273
CA11 03	1.38378	JL	7/7/2009 10:50	6.32875	12.73550	127.3861	0.006329	0.01274
CA11 10	1.38327	JL	7/7/2009 10:52	6.32675	12.73050	127.2860	0.006327	0.01273
CW14 10	1.40927	JL	7/7/2009 10:55	6.32550	12.73200	127.3160	0.006326	0.01273
CA11 02	1.38124	JL	7/7/2009 10:57	6.32850	12.73600	127.3961	0.006329	0.01274
CA11 08	1.37685	JL	7/7/2009 10:59	6.32900	12.73200	127.3160	0.006329	0.01273
CA11 07	1.38356	JL	7/7/2009 11:01	6.32925	12.73250	127.3260	0.006329	0.01273
CW14 08	1.40761	JL	7/7/2009 11:02	6.32650	12.73100	127.2960	0.006327	0.01273
CW14 06	1.40726	JL	7/7/2009 12:12	6.32250	12.73200	127.3160	0.006323	0.01273
CA11 11	1.38057	JL	7/7/2009 12:15	6.32675	12.73000	127.2761	0.006327	0.01273
CW14 07	1.40475	JL	7/7/2009 12:17	6.31675	12.73200	127.3160	0.006317	0.01273
CA11 09	1.38465	JL	7/7/2009 12:18	6.32700	12.73350	127.3460	0.006327	0.01273
CA11 05	1.39135	JL	7/7/2009 12:20	6.32900	12.73550	127.3861	0.006329	0.01274
CW14 04	1.40855	JL	7/7/2009 12:22	6.33175	12.73250	127.3260	0.006332	0.01273
CW14 02	1.41078	JL	7/7/2009 12:24	6.33975	12.73500	127.3761	0.006340	0.01274
CA11 04	1.39171	JL	7/7/2009 12:26	6.32800	12.73650	127.4061	0.006328	0.01274
CW14 03	1.40824	JL	7/7/2009 12:28	6.33050	12.73350	127.3460	0.006331	0.01273
CW14 05	1.41057	JL	7/7/2009 12:29	6.33975	12.73300	127.3360	0.006340	0.01273
CW14 09	1.41285	JL	7/7/2009 12:31	6.32750	12.73350	127.3460	0.006328	0.01273

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
CA11 01	0.0014	1709.02522	1.7090	25.2	21.6	36.4
CA11 06	0.0014	1706.04781	1.7060	25.2	21.8	36.3
CA11 12	0.0014	1725.43505	1.7254	25.2	21.8	36.3
CW14 01	0.0014	1741.63950	1.7416	25.2	21.8	36.4
CA11 03	0.0014	1716.43447	1.7164	25.2	21.8	36.4
CA11 10	0.0014	1717.69274	1.7177	25.2	21.9	36.3
CW14 10	0.0014	1749.91198	1.7499	25.2	21.8	36.4
CA11 02	0.0014	1713.21702	1.7132	25.2	21.8	36.5
CA11 08	0.0014	1708.71012	1.7087	25.2	21.8	36.5
CA11 07	0.0014	1716.83475	1.7168	25.2	21.8	36.5
CW14 08	0.0014	1747.84901	1.7478	25.2	21.8	36.3
CW14 06	0.0014	1748.24528	1.7482	25.2	21.1	36.6
CA11 11	0.0014	1714.47466	1.7145	25.2	21.1	36.6
CW14 07	0.0014	1746.71565	1.7467	25.2	21.1	36.8
CA11 09	0.0014	1718.52838	1.7185	25.2	21.1	36.8
CA11 05	0.0014	1725.75609	1.7258	25.2	21.1	36.9
CW14 04	0.0014	1747.15429	1.7472	25.2	21.2	37
CW14 02	0.0014	1747.02605	1.7470	25.2	21.1	37
CA11 04	0.0014	1726.20431	1.7262	25.2	21.1	37.2
CW14 03	0.0014	1746.84027	1.7468	25.2	21.1	37.2
CW14 05	0.0014	1747.31478	1.7473	25.2	21.1	37.3
CW14 09	0.0014	1753.38964	1.7534	25.2	21.1	37.1

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
CA11 01		41169	11/5/2009 9:01	26.700	0.100	126.799	128.089	126.657
				101.200	0.300	91.213	90.780	90.710
				200.400	0.100	63.101	63.027	62.900
				301.600	0.200	47.243	47.259	47.374
				401.600	0.200	37.930	38.049	37.984
				501.600	0.200	31.923	31.937	31.941
				601.600	0.200	27.612	27.404	27.428
				701.700	0.200	24.272	24.329	24.287
				801.300	0.200	21.816	21.701	21.572
				900.900	0.100	19.815	19.966	19.855
CA11 02		41169	11/5/2009 9:01	1000.900	0.100	18.273	18.341	18.080
				26.100	0.100	127.915	126.624	126.443
				101.200	0.100	90.396	90.588	90.719
				200.500	0.000	63.144	62.944	63.199
				300.700	0.000	47.401	47.434	47.700
				400.900	0.100	38.184	38.132	38.167
				500.900	0.100	31.907	31.831	31.989
				600.900	0.100	27.556	27.574	27.565
				701.100	0.100	24.338	24.292	24.470
				800.900	0.100	22.059	21.995	21.731
CA11 03		41169	11/5/2009 9:01	900.700	0.000	19.839	19.726	19.818
				1000.700	0.100	18.364	18.328	18.319
				25.400	0.100	129.103	128.742	128.690
				101.100	0.200	91.549	91.319	91.946
				200.700	0.000	63.902	63.798	63.758
				300.900	0.100	48.110	48.055	48.105
				401.000	0.100	38.731	38.747	38.707
				501.000	0.100	32.331	32.360	32.210
				601.000	0.100	27.936	27.834	27.822
				701.000	0.100	24.660	24.719	24.693
CA11 06		41169	11/5/2009 8:05	800.900	0.100	22.204	22.149	22.174
				900.700	0.100	20.232	20.280	20.053
				1000.700	0.100	18.399	18.506	18.588
				25.000	0.100	129.308	129.452	129.393

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
CA11 04		41169	11/5/2009 8:05	99.600	0.200	91.835	92.355	92.598
				199.300	0.100	63.836	63.897	64.120
				299.300	0.100	48.102	48.059	47.930
				399.400	0.100	38.483	38.513	38.553
				499.700	0.200	32.218	32.123	32.176
				599.500	0.100	27.814	27.790	27.779
				699.400	0.100	24.568	24.597	24.534
				799.300	0.100	22.018	22.067	22.006
				899.200	0.000	20.088	20.125	20.082
				999.200	0.000	18.653	18.493	18.452
				26.400	0.200	126.835	125.803	126.036
				100.200	0.200	91.131	90.440	90.427
				199.200	0.100	62.910	63.098	62.950
				300.800	0.400	47.153	47.047	47.121
401.100	0.500	37.715	37.845	37.882				
501.600	0.400	31.792	31.513	31.720				
600.900	0.300	27.484	27.346	27.370				
700.100	0.200	24.248	24.185	24.248				
799.700	0.100	21.792	21.779	21.831				
899.500	0.100	19.830	19.835	19.769				
999.400	0.100	18.093	18.242	18.247				
25.700	0.100	128.829	126.789	128.475				
100.000	0.200	90.720	91.229	91.042				
199.100	0.000	63.254	63.330	63.265				
299.600	0.100	47.315	47.614	47.421				
399.600	0.100	37.996	37.958	37.884				
500.300	0.300	31.811	31.794	31.826				
600.000	0.200	27.443	27.447	27.598				
699.600	0.100	24.244	24.262	24.280				
799.500	0.100	21.811	21.796	21.835				
899.400	0.100	19.880	19.879	19.834				
999.400	0.100	18.211	18.397	18.105				
26.300	0.200	142.047	143.933	142.573				
100.100	0.200	103.250	103.318	103.279				
CA11 05		41169	11/5/2009 8:05					
CW14 04		41169	11/30/2009 7:54	26.300	0.200	142.047	143.933	142.573
				100.100	0.200	103.250	103.318	103.279

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
CW14 05		41169	11/30/2009 7:54	199.200	0.100	72.059	71.787	71.706
				300.600	0.300	53.881	53.775	53.730
				401.100	0.500	42.923	43.138	43.252
				501.700	0.400	36.078	36.071	36.163
				600.800	0.300	31.200	31.114	31.335
				699.900	0.200	27.586	27.658	27.668
				799.500	0.100	24.734	24.957	24.813
				899.400	0.100	22.662	22.578	22.511
				999.300	0.100	20.776	20.898	20.740
				25.300	0.200	143.969	144.665	143.932
				100.200	0.200	102.426	102.720	102.493
				199.300	0.100	71.475	71.701	71.486
				299.700	0.200	53.775	53.720	53.855
				399.800	0.200	43.232	43.296	43.356
				500.500	0.300	36.210	36.107	36.180
600.100	0.200	31.101	31.295	31.290				
699.700	0.200	27.534	27.682	27.720				
799.500	0.100	24.818	24.928	24.834				
899.500	0.100	22.619	22.575	22.617				
999.500	0.100	20.888	20.680	21.042				
CW14 06		41169	11/30/2009 7:54	24.500	0.200	146.608	146.667	145.674
				99.500	0.200	103.566	104.086	104.045
				199.100	0.000	71.923	72.071	71.911
				299.300	0.100	54.070	54.054	54.098
				399.300	0.100	43.167	43.263	43.408
				499.700	0.200	36.268	36.288	36.387
				599.500	0.100	31.211	31.314	31.333
				699.300	0.100	27.609	27.706	27.644
				799.200	0.000	24.819	24.711	24.710
				899.200	0.100	22.706	22.657	22.464
				999.200	0.000	20.912	20.550	20.977
				26.500	0.200	142.541	143.282	144.490
				101.200	0.300	102.258	102.289	102.165
				200.200	0.100	71.347	71.450	71.393
				CW14 01		41169	11/30/2009 8:00	199.200
300.600	0.300	53.881	53.775					53.730
401.100	0.500	42.923	43.138					43.252

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)	
CW14 02				300.500	0.200	53.604	53.828	53.873	
				401.300	0.400	43.094	43.165	43.250	
				501.400	0.300	36.168	36.230	36.135	
				600.400	0.200	31.208	31.282	31.450	
				699.900	0.100	27.693	27.683	27.774	
				799.300	0.200	24.811	24.889	24.807	
				898.800	0.000	22.795	22.743	22.628	
				998.800	0.100	20.978	20.972	20.668	
			41169	11/30/2009 8:00	25.600	0.200	143.362	139.525	142.485
					101.200	0.200	101.918	101.834	102.053
					200.300	0.100	71.324	71.026	71.146
					300.000	0.100	53.716	53.619	53.740
					400.100	0.100	43.113	43.044	43.270
					500.200	0.200	36.158	36.227	35.933
CW14 03				599.800	0.200	31.251	31.278	31.141	
				699.500	0.200	27.564	27.243	27.522	
				798.700	0.200	24.751	24.691	24.925	
				898.900	0.000	22.661	22.504	22.618	
				998.700	0.100	20.507	20.588	20.848	
			41169	11/30/2009 8:00	24.900	0.100	147.535	146.506	147.538
					100.800	0.200	104.325	104.072	104.681
					200.500	0.100	72.620	72.642	72.783
					300.000	0.100	54.947	54.953	54.999
					400.000	0.100	44.089	44.374	44.210
					499.900	0.100	37.186	37.389	37.278
					599.700	0.100	32.031	31.971	31.950
					699.200	0.100	28.290	28.216	28.229
					798.800	0.000	25.277	25.386	25.369
				898.900	0.000	23.021	23.185	23.300	
				998.700	0.100	21.280	21.064	21.379	

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
CA11 01	127.182	0.789		6.345	InSb	12.7	100	Ar	E 1461-07
	90.901	0.272							
	63.009	0.102							
	47.292	0.071							
	37.988	0.060							
	31.934	0.009							
	27.481	0.114							
	24.296	0.030							
	21.696	0.122							
	19.879	0.078							
	18.231	0.135							
CA11 02	126.994	0.803		6.345	InSb	12.7	100	Ar	E 1461-07
	90.568	0.162							
	63.096	0.134							
	47.512	0.164							
	38.161	0.027							
	31.909	0.079							
	27.565	0.009							
	24.367	0.092							
	21.928	0.174							
	19.794	0.060							
	18.337	0.024							
CA11 03	128.845	0.225		6.345	InSb	12.7	100	Ar	E 1461-07
	91.605	0.317							
	63.819	0.074							
	48.090	0.030							
	38.728	0.020							
	32.300	0.080							
	27.864	0.063							
	24.691	0.030							
	22.176	0.028							
	20.188	0.120							
	18.498	0.095							
CA11 06	129.384	0.072		6.345	InSb	12.7	100	Ar	E 1461-07

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
CA11 04	92.263	0.390							
	63.951	0.150							
	48.030	0.090							
	38.516	0.035							
	32.172	0.048							
	27.794	0.018							
	24.566	0.032							
	22.030	0.032							
	20.098	0.023							
	18.533	0.106							
	126.225	0.541		6.345	InSb	12.7	100	Ar	E 1461-07
	90.666	0.403							
	62.986	0.099							
	47.107	0.054							
37.814	0.088								
31.675	0.145								
27.400	0.074								
24.227	0.036								
21.801	0.027								
19.811	0.037								
18.194	0.088								
128.031	1.090		6.345	InSb	12.7	100	Ar	E 1461-07	
90.997	0.257								
63.283	0.041								
47.450	0.152								
37.946	0.057								
31.810	0.016								
27.496	0.088								
24.262	0.018								
21.814	0.020								
19.864	0.026								
18.238	0.148								
142.851	0.973		6.345	InSb	12.7	100	Ar	E 1461-07	
103.282	0.034								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
CW14 05	71.851	0.185							
	53.795	0.078							
	43.104	0.167							
	36.104	0.051							
	31.216	0.111							
	27.637	0.045							
	24.835	0.113							
	22.584	0.076							
	20.805	0.083							
	144.189	0.413		6.345	InSb	12.7	100	Ar	E 1461-07
	102.546	0.154							
	71.554	0.127							
	53.783	0.068							
	43.295	0.062							
36.166	0.053								
31.229	0.111								
27.645	0.098								
24.860	0.059								
22.604	0.025								
20.870	0.182								
CW14 06	146.316	0.557		6.345	InSb	12.7	100	Ar	E 1461-07
	103.899	0.289							
	71.968	0.089							
	54.074	0.022							
	43.279	0.121							
	36.314	0.064							
	31.286	0.066							
	27.653	0.049							
	24.747	0.063							
	22.609	0.128							
	20.813	0.230							
	143.438	0.984		6.345	InSb	12.7	100	Ar	E 1461-07
	102.237	0.065							
	71.397	0.052							
CW14 01									

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
CW14 02	53.768	0.144							
	43.170	0.078							
	36.178	0.048							
	31.313	0.124							
	27.717	0.050							
	24.836	0.046							
	22.722	0.085							
	20.873	0.177							
	141.791	2.011		6.345	InSb	12.7	100	Ar	E 1461-07
	101.935	0.110							
	71.165	0.150							
	53.692	0.064							
	43.142	0.116							
	36.106	0.154							
31.223	0.073								
27.443	0.174								
24.789	0.122								
22.594	0.081								
20.648	0.178								
147.193	0.595		6.345	InSb	12.7	100	Ar	E 1461-07	
104.359	0.306								
72.682	0.088								
54.966	0.028								
44.224	0.143								
37.284	0.102								
31.984	0.042								
28.245	0.040								
25.344	0.059								
23.169	0.140								
21.241	0.161								

Specimen Number	CA11 01	CA11 02	CA11 03	CA11 06	CA11 04	CA11 05
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/5/09 9:01 AM	11/5/09 9:01 AM	11/5/09 9:01 AM	11/5/09 8:05 AM	11/5/09 8:05 AM	11/5/09 8:05 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	127.1817	126.9940	128.8450	129.3843	126.2247	128.0310
100	90.9010	90.5677	91.6047	92.2627	90.6660	90.9970
200	63.0093	63.0957	63.8193	63.9510	62.9860	63.2830
300	47.2920	47.5117	48.0900	48.0303	47.1070	47.4500
400	37.9877	38.1610	38.7283	38.5163	37.8140	37.9460
500	31.9337	31.9090	32.3003	32.1723	31.6750	31.8103
600	27.4813	27.5650	27.8640	27.7943	27.4000	27.4960
700	24.2960	24.3667	24.6907	24.5663	24.2270	24.2620
800	21.6963	21.9283	22.1757	22.0303	21.8007	21.8140
900	19.8787	19.7943	20.1883	20.0983	19.8113	19.8643
1000	18.2313	18.3370	18.4977	18.5327	18.1940	18.2377

Specimen Number	CW14 04	CW14 05	CW14 06	CW14 01	CW14 02	CW14 03
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/30/09 7:54 AM	11/30/09 7:54 AM	11/30/09 7:54 AM	11/30/09 8:00 AM	11/30/09 8:00 AM	11/30/09 8:00 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	142.8510	144.1887	146.3163	143.4377	141.7907	147.1930
100	103.2823	102.5463	103.8990	102.2373	101.9350	104.3593
200	71.8507	71.5540	71.9683	71.3967	71.1653	72.6817
300	53.7953	53.7833	54.0740	53.7683	53.6917	54.9663
400	43.1043	43.2947	43.2793	43.1697	43.1423	44.2243
500	36.1040	36.1657	36.3143	36.1777	36.1060	37.2843
600	31.2163	31.2287	31.2860	31.3133	31.2233	31.9840
700	27.6373	27.6453	27.6530	27.7167	27.4430	28.2450
800	24.8347	24.8600	24.7467	24.8357	24.7890	25.3440
900	22.5837	22.6037	22.6090	22.7220	22.5943	23.1687
1000	20.8047	20.8700	20.8130	20.8727	20.6477	21.2410

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	CW14 06	W	6.318	6.320	6.319	6.320	12.739	12.733	1.40685
	CA11 02	A	6.329	6.327	6.327	6.329	12.740	12.737	1.38021
	CA11 01	A	6.347	6.345	6.346	6.347	12.731	12.730	1.37922
	CW14 03	W	6.331	6.330	6.330	6.331	12.734	12.733	1.40772
	CW14 05	W	6.339	6.340	6.336	6.339	12.737	12.735	1.41013
	CW14 04	W	6.331	6.330	6.331	6.332	12.737	12.737	1.40821

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
CW14 06	47735	12/4/2010 13:26	6.31925	12.73600	127.3961	0.006319	0.01274
CA11 02	41169	12/6/2010 11:00	6.32800	12.73850	127.4461	0.006328	0.01274
CA11 01	41169	12/6/2010 11:10	6.34625	12.73050	127.2860	0.006346	0.01273
CW14 03	41169	12/7/2010 8:45	6.33050	12.73350	127.3460	0.006331	0.01273
CW14 05	41169	12/7/2010 9:59	6.33850	12.73600	127.3961	0.006339	0.01274
CW14 04	41169	12/7/2010 10:15	6.33100	12.73700	127.4161	0.006331	0.01274

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
CW14 06	0.0014	25.4	22.1	17.1
CA11 02	0.0014	25.3	22.8	18.4
CA11 01	0.0014	25.3	22.9	18.9
CW14 03	0.0014	25.6	22.6	21.7
CW14 05	0.0014	25.6	22.9	21.3
CW14 04	0.0014	25.6	22.8	21.4

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Graphite Grade: HLM
Graphite Manufacturer: SGL Carbon Company
Forming Process: Extruded
Coke Particle Size: Medium grain
Coke Type: Petroleum coke
ASTM Class: ENHP
Specimen Geometry: Cylinder

Specimen ID #'s:

J1 01
J1 02
J1 03
J1 04
J1 05
J1 06
J1 07
J1 08
J1 09
J1 10
J1 11
J1 12
J2 01
J2 02
J2 03
J2 04
J2 05
J2 06
J2 07
J2 08
J2 09
J2 10
J2 11
J2 12
J1 SPARE
J2 SPARE

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	J2 10		6.330	6.331	6.329	6.328	12.726	12.724
	J2 07		6.323	6.324	6.324	6.324	12.733	12.734
	J1 06		6.322	6.331	6.328	6.329	12.729	12.731
	J2 03		6.328	6.329	6.330	6.329	12.724	12.723
	J1 08		6.335	6.335	6.336	6.332	12.729	12.730
	J2 06		6.319	6.321	6.321	6.320	12.743	12.745
	J1 09		6.326	6.331	6.329	6.327	12.725	12.726
	J1 04		6.325	6.331	6.335	6.330	12.728	12.725
	J1 01		6.331	6.329	6.331	6.331	12.728	12.729
	J2 02		6.328	6.328	6.324	6.326	12.709	12.708
	J2 11		6.325	6.326	6.329	6.329	12.710	12.712
	J1 07		6.332	6.331	6.335	6.336	12.730	12.729
	J2 09		6.328	6.326	6.326	6.328	12.722	12.723
	J1 12		6.329	6.331	6.330	6.331	12.726	12.729
	J2 12		6.333	6.335	6.334	6.332	12.726	12.726
	J1 10		6.328	6.331	6.334	6.330	12.728	12.726
	J2 01		6.328	6.333	6.334	6.333	12.725	12.724
	J2 04		6.326	6.325	6.325	6.326	12.727	12.726
	J2 08		6.331	6.333	6.332	6.334	12.726	12.726
	J1 02		6.334	6.335	6.335	6.331	12.731	12.731
	J1 11		6.328	6.327	6.332	6.329	12.725	12.724
	J2 05		6.321	6.325	6.324	6.324	12.720	12.721
	J1 05		6.330	6.331	6.333	6.330	12.731	12.730
	J1 03		6.330	6.332	6.332	6.330	12.728	12.730
	J1 SPARE		6.330	6.330	6.330	6.329	12.722	12.723
	J2 SPARE		6.331	6.329	6.331	6.331	12.728	12.729

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
J2 10	1.41224	jil	7/9/2009 13:31	6.32950	12.72500	127.1761	0.006330	0.01273
J2 07	1.40659	jil	7/9/2009 13:33	6.32375	12.73350	127.3460	0.006324	0.01273
J1 06	1.40955	jil	7/9/2009 13:36	6.32750	12.73000	127.2761	0.006328	0.01273
J2 03	1.41207	jil	7/9/2009 13:38	6.32900	12.72350	127.1461	0.006329	0.01272
J1 08	1.41350	jil	7/9/2009 13:41	6.33450	12.72950	127.2661	0.006335	0.01273
J2 06	1.41312	jil	7/9/2009 13:43	6.32025	12.74400	127.5562	0.006320	0.01274
J1 09	1.41103	jil	7/9/2009 13:45	6.32825	12.72550	127.1861	0.006328	0.01273
J1 04	1.41279	jil	7/9/2009 13:50	6.33025	12.72650	127.2061	0.006330	0.01273
J1 01	1.41202	jil	7/9/2009 13:53	6.33050	12.72850	127.2461	0.006331	0.01273
J2 02	1.40613	jil	7/9/2009 13:54	6.32650	12.70850	126.8465	0.006327	0.01271
J2 11	1.41218	jil	7/9/2009 13:57	6.32725	12.71100	126.8964	0.006327	0.01271
J1 07	1.41188	jil	7/9/2009 13:59	6.33350	12.72950	127.2661	0.006334	0.01273
J2 09	1.41407	jil	7/9/2009 14:17	6.32700	12.72250	127.1261	0.006327	0.01272
J1 12	1.41453	jil	7/9/2009 14:20	6.33025	12.72750	127.2261	0.006330	0.01273
J2 12	1.41188	jil	7/9/2009 14:21	6.33350	12.72600	127.1961	0.006334	0.01273
J1 10	1.41469	jil	7/9/2009 14:23	6.33075	12.72700	127.2161	0.006331	0.01273
J2 01	1.41019	jil	7/9/2009 14:25	6.33200	12.72450	127.1661	0.006332	0.01272
J2 04	1.40740	jil	7/9/2009 14:27	6.32550	12.72650	127.2061	0.006326	0.01273
J2 08	1.41471	jil	7/9/2009 14:29	6.33250	12.72600	127.1961	0.006333	0.01273
J1 02	1.40635	jil	7/9/2009 14:30	6.33375	12.73100	127.2960	0.006334	0.01273
J1 11	1.41263	jil	7/9/2009 14:33	6.32900	12.72450	127.1661	0.006329	0.01272
J2 05	1.41178	jil	7/9/2009 14:34	6.32350	12.72050	127.0862	0.006324	0.01272
J1 05	1.40860	jil	7/9/2009 14:36	6.33100	12.73050	127.2860	0.006331	0.01273
J1 03	1.41174	jil	7/9/2009 14:37	6.33100	12.72900	127.2561	0.006331	0.01273
J1 SPARE	1.41553	JL	7/22/2009 12:37	6.32975	12.72250	127.1261	0.006330	0.01272
J2 SPARE	1.40856	JL	7/22/2009 12:40	6.33050	12.72850	127.2461	0.006331	0.01273

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
J2 10	0.0014	1754.42029	1.7544	25.3	20.8	34.1
J2 07	0.0014	1746.65595	1.7467	25.3	20.9	33.8
J1 06	0.0014	1750.25628	1.7503	25.3	20.9	33.6
J2 03	0.0014	1754.76135	1.7548	25.3	21	33.2
J1 08	0.0014	1753.35921	1.7534	25.3	21	32.9
J2 06	0.0014	1752.84445	1.7528	25.3	20.9	32.4
J1 09	0.0014	1753.12558	1.7531	25.3	21	32.6
J1 04	0.0014	1754.48195	1.7545	25.3	21.1	32.2
J1 01	0.0014	1752.90548	1.7529	25.3	21.1	32.1
J2 02	0.0014	1752.19926	1.7522	25.3	21.1	32.1
J2 11	0.0014	1758.83761	1.7588	25.3	21.1	32.1
J1 07	0.0014	1751.62623	1.7516	25.3	21.9	30.6
J2 09	0.0014	1758.07854	1.7581	25.3	21.2	32.7
J1 12	0.0014	1756.36675	1.7564	25.3	21.3	32.6
J2 12	0.0014	1752.58985	1.7526	25.3	21.4	32.8
J1 10	0.0014	1756.56470	1.7566	25.3	21.3	33
J2 01	0.0014	1751.31953	1.7513	25.3	21.3	33
J2 04	0.0014	1749.10081	1.7491	25.3	21.4	32.7
J2 08	0.0014	1756.38009	1.7564	25.3	21.4	32.1
J1 02	0.0014	1744.28555	1.7443	25.3	21.4	32
J1 11	0.0014	1755.18135	1.7552	25.3	21.4	32.6
J2 05	0.0014	1756.75523	1.7568	25.3	21.5	32.6
J1 05	0.0014	1747.97238	1.7480	25.3	21.4	32.8
J1 03	0.0014	1752.28181	1.7523	25.3	21.5	32.6
J1 SPARE	0.0014	1759.12913	1.7591	25.3	22	47.3
J2 SPARE	0.0014	1748.61018	1.7486	25.3	22	47.1

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
J1 01		41169	12/1/2009 8:04	26.300	0.200	150.245	151.095	153.465
				100.200	0.200	107.755	107.432	107.268
				199.200	0.100	73.700	73.878	73.543
				300.700	0.400	54.551	54.786	54.818
				401.100	0.500	43.286	43.541	43.592
				501.700	0.500	36.061	36.211	36.099
				600.800	0.300	31.126	31.093	30.940
				700.000	0.200	27.487	27.283	27.361
				799.500	0.100	24.343	24.488	24.373
				899.400	0.100	22.151	22.247	22.129
J1 02		41169	12/1/2009 8:04	999.200	0.000	20.303	20.283	20.535
				25.400	0.200	156.129	156.405	156.970
				100.100	0.200	109.646	110.302	110.112
				199.200	0.000	75.389	75.108	75.275
				299.700	0.100	56.058	56.117	56.323
				400.000	0.300	44.605	44.595	44.692
				500.500	0.300	36.925	37.008	37.025
				600.100	0.300	31.777	31.798	31.851
				699.800	0.200	27.945	28.134	27.986
				799.500	0.100	24.978	25.036	25.204
J1 03		41169	12/1/2009 8:04	899.500	0.100	22.741	22.714	22.758
				999.500	0.100	20.832	20.824	20.808
				24.600	0.200	153.825	155.233	156.598
				99.400	0.200	109.222	109.441	109.595
				199.100	0.000	75.159	74.810	75.003
				299.200	0.100	55.627	55.757	55.774
				399.400	0.100	44.453	44.380	44.522
				499.700	0.100	36.933	36.993	37.020
				599.500	0.100	31.901	31.824	31.920
				699.300	0.100	28.084	27.985	28.103
J1 04		41169	12/1/2009 8:11	799.200	0.000	25.012	25.005	25.060
				899.200	0.000	22.811	22.770	22.805
				999.100	0.000	20.991	20.897	21.097
				26.400	0.200	155.241	155.222	155.169

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
J1 05		41169	12/1/2009 8:11	100.900	0.400	109.467	109.590	109.619
	199.800			0.100	75.078	74.762	75.172	
	301.000			0.300	55.870	55.919	55.981	
	401.300			0.400	44.607	44.713	44.568	
	501.400			0.300	37.191	37.059	37.242	
	600.500			0.200	31.950	31.959	32.099	
	700.300			0.100	28.188	28.329	28.209	
	799.800			0.100	25.353	25.273	25.392	
	899.400			0.100	23.107	23.021	23.077	
	999.000			0.100	20.887	21.067	21.154	
J1 06		41169	12/1/2009 8:11	25.700	0.200	156.353	156.922	156.843
	101.100			0.200	109.199	109.779	109.864	
	200.100			0.000	75.200	75.283	75.398	
	300.100			0.100	56.249	56.228	56.335	
	400.200			0.200	44.990	45.269	45.336	
	500.300			0.300	37.666	37.659	37.692	
	599.900			0.200	32.409	32.435	32.419	
	700.000			0.100	28.524	28.539	28.509	
	799.600			0.100	25.333	25.456	25.533	
	899.300			0.100	23.135	23.115	22.940	
J1 10		41169	12/2/2009 8:18	998.900	0.100	21.473	21.212	21.291
	25.000			0.100	156.889	158.785	156.669	
	100.800			0.200	109.337	109.558	109.569	
	200.200			0.000	74.982	74.859	74.816	
	300.100			0.100	56.002	55.942	56.164	
	400.200			0.100	44.599	44.908	44.757	
	500.000			0.200	37.284	37.230	37.312	
	599.800			0.100	32.028	32.036	31.997	
	699.800			0.100	28.213	28.183	28.377	
	799.600			0.100	25.267	25.258	25.303	
899.300	0.100	22.964	22.934	22.822				
998.800	0.100	20.951	20.899	20.856				
26.300	0.200	157.535	161.657	160.286				
100.200	0.200	112.912	112.385	112.796				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
J1 11		41169	12/2/2009 8:18	199.200	0.100	77.249	77.014	77.395
				300.700	0.300	57.152	57.384	57.310
				401.100	0.500	45.524	45.564	45.737
				501.700	0.500	37.992	38.035	38.258
				600.900	0.300	32.737	32.785	32.709
				699.900	0.200	28.812	28.866	28.854
				799.500	0.100	25.899	25.742	25.677
				899.500	0.100	23.466	23.444	23.491
				999.300	0.100	21.457	21.450	21.499
				25.400	0.200	161.959	159.498	160.000
				100.100	0.200	111.824	112.019	112.061
				199.200	0.000	76.733	76.942	77.092
299.600	0.100	57.098	57.273	57.271				
400.000	0.200	45.468	45.532	45.638				
500.400	0.300	37.817	37.879	37.980				
600.100	0.200	32.564	32.757	32.757				
699.700	0.200	28.626	28.721	28.748				
799.500	0.100	25.762	25.768	25.642				
899.500	0.100	23.347	23.381	23.391				
999.500	0.100	21.321	21.491	21.223				
24.600	0.200	162.447	157.499	163.284				
99.400	0.200	112.865	112.864	113.104				
199.100	0.000	77.562	77.629	77.434				
299.200	0.000	57.771	57.706	57.738				
399.500	0.100	45.988	45.911	45.924				
499.700	0.200	38.389	38.465	38.565				
599.500	0.100	32.954	33.135	32.990				
699.300	0.100	29.023	29.081	29.094				
799.200	0.100	26.077	26.013	26.029				
899.200	0.100	23.660	23.629	23.633				
999.200	0.000	21.957	21.631	21.752				
26.400	0.200	156.757	156.646	157.053				
100.400	0.200	109.910	110.291	109.824				
199.200	0.100	75.638	75.496	75.919				
J2 04		41169	12/3/2009 13:50	26.400	0.200	156.757	156.646	157.053
				100.400	0.200	109.910	110.291	109.824
				199.200	0.100	75.638	75.496	75.919

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
J2 05		41169	12/3/2009 13:50	300.900	0.400	56.128	56.215	56.358
				401.100	0.500	44.734	44.961	44.924
				501.700	0.500	37.386	37.551	37.367
				600.900	0.300	32.122	32.169	32.285
				700.100	0.200	28.304	28.267	28.339
				799.600	0.100	25.369	25.436	25.471
				899.400	0.100	23.236	22.963	23.092
				999.400	0.100	21.011	21.245	21.177
				25.500	0.200	162.112	162.398	159.071
				100.200	0.200	112.394	112.122	113.275
				199.200	0.100	77.349	77.345	77.506
				299.700	0.200	57.829	57.757	57.748
399.900	0.200	45.946	46.162	46.036				
500.300	0.300	38.098	38.472	38.513				
600.000	0.200	33.100	33.033	33.192				
699.600	0.100	29.153	29.127	29.385				
799.400	0.100	26.184	26.095	26.159				
899.300	0.000	23.675	23.602	23.929				
999.300	0.000	21.796	21.920	21.827				
J2 06		41169	12/3/2009 13:50	24.700	0.200	151.681	152.729	152.352
				99.400	0.200	106.633	106.247	106.540
				199.100	0.000	73.123	73.175	72.969
				299.300	0.100	54.344	54.435	54.502
				399.500	0.100	43.170	43.104	43.242
				499.700	0.200	35.934	35.928	35.935
				599.500	0.100	30.914	30.925	30.762
				699.300	0.100	27.066	27.196	27.163
				799.200	0.100	24.369	24.335	24.282
				899.200	0.100	22.199	22.051	22.080
				999.200	0.000	20.356	20.515	20.389
				25.700	0.100	163.201	161.968	162.310
101.300	0.200	113.936	113.275	113.595				
200.400	0.200	77.807	77.866	78.038				
301.500	0.300	57.901	58.007	57.981				
J2 01		41169	12/3/2009 13:54	101.300	0.200	113.936	113.275	113.595
				200.400	0.200	77.807	77.866	78.038
				301.500	0.300	57.901	58.007	57.981

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
				401.500	0.300	46.049	46.109	46.208
				501.400	0.400	38.346	38.313	38.385
				601.300	0.200	32.967	32.996	32.980
				700.900	0.200	28.920	28.893	29.046
				800.800	0.200	26.080	25.987	25.912
				900.200	0.100	23.527	23.577	23.754
				1000.000	0.100	21.650	21.774	22.274
J2 02		41169	12/3/2009 13:54	25.700	0.000	149.705	149.017	149.818
				101.200	0.100	104.487	104.525	104.828
				200.400	0.000	71.853	72.024	71.757
				300.700	0.000	53.888	53.729	53.711
				400.700	0.100	42.639	42.683	42.788
				500.600	0.100	35.662	35.592	35.573
				600.500	0.200	30.623	30.631	30.741
				700.300	0.200	27.022	27.033	27.109
				800.400	0.100	24.230	24.265	24.314
				900.100	0.100	21.879	21.943	22.253
				1000.000	0.000	20.079	20.113	19.941
J2 03		41169	12/3/2009 13:54	25.400	0.100	158.338	157.983	157.008
				101.100	0.200	110.835	111.587	111.506
				200.500	0.100	76.463	76.346	76.335
				300.700	0.100	57.100	57.006	56.959
				400.900	0.100	45.444	45.395	45.451
				500.600	0.100	37.912	37.979	37.753
				600.500	0.100	32.534	32.503	32.628
				700.200	0.000	28.665	28.646	28.585
				800.300	0.100	25.692	25.674	25.591
				900.100	0.100	23.251	23.328	23.596
				999.900	0.100	21.526	21.280	21.183
J2 07		41169	12/7/2009 7:54	26.200	0.200	149.613	150.123	150.067
				100.200	0.200	105.742	105.276	104.877
				199.200	0.100	72.040	72.491	72.316
				300.800	0.400	53.600	53.636	53.882
				401.100	0.500	42.730	42.642	42.792

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
J2 08		41169	12/7/2009 7:54	501.700	0.500	35.559	35.804	35.735
				600.900	0.400	30.848	30.540	30.838
				700.000	0.200	27.100	27.011	26.972
				799.600	0.100	24.217	24.245	24.182
				899.400	0.100	21.998	21.950	22.100
				999.400	0.100	20.274	20.021	20.093
				25.300	0.200	159.252	163.038	158.748
				100.100	0.200	112.527	112.265	112.858
				199.100	0.000	77.099	76.924	77.413
				299.600	0.100	57.579	57.519	57.299
J2 09		41169	12/7/2009 7:54	399.900	0.200	45.616	45.624	45.750
				500.400	0.300	37.944	38.101	38.152
				600.000	0.200	32.734	32.683	32.658
				699.600	0.100	28.796	28.797	28.878
				799.400	0.100	25.755	25.783	25.877
				899.400	0.100	23.367	23.322	23.381
				999.400	0.100	21.310	21.426	21.431
				24.400	0.200	161.831	159.664	160.425
				99.500	0.200	113.505	113.753	113.161
				199.100	0.000	77.850	78.288	77.956
J2 10		41169	12/7/2009 7:59	299.300	0.100	58.208	58.123	58.283
				399.500	0.100	46.503	46.586	46.637
				499.700	0.200	38.564	38.890	38.920
				599.500	0.100	33.340	33.327	33.337
				699.300	0.100	29.364	29.344	29.296
				799.200	0.100	26.262	26.292	26.300
				899.200	0.000	23.719	23.950	23.920
				999.200	0.000	21.969	21.970	21.733
				26.400	0.200	155.554	156.914	156.226
				101.200	0.300	109.539	109.931	108.977
				200.500	0.100	75.281	75.456	75.002
				301.400	0.400	56.084	56.210	56.197
				401.300	0.400	44.715	44.951	44.909
				501.500	0.400	37.479	37.468	37.441

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
J2 11		41169	12/7/2009 7:59	600.600	0.200	32.150	32.278	32.247
				700.000	0.100	28.283	28.425	28.318
				799.300	0.200	25.313	25.426	25.298
				898.900	0.000	22.805	23.146	23.021
				999.600	0.000	21.409	21.439	21.342
				25.600	0.200	156.414	155.995	156.100
				101.300	0.200	109.208	109.153	109.134
				200.500	0.000	75.203	74.766	75.251
				300.400	0.100	56.164	56.178	56.351
				400.200	0.200	44.820	44.887	45.034
J2 12		41169	12/7/2009 7:59	500.400	0.200	37.427	37.420	37.385
				599.900	0.200	32.333	32.120	32.309
				699.600	0.100	28.415	28.432	28.366
				799.100	0.100	25.425	25.291	25.500
				899.000	0.000	23.032	23.107	23.112
				999.500	0.100	21.269	21.071	21.136
				24.900	0.100	159.643	159.754	158.615
				101.100	0.200	110.916	111.029	111.423
				200.600	0.000	76.423	76.404	76.453
				300.400	0.000	57.067	57.119	57.224
J1 SPARE		41169	12/8/2009 8:29	400.200	0.200	45.633	45.577	45.621
				500.100	0.200	37.908	37.953	38.044
				599.700	0.100	32.718	32.656	32.736
				699.500	0.100	28.789	28.771	28.828
				799.000	0.100	25.980	25.750	25.884
				899.200	0.000	23.494	23.413	23.288
				999.500	0.100	21.416	21.205	21.518
				25.300	0.200	155.711	155.842	160.703
				100.000	0.200	111.003	111.637	111.132
				199.200	0.000	76.416	76.456	76.612
299.600	0.100	56.908	56.845	56.925				
399.900	0.200	45.235	45.449	45.249				
500.300	0.300	37.772	37.792	37.724				
599.900	0.200	32.460	32.378	32.460				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
J2 SPARE		41169	12/8/2009 8:29	699.600	0.100	28.495	28.468	28.577
				799.400	0.100	25.699	25.641	25.662
				899.400	0.100	23.130	23.379	23.209
				999.400	0.100	21.382	21.336	21.362
				24.500	0.200	152.839	153.562	153.302
				99.500	0.200	107.796	107.910	108.507
				199.100	0.000	74.351	74.247	74.098
				299.300	0.100	55.326	55.274	55.346
				399.500	0.100	43.965	43.980	44.036
				499.700	0.200	36.594	36.631	36.710
J1 07		41169	12/2/2009 8:08	599.500	0.100	31.399	31.705	31.500
				699.300	0.100	27.725	27.782	27.762
				799.200	0.100	24.843	24.853	24.975
				899.100	0.000	22.498	22.648	22.642
				999.100	0.000	20.741	20.837	20.861
				26.400	0.200	148.751	149.949	149.651
				101.300	0.200	105.527	104.892	105.091
				200.400	0.100	72.370	72.116	72.236
				301.300	0.300	53.780	53.815	53.761
				401.300	0.400	42.910	43.108	43.079
J1 08		41169	12/2/2009 8:08	501.600	0.400	35.795	35.796	36.004
				600.500	0.200	30.799	30.820	30.859
				700.000	0.200	27.213	27.148	27.246
				800.500	0.200	24.391	24.185	24.357
				899.900	0.100	22.141	22.127	22.015
				1000.000	0.100	20.304	20.374	19.938
				25.600	0.100	157.292	157.675	156.424
				101.200	0.200	110.273	110.166	110.709
				200.500	0.000	75.813	75.625	75.686
				300.300	0.100	56.426	56.704	56.671
400.300	0.200	45.142	45.271	45.242				
500.400	0.200	37.661	37.769	37.646				
599.800	0.100	32.319	32.439	32.322				
699.900	0.000	28.505	28.519	28.506				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm^2/sec)	Diffusivity Shot 2 (mm^2/sec)	Diffusivity Shot 3 (mm^2/sec)
J1 09		41169	12/2/2009 8:08	800.200	0.100	25.449	25.542	25.638
				899.800	0.100	23.114	23.324	23.360
				999.800	0.100	21.326	21.240	21.311
				24.900	0.200	159.473	160.830	162.075
				101.000	0.200	112.581	112.569	112.740
				200.600	0.100	77.206	77.137	77.136
				300.300	0.100	57.665	57.937	57.949
				400.300	0.200	46.111	46.186	46.055
				500.000	0.200	38.304	38.453	38.577
				599.700	0.100	33.026	33.085	33.016
				700.000	0.000	29.103	28.979	29.151
				800.200	0.100	25.924	26.016	26.123
				899.900	0.100	23.593	23.690	23.738
				999.700	0.100	21.917	21.573	21.749

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
J1 01	151.602	1.669		6.33	InSb	12.7	100	Ar	E 1461-07
	107.485	0.248							
	73.707	0.168							
	54.718	0.146							
	43.473	0.164							
	36.124	0.078							
	31.053	0.099							
	27.377	0.103							
	24.401	0.077							
	22.176	0.063							
J1 02	20.374	0.140		6.33	InSb	12.7	100	Ar	E 1461-07
	156.501	0.429							
	110.020	0.338							
	75.257	0.141							
	56.166	0.139							
	44.631	0.053							
	36.986	0.054							
	31.809	0.038							
	28.022	0.099							
	25.073	0.117							
J1 03	22.738	0.022		6.33	InSb	12.7	100	Ar	E 1461-07
	20.821	0.012							
	155.219	1.387							
	109.419	0.187							
	74.991	0.175							
	55.719	0.080							
	44.452	0.071							
	36.982	0.045							
	31.882	0.051							
	28.057	0.063							
J1 04	25.026	0.030		6.33	InSb	12.7	100	Ar	E 1461-07
	22.795	0.022							
	20.995	0.100							
	155.211	0.037							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
J1 05	109.559	0.081							
	75.004	0.215							
	55.923	0.056							
	44.629	0.075							
	37.164	0.094							
	32.003	0.084							
	28.242	0.076							
	25.339	0.061							
	23.068	0.044							
	21.036	0.136							
	156.706	0.308		6.33	InSb	12.7	100	Ar	E 1461-07
	109.614	0.362							
	75.294	0.099							
	56.271	0.057							
45.198	0.184								
37.672	0.017								
32.421	0.013								
28.524	0.015								
25.441	0.101								
23.063	0.107								
21.325	0.134								
157.448	1.163		6.33	InSb	12.7	100	Ar	E 1461-07	
109.488	0.131								
74.886	0.086								
56.036	0.115								
44.755	0.155								
37.275	0.042								
32.020	0.021								
28.258	0.104								
25.276	0.024								
22.907	0.075								
20.902	0.048								
159.826	2.099		6.33	InSb	12.7	100	Ar	E 1461-07	
112.698	0.277								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
J1 11	77.219	0.192							
	57.282	0.119							
	45.608	0.113							
	38.095	0.143							
	32.744	0.038							
	28.844	0.028							
	25.773	0.114							
	23.467	0.024							
	21.469	0.027							
	160.486	1.300		6.33	InSb	12.7	100	Ar	E 1461-07
	111.968	0.126							
	76.922	0.180							
	57.214	0.100							
	45.546	0.086							
37.892	0.082								
32.693	0.111								
28.698	0.064								
25.724	0.071								
23.373	0.023								
21.345	0.136								
J1 12	161.077	3.126		6.33	InSb	12.7	100	Ar	E 1461-07
	112.944	0.138							
	77.542	0.099							
	57.738	0.033							
	45.941	0.041							
	38.473	0.088							
	33.026	0.096							
	29.066	0.038							
	26.040	0.033							
	23.641	0.017							
	21.780	0.165							
	156.819	0.210		6.33	InSb	12.7	100	Ar	E 1461-07
	110.008	0.249							
	75.684	0.215							
J2 04									

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
	56.234	0.116							
	44.873	0.122							
	37.435	0.101							
	32.192	0.084							
	28.303	0.036							
	25.425	0.052							
	23.097	0.137							
	21.144	0.120							
J2 05	161.194	1.844		6.33	InSb	12.7	100	Ar	E 1461-07
	112.597	0.603							
	77.400	0.092							
	57.778	0.044							
	46.048	0.108							
	38.361	0.229							
	33.108	0.080							
	29.222	0.142							
	26.146	0.046							
	23.735	0.172							
	21.848	0.065							
J2 06	152.254	0.531		6.33	InSb	12.7	100	Ar	E 1461-07
	106.473	0.201							
	73.089	0.107							
	54.427	0.079							
	43.172	0.069							
	35.932	0.004							
	30.867	0.091							
	27.142	0.068							
	24.329	0.044							
	22.110	0.078							
	20.420	0.084							
J2 01	162.493	0.637		6.33	InSb	12.7	100	Ar	E 1461-07
	113.602	0.331							
	77.904	0.120							
	57.963	0.055							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
	46.122	0.080							
	38.348	0.036							
	32.981	0.015							
	28.953	0.082							
	25.993	0.084							
	23.619	0.119							
	21.899	0.330							
J2 02	149.513	0.434		6.33	InSb	12.7	100	Ar	E 1461-07
	104.613	0.187							
	71.878	0.135							
	53.776	0.097							
	42.703	0.077							
	35.609	0.047							
	30.665	0.066							
	27.055	0.047							
	24.270	0.042							
	22.025	0.200							
	20.044	0.091							
J2 03	157.776	0.689		6.33	InSb	12.7	100	Ar	E 1461-07
	111.309	0.413							
	76.381	0.071							
	57.022	0.072							
	45.430	0.031							
	37.881	0.116							
	32.555	0.065							
	28.632	0.042							
	25.652	0.054							
	23.392	0.181							
	21.330	0.177							
J2 07	149.934	0.280		6.33	InSb	12.7	100	Ar	E 1461-07
	105.298	0.433							
	72.282	0.227							
	53.706	0.153							
	42.721	0.075							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
	35.699	0.126							
	30.742	0.175							
	27.028	0.066							
	24.215	0.032							
	22.016	0.077							
	20.129	0.130							
J2 08	160.346	2.345		6.33	InSb	12.7	100	Ar	E 1461-07
	112.550	0.297							
	77.145	0.248							
	57.466	0.147							
	45.663	0.075							
	38.066	0.108							
	32.692	0.039							
	28.824	0.047							
	25.805	0.064							
	23.357	0.031							
	21.389	0.068							
J2 09	160.640	1.099		6.33	InSb	12.7	100	Ar	E 1461-07
	113.473	0.297							
	78.031	0.229							
	58.205	0.080							
	46.575	0.068							
	38.791	0.197							
	33.335	0.007							
	29.335	0.035							
	26.285	0.020							
	23.863	0.126							
	21.891	0.137							
J2 10	156.231	0.680		6.33	InSb	12.7	100	Ar	E 1461-07
	109.482	0.480							
	75.246	0.229							
	56.164	0.069							
	44.858	0.126							
	37.463	0.020							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
J2 11	32.225	0.067							
	28.342	0.074							
	25.346	0.070							
	22.991	0.173							
	21.397	0.050							
	156.170	0.218		6.33	InSb	12.7	100	Ar	E 1461-07
	109.165	0.038							
	75.073	0.267							
	56.231	0.104							
	44.914	0.109							
37.411	0.023								
32.254	0.117								
28.404	0.034								
25.405	0.106								
23.084	0.045								
21.159	0.101								
J2 12	159.337	0.628		6.33	InSb	12.7	100	Ar	E 1461-07
	111.123	0.266							
	76.427	0.025							
	57.137	0.080							
	45.610	0.029							
	37.968	0.069							
	32.703	0.042							
	28.796	0.029							
	25.871	0.116							
	23.398	0.104							
21.380	0.160								
J1 SPARE	157.419	2.845		6.33	InSb	12.7	100	Ar	E 1461-07
	111.257	0.335							
	76.495	0.104							
	56.893	0.042							
	45.311	0.120							
	37.763	0.035							
	32.433	0.047							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
J2 SPARE	28.513	0.057							
	25.667	0.029							
	23.239	0.127							
	21.360	0.023		6.33	InSb	12.7	100	Ar	E 1461-07
	153.234	0.366							
	108.071	0.382							
	74.232	0.127							
	55.315	0.037							
	43.994	0.037							
	36.645	0.059							
31.535	0.156								
27.756	0.029								
24.890	0.073								
22.596	0.085								
20.813	0.063								
J1 07	149.450	0.624		6.33	InSb	12.7	100	Ar	E 1461-07
	105.170	0.325							
	72.241	0.127							
	53.785	0.027							
	43.032	0.107							
	35.865	0.120							
	30.826	0.030							
	27.202	0.050							
	24.311	0.110							
	22.094	0.069							
20.205	0.234								
J1 08	157.130	0.641		6.33	InSb	12.7	100	Ar	E 1461-07
	110.383	0.288							
	75.708	0.096							
	56.600	0.152							
	45.218	0.068							
	37.692	0.067							
	32.360	0.068							
	28.510	0.008							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
J1 09	25.543	0.095		6.33	InSb	12.7	100	Ar	E 1461-07
	23.266	0.133							
	21.292	0.046							
	160.793	1.301							
	112.630	0.095							
	77.160	0.040							
	57.850	0.161							
	46.117	0.066							
	38.445	0.137							
	33.042	0.037							
29.078	0.089								
26.021	0.100								
23.674	0.074								
21.746	0.172								

Specimen Number	J1 01	J1 02	J1 03	J1 04	J1 05	J1 06	J1 10
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	12/1/09 8:04 AM	12/1/09 8:04 AM	12/1/09 8:04 AM	12/1/09 8:11 AM	12/1/09 8:11 AM	12/1/09 8:11 AM	12/2/09 8:18 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	151.6017	156.5013	155.2187	155.2107	156.7060	157.4477	159.8260
100	107.4850	110.0200	109.4193	109.5587	109.6140	109.4880	112.6977
200	73.7070	75.2573	74.9907	75.0040	75.2937	74.8857	77.2193
300	54.7183	56.1660	55.7193	55.9233	56.2707	56.0360	57.2820
400	43.4730	44.6307	44.4517	44.6293	45.1983	44.7547	45.6083
500	36.1237	36.9860	36.9820	37.1640	37.6723	37.2753	38.0950
600	31.0530	31.8087	31.8817	32.0027	32.4210	32.0203	32.7437
700	27.3770	28.0217	28.0573	28.2420	28.5240	28.2577	28.8440
800	24.4013	25.0727	25.0257	25.3393	25.4407	25.2760	25.7727
900	22.1757	22.7377	22.7953	23.0683	23.0633	22.9067	23.4670
1000	20.3737	20.8213	20.9950	21.0360	21.3253	20.9020	21.4687

Specimen Number	J1 11	J1 12	J2 04	J2 05	J2 06	J2 01	J2 02
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	12/2/09 8:18 AM	12/2/09 8:18 AM	12/3/09 1:50 PM	12/3/09 1:50 PM	12/3/09 1:50 PM	12/3/09 1:54 PM	12/3/09 1:54 PM
Diffusivity (mm ² /sec)							
Temperature °C							
25	160.4857	161.0767	156.8187	161.1937	152.2540	162.4930	149.5133
100	111.9680	112.9443	110.0083	112.5970	106.4733	113.6020	104.6133
200	76.9223	77.5417	75.6843	77.4000	73.0890	77.9037	71.8780
300	57.2140	57.7383	56.2337	57.7780	54.4270	57.9630	53.7760
400	45.5460	45.9410	44.8730	46.0480	43.1720	46.1220	42.7033
500	37.8920	38.4730	37.4347	38.3610	35.9323	38.3480	35.6090
600	32.6927	33.0263	32.1920	33.1083	30.8670	32.9810	30.6650
700	28.6983	29.0660	28.3033	29.2217	27.1417	28.9530	27.0547
800	25.7240	26.0397	25.4253	26.1460	24.3287	25.9930	24.2697
900	23.3730	23.6407	23.0970	23.7353	22.1100	23.6193	22.0250
1000	21.3450	21.7800	21.1443	21.8477	20.4200	21.8993	20.0443

Specimen Number	J2 03	J2 07	J2 08	J2 09	J2 10	J2 11	J2 12
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	12/3/09 1:54 PM	12/7/09 7:54 AM	12/7/09 7:54 AM	12/7/09 7:54 AM	12/7/09 7:59 AM	12/7/09 7:59 AM	12/7/09 7:59 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	157.7763	149.9343	160.3460	160.6400	156.2313	156.1697	159.3373
100	111.3093	105.2983	112.5500	113.4730	109.4823	109.1650	111.1227
200	76.3813	72.2823	77.1453	78.0313	75.2463	75.0733	76.4267
300	57.0217	53.7060	57.4657	58.2047	56.1637	56.2310	57.1367
400	45.4300	42.7213	45.6633	46.5753	44.8583	44.9137	45.6103
500	37.8813	35.6993	38.0657	38.7913	37.4627	37.4107	37.9683
600	32.5550	30.7420	32.6917	33.3347	32.2250	32.2540	32.7033
700	28.6320	27.0277	28.8237	29.3347	28.3420	28.4043	28.7960
800	25.6523	24.2147	25.8050	26.2847	25.3457	25.4053	25.8713
900	23.3917	22.0160	23.3567	23.8630	22.9907	23.0837	23.3983
1000	21.3297	20.1293	21.3890	21.8907	21.3967	21.1587	21.3797

Specimen Number	J1 SPARE	J2 SPARE	J1 07	J1 08	J1 09
Measured By	41169	41169	41169	41169	41169
Measured Date	12/8/09 8:29 AM	12/8/09 8:29 AM	12/2/09 8:08 AM	12/2/09 8:08 AM	12/2/09 8:08 AM
Diffusivity (mm ² /sec)					
Temperature °C					
25	157.4187	153.2343	149.4503	157.1303	160.7927
100	111.2573	108.0710	105.1700	110.3827	112.6300
200	76.4947	74.2320	72.2407	75.7080	77.1597
300	56.8927	55.3153	53.7853	56.6003	57.8503
400	45.3110	43.9937	43.0323	45.2183	46.1173
500	37.7627	36.6450	35.8650	37.6920	38.4447
600	32.4327	31.5347	30.8260	32.3600	33.0423
700	28.5133	27.7563	27.2023	28.5100	29.0777
800	25.6673	24.8903	24.3110	25.5430	26.0210
900	23.2393	22.5960	22.0943	23.2660	23.6737
1000	21.3600	20.8130	20.2053	21.2923	21.7463

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	J2 11		6.333	6.327	6.329	6.334	12.710	12.712	1.41186
	J2 09		6.328	6.329	6.327	6.327	12.724	12.721	1.41373
	J2 10		6.330	6.329	6.326	6.329	12.726	12.724	1.41197
	J2 06		6.324	6.323	6.324	6.325	12.741	12.741	1.41285
	J2 07		6.324	6.326	6.324	6.325	12.734	12.734	1.40638
	J2 08		6.332	6.332	6.333	6.334	12.720	12.723	1.41450
	J1 02		6.329	6.334	6.332	6.331	12.726	12.729	1.40610
	J1 03		6.329	6.331	6.330	6.327	12.728	12.730	1.41149
	J1 01		6.331	6.330	6.329	6.332	12.727	12.728	1.41169
	J1 06		6.328	6.329	6.327	6.326	12.730	12.729	1.41175
	J1 05		6.329	6.331	6.329	6.330	12.731	12.732	1.40826
	J1 07		6.330	6.330	6.332	6.332	12.724	12.727	1.41159
	J1 04		6.329	6.331	6.327	6.327	12.724	12.726	1.41248
	J1 11		6.327	6.325	6.327	6.328	12.725	12.725	1.41232
	J1 09		6.327	6.329	6.327	6.328	12.728	12.726	1.41064
	J1 08		6.329	6.332	6.332	6.330	12.728	12.727	1.41307
	J1 10		6.328	6.330	6.330	6.329	12.728	12.728	1.41447

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
J2 11	47735	12/2/2010 15:28	6.33075	12.71100	126.8964	0.006331	0.01271
J2 09	41169	12/3/2010 9:30	6.32775	12.72250	127.1261	0.006328	0.01272
J2 10	41169	12/3/2010 13:33	6.32850	12.72500	127.1761	0.006329	0.01273
J2 06	41169	12/4/2010 8:05	6.32400	12.74100	127.4961	0.006324	0.01274
J2 07	41169	12/4/2010 10:20	6.32475	12.73400	127.3560	0.006325	0.01273
J2 08	41169	12/4/2010 13:35	6.33275	12.72150	127.1061	0.006333	0.01272
J1 02	41169	12/6/2010 10:50	6.33150	12.72750	127.2261	0.006332	0.01273
J1 03	41169	12/6/2010 11:07	6.32925	12.72900	127.2561	0.006329	0.01273
J1 01	41169	12/6/2010 11:16	6.33050	12.72750	127.2261	0.006331	0.01273
J1 06	41169	12/6/2010 13:07	6.32750	12.72950	127.2661	0.006328	0.01273
J1 05	41169	12/6/2010 13:22	6.32975	12.73150	127.3060	0.006330	0.01273
J1 07	41169	12/6/2010 13:25	6.33100	12.72550	127.1861	0.006331	0.01273
J1 04	41169	12/6/2010 13:53	6.32850	12.72500	127.1761	0.006329	0.01273
J1 11	41169	12/7/2010 8:01	6.32675	12.72500	127.1761	0.006327	0.01273
J1 09	41169	12/7/2010 8:57	6.32775	12.72700	127.2161	0.006328	0.01273
J1 08	41169	12/7/2010 9:28	6.33075	12.72750	127.2261	0.006331	0.01273
J1 10	41169	12/7/2010 10:18	6.32925	12.72800	127.2361	0.006329	0.01273

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
J2 11	0.0014	25.2	22.7	17.8
J2 09	0.0014	25.3	22.9	20.9
J2 10	0.0014	25.3	22.6	19.9
J2 06	0.0014	25.4	22.3	13.1
J2 07	0.0014	25.4	22.2	12.9
J2 08	0.0014	25.4	22.4	14.1
J1 02	0.0014	25.3	22.7	18.1
J1 03	0.0014	25.3	22.9	18.7
J1 01	0.0014	25.3	23	18.8
J1 06	0.0014	25.3	22.4	21.6
J1 05	0.0014	25.3	22.7	21.2
J1 07	0.0014	25.3	22.7	21.2
J1 04	0.0014	25.3	22.9	21.1
J1 11	0.0014	25.6	22.3	21.9
J1 09	0.0014	25.6	22.8	21.5
J1 08	0.0014	25.6	22.9	21.3
J1 10	0.0014	25.6	22.8	21.4

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity

Graphite Grade: IG-110
Graphite Manufacturer: Toyo Tanso
Forming Process: Isostatic-molded
Coke Particle Size: Fine grain
Coke Type: Petroleum coke filler, pitch binder
ASTM Class: INHP
Specimen Geometry: Cylinder

Specimen ID #'s:

EW15 01
EW15 02
EW15 03
EW15 04
EW15 05
EW15 06
EW15 07
EW15 08
EW15 09
EW15 10
EW15 11
EW15 12
EW14 01
EW14 02
EW14 03
EW14 04
EW14 05
EW14 06
EW14 07
EW14 08
EW14 09
EW14 10
EW14 11
EW14 12

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	EW14 07	W	6.346	6.348	6.347	6.346	12.736	12.734
	EW14 05	W	6.342	6.344	6.344	6.344	12.735	12.734
	EW14 04	W	6.342	6.343	6.341	6.342	12.738	12.737
	EW15 07	W	6.353	6.353	6.354	6.353	12.735	12.735
	EW14 12	W	6.345	6.343	6.344	6.345	12.736	12.735
	EW14 02	W	6.340	6.340	6.340	6.340	12.736	12.734
	EW15 03	W	6.345	6.345	6.345	6.345	12.732	12.730
	EW14 03	W	6.342	6.341	6.342	6.341	12.735	12.734
	EW15 06	W	6.351	6.351	6.351	6.351	12.732	12.734
	EW15 10	W	6.351	6.353	6.351	6.351	12.734	12.735
	EW15 11	W	6.352	6.352	6.353	6.354	12.735	12.736
	EW15 09	W	6.352	6.352	6.350	6.352	12.735	12.734
	EW14 01	W	6.347	6.346	6.347	6.346	12.736	12.734
	EW14 10	W	6.345	6.346	6.344	6.343	12.734	12.735
	EW15 04	W	6.345	6.347	6.347	6.346	12.731	12.732
	EW15 01	W	6.348	6.348	6.348	6.348	12.735	12.734
	EW15 08	W	6.351	6.350	6.352	6.351	12.733	12.733
	EW14 08	W	6.346	6.346	6.346	6.345	12.734	12.733
	EW14 06	W	6.346	6.345	6.345	6.345	12.732	12.731
	EW15 12	W	6.352	6.352	6.349	6.351	12.737	12.738
	EW15 05	W	6.349	6.347	6.348	6.349	12.734	12.732
	EW14 11	W	6.343	6.344	6.346	6.345	12.734	12.735
	EW15 02	W	6.339	6.340	6.339	6.340	12.734	12.736
	EW14 09	W	6.344	6.343	6.344	6.344	12.733	12.735

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
EW14 07	1.43067	jl	7/14/2009 15:27	6.34675	12.73500	127.3761	0.006347	0.01274
EW14 05	1.43590	jl	7/14/2009 15:29	6.34350	12.73450	127.3660	0.006344	0.01273
EW14 04	1.44069	jl	7/14/2009 15:31	6.34200	12.73750	127.4261	0.006342	0.01274
EW15 07	1.43134	jl	7/14/2009 15:32	6.35325	12.73500	127.3761	0.006353	0.01274
EW14 12	1.42376	jl	7/15/2009 7:29	6.34425	12.73550	127.3861	0.006344	0.01274
EW14 02	1.43021	jl	7/15/2009 7:32	6.34000	12.73500	127.3761	0.006340	0.01274
EW15 03	1.42686	jl	7/15/2009 7:33	6.34500	12.73100	127.2960	0.006345	0.01273
EW14 03	1.43626	jl	7/15/2009 7:35	6.34150	12.73450	127.3660	0.006342	0.01273
EW15 06	1.43800	jl	7/15/2009 7:36	6.35100	12.73300	127.3360	0.006351	0.01273
EW15 10	1.43525	jl	7/15/2009 7:38	6.35150	12.73450	127.3660	0.006352	0.01273
EW15 11	1.42733	jl	7/15/2009 7:40	6.35275	12.73550	127.3861	0.006353	0.01274
EW15 09	1.43374	jl	7/15/2009 7:42	6.35150	12.73450	127.3660	0.006352	0.01273
EW14 01	1.44026	jl	7/15/2009 7:44	6.34650	12.73500	127.3761	0.006347	0.01274
EW14 10	1.43205	jl	7/15/2009 7:45	6.34450	12.73450	127.3660	0.006345	0.01273
EW15 04	1.43192	jl	7/15/2009 7:47	6.34625	12.73150	127.3060	0.006346	0.01273
EW15 01	1.43712	jl	7/15/2009 7:49	6.34800	12.73450	127.3660	0.006348	0.01273
EW15 08	1.43869	jl	7/15/2009 13:45	6.35100	12.73300	127.3360	0.006351	0.01273
EW14 08	1.42595	jl	7/15/2009 13:46	6.34575	12.73350	127.3460	0.006346	0.01273
EW14 06	1.43549	jl	7/15/2009 13:48	6.34525	12.73150	127.3060	0.006345	0.01273
EW15 12	1.42900	jl	7/15/2009 13:50	6.35100	12.73750	127.4261	0.006351	0.01274
EW15 05	1.43315	jl	7/15/2009 13:52	6.34825	12.73300	127.3360	0.006348	0.01273
EW14 11	1.43515	jl	7/15/2009 13:53	6.34450	12.73450	127.3660	0.006345	0.01273
EW15 02	1.43025	jl	7/15/2009 13:54	6.33950	12.73500	127.3761	0.006340	0.01274
EW14 09	1.43415	jl	7/15/2009 13:56	6.34375	12.73400	127.3560	0.006344	0.01273

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
EW14 07	0.0014	1769.70264	1.7697	25.4	21.1	36.6
EW14 05	0.0014	1777.22157	1.7772	25.4	21.1	36.4
EW14 04	0.0014	1782.73187	1.7827	25.4	21.1	36.4
EW15 07	0.0014	1768.71999	1.7687	25.4	21.1	36.6
EW14 12	0.0014	1761.71080	1.7617	25.4	20.8	38.5
EW14 02	0.0014	1771.01717	1.7710	25.4	20.8	38.5
EW15 03	0.0014	1766.58614	1.7666	25.4	20.8	38.6
EW14 03	0.0014	1778.22778	1.7782	25.4	20.9	38.4
EW15 06	0.0014	1778.13780	1.7781	25.4	20.9	38.4
EW15 10	0.0014	1774.17958	1.7742	25.4	20.9	38.3
EW15 11	0.0014	1763.76511	1.7638	25.4	20.8	38.5
EW15 09	0.0014	1772.31300	1.7723	25.4	20.9	38.4
EW14 01	0.0014	1781.63541	1.7816	25.4	20.9	38.5
EW14 10	0.0014	1772.17703	1.7722	25.4	20.9	38.5
EW15 04	0.0014	1772.36248	1.7724	25.4	20.9	38.4
EW15 01	0.0014	1777.47065	1.7775	25.4	20.9	38.6
EW15 08	0.0014	1778.99101	1.7790	25.4	20.6	38
EW14 08	0.0014	1764.55773	1.7646	25.4	20.5	37.9
EW14 06	0.0014	1777.06128	1.7771	25.4	20.6	37.9
EW15 12	0.0014	1765.76068	1.7658	25.4	20.6	38
EW15 05	0.0014	1772.90828	1.7729	25.4	20.6	38.2
EW14 11	0.0014	1776.01331	1.7760	25.4	20.6	38
EW15 02	0.0014	1771.20639	1.7712	25.4	20.6	38
EW14 09	0.0014	1775.12502	1.7751	25.4	20.6	38

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
EW14 01		41169	12/8/2009 8:36	26.700	0.200	95.366	97.234	97.059
				101.300	0.200	73.039	72.595	72.700
				200.500	0.100	52.817	52.973	52.909
				301.600	0.200	40.635	40.823	40.747
				401.600	0.200	33.307	33.261	33.373
				501.600	0.200	28.298	28.314	28.438
				601.600	0.200	24.695	24.807	24.686
				701.800	0.200	22.215	22.036	22.080
				801.400	0.100	19.948	19.942	19.897
				900.900	0.100	18.247	18.184	18.361
EW14 02		41169	12/8/2009 8:36	1000.900	0.100	16.782	16.714	16.990
				26.100	0.200	96.858	97.150	97.324
				100.900	0.100	72.010	72.044	72.052
				200.500	0.100	52.207	52.339	52.227
				300.600	0.000	40.362	40.364	40.428
				400.700	0.000	33.022	33.089	33.023
				500.800	0.000	28.144	28.043	28.051
				600.900	0.100	24.576	24.631	24.590
				701.200	0.100	21.914	21.928	21.844
				801.000	0.100	19.826	19.868	19.951
EW14 03		41169	12/8/2009 8:36	900.700	0.100	18.370	18.097	18.243
				1000.700	0.100	16.691	16.836	16.443
				25.500	0.200	98.341	97.806	97.326
				101.100	0.100	72.835	73.274	73.072
				200.700	0.100	53.211	53.108	53.206
				300.900	0.100	40.921	41.001	40.953
				401.100	0.200	33.423	33.504	33.528
				501.000	0.100	28.466	28.579	28.464
				601.000	0.100	24.939	24.861	24.933
				701.100	0.100	22.179	22.146	22.184
EW14 07		41169	12/9/2009 8:09	800.900	0.100	20.108	20.111	20.134
				900.800	0.100	18.412	18.362	18.473
				1000.700	0.100	17.080	17.193	17.209
				26.600	0.200	95.391	95.565	95.481

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
EW14 08		41169	12/9/2009 8:09	101.200	0.200	72.152	71.702	71.634
				200.500	0.100	52.135	51.966	52.058
				301.600	0.200	40.198	40.230	40.276
				401.600	0.200	32.870	33.018	32.995
				501.600	0.200	27.971	27.999	27.982
				601.600	0.200	24.395	24.495	24.423
				701.800	0.100	21.796	21.790	21.789
				801.300	0.200	19.720	19.587	19.660
				900.900	0.100	17.953	18.039	18.056
				1001.000	0.100	16.712	16.828	16.668
EW14 09		41169	12/9/2009 8:09	26.100	0.200	94.262	96.312	96.443
				101.100	0.100	71.458	71.727	71.556
				200.500	0.000	51.978	51.834	52.107
				300.800	0.000	40.129	40.209	40.265
				400.900	0.100	32.819	32.858	32.854
				500.900	0.100	27.957	28.059	27.865
				601.000	0.100	24.430	24.424	24.438
				701.300	0.100	21.802	21.825	21.772
				801.000	0.100	19.816	19.639	19.810
				900.800	0.000	18.080	18.131	17.905
EW14 04		41169	12/9/2009 8:04	1000.800	0.100	16.719	16.819	16.649
				25.500	0.200	96.734	94.976	96.538
				101.100	0.200	71.588	71.484	71.804
				200.700	0.100	51.833	51.862	51.823
				300.800	0.100	40.273	40.226	40.135
				401.000	0.100	32.770	32.843	32.914
				501.000	0.100	27.918	27.837	27.854
				601.000	0.100	24.271	24.319	24.239
				701.100	0.100	21.653	21.716	21.745
				800.900	0.100	19.812	19.521	19.644
900.800	0.100	18.255	18.105	17.976				
1000.800	0.100	16.627	16.815	16.793				
26.600	0.200	98.040	98.153	99.084				
100.200	0.200	73.841	73.671	74.098				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
EW14 05		41169	12/9/2009 8:04	199.100	0.100	53.443	53.612	53.292
				300.600	0.300	41.139	41.086	41.046
				401.100	0.500	33.520	33.688	33.617
				501.700	0.500	28.541	28.574	28.556
				600.800	0.300	25.051	24.979	24.945
				700.000	0.200	22.275	22.200	22.301
				799.500	0.100	20.222	20.122	20.220
				899.500	0.100	18.466	18.450	18.441
				999.300	0.100	17.022	17.134	16.996
				25.900	0.200	97.175	96.833	97.278
				100.100	0.200	72.812	73.022	73.143
				199.200	0.000	52.860	52.961	52.873
				299.600	0.100	40.802	40.888	40.949
				399.900	0.200	33.217	33.375	33.293
				500.400	0.300	28.153	28.224	28.217
EW14 06		41169	12/9/2009 8:04	600.000	0.200	24.632	24.816	24.693
				699.700	0.200	22.001	22.023	22.070
				799.500	0.100	19.949	19.952	20.133
				899.500	0.100	18.288	18.178	18.271
				999.500	0.100	17.059	16.932	16.890
				25.200	0.200	93.854	93.982	91.692
				99.500	0.200	70.233	70.166	70.667
				199.100	0.000	51.072	51.077	51.003
				299.300	0.100	39.475	39.503	39.465
				399.400	0.100	32.134	32.151	32.157
				499.700	0.200	27.252	27.363	27.300
				599.500	0.100	23.920	23.853	23.926
				699.300	0.100	21.352	21.324	21.293
				799.200	0.000	19.379	19.334	19.206
				899.200	0.000	17.678	17.668	17.688
EW15 09		41169	11/16/2010 8:48	999.200	0.100	16.528	16.368	16.384
				26.700	0.200	94.711	95.196	95.077
				100.400	0.200	71.580	71.487	71.770
				199.200	0.100	51.830	51.970	51.821

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
EW15 10		41169	11/16/2010 8:48	300.700	0.300	39.849	39.926	39.776
				401.100	0.500	32.515	32.449	32.540
				501.200	0.400	27.609	27.630	27.694
				600.900	0.400	24.075	24.051	24.111
				700.200	0.400	21.598	21.462	21.617
				799.800	0.100	19.519	19.423	19.439
				899.500	0.100	17.910	17.989	17.934
				999.400	0.100	16.579	16.608	16.498
				26.200	0.200	93.743	93.749	93.457
				100.100	0.200	69.903	70.289	69.980
EW15 11		41169	11/16/2010 8:48	199.100	0.000	50.699	51.154	50.915
				299.600	0.100	39.199	39.171	39.282
				399.900	0.200	31.885	31.993	32.038
				500.000	0.200	27.046	27.154	27.089
				600.000	0.200	23.579	23.578	23.640
				699.600	0.100	21.129	21.127	21.060
				799.500	0.100	19.163	19.342	19.177
				899.400	0.100	17.625	17.592	17.615
				999.400	0.100	16.290	16.184	16.425
				25.700	0.100	96.399	97.384	96.660
99.400	0.200	72.400	72.377	72.616				
199.100	0.000	52.295	52.156	52.152				
299.200	0.000	40.365	40.442	40.434				
399.400	0.100	32.863	32.974	32.981				
499.500	0.100	27.859	27.941	27.949				
599.500	0.100	24.256	24.338	24.219				
699.300	0.000	21.627	21.734	21.675				
799.200	0.000	19.666	19.689	19.603				
899.100	0.000	18.012	17.990	17.994				
999.100	0.000	16.692	16.678	16.624				

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
EW14 01	96.553	1.032		6.346	InSb	12.7	100	Ar	E 1461-07
	72.778	0.232							
	52.900	0.078							
	40.735	0.095							
	33.314	0.056							
	28.350	0.077							
	24.729	0.067							
	22.110	0.093							
	19.929	0.028							
	18.264	0.090							
EW14 02	16.829	0.144		6.346	InSb	12.7	100	Ar	E 1461-07
	97.111	0.235							
	72.035	0.022							
	52.258	0.071							
	40.385	0.038							
	33.045	0.038							
	28.079	0.056							
	24.599	0.029							
	21.895	0.045							
	19.882	0.064							
EW14 03	18.237	0.137		6.346	InSb	12.7	100	Ar	E 1461-07
	16.657	0.199							
	97.824	0.508							
	73.060	0.220							
	53.175	0.058							
	40.958	0.040							
	33.485	0.055							
	28.503	0.066							
	24.911	0.043							
	22.170	0.021							
EW14 07	20.118	0.014		6.346	InSb	12.7	100	Ar	E 1461-07
	18.416	0.056							
	17.161	0.070							
	95.479	0.087							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
EW14 08	71.829	0.281							
	52.053	0.085							
	40.235	0.039							
	32.961	0.080							
	27.984	0.014							
	24.438	0.052							
	21.792	0.004							
	19.656	0.067							
	18.016	0.055							
	16.736	0.083							
	95.672	1.223		6.346	InSb	12.7	100	Ar	E 1461-07
	71.580	0.136							
	51.973	0.137							
	40.201	0.068							
32.844	0.021								
27.960	0.097								
24.431	0.007								
21.800	0.027								
19.755	0.101								
18.039	0.119								
16.729	0.085								
EW14 09	96.083	0.963		6.346	InSb	12.7	100	Ar	E 1461-07
	71.625	0.163							
	51.839	0.020							
	40.211	0.070							
	32.842	0.072							
	27.870	0.043							
	24.276	0.040							
	21.705	0.047							
	19.659	0.146							
	18.112	0.140							
	16.745	0.103							
	98.426	0.573		6.346	InSb	12.7	100	Ar	E 1461-07
	73.870	0.215							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM	
EW14 05	53.449	0.160								
	41.090	0.047								
	33.608	0.084								
	28.557	0.017								
	24.992	0.054								
	22.259	0.052								
	20.188	0.057								
	18.452	0.013								
	17.051	0.073								
	97.095	0.233		6.346	InSb	12.7	100	Ar	E 1461-07	
	72.992	0.167								
	52.898	0.055								
	40.880	0.074								
	33.295	0.079								
28.198	0.039									
24.714	0.094									
22.031	0.035									
20.011	0.105									
18.246	0.059									
16.960	0.088									
EW14 06	93.176	1.287		6.346	InSb	12.7	100	Ar	E 1461-07	
	70.355	0.272								
	51.051	0.041								
	39.481	0.020								
	32.147	0.012								
	27.305	0.056								
	23.900	0.041								
	21.323	0.030								
	19.306	0.090								
	17.678	0.010								
	16.427	0.088								
	EW15 09	94.995	0.253		6.346	InSb	12.7	100	Ar	E 1461-07
		71.612	0.144							
		51.874	0.084							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
EW15 10	39.850	0.075							
	32.501	0.047							
	27.644	0.044							
	24.079	0.030							
	21.559	0.085							
	19.460	0.051							
	17.944	0.041							
	16.562	0.057							
	93.650	0.167		6.346	InSb	12.7	100	Ar	E 1461-07
	70.057	0.204							
50.923	0.228								
39.217	0.058								
31.972	0.079								
27.096	0.054								
23.599	0.036								
21.105	0.039								
19.227	0.100								
17.611	0.017								
16.300	0.121								
96.814	0.510		6.346	InSb	12.7	100	Ar	E 1461-07	
72.464	0.132								
52.201	0.081								
40.414	0.042								
32.939	0.066								
27.916	0.050								
24.271	0.061								
21.679	0.054								
19.653	0.045								
17.999	0.012								
16.665	0.036								

Specimen Number	EW14 01	EW14 02	EW14 03	EW14 07	EW14 08	EW14 09	EW14 04
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	12/8/09 8:36 AM	12/8/09 8:36 AM	12/8/09 8:36 AM	12/9/09 8:09 AM	12/9/09 8:09 AM	12/9/09 8:09 AM	12/9/09 8:04 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	96.5530	97.1107	97.8243	95.4790	95.6723	96.0827	98.4257
100	72.7780	72.0353	73.0603	71.8293	71.5803	71.6253	73.8700
200	52.8997	52.2577	53.1750	52.0530	51.9730	51.8393	53.4490
300	40.7350	40.3847	40.9583	40.2347	40.2010	40.2113	41.0903
400	33.3137	33.0447	33.4850	32.9610	32.8437	32.8423	33.6083
500	28.3500	28.0793	28.5030	27.9840	27.9603	27.8697	28.5570
600	24.7293	24.5990	24.9110	24.4377	24.4307	24.2763	24.9917
700	22.1103	21.8953	22.1697	21.7917	21.7997	21.7047	22.2587
800	19.9290	19.8817	20.1177	19.6557	19.7550	19.6590	20.1880
900	18.2640	18.2367	18.4157	18.0160	18.0387	18.1120	18.4523
1000	16.8287	16.6567	17.1607	16.7360	16.7290	16.7450	17.0507

Specimen Number	EW14 05	EW14 06	EW15 09	EW15 10	EW15 11
Measured By	41169	41169	41169	41169	41169
Measured Date	12/9/09 8:04 AM	12/9/09 8:04 AM	11/16/10 8:48 AM	11/16/10 8:48 AM	11/16/10 8:48 AM
Diffusivity (mm ² /sec)					
Temperature °C					
25	97.0953	93.1760	94.9947	93.6497	96.8143
100	72.9923	70.3553	71.6123	70.0573	72.4643
200	52.8980	51.0507	51.8737	50.9227	52.2010
300	40.8797	39.4810	39.8503	39.2173	40.4137
400	33.2950	32.1473	32.5013	31.9720	32.9393
500	28.1980	27.3050	27.6443	27.0963	27.9163
600	24.7137	23.8997	24.0790	23.5990	24.2710
700	22.0313	21.3230	21.5590	21.1053	21.6787
800	20.0113	19.3063	19.4603	19.2273	19.6527
900	18.2457	17.6780	17.9443	17.6107	17.9987
1000	16.9603	16.4267	16.5617	16.2997	16.6647

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	EW14 06	W	6.341	6.341	6.341	6.339	12.736	12.738	1.43525
	EW15 11	W	6.350	6.351	6.350	6.349	12.737	12.738	1.42697
	EW15 07	W	6.348	6.347	6.347	6.348	12.737	12.733	1.43102
	EW14 05	W	6.339	6.340	6.339	6.339	12.738	12.733	1.43569
	EW15 08	W	6.348	6.349	6.348	6.349	12.733	12.735	1.43820
	EW15 06	W	6.348	6.348	6.347	6.348	12.736	12.736	1.43759
	EW14 01	W	6.343	6.347	6.347	6.343	12.736	12.733	1.43996
	EW14 02	W	6.338	6.339	6.338	6.337	12.740	12.739	1.42985
	EW15 09	W	6.349	6.351	6.349	6.347	12.738	12.734	1.43343
	EW15 10	W	6.349	6.345	6.347	6.349	12.737	12.738	1.43466
	EW14 03	W	6.339	6.338	6.340	6.339	12.740	12.742	1.43591
	EW14 09	W	6.341	6.339	6.340	6.341	12.735	12.738	1.43379
	EW14 08	W	6.343	6.343	6.343	6.342	12.737	12.740	1.42560
	EW14 07	W	6.343	6.343	6.342	6.341	12.737	12.734	1.43027
	EW14 12	W	6.342	6.343	6.342	6.342	12.737	12.738	1.42351
	EW15 01	W	6.346	6.346	6.346	6.346	12.734	12.733	1.43694
	EW14 11	W	6.341	6.342	6.342	6.342	12.736	12.739	1.43477
	EW14 10	W	6.343	6.342	6.340	6.342	12.740	12.737	1.43168
	EW15 02	W	6.339	6.338	6.337	6.339	12.734	12.735	1.43016
	EW15 03	W	6.343	6.342	6.342	6.343	12.734	12.731	1.42669
	EW14 04	W	6.336	6.337	6.337	6.338	12.740	12.739	1.44044

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
EW14 06	47735	12/2/2010 15:48	6.34050	12.73700	127.4161	0.006341	0.01274
EW15 11	41169	12/3/2010 13:14	6.35000	12.73750	127.4261	0.006350	0.01274
EW15 07	41169	12/3/2010 13:18	6.34750	12.73500	127.3761	0.006348	0.01274
EW14 05	41169	12/3/2010 13:26	6.33925	12.73550	127.3861	0.006339	0.01274
EW15 08	41169	12/3/2010 13:29	6.34850	12.73400	127.3560	0.006349	0.01273
EW15 06	41169	12/3/2010 13:35	6.34775	12.73600	127.3961	0.006348	0.01274
EW14 01	41169	12/4/2010 8:07	6.34500	12.73450	127.3660	0.006345	0.01273
EW14 02	41169	12/4/2010 10:15	6.33800	12.73950	127.4661	0.006338	0.01274
EW15 09	41169	12/4/2010 10:23	6.34900	12.73600	127.3961	0.006349	0.01274
EW15 10	41169	12/4/2010 10:38	6.34750	12.73750	127.4261	0.006348	0.01274
EW14 03	41169	12/4/2010 13:32	6.33900	12.74100	127.4961	0.006339	0.01274
EW14 09	41169	12/6/2010 9:30	6.34025	12.73650	127.4061	0.006340	0.01274
EW14 08	41169	12/6/2010 11:01	6.34275	12.73850	127.4461	0.006343	0.01274
EW14 07	41169	12/6/2010 11:15	6.34225	12.73550	127.3861	0.006342	0.01274
EW14 12	41169	12/6/2010 13:13	6.34225	12.73750	127.4261	0.006342	0.01274
EW15 01	41169	12/6/2010 13:38	6.34600	12.73350	127.3460	0.006346	0.01273
EW14 11	41169	12/6/2010 13:56	6.34175	12.73750	127.4261	0.006342	0.01274
EW14 10	41169	12/6/2010 14:08	6.34175	12.73850	127.4461	0.006342	0.01274
EW15 02	41169	12/7/2010 10:17	6.33825	12.73450	127.3660	0.006338	0.01273
EW15 03	41169	12/7/2010 10:27	6.34250	12.73250	127.3260	0.006343	0.01273
EW14 04	41169	12/7/2010 10:30	6.33700	12.73950	127.4661	0.006337	0.01274

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
EW14 06	0.0014	25.2	22.8	17.8
EW15 11	0.0014	25.3	22.6	20.1
EW15 07	0.0014	25.3	22.6	20.1
EW14 05	0.0014	25.3	22.5	20.1
EW15 08	0.0014	25.3	22.5	20.2
EW15 06	0.0014	25.3	22.6	19.9
EW14 01	0.0014	25.4	22.3	13.1
EW14 02	0.0014	25.4	22.2	12.9
EW15 09	0.0014	25.4	22.1	12.9
EW15 10	0.0014	25.4	22.1	12.9
EW14 03	0.0014	25.4	22.4	14
EW14 09	0.0014	25.3	22	16.4
EW14 08	0.0014	25.3	22.8	18.4
EW14 07	0.0014	25.3	23	18.7
EW14 12	0.0014	25.3	22.4	21.5
EW15 01	0.0014	25.3	22.8	21.1
EW14 11	0.0014	25.3	23	21.2
EW14 10	0.0014	25.3	23	21.2
EW15 02	0.0014	25.6	22.8	21.4
EW15 03	0.0014	25.6	22.6	21.6
EW14 04	0.0014	25.6	22.5	21.8

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity

Graphite Grade: IG-430
Graphite Manufacturer: Toyo Tanso
Forming Process: Isostatic-molded
Coke Particle Size: Fine grain
Coke Type: Pitch coke
ASTM Class: INHP
Specimen Geometry: Cylinder

Specimen ID #'s:

FW15 01
FW15 02
FW15 03
FW15 04
FW15 05
FW15 06
FW15 07
FW15 08
FW15 09
FW15 10
FW15 11
FW15 12
FW16 01
FW16 02
FW16 03
FW16 04
FW16 05
FW16 06
FW16 07
FW16 08
FW16 09
FW16 10
FW16 11
FW16 12

Specimen Type	Specimen Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	FW15 09	W	6.329	6.330	6.329	6.330	12.731	12.728
	FW16 01	W	6.330	6.331	6.331	6.332	12.731	12.728
	FW15 04	W	6.336	6.338	6.336	6.338	12.728	12.727
	FW15 01	W	6.331	6.331	6.331	6.331	12.748	12.748
	FW15 06	W	6.337	6.337	6.337	6.336	12.730	12.728
	FW15 03	W	6.348	6.350	6.347	6.348	12.739	12.737
	FW16 03	W	6.330	6.329	6.331	6.331	12.729	12.727
	FW15 07	W	6.330	6.330	6.330	6.327	12.729	12.729
	FW16 06	W	6.331	6.330	6.331	6.330	12.725	12.727
	FW15 05	W	6.337	6.337	6.336	6.335	12.728	12.728
	FW16 10	W	6.323	6.323	6.323	6.324	12.728	12.727
	FW15 10	W	6.330	6.330	6.331	6.330	12.732	12.729
	FW16 04	W	6.330	6.329	6.331	6.330	12.725	12.726
	FW15 08	W	6.330	6.330	6.330	6.329	12.729	12.730
	FW15 12	W	6.331	6.330	6.329	6.330	12.728	12.728
	FW16 09	W	6.331	6.330	6.330	6.330	12.725	12.727
	FW15 02	W	6.330	6.331	6.333	6.331	12.737	12.737
	FW16 05	W	6.331	6.331	6.329	6.330	12.726	12.728
	FW15 11	W	6.330	6.331	6.330	6.330	12.729	12.730
	FW16 12	W	6.324	6.323	6.323	6.323	12.726	12.726
	FW16 07	W	6.331	6.329	6.330	6.330	12.727	12.727
	FW16 02	W	6.331	6.331	6.329	6.331	12.727	12.728
	FW16 11	W	6.325	6.324	6.324	6.324	12.727	12.728
	FW16 08	W	6.328	6.329	6.330	6.331	12.726	12.727

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
FW15 09	1.45497	jl	7/20/2009 9:58	6.32950	12.72950	127.2661	0.006330	0.01273
FW16 01	1.45494	jl	7/20/2009 10:00	6.33100	12.72950	127.2661	0.006331	0.01273
FW15 04	1.45939	jl	7/20/2009 10:02	6.33700	12.72750	127.2261	0.006337	0.01273
FW15 01	1.45761	jl	7/20/2009 13:14	6.33100	12.74800	127.6362	0.006331	0.01275
FW15 06	1.46319	jl	7/20/2009 13:16	6.33675	12.72900	127.2561	0.006337	0.01273
FW15 03	1.46300	jl	7/20/2009 13:17	6.34825	12.73800	127.4361	0.006348	0.01274
FW16 03	1.45490	jl	7/20/2009 13:20	6.33025	12.72800	127.2361	0.006330	0.01273
FW15 07	1.45381	jl	7/20/2009 13:21	6.32925	12.72900	127.2561	0.006329	0.01273
FW16 06	1.46242	jl	7/20/2009 13:23	6.33050	12.72600	127.1961	0.006331	0.01273
FW15 05	1.46161	jl	7/20/2009 13:25	6.33625	12.72800	127.2361	0.006336	0.01273
FW16 10	1.46709	jl	7/20/2009 13:26	6.32325	12.72750	127.2261	0.006323	0.01273
FW15 10	1.45690	jl	7/20/2009 13:29	6.33025	12.73050	127.2860	0.006330	0.01273
FW16 04	1.46187	jl	7/20/2009 13:30	6.33000	12.72550	127.1861	0.006330	0.01273
FW15 08	1.45811	jl	7/20/2009 13:32	6.32975	12.72950	127.2661	0.006330	0.01273
FW15 12	1.45457	jl	7/20/2009 13:34	6.33000	12.72800	127.2361	0.006330	0.01273
FW16 09	1.46633	jl	7/20/2009 13:35	6.33025	12.72600	127.1961	0.006330	0.01273
FW15 02	1.45753	jl	7/20/2009 13:36	6.33125	12.73700	127.4161	0.006331	0.01274
FW16 05	1.45942	jl	7/20/2009 13:38	6.33025	12.72700	127.2161	0.006330	0.01273
FW15 11	1.45657	jl	7/20/2009 13:39	6.33025	12.72950	127.2661	0.006330	0.01273
FW16 12	1.46590	jl	7/20/2009 13:41	6.32325	12.72600	127.1961	0.006323	0.01273
FW16 07	1.46087	jl	7/20/2009 13:42	6.33000	12.72700	127.2161	0.006330	0.01273
FW16 02	1.45506	jl	7/20/2009 13:44	6.33050	12.72750	127.2261	0.006331	0.01273
FW16 11	1.46733	jl	7/20/2009 13:45	6.32425	12.72750	127.2261	0.006324	0.01273
FW16 08	1.45874	jl	7/20/2009 13:47	6.32950	12.72650	127.2061	0.006330	0.01273

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
FW15 09	0.0015	1806.22589	1.8062	25.4	21.6	45.3
FW16 01	0.0015	1805.76071	1.8058	25.4	21.5	45
FW15 04	0.0015	1810.13750	1.8101	25.4	21.6	44.4
FW15 01	0.0015	1803.82763	1.8038	25.4	21.8	41.1
FW15 06	0.0015	1814.49467	1.8145	25.4	21.8	41.1
FW15 03	0.0015	1808.41431	1.8084	25.4	21.8	40.8
FW16 03	0.0015	1806.35068	1.8064	25.4	21.8	40.7
FW15 07	0.0015	1804.99892	1.8050	25.4	21.9	40.7
FW16 06	0.0015	1816.18626	1.8162	25.4	21.9	40.6
FW15 05	0.0015	1812.96319	1.8130	25.4	21.9	40.5
FW16 10	0.0015	1823.64505	1.8236	25.4	21.8	40.7
FW15 10	0.0015	1808.12345	1.8081	25.4	21.8	40.6
FW16 04	0.0015	1815.78930	1.8158	25.4	21.8	40.7
FW15 08	0.0015	1810.05245	1.8101	25.4	21.8	40.8
FW15 12	0.0015	1806.01229	1.8060	25.4	21.8	40.6
FW16 09	0.0015	1821.11402	1.8211	25.4	21.8	40.3
FW15 02	0.0015	1806.77412	1.8068	25.4	21.8	40.1
FW16 05	0.0015	1812.24730	1.8122	25.4	21.8	40.2
FW15 11	0.0015	1807.99792	1.8080	25.4	21.7	40.3
FW16 12	0.0015	1822.59541	1.8226	25.4	21.8	40.2
FW16 07	0.0015	1814.11950	1.8141	25.4	21.8	39.9
FW16 02	0.0015	1806.61993	1.8066	25.4	21.7	40
FW16 11	0.0015	1823.65497	1.8237	25.4	21.7	39.8
FW16 08	0.0015	1811.75990	1.8118	25.4	21.7	39.7

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
FW15 01		41169	11/9/2009 9:06	26.700	0.200	109.143	108.634	108.263
				101.300	0.300	79.911	79.742	79.827
				198.800	0.500	56.933	57.052	57.050
				301.500	0.200	43.024	43.216	43.217
				401.600	0.300	34.972	34.870	35.135
				501.600	0.200	29.544	29.469	29.467
				601.600	0.200	25.549	25.526	25.516
				701.800	0.100	22.691	22.662	22.637
				801.300	0.200	20.493	20.398	20.463
				900.900	0.100	18.683	18.730	18.563
FW15 02		41169	11/9/2009 9:06	1000.900	0.100	17.257	17.147	17.159
				25.800	0.200	108.917	109.452	106.558
				101.100	0.200	79.427	79.209	79.703
				200.200	0.200	56.416	56.742	56.348
				300.800	0.100	43.062	43.059	43.167
				400.900	0.100	35.000	35.023	34.962
				500.900	0.100	29.365	29.547	29.550
				601.000	0.100	25.524	25.478	25.580
				701.300	0.200	22.595	22.736	22.668
				800.900	0.100	20.531	20.427	20.486
FW15 07		41169	11/10/2009 8:10	900.700	0.000	18.596	18.691	18.607
				1000.700	0.000	17.444	17.041	17.205
				26.700	0.200	109.685	110.427	110.690
				101.300	0.200	80.754	80.596	80.683
				200.500	0.100	57.206	57.223	57.429
				301.600	0.200	43.521	43.824	43.643
				401.500	0.200	35.493	35.465	35.517
				501.600	0.200	29.806	29.801	29.871
				601.700	0.200	25.906	25.995	26.035
				701.800	0.100	23.073	22.951	23.019
FW15 08		41169	11/10/2009 8:10	801.300	0.200	20.803	20.708	20.874
				901.000	0.100	19.018	19.022	18.944
				1000.900	0.100	17.383	17.592	17.482
				26.100	0.200	107.472	106.736	106.477

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)	
FW15 09				101.200	0.100	77.537	77.750	77.889	
				200.600	0.000	55.225	55.356	55.378	
				300.800	0.000	42.121	42.139	42.134	
				401.000	0.100	34.143	34.031	34.145	
				501.000	0.100	28.715	28.777	28.847	
				601.100	0.100	25.045	25.015	24.949	
				701.300	0.200	22.192	22.151	22.135	
				801.000	0.100	19.984	19.853	19.871	
				900.900	0.100	18.233	18.328	18.150	
				1000.800	0.000	16.780	16.879	17.076	
			41169	11/10/2009 8:10	25.600	0.200	107.283	105.124	107.997
					101.100	0.200	77.887	78.335	78.355
					200.700	0.000	55.505	55.596	55.825
					300.800	0.100	42.578	42.698	42.496
					401.000	0.200	34.459	34.513	34.522
FW15 03				501.000	0.100	28.996	29.134	29.007	
				601.000	0.100	25.166	25.259	25.177	
				701.100	0.100	22.377	22.288	22.347	
				800.800	0.100	20.434	20.044	20.126	
				900.800	0.100	18.321	18.435	18.505	
				1000.700	0.100	17.011	17.012	16.941	
			41169	11/9/2009 9:06	25.200	0.200	107.092	107.257	104.487
					101.100	0.100	78.565	78.856	78.438
					200.800	0.100	56.047	56.017	55.931
					300.900	0.100	42.819	42.646	42.736
					401.000	0.100	34.576	34.626	34.666
					501.000	0.100	29.137	29.150	29.206
					601.000	0.100	25.315	25.355	25.306
					701.000	0.100	22.516	22.476	22.453
					800.800	0.100	20.175	20.279	20.227
				900.700	0.100	18.638	18.522	18.471	
FW15 04				1000.700	0.100	16.910	17.143	17.118	
			41169	26.500	0.300	106.339	106.741	107.161	
			11/9/2009 8:55	100.100	0.200	78.933	78.896	78.529	

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
FW15 05		41169	11/9/2009 8:55	199.200	0.100	56.058	55.871	55.767
				300.900	0.400	42.457	42.387	42.576
				401.200	0.500	34.292	34.413	34.525
				501.600	0.400	28.931	28.995	29.061
				600.900	0.300	25.198	25.217	25.152
				700.000	0.200	22.397	22.407	22.368
				799.600	0.100	20.184	20.197	20.107
				899.400	0.100	18.361	18.447	18.396
				999.400	0.100	16.908	17.053	16.946
				25.800	0.200	105.769	104.465	105.115
FW15 06		41169	11/9/2009 8:55	100.100	0.200	76.276	76.897	77.082
				199.200	0.000	54.742	54.515	54.656
				299.600	0.100	41.668	41.630	41.754
				399.900	0.200	33.704	33.817	33.723
				500.300	0.300	28.352	28.416	28.401
				600.100	0.200	24.585	24.696	24.829
				699.700	0.100	21.997	21.994	21.977
				799.400	0.100	19.728	19.730	19.707
				899.400	0.100	18.033	18.083	18.112
				999.400	0.100	16.747	16.705	16.645
FW15 10		41169	11/10/2009 7:48	25.100	0.200	106.965	107.855	109.260
				99.500	0.200	78.597	79.044	79.145
				199.200	0.100	55.880	55.964	56.046
				299.300	0.100	42.706	42.816	42.930
				399.400	0.100	34.616	34.643	34.737
				499.600	0.100	29.087	29.179	29.065
				599.500	0.100	25.275	25.224	25.254
				699.300	0.100	22.490	22.358	22.470
				799.200	0.100	20.240	20.210	20.246
				899.200	0.000	18.498	18.499	18.438
999.200	0.100	17.139	16.966	16.961				
26.600	0.200	108.104	109.197	106.845				
100.200	0.200	80.095	79.394	80.491				
199.200	0.100	56.829	57.053	56.822				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
FW15 11		41169	11/10/2009 7:48	300.800	0.400	43.056	43.182	43.191
				401.100	0.500	34.988	35.114	34.990
				501.000	0.400	29.579	29.526	29.587
				600.800	0.300	25.580	25.665	25.658
				699.900	0.200	22.745	22.743	22.786
				799.500	0.100	20.594	20.539	20.544
				899.400	0.100	18.763	18.746	18.622
				999.300	0.100	17.261	17.246	17.254
				25.600	0.200	109.576	110.663	110.234
				100.100	0.200	80.425	80.685	80.728
FW15 12		41169	11/10/2009 7:48	199.200	0.000	57.511	57.363	57.439
				299.700	0.100	43.599	43.641	43.819
				400.000	0.200	35.357	35.412	35.421
				500.000	0.300	29.782	29.794	29.760
				600.100	0.200	25.913	25.821	25.943
				699.700	0.100	22.954	22.862	22.872
				799.500	0.100	20.571	20.702	20.645
				899.500	0.100	18.893	19.002	18.908
				999.500	0.100	17.434	17.393	17.361
				25.000	0.200	106.439	104.339	106.737
				99.500	0.200	78.116	78.284	78.341
				199.100	0.000	55.458	55.342	55.385
				299.300	0.100	42.097	42.242	42.189
				399.500	0.100	33.997	34.174	34.122
				499.500	0.100	28.791	28.798	28.805
				599.500	0.100	24.945	25.004	25.001
				699.300	0.100	22.127	22.191	22.162
				799.200	0.100	19.986	20.062	19.980
				899.200	0.000	18.124	18.130	18.140
				999.200	0.000	16.833	16.830	16.723

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
FW16 01		41169	2/2/2010 8:53	26.700	0.200	110.073	110.296	109.615
				99.600	0.300	81.362	80.876	81.218
				199.100	0.100	57.719	57.660	57.606
				300.600	0.400	43.570	43.780	43.804
				401.100	0.500	35.401	35.378	35.311
				501.900	0.500	29.789	29.900	29.788
				601.200	0.300	25.893	25.895	25.919
				700.200	0.200	22.932	22.922	22.916
				799.600	0.100	20.839	20.613	20.613
				899.500	0.100	18.860	18.762	18.777
				999.400	0.100	17.167	17.368	17.397

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
FW15 01	108.680	0.442		6.331	InSb	12.7	100	Ar	E 1461-07
	79.827	0.085							
	57.012	0.068							
	43.152	0.111							
	34.992	0.134							
	29.493	0.044							
	25.530	0.017							
	22.663	0.027							
	20.451	0.049							
	18.659	0.086							
FW15 02	17.188	0.060		6.331	InSb	12.7	100	Ar	E 1461-07
	108.309	1.540							
	79.446	0.248							
	56.502	0.211							
	43.096	0.062							
	34.995	0.031							
	29.487	0.106							
	25.527	0.051							
	22.666	0.071							
	20.481	0.052							
FW15 07	18.631	0.052		6.331	InSb	12.7	100	Ar	E 1461-07
	17.230	0.203							
	110.267	0.521							
	80.678	0.079							
	57.286	0.124							
	43.663	0.152							
	35.492	0.026							
	29.826	0.039							
	25.979	0.066							
	23.014	0.061							
FW15 08	20.795	0.083		6.331	InSb	12.7	100	Ar	E 1461-07
	18.995	0.044							
	17.486	0.105							
	106.895	0.516							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
FW15 09	77.725	0.177							
	55.320	0.083							
	42.131	0.009							
	34.106	0.065							
	28.780	0.066							
	25.003	0.049							
	22.159	0.029							
	19.903	0.071							
	18.237	0.089							
	16.912	0.151							
	106.801	1.496		6.331	InSb	12.7	100	Ar	E 1461-07
	78.192	0.265							
	55.642	0.165							
	42.591	0.102							
	34.498	0.034							
29.046	0.077								
25.201	0.051								
22.337	0.045								
20.201	0.206								
18.420	0.093								
16.988	0.041								
FW15 03	106.279	1.554		6.331	InSb	12.7	100	Ar	E 1461-07
	78.620	0.214							
	55.998	0.060							
	42.734	0.087							
	34.623	0.045							
	29.164	0.037							
25.325	0.026								
22.482	0.032								
20.227	0.052								
18.544	0.086								
17.057	0.128								
FW15 04	106.747	0.411		6.331	InSb	12.7	100	Ar	E 1461-07
	78.786	0.223							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
FW15 05	55.899	0.147							
	42.473	0.096							
	34.410	0.117							
	28.996	0.065							
	25.189	0.033							
	22.391	0.020							
	20.163	0.049							
	18.401	0.043							
	16.969	0.075							
	105.116	0.652		6.331	InSb	12.7	100	Ar	E 1461-07
	76.752	0.422							
	54.638	0.115							
	41.684	0.064							
	33.748	0.061							
	28.390	0.033							
24.703	0.122								
21.989	0.011								
19.722	0.013								
18.076	0.040								
16.699	0.051								
FW15 06	108.027	1.157		6.331	InSb	12.7	100	Ar	E 1461-07
	78.929	0.292							
	55.963	0.083							
	42.817	0.112							
	34.665	0.064							
	29.110	0.060							
FW15 10	25.251	0.026							
	22.439	0.071							
	20.232	0.019							
	18.478	0.035							
	17.022	0.101							
	108.049	1.177		6.331	InSb	12.7	100	Ar	E 1461-07
79.993	0.556								
56.901	0.131								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
	43.143	0.075							
	35.031	0.072							
	29.564	0.033							
	25.634	0.047							
	22.758	0.024							
	20.559	0.030							
	18.710	0.077							
	17.254	0.008							
FW15 11	110.158	0.548		6.331	InSb	12.7	100	Ar	E 1461-07
	80.613	0.164							
	57.438	0.074							
	43.686	0.117							
	35.397	0.035							
	29.779	0.017							
	25.892	0.064							
	22.896	0.050							
	20.639	0.066							
	18.934	0.059							
	17.396	0.037							
FW15 12	105.838	1.307		6.331	InSb	12.7	100	Ar	E 1461-07
	78.247	0.117							
	55.395	0.059							
	42.176	0.073							
	34.098	0.091							
	28.798	0.007							
	24.983	0.033							
	22.160	0.032							
	20.009	0.046							
	18.131	0.008							
	16.795	0.063							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
FW16 01	109.995	0.347		6.331	InSb	12.7	100	Ar	E 1461-07
	81.152	0.250							
	57.662	0.057							
	43.718	0.129							
	35.363	0.047							
	29.826	0.064							
	25.902	0.014							
	22.923	0.008							
	20.688	0.130							
	18.800	0.053							
	17.311	0.125							

Specimen Number	FW15 01	FW15 02	FW15 07	FW15 08	FW15 09	FW15 03
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/9/09 9:06 AM	11/9/09 9:06 AM	11/10/09 8:10 AM	11/10/09 8:10 AM	11/10/09 8:10 AM	11/9/09 9:06 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	108.6800	108.3090	110.2673	106.8950	106.8013	106.2787
100	79.8267	79.4463	80.6777	77.7253	78.1923	78.6197
200	57.0117	56.5020	57.2860	55.3197	55.6420	55.9983
300	43.1523	43.0960	43.6627	42.1313	42.5907	42.7337
400	34.9923	34.9950	35.4917	34.1063	34.4980	34.6227
500	29.4933	29.4873	29.8260	28.7797	29.0457	29.1643
600	25.5303	25.5273	25.9787	25.0030	25.2007	25.3253
700	22.6633	22.6663	23.0143	22.1593	22.3373	22.4817
800	20.4513	20.4813	20.7950	19.9027	20.2013	20.2270
900	18.6587	18.6313	18.9947	18.2370	18.4203	18.5437
1000	17.1877	17.2300	17.4857	16.9117	16.9880	17.0570

Specimen Number	FW15 04	FW15 05	FW15 06	FW15 10	FW15 11	FW15 12
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/9/09 8:55 AM	11/9/09 8:55 AM	11/9/09 8:55 AM	11/10/09 7:48 AM	11/10/09 7:48 AM	11/10/09 7:48 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	106.7470	105.1163	108.0267	108.0487	110.1577	105.8383
100	78.7860	76.7517	78.9287	79.9933	80.6127	78.2470
200	55.8987	54.6377	55.9633	56.9013	57.4377	55.3950
300	42.4733	41.6840	42.8173	43.1430	43.6863	42.1760
400	34.4100	33.7480	34.6653	35.0307	35.3967	34.0977
500	28.9957	28.3897	29.1103	29.5640	29.7787	28.7980
600	25.1890	24.7033	25.2510	25.6343	25.8923	24.9833
700	22.3907	21.9893	22.4393	22.7580	22.8960	22.1600
800	20.1627	19.7217	20.2320	20.5590	20.6393	20.0093
900	18.4013	18.0760	18.4783	18.7103	18.9343	18.1313
1000	16.9690	16.6990	17.0220	17.2537	17.3960	16.7953

Specimen Number	FW16 01
Measured By	41169
Measured Date	2/2/10 8:53 AM
Diffusivity (mm²/sec)	
Temperature °C	
25	109.9947
100	81.1520
200	57.6617
300	43.7180
400	35.3633
500	29.8257
600	25.9023
700	22.9233
800	20.6883
900	18.7997
1000	17.3107

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	FW15 01	W	6.329	6.329	6.329	6.325	12.748	12.750	1.45721
	FW15 02	W	6.328	6.327	6.328	6.326	12.734	12.736	1.45721
	FW15 03	W	6.345	6.343	6.344	6.343	12.735	12.738	1.46267
	FW15 08	W	6.325	6.324	6.324	6.324	12.727	12.725	1.45773
	FW15 07	W	6.327	6.326	6.326	6.324	12.728	12.726	1.45347
	FW15 09	W	6.326	6.326	6.325	6.325	12.729	12.731	1.45456
	FW15 10	W	6.325	6.326	6.327	6.325	12.726	12.729	1.45668
	FW15 12	W	6.325	6.324	6.325	6.324	12.729	12.730	1.45429
	FW15 11	W	6.325	6.324	6.325	6.326	12.726	12.728	1.45630
	FW16 01	W	6.328	6.327	6.327	6.327	12.727	12.726	1.45460
	FW15 04	W	6.334	6.333	6.333	6.332	12.730	12.731	1.45912
	FW15 06	W	6.331	6.333	6.331	6.333	12.730	12.728	1.46297
	FW15 05	W	6.333	6.331	6.330	6.330	12.728	12.729	1.46126

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
FW15 01	41169	12/4/2010 7:48	6.32800	12.74900	127.6563	0.006328	0.01275
FW15 02	41169	12/4/2010 10:21	6.32725	12.73500	127.3761	0.006327	0.01274
FW15 03	41169	12/4/2010 14:03	6.34375	12.73650	127.4061	0.006344	0.01274
FW15 08	41169	12/6/2010 9:59	6.32425	12.72600	127.1961	0.006324	0.01273
FW15 07	41169	12/6/2010 11:02	6.32575	12.72700	127.2161	0.006326	0.01273
FW15 09	41169	12/6/2010 11:17	6.32550	12.73000	127.2761	0.006326	0.01273
FW15 10	41169	12/6/2010 13:10	6.32575	12.72750	127.2261	0.006325	0.01273
FW15 12	41169	12/6/2010 13:14	6.32450	12.72950	127.2661	0.006325	0.01273
FW15 11	41169	12/6/2010 13:42	6.32500	12.72700	127.2161	0.006325	0.01273
FW16 01	41169	12/6/2010 13:44	6.32725	12.72650	127.2061	0.006327	0.01273
FW15 04	41169	12/7/2010 9:00	6.33300	12.73050	127.2860	0.006333	0.01273
FW15 06	41169	12/7/2010 10:00	6.33200	12.72900	127.2561	0.006332	0.01273
FW15 05	41169	12/7/2010 10:24	6.33100	12.72850	127.2461	0.006331	0.01273

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
FW15 01	0.0015	25.4	22.4	13.1
FW15 02	0.0015	25.4	22.2	12.9
FW15 03	0.0015	25.4	22.6	14.2
FW15 08	0.0015	25.3	22.4	16.7
FW15 07	0.0015	25.3	22.8	18.6
FW15 09	0.0015	25.3	23	18.8
FW15 10	0.0015	25.3	22.4	21.5
FW15 12	0.0015	25.3	22.5	21.3
FW15 11	0.0015	25.3	22.9	21.1
FW16 01	0.0015	25.3	22.9	21
FW15 04	0.0015	25.6	22.9	21.4
FW15 06	0.0015	25.6	22.6	21.7
FW15 05	0.0015	25.6	22.7	21.6

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity

Graphite Grade: NBG-10
Graphite Manufacturer: SGL Carbon Company
Forming Process: Extruded
Coke Particle Size: Medium grain
Coke Type: Pitch coke
ASTM Class: ENHP
Specimen Geometry: Cylinder

Specimen ID #'s:

S1 01
S1 02
S1 03
S1 04
S1 05
S1 06
S1 07
S1 08
S1 09
S1 10
S1 11
S1 12
S2 01
S2 02
S2 03
S2 04
S2 05
S2 06
S2 07
S2 08
S2 09
S2 10
S2 11
S2 12

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	S2 02		6.325	6.325	6.325	6.325	12.719	12.719
	S1 11		6.327	6.326	6.326	6.326	12.717	12.719
	S2 03		6.325	6.324	6.325	6.326	12.718	12.720
	S1 05		6.324	6.328	6.329	6.328	12.717	12.720
	S2 06		6.329	6.327	6.326	6.328	12.722	12.721
	S1 07		6.323	6.324	6.326	6.324	12.716	12.716
	S1 04		6.328	6.328	6.326	6.327	12.718	12.719
	S1 12		6.326	6.327	6.325	6.325	12.720	12.720
	S1 06		6.328	6.328	6.328	6.328	12.719	12.718
	S1 08		6.326	6.325	6.325	6.325	12.717	12.718
	S1 01		6.315	6.315	6.312	6.314	12.706	12.704
	S2 12		6.328	6.327	6.327	6.328	12.728	12.726
	S2 10		6.327	6.327	6.326	6.327	12.725	12.725
	S1 03		6.327	6.326	6.327	6.329	12.714	12.717
	S2 08		6.328	6.327	6.327	6.327	12.726	12.723
	S1 09		6.324	6.326	6.325	6.324	12.720	12.720
	S1 10		6.325	6.324	6.326	6.325	12.718	12.720
	S2 04		6.326	6.324	6.326	6.326	12.718	12.721
	S2 05		6.327	6.325	6.325	6.327	12.725	12.723
	S1 02		6.329	6.330	6.330	6.329	12.720	12.718
	S2 01		6.327	6.325	6.323	6.325	12.722	12.723
	S2 09		6.329	6.328	6.328	6.327	12.724	12.724
	S2 07		6.326	6.328	6.325	6.328	12.725	12.722
	S2 11		6.325	6.327	6.325	6.327	12.727	12.726

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
S2 02	1.44188	jl	8/10/2009 12:53	6.32500	12.71900	127.0562	0.006325	0.01272
S1 11	1.43594	jl	8/10/2009 12:54	6.32625	12.71800	127.0362	0.006326	0.01272
S2 03	1.44258	jl	8/10/2009 12:56	6.32500	12.71900	127.0562	0.006325	0.01272
S1 05	1.44056	jl	8/10/2009 12:58	6.32725	12.71850	127.0462	0.006327	0.01272
S2 06	1.43969	jl	8/10/2009 12:59	6.32750	12.72150	127.1061	0.006328	0.01272
S1 07	1.43482	jl	8/10/2009 13:01	6.32425	12.71600	126.9963	0.006324	0.01272
S1 04	1.43526	jl	8/10/2009 13:02	6.32725	12.71850	127.0462	0.006327	0.01272
S1 12	1.43598	jl	8/10/2009 13:04	6.32575	12.72000	127.0762	0.006326	0.01272
S1 06	1.43786	jl	8/10/2009 13:05	6.32800	12.71850	127.0462	0.006328	0.01272
S1 08	1.43613	jl	8/10/2009 13:06	6.32525	12.71750	127.0262	0.006325	0.01272
S1 01	1.42799	jl	8/10/2009 13:08	6.31400	12.70500	126.7766	0.006314	0.01271
S2 12	1.44366	jl	8/10/2009 13:09	6.32750	12.72700	127.2161	0.006328	0.01273
S2 10	1.43629	jl	8/10/2009 13:10	6.32675	12.72500	127.1761	0.006327	0.01273
S1 03	1.43418	jl	8/10/2009 13:12	6.32725	12.71550	126.9863	0.006327	0.01272
S2 08	1.44021	jl	8/10/2009 13:13	6.32725	12.72450	127.1661	0.006327	0.01272
S1 09	1.43211	jl	8/10/2009 13:15	6.32475	12.72000	127.0762	0.006325	0.01272
S1 10	1.43130	jl	8/10/2009 13:16	6.32500	12.71900	127.0562	0.006325	0.01272
S2 04	1.44106	jl	8/10/2009 13:17	6.32550	12.71950	127.0662	0.006326	0.01272
S2 05	1.44406	jl	8/10/2009 13:18	6.32600	12.72400	127.1561	0.006326	0.01272
S1 02	1.43328	jl	8/10/2009 13:20	6.32950	12.71900	127.0562	0.006330	0.01272
S2 01	1.44131	jl	8/10/2009 13:21	6.32500	12.72250	127.1261	0.006325	0.01272
S2 09	1.43873	jl	8/10/2009 13:22	6.32800	12.72400	127.1561	0.006328	0.01272
S2 07	1.44151	jl	8/10/2009 13:24	6.32675	12.72350	127.1461	0.006327	0.01272
S2 11	1.43753	jl	8/10/2009 13:26	6.32600	12.72650	127.2061	0.006326	0.01273

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
S2 02	0.0014	1794.20793	1.7942	25.4	23.7	31.7
S1 11	0.0014	1786.74436	1.7867	25.4	23.6	31.7
S2 03	0.0014	1795.07898	1.7951	25.4	23.6	31.7
S1 05	0.0014	1792.06883	1.7921	25.4	23.6	31.7
S2 06	0.0014	1790.07121	1.7901	25.4	23.6	31.7
S1 07	0.0014	1786.47718	1.7865	25.4	23.6	31.5
S1 04	0.0014	1785.47559	1.7855	25.4	23.6	31.3
S1 12	0.0014	1786.37348	1.7864	25.4	23.6	31.3
S1 06	0.0014	1788.49801	1.7885	25.4	23.7	31.1
S1 08	0.0014	1787.40383	1.7874	25.4	23.7	31.1
S1 01	0.0014	1783.94462	1.7839	25.4	23.6	31.1
S2 12	0.0014	1793.45630	1.7935	25.4	23.6	31.2
S2 10	0.0014	1785.07308	1.7851	25.4	23.7	31.1
S1 03	0.0014	1784.97403	1.7850	25.4	23.7	31.2
S2 08	0.0014	1789.94421	1.7899	25.4	23.7	31
S1 09	0.0014	1781.84084	1.7818	25.4	23.7	31
S1 10	0.0014	1781.04267	1.7810	25.4	23.7	31
S2 04	0.0014	1792.90485	1.7929	25.4	23.7	31
S2 05	0.0014	1795.22484	1.7952	25.4	23.7	30.9
S1 02	0.0014	1782.23850	1.7822	25.4	23.7	30.8
S2 01	0.0014	1792.51199	1.7925	25.4	23.7	30.8
S2 09	0.0014	1788.03340	1.7880	25.4	23.7	30.7
S2 07	0.0014	1791.98313	1.7920	25.4	23.7	30.7
S2 11	0.0014	1786.40483	1.7864	25.4	23.8	30.5

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
S1 03		41169	11/14/2009 9:35	25.000	0.200	107.290	106.004	107.262
				99.500	0.200	79.159	78.983	79.643
				199.100	0.000	57.129	56.855	56.949
				299.300	0.100	43.815	43.740	43.707
				399.300	0.100	35.451	35.357	35.322
				499.700	0.200	29.819	29.966	29.793
				599.500	0.100	25.977	25.993	25.949
				699.300	0.100	23.050	23.082	23.016
				799.200	0.100	20.892	20.742	20.827
				899.200	0.100	19.115	19.165	19.199
S1 01		41169	11/14/2009 9:35	999.200	0.000	17.692	17.670	17.511
				26.500	0.300	108.151	105.941	107.501
				100.200	0.200	80.092	79.946	79.838
				199.200	0.000	57.325	57.292	57.454
				300.600	0.400	43.676	43.796	43.865
				401.100	0.500	35.393	35.473	35.437
				501.700	0.500	30.045	29.950	29.941
				600.900	0.300	26.024	26.134	26.121
				700.000	0.200	23.184	23.225	23.123
				799.500	0.100	20.927	20.973	20.799
S1 02		41169	11/14/2009 9:35	899.400	0.100	19.130	19.003	19.101
				999.300	0.000	17.697	17.652	17.639
				25.700	0.200	108.296	109.118	109.347
				100.000	0.200	80.399	80.761	80.730
				199.100	0.000	57.820	57.721	57.874
				299.500	0.100	44.213	44.132	44.271
				399.900	0.200	35.775	35.852	35.776
				500.300	0.300	30.264	30.326	30.251
				600.000	0.200	26.352	26.294	26.393
				699.600	0.100	23.413	23.415	23.343
S1 05		41169	11/15/2009 9:45	799.400	0.100	21.173	21.058	21.148
				899.400	0.100	19.396	19.295	19.348
				999.400	0.100	17.807	17.870	17.781
				26.000	0.200	110.499	110.917	108.147

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)	
S1 06				101.200	0.200	80.924	81.081	81.302	
				200.500	0.100	57.954	58.130	58.007	
				300.900	0.100	44.568	44.501	44.688	
				401.000	0.100	36.138	36.128	36.142	
				500.900	0.100	30.640	30.617	30.613	
				601.100	0.100	26.625	26.679	26.624	
				701.300	0.200	23.658	23.575	23.700	
				801.000	0.100	21.251	21.331	21.271	
				900.800	0.100	19.463	19.405	19.429	
				1000.800	0.100	18.314	18.024	17.943	
			41169	11/15/2009 9:45	25.400	0.200	109.134	110.746	111.886
					101.100	0.200	80.962	81.183	81.244
					200.800	0.100	58.114	57.972	57.821
					300.900	0.100	44.422	44.347	44.422
					401.000	0.200	36.143	36.267	36.183
S1 04				500.900	0.100	30.467	30.569	30.559	
				601.000	0.100	26.617	26.525	26.516	
				701.000	0.100	23.617	23.573	23.672	
				800.800	0.100	21.242	21.254	21.137	
				900.700	0.100	19.627	19.450	19.448	
				1000.700	0.100	17.845	18.149	17.984	
			41169	11/15/2009 9:45	26.700	0.200	109.743	109.719	109.902
					101.300	0.200	81.026	80.811	80.426
					199.000	0.500	57.965	57.991	58.049
					301.600	0.300	44.037	44.311	44.208
					401.600	0.200	35.968	36.068	35.974
					501.600	0.200	30.369	30.535	30.459
					601.600	0.200	26.552	26.436	26.526
					701.800	0.100	23.592	23.471	23.500
					801.400	0.200	21.271	21.477	21.291
				901.000	0.100	19.425	19.569	19.452	
S1 07				1001.000	0.100	18.085	18.041	17.985	
			41169	11/15/2009 9:36	26.600	0.200	109.574	109.459	
				100.200	0.200	80.912	81.178	81.026	

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
S1 08				199.200	0.100	57.717	57.671	57.888
				300.600	0.300	44.099	44.115	44.112
				401.100	0.500	35.628	35.681	35.861
				501.700	0.500	30.207	30.215	30.330
				600.900	0.300	26.312	26.382	26.328
				699.900	0.200	23.298	23.418	23.385
				799.500	0.100	21.191	21.029	21.142
				899.400	0.100	19.341	19.534	19.414
				999.300	0.100	17.747	17.767	17.715
			41169	11/15/2009 9:36	25.800	0.200	110.833	109.788
S1 09				100.000	0.200	81.215	81.169	81.425
				199.200	0.000	58.074	58.398	58.140
				299.600	0.100	44.400	44.352	44.383
				399.900	0.200	35.973	36.016	35.896
				500.300	0.300	30.364	30.446	30.329
				600.100	0.200	26.467	26.547	26.487
				699.600	0.100	23.360	23.662	23.519
				799.500	0.100	21.201	21.182	21.145
				899.500	0.100	19.291	19.392	19.435
				999.500	0.100	17.810	17.787	17.973
S1 10				25.200	0.200	107.723	109.260	109.097
				99.400	0.200	80.314	80.712	80.971
				199.100	0.000	57.747	57.727	57.831
				299.300	0.000	44.025	44.118	44.162
				399.400	0.100	35.808	35.936	35.869
				499.700	0.100	30.266	30.349	30.308
				599.500	0.100	26.204	26.266	26.286
				699.300	0.100	23.215	23.334	23.252
				799.200	0.000	21.142	20.941	20.993
				899.200	0.000	19.226	19.228	19.308
S1 10				999.100	0.000	17.906	17.814	17.894
				26.600	0.200	108.258	107.222	108.991
			41169	11/16/2009 13:00	100.100	0.200	80.097	80.382
				199.000	0.200	57.404	57.438	57.167

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
S1 12		41169	11/16/2009 13:00	300.700	0.400	43.665	43.641	43.888
				401.200	0.500	35.349	35.462	35.430
				501.600	0.400	29.965	29.985	29.936
				600.800	0.300	26.055	26.139	26.023
				700.000	0.200	23.115	23.101	23.123
				799.500	0.100	20.948	20.911	20.875
				899.400	0.100	19.074	19.028	19.082
				999.300	0.100	17.700	17.845	17.702
				24.800	0.200	110.712	109.117	108.641
				99.400	0.200	80.983	80.922	81.217
				199.100	0.000	57.651	57.647	57.608
				299.300	0.100	44.169	44.298	44.217
399.400	0.100	35.758	35.773	35.825				
499.700	0.200	30.087	30.130	30.326				
599.500	0.100	26.197	26.271	26.414				
699.300	0.100	23.334	23.315	23.379				
799.200	0.000	21.048	21.092	21.032				
899.200	0.000	19.311	19.252	19.365				
999.100	0.000	17.760	17.847	17.655				
S2 01		41169	11/16/2009 13:08	26.700	0.200	108.748	109.016	109.703
				101.300	0.200	81.363	81.367	81.240
				200.300	0.200	58.032	57.904	58.195
				301.600	0.200	44.302	44.609	44.319
				401.600	0.200	36.138	36.216	36.088
				501.600	0.200	30.543	30.460	30.532
				601.700	0.200	26.567	26.576	26.497
				701.700	0.200	23.608	23.593	23.615
				801.400	0.300	21.413	21.264	21.257
				901.000	0.100	19.419	19.548	19.355
				1001.100	0.100	17.751	17.930	18.048
				26.100	0.100	109.953	110.402	109.845
100.900	0.100	80.693	81.050	81.226				
200.400	0.100	57.947	57.722	57.665				
300.600	0.100	44.319	44.407	44.473				
S2 02		41169	11/16/2009 13:08	26.100	0.100	109.953	110.402	109.845
				100.900	0.100	80.693	81.050	81.226
				200.400	0.100	57.947	57.722	57.665
				300.600	0.100	44.319	44.407	44.473

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
S2 03		41169	11/16/2009 13:08	400.600	0.000	36.258	36.294	36.190
				500.700	0.000	30.619	30.522	30.542
				600.800	0.000	26.613	26.751	26.562
				700.900	0.100	23.720	23.643	23.686
				800.700	0.100	21.264	21.285	21.358
				900.500	0.000	19.553	19.676	19.741
				1000.600	0.000	18.014	18.142	18.033
				25.600	0.200	110.495	109.766	110.084
				101.200	0.200	80.731	80.882	81.249
				200.700	0.000	57.861	57.950	57.840
S1 11		41169	11/16/2009 13:00	300.900	0.100	44.546	44.441	44.538
				401.100	0.200	36.092	36.097	36.304
				501.100	0.200	30.526	30.656	30.704
				601.000	0.100	26.597	26.672	26.616
				701.000	0.100	23.596	23.630	23.673
				800.900	0.100	21.414	21.344	21.319
				900.800	0.100	19.528	19.654	19.401
				1000.800	0.100	17.957	18.035	17.921
				25.500	0.200	109.765	111.374	109.001
				100.000	0.200	81.221	80.855	81.518
S2 07		41169	11/17/2009 8:19	199.200	0.000	58.078	57.866	57.790
				299.600	0.100	44.360	44.228	44.420
				399.900	0.200	35.922	36.015	35.971
				500.400	0.300	30.189	30.231	30.332
				600.000	0.200	26.284	26.415	26.281
				699.700	0.100	23.361	23.393	23.439
				799.500	0.100	21.044	21.150	21.249
				899.400	0.100	19.272	19.307	19.334
				999.500	0.100	17.868	17.876	17.849
				26.400	0.200	109.036	109.403	109.976
101.300	0.300	81.128	81.498	81.224				
200.400	0.200	58.207	58.094	58.005				
301.600	0.200	44.354	44.327	44.408				
401.600	0.200	36.091	36.046	36.224				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
S2 08		41169	11/17/2009 8:19	501.600	0.200	30.514	30.464	30.653
				601.600	0.200	26.494	26.517	26.518
				701.800	0.200	23.613	23.679	23.532
				801.300	0.200	21.361	21.286	21.346
				900.900	0.100	19.206	19.292	19.522
				1001.000	0.100	17.991	18.055	18.003
				25.800	0.200	109.510	108.848	109.960
				101.000	0.100	80.621	80.432	80.456
				200.500	0.100	57.627	57.499	57.624
				300.700	0.000	44.015	44.086	44.238
S2 09		41169	11/17/2009 8:19	400.800	0.000	35.921	35.944	35.842
				500.800	0.100	30.297	30.328	30.390
				601.000	0.100	26.246	26.437	26.412
				701.200	0.100	23.496	23.339	23.470
				800.900	0.100	21.325	21.151	21.113
				900.700	0.000	19.249	19.389	19.290
				1000.800	0.100	17.851	17.909	18.058
				24.900	0.200	111.002	110.305	110.807
				101.100	0.200	80.660	80.698	81.056
				200.700	0.100	57.887	58.056	57.903
S2 04		41169	11/17/2009 8:29	300.900	0.100	44.447	44.255	44.264
				401.100	0.200	35.865	35.983	35.988
				501.000	0.100	30.355	30.342	30.447
				601.000	0.100	26.393	26.448	26.413
				701.100	0.100	23.509	23.602	23.482
				800.900	0.100	21.098	21.233	21.414
				900.800	0.100	19.370	19.339	19.253
				1000.800	0.100	17.679	17.683	17.985
				26.500	0.300	109.928	109.320	109.484
				100.200	0.200	81.175	80.786	80.724
199.200	0.100	57.630	57.916	57.838				
300.600	0.300	44.012	44.335	44.299				
401.100	0.500	35.880	35.780	35.848				
501.700	0.600	30.313	30.320	30.216				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
S2 05		41169	11/17/2009 8:29	600.900	0.400	26.353	26.321	26.310
				699.900	0.200	23.388	23.425	23.471
				799.500	0.100	21.103	21.207	21.139
				899.400	0.100	19.288	19.228	19.390
				999.300	0.100	17.818	17.896	17.758
				25.500	0.200	110.033	110.941	109.856
				100.000	0.200	80.651	81.020	81.241
				199.100	0.000	57.973	58.178	57.850
				299.500	0.100	44.320	44.340	44.487
				399.600	0.100	36.011	35.903	35.971
S2 06		41169	11/17/2009 8:29	500.300	0.300	30.326	30.295	30.297
				600.000	0.200	26.432	26.606	26.464
				699.600	0.100	23.395	23.481	23.546
				799.400	0.100	21.141	21.077	21.229
				899.400	0.100	19.498	19.372	19.343
				999.400	0.100	17.973	17.957	17.946
				24.800	0.200	109.488	109.228	110.589
				99.500	0.200	80.377	81.096	80.462
				199.200	0.100	57.676	57.709	57.648
				299.300	0.100	44.293	44.346	44.235
399.400	0.100	35.786	35.955	35.942				
499.700	0.200	30.369	30.482	30.340				
599.600	0.100	26.379	26.353	26.487				
699.300	0.100	23.517	23.497	23.404				
799.200	0.000	21.267	21.109	21.262				
899.200	0.000	19.401	19.371	19.363				
999.200	0.000	18.011	17.661	17.771				

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
S1 03	106.852	0.735		6.327	InSb	12.7	100	Ar	E 1461-07
	79.262	0.342							
	56.978	0.139							
	43.754	0.055							
	35.377	0.067							
	29.859	0.093							
	25.973	0.022							
	23.049	0.033							
	20.820	0.075							
	19.160	0.042							
17.624	0.099								
S1 01	107.198	1.136		6.327	InSb	12.7	100	Ar	E 1461-07
	79.959	0.127							
	57.357	0.086							
	43.779	0.096							
	35.434	0.040							
	29.979	0.058							
	26.093	0.060							
	23.177	0.051							
	20.900	0.090							
	19.078	0.067							
17.663	0.030								
S1 02	108.920	0.553		6.327	InSb	12.7	100	Ar	E 1461-07
	80.630	0.201							
	57.805	0.078							
	44.205	0.070							
	35.801	0.044							
	30.280	0.040							
	26.346	0.050							
	23.390	0.041							
	21.126	0.060							
	19.346	0.051							
17.819	0.046								
S1 05	109.854	1.493		6.327	InSb	12.7	100	Ar	E 1461-07

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
S1 06	81.102	0.190							
	58.030	0.090							
	44.586	0.095							
	36.136	0.007							
	30.623	0.015							
	26.643	0.031							
	23.644	0.064							
	21.284	0.042							
	19.432	0.029							
	18.094	0.195							
	110.589	1.383		6.327	InSb	12.7	100	Ar	E 1461-07
	81.130	0.148							
	57.969	0.147							
	44.397	0.043							
36.198	0.063								
30.532	0.056								
26.553	0.056								
23.621	0.050								
21.211	0.064								
19.508	0.103								
17.993	0.152								
109.788	0.099		6.327	InSb	12.7	100	Ar	E 1461-07	
80.754	0.304								
58.002	0.043								
44.185	0.138								
36.003	0.056								
30.454	0.083								
26.505	0.061								
23.521	0.063								
21.346	0.114								
19.482	0.077								
18.037	0.050								
108.768	1.298		6.327	InSb	12.7	100	Ar	E 1461-07	
81.039	0.133								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
S1 08	57.759	0.114							
	44.109	0.009							
	35.723	0.122							
	30.251	0.069							
	26.341	0.037							
	23.367	0.062							
	21.121	0.083							
	19.430	0.097							
	17.743	0.026							
	110.225	0.543		6.327	InSb	12.7	100	Ar	E 1461-07
S1 09	81.270	0.136							
	58.204	0.171							
	44.378	0.024							
	35.962	0.061							
	30.380	0.060							
	26.500	0.042							
	23.514	0.151							
	21.176	0.028							
	19.373	0.074							
	17.857	0.101							
S1 10	108.693	0.844		6.327	InSb	12.7	100	Ar	E 1461-07
	80.666	0.331							
	57.768	0.055							
	44.102	0.070							
	35.871	0.064							
	30.308	0.042							
	26.252	0.043							
	23.267	0.061							
	21.025	0.104							
	19.254	0.047							
S1 10	17.871	0.050							
	108.157	0.889		6.327	InSb	12.7	100	Ar	E 1461-07
	80.182	0.174							
	57.336	0.148							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
S1 12	43.731	0.136							
	35.414	0.058							
	29.962	0.025							
	26.072	0.060							
	23.113	0.011							
	20.911	0.037							
	19.061	0.029							
	17.749	0.083							
	109.490	1.085		6.327	InSb	12.7	100	Ar	E 1461-07
	81.041	0.156							
	57.635	0.024							
	44.228	0.065							
35.785	0.035								
30.181	0.127								
26.294	0.110								
23.343	0.033								
21.057	0.031								
19.309	0.057								
17.754	0.096								
109.156	0.493		6.327	InSb	12.7	100	Ar	E 1461-07	
81.323	0.072								
58.044	0.146								
44.410	0.173								
36.147	0.065								
30.512	0.045								
26.547	0.043								
23.605	0.011								
21.311	0.088								
19.441	0.098								
17.910	0.150								
110.067	0.295		6.327	InSb	12.7	100	Ar	E 1461-07	
80.990	0.272								
57.778	0.149								
44.400	0.077								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
	36.247	0.053							
	30.561	0.051							
	26.642	0.098							
	23.683	0.039							
	21.302	0.049							
	19.657	0.095							
	18.063	0.069							
S2 03	110.115	0.365		6.327	InSb	12.7	100	Ar	E 1461-07
	80.954	0.266							
	57.884	0.058							
	44.508	0.058							
	36.164	0.121							
	30.629	0.092							
	26.628	0.039							
	23.633	0.039							
	21.359	0.049							
	19.528	0.127							
	17.971	0.058							
S1 11	110.047	1.211		6.327	InSb	12.7	100	Ar	E 1461-07
	81.198	0.332							
	57.911	0.149							
	44.336	0.098							
	35.969	0.047							
	30.251	0.074							
	26.327	0.077							
	23.398	0.039							
	21.148	0.103							
	19.304	0.031							
	17.864	0.014							
S2 07	109.472	0.474		6.327	InSb	12.7	100	Ar	E 1461-07
	81.283	0.192							
	58.102	0.101							
	44.363	0.041							
	36.120	0.093							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
S2 08	30.544	0.098							
	26.510	0.014							
	23.608	0.074							
	21.331	0.040							
	19.340	0.163							
	18.016	0.034							
	109.439	0.559		6.327	InSb	12.7	100	Ar	E 1461-07
	80.503	0.103							
	57.583	0.073							
	44.113	0.114							
35.902	0.054								
30.338	0.047								
26.365	0.104								
23.435	0.084								
21.196	0.113								
19.309	0.072								
17.939	0.107								
110.705	0.360		6.327	InSb	12.7	100	Ar	E 1461-07	
80.805	0.218								
57.949	0.093								
44.322	0.108								
35.945	0.070								
30.381	0.057								
26.418	0.028								
23.531	0.063								
21.248	0.159								
19.321	0.061								
17.782	0.176								
109.577	0.315		6.327	InSb	12.7	100	Ar	E 1461-07	
80.895	0.244								
57.795	0.148								
44.215	0.177								
35.836	0.051								
30.283	0.058								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
S2 05	26.328	0.022		6.327	InSb	12.7	100	Ar	E 1461-07
	23.428	0.042							
	21.150	0.053							
	19.302	0.082							
	17.824	0.069							
	110.277	0.582							
	80.971	0.298							
	58.000	0.166							
	44.382	0.091							
	35.962	0.055							
30.306	0.017								
26.501	0.093								
23.474	0.076								
21.149	0.076								
19.404	0.082								
17.959	0.014								
109.768	0.723		6.327	InSb	12.7	100	Ar	E 1461-07	
80.645	0.393								
57.678	0.031								
44.291	0.056								
35.894	0.094								
30.397	0.075								
26.406	0.071								
23.473	0.060								
21.213	0.090								
19.378	0.020								
17.814	0.179								

Specimen Number	S1 03	S1 01	S1 02	S1 05	S1 06	S1 04
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/14/09 9:35 AM	11/14/09 9:35 AM	11/14/09 9:35 AM	11/15/09 9:45 AM	11/15/09 9:45 AM	11/15/09 9:45 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	106.8520	107.1977	108.9203	109.8543	110.5887	109.7880
100	79.2617	79.9587	80.6300	81.1023	81.1297	80.7543
200	56.9777	57.3570	57.8050	58.0303	57.9690	58.0017
300	43.7540	43.7790	44.2053	44.5857	44.3970	44.1853
400	35.3767	35.4343	35.8010	36.1360	36.1977	36.0033
500	29.8593	29.9787	30.2803	30.6233	30.5317	30.4543
600	25.9730	26.0930	26.3463	26.6427	26.5527	26.5047
700	23.0493	23.1773	23.3903	23.6443	23.6207	23.5210
800	20.8203	20.8997	21.1263	21.2843	21.2110	21.3463
900	19.1597	19.0780	19.3463	19.4323	19.5083	19.4820
1000	17.6243	17.6627	17.8193	18.0937	17.9927	18.0370

Specimen Number	S1 07	S1 08	S1 09	S1 10	S1 12	S2 01
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/15/09 9:36 AM	11/15/09 9:36 AM	11/15/09 9:36 AM	11/16/09 1:00 PM	11/16/09 1:00 PM	11/16/09 1:08 PM
Diffusivity (mm ² /sec)						
Temperature °C						
25	108.7677	110.2247	108.6933	108.1570	109.4900	109.1557
100	81.0387	81.2697	80.6657	80.1817	81.0407	81.3233
200	57.7587	58.2040	57.7683	57.3363	57.6353	58.0437
300	44.1087	44.3783	44.1017	43.7313	44.2280	44.4100
400	35.7233	35.9617	35.8710	35.4137	35.7853	36.1473
500	30.2507	30.3797	30.3077	29.9620	30.1810	30.5117
600	26.3407	26.5003	26.2520	26.0723	26.2940	26.5467
700	23.3670	23.5137	23.2670	23.1130	23.3427	23.6053
800	21.1207	21.1760	21.0253	20.9113	21.0573	21.3113
900	19.4297	19.3727	19.2540	19.0613	19.3093	19.4407
1000	17.7430	17.8567	17.8713	17.7490	17.7540	17.9097

Specimen Number	S2 02	S2 03	S1 11	S2 07	S2 08	S2 09
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/16/09 1:08 PM	11/16/09 1:08 PM	11/16/09 1:00 PM	11/17/09 8:19 AM	11/17/09 8:19 AM	11/17/09 8:19 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	110.0667	110.1150	110.0467	109.4717	109.4393	110.7047
100	80.9897	80.9540	81.1980	81.2833	80.5030	80.8047
200	57.7780	57.8837	57.9113	58.1020	57.5833	57.9487
300	44.3997	44.5083	44.3360	44.3630	44.1130	44.3220
400	36.2473	36.1643	35.9693	36.1203	35.9023	35.9453
500	30.5610	30.6287	30.2507	30.5437	30.3383	30.3813
600	26.6420	26.6283	26.3267	26.5097	26.3650	26.4180
700	23.6830	23.6330	23.3977	23.6080	23.4350	23.5310
800	21.3023	21.3590	21.1477	21.3310	21.1963	21.2483
900	19.6567	19.5277	19.3043	19.3400	19.3093	19.3207
1000	18.0630	17.9710	17.8643	18.0163	17.9393	17.7823

Specimen Number	S2 04	S2 05	S2 06
Measured By	41169	41169	41169
Measured Date	11/17/09 8:29 AM	11/17/09 8:29 AM	11/17/09 8:29 AM
Diffusivity (mm ² /sec)			
Temperature °C			
25	109.5773	110.2767	109.7683
100	80.8950	80.9707	80.6450
200	57.7947	58.0003	57.6777
300	44.2153	44.3823	44.2913
400	35.8360	35.9617	35.8943
500	30.2830	30.3060	30.3970
600	26.3280	26.5007	26.4063
700	23.4280	23.4740	23.4727
800	21.1497	21.1490	21.2127
900	19.3020	19.4043	19.3783
1000	17.8240	17.9587	17.8143

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	S2 12		6.327	6.326	6.325	6.327	12.728	12.731	1.44323
	S2 10		6.328	6.326	6.327	6.325	12.723	12.732	1.43595
	S2 11		6.326	6.327	6.327	6.326	12.727	12.727	1.43722
	S2 07		6.328	6.328	6.326	6.327	12.728	12.724	1.44103
	S2 08		6.327	6.326	6.326	6.326	12.728	12.722	1.43975
	S2 09		6.327	6.327	6.328	6.327	12.729	12.729	1.43826
	S1 03		6.329	6.326	6.326	6.327	12.718	12.717	1.43372
	S1 04		6.327	6.329	6.325	6.325	12.719	12.718	1.43458
	S1 01		6.313	6.315	6.315	6.313	12.708	12.707	1.42744
	S1 02		6.326	6.329	6.331	6.324	12.721	12.719	1.43284
	S1 07		6.324	6.324	6.325	6.323	12.721	12.720	1.43446
	S1 06		6.329	6.328	6.328	6.328	12.718	12.719	1.43740
	S1 05		6.327	6.328	6.326	6.326	12.721	12.718	1.43997
	S1 08		6.326	6.325	6.325	6.326	12.723	12.725	1.43565
	S1 09		6.322	6.323	6.323	6.324	12.725	12.723	1.43163
	S1 11		6.326	6.325	6.325	6.326	12.721	12.719	1.43549
	S1 10		6.324	6.323	6.324	6.324	12.725	12.726	1.43095

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
S2 12	47735	12/2/2010 16:21	6.32625	12.72950	127.2661	0.006326	0.01273
S2 10	41169	12/3/2010 9:39	6.32650	12.72750	127.2261	0.006327	0.01273
S2 11	41169	12/3/2010 13:28	6.32650	12.72700	127.2161	0.006327	0.01273
S2 07	41169	12/4/2010 7:50	6.32725	12.72600	127.1961	0.006327	0.01273
S2 08	41169	12/4/2010 10:29	6.32625	12.72500	127.1761	0.006326	0.01273
S2 09	41169	12/4/2010 13:44	6.32725	12.72900	127.2561	0.006327	0.01273
S1 03	41169	12/6/2010 9:39	6.32700	12.71750	127.0262	0.006327	0.01272
S1 04	41169	12/6/2010 9:57	6.32650	12.71850	127.0462	0.006327	0.01272
S1 01	41169	12/6/2010 10:45	6.31400	12.70750	126.8265	0.006314	0.01271
S1 02	41169	12/6/2010 11:22	6.32750	12.72000	127.0762	0.006328	0.01272
S1 07	41169	12/6/2010 12:53	6.32400	12.72050	127.0862	0.006324	0.01272
S1 06	41169	12/6/2010 13:45	6.32825	12.71850	127.0462	0.006328	0.01272
S1 05	41169	12/6/2010 13:55	6.32675	12.71950	127.0662	0.006327	0.01272
S1 08	41169	12/7/2010 8:48	6.32550	12.72400	127.1561	0.006326	0.01272
S1 09	41169	12/7/2010 9:23	6.32300	12.72400	127.1561	0.006323	0.01272
S1 11	41169	12/7/2010 10:03	6.32550	12.72000	127.0762	0.006326	0.01272
S1 10	41169	12/7/2010 10:12	6.32375	12.72550	127.1861	0.006324	0.01273

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
S2 12	0.0014	25.2	22.8	17.8
S2 10	0.0014	25.3	23	20.7
S2 11	0.0014	25.3	22.5	20.2
S2 07	0.0014	25.4	22.3	13.1
S2 08	0.0014	25.4	22.1	12.9
S2 09	0.0014	25.4	22.5	14.1
S1 03	0.0014	25.3	22.4	16.3
S1 04	0.0014	25.3	22.4	16.7
S1 01	0.0014	25.3	22.7	17.9
S1 02	0.0014	25.3	22.9	19
S1 07	0.0014	25.3	22.2	21.6
S1 06	0.0014	25.3	23	21
S1 05	0.0014	25.3	22.9	21.2
S1 08	0.0014	25.6	22.5	21.8
S1 09	0.0014	25.6	22.6	21.8
S1 11	0.0014	25.6	22.8	21.4
S1 10	0.0014	25.6	22.9	21.3

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity

Graphite Grade: NBG-17
Graphite Manufacturer: SGL Carbon Company
Forming Process: Vibration molded
Coke Particle Size: Medium grain
Coke Type: Pitch coke filler, pitch binder
ASTM Class: MNHP
Specimen Geometry: Cylinder

Specimen ID #'s:

AP7 01
AP7 02
AP7 03
AP7 04
AP7 05
AP7 06
AP7 07
AP7 08
AP7 09
AP7 10
AL14 01
AL14 02
AL14 03
AL14 04
AL14 05
AL14 06
AL14 07
AL14 08
AL14 09
AL14 10
AW17 01
AW17 02
AW17 03
AW17 04
AW17 05
AW17 06
AW17 07
AW17 08
AW17 09
AW17 10

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	AL14 06	L	6.315	6.316	6.317	6.316	12.731	12.735
	AP7 03	P	6.309	6.312	6.312	6.312	12.733	12.736
	AP7 04	P	6.312	6.314	6.315	6.314	12.727	12.730
	AP7 02	P	6.334	6.337	6.337	6.336	12.731	12.732
	AP7 05	P	6.326	6.325	6.323	6.326	12.726	12.731
	AL14 05	L	6.314	6.316	6.315	6.315	12.732	12.731
	AW17 03	W	6.327	6.327	6.326	6.326	12.732	12.732
	AP7 10	P	6.325	6.327	6.326	6.325	12.732	12.728
	AL14 10	L	6.316	6.317	6.318	6.315	12.733	12.736
	AW17 09	W	6.329	6.331	6.332	6.329	12.727	12.727
	AW17 07	W	6.329	6.329	6.330	6.330	12.725	12.727
	AL14 03	L	6.313	6.316	6.316	6.314	12.729	12.731
	AP7 08	P	6.326	6.325	6.323	6.325	12.728	12.730
	AP7 06	P	6.323	6.327	6.325	6.323	12.728	12.727
	AP7 07	P	6.326	6.325	6.325	6.327	12.729	12.731
	AP7 09	P	6.326	6.328	6.326	6.325	12.729	12.729
	AL14 04	L	6.315	6.316	6.317	6.315	12.732	12.730
	AW17 08	W	6.331	6.330	6.329	6.331	12.726	12.728
	AL14 08	L	6.316	6.316	6.317	6.315	12.734	12.732
	AW17 02	W	6.348	6.348	6.349	6.348	12.731	12.732
	AW17 05	W	6.333	6.334	6.335	6.334	12.732	12.736
	AW17 01	W	6.306	6.308	6.309	6.307	12.728	12.730
	AL14 02	L	6.328	6.329	6.328	6.327	12.727	12.728
	AL14 01	L	6.330	6.330	6.327	6.328	12.727	12.731
	AW17 06	W	6.328	6.329	6.329	6.329	12.730	12.733
	AW17 10	W	6.319	6.321	6.320	6.321	12.729	12.729
	AW17 04	W	6.334	6.334	6.334	6.335	12.735	12.733
	AL14 07	L	6.317	6.315	6.313	6.316	12.732	12.732
	AP7 01	P	6.351	6.350	6.351	6.353	12.728	12.731
	AL14 09	L	6.317	6.318	6.318	6.317	12.732	12.734

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
AL14 06	1.50061	jl	6/22/2009 10:27	6.31600	12.73300	127.3360	0.006316	0.01273
AP7 03	1.49268	jl	6/22/2009 10:32	6.31125	12.73450	127.3660	0.006311	0.01273
AP7 04	1.49516	jl	6/22/2009 10:34	6.31375	12.72850	127.2461	0.006314	0.01273
AP7 02	1.50045	jl	6/22/2009 10:37	6.33600	12.73150	127.3060	0.006336	0.01273
AP7 05	1.49715	jl	6/22/2009 10:39	6.32500	12.72850	127.2461	0.006325	0.01273
AL14 05	1.50203	jl	6/22/2009 10:42	6.31500	12.73150	127.3060	0.006315	0.01273
AW17 03	1.50036	jl	6/22/2009 10:44	6.32650	12.73200	127.3160	0.006327	0.01273
AP7 10	1.50017	jl	6/22/2009 10:49	6.32575	12.73000	127.2761	0.006326	0.01273
AL14 10	1.50080	jl	6/22/2009 10:51	6.31650	12.73450	127.3660	0.006317	0.01273
AW17 09	1.50390	jl	6/22/2009 10:53	6.33025	12.72700	127.2161	0.006330	0.01273
AW17 07	1.50072	jl	6/22/2009 10:55	6.32950	12.72600	127.1961	0.006330	0.01273
AL14 03	1.49982	jl	6/22/2009 10:58	6.31475	12.73000	127.2761	0.006315	0.01273
AP7 08	1.49763	jl	6/22/2009 10:59	6.32475	12.72900	127.2561	0.006325	0.01273
AP7 06	1.49485	jl	6/22/2009 11:02	6.32450	12.72750	127.2261	0.006325	0.01273
AP7 07	1.49830	jl	6/22/2009 11:06	6.32575	12.73000	127.2761	0.006326	0.01273
AP7 09	1.49971	jl	6/22/2009 11:08	6.32625	12.72900	127.2561	0.006326	0.01273
AL14 04	1.49925	jl	6/22/2009 11:10	6.31575	12.73100	127.2960	0.006316	0.01273
AW17 08	1.50474	jl	6/22/2009 11:12	6.33025	12.72700	127.2161	0.006330	0.01273
AL14 08	1.50081	jl	6/22/2009 11:14	6.31600	12.73300	127.3360	0.006316	0.01273
AW17 02	1.50082	jl	6/22/2009 12:39	6.34825	12.73150	127.3060	0.006348	0.01273
AW17 05	1.50364	jl	6/22/2009 12:42	6.33400	12.73400	127.3560	0.006334	0.01273
AW17 01	1.47318	jl	6/22/2009 12:44	6.30750	12.72900	127.2561	0.006308	0.01273
AL14 02	1.50275	jl	6/22/2009 12:46	6.32800	12.72750	127.2261	0.006328	0.01273
AL14 01	1.50430	jl	6/22/2009 12:48	6.32875	12.72900	127.2561	0.006329	0.01273
AW17 06	1.50237	jl	6/22/2009 12:51	6.32875	12.73150	127.3060	0.006329	0.01273
AW17 10	1.50445	jl	6/22/2009 12:55	6.32025	12.72900	127.2561	0.006320	0.01273
AW17 04	1.50417	jl	6/22/2009 12:57	6.33425	12.73400	127.3560	0.006334	0.01273
AL14 07	1.50222	jl	6/22/2009 12:59	6.31525	12.73200	127.3160	0.006315	0.01273
AP7 01	1.50296	jl	6/22/2009 13:01	6.35125	12.72950	127.2661	0.006351	0.01273
AL14 09	1.50023	jl	6/22/2009 13:03	6.31750	12.73300	127.3360	0.006318	0.01273

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
AL14 06	0.0015	1865.83981	1.8658	25.3	20.5	33.1
AP7 03	0.0015	1856.93907	1.8569	25.3	20.5	33.1
AP7 04	0.0015	1861.04105	1.8610	25.3	20.5	33.5
AP7 02	0.0015	1860.19010	1.8602	25.3	20.5	33.1
AP7 05	0.0015	1860.20347	1.8602	25.3	20.6	33
AL14 05	0.0015	1868.34133	1.8683	25.3	20.5	33.2
AW17 03	0.0015	1862.72534	1.8627	25.3	20.5	33.1
AP7 10	0.0015	1863.29562	1.8633	25.3	20.7	33
AL14 10	0.0015	1865.48879	1.8655	25.3	20.6	32.7
AW17 09	0.0015	1867.48072	1.8675	25.3	20.6	32.8
AW17 07	0.0015	1864.04566	1.8640	25.3	20.6	32.7
AL14 03	0.0015	1866.10592	1.8661	25.3	20.6	32.6
AP7 08	0.0015	1860.72723	1.8607	25.3	20.7	32.6
AP7 06	0.0015	1857.78446	1.8578	25.3	20.6	32.5
AP7 07	0.0015	1860.97298	1.8610	25.3	20.6	32.6
AP7 09	0.0015	1862.86972	1.8629	25.3	20.6	32.8
AL14 04	0.0015	1864.80837	1.8648	25.3	20.6	32.5
AW17 08	0.0015	1868.52380	1.8685	25.3	20.6	32
AL14 08	0.0015	1866.08849	1.8661	25.3	20.7	32
AW17 02	0.0015	1857.05838	1.8571	25.3	20.5	33.6
AW17 05	0.0015	1864.00142	1.8640	25.3	20.5	33.2
AW17 01	0.0015	1835.35509	1.8354	25.3	20.4	33.1
AL14 02	0.0015	1866.56954	1.8666	25.3	20.4	32.7
AL14 01	0.0015	1867.83307	1.8678	25.3	20.3	32.3
AW17 06	0.0015	1864.70413	1.8647	25.3	20.3	32.8
AW17 10	0.0015	1870.53159	1.8705	25.3	20.3	32.8
AW17 04	0.0015	1864.58485	1.8646	25.3	20.3	32.5
AL14 07	0.0015	1868.35695	1.8684	25.3	20.4	32.5
AP7 01	0.0015	1859.41206	1.8594	25.3	20.4	32.7
AL14 09	0.0015	1864.92442	1.8649	25.3	20.4	32.6

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
AW17 04		41169	11/2/2009 15:05	25.7	2	109.160	106.289	107.631
				101.3	0.3	79.762	79.613	79.395
				199.1	0.4	57.118	57.272	57.039
				301.5	0.3	43.666	43.561	43.649
				401.6	0.2	35.582	35.613	35.600
				501.6	0.2	29.981	30.057	30.094
				601.6	0.2	26.246	26.191	26.166
				701.7	0.1	23.278	23.287	23.317
				801.2	0.2	21.065	21.103	20.986
				901	0.1	19.254	19.175	19.288
AW17 05		41169	11/2/2009 15:05	1000.8	0	17.752	17.632	17.805
				26.6	0.1	108.211	107.238	108.485
				101.2	0.1	79.142	79.415	79.127
				200.5	0.1	57.126	57.121	56.990
				300.8	0	43.678	43.863	43.762
				400.9	0.1	35.664	35.593	35.601
				501	0.1	30.141	30.208	30.182
				601.1	0.1	26.179	26.325	26.390
				701.2	0.1	23.399	23.429	23.446
				800.9	0.1	21.149	21.132	21.169
AW17 06		41169	11/2/2009 15:05	900.8	0.1	19.248	19.425	19.383
				1000.7	0	17.961	17.818	17.735
				26.2	0.2	108.533	108.906	108.154
				101.4	0.2	79.604	79.893	79.932
				200.7	0.1	57.153	57.115	57.058
				300.9	0.1	43.952	44.125	43.906
				401.2	0.2	35.693	35.935	36.004
				501	0.1	30.336	30.473	30.386
				601.1	0.1	26.326	26.371	26.325
				701.2	0.2	23.444	23.528	23.507
AW17 01		41169	11/2/2009 14:35	801	0.1	21.204	21.327	21.188
				900.9	0.1	19.519	19.530	19.318
				1000.7	0.1	17.982	17.929	18.114
				26.7	0.1	106.326	106.773	103.658

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)	
AW17 02				100.1	0.2	78.434	78.410	78.358	
				199.2	0	56.476	56.240	56.036	
				300.3	0.3	43.134	43.232	43.013	
				401.2	0.5	34.913	35.033	35.094	
				501.8	0.4	29.680	29.766	29.716	
				600.8	0.3	25.786	25.883	25.863	
				699.9	0.2	22.842	22.882	23.019	
				799.6	0.1	20.818	20.798	20.688	
				899.4	0.1	19.023	18.929	18.991	
				999.4	0.1	17.381	17.381	17.570	
			41169	11/2/2009 14:35	26.3	0.1	108.742	106.233	106.614
					100.2	0.2	79.264	79.186	79.291
					199.3	0.1	56.420	56.691	56.667
					299.5	0.1	43.491	43.544	43.351
					399.9	0.2	35.212	35.251	35.367
AW17 03				500.4	0.3	29.814	29.800	29.808	
				600	0.2	26.039	26.018	26.010	
				699.6	0.1	23.046	23.178	23.185	
				799.4	0.1	20.935	20.879	20.852	
				899.3	0.1	19.056	19.053	19.047	
				999.3	0.1	17.661	17.569	17.837	
			41169	11/2/2009 14:35	25.8	0.2	107.494	108.006	107.620
					99.6	0.2	79.445	79.488	79.667
					199.1	0	57.022	57.254	56.907
					299.3	0.1	43.939	44.039	43.956
					399.5	0.1	35.565	35.561	35.662
					499.8	0.2	30.038	30.044	30.125
					599.5	0.1	26.167	26.170	26.235
					699.4	0.1	23.210	23.208	23.262
					799.3	0.1	21.162	21.084	21.034
AP7 09				899.2	0	19.351	19.280	19.210	
				999.2	0	17.678	17.777	17.895	
			47735	12/11/2009 16:12	25.5	0.2	104.846	104.960	104.934
					100.1	0.2	76.984	77.823	77.605

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
AP7 10		47735	12/11/2009 16:12	199.2	0	55.632	55.462	55.765
				299.5	0.1	42.429	42.568	42.747
				399.9	0.2	34.509	34.594	34.547
				500.3	0.3	29.127	29.199	29.320
				600.1	0.2	25.428	25.345	25.397
				699.7	0.1	22.629	22.660	22.695
				799.5	0.1	20.480	20.595	20.340
				899.4	0.1	18.740	18.718	18.579
				999.4	0.1	17.319	17.307	17.376
				24.8	0.2	105.877	104.518	105.232
				99.5	0.2	77.296	77.328	77.375
				199.1	0	55.365	55.348	55.291
				299.2	0	42.597	42.578	42.651
				399.5	0.1	34.517	34.497	34.664
499.7	0.2	29.202	29.270	29.266				
599.5	0.1	25.441	25.394	25.446				
699.3	0.1	22.489	22.496	22.685				
799.2	0	20.366	20.333	20.505				
899.2	0	18.620	18.616	18.706				
999.1	0	17.231	17.366	17.314				
AP7 08		47735	12/11/2009 16:12	26.6	0.2	104.238	104.949	97.613
				100.2	0.2	77.556	77.135	77.476
				199.1	0.1	55.487	55.460	55.403
				300.2	0.3	42.434	42.448	42.545
				401.1	0.5	34.353	34.467	34.551
				501.7	0.5	29.185	29.208	29.104
				600.9	0.3	25.324	25.289	25.397
				700	0.2	22.615	22.521	22.514
				799.5	0.1	20.306	20.371	20.365
				899.4	0.1	18.620	18.531	18.618
999.4	0.1	17.157	17.325	17.139				

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
AW17 04	107.693	1.437		6.334	InSb	12.7	100	Ar	E 1461-07
	79.590	0.185							
	57.143	0.118							
	43.625	0.056							
	35.598	0.016							
	30.044	0.058							
	26.201	0.041							
	23.294	0.020							
	21.051	0.060							
	19.239	0.058							
AW17 05	17.730	0.089		6.334	InSb	12.7	100	Ar	E 1461-07
	107.978	0.655							
	79.228	0.162							
	57.079	0.077							
	43.768	0.093							
	35.619	0.039							
	30.177	0.034							
	26.298	0.108							
	23.425	0.024							
	21.150	0.019							
AW17 06	19.352	0.092		6.334	InSb	12.7	100	Ar	E 1461-07
	17.838	0.114							
	108.531	0.376							
	79.810	0.179							
	57.109	0.048							
	43.994	0.115							
	35.877	0.163							
	30.398	0.069							
	26.341	0.026							
	23.493	0.044							
AW17 01	21.240	0.076		6.334	InSb	12.7	100	Ar	E 1461-07
	19.456	0.119							
	18.008	0.095							
	105.586	1.684							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
	78.401	0.039							
	56.251	0.220							
	43.126	0.110							
	35.013	0.092							
	29.721	0.043							
	25.844	0.051							
	22.914	0.093							
	20.768	0.070							
	18.981	0.048							
	17.444	0.109							
AW17 02	107.196	1.352		6.334	InSb	12.7	100	Ar	E 1461-07
	79.247	0.055							
	56.593	0.150							
	43.462	0.100							
	35.277	0.081							
	29.807	0.007							
	26.022	0.015							
	23.136	0.078							
	20.889	0.042							
	19.052	0.005							
	17.689	0.136							
AW17 03	107.707	0.267		6.334	InSb	12.7	100	Ar	E 1461-07
	79.533	0.118							
	57.061	0.177							
	43.978	0.054							
	35.596	0.057							
	30.069	0.049							
	26.191	0.038							
	23.227	0.031							
	21.093	0.065							
	19.280	0.071							
	17.783	0.109							
AP7 09	104.913	0.060		6.334	InSb	12.7	100	Ar	E 1461-07
	77.471	0.435							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
AP7 10	55.620	0.152							
	42.581	0.159							
	34.550	0.043							
	29.215	0.098							
	25.390	0.042							
	22.661	0.033							
	20.472	0.128							
	18.679	0.087							
	17.334	0.037							
	105.209	0.680		6.334	InSb	12.7	100	Ar	E 1461-07
AP7 08	77.333	0.040							
	55.335	0.039							
	42.609	0.038							
	34.559	0.091							
	29.246	0.038							
	25.427	0.029							
	22.557	0.111							
	20.401	0.091							
	18.647	0.051							
	17.304	0.068							
102.267	4.046		6.334	InSb	12.7	100	Ar	E 1461-07	
77.389	0.224								
55.450	0.043								
42.476	0.060								
34.457	0.099								
29.166	0.055								
25.337	0.055								
22.550	0.056								
20.347	0.036								
18.590	0.051								
17.207	0.103								

Specimen Number	AW17 04	AW17 05	AW17 06	AW17 01	AW17 02	AW17 03
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/2/09 3:05 PM	11/2/09 3:05 PM	11/2/09 3:05 PM	11/2/09 2:35 PM	11/2/09 2:35 PM	11/2/09 2:35 PM
Diffusivity (mm ² /sec)						
Temperature °C						
25	107.6933	107.9780	108.5310	105.5857	107.1963	107.7067
100	79.5900	79.2280	79.8097	78.4007	79.2470	79.5333
200	57.1430	57.0790	57.1087	56.2507	56.5927	57.0610
300	43.6253	43.7677	43.9943	43.1263	43.4620	43.9780
400	35.5983	35.6193	35.8773	35.0133	35.2767	35.5960
500	30.0440	30.1770	30.3983	29.7207	29.8073	30.0690
600	26.2010	26.2980	26.3407	25.8440	26.0223	26.1907
700	23.2940	23.4247	23.4930	22.9143	23.1363	23.2267
800	21.0513	21.1500	21.2397	20.7680	20.8887	21.0933
900	19.2390	19.3520	19.4557	18.9810	19.0520	19.2803
1000	17.7297	17.8380	18.0083	17.4440	17.6890	17.7833

Specimen Number	AP7 09	AP7 10	AP7 08
Measured By	47735	47735	47735
Measured Date	12/11/09 4:12 PM	12/11/09 4:12 PM	12/11/09 4:12 PM
Diffusivity (mm ² /sec)			
Temperature °C			
25	104.9133	105.2090	102.2667
100	77.4707	77.3330	77.3890
200	55.6197	55.3347	55.4500
300	42.5813	42.6087	42.4757
400	34.5500	34.5593	34.4570
500	29.2153	29.2460	29.1657
600	25.3900	25.4270	25.3367
700	22.6613	22.5567	22.5500
800	20.4717	20.4013	20.3473
900	18.6790	18.6473	18.5897
1000	17.3340	17.3037	17.2070

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	AL14 03	L	6.310	6.311	6.312	6.309	12.726	12.727	1.49971
	AW17 10	W	6.317	6.318	6.317	6.317	12.726	12.725	1.50448
	AL14 02	L	6.326	6.326	6.324	6.327	12.728	12.725	1.50271
	AW17 09	W	6.327	6.327	6.327	6.325	12.726	12.725	1.50385
	AW17 08	W	6.327	6.327	6.325	6.327	12.724	12.725	1.50464
	AW17 07	W	6.326	6.325	6.326	6.326	12.722	12.722	1.50067
	AW17 06	W	6.321	6.321	6.321	6.320	12.740	12.737	1.50203
	AW17 05	W	6.327	6.327	6.326	6.326	12.744	12.740	1.50329
	AW17 04	W	6.328	6.326	6.327	6.328	12.745	12.743	1.50372
	AW17 01	W	6.303	6.304	6.304	6.301	12.724	12.726	1.47282
	AW17 02	W	6.342	6.342	6.342	6.342	12.738	12.741	1.50050
	AW17 03	W	6.322	6.321	6.321	6.319	12.736	12.739	1.50002
	AP7 10	P	6.323	6.323	6.321	6.322	12.732	12.731	1.49977
	AP7 08	P	6.320	6.320	6.319	6.321	12.728	12.732	1.49736
	AP7 09	P	6.321	6.322	6.320	6.320	12.731	12.732	1.49940

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
AL14 03	41169	12/3/2010 10:27	6.31050	12.72650	127.2061	0.006311	0.01273
AW17 10	41169	12/3/2010 13:30	6.31725	12.72550	127.1861	0.006317	0.01273
AL14 02	41169	12/4/2010 7:45	6.32575	12.72650	127.2061	0.006326	0.01273
AW17 09	41169	12/4/2010 10:33	6.32650	12.72550	127.1861	0.006327	0.01273
AW17 08	41169	12/4/2010 10:41	6.32650	12.72450	127.1661	0.006327	0.01272
AW17 07	41169	12/4/2010 10:44	6.32575	12.72200	127.1161	0.006326	0.01272
AW17 06	41169	12/6/2010 9:31	6.32075	12.73850	127.4461	0.006321	0.01274
AW17 05	41169	12/6/2010 9:36	6.32650	12.74200	127.5161	0.006327	0.01274
AW17 04	41169	12/6/2010 10:02	6.32725	12.74400	127.5562	0.006327	0.01274
AW17 01	41169	12/6/2010 12:49	6.30300	12.72500	127.1761	0.006303	0.01273
AW17 02	41169	12/6/2010 13:02	6.34200	12.73950	127.4661	0.006342	0.01274
AW17 03	41169	12/6/2010 13:48	6.32075	12.73750	127.4261	0.006321	0.01274
AP7 10	41169	12/7/2010 9:33	6.32225	12.73150	127.3060	0.006322	0.01273
AP7 08	41169	12/7/2010 9:57	6.32000	12.73000	127.2761	0.006320	0.01273
AP7 09	41169	12/7/2010 10:25	6.32075	12.73150	127.3060	0.006321	0.01273

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
AL14 03	0.0015	25.3	23.2	20.4
AW17 10	0.0015	25.3	22.5	20.1
AL14 02	0.0015	25.4	22.3	13.1
AW17 09	0.0015	25.4	22.2	12.8
AW17 08	0.0015	25.4	22	12.9
AW17 07	0.0015	25.4	22.1	12.9
AW17 06	0.0015	25.3	22.1	16.4
AW17 05	0.0015	25.3	22.3	16.2
AW17 04	0.0015	25.3	22.4	16.7
AW17 01	0.0015	25.3	22.3	21.5
AW17 02	0.0015	25.3	22.3	21.5
AW17 03	0.0015	25.3	23	21
AP7 10	0.0015	25.6	22.8	21.4
AP7 08	0.0015	25.6	23	21.2
AP7 09	0.0015	25.6	22.7	21.6

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity

Graphite Grade: NBG-18
Graphite Manufacturer: SGL Carbon Company
Forming Process: Vibration molded
Coke Particle Size: Medium grain
Coke Type: Pitch coke filler, pitch binder
ASTM Class: MNHP
Specimen Geometry: Cylinder

Specimen ID #'s:

BW17 01
BW17 02
BW17 03
BW17 04
BW17 05
BW17 06
BW17 07
BW17 08
BW17 09
BW17 10
BP7 01
BP7 02
BP7 03
BP7 04
BP7 05
BP7 06
BP7 07
BP7 08
BP7 09
BP7 10
BL14-01
BL14-02
BL14-03
BL14-04
BL14-05
BL14-06
BL14-07
BL14-08
BL14-09
BL14-10
BL8-1mm
BL8-2mm
BL8-4mm
BL8-6mm
BL8-8mm
BL8-10mm

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	BW17 09	W	6.318	6.321	6.321	6.318	12.720	12.722
	BL14-05	L	6.321	6.322	6.321	6.321	12.722	12.725
	BP7 09	P	6.316	6.317	6.318	6.317	12.724	12.722
	BP7 10	P	6.316	6.317	6.316	6.316	12.720	12.724
	BP7 03	P	6.301	6.303	6.305	6.303	12.736	12.733
	BL14-04	L	6.325	6.324	6.325	6.326	12.722	12.723
	BW17 08	W	6.327	6.328	6.327	6.328	12.725	12.723
	BW17 03	W	6.319	6.319	6.319	6.320	12.724	12.721
	BW17 04	W	6.326	6.328	6.328	6.328	12.724	12.725
	BP7 05	P	6.307	6.308	6.308	6.310	12.724	12.723
	BW17 06	W	6.326	6.327	6.328	6.327	12.720	12.725
	BW17 01	W	6.321	6.323	6.322	6.322	12.724	12.723
	BP7 07	P	6.320	6.318	6.319	6.319	12.724	12.727
	BL14-08	L	6.328	6.327	6.329	6.329	12.723	12.725
	BL14-01	L	6.318	6.317	6.317	6.317	12.722	12.723
	BW17 05	W	6.324	6.325	6.326	6.326	12.722	12.719
	BL14-07	L	6.317	6.318	6.318	6.316	12.724	12.724
	BL14-09	L	6.323	6.324	6.325	6.324	12.722	12.722
	BP7 08	P	6.317	6.319	6.317	6.318	12.724	12.724
	BW17 10	W	6.329	6.330	6.330	6.329	12.722	12.722
	BP7 04	P	6.309	6.310	6.311	6.310	12.721	12.723
	BL14-10	L	6.319	6.318	6.318	6.318	12.725	12.724
	BL14-06	L	6.315	6.315	6.315	6.314	12.719	12.720
	BW17 02	W	6.315	6.316	6.314	6.315	12.720	12.723
	BL14-02	L	6.317	6.320	6.319	6.318	12.720	12.723
	BP7 02	P	6.341	6.344	6.344	6.341	12.729	12.729
	BW17 07	W	6.327	6.326	6.324	6.324	12.720	12.722
	BL14-03	L	6.319	6.319	6.319	6.319	12.721	12.721
	BP7 06	P	6.318	6.318	6.317	6.318	12.722	12.725
	BP7 01	P	6.335	6.336	6.336	6.336	12.742	12.743

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
BW17 09	1.50037	JL	6/29/09 10:54 AM	6.31950	12.72100	127.0961	0.006320	0.01272
BL14-05	1.50519	JL	6/29/09 10:59 AM	6.32125	12.72350	127.1461	0.006321	0.01272
BP7 09	1.50334	JL	6/29/09 11:00 AM	6.31700	12.72300	127.1361	0.006317	0.01272
BP7 10	1.50135	JL	6/29/09 12:32 PM	6.31625	12.72200	127.1161	0.006316	0.01272
BP7 03	1.49797	JL	6/29/09 12:34 PM	6.30300	12.73450	127.3660	0.006303	0.01273
BL14-04	1.50433	JL	6/29/09 12:36 PM	6.32500	12.72250	127.1261	0.006325	0.01272
BW17 08	1.49876	JL	6/29/09 12:38 PM	6.32750	12.72400	127.1561	0.006328	0.01272
BW17 03	1.49831	JL	6/29/09 12:39 PM	6.31925	12.72250	127.1261	0.006319	0.01272
BW17 04	1.49930	JL	6/29/09 12:41 PM	6.32750	12.72450	127.1661	0.006328	0.01272
BP7 05	1.50008	JL	6/29/09 12:43 PM	6.30825	12.72350	127.1461	0.006308	0.01272
BW17 06	1.50353	JL	6/29/09 12:45 PM	6.32700	12.72250	127.1261	0.006327	0.01272
BW17 01	1.50146	JL	6/29/09 12:47 PM	6.32200	12.72350	127.1461	0.006322	0.01272
BP7 07	1.50089	JL	6/29/09 12:49 PM	6.31900	12.72550	127.1861	0.006319	0.01273
BL14-08	1.50527	JL	6/29/09 12:51 PM	6.32825	12.72400	127.1561	0.006328	0.01272
BL14-01	1.50193	JL	6/29/09 12:52 PM	6.31725	12.72250	127.1261	0.006317	0.01272
BW17 05	1.49673	JL	6/29/09 12:54 PM	6.32525	12.72050	127.0862	0.006325	0.01272
BL14-07	1.50035	JL	6/29/09 3:58 PM	6.31725	12.72400	127.1561	0.006317	0.01272
BL14-09	1.50429	JL	6/29/09 4:00 PM	6.32400	12.72200	127.1161	0.006324	0.01272
BP7 08	1.50109	JL	6/29/09 4:02 PM	6.31775	12.72400	127.1561	0.006318	0.01272
BW17 10	1.50137	JL	6/29/09 4:03 PM	6.32950	12.72200	127.1161	0.006330	0.01272
BP7 04	1.49845	JL	6/29/09 4:05 PM	6.31000	12.72200	127.1161	0.006310	0.01272
BL14-10	1.50370	JL	6/29/09 4:07 PM	6.31825	12.72450	127.1661	0.006318	0.01272
BL14-06	1.49925	JL	6/29/09 4:07 PM	6.31475	12.71950	127.0662	0.006315	0.01272
BW17 02	1.49723	JL	6/30/09 1:08 PM	6.31500	12.72150	127.1061	0.006315	0.01272
BL14-02	1.50171	JL	6/30/09 1:10 PM	6.31850	12.72150	127.1061	0.006319	0.01272
BP7 02	1.50459	JL	6/30/09 1:12 PM	6.34250	12.72900	127.2561	0.006343	0.01273
BW17 07	1.50287	JL	6/30/09 1:15 PM	6.32525	12.72100	127.0961	0.006325	0.01272
BL14-03	1.50397	JL	6/30/09 1:17 PM	6.31900	12.72100	127.0961	0.006319	0.01272
BP7 06	1.50188	JL	6/30/09 1:19 PM	6.31775	12.72350	127.1461	0.006318	0.01272
BP7 01	1.50793	JL	6/30/09 1:20 PM	6.33575	12.74250	127.5261	0.006336	0.01274

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
BW17 09	0.0015	1868.02751	1.8680	25.3	21	51.3
BL14-05	0.0015	1872.77364	1.8728	25.3	21	51.3
BP7 09	0.0015	1871.87740	1.8719	25.3	21.1	50.9
BP7 10	0.0015	1869.91546	1.8699	25.3	21.7	47.9
BP7 03	0.0015	1865.95915	1.8660	25.3	21.8	47.9
BL14-04	0.0015	1870.88799	1.8709	25.3	21.8	48
BW17 08	0.0015	1862.78502	1.8628	25.3	21.9	47.9
BW17 03	0.0015	1865.09664	1.8651	25.3	22	47.5
BW17 04	0.0015	1863.30974	1.8633	25.3	22	47.7
BP7 05	0.0015	1870.26202	1.8703	25.3	22.1	47.4
BW17 06	0.0015	1869.30197	1.8693	25.3	22.1	47.6
BW17 01	0.0015	1867.91111	1.8679	25.3	22.1	47.3
BP7 07	0.0015	1867.50132	1.8675	25.3	22.1	47.7
BL14-08	0.0015	1870.65447	1.8707	25.3	22.1	47.4
BL14-01	0.0015	1870.19472	1.8702	25.3	22.1	47.5
BW17 05	0.0015	1861.94789	1.8619	25.3	22.2	47.4
BL14-07	0.0015	1867.78686	1.8678	25.2	21	46.3
BL14-09	0.0015	1871.28115	1.8713	25.2	21.1	46.2
BP7 08	0.0015	1868.56020	1.8686	25.2	21.1	46
BW17 10	0.0015	1866.02589	1.8660	25.2	21.1	45.8
BP7 04	0.0015	1868.15210	1.8682	25.2	21.1	45.5
BL14-10	0.0015	1871.51391	1.8715	25.2	21.1	45.4
BL14-06	0.0015	1868.47777	1.8685	25.2	21.2	47.4
BW17 02	0.0015	1865.29978	1.8653	25.2	21.1	47.5
BL14-02	0.0015	1869.84478	1.8698	25.2	21.2	47.4
BP7 02	0.0015	1864.14307	1.8641	25.2	21.2	47
BW17 07	0.0015	1869.43915	1.8694	25.2	21.2	47
BL14-03	0.0015	1872.65783	1.8727	25.2	21.2	47
BP7 06	0.0015	1869.69053	1.8697	25.2	21.2	46.9
BP7 01	0.0015	1866.31086	1.8663	25.2	21.2	46.9

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
BP7 09		41169	1/20/2010 9:02	26.800	0.100	109.827	108.797	109.319
				101.000	0.300	82.031	81.573	81.721
				199.400	0.300	58.980	58.618	58.625
				301.600	0.200	44.916	44.839	44.902
				401.600	0.200	36.604	36.611	36.605
				501.600	0.200	30.871	31.036	31.007
				601.600	0.200	26.985	26.865	26.951
				701.800	0.200	23.893	23.969	23.892
				801.400	0.200	21.614	21.565	21.569
				900.900	0.100	19.858	19.677	19.714
BW17 05		41169	11/3/2009 12:59	1001.000	0.100	18.281	18.372	18.291
				26.300	0.100	107.135	107.027	106.632
				100.100	0.200	78.694	78.904	79.247
				199.100	0.000	56.864	57.035	56.926
				299.400	0.000	43.567	43.587	43.704
				399.800	0.200	35.364	35.437	35.353
				500.200	0.300	29.930	30.020	29.945
				599.900	0.200	26.006	26.086	26.128
				699.600	0.100	23.065	23.327	23.215
				799.400	0.100	21.062	21.037	20.918
BW17 06		41169	11/3/2009 12:59	899.300	0.000	19.183	19.213	19.146
				999.300	0.100	17.561	17.667	17.600
				25.800	0.200	107.123	106.358	106.730
				99.600	0.200	79.194	79.541	79.543
				199.100	0.000	56.889	56.843	57.065
				299.300	0.100	43.780	43.787	43.664
				399.500	0.100	35.456	35.497	35.555
				499.700	0.200	29.916	30.104	29.999
				599.500	0.100	26.164	26.169	26.247
				699.400	0.100	23.294	23.212	23.327
BW17 01		41169	11/3/2009 11:25	799.200	0.100	20.952	20.951	20.997
				899.200	0.000	19.221	19.314	19.258
				999.200	0.000	17.811	17.732	17.746
				25.800	1.800	105.932	105.557	105.007

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
BW17 03		41169	11/3/2009 11:25	101.300	0.300	78.013	77.542	77.560
				200.400	0.100	55.980	55.750	55.781
				301.500	0.300	42.800	42.875	42.831
				401.500	0.300	34.889	34.949	35.028
				501.600	0.200	29.594	29.577	29.568
				601.900	0.200	25.810	25.863	25.825
				701.400	0.100	22.968	22.935	22.940
				800.900	0.100	20.673	20.709	20.744
				900.500	0.000	18.899	18.880	19.110
				1000.200	0.100	17.783	17.632	17.342
BW17 07		41169	11/4/2009 8:44	26.200	0.200	106.806	106.068	104.561
				101.100	0.200	78.538	78.817	78.475
				200.700	0.100	56.550	56.404	56.447
				300.800	0.100	43.507	43.580	43.536
				400.900	0.100	35.162	35.356	35.312
				500.800	0.100	29.863	29.999	29.931
				601.100	0.200	26.128	26.026	25.977
				700.800	0.100	23.219	23.103	23.116
				800.500	0.100	20.864	20.683	20.853
				900.500	0.100	19.098	19.111	19.207
BW17 08		41169	11/4/2009 8:44	1000.200	0.100	17.884	17.574	17.686
				25.700	2.000	108.622	105.270	104.611
				101.300	0.200	79.084	79.278	78.877
				200.400	0.200	56.749	57.006	56.809
				301.600	0.200	43.625	43.554	43.557
				401.600	0.200	35.536	35.675	35.527
				501.600	0.200	30.067	30.190	30.124
				601.700	0.200	26.262	26.230	26.297
				701.800	0.100	23.257	23.299	23.396
				801.400	0.100	21.110	21.127	21.179
BW17 08		41169	11/4/2009 8:44	901.000	0.100	19.285	19.484	19.326
				1000.700	0.000	18.047	17.751	17.655
				26.600	0.100	106.745	106.175	105.878
				101.100	0.100	78.849	78.913	79.021

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
BW17 09		41169	11/4/2009 8:44	200.600	0.000	56.655	56.724	56.930
				300.800	0.000	43.617	43.549	43.531
				400.900	0.100	35.505	35.421	35.496
				501.000	0.100	30.113	30.123	30.021
				601.000	0.100	26.300	26.188	26.183
				701.300	0.100	23.311	23.297	23.385
				801.100	0.100	21.036	21.069	20.948
				900.800	0.100	19.374	19.388	19.293
				1000.600	0.000	17.850	17.475	17.765
				26.200	0.100	105.283	107.015	106.745
BW17 02		41169	11/3/2009 11:25	101.100	0.200	78.991	79.168	79.378
				200.700	0.100	56.748	56.839	56.963
				300.900	0.100	43.741	43.621	43.639
				401.100	0.200	35.660	35.650	35.689
				500.900	0.100	30.208	30.200	30.099
				601.000	0.100	26.155	26.383	26.198
				701.100	0.100	23.402	23.310	23.373
				801.000	0.100	21.211	21.076	21.096
				900.800	0.100	19.392	19.330	19.369
				1000.600	0.100	17.885	17.680	17.718
BP7 08		47735	12/11/2009 16:24	26.600	0.100	104.451	105.449	104.686
				101.200	0.100	77.226	77.699	77.587
				200.500	0.000	55.623	55.819	55.710
				300.700	0.100	42.912	42.951	42.701
				400.900	0.200	34.959	34.872	34.878
				500.800	0.100	29.491	29.580	29.594
				601.300	0.200	25.696	25.770	25.722
				701.000	0.200	22.916	22.873	22.841
				800.600	0.100	20.644	20.795	20.551
				900.500	0.100	18.916	19.025	18.900
1000.200	0.100	17.339	17.660	17.408				
25.700	0.300	110.686	112.087	111.221				
101.700	0.200	81.745	81.837	81.611				
200.800	0.100	58.888	58.690	58.626				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
BP7 10		41169	1/20/2010 9:02	301.000	0.100	45.209	45.201	45.363
				401.300	0.200	36.800	36.866	36.932
				501.200	0.200	31.089	31.114	31.135
				601.300	0.200	27.116	27.071	27.058
				701.300	0.200	24.140	24.113	24.035
				801.100	0.100	21.864	21.704	21.899
				900.900	0.100	20.010	19.835	19.902
				1000.800	0.100	18.465	18.605	18.556
				26.200	0.100	110.305	110.342	110.246
				101.300	0.100	81.292	81.393	81.791
BP7 06		47735	12/11/2009 16:24	200.600	0.000	58.660	58.508	58.531
				300.900	0.100	45.073	45.082	45.175
				401.100	0.200	36.682	36.596	36.761
				501.100	0.100	30.973	31.058	30.967
				601.200	0.100	26.947	27.047	27.001
				701.400	0.200	23.977	24.080	24.145
				801.100	0.100	21.586	21.740	21.773
				900.900	0.100	19.982	19.804	19.959
				1000.900	0.100	18.385	18.485	18.425
				24.800	0.200	109.848	111.092	111.042
BP7 07		47735	12/11/2009 16:24	100.600	0.200	81.534	81.699	81.828
				200.400	0.100	58.591	58.561	58.620
				300.400	0.100	44.996	44.858	45.015
				400.500	0.000	36.663	36.697	36.641
				500.600	0.000	31.047	31.061	30.813
				600.600	0.000	26.946	26.969	27.006
				700.600	0.000	23.886	23.965	23.985
				800.600	0.000	21.590	21.566	21.804
				900.500	0.000	19.704	19.782	19.832
				1000.500	0.000	18.395	18.275	18.552
26.400	0.200	108.840	110.986	111.088				
101.300	0.200	81.645	81.971	81.851				
200.500	0.100	58.832	58.828	58.944				
301.500	0.200	44.988	45.137	45.177				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
BW17 04		41169	11/3/2009 12:59	401.600	0.200	36.904	36.872	36.840
				501.600	0.200	31.195	31.214	31.189
				601.600	0.200	27.182	27.235	27.105
				701.700	0.200	24.068	24.084	24.159
				801.400	0.300	21.881	21.967	21.983
				901.100	0.200	19.847	20.297	20.007
				1000.900	0.100	18.609	18.572	18.525
				26.700	0.200	104.459	103.164	103.000
				100.300	0.200	78.065	78.320	77.996
				199.200	0.100	56.223	55.906	56.180
				300.300	0.300	42.946	42.995	43.043
				401.100	0.500	34.778	34.827	35.003
				501.700	0.500	29.529	29.577	29.527
				600.900	0.300	25.754	25.816	25.745
				700.100	0.200	22.958	22.872	22.835
				799.600	0.100	20.733	20.805	20.808
899.400	0.100	18.963	18.993	18.957				
999.400	0.100	17.399	17.446	17.536				

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
BP7 09	109.314	0.515		6.317	InSb	12.7	100	Ar	E 1461-07
	81.775	0.234							
	58.741	0.207							
	44.886	0.041							
	36.607	0.004							
	30.971	0.088							
	26.934	0.062							
	23.918	0.044							
	21.583	0.027							
	19.750	0.096							
BW17 05	18.315	0.050		6.317	InSb	12.7	100	Ar	E 1461-07
	106.931	0.265							
	78.948	0.279							
	56.942	0.087							
	43.619	0.074							
	35.385	0.046							
	29.965	0.048							
	26.073	0.062							
	23.202	0.131							
	21.006	0.077							
BW17 06	19.181	0.034		6.317	InSb	12.7	100	Ar	E 1461-07
	17.609	0.054							
	106.737	0.383							
	79.426	0.201							
	56.932	0.117							
	43.744	0.069							
	35.503	0.050							
	30.006	0.094							
	26.193	0.047							
	23.278	0.059							
BW17 01	20.967	0.026		6.317	InSb	12.7	100	Ar	E 1461-07
	19.264	0.047							
	17.763	0.042							
	105.499	0.465							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
BW17 03	77.705	0.267							
	55.837	0.125							
	42.835	0.038							
	34.955	0.070							
	29.580	0.013							
	25.833	0.027							
	22.948	0.018							
	20.709	0.036							
	18.963	0.128							
	17.586	0.224							
	105.812	1.144		6.317	InSb	12.7	100		Ar E 1461-07
	78.610	0.182							
	56.467	0.075							
	43.541	0.037							
	35.277	0.102							
	29.931	0.068							
	26.044	0.077							
	23.146	0.064							
20.800	0.101								
19.139	0.060								
17.715	0.157								
BW17 07	106.168	2.151		6.317	InSb	12.7	100		Ar E 1461-07
	79.080	0.201							
	56.855	0.134							
	43.579	0.040							
	35.579	0.083							
	30.127	0.062							
BW17 08	26.263	0.034							
	23.317	0.071							
	21.139	0.036							
	19.365	0.105							
	17.818	0.204							
	106.266	0.441		6.317	InSb	12.7	100		Ar E 1461-07
	78.928	0.087							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
BW17 09	56.770	0.143							
	43.566	0.045							
	35.474	0.046							
	30.086	0.056							
	26.224	0.066							
	23.331	0.047							
	21.018	0.063							
	19.352	0.051							
	17.697	0.197							
	106.348	0.932		6.317	InSb	12.7	100	Ar	E 1461-07
	79.179	0.194							
	56.850	0.108							
	43.667	0.065							
	35.666	0.020							
	30.169	0.061							
	26.245	0.121							
	23.362	0.047							
21.128	0.073								
19.364	0.031								
17.761	0.109								
BW17 02	104.862	0.522		6.317	InSb	12.7	100	Ar	E 1461-07
	77.504	0.247							
	55.717	0.098							
	42.855	0.135							
	34.903	0.049							
	29.555	0.056							
	25.729	0.038							
	22.877	0.038							
	20.663	0.123							
	18.947	0.068							
BP7 08	17.469	0.169							
	111.331	0.707		6.317	InSb	12.7	100	Ar	E 1461-07
	81.731	0.114							
	58.735	0.137							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
BP7 10	45.258	0.091							
	36.866	0.066							
	31.113	0.023							
	27.082	0.030							
	24.096	0.055							
	21.822	0.104							
	19.916	0.088							
	18.542	0.071							
	110.298	0.048		6.317	InSb	12.7	100	Ar	E 1461-07
	81.492	0.264							
58.566	0.082								
45.110	0.056								
36.680	0.083								
30.999	0.051								
26.998	0.050								
24.067	0.085								
21.700	0.100								
19.915	0.097								
18.432	0.050								
BP7 06	110.661	0.704		6.317	InSb	12.7	100	Ar	E 1461-07
	81.687	0.147							
	58.591	0.030							
	44.956	0.086							
	36.667	0.028							
	30.974	0.139							
	26.974	0.030							
	23.945	0.052							
	21.653	0.131							
	19.773	0.065							
BP7 07	18.407	0.139							
	110.305	1.269		6.317	InSb	12.7	100	Ar	E 1461-07
	81.822	0.165							
	58.868	0.066							
	45.101	0.100							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
BW17 04	36.872	0.032							
	31.199	0.013							
	27.174	0.065							
	24.104	0.049							
	21.944	0.055							
	20.050	0.228							
	18.569	0.042							
	103.541	0.799		6.317	InSb	12.7	100	Ar	E 1461-07
	78.127	0.171							
	56.103	0.172							
	42.995	0.049							
	34.869	0.118							
	29.544	0.028							
	25.772	0.039							
22.888	0.063								
20.782	0.042								
18.971	0.019								
17.460	0.070								

Specimen Number	BP7 09	BW17 05	BW17 06	BW17 01	BW17 03	BW17 07
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	1/20/10 9:02 AM	11/3/09 12:59 PM	11/3/09 12:59 PM	11/3/09 11:25 AM	11/3/09 11:25 AM	11/4/09 8:44 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	109.3143	106.9313	106.7370	105.4987	105.8117	106.1677
100	81.7750	78.9483	79.4260	77.7050	78.6100	79.0797
200	58.7410	56.9417	56.9323	55.8370	56.4670	56.8547
300	44.8857	43.6193	43.7437	42.8353	43.5410	43.5787
400	36.6067	35.3847	35.5027	34.9553	35.2767	35.5793
500	30.9713	29.9650	30.0063	29.5797	29.9310	30.1270
600	26.9337	26.0733	26.1933	25.8327	26.0437	26.2630
700	23.9180	23.2023	23.2777	22.9477	23.1460	23.3173
800	21.5827	21.0057	20.9667	20.7087	20.8000	21.1387
900	19.7497	19.1807	19.2643	18.9630	19.1387	19.3650
1000	18.3147	17.6093	17.7630	17.5857	17.7147	17.8177

Specimen Number	BW17 08	BW17 09	BW17 02	BP7 08	BP7 10	BP7 06
Measured By	41169	41169	41169	47735	41169	47735
Measured Date	11/4/09 8:44 AM	11/4/09 8:44 AM	11/3/09 11:25 AM	12/11/09 4:24 PM	1/20/10 9:02 AM	12/11/09 4:24 PM
Diffusivity (mm ² /sec)						
Temperature °C						
25	106.2660	106.3477	104.8620	111.3313	110.2977	110.6607
100	78.9277	79.1790	77.5040	81.7310	81.4920	81.6870
200	56.7697	56.8500	55.7173	58.7347	58.5663	58.5907
300	43.5657	43.6670	42.8547	45.2577	45.1100	44.9563
400	35.4740	35.6663	34.9030	36.8660	36.6797	36.6670
500	30.0857	30.1690	29.5550	31.1127	30.9993	30.9737
600	26.2237	26.2453	25.7293	27.0817	26.9983	26.9737
700	23.3310	23.3617	22.8767	24.0960	24.0673	23.9453
800	21.0177	21.1277	20.6633	21.8223	21.6997	21.6533
900	19.3517	19.3637	18.9470	19.9157	19.9150	19.7727
1000	17.6967	17.7610	17.4690	18.5420	18.4317	18.4073

Specimen Number	BP7 07	BW17 04
Measured By	47735	41169
Measured Date	12/11/09 4:24 PM	11/3/09 12:59 PM
Diffusivity (mm²/sec)		
Temperature °C		
25	110.3047	103.5410
100	81.8223	78.1270
200	58.8680	56.1030
300	45.1007	42.9947
400	36.8720	34.8693
500	31.1993	29.5443
600	27.1740	25.7717
700	24.1037	22.8883
800	21.9437	20.7820
900	20.0503	18.9710
1000	18.5687	17.4603

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	BP7 06	P	6.318	6.317	6.319	6.320	12.726	12.733	1.50105
	BP7 07	P	6.317	6.315	6.316	6.316	12.726	12.725	1.50024
	BW17 04	W	6.324	6.324	6.324	6.324	12.724	12.723	1.49891
	BW17 03	W	6.317	6.315	6.317	6.315	12.720	12.722	1.49775
	BW17 02	W	6.315	6.317	6.316	6.316	12.720	12.722	1.49656
	BW17 07	W	6.325	6.323	6.324	6.324	12.722	12.723	1.50226
	BW17 08	W	6.325	6.327	6.327	6.324	12.726	12.723	1.49819
	BW17 05	W	6.323	6.321	6.322	6.325	12.723	12.724	1.49629
	BP7 08	P	6.316	6.314	6.314	6.315	12.724	12.728	1.50024
	BP7 09	P	6.314	6.314	6.315	6.315	12.727	12.727	1.50265
	BW17 09	W	6.315	6.316	6.316	6.316	12.723	12.726	1.49957
	BW17 01	W	6.318	6.319	6.320	6.318	12.727	12.724	1.50081
	BP7 10	P	6.310	6.313	6.312	6.315	12.727	12.723	1.50052

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m	Final Specimen Mass kg
BP7 06	41169	12/4/2010	6.31850	12.72950	127.2661	0.006319	0.01273	0.0015
BP7 07	41169	12/4/2010	6.31600	12.72550	127.1861	0.006316	0.01273	0.0015
BW17 04	41169	12/6/2010	6.32400	12.72350	127.1461	0.006324	0.01272	0.0015
BW17 03	41169	12/6/2010	6.31600	12.72100	127.0961	0.006316	0.01272	0.0015
BW17 02	41169	12/6/2010	6.31600	12.72100	127.0961	0.006316	0.01272	0.0015
BW17 07	41169	12/6/2010	6.32400	12.72250	127.1261	0.006324	0.01272	0.0015
BW17 08	41169	12/6/2010	6.32575	12.72450	127.1661	0.006326	0.01272	0.0015
BW17 05	41169	12/6/2010	6.32275	12.72350	127.1461	0.006323	0.01272	0.0015
BP7 08	41169	12/7/2010	6.31475	12.72600	127.1961	0.006315	0.01273	0.0015
BP7 09	41169	12/7/2010	6.31450	12.72700	127.2161	0.006315	0.01273	0.0015
BW17 09	41169	12/7/2010	6.31575	12.72450	127.1661	0.006316	0.01272	0.0015
BW17 01	41169	12/7/2010	6.31875	12.72550	127.1861	0.006319	0.01273	0.0015
BP7 10	41169	12/7/2010	6.31250	12.72500	127.1761	0.006313	0.01273	0.0015

Specimen ID Number	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
BP7 06	25.4	22.3	13.2
BP7 07	25.4	22.1	12.9
BW17 04	25.3	22.4	16.6
BW17 03	25.3	22.6	17.7
BW17 02	25.3	23	18.7
BW17 07	25.3	22.5	21.3
BW17 08	25.3	23	21.1
BW17 05	25.3	23	21.1
BP7 08	25.6	22.5	21.8
BP7 09	25.6	22.6	21.7
BW17 09	25.6	22.7	21.7
BW17 01	25.6	22.9	21.3
BP7 10	25.6	22.5	21.8

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity

Graphite Grade:	NBG-25
Graphite Manufacturer:	SGL Carbon Company
Forming Process:	Isostatic-molded
Coke Particle Size:	Fine grain
Coke Type:	Petroleum coke
ASTM Class:	INHP
Specimen Geometry:	Cylinder

Specimen ID #'s:

M1-01
M1-02
M1-03
M1-04
M1-05
M1-06
M1-07
M1-08
M1-09
M1-10
M1-11
M1-12
M2-01
M2-02
M2-03
M2-04
M2-05
M2-06
M2-07
M2-08
M2-09
M2-10
M2-11
M2-12

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	M1-05		6.319	6.329	6.329	6.329	12.728	12.726
	M1-11		6.332	6.332	6.332	6.332	12.729	12.731
	M2-11		6.335	6.336	6.336	6.336	12.730	12.730
	M2-10		6.337	6.338	6.337	6.336	12.732	12.734
	M1-04		6.331	6.331	6.331	6.331	12.729	12.729
	M2-02		6.336	6.335	6.335	6.335	12.729	12.734
	M2-01		6.326	6.326	6.324	6.326	12.728	12.730
	M1-02		6.338	6.338	6.335	6.336	12.726	12.726
	M2-12		6.337	6.337	6.337	6.337	12.732	12.731
	M1-09		6.333	6.332	6.333	6.332	12.730	12.732
	M2-08		6.333	6.333	6.332	6.334	12.732	12.731
	M2-09		6.333	6.334	6.332	6.332	12.730	12.731
	M1-12		6.332	6.334	6.332	6.333	12.730	12.730
	M1-01		6.306	6.307	6.306	6.308	12.738	12.737
	M2-05		6.336	6.336	6.336	6.335	12.728	12.729
	M1-10		6.332	6.331	6.331	6.331	12.729	12.729
	M2-07		6.334	6.335	6.335	6.335	12.729	12.734
	M2-06		6.335	6.334	6.335	6.334	12.734	12.730
	M1-07		6.331	6.332	6.332	6.332	12.730	12.730
	M2-03		6.333	6.332	6.333	6.331	12.733	12.731
	M1-03		6.349	6.348	6.348	6.349	12.726	12.728
	M2-04		6.335	6.336	6.336	6.334	12.730	12.733
	M1-08		6.331	6.333	6.332	6.332	12.728	12.730
	M1-06		6.328	6.332	6.330	6.330	12.729	12.729

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
M1-05	1.48504	jil	7/6/2009 13:40	6.32650	12.72700	127.2161	0.006327	0.01273
M1-11	1.48772	jil	7/6/2009 13:44	6.33225	12.73000	127.2761	0.006332	0.01273
M2-11	1.48531	jil	7/6/2009 13:54	6.33575	12.73000	127.2761	0.006336	0.01273
M2-10	1.48405	jil	7/6/2009 13:56	6.33700	12.73300	127.3360	0.006337	0.01273
M1-04	1.48618	jil	7/6/2009 13:58	6.33100	12.72900	127.2561	0.006331	0.01273
M2-02	1.48424	jil	7/6/2009 13:59	6.33525	12.73150	127.3060	0.006335	0.01273
M2-01	1.48116	jil	7/6/2009 14:01	6.32550	12.72900	127.2561	0.006326	0.01273
M1-02	1.48604	jil	7/6/2009 14:03	6.33675	12.72600	127.1961	0.006337	0.01273
M2-12	1.48658	jil	7/6/2009 14:04	6.33700	12.73150	127.3060	0.006337	0.01273
M1-09	1.48570	jil	7/6/2009 14:06	6.33250	12.73100	127.2960	0.006333	0.01273
M2-08	1.48477	jil	7/6/2009 14:07	6.33300	12.73150	127.3060	0.006333	0.01273
M2-09	1.48409	jil	7/6/2009 14:08	6.33275	12.73050	127.2860	0.006333	0.01273
M1-12	1.48957	jil	7/6/2009 14:10	6.33275	12.73000	127.2761	0.006333	0.01273
M1-01	1.48165	jil	7/6/2009 14:11	6.30675	12.73750	127.4261	0.006307	0.01274
M2-05	1.48639	jil	7/6/2009 14:13	6.33575	12.72850	127.2461	0.006336	0.01273
M1-10	1.48594	jil	7/6/2009 15:02	6.33125	12.72900	127.2561	0.006331	0.01273
M2-07	1.48526	jil	7/6/2009 15:04	6.33475	12.73150	127.3060	0.006335	0.01273
M2-06	1.48566	jil	7/6/2009 15:06	6.33450	12.73200	127.3160	0.006335	0.01273
M1-07	1.48768	jil	7/6/2009 15:08	6.33175	12.73000	127.2761	0.006332	0.01273
M2-03	1.48529	jil	7/6/2009 15:09	6.33225	12.73200	127.3160	0.006332	0.01273
M1-03	1.49161	jil	7/6/2009 15:11	6.34850	12.72700	127.2161	0.006349	0.01273
M2-04	1.48480	jil	7/6/2009 15:13	6.33525	12.73150	127.3060	0.006335	0.01273
M1-08	1.48531	jil	7/6/2009 15:15	6.33200	12.72900	127.2561	0.006332	0.01273
M1-06	1.48670	jil	7/6/2009 15:17	6.33000	12.72900	127.2561	0.006330	0.01273

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
M1-05	0.0015	1845.15422	1.8452	25.2	21.4	53.9
M1-11	0.0015	1845.93524	1.8459	25.2	21.4	54
M2-11	0.0015	1841.92687	1.8419	25.2	21.2	54.3
M2-10	0.0015	1839.13440	1.8391	25.2	21.2	54.3
M1-04	0.0015	1844.67832	1.8447	25.2	22.1	51.1
M2-02	0.0015	1840.31152	1.8403	25.2	22.1	51
M2-01	0.0015	1840.04592	1.8400	25.2	21.9	51.3
M1-02	0.0015	1843.69979	1.8437	25.2	21.8	51.5
M2-12	0.0015	1842.70387	1.8427	25.2	21.8	51.6
M1-09	0.0015	1843.06651	1.8431	25.2	21.7	51.6
M2-08	0.0015	1841.62273	1.8416	25.2	21.6	51.8
M2-09	0.0015	1841.14118	1.8411	25.2	21.6	51.8
M1-12	0.0015	1848.08476	1.8481	25.2	21.6	51.6
M1-01	0.0015	1843.66382	1.8437	25.2	21.8	51.2
M2-05	0.0015	1843.70064	1.8437	25.2	21.8	50.9
M1-10	0.0015	1844.30760	1.8443	25.2	21.8	50.9
M2-07	0.0015	1841.72157	1.8417	25.1	21.9	50.5
M2-06	0.0015	1842.14558	1.8421	25.1	21.9	50.1
M1-07	0.0015	1846.03137	1.8460	25.1	21.8	50.4
M2-03	0.0015	1842.34120	1.8423	25.1	22	49.8
M1-03	0.0015	1846.89495	1.8469	25.2	21.9	49.9
M2-04	0.0015	1841.00586	1.8410	25.1	22	49.4
M1-08	0.0015	1843.30731	1.8433	25.1	22.1	48.9
M1-06	0.0015	1845.61528	1.8456	25.1	22.2	48.6

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
M1-05		41169	11/11/2009 8:16	26.600	0.200	88.686	87.794	88.290
				100.100	0.200	67.777	67.886	67.925
				199.200	0.100	50.011	49.893	49.885
				300.600	0.400	38.701	38.926	38.836
				401.100	0.500	31.920	31.877	31.980
				501.700	0.500	27.285	27.281	27.243
				600.800	0.300	23.980	23.858	23.956
				700.000	0.200	21.370	21.468	21.477
				799.500	0.100	19.437	19.488	19.448
				899.400	0.100	17.845	17.903	17.943
M1-06		41169	11/11/2009 8:16	999.300	0.100	16.598	16.677	16.684
				25.900	0.200	87.530	89.608	88.397
				100.000	0.200	68.249	68.176	68.502
				199.200	0.000	50.207	50.376	50.267
				299.600	0.100	39.270	39.433	39.331
				399.900	0.200	32.309	32.354	32.423
				500.300	0.300	27.575	27.608	27.542
				600.000	0.200	24.223	24.210	24.271
				699.600	0.100	21.658	21.637	21.739
				799.500	0.100	19.705	19.744	19.640
M1-07		41169	11/11/2009 8:16	899.500	0.100	18.225	18.096	18.076
				999.500	0.100	16.752	16.863	16.788
				25.200	0.200	89.041	88.315	88.616
				99.500	0.200	67.801	68.088	68.289
				199.100	0.000	50.192	50.120	50.192
				299.300	0.100	39.243	39.213	39.209
				399.500	0.100	32.267	32.149	32.141
				499.700	0.200	27.422	27.519	27.443
				599.500	0.100	24.160	24.029	24.190
				699.300	0.100	21.561	21.551	21.601
M1-01		41169	11/11/2009 8:30	799.200	0.100	19.544	19.765	19.634
				899.200	0.000	18.033	17.936	18.056
				999.200	0.000	16.804	16.654	16.682
				26.600	0.300	89.825	87.312	88.996

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
M1-02		41169	11/11/2009 8:30	101.300	0.200	68.284	67.945	67.904
				200.500	0.100	50.091	50.078	50.028
				301.600	0.200	39.164	39.246	39.281
				401.600	0.200	32.204	32.344	32.339
				501.600	0.200	27.594	27.524	27.638
				601.600	0.200	24.128	24.146	24.249
				701.700	0.100	21.592	21.594	21.614
				801.200	0.200	19.619	19.686	19.581
				900.800	0.100	18.014	18.117	18.058
				1000.900	0.000	16.664	16.915	16.773
M1-04		41169	11/11/2009 8:30	25.800	0.200	88.762	89.204	90.222
				101.400	0.200	67.724	67.650	67.992
				200.500	0.000	50.079	49.904	50.168
				300.900	0.100	39.183	39.279	39.269
				401.000	0.100	32.238	32.298	32.197
				501.000	0.100	27.481	27.532	27.484
				601.100	0.100	24.149	24.135	24.105
				701.100	0.100	21.744	21.739	21.547
				800.900	0.100	19.639	19.580	19.672
				900.700	0.100	18.006	18.122	17.967
M1-08		41169	11/12/2009 7:46	1000.800	0.100	16.762	16.777	17.092
				25.300	0.200	87.518	89.681	89.898
				100.900	0.200	67.977	68.228	68.046
				200.700	0.000	50.176	50.249	50.241
				300.800	0.100	39.332	39.232	39.423
				401.000	0.100	32.381	32.454	32.327
				500.900	0.100	27.683	27.732	27.550
				601.000	0.100	24.175	24.265	24.165
				701.000	0.100	21.639	21.791	21.646
				800.800	0.100	19.744	19.715	19.735
900.800	0.100	17.948	18.151	18.181				
1000.800	0.100	16.733	16.865	16.753				
26.500	0.200	88.939	89.025	89.901				
100.200	0.200	68.377	68.300	68.079				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
M1-09		41169	11/12/2009 7:46	199.200	0.100	50.121	50.313	50.337
				300.800	0.400	39.001	39.206	39.230
				401.100	0.500	32.201	32.196	32.332
				501.700	0.500	27.467	27.482	27.464
				600.800	0.300	24.169	24.117	24.132
				700.000	0.200	21.664	21.587	21.538
				799.500	0.100	19.688	19.652	19.616
				899.400	0.100	17.949	17.995	18.027
				999.300	0.100	16.609	16.552	16.727
				25.800	0.200	89.561	89.463	90.120
M1-10		41169	11/12/2009 7:46	100.100	0.200	68.482	68.490	68.374
				199.200	0.000	50.511	50.647	50.500
				299.600	0.100	39.421	39.367	39.474
				399.900	0.200	32.330	32.490	32.593
				500.400	0.300	27.769	27.687	27.744
				600.000	0.200	24.300	24.315	24.398
				699.700	0.100	21.725	21.808	21.689
				799.500	0.100	19.742	19.825	19.634
				899.500	0.100	18.176	18.187	18.352
				999.500	0.100	16.883	16.895	16.856
M1-11		41169	11/12/2009 7:52	25.200	0.200	89.371	89.109	89.550
				99.500	0.200	68.260	68.122	68.761
				199.100	0.000	50.363	50.494	50.203
				299.300	0.100	39.574	39.389	39.487
				399.500	0.100	32.344	32.355	32.436
				499.700	0.200	27.701	27.672	27.582
				599.400	0.100	24.210	24.225	24.264
				699.300	0.100	21.673	21.743	21.802
				799.200	0.100	19.705	19.713	19.892
				899.100	0.000	18.189	18.148	18.107
999.100	0.000	16.840	16.690	16.828				
26.700	0.200	88.863	89.756	89.759				
101.100	0.300	68.420	68.384	68.095				
200.400	0.200	50.292	50.299	50.128				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
M1-12		41169	11/12/2009 7:52	301.500	0.200	39.256	39.249	39.209
				401.600	0.200	32.331	32.322	32.377
				501.600	0.200	27.588	27.681	27.694
				601.600	0.200	24.273	24.258	24.233
				701.800	0.100	21.662	21.671	21.662
				801.300	0.200	19.702	19.731	19.817
				900.900	0.100	18.141	18.188	18.172
				1000.900	0.100	16.796	17.014	16.883
				26.100	0.200	89.578	88.924	89.516
				101.100	0.100	67.741	67.731	68.416
M2-01		41169	11/12/2009 7:52	200.600	0.000	50.210	50.150	50.237
				300.800	0.000	39.176	39.296	39.118
				401.000	0.100	32.254	32.311	32.450
				501.000	0.100	27.562	27.694	27.651
				601.100	0.100	24.235	24.162	24.305
				701.300	0.200	21.667	21.650	21.706
				801.000	0.100	19.630	19.696	19.688
				900.800	0.000	18.059	18.046	18.091
				1000.700	0.100	16.836	16.806	16.805
				25.600	0.200	90.333	89.909	89.549
M2-05		41169	11/13/2009 8:12	100.900	0.200	68.261	68.209	68.338
				200.700	0.000	50.296	50.548	50.272
				300.900	0.100	39.384	39.360	39.521
				401.000	0.100	32.349	32.502	32.562
				501.000	0.100	27.657	27.703	27.613
				601.000	0.100	24.271	24.302	24.311
				701.100	0.100	21.705	21.701	21.755
				800.900	0.100	19.771	19.730	19.810
				900.800	0.100	18.055	18.173	18.195
				1000.700	0.100	16.804	16.881	16.836
26.600	0.200	88.817	89.114	88.625				
100.100	0.200	67.564	67.861	67.543				
199.200	0.100	50.024	49.833	50.021				
300.700	0.400	38.863	38.955	38.779				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
M2-06		41169	11/13/2009 8:12	401.100	0.500	31.796	32.010	31.964
				501.600	0.400	27.272	27.227	27.216
				600.800	0.300	23.895	23.993	23.862
				700.100	0.400	21.422	21.413	21.553
				799.500	0.100	19.410	19.435	19.453
				899.400	0.100	17.902	17.713	17.746
				999.300	0.100	16.420	16.527	16.578
				25.800	0.200	89.821	89.551	89.871
				100.000	0.200	67.992	67.861	68.046
				199.100	0.000	50.233	50.457	50.437
M2-07		41169	11/13/2009 8:12	299.600	0.100	39.316	39.406	39.133
				399.900	0.200	32.257	32.358	32.420
				500.300	0.300	27.542	27.642	27.605
				600.000	0.200	24.258	24.134	24.139
				699.600	0.100	21.707	21.660	21.752
				799.500	0.100	19.734	19.743	19.686
				899.500	0.100	18.153	17.975	18.096
				999.500	0.100	16.792	16.701	16.857
				25.100	0.200	89.250	88.898	89.104
				99.500	0.200	68.060	67.912	67.740
M2-02		41169	11/13/2009 8:30	199.200	0.100	50.097	50.080	50.175
				299.300	0.100	39.123	39.200	39.272
				399.400	0.100	32.211	32.257	32.124
				499.700	0.200	27.372	27.406	27.415
				599.500	0.100	24.108	24.047	24.180
				699.300	0.100	21.651	21.548	21.558
				799.200	0.000	19.563	19.635	19.620
				899.200	0.000	18.081	17.901	17.936
				999.200	0.000	16.708	16.692	16.621
				26.600	0.200	90.109	89.752	89.708
101.200	0.200	68.141	68.405	68.043				
200.500	0.100	50.294	50.245	50.148				
301.600	0.200	39.145	39.173	39.174				
401.500	0.200	32.298	32.399	32.207				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
M2-03		41169	11/13/2009 8:30	501.600	0.200	27.570	27.502	27.550
				601.600	0.200	24.149	24.227	24.180
				701.700	0.200	21.597	21.658	21.555
				801.100	0.300	19.559	19.550	19.597
				900.700	0.100	18.037	17.991	17.942
				1000.600	0.100	16.812	16.849	16.795
				26.100	0.200	89.311	89.977	89.785
				101.000	0.100	68.100	68.298	68.184
				200.500	0.000	50.194	50.141	50.131
				300.700	0.000	39.158	39.352	39.253
M2-04		41169	11/13/2009 8:30	400.800	0.100	32.237	32.392	32.431
				500.800	0.100	27.573	27.590	27.664
				600.900	0.100	24.180	24.308	24.257
				701.000	0.100	21.643	21.710	21.625
				800.600	0.100	19.693	19.768	19.662
				900.400	0.100	18.052	18.177	18.099
				1000.400	0.000	16.925	16.777	16.692
				25.500	0.200	90.001	90.060	91.822
				101.000	0.200	68.554	68.867	68.708
				200.700	0.000	50.682	50.750	50.463
M2-08		41169	11/14/2009 9:42	300.800	0.100	39.501	39.550	39.691
				401.000	0.100	32.531	32.509	32.577
				500.900	0.100	27.780	27.763	27.924
				600.900	0.100	24.395	24.347	24.400
				701.000	0.100	21.662	21.814	21.842
				800.700	0.100	19.882	19.768	19.774
				900.500	0.100	18.288	18.066	18.271
				1000.500	0.100	16.896	16.868	16.701
				26.600	0.200	89.748	89.055	88.562
				101.300	0.300	68.257	68.034	68.046
200.500	0.100	50.156	50.154	50.163				
301.400	0.300	39.039	39.144	39.257				
401.500	0.300	32.148	32.232	32.281				
501.500	0.200	27.551	27.576	27.527				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
M2-09		41169	11/14/2009 9:42	601.800	0.300	24.123	24.109	24.080
				701.700	0.100	21.492	21.666	21.658
				801.300	0.200	19.590	19.567	19.681
				900.900	0.100	17.952	18.005	17.992
				1001.000	0.000	16.601	16.635	16.484
				26.000	0.200	87.992	88.758	89.526
				101.300	0.100	67.800	67.835	68.022
				200.500	0.000	49.882	50.110	49.866
				300.500	0.100	39.053	39.204	39.067
				400.700	0.100	32.129	32.172	32.308
M2-10		41169	11/14/2009 9:42	500.900	0.100	27.358	27.452	27.531
				600.900	0.200	24.103	24.164	24.134
				701.200	0.100	21.508	21.550	21.592
				800.900	0.100	19.435	19.782	19.534
				900.700	0.100	18.112	18.149	17.985
				1000.800	0.100	16.826	16.599	16.549
				25.400	0.200	88.591	89.447	89.338
				101.100	0.200	67.320	67.579	67.723
				200.600	0.000	49.719	49.867	49.880
				300.700	0.100	38.993	39.080	38.957
M2-11		41169	1/27/2010 7:57	400.800	0.200	32.133	32.061	32.234
				500.900	0.100	27.310	27.406	27.358
				600.700	0.100	23.998	23.973	24.050
				701.100	0.100	21.456	21.521	21.546
				800.900	0.100	19.455	19.485	19.495
				900.700	0.100	17.886	17.778	17.962
				1000.800	0.100	16.955	16.550	16.773
				26.600	0.200	87.483	87.937	88.964
				100.000	0.200	68.145	67.912	67.999
				199.000	0.200	50.293	50.206	50.175
300.800	0.400	38.922	39.132	39.138				
401.100	0.500	32.074	32.153	32.064				
501.500	0.400	27.400	27.340	27.377				
600.800	0.300	24.062	24.180	24.024				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)	
M2-12				700.000	0.300	21.489	21.480	21.561	
				799.700	0.200	19.507	19.515	19.475	
				899.300	0.000	17.965	18.060	17.951	
				999.200	0.000	16.570	16.537	16.583	
			41169	1/27/2010 7:57	26.000	0.200	89.900	89.821	87.532
					99.900	0.200	68.590	68.313	68.534
					199.200	0.000	50.411	50.539	50.373
					299.700	0.100	39.485	39.442	39.378
					400.000	0.200	32.435	32.369	32.487
					500.400	0.200	27.588	27.610	27.650
					600.100	0.200	24.269	24.196	24.358
					699.700	0.100	21.703	21.728	21.758
					799.600	0.100	19.796	19.785	19.614
					899.500	0.100	18.039	18.212	18.171
				999.500	0.100	16.823	16.731	16.887	

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
M1-05	88.257	0.447		6.327	InSb	12.7	100	Ar	E 1461-07
	67.863	0.077							
	49.930	0.071							
	38.821	0.113							
	31.926	0.052							
	27.270	0.023							
	23.931	0.065							
	21.438	0.059							
	19.458	0.027							
	17.897	0.049							
	16.653	0.048							
M1-06	88.512	1.044		6.327	InSb	12.7	100	Ar	E 1461-07
	68.309	0.171							
	50.283	0.086							
	39.345	0.082							
	32.362	0.057							
	27.575	0.033							
	24.235	0.032							
	21.678	0.054							
	19.696	0.053							
	18.132	0.081							
	16.801	0.057							
M1-07	88.657	0.365		6.327	InSb	12.7	100	Ar	E 1461-07
	68.059	0.245							
	50.168	0.042							
	39.222	0.019							
	32.186	0.071							
	27.461	0.051							
	24.126	0.086							
	21.571	0.026							
	19.648	0.111							
	18.008	0.064							
	16.713	0.080							
M1-01	88.711	1.281		6.327	InSb	12.7	100	Ar	E 1461-07

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
M1-09	50.257	0.118							
	39.146	0.126							
	32.243	0.077							
	27.471	0.010							
	24.139	0.027							
	21.596	0.064							
	19.652	0.036							
	17.990	0.039							
	16.629	0.089							
	89.715	0.354		6.327	InSb	12.7	100	Ar	E 1461-07
	68.449	0.065							
50.553	0.082								
39.421	0.054								
32.471	0.133								
27.733	0.042								
24.338	0.053								
21.741	0.061								
19.734	0.096								
18.238	0.099								
16.878	0.020								
89.343	0.222		6.327	InSb	12.7	100	Ar	E 1461-07	
68.381	0.336								
50.353	0.146								
39.483	0.093								
32.378	0.050								
27.652	0.062								
24.233	0.028								
21.739	0.065								
19.770	0.106								
18.148	0.041								
16.786	0.083								
89.459	0.516		6.327	InSb	12.7	100	Ar	E 1461-07	
68.300	0.178								
50.240	0.097								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
M1-12	39.238	0.025							
	32.343	0.030							
	27.654	0.058							
	24.255	0.020							
	21.665	0.005							
	19.750	0.060							
	18.167	0.024							
	16.898	0.110							
	89.339	0.361		6.327	InSb	12.7	100	Ar	E 1461-07
	67.963	0.393							
	50.199	0.045							
	39.197	0.091							
32.338	0.101								
27.636	0.067								
24.234	0.072								
21.674	0.029								
19.671	0.036								
18.065	0.023								
16.816	0.018								
89.930	0.392		6.327	InSb	12.7	100	Ar	E 1461-07	
68.269	0.065								
50.372	0.153								
39.422	0.087								
32.471	0.110								
27.658	0.045								
24.295	0.021								
21.720	0.030								
19.770	0.040								
18.141	0.075								
16.840	0.039								
88.852	0.246		6.327	InSb	12.7	100	Ar	E 1461-07	
67.656	0.178								
49.959	0.109								
38.866	0.088								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
M2-06	31.923	0.113							
	27.238	0.030							
	23.917	0.068							
	21.463	0.078							
	19.433	0.022							
	17.787	0.101							
	16.508	0.081							
	89.748	0.172		6.327	InSb	12.7	100	Ar	E 1461-07
	67.966	0.095							
	50.376	0.124							
	39.285	0.139							
	32.345	0.082							
	27.596	0.051							
	24.177	0.070							
21.706	0.046								
19.721	0.031								
18.075	0.091								
16.783	0.078								
M2-07	89.084	0.177		6.327	InSb	12.7	100	Ar	E 1461-07
	67.904	0.160							
	50.117	0.051							
	39.198	0.075							
	32.197	0.068							
	27.398	0.023							
	24.112	0.067							
	21.586	0.057							
	19.606	0.038							
	17.973	0.095							
	16.674	0.046							
	89.856	0.220		6.327	InSb	12.7	100	Ar	E 1461-07
	68.196	0.187							
	50.229	0.074							
39.164	0.016								
32.301	0.096								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
M2-03	27.541	0.035							
	24.185	0.039							
	21.603	0.052							
	19.569	0.025							
	17.990	0.048							
	16.819	0.028							
	89.691	0.343		6.327	InSb	12.7	100	Ar	E 1461-07
	68.194	0.099							
	50.155	0.034							
	39.254	0.097							
M2-04	32.353	0.103							
	27.609	0.048							
	24.248	0.064							
	21.659	0.045							
	19.708	0.055							
	18.109	0.063							
	16.798	0.118							
	90.628	1.035		6.327	InSb	12.7	100	Ar	E 1461-07
	68.710	0.157							
	50.632	0.150							
M2-08	39.581	0.099							
	32.539	0.035							
	27.822	0.088							
	24.381	0.029							
	21.773	0.097							
	19.808	0.064							
	18.208	0.124							
	16.822	0.105							
	89.122	0.596		6.327	InSb	12.7	100	Ar	E 1461-07
	68.112	0.125							
50.158	0.005								
39.147	0.109								
32.220	0.067								
27.551	0.025								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
M2-09	24.104	0.022		6.327	InSb	12.7	100	Ar	E 1461-07
	21.605	0.098							
	19.613	0.060							
	17.983	0.028							
	16.573	0.079							
	88.759	0.767							
	67.886	0.119							
	49.953	0.136							
	39.108	0.083							
	32.203	0.093							
27.447	0.087								
24.134	0.031								
21.550	0.042								
19.584	0.179								
18.082	0.086								
16.658	0.148								
89.125	0.466		6.327	InSb	12.7	100	Ar	E 1461-07	
67.541	0.204								
49.822	0.089								
39.010	0.063								
32.143	0.087								
27.358	0.048								
24.007	0.039								
21.508	0.046								
19.478	0.021								
17.875	0.092								
16.759	0.203								
88.128	0.759								
68.019	0.118								
50.225	0.061								
39.064	0.123								
32.097	0.049								
27.372	0.030								
24.089	0.081								
M2-11	24.104	0.022		6.327	InSb	12.7	100	Ar	E 1461-07
	21.605	0.098							
	19.613	0.060							
	17.983	0.028							
	16.573	0.079							
	88.759	0.767							
	67.886	0.119							
	49.953	0.136							
	39.108	0.083							
	32.203	0.093							
27.447	0.087								
24.134	0.031								
21.550	0.042								
19.584	0.179								
18.082	0.086								
16.658	0.148								
89.125	0.466								
67.541	0.204								
49.822	0.089								
39.010	0.063								
32.143	0.087								
27.358	0.048								
24.007	0.039								
21.508	0.046								
19.478	0.021								
17.875	0.092								
16.759	0.203								
88.128	0.759								
68.019	0.118								
50.225	0.061								
39.064	0.123								
32.097	0.049								
27.372	0.030								
24.089	0.081								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
M2-12	21.510	0.044		6.327	InSb	12.7	100	Ar	E 1461-07
	19.499	0.021							
	17.992	0.059							
	16.563	0.024							
	89.084	1.345							
	68.479	0.146							
	50.441	0.087							
	39.435	0.054							
	32.430	0.059							
	27.616	0.031							
	24.274	0.081							
	21.730	0.028							
19.732	0.102								
18.141	0.090								
16.814	0.078								

Specimen Number	M1-05	M1-06	M1-07	M1-01	M1-02	M1-04
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/11/09 8:16 AM	11/11/09 8:16 AM	11/11/09 8:16 AM	11/11/09 8:30 AM	11/11/09 8:30 AM	11/11/09 8:30 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	88.2567	88.5117	88.6573	88.7110	89.3960	89.0323
100	67.8627	68.3090	68.0593	68.0443	67.7887	68.0837
200	49.9297	50.2833	50.1680	50.0657	50.0503	50.2220
300	38.8210	39.3447	39.2217	39.2303	39.2437	39.3290
400	31.9257	32.3620	32.1857	32.2957	32.2443	32.3873
500	27.2697	27.5750	27.4613	27.5853	27.4990	27.6550
600	23.9313	24.2347	24.1263	24.1743	24.1297	24.2017
700	21.4383	21.6780	21.5710	21.6000	21.6767	21.6920
800	19.4577	19.6963	19.6477	19.6287	19.6303	19.7313
900	17.8970	18.1323	18.0083	18.0630	18.0317	18.0933
1000	16.6530	16.8010	16.7133	16.7840	16.8770	16.7837

Specimen Number	M1-08	M1-09	M1-10	M1-11	M1-12	M2-01
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/12/09 7:46 AM	11/12/09 7:46 AM	11/12/09 7:46 AM	11/12/09 7:52 AM	11/12/09 7:52 AM	11/12/09 7:52 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	89.2883	89.7147	89.3433	89.4593	89.3393	89.9303
100	68.2520	68.4487	68.3810	68.2997	67.9627	68.2693
200	50.2570	50.5527	50.3533	50.2397	50.1990	50.3720
300	39.1457	39.4207	39.4833	39.2380	39.1967	39.4217
400	32.2430	32.4710	32.3783	32.3433	32.3383	32.4710
500	27.4710	27.7333	27.6517	27.6543	27.6357	27.6577
600	24.1393	24.3377	24.2330	24.2547	24.2340	24.2947
700	21.5963	21.7407	21.7393	21.6650	21.6743	21.7203
800	19.6520	19.7337	19.7700	19.7500	19.6713	19.7703
900	17.9903	18.2383	18.1480	18.1670	18.0653	18.1410
1000	16.6293	16.8780	16.7860	16.8977	16.8157	16.8403

Specimen Number	M2-05	M2-06	M2-07	M2-02	M2-03	M2-04
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/13/09 8:12 AM	11/13/09 8:12 AM	11/13/09 8:12 AM	11/13/09 8:30 AM	11/13/09 8:30 AM	11/13/09 8:30 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	88.8520	89.7477	89.0840	89.8563	89.6910	90.6277
100	67.6560	67.9663	67.9040	68.1963	68.1940	68.7097
200	49.9593	50.3757	50.1173	50.2290	50.1553	50.6317
300	38.8657	39.2850	39.1983	39.1640	39.2543	39.5807
400	31.9233	32.3450	32.1973	32.3013	32.3533	32.5390
500	27.2383	27.5963	27.3977	27.5407	27.6090	27.8223
600	23.9167	24.1770	24.1117	24.1853	24.2483	24.3807
700	21.4627	21.7063	21.5857	21.6033	21.6593	21.7727
800	19.4327	19.7210	19.6060	19.5687	19.7077	19.8080
900	17.7870	18.0747	17.9727	17.9900	18.1093	18.2083
1000	16.5083	16.7833	16.6737	16.8187	16.7980	16.8217

Specimen Number	M2-08	M2-09	M2-10	M2-11	M2-12
Measured By	41169	41169	41169	41169	41169
Measured Date	11/14/09 9:42 AM	11/14/09 9:42 AM	11/14/09 9:42 AM	1/27/10 7:57 AM	1/27/10 7:57 AM
Diffusivity (mm ² /sec)					
Temperature °C					
25	89.1217	88.7587	89.1253	88.1280	89.0843
100	68.1123	67.8857	67.5407	68.0187	68.4790
200	50.1577	49.9527	49.8220	50.2247	50.4410
300	39.1467	39.1080	39.0100	39.0640	39.4350
400	32.2203	32.2030	32.1427	32.0970	32.4303
500	27.5513	27.4470	27.3580	27.3723	27.6160
600	24.1040	24.1337	24.0070	24.0887	24.2743
700	21.6053	21.5500	21.5077	21.5100	21.7297
800	19.6127	19.5837	19.4783	19.4990	19.7317
900	17.9830	18.0820	17.8753	17.9920	18.1407
1000	16.5733	16.6580	16.7593	16.5633	16.8137

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	M2-10		6.330	6.331	6.330	6.330	12.724	12.730	1.48373
	M2-11		6.328	6.328	6.327	6.326	12.723	12.727	1.48487
	M2-07		6.328	6.329	6.327	6.327	12.723	12.727	1.48513
	M2-08		6.326	6.325	6.323	6.325	12.728	12.726	1.48459
	M2-12		6.326	6.327	6.326	6.327	12.723	12.725	1.48619
	M2-09		6.327	6.326	6.326	6.327	12.726	12.724	1.48395
	M1-04		6.323	6.324	6.321	6.323	12.723	12.722	1.48596
	M1-05		6.322	6.321	6.322	6.322	12.721	12.722	1.48485
	M1-02		6.330	6.328	6.329	6.331	12.720	12.719	1.48580
	M1-01		6.300	6.299	6.296	6.298	12.730	12.730	1.48141
	M1-06		6.323	6.323	6.323	6.323	12.722	12.723	1.48655
	M1-08		6.323	6.324	6.323	6.323	12.721	12.724	1.48513
	M1-07		6.324	6.324	6.323	6.323	12.722	12.724	1.48745
	M1-12		6.326	6.325	6.326	6.326	12.725	12.725	1.48934
	M1-11		6.326	6.325	6.325	6.325	12.722	12.724	1.48748
	M1-10		6.326	6.324	6.325	6.325	12.724	12.722	1.48579
	M1-09		6.323	6.324	6.323	6.324	12.725	12.724	1.48556

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
M2-10	41169	12/3/2010 9:28	6.33025	12.72700	127.2161	0.006330	0.01273
M2-11	41169	12/3/2010 13:12	6.32725	12.72500	127.1761	0.006327	0.01273
M2-07	41169	12/4/2010 7:52	6.32775	12.72500	127.1761	0.006328	0.01273
M2-08	41169	12/4/2010 10:18	6.32475	12.72700	127.2161	0.006325	0.01273
M2-12	47735	12/4/2010 13:15	6.32650	12.72400	127.1561	0.006327	0.01272
M2-09	41169	12/4/2010 13:41	6.32650	12.72500	127.1761	0.006327	0.01273
M1-04	41169	12/6/2010 9:28	6.32275	12.72250	127.1261	0.006323	0.01272
M1-05	41169	12/6/2010 9:33	6.32175	12.72150	127.1061	0.006322	0.01272
M1-02	41169	12/6/2010 9:41	6.32950	12.71950	127.0662	0.006330	0.01272
M1-01	41169	12/6/2010 10:05	6.29825	12.73000	127.2761	0.006298	0.01273
M1-06	41169	12/6/2010 13:15	6.32300	12.72250	127.1261	0.006323	0.01272
M1-08	41169	12/6/2010 13:20	6.32325	12.72250	127.1261	0.006323	0.01272
M1-07	41169	12/6/2010 13:31	6.32350	12.72300	127.1361	0.006324	0.01272
M1-12	41169	12/7/2010 8:24	6.32575	12.72500	127.1761	0.006326	0.01273
M1-11	41169	12/7/2010 8:55	6.32525	12.72300	127.1361	0.006325	0.01272
M1-10	41169	12/7/2010 10:10	6.32500	12.72300	127.1361	0.006325	0.01272
M1-09	41169	12/7/2010 10:14	6.32350	12.72450	127.1661	0.006324	0.01272

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
M2-10	0.0015	25.3	22.9	20.9
M2-11	0.0015	25.3	22.7	20.1
M2-07	0.0015	25.4	22.3	13.2
M2-08	0.0015	25.4	22.2	12.9
M2-12	0.0015	25.4	22.2	17
M2-09	0.0015	25.4	22.5	14.1
M1-04	0.0015	25.3	22	16.4
M1-05	0.0015	25.3	22.2	16.4
M1-02	0.0015	25.3	22.3	16.3
M1-01	0.0015	25.3	22.4	16.9
M1-06	0.0015	25.3	22.5	21.3
M1-08	0.0015	25.3	22.6	21.3
M1-07	0.0015	25.3	22.7	21.2
M1-12	0.0015	25.6	22.5	21.7
M1-11	0.0015	25.6	22.7	21.6
M1-10	0.0015	25.6	22.8	21.3
M1-09	0.0015	25.6	22.8	21.3

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity
and Temperature Transmitter Model PTU301

Graphite Grade:	A-3 New Matrix
Graphite Manufacturer:	ORNL
Forming Process:	Unknown
Coke Particle Size:	Unknown
Coke Type:	Unknown
ASTM Class:	Unknown
Specimen Geometry:	Cylinder

Specimen ID #'s:

A3-H08-Z07
A3-H08-Z19
A3-H08-Z01
A3-P33-Z09
A3-P33-Z20
A3-P33-Z18
A3-P43-Z03
A3-P43-Z12
A3-P43-Z06
A3-H08-Z07p
A3-H08-Z19p
A3-H08-Z01p
A3-P33-Z09p
A3-P33-Z20p
A3-P33-Z18p
A3-P43-Z03p
A3-P43-Z12p
A3-P43-Z06p

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	A3-H08-Z19		6.304	6.302	6.285	6.292	12.707	12.710
	A3-H08-Z07		6.313	6.315	6.313	6.314	12.719	12.720
	A3-H08-Z01		6.311	6.303	6.305	6.313	12.709	12.710
	A3-P33-Z09		6.336	6.342	6.339	6.336	12.714	12.715
	A3-P33-Z20		6.324	6.315	6.316	6.324	12.714	12.717
	A3-P33-Z18		6.335	6.337	6.336	6.331	12.723	12.726
	A3-P43-Z03		6.313	6.318	6.315	6.314	12.731	12.731
	A3-P43-Z12		6.327	6.337	6.325	6.326	12.717	12.716
	A3-P43-Z06		6.348	6.348	6.346	6.346	12.735	12.735

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
A3-H08-Z19	1.3365	41169	11/9/2010 14:26	6.29575	12.70850	126.8465	0.006296	0.01271
A3-H08-Z07	1.35852	41169	11/9/2010 14:34	6.31375	12.71950	127.0662	0.006314	0.01272
A3-H08-Z01	1.34015	41169	11/9/2010 14:36	6.30800	12.70950	126.8665	0.006308	0.01271
A3-P33-Z09	1.41496	41169	11/9/2010 14:38	6.33825	12.71450	126.9663	0.006338	0.01271
A3-P33-Z20	1.35233	41169	11/9/2010 14:39	6.31975	12.71550	126.9863	0.006320	0.01272
A3-P33-Z18	1.39927	41169	11/9/2010 14:41	6.33475	12.72450	127.1661	0.006335	0.01272
A3-P43-Z03	1.41378	41169	11/9/2010 14:42	6.31500	12.73100	127.2960	0.006315	0.01273
A3-P43-Z12	1.44456	41169	11/9/2010 14:43	6.32875	12.71650	127.0062	0.006329	0.01272
A3-P43-Z06	1.41635	41169	11/9/2010 14:45	6.34700	12.73500	127.3761	0.006347	0.01274

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
A3-H08-Z19	0.0013	1673.56668	1.6736	25.2	22.5	18.2
A3-H08-Z07	0.0014	1693.35765	1.6934	25.2	22.6	18
A3-H08-Z01	0.0013	1674.61476	1.6746	25.2	22.7	17.8
A3-P33-Z09	0.0014	1758.27315	1.7583	25.2	22.8	17.7
A3-P33-Z20	0.0014	1685.10132	1.6851	25.2	22.7	17.7
A3-P33-Z18	0.0014	1737.00356	1.7370	25.2	22.8	17.7
A3-P43-Z03	0.0014	1758.70728	1.7587	25.2	22.8	17.7
A3-P43-Z12	0.0014	1797.18412	1.7972	25.2	22.8	17.7
A3-P43-Z06	0.0014	1751.92015	1.7519	25.2	22.8	17.6

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm^2/sec)	Diffusivity Shot 2 (mm^2/sec)	Diffusivity Shot 3 (mm^2/sec)
A3-H08-Z07		41169	11/10/2010 10:10	26.5	0.2	21.226	21.31	21.56
				100.4	0.2	16.391	16.3	16.426
				199.1	0.1	12.482	12.462	12.474
				300.9	0.4	9.957	9.992	9.993
				400.5	0.8	8.471	8.479	8.434
				501.2	0.4	7.33	7.39	7.351
				600.9	0.4	6.783	6.597	6.538
				700.1	0.5	6.139	5.823	5.839
				799.6	0.1	5.359	5.332	5.298
				899.4	0.1	5.05	5.026	5.017
				999.2	0.1	4.885	4.758	4.713
A3-H08-Z19		41169	11/10/2010 10:10	25.7	0.2	19.996	20.699	20.306
				100.1	0.2	15.824	15.911	15.823
				199.2	0	11.988	12.15	12.157
				299.8	0.1	9.73	9.764	9.779
				399.5	0.1	8.27	8.264	8.204
				500.1	0.2	7.241	7.206	7.207
				600	0.2	6.496	6.411	6.314
				699.5	0.1	5.83	5.696	5.727
				799.4	0.1	5.315	5.278	5.193
				899.3	0.1	4.843	4.795	4.844
				999.2	0.1	4.726	4.488	4.721
A3-H08-Z01		41169	11/10/2010 10:10	25.1	0.1	21.695	21.964	21.672
				99.4	0.2	16.89	16.818	16.808
				199.1	0	12.796	12.752	12.818
				299.3	0.1	10.332	10.335	10.349
				399.3	0.1	8.813	8.788	8.767
				499.5	0.1	7.688	7.743	7.693
				599.4	0.1	6.967	6.939	6.946
				699.2	0	6.357	6.278	6.312
				799.1	0	5.831	5.803	5.756
				899.1	0	5.505	5.351	5.358
				998.9	0	5.127	4.992	4.878
A3-P33-Z18		41169	11/11/2010 8:06	24.9	0.1	21.064	20.882	20.567

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
A3-P33-Z20		41169	11/11/2010 8:06	99.4	0.2	16.133	16.256	16.351
				199.1	0	12.486	12.481	12.468
				299.3	0.1	10.1	10.152	10.103
				399.4	0.1	8.632	8.663	8.628
				499.5	0.1	7.716	7.701	7.688
				599.4	0.1	7.003	6.969	6.914
				699.3	0.1	6.389	6.335	6.299
				799.1	0	5.861	5.796	5.679
				899.1	0	5.441	5.433	5.339
				999	0	5.177	5.131	5.034
A3-P33-Z09		41169	11/11/2010 8:06	25.6	0.2	19.767	19.743	19.635
				100	0.2	15.427	15.357	15.292
				199.2	0	11.862	11.826	11.803
				299.7	0.1	9.648	9.643	9.635
				399.8	0.2	8.247	8.239	8.217
				500.1	0.2	7.27	7.302	7.251
				600	0.2	6.526	6.486	6.488
				699.6	0.1	5.841	5.935	5.833
				799.4	0.1	5.477	5.382	5.365
				899.4	0.1	5.296	5.057	5.04
A3-P43-Z03		41169	11/12/2010 9:02	999.2	0.1	4.949	4.848	4.757
				26.4	0.2	22.347	22.711	23.094
				100.3	0.2	17.974	17.861	17.889
				199.2	0.1	13.728	13.735	13.631
				300.9	0.4	11.055	11.065	11.061
				401	0.5	9.445	9.466	9.437
				501.2	0.4	8.413	8.384	8.392
				600.9	0.3	7.658	7.571	7.626
				700.1	0.4	7.144	6.973	6.985
				799.6	0.1	6.43	6.387	6.383
899.5	0.1	5.986	6.003	5.888				
999.4	0.1	5.462	5.693	5.654				
26.5	0.2	20.578	20.667	20.333				
100.4	0.2	15.73	15.589	15.667				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
A3-P43-Z06		41169	11/12/2010 9:02	199.2	0.1	11.756	11.79	11.721
				300.2	0.2	9.416	9.395	9.406
				401.1	0.5	7.867	7.855	7.872
				501.2	0.4	6.819	6.798	6.731
				600.9	0.3	6.138	5.89	5.844
				700.2	0.5	5.56	5.262	5.282
				799.6	0.1	4.816	4.801	4.705
				899.5	0.1	4.459	4.414	4.435
				999.3	0.1	4.142	4.042	4.219
				25.1	0.1	22.749	22.491	22.779
				99.4	0.2	17.352	17.511	17.637
				199.1	0	13.103	13.029	13.11
				299.3	0.1	10.418	10.472	10.428
				399.4	0.1	8.762	8.772	8.791
				499.5	0.1	7.73	7.734	7.762
A3-P43-Z12		41169	11/12/2010 9:02	599.5	0.1	6.924	6.875	6.85
				699.2	0	6.249	6.141	6.157
				799.1	0	5.758	5.615	5.685
				899.1	0	5.347	5.187	5.117
				999	0	4.963	4.69	4.387
				25.7	0.2	20.772	19.962	20.397
				100.1	0.2	15.66	15.576	15.551
				199.1	0	11.723	11.75	11.681
				299.5	0.1	9.347	9.303	9.349
				399.8	0.2	7.85	7.857	7.856
				500	0.2	6.84	6.776	6.779
				600	0.2	5.998	5.856	5.869
				699.5	0.1	5.384	5.261	5.31
				799.4	0.1	4.963	4.75	4.853
				899.3	0.1	4.538	4.53	4.379
999.3	0	4.175	4.075	4.264				

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
A3-H08-Z07	21.365 16.372 12.473 9.981 8.461 7.357 6.639 5.934 5.330 5.031 4.785	0.174 0.065 0.010 0.021 0.024 0.030 0.128 0.178 0.031 0.017 0.089		6.314	InSb	12.7	100	Ar	E 1461-07
A3-H08-Z19	20.334 15.853 12.098 9.758 8.246 7.218 6.407 5.751 5.262 4.827 4.645	0.352 0.051 0.096 0.025 0.036 0.020 0.091 0.070 0.063 0.028 0.136		6.314	InSb	12.7	100	Ar	E 1461-07
A3-H08-Z01	21.777 16.839 12.789 10.339 8.789 7.708 6.951 6.316 5.797 5.405 4.999	0.162 0.045 0.034 0.009 0.023 0.030 0.015 0.040 0.038 0.087 0.125		6.314	InSb	12.7	100	Ar	E 1461-07
A3-P33-Z18	20.838	0.251		6.314	InSb	12.7	100	Ar	E 1461-07

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
A3-P33-Z20	16.247	0.109							
	12.478	0.009							
	10.118	0.029							
	8.641	0.019							
	7.702	0.014							
	6.962	0.045							
	6.341	0.045							
	5.779	0.092							
	5.404	0.057							
	5.114	0.073							
	19.715	0.070		6.314	InSb	12.7	100		Ar E 1461-07
	15.359	0.068							
	11.830	0.030							
	9.642	0.007							
8.234	0.016								
7.274	0.026								
6.500	0.023								
5.870	0.057								
5.408	0.060								
5.131	0.143								
4.851	0.096								
A3-P33-Z09	22.717	0.374		6.314	InSb	12.7	100		Ar E 1461-07
	17.908	0.059							
	13.698	0.058							
	11.060	0.005							
	9.449	0.015							
8.396	0.015								
7.618	0.044								
7.034	0.095								
6.400	0.026								
5.959	0.062								
5.603	0.124								
A3-P43-Z03	20.526	0.173		6.314	InSb	12.7	100		Ar E 1461-07
	15.662	0.071							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
	11.756	0.035							
	9.406	0.011							
	7.865	0.009							
	6.783	0.046							
	5.957	0.158							
	5.368	0.167							
	4.774	0.060							
	4.436	0.023							
	4.134	0.089							
A3-P43-Z06	22.673	0.158		6.314	InSb	12.7	100	Ar	E 1461-07
	17.500	0.143							
	13.081	0.045							
	10.439	0.029							
	8.775	0.015							
	7.742	0.017							
	6.883	0.038							
	6.182	0.058							
	5.686	0.072							
	5.217	0.118							
	4.680	0.288							
A3-P43-Z12	20.377	0.405		6.314	InSb	12.7	100	Ar	E 1461-07
	15.596	0.057							
	11.718	0.035							
	9.333	0.026							
	7.854	0.004							
	6.798	0.036							
	5.908	0.079							
	5.318	0.062							
	4.855	0.107							
	4.482	0.090							
	4.171	0.095							

Specimen Number	A3-H08-Z07	A3-H08-Z19	A3-H08-Z01	A3-P33-Z18	A3-P33-Z20	A3-P33-Z09
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	11/10/10 10:10 AM	11/10/10 10:10 AM	11/10/10 10:10 AM	11/11/10 8:06 AM	11/11/10 8:06 AM	11/11/10 8:06 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	21.3653	20.3337	21.7770	20.8377	19.7150	22.7173
100	16.3723	15.8527	16.8387	16.2467	15.3587	17.9080
200	12.4727	12.0983	12.7887	12.4783	11.8303	13.6980
300	9.9807	9.7577	10.3387	10.1183	9.6420	11.0603
400	8.4613	8.2460	8.7893	8.6410	8.2343	9.4493
500	7.3570	7.2180	7.7080	7.7017	7.2743	8.3963
600	6.6393	6.4070	6.9507	6.9620	6.5000	7.6183
700	5.9337	5.7510	6.3157	6.3410	5.8697	7.0340
800	5.3297	5.2620	5.7967	5.7787	5.4080	6.4000
900	5.0310	4.8273	5.4047	5.4043	5.1310	5.9590
1000	4.7853	4.6450	4.9990	5.1140	4.8513	5.6030

Specimen Number	A3-P43-Z03	A3-P43-Z06	A3-P43-Z12
Measured By	41169	41169	41169
Measured Date	11/12/10 9:02 AM	11/12/10 9:02 AM	11/12/10 9:02 AM
Diffusivity (mm ² /sec)			
Temperature °C			
25	20.5260	22.6730	20.3770
100	15.6620	17.5000	15.5957
200	11.7557	13.0807	11.7180
300	9.4057	10.4393	9.3330
400	7.8647	8.7750	7.8543
500	6.7827	7.7420	6.7983
600	5.9573	6.8830	5.9077
700	5.3680	6.1823	5.3183
800	4.7740	5.6860	4.8553
900	4.4360	5.2170	4.4823
1000	4.1343	4.6800	4.1713

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	A3-H08-Z07p		6.309	6.309	6.311	6.308	12.709	12.710	1.35133
	A3-P33-Z18p		6.332	6.337	6.332	6.335	12.724	12.723	1.39875
	A3-P43-Z06p		6.349	6.349	6.346	6.349	12.732	12.736	1.41596
	A3-H08-Z01p		6.300	6.311	6.305	6.311	12.711	12.709	1.33912
	A3-P43-Z12p		6.332	6.327	6.322	6.328	12.712	12.716	1.44257
	A3-P33-Z20p		6.312	6.319	6.311	6.317	12.711	12.712	1.34826
	A3-H08-Z19p		6.293	6.284	6.293	6.281	12.706	12.708	1.33232
	A3-P33-Z09p		6.339	6.337	6.339	6.338	12.714	12.715	1.41329
	A3-P43-Z03p		6.312	6.314	6.313	6.315	12.726	12.730	1.41235

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
A3-H08-Z07p	47735	11/19/2010 9:50	6.30925	12.70950	126.8665	0.006309	0.01271
A3-P33-Z18p	47735	11/19/2010 9:57	6.33400	12.72350	127.1461	0.006334	0.01272
A3-P43-Z06p	47735	11/19/2010 10:00	6.34825	12.73400	127.3560	0.006348	0.01273
A3-H08-Z01p	47735	11/19/2010 10:02	6.30675	12.71000	126.8764	0.006307	0.01271
A3-P43-Z12p	47735	11/19/2010 10:05	6.32725	12.71400	126.9563	0.006327	0.01271
A3-P33-Z20p	47735	11/19/2010 10:07	6.31475	12.71150	126.9064	0.006315	0.01271
A3-H08-Z19p	47735	11/19/2010 10:10	6.28775	12.70700	126.8166	0.006288	0.01271
A3-P33-Z09p	47735	11/19/2010 10:15	6.33825	12.71450	126.9663	0.006338	0.01271
A3-P43-Z03p	47735	11/19/2010 10:17	6.31350	12.72800	127.2361	0.006314	0.01273

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
A3-H08-Z07p	0.0014	25.1	23.1	15.4
A3-P33-Z18p	0.0014	25.1	22.9	15.6
A3-P43-Z06p	0.0014	25.1	22.9	15.6
A3-H08-Z01p	0.0013	25.1	22.9	15.5
A3-P43-Z12p	0.0014	25.1	22.9	15.6
A3-P33-Z20p	0.0013	25.1	22.9	15.6
A3-H08-Z19p	0.0013	25.1	22.9	15.6
A3-P33-Z09p	0.0014	25.1	22.9	15.6
A3-P43-Z03p	0.0014	25.1	23	15.5

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity
and Temperature Transmitter Model PTU301

Graphite Grade: PCEA
Graphite Manufacturer: Graftech International
Forming Process: Extruded
Coke Particle Size: Medium grain
Coke Type: Pitch coke filler, pitch binder
ASTM Class: ENHP
Specimen Geometry: Cylinder

Specimen ID #'s:

DW18 01
DW18 02
DW18 03
DW18 04
DW18 05
DW18 06
DW18 07
DW18 08
DW18 09
DW18 10
DW18 11
DW18 12
DA8 01
DA8 02
DA8 03
DA8 04
DA8 05
DA8 06
DA9 01
DA9 02
DA9 03
DA9 04
DA9 05
DA9 06

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	DW18 01	W	6.295	6.294	6.295	6.296	12.747	12.746
	DW18 02	W	6.344	6.345	6.344	6.343	12.731	12.728
	DW18 03	W	6.337	6.337	6.338	6.338	12.740	12.736
	DW18 04	W	6.338	6.337	6.337	6.337	12.737	12.737
	DW18 05	W	6.338	6.337	6.337	6.339	12.728	12.726
	DW18 06	W	6.335	6.338	6.338	6.337	12.730	12.729
	DW18 07	W	6.337	6.335	6.336	6.337	12.733	12.735
	DW18 08	W	6.337	6.339	6.337	6.337	12.732	12.729
	DW18 09	W	6.336	6.337	6.338	6.338	12.734	12.732
	DW18 10	W	6.336	6.338	6.338	6.337	12.734	12.734
	DW18 11	W	6.337	6.339	6.339	6.339	12.732	12.730
	DW18 12	W	6.340	6.339	6.340	6.339	12.732	12.730
	DA8 01	A	6.340	6.339	6.338	6.340	12.733	12.734
	DA8 02	A	6.339	6.340	6.339	6.339	12.736	12.734
	DA8 03	A	6.336	6.338	6.338	6.337	12.734	12.734
	DA8 04	A	6.340	6.339	6.340	6.340	12.730	12.731
	DA8 05	A	6.339	6.340	6.341	6.340	12.734	12.735
	DA8 06	A	6.341	6.340	6.339	6.340	12.736	12.737
	DA9 01	A	6.345	6.347	6.347	6.347	12.738	12.738
	DA9 02	A	6.357	6.358	6.357	6.357	12.743	12.741
	DA9 03	A	6.356	6.356	6.357	6.357	12.727	12.729
	DA9 04	A	6.356	6.357	6.358	6.356	12.727	12.725
	DA9 05	A	6.361	6.363	6.364	6.363	12.731	12.730
	DA9 06	A	6.336	6.336	6.334	6.335	12.730	12.729

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
DW18 01	1.41844	jl	5/20/2009 13:55	6.29500	12.74650	127.6062	0.006295	0.01275
DW18 02	1.42347	jl	5/20/2009 14:02	6.34400	12.72950	127.2661	0.006344	0.01273
DW18 03	1.42412	jl	5/20/2009 14:26	6.33750	12.73800	127.4361	0.006338	0.01274
DW18 04	1.42204	jl	5/20/2009 14:30	6.33725	12.73700	127.4161	0.006337	0.01274
DW18 05	1.42478	jl	5/20/2009 14:34	6.33775	12.72700	127.2161	0.006338	0.01273
DW18 06	1.42356	jl	5/20/2009 14:37	6.33700	12.72950	127.2661	0.006337	0.01273
DW18 07	1.42461	jl	5/20/2009 14:42	6.33625	12.73400	127.3560	0.006336	0.01273
DW18 08	1.42777	jl	5/20/2009 14:47	6.33750	12.73050	127.2860	0.006338	0.01273
DW18 09	1.42774	jl	5/20/2009 14:50	6.33725	12.73300	127.3360	0.006337	0.01273
DW18 10	1.42603	jl	5/20/2009 14:54	6.33725	12.73400	127.3560	0.006337	0.01273
DW18 11	1.42996	jl	5/20/2009 14:57	6.33850	12.73100	127.2960	0.006339	0.01273
DW18 12	1.43016	jl	5/20/2009 14:59	6.33950	12.73100	127.2960	0.006340	0.01273
DA8 01	1.42142	JL	5/21/2009 10:23	6.33925	12.73350	127.3460	0.006339	0.01273
DA8 02	1.42754	JL	5/21/2009 10:29	6.33925	12.73500	127.3761	0.006339	0.01274
DA8 03	1.42732	JL	5/21/2009 10:33	6.33725	12.73400	127.3560	0.006337	0.01273
DA8 04	1.42454	JL	5/21/2009 10:37	6.33975	12.73050	127.2860	0.006340	0.01273
DA8 05	1.42534	JL	5/21/2009 10:40	6.34000	12.73450	127.3660	0.006340	0.01273
DA8 06	1.43113	JL	5/21/2009 10:44	6.34000	12.73650	127.4061	0.006340	0.01274
DA9 01	1.43575	JL	5/21/2009 10:48	6.34650	12.73800	127.4361	0.006347	0.01274
DA9 02	1.42549	JL	5/21/2009 10:51	6.35725	12.74200	127.5161	0.006357	0.01274
DA9 03	1.42477	JL	5/21/2009 10:53	6.35650	12.72800	127.2361	0.006357	0.01273
DA9 04	1.43292	JL	5/21/2009 10:56	6.35675	12.72600	127.1961	0.006357	0.01273
DA9 05	1.43521	JL	5/21/2009 11:01	6.36275	12.73050	127.2860	0.006363	0.01273
DA9 06	1.43035	JL	5/21/2009 11:07	6.33525	12.72950	127.2661	0.006335	0.01273

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
DW18 01	0.0014	1765.80789	1.7658	25.2	24.3	18.4
DW18 02	0.0014	1763.08225	1.7631	25.2	24.3	18.3
DW18 03	0.0014	1763.34075	1.7633	25.2	24.2	18.4
DW18 04	0.0014	1761.11126	1.7611	25.2	24.3	18.4
DW18 05	0.0014	1767.13910	1.7671	25.2	24.3	18.5
DW18 06	0.0014	1765.14138	1.7651	25.2	24.3	18.4
DW18 07	0.0014	1765.40402	1.7654	25.2	24.3	18.4
DW18 08	0.0014	1769.94380	1.7699	25.2	24.3	18.5
DW18 09	0.0014	1769.28146	1.7693	25.2	24.3	18.2
DW18 10	0.0014	1766.88486	1.7669	25.2	24.3	18.2
DW18 11	0.0014	1772.23976	1.7722	25.2	24.3	18.3
DW18 12	0.0014	1772.20804	1.7722	25.2	24.3	18.4
DA8 01	0.0014	1760.75559	1.7608	25.3	23.4	13.1
DA8 02	0.0014	1767.92007	1.7679	25.3	23.4	13.1
DA8 03	0.0014	1768.48320	1.7685	25.3	23.5	12.9
DA8 04	0.0014	1765.31297	1.7653	25.3	23.5	12.9
DA8 05	0.0014	1765.12529	1.7651	25.3	24.4	12.3
DA8 06	0.0014	1771.73901	1.7717	25.3	23.8	12.7
DA9 01	0.0014	1775.21995	1.7752	25.3	23.6	13
DA9 02	0.0014	1758.44910	1.7584	25.3	23.5	12.9
DA9 03	0.0014	1761.63730	1.7616	25.3	23.5	12.8
DA9 04	0.0014	1772.20147	1.7722	25.3	23.4	13.3
DA9 05	0.0014	1772.10638	1.7721	25.3	23.4	13.3
DA9 06	0.0014	1774.05055	1.7741	25.3	23.4	13.3

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
DA8 01		41169	12/15/2009 8:02	25.300	0.200	126.639	127.387	123.433
				100.100	0.200	91.589	91.650	92.194
				199.200	0.000	65.157	64.943	64.652
				299.700	0.100	49.034	49.167	49.126
				399.900	0.200	39.549	39.546	39.711
				500.400	0.300	33.234	33.249	33.276
				600.100	0.200	28.837	28.804	28.879
				699.700	0.100	25.542	25.570	25.561
				799.500	0.100	23.136	22.926	22.897
				899.400	0.100	20.912	20.910	20.902
DA8 02		41169	12/15/2009 8:02	999.500	0.100	19.185	19.063	19.340
				24.500	0.200	125.423	126.261	125.665
				99.500	0.200	91.246	91.615	91.940
				199.100	0.000	64.857	64.498	64.798
				299.300	0.100	49.121	49.162	49.040
				399.400	0.100	39.448	39.450	39.628
				499.700	0.200	33.183	33.163	33.113
				599.500	0.100	28.655	28.816	28.682
				699.300	0.100	25.330	25.404	25.422
				799.200	0.100	22.894	22.837	22.773
DW18 12		41169	12/15/2009 8:02	899.200	0.000	20.813	20.761	20.814
				999.100	0.000	19.110	19.086	19.304
				26.300	0.200	139.354	138.873	137.887
				100.200	0.200	101.513	101.854	101.422
				199.200	0.100	71.928	71.752	71.816
				300.800	0.400	54.025	54.307	54.423
				401.000	0.500	43.592	43.717	43.742
				501.700	0.500	36.847	36.856	36.701
				600.800	0.300	31.835	31.783	31.988
				700.000	0.200	28.135	28.269	28.299
DW18 06		41169	12/14/2009 8:11	799.600	0.100	25.547	25.261	25.468
				899.400	0.100	23.069	23.081	23.105
				999.300	0.100	21.308	21.405	21.327
				26.300	0.200	136.085	136.178	137.894

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)	
DW18 07				100.200	0.200	99.883	99.935	99.953	
				199.200	0.100	70.511	70.622	70.544	
				300.900	0.400	53.311	53.148	53.324	
				401.200	0.500	42.953	42.800	42.985	
				501.700	0.500	36.097	36.208	36.207	
				600.800	0.300	31.207	31.220	31.356	
				700.000	0.200	27.560	27.656	27.781	
				799.700	0.100	24.964	25.069	24.839	
				899.400	0.100	22.649	22.645	22.754	
				999.300	0.100	20.787	20.992	20.788	
			41169	12/14/2009 8:11	25.300	0.200	136.753	138.285	134.849
					100.100	0.200	100.084	100.111	100.473
					199.200	0.000	70.499	70.801	70.924
					299.700	0.100	53.525	53.630	53.517
					399.900	0.200	43.054	43.312	43.391
				500.400	0.300	36.328	36.176	36.345	
				600.000	0.200	31.441	31.440	31.462	
				699.700	0.200	27.691	27.909	27.800	
				799.500	0.100	25.064	25.061	25.087	
				899.400	0.100	22.631	22.760	22.865	
				999.500	0.100	21.013	21.003	20.953	
DW18 08				24.500	0.200	139.860	137.186	140.626	
				99.500	0.200	100.608	101.287	101.423	
				199.100	0.000	71.523	71.348	71.491	
				299.300	0.100	54.131	54.225	54.122	
				399.500	0.100	43.500	43.419	43.391	
				499.700	0.100	36.584	36.676	36.590	
				599.500	0.100	31.768	31.766	31.623	
				699.300	0.100	28.115	28.216	28.128	
				799.300	0.100	25.220	25.333	25.287	
				899.200	0.100	23.055	22.962	23.015	
				999.200	0.100	21.185	21.033	21.005	
			41169	12/15/2009 8:23	26.400	0.200	137.018	138.017	137.264
					101.300	0.200	99.485	99.308	99.819

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
DW18 04		41169	12/15/2009 8:23	200.400	0.100	70.431	70.335	70.432
				301.500	0.300	53.140	53.433	53.451
				401.500	0.300	43.225	43.185	43.156
				501.400	0.400	36.315	36.364	36.263
				601.900	0.200	31.291	31.410	31.298
				701.600	0.100	27.698	27.790	27.857
				801.200	0.100	24.859	25.104	25.090
				900.800	0.100	22.880	22.722	22.748
				1000.700	0.000	21.176	21.078	20.970
				25.600	0.200	135.283	136.472	134.887
DW18 09		41169	12/16/2009 8:42	101.200	0.100	98.663	98.492	98.426
				200.300	0.000	69.923	70.053	69.798
				300.600	0.000	52.874	52.951	52.967
				400.800	0.100	42.630	42.655	42.696
				500.500	0.100	35.660	35.877	35.990
				601.200	0.100	31.036	30.989	31.025
				701.100	0.100	27.407	27.442	27.415
				800.900	0.100	24.572	24.764	24.707
				900.700	0.100	22.488	22.433	22.411
				1000.700	0.100	20.639	20.710	20.631
DW18 10		41169	12/16/2009 8:42	26.300	0.300	136.930	136.339	136.910
				101.200	0.300	99.875	99.526	99.466
				200.400	0.100	70.270	70.300	70.353
				301.500	0.300	53.298	53.265	53.321
				401.500	0.300	42.979	43.291	43.115
				501.500	0.300	36.246	36.349	36.436
				601.500	0.200	31.377	31.314	31.502
				701.700	0.100	27.792	27.747	27.624
				801.300	0.200	24.993	25.005	25.020
				900.900	0.100	22.717	22.580	22.878
1000.900	0.100	20.915	20.945	20.883				
25.300	0.300	138.013	138.652	138.311				
101.100	0.100	100.014	100.311	100.129				
200.500	0.000	70.791	70.813	70.925				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
DW18 05		41169	12/15/2009 8:23	300.600	0.100	53.750	53.831	53.770
				400.800	0.100	43.458	43.612	43.466
				500.700	0.100	36.550	36.523	36.479
				601.000	0.200	31.535	31.537	31.498
				701.300	0.200	27.988	28.036	28.039
				801.000	0.100	25.122	24.949	25.133
				900.800	0.100	22.944	22.677	22.889
				1000.800	0.100	21.119	21.130	21.187
				24.900	0.200	137.987	137.868	139.576
				101.000	0.200	100.022	100.227	100.708
DW18 11		41169	12/16/2009 8:42	200.500	0.100	70.831	71.160	70.842
				300.700	0.100	53.893	53.980	54.050
				400.900	0.200	43.564	43.623	43.521
				500.400	0.100	36.598	36.547	36.681
				601.100	0.100	31.651	31.494	31.759
				701.000	0.100	27.909	28.070	28.036
				800.900	0.100	25.124	25.417	25.327
				900.700	0.100	22.947	22.939	22.876
				1000.700	0.100	20.881	21.169	21.095
				24.600	0.100	137.839	138.612	138.675
				101.000	0.200	99.934	100.198	100.352
				200.700	0.100	71.068	70.919	71.141
				300.600	0.100	53.785	53.736	53.862
				400.800	0.100	43.467	43.557	43.583
				500.600	0.100	36.373	36.540	36.496
				600.800	0.100	31.571	31.586	31.449
				701.100	0.100	27.933	27.926	27.981
				800.900	0.100	25.048	25.183	25.060
				900.800	0.100	22.785	22.774	22.849
				1000.800	0.100	21.035	21.054	21.004

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
DA8 03		41169	12/16/2009 8:35	26.300	0.200	124.287	124.821	125.554
				100.200	0.200	90.761	91.425	91.153
				199.200	0.100	64.147	64.288	64.301
				300.700	0.300	48.559	48.663	48.477
				401.100	0.500	39.106	39.107	39.255
				501.600	0.500	32.890	32.767	32.850
				600.900	0.300	28.538	28.506	28.557
				699.900	0.300	25.261	25.202	25.243
				799.600	0.100	22.647	22.638	22.712
				899.400	0.100	20.648	20.712	20.666
				999.400	0.100	19.133	19.083	19.038

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
DA8 01	125.820	2.100		6.339	InSb	12.7	100	Ar	E 1461-07
	91.811	0.333							
	64.917	0.253							
	49.109	0.068							
	39.602	0.094							
	33.253	0.021							
	28.840	0.038							
	25.558	0.014							
	22.986	0.130							
	20.908	0.005							
	19.196	0.139							
	125.783	0.431							
	91.600	0.347							
64.718	0.193								
49.108	0.062								
39.509	0.103								
33.153	0.036								
28.718	0.086								
25.385	0.049								
22.835	0.061								
20.796	0.030								
19.167	0.120								
DW18 12	138.705	0.748		6.339	InSb	12.7	100	Ar	E 1461-07
	101.596	0.228							
	71.832	0.089							
	54.252	0.205							
	43.684	0.080							
	36.801	0.087							
	31.869	0.107							
	28.234	0.087							
	25.425	0.148							
	23.085	0.018							
	21.347	0.051							
	136.719	1.019							
	DW18 06	138.705	0.748						
101.596		0.228							
71.832		0.089							
54.252		0.205							
43.684		0.080							
36.801		0.087							
31.869		0.107							
28.234		0.087							
25.425		0.148							
23.085		0.018							
21.347		0.051							
136.719		1.019							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
DW18 07	99.924	0.036							
	70.559	0.057							
	53.261	0.098							
	42.913	0.099							
	36.171	0.064							
	31.261	0.083							
	27.666	0.111							
	24.957	0.115							
	22.683	0.062							
	20.856	0.118							
	136.629	1.721		6.339	InSb	12.7	100	Ar	E 1461-07
	100.223	0.217							
	70.741	0.219							
	53.557	0.063							
43.252	0.176								
36.283	0.093								
31.448	0.012								
27.800	0.109								
25.071	0.014								
22.752	0.117								
20.990	0.032								
DW18 08	139.224	1.806		6.339	InSb	12.7	100	Ar	E 1461-07
	101.106	0.437							
	71.454	0.093							
	54.159	0.057							
	43.437	0.057							
	36.617	0.051							
	31.719	0.083							
	28.153	0.055							
	25.280	0.057							
	23.011	0.047							
	21.074	0.097							
	137.433	0.521		6.339	InSb	12.7	100	Ar	E 1461-07
	99.537	0.259							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
DW18 04	70.399	0.056							
	53.341	0.175							
	43.189	0.035							
	36.314	0.051							
	31.333	0.067							
	27.782	0.080							
	25.018	0.138							
	22.783	0.085							
	21.075	0.103							
	135.547	0.825		6.339	InSb	12.7	100	Ar	E 1461-07
DW18 09	98.527	0.122							
	69.925	0.128							
	52.931	0.050							
	42.660	0.033							
	35.842	0.168							
	31.017	0.025							
	27.421	0.018							
	24.681	0.099							
	22.444	0.040							
	20.660	0.043							
DW18 10	136.726	0.336		6.339	InSb	12.7	100	Ar	E 1461-07
	99.622	0.221							
	70.308	0.042							
	53.295	0.028							
	43.128	0.156							
	36.344	0.095							
	31.398	0.096							
	27.721	0.087							
	25.006	0.014							
	22.725	0.149							
DW18 10	20.914	0.031							
	138.325	0.320		6.339	InSb	12.7	100	Ar	E 1461-07
	100.151	0.150							
	70.843	0.072							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
DW18 05	53.784	0.042							
	43.512	0.087							
	36.517	0.036							
	31.523	0.022							
	28.021	0.029							
	25.068	0.103							
	22.837	0.141							
	21.145	0.037							
	138.477	0.954		6.339	InSb	12.7	100	Ar	E 1461-07
	100.319	0.352							
	70.944	0.187							
	53.974	0.079							
	43.569	0.051							
	36.609	0.068							
31.635	0.133								
28.005	0.085								
25.289	0.150								
22.921	0.039								
21.048	0.150								
DW18 11	138.375	0.466		6.339	InSb	12.7	100	Ar	E 1461-07
	100.161	0.211							
	71.043	0.113							
	53.794	0.064							
	43.536	0.061							
	36.470	0.087							
	31.535	0.075							
	27.947	0.030							
25.097	0.075								
22.803	0.041								
21.031	0.025								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
DA8 03	124.887	0.636		6.339	InSb	12.7	100	Ar	E 1461-07
	91.113	0.334							
	64.245	0.085							
	48.566	0.093							
	39.156	0.086							
	32.836	0.063							
	28.534	0.026							
	25.235	0.030							
	22.666	0.040							
	20.675	0.033							
	19.085	0.048							

Specimen Number	DA8 01	DA8 02	DW18 12	DW18 06	DW18 07	DW18 08
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	12/15/09 8:02 AM	12/15/09 8:02 AM	12/15/09 8:02 AM	12/14/09 8:11 AM	12/14/09 8:11 AM	12/14/09 8:11 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	125.8197	125.7830	138.7047	136.7190	136.6290	139.2240
100	91.8110	91.6003	101.5963	99.9237	100.2227	101.1060
200	64.9173	64.7177	71.8320	70.5590	70.7413	71.4540
300	49.1090	49.1077	54.2517	53.2610	53.5573	54.1593
400	39.6020	39.5087	43.6837	42.9127	43.2523	43.4367
500	33.2530	33.1530	36.8013	36.1707	36.2830	36.6167
600	28.8400	28.7177	31.8687	31.2610	31.4477	31.7190
700	25.5577	25.3853	28.2343	27.6657	27.8000	28.1530
800	22.9863	22.8347	25.4253	24.9573	25.0707	25.2800
900	20.9080	20.7960	23.0850	22.6827	22.7520	23.0107
1000	19.1960	19.1667	21.3467	20.8557	20.9897	21.0743

Specimen Number	DW18 03	DW18 04	DW18 09	DW18 10	DW18 05	DW18 11
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	12/15/09 8:23 AM	12/15/09 8:23 AM	12/16/09 8:42 AM	12/16/09 8:42 AM	12/15/09 8:23 AM	12/16/09 8:42 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	137.4330	135.5473	136.7263	138.3253	138.4770	138.3753
100	99.5373	98.5270	99.6223	100.1513	100.3190	100.1613
200	70.3993	69.9247	70.3077	70.8430	70.9443	71.0427
300	53.3413	52.9307	53.2947	53.7837	53.9743	53.7943
400	43.1887	42.6603	43.1283	43.5120	43.5693	43.5357
500	36.3140	35.8423	36.3437	36.5173	36.6087	36.4697
600	31.3330	31.0167	31.3977	31.5233	31.6347	31.5353
700	27.7817	27.4213	27.7210	28.0210	28.0050	27.9467
800	25.0177	24.6810	25.0060	25.0680	25.2893	25.0970
900	22.7833	22.4440	22.7250	22.8367	22.9207	22.8027
1000	21.0747	20.6600	20.9143	21.1453	21.0483	21.0310

Specimen Number	DA8.03
Measured By	41169
Measured Date	12/16/09 8:35 AM
Diffusivity (mm²/sec)	
Temperature °C	
25	124.8873
100	91.1130
200	64.2453
300	48.5663
400	39.1560
500	32.8357
600	28.5337
700	25.2353
800	22.6657
900	20.6753
1000	19.0847

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	DW18 06	W	6.337	6.337	6.338	6.336	12.739	12.737	1.42328
	DW18 07	W	6.340	6.337	6.338	6.338	12.741	12.741	1.42434
	DW18 03	W	6.339	6.338	6.337	6.335	12.738	12.740	1.42382
	DW18 04	W	6.338	6.337	6.338	6.337	12.743	12.730	1.42176
	DW18 05	W	6.339	6.338	6.336	6.336	12.739	12.740	1.42455
	DW18 09	W	6.337	6.337	6.337	6.337	12.735	12.740	1.42739
	DW18 11	W	6.336	6.338	6.337	6.339	12.737	12.734	1.42971
	DW18 10	W	6.337	6.337	6.337	6.336	12.740	12.739	1.42572
	DA8 02	A	6.339	6.339	6.337	6.336	12.735	12.735	1.42732
	DW18 12	W	6.341	6.340	6.340	6.340	12.739	12.738	1.42984
	DA8 01	A	6.339	6.338	6.339	6.338	12.737	12.741	1.42125
	DW18 08	W	6.338	6.338	6.337	6.337	12.740	12.736	1.42746
	DA8 03	A	6.338	6.340	6.338	6.339	12.742	12.741	1.42707
	DA8 05	A	6.342	6.342	6.342	6.340	12.740	12.740	1.42518
	DA8 04	A	6.339	6.338	6.337	6.338	12.741	12.744	1.42428

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
DW18 06	41169	12/3/2010 9:16	6.33700	12.73800	127.4361	0.006337	0.01274
DW18 07	41169	12/3/2010 11:56	6.33825	12.74100	127.4961	0.006338	0.01274
DW18 03	41169	12/4/2010 8:02	6.33725	12.73900	127.4561	0.006337	0.01274
DW18 04	41169	12/4/2010 10:37	6.33750	12.73650	127.4061	0.006338	0.01274
DW18 05	41169	12/4/2010 13:53	6.33725	12.73950	127.4661	0.006337	0.01274
DW18 09	41169	12/6/2010 10:03	6.33700	12.73750	127.4261	0.006337	0.01274
DW18 11	41169	12/6/2010 10:46	6.33750	12.73550	127.3861	0.006338	0.01274
DW18 10	41169	12/6/2010 10:57	6.33675	12.73950	127.4661	0.006337	0.01274
DA8 02	41169	12/6/2010 13:09	6.33775	12.73500	127.3761	0.006338	0.01274
DW18 12	41169	12/6/2010 13:40	6.34025	12.73850	127.4461	0.006340	0.01274
DA8 01	41169	12/6/2010 14:00	6.33850	12.73900	127.4561	0.006339	0.01274
DW18 08	41169	12/7/2010 8:43	6.33750	12.73800	127.4361	0.006338	0.01274
DA8 03	41169	12/7/2010 8:46	6.33875	12.74150	127.5061	0.006339	0.01274
DA8 05	41169	12/7/2010 8:50	6.34150	12.74000	127.4761	0.006342	0.01274
DA8 04	41169	12/7/2010 9:31	6.33800	12.74250	127.5261	0.006338	0.01274

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
DW18 06	0.0014	25.2	23.1	20.7
DW18 07	0.0014	25.3	23.2	19.9
DW18 03	0.0014	25.4	22.2	13.2
DW18 04	0.0014	25.4	22.1	12.8
DW18 05	0.0014	25.4	22.5	14.3
DW18 09	0.0014	25.3	22.4	16.8
DW18 11	0.0014	25.3	22.7	17.9
DW18 10	0.0014	25.3	22.9	18.1
DA8 02	0.0014	25.3	22.4	21.5
DW18 12	0.0014	25.3	22.9	21.1
DA8 01	0.0014	25.3	23	21.1
DW18 08	0.0014	25.6	22.5	21.8
DA8 03	0.0014	25.6	22.5	21.8
DA8 05	0.0014	25.6	22.6	21.6
DA8 04	0.0014	25.6	22.9	21.3

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity
and Temperature Transmitter Model PTU301

Graphite Grade:	PCIB
Graphite Manufacturer:	Graftech International
Forming Process:	Isostatic-molded
Coke Particle Size:	Fine grain
Coke Type:	Petroleum coke
ASTM Class:	INHP
Specimen Geometry:	Cylinder

Specimen ID #'s:

P1-01
P1-02
P1-03
P1-04
P1-05
P1-06
P1-07
P1-08
P1-09
P1-10
P2-01
P2-02
P2-03
P2-04
P2-05
P2-06
P2-07
P2-08
P2-09
P2-10
P3-01
P3-02
P3-03
P3-04
P3-05
P3-06
P3-07
P3-08
P3-09
P3-10

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	P1-07		6.335	6.334	6.334	6.334	12.729	12.733
	P3-10		6.332	6.332	6.333	6.334	12.732	12.731
	P1-03		6.337	6.336	6.336	6.337	12.735	12.737
	P3-08		6.332	6.333	6.333	6.332	12.731	12.732
	P2-10		6.330	6.331	6.331	6.332	12.732	12.733
	P2-03		6.329	6.332	6.332	6.328	12.730	12.731
	P1-06		6.328	6.329	6.328	6.329	12.724	12.725
	P1-05		6.327	6.329	6.328	6.329	12.727	12.726
	P2-07		6.325	6.325	6.324	6.324	12.726	12.727
	P2-01		6.328	6.328	6.327	6.328	12.720	12.721
	P3-02		6.324	6.325	6.326	6.325	12.724	12.728
	P3-01		6.326	6.326	6.328	6.327	12.726	12.728
	P1-10		6.327	6.329	6.331	6.329	12.727	12.726
	P3-04		6.325	6.328	6.327	6.327	12.724	12.726
	P3-03		6.323	6.326	6.327	6.326	12.728	12.727
	P2-08		6.326	6.326	6.325	6.324	12.727	12.727
	P3-05		6.325	6.326	6.326	6.324	12.728	12.727
	P3-06		6.325	6.326	6.327	6.326	12.725	12.726
	P3-07		6.326	6.326	6.326	6.326	12.726	12.727
	P2-06		6.326	6.322	6.323	6.325	12.725	12.725
	P1-08		6.328	6.327	6.329	6.327	12.724	12.724
	P1-04		6.331	6.331	6.328	6.329	12.726	12.725
	P1-01		6.329	6.329	6.328	6.330	12.742	12.742
	P2-09		6.324	6.325	6.325	6.326	12.727	12.729
	P3-09		6.327	6.329	6.328	6.326	12.727	12.727
	P2-04		6.323	6.325	6.322	6.324	12.723	12.725
	P2-02		6.324	6.325	6.324	6.323	12.726	12.724
	P2-05		6.325	6.327	6.325	6.326	12.726	12.727
	P1-02		6.331	6.332	6.332	6.332	12.732	12.730
	P1-09		6.327	6.329	6.329	6.329	12.726	12.727

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
P1-07	1.47452	JL	7/6/2009 15:24	6.33425	12.73100	127.2960	0.006334	0.01273
P3-10	1.46969	JL	7/6/2009 15:27	6.33275	12.73150	127.3060	0.006333	0.01273
P1-03	1.47567	JL	7/6/2009 15:29	6.33650	12.73600	127.3961	0.006337	0.01274
P3-08	1.47164	JL	7/6/2009 15:32	6.33250	12.73150	127.3060	0.006333	0.01273
P2-10	1.46770	JL	7/6/2009 15:34	6.33100	12.73250	127.3260	0.006331	0.01273
P2-03	1.47457	JL	7/6/2009 15:35	6.33025	12.73050	127.2860	0.006330	0.01273
P1-06	1.47270	JL	7/7/2009 7:50	6.32850	12.72450	127.1661	0.006329	0.01272
P1-05	1.47287	JL	7/7/2009 8:34	6.32825	12.72650	127.2061	0.006328	0.01273
P2-07	1.47742	JL	7/7/2009 8:37	6.32450	12.72650	127.2061	0.006325	0.01273
P2-01	1.47549	JL	7/7/2009 8:38	6.32775	12.72050	127.0862	0.006328	0.01272
P3-02	1.47734	JL	7/7/2009 8:40	6.32500	12.72600	127.1961	0.006325	0.01273
P3-01	1.47351	JL	7/7/2009 8:41	6.32675	12.72700	127.2161	0.006327	0.01273
P1-10	1.47116	JL	7/7/2009 8:43	6.32900	12.72650	127.2061	0.006329	0.01273
P3-04	1.46902	JL	7/7/2009 8:44	6.32675	12.72500	127.1761	0.006327	0.01273
P3-03	1.47252	JL	7/7/2009 8:46	6.32550	12.72750	127.2261	0.006326	0.01273
P2-08	1.46885	JL	7/7/2009 8:48	6.32525	12.72700	127.2161	0.006325	0.01273
P3-05	1.47198	JL	7/7/2009 8:50	6.32525	12.72750	127.2261	0.006325	0.01273
P3-06	1.47525	JL	7/7/2009 8:52	6.32600	12.72550	127.1861	0.006326	0.01273
P3-07	1.47759	JL	7/7/2009 8:53	6.32600	12.72650	127.2061	0.006326	0.01273
P2-06	1.47907	JL	7/7/2009 8:55	6.32400	12.72500	127.1761	0.006324	0.01273
P1-08	1.47447	JL	7/7/2009 8:57	6.32775	12.72400	127.1561	0.006328	0.01272
P1-04	1.47719	JL	7/7/2009 8:59	6.32975	12.72550	127.1861	0.006330	0.01273
P1-01	1.47847	JL	7/7/2009 9:01	6.32900	12.74200	127.5161	0.006329	0.01274
P2-09	1.47112	JL	7/7/2009 9:02	6.32500	12.72800	127.2361	0.006325	0.01273
P3-09	1.46980	JL	7/7/2009 9:04	6.32750	12.72700	127.2161	0.006328	0.01273
P2-04	1.46484	JL	7/7/2009 9:06	6.32350	12.72400	127.1561	0.006324	0.01272
P2-02	1.47243	JL	7/7/2009 9:07	6.32400	12.72500	127.1761	0.006324	0.01273
P2-05	1.47651	JL	7/7/2009 9:09	6.32575	12.72650	127.2061	0.006326	0.01273
P1-02	1.47756	JL	7/7/2009 9:10	6.33175	12.73100	127.2960	0.006332	0.01273
P1-09	1.47419	JL	7/7/2009 9:12	6.32850	12.72650	127.2061	0.006329	0.01273

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
P1-07	0.0015	1828.69194	1.8287	25.1	22.1	48.8
P3-10	0.0015	1822.99033	1.8230	25.1	22.1	48.2
P1-03	0.0015	1828.03214	1.8280	25.1	22.1	48.2
P3-08	0.0015	1825.48116	1.8255	25.1	22.1	48.3
P2-10	0.0015	1820.73915	1.8207	25.1	22.1	48.1
P2-03	0.0015	1830.05326	1.8301	25.1	22.2	47.8
P1-06	0.0015	1829.96241	1.8300	25.2	21.4	37.6
P1-05	0.0015	1829.67074	1.8297	25.2	21.7	37.2
P2-07	0.0015	1836.41120	1.8364	25.2	21.6	37.3
P2-01	0.0015	1834.79992	1.8348	25.2	21.6	37.2
P3-02	0.0015	1836.31088	1.8363	25.2	21.6	37.4
P3-01	0.0015	1830.75591	1.8308	25.2	21.7	37.2
P1-10	0.0015	1827.32993	1.8273	25.2	21.7	37.2
P3-04	0.0015	1825.75110	1.8258	25.2	21.8	36.9
P3-03	0.0015	1829.74365	1.8297	25.2	21.8	36.9
P2-08	0.0015	1825.39889	1.8254	25.2	21.9	37
P3-05	0.0015	1829.14494	1.8291	25.2	21.9	37
P3-06	0.0015	1833.56725	1.8336	25.2	21.9	37.3
P3-07	0.0015	1836.18701	1.8362	25.2	21.9	37.5
P2-06	0.0015	1839.04097	1.8390	25.2	22	37.1
P1-08	0.0015	1832.52297	1.8325	25.2	22.1	37
P1-04	0.0015	1834.89074	1.8349	25.2	22	37.2
P1-01	0.0015	1831.94461	1.8319	25.2	22.1	36.9
P2-09	0.0015	1828.00490	1.8280	25.2	22.1	36.9
P3-09	0.0015	1825.92998	1.8259	25.2	22.1	36.9
P2-04	0.0015	1821.77805	1.8218	25.2	22.2	36.5
P2-02	0.0015	1830.78495	1.8308	25.2	22.2	36.6
P2-05	0.0015	1834.91742	1.8349	25.2	22.3	36.5
P1-02	0.0015	1833.18565	1.8332	25.2	22.4	36.4
P1-09	0.0015	1831.23817	1.8312	25.2	22.3	36.5

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
P1-01		41169	12/17/2009 8:17	26.600	0.200	95.783	96.128	94.988
				100.200	0.200	72.536	72.212	72.042
				199.200	0.100	52.690	52.849	52.892
				300.800	0.400	40.812	40.685	40.947
				401.100	0.500	33.402	33.483	33.273
				501.700	0.500	28.387	28.416	28.361
				600.900	0.300	24.760	24.868	24.887
				699.900	0.200	22.031	22.169	22.051
				799.500	0.100	20.074	20.015	20.148
				899.400	0.100	18.331	18.513	18.295
P1-02		41169	12/17/2009 8:17	999.300	0.000	17.026	16.852	17.114
				26.000	0.200	94.472	97.489	96.218
				100.000	0.200	72.636	72.297	72.422
				199.200	0.000	52.934	52.950	52.979
				299.700	0.100	41.028	41.099	40.920
				400.000	0.200	33.581	33.572	33.605
				500.400	0.300	28.443	28.496	28.599
				600.100	0.200	24.856	24.891	24.891
				699.700	0.100	22.222	22.226	22.194
				799.500	0.100	20.183	20.290	20.343
P1-03		41169	12/17/2009 8:17	899.500	0.100	18.508	18.491	18.485
				999.600	0.100	17.039	17.276	17.244
				25.300	0.200	97.047	96.462	95.397
				99.500	0.200	72.077	72.433	72.446
				199.100	0.000	52.940	52.927	52.964
				299.300	0.100	41.016	41.036	41.082
				399.400	0.100	33.444	33.541	33.477
				499.600	0.100	28.434	28.519	28.489
				599.500	0.100	24.877	24.860	24.915
				699.200	0.000	22.089	22.202	22.265
P1-07		41169	12/21/2009 12:49	799.200	0.000	20.268	20.146	20.078
				899.100	0.100	18.452	18.393	18.423
				999.100	0.000	17.060	16.970	17.107
				26.600	0.200	95.013	95.746	96.070

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
P1-08		41169	12/21/2009 12:49	100.300	0.100	72.240	72.350	72.559
				199.200	0.000	52.926	53.076	52.927
				300.700	0.400	40.862	41.101	40.965
				401.100	0.500	33.536	33.664	33.587
				501.700	0.500	28.591	28.537	28.705
				600.900	0.300	25.068	25.131	25.008
				700.000	0.200	22.326	22.390	22.259
				799.500	0.100	20.246	20.262	20.143
				899.500	0.100	18.708	18.548	18.572
				999.300	0.000	17.187	17.186	17.350
P1-09		41169	12/21/2009 12:49	26.000	0.200	94.212	94.978	94.502
				100.000	0.200	71.363	71.922	72.297
				199.200	0.000	52.402	52.419	52.823
				299.600	0.100	40.810	40.734	40.762
				399.900	0.200	33.230	33.366	33.424
				500.400	0.300	28.286	28.367	28.350
				600.100	0.200	24.683	24.858	24.825
				699.800	0.200	22.105	22.112	22.122
				799.500	0.100	20.017	20.097	20.011
				899.500	0.100	18.408	18.410	18.405
P1-10		41169	12/21/2009 12:40	999.500	0.100	17.138	17.033	17.132
				25.400	0.200	94.783	91.762	92.828
				99.400	0.200	71.063	70.734	71.407
				199.100	0.000	52.168	52.166	52.133
				299.200	0.000	40.437	40.639	40.647
				399.400	0.100	33.141	33.225	33.236
				499.600	0.100	28.246	28.292	28.273
				599.500	0.100	24.693	24.608	24.602
				699.300	0.100	22.018	21.991	22.068
				799.200	0.000	19.840	19.991	19.979
P1-10		41169	12/21/2009 12:40	899.200	0.000	18.236	18.227	18.223
				999.100	0.000	17.104	16.813	16.792
				26.700	0.200	94.735	96.192	95.748
				101.300	0.200	72.341	72.399	72.296

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
P2-01		41169	12/21/2009 12:40	200.500	0.100	52.749	52.552	52.699
				301.600	0.200	40.707	40.867	40.938
				401.600	0.200	33.529	33.492	33.638
				501.600	0.200	28.449	28.564	28.575
				601.600	0.200	24.813	24.923	24.885
				701.800	0.100	22.208	22.277	22.148
				801.300	0.200	20.132	20.098	20.022
				900.900	0.100	18.413	18.503	18.479
				1000.900	0.100	17.077	17.078	17.111
				26.200	0.100	94.460	95.443	93.696
P2-02		41169	12/21/2009 12:40	101.100	0.200	71.519	71.553	71.521
				200.600	0.000	52.157	52.551	52.372
				300.700	0.000	40.702	40.729	40.491
				400.900	0.100	33.225	33.230	33.218
				501.000	0.100	28.257	28.421	28.363
				601.100	0.100	24.716	24.805	24.707
				701.300	0.200	22.125	22.024	22.182
				801.000	0.100	20.047	20.111	19.961
				900.800	0.100	18.335	18.368	18.336
				1000.800	0.100	16.937	17.185	16.961
P1-04		41169	12/17/2009 8:23	25.600	0.200	95.090	95.521	95.481
				100.900	0.200	71.738	72.084	71.853
				200.700	0.100	52.383	52.663	52.491
				300.800	0.100	40.799	40.775	40.757
				401.100	0.100	33.447	33.355	33.425
				501.000	0.100	28.411	28.367	28.486
				601.000	0.100	24.802	24.833	24.754
				701.100	0.100	22.092	22.125	22.153
				800.900	0.100	20.219	20.019	20.046
				900.800	0.100	18.351	18.497	18.405
1000.700	0.100	16.977	16.873	17.106				
26.700	0.200	94.761	96.007	95.198				
101.200	0.300	72.437	72.039	72.319				
200.500	0.100	52.663	52.601	52.784				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
P1-05		41169	12/17/2009 8:23	301.600	0.200	40.824	40.877	40.836
				401.600	0.200	33.464	33.590	33.547
				501.600	0.200	28.452	28.483	28.396
				601.600	0.200	24.901	24.795	24.947
				701.800	0.100	22.189	22.177	22.191
				801.300	0.200	20.253	20.060	20.043
				900.900	0.100	18.470	18.454	18.376
				1001.000	0.100	17.089	17.269	16.988
				26.100	0.200	94.847	94.926	94.193
				101.300	0.100	71.132	71.542	71.386
P1-06		41169	12/17/2009 8:23	200.500	0.000	52.261	52.285	52.249
				300.900	0.000	40.537	40.589	40.742
				401.000	0.100	33.191	33.334	33.411
				501.000	0.100	28.321	28.378	28.214
				601.100	0.100	24.798	24.885	24.745
				701.200	0.100	22.090	22.123	22.155
				801.000	0.100	20.031	19.982	20.154
				900.800	0.100	18.323	18.459	18.421
				1000.800	0.100	16.969	16.832	16.893
				25.600	0.200	93.458	94.303	95.069
P2-03		41169	12/22/2009 9:47	101.100	0.200	71.713	71.841	71.566
				200.700	0.100	52.378	52.309	52.476
				300.800	0.100	40.761	40.805	40.817
				401.000	0.100	33.347	33.442	33.434
				501.000	0.100	28.380	28.283	28.329
				601.000	0.100	24.701	24.840	24.765
				701.000	0.100	22.211	22.093	22.106
				800.900	0.100	20.011	20.095	20.011
				900.700	0.100	18.416	18.535	18.428
				1000.700	0.100	17.133	16.942	17.162
P2-03		41169	12/22/2009 9:47	26.600	0.200	95.354	94.653	96.531
				100.300	0.200	72.717	72.053	72.629
				199.100	0.100	52.979	52.767	52.852
				300.800	0.400	40.832	40.965	41.011

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
P2-04		41169	12/22/2009 9:47	401.200	0.500	33.453	33.456	33.593
				501.700	0.500	28.573	28.490	28.702
				600.900	0.300	24.924	25.010	24.870
				700.000	0.200	22.231	22.263	22.320
				799.600	0.100	20.079	20.150	20.243
				899.400	0.100	18.477	18.433	18.550
				999.400	0.000	17.142	17.023	17.115
				26.000	0.200	93.426	92.679	94.040
				100.100	0.200	70.107	70.722	70.952
				199.200	0.000	51.645	51.800	51.490
				299.700	0.100	40.056	40.122	39.957
				400.000	0.200	32.625	32.793	32.739
P2-05		41169	12/22/2009 9:47	500.400	0.300	27.727	27.918	27.761
				600.200	0.300	24.324	24.295	24.389
				699.700	0.200	21.731	21.705	21.731
				799.500	0.100	19.705	19.716	19.722
				899.500	0.100	17.986	18.026	18.073
				999.600	0.100	16.714	17.005	16.639
				25.400	0.200	94.782	95.055	95.918
				99.500	0.200	72.327	72.749	72.524
				199.100	0.000	52.713	52.991	52.978
				299.300	0.100	40.924	41.074	41.147
				399.400	0.100	33.515	33.425	33.420
				499.600	0.200	28.443	28.476	28.498
P2-09		41169	12/23/2009 8:14	599.500	0.100	24.930	24.930	24.875
				699.300	0.100	22.176	22.258	22.122
				799.100	0.000	20.340	20.147	20.250
				899.100	0.100	18.509	18.513	18.389
				999.100	0.000	17.062	16.974	17.107
				26.600	0.200	92.502	92.816	92.391
				100.300	0.200	70.732	70.790	70.880
				199.200	0.100	51.766	51.851	51.892
				300.600	0.400	40.111	40.062	40.253
				401.100	0.500	32.783	32.896	32.849

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
P2-10		41169	12/23/2009 8:14	501.700	0.500	27.894	28.055	28.065
				600.800	0.300	24.454	24.603	24.440
				700.000	0.200	21.946	21.907	21.890
				799.500	0.100	19.713	20.001	19.780
				899.400	0.100	18.230	18.083	18.118
				999.300	0.100	16.683	16.724	16.764
				25.900	0.200	92.325	93.244	92.444
				100.100	0.200	70.348	70.902	70.636
				199.200	0.000	51.804	51.825	51.841
				299.600	0.100	40.205	40.163	40.202
P3-01		41169	12/23/2009 8:14	399.900	0.200	32.846	32.920	32.845
				500.500	0.300	27.965	28.091	28.019
				600.100	0.200	24.442	24.497	24.439
				699.700	0.200	21.851	21.857	21.924
				799.500	0.100	20.028	19.916	19.838
				899.500	0.100	18.240	18.061	18.174
				999.600	0.100	16.935	16.956	16.991
				25.300	0.200	94.678	96.138	95.311
				99.500	0.200	71.988	72.100	72.487
				199.100	0.000	52.930	52.991	52.790
P2-06		41169	12/22/2009 10:02	299.200	0.000	40.945	40.838	41.032
				399.400	0.100	33.511	33.423	33.449
				499.700	0.100	28.454	28.350	28.396
				599.400	0.100	24.770	24.918	24.866
				699.300	0.100	22.113	22.189	22.108
				799.100	0.000	20.080	20.156	20.034
				899.100	0.000	18.254	18.359	18.319
				999.100	0.000	17.214	17.024	17.058
				26.700	0.200	95.023	95.517	95.885
				101.200	0.200	72.218	72.361	72.161
				198.900	0.500	53.183	53.163	52.896
				301.600	0.200	40.865	41.069	41.005
				401.600	0.200	33.651	33.698	33.743
				501.600	0.200	28.679	28.542	28.672

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
P2-07		41169	12/22/2009 10:02	601.600	0.200	24.973	25.142	24.969
				701.800	0.100	22.254	22.252	22.330
				801.300	0.200	20.198	20.164	20.100
				900.900	0.100	18.449	18.707	18.612
				1001.000	0.100	17.192	17.149	17.121
				26.200	0.200	95.024	95.609	95.635
				101.000	0.200	71.598	71.851	71.569
				200.500	0.100	52.474	52.340	52.440
				300.700	0.000	40.709	40.728	40.833
				400.900	0.100	33.476	33.378	33.476
P2-08		41169	12/22/2009 10:02	500.900	0.100	28.454	28.475	28.496
				601.000	0.100	24.922	24.872	24.979
				701.200	0.100	22.167	22.187	22.194
				800.900	0.100	20.112	20.075	20.094
				900.700	0.100	18.463	18.483	18.443
				1000.800	0.100	17.182	17.111	16.712
				25.700	0.200	94.433	94.042	92.945
				101.000	0.100	70.682	70.517	70.722
				200.800	0.100	51.826	51.882	51.860
				300.900	0.100	40.293	40.211	40.305
P3-05		41169	1/26/2010 8:00	401.100	0.200	32.972	33.120	33.109
				501.000	0.100	28.108	28.075	28.155
				601.000	0.100	24.590	24.574	24.605
				701.100	0.100	21.927	22.045	21.952
				800.900	0.100	19.889	19.984	19.853
				900.800	0.100	18.293	18.336	18.173
				1000.700	0.100	16.881	16.852	16.768
				26.600	0.200	94.400	95.186	94.175
				100.000	0.200	71.590	71.795	71.623
				199.100	0.100	52.474	52.201	52.327
				300.800	0.400	40.516	40.426	40.597
				401.100	0.500	33.137	33.257	33.200
				501.600	0.400	28.140	28.213	28.254
				600.800	0.300	24.610	24.542	24.738

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
P3-06		41169	1/26/2010 8:00	700.200	0.200	21.896	22.166	22.105
				799.600	0.200	20.013	19.884	19.897
				899.300	0.100	18.313	18.223	18.355
				999.200	0.000	16.794	16.862	16.834
				26.000	0.200	94.318	93.590	94.385
				100.000	0.200	71.779	72.128	72.044
				199.200	0.000	52.640	52.686	52.724
				299.700	0.100	40.823	40.742	40.943
				400.000	0.200	33.368	33.402	33.383
				500.400	0.300	28.325	28.333	28.495
P3-02		41169	1/26/2010 8:04	600.100	0.200	24.788	24.774	24.747
				700.000	0.200	22.152	22.116	22.163
				799.600	0.100	20.120	20.008	20.010
				899.500	0.100	18.378	18.382	18.325
				999.500	0.100	16.979	17.110	17.160
				26.700	0.200	95.750	95.193	94.123
				101.200	0.300	72.579	72.524	72.201
				200.400	0.200	52.891	52.957	52.737
				301.600	0.200	40.871	40.916	41.113
				401.600	0.200	33.537	33.616	33.587
P3-03		41169	1/26/2010 8:04	501.600	0.200	28.577	28.513	28.619
				601.700	0.200	24.953	24.916	25.010
				701.700	0.200	22.325	22.300	22.194
				801.400	0.200	20.188	20.086	20.086
				901.000	0.100	18.566	18.594	18.419
				1001.000	0.100	17.264	17.194	17.115
				26.200	0.100	93.667	95.681	96.520
				101.000	0.100	71.550	71.458	71.740
				200.500	0.100	52.282	52.237	52.258
				300.600	0.000	40.728	40.807	40.843
400.700	0.000	33.367	33.207	33.311				
500.800	0.000	28.383	28.254	28.361				
600.900	0.000	24.855	24.773	24.783				
701.000	0.100	22.078	22.134	22.237				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
P3-04		41169	1/26/2010 8:04	800.800	0.100	20.067	19.991	20.064
				900.600	0.000	18.274	18.539	18.487
				1000.700	0.100	17.169	16.989	16.964
				25.800	0.200	94.494	94.808	94.524
				101.200	0.100	70.907	71.160	71.043
				200.700	0.100	52.018	52.072	51.872
				300.900	0.100	40.369	40.420	40.340
				401.100	0.100	32.943	33.079	33.058
				501.000	0.100	28.091	28.089	28.175
				601.000	0.100	24.544	24.629	24.569
				701.000	0.100	21.944	22.069	21.978
				800.900	0.100	19.917	19.769	19.943
				900.700	0.100	18.340	18.083	18.195
				1000.700	0.100	17.033	16.889	16.716

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
P1-01	95.633	0.585		6.329	InSb	12.7	100	Ar	E 1461-07
	72.263	0.251							
	52.810	0.106							
	40.815	0.131							
	33.386	0.106							
	28.388	0.028							
	24.838	0.069							
	22.084	0.075							
	20.079	0.067							
	18.380	0.117							
P1-02	16.997	0.133		6.329	InSb	12.7	100	Ar	E 1461-07
	96.060	1.515							
	72.452	0.171							
	52.954	0.023							
	41.016	0.090							
	33.586	0.017							
	28.513	0.079							
	24.879	0.020							
	22.214	0.017							
	20.272	0.082							
P1-03	18.495	0.012		6.329	InSb	12.7	100	Ar	E 1461-07
	17.186	0.129							
	96.302	0.837							
	72.319	0.209							
	52.944	0.019							
	41.045	0.034							
	33.487	0.049							
	28.481	0.043							
	24.884	0.028							
	22.185	0.089							
P1-07	20.164	0.096		6.329	InSb	12.7	100	Ar	E 1461-07
	18.423	0.030							
	17.046	0.070							
	95.610	0.542							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
P1-08	72.383	0.162							
	52.976	0.086							
	40.976	0.120							
	33.596	0.064							
	28.611	0.086							
	25.069	0.062							
	22.325	0.066							
	20.217	0.065							
	18.609	0.086							
	17.241	0.094							
P1-09	94.564	0.387		6.329	InSb	12.7	100	Ar	E 1461-07
	71.861	0.470							
	52.548	0.238							
	40.769	0.038							
	33.340	0.100							
	28.334	0.043							
	24.789	0.093							
	22.113	0.009							
	20.042	0.048							
	18.408	0.003							
P1-10	17.101	0.059							
	93.124	1.532		6.329	InSb	12.7	100	Ar	E 1461-07
	71.068	0.337							
	52.156	0.020							
	40.574	0.119							
	33.201	0.052							
	28.270	0.023							
	24.634	0.051							
	22.026	0.039							
	19.937	0.084							
P1-10	18.229	0.007							
	16.903	0.174							
	95.558	0.747		6.329	InSb	12.7	100	Ar	E 1461-07
	72.345	0.052							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
P2-01	52.667	0.102							
	40.837	0.118							
	33.553	0.076							
	28.529	0.070							
	24.874	0.056							
	22.211	0.065							
	20.084	0.056							
	18.465	0.047							
	17.089	0.019							
	94.533	0.876		6.329	InSb	12.7	100	Ar	E 1461-07
	71.531	0.019							
	52.360	0.197							
	40.641	0.130							
	33.224	0.006							
28.347	0.083								
24.743	0.054								
22.110	0.080								
20.040	0.075								
18.346	0.019								
17.028	0.137								
P2-02	95.364	0.238		6.329	InSb	12.7	100	Ar	E 1461-07
	71.892	0.176							
	52.512	0.141							
	40.777	0.021							
	33.409	0.048							
	28.421	0.060							
	24.796	0.040							
	22.123	0.031							
	20.095	0.109							
	18.418	0.074							
	16.985	0.117							
	95.322	0.632		6.329	InSb	12.7	100	Ar	E 1461-07
	72.265	0.204							
	52.683	0.093							
P1-04									

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
P1-05	40.846	0.028							
	33.534	0.064							
	28.444	0.044							
	24.881	0.078							
	22.186	0.008							
	20.119	0.117							
	18.433	0.050							
	17.115	0.142							
	94.655	0.402		6.329	InSb	12.7	100	Ar	E 1461-07
	71.353	0.207							
	52.265	0.018							
	40.623	0.107							
33.312	0.112								
28.304	0.083								
24.809	0.071								
22.123	0.033								
20.056	0.089								
18.401	0.070								
16.898	0.069								
P1-06	94.277	0.806		6.329	InSb	12.7	100	Ar	E 1461-07
	71.707	0.138							
	52.388	0.084							
	40.794	0.029							
	33.408	0.053							
	28.331	0.049							
24.769	0.070								
22.137	0.065								
20.039	0.048								
18.460	0.066								
17.079	0.120								
P2-03	95.513	0.949		6.329	InSb	12.7	100	Ar	E 1461-07
	72.466	0.361							
	52.866	0.107							
	40.936	0.093							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
P2-04	33.501	0.080							
	28.588	0.107							
	24.935	0.071							
	22.271	0.045							
	20.157	0.082							
	18.487	0.059							
	17.093	0.062							
	93.382	0.682		6.329	InSb	12.7	100	Ar	E 1461-07
	70.594	0.437							
	51.645	0.155							
P2-05	40.045	0.083							
	32.719	0.086							
	27.802	0.102							
	24.336	0.048							
	21.722	0.015							
	19.714	0.009							
	18.028	0.044							
	16.786	0.193							
	95.252	0.593		6.329	InSb	12.7	100	Ar	E 1461-07
	72.533	0.211							
P2-09	52.894	0.157							
	41.048	0.114							
	33.453	0.053							
	28.472	0.028							
	24.912	0.032							
	22.185	0.068							
	20.246	0.097							
	18.470	0.070							
	17.048	0.068							
	92.570	0.220		6.329	InSb	12.7	100	Ar	E 1461-07
70.801	0.075								
51.836	0.064								
40.142	0.099								
32.843	0.057								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
P2-10	28.005	0.096							
	24.499	0.090							
	21.914	0.029							
	19.831	0.151							
	18.144	0.077							
	16.724	0.041							
	92.671	0.500		6.329	InSb	12.7	100	Ar	E 1461-07
	70.629	0.277							
	51.823	0.019							
	40.190	0.023							
P3-01	32.870	0.043							
	28.025	0.063							
	24.459	0.033							
	21.877	0.041							
	19.927	0.096							
	18.158	0.091							
	16.961	0.028							
	95.376	0.732		6.329	InSb	12.7	100	Ar	E 1461-07
	72.192	0.262							
	52.904	0.103							
P2-06	40.938	0.097							
	33.461	0.045							
	28.400	0.052							
	24.851	0.075							
	22.137	0.045							
	20.090	0.062							
	18.311	0.053							
	17.099	0.101							
	95.475	0.433		6.329	InSb	12.7	100	Ar	E 1461-07
	72.247	0.103							
53.081	0.160								
40.980	0.104								
33.697	0.046								
28.631	0.077								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
P2-07	25.028	0.099		6.329	InSb	12.7	100	Ar	E 1461-07
	22.279	0.044							
	20.154	0.050							
	18.589	0.130							
	17.154	0.036							
	95.423	0.346							
	71.673	0.155							
	52.418	0.070							
	40.757	0.067							
	33.443	0.057							
28.475	0.021								
24.924	0.054								
22.183	0.014								
20.094	0.019								
18.463	0.020								
17.002	0.253								
93.807	0.771		6.329	InSb	12.7	100	Ar	E 1461-07	
70.640	0.109								
51.856	0.028								
40.270	0.051								
33.067	0.082								
28.113	0.040								
24.590	0.016								
21.975	0.062								
19.909	0.068								
18.267	0.084								
16.834	0.059								
94.587	0.531		6.329	InSb	12.7	100	Ar	E 1461-07	
71.669	0.110								
52.334	0.137								
40.513	0.086								
33.198	0.060								
28.202	0.058								
24.630	0.100								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
P3-06	22.056	0.142							
	19.931	0.071							
	18.297	0.067							
	16.830	0.034		6.329	InSb	12.7	100	Ar	E 1461-07
	94.098	0.441							
	71.984	0.182							
	52.683	0.042							
	40.836	0.101							
	33.384	0.017							
	28.384	0.096							
P3-02	24.770	0.021							
	22.144	0.025							
	20.046	0.064							
	18.362	0.032							
	17.083	0.093							
	95.022	0.827		6.329	InSb	12.7	100	Ar	E 1461-07
	72.435	0.204							
	52.862	0.113							
	40.967	0.129							
	33.580	0.040							
P3-03	28.570	0.053							
	24.960	0.047							
	22.273	0.070							
	20.120	0.059							
	18.526	0.094							
	17.191	0.075							
	95.289	1.466		6.329	InSb	12.7	100	Ar	E 1461-07
	71.583	0.144							
	52.259	0.023							
	40.793	0.059							
33.295	0.081								
28.333	0.069								
24.804	0.045								
22.150	0.081								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
P3-04	20.041	0.043		6.329	InSb	12.7	100	Ar	E 1461-07
	18.433	0.140							
	17.041	0.112							
	94.609	0.173							
	71.037	0.127							
	51.987	0.103							
	40.376	0.041							
	33.027	0.073							
	28.118	0.049							
	24.581	0.044							
21.997	0.065								
19.876	0.094								
18.206	0.129								
16.879	0.159								

Specimen Number	P1-01	P1-02	P1-03	P1-07	P1-08	P1-09
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	12/17/09 8:17 AM	12/17/09 8:17 AM	12/17/09 8:17 AM	12/21/09 12:49 PM	12/21/09 12:49 PM	12/21/09 12:49 PM
Diffusivity (mm ² /sec)						
Temperature °C						
25	95.6330	96.0597	96.3020	95.6097	94.5640	93.1243
100	72.2633	72.4517	72.3187	72.3830	71.8607	71.0680
200	52.8103	52.9643	52.9437	52.9763	52.5480	52.1557
300	40.8147	41.0157	41.0447	40.9760	40.7687	40.5743
400	33.3860	33.5860	33.4873	33.5957	33.3400	33.2007
500	28.3880	28.5127	28.4807	28.6110	28.3343	28.2703
600	24.8383	24.8793	24.8840	25.0690	24.7887	24.6343
700	22.0837	22.2140	22.1853	22.3250	22.1130	22.0257
800	20.0790	20.2720	20.1640	20.2170	20.0417	19.9367
900	18.3797	18.4947	18.4227	18.6093	18.4077	18.2287
1000	16.9973	17.1863	17.0457	17.2410	17.1010	16.9030

Specimen Number	P1-10	P2-01	P2-02	P1-04	P1-05	P1-06
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	12/21/09 12:40 PM	12/21/09 12:40 PM	12/21/09 12:40 PM	12/17/09 8:23 AM	12/17/09 8:23 AM	12/17/09 8:23 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	95.5583	94.5330	95.3640	95.3220	94.6553	94.2767
100	72.3453	71.5310	71.8917	72.2650	71.3533	71.7067
200	52.6667	52.3600	52.5123	52.6827	52.2650	52.3877
300	40.8373	40.6407	40.7770	40.8457	40.6227	40.7943
400	33.5530	33.2243	33.4090	33.5337	33.3120	33.4077
500	28.5293	28.3470	28.4213	28.4437	28.3043	28.3307
600	24.8737	24.7427	24.7963	24.8810	24.8093	24.7687
700	22.2110	22.1103	22.1233	22.1857	22.1227	22.1367
800	20.0840	20.0397	20.0947	20.1187	20.0557	20.0390
900	18.4650	18.3463	18.4177	18.4333	18.4010	18.4597
1000	17.0887	17.0277	16.9853	17.1153	16.8980	17.0790

Specimen Number	P2-03	P2-04	P2-05	P2-09	P2-10	P3-01
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	12/22/09 9:47 AM	12/22/09 9:47 AM	12/22/09 9:47 AM	12/23/09 8:14 AM	12/23/09 8:14 AM	12/23/09 8:14 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	95.5127	93.3817	95.2517	92.5697	92.6710	95.3757
100	72.4663	70.5937	72.5333	70.8007	70.6287	72.1917
200	52.8660	51.6450	52.8940	51.8363	51.8233	52.9037
300	40.9360	40.0450	41.0483	40.1420	40.1900	40.9383
400	33.5007	32.7190	33.4533	32.8427	32.8703	33.4610
500	28.5883	27.8020	28.4723	28.0047	28.0250	28.4000
600	24.9347	24.3360	24.9117	24.4990	24.4593	24.8513
700	22.2713	21.7223	22.1853	21.9143	21.8773	22.1367
800	20.1573	19.7143	20.2457	19.8313	19.9273	20.0900
900	18.4867	18.0283	18.4703	18.1437	18.1583	18.3107
1000	17.0933	16.7860	17.0477	16.7237	16.9607	17.0987

Specimen Number	P2-06	P2-07	P2-08	P3-05	P3-06	P3-02
Measured By	41169	41169	41169	41169	41169	41169
Measured Date	12/22/09 10:02 AM	12/22/09 10:02 AM	12/22/09 10:02 AM	1/26/10 8:00 AM	1/26/10 8:00 AM	1/26/10 8:04 AM
Diffusivity (mm ² /sec)						
Temperature °C						
25	95.4750	95.4227	93.8067	94.5870	94.0977	95.0220
100	72.2467	71.6727	70.6403	71.6693	71.9837	72.4347
200	53.0807	52.4180	51.8560	52.3340	52.6833	52.8617
300	40.9797	40.7567	40.2697	40.5130	40.8360	40.9667
400	33.6973	33.4433	33.0670	33.1980	33.3843	33.5800
500	28.6310	28.4750	28.1127	28.2023	28.3843	28.5697
600	25.0280	24.9243	24.5897	24.6300	24.7697	24.9597
700	22.2787	22.1827	21.9747	22.0557	22.1437	22.2730
800	20.1540	20.0937	19.9087	19.9313	20.0460	20.1200
900	18.5893	18.4630	18.2673	18.2970	18.3617	18.5263
1000	17.1540	17.0017	16.8337	16.8300	17.0830	17.1910

Specimen Number	P3-03	P3-04
Measured By	41169	41169
Measured Date	1/26/10 8:04 AM	1/26/10 8:04 AM
Diffusivity (mm ² /sec)		
Temperature °C		
25	95.2893	94.6087
100	71.5827	71.0367
200	52.2590	51.9873
300	40.7927	40.3763
400	33.2950	33.0267
500	28.3327	28.1183
600	24.8037	24.5807
700	22.1497	21.9970
800	20.0407	19.8763
900	18.4333	18.2060
1000	17.0407	16.8793

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	P3-04		6.327	6.327	6.325	6.328	12.726	12.729	1.46873
	P3-03		6.323	6.325	6.326	6.324	12.725	12.728	1.47220
	P3-01		6.326	6.326	6.327	6.326	12.727	12.731	1.47306
	P3-06		6.324	6.325	6.325	6.325	12.727	12.727	1.47476
	P3-05		6.325	6.325	6.324	6.325	12.727	12.727	1.47162
	P3-02		6.324	6.323	6.324	6.323	12.724	12.728	1.47712
	P2-08		6.326	6.326	6.325	6.327	12.727	12.730	1.46862
	P2-09		6.325	6.325	6.323	6.323	12.728	12.723	1.47093
	P2-10		6.321	6.323	6.324	6.324	12.727	12.728	1.46744
	P1-03		6.330	6.329	6.328	6.329	12.730	12.731	1.47557
	P1-02		6.331	6.330	6.330	6.331	12.730	12.732	1.47735
	P1-04		6.329	6.329	6.328	6.328	12.727	12.726	1.47666
	P1-01		6.328	6.327	6.327	6.327	12.742	12.741	1.47822
	P1-06		6.326	6.328	6.326	6.326	12.725	12.726	1.47221
	P1-05		6.328	6.327	6.328	6.327	12.727	12.726	1.47242
	P1-07		6.328	6.327	6.328	6.328	12.728	12.726	1.47439
	P2-01		6.327	6.327	6.326	6.326	12.723	12.721	1.47541
	P1-08		6.329	6.328	6.327	6.327	12.726	12.725	1.47419
	P1-10		6.327	6.327	6.328	6.327	12.727	12.724	1.47115
	P1-09		6.328	6.326	6.326	6.326	12.728	12.727	1.47400

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
P3-04	78283	12/2/2010 14:58	6.32675	12.72750	127.2261	0.006327	0.01273
P3-03	47735	12/2/2010 15:50	6.32450	12.72650	127.2061	0.006325	0.01273
P3-01	41169	12/3/2010 9:14	6.32625	12.72900	127.2561	0.006326	0.01273
P3-06	41169	12/3/2010 9:31	6.32475	12.72700	127.2161	0.006325	0.01273
P3-05	41169	12/3/2010 13:23	6.32475	12.72700	127.2161	0.006325	0.01273
P3-02	41169	12/3/2010 13:24	6.32350	12.72600	127.1961	0.006324	0.01273
P2-08	41169	12/4/2010 7:44	6.32600	12.72850	127.2461	0.006326	0.01273
P2-09	41169	12/4/2010 10:27	6.32400	12.72550	127.1861	0.006324	0.01273
P2-10	41169	12/4/2010 13:59	6.32300	12.72750	127.2261	0.006323	0.01273
P1-03	41169	12/6/2010 9:38	6.32900	12.73050	127.2860	0.006329	0.01273
P1-02	41169	12/6/2010 10:48	6.33050	12.73100	127.2960	0.006331	0.01273
P1-04	41169	12/6/2010 10:58	6.32850	12.72650	127.2061	0.006329	0.01273
P1-01	41169	12/6/2010 11:21	6.32725	12.74150	127.5061	0.006327	0.01274
P1-06	41169	12/6/2010 13:50	6.32650	12.72550	127.1861	0.006327	0.01273
P1-05	41169	12/6/2010 13:51	6.32750	12.72650	127.2061	0.006328	0.01273
P1-07	41169	12/6/2010 14:04	6.32775	12.72700	127.2161	0.006328	0.01273
P2-01	41169	12/7/2010 7:59	6.32650	12.72200	127.1161	0.006327	0.01272
P1-08	41169	12/7/2010 8:58	6.32775	12.72550	127.1861	0.006328	0.01273
P1-10	41169	12/7/2010 9:44	6.32725	12.72550	127.1861	0.006327	0.01273
P1-09	41169	12/7/2010 10:08	6.32650	12.72750	127.2261	0.006327	0.01273

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
P3-04	0.0015	25.2	22.9	17.8
P3-03	0.0015	25.2	22.8	17.8
P3-01	0.0015	25.2	23.1	20.8
P3-06	0.0015	25.3	22.9	20.9
P3-05	0.0015	25.3	22.6	20.1
P3-02	0.0015	25.3	22.6	20.1
P2-08	0.0015	25.4	22.3	13.1
P2-09	0.0015	25.4	22.1	12.9
P2-10	0.0015	25.4	22.5	14.3
P1-03	0.0015	25.3	22.3	16.3
P1-02	0.0015	25.3	22.6	18.1
P1-04	0.0015	25.3	22.8	18.3
P1-01	0.0015	25.3	22.8	19
P1-06	0.0015	25.3	22.9	21.1
P1-05	0.0015	25.3	22.9	21.2
P1-07	0.0015	25.3	23	21.1
P2-01	0.0015	25.6	22.2	22.1
P1-08	0.0015	25.6	22.8	21.4
P1-10	0.0015	25.6	22.8	21.5
P1-09	0.0015	25.6	22.9	21.3

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity
and Temperature Transmitter Model PTU301

Graphite Grade:	PGX
Graphite Manufacturer:	Graftech International
Forming Process:	Molded
Coke Particle Size:	Medium grain
Coke Type:	Petroleum coke
ASTM Class:	MNHP
Specimen Geometry:	Cylinder

Specimen ID #'s:

K1 01
K1 02
K1 03
K1 04
K1 05
K1 06
K1 07
K1 08
K1 09
K1 10
K2 01
K2 02
K2 03
K2 04
K2 05
K2 06
K2 07
K2 08
K2 09
K2 10
K3 01
K3 02
K3 03
K3 04
K3 05
K3 06
K3 07
K3 08
K3 09
K3 10

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	K1 07		6.328	6.328	6.328	6.328	12.722	12.726
	K2 09		6.332	6.335	6.334	6.333	12.740	12.741
	K2 07		6.330	6.332	6.331	6.329	12.738	12.738
	K3 10		6.326	6.325	6.325	6.325	12.726	12.728
	K2 05		6.329	6.329	6.330	6.329	12.730	12.729
	K1 08		6.327	6.326	6.326	6.327	12.724	12.725
	K1 10		6.326	6.327	6.328	6.326	12.725	12.726
	K3 04		6.332	6.332	6.332	6.331	12.723	12.725
	K3 01		6.302	6.302	6.303	6.304	12.723	12.724
	K2 04		6.329	6.331	6.330	6.330	12.731	12.729
	K1 09		6.328	6.329	6.329	6.329	12.726	12.727
	K3 07		6.322	6.324	6.324	6.323	12.727	12.728
	K3 08		6.323	6.325	6.324	6.325	12.727	12.728
	K1 06		6.327	6.326	6.327	6.327	12.723	12.724
	K2 10		6.332	6.334	6.334	6.332	12.723	12.724
	K3 02		6.332	6.331	6.330	6.332	12.723	12.725
	K1 05		6.327	6.326	6.328	6.327	12.732	12.733
	K3 03		6.332	6.332	6.333	6.333	12.726	12.727
	K3 06		6.323	6.324	6.323	6.322	12.729	12.728
	K1 03		6.324	6.325	6.325	6.326	12.730	12.731
	K2 08		6.331	6.332	6.333	6.333	12.741	12.738
	K1 04		6.326	6.326	6.326	6.327	12.732	12.731
	K3 05		6.333	6.334	6.333	6.333	12.727	12.728
	K3 09		6.324	6.324	6.325	6.325	12.728	12.726
	K1 02		6.338	6.340	6.339	6.340	12.726	12.730
	K1 01		6.297	6.297	6.298	6.298	12.731	12.732
	K2 06		6.332	6.331	6.331	6.329	12.731	12.732
	K2 03		6.330	6.330	6.330	6.329	12.729	12.728
	K2 02		6.330	6.329	6.328	6.329	12.729	12.728
	K2 01		6.328	6.329	6.329	6.328	12.728	12.726

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
K1 07	1.42589	jl	6/2/2009 14:37	6.32800	12.72400	127.1561	0.006328	0.01272
K2 09	1.42925	jl	6/2/2009 14:41	6.33350	12.74050	127.4861	0.006334	0.01274
K2 07	1.42692	jl	6/3/2009 8:03	6.33050	12.73800	127.4361	0.006331	0.01274
K3 10	1.42210	jl	6/3/2009 8:33	6.32525	12.72700	127.2161	0.006325	0.01273
K2 05	1.42383	jl	6/3/2009 8:38	6.32925	12.72950	127.2661	0.006329	0.01273
K1 08	1.42657	jl	6/3/2009 8:42	6.32650	12.72450	127.1661	0.006327	0.01272
K1 10	1.42546	jl	6/3/2009 8:45	6.32675	12.72550	127.1861	0.006327	0.01273
K3 04	1.42419	jl	6/3/2009 8:53	6.33175	12.72400	127.1561	0.006332	0.01272
K3 01	1.41399	jl	6/3/2009 8:56	6.30275	12.72350	127.1461	0.006303	0.01272
K2 04	1.42402	jl	6/3/2009 8:59	6.33000	12.73000	127.2761	0.006330	0.01273
K1 09	1.42602	jl	6/3/2009 9:03	6.32875	12.72650	127.2061	0.006329	0.01273
K3 07	1.42580	jl	6/3/2009 9:07	6.32325	12.72750	127.2261	0.006323	0.01273
K3 08	1.42653	jl	6/3/2009 9:10	6.32425	12.72750	127.2261	0.006324	0.01273
K1 06	1.42211	jl	6/3/2009 9:14	6.32675	12.72350	127.1461	0.006327	0.01272
K2 10	1.42377	jl	6/3/2009 9:17	6.33300	12.72350	127.1461	0.006333	0.01272
K3 02	1.42051	jl	6/3/2009 9:20	6.33125	12.72400	127.1561	0.006331	0.01272
K1 05	1.42389	jl	6/3/2009 9:23	6.32700	12.73250	127.3260	0.006327	0.01273
K3 03	1.41976	jl	6/4/2009 9:08	6.33250	12.72650	127.2061	0.006333	0.01273
K3 06	1.42409	jl	6/4/2009 9:16	6.32300	12.72850	127.2461	0.006323	0.01273
K1 03	1.42208	jl	6/4/2009 9:48	6.32500	12.73050	127.2860	0.006325	0.01273
K2 08	1.42958	jl	6/4/2009 9:54	6.33225	12.73950	127.4661	0.006332	0.01274
K1 04	1.42126	jl	6/4/2009 9:57	6.32625	12.73150	127.3060	0.006326	0.01273
K3 05	1.42177	jl	6/4/2009 10:00	6.33325	12.72750	127.2261	0.006333	0.01273
K3 09	1.42568	jl	6/4/2009 10:03	6.32450	12.72700	127.2161	0.006325	0.01273
K1 02	1.42378	jl	6/4/2009 10:05	6.33925	12.72800	127.2361	0.006339	0.01273
K1 01	1.41633	jl	6/4/2009 10:08	6.29750	12.73150	127.3060	0.006298	0.01273
K2 06	1.42605	jl	6/4/2009 10:10	6.33075	12.73150	127.3060	0.006331	0.01273
K2 03	1.42056	jl	6/4/2009 10:13	6.32975	12.72850	127.2461	0.006330	0.01273
K2 02	1.42131	jl	6/4/2009 10:15	6.32900	12.72850	127.2461	0.006329	0.01273
K2 01	1.41883	jl	6/4/2009 10:17	6.32850	12.72700	127.2161	0.006329	0.01273

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
K1 07	0.0014	1772.07603	1.7721	25.3	20.9	53.4
K2 09	0.0014	1770.11548	1.7701	25.3	20.9	53.4
K2 07	0.0014	1768.76136	1.7688	25.3	19.7	51.8
K3 10	0.0014	1767.30079	1.7673	25.3	19.9	51.4
K2 05	0.0014	1767.63795	1.7676	25.3	20.2	51
K1 08	0.0014	1773.20212	1.7732	25.3	20.3	50.8
K1 10	0.0014	1771.47395	1.7715	25.3	20.4	50.5
K3 04	0.0014	1768.91502	1.7689	25.3	20.6	50.7
K3 01	0.0014	1764.46557	1.7645	25.3	20.6	50.3
K2 04	0.0014	1767.52551	1.7675	25.3	20.6	50.1
K1 09	0.0014	1771.33144	1.7713	25.3	20.6	50
K3 07	0.0014	1772.32011	1.7723	25.3	20.7	49.9
K3 08	0.0014	1772.94714	1.7729	25.3	20.7	50.1
K1 06	0.0014	1767.86642	1.7679	25.3	20.7	49.9
K2 10	0.0014	1768.18328	1.7682	25.3	20.7	49.7
K3 02	0.0014	1764.48362	1.7645	25.3	20.8	49.5
K1 05	0.0014	1767.50786	1.7675	25.3	20.8	49.5
K3 03	0.0014	1762.51123	1.7625	25.3	20.1	48.9
K3 06	0.0014	1769.98636	1.7700	25.3	20.1	49.7
K1 03	0.0014	1766.37413	1.7664	25.3	20.2	49
K2 08	0.0014	1771.15171	1.7712	25.3	20.2	48.9
K1 04	0.0014	1764.72953	1.7647	25.3	20.2	48.8
K3 05	0.0014	1764.52015	1.7645	25.3	20.2	48.9
K3 09	0.0014	1771.95991	1.7720	25.3	20.2	48.9
K1 02	0.0014	1765.20356	1.7652	25.3	20.2	48.9
K1 01	0.0014	1766.63670	1.7666	25.3	20.2	49.1
K2 06	0.0014	1769.41848	1.7694	25.3	20.2	49
K2 03	0.0014	1763.71614	1.7637	25.3	20.2	48.8
K2 02	0.0014	1764.85643	1.7649	25.3	20.3	48.9
K2 01	0.0014	1762.33152	1.7623	25.3	20.2	48.9

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
K1 02		41169	12/23/2009 8:17	26.700	0.200	98.603	97.522	97.865
				101.300	0.200	71.118	71.507	71.168
				200.500	0.100	50.281	50.417	50.367
				301.600	0.200	38.187	38.245	38.333
				401.600	0.200	30.917	30.993	31.024
				501.600	0.200	26.034	26.114	26.072
				601.700	0.200	22.639	22.613	22.681
				701.800	0.100	19.973	20.143	20.058
				801.300	0.200	18.157	18.094	18.115
				900.900	0.100	16.433	16.456	16.649
K1 03		41169	12/23/2009 8:17	1000.900	0.100	15.221	15.207	15.440
				26.100	0.200	96.813	97.015	96.512
				101.100	0.100	69.908	70.037	70.433
				200.500	0.000	49.583	49.424	49.683
				300.800	0.000	37.810	37.823	37.859
				400.900	0.100	30.586	30.681	30.602
				501.000	0.100	25.790	25.786	25.770
				601.100	0.100	22.388	22.357	22.369
				701.300	0.200	19.879	19.852	19.898
				801.000	0.100	17.785	17.966	17.823
K1 04		41169	12/23/2009 8:17	900.800	0.100	16.437	16.498	16.403
				1000.800	0.100	15.113	15.139	15.163
				25.500	0.200	98.562	98.447	97.998
				101.000	0.200	71.446	71.197	71.313
				200.700	0.100	50.415	50.422	50.522
				300.800	0.100	38.443	38.402	38.354
				401.000	0.100	31.022	31.104	31.184
				501.000	0.100	26.141	26.302	26.252
				601.000	0.100	22.756	22.815	22.764
				701.100	0.100	20.137	20.231	20.264
K1 08		41169	1/4/2010 9:40	800.900	0.100	18.237	18.242	18.377
				900.700	0.100	16.636	16.614	16.718
				1000.700	0.100	15.359	15.356	15.398
				26.700	0.200	98.277	99.134	97.774

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
K1 09		41169	1/4/2010 9:40	101.300	0.200	71.588	71.551	71.942
				200.500	0.100	50.771	50.873	50.937
				301.600	0.200	38.647	38.485	38.555
				401.600	0.200	31.163	31.288	31.182
				501.600	0.200	26.271	26.365	26.402
				601.700	0.200	22.849	22.886	22.937
				701.500	0.300	20.199	20.203	20.256
				801.200	0.200	18.278	18.387	18.340
				900.900	0.100	16.701	16.630	16.590
				1000.900	0.100	15.538	15.482	15.371
K1 10		41169	1/4/2010 9:40	26.000	0.300	96.388	96.444	95.404
				101.200	0.200	70.137	70.597	70.923
				200.600	0.000	49.881	49.856	49.794
				300.800	0.000	37.861	38.021	38.040
				401.000	0.100	30.655	30.571	30.702
				501.000	0.100	25.887	25.893	25.870
				601.000	0.100	22.439	22.440	22.428
				701.000	0.100	19.873	19.907	19.999
				800.900	0.100	17.925	17.957	17.860
				900.700	0.000	16.595	16.309	16.371
K1 05		41169	1/4/2010 9:35	1000.800	0.100	15.383	15.101	15.332
				25.300	0.200	98.242	98.511	98.259
				101.100	0.200	70.810	70.827	71.275
				200.700	0.100	50.272	50.455	50.383
				300.900	0.100	38.285	38.438	38.225
				401.000	0.200	30.946	31.082	31.007
				501.100	0.100	26.223	26.144	26.125
				601.000	0.100	22.744	22.756	22.755
				701.000	0.100	20.110	20.197	20.168
				800.900	0.100	18.228	18.150	18.148
900.800	0.100	16.576	16.741	16.561				
1000.800	0.100	15.296	15.282	15.319				
26.600	0.200	96.919	98.302	97.008				
100.200	0.200	71.583	71.813	71.353				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
K1 06		41169	1/4/2010 9:35	199.100	0.100	50.596	50.792	50.618
				300.600	0.300	38.429	38.546	38.424
				401.100	0.500	30.944	30.960	31.152
				501.700	0.500	26.169	26.110	26.088
				600.900	0.300	22.744	22.702	22.715
				700.000	0.200	20.167	20.164	20.187
				799.500	0.100	18.268	18.125	18.241
				899.400	0.100	16.594	16.544	16.591
				999.300	0.100	15.310	15.361	15.238
				25.900	0.200	98.470	97.590	98.568
				100.000	0.200	71.034	71.236	71.523
				199.200	0.000	50.532	50.397	50.609
				299.600	0.100	38.412	38.353	38.319
				400.000	0.200	31.100	31.134	31.040
				500.400	0.300	26.162	26.074	26.204
600.100	0.300	22.758	22.760	22.629				
699.800	0.200	20.140	20.191	20.213				
799.500	0.100	18.103	18.048	18.199				
899.500	0.100	16.615	16.601	16.601				
999.600	0.100	15.543	15.372	15.551				
K1 07		41169	1/4/2010 9:35	25.200	0.200	99.435	100.013	97.610
				99.400	0.200	71.886	72.224	72.653
				199.100	0.000	51.160	51.303	51.299
				299.200	0.000	38.944	39.010	39.057
				399.400	0.100	31.421	31.450	31.492
				499.600	0.100	26.515	26.544	26.482
				599.400	0.100	23.112	23.114	22.960
				699.300	0.100	20.422	20.340	20.422
				799.100	0.000	18.467	18.327	18.425
				899.100	0.000	16.812	16.857	16.882
				999.100	0.000	15.517	15.457	15.518
				26.700	0.200	97.350	97.071	96.996
				101.200	0.300	70.821	70.651	70.823
				200.500	0.100	49.855	49.885	49.940
				K2 04		41169	1/5/2010 9:06	

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
K2 05		41169	1/5/2010 9:06	301.600	0.200	38.011	37.971	38.160
				401.600	0.200	30.909	30.833	30.823
				501.600	0.300	26.041	25.955	25.922
				601.600	0.200	22.539	22.528	22.610
				701.700	0.100	20.026	20.144	20.039
				801.300	0.200	18.183	18.115	18.036
				900.900	0.100	16.570	16.649	16.520
				1000.900	0.100	15.190	15.265	15.434
				26.100	0.200	96.966	97.930	98.369
				101.000	0.100	71.164	71.255	71.330
K2 06		41169	1/5/2010 9:06	200.500	0.000	50.304	50.355	50.212
				300.800	0.100	38.335	38.400	38.417
				400.900	0.100	30.946	30.920	30.998
				500.900	0.100	26.081	26.059	26.044
				601.000	0.100	22.658	22.595	22.728
				701.200	0.200	20.236	20.063	20.074
				800.900	0.100	18.166	18.183	18.114
				900.700	0.100	16.606	16.640	16.606
				1000.800	0.100	15.241	15.099	15.378
				25.600	0.200	97.521	98.239	97.825
K2 01		41169	1/5/2010 8:41	101.100	0.100	71.122	71.320	71.684
				200.700	0.100	50.519	50.462	50.270
				300.900	0.100	38.303	38.407	38.463
				401.000	0.200	30.998	31.178	31.101
				501.100	0.100	26.219	26.214	26.147
				601.000	0.100	22.660	22.678	22.712
				701.000	0.100	20.117	20.193	20.192
				800.900	0.100	18.287	18.214	18.281
				900.800	0.100	16.718	16.716	16.708
				1000.800	0.100	15.501	15.558	15.261
K2 01		41169	1/5/2010 8:41	26.600	0.200	97.572	97.644	97.805
				100.300	0.200	71.497	71.308	71.441
				199.100	0.200	50.682	50.579	50.475
				300.800	0.400	38.234	38.268	38.457

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
K2 02		41169	1/5/2010 8:41	401.200	0.500	30.934	30.920	30.942
				501.700	0.600	26.030	26.091	26.116
				600.900	0.300	22.635	22.723	22.716
				700.000	0.200	20.123	20.126	20.083
				799.700	0.100	18.110	18.101	18.100
				899.400	0.100	16.607	16.496	16.541
				999.400	0.100	15.289	15.302	15.235
				25.900	0.200	97.763	97.753	97.007
				100.000	0.200	70.967	71.396	70.888
				199.200	0.000	50.222	50.300	50.309
K2 03		41169	1/5/2010 8:41	299.600	0.100	38.292	38.297	38.267
				399.700	0.100	30.851	30.892	30.836
				500.400	0.300	25.988	26.064	26.080
				600.100	0.200	22.527	22.619	22.611
				699.700	0.200	19.950	20.053	20.076
				799.500	0.100	18.022	18.196	18.047
				899.500	0.100	16.561	16.465	16.524
				999.500	0.100	15.125	15.365	15.280
				25.300	0.200	97.230	97.482	97.018
				99.400	0.200	71.301	71.132	71.104
K2 10		41169	1/6/2010 8:03	199.100	0.000	50.183	50.199	50.263
				299.300	0.100	38.216	38.315	38.331
				399.300	0.100	30.789	30.882	30.862
				499.700	0.200	25.833	25.959	25.987
				599.500	0.100	22.546	22.537	22.525
				699.300	0.100	19.909	19.836	19.986
				799.200	0.000	17.991	17.966	17.986
				899.100	0.000	16.434	16.415	16.374
				999.100	0.000	15.179	15.229	15.117
				26.600	0.200	98.289	96.639	98.138
100.200	0.200	71.386	71.291	71.331				
199.200	0.100	50.505	50.407	50.472				
300.800	0.400	38.205	38.358	38.399				
401.100	0.500	30.859	31.021	30.917				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
K3 01		41169	1/6/2010 8:03	501.600	0.400	26.073	26.114	25.982
				600.800	0.300	22.637	22.556	22.748
				700.000	0.200	20.120	20.042	19.947
				799.700	0.100	18.172	18.159	18.037
				899.400	0.100	16.474	16.492	16.461
				999.400	0.000	15.355	15.227	15.212
				26.000	0.200	97.771	97.404	97.729
				100.100	0.200	70.928	71.276	71.013
				199.100	0.000	50.428	50.158	50.515
				299.700	0.100	38.228	38.354	38.225
K3 02		41169	1/6/2010 8:03	399.900	0.200	30.859	31.008	30.992
				500.400	0.300	25.999	26.016	25.952
				600.000	0.200	22.561	22.625	22.668
				699.600	0.100	20.111	19.995	20.167
				799.600	0.100	18.041	18.090	18.133
				899.500	0.100	16.505	16.593	16.666
				999.500	0.100	15.408	15.423	15.376
				25.300	0.200	95.553	97.315	98.059
				99.500	0.200	70.558	70.530	70.477
				199.100	0.100	49.966	49.916	49.934
K2 07		41169	1/6/2010 8:10	299.300	0.100	37.918	37.944	37.845
				399.400	0.100	30.616	30.686	30.533
				499.600	0.100	25.671	25.702	25.694
				599.400	0.100	22.418	22.400	22.454
				699.300	0.000	19.882	19.877	19.807
				799.200	0.100	17.908	17.820	17.928
				899.100	0.100	16.387	16.317	16.285
				999.100	0.000	15.107	15.228	15.147
				26.700	0.100	97.039	99.138	98.741
				101.300	0.300	71.550	71.377	71.121
200.400	0.100	50.446	50.533	50.372				
301.500	0.300	38.320	38.282	38.304				
401.500	0.300	30.995	31.129	31.154				
501.500	0.300	26.204	26.165	26.193				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
K2 08		41169	1/6/2010 8:10	601.500	0.300	22.686	22.756	22.806
				700.800	0.100	20.153	20.143	20.245
				800.200	0.200	18.221	18.204	18.203
				899.800	0.100	16.549	16.735	16.589
				999.600	0.100	15.098	15.540	15.286
				26.200	0.200	98.233	97.473	98.257
				101.200	0.200	70.479	71.042	70.881
				200.500	0.000	50.046	50.242	50.456
				300.800	0.100	38.229	38.359	38.298
				400.800	0.100	30.909	31.022	31.052
K2 09		41169	1/6/2010 8:10	500.900	0.100	26.115	26.100	26.039
				600.700	0.200	22.756	22.700	22.645
				700.300	0.200	20.104	20.104	20.056
				800.000	0.100	18.153	18.220	18.269
				899.700	0.100	16.511	16.427	16.628
				999.700	0.000	15.338	15.290	15.378
				25.700	0.200	97.632	98.225	98.855
				101.000	0.200	71.536	71.287	71.740
				200.600	0.000	50.622	50.647	50.486
				300.700	0.100	38.554	38.625	38.717
K3 03		41169	1/25/2010 14:27	400.900	0.100	31.182	31.265	31.328
				500.800	0.100	26.259	26.324	26.276
				600.400	0.200	22.956	22.896	22.781
				700.100	0.100	20.208	20.239	20.268
				800.000	0.100	18.209	18.287	18.270
				899.700	0.100	16.624	16.699	16.675
				999.700	0.100	15.439	15.423	15.266
				26.700	0.100	98.299	97.706	98.084
				101.000	0.300	71.284	70.945	70.840
				199.300	0.400	50.409	50.312	50.163
301.600	0.200	38.147	38.093	38.198				
401.600	0.200	30.818	30.909	30.998				
501.600	0.200	26.122	26.113	26.025				
601.600	0.200	22.734	22.590	22.643				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
K3 04				701.700	0.200	20.070	20.104	20.156
				801.500	0.300	18.286	18.125	18.275
				901.300	0.200	16.637	16.544	16.523
				1001.100	0.200	15.401	15.352	15.376
			41169	26.200	0.100	97.665	97.832	98.099
				101.000	0.100	70.834	70.988	70.580
				200.500	0.100	50.065	50.217	50.182
				300.700	0.000	38.232	38.272	38.170
				400.900	0.100	30.934	30.939	31.095
				500.900	0.100	26.052	26.189	26.096
K3 05				600.900	0.100	22.637	22.689	22.845
				701.000	0.100	20.115	20.190	20.242
				800.900	0.100	18.232	18.230	18.182
				900.800	0.100	16.687	16.588	16.517
				1000.800	0.100	15.280	15.206	15.282
			41169	26.600	0.200	97.510	97.960	96.778
				100.000	0.200	71.025	70.808	70.681
				199.000	0.100	50.193	50.165	50.127
				300.800	0.400	37.830	37.908	37.950
				401.100	0.500	30.654	30.702	30.652
			501.600	0.400	25.933	25.900	25.946	
			600.700	0.300	22.531	22.541	22.530	
			700.000	0.300	19.949	19.914	19.918	
			799.600	0.100	17.951	17.885	18.023	
			899.300	0.000	16.368	16.270	16.368	
			999.200	0.000	15.021	15.059	14.994	

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
K3 06		41169	1/25/2010 15:43	26.000	0.200	98.095	97.306	97.923
				99.900	0.200	71.891	72.000	71.881
				199.200	0.000	50.776	50.909	50.653
				299.700	0.100	38.503	38.689	38.619
				399.900	0.200	31.157	31.139	31.190
				500.400	0.300	26.222	26.387	26.258
				600.100	0.200	22.815	22.877	22.819
				699.700	0.100	20.246	20.300	20.234
				799.600	0.100	18.376	18.344	18.224
				899.500	0.100	16.777	16.650	16.719
				999.500	0.100	15.472	15.431	15.680

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
K1 02	97.997	0.552		6.339	InSb	12.7	100	Ar	E 1461-07
	71.264	0.212							
	50.355	0.069							
	38.255	0.074							
	30.978	0.055							
	26.073	0.040							
	22.644	0.034							
	20.058	0.085							
	18.122	0.032							
	16.513	0.119							
K1 03	15.289	0.131		6.339	InSb	12.7	100	Ar	E 1461-07
	96.780	0.253							
	70.126	0.274							
	49.563	0.131							
	37.831	0.025							
	30.623	0.051							
	25.782	0.011							
	22.371	0.016							
	19.876	0.023							
	17.858	0.095							
K1 04	16.446	0.048		6.339	InSb	12.7	100	Ar	E 1461-07
	15.138	0.025							
	98.336	0.298							
	71.319	0.125							
	50.453	0.060							
	38.400	0.045							
	31.103	0.081							
	26.232	0.082							
	22.778	0.032							
	20.211	0.066							
K1 08	18.285	0.079		6.339	InSb	12.7	100	Ar	E 1461-07
	16.656	0.055							
	15.371	0.023							
	98.395	0.688							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
K1 09	71.694	0.216							
	50.860	0.084							
	38.562	0.081							
	31.211	0.067							
	26.346	0.068							
	22.891	0.044							
	20.219	0.032							
	18.335	0.055							
	16.640	0.056							
	15.464	0.085							
	96.079	0.585		6.339	InSb	12.7	100	Ar	E 1461-07
	70.552	0.395							
	49.844	0.045							
	37.974	0.098							
30.643	0.066								
25.883	0.012								
22.436	0.007								
19.926	0.065								
17.914	0.049								
16.425	0.150								
15.272	0.150								
98.337	0.151								
70.971	0.264								
50.370	0.092								
38.316	0.110								
31.012	0.068								
26.164	0.052								
22.752	0.007								
20.158	0.044								
18.175	0.046								
16.626	0.100								
15.299	0.019								
97.410	0.774								
71.583	0.230								
K1 05									
				6.339	InSb	12.7	100	Ar	E 1461-07

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
K1 06	50.669	0.107							
	38.466	0.069							
	31.019	0.116							
	26.122	0.042							
	22.720	0.022							
	20.173	0.013							
	18.211	0.076							
	16.576	0.028							
	15.303	0.062							
	98.209	0.539		6.339	InSb	12.7	100	Ar	E 1461-07
	71.264	0.246							
	50.513	0.107							
	38.361	0.047							
	31.091	0.048							
26.147	0.066								
22.716	0.075								
20.181	0.037								
18.117	0.076								
16.606	0.008								
15.489	0.101								
K1 07	99.019	1.254		6.339	InSb	12.7	100	Ar	E 1461-07
	72.254	0.384							
	51.254	0.081							
	39.004	0.057							
	31.454	0.036							
	26.514	0.031							
	23.062	0.088							
	20.395	0.047							
	18.406	0.072							
	16.850	0.035							
K2 04	15.497	0.035							
	97.139	0.187		6.339	InSb	12.7	100	Ar	E 1461-07
	70.765	0.099							
	49.893	0.043							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
K2 05	38.047	0.100							
	30.855	0.047							
	25.973	0.061							
	22.559	0.045							
	20.070	0.065							
	18.111	0.074							
	16.580	0.065							
	15.296	0.125							
	97.755	0.718		6.339	InSb	12.7	100	Ar	E 1461-07
	71.250	0.083							
	50.290	0.072							
	38.384	0.043							
	30.955	0.040							
	26.061	0.019							
22.660	0.067								
20.124	0.097								
18.154	0.036								
16.617	0.020								
15.239	0.140								
97.862	0.360		6.339	InSb	12.7	100	Ar	E 1461-07	
71.375	0.285								
50.417	0.130								
38.391	0.081								
31.092	0.090								
26.193	0.040								
22.683	0.026								
20.167	0.044								
18.261	0.041								
16.714	0.005								
15.440	0.158								
97.674	0.119		6.339	InSb	12.7	100	Ar	E 1461-07	
71.415	0.097								
50.579	0.104								
38.320	0.120								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
K2 02	30.932	0.011		6.339	InSb	12.7	100	Ar	E 1461-07
	26.079	0.044							
	22.691	0.049							
	20.111	0.024							
	18.104	0.006							
	16.548	0.056							
	15.275	0.036							
	97.508	0.434							
	71.084	0.273							
	50.277	0.048							
38.285	0.016								
30.860	0.029								
26.044	0.049								
22.586	0.051								
20.026	0.067								
18.088	0.094								
16.517	0.048								
15.257	0.122								
97.243	0.232			6.339	InSb	12.7	100	Ar	E 1461-07
71.179	0.107								
50.215	0.042								
38.287	0.062								
30.844	0.049								
25.926	0.082								
22.536	0.011								
19.910	0.075								
17.981	0.013								
16.408	0.031								
15.175	0.056								
97.689	0.912								
71.336	0.048								
50.461	0.050								
38.321	0.102								
30.932	0.082								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
K3 01	26.056	0.068		6.339	InSb	12.7	100	Ar	E 1461-07
	22.647	0.096							
	20.036	0.087							
	18.123	0.074							
	16.476	0.016							
	15.265	0.079							
	97.635	0.201							
	71.072	0.181							
	50.367	0.186							
	38.269	0.074							
	30.953	0.082							
	25.989	0.033							
	22.618	0.054							
	20.091	0.088							
18.088	0.046								
16.588	0.081								
15.402	0.024								
K3 02	96.976	1.287		6.339	InSb	12.7	100	Ar	E 1461-07
	70.522	0.041							
	49.939	0.025							
	37.902	0.051							
	30.612	0.077							
	25.689	0.016							
	22.424	0.027							
K2 07	19.855	0.042		6.339	InSb	12.7	100	Ar	E 1461-07
	17.885	0.057							
	16.330	0.052							
	15.161	0.062							
	98.306	1.115							
	71.349	0.216							
	50.450	0.081							
38.302	0.019								
31.093	0.086								
26.187	0.020								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
K2 08	22.749	0.060							
	20.180	0.056							
	18.209	0.010							
	16.624	0.098							
	15.308	0.222							
	97.988	0.446		6.339	InSb	12.7	100	Ar	E 1461-07
	70.801	0.290							
	50.248	0.205							
	38.295	0.065							
	30.994	0.075							
K2 09	26.085	0.040							
	22.700	0.056							
	20.088	0.028							
	18.214	0.058							
	16.522	0.101							
	15.335	0.044							
	98.237	0.612		6.339	InSb	12.7	100	Ar	E 1461-07
	71.521	0.227							
	50.585	0.087							
	38.632	0.082							
K3 03	31.258	0.073							
	26.286	0.034							
	22.878	0.089							
	20.238	0.030							
	18.255	0.041							
	16.666	0.038							
	15.376	0.096							
	98.030	0.300		6.339	InSb	12.7	100	Ar	E 1461-07
	71.023	0.232							
	50.295	0.124							
38.146	0.053								
30.908	0.090								
26.087	0.054								
22.656	0.073								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
K3 04	20.110	0.043		6.339	InSb	12.7	100	Ar	E 1461-07
	18.229	0.090							
	16.568	0.061							
	15.376	0.025							
	97.865	0.219							
	70.801	0.206							
	50.155	0.080							
	38.225	0.051							
	30.989	0.092							
	26.112	0.070							
K3 05	22.724	0.108		6.339	InSb	12.7	100	Ar	E 1461-07
	20.182	0.064							
	18.215	0.028							
	16.597	0.085							
	15.256	0.043							
	97.416	0.597							
	70.838	0.174							
	50.162	0.033							
	37.896	0.061							
	30.669	0.028							
25.926	0.024								
22.534	0.006								
19.927	0.019								
17.953	0.069								
16.335	0.057								
15.025	0.033								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
K3 06	97.775	0.415		6.339	InSb	12.7	100	Ar	E 1461-07
	71.924	0.066							
	50.779	0.128							
	38.604	0.094							
	31.162	0.026							
	26.289	0.087							
	22.837	0.035							
	20.260	0.035							
	18.315	0.080							
	16.715	0.064							
	15.528	0.134							

Specimen Number	K1 02	K1 03	K1 04	K1 08	K1 09	K1 10	K1 05
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	12/23/09 8:17 AM	12/23/09 8:17 AM	12/23/09 8:17 AM	1/4/10 9:40 AM	1/4/10 9:40 AM	1/4/10 9:40 AM	1/4/10 9:35 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	97.9967	96.7800	98.3357	98.3950	96.0787	98.3373	97.4097
100	71.2643	70.1260	71.3187	71.6937	70.5523	70.9707	71.5830
200	50.3550	49.5633	50.4530	50.8603	49.8437	50.3700	50.6687
300	38.2550	37.8307	38.3997	38.5623	37.9740	38.3160	38.4663
400	30.9780	30.6230	31.1033	31.2110	30.6427	31.0117	31.0187
500	26.0733	25.7820	26.2317	26.3460	25.8833	26.1640	26.1223
600	22.6443	22.3713	22.7783	22.8907	22.4357	22.7517	22.7203
700	20.0580	19.8763	20.2107	20.2193	19.9263	20.1583	20.1727
800	18.1220	17.8580	18.2853	18.3350	17.9140	18.1753	18.2113
900	16.5127	16.4460	16.6560	16.6403	16.4250	16.6260	16.5763
1000	15.2893	15.1383	15.3710	15.4637	15.2720	15.2990	15.3030

Specimen Number	K1 06	K1 07	K2 04	K2 05	K2 06	K2 01	K2 02
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	1/4/10 9:35 AM	1/4/10 9:35 AM	1/5/10 9:06 AM	1/5/10 9:06 AM	1/5/10 9:06 AM	1/5/10 8:41 AM	1/5/10 8:41 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	98.2093	99.0193	97.1390	97.7550	97.8617	97.6737	97.5077
100	71.2643	72.2543	70.7650	71.2497	71.3753	71.4153	71.0837
200	50.5127	51.2540	49.8933	50.2903	50.4170	50.5787	50.2770
300	38.3613	39.0037	38.0473	38.3840	38.3910	38.3197	38.2853
400	31.0913	31.4543	30.8550	30.9547	31.0923	30.9320	30.8597
500	26.1467	26.5137	25.9727	26.0613	26.1933	26.0790	26.0440
600	22.7157	23.0620	22.5590	22.6603	22.6833	22.6913	22.5857
700	20.1813	20.3947	20.0697	20.1243	20.1673	20.1107	20.0263
800	18.1167	18.4063	18.1113	18.1543	18.2607	18.1037	18.0883
900	16.6057	16.8503	16.5797	16.6173	16.7140	16.5480	16.5167
1000	15.4887	15.4973	15.2963	15.2393	15.4400	15.2753	15.2567

Specimen Number	K2 03	K2 10	K3 01	K3 02	K2 07	K2 08	K2 09
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	1/5/10 8:41 AM	1/6/10 8:03 AM	1/6/10 8:03 AM	1/6/10 8:03 AM	1/6/10 8:10 AM	1/6/10 8:10 AM	1/6/10 8:10 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	97.2433	97.6887	97.6347	96.9757	98.3060	97.9877	98.2373
100	71.1790	71.3360	71.0723	70.5217	71.3493	70.8007	71.5210
200	50.2150	50.4613	50.3670	49.9387	50.4503	50.2480	50.5850
300	38.2873	38.3207	38.2690	37.9023	38.3020	38.2953	38.6320
400	30.8443	30.9323	30.9530	30.6117	31.0927	30.9943	31.2583
500	25.9263	26.0563	25.9890	25.6890	26.1873	26.0847	26.2863
600	22.5360	22.6470	22.6180	22.4240	22.7493	22.7003	22.8777
700	19.9103	20.0363	20.0910	19.8553	20.1803	20.0880	20.2383
800	17.9810	18.1227	18.0880	17.8853	18.2093	18.2140	18.2553
900	16.4077	16.4757	16.5880	16.3297	16.6243	16.5220	16.6660
1000	15.1750	15.2647	15.4023	15.1607	15.3080	15.3353	15.3760

Specimen Number	K3 03	K3 04	K3 05	K3 06
Measured By	41169	41169	41169	41169
Measured Date	1/25/10 2:27 PM	1/25/10 2:27 PM	1/25/10 3:43 PM	1/25/10 3:43 PM
Diffusivity (mm ² /sec)				
Temperature °C				
25	98.0297	97.8653	97.4160	97.7747
100	71.0230	70.8007	70.8380	71.9240
200	50.2947	50.1547	50.1617	50.7793
300	38.1460	38.2247	37.8960	38.6037
400	30.9083	30.9893	30.6693	31.1620
500	26.0867	26.1123	25.9263	26.2890
600	22.6557	22.7237	22.5340	22.8370
700	20.1100	20.1823	19.9270	20.2600
800	18.2287	18.2147	17.9530	18.3147
900	16.5680	16.5973	16.3353	16.7153
1000	15.3763	15.2560	15.0247	15.5277

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	K3 06		6.322	6.323	6.323	6.323	12.728	12.729	1.42369
	K3 04		6.332	6.331	6.331	6.333	12.727	12.728	1.42378
	K3 05		6.334	6.334	6.334	6.333	12.731	12.730	1.42150
	K3 02		6.334	6.332	6.332	6.332	12.726	12.727	1.42014
	K3 03		6.332	6.331	6.332	6.331	12.726	12.729	1.41933
	K2 09		6.333	6.335	6.333	6.333	12.744	12.745	1.42884
	K2 10		6.333	6.335	6.333	6.330	12.728	12.726	1.42345
	K3 01		6.305	6.305	6.305	6.306	12.724	12.724	1.41372
	K1 04		6.328	6.327	6.328	6.326	12.737	12.732	1.42092
	K1 03		6.325	6.326	6.328	6.326	12.732	12.734	1.42158
	K1 01		6.295	6.298	6.296	6.296	12.730	12.731	1.41619
	K1 08		6.326	6.325	6.326	6.325	12.727	12.728	1.42607
	K1 06		6.327	6.326	6.328	6.327	12.726	12.726	1.42181
	K1 05		6.327	6.327	6.329	6.326	12.735	12.736	1.42351
	K1 07		6.328	6.328	6.328	6.328	12.726	12.727	1.42458
	K2 02		6.329	6.328	6.328	6.328	12.729	12.725	1.41998
	K1 10		6.326	6.328	6.326	6.327	12.732	12.729	1.42508
	K1 09		6.328	6.330	6.329	6.328	12.729	12.729	1.42565
	K2 01		6.329	6.329	6.327	6.329	12.728	12.726	1.41768

Specimen ID Number	Measurements by:	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
K3 06	47735	12/2/2010 16:27	6.32275	12.72850	127.2461	0.006323	0.01273
K3 04	47735	12/2/2010 16:29	6.33175	12.72750	127.2261	0.006332	0.01273
K3 05	41169	12/3/2010 9:36	6.33375	12.73050	127.2860	0.006334	0.01273
K3 02	41169	12/3/2010 9:37	6.33250	12.72650	127.2061	0.006333	0.01273
K3 03	41169	12/3/2010 13:16	6.33150	12.72750	127.2261	0.006332	0.01273
K2 09	41169	12/4/2010 8:11	6.33350	12.74450	127.5662	0.006334	0.01274
K2 10	41169	12/4/2010 10:40	6.33275	12.72700	127.2161	0.006333	0.01273
K3 01	41169	12/4/2010 14:04	6.30525	12.72400	127.1561	0.006305	0.01272
K1 04	41169	12/6/2010 10:53	6.32725	12.73450	127.3660	0.006327	0.01273
K1 03	41169	12/6/2010 11:20	6.32625	12.73300	127.3360	0.006326	0.01273
K1 01	41169	12/6/2010 11:26	6.29625	12.73050	127.2860	0.006296	0.01273
K1 08	41169	12/6/2010 12:55	6.32550	12.72750	127.2261	0.006326	0.01273
K1 06	41169	12/6/2010 12:56	6.32700	12.72600	127.1961	0.006327	0.01273
K1 05	41169	12/6/2010 13:58	6.32725	12.73550	127.3861	0.006327	0.01274
K1 07	41169	12/6/2010 14:05	6.32800	12.72650	127.2061	0.006328	0.01273
K2 02	41169	12/7/2010 8:26	6.32825	12.72700	127.2161	0.006328	0.01273
K1 10	41169	12/7/2010 8:41	6.32675	12.73050	127.2860	0.006327	0.01273
K1 09	41169	12/7/2010 10:01	6.32875	12.72900	127.2561	0.006329	0.01273
K2 01	41169	12/7/2010 10:21	6.32850	12.72700	127.2161	0.006329	0.01273

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
K3 06	0.0014	25.2	22.8	17.7
K3 04	0.0014	25.2	22.8	17.7
K3 05	0.0014	25.3	23	20.8
K3 02	0.0014	25.3	23	20.8
K3 03	0.0014	25.3	22.6	20.1
K2 09	0.0014	25.4	22.3	13.1
K2 10	0.0014	25.4	22	12.9
K3 01	0.0014	25.4	22.6	14.2
K1 04	0.0014	25.3	22.7	18.1
K1 03	0.0014	25.3	22.9	18.9
K1 01	0.0014	25.3	22.7	19.2
K1 08	0.0014	25.3	22.1	21.7
K1 06	0.0014	25.3	22.2	21.7
K1 05	0.0014	25.3	23	21.1
K1 07	0.0014	25.3	23	21.1
K2 02	0.0014	25.6	22.5	21.7
K1 10	0.0014	25.6	22.5	21.7
K1 09	0.0014	25.6	22.7	21.7
K2 01	0.0014	25.6	22.7	21.4

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity
and Temperature Transmitter Model PTU301

Graphite Grade: PPEA
Graphite Manufacturer: Graftech International
Forming Process: Extruded
Coke Particle Size: Medium grain
Coke Type: Pitch coke
ASTM Class: ENHP
Specimen Geometry: Cylinder

Specimen ID #'s:

L1 01
L1 02
L1 03
L1 04
L1 05
L1 06
L1 07
L1 08
L1 09
L1 10
L2 01
L2 02
L2 03
L2 04
L2 05
L2 06
L2 07
L2 08
L2 09
L2 10
L2 11
L3 01
L3 02
L3 03
L3 04
L3 05
L3 06
L3 07
L3 08
L3 09
L3 10

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Specimen Length Measurements, mm				Specimen Outside Diameter Measurements, mm	
			L1	L2	L3	L4	D1	D1 ⁹⁰
	L3 10		6.334	6.334	6.335	6.334	12.732	12.732
	L3 02		6.331	6.332	6.331	6.331	12.732	12.734
	L2 03		6.325	6.326	6.327	6.325	12.720	12.722
	L1 08		6.325	6.324	6.325	6.325	12.730	12.728
	L1 02		6.321	6.321	6.320	6.321	12.722	12.721
	L1 10		6.326	6.325	6.323	6.323	12.730	12.731
	L2 07		6.329	6.329	6.329	6.331	12.726	12.726
	L3 04		6.331	6.332	6.333	6.331	12.727	12.726
	L2 06		6.328	6.327	6.328	6.328	12.724	12.724
	L2 09		6.330	6.332	6.331	6.330	12.729	12.729
	L3 05		6.332	6.334	6.332	6.332	12.727	12.728
	L1 03		6.322	6.323	6.323	6.322	12.721	12.722
	L3 03		6.332	6.332	6.330	6.332	12.725	12.724
	L2 10		6.331	6.330	6.329	6.330	12.732	12.730
	L1 07		6.324	6.325	6.321	6.321	12.727	12.729
	L2 04		6.327	6.326	6.328	6.327	12.721	12.723
	L1 05		6.324	6.324	6.324	6.323	12.724	12.726
	L1 09		6.326	6.324	6.323	6.326	12.731	12.729
	L2 05		6.326	6.328	6.328	6.328	12.722	12.724
	L3 07		6.332	6.333	6.333	6.331	12.729	12.730
	L1 06		6.324	6.324	6.323	6.324	12.726	12.728
	L3 06		6.332	6.332	6.332	6.333	12.730	12.728
	L3 01		6.333	6.330	6.330	6.332	12.732	12.732
	L2 02		6.327	6.328	6.327	6.326	12.734	12.733
	L1 01		6.323	6.322	6.321	6.323	12.743	12.743
	L2 01		6.325	6.326	6.325	6.325	12.732	12.731
	L3 08		6.333	6.335	6.332	6.332	12.729	12.732
	L2 08		6.327	6.329	6.329	6.328	12.728	12.727
	L3 09		6.334	6.335	6.333	6.333	12.732	12.733
	L1 04		6.324	6.325	6.324	6.323	12.724	12.723

Specimen ID Number	Specimen Mass, g	Measurements by:	Date: mm/dd/yr	Specimen Length mm	Specimen Diameter mm	Average Cross-sectional Area mm ²	Specimen Length m	Specimen Diameter m
L3 10	1.47818	JL	8/10/2009 11:29	6.33425	12.73200	127.3160	0.006334	0.01273
L3 02	1.47401	JL	8/10/2009 11:30	6.33125	12.73300	127.3360	0.006331	0.01273
L2 03	1.47401	JL	8/10/2009 11:33	6.32575	12.72100	127.0961	0.006326	0.01272
L1 08	1.47868	JL	8/10/2009 11:35	6.32475	12.72900	127.2561	0.006325	0.01273
L1 02	1.47593	JL	8/10/2009 11:37	6.32075	12.72150	127.1061	0.006321	0.01272
L1 10	1.47877	JL	8/10/2009 11:38	6.32425	12.73050	127.2860	0.006324	0.01273
L2 07	1.47771	JL	8/10/2009 11:40	6.32950	12.72600	127.1961	0.006330	0.01273
L3 04	1.47396	JL	8/10/2009 11:41	6.33175	12.72650	127.2061	0.006332	0.01273
L2 06	1.47721	JL	8/10/2009 11:43	6.32775	12.72400	127.1561	0.006328	0.01272
L2 09	1.47691	JL	8/10/2009 11:44	6.33075	12.72900	127.2561	0.006331	0.01273
L3 05	1.47248	JL	8/10/2009 11:45	6.33250	12.72750	127.2261	0.006333	0.01273
L1 03	1.47664	JL	8/10/2009 12:07	6.32250	12.72150	127.1061	0.006323	0.01272
L3 03	1.47328	JL	8/10/2009 12:08	6.33150	12.72450	127.1661	0.006332	0.01272
L2 10	1.47676	JL	8/10/2009 12:10	6.33000	12.73100	127.2960	0.006330	0.01273
L1 07	1.47657	JL	8/10/2009 12:12	6.32275	12.72800	127.2361	0.006323	0.01273
L2 04	1.47488	JL	8/10/2009 12:13	6.32700	12.72200	127.1161	0.006327	0.01272
L1 05	1.47676	JL	8/10/2009 12:15	6.32375	12.72500	127.1761	0.006324	0.01273
L1 09	1.47903	JL	8/10/2009 12:16	6.32475	12.73000	127.2761	0.006325	0.01273
L2 05	1.47623	jl	8/10/2009 12:28	6.32750	12.72300	127.1361	0.006328	0.01272
L3 07	1.47442	jl	8/10/2009 12:34	6.33225	12.72950	127.2661	0.006332	0.01273
L1 06	1.47534	jl	8/10/2009 12:36	6.32375	12.72700	127.2161	0.006324	0.01273
L3 06	1.47441	jl	8/10/2009 12:37	6.33225	12.72900	127.2561	0.006332	0.01273
L3 01	1.47429	jl	8/10/2009 12:38	6.33125	12.73200	127.3160	0.006331	0.01273
L2 02	1.47459	jl	8/10/2009 12:39	6.32700	12.73350	127.3460	0.006327	0.01273
L1 01	1.48325	jl	8/10/2009 12:41	6.32225	12.74300	127.5361	0.006322	0.01274
L2 01	1.47847	jl	8/10/2009 12:44	6.32525	12.73150	127.3060	0.006325	0.01273
L3 08	1.47764	jl	8/10/2009 12:45	6.33300	12.73050	127.2860	0.006333	0.01273
L2 08	1.47539	jl	8/10/2009 12:47	6.32825	12.72750	127.2261	0.006328	0.01273
L3 09	1.47442	jl	8/10/2009 12:48	6.33375	12.73250	127.3260	0.006334	0.01273
L1 04	1.47623	jl	8/10/2009 12:49	6.32400	12.72350	127.1461	0.006324	0.01272

Specimen ID Number	Specimen Mass kg	Specimen Density kg/m ³	Specimen Density g/cm ³	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
L3 10	0.0015	1832.94309	1.8329	25.5	23.7	31.5
L3 02	0.0015	1828.35114	1.8284	25.5	23.7	31.4
L2 03	0.0015	1833.39490	1.8334	25.5	23.7	31.4
L1 08	0.0015	1837.18284	1.8372	25.5	23.7	31.5
L1 02	0.0015	1837.09080	1.8371	25.5	23.7	31.5
L1 10	0.0015	1837.00694	1.8370	25.5	23.7	31.3
L2 07	0.0015	1835.46492	1.8355	25.5	23.7	31.4
L3 04	0.0015	1830.01266	1.8300	25.5	23.7	31.4
L2 06	0.0015	1835.92833	1.8359	25.5	23.7	31.3
L2 09	0.0015	1833.24459	1.8332	25.5	23.7	31.3
L3 05	0.0015	1827.67139	1.8277	25.5	23.7	31.3
L1 03	0.0015	1837.46580	1.8375	25.5	23.5	31.9
L3 03	0.0015	1829.81570	1.8298	25.5	23.6	31.8
L2 10	0.0015	1832.69963	1.8327	25.5	23.6	31.8
L1 07	0.0015	1835.42996	1.8354	25.5	23.6	31.8
L2 04	0.0015	1833.82626	1.8338	25.5	23.7	31.8
L1 05	0.0015	1836.24136	1.8362	25.5	23.6	31.7
L1 09	0.0015	1837.32900	1.8373	25.5	23.6	31.7
L2 05	0.0015	1835.07128	1.8351	25.4	23.7	31.6
L3 07	0.0015	1829.57656	1.8296	25.4	23.7	31.8
L1 06	0.0015	1833.89918	1.8339	25.4	23.6	32
L3 06	0.0015	1829.70789	1.8297	25.4	23.6	31.9
L3 01	0.0015	1828.98572	1.8290	25.4	23.7	31.7
L2 02	0.0015	1830.15547	1.8302	25.4	23.6	31.9
L1 01	0.0015	1839.54088	1.8395	25.4	23.6	31.9
L2 01	0.0015	1836.05544	1.8361	25.4	23.6	31.9
L3 08	0.0015	1833.06703	1.8331	25.4	23.6	31.9
L2 08	0.0015	1832.51321	1.8325	25.4	23.6	31.9
L3 09	0.0015	1828.28142	1.8283	25.4	23.7	31.7
L1 04	0.0015	1835.94259	1.8359	25.4	23.7	31.6

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity and Temperature Transmitter Model PTU301

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
L1 01		41169	1/7/2010 8:19	26.200	0.200	111.682	111.180	110.759
				100.300	0.200	83.482	83.204	83.065
				199.200	0.100	59.878	60.029	60.060
				300.700	0.400	45.864	46.088	46.073
				401.100	0.500	37.450	37.489	37.410
				501.700	0.500	31.647	31.630	31.703
				600.800	0.300	27.633	27.593	27.624
				700.100	0.400	24.501	24.477	24.598
				799.600	0.100	22.214	22.191	22.301
				899.400	0.100	20.333	20.284	20.362
L1 02		41169	1/7/2010 8:19	999.300	0.100	18.711	18.757	18.805
				25.500	0.200	111.176	110.067	111.561
				100.100	0.200	82.858	82.759	82.831
				199.100	0.000	59.583	59.600	59.916
				299.600	0.100	45.866	45.898	45.794
				399.900	0.200	37.262	37.246	37.451
				500.400	0.300	31.512	31.734	31.698
				600.100	0.200	27.590	27.517	27.679
				699.700	0.200	24.560	24.558	24.568
				799.500	0.100	22.226	22.287	22.166
L1 03		41169	1/7/2010 8:19	899.500	0.100	20.260	20.286	20.271
				999.500	0.100	18.866	18.844	18.706
				24.900	0.200	111.532	112.171	111.282
				99.500	0.200	83.060	83.514	83.282
				199.100	0.000	60.005	60.188	59.866
				299.300	0.000	46.161	46.084	46.002
				399.400	0.100	37.406	37.530	37.580
				499.600	0.100	31.590	31.636	31.779
				599.500	0.100	27.703	27.617	27.675
				699.300	0.100	24.608	24.602	24.583
L1 04		41169	1/7/2010 8:33	799.100	0.000	22.262	22.165	22.182
				899.100	0.000	20.338	20.313	20.268
				999.100	0.000	18.794	18.811	18.784
				26.600	0.200	109.776	109.975	109.879

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
L1 05		41169	1/7/2010 8:33	101.200	0.200	82.478	82.645	82.613
				200.200	0.100	59.464	59.212	59.526
				301.400	0.300	45.626	45.742	45.634
				401.600	0.200	37.285	37.223	37.333
				501.600	0.200	31.634	31.538	31.562
				601.700	0.200	27.546	27.550	27.531
				701.800	0.100	24.458	24.501	24.495
				801.300	0.200	22.110	22.261	22.108
				900.900	0.100	20.274	20.280	20.243
				1000.900	0.100	18.531	18.920	18.893
L1 06		41169	1/7/2010 8:33	25.800	0.200	110.798	110.901	111.932
				101.100	0.100	82.404	82.255	82.325
				200.100	0.000	59.348	59.606	59.237
				300.400	0.100	45.808	45.762	45.875
				400.900	0.100	37.358	37.310	37.186
				500.900	0.100	31.624	31.569	31.549
				601.100	0.100	27.632	27.641	27.588
				701.300	0.100	24.468	24.535	24.588
				800.900	0.100	22.031	22.129	22.144
				900.700	0.100	20.273	20.232	20.300
L1 07		41169	1/8/2010 8:24	1000.800	0.100	18.843	18.718	18.805
				25.300	0.200	110.741	111.042	112.070
				101.000	0.200	82.578	82.756	82.525
				200.300	0.100	59.584	59.417	59.647
				300.500	0.100	45.886	45.811	45.805
				401.100	0.200	37.228	37.346	37.437
				501.100	0.100	31.560	31.598	31.590
				601.000	0.100	27.554	27.566	27.525
				701.100	0.100	24.445	24.497	24.453
				800.900	0.100	22.219	22.030	22.104
900.800	0.100	20.399	20.292	20.496				
1000.800	0.100	18.591	18.787	18.753				
26.700	0.200	110.779	111.407	111.281				
101.300	0.200	82.512	82.567	83.047				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
L1 08		41169	1/8/2010 8:24	200.500	0.100	59.520	59.381	59.597
				301.600	0.200	45.748	45.799	45.671
				401.500	0.200	37.284	37.395	37.348
				501.600	0.200	31.556	31.570	31.546
				601.600	0.200	27.526	27.559	27.558
				701.800	0.200	24.429	24.613	24.425
				801.300	0.200	22.132	22.037	21.978
				900.900	0.100	20.466	20.119	20.289
				1000.900	0.100	18.876	18.726	18.698
				26.100	0.200	111.562	112.397	110.015
L1 09		41169	1/8/2010 8:24	101.100	0.100	82.683	82.691	82.447
				200.500	0.000	59.451	59.452	59.733
				300.600	0.000	45.711	45.812	45.929
				400.800	0.100	37.234	37.241	37.333
				500.900	0.100	31.615	31.547	31.638
				601.000	0.100	27.448	27.572	27.526
				701.200	0.100	24.482	24.524	24.533
				800.900	0.100	22.110	22.150	22.128
				900.700	0.000	20.123	20.233	20.332
				1000.800	0.100	18.758	18.912	19.056
L1 10		41169	1/8/2010 8:19	25.500	0.200	111.059	112.991	110.528
				101.100	0.200	83.203	83.236	83.530
				200.700	0.100	60.037	60.231	59.975
				300.800	0.100	46.349	46.331	46.308
				401.100	0.100	37.589	37.688	37.620
				501.100	0.100	31.902	31.994	31.973
				601.000	0.100	27.779	27.854	27.758
				701.100	0.200	24.764	24.764	24.782
				800.900	0.100	22.360	22.343	22.279
				900.800	0.100	20.465	20.530	20.788
1000.800	0.100	19.099	18.921	19.301				
26.600	0.200	111.580	109.260	110.924				
100.300	0.200	82.999	82.952	83.025				
199.200	0.100	59.628	60.050	59.992				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
L2 01		41169	1/8/2010 8:19	300.700	0.400	45.663	45.937	45.838
				401.100	0.500	37.141	37.456	37.235
				501.700	0.500	31.542	31.504	31.521
				600.900	0.300	27.484	27.495	27.572
				700.000	0.200	24.419	24.425	24.501
				799.500	0.100	22.166	22.069	22.062
				899.400	0.100	20.333	20.290	20.242
				999.400	0.100	18.516	18.733	18.708
				25.900	0.200	109.844	112.164	110.617
				100.100	0.200	82.720	83.457	83.515
L2 02		41169	1/8/2010 8:19	199.200	0.000	59.918	60.043	59.971
				299.600	0.100	46.026	46.108	46.044
				400.000	0.200	37.316	37.520	37.489
				500.400	0.300	31.723	31.770	31.768
				600.100	0.200	27.622	27.689	27.666
				699.700	0.200	24.540	24.575	24.613
				799.500	0.100	22.308	22.340	22.337
				899.500	0.100	20.426	20.358	20.522
				999.500	0.100	18.846	18.885	18.781
				25.200	0.200	112.006	111.056	111.634
L2 03		41169	1/11/2010 8:17	99.500	0.200	82.348	82.576	82.549
				199.100	0.000	59.420	59.187	59.546
				299.300	0.100	45.672	45.702	45.776
				399.400	0.100	37.026	37.090	37.183
				499.600	0.100	31.444	31.442	31.436
				599.500	0.100	27.210	27.386	27.440
				699.300	0.100	24.345	24.308	24.227
				799.100	0.000	21.913	21.969	22.004
				899.100	0.000	20.063	20.317	20.134
				999.100	0.000	18.623	18.584	18.558
26.700	0.200	109.390	109.895	110.140				
101.300	0.200	81.815	81.943	81.614				
200.400	0.100	58.848	59.095	58.752				
301.600	0.200	45.175	45.290	45.270				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
L2 04		41169	1/11/2010 8:17	401.600	0.300	37.003	37.166	37.037
				501.600	0.200	31.334	31.405	31.303
				601.700	0.200	27.339	27.403	27.342
				701.700	0.100	24.259	24.374	24.422
				801.200	0.200	22.054	22.033	22.040
				900.900	0.100	20.264	20.032	20.083
				1000.900	0.100	18.660	18.539	18.564
				26.200	0.100	109.978	109.892	111.725
				101.200	0.100	82.351	82.341	82.285
				200.500	0.000	59.215	59.308	59.338
L2 05		41169	1/11/2010 8:17	300.800	0.000	45.733	45.592	45.613
				400.900	0.100	37.239	37.291	37.424
				501.000	0.100	31.494	31.613	31.476
				601.100	0.100	27.370	27.373	27.441
				701.300	0.200	24.448	24.483	24.424
				801.000	0.100	22.174	22.150	22.180
				900.800	0.100	20.269	20.269	20.204
				1000.900	0.100	18.696	18.921	18.924
				25.800	0.200	110.295	111.086	109.846
				101.100	0.200	82.305	82.288	82.297
L2 06		41169	1/11/2010 8:27	200.700	0.000	59.482	59.540	59.514
				300.900	0.100	45.801	45.780	45.928
				401.000	0.100	37.169	37.202	37.266
				501.000	0.100	31.485	31.559	31.569
				601.000	0.100	27.465	27.412	27.398
				701.100	0.100	24.430	24.490	24.444
				800.900	0.100	22.049	22.058	22.022
				900.800	0.100	20.168	20.254	20.280
				1000.800	0.100	18.680	18.721	18.714
				26.700	0.200	110.988	111.053	110.977
				100.300	0.200	83.198	82.774	82.716
				199.200	0.100	59.679	59.680	59.824
				300.800	0.400	45.713	45.703	45.841
				401.100	0.500	37.188	37.133	37.326

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
L2 07		41169	1/11/2010 8:27	501.700	0.500	31.612	31.548	31.537
				600.800	0.300	27.529	27.596	27.540
				699.900	0.200	24.396	24.559	24.535
				799.500	0.100	21.956	22.061	22.346
				899.400	0.100	20.263	20.300	20.124
				999.300	0.100	18.469	18.569	18.706
				26.100	0.200	111.253	110.412	112.606
				100.100	0.200	82.993	83.367	83.415
				199.200	0.000	59.682	59.799	60.007
				299.700	0.100	45.819	45.912	46.000
L2 08		41169	1/11/2010 8:27	399.900	0.200	37.239	37.309	37.408
				500.400	0.300	31.598	31.595	31.666
				600.100	0.200	27.604	27.701	27.619
				699.700	0.100	24.565	24.461	24.483
				799.500	0.100	22.121	22.265	22.209
				899.500	0.100	20.331	20.288	20.295
				999.600	0.100	18.648	18.771	18.841
				25.500	0.200	111.245	111.551	108.333
				99.500	0.200	82.134	82.138	82.727
				199.100	0.000	59.452	59.233	59.487
L2 09		41169	1/12/2010 8:18	299.300	0.100	45.587	45.684	45.660
				399.400	0.100	37.056	37.242	37.225
				499.600	0.100	31.471	31.448	31.408
				599.500	0.100	27.400	27.367	27.544
				699.300	0.100	24.364	24.281	24.366
				799.200	0.000	22.029	21.988	21.902
				899.100	0.000	20.045	20.095	20.142
				999.100	0.000	18.442	18.511	18.654
				26.300	0.200	112.344	111.259	111.627
				100.300	0.200	83.223	83.021	83.234
199.200	0.100	59.779	59.624	59.863				
300.800	0.400	45.768	45.904	45.993				
401.100	0.500	37.196	37.320	37.347				
501.700	0.500	31.478	31.571	31.552				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)
L2 10		41169	1/12/2010 8:18	600.800	0.300	27.513	27.533	27.506
				700.100	0.400	24.457	24.507	24.451
				799.500	0.100	22.000	22.111	22.146
				899.400	0.100	20.072	20.197	20.225
				999.300	0.100	18.461	18.586	18.810
				25.700	0.200	110.938	111.685	111.216
				100.100	0.200	82.579	82.927	82.719
				199.100	0.000	59.737	59.564	59.700
				299.700	0.100	45.561	45.588	45.733
				399.900	0.200	37.026	37.207	37.155
L3 01		41169	1/12/2010 8:18	500.400	0.300	31.505	31.476	31.393
				600.100	0.200	27.404	27.415	27.436
				699.700	0.200	24.331	24.433	24.446
				799.500	0.100	22.054	21.951	21.951
				899.500	0.100	20.071	20.252	20.222
				999.500	0.100	18.624	18.594	18.611
				25.100	0.200	110.087	109.726	109.491
				99.400	0.200	81.442	81.659	81.999
				199.100	0.000	58.671	58.700	58.987
				299.300	0.100	45.196	45.166	45.219
L3 03		41169	1/12/2010 8:24	399.400	0.100	36.796	36.907	36.863
				499.600	0.100	31.059	31.075	31.032
				599.500	0.100	27.025	27.072	27.114
				699.300	0.100	24.008	24.058	24.091
				799.200	0.000	21.799	21.698	21.882
				899.100	0.000	19.949	19.942	19.852
				999.100	0.000	18.365	18.343	18.434
				26.200	0.100	108.338	109.263	109.521
				100.900	0.100	81.257	81.677	81.460
				200.400	0.100	58.762	58.681	58.557
300.600	0.000	45.086	45.186	45.010				
400.700	0.000	36.777	36.758	36.812				
500.800	0.000	31.174	31.304	31.177				
600.900	0.000	27.197	27.146	27.202				

Specimen ID Number	Specimen Location	Measured By	Measured Date	Average Temp (C)	Std Dev Temperature	Diffusivity Shot 1 (mm ² /sec)	Diffusivity Shot 2 (mm ² /sec)	Diffusivity Shot 3 (mm ² /sec)	
L3 04				701.100	0.100	24.151	24.276	24.192	
				800.800	0.100	21.774	21.829	21.839	
				900.700	0.100	20.062	19.933	20.085	
				1000.700	0.100	18.737	18.239	18.671	
				25.500	0.200	110.614	110.291	108.957	
			41169	1/12/2010 8:24	101.100	0.200	81.449	81.788	81.630
					200.700	0.100	58.828	59.018	58.713
					300.900	0.100	45.242	45.331	45.524
					401.100	0.200	36.954	36.942	36.982
					501.000	0.100	31.374	31.257	31.280
					601.000	0.100	27.248	27.328	27.300
					701.100	0.100	24.222	24.254	24.358
					800.900	0.100	21.960	22.083	21.971
					900.800	0.100	20.174	20.125	19.828
				1000.800	0.100	18.634	18.561	18.685	

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
L1 01	111.207	0.462		6.322	InSb	12.7	100	Ar	E 1461-07
	83.250	0.212							
	59.989	0.097							
	46.008	0.125							
	37.450	0.040							
	31.660	0.038							
	27.617	0.021							
	24.525	0.064							
	22.235	0.058							
	20.326	0.039							
L1 02	18.758	0.047		6.322	InSb	12.7	100	Ar	E 1461-07
	110.935	0.776							
	82.816	0.051							
	59.700	0.188							
	45.853	0.053							
	37.320	0.114							
	31.648	0.119							
	27.595	0.081							
	24.562	0.005							
	22.226	0.061							
L1 03	20.272	0.013		6.322	InSb	12.7	100	Ar	E 1461-07
	18.805	0.087							
	111.662	0.458							
	83.285	0.227							
	60.020	0.162							
	46.082	0.080							
	37.505	0.090							
	31.668	0.099							
	27.665	0.044							
	24.598	0.013							
L1 04	22.203	0.052		6.322	InSb	12.7	100	Ar	E 1461-07
	20.306	0.035							
	18.796	0.014							
	109.877	0.100							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
L1 05	82.579	0.089							
	59.401	0.166							
	45.667	0.065							
	37.280	0.055							
	31.578	0.050							
	27.542	0.010							
	24.485	0.023							
	22.160	0.088							
	20.266	0.020							
	18.781	0.217							
	111.210	0.627		6.322	InSb	12.7	100	Ar	E 1461-07
	82.328	0.075							
	59.397	0.189							
	45.815	0.057							
37.285	0.089								
31.581	0.039								
27.620	0.028								
24.530	0.060								
22.101	0.061								
20.268	0.034								
18.789	0.064								
111.284	0.697		6.322	InSb	12.7	100	Ar	E 1461-07	
82.620	0.121								
59.549	0.119								
45.834	0.045								
37.337	0.105								
31.583	0.020								
27.548	0.021								
24.465	0.028								
22.118	0.095								
20.396	0.102								
18.710	0.105								
111.156	0.332		6.322	InSb	12.7	100	Ar	E 1461-07	
82.709	0.294								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
L1 08	59.499	0.109							
	45.739	0.064							
	37.342	0.056							
	31.557	0.012							
	27.548	0.019							
	24.489	0.107							
	22.049	0.078							
	20.291	0.174							
	18.767	0.096							
	111.325	1.209		6.322	InSb	12.7	100	Ar	E 1461-07
	82.607	0.139							
	59.545	0.163							
	45.817	0.109							
	37.269	0.055							
31.600	0.047								
27.515	0.063								
24.513	0.027								
22.129	0.020								
20.229	0.105								
18.909	0.149								
L1 09	111.526	1.296		6.322	InSb	12.7	100	Ar	E 1461-07
	83.323	0.180							
	60.081	0.134							
	46.329	0.021							
	37.632	0.051							
	31.956	0.048							
	27.797	0.050							
	24.770	0.010							
	22.327	0.043							
	20.594	0.171							
L1 10	19.107	0.190							
	110.588	1.196		6.322	InSb	12.7	100	Ar	E 1461-07
	82.992	0.037							
	59.890	0.229							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
	45.813	0.139							
	37.277	0.162							
	31.522	0.019							
	27.517	0.048							
	24.448	0.046							
	22.099	0.058							
	20.288	0.046							
	18.652	0.119							
L2 01	110.875	1.181		6.322	InSb	12.7	100	Ar	E 1461-07
	83.231	0.443							
	59.977	0.063							
	46.059	0.043							
	37.442	0.110							
	31.754	0.027							
	27.659	0.034							
	24.576	0.037							
	22.328	0.018							
	20.435	0.082							
	18.837	0.053							
L2 02	111.565	0.479		6.322	InSb	12.7	100	Ar	E 1461-07
	82.491	0.125							
	59.384	0.182							
	45.717	0.054							
	37.100	0.079							
	31.441	0.004							
	27.345	0.120							
	24.293	0.060							
	21.962	0.046							
	20.171	0.131							
	18.588	0.033							
L2 03	109.808	0.382		6.322	InSb	12.7	100	Ar	E 1461-07
	81.791	0.166							
	58.898	0.177							
	45.245	0.061							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
	37.069	0.086							
	31.347	0.052							
	27.361	0.036							
	24.352	0.084							
	22.042	0.011							
	20.126	0.122							
	18.588	0.064							
L2 04	110.532	1.034		6.322	InSb	12.7	100	Ar	E 1461-07
	82.326	0.036							
	59.287	0.064							
	45.646	0.076							
	37.318	0.095							
	31.528	0.074							
	27.395	0.040							
	24.452	0.030							
	22.168	0.016							
	20.247	0.038							
	18.847	0.131							
L2 05	110.409	0.628		6.322	InSb	12.7	100	Ar	E 1461-07
	82.297	0.009							
	59.512	0.029							
	45.836	0.080							
	37.212	0.049							
	31.538	0.046							
	27.425	0.035							
	24.455	0.031							
	22.043	0.019							
	20.234	0.059							
	18.705	0.022							
L2 06	111.006	0.041		6.322	InSb	12.7	100	Ar	E 1461-07
	82.896	0.263							
	59.728	0.083							
	45.752	0.077							
	37.216	0.099							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
L2 07	31.566	0.041		6.322	InSb	12.7	100	Ar	E 1461-07
	27.555	0.036							
	24.497	0.088							
	22.121	0.202							
	20.229	0.093							
	18.581	0.119							
	111.424	1.107							
	83.258	0.231							
	59.829	0.165							
	45.910	0.091							
	37.319	0.085							
	31.620	0.040							
	27.641	0.052							
24.503	0.055								
22.198	0.073								
20.305	0.023								
18.753	0.098								
L2 08	110.376	1.776		6.322	InSb	12.7	100	Ar	E 1461-07
	82.333	0.341							
	59.391	0.138							
	45.644	0.051							
	37.174	0.103							
	31.442	0.032							
	27.437	0.094							
	24.337	0.049							
	21.973	0.065							
	20.094	0.049							
	18.536	0.108							
	111.743	0.552							
	83.159	0.120							
59.755	0.121								
45.888	0.113								
37.288	0.081								
31.534	0.049								
L2 09	31.566	0.041		6.322	InSb	12.7	100	Ar	E 1461-07
	27.555	0.036							
	24.497	0.088							
	22.121	0.202							
	20.229	0.093							
	18.581	0.119							
	111.424	1.107							
	83.258	0.231							
	59.829	0.165							
	45.910	0.091							
	37.319	0.085							
	31.620	0.040							
	27.641	0.052							
24.503	0.055								
22.198	0.073								
20.305	0.023								
18.753	0.098								

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
	27.517	0.014							
	24.472	0.031							
	22.086	0.076							
	20.165	0.081							
	18.619	0.177							
L2 10	111.280	0.378		6.322	InSb	12.7	100	Ar	E 1461-07
	82.742	0.175							
	59.667	0.091							
	45.627	0.093							
	37.129	0.093							
	31.458	0.058							
	27.418	0.016							
	24.403	0.063							
	21.985	0.059							
	20.182	0.097							
	18.610	0.015							
L3 01	109.768	0.300		6.322	InSb	12.7	100	Ar	E 1461-07
	81.700	0.281							
	58.786	0.175							
	45.194	0.027							
	36.855	0.056							
	31.055	0.022							
	27.070	0.045							
	24.052	0.042							
	21.793	0.092							
	19.914	0.054							
	18.381	0.047							
L3 03	109.041	0.622		6.322	InSb	12.7	100	Ar	E 1461-07
	81.465	0.210							
	58.667	0.103							
	45.094	0.088							
	36.782	0.027							
	31.218	0.074							
	27.182	0.031							

Specimen ID Number	Diffusivity at X °C (mm ² /sec)	Std Dev Diffusivity	Conductivity W/(m*K)	Thickness RT mm	Sensor	Beam Enlargement mm	Laser filter mm	Atmosphere	ASTM
L3 04	24.206	0.064		6.322	InSb	12.7	100	Ar	E 1461-07
	21.814	0.035							
	20.027	0.082							
	18.549	0.270							
	109.954	0.878							
	81.622	0.170							
	58.853	0.154							
	45.366	0.144							
	36.959	0.021							
	31.304	0.062							
	27.292	0.041							
	24.278	0.071							
	22.005	0.068							
	20.042	0.187							
18.627	0.062								

Specimen Number	L1 01	L1 02	L1 03	L1 04	L1 05	L1 06	L1 07
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	1/7/10 8:19 AM	1/7/10 8:19 AM	1/7/10 8:19 AM	1/7/10 8:33 AM	1/7/10 8:33 AM	1/7/10 8:33 AM	1/8/10 8:24 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	111.2070	110.9347	111.6617	109.8767	111.2103	111.2843	111.1557
100	83.2503	82.8160	83.2853	82.5787	82.3280	82.6197	82.7087
200	59.9890	59.6997	60.0197	59.4007	59.3970	59.5493	59.4993
300	46.0083	45.8527	46.0823	45.6673	45.8150	45.8340	45.7393
400	37.4497	37.3197	37.5053	37.2803	37.2847	37.3370	37.3423
500	31.6600	31.6480	31.6683	31.5780	31.5807	31.5827	31.5573
600	27.6167	27.5953	27.6650	27.5423	27.6203	27.5483	27.5477
700	24.5253	24.5620	24.5977	24.4847	24.5303	24.4650	24.4890
800	22.2353	22.2263	22.2030	22.1597	22.1013	22.1177	22.0490
900	20.3263	20.2723	20.3063	20.2657	20.2683	20.3957	20.2913
1000	18.7577	18.8053	18.7963	18.7813	18.7887	18.7103	18.7667

Specimen Number	L1 08	L1 09	L1 10	L2 01	L2 02	L2 03	L2 04
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	1/8/10 8:24 AM	1/8/10 8:24 AM	1/8/10 8:19 AM	1/8/10 8:19 AM	1/8/10 8:19 AM	1/11/10 8:17 AM	1/11/10 8:17 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	111.3247	111.5260	110.5880	110.8750	111.5653	109.8083	110.5317
100	82.6070	83.3230	82.9920	83.2307	82.4910	81.7907	82.3257
200	59.5453	60.0810	59.8900	59.9773	59.3843	58.8983	59.2870
300	45.8173	46.3293	45.8127	46.0593	45.7167	45.2450	45.6460
400	37.2693	37.6323	37.2773	37.4417	37.0997	37.0687	37.3180
500	31.6000	31.9563	31.5223	31.7537	31.4407	31.3473	31.5277
600	27.5153	27.7970	27.5170	27.6590	27.3453	27.3613	27.3947
700	24.5130	24.7700	24.4483	24.5760	24.2933	24.3517	24.4517
800	22.1293	22.3273	22.0990	22.3283	21.9620	22.0423	22.1680
900	20.2293	20.5943	20.2883	20.4353	20.1713	20.1263	20.2473
1000	18.9087	19.1070	18.6523	18.8373	18.5883	18.5877	18.8470

Specimen Number	L2 05	L2 06	L2 07	L2 08	L2 09	L2 10	L3 01
Measured By	41169	41169	41169	41169	41169	41169	41169
Measured Date	1/11/10 8:17 AM	1/11/10 8:27 AM	1/11/10 8:27 AM	1/11/10 8:27 AM	1/12/10 8:18 AM	1/12/10 8:18 AM	1/12/10 8:18 AM
Diffusivity (mm ² /sec)							
Temperature °C							
25	110.4090	111.0060	111.4237	110.3763	111.7433	111.2797	109.7680
100	82.2967	82.8960	83.2583	82.3330	83.1593	82.7417	81.7000
200	59.5120	59.7277	59.8293	59.3907	59.7553	59.6670	58.7860
300	45.8363	45.7523	45.9103	45.6437	45.8883	45.6273	45.1937
400	37.2123	37.2157	37.3187	37.1743	37.2877	37.1293	36.8553
500	31.5377	31.5657	31.6197	31.4423	31.5337	31.4580	31.0553
600	27.4250	27.5550	27.6413	27.4370	27.5173	27.4183	27.0703
700	24.4547	24.4967	24.5030	24.3370	24.4717	24.4033	24.0523
800	22.0430	22.1210	22.1983	21.9730	22.0857	21.9853	21.7930
900	20.2340	20.2290	20.3047	20.0940	20.1647	20.1817	19.9143
1000	18.7050	18.5813	18.7533	18.5357	18.6190	18.6097	18.3807

Specimen Number	L3 03	L3 04
Measured By	41169	41169
Measured Date	1/12/10 8:24 AM	1/12/10 8:24 AM
Diffusivity (mm²/sec)		
Temperature °C		
25	109.0407	109.9540
100	81.4647	81.6223
200	58.6667	58.8530
300	45.0940	45.3657
400	36.7823	36.9593
500	31.2183	31.3037
600	27.1817	27.2920
700	24.2063	24.2780
800	21.8140	22.0047
900	20.0267	20.0423
1000	18.5490	18.6267

Specimen Type	Specimen ID Number	Specimen Grain Orientation	Final Length Measurements, mm				Final Outside Diameter Measurements, mm		Final Specimen Mass, g
			L1	L2	L3	L4	D1	D1 ⁹⁰	
	L3 01		6.334	6.331	6.332	6.330	12.731	12.733	1.47395
	L3 05		6.332	6.333	6.333	6.332	12.730	12.731	1.47211
	L3 06		6.332	6.333	6.333	6.333	12.731	12.731	1.47405
	L3 02		6.331	6.332	6.331	6.331	12.733	12.735	1.47353
	L2 08		6.329	6.331	6.330	6.327	12.731	12.730	1.47510
	L2 09		6.329	6.329	6.330	6.329	12.731	12.731	1.47670
	L3 03		6.332	6.330	6.331	6.330	12.727	12.725	1.47300
	L3 04		6.331	6.332	6.332	6.331	12.726	12.729	1.47371
	L2 10		6.330	6.330	6.327	6.330	12.733	12.732	1.47644
	L1 03		6.324	6.323	6.322	6.322	12.723	12.723	1.47638
	L1 02		6.321	6.319	6.321	6.320	12.722	12.721	1.47575
	L1 01		6.323	6.321	6.320	6.323	12.742	12.744	1.48295
	L1 07		6.324	6.323	6.322	6.322	12.727	12.729	1.47633
	L1 06		6.324	6.324	6.324	6.322	12.726	12.727	1.47512
	L1 04		6.321	6.323	6.324	6.323	12.722	12.725	1.47590
	L1 05		6.322	6.324	6.323	6.323	12.726	12.728	1.47647
	L2 01		6.326	6.323	6.327	6.323	12.731	12.733	1.47820
	L1 10		6.325	6.326	6.325	6.323	12.734	12.733	1.47846
	L1 08		6.323	6.324	6.324	6.324	12.728	12.729	1.47842
	L1 09		6.325	6.325	6.325	6.325	12.730	12.731	1.47873

Specimen ID Number	Measurements by	Date: mm/dd/yr	Final Specimen Length mm	Final Specimen Diameter mm	Average Cross-sectional Area mm ²	Final Specimen Length m	Final Specimen Diameter m
L3 01	41169	12/3/2010 9:33	6.33175	12.73200	127.3160	0.006332	0.01273
L3 05	41169	12/3/2010 9:35	6.33250	12.73050	127.2860	0.006333	0.01273
L3 06	41169	12/3/2010 11:54	6.33275	12.73100	127.2960	0.006333	0.01273
L3 02	41169	12/3/2010 11:57	6.33125	12.73400	127.3560	0.006331	0.01273
L2 08	41169	12/4/2010 8:09	6.32925	12.73050	127.2860	0.006329	0.01273
L2 09	41169	12/4/2010 10:25	6.32925	12.73100	127.2960	0.006329	0.01273
L3 03	47735	12/4/2010 13:22	6.33075	12.72600	127.1961	0.006331	0.01273
L3 04	41169	12/4/2010 13:39	6.33150	12.72750	127.2261	0.006332	0.01273
L2 10	41169	12/4/2010 13:42	6.32925	12.73250	127.3260	0.006329	0.01273
L1 03	41169	12/6/2010 10:41	6.32275	12.72300	127.1361	0.006323	0.01272
L1 02	41169	12/6/2010 10:43	6.32025	12.72150	127.1061	0.006320	0.01272
L1 01	41169	12/6/2010 11:24	6.32175	12.74300	127.5361	0.006322	0.01274
L1 07	41169	12/6/2010 13:00	6.32275	12.72800	127.2361	0.006323	0.01273
L1 06	41169	12/6/2010 13:05	6.32350	12.72650	127.2061	0.006324	0.01273
L1 04	41169	12/6/2010 13:29	6.32275	12.72350	127.1461	0.006323	0.01272
L1 05	41169	12/6/2010 13:34	6.32300	12.72700	127.2161	0.006323	0.01273
L2 01	41169	12/7/2010 8:06	6.32475	12.73200	127.3160	0.006325	0.01273
L1 10	41169	12/7/2010 9:01	6.32475	12.73350	127.3460	0.006325	0.01273
L1 08	41169	12/7/2010 10:07	6.32375	12.72850	127.2461	0.006324	0.01273
L1 09	41169	12/7/2010 10:19	6.32500	12.73050	127.2860	0.006325	0.01273

Specimen ID Number	Final Specimen Mass kg	Atmospheric Pressure in. of Hg	Room Temperature Deg C	Room Humidity %
L3 01	0.0015	25.3	23	20.8
L3 05	0.0015	25.3	23	20.8
L3 06	0.0015	25.3	23.2	19.8
L3 02	0.0015	25.3	23.2	19.9
L2 08	0.0015	25.4	22.3	13.1
L2 09	0.0015	25.4	22.1	12.9
L3 03	0.0015	25.4	22.2	17
L3 04	0.0015	25.4	22.5	14.1
L2 10	0.0015	25.4	22.5	14.1
L1 03	0.0015	25.3	22.6	17.9
L1 02	0.0015	25.3	22.6	18
L1 01	0.0015	25.3	22.7	19.2
L1 07	0.0015	25.3	22.2	21.7
L1 06	0.0015	25.3	22.3	21.6
L1 04	0.0015	25.3	22.8	21.1
L1 05	0.0015	25.3	22.9	21.1
L2 01	0.0015	25.6	22.3	21.9
L1 10	0.0015	25.6	22.8	21.4
L1 08	0.0015	25.6	22.9	21.2
L1 09	0.0015	25.6	22.8	21.4

Instruments
Sartorius Balance Model ME 235P
Mitutoyo Micrometer Model 121-155
Mitutoyo Caliper Model CD-6" CSX
Vaisala Combined Pressure, Humidity
and Temperature Transmitter Model PTU301