



DEEP DRILLING BTA SYSTEM



CONTENTS





BTA System Selection Guide	239
Indexable Drilling Heads	244
TRI-DEEP Ø.630 – 1.575”244 ISD/IDD...FT	
FINE-BEAM Ø.984 – 3.504”253 ISD/IDD...FB	
ISCAR DEEP-DRILL Ø1.496 – 11.574”262 ISD/IDD-EC/IC	
Brazed Drilling Heads	280
ISCAR DEEP-DRILLS283 ISD...E0/E1/E2/E3, IDD... E3	
Counterboring Heads	286
INDEXABLE COUNTERBORING286 ISC-EA/EC/IA/IC IDC-EA/EC	
Trepanning Heads	311
INDEXABLE TREPANNING (SPECIAL)311 ISTR EC/IC	
Drill Tubes	321
TS***, TS-I**, TS-O**321	
TDO-I324	
User Guide	326

Indexable Drill Heads

Applications		STS (Single Tube System)			DTS (Double Tube System)		
		TRIDEEP DEEP DRILLING	FINEBEAM	ISCARDEEPDRILL	TRIDEEP DEEP DRILLING	FINEBEAM	ISCARDEEPDRILL
		ISD-EF/IF...FT	ISD-EF/IF...FB	ISD-ECVC	IDD...FT	IDD...FB	IDD-EC
Drill heads for solid drilling							
Drill diameter (inch)		Ø.63 - 1.575	Ø.984 - 3.504	Ø1.496 - 11.574	Ø.725 - 1.102	Ø.984 - 2.559	Ø1.496 - 7.244
Thread types	External 4-start thread	✓	✓	✓	✓	✓	✓
	Internal single-start thread	✓	✓	✓	-	-	-
Hole tolerance		IT10	IT10	IT10	IT10	IT10	IT10
Surface finish Ra (µinch)		80	80	120	80	80	120
Machines	Deep hole drilling machines	✓	✓	✓	✓	✓	✓
	NC machines	-	-	-	✓	✓	✓
	Lathes	-	-	-	✓	✓	✓
	Machining centers M/C	-	-	-	✓	✓	✓
Workpiece materials	P Steel	•••	•••	•••	•••	•••	•••
	M Stainless	•••	•••	•••	•••	•••	•••
	K Cast iron	•••	•••	•••	•••	•••	•••
	N Non-ferrous	•••	•••	•••	•••	•••	•••
	S Superalloys	••	••	••	••	••	••
	H Hard materials (≥40HRC)	••	••	••	••	••	••
Insert type		TOGT	NPHT / NPMT	NPMX / TPMX	TOGT	NPHT / NPMT	NPMX / TPMX
Plus cartridge and guide pad +.039" - +.196"		-	-	✓	-	-	✓
Page		244	253	262	245	255	264

••• (Excellent) ← → • (Standard)

Brazed Drill Heads

Applications		STS (Single Tube System)			DTS (Double Tube System)
		ISD-E0	ISD-E1	ISD-E2/E3	IDD-E3
Brazed drill heads					
Drill diameter (inch)		Ø.315 - .582	Ø.496 - .787	Ø.496 - 2.559	Ø.725 - 2.559
Thread type	External single-start thread	✓	-	-	-
	External 2-start thread	-	Ø.496 - .613	Ø.496 - .613	-
	External 4-start thread	-	Ø.614 - .787	Ø.614 - 2.559	✓
Hole tolerance		IT9	IT9	IT9	IT9
Surface finish Ra (µinch)		80	80	80	80
Machine	Deep hole drilling machines	✓	✓	✓	✓
	NC machines	-	-	-	✓
	Lathes	-	-	-	✓
	Machining centers M/C	-	-	-	✓
Workpiece material	P Steel	•••	•••	•••	•••
	M Stainless	•••	•••	•••	•••
	K Cast iron	•••	•••	•••	•••
	N Non-ferrous	•••	•••	•••	•••
	S Superalloys	••	••	••	••
	H Hard materials (≥40HRC)	••	••	••	••
Page		283	283	284	285



••• (Excellent) ← → • (Standard)

Indexable Counterboring Heads

Applications		STS (Single Tube System)				DTS (Double Tube System)	
		ISC- EA	ISC- EC	ISC- IA/IC		IDC-EA/EC	
Drill head							
Drill diameter (inch)		Ø.984 - 1.574	Ø1.575 - 11.496	Ø.984 - 1.574	Ø1.575 - 11.574	Ø.984 - 1.574	Ø1.575 - 7.243
Thread type	External 4-start thread	✓	✓	-	-	✓	✓
	Internal single-start thread	-	-	✓	✓	-	-
Hole tolerance		IT10	IT10	IT10	IT10	IT10	IT10
Surface finish Ra (µinch)		80	80	80	80	80	80
Machine	Deep hole drilling machines	✓	✓	✓	✓	✓	✓
	NC machines	-	-	-	-	✓	✓
	Lathes	-	-	-	-	✓	✓
	Machining centers M/C	-	-	-	-	✓	✓
Workpiece material	P Steel	•••	•••	•••	•••	•••	•••
	M Stainless	•••	•••	•••	•••	•••	•••
	K Cast iron	•••	•••	•••	•••	•••	•••
	N Non-ferrous	•••	•••	•••	•••	•••	•••
	S Superalloys	••	••	••	••	••	••
	H Hard materials (≥40HRC)	••	••	••	••	••	••
Insert type		XPMT	TPMX	XPMT	TPMX	XPMT	TPMX
Plus cartridge and guide pad +.039" - +.196"		-	✓	-	✓	-	✓
Page		286	289	294	297	302	305

•••(Excellent) ← → •(Standard)

Indexable Trepanning Heads

Applications		STS (Single Tube System)	
		ISTR	
		EC	IC
Drill head			
Drill diameter (inch)		Ø3.937 - 12.913	Ø3.937 - 12.047
Thread type	External 4-start thread	✓	-
	Internal single-start thread	-	✓
Hole tolerance		IT10	IT10
Surface finish Ra (µinch)		80	80
Machine	Deep hole drilling machines	✓	✓
	Lathes	-	-
	Machining centers M/C	-	-
Workpiece material	P Steel	•••	•••
	M Stainless	•••	•••
	K Cast iron	•••	•••
	N Non-ferrous	•••	•••
	S Superalloys	••	••
	H Hard materials (≥40HRC)	••	••
Insert type		TPMX	TPMX
Page		311	315

•••(Excellent) ←→ •(Standard)

Deep Hole Drilling Index

Single Tube System

Single Tube System (STS) –

Cooling fluid is induced through the gap between the drill and the hole. Conveying the chips through the tube requires the use of dedicated machines.



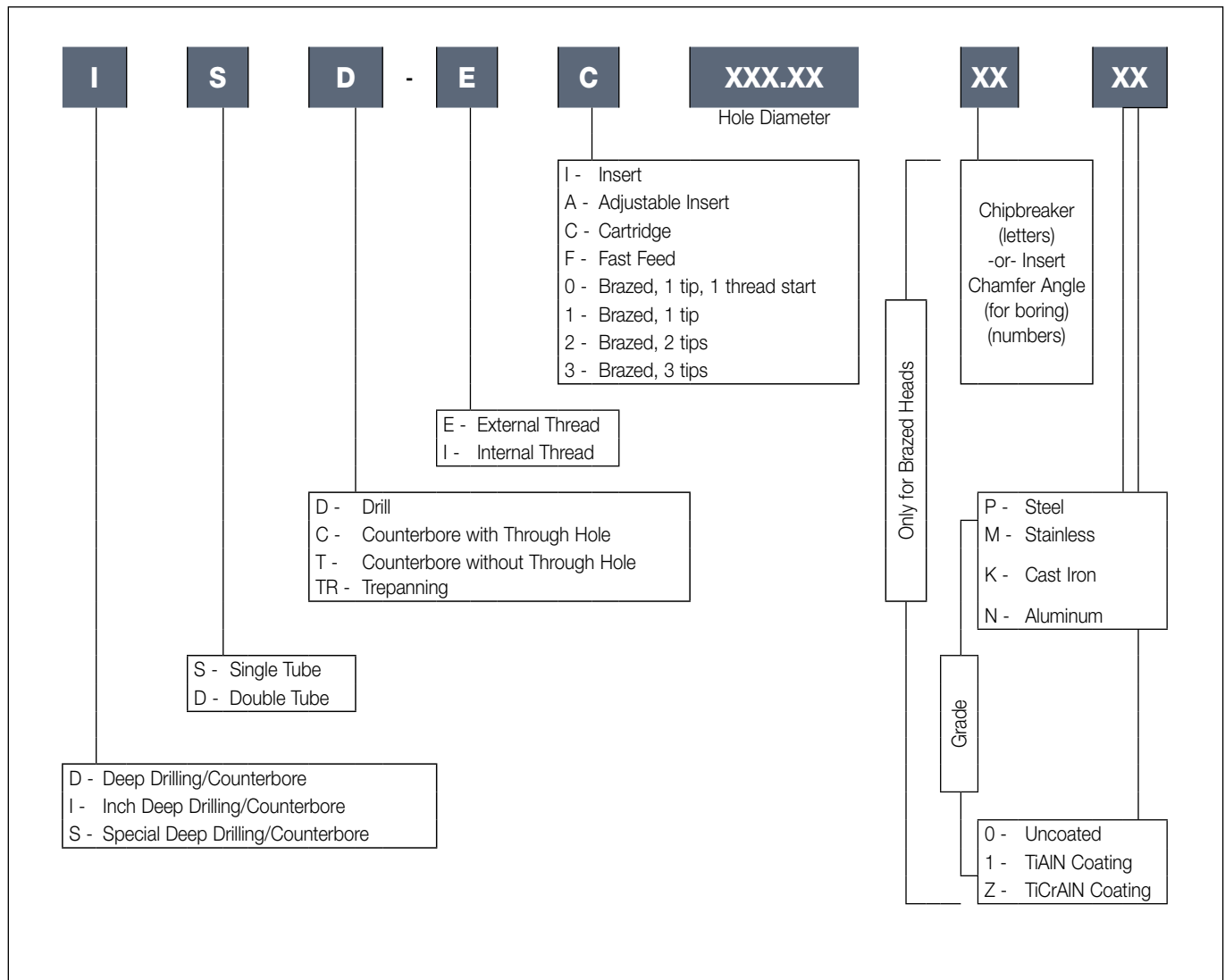
Double Tube System

Double Tube System (DTS) -

Cooling fluid is induced between the coaxial tubes, conveying the chips through the inner tube and can be applied on standard machines.



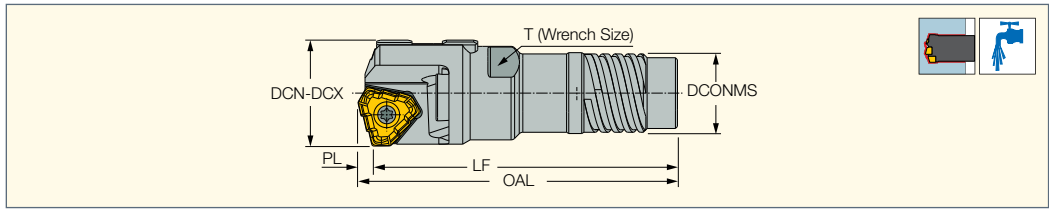
Deep Drilling Heads Identification System





ISD-EF-FT

Deep Single Tube Drills with External 4-Start Thread Connection Carrying Triangular Inserts (.630-1.575 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	LF	OAL	PL	DCONMS	THOD ⁽³⁾
ISD-EF 0.630-0.657-FT	.630	.657	2.165	2.252	.087	.496	TS-10
ISD-EF 0.658-0.696-FT	.658	.696	2.165	2.252	.087	.535	TS-11
ISD-EF 0.697-0.744-FT	.697	.744	2.205	2.323	.118	.571	TS-12
ISD-EF 0.745-0.787-FT	.745	.787	2.205	2.323	.118	.610	TS-13
ISD-EF 0.788-0.858-FT	.788	.858	2.362	2.488	.126	.630	TS-14
ISD-EF 0.859-0.866-FT	.859	.866	2.500	2.626	.126	.709	TS-15
ISD-EF 0.867-0.948-FT	.867	.948	2.579	2.713	.134	.709	TS-15
ISD-EF 0.949-0.984-FT	.949	.984	2.579	2.713	.134	.768	TS-16
ISD-EF 0.985-1.039-FT	.985	1.039	2.657	2.799	.142	.768	TS-16
ISD-EF 1.040-1.102-FT	1.040	1.102	2.657	2.799	.142	.827	TS-17
ISD-EF 1.103-1.129-FT	1.103	1.129	2.756	2.936	.180	.827	TS-17
ISD-EF 1.130-1.220-FT	1.130	1.220	2.953	3.133	.180	.925	TS-18
ISD-EF 1.221-1.259-FT	1.221	1.259	2.953	3.133	.180	1.004	TS-19
ISD-EF 1.260-1.311-FT	1.260	1.311	2.933	2.950	.214	1.004	TS-19
ISD-EF 1.312-1.425-FT	1.312	1.425	3.130	3.344	.214	1.102	TS-110
ISD-EF 1.426-1.559-FT	1.426	1.559	3.524	3.737	.214	1.181	TS-111
ISD-EF 1.560-1.575-FT	1.560	1.575	3.720	3.934	.214	1.299	TS-112

- Note: Each item in the attached catalog page represents a diameter range. • For spare parts, insert information and user guide see pages 248-252
- Inserts and guide pads to be ordered separately • Ordering example: ISD-EF 1.430-FT

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Tube designation

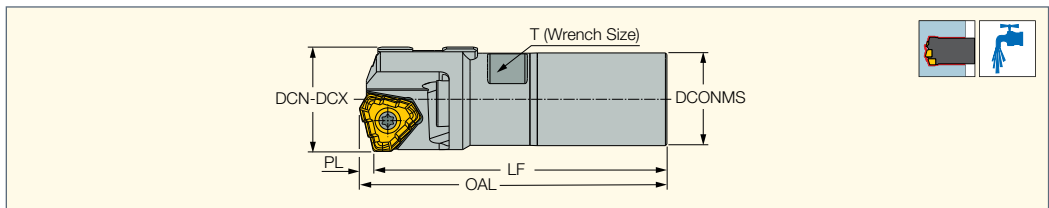
For inserts, see pages: TOGT-DT (246) • TOGT-GF (246)

For holders, see pages: TS-I** (322)



ISD-IF-FT

Deep Single Tube Drills with Internal Single-Start Thread Connection Carrying Triangular Inserts (.630-1.260 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	LF	OAL	PL	DCONMS	THID ⁽³⁾
ISD-IF 0.630-0.649-FT	.630	.649	2.106	2.193	.087	.500	TS-O ₃
ISD-IF 0.650-0.679-FT	.650	.679	2.106	2.193	.087	.528	TS-O ₄
ISD-IF 0.680-0.708-FT	.680	.708	2.106	2.193	.087	.539	TS-O ₅
ISD-IF 0.709-0.748-FT	.709	.748	2.106	2.224	.118	.567	TS-O ₆
ISD-IF 0.749-0.787-FT	.749	.787	2.106	2.232	.126	.606	TS-O ₇
ISD-IF 0.788-0.866-FT	.788	.866	2.283	2.409	.126	.650	TS-O ₈
ISD-IF 0.867-0.984-FT	.867	.984	2.362	2.496	.134	.748	TS-O ₉
ISD-IF 0.985-1.062-FT	.985	1.062	2.559	2.701	.142	.787	TS-10
ISD-IF 1.063-1.102-FT	1.063	1.102	2.559	2.701	.142	.866	TS-11
ISD-IF 1.103-1.180-FT	1.103	1.180	2.953	3.133	.180	.866	TS-12
ISD-IF 1.181-1.259-FT	1.181	1.259	2.953	3.133	.180	.945	TS-13
ISD-IF 1.260-FT	1.260	1.260	2.953	3.133	.180	1.024	TS-14

- Note: Each item in the attached catalog page represents a diameter range • For spare parts, insert information and user guide, see pages 248-252
- Inserts and guide pads to be ordered separately • Ordering example: ISD-IF 1.150-FT

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

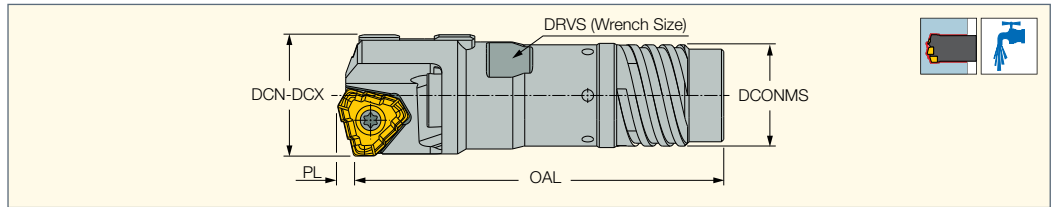
⁽³⁾ Tube designation

For inserts, see pages: TOGT-DT (246) • TOGT-GF (246)

For holders, see pages: TS-O** (323)

IDD-EF-FT

Deep Double Tube Drills
with External 4-Start Thread
Connection Carrying Triangular
Inserts (.725-1.102 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	PL	OAL	DCONMS	THOD ⁽³⁾	THID ⁽⁴⁾
IDD-EF 0.725-0.787-FT	.725	.787	.118	2.520	.630	TDO-10	TDI-N0
IDD-EF 0.788-0.858-FT	.788	.858	.126	2.626	.709	TDO-11	TDI-N1
IDD-EF 0.859-0.866-FT	.859	.866	.126	2.626	.768	TDO-12	TDI-N2
IDD-EF 0.867-0.948-FT	.867	.948	.134	2.713	.768	TDO-12	TDI-N2
IDD-EF 0.949-0.984-FT	.949	.984	.134	2.713	.827	TDO-13	TDI-N3
IDD-EF 0.985-1.039-FT	.985	1.039	.142	2.799	.827	TDO-13	TDI-N3
IDD-EF 1.040-1.102-FT	1.040	1.102	.142	2.917	.925	TDO-14	TDI-N4

• Note: Each item in the attached catalog page represents a diameter range. • For spare parts, insert information and user guide, see pages 248-252

• Inserts and guide pads to be ordered separately • Ordering example: IDD-EF 0.750FT

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Outer tube designation

⁽⁴⁾ Inner tube designation

For inserts, see pages: TOGT-DT (246) • TOGT-GF (246)

For holders, see pages: TDO-I (D.725-2.56) (324)

Universal Marking for Deep Drilling Tools

D- Tool diameter

Metric- D16.00

Inch- D.630

d- Pilot diameter

Metric- d12.6

Inch- d.496

Tool style

F- Fixed pocket 3-5 cutting edges

G- Fixed pocket single cutting edge

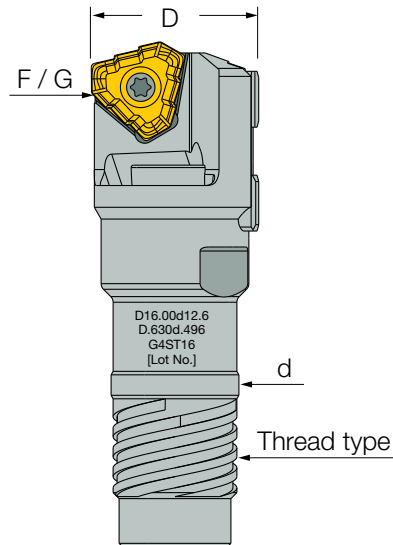
Thread type

4ST- Four-start thread single tube

1ST- Single-start thread single tube

4DT- Four-start thread double tube

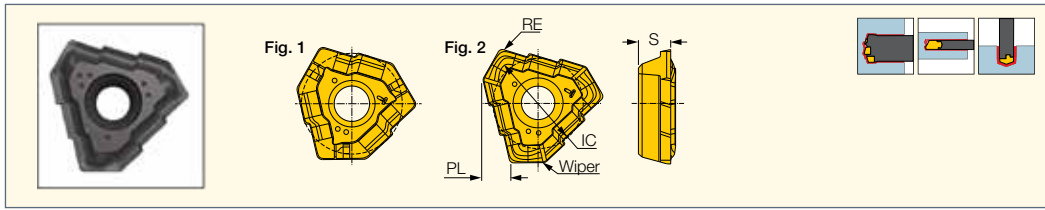
16- Tube diameter





TOGT-DT

Deep Drilling Inserts with 3 Chip Splitting Cutting Edges, a Positive Rake Chipbreaker and a Wiper



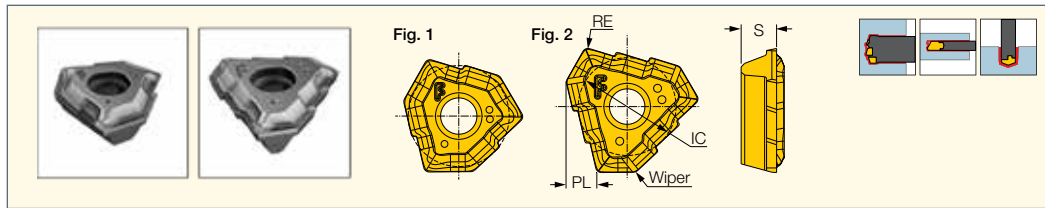
Designation	Dimensions					Fig.	IC908
	IC	RE	PL	S			
TOGT 070304-DT	.303	.0157	.077	.091		1	•
TOGT 080305-DT	.337	.0197	.087	.110		1	•
TOGT 090305-DT	.328	.0197	.118	.118		2	•
TOGT 100305-DT	.363	.0197	.126	.130		2	•
TOGT 110405-DT	.409	.0197	.134	.150		2	•
TOGT 120405-DT	.456	.0197	.142	.169		2	•
TOGT 130408-DT	.506	.0315	.180	.187		2	•
TOGT 140510-DT	.663	.0394	.214	.207		2	•

For tools, see pages: GD-DH (344) • GDH-MKT (348) • IDD-EF-FT (245) • ISD-EF-FT (244) • ISD-IF-FT (244)



TOGT-GF

Deep Drilling Inserts with 3 Chip Splitting Cutting Edges, a Positive Rake Chipbreaker and a Wiper

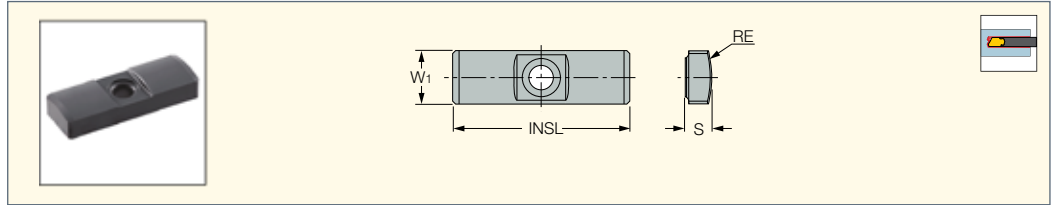


Designation	Dimensions					Fig.	IC908
	IC	RE	PL	S			
TOGT 070304-GF	.303	.0157	.077	.091		1	•
TOGT 080305-GF	.337	.0197	.087	.110		1	•
TOGT 090305-GF	.328	.0197	.118	.118		2	•
TOGT 100305-GF	.363	.0197	.126	.130		2	•
TOGT 110405-GF	.409	.0197	.134	.150		2	•
TOGT 120405-GF	.456	.0197	.142	.169		2	•
TOGT 130408-GF	.506	.0315	.180	.187		2	•

For tools, see pages: GD-DH (344) • GDH-MKT (348) • IDD-EF-FT (245) • ISD-EF-FT (244) • ISD-IF-FT (244)

Chipbreaker Appearances

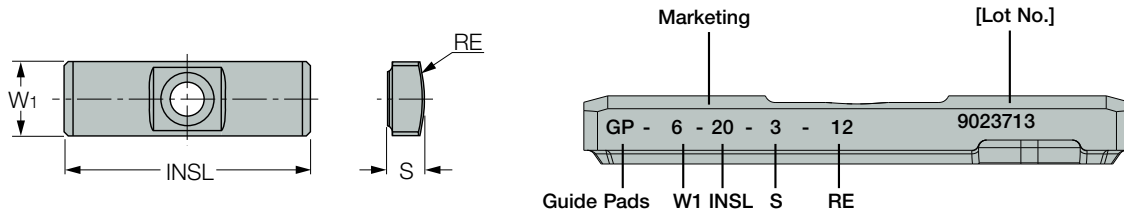
		GF	DT
1	<p>Rake angle</p>	$a^\circ=25^\circ$	$a^\circ=20^\circ$
2	<p>ID mark</p>		



Designation	Dimensions				Tough ↔ Hard		
	W1	INSL	S	RE	IC928	IC950	IC908
GPS-04-16-055-DC	.157	.630	.079	.2165	•		•
GPS-05-18-060-DC	.197	.709	.098	.2362	•		•
GPS-05-18-075-DC	.197	.709	.098	.2953	•		•
GPS-06-20-075-DC	.236	.787	.118	.2953			•
GPS-06-20-075	.236	.787	.118	.2953		•	•
GPS-06-20-085-DC	.236	.787	.118	.3346	•		•
GPS-06-20-085	.236	.787	.118	.3346		•	
GPS-06-20-100-DC	.236	.787	.118	.3937	•		•
GPS-06-20-100	.236	.787	.118	.3937		•	
GPS-06-20-120-DC	.236	.787	.118	.4724	•		•
GPS-06-20-120	.236	.787	.118	.4724		•	
GPS-07-20-120-DC	.276	.787	.138	.4724	•		•
GPS-07-20-120	.276	.787	.138	.4724		•	•
GPS-08-25-155-DC	.315	.984	.177	.6102	•		•
GPS-08-25-155	.315	.984	.177	.6102		•	•
GPS-10-30-200-DC	.394	1.181	.177	.7874	•		•
GPS-10-30-200	.394	1.181	.177	.7874		•	
GPS-10-35-200-DC	.394	1.378	.236	.7874	•		•
GPS-10-35-200	.394	1.378	.236	.7874		•	•
GPS-12-35-250-DC	.472	1.378	.217	.9842	•		•
GPS-12-35-250	.472	1.378	.217	.9842		•	•
GPS-14-40-250-DC	.551	1.575	.295	.9842	•		•
GPS-14-40-250	.551	1.575	.295	.9842		•	•
GPS-18-40-300-DC	.709	1.575	.354	1.1811	•		•

• DC- Double Chamfer

Universal Marking for Deep Drilling Tools



Guide Pad Grade Recommendation

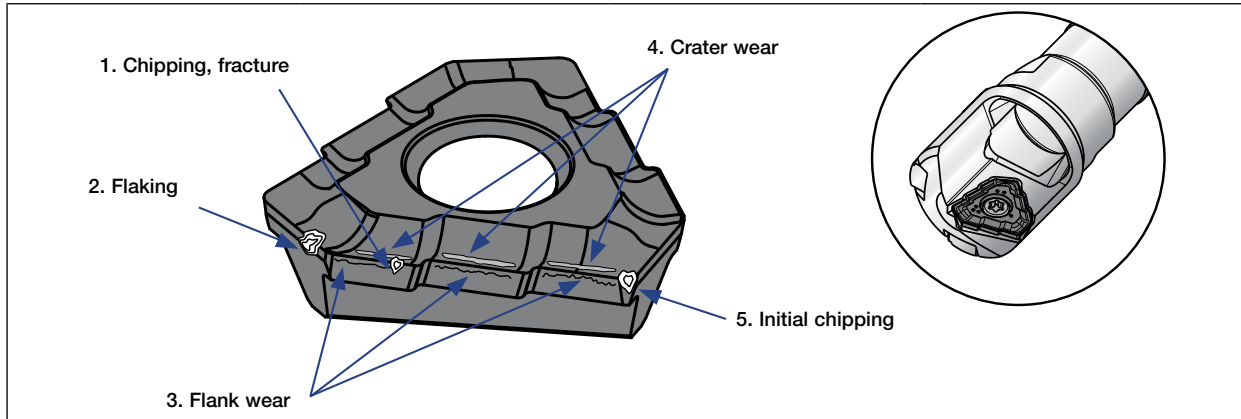
Priority	Oil Coolant			Water Based Coolant		
	1	2	3	1	2	3
ISO-P	IC950	IC908	IC928	IC928	IC908	-
ISO-K	IC950	IC908	IC928	IC928	IC908	-
ISO-M	IC928	IC908	IC950	IC928	IC908	-
ISO-S	IC928	IC908	IC950	IC928	IC908	-

Spare Parts

Diameter range	Insert	Insert clamping screw	Key	lbf*in	Solid carbide guide pad	Guide pad clamping screw	Key
.551-.629	TOGT 070304-DT/GF	SR 14-560/S M2.5X0.45	T-8/5	10.6	GPS-05-18-060-DC	SR 34-508 M2.2X0.45	T-7/5
.630-.708	TOGT 080305-DT/GF	SR 14-560/S M2.5X0.45	T-8/5	10.6	GPS-05-18-075-DC		
.709-.787	TOGT 090305-DT/GF	SR 14-560/S M2.5X0.45	T-8/5	10.6	GPS-06-20-085-DC		
.788-.826	TOGT 100305-DT/GF	SR 34-506 M3X0.5	T-9/5	17.7	GPS-06-20-085-DC		
.827-.865	TOGT 100305-DT/GF				GPS-06-20-100-DC		
.866-.984	TOGT 110405-DT/GF	SR 14-571/S M3.5X0.6	T-15/5	42.5	GPS-06-20-100-DC		
.985-1.102	TOGT 120405-DT/GF	SR 14-506 M4X0.7	T-15/5	42.5	GPS-06-20-120-DC		
1.103-1.180	TOGT 130408-DT/GF	SR 16-212/L10 M5X0.8	T20/5	88.5	GPS-06-20-120-DC	SR 34-508 M2.2X0.45	T-7/5
1.181-1.259	TOGT 130408-DT/GF				GPS-07-20-120-DC	CSTB-3L065 M2.2X0.45	T-9/5
1.260-1.535	TOGT 140510-DT/GF				GPS-07-20-120-DC		
1.536-1.575	TOGT 140510-DT/GF				GPS-08-25-155-DC		

Troubleshooting for Insert Damage

Examples of Trouble With the Cutting Edge



Problem	Cause	Solution	
		Grade	Cutting conditions / other
1. Chipping, fracture	<ul style="list-style-type: none"> Excessive vibration or impact Torn away built-up edge 	<ul style="list-style-type: none"> Use a tough grade 	<ul style="list-style-type: none"> Reduce the feed rate Eliminate the vibration
2. Flaking	<ul style="list-style-type: none"> Excessive vibration or impact 	<ul style="list-style-type: none"> Use a tough grade 	<ul style="list-style-type: none"> Reduce the feed rate Eliminate the vibration
3. Flank wear	<ul style="list-style-type: none"> Cutting speed too high Inadequate tool toughness 	<ul style="list-style-type: none"> Use a grade with high wear resistance Use a coated grade 	<ul style="list-style-type: none"> Reduce the cutting speed Reduce the feed rate Use coolant properly
4. Crater wear	<ul style="list-style-type: none"> Cutting speed too high Feed rate too high Inadequate tool toughness 	<ul style="list-style-type: none"> Use a grade with high wear resistance Use a coated grade 	<ul style="list-style-type: none"> Reduce the cutting speed Reduce the feed rate Use coolant properly
5. Initial chipping	<ul style="list-style-type: none"> Inappropriate guide bush or pilot hole Misalignment 	<ul style="list-style-type: none"> Use a tough grade 	<ul style="list-style-type: none"> Adjust or change the guide bushing or pilot hole Reduce the feed rate Correct the misalignment

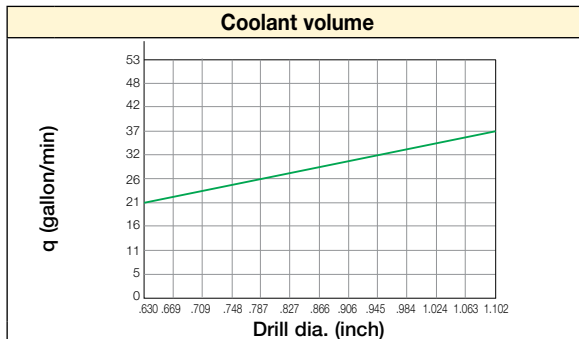
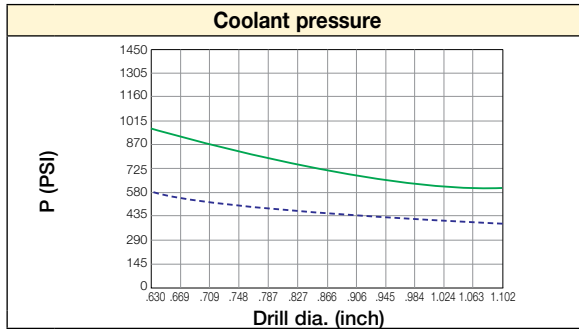
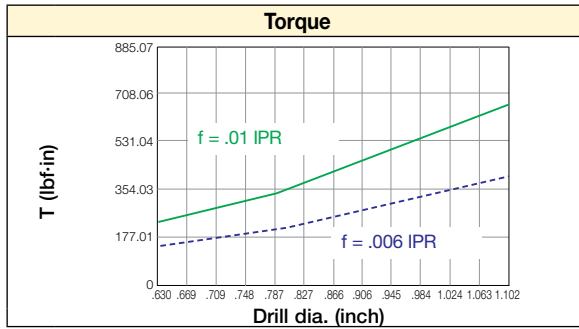
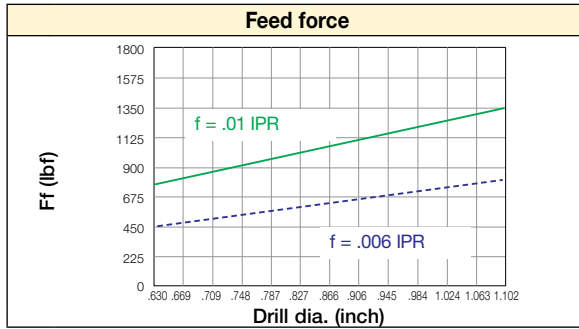
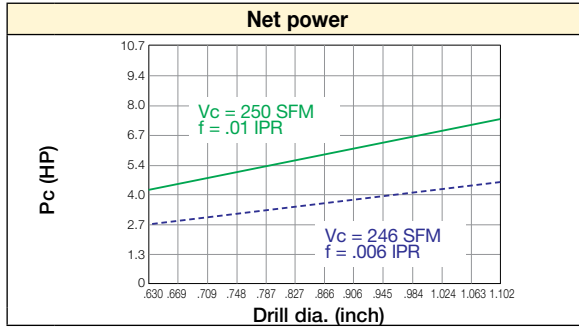
Machining Recommendations for TRIDEEP BTA Drilling Heads

ISO	Material	Condition	Tensile Strength [ksi]	Material Group No. ⁽¹⁾	Hardness (HB)	Chipbreaker	Cutting Speed V _c (SFM)	Feed : f (IPR)		
								Drill dia. (inch)		
								Ø.630-.709	Ø.7091-1.575	
P	Non-alloy steel and cast steel, free cutting steel	<0.25% C	Annealed	61	1	125	GF	165 - 330	.001 - .004	.001 - .004
							DT	260 - 460	.002 - .004	.002 - .004
		≥0.25% C	Annealed	94	2	190	GF	165 - 330	.001 - .004	.001 - .004
							DT	260 - 460	.002 - .004	.002 - .004
		<0.55% C	Quenched and tempered	123	3	250	GF	165 - 330	.001 - .004	.001 - .005
							DT	260 - 460	.002 - .006	.002 - .008
		≥0.55% C	Annealed	109	4	220	GF	165 - 330	.001 - .004	.001 - .005
							DT	260 - 460	.002 - .006	.002 - .008
		Quenched and tempered	145	5	300	GF	165 - 330	.001 - .004	.001 - .005	
						DT	260 - 460	.002 - .006	.002 - .008	
	Low alloy and cast steel (less than 5% of alloying elements)	Annealed	87	6	200	GF	165 - 330	.001 - .004	.001 - .004	
						DT	260 - 460	.002 - .004	.002 - .004	
		Quenched and tempered	135	7	275	GF	165 - 330	.001 - .004	.001 - .004	
						DT	260 - 460	.002 - .004	.002 - .004	
			145	8	300	GF	165 - 330	.001 - .004	.001 - .004	
						DT	260 - 460	.002 - .004	.002 - .004	
	174	9	350	GF	165 - 330	.001 - .004	.001 - .004			
				DT	260 - 460	.002 - .004	.002 - .004			
	High alloyed steel, cast steel and tool steel	Annealed	99	10	200	GF	165 - 330	.001 - .004	.001 - .005	
						DT	260 - 395	.002 - .006	.002 - .008	
Quenched and tempered		160	11	325	GF	165 - 330	.001 - .004	.001 - .005		
					DT	260 - 395	.002 - .006	.002 - .008		
Stainless steel and cast steel	Ferritic/martensitic	99	12	200	GF	165 - 330	.001 - .002	.001 - .002		
					DT	195 - 330	.002 - .004	.002 - .004		
	Martensitic	119	13	240	GF	165 - 330	.001 - .002	.001 - .002		
					DT	195 - 330	.002 - .004	.002 - .004		
M	Stainless steel and cast steel	Austenitic, duplex	87	14	180	GF	165 - 330	.001 - .002	.001 - .002	
						DT	195 - 330	.002 - .004	.002 - .004	
K	Grey cast iron (GG)	Ferritic/pearlitic		15	180	GF	165 - 330	.001 - .006	.002 - .007	
						DT	260 - 460	.002 - .01	.002 - .012	
		Pearlitic/martensitic		16	260	GF	165 - 330	.001 - .006	.002 - .007	
						DT	260 - 460	.002 - .01	.002 - .012	
	Nodular cast iron (GGG)	Ferritic		17	160	GF	165 - 330	.001 - .006	.002 - .007	
						DT	260 - 460	.002 - .01	.002 - .012	
		Pearlitic		18	250	GF	165 - 330	.001 - .006	.002 - .007	
						DT	260 - 460	.002 - .01	.002 - .012	
	Malleable cast iron	Ferritic		19	130	GF	165 - 330	.001 - .006	.002 - .007	
						DT	260 - 460	.002 - .01	.002 - .012	
Pearlitic		20	230	GF	165 - 330	.001 - .006	.002 - .007			
				DT	260 - 460	.002 - .01	.002 - .012			
N	Aluminum-wrought alloys	Not hardenable		21	60	GF	260 - 525	.001 - .006	.001 - .006	
						DT	330 - 655	.002 - .008	.002 - .008	
		Hardenable		22	100	GF	260 - 525	.001 - .006	.001 - .006	
						DT	330 - 655	.002 - .008	.002 - .008	
	Aluminum- cast alloys	≤12% Si	Not hardenable		23	75	GF	260 - 525	.001 - .006	.001 - .006
							DT	330 - 655	.002 - .008	.002 - .008
		Hardenable		24	90	GF	260 - 525	.001 - .006	.001 - .006	
						DT	330 - 655	.002 - .008	.002 - .008	
	>12% Si	High temperature		25	130	GF	260 - 525	.001 - .006	.001 - .006	
						DT	330 - 655	.002 - .008	.002 - .008	
	Copper alloys	>1% Pb	Free cutting		26	110	GF	260 - 525	.001 - .006	.001 - .006
							DT	330 - 655	.002 - .008	.002 - .008
		Brass		27	90	GF	260 - 525	.001 - .006	.001 - .006	
						DT	330 - 655	.002 - .008	.002 - .008	
Electrolitic copper				28	100	GF	260 - 525	.001 - .006	.001 - .006	
						DT	330 - 655	.002 - .008	.002 - .008	
S	High temperature alloys	Fe based	Annealed	31	200	GF	165 - 330	.001 - .002	.001 - .002	
						DT	195 - 330	.002 - .004	.002 - .004	
		Hardened		32	280	GF	165 - 330	.001 - .002	.001 - .002	
						DT	195 - 330	.002 - .004	.002 - .004	
		Annealed		33	250	GF	65 - 165	.001 - .002	.001 - .003	
						DT	65 - 165	.002 - .003	.002 - .004	
	Hardened		34	350	GF	65 - 165	.001 - .002	.001 - .003		
					DT	65 - 165	.002 - .003	.002 - .004		
	Titanium alloys	Cast		35	320	GF	65 - 165	.001 - .002	.001 - .003	
						DT	65 - 165	.002 - .003	.002 - .004	
Pure			58	36	GF	100 - 195	.001 - .004	.001 - .005		
					DT	100 - 195	.002 - .005	.002 - .006		
Alpha+Beta alloys hardened		152	37	GF	100 - 195	.001 - .004	.001 - .005			
				DT	100 - 195	.002 - .005	.002 - .006			
H	Hardened steel ≥40HRC	Hardened		38		GF	130 - 330	.001 - .003	.001 - .003	
						DT	165 - 330	.002 - .003	.002 - .004	

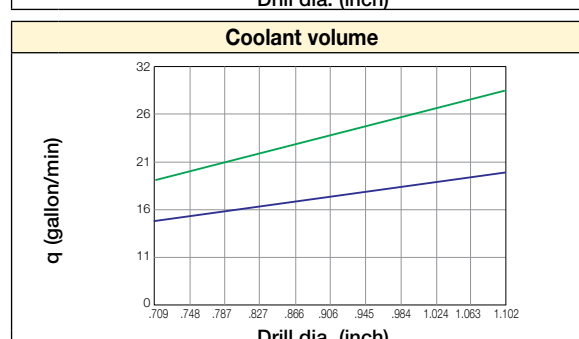
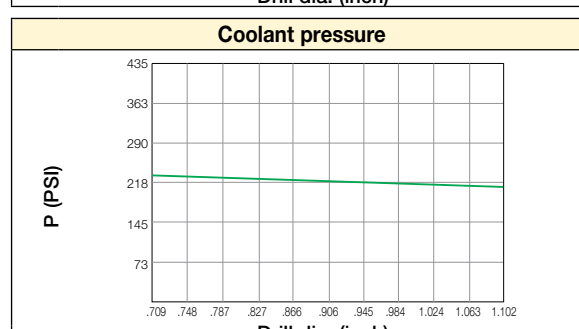
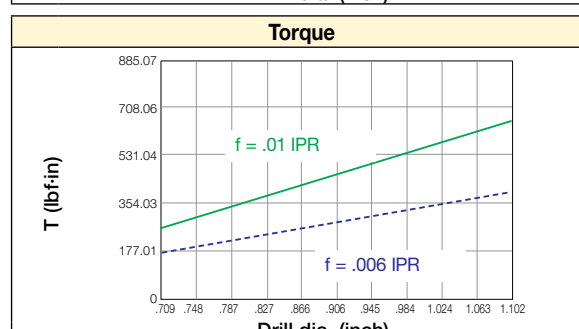
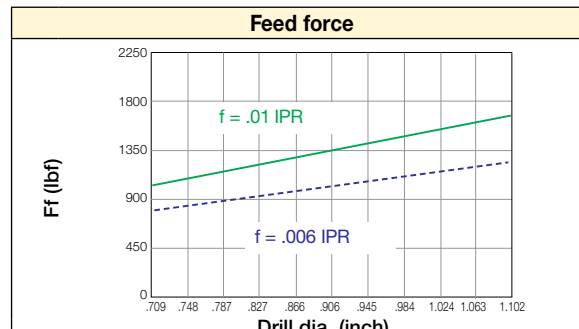
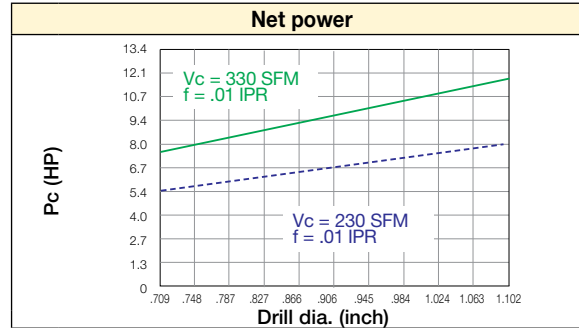
⁽¹⁾ For material groups see pages 573-604

Technical Guide

STS - Machine Setting for Single Tube System



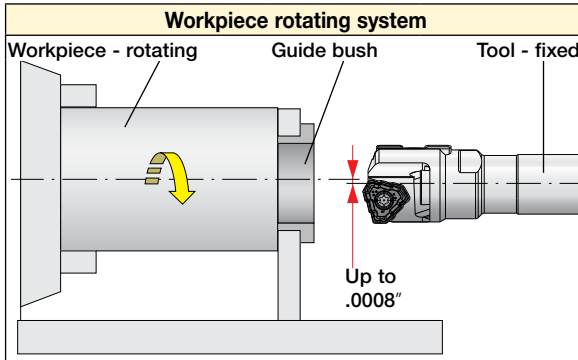
DTS - Machine Setting for Double Tube System



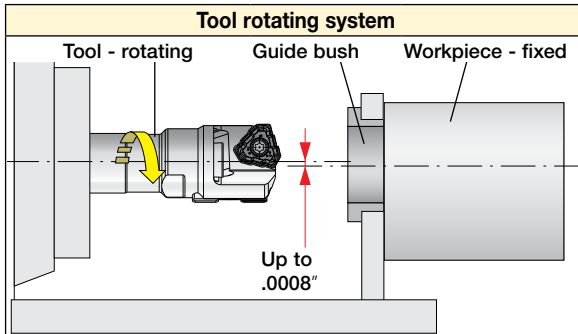
The above values should not be used as the exact recommendations. They may need modification depending on the machining conditions, materials, etc.

Machine Setup

STS and DTS



- Only used when the workpiece and the tool axis are on the same line.
- Better hole straightness and wear resistance on guide bush are provided compared to the tool rotating system.
- Keep the alignment between guide bush and spindle within .0008".



- Can be used when the workpiece and the tool axis are not on the same line.
- Keep the alignment between guide bush and spindle within .0008".

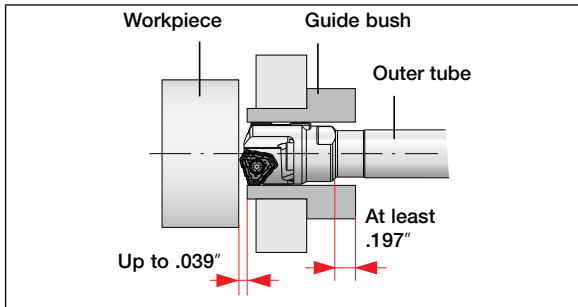
DTS

Positioning of outer tube and guide bush

Be sure to set the outer tube more than .197" into the guide bush to properly supply the coolant.

Positioning of workpiece material and guide bush

Sealing is not required for DTS because of the vacuum effect, but keep the gap between workpiece material and guide bush within .039".



Guide Bush

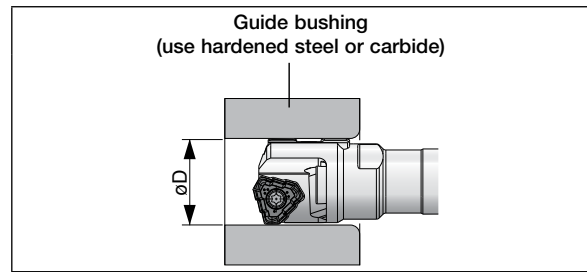
Tolerance

Guide bush tolerance should be G6 in order to keep consistent tool life and cutting accuracy. Diameters for G6 tolerance are shown on the right.

øD (inch)	G6 tolerance (µinch)
.630 - .709	+240 - +680
.7091 - 1.181	+280 - +800
1.1815 - 1.575	+360 - +1000

Material

Guide bush material	System	Advantage
Hardened steel	Workpiece rotating	Cost efficient (inexpensive)
Tungsten carbide	Tool rotating Workpiece rotating	Long life guide bush



Coolant

Temperature

The proper coolant temperature is 30 - 40°C (90 - 100°F). If the temperature exceeds this range, the coolant will deteriorate easily and may shorten tool life and generate poor surface finish.

Filtration

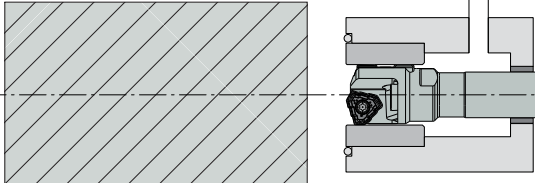
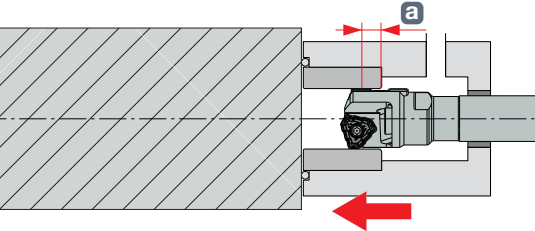
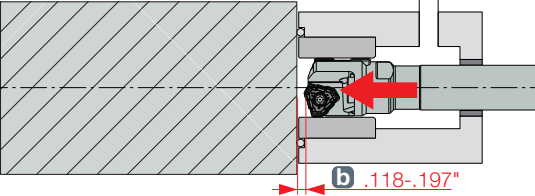
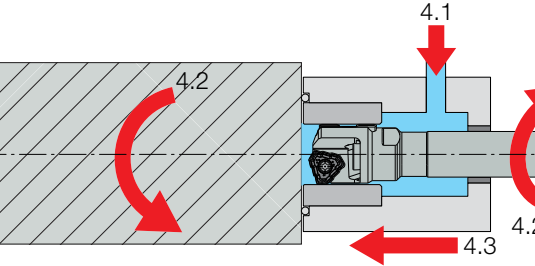
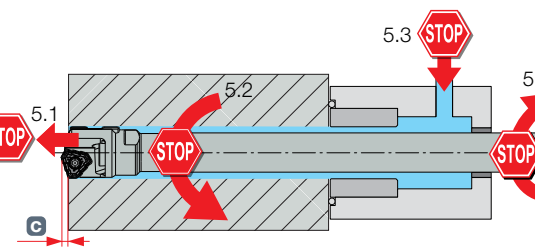
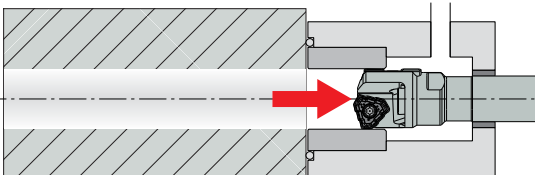
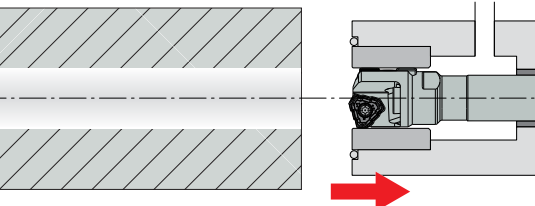
The coolant must be filtered properly in order to protect guide pads and workpiece surface.

Water-soluble type

Around 10% (dilution rate 1/10) is recommended for the concentration of water-soluble coolant in order to protect guide pads.

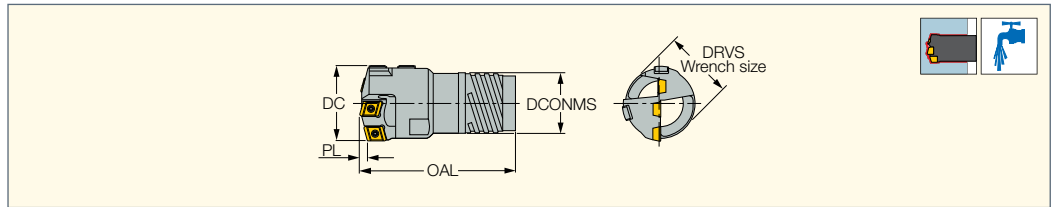
CNC Drilling Cycle Operations

Use the CNC drilling cycle as instructed below in order to optimize the tool performance safely.

	<p>1. Start the CNC cycle operation</p>
	<p>2. Move the oil pressure head and securely seal onto the face of the workpiece.</p> <p>a Make sure to position the drill so that the guide pads remain inside the guide bushing when the pressure head is moved towards the workpiece face.</p>
	<p>3. Move the BTA drill toward the workpiece</p> <p>b Keep the drill .118 - .197** off the face of the workpiece. * If the machine allows this drill setting in Step 1, move on to Step 4.</p>
	<p>4. Start the cutting</p> <p>4.1 Activate the coolant supply. 4.2 Start the rotation (of the drill, the workpiece, or the drill+workpiece). 4.3 Start the drill feed.</p>
	<p>5. Stop the cutting</p> <p>5.1 Stop the drill feed. 5.2 Stop the rotation. 5.3 Stop the coolant supply.</p> <p>c Stop the cutting when the drill shoulder is completely through the end face of the workpiece.</p>
	<p>6. Return the drill to the starting point</p>
	<p>7. Return the oil pressure head to the starting point</p>

ISD-EF-FB

Deep Single Tube Drills with External 4-Start Thread Connection for High Feed (.984-3.504 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	OAL	PL	DCONMS	DRVS ⁽³⁾	TS ⁽⁴⁾
ISD-EF 0.984-1.039-FB	.984	1.039	2.874	.118	.768	.866	TS-16
ISD-EF 1.040-1.129-FB	1.040	1.129	2.874	.118	.827	.906	TS-17
ISD-EF 1.130-1.220-FB	1.130	1.220	3.071	.118	.925	.945	TS-18
ISD-EF 1.221-1.311-FB	1.221	1.311	3.071	.118	1.004	1.063	TS-19
ISD-EF 1.312-1.425-FB	1.312	1.425	3.268	.118	1.102	1.142	TS-110
ISD-EF 1.426-1.559-FB	1.426	1.559	3.661	.118	1.181	1.260	TS-111
ISD-EF 1.560-1.692-FB	1.560	1.692	3.898	.157	1.299	1.378	TS-112
ISD-EF 1.693-1.850-FB	1.693	1.850	4.094	.157	1.417	1.496	TS-113
ISD-EF 1.851-2.035-FB	1.851	2.035	4.094	.157	1.535	1.614	TS-114
ISD-EF 2.036-2.212-FB	2.036	2.212	4.488	.157	1.693	1.811	TS-115
ISD-EF 2.213-2.385-FB	2.213	2.385	4.724	.197	1.850	1.968	TS-116
ISD-EF 2.386-2.559-FB	2.386	2.559	4.724	.197	2.008	2.165	TS-117
ISD-EF 2.560-2.637-FB	2.560	2.637	5.866	.315	2.047	2.480	TS-118
ISD-EF 2.638-2.873-FB	2.638	2.873	5.866	.315	2.283	2.717	TS-119
ISD-EF 2.874-3.149-FB	2.874	3.149	5.906	.354	2.480	2.992	TS-120
ISD-EF 3.150-3.424-FB	3.150	3.424	6.811	.354	2.756	3.268	TS-121
ISD-EF 3.425-3.504-FB	3.425	3.504	6.811	.354	3.031	3.386	TS-122

• For spare parts and insert information, see page 259 • For user guide and quotation form, see pages 260-261, 337-338 • Inserts and guide pads to be ordered separately
 • Ordering example: ISD-EF 1.697-FB

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Torque key size

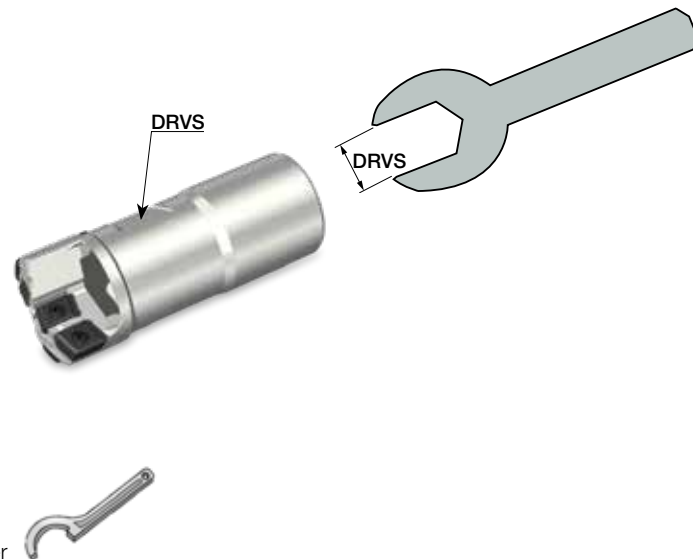
⁽⁴⁾ Tube designation

For inserts, see pages: NPHT (256) • NPMT (257)

For holders, see pages: TS-1** (322)

Wrench Size

Designation	Wrench size DRVS (mm)
ISD-EF 0.984-1.039-FB	22 (.866")
ISD-EF 1.040-1.129-FB	23 (.906")
ISD-EF 1.130-1.220-FB	24 (15/16")
ISD-EF 1.221-1.311-FB	27 (1.063")
ISD-EF 1.312-1.425-FB	29 (1-1/8")
ISD-EF 1.426-1.559-FB	32 (1.260")
ISD-EF 1.560-1.692-FB	35 (1.378")
ISD-EF 1.693-1.850-FB	38 (1-1/2")
ISD-EF 1.851-2.035-FB	41 (1.614")
ISD-EF 2.036-2.212-FB	46 (1.811")
ISD-EF 2.213-2.385-FB	50 (1.968")
ISD-EF 2.386-2.559-FB	55 (2.165")
ISD-EF 2.560-2.637-FB	63 (2.480")
ISD-EF 2.638-2.873-FB	69 (2.717")
ISD-EF 2.874-3.149-FB	76 (2.992")
ISD-EF 3.150-3.424-FB	83 (3.268")
ISD-EF 3.425-3.504-FB	86 (3-3/8")

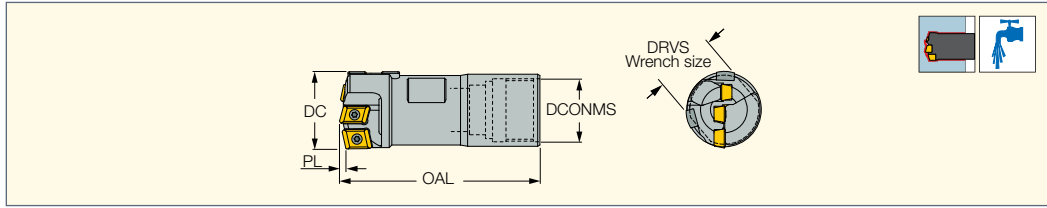


For diameter DC range larger than 2.559" use hook spanner

FINEBEAM

ISD-IF-FB

Deep Single Tube Drills with Internal Single-Start Thread Connection (.984-3.504 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	OAL	PL	DRVS ⁽³⁾	DCONMS	Ts ⁽⁴⁾
ISD-IF 0.984-1.062-FB	.984	1.062	2.874	.118	.748	.787	TS-010
ISD-IF 1.063-1.141-FB	1.063	1.141	2.874	.118	.827	.866	TS-011
ISD-IF 1.142-1.181-FB	1.142	1.181	2.874	.118	.945	.866	TS-011
ISD-IF 1.182-1.259-FB	1.182	1.259	3.071	.118	1.024	.945	TS-012
ISD-IF 1.260-1.338-FB	1.260	1.338	3.071	.118	1.102	1.024	TS-013
ISD-IF 1.339-1.456-FB	1.339	1.456	3.661	.118	1.181	1.063	TS-014
ISD-IF 1.457-1.574-FB	1.457	1.574	3.858	.118	1.260	1.181	TS-015
ISD-IF 1.575-1.732-FB	1.575	1.732	4.094	.157	1.417	1.299	TS-016
ISD-IF 1.733-1.850-FB	1.733	1.850	4.291	.157	1.496	1.457	TS-017
ISD-IF 1.851-2.047-FB	1.851	2.047	4.291	.157	1.811	1.614	TS-018
ISD-IF 2.048-2.244-FB	2.048	2.244	4.488	.157	1.968	1.732	TS-019
ISD-IF 2.245-2.401-FB	2.245	2.401	4.724	.197	2.126	1.929	TS-020
ISD-IF 2.402-2.559-FB	2.402	2.559	4.724	.197	2.480	2.087	TS-021
ISD-IF 2.560-2.677-FB	2.560	2.677	4.409	.315	2.717	2.087	TS-021
ISD-IF 2.678-2.952-FB	2.678	2.952	4.449	.354	2.992	2.323	TS-022
ISD-IF 2.953-3.188-FB	2.953	3.188	5.630	.354	3.268	2.559	TS-023
ISD-IF 3.189-3.504-FB	3.189	3.504	5.630	.354	3.386	2.795	TS-024

• For spare parts and insert information, see page 259 • For user guide and quotation form, see pages 260-261, 337-338 • Inserts and guide pads to be ordered separately
 • Ordering example: ISD-IF 1.697-FB

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Torque key size

⁽⁴⁾ Tube designation

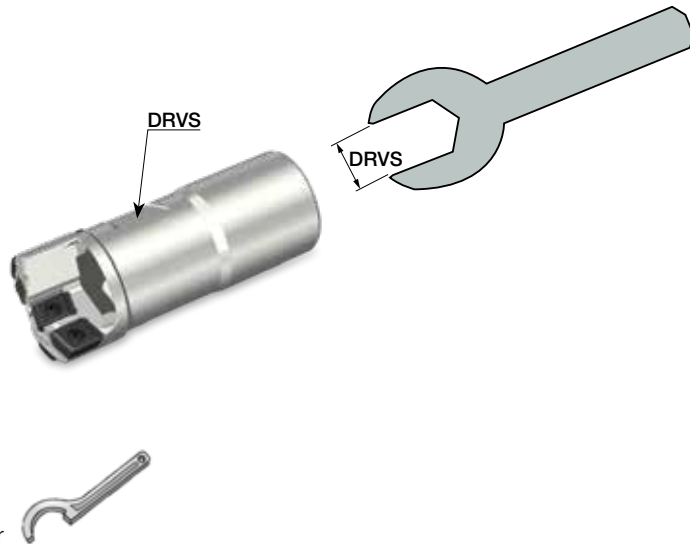
For inserts, see pages: NPHT (256) • NPMT (257)

For holders, see pages: TS-O** (323)

Wrench Size

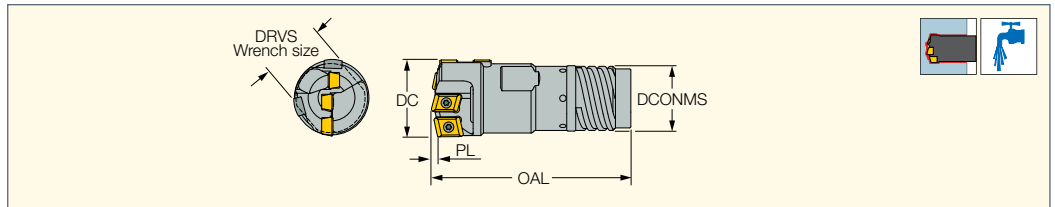
Designation	Wrench size DRVS (mm)
ISD-IF 0.984-1.062-FB	19 (3/4")
ISD-IF 1.063-1.141-FB	21 (13/16")
ISD-IF 1.142-1.181-FB	24 (15/16")
ISD-IF 1.182-1.259-FB	26 (1.024")
ISD-IF 1.260-1.338-FB	28 (1.102")
ISD-IF 1.339-1.456-FB	30 (1.181")
ISD-IF 1.457-1.574-FB	32 (1.260")
ISD-IF 1.575-1.732-FB	36 (1.417")
ISD-IF 1.733-1.850-FB	38 (1-1/2")
ISD-IF 1.851-2.047-FB	46 (1.811")
ISD-IF 2.048-2.244-FB	50 (1.968")
ISD-IF 2.245-2.401-FB	54 (2.126")
ISD-IF 2.402-2.559-FB	63 (2.480")
ISD-IF 2.560-2.677-FB	69 (2.717")
ISD-IF 2.678-2.952-FB	76 (2.992")
ISD-IF 2.953-3.188-FB	83 (3.268")
ISD-IF 3.189-3.504-FB	86 (3-3/8")

For diameter DC range larger than 2.559" use hook spanner



IDD-EF-FB

Deep Double Tube Drills with External 4-Start Thread Connection for High Feed (.984-2.559 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	OAL	PL	DCONMS	DRVS ⁽³⁾	Ts ⁽⁴⁾	Tsi ⁽⁵⁾
IDD-EF 0.984-1.039-FB	.984	1.039	2.874	.118	.827	.866	TDO-I3	TDI-N3
IDD-EF 1.040-1.129-FB	1.040	1.129	3.071	.118	.925	.906	TDO-I4	TDI-N4
IDD-EF 1.130-1.220-FB	1.130	1.220	3.071	.118	1.004	.945	TDO-I5	TDI-N5
IDD-EF 1.221-1.311-FB	1.221	1.311	3.268	.118	1.102	1.063	TDO-I6	TDI-N6
IDD-EF 1.312-1.425-FB	1.312	1.425	3.661	.118	1.181	1.142	TDO-I7	TDI-N7
IDD-EF 1.426-1.559-FB	1.426	1.559	3.898	.157	1.299	1.260	TDO-I8	TDI-N8
IDD-EF 1.560-1.692-FB	1.560	1.692	4.094	.157	1.417	1.378	TDO-I9	TDI-N9
IDD-EF 1.693-1.850-FB	1.693	1.850	4.094	.157	1.535	1.496	TDO-I10	TDI-N10
IDD-EF 1.851-2.035-FB	1.851	2.035	4.488	.157	1.693	1.614	TDO-I11	TDI-N11
IDD-EF 2.036-2.212-FB	2.036	2.212	4.724	.197	1.850	1.811	TDO-I12	TDI-N12
IDD-EF 2.213-2.385-FB	2.213	2.385	4.724	.197	2.008	1.968	TDO-I13	TDI-N13
IDD-EF 2.386-2.559-FB	2.386	2.559	4.724	.197	2.008	2.165	TDO-I13	TDI-N13

• For spare parts and insert information, see page 259 • For user guide and quotation form, see pages 260-261, 337-338 • Inserts and guide pads to be ordered separately

• Ordering example: IDD-EF 1.693-FB

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Torque key size

⁽⁴⁾ Outer tube designation

⁽⁵⁾ Inner tube designation

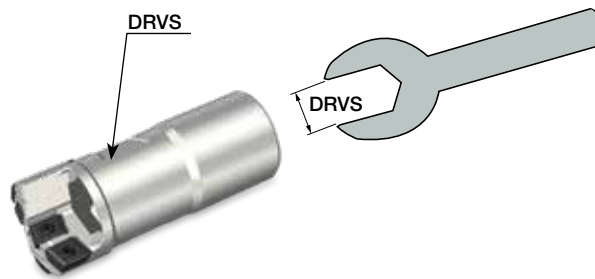
For inserts, see pages: NPHT (256) • NPMT (257)

For holders, see pages: TDO-I (D.725-2.56) (324)

Universal Marking for Deep Drilling Tools

Wrench Size

Designation	Wrench size DRVS (mm)
IDD-EF 0.984-1.039-FB	22 (.866")
IDD-EF 1.040-1.129-FB	23 (.906")
IDD-EF 1.130-1.220-FB	24 (15/16")
IDD-EF 1.221-1.311-FB	27 (1.063")
IDD-EF 1.312-1.425-FB	29 (1-1/8")
IDD-EF 1.426-1.559-FB	32 (1.260")
IDD-EF 1.560-1.692-FB	35 (1.378")
IDD-EF 1.693-1.850-FB	38 (1-1/2")
IDD-EF 1.851-2.035-FB	41 (1.614")
IDD-EF 2.036-2.212-FB	46 (1.811")
IDD-EF 2.213-2.385-FB	50 (1.968")
IDD-EF 2.386-2.559-FB	55 (2.165")



D- Tool diameter

Metric- D25.4

Inch- D1.000

d- Pilot diameter

Metric- d19.5

Inch- d.768

Tool style

F- Fixed pocket 3-5 cutting edge

G- Fixed pocket single cutting edge

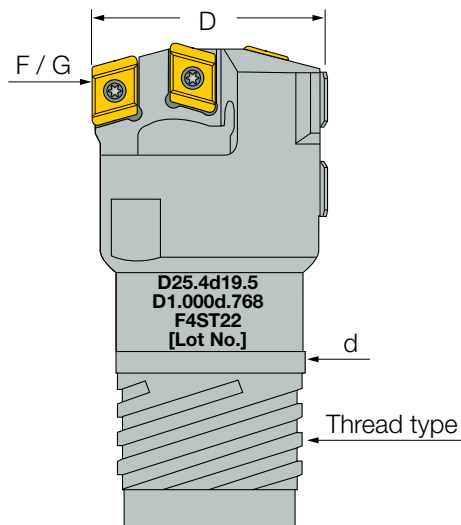
Thread type

4ST- Four-start thread single tube

1ST- Single-start thread single tube

4DT- Four-start thread double tube

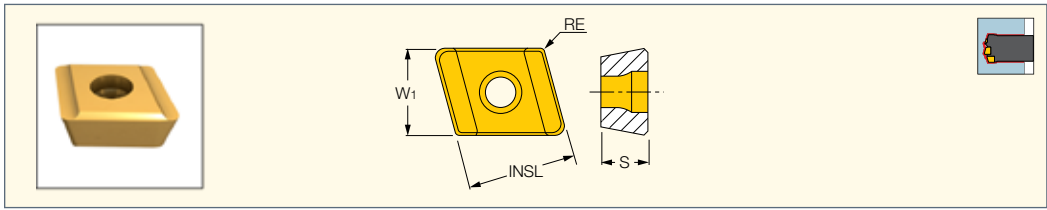
22- Tube diameter





NPHT

Peripheral Precision Inserts
for Drilling Heads ISD-EF-FB
/ IDD-EF-FB / ISD-IF-FB



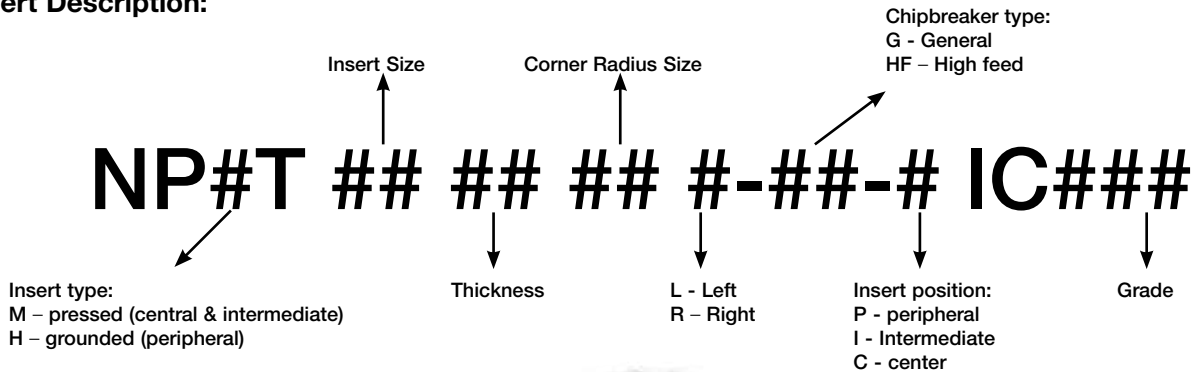
Designation	Dimensions				Tough ↔ Hard		
	W1	INSL	S	RE	IC908	IC520	IC806
NPHT 060304R-G-P	.236	.315	.118	.0157	●	●	
NPHT 070404R-G-P	.295	.394	.157	.0157	●	●	
NPHT 090404R-G-P	.354	.394	.157	.0157	●	●	
NPHT 110404R-G-P	.433	.394	.157	.0157	●	●	
NPHT 130404R-G-P	.512	.394	.157	.0157	●	●	
NPHT 060308R-G-P	.236	.315	.118	.0315	●		●
NPHT 070408R-G-P	.295	.394	.157	.0315	●		●
NPHT 090408R-G-P	.354	.394	.157	.0315	●		●
NPHT 110408R-G-P	.433	.394	.157	.0315	●		●
NPHT 130408R-G-P	.512	.394	.157	.0315	●		●
NPHT 060308R-HF-P	.236	.315	.118	.0315	●		●
NPHT 070408R-HF-P	.295	.394	.157	.0315	●		●
NPHT 090408R-HF-P	.354	.394	.157	.0315	●		●
NPHT 110408R-HF-P	.433	.394	.157	.0315	●		●
NPHT 130408R-HF-P	.512	.394	.157	.0315	●		●

For tools, see pages: IDD-EF-FB (255) • ISD-EF-FB (253) • ISD-IF-FB (254)

	NPHT		
	IC908	IC520	IC806
P	● ● ●	○	○ ○
M	○ ○	○	● ● ●
K	● ● ●		○ ○
N	● ● ●		○ ○
S	○ ○	○	● ● ●
H	○ ○		● ● ●

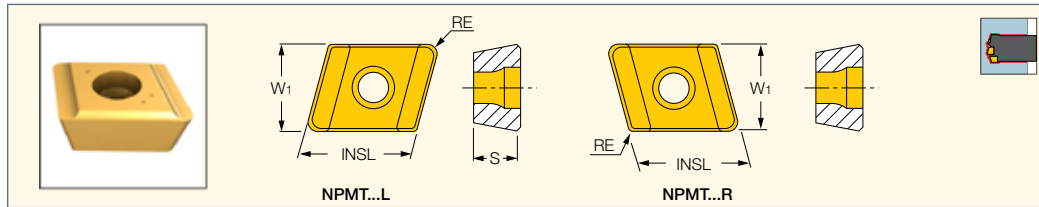
● ● ● First priority

Insert Description:



NPMT

Internal and Central Inserts for Drilling Heads
ISD-EF-FB /IDD-EF-FB



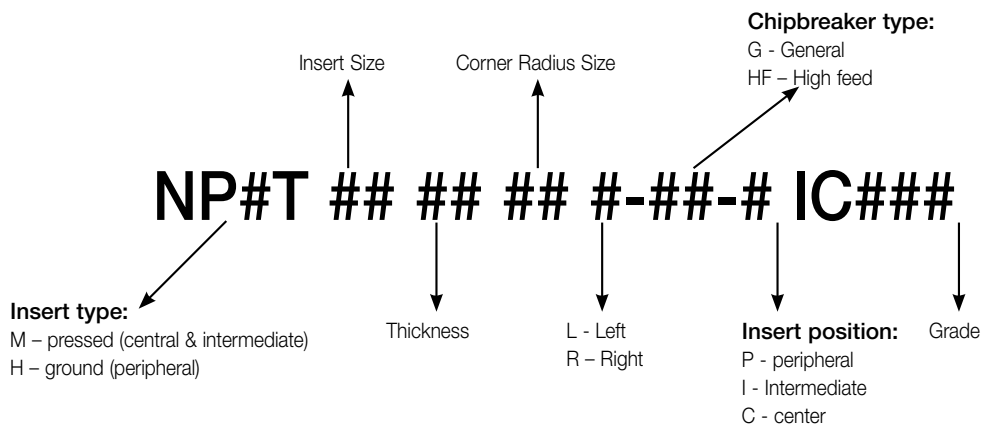
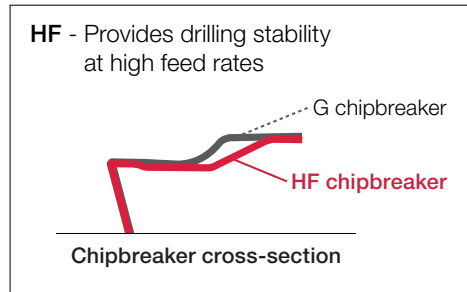
Designation	Dimensions				Tough ↔ Hard			
	W1	INSL	S	RE	IC9025	IC908	IC520	IC806
NPMT 050304R-G-I	.217	.315	.118	.0157		●	●	●
NPMT 060404R-G-I	.256	.394	.157	.0157	●	●	●	●
NPMT 080404R-G-I	.315	.394	.157	.0157	●	●	●	●
NPMT 090404R-G-I	.374	.394	.157	.0157	●	●	●	●
NPMT 120404R-G-I	.492	.394	.157	.0157	●	●	●	●
NPMT 050304R-HF-I	.217	.315	.118	.0157		●		●
NPMT 060404R-HF-I	.256	.394	.157	.0157		●		●
NPMT 080404R-HF-I	.315	.394	.157	.0157		●		●
NPMT 090404R-HF-I	.374	.394	.157	.0157		●		●
NPMT 120404R-HF-I	.492	.394	.157	.0157		●		●
NPMT 050308L-G-C	.217	.315	.118	.0315		●	●	●
NPMT 060408L-G-C	.256	.394	.157	.0315	●	●	●	●
NPMT 080408L-G-C	.315	.394	.157	.0315	●	●	●	●
NPMT 090408L-G-C	.374	.394	.157	.0315	●	●	●	●
NPMT 120408L-G-C	.492	.394	.157	.0315	●	●	●	●
NPMT 050308L-HF-C	.217	.315	.118	.0315		●		●
NPMT 060408L-HF-C	.256	.394	.157	.0315		●		●
NPMT 080408L-HF-C	.315	.394	.157	.0315		●		●
NPMT 090408L-HF-C	.374	.394	.157	.0315		●		●
NPMT 120408L-HF-C	.492	.394	.157	.0315		●		●

For tools, see pages: IDD-EF-FB (255) • ISD-EF-FB (253) • ISD-IF-FB (254)

	NPMT & NPHT		
	IC908	IC520	IC806
P	●●●	○	○○
M	○○	○	●●●
K	●●●	○	○○
N	●●●		○○
S	○○	○	●●●
H	○○		●●●

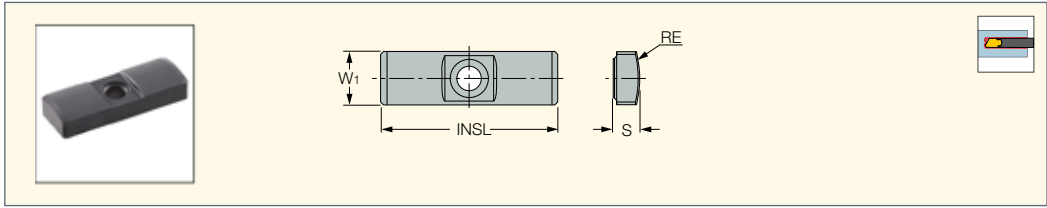
●●● First priority

Chipbreaker Comparison



FINEBEAM

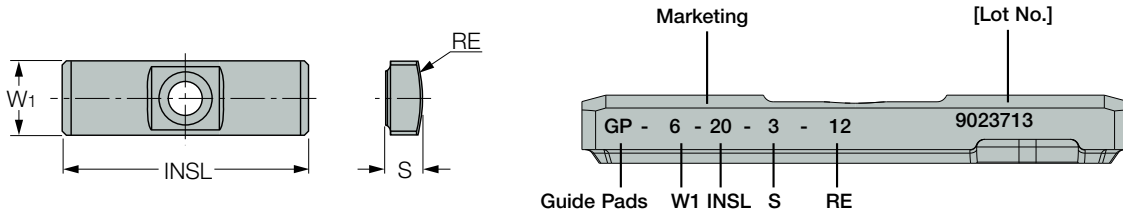
GPS
Deep Drilling Solid Carbide Guide Pads



Designation	Dimensions				Tough ← Hard		
	W1	INSL	S	RE	IC928	IC950	IC908
GPS-04-16-055-DC	.157	.630	.079	.2165	●		●
GPS-05-18-060-DC	.197	.709	.098	.2362	●		●
GPS-05-18-075-DC	.197	.709	.098	.2953	●		●
GPS-06-20-075-DC	.236	.787	.118	.2953			●
GPS-06-20-075	.236	.787	.118	.2953		●	●
GPS-06-20-085-DC	.236	.787	.118	.3346	●		●
GPS-06-20-085	.236	.787	.118	.3346		●	●
GPS-06-20-100-DC	.236	.787	.118	.3937	●		●
GPS-06-20-100	.236	.787	.118	.3937		●	●
GPS-06-20-120-DC	.236	.787	.118	.4724	●		●
GPS-06-20-120	.236	.787	.118	.4724		●	●
GPS-07-20-120-DC	.276	.787	.138	.4724	●		●
GPS-07-20-120	.276	.787	.138	.4724		●	●
GPS-08-25-155-DC	.315	.984	.177	.6102	●		●
GPS-08-25-155	.315	.984	.177	.6102		●	●
GPS-10-30-200-DC	.394	1.181	.177	.7874	●		●
GPS-10-30-200	.394	1.181	.177	.7874		●	●
GPS-10-35-200-DC	.394	1.378	.236	.7874	●		●
GPS-10-35-200	.394	1.378	.236	.7874		●	●
GPS-12-35-250-DC	.472	1.378	.217	.9842	●		●
GPS-12-35-250	.472	1.378	.217	.9842		●	●
GPS-14-40-250-DC	.551	1.575	.295	.9842	●		●
GPS-14-40-250	.551	1.575	.295	.9842		●	●
GPS-18-40-300-DC	.709	1.575	.354	1.1811	●		●

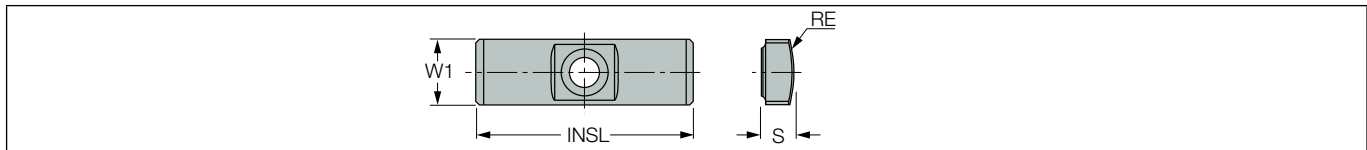
● DC- Double Chamfer

Universal Marking for Deep Drilling Tools



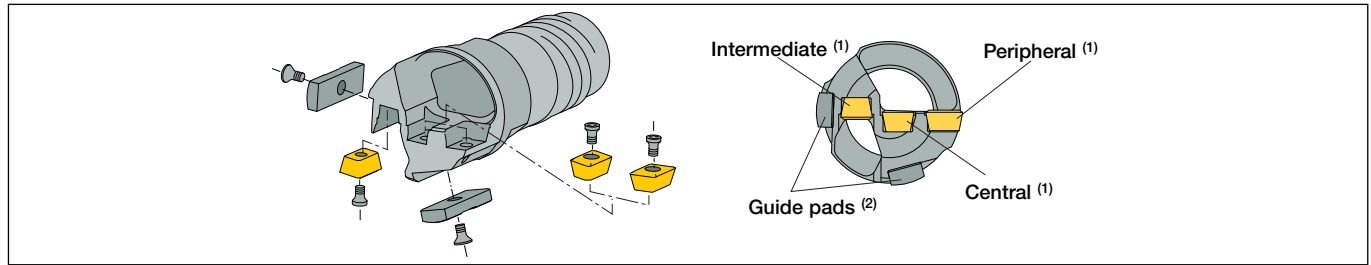
Guide Pad Grade Recommendation

Priority	Oil Coolant			Water Based Coolant		
	1	2	3	1	2	3
ISO-P	IC950	IC908	IC928	IC928	IC908	-
ISO-K	IC950	IC908	IC928	IC928	IC908	-
ISO-M	IC928	IC908	IC950	IC928	IC908	-
ISO-S	IC928	IC908	IC950	IC928	IC908	-

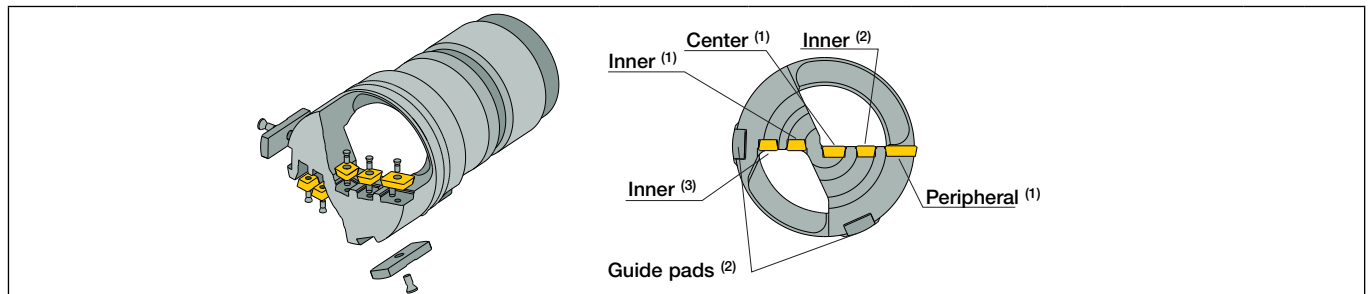


	Tool diameter		Dimensions (inch)				Solid carbide
	Min	Max	W1	INSL	RE	S	Description
FINEBEAM	.984	1.181	.236	.787	.472	.118	GPS-06-20-120-DC
	1.181	1.535	.276	.787	.472	.138	GPS-07-20-120-DC
	1.536	1.772	.315	.984	.610	.177	GPS-08-25-155-DC
	1.772	2.244	.394	1.181	.787	.177	GPS-10-30-200-DC
	2.244	3.504	.472	1.378	.984	.217	GPS-12-35-250-DC

ISD-EF-FB / IDD-EF-FB / ISD-IF-FB
Spare Parts List



Drill Diameter	Insert									Guide pad		
	Peripheral insert	Screw	Key	Intermediate insert	Screw	Key	Central insert	Screw	Key		Screw	Key
.984-1.102	NPHT 060308R-G-P	SR11201753-2	T-7/5	NPMT 050304R-G-I	SR11201753-2	T-7/5	NPMT 050308L-G-C	SR11201753-2	T-7/5	GPS-06	SR11201753-1	T-7/5
	NPHT 060308R-HF-P	SR11201753-2	T-7/5	NPMT 050304R-HF-I	SR11201753-2	T-7/5	NPMT 050308L-HF-C	SR11201753-2	T-7/5	GPS-06	SR11201753-1	T-7/5
1.103-1.181	NPHT 060308R-G-P	SR11201753-2	T-7/5	NPMT 050304R-G-I	SR11201753-2	T-7/5	NPMT 060408L-G-C	SR 14-560-HG	T-8/5	GPS-06	SR11201753-1	T-7/5
	NPHT 060308R-HF-P	SR11201753-2	T-7/5	NPMT 050304R-HF-I	SR11201753-2	T-7/5	NPMT 060408L-HF-C	SR 14-560-HG	T-8/5	GPS-06	SR11201753-1	T-7/5
1.181-1.378	NPHT 070408R-G-P	SR 14-560-HG	T-8/5	NPMT 060404R-G-I	SR 14-560-HG	T-8/5	NPMT 060408L-G-C	SR 14-560-HG	T-8/5	GPS-07	SR11201753-4	T-9/5
	NPHT 070408R-HF-P	SR 14-560-HG	T-8/5	NPMT 060404R-HF-I	SR 14-560-HG	T-8/5	NPMT 060408L-HF-C	SR 14-560-HG	T-8/5	GPS-07	SR11201753-4	T-9/5
1.378-1.496	NPHT 070408R-G-P	SR 14-560-HG	T-8/5	NPMT 060404R-G-I	SR 14-560-HG	T-8/5	NPMT 080408L-G-C	SR 14-560-HG	T-8/5	GPS-07	SR11201753-4	T-9/5
	NPHT 070408R-HF-P	SR 14-560-HG	T-8/5	NPMT 060404R-HF-I	SR 14-560-HG	T-8/5	NPMT 080408L-HF-C	SR 14-560-HG	T-8/5	GPS-07	SR11201753-4	T-9/5
1.496-1.535	NPHT 090408R-G-P	SR 14-560-HG	T-8/5	NPMT 060404R-G-I	SR 14-560-HG	T-8/5	NPMT 080408L-G-C	SR 14-560-HG	T-8/5	GPS-07	SR11201753-4	T-9/5
	NPHT 090408R-HF-P	SR 14-560-HG	T-8/5	NPMT 060404R-HF-I	SR 14-560-HG	T-8/5	NPMT 080408L-HF-C	SR 14-560-HG	T-8/5	GPS-07	SR11201753-4	T-9/5
1.536-1.614	NPHT 090408R-G-P	SR 14-560-HG	T-8/5	NPMT 060404R-G-I	SR 14-560-HG	T-8/5	NPMT 080408L-G-C	SR 14-560-HG	T-8/5	GPS-08	SR11201753-4	T-9/5
	NPHT 090408R-HF-P	SR 14-560-HG	T-8/5	NPMT 060404R-HF-I	SR 14-560-HG	T-8/5	NPMT 080408L-HF-C	SR 14-560-HG	T-8/5	GPS-08	SR11201753-4	T-9/5
1.615-1.732	NPHT 090408R-G-P	SR 14-560-HG	T-8/5	NPMT 080404R-G-I	SR 14-560-HG	T-8/5	NPMT 080408L-G-C	SR 14-560-HG	T-8/5	GPS-08	SR11201753-4	T-9/5
	NPHT 090408R-HF-P	SR 14-560-HG	T-8/5	NPMT 080404R-HF-I	SR 14-560-HG	T-8/5	NPMT 080408L-HF-C	SR 14-560-HG	T-8/5	GPS-08	SR11201753-4	T-9/5
1.733-1.772	NPHT 090408R-G-P	SR 14-560-HG	T-8/5	NPMT 080404R-G-I	SR 14-560-HG	T-8/5	NPMT 090408L-G-C	SR 14-560-HG	T-8/5	GPS-08	SR11201753-4	T-9/5
	NPHT 090408R-HF-P	SR 14-560-HG	T-8/5	NPMT 080404R-HF-I	SR 14-560-HG	T-8/5	NPMT 090408L-HF-C	SR 14-560-HG	T-8/5	GPS-08	SR11201753-4	T-9/5
1.772-1.850	NPHT 090408R-G-P	SR 14-560-HG	T-8/5	NPMT 080404R-G-I	SR 14-560-HG	T-8/5	NPMT 090408L-G-C	SR 14-560-HG	T-8/5	GPS-10	SR11201753-6	T-15/5
	NPHT 090408R-HF-P	SR 14-560-HG	T-8/5	NPMT 080404R-HF-I	SR 14-560-HG	T-8/5	NPMT 090408L-HF-C	SR 14-560-HG	T-8/5	GPS-10	SR11201753-6	T-15/5
1.851-2.008	NPHT 110408R-G-P	SR 14-560-HG	T-8/5	NPMT 080404R-G-I	SR 14-560-HG	T-8/5	NPMT 090408L-G-C	SR 14-560-HG	T-8/5	GPS-10	SR11201753-6	T-15/5
	NPHT 110408R-HF-P	SR 14-560-HG	T-8/5	NPMT 080404R-HF-I	SR 14-560-HG	T-8/5	NPMT 090408L-HF-C	SR 14-560-HG	T-8/5	GPS-10	SR11201753-6	T-15/5
2.008-2.126	NPHT 110408R-G-P	SR 14-560-HG	T-8/5	NPMT 090404R-G-I	SR 14-560-HG	T-8/5	NPMT 090408L-G-C	SR 14-560-HG	T-8/5	GPS-10	SR11201753-6	T-15/5
	NPHT 110408R-HF-P	SR 14-560-HG	T-8/5	NPMT 090404R-HF-I	SR 14-560-HG	T-8/5	NPMT 090408L-HF-C	SR 14-560-HG	T-8/5	GPS-10	SR11201753-6	T-15/5
2.126-2.244	NPHT 110408R-G-P	SR 14-560-HG	T-8/5	NPMT 090404R-G-I	SR 14-560-HG	T-8/5	NPMT 120408L-G-C	SR 14-560-HG	T-8/5	GPS-10	SR11201753-6	T-15/5
	NPHT 110408R-HF-P	SR 14-560-HG	T-8/5	NPMT 090404R-HF-I	SR 14-560-HG	T-8/5	NPMT 120408L-HF-C	SR 14-560-HG	T-8/5	GPS-10	SR11201753-6	T-15/5
2.244-2.362	NPHT 110408R-G-P	SR 14-560-HG	T-8/5	NPMT 090404R-G-I	SR 14-560-HG	T-8/5	NPMT 120408L-G-C	SR 14-560-HG	T-8/5	GPS-12	SR11201753-6	T-15/5
	NPHT 110408R-HF-P	SR 14-560-HG	T-8/5	NPMT 090404R-HF-I	SR 14-560-HG	T-8/5	NPMT 120408L-HF-C	SR 14-560-HG	T-8/5	GPS-12	SR11201753-6	T-15/5
2.363-2.520	NPHT 130408R-G-P	SR 14-560-HG	T-8/5	NPMT 090404R-G-I	SR 14-560-HG	T-8/5	NPMT 120408L-G-C	SR 14-560-HG	T-8/5	GPS-12	SR11201753-6	T-15/5
	NPHT 130408R-HF-P	SR 14-560-HG	T-8/5	NPMT 090404R-HF-I	SR 14-560-HG	T-8/5	NPMT 120408L-HF-C	SR 14-560-HG	T-8/5	GPS-12	SR11201753-6	T-15/5
2.520-2.559	NPHT 130408R-G-P	SR 14-560-HG	T-8/5	NPMT 120404R-G-I	SR 14-560-HG	T-8/5	NPMT 120408L-G-C	SR 14-560-HG	T-8/5	GPS-12	SR11201753-6	T-15/5
	NPHT 130408R-HF-P	SR 14-560-HG	T-8/5	NPMT 120404R-HF-I	SR 14-560-HG	T-8/5	NPMT 120408L-HF-C	SR 14-560-HG	T-8/5	GPS-12	SR11201753-6	T-15/5



Tool dia		Insert					Guide pad			Wrench	
Min	Max	Center	Inner 1	Inner 2	Inner 3	Peripheral	Screw X 5 pcs	GPS X 2 pcs	Screw X 2 pcs	Insert	Pad
2.560	2.795	NPMT09....L**-C	NPMT08....R**-I	NPMT08....R**-I	NPMT06....R**-I	NPHT11....R**-P	SR 14-560-HG	GPS12	SR 11201753-6	T-8/5	T-15/5
2.796	3.267				NPMT08....R**-I	NPHT13....R**-P					
3.268	3.543	NPMT12....L**-C	NPMT08....R**-I	NPMT08....R**-I	NPMT08....R**-I	NPHT13....R**-P					

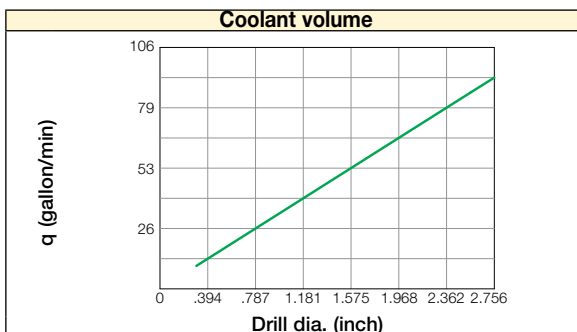
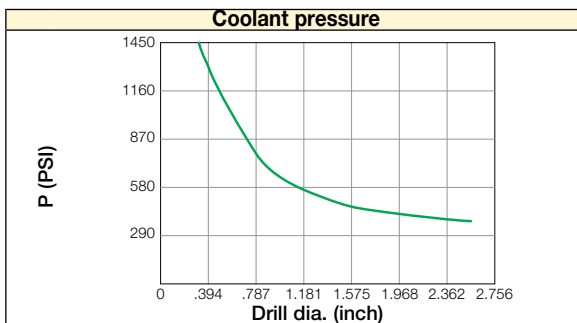
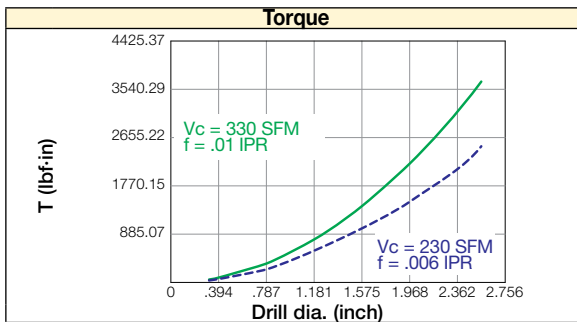
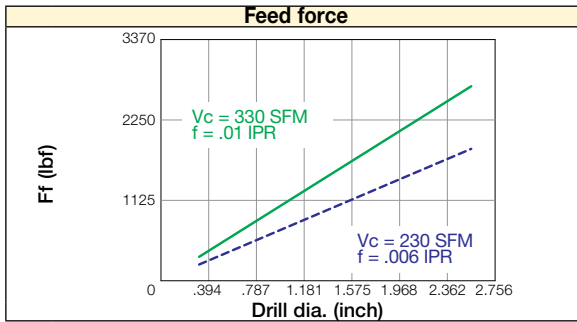
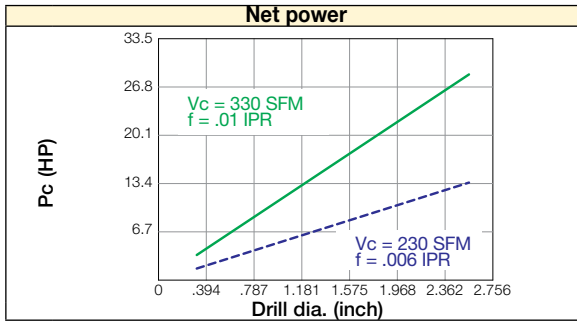
Machining Recommendations for FINEBEAM Drills

ISO	Material	Condition	Tensile Strength [ksi]	Material Group No. (1)	Hardness (HB)	Chipbreaker	Cutting Speed V _c (SFM)	Feed : f (IPR)		
								Drill dia. (inch)		
								Ø.984 - 1.693	Ø1.693 - 3.504	
P	Non-alloy steel and cast steel, free cutting steel	<0.25% C	Annealed	61	1	125	HF	230 - 425	.004 - .016	.006 - .018
							G	230 - 425	.004 - .012	.005 - .014
		≥0.25% C	Annealed	94	2	190	HF	230 - 425	.004 - .016	.006 - .018
							G	230 - 425	.004 - .012	.005 - .014
		<0.55% C	Quenched and tempered	123	3	250	HF	230 - 425	.004 - .016	.006 - .018
							G	230 - 425	.004 - .012	.005 - .014
	≥0.55% C	Annealed	109	4	220	HF	230 - 425	.004 - .016	.006 - .018	
						G	230 - 425	.004 - .012	.005 - .014	
	Low alloy and cast steel (less than 5% of alloying elements)	Annealed	87	6	200	HF	230 - 395	.004 - .016	.008 - .018	
						G	230 - 395	.004 - .012	.005 - .014	
						HF	180 - 360	.004 - .016	.008 - .018	
		Quenched and tempered	135	7	275	G	195 - 395	.004 - .012	.005 - .014	
						HF	180 - 360	.004 - .016	.008 - .018	
						G	195 - 395	.004 - .012	.005 - .014	
	145	8	300	HF	180 - 360	.004 - .016	.008 - .018			
				G	195 - 395	.004 - .012	.005 - .014			
				HF	180 - 360	.004 - .016	.008 - .018			
	174	9	350	G	195 - 395	.004 - .012	.005 - .014			
HF				180 - 360	.004 - .016	.008 - .018				
G				195 - 395	.004 - .012	.005 - .014				
High alloyed steel, cast steel and tool steel	Annealed	99	10	200	HF	180 - 360	.004 - .015	.008 - .016		
					G	230 - 425	.004 - .012	.005 - .014		
	Quenched and tempered	160	11	325	HF	180 - 360	.004 - .015	.008 - .016		
					G	230 - 425	.004 - .012	.005 - .014		
Stainless steel and cast steel	Ferritic/martensitic	99	12	200	HF	130 - 360	.004 - .016	.008 - .018		
					G	230 - 425	.004 - .012	.005 - .014		
	Martensitic	119	13	240	HF	130 - 360	.004 - .016	.008 - .018		
					G	230 - 425	.004 - .012	.005 - .014		
M	Stainless steel and cast steel	Austenitic, duplex	87	14	180	HF	130 - 360	.004 - .016	.008 - .018	
						G	230 - 425	.004 - .012	.005 - .014	
K	Grey cast iron (GG)	Ferritic/pearlitic		15	180	HF	165 - 360	.004 - .015	.009 - .016	
						G	165 - 360	.004 - .01	.005 - .014	
		Pearlitic/martensitic		16	260	HF	165 - 360	.004 - .015	.009 - .016	
						G	165 - 360	.004 - .01	.005 - .014	
	Nodular cast iron (GGG)	Ferritic		17	160	HF	165 - 360	.004 - .015	.009 - .016	
						G	165 - 360	.004 - .01	.005 - .014	
		Pearlitic		18	250	HF	165 - 360	.004 - .015	.009 - .016	
						G	165 - 360	.004 - .01	.005 - .014	
	Malleable cast iron	Ferritic		19	130	HF	165 - 360	.004 - .015	.009 - .016	
						G	165 - 360	.004 - .01	.005 - .014	
Pearlitic			20	230	HF	165 - 360	.004 - .015	.009 - .016		
					G	165 - 360	.004 - .01	.005 - .014		
N	Aluminum-wrought alloys	Not hardenable		21	60	HF	215 - 490	.004 - .013	.009 - .014	
						G	215 - 425	.004 - .01	.005 - .014	
		Hardenable		22	100	HF	215 - 490	.004 - .013	.009 - .014	
						G	215 - 425	.003 - .009	.005 - .011	
	Aluminum-cast alloys	≤12% Si	Not hardenable		23	75	HF	215 - 490	.004 - .013	.009 - .014
							G	215 - 425	.003 - .009	.005 - .011
		Hardenable		24	90	HF	215 - 490	.004 - .013	.009 - .014	
						G	215 - 425	.003 - .009	.005 - .011	
	>12% Si	High temperature		25	130	HF	215 - 490	.004 - .013	.009 - .014	
						G	215 - 425	.003 - .009	.005 - .011	
		>1% Pb	Free cutting		26	110	HF	215 - 490	.004 - .013	.009 - .014
							G	215 - 425	.003 - .009	.005 - .011
Copper alloys	Brass		27	90	HF	215 - 490	.004 - .013	.009 - .014		
					G	215 - 425	.003 - .009	.005 - .011		
	Electrolytic copper		28	100	HF	215 - 490	.004 - .013	.009 - .014		
					G	215 - 425	.003 - .009	.005 - .011		
S	High temperature alloys	Fe based	Annealed	31	200	HF	65 - 180	.004 - .012	.008 - .013	
						G	65 - 165	.003 - .009	.005 - .011	
		Hardened		32	280	HF	65 - 180	.004 - .012	.008 - .013	
						G	65 - 165	.003 - .009	.005 - .011	
		Annealed		33	250	HF	65 - 180	.004 - .012	.008 - .013	
						G	65 - 165	.003 - .009	.005 - .011	
	Hardened		34	350	HF	65 - 180	.004 - .012	.008 - .013		
					G	65 - 165	.003 - .009	.005 - .011		
	Cast		35	320	HF	65 - 180	.004 - .012	.008 - .013		
					G	65 - 165	.003 - .009	.005 - .011		
	Titanium alloys	Pure	58	36		HF	100 - 195	.004 - .012	.008 - .013	
						G	100 - 195	.003 - .009	.005 - .011	
		Alpha+Beta alloys hardened	152	37		HF	100 - 195	.004 - .012	.008 - .013	
						G	100 - 195	.003 - .009	.005 - .011	
H	Hardened steel ≥40HRC	Hardened		38		HF	100 - 195	.004 - .012	.008 - .013	
						G	100 - 195	.003 - .009	.005 - .011	

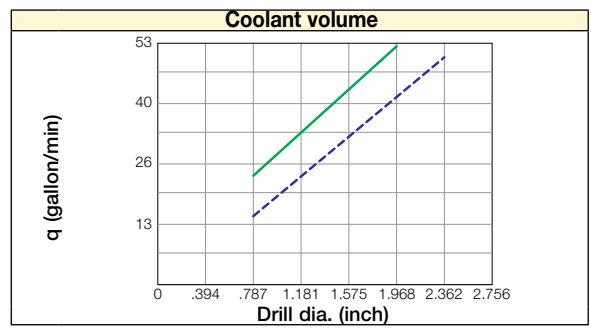
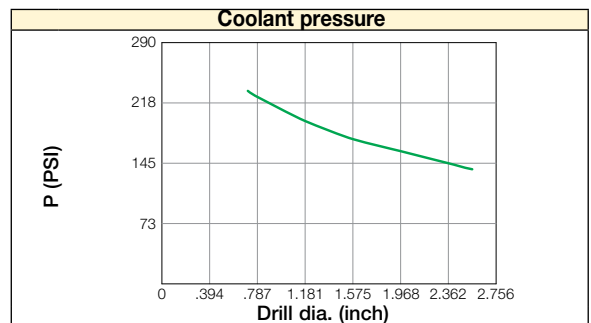
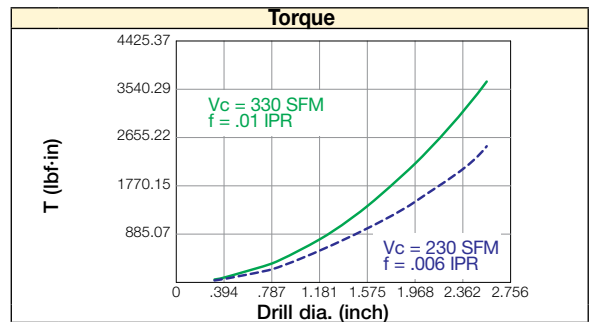
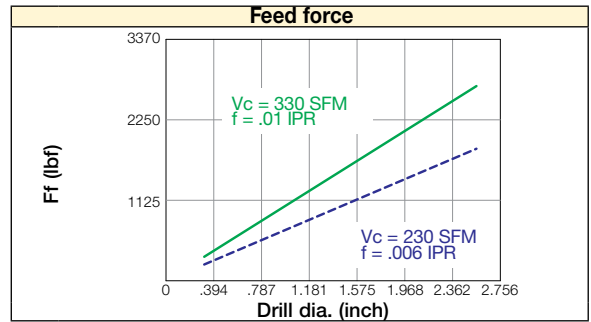
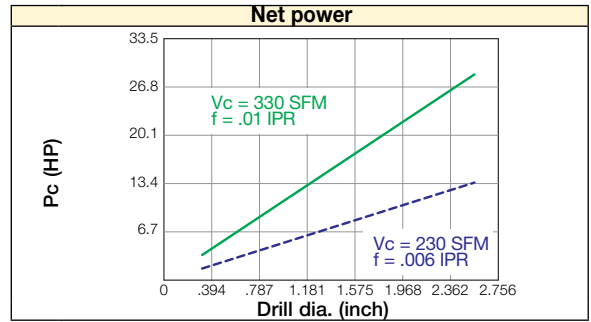
(1) For material groups see pages 573-604

Technical Guide

STS - Setting Guidelines for Cutting Loads, Fluid Pressure and Flow Rate During STS Operation



DTS - Setting Guidelines for Cutting Loads, Fluid Pressure and Flow Rate During DTS Operation

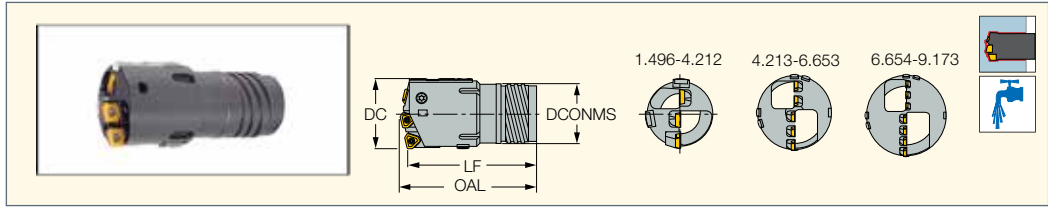


The above values should not be used as the exact recommendations. They may need modification depending on the machining conditions, materials, etc.

ISCARDEEPDRILL

ISD-EC

Deep Single Tube Drills with External 4-Start Thread Connection and Cartridges (1.496-11.496 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	OAL	LF	DCONMS	TS ⁽³⁾
ISD-EC 1.496-1.559	1.496	1.559	3.543	3.346	1.181	TS-111
ISD-EC 1.560-1.692	1.560	1.692	3.583	3.346	1.299	TS-112
ISD-EC 1.693-1.850	1.693	1.850	3.976	3.740	1.417	TS-113
ISD-EC 1.851-2.035	1.851	2.035	4.016	3.740	1.535	TS-114
ISD-EC 2.036-2.212	2.036	2.212	4.213	3.937	1.693	TS-115
ISD-EC 2.213-2.385	2.213	2.385	4.646	4.331	1.850	TS-116
ISD-EC 2.386-2.558	2.386	2.558	4.685	4.331	2.008	TS-117
ISD-EC 2.559-2.637	2.559	2.637	6.260	5.906	2.047	TS-118
ISD-EC 2.638-2.873	2.638	2.873	6.260	5.906	2.283	TS-119
ISD-EC 2.874-3.149	2.874	3.149	6.299	5.906	2.480	TS-120
ISD-EC 3.150-3.424	3.150	3.424	7.520	7.087	2.756	TS-121
ISD-EC 3.425-3.936	3.425	3.936	7.598	7.087	3.031	TS-122
ISD-EC 3.937-4.212	3.937	4.212	7.598	7.087	3.504	TS-123
ISD-EC 4.213-4.409	4.213	4.409	7.756	7.087	3.504	TS-123
ISD-EC 4.410-4.881	4.410	4.881	8.701	8.071	3.976	TS-124
ISD-EC 4.882-5.353	4.882	5.353	8.740	8.071	4.449	TS-125
ISD-EC 5.354-5.826	5.354	5.826	8.780	8.071	4.921	TS-126
ISD-EC 5.827-6.298	5.827	6.298	9.646	8.858	5.394	TS-127
ISD-EC 6.299-6.653	6.299	6.653	9.685	8.858	5.866	TS-128
ISD-EC 6.654-6.771	6.654	6.771	9.685	8.858	5.866	TS-128
ISD-EC 6.772-7.243	6.772	7.243	9.724	8.858	6.339	TS-129
ISD-EC 7.244-7.716	7.244	7.716	10.512	9.646	6.811	TS-130
ISD-EC 7.717-8.188	7.717	8.188	10.630	9.646	7.283	TS-131
ISD-EC 8.189-8.661	8.189	8.661	10.669	9.646	7.756	TS-132
ISD-EC 8.662-9.133	8.662	9.133	11.535	10.433	8.189	TS-133
ISD-EC 9.134-9.172	9.134	9.172	11.535	10.433	8.661	TS-134
ISD-EC 9.173-9.606	9.173	9.606	11.575	10.433	8.661	TS-134
ISD-EC 9.607-10.078	9.607	10.078	11.575	10.433	9.134	TS-135
ISD-EC 10.079-10.551	10.079	10.551	12.677	11.417	9.606	TS-136
ISD-EC 10.552-11.023	10.552	11.023	12.717	11.417	10.079	TS-137
ISD-EC 11.024-11.496	11.024	11.496	12.795	11.417	10.551	TS-138

- Important: The specified drilling range using the original outer cartridge and pad may be enlarged by using optional outer cartridges and pads as specified on page 274
- For quotation form and user guide see pages 269-271, 275-279, 337-338
- For spare parts, see pages 265-266
- Ordering example: ISD-EC 2.650

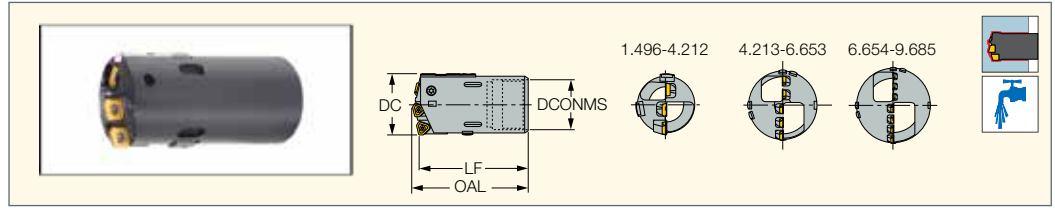
⁽¹⁾ Cutting diameter minimum
⁽²⁾ Cutting diameter maximum
⁽³⁾ Tube designation

For inserts, see pages: NPMX 0803 RB/RG (267) • TPMX (267)
 For holders, see pages: TS-I** (322)



ISD-IC

Deep Single Tube Drills with Internal Single-Start Thread Connection and Cartridges (1.496-11.574 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	OAL	LF	DCONMS	Ts ⁽³⁾
ISD-IC 1.496-1.574	1.496	1.574	3.346	3.150	1.181	TS-O15
ISD-IC 1.575-1.731	1.575	1.731	3.386	3.150	1.299	TS-O16
ISD-IC 1.732-1.850	1.732	1.850	3.780	3.543	1.457	TS-O17
ISD-IC 1.851-2.046	1.851	2.046	3.819	3.543	1.614	TS-O18
ISD-IC 2.047-2.243	2.047	2.243	4.213	3.937	1.732	TS-O19
ISD-IC 2.244-2.401	2.244	2.401	4.646	4.331	1.929	TS-O20
ISD-IC 2.402-2.676	2.402	2.676	4.685	4.331	2.087	TS-O21
ISD-IC 2.677-2.952	2.677	2.952	5.079	4.724	2.323	TS-O22
ISD-IC 2.953-3.188	2.953	3.188	6.339	5.906	2.559	TS-O23
ISD-IC 3.189-3.582	3.189	3.582	6.378	5.906	2.795	TS-O24
ISD-IC 3.583-3.897	3.583	3.897	6.378	5.906	3.110	TS-O25
ISD-IC 3.898-4.212	3.898	4.212	6.417	5.906	3.543	TS-O26
ISD-IC 4.213-4.369	4.213	4.369	6.457	5.906	3.543	TS-O26
ISD-IC 4.370-4.842	4.370	4.842	6.496	5.906	4.016	TS-O27
ISD-IC 4.843-5.314	4.843	5.314	6.575	5.906	4.488	TS-O28
ISD-IC 5.315-5.865	5.315	5.865	6.614	5.906	4.961	TS-O29
ISD-IC 5.866-6.377	5.866	6.377	6.693	5.906	5.472	TS-O30
ISD-IC 6.378-6.653	6.378	6.653	8.307	7.480	5.945	TS-O31
ISD-IC 6.654-6.850	6.654	6.850	8.307	7.480	5.945	TS-O31
ISD-IC 6.851-7.322	6.851	7.322	8.386	7.480	6.417	TS-O32
ISD-IC 7.323-7.794	7.323	7.794	8.346	7.480	6.890	TS-O33
ISD-IC 7.795-8.267	7.795	8.267	8.465	7.480	7.362	TS-O34
ISD-IC 8.268-8.740	8.268	8.740	8.543	7.480	7.835	TS-O35
ISD-IC 8.741-9.172	8.741	9.172	8.583	7.480	8.307	TS-O36
ISD-IC 9.173-9.212	9.173	9.212	8.543	7.480	8.307	TS-O36
ISD-IC 9.213-9.685	9.213	9.685	8.622	7.480	8.780	TS-O37
ISD-IC 9.686-10.157	9.686	10.157	8.701	7.480	9.252	TS-O38
ISD-IC 10.158-10.629	10.158	10.629	9.528	8.268	9.646	TS-O39
ISD-IC 10.630-11.102	10.630	11.102	9.606	8.268	10.197	TS-O40
ISD-IC 11.103-11.574	11.103	11.574	9.646	8.268	10.669	TS-O41

- Important: The specified drilling range using the original outer cartridge and pad may be enlarged by using optional outer cartridges and pads as specified on page 274
- For spare parts and insert information, see pages 265-266 • For user guide and quotation form, see pages 269-271, 275-279, 337-338
- Ordering example: DSD-IC 2.650

⁽¹⁾ Cutting diameter minimum
⁽²⁾ Cutting diameter maximum

⁽³⁾ Tube designation

For inserts, see pages: NPMX 0803 RB/RG (267) • TPMX (267)

For holders, see pages: TS-O** (323)

Universal Marking for Deep Drilling Tools

D- Tool diameter

Metric- D197.00

Inch- D7.756

d- Pilot diameter

Metric- d175

Inch- d6.890

Tool style

K- Solid drill cartridge style

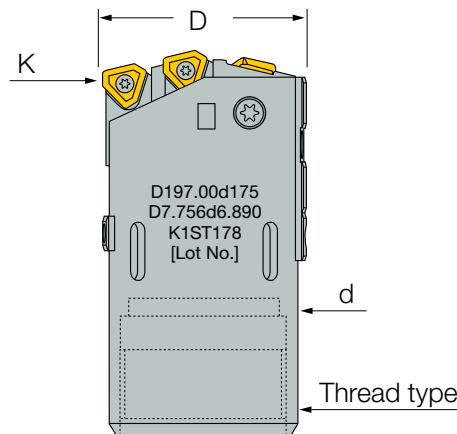
Thread type

4ST- Four-start thread single tube

1ST- Single-start thread single tube

4DT- Four-start thread double tube

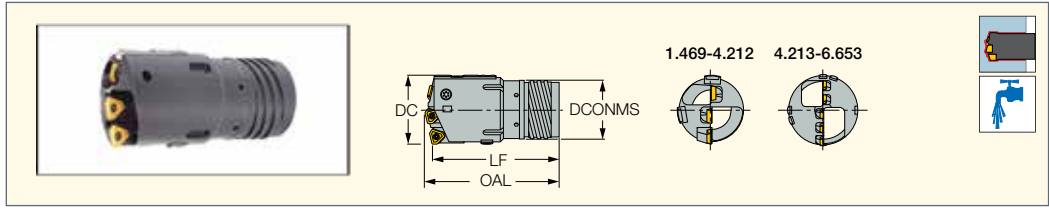
178- Tube diameter



ISCARDEEPPDRILL

IDD-EC

Deep Double Tube Drills with External 4-Start Thread Connection and Cartridges (1.496-7.244 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	OAL	LF	DCONMS	Ts ⁽³⁾	Tsi ⁽⁴⁾
IDD-EC 1.496-1.559	1.496	1.559	3.543	3.346	1.299	TDO-I8	TDI-N8
IDD-EC 1.560-1.692	1.560	1.692	3.583	3.346	1.417	TDO-I9	TDI-N9
IDD-EC 1.693-1.850	1.693	1.850	3.976	3.740	1.535	TDO-I10	TDI-N10
IDD-EC 1.851-2.035	1.851	2.035	4.016	3.937	1.693	TDO-I11	TDI-N11
IDD-EC 2.036-2.212	2.036	2.212	4.213	3.937	1.850	TDO-I12	TDI-N12
IDD-EC 2.213-2.558	2.213	2.558	4.685	4.331	2.008	TDO-I13	TDI-N13
IDD-EC 2.559-2.637	2.559	2.637	6.260	5.906	2.047	TDO-I14	TDI-N14
IDD-EC 2.638-2.873	2.638	2.873	6.260	5.906	2.283	TDO-I15	TDI-N15
IDD-EC 2.874-3.149	2.874	3.149	6.299	5.906	2.480	TDO-I16	TDI-N16
IDD-EC 3.150-3.424	3.150	3.424	7.520	7.087	2.756	TDO-I17	TDI-N17
IDD-EC 3.425-3.936	3.425	3.936	7.598	7.087	3.031	TDO-I18	TDI-N18
IDD-EC 3.937-4.212	3.937	4.212	7.598	7.087	3.504	TDO-I19	TDI-N19
IDD-EC 4.213-4.409	4.213	4.409	7.756	7.087	3.504	TDO-I19	TDI-N19
IDD-EC 4.410-4.881	4.410	4.881	8.701	8.071	3.976	TDO-I20	TDI-N20
IDD-EC 4.882-5.353	4.882	5.353	8.740	8.071	4.449	TDO-I21	TDI-N21
IDD-EC 5.354-5.826	5.354	5.826	8.780	8.071	4.921	TDO-I22	TDI-N22
IDD-EC 5.827-6.298	5.827	6.298	9.646	8.858	5.394	TDO-I23	TDI-N23
IDD-EC 6.299-6.653	6.299	6.653	9.685	8.858	5.866	TDO-I24	TDI-N24
IDD-EC 6.654-6.771	6.654	6.771	9.685	8.858	5.866	TDO-I24	TDI-N24
IDD-EC 6.772-7.244	6.772	7.244	9.724	8.858	6.339	TDO-I25	TDI-N25

- Important: The specified drilling range using the original outer cartridge and pad may be enlarged by using optional outer cartridges and pads as specified on page 274
- For spare parts and insert information, see pages 265-266 • For user guide and quotation form, see pages 269-271, 275-279, 337-338
- Ordering example: IDD-EC 5.827
- (1) Cutting diameter minimum
- (2) Cutting diameter maximum
- (3) Outer tube designation
- (4) Inner tube designation

For inserts, see pages: NPMX 0803 RB/RG (267) • TPMX (267)
 For holders, see pages: TDO-I (D.725-2.56) (324) • TDO-I (D2.56-6.77) (325)

Universal Marking for Deep Drilling Tools

D- Tool diameter

Metric- D80.0

Inch- D3.150

d- Pilot diameter

Metric- d70

Inch- d2.756

Tool style

K- Cartridge style solid drill

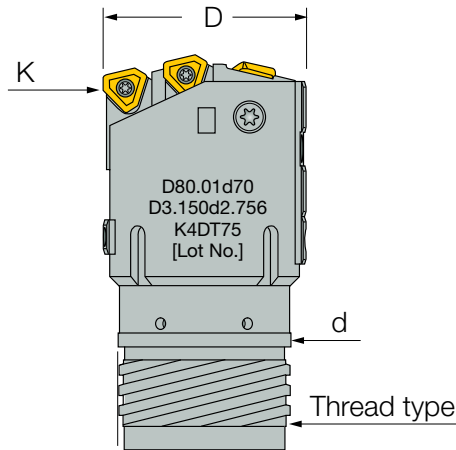
Thread type

4ST- Four-start thread single tube








1ST- Single-start thread single tube

4DT- Four-start thread double tube

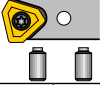





75- Tube diameter



Spare Parts

Diameter														
	Peripheral	Qty.	Inner / Central	Qty.	Guide Pad	Qty.	Guide Pad Protectors	Qty.	Sub Guide Pad	Qty.	Peripheral Insert	Qty.	Inner / Central Insert	Qty.
1.496-1.574	CAOD-080	1	CAID-080	1	GPS-08-25-155-DC	2	GPP-06	2	SGP-02	1	NPMX 08**R..	1	NPMX 08**R..	1
			CAID-080	1									NPMX 08**R..	1
1.575-1.771	CAOD-0845	1	CAID-080	1	GPS-08-25-155-DC	2	GPP-06	2	SGP-02	1	TPMX 14**R..	1	NPMX 08**R..	1
			CAID-080	1									NPMX 08**R..	1
1.772-1.889	CAOD-0845	1	CAID-080	1	GPS-10-35-200-DC	2	GPP-07	2	SGP-02	1	TPMX 14**R..	1	NPMX 08**R..	1
			CAID-0845	1									TPMX 14**R..	1
1.89-2.047	CAOD-0845	1	CAID-0845	1	GPS-10-35-200-DC	2	GPP-07	2	SGP-02	1	TPMX 14**R..	1	TPMX 14**R..	1
			CAID-0845	1									TPMX 14**R..	1
2.047-2.165	CAOD-103	1	CAID-0845	1	GPS-10-35-200-DC	2	GPP-07	2	SGP-02	1	TPMX 17**R..	1	TPMX 14**R..	1
			CAID-0845	1									TPMX 14**R..	1
2.165-2.283	CAOD-103	1	CAID-0845	1	GPS-10-35-200-DC	2	GPP-07	2	SGP-02	1	TPMX 17**R..	1	TPMX 14**R..	1
			CAID-103	1									TPMX 17**R..	1
2.283-2.362	CAOD-103	1	CAID-103	1	GPS-10-35-200-DC	2	GPP-07	2	SGP-02	1	TPMX 17**R..	1	TPMX 17**R..	1
			CAID-103	1									TPMX 17**R..	1
2.362-2.519	CAOD-103	1	CAID-103	1	GPS-14-40-250-DC	2	GPP-08	2	SGP-02	1	TPMX 17**R..	1	TPMX 17**R..	1
			CAID-103	1									TPMX 17**R..	1
2.52-2.677	CAOD-142	1	CAID-103	1	GPS-14-40-250-DC	2	GPP-08	2	SGP-03	1	TPMX 24**R..	1	TPMX 17**R..	1
			CAID-103	1									TPMX 17**R..	1
2.677-3.07	CAOD-103	1	CAID-142	1	GPS-14-40-250-DC	2	GPP-08	2	SGP-03	1	TPMX 17**R..	1	TPMX 24**R..	1
			CAID-142	1									TPMX 24**R..	1
3.071-3.346	CAOD-142	1	CAID-142	1	GPS-14-40-250-DC	2	GPP-08	2	SGP-03	1	TPMX 24**R..	1	TPMX 24**R..	1
			CAID-142	1									TPMX 24**R..	1
3.346-3.622	CAOD-170	1	CAID-142	1	GPS-14-40-250-DC	2	GPP-08	2	SGP-03	1	TPMX 28**R..	1	TPMX 24**R..	1
			CAID-142	1									TPMX 24**R..	1
3.622-3.897	CAOD-142	1	CAID-170	1	GPS-14-40-250-DC	2	GPP-08	2	SGP-03	1	TPMX 24**R..	1	TPMX 28**R..	1
			CAID-170	1									TPMX 28**R..	1
3.898-4.212	CAOD-170	1	CAID-170	1	GPS-18-40-300-DC	2	GPP-09	2	SGP-04	1	TPMX 28**R..	1	TPMX 28**R..	1
			CAID-170	1									TPMX 28**R..	1
4.213-4.645	CAOD-142	1	CAID-103	3	GPS-18-40-300-DC	2	GPP-09	2	SGP-04	1	TPMX 24**R..	1	TPMX 17**R..	3
			CAID-142	1									TPMX 24**R..	1
6.646-5.354	CAOD-142	1	CAID-142	3	GPS-18-40-300-DC	2	GPP-09	2	SGP-04	1	TPMX 24**R..	1	TPMX 24**R..	3
			CAID-142	1									TPMX 24**R..	1
5.354-5.708	CAOD-142	1	CAID-142	3	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 24**R..	1	TPMX 24**R..	3
			CAID-170	1									TPMX 28**R..	1
5.709-5.944	CAOD-142	1	CAID-142	2	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 24**R..	1	TPMX 24**R..	2
			CAID-170	1									TPMX 28**R..	1
5.945-6.181	CAOD-170	1	CAID-142	2	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 24**R..	2
			CAID-170	1									TPMX 28**R..	1
6.181-6.417	CAOD-170	1	CAID-142	1	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 24**R..	1
			CAID-170	2									TPMX 28**R..	2
6.417-6.653	CAOD-170	1	CAID-170	3	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 28**R..	3
			CAID-170	1									TPMX 28**R..	1
6.654-7.441	CAOD-142	1	CAID-142	5	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 24**R..	1	TPMX 24**R..	5
			CAID-142	1									TPMX 24**R..	1
7.441-7.756	CAOD-142	1	CAID-142	5	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 24**R..	1	TPMX 24**R..	5
			CAID-170	1									TPMX 28**R..	1
7.756-7.992	CAOD-142	1	CAID-142	4	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 24**R..	1	TPMX 24**R..	4
			CAID-170	1									TPMX 28**R..	1
7.992-8.228	CAOD-142	1	CAID-142	3	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 24**R..	1	TPMX 24**R..	3
			CAID-170	2									TPMX 28**R..	2
8.228-8.464	CAOD-170	1	CAID-142	3	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 24**R..	3
			CAID-170	2									TPMX 28**R..	2
			CAID-170	1									TPMX 28**R..	1

Spare Parts

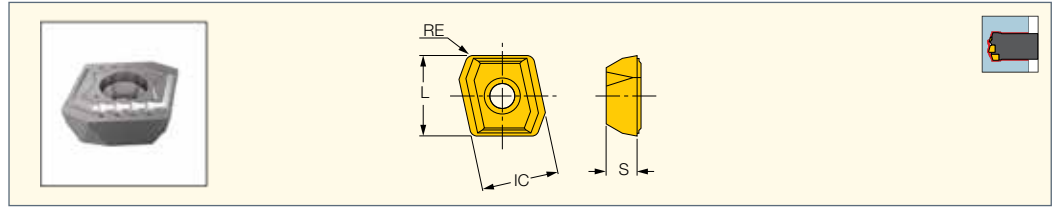
Diameter														
	Peripheral	Qty.	Inner / Central	Qty.	Guide Pad	Qty.	Guide Pad Protectors	Qty.	Sub Guide Pad	Qty.	Peripheral Insert	Qty.	Inner / Central Insert	Qty.
8.465-8.7	CAOD-170	1	CAID-142	2	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 24**R..	2
			CAID-170	3									TPMX 28**R..	3
			CAID-170	1									TPMX 28**R..	1
8.701-8.937	CAOD-170	1	CAID-142	1	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 24**R..	1
			CAID-170	4									TPMX 28**R..	4
			CAID-170	1									TPMX 28**R..	1
8.937-9.173	CAOD-170	1	CAID-170	5	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 28**R..	5
			CAID-170	1									TPMX 28**R..	1
9.1732-9.763	CAOD-142	1	CAID-142	7	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 24**R..	1	TPMX 24**R..	7
			CAID-170	1									TPMX 28**R..	1
9.764-10.000	CAOD-170	1	CAID-142	7	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 24**R..	7
			CAID-170	1									TPMX 28**R..	1
10.000-10.196	CAOD-170	1	CAID-142	6	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 24**R..	6
			CAID-170	1									TPMX 28**R..	1
			CAID-170	1									TPMX 28**R..	1
10.197-10.433	CAOD-170	1	CAID-142	5	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 24**R..	5
			CAID-170	2									TPMX 28**R..	2
			CAID-170	1									TPMX 28**R..	1
10.433-10.708	CAOD-170	1	CAID-142	4	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 24**R..	4
			CAID-170	3									TPMX 28**R..	3
			CAID-170	1									TPMX 28**R..	1
10.709-10.866	CAOD-170	1	CAID-142	3	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 24**R..	3
			CAID-170	4									TPMX 28**R..	4
			CAID-170	1									TPMX 28**R..	1
10.8661-11.220	CAOD-170	1	CAID-142	2	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 24**R..	2
			CAID-170	5									TPMX 28**R..	5
			CAID-170	1									TPMX 28**R..	1
11.2204-11.417	CAOD-170	1	CAID-142	1	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 24**R..	1
			CAID-170	6									TPMX 28**R..	6
			CAID-170	1									TPMX 28**R..	1
11.4173-11.574	CAOD-170	1	CAID-170	7	GPS-18-40-300-DC	4	GPP-09	4	SGP-04	1	TPMX 28**R..	1	TPMX 28**R..	7
			CAID-170	1									TPMX 28**R..	1



ISCARDEEPPDRILL

NPMX 0803 RB/RG

Inserts for Drilling Heads
ISD-EC / IDD-EC / ISD-IC

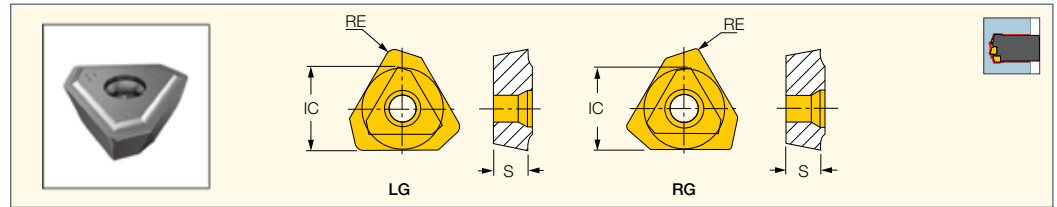


Designation	Dimensions				Tough ← Hard		
	IC	S	RE	L	IC9025	IC908	IC520
NPMX 080304R-B	.315	.125	.0157	.329	•	•	•
NPMX 080308R-G	.315	.125	.0315	.329	•	•	•

ISCARDEEPPDRILL

TPMX

Inserts for Drilling / Boring
Heads ISD-EC / IDD-EC /
ISD-IC / ISC-EC / ISC-IC



Designation	Dimensions			Tough ← Hard						
	IC	S	RE	IC920	IC5500	IC9025	IC508	IC908	IC520	IC806
TPMX 140304R-B	.333	.138	.0157	•		•		•	•	•
TPMX 140308R-DT	.333	.138	.0315			•		•	•	•
TPMX 140308R-G	.333	.138	.0315		•	•	•	•	•	•
TPMX 140308R-B	.333	.138	.0315			•		•	•	•
TPMX 170404R-B	.406	.157	.0157	•		•		•	•	•
TPMX 170408R-B	.406	.157	.0315			•		•	•	•
TPMX 170408R-BG	.406	.157	.0315			•	•	•	•	•
TPMX 170408R-DT	.406	.157	.0315			•		•	•	•
TPMX 170408R-G	.406	.157	.0315		•	•	•	•	•	•
TPMX 240504R-B	.559	.217	.0157	•		•		•	•	•
TPMX 240512R-BG	.559	.217	.0472			•		•	•	•
TPMX 240512R-DT	.559	.217	.0472			•		•	•	•
TPMX 240512R-G	.559	.217	.0472		•	•	•	•	•	•
TPMX 240512R-B	.559	.217	.0472			•		•	•	•
TPMX 280708R-B	.669	.295	.0315	•		•		•	•	•
TPMX 280716R-BG	.669	.295	.0630			•	•	•	•	•
TPMX 280716R-DT	.669	.295	.0630			•		•	•	•
TPMX 280716R-G	.669	.295	.0630		•	•	•	•	•	•
TPMX 280716R-B	.669	.295	.0630			•		•	•	•
TPMX 140308L-G	.333	.138	.0315			•		•	•	•
TPMX 170404L-BG	.406	.157	.0157			•		•	•	•
TPMX 170408L-DT	.406	.157	.0315			•		•	•	•
TPMX 170408L-G	.406	.157	.0315			•		•	•	•
TPMX 240504L-BG	.559	.217	.0157			•	•	•	•	•
TPMX 240512L-DT	.559	.217	.0472			•		•	•	•
TPMX 240512L-G	.559	.217	.0472			•		•	•	•
TPMX 280708L-BG	.669	.295	.0315			•		•	•	•
TPMX 280716L-G	.669	.295	.0630			•		•	•	•

For tools, see pages: IDC-EC (305) • IDD-EC (264) • ISC-EC (289) • ISC-IC (297) • ISD-EC (262) • ISD-IC (263) • ISTR-EC (311)

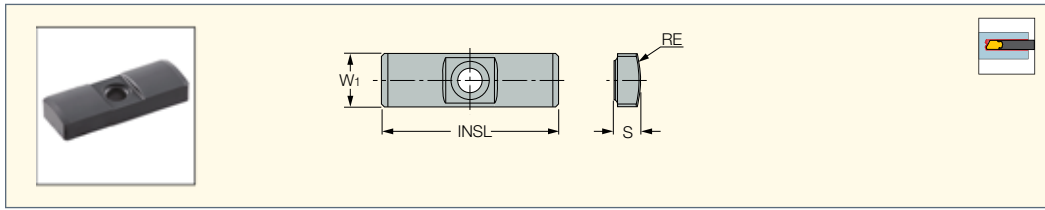
*Chipbreaker Selection

G			B		
	Versatile			Good chip control for heat-resistant alloy	
BG			DT		
	Chip control for difficult-to-cut steel			To reduce machine load	

ISCARDEEPPDRILL

GPS

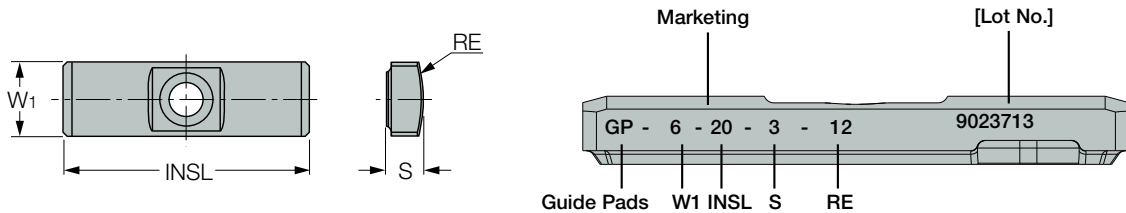
Deep Drilling Solid Carbide Guide Pads



Designation	Dimensions				Tough ↔ Hard		
	W1	INSL	S	RE	IC928	IC950	IC908
GPS-04-16-055-DC	.157	.630	.079	.2165	●		●
GPS-05-18-060-DC	.197	.709	.098	.2362	●		●
GPS-05-18-075-DC	.197	.709	.098	.2953	●		●
GPS-06-20-075-DC	.236	.787	.118	.2953			●
GPS-06-20-075	.236	.787	.118	.2953		●	●
GPS-06-20-085-DC	.236	.787	.118	.3346	●		●
GPS-06-20-085	.236	.787	.118	.3346		●	
GPS-06-20-100-DC	.236	.787	.118	.3937	●		●
GPS-06-20-100	.236	.787	.118	.3937		●	
GPS-06-20-120-DC	.236	.787	.118	.4724	●		●
GPS-06-20-120	.236	.787	.118	.4724		●	
GPS-07-20-120-DC	.276	.787	.138	.4724	●		●
GPS-07-20-120	.276	.787	.138	.4724		●	●
GPS-08-25-155-DC	.315	.984	.177	.6102	●		●
GPS-08-25-155	.315	.984	.177	.6102		●	●
GPS-10-30-200-DC	.394	1.181	.177	.7874	●		●
GPS-10-30-200	.394	1.181	.177	.7874		●	
GPS-10-35-200-DC	.394	1.378	.236	.7874	●		●
GPS-10-35-200	.394	1.378	.236	.7874		●	●
GPS-12-35-250-DC	.472	1.378	.217	.9842	●		●
GPS-12-35-250	.472	1.378	.217	.9842		●	●
GPS-14-40-250-DC	.551	1.575	.295	.9842	●		●
GPS-14-40-250	.551	1.575	.295	.9842		●	●
GPS-18-40-300-DC	.709	1.575	.354	1.1811	●		●

• DC- Double Chamfer

Universal Marking for Deep Drilling Tools



Guide Pad Grade Recommendation

Priority	Oil Coolant			Water Based Coolant		
	1	2	3	1	2	3
ISO-P	IC950	IC908	IC928	IC928	IC908	-
ISO-K	IC950	IC908	IC928	IC928	IC908	-
ISO-M	IC928	IC908	IC950	IC928	IC908	-
ISO-S	IC928	IC908	IC950	IC928	IC908	-

Chip Form General Information

Chip Form in Deep Hole Drilling

Chip form plays a key role in STS (Single tube system) and DTS (Double tube system) while large-volume and high-pressure coolant do so as well. Because chips are removed through the tube with coolant, proper chip formation is essential for smooth and steady evacuation.

Chip Formation

Chip formation is affected by multiple factors, such as workpiece material, chipbreaker geometry, cutting speed, feed, type of coolant, and coolant temperature. Suitable chip formation depends on cutting operation but is controllable by changing the cutting conditions.

How to Decide the Chip Form

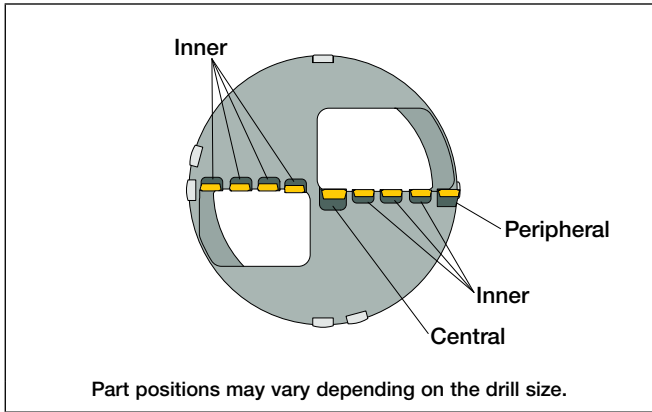
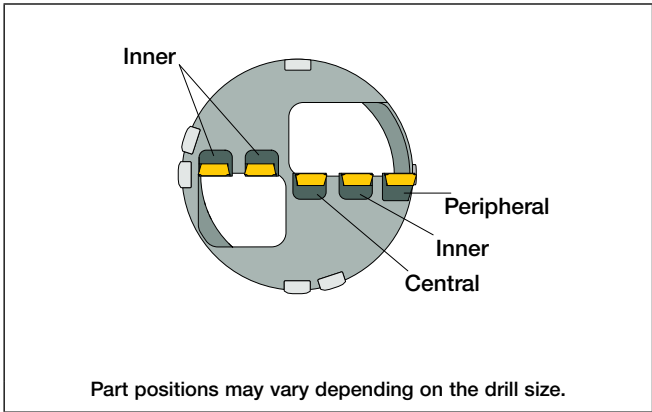
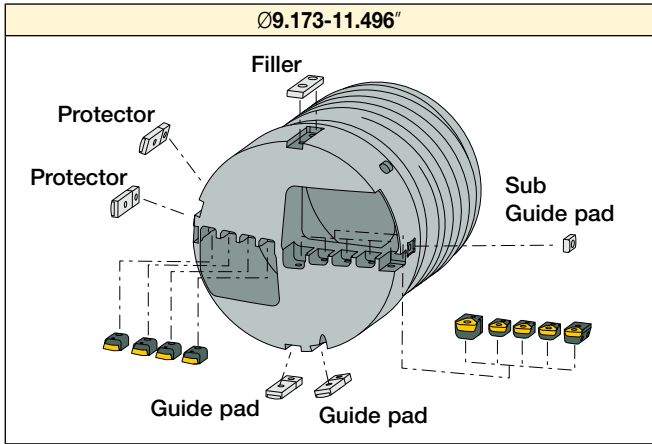
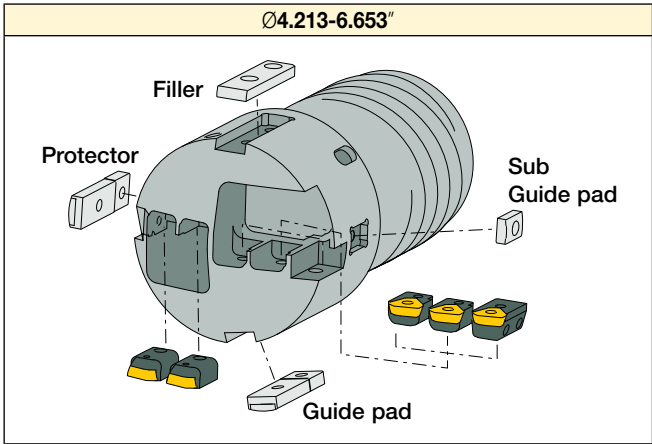
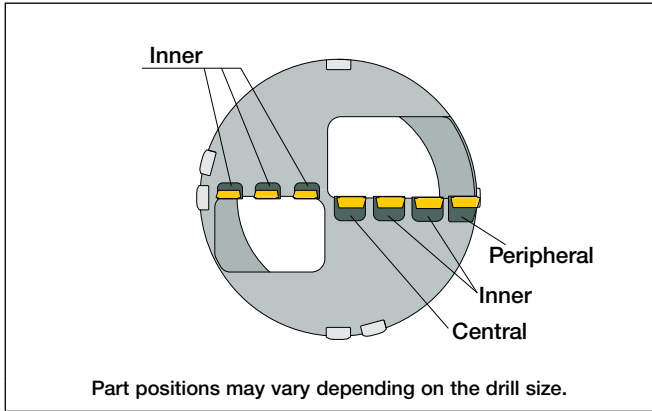
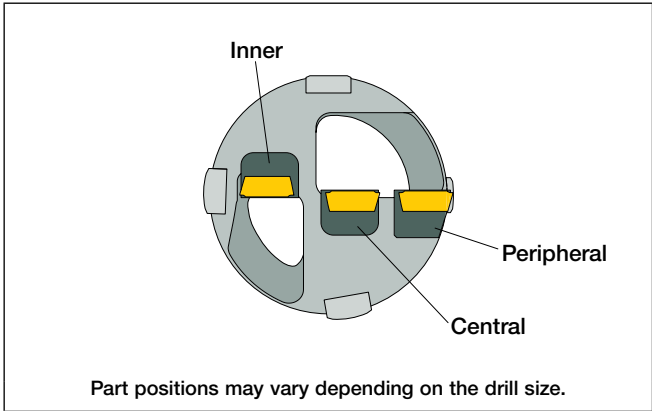
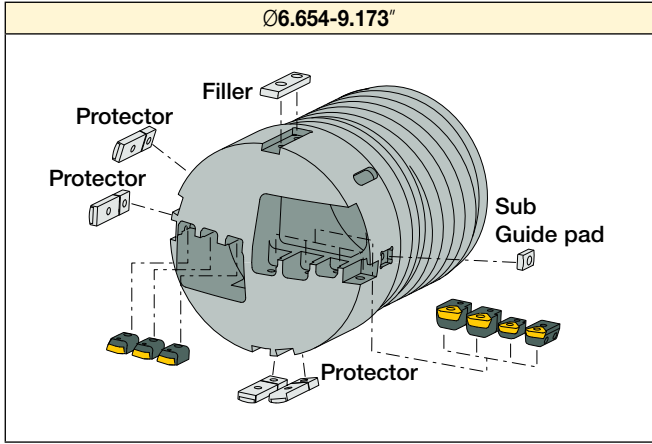
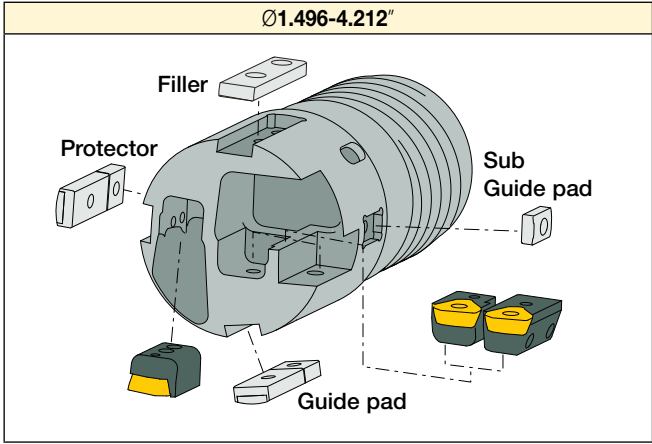
Generally the chip length should be 3 - 4 times its width, but tends to be longer with difficult-to-cut materials. In this case, chip evacuation can be improved by making the chips thinner, which is normally done by reducing the feed rate.

The graph below shows chip formation for different cutting speeds and feeds. Short chips are created by reducing the cutting speed or increasing the feed.

		Table 1		
		Central	Intermediate	Peripheral
Cutting Speed: V_c (SFM)	360			
	300			
	230			
	160			
Condition		.004	.006	.008
		Feed: f (IPR)		

From left to right in each box the order is central, intermediate and peripheral chip.



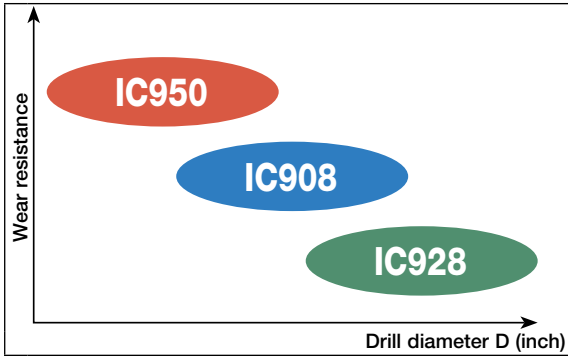


*For more information regarding the filler please see page 271

Guide Pads

Guide pads are subject to wear, like inserts.

- Each guide pad can be used on two sides. When the first corner wears out 70% of the width, reverse the guide pad to use the second corner.
- Replace with a new guide pad when the second corner wears out.



For higher wear resistance

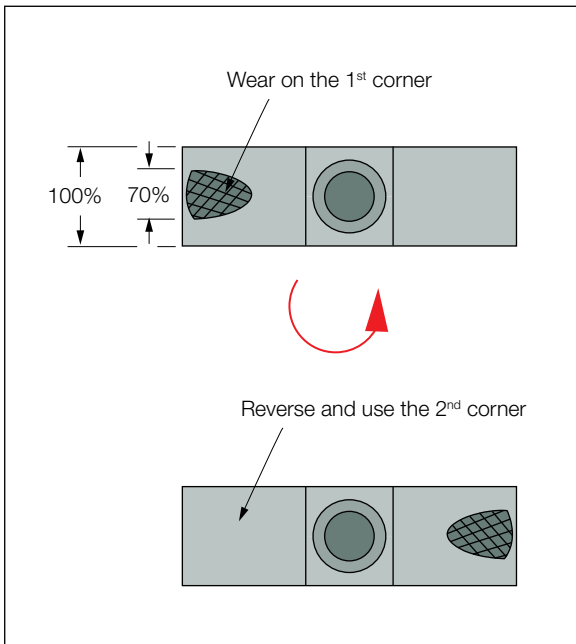
- High wear-resistant grade

First recommendation

- Suitable for various workpiece materials
- Long tool life due to unique substrate and coating

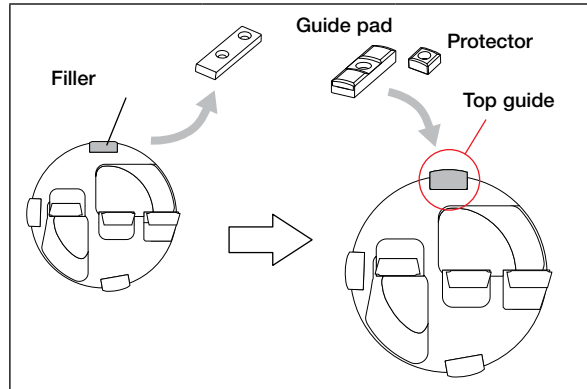
For higher fracture resistance

- High fracture-resistant grade



Please Replace the Filler With the Top Guide Pad When:

- High hole accuracy is required
- L/D (hole length-to-diameter) ratio is greater than 50:1
- Drilling a workpiece which has a tail stock hole
- The DOC required is greater than the range of the peripheral insert for counterboring. *See chart below.



*Maximum DOC of peripheral insert

Cartridge	DOC (inch)	Guide pad
CAOD-0845	.252	GPS-08.../GPS-10...
CAOD-103	.283	GPS-10.../GPS-14...
CAOD-142	.409	GPS-14.../GPS-18...
CAOD-170	.472	GPS-18...

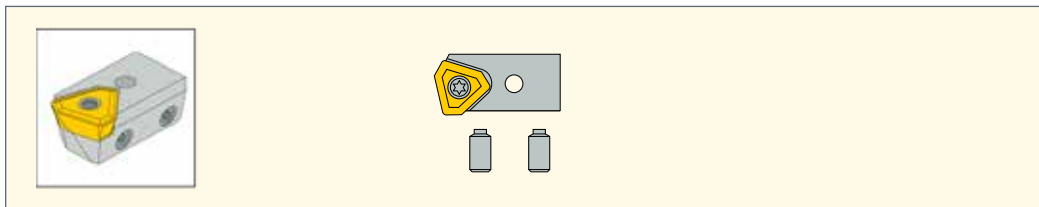
For diameter less than 3.622", the drill head is semi-standard using the top guide pad. Please contact your dealer for further information.

	Guide pad	
	Screw	Key
GPS-05	SR 34-508 M2.2x0.45	T-7/5
GPS-06	SR 11201753-1	T-7/5
GPS-07	SR 11201753-4	T-9/5
GPS-08	SR 11201753-4	T-9/5
GPS-10	SR 11201753-6	T-15/5
GPS-12	SR 11201753-6	T-15/5
GPS-14	SR 11201752-2	T-15/5
GPS-18	SR 11201756-7S	T-15/5

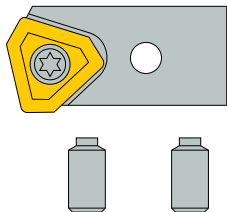
ISCARDEEPDRILL

CAOD

Drilling Head Peripheral Cartridge



Universal Marking for Deep Drilling Tools



CA - P - DR - 0800 - R

└─ Peripheral Cartridge
└─ DR : Drilling
CB : Counter Bore
└─ IC
└─ L/R HAND

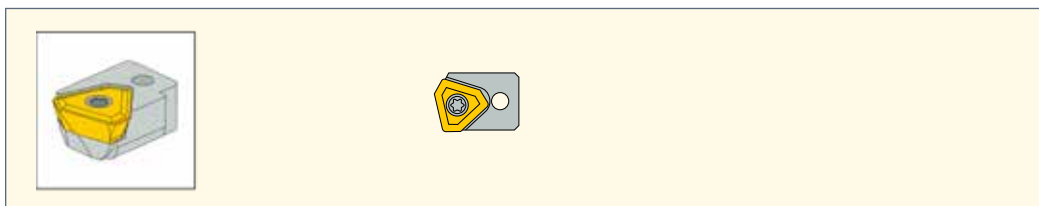
Spare Parts

Designation	Adjustment Screw	Key	Locking Screw	Key	Insert	Insert Clamping Screw
CAOD-080	SR 11201755-4	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-0845	SR 11201755-6	HW 2.0	SR 11201756-10	HW 2.5	TPMX 1403..R-G	SR 11201753-3
CAOD-085	SR 11201755-7	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-103	SR 11201755-8	HW 2.5	SR 11201756-12	HW 3.0	TPMX 1704..R-G	SR 11201753-7
CAOD-142	SR 11201755-9	HW 2.5	SR 11201756-15	HW 4.0	TPMX 2405..R-G	SR 11201753-9
CAOD-170	SR 11201755-11	HW 3.0	SR 11201756-15	HW 4.0	TPMX 2807..R-G	SR 11201753-10

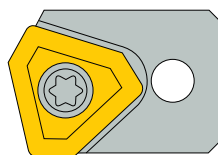
ISCARDEEPDRILL

CAID

Drilling Head Inner Cartridge



Universal Marking for Deep Drilling Tools



CA - I - 0845 - R

└─ Internal Cartridge
└─ IC
└─ L/R HAND

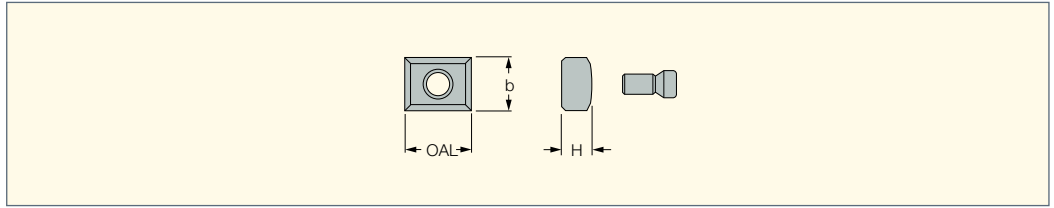
Spare Parts

Designation	Locking Screw	Key	Insert	Insert Clamping Screw	Key
CAID-080	SR 11201753-5	T-9/51	NPMX 0803..R-G	SR 11201753-2	T-7/51
CAID-0845	SR 11201753-6	T-15/51	TPMX 1403..R-G	SR 11201753-3	T-8/51
CAID-085	SR 11201753-5	T-9/51	NPMX 0803..R-G	SR 11201753-2	T-7/51
CAID-103	SR 11201752-1	T-15/51	TPMX 1704..R-G	SR 11201753-7	T-9/51
CAID-142	SR 11201756-7	HW 3.0	TPMX 2405..R-G	SR 11201753-9	T-15/51
CAID-170	SR 11201756-7	HW 3.0	TPMX 2807..R-G	SR 11201753-10	T-20/51

ISCARDEEPDRILL

SGP

Drilling Head Sub-Guide Pads



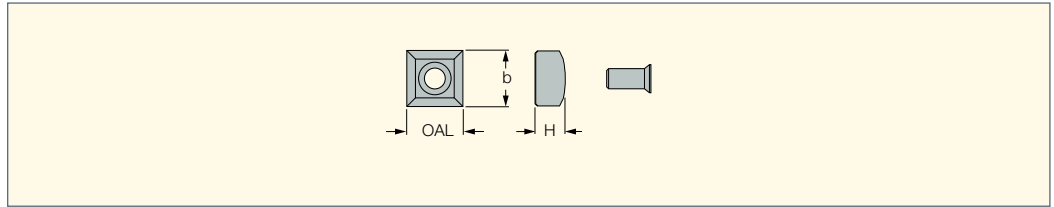
Designation	OAL	b	H
SGP-01	.394	.236	.118
SGP-02	.394	.315	.177
SGP-03	.394	.394	.197
SGP-04	.787	.551	.276

- Select an outer cartridge and pad for the required enlarged diameter.

ISCARDEEPDRILL

GPP


Drilling Head
Guide Pad Protectors





Designation	OAL	b	H
GPP-04	.315	.315	.173
GPP-05	.315	.315	.138
GPP-06	.315	.315	.177
GPP-07	.394	.394	.236
GPP-08	.551	.551	.295
GPP-09	.709	.709	.354

- Select an outer cartridge and pad for the required enlarged diameter.

Recommended Clamping Torque

Insert screw	
	lbf-in
SR 11201753-2	8.9
SR 11201753-3	11.5
SR 11201753-7	20.4
SR 11201753-9	31.0
SR 11201753-7	44.3

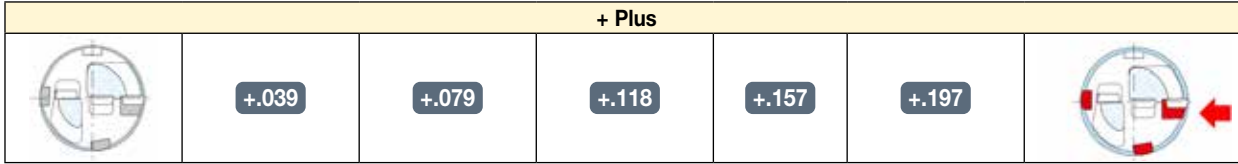
Cartridge screw	
	lbf-in
SR 11201752-1	31.0
SR 11201753-5	20.4
SR 11201753-5	31.0
SR 11201756-7	26.6
SR 11201756-10	19.5
SR 11201756-11	19.5
SR 11201756-12	26.6
SR 11201756-15	44.3

Guide pad screw	
	lbf-in
SR 14-571/5	31.0
SR 34-506-C	20.4
LS1206SSS	26.6



(+) Plus Parts for Diameter Enlargement

By exchanging only the peripheral cartridge and guide pads, the original head diameter can be increased up to .197".
 (Standard plus parts = .039", .079", .118", .157", .197")



Plus Cartridge - CAOD

Original	+.039 inch	+.079 inch	+.118 inch	+.157 inch	+.197 inch
CAOD-080	CAOD-080+.039	CAOD-080+.079	-	-	-
CAOD-0845	CAOD-0845+.039	CAOD-0845+.079	CAOD-0845+.118	-	-
CAOD-103	CAOD-103+.039	CAOD-103+.079	CAOD-103+.118	CAOD-103+.157	-
CAOD-142	CAOD-142+.039	CAOD-142+.079	CAOD-142+.118	CAOD-142+.157	CAOD-142+.197
CAOD-170	CAOD-170+.039	CAOD-170+.079	CAOD-170+.118	CAOD-170+.157	CAOD-170+.197

Plus Cartridge - CAORC

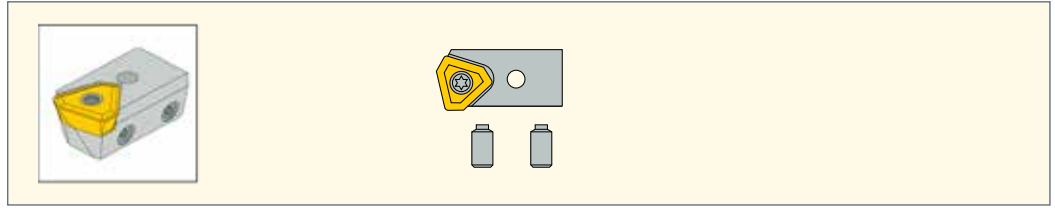
Original cartridge	+.039 inch	+.079 inch	+.118 inch	+.157 inch	+.197 inch
CAORC-0845	CAORC-0845+.039	CAORC-0845+.079	CAORC-0845+.118	-	-
CAORC-103	CAORC-103+.039	CAORC-103+.079	CAORC-103+.118	CAORC-103+.157	-
CAORC-142	CAORC-142+.039	CAORC-142+.079	CAORC-142+.118	CAORC-142+.157	CAORC-142+.197
CAORC-170	CAORC-170+.039	CAORC-170+.079	CAORC-170+.118	CAORC-170+.157	CAORC-170+.197

Plus Guide Pad

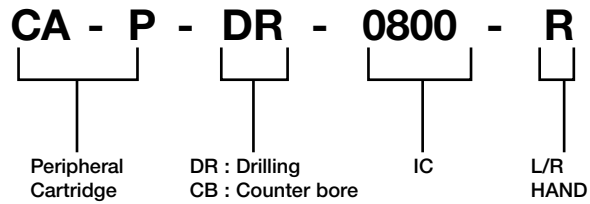
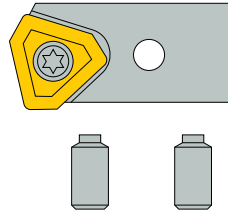
Original pad	+.039 inch	+.079 inch	+.118 inch	+.157 inch	+.197 inch
GPS-08-25-155	GPB-08-25-155+.039	GPB-08-25-155+.079	GPB-08-25-155+.118	-	-
GPS-10-35-200	GPB-10-35-200+.039	GPB-10-35-200+.079	GPB-10-35-200+.118	GPB-10-35-200+.157	-
GPS-14-40-250	GPB-14-40-250+.039	GPB-14-40-250+.079	GPB-14-40-250+.118	GPB-14-40-250+.157	GPB-14-40-250+.197
GPS-18-40-300	GPB-18-40-300+.039	GPB-18-40-300+.079	GPB-18-40-300+.118	GPB-18-40-300+.157	GPB-18-40-300+.197

CAOD

Drilling Head Peripheral Cartridge



Universal Marking for Deep Drilling Tools



Spare Parts

Designation	Adjustment Screw	Key	Locking Screw	Key	Insert	Insert Clamping Screw
CAOD-080+.039	SR 11201755-4	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-080+.079	SR 11201755-4	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-085+.039	SR 11201755-7	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-085+.079	SR 11201755-7	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-085+.118	SR 11201755-7	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-103+.039	SR 11201755-8	HW 2.5	SR 11201756-12	HW 3.0	TPMX 1704..R-G	SR 11201753-7
CAOD-103+.079	SR 11201755-8	HW 2.5	SR 11201756-12	HW 3.0	TPMX 1704..R-G	SR 11201753-7
CAOD-103+.118	SR 11201755-8	HW 2.5	SR 11201756-12	HW 3.0	TPMX 1704..R-G	SR 11201753-7
CAOD-103+.157	SR 11201755-8	HW 2.5	SR 11201756-12	HW 3.0	TPMX 1704..R-G	SR 11201753-7
CAOD-142+.039	SR 11201755-9	HW 2.5	SR 11201756-15	HW 4.0	TPMX 2405..R-G	SR 11201753-9
CAOD-142+.079	SR 11201755-9	HW 2.5	SR 11201756-15	HW 4.0	TPMX 2405..R-G	SR 11201753-9
CAOD-142+.118	SR 11201755-9	HW 2.5	SR 11201756-15	HW 4.0	TPMX 2405..R-G	SR 11201753-9
CAOD-142+.157	SR 11201755-9	HW 2.5	SR 11201756-15	HW 4.0	TPMX 2405..R-G	SR 11201753-9
CAOD-142+.197	SR 11201755-9	HW 2.5	SR 11201756-15	HW 4.0	TPMX 2405..R-G	SR 11201753-9
CAOD-170+.039	SR 11201755-11	HW 3.0	SR 11201756-15	HW 4.0	TPMX 2807..R-G	SR 11201753-10
CAOD-170+.079	SR 11201755-11	HW 3.0	SR 11201756-15	HW 4.0	TPMX 2807..R-G	SR 11201753-10
CAOD-170+.118	SR 11201755-11	HW 3.0	SR 11201756-15	HW 4.0	TPMX 2807..R-G	SR 11201753-10
CAOD-170+.157	SR 11201755-11	HW 3.0	SR 11201756-15	HW 4.0	TPMX 2807..R-G	SR 11201753-10
CAOD-170+.197	SR 11201755-11	HW 3.0	SR 11201756-15	HW 4.0	TPMX 2807..R-G	SR 11201753-10



Machining Recommendations

ISO	Material	Condition	Tensile Strength [ksi]	Material Group No. ⁽¹⁾	Hardness HB	Chipbreaker			
						Troubleshooting			
						First Choice	Fracture	Wear	
P	Non-alloy steel and cast steel, free cutting steel	<0.25% C	Annealed	61	1	125	G IC908	BG IC806	B IC9025
		≥0.25% C	Annealed	94	2	190			
		<0.55% C	Quenched and tempered	123	3	250			
		≥0.55% C	Annealed	109	4	220			
		≥0.55% C	Quenched and tempered	145	5	300			
	Low alloy and cast steel (less than 5% of alloying elements)	Quenched and tempered	Annealed	87	6	200	G IC908	BG IC806	B IC9025
				135	7	275			
				145	8	300			
				174	9	350			
	High alloyed steel, cast steel and tool steel	Annealed	99	10	200	G IC908	BG IC806	B IC9025	
		Quenched and tempered	160	11	325				
Stainless steel and cast steel	Ferritic/martensitic	99	12	200	G IC908	BG IC806	B IC9025		
	Martensitic	119	13	240					
M	Stainless steel and cast steel	Austenitic, duplex	87	14	180	G IC806	B IC908	B IC9025	
K	Gray cast iron (GG)	Ferritic/pearlitic		15	180	G IC908	G IC806	B IC9025	
		Pearlitic/martensitic		16	260				
	Nodular cast iron (GGG)	Ferritic		17	160				
		Pearlitic		18	250				
	Malleable cast iron	Ferritic		19	130				
Pearlitic			20	230					
N	Aluminum-wrought alloys	Not hardenable		21	60	G IC908	G IC806	B IC9025	
		Hardenable		22	100				
	Aluminum-cast alloys	≤12% Si	Not hardenable		23				75
		>12% Si	Hardenable		24				90
	Copper alloys	>1% Pb	High temperature		25				130
			Free cutting		26				110
			Brass		27				90
			Electrolytic copper		28				100
Non metallic	Duroplastics, fiber plastics			29					
		Hard rubber		30					
S	High temperature alloys	Fe based	Annealed		31	200	B IC806	B IC908	B IC9025
			Hardened		32	280			
		Ni or Co based	Annealed		33	250			
			Hardened		34	350			
			Cast		35	320			
	Titanium alloys	Pure	58	36					
	Alpha+Beta alloys hardened	152	37						
H	Hardened steel	Hardened		38		B IC806	B IC908	B IC908	
		Hardened		39					
	Chilled cast iron	Cast	40	400					
	Cast iron	Hardened	41						

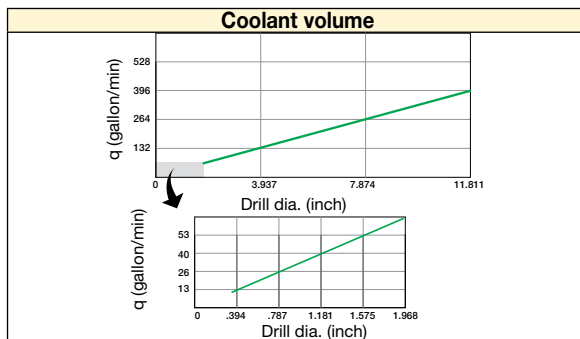
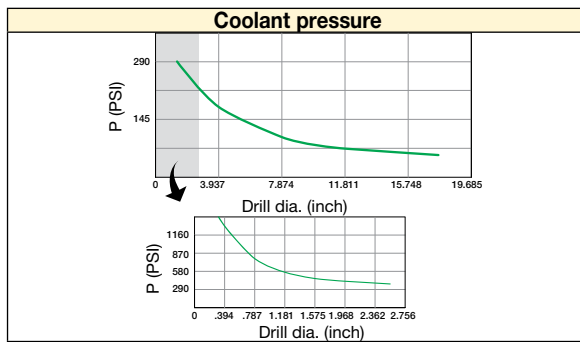
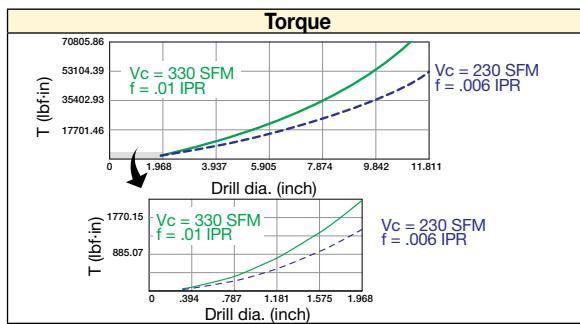
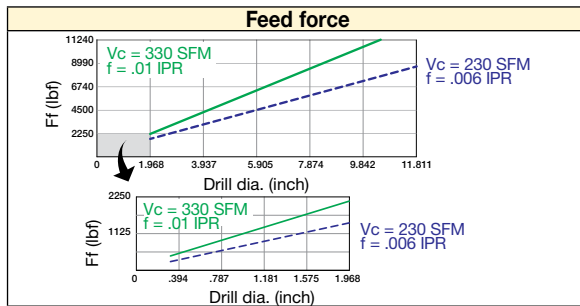
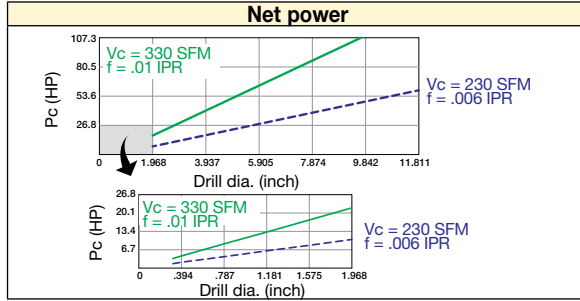
⁽¹⁾ For material groups see pages 573-604

Indexable Drill Heads ISD-EC, IDD-EC, ISD-IC					
Dia. Range	1.496-1.574	1.575-2.047	2.0472-2.519	2.520-3.346	3.3464-11.535
V _c (SFM)	Feed Rate f (IPR)				
195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 330	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 330	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
165 - 330	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
165 - 330	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 360	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 360	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 360	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
260 - 460	.008 - .012	.008 - .012	.009 - .013	.009 - .013	.01 - .016
260 - 460	.008 - .012	.008 - .012	.009 - .013	.009 - .013	.01 - .016
260 - 460	.008 - .012	.008 - .012	.009 - .013	.009 - .013	.01 - .016
260 - 460	.008 - .012	.008 - .012	.009 - .013	.009 - .013	.01 - .016
260 - 460	.008 - .012	.008 - .012	.009 - .013	.009 - .013	.01 - .016
260 - 460	.008 - .012	.008 - .012	.009 - .013	.009 - .013	.01 - .016
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
195 - 425	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
195 - 425	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
65 - 215	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.007 - .011
65 - 215	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.007 - .011
65 - 215	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.007 - .011
100 - 330	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.007 - .011
100 - 330	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.007 - .011
100 - 195	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.007 - .011
100 - 195	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.007 - .011
100 - 260	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.006 - .011
100 - 260	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.006 - .011
100 - 260	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.006 - .011
100 - 260	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.006 - .011

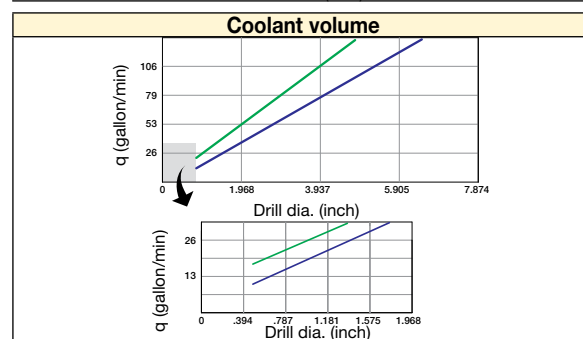
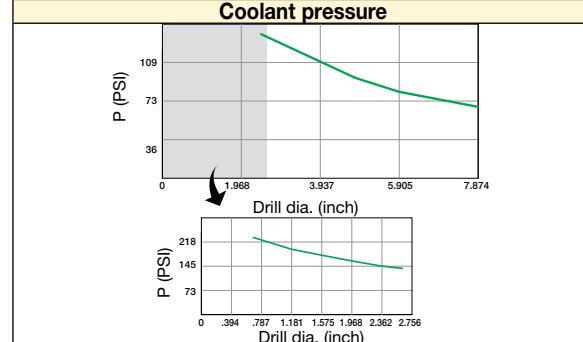
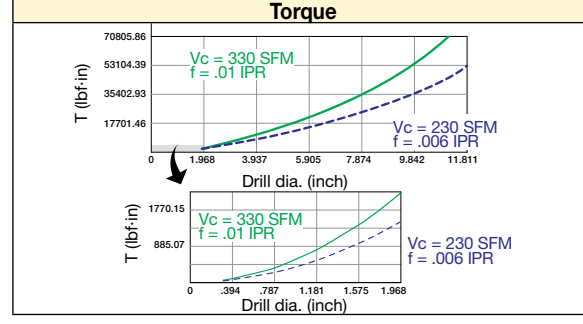
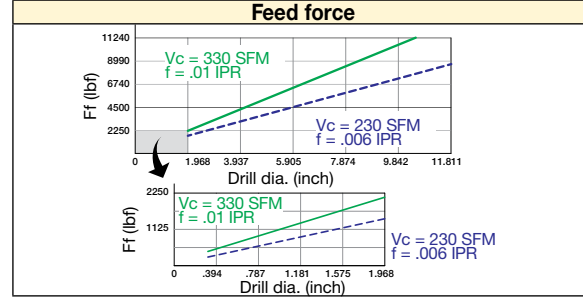
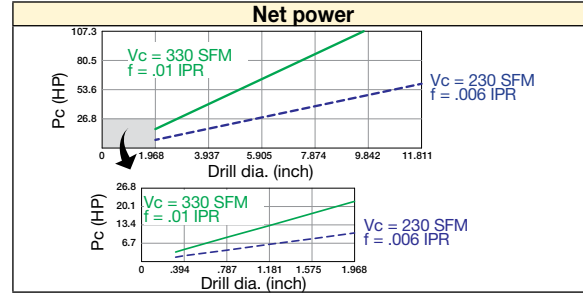
⁽¹⁾ For material groups see pages 573-604

Technical Guide

Setting guidelines for cutting loads, fluid pressure and flow rate during STS operation



Setting guidelines for cutting loads, fluid pressure and flow rate during DTS operation



**Technical Information -
Cartridge Style Drill Head Diameter Settings**

The drill head diameter is set and inspected with a master insert in our final inspection. However, the inserts in the market have a tolerance fluctuation so each time you index the insert, the diameter must be adjusted as per the following method.

Note: When a corner change is made on the insert, it must be adjusted to the correct size or damage can be caused to the head body or workpiece material.

	<p>1. Remove the inner cartridge to avoid interference with the guide screw.</p>
	<p>2. The dimensional guide pad must be slid forward to measure the diameter. 2.1 Loosen the lock screw and slide the guide pad forward. 2.2 Re-tighten the lock screw at the measuring position.</p>
	<p>3. Measure the diameter with a micrometer. We recommend setting the tool diameter at h8 tolerance to the cutting diameter. If the diameter is incorrect, go to step 4 below. If it's correct, go to step 5 below.</p>
	<p>4. Adjust the outer cartridge 4.1 First loosen the lock screw of the outer cartridge and then tighten it slightly.</p>
	<p>4.2 Proceed to adjust the diameter, using the 2 adjustment screws and measure with a micrometer.</p>
	<p>4.3 When set to the size, re-tighten the lock screw. 4.4 Recheck the diameter with a micrometer. If it is still out of tolerance, repeat the procedure from steps 1-4. Note: Please make sure to tighten the lock screw firmly before use. If loose, the cartridge may move and cause serious problems during machining.</p>
	<p>5. Slide the dimensional guide pad back to the original position and tighten the lock screw. 6. Replace the inner cartridge and tighten the lock screw. Note: Please check that all lock screws are firmly tightened, as they may come loose if vibration occurs during drilling.</p>

Brazed Drilling Head



Single Tube System – External Thread:

DSD-E0 - Deep Single Tube Drills with External Single Thread Connection and a Brazed Single Tip (.315-.583 dia.)

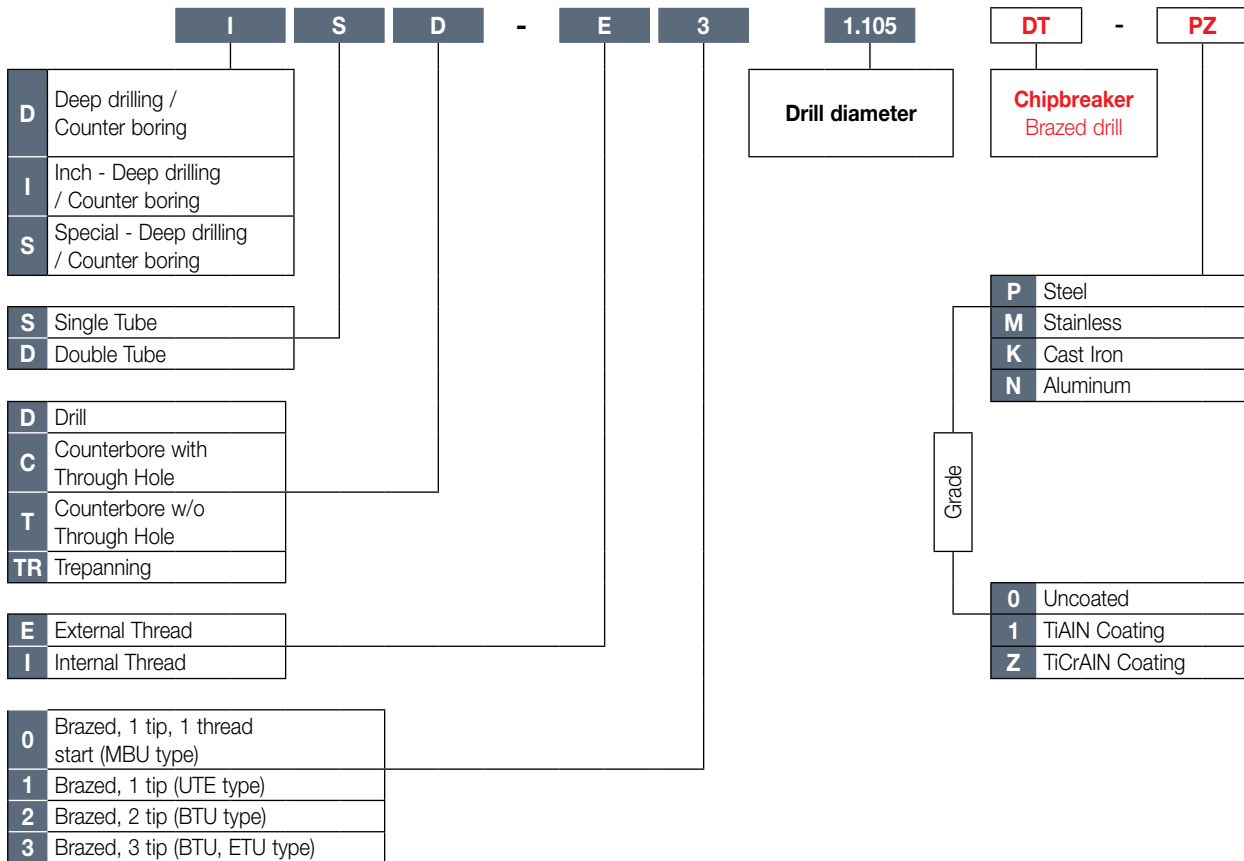
DSD-E1 - Deep Single Tube Drills with External 2 and 4 Start Thread Connections and a Single Brazed Tip (.496-.787 dia.)

DSD-E2/E3 - Deep Single Tube Drills with External 2 and 4 Start Thread Connections and 2 or 3 Brazed Tips (.496-2.559 dia.)

Double Tube System:

DDD-E3 - Deep Double Tube Drills with External 4 Start Thread Connection and Brazed Tips (.724-2.559 dia.)

Grade of Brazed Heads



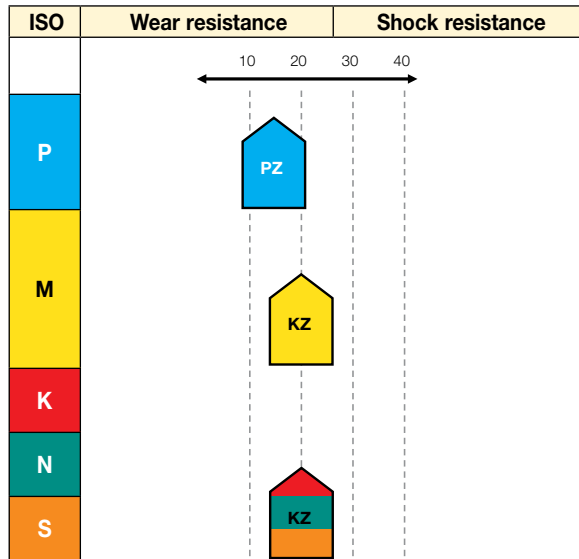
Brazed Head Grades

ISD-E0

ISD-E0 (MBU style) STS



Ø.315 - .582"



ISD-E2

ISD-E2 (BTU 2tip style) STS



Ø.496 ~ .787"

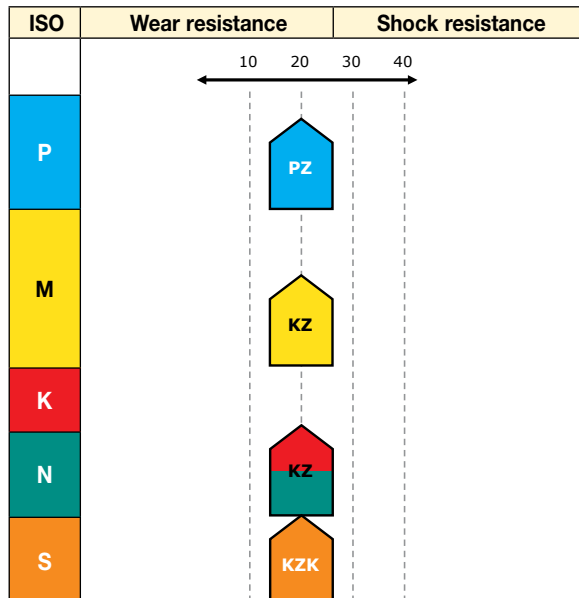


ISD-E1

ISD-E1 (UTE style) STS



Ø.496 ~ .787"



ISD-E3

ISD-E3 (BTU style) STS

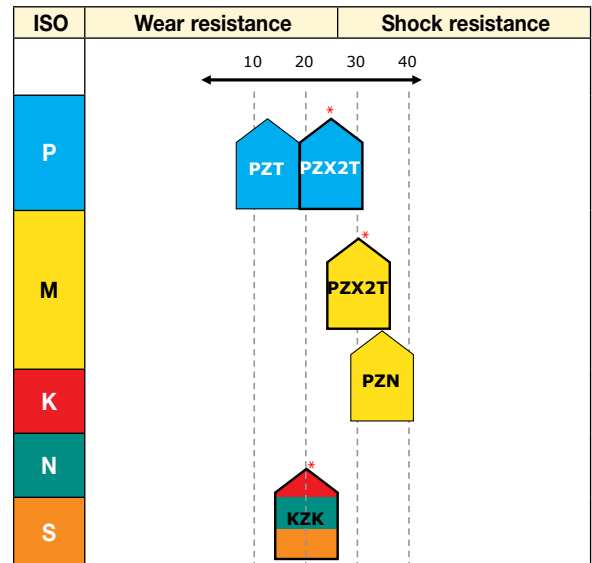


Ø.615 ~ 2.559"

IDD-E3 (ETU style) DTS







Ø.725 ~ 2.559"



* indicates the first recommendation

Tool Grades

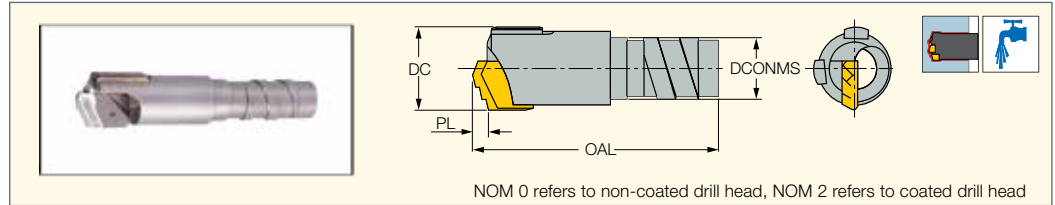
Application	Grade	Coating		Features	Brazed drill heads			
		Main composition	Thickness / μ inch		ISD-E0	ISD-E1	ISD-E2/E3	IDD-E3
1122								
P	P10 - P30	TiAlCr	100	<ul style="list-style-type: none"> • High wear resistance • Suitable for steel, cast iron, and difficult-to-cut material 	✓	✓	✓	✓
K	K15 - K25							
N	N15 - N25							
S	S15 - S25							
H	H15 - H25							
1132								
P	P20 - P30	TiAlCr	100	<ul style="list-style-type: none"> • Good balance between wear and chipping resistance • Suitable for steel and stainless steel under general cutting conditions 			✓	✓
M	M25 - M35							
2122								
M	M30 - M40	TiAlCr	100	<ul style="list-style-type: none"> • High fracture resistance • Suitable for stainless steel 			✓	✓
3112								
M	M15 - M25	TiAlCr	100	<ul style="list-style-type: none"> • Good balance between wear and fracture resistance 	✓	✓		
K	K10 - K20							
N	N15 - N25							
S	S15 - S25							
H	H15 - H25							
3132								
K	K15 - K25	TiAlCr	100	<ul style="list-style-type: none"> • First choice for heat-resistant alloy under general cutting conditions 			✓	✓
N	N10 - N20							
S	S15 - S25							
H	H15 - H25							

Note: For brazed tools, the grade codes represent the grade combination of the brazed carbide tip and guide pad grades. They do not represent the individual grade of carbide tips or guide pads.

ISCARDEEPDRILL

ISD-E0

Deep Single Tube Drills with External Single Thread Connection and a Brazed Single Tip (.315-.582 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	OAL	DCONMS	PL	Ts ⁽³⁾
ISD-E0 .315-.353 NOM 0	.315	.353	1.378	.236	.079	TS001
ISD-E0 .315-.353 NOM 2	.315	.353	1.378	.236	.079	TS001
ISD-E0 .354-.393 NOM 0	.354	.393	1.378	.283	.079	TS002
ISD-E0 .354-.393 NOM 2	.354	.393	1.378	.283	.079	TS002
ISD-E0 .394-.432 NOM 0	.394	.432	1.386	.299	.087	TS003
ISD-E0 .394-.432 NOM 2	.394	.432	1.386	.299	.087	TS003
ISD-E0 .433-.472 NOM 0	.433	.472	1.386	.339	.087	TS004
ISD-E0 .433-.472 NOM 2	.433	.472	1.386	.339	.087	TS004
ISD-E0 .473-.531 NOM 0	.472	.531	1.390	.358	.091	TS005
ISD-E0 .473-.531 NOM 2	.472	.531	1.390	.358	.091	TS005
ISD-E0 .532-.582 NOM 0	.532	.582	1.394	.425	.094	TS006
ISD-E0 .532-.582 NOM 2	.532	.582	1.394	.425	.094	TS006

- The drill tip is supplied in a grade that is suitable to machine the material group indicated in the drill head designation: P-Steel, M-Stainless Steel, K-Cast Iron.
- For user guide and quotation form, see pages 326-338 • Ordering example: ISD-E0 .444 DT-PO

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

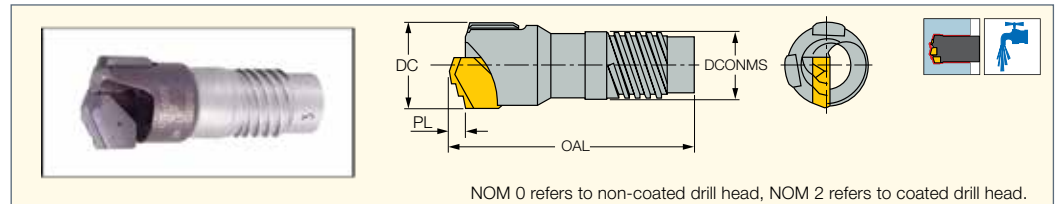
⁽³⁾ Tube designation

For holders, see pages: TS*** (321)

ISCARDEEPDRILL

ISD-E1

Deep Single Tube Drills with External 2 and 4 Start Thread Connections and a Single Brazed Tip (.496-.787 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	OAL	DCONMS	PL	Threads ⁽³⁾	Ts ⁽⁴⁾
ISD-E1 .496-.535 NOM 0	.496	.535	1.673	.378	.091	2	TS-I01
ISD-E1 .496-.535 NOM 2	.496	.535	1.673	.378	.091	2	TS-I01
ISD-E1 .536-.574 NOM 0	.536	.574	1.681	.417	.094	2	TS-I02
ISD-E1 .536-.574 NOM 2	.536	.574	1.681	.417	.094	2	TS-I02
ISD-E1 .575-.614 NOM 0	.575	.614	1.681	.457	.118	2	TS-I03
ISD-E1 .575-.614 NOM 2	.575	.614	1.681	.457	.118	2	TS-I03
ISD-E1 .615-.657 NOM 0	.615	.657	1.681	.457	.094	4	TS-I0
ISD-E1 .615-.657 NOM 2	.615	.657	1.681	.457	.094	4	TS-I0
ISD-E1 .658-.696 NOM 0	.658	.696	1.701	.535	.118	4	TS-I1
ISD-E1 .658-.696 NOM 2	.658	.696	1.701	.535	.118	4	TS-I1
ISD-E1 .697-.744 NOM 0	.697	.744	1.717	.571	.130	4	TS-I2
ISD-E1 .697-.744 NOM 2	.697	.744	1.717	.571	.130	4	TS-I2
ISD-E1 .745-.787 NOM 0	.745	.787	1.717	.610	.130	4	TS-I3
ISD-E1 .745-.787 NOM 2	.745	.787	1.717	.610	.130	4	TS-I3

- The drill tip is supplied in a grade that is suitable to machine the material group indicated in the drill head designation: P-Steel, M-Stainless Steel, K-Cast Iron.
- For user guide and quotation form, see pages 326-338 • Ordering example: ISD-E1 .571 DT-PO

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ No. of thread starts

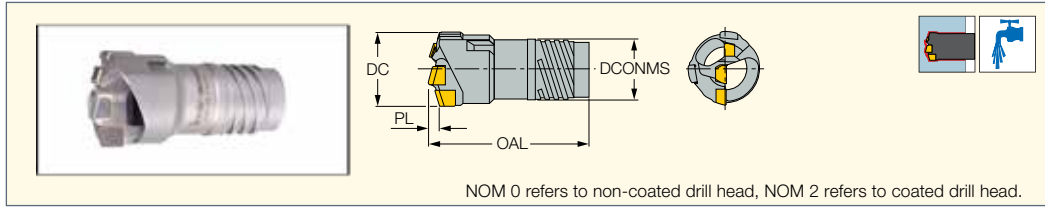
⁽⁴⁾ Tube designation

For holders, see pages: TS-I** (322)

ISCARDEEPPDRILL

ISD-E2/E3

Deep Single Tube Drills with External 2 and 4 Start Thread Connections and 2 or 3 Brazed Tips (.496-2.559 dia.)



NOM 0 refers to non-coated drill head, NOM 2 refers to coated drill head.

Designation	DCN ⁽¹⁾	DCX ⁽²⁾	OAL	DCNMS	PL	Threads ⁽³⁾	Ts ⁽⁴⁾
ISD-E2 .496-.535 NOM 0	.496	.535	1.693	.378	.043	2	TS-I01
ISD-E2 .496-.535 NOM 2	.496	.535	1.693	.378	.043	2	TS-I01
ISD-E2 .536-.575 NOM 0	.536	.575	1.693	.417	.050	2	TS-I02
ISD-E2 .536-.575 NOM 2	.536	.575	1.693	.417	.050	2	TS-I02
ISD-E2 .576-.614 NOM 0	.575	.614	1.693	.457	.051	2	TS-I03
ISD-E2 .576-.614 NOM 2	.575	.614	1.693	.457	.051	2	TS-I03
ISD-E3 .615-.657 NOM 0	.614	.657	1.693	.496	.110	4	TS-I0
ISD-E3 .615-.657 NOM 2	.614	.657	1.693	.496	.110	4	TS-I0
ISD-E3 .658-.697 NOM 0	.658	.697	1.693	.535	.110	4	TS-I1
ISD-E3 .658-.697 NOM 2	.658	.697	1.693	.535	.110	4	TS-I1
ISD-E3 .698-.744 NOM 0	.697	.744	1.850	.571	.110	4	TS-I2
ISD-E3 .698-.744 NOM 2	.697	.744	1.850	.571	.110	4	TS-I2
ISD-E3 .745-.787 NOM 0	.744	.787	1.850	.610	.114	4	TS-I3
ISD-E3 .745-.787 NOM 2	.744	.787	1.850	.610	.114	4	TS-I3
ISD-E3 .788-.858 NOM 0	.788	.858	2.067	.630	.126	4	TS-I4
ISD-E3 .788-.858 NOM 2	.788	.858	2.067	.630	.126	4	TS-I4
ISD-E3 .859-.948 NOM 0	.859	.949	2.205	.709	.126	4	TS-I5
ISD-E3 .859-.948 NOM 2	.859	.949	2.205	.709	.126	4	TS-I5
ISD-E3 .949-1.039 NOM 0	.949	1.039	2.264	.768	.138	4	TS-I6
ISD-E3 .949-1.039 NOM 2	.949	1.039	2.264	.768	.138	4	TS-I6
ISD-E3 1.040-1.129 NOM 0	1.040	1.130	2.264	.827	.146	4	TS-I7
ISD-E3 1.040-1.129 NOM 2	1.040	1.130	2.264	.827	.146	4	TS-I7
ISD-E3 1.130-1.220 NOM 0	1.130	1.220	2.500	.925	.157	4	TS-I8
ISD-E3 1.130-1.220 NOM 2	1.130	1.220	2.500	.925	.157	4	TS-I8
ISD-E3 1.221-1.311 NOM 0	1.221	1.311	2.500	1.004	.169	4	TS-I9
ISD-E3 1.221-1.311 NOM 2	1.221	1.311	2.500	1.004	.169	4	TS-I9
ISD-E3 1.312-1.425 NOM 0	1.311	1.425	2.500	1.102	.177	4	TS-I10
ISD-E3 1.312-1.425 NOM 2	1.311	1.425	2.500	1.102	.177	4	TS-I10
ISD-E3 1.426-1.559 NOM 0	1.426	1.559	2.894	1.181	.189	4	TS-I11
ISD-E3 1.426-1.559 NOM 2	1.426	1.559	2.894	1.181	.189	4	TS-I11
ISD-E3 1.560-1.692 NOM 0	1.559	1.693	2.894	1.299	.220	4	TS-I12
ISD-E3 1.560-1.692 NOM 2	1.559	1.693	2.894	1.299	.220	4	TS-I12
ISD-E3 1.693-1.850 NOM 0	1.693	1.850	2.953	1.417	.213	4	TS-I13
ISD-E3 1.693-1.850 NOM 2	1.693	1.850	2.953	1.417	.213	4	TS-I13
ISD-E3 1.851-2.035 NOM 0	1.851	2.035	2.953	1.535	.240	4	TS-I14
ISD-E3 1.851-2.035 NOM 2	1.851	2.035	2.953	1.535	.240	4	TS-I14
ISD-E3 2.036-2.212 NOM 0	2.036	2.213	3.228	1.693	.256	4	TS-I15
ISD-E3 2.036-2.212 NOM 2	2.036	2.213	3.228	1.693	.256	4	TS-I15
ISD-E3 2.213-2.385 NOM 0	2.213	2.386	3.307	1.850	.260	4	TS-I16
ISD-E3 2.213-2.385 NOM 2	2.213	2.386	3.307	1.850	.260	4	TS-I16
ISD-E3 2.386-2.559 NOM 0	2.386	2.559	3.307	1.850	.276	4	TS-I17
ISD-E3 2.386-2.559 NOM 2	2.386	2.559	3.307	1.850	.276	4	TS-I17

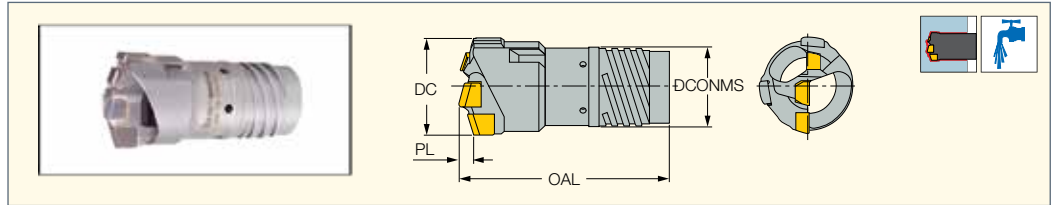
- The drill tip is supplied in a grade that is suitable to machine the material group indicated in the drill head designation: ISO P, K, M, N materials
- For user guide and quotation form, see pages 326-338 • Ordering example: ISD-E3 1.705 DT-PO

⁽¹⁾ Cutting diameter minimum
⁽²⁾ Cutting diameter maximum
⁽³⁾ Number of thread starts
⁽⁴⁾ Tube designation

For holders, see pages: TS-I** (322)

IDD-E3

Deep Double Tube Drills with External 4 Start Thread Connection and Brazed Tips (.725-2.559 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	OAL	DCONMS	PL	Ts ⁽³⁾	Tsi ⁽⁴⁾
IDD-E3 .725-.787 NOM 0	.725	.787	1.968	.630	.114	TDO-I0	TDI-N0
IDD-E3 .725-.787 NOM 2	.725	.787	1.968	.630	.114	TDO-I0	TDI-N0
IDD-E3 .788-.858 NOM 0	.788	.858	2.205	.709	.130	TDO-I1	TDI-N1
IDD-E3 .788-.858 NOM 2	.788	.858	2.205	.709	.126	TDO-I1	TDI-N1
IDD-E3 .859-.948 NOM 0	.859	.948	2.205	.768	.130	TDO-I2	TDI-N2
IDD-E3 .859-.948 NOM 2	.859	.948	2.205	.768	.126	TDO-I2	TDI-N2
IDD-E3 .949-1.039 NOM 0	.949	1.039	2.264	.827	.140	TDO-I3	TDI-N3
IDD-E3 .949-1.039 NOM 2	.949	1.039	2.264	.827	.138	TDO-I3	TDI-N3
IDD-E3 1.040-1.129 NOM 0	1.040	1.129	2.382	.925	.150	TDO-I4	TDI-N4
IDD-E3 1.040-1.129 NOM 2	1.040	1.129	2.382	.925	.146	TDO-I4	TDI-N4
IDD-E3 1.130-1.220 NOM 0	1.130	1.220	2.500	1.004	.160	TDO-I5	TDI-N5
IDD-E3 1.130-1.220 NOM 2	1.130	1.220	2.500	1.004	.157	TDO-I5	TDI-N5
IDD-E3 1.221-1.311 NOM 0	1.221	1.311	2.500	1.102	.161	TDO-I6	TDI-N6
IDD-E3 1.221-1.311 NOM 2	1.221	1.311	2.500	1.102	.161	TDO-I6	TDI-N6
IDD-E3 1.312-1.425 NOM 0	1.312	1.425	2.776	1.181	.180	TDO-I7	TDI-N7
IDD-E3 1.312-1.425 NOM 2	1.312	1.425	2.776	1.181	.177	TDO-I7	TDI-N7
IDD-E3 1.426-1.559 NOM 0	1.426	1.559	2.894	1.299	.189	TDO-I8	TDI-N8
IDD-E3 1.426-1.559 NOM 2	1.426	1.559	2.894	1.299	.189	TDO-I8	TDI-N8
IDD-E3 1.560-1.692 NOM 0	1.560	1.692	2.894	1.417	.209	TDO-I9	TDI-N9
IDD-E3 1.560-1.692 NOM 2	1.560	1.692	2.894	1.417	.209	TDO-I9	TDI-N9
IDD-E3 1.693-1.850 NOM 0	1.693	1.850	2.953	1.535	.217	TDO-I10	TDI-N10
IDD-E3 1.693-1.850 NOM 2	1.693	1.850	2.953	1.535	.217	TDO-I10	TDI-N10
IDD-E3 1.851-2.035 NOM 0	1.851	2.035	3.110	1.693	.240	TDO-I11	TDI-N11
IDD-E3 1.851-2.035 NOM 2	1.851	2.035	3.110	1.693	.240	TDO-I11	TDI-N11
IDD-E3 2.036-2.212 NOM 0	2.036	2.212	3.228	1.850	.256	TDO-I12	TDI-N12
IDD-E3 2.036-2.212 NOM 2	2.036	2.212	3.228	1.850	.256	TDO-I12	TDI-N12
IDD-E3 2.213-2.559 NOM 0	2.213	2.559	3.307	2.008	.260	TDO-I13	TDI-N13
IDD-E3 2.213-2.559 NOM 2	2.213	2.559	3.307	2.008	.260	TDO-I13	TDI-N13

- The drill tip is supplied in a grade that is suitable to machine the material group indicated in the drill head designation: ISO P, K, M, N materials
- NOM 0 refers to non-coated drill head, NOM 2 refers to coated drill head. • Ordering example: IDD-E3 1.854 OT-P0
- For quotation form and user guide, see pages 326-338

- ⁽¹⁾ Cutting diameter minimum
- ⁽²⁾ Cutting diameter maximum
- ⁽³⁾ Outer tube designation
- ⁽⁴⁾ Inner tube designation

For holders, see pages: TDO-I (D.725-2.56) (324)

Universal Marking for Deep Drilling Tools

D- Tool diameter

Metric- D18.40

Inch- D.724

d- Pilot diameter

Metric- d23.5

Inch- d.630

Tool style

A- Single cutting edge

B- Multiple cutting edges

Thread type

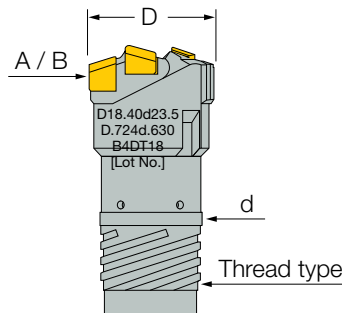
1ST- Single-start thread single tube

2ST- Two-start thread single tube

4ST- Four-start thread single tube

4DT- Four-start thread double tube

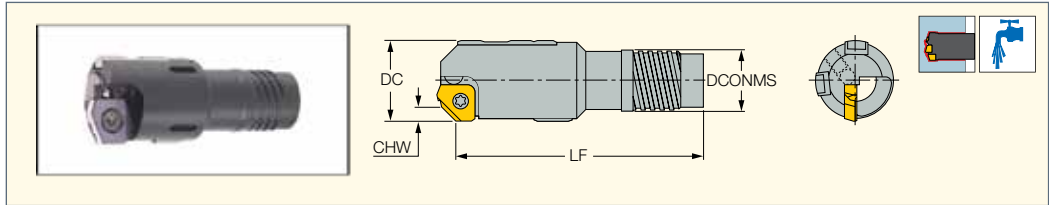
18- Tube diameter



ISCARDEEPDRILL

ISC-EA

Deep Single Tube Counterbore with Through Hole, External 4 Start Thread and Adjustable Diameter (.984-1.574 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	CHW	LF	DCONMS	Ts ⁽³⁾
ISC-EA 0.984-1.039	.984	1.039	.14	2.756	.768	TS-I6
ISC-EA 1.040-1.129	1.040	1.129	.14	2.756	.827	TS-I7
ISC-EA 1.130-1.220	1.130	1.220	.14	2.953	.925	TS-I8
ISC-EA 1.221-1.311	1.221	1.311	.14	2.953	1.004	TS-I9
ISC-EA 1.312-1.425	1.312	1.425	.14	2.953	1.102	TS-I10
ISC-EA 1.426-1.559	1.426	1.559	.14	3.543	1.181	TS-I11
ISC-EA 1.560-1.574	1.560	1.574	.14	3.543	1.299	TS-I12

• For user guide and quotation form, see pages 330-338 • Ordering example: ISC-EA 1.307

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Tube designation

For inserts, see pages: XPMT-45 (287) • XPMT-UB (287)

For holders, see pages: TS-I** (322)

ISC-EA

Diameter	Insert	Insert Clamping Screw	QTY	Guide Pads	QTY	Screw	QTY	Key
.984-1.181	XPMT 16002-45	SR 11201754-4	1 PCS	GPS-06-20-120-DC	2 PCS	SR 34-508 M2.2x0.45	2 PCS	T-7/5
1.181-1.496	XPMT 16002-45	SR 11201754-4	1 PCS	GPS-07-20-120-DC	3 PCS	SR 11201753-4	3 PCS	T-9/5
1.496-1.574	XPMT 16002-45	SR 11201754-4	1 PCS	GPS-08-25-155-DC	3 PCS	SR 11201753-4	3 PCS	T-9/5

ISC-EA (continued)

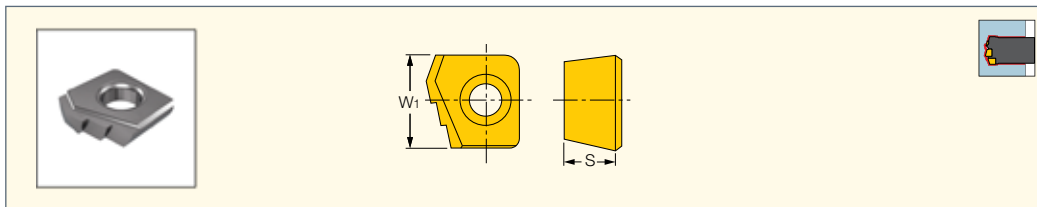
Diameter	Guide Pad Protectors	QTY	Screw	QTY	Key	Sub Guide Pad	QTY	Screw	QTY	Key
.984-1.181	GPP-04	2 PCS	SR11201753-4	2 PCS	T-9/5	SGP-02	1 PCS	SR11201753-1	1 PCS	T-7/5
1.181-1.496	GPP-05	3 PCS	SR11201753-4	3 PCS	T-9/5	SGP-02	1 PCS	SR11201753-1	1 PCS	T-7/5
1.496-1.574	GPP-06	3 PCS	SR11201753-4	3 PCS	T-9/5	SGP-02	1 PCS	SR11201753-4	1 PCS	T-9/5



ISCARDEEPDRILL

XPMT-UB

Inserts for ISD/ISC
Drilling/Boring Heads



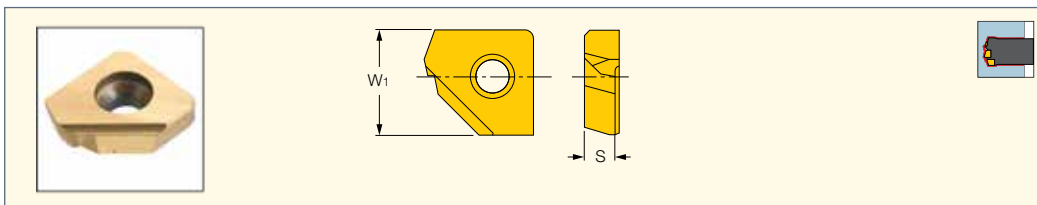
Designation	Dimensions		Tough ↔ Hard	
	W1	S	IC908	IC520M
XPMT 16002UB	.374	.110	•	
XPMT 18003UB	.433	.120	•	
XPMT 21003UB	.512	.140		•
XPMT 25003UB	.571	.134	•	

For tools, see pages: ISC-EA (286) • ISC-IA (294)

ISCARDEEPDRILL

XPMT-45

Inserts for DSC Boring Heads



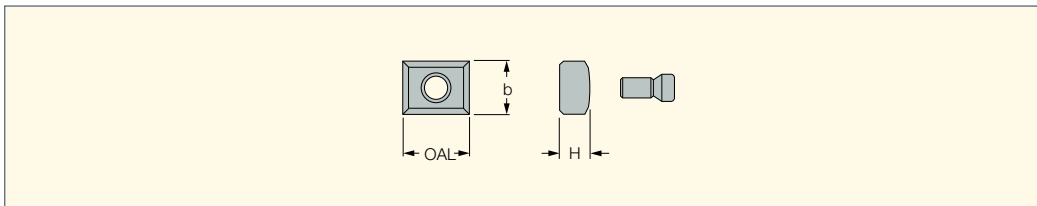
Designation	Dimensions		IC950
	W1	S	
XPMT 16002-45	.374	.110	•

For tools, see pages: IDC-EA (302) • ISC-EA (286) • ISC-IA (294)

ISCARDEEPDRILL

SGP

Drilling Head Sub-Guide Pads



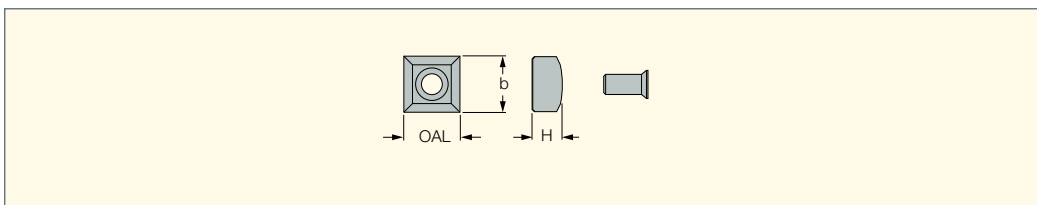
Designation	OAL	b	H
SGP-01	.394	.236	.118
SGP-02	.394	.315	.177
SGP-03	.394	.394	.197
SGP-04	.787	.551	.276

• Select an outer cartridge and pad for the required enlarged diameter.

ISCARDEEPDRILL

GPP

Drilling Head Guide
Pad Protectors



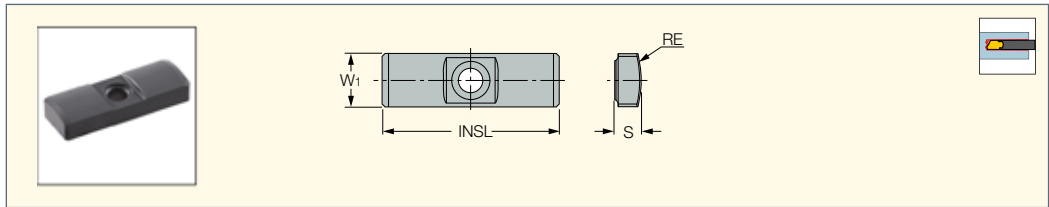
Designation	OAL	b	H
GPP-04	.315	.315	.173
GPP-05	.315	.315	.138
GPP-06	.315	.315	.177
GPP-07	.394	.394	.236
GPP-08	.551	.551	.295
GPP-09	.709	.709	.354

• Select an outer cartridge and pad for the required enlarged diameter.

ISCARDEEPPDRILL

GPS

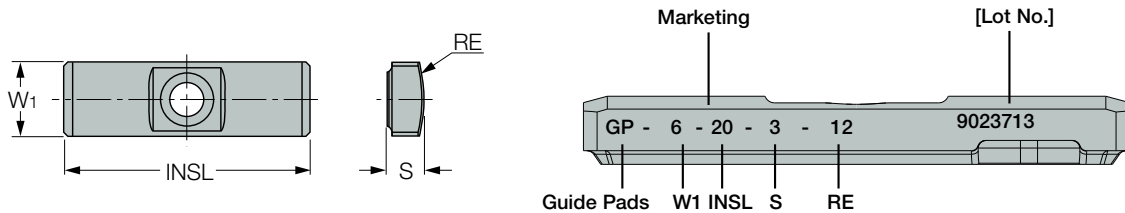
Deep Drilling Solid Carbide Guide Pads



Designation	Dimensions				Tough ↔ Hard		
	W1	INSL	S	RE	IC928	IC950	IC908
GPS-04-16-055-DC	.157	.630	.079	.2165	●		●
GPS-05-18-060-DC	.197	.709	.098	.2362	●		●
GPS-05-18-075-DC	.197	.709	.098	.2953	●		●
GPS-06-20-075-DC	.236	.787	.118	.2953			●
GPS-06-20-075	.236	.787	.118	.2953		●	●
GPS-06-20-085-DC	.236	.787	.118	.3346	●		●
GPS-06-20-085	.236	.787	.118	.3346		●	
GPS-06-20-100-DC	.236	.787	.118	.3937	●		●
GPS-06-20-100	.236	.787	.118	.3937		●	
GPS-06-20-120-DC	.236	.787	.118	.4724	●		●
GPS-06-20-120	.236	.787	.118	.4724		●	
GPS-07-20-120-DC	.276	.787	.138	.4724	●		●
GPS-07-20-120	.276	.787	.138	.4724		●	●
GPS-08-25-155-DC	.315	.984	.177	.6102	●		●
GPS-08-25-155	.315	.984	.177	.6102		●	●
GPS-10-30-200-DC	.394	1.181	.177	.7874	●		●
GPS-10-30-200	.394	1.181	.177	.7874		●	
GPS-10-35-200-DC	.394	1.378	.236	.7874	●		●
GPS-10-35-200	.394	1.378	.236	.7874		●	●
GPS-12-35-250-DC	.472	1.378	.217	.9842	●		●
GPS-12-35-250	.472	1.378	.217	.9842		●	●
GPS-14-40-250-DC	.551	1.575	.295	.9842	●		●
GPS-14-40-250	.551	1.575	.295	.9842		●	●
GPS-18-40-300-DC	.709	1.575	.354	1.1811	●		●

• DC- Double Chamfer

Universal Marking for Deep Drilling Tools

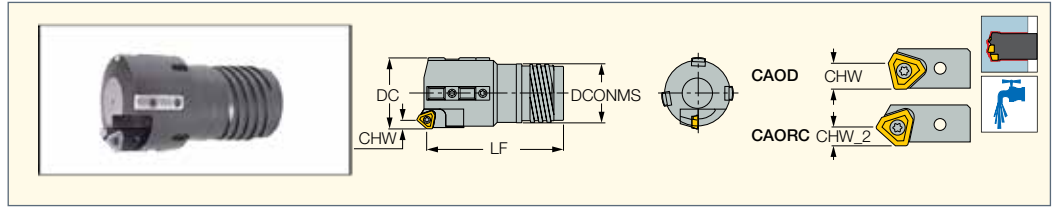


Guide Pad Grade Recommendation

Priority	Oil Coolant			Water Based Coolant		
	1	2	3	1	2	3
ISO-P	IC950	IC908	IC928	IC928	IC908	-
ISO-K	IC950	IC908	IC928	IC928	IC908	-
ISO-M	IC928	IC908	IC950	IC928	IC908	-
ISO-S	IC928	IC908	IC950	IC928	IC908	-

ISC-EC

Deep Single Tube Counterbore with Through Hole, External 4 Start Thread Connection and a Cartridge (1.575-11.496 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	CHW	CHW_2	LF	DCONMS	Ts ⁽³⁾
ISC-EC 1.575-1.692	1.575	1.692	.25	.16	3.543	1.299	TS-I12
ISC-EC 1.693-1.850	1.693	1.850	.25	.16	3.740	1.417	TS-I13
ISC-EC 1.851-2.035	1.851	2.035	.25	.16	3.937	1.535	TS-I14
ISC-EC 2.036-2.212	2.036	2.212	.25	.16	3.937	1.693	TS-I15
ISC-EC 2.213-2.385	2.213	2.385	.28	.19	4.134	1.850	TS-I16
ISC-EC 2.386-2.558	2.386	2.558	.28	.19	4.331	2.008	TS-I17
ISC-EC 2.559-2.637	2.559	2.637	.28	.19	5.906	2.047	TS-I18
ISC-EC 2.638-2.873	2.638	2.873	.41	.25	5.906	2.283	TS-I19
ISC-EC 2.874-3.149	2.874	3.149	.41	.25	5.906	2.480	TS-I20
ISC-EC 3.150-3.424	3.150	3.424	.41	.25	7.087	2.756	TS-I21
ISC-EC 3.425-3.936	3.425	3.936	.41	.25	7.087	3.031	TS-I22
ISC-EC 3.937-4.409	3.937	4.409	.41	.25	7.087	3.504	TS-I23
ISC-EC 4.410-4.881	4.410	4.881	.41	.25	8.071	3.976	TS-I24
ISC-EC 4.882-5.354	4.882	5.354	.41	.25	8.071	4.449	TS-I25
ISC-EC 5.355-5.826	5.355	5.826	.41	.25	8.071	4.921	TS-I26
ISC-EC 5.827-6.299	5.827	6.299	.41	.25	8.858	5.394	TS-I27
ISC-EC 6.300-6.771	6.300	6.771	.41	.25	8.858	5.866	TS-I28
ISC-EC 6.772-7.244	6.772	7.244	.41	.25	8.858	6.339	TS-I29
ISC-EC 7.245-7.716	7.245	7.716	.41	.25	9.646	6.811	TS-I30
ISC-EC 7.717-8.188	7.717	8.188	.41	.25	9.646	7.283	TS-I31
ISC-EC 8.189-8.661	8.189	8.661	.41	.25	9.646	7.756	TS-I32
ISC-EC 8.662-9.133	8.662	9.133	.41	.25	10.433	8.189	TS-I33
ISC-EC 9.134-9.606	9.134	9.606	.41	.25	10.433	8.661	TS-I34
ISC-EC 9.607-10.078	9.607	10.078	.41	.25	10.433	9.134	TS-I35
ISC-EC 10.079-10.551	10.079	10.551	.41	.25	11.417	9.606	TS-I36
ISC-EC 10.552-11.023	10.552	11.023	.41	.25	11.417	10.079	TS-I37
ISC-EC 11.024-11.496	11.024	11.496	.41	.25	11.417	10.551	TS-I38

- CAOD - Rough boring cartridge (for large D.O.C.), supplied with the cartridge, unless ordered differently
- CAORC - Precision boring cartridge
- For quotation form and user guide, see pages 330-338
- Ordering example: ISC-EC 3.437

⁽¹⁾ Cutting diameter minimum
⁽²⁾ Cutting diameter maximum
⁽³⁾ Tube designation

For inserts, see pages: TPMX (267)
 For holders, see pages: TS-I** (322)

ISC-EC

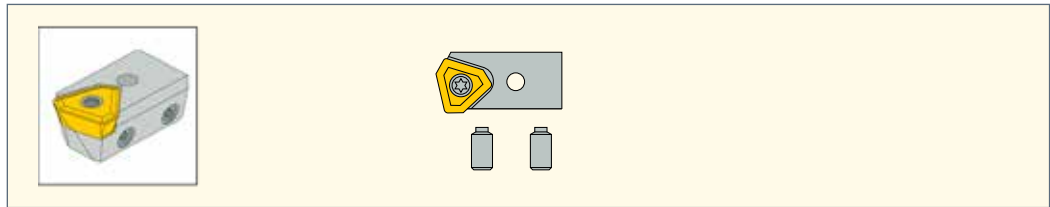


Diameter	Boring Head Central Cartridge	Central Cartridge Insert	Boring Head Peripheral Cartridge	Peripheral Cartridge Insert	Guide Pads	Sub Guide Pad	Guide Pad Protectors
1.575-1.811	CAORC-0845	TPMX 1403LG	CAOD-0845	TPMX 1403RG	GPS-08-25-155-DC	SGP-02	GPP-06
1.811-2.047	CAORC-0845	TPMX 1403LG	CAOD-0845	TPMX 1403RG	GPS-10-35-200-DC	SGP-02	GPP-07
2.047-2.244	CAORC-103	TPMX 1704LG	CAOD-103	TPMX 1704RG	GPS-10-35-200-DC	SGP-02	GPP-07
2.244-2.362	CAORC-103	TPMX 1704LG	CAOD-103	TPMX 1704RG	GPS-10-35-200-DC	SGP-02	GPP-07
2.362-2.637	CAORC-103	TPMX 1704LG	CAOD-103	TPMX 1704RG	GPS-14-40-250-DC	SGP-03	GPP-08
2.638-3.189	CAORC-142	TPMX 2405LG	CAOD-142	TPMX 2405RG	GPS-14-40-250-DC	SGP-03	GPP-08
3.189-3.582	CAORC-142	TPMX 2405LG	CAOD-142	TPMX 2405RG	GPS-14-40-250-DC	SGP-03	GPP-08
3.583-3.937	CAORC-142	TPMX 2405LG	CAOD-142	TPMX 2405RG	GPS-14-40-250-DC	SGP-03	GPP-08
3.937-11.495	CAORC-142	TPMX 2405LG	CAOD-142	TPMX 2405RG	GPS-18-40-300-DC	SGP-04	GPP-09

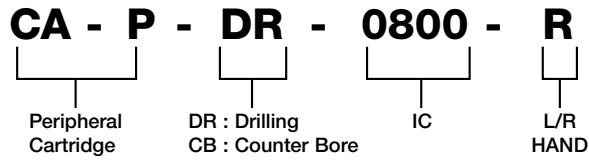
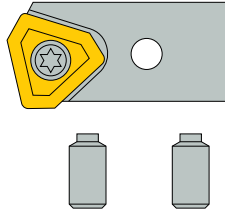
ISCARDEEPDRILL

CAOD

Drilling Head Peripheral Cartridge



Universal Marking for Deep Drilling Tools



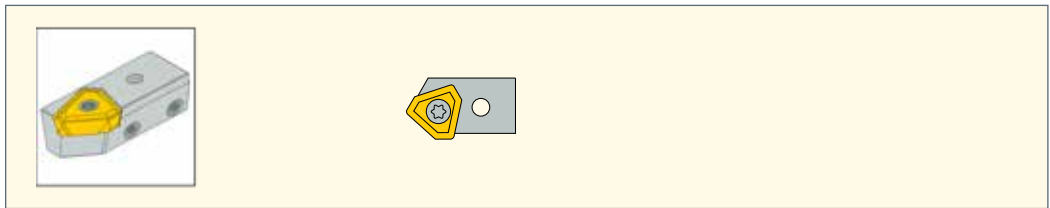
Spare Parts

Designation	Adjustment Screw	Key	Locking Screw	Key	Insert	Insert Clamping Screw
CAOD-080	SR 11201755-4	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-0845	SR 11201755-6	HW 2.0	SR 11201756-10	HW 2.5	TPMX 1403..R-G	SR 11201753-3
CAOD-085	SR 11201755-7	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-103	SR 11201755-8	HW 2.5	SR 11201756-12	HW 3.0	TPMX 1704..R-G	SR 11201753-7
CAOD-142	SR 11201755-9	HW 2.5	SR 11201756-15	HW 4.0	TPMX 2405..R-G	SR 11201753-9
CAOD-170	SR 11201755-11	HW 3.0	SR 11201756-15	HW 4.0	TPMX 2807..R-G	SR 11201753-10

ISCARDEEPDRILL

CAORC

Boring Head Central Cartridge



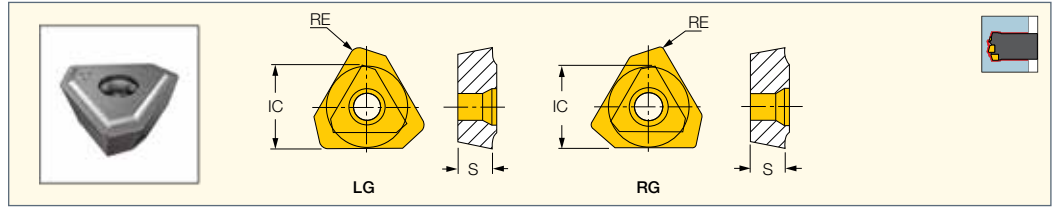
Spare Parts

Designation	Adjustment Screw	Key	Locking Screw	Key	Insert	Insert Clamping Screw
CAORC-0845	SR 11201755-6	HW 2.0	SR 11201756-10	HW 2.5	TPMX 140308L-G	SR 11201753-3
CAORC-103	SR 11201755-10	HW 2.5	SR 11201756-12	HW 3.0	TPMX 170408L-G	SR 11201753-7
CAORC-142	SR 11201755-11	HW 2.5	SR 11201756-15	HW 4.0	TPMX 240512L-G	SR 11201753-9
CAORC-170	SR 11201755-11	HW 3.0	SR 11201756-15	HW 4.0	TPMX 280716L-G	SR 11201753-10



TPMX

Inserts for Drilling /
Boring Heads ISD-EC /
IDD-EC / ISD-IC /
ISC-EC / ISC-IC



Designation	Dimensions			Tough → Hard						
	IC	S	RE	IC920	IC5500	IC9025	IC508	IC908	IC520	IC806
TPMX 140304R-B	.333	.138	.0157	•						
TPMX 140308R-DT	.333	.138	.0315							
TPMX 140308R-G	.333	.138	.0315		•	•	•	•	•	•
TPMX 140308R-B	.333	.138	.0315							•
TPMX 170404R-B	.406	.157	.0157	•						•
TPMX 170408R-B	.406	.157	.0315							•
TPMX 170408R-BG	.406	.157	.0315						•	•
TPMX 170408R-DT	.406	.157	.0315			•		•	•	•
TPMX 170408R-G	.406	.157	.0315		•		•	•	•	•
TPMX 240504R-B	.559	.217	.0157	•						•
TPMX 240512R-BG	.559	.217	.0472						•	•
TPMX 240512R-DT	.559	.217	.0472			•		•	•	•
TPMX 240512R-G	.559	.217	.0472		•		•	•	•	•
TPMX 240512R-B	.559	.217	.0472							•
TPMX 280708R-B	.669	.295	.0315	•						•
TPMX 280716R-BG	.669	.295	.0630						•	•
TPMX 280716R-DT	.669	.295	.0630						•	•
TPMX 280716R-G	.669	.295	.0630		•		•	•	•	•
TPMX 280716R-B	.669	.295	.0630							•
TPMX 140308L-G	.333	.138	.0315			•		•		
TPMX 170404L-BG	.406	.157	.0157					•		
TPMX 170408L-DT	.406	.157	.0315					•		
TPMX 170408L-G	.406	.157	.0315			•		•	•	
TPMX 240504L-BG	.559	.217	.0157					•		
TPMX 240512L-DT	.559	.217	.0472					•		
TPMX 240512L-G	.559	.217	.0472			•		•	•	
TPMX 280708L-BG	.669	.295	.0315					•		
TPMX 280716L-G	.669	.295	.0630			•		•	•	

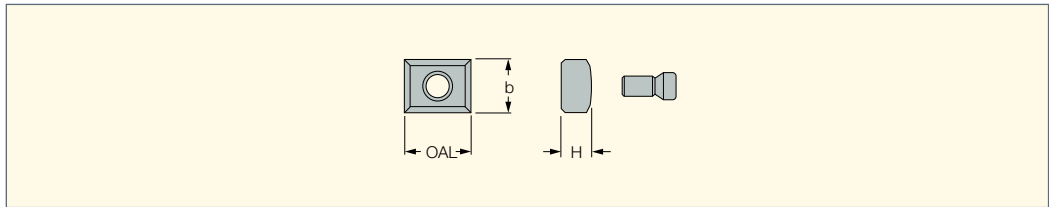
For tools, see pages: IDC-EC (305) • IDD-EC (264) • ISC-EC (289) • ISC-IC (297) • ISD-EC (262) • ISD-IC (263) • ISTR-EC (311)
• ISTR-IC (315)



ISCARDEEPDRILL

SGP

Drilling Head Sub-Guide Pads



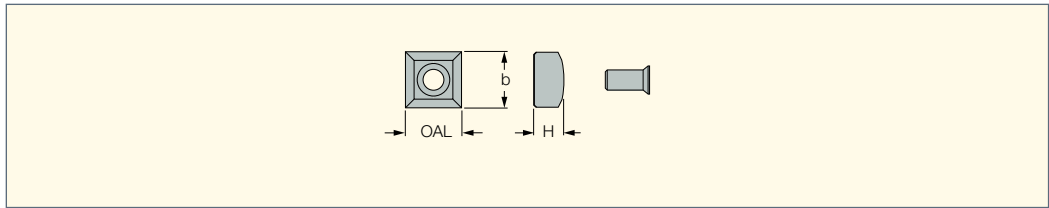
Designation	OAL	b	H
SGP-01	.394	.236	.118
SGP-02	.394	.315	.177
SGP-03	.394	.394	.197
SGP-04	.787	.551	.276

- Select an outer cartridge and pad for the required enlarged diameter.

ISCARDEEPDRILL

GPP

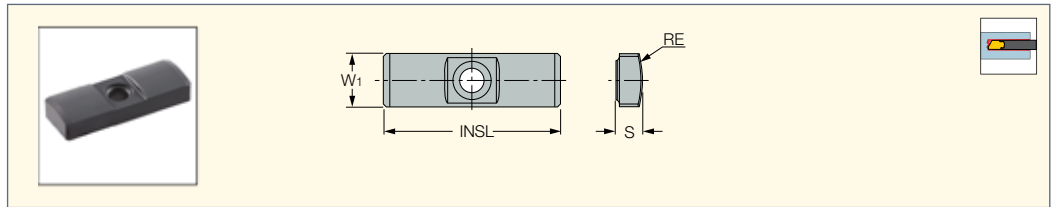
Drilling Head Guide Pad Protectors



Designation	OAL	b	H
GPP-04	.315	.315	.173
GPP-05	.315	.315	.138
GPP-06	.315	.315	.177
GPP-07	.394	.394	.236
GPP-08	.551	.551	.295
GPP-09	.709	.709	.354

- Select an outer cartridge and pad for the required enlarged diameter.

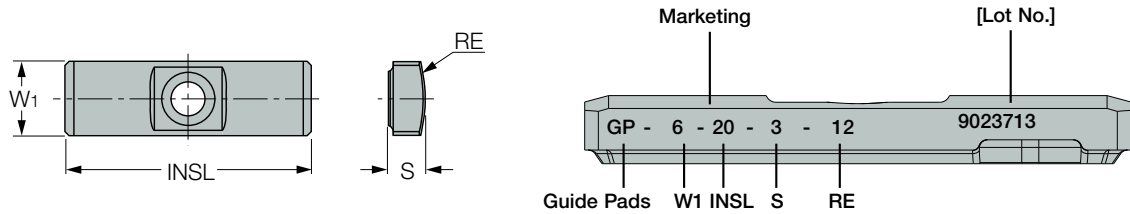
GPS
Deep Drilling Solid Carbide Guide Pads



Designation	Dimensions				Tough		Hard
	W1	INSL	S	RE	IC928	IC950	IC908
GPS-04-16-055-DC	.157	.630	.079	.2165	•		•
GPS-05-18-060-DC	.197	.709	.098	.2362	•		•
GPS-05-18-075-DC	.197	.709	.098	.2953	•		•
GPS-06-20-075-DC	.236	.787	.118	.2953			•
GPS-06-20-075	.236	.787	.118	.2953		•	•
GPS-06-20-085-DC	.236	.787	.118	.3346	•		•
GPS-06-20-085	.236	.787	.118	.3346		•	
GPS-06-20-100-DC	.236	.787	.118	.3937	•		•
GPS-06-20-100	.236	.787	.118	.3937		•	
GPS-06-20-120-DC	.236	.787	.118	.4724	•		•
GPS-06-20-120	.236	.787	.118	.4724		•	
GPS-07-20-120-DC	.276	.787	.138	.4724	•		•
GPS-07-20-120	.276	.787	.138	.4724		•	
GPS-08-25-155-DC	.315	.984	.177	.6102	•		•
GPS-08-25-155	.315	.984	.177	.6102		•	•
GPS-10-30-200-DC	.394	1.181	.177	.7874	•		•
GPS-10-30-200	.394	1.181	.177	.7874		•	
GPS-10-35-200-DC	.394	1.378	.236	.7874	•		•
GPS-10-35-200	.394	1.378	.236	.7874		•	•
GPS-12-35-250-DC	.472	1.378	.217	.9842	•		•
GPS-12-35-250	.472	1.378	.217	.9842		•	•
GPS-14-40-250-DC	.551	1.575	.295	.9842	•		•
GPS-14-40-250	.551	1.575	.295	.9842		•	•
GPS-18-40-300-DC	.709	1.575	.354	1.1811	•		•

• DC- Double Chamfer

Universal Marking for Deep Drilling Tools



Guide Pad Grade Recommendation

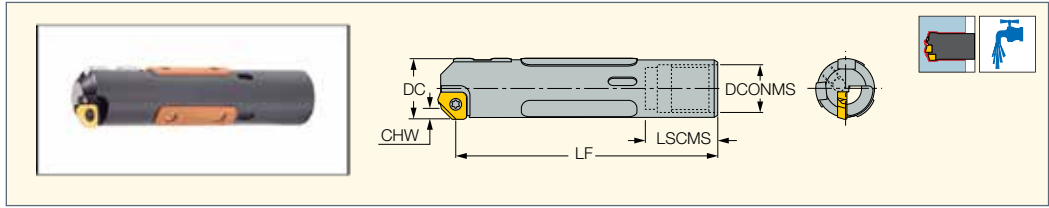
Priority	Oil Coolant			Water Based Coolant		
	1	2	3	1	2	3
ISO-P	IC950	IC908	IC928	IC928	IC908	-
ISO-K	IC950	IC908	IC928	IC928	IC908	-
ISO-M	IC928	IC908	IC950	IC928	IC908	-
ISO-S	IC928	IC908	IC950	IC928	IC908	-



ISCARDEEPDRILL

ISC-IA

Deep Single Tube Counterbore with a Through Hole, Internal Single-Start Thread and Adjustable Diameter (.984-1.574 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	CHW	LF	LSCMS	DCONMS	Ts ⁽³⁾
ISC-IA 0.984-1.062	.984	1.062	.11	4.331	.984	.787	TS-O10
ISC-IA 1.063-1.180	1.063	1.180	.11	4.331	.984	.866	TS-O11
ISC-IA 1.181-1.259	1.181	1.259	.11	4.331	.984	.945	TS-O12
ISC-IA 1.260-1.338	1.260	1.338	.11	4.331	.984	1.024	TS-O13
ISC-IA 1.339-1.456	1.339	1.456	.11	5.315	1.575	1.063	TS-O14
ISC-IA 1.457-1.574	1.457	1.574	.11	5.315	1.575	1.181	TS-O15

• For user guide and quotation form, see pages 330-338 • Ordering example: ISC-IA 1.195

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Tube designation

For inserts, see pages: XPMT-45 (287) • XPMT-UB (287)

For holders, see pages: TS-O** (323)

Universal Marking for Deep Drilling Tools

D- Tool diameter

Metric- D100.00

Inch- D3.937

d- Pilot diameter

Metric- d90

Inch- d3.543

Tool style

R- Cartridge style counter boring

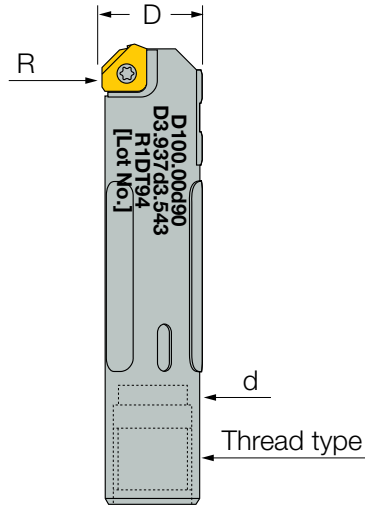
Thread type

4ST- Four-start thread single tube

1ST- Single-start thread single tube

4DT- Four-start thread double tube

94- Tube diameter



ISC-IA

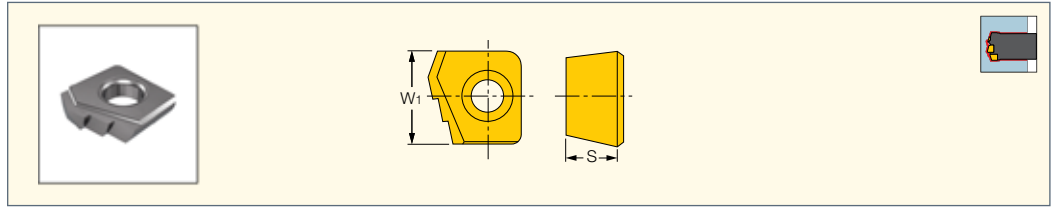


Diameter	Guide Pads (3 pcs)	Resin Guide Pads (3 pcs)	Close Tolerance Insert	Insert Clamping Screw
.984-1.102	GPS-06-20-120-DC	RGP01	XPMT 16002-45	SR 11201754-4
1.102-1.181	GPS-06-20-120-DC	RGP02	XPMT 16002-45	SR 11201754-4
1.181-1.496	GPS-07-20-120-DC	RGP02	XPMT 16002-45	SR 11201754-4
1.496-1.574	GPS-08-25-155-DC	RGP03	XPMT 16002-45	SR 11201754-4

ISCARDEEPDRILL

XPMT-UB

Inserts for ISD/ISC
Drilling/Boring Heads



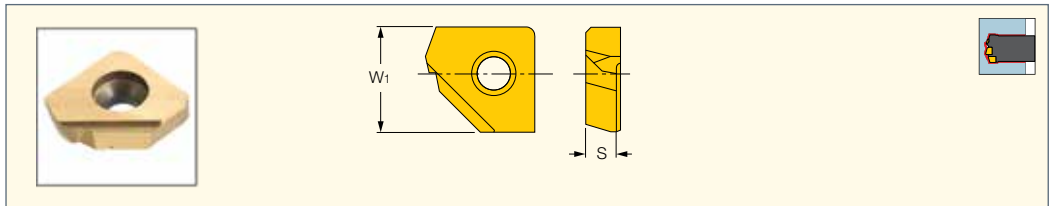
Designation	Dimensions		Tough	Hard
	W1	S	IC908	IC520M
XPMT 16002UB	.374	.110	•	
XPMT 18003UB	.433	.120	•	
XPMT 21003UB	.512	.140		•
XPMT 25003UB	.571	.134	•	

For tools, see pages: ISC-EA (286) • ISC-IA (294)

ISCARDEEPDRILL

XPMT-45

Inserts for DSC Boring Heads

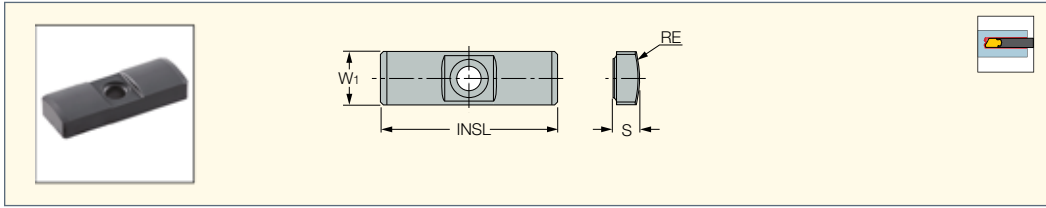


Designation	Dimensions		IC950
	W1	S	
XPMT 16002-45	.374	.110	•

For tools, see pages: IDC-EA (302) • ISC-EA (286) • ISC-IA (294)

ISCARDEEPDRILL

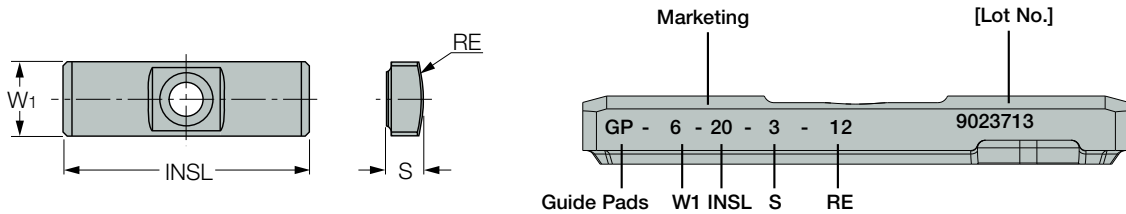
GPS
Deep Drilling Solid Carbide Guide Pads



Designation	Dimensions				Tough ↔ Hard		
	W1	INSL	S	RE	IC928	IC950	IC908
GPS-04-16-055-DC	.157	.630	.079	.2165	●		●
GPS-05-18-060-DC	.197	.709	.098	.2362	●		●
GPS-05-18-075-DC	.197	.709	.098	.2953	●		●
GPS-06-20-075-DC	.236	.787	.118	.2953		●	●
GPS-06-20-075	.236	.787	.118	.2953		●	●
GPS-06-20-085-DC	.236	.787	.118	.3346	●		●
GPS-06-20-085	.236	.787	.118	.3346		●	●
GPS-06-20-100-DC	.236	.787	.118	.3937	●		●
GPS-06-20-100	.236	.787	.118	.3937		●	●
GPS-06-20-120-DC	.236	.787	.118	.4724	●		●
GPS-06-20-120	.236	.787	.118	.4724		●	●
GPS-07-20-120-DC	.276	.787	.138	.4724	●		●
GPS-07-20-120	.276	.787	.138	.4724		●	●
GPS-08-25-155-DC	.315	.984	.177	.6102	●		●
GPS-08-25-155	.315	.984	.177	.6102		●	●
GPS-10-30-200-DC	.394	1.181	.177	.7874	●		●
GPS-10-30-200	.394	1.181	.177	.7874		●	●
GPS-10-35-200-DC	.394	1.378	.236	.7874	●		●
GPS-10-35-200	.394	1.378	.236	.7874		●	●
GPS-12-35-250-DC	.472	1.378	.217	.9842	●		●
GPS-12-35-250	.472	1.378	.217	.9842		●	●
GPS-14-40-250-DC	.551	1.575	.295	.9842	●		●
GPS-14-40-250	.551	1.575	.295	.9842		●	●
GPS-18-40-300-DC	.709	1.575	.354	1.1811	●		●

• DC- Double Chamfer

Universal Marking for Deep Drilling Tools



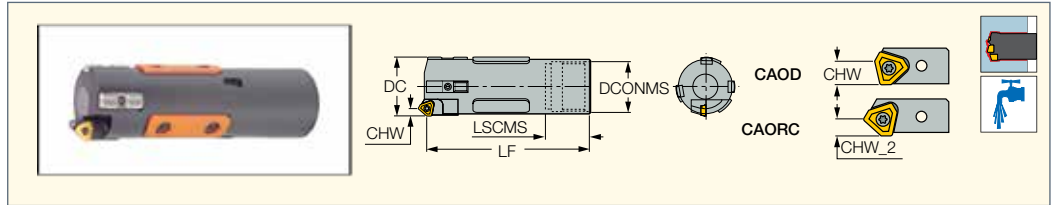
Guide Pad Grade Recommendation

Priority	Oil Coolant			Water Based Coolant		
	1	2	3	1	2	3
ISO-P	IC950	IC908	IC928	IC928	IC908	-
ISO-K	IC950	IC908	IC928	IC928	IC908	-
ISO-M	IC928	IC908	IC950	IC928	IC908	-
ISO-S	IC928	IC908	IC950	IC928	IC908	-

ISCARDEEPDRILL

ISC-IC

Deep Single Tube Counterbore with a Through Hole, Internal Single Start Thread and a Cartridge (1.575-11.574 dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	CHW	CHW_2	LF	DCONMS	Ts ⁽³⁾
ISC-IC 1.575-1.731	1.575	1.731	.25	.16	5.315	1.299	TS-016
ISC-IC 1.732-1.850	1.732	1.850	.25	.16	5.315	1.457	TS-017
ISC-IC 1.851-2.046	1.851	2.046	.25	.16	5.709	1.614	TS-018
ISC-IC 2.047-2.243	2.047	2.243	.28	.19	5.709	1.732	TS-019
ISC-IC 2.244-2.401	2.244	2.401	.28	.19	6.693	1.929	TS-020
ISC-IC 2.402-2.676	2.402	2.676	.28	.19	6.693	2.087	TS-021
ISC-IC 2.677-2.952	2.677	2.952	.41	.25	6.693	2.323	TS-022
ISC-IC 2.953-3.188	2.953	3.188	.41	.25	8.071	2.559	TS-023
ISC-IC 3.189-3.582	3.189	3.582	.41	.25	8.071	2.795	TS-024
ISC-IC 3.583-3.897	3.583	3.897	.41	.25	8.465	3.110	TS-025
ISC-IC 3.898-4.369	3.898	4.369	.41	.25	8.858	3.543	TS-026
ISC-IC 4.371-4.842	4.370	4.842	.41	.25	9.252	4.016	TS-027
ISC-IC 4.843-5.314	4.843	5.314	.41	.25	10.433	4.094	TS-028
ISC-IC 5.315-5.866	5.315	5.866	.41	.25	10.433	4.961	TS-029
ISC-IC 5.867-6.377	5.867	6.377	.41	.25	10.433	5.472	TS-030
ISC-IC 6.378-6.850	6.378	6.850	.41	.25	11.220	5.945	TS-031
ISC-IC 6.851-7.322	6.851	7.322	.41	.25	11.220	6.417	TS-032
ISC-IC 7.323-7.795	7.323	7.795	.41	.25	12.205	6.890	TS-033
ISC-IC 7.796-8.267	7.796	8.267	.41	.25	12.205	7.362	TS-034
ISC-IC 8.268-8.740	8.268	8.740	.41	.25	12.598	7.835	TS-035
ISC-IC 8.741-9.212	8.741	9.212	.41	.25	12.795	8.307	TS-036
ISC-IC 9.213-9.685	9.213	9.685	.41	.25	12.795	8.780	TS-037
ISC-IC 9.686-10.157	9.686	10.157	.41	.25	12.795	9.252	TS-038
ISC-IC 10.158-10.629	10.158	10.629	.41	.25	14.173	9.646	TS-039
ISC-IC 10.630-11.102	10.630	11.102	.41	.25	14.173	10.197	TS-040
ISC-IC 11.103-11.574	11.103	11.574	.41	.25	14.173	10.669	TS-041

- CAOD - Rough boring cartridge (for large D.O.C.) supplied with the cartridge, unless ordered differently
- CAORC - Precision boring cartridge
- For user guide and quotation form, see pages 330-338
- Ordering example: ISC-IC 3.587

(1) Cutting diameter minimum

(2) Cutting diameter maximum

(3) Tube designation

For inserts, see pages: TPMX (267)

For holders, see pages: TS-O** (323)



Universal Marking for Deep Drilling Tools

D- Tool diameter

Metric- D100.00

Inch- D3.937

d- Pilot diameter

Metric- d90

Inch- d3.543

Tool style

R- Cartridge style counter boring

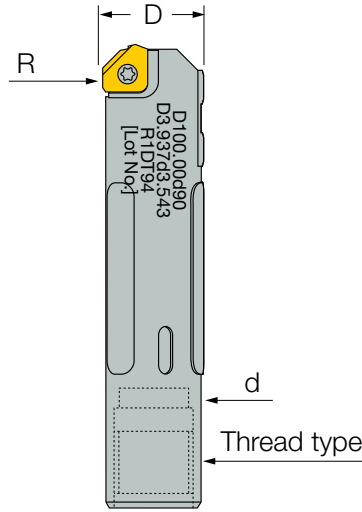
Thread type

4ST- Four-start thread single tube

1ST- Single-start thread single tube

4DT- Four-start thread double tube

94- Tube diameter



ISC-IC

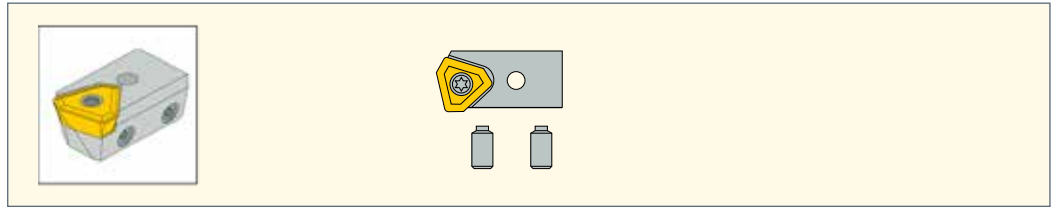


Diameter	Boring Head Central Cartridge	Central Cartridge Insert	Boring Head Peripheral Cartridge	Peripheral Cartridge Insert	Guide Pads (3 pcs)	Resin Guide Pads (3 pcs)
1.575-1.811	CAORC-0845	TPMX 1403LG	CAOD-0845	TPMX 1403RG	GPS-08-25-155-DC	RGP03
1.811-2.047	CAORC-0845	TPMX 1403LG	CAOD-0845	TPMX 1403RG	GPS-10-35-200-DC	RGP03
2.047-2.244	CAORC-103	TPMX 1704LG	CAOD-103	TPMX 1704RG	GPS-10-35-200-DC	RGP03
2.244-2.362	CAORC-103	TPMX 1704LG	CAOD-103	TPMX 1704RG	GPS-10-35-200-DC	RGP03
2.362-2.637	CAORC-103	TPMX 1704LG	CAOD-103	TPMX 1704RG	GPS-14-40-250-DC	RGP04
2.638-3.189	CAORC-142	TPMX 2405LG	CAOD-142	TPMX 2405RG	GPS-14-40-250-DC	RGP04
2.638-3.582	CAORC-142	TPMX 2405LG	CAOD-142	TPMX 2405RG	GPS-14-40-250-DC	RGP05
3.583-3.937	CAORC-142	TPMX 2405LG	CAOD-142	TPMX 2405RG	GPS-14-40-250-DC	RGP06
3.937-4.842	CAORC-142	TPMX 2405LG	CAOD-142	TPMX 2405RG	GPS-18-40-300-DC	RGP06
4.842-5.354	CAORC-142	TPMX 1403LG	CAOD-142	TPMX 2405RG	GPS-18-40-300-DC	RGP07
5.354-7.322	CAORC-142	TPMX 1403LG	CAOD-142	TPMX 2405RG	GPS-18-40-300-DC	RGP07
7.323-8.267	CAORC-142	TPMX 1403LG	CAOD-142	TPMX 2405RG	GPS-18-40-300-DC	RGP08
8.268-9.684	CAORC-142	TPMX 1403LG	CAOD-142	TPMX 2405RG	GPS-18-40-300-DC	RGP09
9.685-11.574	CAORC-142	TPMX 1403LG	CAOD-142	TPMX 2405RG	GPS-18-40-300-DC	RGP10

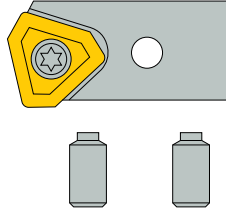
ISCARDEEPDRILL

CAOD

Drilling Head Peripheral Cartridge



Universal Marking for Deep Drilling Tools



CA - P - DR - 0800 - R

CA : Peripheral Cartridge
 DR : Drilling
 CB : Counter Bore
 IC : IC
 R : L/R HAND

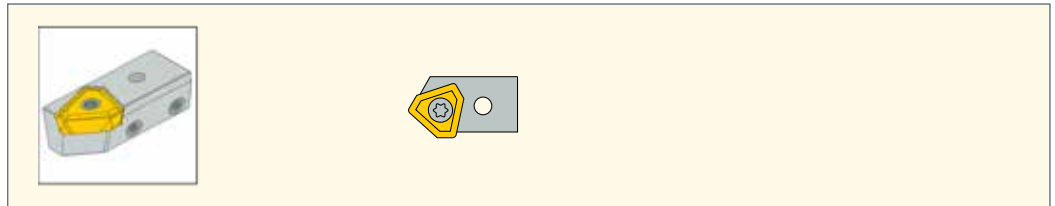
Spare Parts

Designation	Adjustment Screw	Key	Locking Screw	Key	Insert	Insert Clamping Screw
CAOD-080	SR 11201755-4	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-0845	SR 11201755-6	HW 2.0	SR 11201756-10	HW 2.5	TPMX 1403..R-G	SR 11201753-3
CAOD-085	SR 11201755-7	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-103	SR 11201755-8	HW 2.5	SR 11201756-12	HW 3.0	TPMX 1704..R-G	SR 11201753-7
CAOD-142	SR 11201755-9	HW 2.5	SR 11201756-15	HW 4.0	TPMX 2405..R-G	SR 11201753-9
CAOD-170	SR 11201755-11	HW 3.0	SR 11201756-15	HW 4.0	TPMX 2807..R-G	SR 11201753-10

ISCARDEEPDRILL

CAORC

Boring Head Central Cartridge



Spare Parts

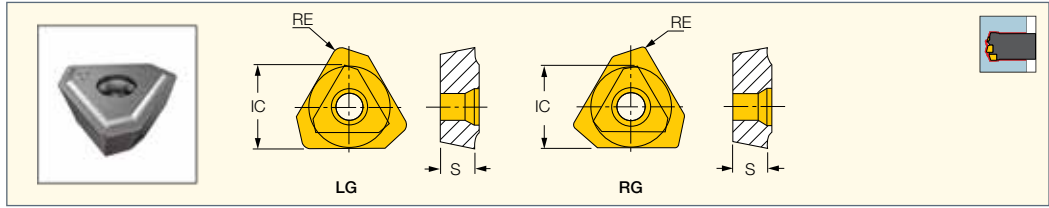
Designation	Adjustment Screw	Key	Locking Screw	Key	Insert	Insert Clamping Screw
CAORC-0845	SR 11201755-6	HW 2.0	SR 11201756-10	HW 2.5	TPMX 140308L-G	SR 11201753-3
CAORC-103	SR 11201755-10	HW 2.5	SR 11201756-12	HW 3.0	TPMX 170408L-G	SR 11201753-7
CAORC-142	SR 11201755-11	HW 2.5	SR 11201756-15	HW 4.0	TPMX 240512L-G	SR 11201753-9
CAORC-170	SR 11201755-11	HW 3.0	SR 11201756-15	HW 4.0	TPMX 280716L-G	SR 11201753-10



ISCARDEEPDRILL

TPMX

Inserts for Drilling / Boring
Heads ISD-EC / IDD-EC /
ISD-IC / ISC-EC / ISC-IC



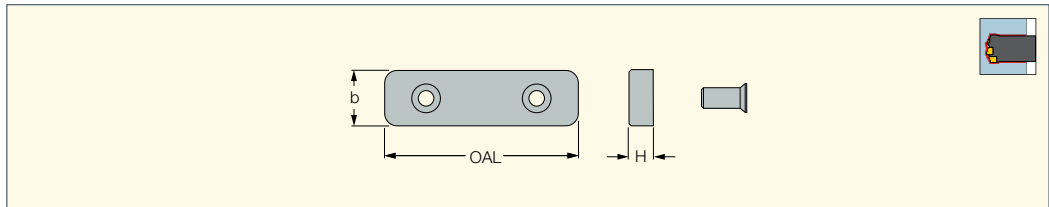
Designation	Dimensions			Tough ↔ Hard						
	IC	S	RE	IC920	IC5500	IC9025	IC508	IC908	IC520	IC806
TPMX 140304R-B	.333	.138	.0157	•		•		•	•	•
TPMX 140308R-DT	.333	.138	.0315			•		•	•	•
TPMX 140308R-G	.333	.138	.0315		•	•	•	•	•	•
TPMX 140308R-B	.333	.138	.0315					•	•	•
TPMX 170404R-B	.406	.157	.0157	•		•		•	•	•
TPMX 170408R-B	.406	.157	.0315					•	•	•
TPMX 170408R-BG	.406	.157	.0315					•	•	•
TPMX 170408R-DT	.406	.157	.0315			•		•	•	•
TPMX 170408R-G	.406	.157	.0315		•		•	•	•	•
TPMX 240504R-B	.559	.217	.0157	•		•		•	•	•
TPMX 240512R-BG	.559	.217	.0472			•		•	•	•
TPMX 240512R-DT	.559	.217	.0472			•		•	•	•
TPMX 240512R-G	.559	.217	.0472		•		•	•	•	•
TPMX 240512R-B	.559	.217	.0472					•	•	•
TPMX 280708R-B	.669	.295	.0315	•		•		•	•	•
TPMX 280716R-BG	.669	.295	.0630					•	•	•
TPMX 280716R-DT	.669	.295	.0630					•	•	•
TPMX 280716R-G	.669	.295	.0630		•		•	•	•	•
TPMX 280716R-B	.669	.295	.0630					•	•	•
TPMX 140308L-G	.333	.138	.0315			•		•		
TPMX 170404L-BG	.406	.157	.0157					•		
TPMX 170408L-DT	.406	.157	.0315					•		
TPMX 170408L-G	.406	.157	.0315			•		•	•	
TPMX 240504L-BG	.559	.217	.0157					•		
TPMX 240512L-DT	.559	.217	.0472					•		
TPMX 240512L-G	.559	.217	.0472			•		•	•	
TPMX 280708L-BG	.669	.295	.0315					•		
TPMX 280716L-G	.669	.295	.0630			•		•	•	

For tools, see pages: IDC-EC (305) • IDD-EC (264) • ISC-EC (289) • ISC-IC (297) • ISD-EC (262) • ISD-IC (263) • ISTR-EC (311)
• ISTR-IC (315)

ISCARDEEPDRILL

RGP

Boring Head Enlargement
Resin Pads

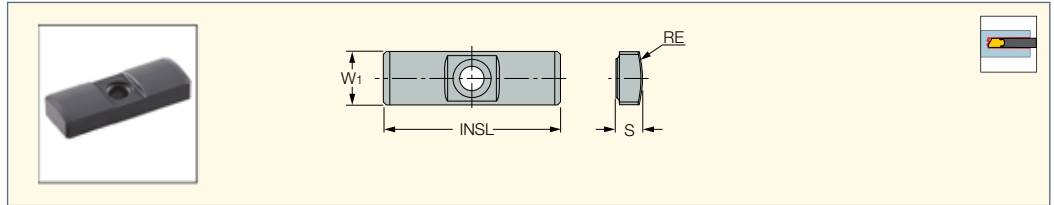


Designation	OAL	b	H
RGP01	1.575	.394	.157
RGP02	1.772	.472	.197
RGP03	1.968	.591	.228
RGP04	2.756	.787	.295
RGP05	3.150	1.181	.492
RGP06	3.937	1.378	.610

• Select an outer cartridge and pad for the required enlarged diameter.

GPS

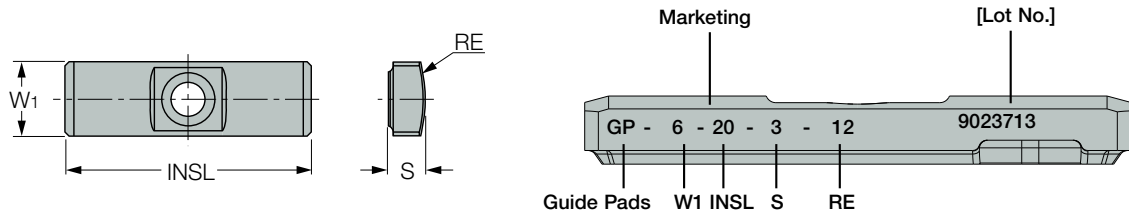
Deep Drilling Solid Carbide Guide Pads



Designation	Dimensions				Tough ↔ Hard		
	W1	INSL	S	RE	IC928	IC950	IC908
GPS-04-16-055-DC	.157	.630	.079	.2165	•		•
GPS-05-18-060-DC	.197	.709	.098	.2362	•		•
GPS-05-18-075-DC	.197	.709	.098	.2953	•		•
GPS-06-20-075-DC	.236	.787	.118	.2953		•	•
GPS-06-20-075	.236	.787	.118	.2953		•	•
GPS-06-20-085-DC	.236	.787	.118	.3346	•		•
GPS-06-20-085	.236	.787	.118	.3346		•	•
GPS-06-20-100-DC	.236	.787	.118	.3937	•		•
GPS-06-20-100	.236	.787	.118	.3937		•	•
GPS-06-20-120-DC	.236	.787	.118	.4724	•		•
GPS-06-20-120	.236	.787	.118	.4724		•	•
GPS-07-20-120-DC	.276	.787	.138	.4724	•		•
GPS-07-20-120	.276	.787	.138	.4724		•	•
GPS-08-25-155-DC	.315	.984	.177	.6102	•		•
GPS-08-25-155	.315	.984	.177	.6102		•	•
GPS-10-30-200-DC	.394	1.181	.177	.7874	•		•
GPS-10-30-200	.394	1.181	.177	.7874		•	•
GPS-10-35-200-DC	.394	1.378	.236	.7874	•		•
GPS-10-35-200	.394	1.378	.236	.7874		•	•
GPS-12-35-250-DC	.472	1.378	.217	.9842	•		•
GPS-12-35-250	.472	1.378	.217	.9842		•	•
GPS-14-40-250-DC	.551	1.575	.295	.9842	•		•
GPS-14-40-250	.551	1.575	.295	.9842		•	•
GPS-18-40-300-DC	.709	1.575	.354	1.1811	•		•

• DC- Double Chamfer

Universal Marking for Deep Drilling Tools



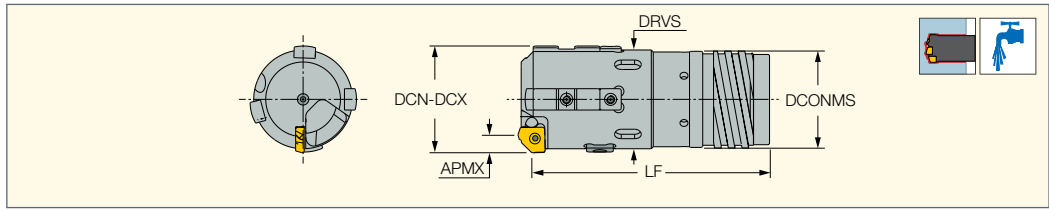
Guide Pad Grade Recommendation

Priority	Oil Coolant			Water Based Coolant		
	1	2	3	1	2	3
ISO-P	IC950	IC908	IC928	IC928	IC908	-
ISO-K	IC950	IC908	IC928	IC928	IC908	-
ISO-M	IC928	IC908	IC950	IC928	IC908	-
ISO-S	IC928	IC908	IC950	IC928	IC908	-

ISCARDEEPDRILL

IDC-EA

Double Tube Counterboring Drills with Outer 4-Start Thread, Cartridges and Adjustable Diameter (.984-1.574" dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	APMX	DRVS ⁽³⁾	LF	DCONMS
IDC-EA 0.984-1.039	.984	1.039	.1102	.945	2.854	.827
IDC-EA 1.040-1.129	1.040	1.129	.1102	1.024	2.854	.925
IDC-EA 1.130-1.220	1.130	1.220	.1102	1.102	2.972	1.004
IDC-EA 1.221-1.311	1.221	1.311	.1102	1.220	2.972	1.102
IDC-EA 1.312-1.425	1.312	1.425	.1102	1.339	2.972	1.181
IDC-EA 1.426-1.559	1.426	1.559	.1102	1.457	3.563	1.299
IDC-EA 1.560-1.574	1.560	1.574	.1102	1.457	3.563	1.417

• For user guide and quotation form, see pages 330-338 • Ordering example: DDC-EA 30.55

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Torque key size

For inserts, see pages: XPMT-45 (287)

For holders, see pages: TDO-I (D.725-2.56) (324)

IDC-EA

Diameter	Insert	Insert Clamping Screw	QTY	Guide Pads	QTY	Screw	QTY	Key
.984-1.181	XPMT 16002-45	SR 11201754-4	1 PCS	GPS-06-20-120-DC	2 PCS	SR 34-508 M2.2x0.45	2 PCS	T-7/5
1.181-1.496	XPMT 16002-45	SR 11201754-4	1 PCS	GPS-07-20-120-DC	3 PCS	SR 11201753-4	3 PCS	T-9/5
1.496-1.574	XPMT 16002-45	SR 11201754-4	1 PCS	GPS-08-25-155-DC	3 PCS	SR 11201753-4	3 PCS	T-9/5

IDC-EA
(continued)

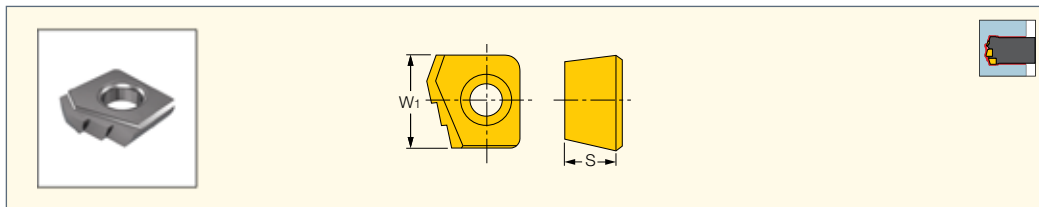
Diameter	Guide Pad Protectors	QTY	Screw	QTY	Key	Sub Guide Pad	QTY	Screw	QTY	Key
.984-1.181	GPP-04	2 PCS	SR11201753-4	2 PCS	T-9/5	SGP-02	1 PCS	SR11201753-1	1 PCS	T-7/5
1.181-1.496	GPP-05	3 PCS	SR11201753-4	3 PCS	T-9/5	SGP-02	1 PCS	SR11201753-1	1 PCS	T-7/5
1.496-1.574	GPP-06	3 PCS	SR11201753-4	3 PCS	T-9/5	SGP-02	1 PCS	SR11201753-4	1 PCS	T-9/5



ISCARDEEPDRILL

XPMT-UB

Inserts for ISD/ISC
Drilling/Boring Heads



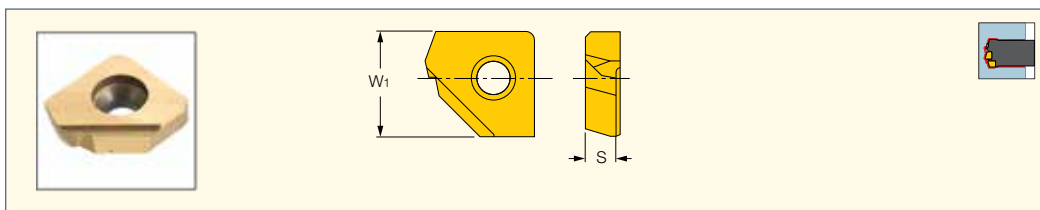
Designation	Dimensions		Tough ↔ Hard	
	W1	S	IC908	IC520M
XPMT 16002UB	.374	.110	•	
XPMT 18003UB	.433	.120	•	
XPMT 21003UB	.512	.140		•
XPMT 25003UB	.571	.134	•	

For tools, see pages: ISC-EA (286) • ISC-IA (294)

ISCARDEEPDRILL

XPMT-45

Inserts for ISC Boring Heads



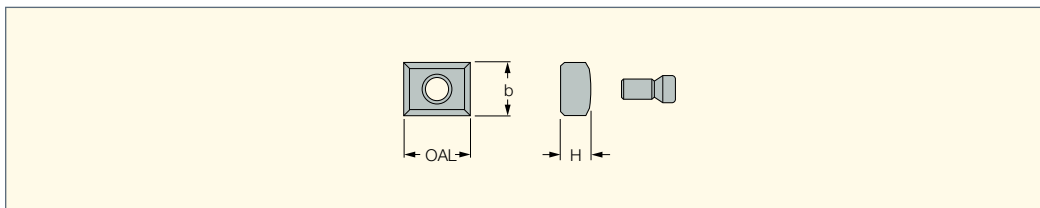
Designation	Dimensions		IC950
	W1	S	
XPMT 16002-45	.374	.110	•

For tools, see pages: IDC-EA (302) • ISC-EA (286) • ISC-IA (294)

ISCARDEEPDRILL

SGP

Drilling Head Sub-Guide Pads



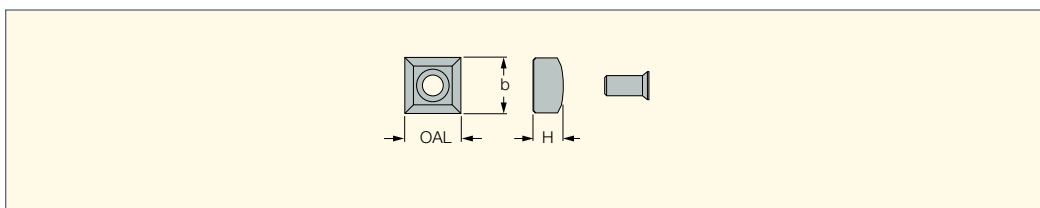
Designation	OAL	b	H
SGP-01	.394	.236	.118
SGP-02	.394	.315	.177
SGP-03	.394	.394	.197
SGP-04	.787	.551	.276

• Select an outer cartridge and pad for the required enlarged diameter.

ISCARDEEPDRILL

GPP

Drilling Head Guide
Pad Protectors



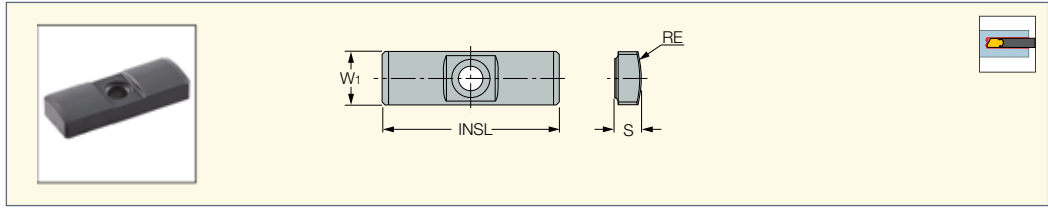
Designation	OAL	b	H
GPP-04	.315	.315	.173
GPP-05	.315	.315	.138
GPP-06	.315	.315	.177
GPP-07	.394	.394	.236
GPP-08	.551	.551	.295
GPP-09	.709	.709	.354

• Select an outer cartridge and pad for the required enlarged diameter.

ISCARDEEPPDRILL

GPS

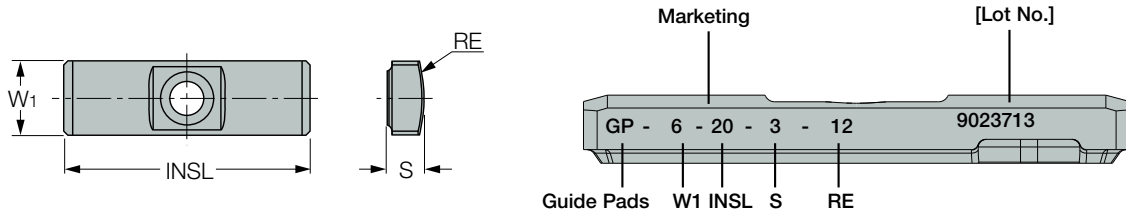
Deep Drilling Solid Carbide Guide Pads



Designation	Dimensions				Tough ↔ Hard		
	W1	INSL	S	RE	IC928	IC950	IC908
GPS-04-16-055-DC	.157	.630	.079	.2165	●		●
GPS-05-18-060-DC	.197	.709	.098	.2362	●		●
GPS-05-18-075-DC	.197	.709	.098	.2953	●		●
GPS-06-20-075-DC	.236	.787	.118	.2953			●
GPS-06-20-075	.236	.787	.118	.2953		●	●
GPS-06-20-085-DC	.236	.787	.118	.3346	●		●
GPS-06-20-085	.236	.787	.118	.3346		●	●
GPS-06-20-100-DC	.236	.787	.118	.3937	●		●
GPS-06-20-100	.236	.787	.118	.3937		●	●
GPS-06-20-120-DC	.236	.787	.118	.4724	●		●
GPS-06-20-120	.236	.787	.118	.4724		●	●
GPS-07-20-120-DC	.276	.787	.138	.4724	●		●
GPS-07-20-120	.276	.787	.138	.4724		●	●
GPS-08-25-155-DC	.315	.984	.177	.6102	●		●
GPS-08-25-155	.315	.984	.177	.6102		●	●
GPS-10-30-200-DC	.394	1.181	.177	.7874	●		●
GPS-10-30-200	.394	1.181	.177	.7874		●	●
GPS-10-35-200-DC	.394	1.378	.236	.7874	●		●
GPS-10-35-200	.394	1.378	.236	.7874		●	●
GPS-12-35-250-DC	.472	1.378	.217	.9842	●		●
GPS-12-35-250	.472	1.378	.217	.9842		●	●
GPS-14-40-250-DC	.551	1.575	.295	.9842	●		●
GPS-14-40-250	.551	1.575	.295	.9842		●	●
GPS-18-40-300-DC	.709	1.575	.354	1.1811	●		●

● DC- Double Chamfer

Universal Marking for Deep Drilling Tools

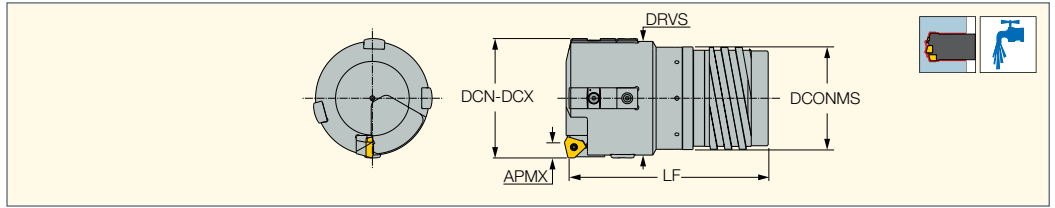


Guide Pad Grade Recommendation

Priority	Oil Coolant			Water Based Coolant		
	1	2	3	1	2	3
ISO-P	IC950	IC908	IC928	IC928	IC908	-
ISO-K	IC950	IC908	IC928	IC928	IC908	-
ISO-M	IC928	IC908	IC950	IC928	IC908	-
ISO-S	IC928	IC908	IC950	IC928	IC908	-

IDC-EC

Double Tube Counterboring Drills with Outer 4-Start Thread, Cartridges and Adjustable Diameter (1.575-7.243" dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	DRVS ⁽³⁾	LF	DCONMS	APMX	APMX_2
IDC-EC 1.575-1.692	1.575	1.692	1.575	3.583	1.417	.2520	.1575
IDC-EC 1.693-1.850	1.693	1.850	1.693	3.740	1.535	.2520	.1575
IDC-EC 1.851-2.035	1.851	2.035	1.890	3.937	1.693	.2520	.1575
IDC-EC 2.036-2.212	2.036	2.212	2.087	3.937	1.850	.2520	.1575
IDC-EC 2.213-2.559	2.213	2.559	2.402	4.331	2.008	.2835	.1890
IDC-EC 2.560-2.637	2.560	2.637	2.480	5.906	2.047	.2835	.1890
IDC-EC 2.638-2.873	2.638	2.873	2.717	5.906	2.283	.4094	.2520
IDC-EC 2.874-3.149	2.874	3.149	2.992	5.906	2.480	.4094	.2520
IDC-EC 3.150-3.424	3.150	3.424	3.268	7.087	2.756	.4094	.2520
IDC-EC 3.425-3.936	3.425	3.936	3.780	7.087	3.031	.4094	.2520
IDC-EC 3.937-4.409	3.937	4.409	4.213	7.087	3.504	.4094	.2520
IDC-EC 4.410-4.881	4.410	4.881	4.685	8.071	3.976	.4094	.2520
IDC-EC 4.882-5.353	4.882	5.353	5.157	8.071	4.449	.4094	.2520
IDC-EC 5.354-5.826	5.354	5.826	5.630	8.071	4.921	.4094	.2520
IDC-EC 5.827-6.298	5.827	6.298	6.102	8.858	5.394	.4094	.2520
IDC-EC 6.299-6.771	6.299	6.771	6.575	8.858	5.866	.4094	.2520
IDC-EC 6.772-7.243	6.772	7.243	7.047	8.858	6.339	.4094	.2520

• For user guide and quotation form, see pages 330-338 • Ordering example: DDC-EC 130.35

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Torque key size

For inserts, see pages: TPMX (267)

For holders, see pages: TDO-I (D.725-2.56) (324) • TDO-I (D2.56-6.77) (325)

IDC-EC



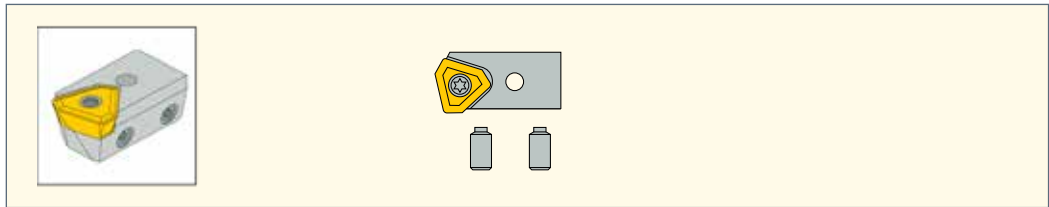
Diameter	Boring Head Central Cartridge	Central Cartridge Insert	Boring Head Peripheral Cartridge	Peripheral Cartridge Insert	Guide Pads	Sub Guide Pad	Guide Pad Protectors
1.575-1.811	CAORC-0845	TPMX 1403LG	CAOD-0845	TPMX 1403RG	GPS-08-25-155-DC	SGP-02	GPP-06
1.811-2.047	CAORC-0845	TPMX 1403LG	CAOD-0845	TPMX 1403RG	GPS-10-35-200-DC	SGP-02	GPP-07
2.047-2.244	CAORC-103	TPMX 1704LG	CAOD-103	TPMX 1704RG	GPS-10-35-200-DC	SGP-02	GPP-07
2.244-2.362	CAORC-103	TPMX 1704LG	CAOD-103	TPMX 1704RG	GPS-10-35-200-DC	SGP-02	GPP-07
2.362-2.637	CAORC-103	TPMX 1704LG	CAOD-103	TPMX 1704RG	GPS-14-40-250-DC	SGP-03	GPP-08
2.638-3.189	CAORC-142	TPMX 2405LG	CAOD-142	TPMX 2405RG	GPS-14-40-250-DC	SGP-03	GPP-08
3.189-3.582	CAORC-142	TPMX 2405LG	CAOD-142	TPMX 2405RG	GPS-14-40-250-DC	SGP-03	GPP-08
3.583-3.937	CAORC-142	TPMX 2405LG	CAOD-142	TPMX 2405RG	GPS-14-40-250-DC	SGP-03	GPP-08
3.937-11.495	CAORC-142	TPMX 2405LG	CAOD-142	TPMX 2405RG	GPS-18-40-300-DC	SGP-04	GPP-09



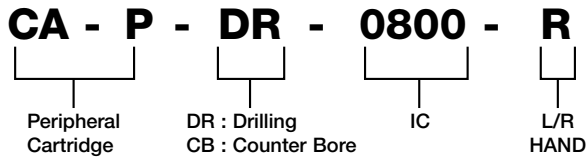
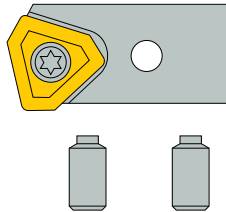
ISCARDEEPDRILL

CAOD

Drilling Head Peripheral Cartridge



Universal Marking for Deep Drilling Tools



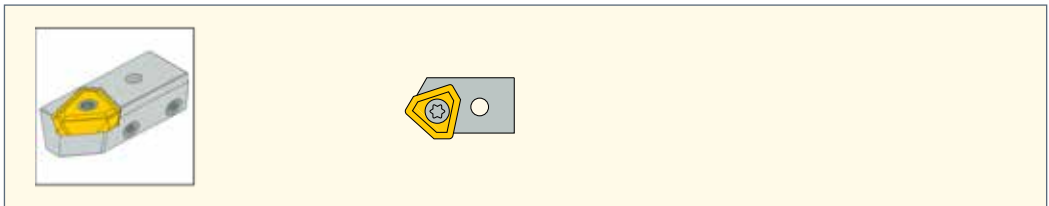
Spare Parts

Designation	Adjustment Screw	Key	Locking Screw	Key	Insert	Insert Clamping Screw
CAOD-080	SR 11201755-4	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-0845	SR 11201755-6	HW 2.0	SR 11201756-10	HW 2.5	TPMX 1403..R-G	SR 11201753-3
CAOD-085	SR 11201755-7	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-103	SR 11201755-8	HW 2.5	SR 11201756-12	HW 3.0	TPMX 1704..R-G	SR 11201753-7
CAOD-142	SR 11201755-9	HW 2.5	SR 11201756-15	HW 4.0	TPMX 2405..R-G	SR 11201753-9
CAOD-170	SR 11201755-11	HW 3.0	SR 11201756-15	HW 4.0	TPMX 2807..R-G	SR 11201753-10

ISCARDEEPDRILL

CAORC

Boring Head Central Cartridge



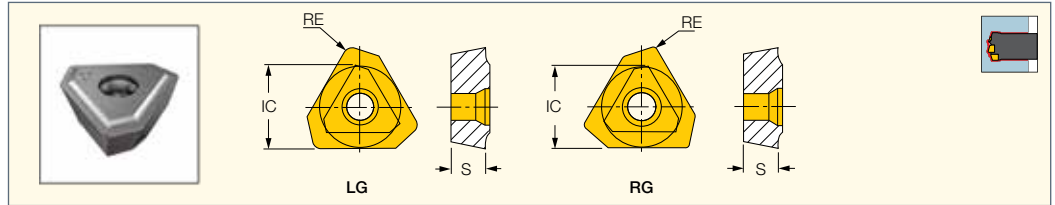
Spare Parts

Designation	Adjustment Screw	Key	Locking Screw	Key	Insert	Insert Clamping Screw
CAORC-0845	SR 11201755-6	HW 2.0	SR 11201756-10	HW 2.5	TPMX 140308L-G	SR 11201753-3
CAORC-103	SR 11201755-10	HW 2.5	SR 11201756-12	HW 3.0	TPMX 170408L-G	SR 11201753-7
CAORC-142	SR 11201755-11	HW 2.5	SR 11201756-15	HW 4.0	TPMX 240512L-G	SR 11201753-9
CAORC-170	SR 11201755-11	HW 3.0	SR 11201756-15	HW 4.0	TPMX 280716L-G	SR 11201753-10

ISCARDEEPDRILL

TPMX

Inserts for Drilling / Boring
Heads ISD-EC / IDD-EC /
ISD-IC / ISC-EC / ISC-IC



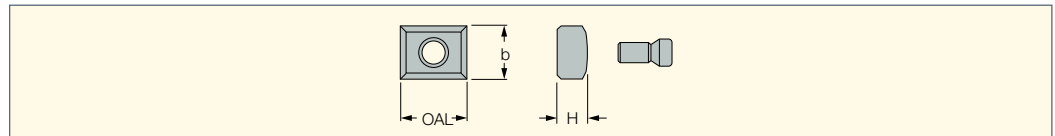
Designation	Dimensions			Tough → Hard						
	IC	S	RE	IC920	IC5500	IC9025	IC508	IC908	IC520	IC806
TPMX 140304R-B	.333	.138	.0157	•						
TPMX 140308R-DT	.333	.138	.0315							
TPMX 140308R-G	.333	.138	.0315		•	•		•	•	•
TPMX 140308R-B	.333	.138	.0315							•
TPMX 170404R-B	.406	.157	.0157	•						•
TPMX 170408R-B	.406	.157	.0315							•
TPMX 170408R-BG	.406	.157	.0315							•
TPMX 170408R-DT	.406	.157	.0315			•		•	•	•
TPMX 170408R-G	.406	.157	.0315				•	•	•	•
TPMX 240504R-B	.559	.217	.0157	•						•
TPMX 240512R-BG	.559	.217	.0472							•
TPMX 240512R-DT	.559	.217	.0472			•		•	•	•
TPMX 240512R-G	.559	.217	.0472		•		•	•	•	•
TPMX 240512R-B	.559	.217	.0472							•
TPMX 280708R-B	.669	.295	.0315	•		•		•	•	•
TPMX 280716R-BG	.669	.295	.0630							•
TPMX 280716R-DT	.669	.295	.0630							•
TPMX 280716R-G	.669	.295	.0630		•		•	•	•	•
TPMX 280716R-B	.669	.295	.0630							•
TPMX 140308L-G	.333	.138	.0315			•		•		
TPMX 170404L-BG	.406	.157	.0157							•
TPMX 170408L-DT	.406	.157	.0315							•
TPMX 170408L-G	.406	.157	.0315			•		•	•	
TPMX 240504L-BG	.559	.217	.0157							•
TPMX 240512L-DT	.559	.217	.0472							•
TPMX 240512L-G	.559	.217	.0472			•		•	•	
TPMX 280708L-BG	.669	.295	.0315							•
TPMX 280716L-G	.669	.295	.0630			•		•	•	

For tools, see pages: IDC-EC (305) • IDD-EC (264) • ISC-EC (289) • ISC-IC (297) • ISD-EC (262) • ISD-IC (263) • ISTR-EC (311)
• ISTR-IC (315)

ISCARDEEPDRILL

SGP

Drilling Head Sub-Guide Pads



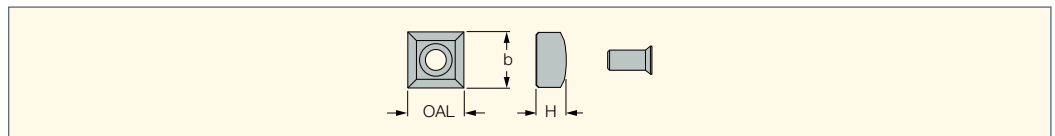
Designation	OAL	b	H
SGP-01	.394	.236	.118
SGP-02	.394	.315	.177
SGP-03	.394	.394	.197
SGP-04	.787	.551	.276

• Select an outer cartridge and pad for the required enlarged diameter.

ISCARDEEPDRILL

GPP

Drilling Head Guide
Pad Protectors



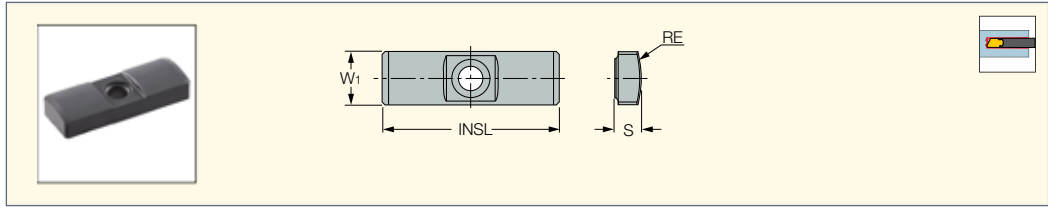
Designation	OAL	b	H
GPP-04	.315	.315	.173
GPP-05	.315	.315	.138
GPP-06	.315	.315	.177
GPP-07	.394	.394	.236
GPP-08	.551	.551	.295
GPP-09	.709	.709	.354

• Select an outer cartridge and pad for the required enlarged diameter.

ISCARDEEPPDRILL

GPS

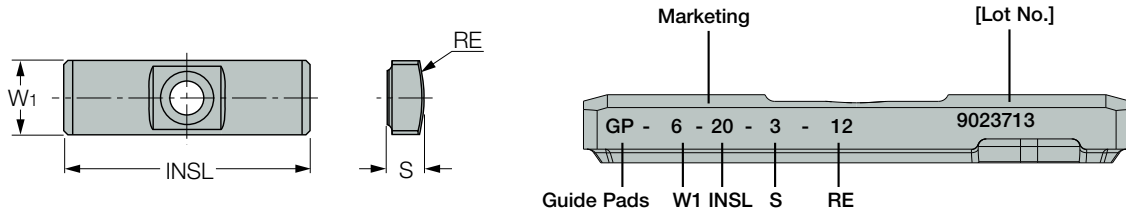
Deep Drilling Solid Carbide Guide Pads



Designation	Dimensions				Tough ← Hard		
	W1	INSL	S	RE	IC928	IC950	IC908
GPS-04-16-055-DC	.157	.630	.079	.2165	●		●
GPS-05-18-060-DC	.197	.709	.098	.2362	●		●
GPS-05-18-075-DC	.197	.709	.098	.2953	●		●
GPS-06-20-075-DC	.236	.787	.118	.2953			●
GPS-06-20-075	.236	.787	.118	.2953		●	●
GPS-06-20-085-DC	.236	.787	.118	.3346	●		●
GPS-06-20-085	.236	.787	.118	.3346		●	
GPS-06-20-100-DC	.236	.787	.118	.3937	●		●
GPS-06-20-100	.236	.787	.118	.3937		●	
GPS-06-20-120-DC	.236	.787	.118	.4724	●		●
GPS-06-20-120	.236	.787	.118	.4724		●	
GPS-07-20-120-DC	.276	.787	.138	.4724	●		●
GPS-07-20-120	.276	.787	.138	.4724		●	●
GPS-08-25-155-DC	.315	.984	.177	.6102	●		●
GPS-08-25-155	.315	.984	.177	.6102		●	●
GPS-10-30-200-DC	.394	1.181	.177	.7874	●		●
GPS-10-30-200	.394	1.181	.177	.7874		●	
GPS-10-35-200-DC	.394	1.378	.236	.7874	●		●
GPS-10-35-200	.394	1.378	.236	.7874		●	●
GPS-12-35-250-DC	.472	1.378	.217	.9842	●		●
GPS-12-35-250	.472	1.378	.217	.9842		●	●
GPS-14-40-250-DC	.551	1.575	.295	.9842	●		●
GPS-14-40-250	.551	1.575	.295	.9842		●	●
GPS-18-40-300-DC	.709	1.575	.354	1.1811	●		●

• DC- Double Chamfer

Universal Marking for Deep Drilling Tools



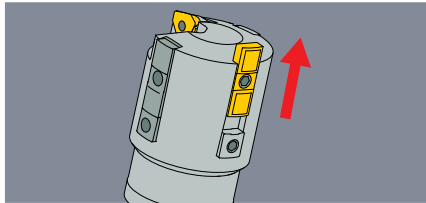
Guide Pad Grade Recommendation

Priority	Oil Coolant			Water Based Coolant		
	1	2	3	1	2	3
ISO-P	IC950	IC908	IC928	IC928	IC908	-
ISO-K	IC950	IC908	IC928	IC928	IC908	-
ISO-M	IC928	IC908	IC950	IC928	IC908	-
ISO-S	IC928	IC908	IC950	IC928	IC908	-

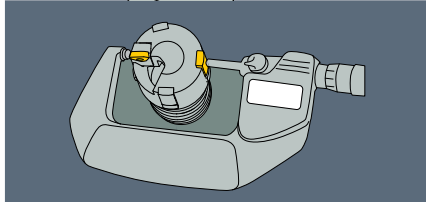
**Technical Information -
Cartridge Style Counter Boring Head Diameter Settings**

The drill head diameter is set and inspected with a master insert in our final inspection. However, the inserts in the market have a tolerance fluctuation so each time you change or index the insert, the diameter must be adjusted as per the following method.

Note: When a corner change is made on the insert, it must be adjusted to the correct size or damage can be caused to the head body or workpiece material.

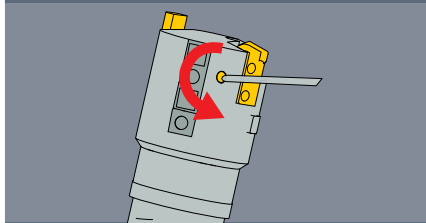


1. The dimensional guide pad must be slid forward to measure the diameter.
 - 1.1 Loosen the lock screw and slide the guide pad forward.
 - 1.2 Retighten the lock screw at the measuring position.

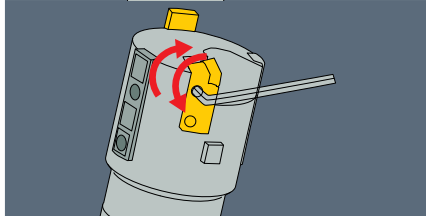


2. Measure the diameter with a micrometer. We recommend setting the tool diameter at h8 tolerance to the cutting diameter.

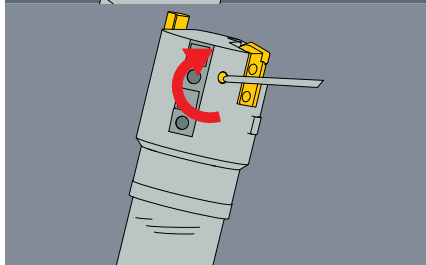
Note: If the diameter is incorrect, go to **step 3**. If it's correct, go to **step 4**



3. Adjust the outer cartridge
 - 3.1 First loosen the lock screw of the outer cartridge and then tighten it slightly.

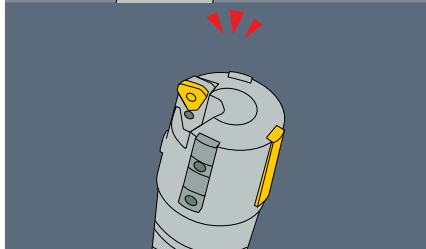


- 3.2 Proceed to adjust the diameter, using the 2 adjustment screws and measure with a micrometer.



- 3.3 When set to the size, re-tighten the lock screw.
- 3.4 Recheck the diameter with a micrometer. If it is still out of tolerance, repeat the procedure from step 3.1.

Note: Please make sure to tighten the lock screw firmly before using. If loose, the cartridge may move and cause serious problems during machining.



4. Slide the dimensional guide pad back to the original position and tighten the lock screw.

Please check all the lock screws are firmly tightened as they may come loose if vibration occurs during drilling.

Technical Information - Adjustable Counter Boring Head Diameter Settings

Drill diameter is adjusted with an adjust ball for diameter $\varnothing.984 - \varnothing1.574$ " by use of the following method.

The diagram illustrates the adjustment process in four stages:

- Step 1:** A perspective view of the drill head showing the 'Dimensional guide pad' being moved forward. A red arrow indicates the direction of movement. A lock screw is shown being re-tightened.
- Step 2:** A top-down view of the 'Head body' showing the 'Adjust ball', 'Insert', and 'Adjust screw'. A wrench is used to tighten the adjust screw, indicated by a red curved arrow.
- Step 3:** A top-down view showing the 'Adjust screw' moving forward, which causes the 'Insert' to move in a peripheral direction, as indicated by red arrows.
- Step 4:** A perspective view of the drill head showing the final 'Drill Dia. $\varnothing Dc$ ' being measured with a micrometer.

1. Slide the dimensional guide pad forward and then re-tighten the lock screw at the measuring position.

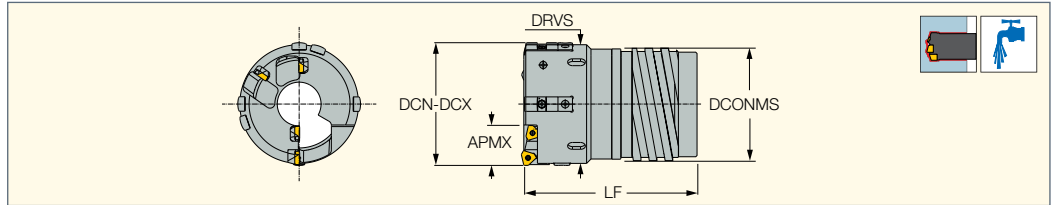
2. Tighten the adjust screw.

3. As the adjust screw moves forward, insert moves in a peripheral direction.

4. Measure the diameter with a micrometer. If the diameter is larger than expected, loosen the adjust screw and insert screw, then re-tighten the insert screw. Repeat the procedure from step 2.

ISTR-EC

Single Tube Trepanning Drills with Outer 4-Start Thread, Cartridges, and Adjustable Diameter (3.937-12.913" dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	APMX	DRVS ⁽³⁾	Lf	DCONMS
ISTR-EC 3.937-4.409	3.937	4.409	1.4961	4.213	6.850	3.504
ISTR-EC 4.410-4.881	4.410	4.881	1.4961	4.685	8.031	3.976
ISTR-EC 4.882-5.354	4.882	5.354	1.9488	5.157	8.031	4.449
ISTR-EC 5.355-5.826	5.355	5.826	1.9488	5.630	8.031	4.921
ISTR-EC 5.827-6.299	5.827	6.299	1.9488	6.102	9.016	5.394
ISTR-EC 6.300-6.771	6.300	6.771	1.9488	6.575	9.016	5.866
ISTR-EC 6.772-7.244	6.772	7.244	1.9488	7.047	9.016	6.339
ISTR-EC 7.245-7.716	7.245	7.716	1.9488	7.520	9.803	6.811
ISTR-EC 7.717-8.188	7.717	8.188	2.2244	7.992	9.803	7.283
ISTR-EC 8.189-8.661	8.189	8.661	2.2244	8.465	9.803	7.756
ISTR-EC 8.662-9.133	8.662	9.133	2.2244	8.937	11.181	8.189
ISTR-EC 9.134-9.606	9.134	9.606	2.2244	9.409	11.181	8.661
ISTR-EC 9.607-10.078	9.607	10.078	2.2244	9.882	11.181	9.134
ISTR-EC 10.079-10.551	10.079	10.551	2.2244	10.354	11.969	9.606
ISTR-EC 10.552-11.023	10.552	11.023	2.2244	10.827	11.969	10.079
ISTR-EC 11.024-11.496	11.024	11.496	2.2244	11.299	11.969	10.551
ISTR-EC 11.497-11.968	11.497	11.968	2.2244	11.772	12.756	11.024
ISTR-EC 11.969-12.440	11.969	12.440	2.2244	12.244	12.756	11.496
ISTR-EC 12.441-12.913	12.441	12.913	2.2244	12.717	12.756	11.969

• For user guide and quotation form, see pages 330-338 • Ordering example: DSTR-EC 120.55

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Torque key size

For inserts, see pages: TPMX (267)

For holders, see pages: TS-1** (322)



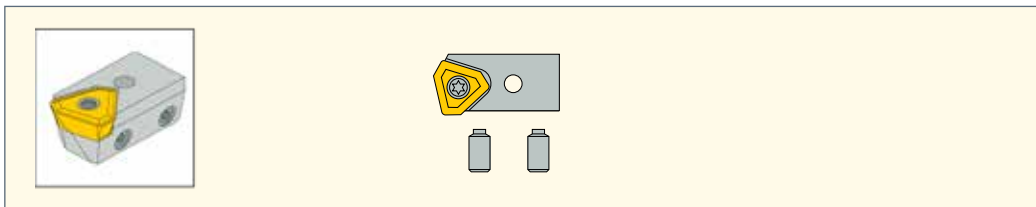
Diameter	Peripheral Cartridge	Qty.	Peripheral Insert	Qty.	Inner/Central Cartridge	Qty.	Inner/ Central Insert	Qty.	Guide Pad	Qty.	Guide Pad Protectors	Qty.	Sub Guide Pad	Qty.
ISTR-EC 3.938-4.409	CAOD-103	1	TPMX 1704RG	1	CAID-103L	3	TPMX 1704RG	3	GPB-18-40-300	3	GPP-09	3	SGP-04	1
ISTR-EC 4.410-4.881	CAOD-103	1	TPMX 1704RG	1	CAID-103L	3	TPMX 1704RG	3	GPB-18-40-300	3	GPP-09	3	SGP-04	1
ISTR-EC 4.882-5.354	CAOD-142	1	TPMX 2405RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-18-40-300	3	GPP-09	3	SGP-04	1
ISTR-EC 5.355-5.826	CAOD-142	1	TPMX 2405RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-18-40-300	5	GPP-09	5	SGP-04	1
ISTR-EC 5.827-6.299	CAOD-142	1	TPMX 2405RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-18-40-300	5	GPP-09	5	SGP-04	1
ISTR-EC 6.300-6.771	CAOD-142	1	TPMX 2405RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-18-40-300	5	GPP-09	5	SGP-04	1
ISTR-EC 6.772-7.244	CAOD-142	1	TPMX 2405RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-18-40-300	5	GPP-09	5	SGP-04	1
ISTR-EC 7.245-7.716	CAOD-142	1	TPMX 2405RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-18-40-300	5	GPP-09	5	SGP-04	1
ISTR-EC 7.717-8.188	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-18-40-300	5	GPP-09	5	SGP-04	1
ISTR-EC 8.189-8.661	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-EC 8.662-9.133	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-EC 9.134-9.606	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-EC 9.607-10.078	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-EC 10.079-10.551	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-EC 10.552-11.023	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-EC 11.024-11.496	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-EC 11.497-11.968	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-EC 11.969-12.440	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-EC 12.441-12.913	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1



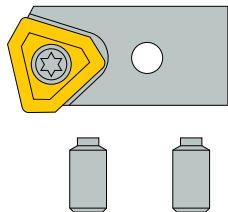
ISCARDEEPDRILL

CAOD

Drilling Head Peripheral Cartridge



Universal Marking for Deep Drilling Tools



CA - P - DR - 0800 - R

└─┬─┘
└─┬─┘
└─┬─┘
└─┬─┘
 Peripheral Cartridge DR : Drilling CB : Counter Bore IC L/R HAND

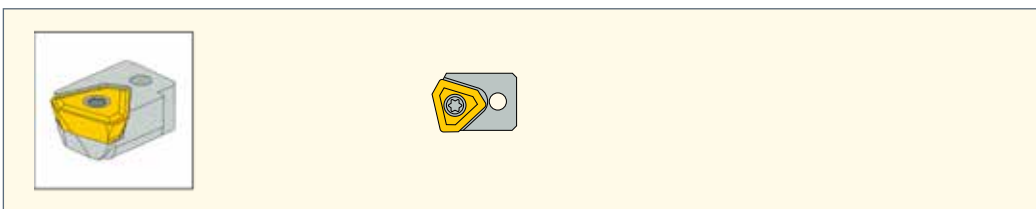
Spare Parts

Designation	Adjustment Screw	Key	Locking Screw	Key	Insert	Insert Clamping Screw
CAOD-080	SR 11201755-4	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-0845	SR 11201755-6	HW 2.0	SR 11201756-10	HW 2.5	TPMX 1403..R-G	SR 11201753-3
CAOD-085	SR 11201755-7	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-103	SR 11201755-8	HW 2.5	SR 11201756-12	HW 3.0	TPMX 1704..R-G	SR 11201753-7
CAOD-142	SR 11201755-9	HW 2.5	SR 11201756-15	HW 4.0	TPMX 2405..R-G	SR 11201753-9
CAOD-170	SR 11201755-11	HW 3.0	SR 11201756-15	HW 4.0	TPMX 2807..R-G	SR 11201753-10

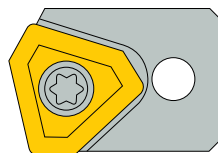
ISCARDEEPDRILL

CAID

Drilling Head Inner Cartridge



Universal Marking for Deep Drilling Tools



CA - I - 0845 - R

└─┬─┘
└─┬─┘
└─┬─┘
 Internal Cartridge IC L/R HAND

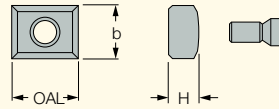
Spare Parts

Designation	Locking Screw	Key	Insert	Insert Clamping Screw	Key
CAID-080	SR 11201753-5	T-9/51	NPMX 0803..R-G	SR 11201753-2	T-7/51
CAID-0845	SR 11201753-6	T-15/51	TPMX 1403..R-G	SR 11201753-3	T-8/51
CAID-085	SR 11201753-5	T-9/51	NPMX 0803..R-G	SR 11201753-2	T-7/51
CAID-103	SR 11201752-1	T-15/51	TPMX 1704..R-G	SR 11201753-7	T-9/51
CAID-142	SR 11201756-7	HW 3.0	TPMX 2405..R-G	SR 11201753-9	T-15/51
CAID-170	SR 11201756-7	HW 3.0	TPMX 2807..R-G	SR 11201753-10	T-20/51

ISCARDEEPDRILL

SGP

Drilling Head Sub-Guide Pads



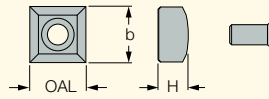
Designation	OAL	b	H
SGP-01	.394	.236	.118
SGP-02	.394	.315	.177
SGP-03	.394	.394	.197
SGP-04	.787	.551	.276

- Select an outer cartridge and pad for the required enlarged diameter.

ISCARDEEPDRILL

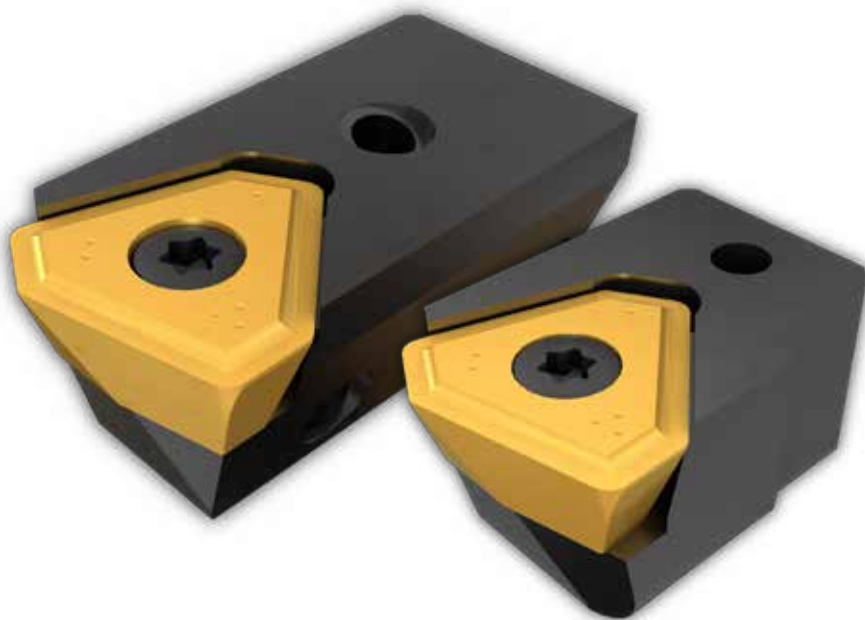
GPP

Drilling Head Guide
Pad Protectors



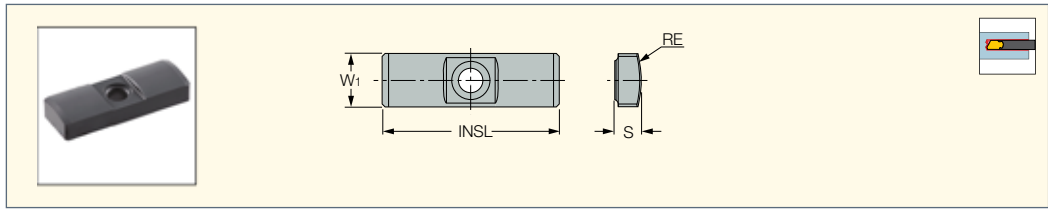
Designation	OAL	b	H
GPP-04	.315	.315	.173
GPP-05	.315	.315	.138
GPP-06	.315	.315	.177
GPP-07	.394	.394	.236
GPP-08	.551	.551	.295
GPP-09	.709	.709	.354

- Select an outer cartridge and pad for the required enlarged diameter.



ISCARDEEPPDRILL

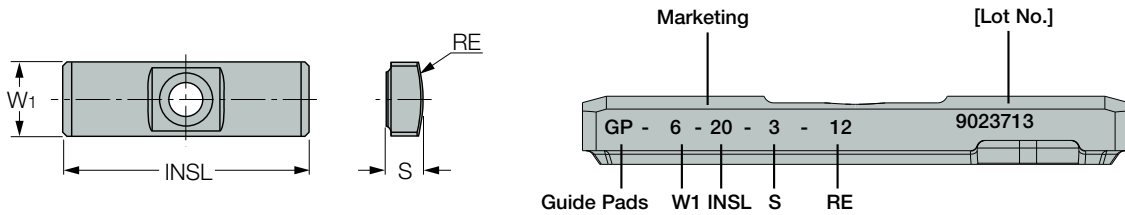
GPS
Deep Drilling Solid Carbide Guide Pads



Designation	Dimensions				Tough ↔ Hard		
	W1	INSL	S	RE	IC928	IC950	IC908
GPS-04-16-055-DC	.157	.630	.079	.2165	●		●
GPS-05-18-060-DC	.197	.709	.098	.2362	●		●
GPS-05-18-075-DC	.197	.709	.098	.2953	●		●
GPS-06-20-075-DC	.236	.787	.118	.2953			●
GPS-06-20-075	.236	.787	.118	.2953		●	●
GPS-06-20-085-DC	.236	.787	.118	.3346	●		●
GPS-06-20-085	.236	.787	.118	.3346		●	
GPS-06-20-100-DC	.236	.787	.118	.3937	●		●
GPS-06-20-100	.236	.787	.118	.3937		●	
GPS-06-20-120-DC	.236	.787	.118	.4724	●		●
GPS-06-20-120	.236	.787	.118	.4724		●	
GPS-07-20-120-DC	.276	.787	.138	.4724	●		●
GPS-07-20-120	.276	.787	.138	.4724		●	●
GPS-08-25-155-DC	.315	.984	.177	.6102	●		●
GPS-08-25-155	.315	.984	.177	.6102		●	●
GPS-10-30-200-DC	.394	1.181	.177	.7874	●		●
GPS-10-30-200	.394	1.181	.177	.7874		●	
GPS-10-35-200-DC	.394	1.378	.236	.7874	●		●
GPS-10-35-200	.394	1.378	.236	.7874		●	●
GPS-12-35-250-DC	.472	1.378	.217	.9842	●		●
GPS-12-35-250	.472	1.378	.217	.9842		●	●
GPS-14-40-250-DC	.551	1.575	.295	.9842	●		●
GPS-14-40-250	.551	1.575	.295	.9842		●	●
GPS-18-40-300-DC	.709	1.575	.354	1.1811	●		●

• DC- Double Chamfer

Universal Marking for Deep Drilling Tools

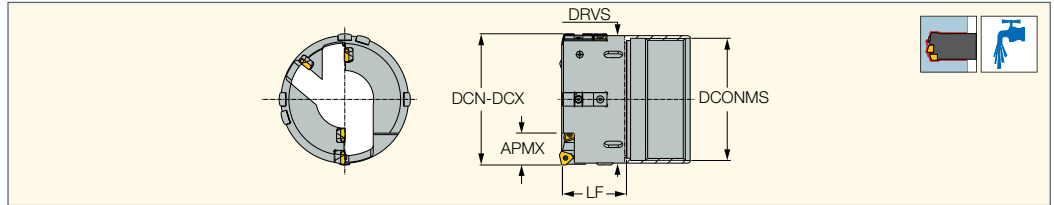


Guide Pad Grade Recommendation

Priority	Oil Coolant			Water Based Coolant		
	1	2	3	1	2	3
ISO-P	IC950	IC908	IC928	IC928	IC908	-
ISO-K	IC950	IC908	IC928	IC928	IC908	-
ISO-M	IC928	IC908	IC950	IC928	IC908	-
ISO-S	IC928	IC908	IC950	IC928	IC908	-

ISTR-IC

Single Tube Trepanning Drills with Inner Single Start Thread, Cartridges and Adjustable Diameter (3.937-12.047" dia.)



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	APMX	DRVS ⁽³⁾	LF	DCONMS
ISTR-IC 3.937-4.370	3.937	4.370	1.4961	4.173	5.472	3.543
ISTR-IC 4.371-4.842	4.371	4.842	1.4961	4.646	5.866	4.016
ISTR-IC 4.843-4.881	4.843	4.881	1.4961	4.685	5.866	4.488
ISTR-IC 4.882-5.314	4.882	5.314	1.9488	5.118	5.866	4.488
ISTR-IC 5.315-5.866	5.315	5.866	1.9488	5.669	5.866	4.961
ISTR-IC 5.867-6.377	5.867	6.377	1.9488	6.181	5.866	5.472
ISTR-IC 6.378-6.850	6.378	6.850	1.9488	6.654	6.654	5.945
ISTR-IC 6.851-7.322	6.851	7.322	1.9488	7.126	6.654	6.417
ISTR-IC 7.323-7.716	7.323	7.716	1.9488	7.520	6.654	6.890
ISTR-IC 7.717-7.795	7.717	7.795	2.2244	7.598	6.654	6.890
ISTR-IC 7.796-8.267	7.796	8.267	2.2244	8.071	6.654	7.362
ISTR-IC 8.268-8.740	8.268	8.740	2.2244	8.543	7.441	7.835
ISTR-IC 8.741-9.212	8.741	9.212	2.2244	9.016	7.441	8.307
ISTR-IC 9.213-9.685	9.213	9.685	2.2244	9.488	7.441	8.780
ISTR-IC 9.686-10.157	9.686	10.157	2.2244	9.961	7.441	9.252
ISTR-IC 10.158-10.511	10.158	10.511	2.2244	10.315	8.228	9.646
ISTR-IC 10.512-11.102	10.512	11.102	2.2244	10.906	8.228	10.197
ISTR-IC 11.103-11.574	11.103	11.574	2.2244	11.378	8.228	10.669
ISTR-IC 11.575-12.047	11.575	12.047	2.2244	11.850	8.228	11.142

• For user guide and quotation form, see pages 330-338 • Ordering example: DSTR-IC 120.55

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Torque key size

For inserts, see pages: TPMX (267)

For holders, see pages: TS-O** (323)

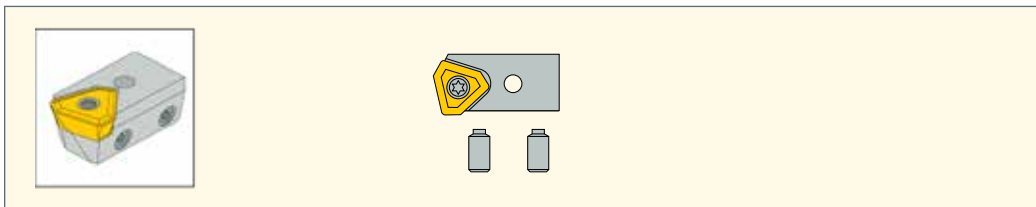


Diameter	Peripheral Cartridge		Peripheral Insert		Inner/ Central Cartridge		Inner/ Central Insert		Guide Pad		Sub Guide Pad			
	Qty.		Qty.		Qty.		Qty.		Qty.		Qty.			
ISTR-IC 3.938-4.370	CAOD-103	1	TPMX 1704RG	1	CAID-103L	3	TPMX 1704RG	3	GPB-18-40-300	3	GPP-09	3	SGP-04	1
ISTR-IC 4.371-4.842	CAOD-103	1	TPMX 1704RG	1	CAID-103L	3	TPMX 1704RG	3	GPB-18-40-300	3	GPP-09	3	SGP-04	1
ISTR-IC 4.843-4.881	CAOD-142	1	TPMX 2405RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-18-40-300	3	GPP-09	3	SGP-04	1
ISTR-IC 4.882-5.314	CAOD-142	1	TPMX 2405RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-18-40-300	3	GPP-09	3	SGP-04	1
ISTR-IC 5.315-5.866	CAOD-142	1	TPMX 2405RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-18-40-300	5	GPP-09	5	SGP-04	1
ISTR-IC 5.867-6.377	CAOD-142	1	TPMX 2405RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-18-40-300	5	GPP-09	5	SGP-04	1
ISTR-IC 6.378-6.850	CAOD-142	1	TPMX 2405RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-18-40-300	5	GPP-09	5	SGP-04	1
ISTR-IC 6.851-7.322	CAOD-170	1	TPMX 2405RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-18-40-300	5	GPP-09	5	SGP-04	1
ISTR-IC 7.323-7.716	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-18-40-300	5	GPP-09	5	SGP-04	1
ISTR-IC 7.717-7.795	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	5	GPP-10	5	SGP-04	1
ISTR-IC 7.796-8.267	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	5	GPP-10	5	SGP-04	1
ISTR-IC 8.268-8.740	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-IC 8.741-9.212	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-IC 9.213-9.685	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-IC 9.686-10.157	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-IC 10.158-10.511	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-IC 10.512-11.102	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-IC 11.103-11.574	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1
ISTR-IC 11.575-12.047	CAOD-170	1	TPMX 2807RG	1	CAID-142L	3	TPMX 2405RG	3	GPB-22-50-750	3	GPP-10	3	SGP-04	1

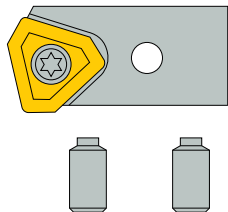
ISCARDEEPDRILL

CAOD

Drilling Head Peripheral Cartridge



Universal Marking for Deep Drilling Tools



CA - P - DR - 0800 - R

└─┬─┘
└─┬─┘
└─┬─┘
└─┬─┘
 Peripheral Cartridge DR : Drilling CB : Counter Bore IC L/R HAND

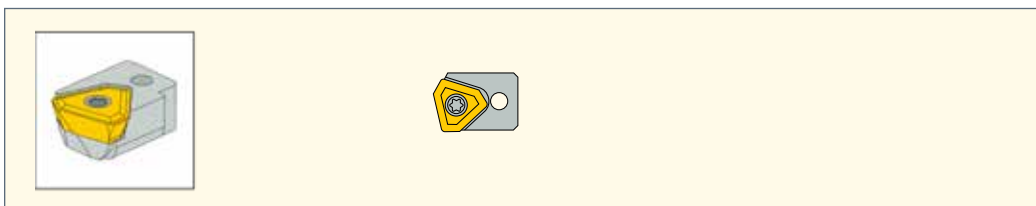
Spare Parts

Designation	Adjustment Screw	Key	Locking Screw	Key	Insert	Insert Clamping Screw
CAOD-080	SR 11201755-4	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-0845	SR 11201755-6	HW 2.0	SR 11201756-10	HW 2.5	TPMX 1403..R-G	SR 11201753-3
CAOD-085	SR 11201755-7	HW 1.5	SR 11201756-11	HW 2.0	NPMX 0803..R-G	SR 11201753-2
CAOD-103	SR 11201755-8	HW 2.5	SR 11201756-12	HW 3.0	TPMX 1704..R-G	SR 11201753-7
CAOD-142	SR 11201755-9	HW 2.5	SR 11201756-15	HW 4.0	TPMX 2405..R-G	SR 11201753-9
CAOD-170	SR 11201755-11	HW 3.0	SR 11201756-15	HW 4.0	TPMX 2807..R-G	SR 11201753-10

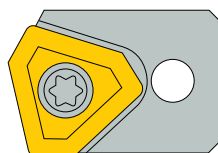
ISCARDEEPDRILL

CAID

Drilling Head Inner Cartridge



Universal Marking for Deep Drilling Tools



CA - I - 0845 - R

└─┬─┘
└─┬─┘
└─┬─┘
 Internal Cartridge IC L/R HAND

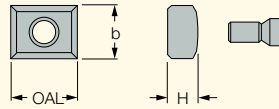
Spare Parts

Designation	Locking Screw	Key	Insert	Insert Clamping Screw	Key
CAID-080	SR 11201753-5	T-9/51	NPMX 0803..R-G	SR 11201753-2	T-7/51
CAID-0845	SR 11201753-6	T-15/51	TPMX 1403..R-G	SR 11201753-3	T-8/51
CAID-085	SR 11201753-5	T-9/51	NPMX 0803..R-G	SR 11201753-2	T-7/51
CAID-103	SR 11201752-1	T-15/51	TPMX 1704..R-G	SR 11201753-7	T-9/51
CAID-142	SR 11201756-7	HW 3.0	TPMX 2405..R-G	SR 11201753-9	T-15/51
CAID-170	SR 11201756-7	HW 3.0	TPMX 2807..R-G	SR 11201753-10	T-20/51

ISCARDEEPDRILL

SGP

Drilling Head Sub-Guide Pads



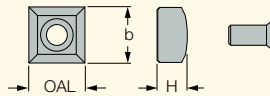
Designation	OAL	b	H
SGP-01	.394	.236	.118
SGP-02	.394	.315	.177
SGP-03	.394	.394	.197
SGP-04	.787	.551	.276

- Select an outer cartridge and pad for the required enlarged diameter.

ISCARDEEPDRILL

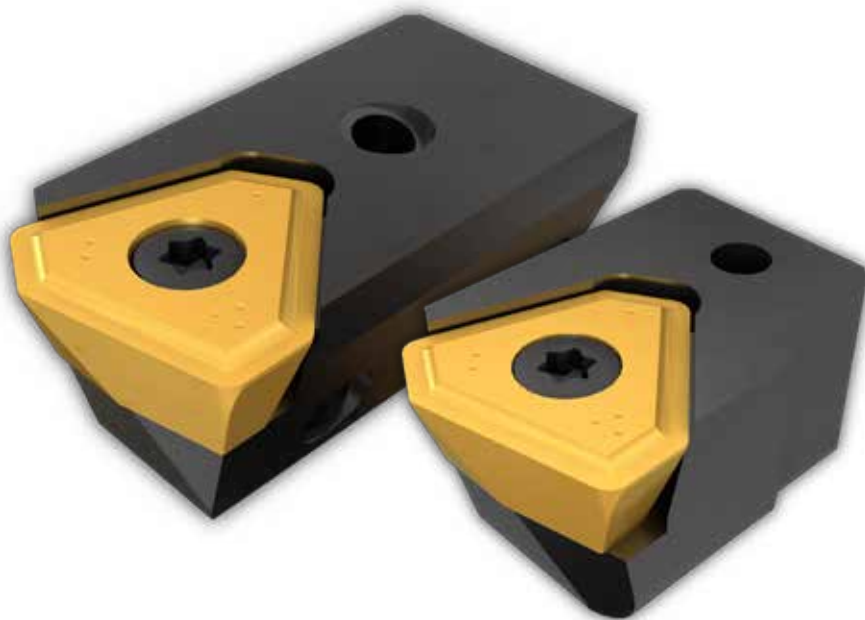
GPP

Drilling Head Guide
Pad Protectors



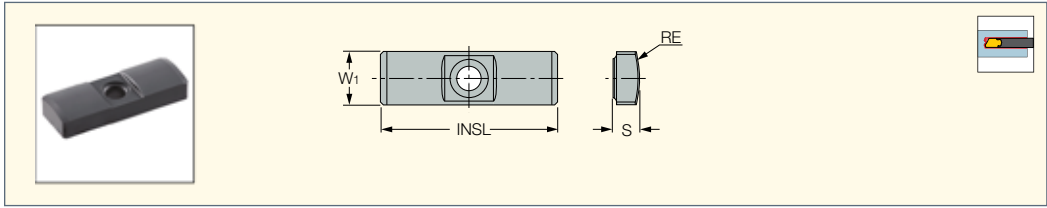
Designation	OAL	b	H
GPP-04	.315	.315	.173
GPP-05	.315	.315	.138
GPP-06	.315	.315	.177
GPP-07	.394	.394	.236
GPP-08	.551	.551	.295
GPP-09	.709	.709	.354

- Select an outer cartridge and pad for the required enlarged diameter.



ISCARDEEPDRILL

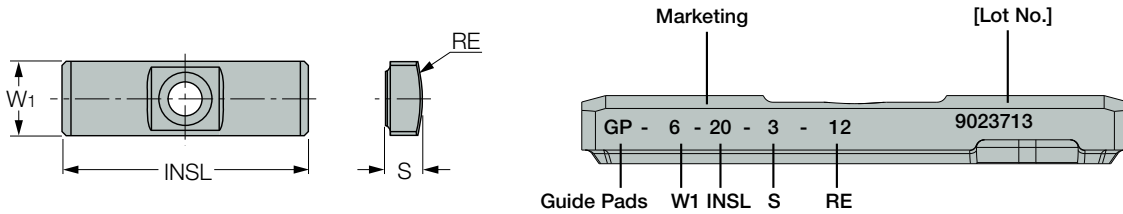
GPS
Deep Drilling Solid Carbide Guide Pads



Designation	Dimensions				Tough ↔ Hard		
	W1	INSL	S	RE	IC928	IC950	IC908
GPS-04-16-055-DC	.157	.630	.079	.2165	●		●
GPS-05-18-060-DC	.197	.709	.098	.2362	●		●
GPS-05-18-075-DC	.197	.709	.098	.2953	●		●
GPS-06-20-075-DC	.236	.787	.118	.2953			●
GPS-06-20-075	.236	.787	.118	.2953		●	●
GPS-06-20-085-DC	.236	.787	.118	.3346	●		●
GPS-06-20-085	.236	.787	.118	.3346		●	
GPS-06-20-100-DC	.236	.787	.118	.3937	●		●
GPS-06-20-100	.236	.787	.118	.3937		●	
GPS-06-20-120-DC	.236	.787	.118	.4724	●		●
GPS-06-20-120	.236	.787	.118	.4724		●	
GPS-07-20-120-DC	.276	.787	.138	.4724	●		●
GPS-07-20-120	.276	.787	.138	.4724		●	●
GPS-08-25-155-DC	.315	.984	.177	.6102	●		●
GPS-08-25-155	.315	.984	.177	.6102		●	●
GPS-10-30-200-DC	.394	1.181	.177	.7874	●		●
GPS-10-30-200	.394	1.181	.177	.7874		●	
GPS-10-35-200-DC	.394	1.378	.236	.7874	●		●
GPS-10-35-200	.394	1.378	.236	.7874		●	●
GPS-12-35-250-DC	.472	1.378	.217	.9842	●		●
GPS-12-35-250	.472	1.378	.217	.9842		●	●
GPS-14-40-250-DC	.551	1.575	.295	.9842	●		●
GPS-14-40-250	.551	1.575	.295	.9842		●	●
GPS-18-40-300-DC	.709	1.575	.354	1.1811	●		●

● DC- Double Chamfer

Universal Marking for Deep Drilling Tools



Guide Pad Grade Recommendation

Priority	Oil Coolant			Water Based Coolant		
	1	2	3	1	2	3
ISO-P	IC950	IC908	IC928	IC928	IC908	-
ISO-K	IC950	IC908	IC928	IC928	IC908	-
ISO-M	IC928	IC908	IC950	IC928	IC908	-
ISO-S	IC928	IC908	IC950	IC928	IC908	-

**Technical Information -
Cartridge Style Trepanning Head Diameter Settings**

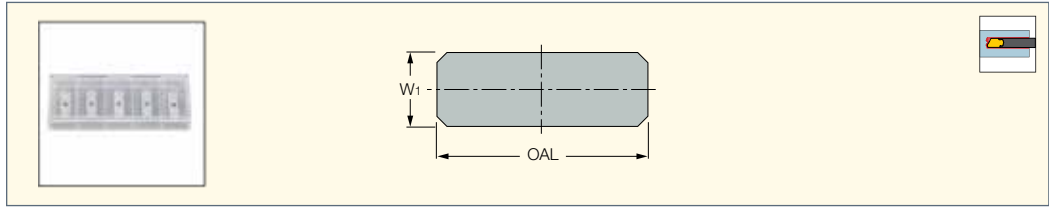
The Drill Head diameter is set and inspected with a master insert in our final inspection. However, the inserts in the market have a tolerance fluctuation so each time you change or index the insert, the diameter must be adjusted as per the following method.

	<p>1. When a corner change is made on the insert, it must be adjusted to the correct size or damage can be caused to the head body or work piece material.</p>
	<p>2. The dimensional guide pad must be slid forward to measure the diameter. 2.1 Loosen the lock screw and slide the guide pad forward. 2.2 Re-tighten the lock screw at the measuring position.</p>
	<p>3. Measure the diameter with a micrometer. We recommend setting the tool diameter at h8 tolerance to the cutting diameter. If the diameter is incorrect, go to step 4 If it's correct, go to step 5</p>
	<p>4. Adjust the peripheral cartridge 4.1 First loosen the lock screw of the peripheral cartridge and then tighten it slightly.</p>
	<p>4.2 Proceed to adjust the diameter, using the 2 adjust screws and measure with a micrometer.</p>
	<p>4.3 When set to the size, retighten the lock screw. 4.4 Recheck the diameter with a micrometer. If it is still out of tolerance, repeat the procedure from step 4-1. <i>Please make sure to tighten the lock screw firmly before using. If loose, the cartridge may move and cause serious problems during machining.</i></p>
	<p>5. Slide the dimensional guide pad back to the original position and tighten the lock screw. 6. Replace the inner cartridge and tighten the lock screw. <i>Please check that all the lock screws are firmly tightened as they may come loose if vibration occurs during drilling.</i></p>

ISCAR DEEP DRILL

SHIM GPS

Shims for GPS Pads



Designation	W1	OAL
SHIMSET-GP04	.157	.626
SHIMSET-GP05	.197	.709
SHIMSET-GP06	.236	.787

• 5 shim set contains 5 shims in thicknesses of .0004", .0008", .0012", .0016" and .002" respectively • Adjusting shims are sold by set only, and are not to be sold separately

Shim Combinations for Various Diameters

Diameter Adjustments (inch)	Shim(s) for Measuring Guide Pad	Shim(s) for Supporting Guide Pad	Number of Shim Sets Needed
+.000393	.000393	.000393	2
+.000787	.000787	.000787	2
+.001181	.001181	.000393+ .000787	1
+.001575	.001575	.000393+ .001181	1
+ .001969	.001969	.000787+ .001181	1
+.002362	.000393+ .001969	.000787+ .001575	1
+.002756	.000787+ .001969	.001181+ .001575	1
+0.003150	.001181+ .001969	.001575+ .001575	2
+.003544	.001575+ .001969	.001575+ .001969	2
+.003938	.001969+ .001969	.001575+ .001575+ .000787	2

Assembly Instructions

STEP 1

Measure the DTD drill diameter between the measuring guide pad and the insert cutting edge. If a presetter is not available, use a micrometer or caliper. For a precise drill diameter measurement, it is recommended to test-drill a hole and measure the hole diameter.



STEP 2

Select the shim combinations according to the chart above to obtain the required hole diameter. Take into consideration that the actual diameter of the drilled hole tends to be slightly larger (usually +787.40 μin to + 1181.10 μin) than the drill's nominal diameter — i.e. add 787.40 μin -1181.10 μin to the measured drill diameter in Step 1 above before the final drill diameter.



STEP 3

Remove the guide pads.



STEP 4

Install the adjusting shims underneath the guide pads, respectively. Put the guide pads back on the tool.



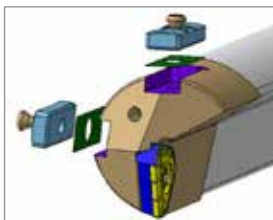
STEP 5

Measure the drill diameter again to confirm that the required diameter is obtained on the DTD.



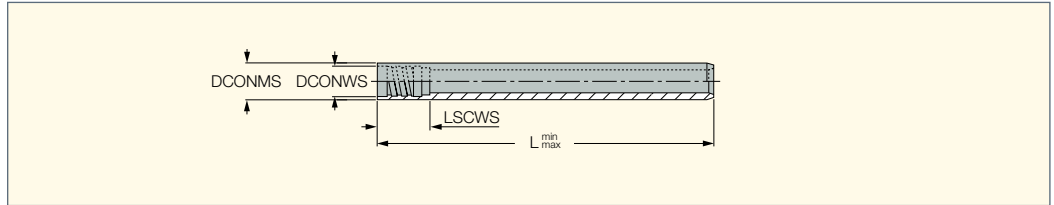
STEP 6

Drill a hole to confirm that the required hole diameter is achieved.



TS***

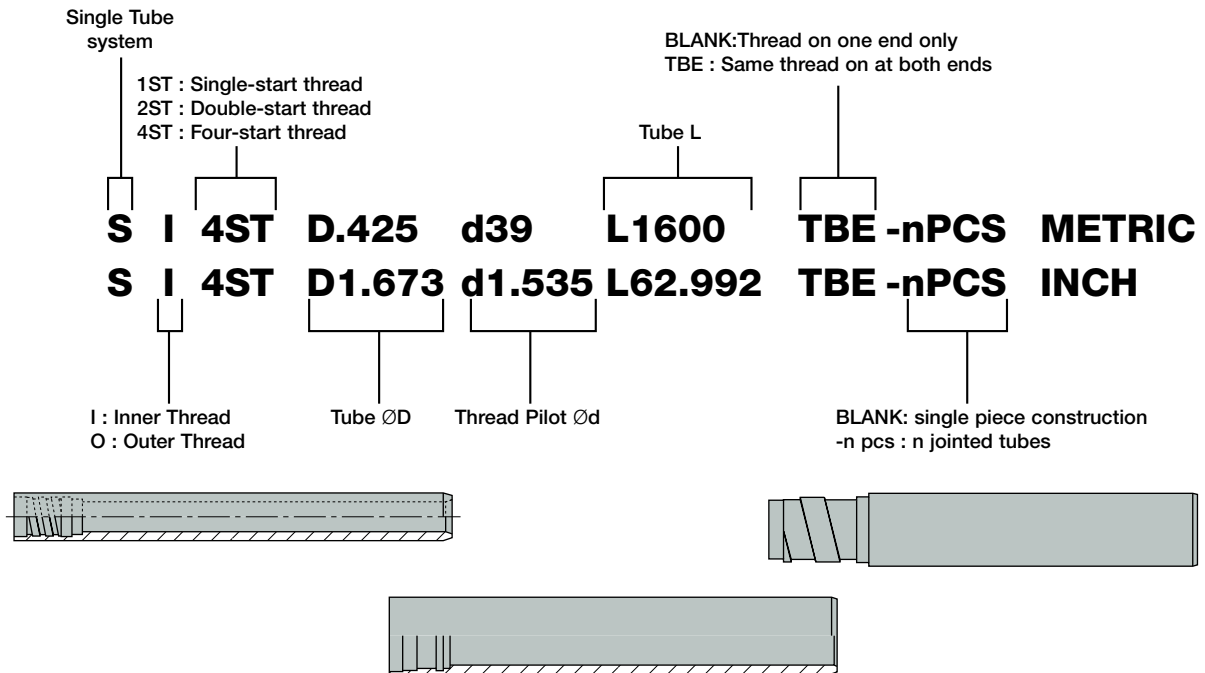
Drill Tubes - STS System - Inner
Single-Start Thread Connection



Designation	d Range	DCONMS	DCONWS	LSCWS	L min	L max
TS001 L=(0-2950)MM	.315 - .354	.280	.236	.630	.00	116.142
TS002 L=(0-2950)MM	.354 - .393	.327	.283	.630	.00	116.142
TS003 L=(0-2950)MM	.394 - .433	.354	.299	.630	.00	116.142
TS004 L=(0-2950)MM	.433 - .472	.394	.339	.630	.00	116.142
TS005 L=(0-2950)MM	.472 - .531	.433	.358	.630	.00	116.142
TS006 L=(0-2950)MM	.531 - .582	.472	.425	.630	.00	116.142

• These products are made to order on request • Indicate overall length (L) when ordering • Ordering example: TS004-L1500 (59.055")

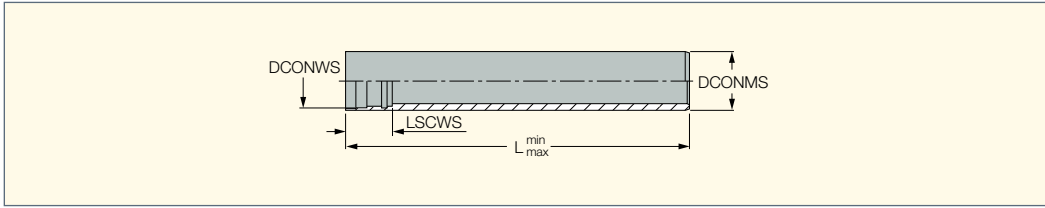
Universal Marking for Deep Drilling Tools



ISCARDEEPDRILL

TS-I**

Drill Tubes - STS System - Inner
2 or 4- Start Thread Connection



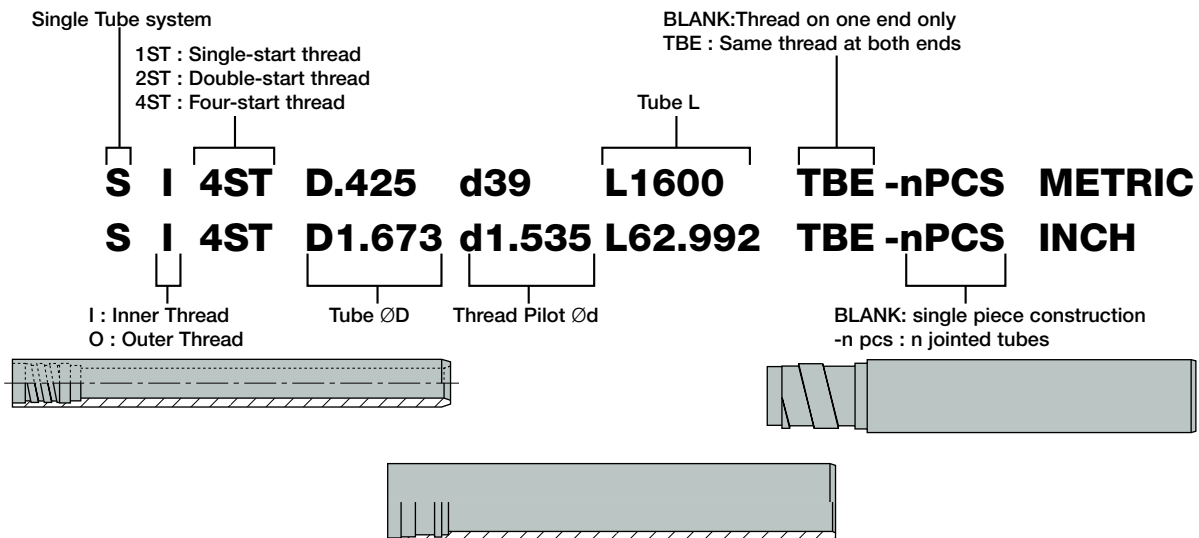
Designation	d Range	DCONMS	DCONWS	LSCWS	L min	L max
TS-I01 L=(0-3700)MM ⁽¹⁾	.496 - .535	.433	.378	.866	.00	145.669
TS-I02 L=(0-3700)MM ⁽¹⁾	.536 - .575	.472	.417	.866	.00	145.669
TS-I03 L=(0-3700)MM ⁽¹⁾	.575 - .614	.512	.457	.866	.00	145.669
TS-I0 L=(0-3700)MM	.614 - .657	.551	.496	.827	.00	145.669
TS-I1 L=(0-3700)MM	.658 - .697	.591	.535	.827	.00	145.669
TS-I2 L=(0-3700)MM	.697 - .744	.630	.571	.866	.00	145.669
TS-I3 L=(0-3700)MM	.744 - .787	.669	.610	.866	.00	145.669
TS-I4 L=(0-3700)MM	.788 - .858	.709	.630	1.083	.00	145.669
TS-I5 L=(0-3700)MM	.859 - .949	.787	.709	1.181	.00	145.669
TS-I6 L=(0-3700)MM	.949 - 1.039	.866	.768	1.181	.00	145.669
TS-I7 L=(0-3700)MM	1.040 - 1.130	.945	.827	1.181	.00	145.669
TS-I8 L=(0-3700)MM	1.130 - 1.220	1.024	.925	1.299	.00	145.669
TS-I9 L=(0-3700)MM	1.221 - 1.311	1.102	1.004	1.299	.00	145.669
TS-I10 L=(0-3700)MM	1.311 - 1.425	1.181	1.102	1.299	.00	145.669
TS-I11 L=(0-3700)MM	1.426 - 1.559	1.299	1.181	1.575	.00	145.669
TS-I12 L=(0-3700)MM	1.559 - 1.693	1.417	1.299	1.575	.00	145.669
TS-I13 L=(0-3700)MM	1.693 - 1.850	1.535	1.417	1.575	.00	145.669
TS-I14 L=(0-3700)MM	1.851 - 2.035	1.693	1.535	1.575	.00	145.669
TS-I15 L=(0-3700)MM	2.036 - 2.213	1.850	1.693	1.732	.00	145.669
TS-I16 L=(0-3700)MM	2.213 - 2.386	2.008	1.850	1.732	.00	145.669
TS-I17 L=(0-3700)MM	2.386 - 2.559	2.205	2.008	1.732	.00	145.669
TS-I18 L=(0-3700)MM	2.559 - 2.637	2.205	2.047	2.953	.00	145.669
TS-I19 L=(0-3700)MM	2.638 - 2.874	2.441	2.283	2.953	.00	145.669
TS-I20 L=(0-3700)MM	2.874 - 3.149	2.677	2.480	2.953	.00	145.669
TS-I21 L=(0-3700)MM	3.150 - 3.425	2.953	2.756	3.819	.00	145.669
TS-I22 L=(0-3700)MM	3.425 - 3.937	3.228	3.031	3.819	.00	145.669
TS-I23 L=(0-3700)MM	3.937 - 4.409	3.701	3.504	3.819	.00	145.669
TS-I24 L=(0-3700)MM	4.409 - 4.881	4.173	3.976	4.646	.00	145.669
TS-I25 L=(0-3700)MM	4.882 - 5.354	4.646	4.449	4.646	.00	145.669
TS-I26 L=(0-3700)MM	5.354 - 5.826	5.118	4.921	4.646	.00	145.669
TS-I27 L=(0-3700)MM	5.827 - 6.299	5.591	5.394	5.472	.00	145.669
TS-I28 L=(0-3700)MM	6.299 - 6.771	6.063	5.866	5.472	.00	145.669
TS-I29 L=(0-3700)MM	6.772 - 7.244	6.535	6.339	5.472	.00	145.669
TS-I30 L=(0-3700)MM	7.244 - 7.716	7.008	6.811	5.669	.00	145.669
TS-I31 L=(0-3700)MM	7.717 - 8.189	7.480	7.283	5.669	.00	145.669
TS-I32 L=(0-3700)MM	8.189 - 8.661	7.953	7.756	5.669	.00	145.669
TS-I33 L=(0-3700)MM	8.661 - 9.133	8.425	8.189	6.457	.00	145.669
TS-I34 L=(0-3700)MM	9.134 - 9.606	8.898	8.661	6.457	.00	145.669

• These products are made to order on request • Indicate overall length (L) when ordering • Ordering example: TS-I12-L2000 (78.740")

⁽¹⁾ 2 Start thread connection

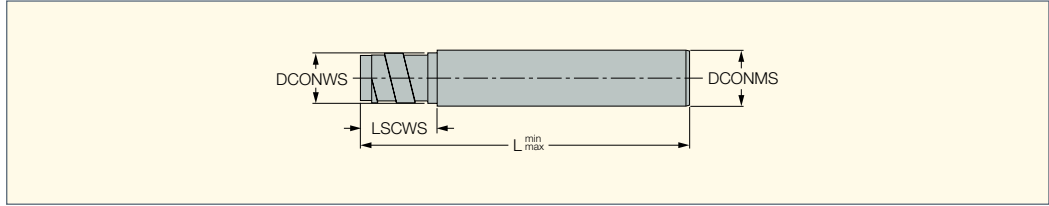
For tools, see pages: ISD-EF-FB (253) • ISD-EF-FT (244) • ISTR-EC (311)

Universal Marking for Deep Drilling Tools



TS-O**

Drill Tubes - STS System - Outer
Single-Start Thread Connection

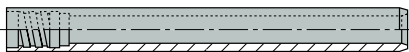
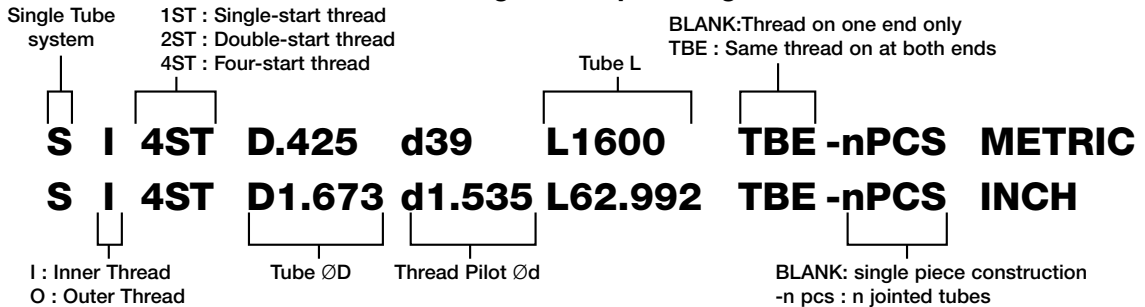


Designation	d Range	DCONMS	DCONWS	LSCWS	L min	L max
TS-O0 L=(0-3700)MM	.571 - .591	.472	.453	.906	.00	145.669
TS-O1 L=(0-3700)MM	.591 - .610	.472	.465	.906	.00	145.669
TS-O2 L=(0-3700)MM	.611 - .630	.512	.488	.906	.00	145.669
TS-O3 L=(0-3700)MM	.630 - .650	.512	.500	.906	.00	145.669
TS-O4 L=(0-3700)MM	.650 - .679	.551	.528	.906	.00	145.669
TS-O5 L=(0-3700)MM	.680 - .709	.551	.539	.906	.00	145.669
TS-O6 L=(0-3700)MM	.709 - .748	.591	.567	.906	.00	145.669
TS-O7 L=(0-3700)MM	.748 - .787	.650	.606	.906	.00	145.669
TS-O8 L=(0-3700)MM	.787 - .866	.709	.650	1.024	.00	145.669
TS-O9 L=(0-3700)MM	.866 - .984	.787	.748	1.024	.00	145.669
TS-O10 L=(0-3700)MM	.984 - 1.063	.866	.787	1.024	.00	145.669
TS-O11 L=(0-3700)MM	1.063 - 1.181	.945	.866	1.024	.00	145.669
TS-O12 L=(0-3700)MM	1.181 - 1.259	1.024	.945	1.024	.00	145.669
TS-O13 L=(0-3700)MM	1.260 - 1.338	1.181	1.063	1.024	.00	145.669
TS-O14 L=(0-3700)MM	1.339 - 1.456	1.181	1.063	1.614	.00	145.669
TS-O15 L=(0-3700)MM	1.457 - 1.574	1.299	1.181	1.614	.00	145.669
TS-O16 L=(0-3700)MM	1.575 - 1.732	1.417	1.299	1.614	.00	145.669
TS-O17 L=(0-3700)MM	1.732 - 1.850	1.535	1.457	1.614	.00	145.669
TS-O18 L=(0-3700)MM	1.850 - 2.047	1.693	1.614	1.614	.00	145.669
TS-O19 L=(0-3700)MM	2.047 - 2.244	1.850	1.732	1.614	.00	145.669
TS-O20 L=(0-3700)MM	2.244 - 2.401	2.008	1.929	1.614	.00	145.669
TS-O21 L=(0-3700)MM	2.402 - 2.677	2.205	2.087	1.614	.00	145.669
TS-O22 L=(0-2950)MM	2.677 - 2.952	2.441	2.323	1.614	.00	116.142
TS-O23 L=(0-3700)MM	2.953 - 3.189	2.677	2.559	2.795	.00	145.669
TS-O24 L=(0-3700)MM	3.189 - 3.582	2.953	2.795	2.795	.00	145.669
TS-O25 L=(0-3700)MM	3.583 - 3.897	3.228	3.110	2.795	.00	145.669
TS-O26 L=(0-3700)MM	3.898 - 4.370	3.701	3.543	2.795	.00	145.669
TS-O27 L=(0-3700)MM	4.379 - 4.842	4.173	4.016	2.795	.00	145.669
TS-O28 L=(0-3700)MM	4.843 - 5.315	4.646	4.488	2.795	.00	145.669
TS-O29 L=(0-3700)MM	5.315 - 5.866	5.118	4.961	2.795	.00	145.669
TS-O30 L=(0-3700)MM	5.866 - 6.378	5.591	5.472	2.795	.00	145.669
TS-O31 L=(0-3700)MM	6.378 - 6.850	6.063	5.945	3.386	.00	145.669
TS-O32 L=(0-3700)MM	6.859 - 7.322	6.535	6.417	3.386	.00	145.669
TS-O33 L=(0-3700)MM	7.323 - 7.795	7.008	6.890	3.386	.00	145.669
TS-O34 L=(0-3700)MM	7.795 - 8.267	7.480	7.362	3.386	.00	145.669
TS-O35 L=(0-3700)MM	8.268 - 8.740	7.953	7.835	3.386	.00	145.669
TS-O36 L=(0-3700)MM	8.749 - 9.212	8.425	8.307	3.386	.00	145.669
TS-O37 L=(0-3700)MM	9.213 - 9.685	8.898	8.780	3.386	.00	145.669

• These products are made to order on request • Indicate overall length (L) when ordering • Ordering example: TS-O36-L1100 (43.307")

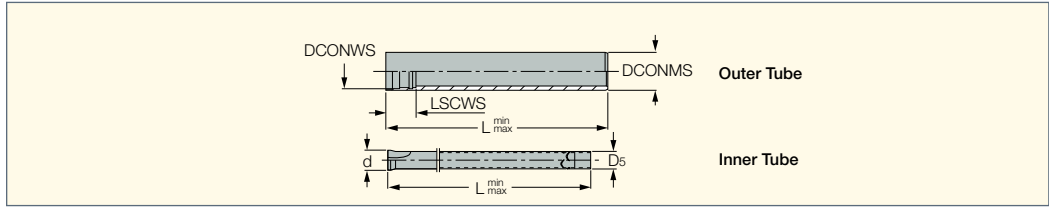
For tools, see pages: ISD-IF-FB (254) • ISD-IF-FT (244) • ISTR-IC (315)

Universal Marking for Deep Drilling Tools



ISCARDEEPDRILL

TDO-I (D.725-2.56)
 Double Tube Drill System
 with 4-Start Thread
 Connection Outer Tubes

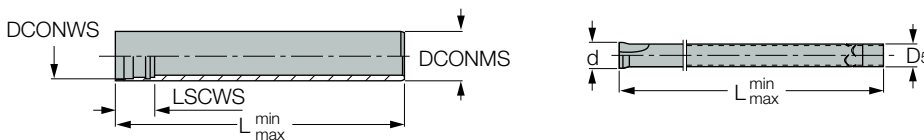
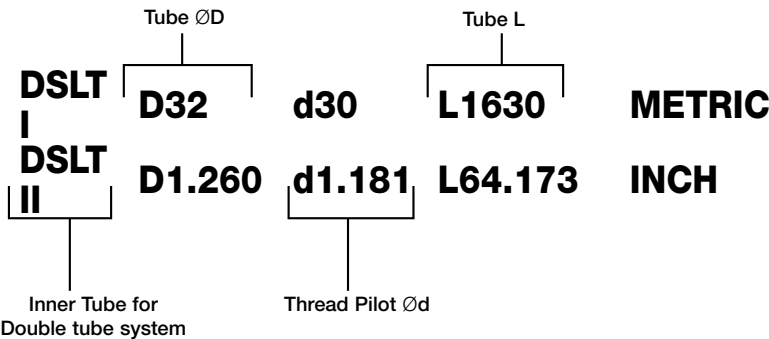
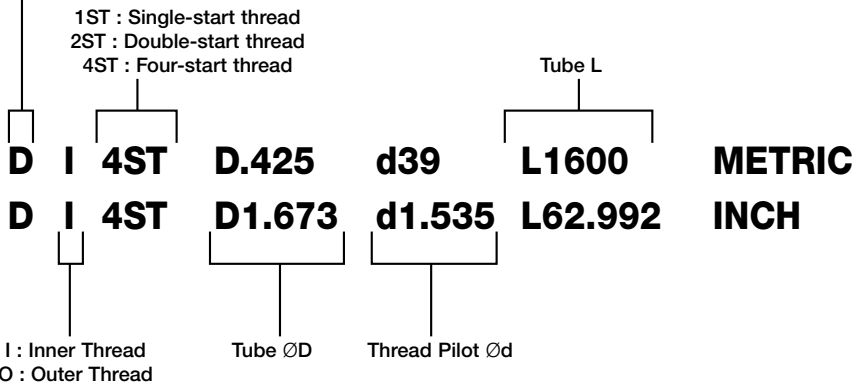


Designation	d Range	DCONMS	DCONWS	LSCWS	Int Tube	d	D5	L min	L max
TDO-I0 L=(0-3700)MM	.725-.787	.709	.630	1.083	TDI-N0	.472	.394	.00	145.669
TDO-I1 L=(0-3700)MM	.788-.858	.768	.709	1.181	TDI-N1	.551	.472	.00	145.669
TDO-I2 L=(0-3700)MM	.859-.949	.846	.768	1.181	TDI-N2	.591	.512	.00	145.669
TDO-I3 L=(0-3700)MM	.949-1.04	.925	.827	1.181	TDI-N3	.630	.551	.00	145.669
TDO-I4 L=(0-3700)MM	1.04-1.13	1.024	.925	1.299	TDI-N4	.709	.630	.00	145.669
TDO-I5 L=(0-3700)MM	1.13-1.22	1.102	1.004	1.299	TDI-N5	.787	.709	.00	145.669
TDO-I6 L=(0-3700)MM	1.221-1.311	1.201	1.102	1.299	TDI-N6	.866	.787	.00	145.669
TDO-I7 L=(0-3700)MM	1.311-1.425	1.299	1.181	1.575	TDI-N7	.945	.866	.00	145.669
TDO-I8 L=(0-3700)MM	1.426-1.559	1.398	1.299	1.575	TDI-N8	1.024	.945	.00	145.669
TDO-I9 L=(0-3700)MM	1.559-1.693	1.535	1.417	1.575	TDI-N9	1.142	1.063	.00	145.669
TDO-I10 L=(0-3700)MM	1.693-1.850	1.673	1.535	1.575	TDI-N10	1.260	1.181	.00	145.669
TDO-I11 L=(0-3700)MM	1.851-2.035	1.831	1.693	1.732	TDI-N11	1.378	1.260	.00	145.669
TDO-I12 L=(0-3700)MM	2.036-2.213	2.008	1.850	1.732	TDI-N12	1.535	1.417	.00	145.669
TDO-I13 L=(0-3700)MM	2.213-2.559	2.185	2.008	1.732	TDI-N13	1.693	1.575	.00	145.669

- These products are made to order on request • Please indicate overall length (L) when ordering • Ordering example: TDO-I13-L1100 (43.307")
 - For 18.41-65.00 (.724"-2.559") diameter range, the inner tube should be 30 mm (1.181") longer than the outer tube
- For tools, see pages: IDC-EA (302) • IDC-EC (305)

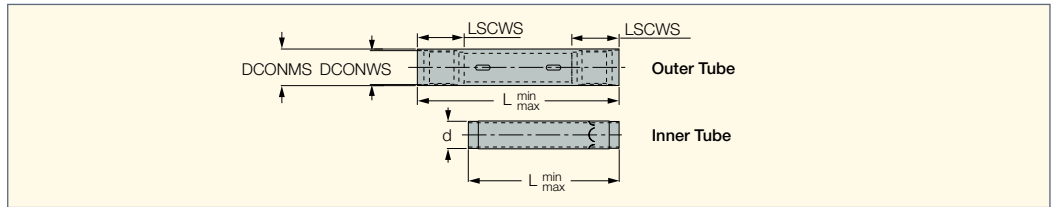
Universal Marking for Deep Drilling Tools

Double Tube system



TDO-I (D2.56-6.77)

Double Tube Drill System
with 4-Start Thread
Connection Outer Tubes

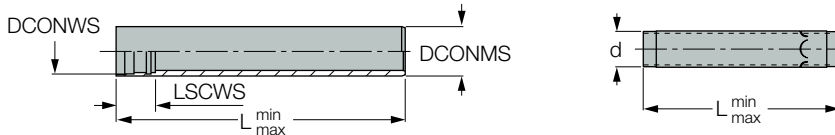
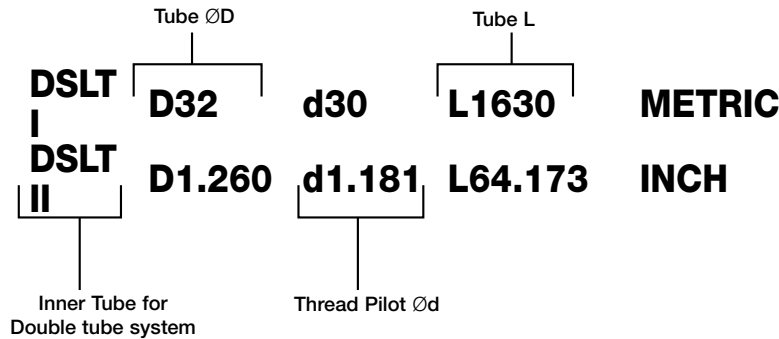
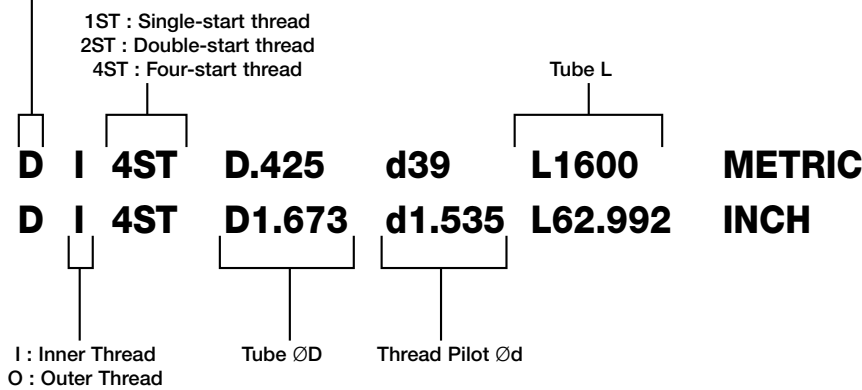


Designation	d Range	DCONMS	DCONWS	LSCWS	Int Tube	d	L min	L max
TDO-I14 L=(0-3700)MM	2.559-2.637	2.205	2.047	2.953	TDI-N14	1.575	.00	145.669
TDO-I15 L=(0-2950)MM	2.638-2.874	2.441	2.283	2.953	TDI-N15	1.732	.00	116.142
TDO-I16 L=(0-3700)MM	2.874-3.149	2.677	2.480	2.953	TDI-N16	1.890	.00	145.669
TDO-I17 L=(0-3700)MM	3.150-3.425	2.953	2.756	3.819	TDI-N17	2.126	.00	145.669
TDO-I18 L=(0-3700)MM	3.425-3.937	3.228	3.031	3.819	TDI-N18	2.362	.00	145.669
TDO-I19 L=(0-3700)MM	3.937-4.409	3.701	3.504	3.819	TDI-N19	2.756	.00	145.669
TDO-I20 L=(0-3700)MM	4.409-4.881	4.173	3.976	4.646	TDI-N20	3.150	.00	145.669
TDO-I21 L=(0-3700)MM	4.882-5.354	4.646	4.449	4.646	TDI-N21	3.150	.00	145.669
TDO-I22 L=(0-3700)MM	5.354-5.826	5.118	4.921	4.646	TDI-N22	3.543	.00	145.669
TDO-I23 L=(0-3700)MM	5.827-6.299	5.591	5.394	5.472	TDI-N23	3.937	.00	145.669
TDO-I24 L=(0-3700)MM	6.299-6.771	6.063	5.866	5.472	TDI-N24	4.724	.00	145.669

- These products are made to order on request • Indicate overall length (L) when ordering • Ordering example: TDO-I18-L1150 (45.275")
 - For 65.00-123.99 mm (2.559"-4.881") diameter range, the inner tube should be 190 mm (7.480") longer than the outer tube
 - For 124.00-183.99 mm (4.882"-7.243") diameter range, the inner tube should be 220 mm (8.661") longer than the outer tube
- For tools, see pages: IDC-EC (305) • IDD-EC (264)

Universal Marking for Deep Drilling Tools

Double Tube system



Recommended Machining Conditions

Ground Brazed Solid Drill Heads ISD-E0, ISD-E1, ISD-E2, ISD-E3, IDD-E3

ISO	Material	Condition	Tensile Strength [ksi]	Hardness HB	Material Group No. ⁽¹⁾	
P	Non-alloy steel and cast steel, free cutting steel	<0.25% C	Annealed	61	125	1
		≥0.25% C	Annealed	94	190	2
		<0.55% C	Quenched and tempered	123	250	3
		≥0.55% C	Annealed	109	220	4
			Quenched and tempered	145	300	5
	Low alloy and cast steel (less than 5% of alloying elements)	Quenched and tempered	Annealed	87	200	6
			Quenched and tempered	135	275	7
				145	300	8
	High alloyed steel, cast steel and tool steel	Quenched and tempered	174	350	9	
			Annealed	99	200	10
	Stainless steel and cast steel	Quenched and tempered	160	325	11	
			Ferritic/martensitic	99	200	12
	Stainless steel and cast steel	Martensitic	119	240	13	
Austenitic, duplex			87	180	14	
M	Stainless steel and cast steel	Austenitic, duplex	87	180	14	
K	Gray cast iron (GG)	Ferritic/pearlitic		180	15	
		Pearlitic/martensitic		260	16	
	Nodular cast iron (GGG)	Ferritic		160	17	
		Pearlitic		250	18	
	Malleable cast iron	Ferritic		130	19	
		Pearlitic		230	20	
N	Aluminum-wrought alloys	Not hardenable		60	21	
		Hardenable		100	22	
	Aluminum-cast alloys	≤12% Si	Not hardenable		75	23
			Hardenable		90	24
		>12% Si	High temperature		130	25
	Copper alloys	>1% Pb	Free cutting		110	26
			Brass		90	27
		Electrolytic copper		100	28	
	Non metallic	Duroplastics, fiber plastics				29
			Hard rubber			30
S	High temperature alloys	Fe based	Annealed		200	31
			Hardened		280	32
		Ni or Co based	Annealed		250	33
			Hardened		350	34
			Cast		320	35
	Titanium alloys	Pure	58		36	
		Alpha+Beta alloys, hardened	152		37	
H	Hardened steel	Hardened		55 HRC	38	
		Hardened		60 HRC	39	
	Chilled cast iron	Cast		400	40	
	Cast iron	Hardened		55 HRC	41	

⁽¹⁾ Based on ISO 513 and VDI 3323 standards

Ground Brazed Solid Drill Heads ISD-E0, ISD-E1, ISD-E2, ISD-E3, IDD-E3					
Dia. Range	.315-.787	.614-.787	.788-1.220	1.221-1.693	1.6933-2.559
V_c (SFM)	Feed Rate F (IPR)				
230 - 395	.002 - .005	.003 - .006	.004 - .007	.005 - .008	.006 - .012
230 - 395	.002 - .005	.003 - .006	.004 - .007	.005 - .008	.006 - .012
130 - 230	.002 - .005	.003 - .006	.004 - .007	.005 - .008	.006 - .012
230 - 395	.002 - .005	.003 - .006	.004 - .007	.005 - .008	.006 - .012
180 - 330	.002 - .004	.003 - .005	.004 - .006	.005 - .007	.006 - .011
230 - 330	.002 - .005	.003 - .006	.004 - .007	.005 - .008	.006 - .012
180 - 330	.002 - .004	.003 - .005	.004 - .006	.005 - .007	.006 - .011
180 - 330	.002 - .004	.003 - .005	.004 - .006	.005 - .007	.006 - .011
180 - 330	.002 - .004	.003 - .005	.004 - .006	.005 - .007	.006 - .011
165 - 280	.002 - .005	.003 - .006	.004 - .007	.005 - .008	.006 - .012
180 - 330	.002 - .004	.003 - .005	.004 - .006	.005 - .007	.006 - .011
195 - 330	.002 - .005	.003 - .006	.004 - .011	.005 - .012	.006 - .014
195 - 330	.002 - .005	.003 - .006	.004 - .011	.005 - .012	.006 - .014
195 - 330	.002 - .005	.002 - .005	.003 - .01	.004 - .011	.006 - .013
260 - 330	.002 - .005	.003 - .006	.004 - .007	.005 - .008	.006 - .012
260 - 330	.002 - .005	.003 - .006	.004 - .007	.005 - .008	.006 - .012
195 - 330	.002 - .005	.002 - .005	.003 - .007	.004 - .008	.006 - .01
195 - 330	.002 - .005	.002 - .005	.003 - .007	.004 - .008	.006 - .01
165 - 330	.002 - .005	.002 - .005	.003 - .007	.004 - .008	.006 - .01
165 - 330	.002 - .005	.002 - .005	.003 - .007	.004 - .008	.006 - .01
215 - 425	.002 - .005	.003 - .006	.004 - .008	.006 - .01	.006 - .012
215 - 330	.002 - .005	.003 - .006	.004 - .008	.006 - .01	.006 - .012
215 - 425	.002 - .005	.003 - .006	.004 - .008	.006 - .01	.006 - .012
215 - 425	.002 - .005	.003 - .006	.004 - .008	.006 - .01	.006 - .012
215 - 425	.002 - .005	.003 - .006	.004 - .008	.006 - .01	.006 - .012
215 - 425	.002 - .005	.003 - .006	.004 - .008	.006 - .01	.006 - .012
215 - 425	.002 - .005	.003 - .006	.004 - .008	.006 - .01	.006 - .012
215 - 425	.002 - .005	.003 - .006	.004 - .008	.006 - .01	.006 - .012
215 - 425	.002 - .005	.003 - .006	.004 - .008	.006 - .01	.006 - .012
35 - 165	.002 - .005	.002 - .005	.003 - .006	.005 - .007	.006 - .01
35 - 165	.002 - .005	.002 - .005	.003 - .006	.005 - .007	.006 - .01
35 - 165	.002 - .005	.002 - .005	.003 - .006	.005 - .007	.006 - .01
35 - 165	.002 - .005	.002 - .005	.003 - .006	.005 - .007	.006 - .01
35 - 165	.002 - .005	.002 - .005	.003 - .006	.005 - .007	.006 - .01
100 - 165	.002 - .004	.002 - .004	.003 - .005	.004 - .006	.005 - .079
100 - 165	.002 - .004	.002 - .004	.003 - .005	.004 - .006	.005 - .008

Machining Recommendations

ISO	Material	Condition	Tensile Strength [ksi]	Material Group No. ⁽¹⁾	Hardness HB	Chipbreaker			
						Troubleshooting			
						First Choice	Fracture	Wear	
P	Non-alloy steel and cast steel, free cutting steel	<0.25% C	Annealed	61	1	125	G IC908	BG IC806	B IC9025
		≥0.25% C	Annealed	94	2	190			
		<0.55% C	Quenched and tempered	123	3	250			
		≥0.55% C	Annealed	109	4	220			
		≥0.55% C	Quenched and tempered	145	5	300			
	Low alloy and cast steel (less than 5% of alloying elements)	Quenched and tempered	Annealed	87	6	200	G IC908	BG IC806	B IC9025
				135	7	275			
				145	8	300			
	High alloyed steel, cast steel and tool steel	Quenched and tempered		174	9	350	G IC908	BG IC806	B IC9025
			Annealed	99	10	200			
Stainless steel and cast steel	Martensitic	Ferritic/martensitic	99	12	200	G IC908	BG IC806	B IC9025	
			160	11	325				
M	Stainless steel and cast steel	Austenitic, duplex	Ferritic/martensitic	99	12	200	G IC908	BG IC806	B IC9025
				119	13	240			
K	Gray cast iron (GG)	Ferritic/pearlitic		87	14	180	G IC806	B IC908	B IC9025
	Nodular cast iron (GGG)	Pearlitic/martensitic	Ferritic		15	180	G IC908	G IC806	B IC9025
			Pearlitic		16	260			
	Malleable cast iron	Ferritic			17	160	G IC908	G IC806	B IC9025
			Pearlitic		18	250			
N	Aluminum-wrought alloys	Not hardenable		19	130	G IC908	G IC806	B IC9025	
					20				230
	Aluminum-cast alloys	≤12% Si	Not hardenable		21	60	G IC908	G IC806	B IC9025
			Hardenable		22	100			
			>12% Si	High temperature		23			
	Copper alloys	>1% Pb	Free cutting		24	90	G IC908	G IC806	B IC9025
			Brass		25	130			
			Electrolytic copper		26	110			
	Non metallic	Duroplastics, fiber plastics			27	90	G IC908	G IC806	B IC9025
			Hard rubber		28	100			
S	High temperature alloys	Fe based	Annealed		29		B IC806	B IC908	B IC9025
			Hardenable		30				
		Ni or Co based	Annealed		31	200			
			Hardenable		32	280			
			Cast		33	250			
	Titanium alloys	Alpha+Beta alloys hardened	Pure		34	350	B IC806	B IC908	B IC9025
				35	320				
H	Hardened steel	Hardened		58	36	B IC806	B IC908	B IC908	
					37				
	Chilled cast iron	Cast		38					
	Cast iron	Hardened		39					
				40	400				
				41					

⁽¹⁾ For material groups see pages 573-604

Indexable Drill Heads ISD-EC, IDD-EC, ISD-IC					
Dia. Range	1.496-1.574	1.575-2.047	2.0472-2.519	2.520-3.346	3.3464-11.535
V _c (SFM)	Feed Rate f (IPR)				
195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 330	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 330	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
165 - 330	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
165 - 330	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 395	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 360	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 360	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
195 - 360	.003 - .006	.004 - .008	.005 - .009	.006 - .01	.007 - .012
260 - 460	.008 - .012	.008 - .012	.009 - .013	.009 - .013	.01 - .016
260 - 460	.008 - .012	.008 - .012	.009 - .013	.009 - .013	.01 - .016
260 - 460	.008 - .012	.008 - .012	.009 - .013	.009 - .013	.01 - .016
260 - 460	.008 - .012	.008 - .012	.009 - .013	.009 - .013	.01 - .016
260 - 460	.008 - .012	.008 - .012	.009 - .013	.009 - .013	.01 - .016
260 - 460	.008 - .012	.008 - .012	.009 - .013	.009 - .013	.01 - .016
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
330 - 655	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
195 - 425	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
195 - 425	.003 - .008	.004 - .01	.005 - .011	.006 - .012	.007 - .013
65 - 215	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.007 - .011
65 - 215	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.007 - .011
65 - 215	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.007 - .011
100 - 330	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.007 - .011
100 - 330	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.007 - .011
100 - 195	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.007 - .011
100 - 195	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.007 - .011
100 - 260	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.006 - .011
100 - 260	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.006 - .011
100 - 260	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.006 - .011
100 - 260	.002 - .005	.003 - .007	.005 - .009	.005 - .009	.006 - .011

⁽¹⁾ For material groups see pages 573-604

Recommended Machining Conditions

Indexable Counterboring Heads ISC-EA, ISC-EC, ISC-IA, ISC-IC, IDC-EA / Trepanning Heads

ISO	Material	Condition	Tensile Strength [ksi]	Hardness HB	Material Group No. ⁽¹⁾	
P	Non-alloy steel and cast steel, free cutting steel	<0.25% C	Annealed	61	125	1
		≥0.25% C	Annealed	94	190	2
		<0.55% C	Quenched and tempered	123	250	3
		≥0.55% C	Annealed	109	220	4
			Quenched and tempered	145	300	5
	Low alloy and cast steel (less than 5% of alloying elements)	Quenched and tempered	Annealed	87	200	6
			Quenched and tempered	135	275	7
				145	300	8
	High alloyed steel, cast steel and tool steel	Quenched and tempered	174	350	9	
			Annealed	99	200	10
	Stainless steel and cast steel	Quenched and tempered	Ferritic/martensitic	99	200	12
			Martensitic	119	240	13
	M	Stainless steel and cast steel	Austenitic, duplex	87	180	14
K	Gray cast iron (GG)	Ferritic/pearlitic		180	15	
		Pearlitic/martensitic		260	16	
	Nodular cast iron (GGG)	Ferritic		160	17	
		Pearlitic		250	18	
	Malleable cast iron	Ferritic		130	19	
		Pearlitic		230	20	
N	Aluminum-wrought alloys	Not hardenable		60	21	
		Hardenable		100	22	
	Aluminum-cast alloys	≤12% Si	Not hardenable		75	23
			Hardenable		90	24
		>12% Si	High temperature		130	25
	Copper alloys	>1% Pb	Free cutting		110	26
			Brass		90	27
			Electrolytic copper		100	28
Non metallic		Duroplastics, fiber plastics			29	
		Hard rubber			30	
S	High temperature alloys	Fe based	Annealed		200	31
			Hardened		280	32
		Ni or Co based	Annealed		250	33
			Hardened		350	34
	Titanium alloys		Cast		320	35
			Pure	58		36
		Alpha+Beta alloys, hardened	152		37	
H	Hardened steel		Hardened		55 HRC	38
			Hardened		60 HRC	39
	Chilled cast iron		Cast		400	40
	Cast iron		Hardened		55 HRC	41

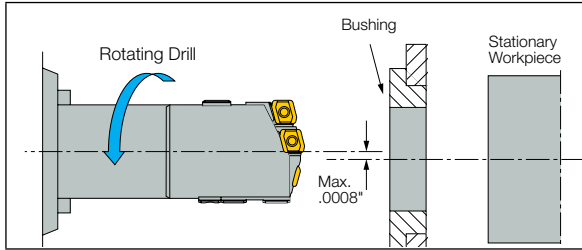
⁽¹⁾ Based on ISO 513 and VDI 3323 standards

Indexable Counterboring Heads ISC-EA, ISC-EC, ISC-IA, ISC-IC, IDC-EA				Trepanning Heads	
Width Of Cut (inch)	.039-.118	.118-.315	.315-.906	Dia. Range (inch)	4.724-15.748
V _c (SFM)	Feed Rate f (IPR)			V _c (SFM)	Feed Rate f (IPR)
195 - 460	.004 - .012	.006 - .012	.004 - .012	260 - 330	.005 - .012
195 - 395	.004 - .012	.006 - .012	.004 - .012	260 - 330	.005 - .012
195 - 395	.004 - .012	.006 - .012	.004 - .012	260 - 330	.005 - .012
165 - 330	.004 - .012	.006 - .012	.004 - .012	260 - 330	.005 - .012
165 - 330	.004 - .012	.006 - .012	.004 - .012	260 - 330	.005 - .012
195 - 425	.004 - .012	.006 - .012	.004 - .012	230 - 330	.005 - .012
195 - 395	.004 - .012	.006 - .012	.004 - .012	230 - 330	.005 - .012
195 - 330	.004 - .012	.006 - .012	.004 - .012	195 - 330	.005 - .012
195 - 330	.004 - .012	.006 - .012	.004 - .012	195 - 330	.005 - .012
165 - 330	.004 - .012	.006 - .012	.004 - .012	230 - 330	.005 - .012
195 - 330	.004 - .012	.006 - .012	.004 - .012	195 - 330	.005 - .012
195 - 330	.004 - .012	.006 - .012	.004 - .012	165 - 295	.005 - .012
195 - 330	.004 - .012	.006 - .012	.004 - .012	165 - 295	.005 - .012
195 - 330	.004 - .012	.006 - .012	.004 - .012	165 - 295	.005 - .012
195 - 395	.004 - .012	.006 - .012	.004 - .012	260 - 330	.005 - .012
165 - 395	.004 - .012	.006 - .012	.004 - .012	195 - 330	.005 - .012
195 - 395	.004 - .012	.006 - .012	.004 - .012	165 - 330	.005 - .012
195 - 395	.004 - .012	.006 - .012	.004 - .012	165 - 330	.005 - .012
195 - 395	.004 - .012	.006 - .012	.004 - .012	260 - 330	.005 - .012
195 - 395	.004 - .012	.006 - .012	.004 - .012	260 - 330	.005 - .012
230 - 655	.004 - .016	.006 - .012	.004 - .012	215 - 425	.004 - .012
195 - 655	.004 - .016	.004 - .016	.004 - .016	215 - 425	.004 - .012
195 - 655	.004 - .016	.004 - .016	.004 - .016	215 - 425	.004 - .012
195 - 655	.004 - .016	.004 - .016	.004 - .016	215 - 425	.004 - .012
195 - 655	.004 - .016	.004 - .016	.004 - .016	215 - 425	.004 - .012
195 - 655	.004 - .016	.004 - .016	.004 - .016	215 - 425	.004 - .012
195 - 655	.004 - .016	.004 - .016	.004 - .016	215 - 425	.004 - .012
195 - 655	.004 - .016	.004 - .016	.004 - .016	215 - 425	.004 - .012
195 - 655	.004 - .016	.004 - .016	.004 - .016	215 - 425	.004 - .012
130 - 260	.004 - .012	.006 - .012	.004 - .012	65 - 215	.004 - .008
130 - 260	.004 - .012	.006 - .012	.004 - .012	65 - 215	.004 - .008
130 - 260	.004 - .012	.006 - .012	.004 - .012	65 - 215	.004 - .008
130 - 260	.004 - .012	.006 - .012	.004 - .012	65 - 215	.004 - .008
130 - 260	.004 - .012	.006 - .012	.004 - .012	65 - 215	.004 - .008
195 - 330	.004 - .012	.006 - .012	.004 - .012	100 - 330	.004 - .008
195 - 330	.004 - .012	.006 - .012	.004 - .012	100 - 330	.004 - .008

Technical Information - Drill Setup

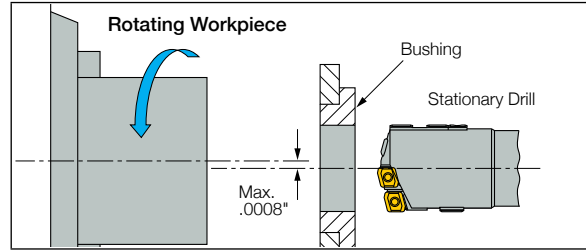
Rotating Drill

- Can be applied on symmetrical and non-symmetrical workpieces
- Drill to bushing center misalignment should not exceed .0008"



Stationary Drill

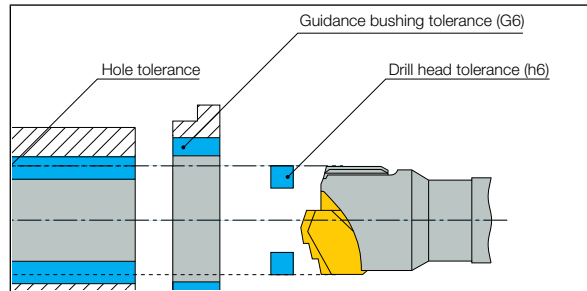
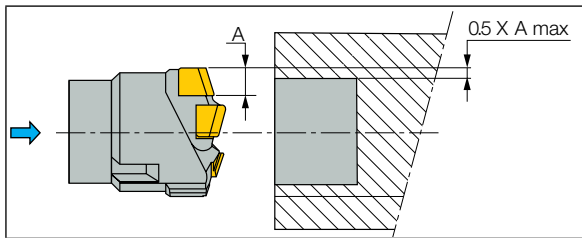
- Applied on symmetrical workpieces
- Improved hole straightness and bushing wear
- Drill to bushing center misalignment should not exceed .0008"



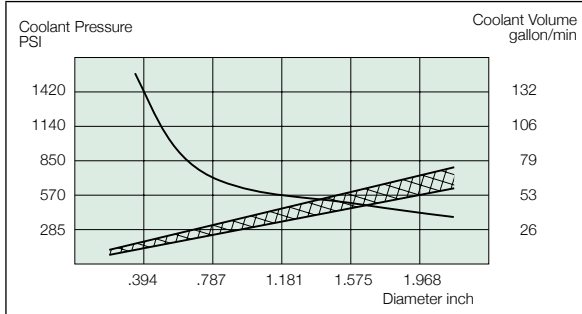
Drill Bushing and Workpiece Tolerance Relative Positioning

Pre-Drilled Hole

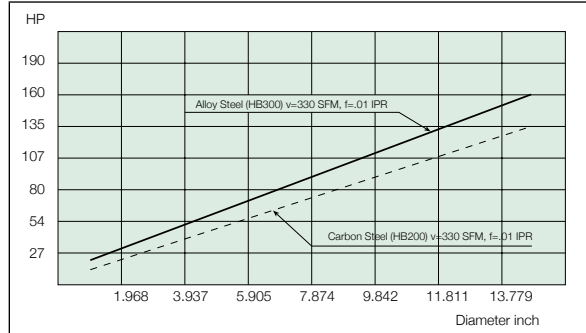
A large pre-drilled hole (larger than D-a) ensures precise hole size and center location.



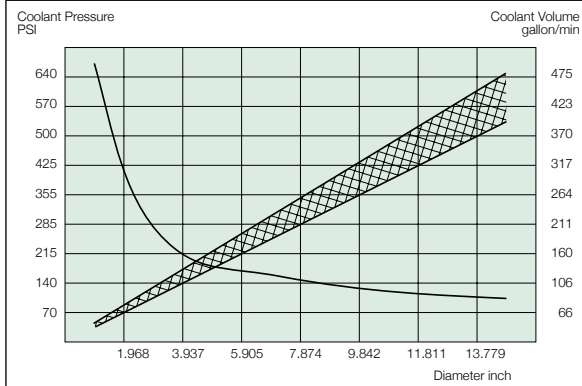
Recommended Coolant Pressure and Volume ≤2.0 inch



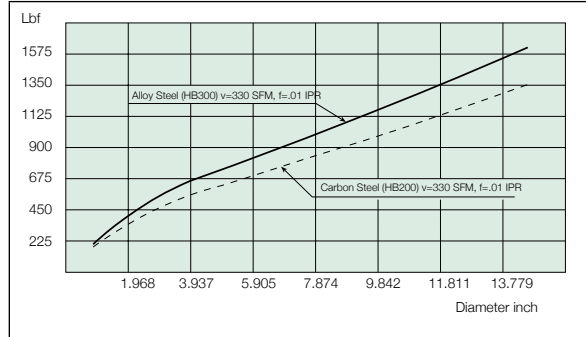
Machine Power



Recommended Coolant Pressure and Volume >2.0 inch



Machine Thrust Force



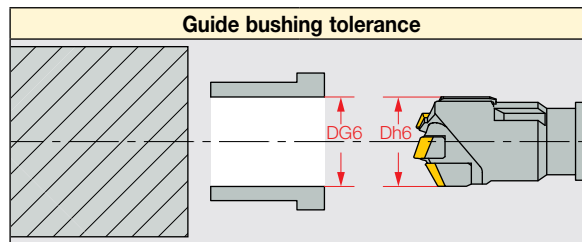
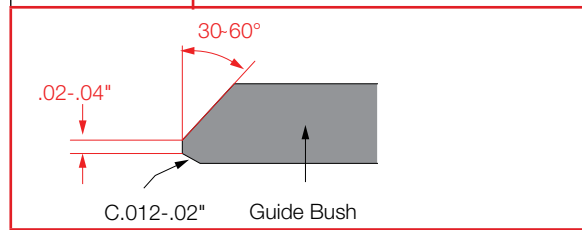
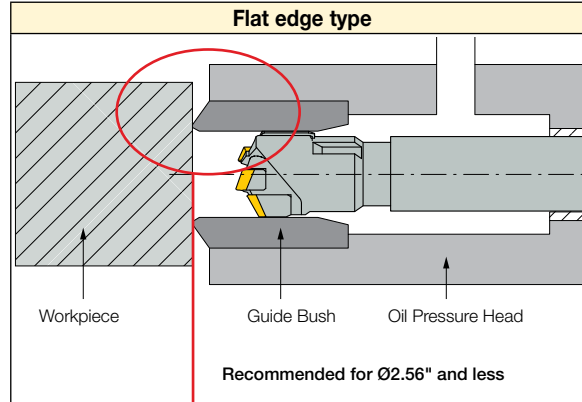
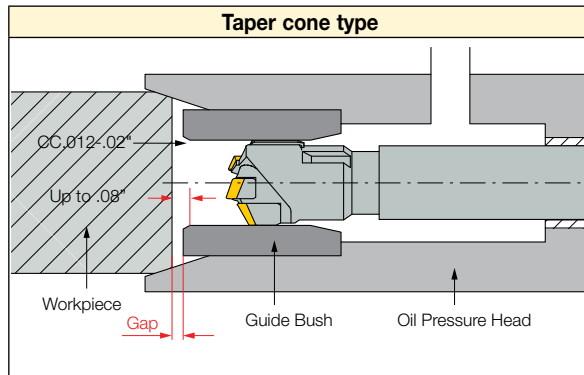
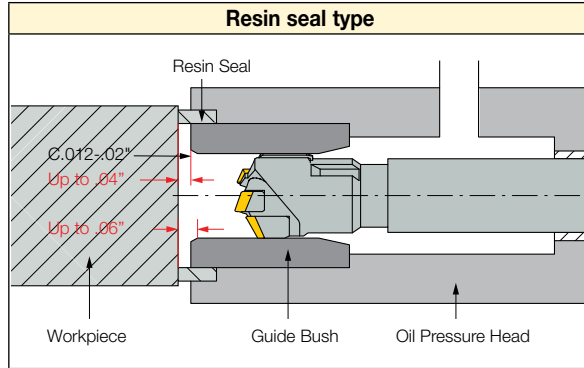
Technical Information - NC Cycle

Use the NC cycle as instructed below to optimize tool performance more safely.

	<p>1. Start NC operation cycle</p>
	<p>2. Oil pressure head moves until it touches the workpiece</p> <p>① Set the starting point of the main axis of the tool so that the guide pad remains inside the guide bush when the oil pressure head moves forward.</p>
	<p>3. Move tool workpiece</p> <p>② Move the tool .118 to .197" from the edge of the workpiece. If the available NC machine can support this approach, the operation process may start from this point</p>
	<p>4. Start cutting</p> <ul style="list-style-type: none"> • Start coolant supply • Start rotating (tool / workpiece / tool & workpiece) • Start feeding
	<p>5. Stop cutting</p> <ul style="list-style-type: none"> • Stop feeding • Stop rotating (tool / workpiece tool & workpiece) • Stop coolant supply <p>③ Stop rotation when the outer tip is at the edge of the workpiece.</p>
	<p>6. Tool main axis back to starting point</p>
	<p>7. Oil pressure head back to starting point</p>

Technical Information - Notes for Guide Bushing Installation

Many of the problems in **BTA** drilling are caused by incorrect use of the guide bushing. The shape, type and tolerance greatly affect cutting accuracy and tool life. Please note the following when using one in your application.



Tool diameter D (inch)	G6 tolerance (µinch)
.315-.394	+200~ +560
.394-.708	+240~ +680
.709-1.180	+280~ +800
1.181-1.968	+360~ +1000
1.969-3.149	+400~ +1160
3.150-4.724	+480~ +1360
4.725-7.086	+560~ +1560
7.087-9.685	+600~ +1760

Deep Hole Drilling Systems

Problem	Possible cause	Solution
The drill breaks or insert chips	• Chip evacuation problems	• Check that the coolant passages are clear and that the Venturi slots are not damaged
	• Center misalignment of drill to workpiece	• Check center alignment of drill to workpiece • Check workpiece and drill clamping rigidity
Poor surface finish	• Workpiece or drill clamping rigidity problem • Inadequate coolant oil • Cutting speed too low	• Improve workpiece or drill clamping • Check the coolant oil and replace if necessary • Increase the cutting speed
Excessive leakage of the coolant	• Chips block the fluid passages • The drill was incorrectly assembled, or the Venturi slots of the internal tube are located in the wrong direction	• Clear the chips • Check all connections and the direction of the internal tube
Insufficient coolant flow at the cutting zone, despite correct fluid supply	• Chips block the fluid passages • Worn bushing or sealing device	• Clear the chips • Check the bushing and seal and replace if necessary
	• Venturi slots are too wide (worn) • Internal tube shorter than the external tube	• Replace the internal tube • Replace the internal tube to one with a correct length
Chips jam in the front end of the drill	• Insufficient coolant flow	• Adjust the fluid flow by raising the pressure; check the filter and fluid quality

Connection Adapters

Various kinds of rotating and non-rotating drill connectors are available upon request.



Oil Pressure Heads

Oil pressure heads are available on request.



Special Heads

Special form heads for trepanning or any other special contours can be produced on request.



Coolant

Successful deep hole drilling is achieved by an optimal combination of the tool, the machine and the coolant. Coolant plays an essential role in achieving secure and cost-efficient deep hole drilling operations. Therefore, it is very important to choose the correct type of coolant and use it appropriately.

Coolant

Coolant plays an essential role in lubricating tools, cooling cutting edges, chips and guide pads, as well as evacuating chips when drilling. It also improves tool life, surface finish and cutting accuracy when continuously supplied during the machining process.

1 Lubrication

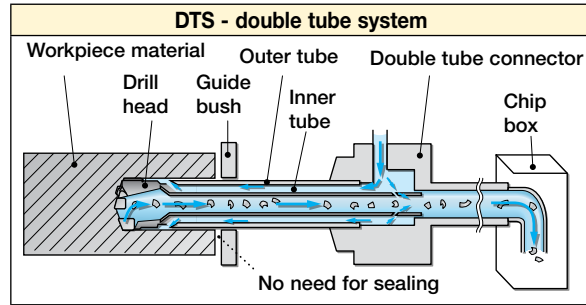
Lubrication of cutting edges and guide pads is necessary in deep hole drilling. For efficient lubrication, it is recommended to use EP (Extreme Pressure) additives which contain sulfur or chlorine.

2 Temperature reduction

The ability to cool down the cutting edge and chips depends on such characteristics as thermal conductivity and relative heat. Coolant with good cooling ability increases tool life, but water-soluble coolant is not preferred in deep hole drilling because it reduces effectiveness. If water-soluble coolant is used, the recommended concentration is 10% (dilution rate 1/10) or more.

3 Chip evacuation

Coolant helps push chips through the back end of the boring bar (for STS) or inner tube (for DTS) until the chips are separated from the workpiece under general cutting conditions. The flow and the pressure of coolant are also important in order to control chip evacuation.



Coolant Unit

A coolant unit is also important to obtain the best effect from the coolant.

1 Coolant pressure and volume should be fixed and continuous.

An ideal coolant unit sets the coolant pressure valves and volume while monitoring the condition with gauges. A system that can detect trapped chips by a pressure gauge and the screw pumps with an inverter controller are both recommended.

2 Coolant temperature should be maintained.

Coolant is heated by factors, such as:

- Cutting edge
- Friction on guide pad
- Contact time of heated chips and coolant
- Pump

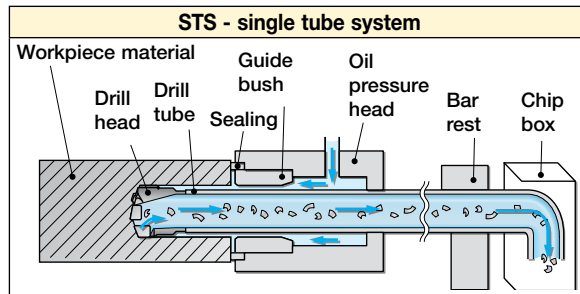
Maintaining coolant temperature is important to maintain stable cutting conditions, chip formation and cutting accuracy. The temperature should be lower than 40°C (100°F) for EP additives to provide sufficient lubrication. Therefore, the coolant temperature should be kept between 30 - 40°C (90 - 100°F) throughout the cutting operation.

3 Filtering

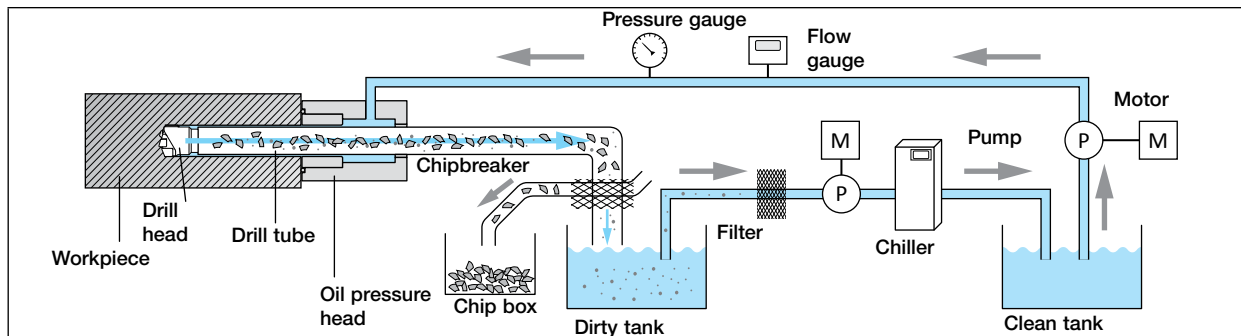
Unwanted particles are contained in coolant after the cutting operations, thus filtration is necessary to remove them. The filter size should be selected carefully to catch particles but not EP additives.

Filter size depends on the coolant, but around 400 - 800 μinch is generally suggested.

For iron-based workpieces, a magnetic separator is helpful as it decreases the frequency of filter maintenance.



Flow Chart of Coolant in Deep Hole Drilling



Requested Information Form for Deep Hole Drill Design

Company name _____ Telephone no. _____

Address _____ Date _____

Contact person _____ Customer no. _____

Workpiece

Product name: _____ Hole diameter: _____

Hole depth: _____ No. of holes: _____ Tolerance (of hole): _____

Surface finish (Rz, Ra...): _____ Deviation (inch/100): _____ Straightness (inch/100): _____

Material

Material (DIN, AISI, JIS...): _____

Hardness (HB, HS, HRC...): _____

Condition: Quenched Tempered Cast Annealed

Other _____

Machine

Machine supplier name: _____

Machine type/model: NC lathe Machining center Other _____

Rigidity: Good Normal Poor

Spindle power (kW): _____

Tool and/or workpiece rotation (TR/WR):

Tool and workpiece Rotating workpiece (WR) Rotating tool (TR)

Type of Coolant

Water based: Soluble Emulsion _____%

Oil based: Coolant Pressure (PSI): _____ Coolant Volume (gal/min): _____

Tool Drill Head

Drill diameter: _____ (mm/inch)

Thread: Inner Outer Brazed

Indexable: Adjustable Direct mount Coating: Coated Uncoated

Solid drilling Counterboring

Pre-drilled hole size: _____ (mm/inch)

Bottom finishing: Full ball R Flat bottom R Corner R Other _____

Trepanning: Y N

Tube outer diameter: _____ (mm/inch) Core size diameter: _____ (mm/inch)

Please fill in and return to your **ISCAR** representative.

Requested Information Form for Deep Hole Drill Design

Tube

Outside diameter: _____ (mm/inch) Total Length: _____ (mm/inch)

Internal Thread: _____

External Thread: 4 Starts 2 Starts 1 Starts

Tube Thread: 1 End Both ends

Inner Tube Length: _____ (mm/inch)

Inner Tube Slit: 1 End Both ends

Drilling System & Boring Conditions

- Single Tube System: Blind Hole Drilling Double Tube System
- Cross Hole Drilling: Through Hole Drilling

Please Sketch Your Drilling Application

General Production Information

Quantity of parts per year: _____

Grade, tool life, etc.: _____

Performance expectation: $V_c =$ _____ SFM $N =$ _____ RPM $F =$ _____ inch/min $f =$ _____ IPR

Cutting data: _____

Description of Present System in Use: _____

Please fill in and return to your **ISCAR** representative.

GUNDRILLS



CONTENTS

TRI-DEEP 341

GD-DH, GD-DHL, GDH-MKT

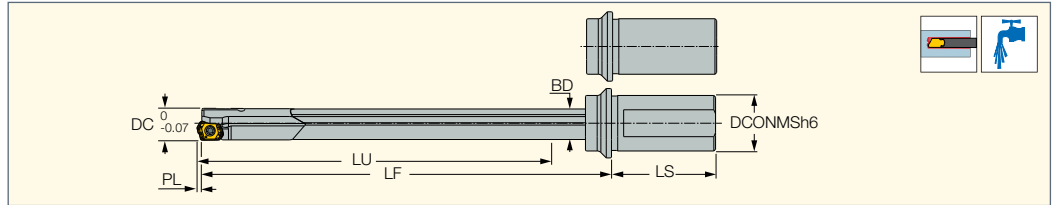
SUMOGUN 354

MNSNT

Solid Carbide Gundrills 359

GD-DH (.500)

Gundrills Carrying Indexable Inserts with 2 Chip Splitting Cutting Edges and a Wiper for High Hole Surface Quality



Designation	DC	LU	LF	PL	DCONMS	BD	LS	Shank	MIID ⁽¹⁾
GD-DH 12.70-95-15D-06	.500	7.7500	8.898	.07100	.750	.472	2.03	C	LOGT 06
GD-DH 12.70-95-20D-06	.500	10.3100	11.457	.07100	.750	.472	2.03	C	LOGT 06
GD-DH 12.70-95-25D-06	.500	12.8700	14.016	.07100	.750	.472	2.03	C	LOGT 06
GD-DH 12.70-99-15D-06	.500	7.7500	8.898	.07100	.750	.472	2.03	W	LOGT 06
GD-DH 12.70-99-20D-06	.500	10.3100	11.457	.07100	.750	.472	2.03	W	LOGT 06
GD-DH 12.70-99-25D-06	.500	12.8700	14.016	.07100	.750	.472	2.03	W	LOGT 06

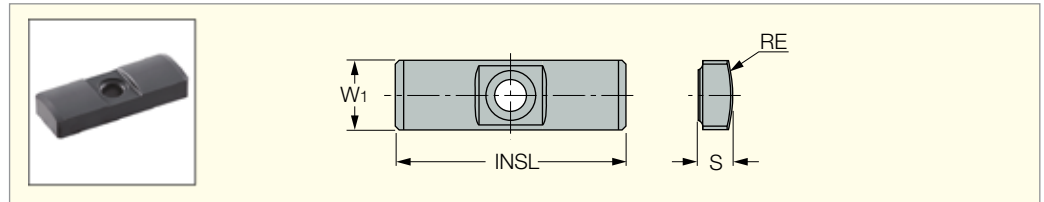
- Note: Gundrills can be supplied with up to 95" length on request.
- Inserts and guide pads to be ordered separately (not included with the tools).
- For user guide and cutting conditions, see pages 350-353
- Preventative measures: Do NOT operate the deep hole drill at full speed before engaging the guide hole.
- Enter the guide hole slowly at a speed of 50 - 100 rpm.

⁽¹⁾ Master insert identification

For inserts, see pages: LOGT (349)

GPS

Deep Drilling Solid Carbide Guide Pads



Designation	Dimensions				Tough	Hard
	W1	RE	INSL	S	IC928	IC908
GPS-04-16-055-DC	.157	.2165	.630	.079	•	•

Spare Parts

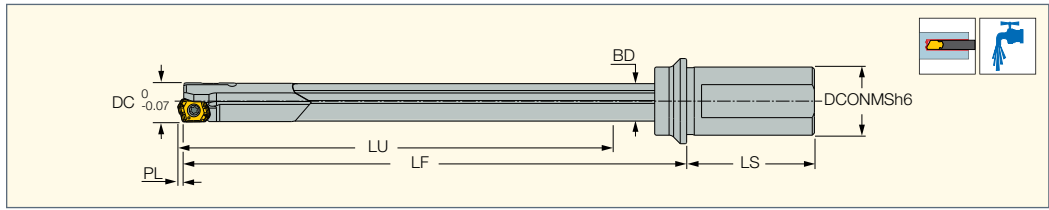
Diameter	Insert	Insert Clamping Screw	Key	lbf-in	Solid Carbide Guide Pad	Guide Pad Clamping Screw	Key	lbf-in
.500	LOGT 060204R-DT	SR 10503833L040	T-7F	8.0	GPS-04-16-055-DC	TS 20043I/HG-P M2X0.4	Wrench IP-6/5	5.8





GD-DH (12-13.5)

Gundrills Carrying Indexable Inserts with 2 Chip Splitting Cutting Edges and a Wiper for High Hole Surface Quality



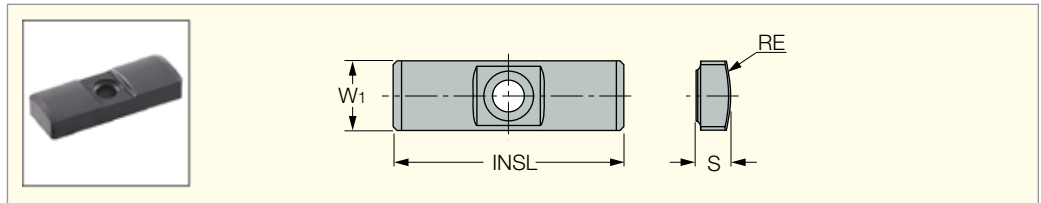
M E T R I C								
Designation	DC	LF	PL	LU	DCONMS	BD	LS	Insert
GD-DH 12.00-M20-15D-06	12.00	225.00	1.800	196.80	20.00	11.50	50.0	LOGT 06..
GD-DH 12.00-M20-20D-06	12.00	280.00	1.800	251.80	20.00	11.50	50.0	LOGT 06..
GD-DH 12.00-M20-25D-06	12.00	343.00	1.800	314.80	20.00	11.50	50.0	LOGT 06..
GD-DH 12.50-M20-15D-06	12.50	226.00	1.800	196.80	20.00	12.00	50.0	LOGT 06..
GD-DH 12.50-M20-20D-06	12.50	291.00	1.800	261.80	20.00	12.00	50.0	LOGT 06..
GD-DH 12.50-M20-25D-06	12.50	356.00	1.800	326.80	20.00	12.00	50.0	LOGT 06..
GD-DH 13.00-M25-15D-06	13.00	238.00	1.800	204.80	25.00	12.50	56.0	LOGT 06..
GD-DH 13.00-M25-20D-06	13.00	305.00	1.800	271.80	25.00	12.50	56.0	LOGT 06..
GD-DH 13.00-M25-25D-06	13.00	373.00	1.800	339.80	25.00	12.50	56.0	LOGT 06..
GD-DH 13.50-M25-15D-06	13.50	245.00	1.800	211.80	25.00	13.00	56.0	LOGT 06..
GD-DH 13.50-M25-20D-06	13.50	315.00	1.800	281.80	25.00	13.00	56.0	LOGT 06..

- Note: Gundrills can be supplied with up to 2400 mm length on request. • Inserts and guide pads to be ordered separately (not included with the tools).
- For user guide and cutting conditions, see pages 350-353
- Preventative measures: Do NOT operate the deep hole drill at full speed before engaging the guide hole. Enter the guide hole slowly at a speed of 50 - 100 rpm.

For inserts, see pages: LOGT (349)

GPS

Deep Drilling Solid Carbide Guide Pads

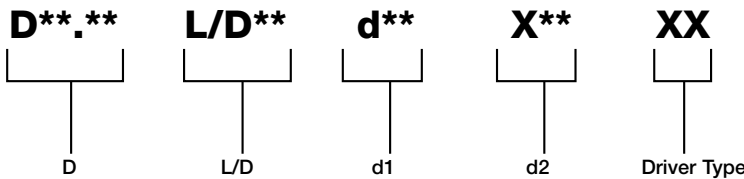
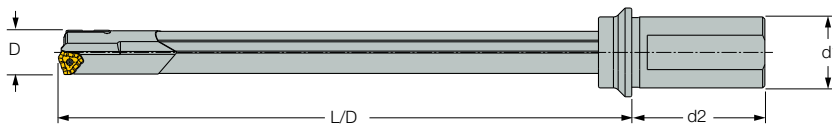


Designation	Dimensions				Tough ↔ Hard	
	W1	RE	INSL	S	IC928	IC908
GPS-04-16-055-DC	4.0	5.50	16.00	2.0	•	•

Spare Parts

Diameter Range	Insert	Insert Clamping Screw	Key	N-m	Solid Carbide Guide Pad	Guide Pad Clamping Screw	Key	N-m
12.00-13.99	LOGT 060204R-DT	SR 10503833L040	T-7F	0.9	GPS-04-16-055-DC	TS 20043I/HG-P M2X0.4	Wrench IP-6/5	0.65

Universal Marking for Deep Drilling Tools



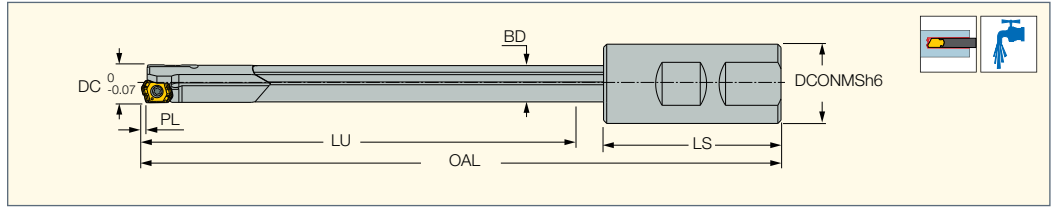
***** [Lot no.]

Example:

Metric: D14.00 L/D15 d25X56M
 Inch: D0.551 L/D15 d0.984X2.205M

GD-DHL

Gundrills Carrying Indexable Inserts with 2 Chip Splitting Cutting Edges and a Wiper for High Hole Surface Quality

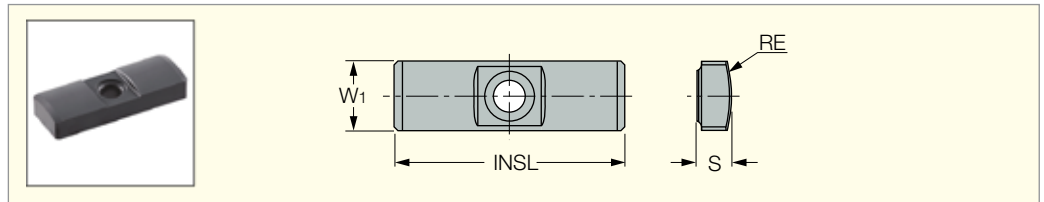


M E T R I C								
Designation	DC	LU	OAL	DCONMS	BD	PL	LS	Insert
GD-DHL 12.00X800-U03	12.00	713.80	801.80	19.05	11.50	1.80	70.0	LOGT 06..
GD-DHL 12.00X800-22	12.00	733.80	801.80	20.00	11.50	1.80	50.0	LOGT 06..
GD-DHL 12.00X800-34	12.00	733.80	801.80	20.00	11.50	1.80	50.0	LOGT 06..
GD-DHL 12.00X1000-U03	12.00	913.80	1001.80	19.05	11.50	1.80	70.0	LOGT 06..
GD-DHL 12.00X1000-22	12.00	933.80	1001.80	20.00	11.50	1.80	50.0	LOGT 06..
GD-DHL 12.00X1000-34	12.00	933.80	1001.80	20.00	11.50	1.80	50.0	LOGT 06..
GD-DHL 12.00X1650-U03	12.00	1563.80	1651.80	19.05	11.50	1.80	70.0	LOGT 06..
GD-DHL 12.00X1650-22	12.00	1583.80	1651.80	20.00	11.50	1.80	50.0	LOGT 06..
GD-DHL 12.00X1650-34	12.00	1583.80	1651.80	20.00	11.50	1.80	50.0	LOGT 06..
GD-DHL 13.00X800-U04	13.00	711.80	801.80	25.40	12.50	1.80	70.0	LOGT 06..
GD-DHL 13.00X800-23	13.00	725.80	801.80	25.00	12.50	1.80	56.0	LOGT 06..
GD-DHL 13.00X800-35	13.00	725.80	801.80	25.00	12.50	1.80	56.0	LOGT 06..
GD-DHL 13.00X1000-U04	13.00	911.80	1001.80	25.40	12.50	1.80	70.0	LOGT 06..
GD-DHL 13.00X1000-23	13.00	925.80	1001.80	25.00	12.50	1.80	56.0	LOGT 06..
GD-DHL 13.00X1000-35	13.00	925.80	1001.80	25.00	12.50	1.80	56.0	LOGT 06..
GD-DHL 13.00X1650-U04	13.00	1561.80	1651.80	25.40	12.50	1.80	70.0	LOGT 06..
GD-DHL 13.00X1650-23	13.00	1575.80	1651.80	25.00	12.50	1.80	56.0	LOGT 06..
GD-DHL 13.00X1650-35	13.00	1575.80	1651.80	25.00	12.50	1.80	56.0	LOGT 06..

- Note: Gundrills can be supplied with up to 2400 mm length on request. • Inserts and guide pads to be ordered separately (not included with the tools).
 - For user guide and cutting conditions, see pages 350-353
 - Preventative measures: Do NOT operate the deep hole drill at full speed before engaging the guide hole. Enter the guide hole slowly at a speed of 50 - 100 rpm.
- For inserts, see pages: LOGT (349)

GPS

Deep Drilling Solid Carbide Guide Pads

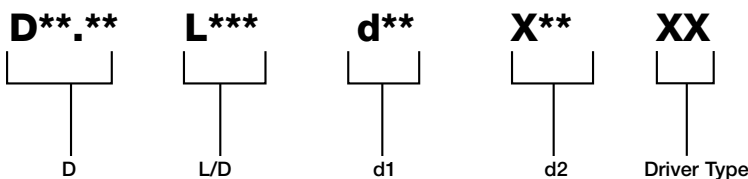
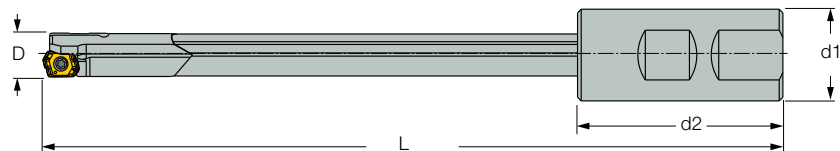


Designation	Dimensions				Tough ↔ Hard	
	W1	RE	INSL	S	IC928	IC908
GPS-04-16-055-DC	4.0	5.50	16.00	2.0	•	•

Spare Parts

Diameter Range	Insert	Insert Clamping Screw	Key	N-m	Solid Carbide Guide Pad	Guide Pad Clamping Screw	Key	N-m
12.00-13.99	LOGT 060204R-DT	SR 10503833L040	T-7F	0.9	GPS-04-16-055-DC	TS 20043I/HG-P M2X0.4	Wrench IP-6/5	0.65

Universal Marking for Deep Drilling Tools



Example:

Metric: D14.00 L1000 d25X56WD

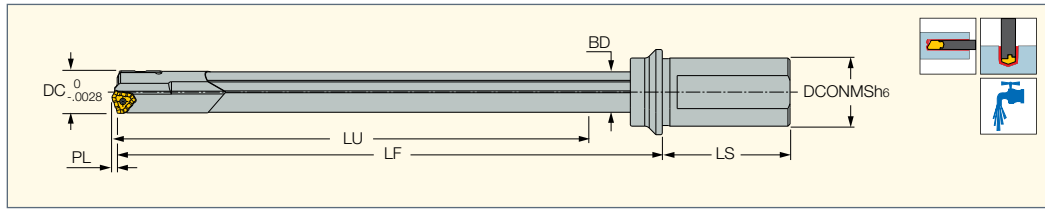
Inch: D0.551 L39.37 d0.984X2.205WD

***** [Lot no.]



GD-DH

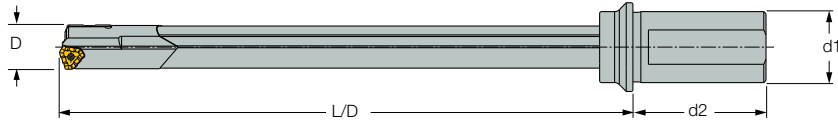
Gundrills Carrying Triangular Inserts Featuring 3 Chip Splitting Cutting Edges and a Wiper for High Hole Surface Quality



Designation	DC	LU	DCONMS	BD	LF	PL	LS	MIID ⁽¹⁾
GD-DH 0.562-10D-I1-07	.562	5.9840	1.000	.531	7.320	.079	2.21	TOGT 07..
GD-DH 0.562-15D-I1-07	.562	8.9370	1.000	.531	10.280	.079	2.21	TOGT 07..
GD-DH 0.562-25D-I1-07	.562	14.8430	1.000	.531	16.180	.079	2.21	TOGT 07..
GD-DH 0.625-10D-I1-07	.625	6.3780	1.000	.571	7.800	.079	2.21	TOGT 07..
GD-DH 0.625-15D-I1-07	.625	9.5280	1.000	.571	10.950	.079	2.21	TOGT 07..
GD-DH 0.625-25D-I1-07	.625	15.8270	1.000	.571	17.240	.079	2.21	TOGT 07..
GD-DH 0.687-10D-I1-08-N	.687	7.1800	1.000	.638	8.660	.086	2.21	TOGT 08..
GD-DH 0.687-15D-I1-08-N	.687	10.7200	1.000	.638	12.210	.086	2.21	TOGT 08..
GD-DH 0.687-25D-I1-08-N	.687	17.8100	1.000	.638	19.290	.086	2.21	TOGT 08..
GD-DH 0.718-10D-I1-09	.718	7.6000	1.000	.677	9.130	.118	2.21	TOGT 09..
GD-DH 0.718-15D-I1-09	.718	11.3400	1.000	.677	12.870	.118	2.21	TOGT 09..
GD-DH 0.718-25D-I1-09	.718	18.8200	1.000	.677	20.350	.118	2.21	TOGT 09..
GD-DH 0.734-10D-I1-09	.734	7.6000	1.000	.677	9.130	.118	2.21	TOGT 09..
GD-DH 0.734-15D-I1-09	.734	11.3400	1.000	.677	12.870	.118	2.21	TOGT 09..
GD-DH 0.734-25D-I1-09	.734	18.8200	1.000	.677	20.350	.118	2.21	TOGT 09..
GD-DH 0.750-10D-I1-09	.750	7.9900	1.000	.717	9.570	.118	2.21	TOGT 09..
GD-DH 0.750-15D-I1-09	.750	11.9300	1.000	.717	13.500	.118	2.21	TOGT 09..
GD-DH 0.750-25D-I1-09	.750	19.8100	1.000	.717	21.380	.118	2.21	TOGT 09..
GD-DH 0.785-10D-I1.25-09	.785	8.3900	1.250	.748	10.040	.118	2.36	TOGT 09..
GD-DH 0.785-15D-I1.25-09	.785	12.5200	1.250	.748	14.170	.118	2.36	TOGT 09..
GD-DH 0.785-25D-I1.25-09	.785	20.7900	1.250	.748	22.440	.118	2.36	TOGT 09..
GD-DH 0.810-10D-I1.25-10	.810	8.4000	1.250	.748	10.040	.126	2.36	TOGT 10..
GD-DH 0.810-15D-I1.25-10	.810	12.5300	1.250	.748	14.170	.126	2.36	TOGT 10..
GD-DH 0.810-25D-I1.25-10	.810	20.8000	1.250	.748	22.440	.126	2.36	TOGT 10..
GD-DH 0.812-10D-I1.25-10	.812	8.4000	1.250	.748	10.040	.126	2.36	TOGT 10..
GD-DH 0.812-15D-I1.25-10	.812	12.5300	1.250	.748	14.170	.126	2.36	TOGT 10..
GD-DH 0.812-25D-I1.25-10	.812	20.8000	1.250	.748	22.440	.126	2.36	TOGT 10..
GD-DH 0.844-10D-I1.25-10	.844	8.6600	1.250	.787	10.470	.126	2.36	TOGT 10..
GD-DH 0.844-15D-I1.25-10	.844	12.9900	1.250	.787	14.800	.126	2.36	TOGT 10..
GD-DH 0.844-25D-I1.25-10	.844	21.6500	1.250	.787	23.460	.126	2.36	TOGT 10..
GD-DH 0.845-25D-I1.25-10	.845	21.7800	1.250	.787	23.470	.126	2.36	TOGT 10..
GD-DH 0.875-10D-I1.25-11	.875	9.1890	1.250	.827	10.950	.134	2.36	TOGT 11..
GD-DH 0.875-15D-I1.25-11	.875	13.7100	1.250	.827	15.470	.134	2.36	TOGT 11..
GD-DH 0.875-25D-I1.25-11	.875	22.7700	1.250	.827	24.530	.134	2.36	TOGT 11..
GD-DH 0.937-10D-I1.25-11	.937	9.9700	1.250	.906	11.850	.134	2.36	TOGT 11..
GD-DH 0.937-15D-I1.25-11	.937	14.8900	1.250	.906	16.770	.134	2.36	TOGT 11..
GD-DH 0.937-25D-I1.25-11	.937	24.7400	1.250	.906	26.610	.134	2.36	TOGT 11..
GD-DH 1.000-10D-I1.25-12	1.000	10.6180	1.250	.945	12.280	.142	2.36	TOGT 12..
GD-DH 1.000-15D-I1.25-12	1.000	15.4900	1.250	.945	17.400	.142	2.36	TOGT 12..
GD-DH 1.000-25D-I1.25-12	1.000	25.7300	1.250	.945	27.640	.142	2.36	TOGT 12..
GD-DH 1.062-10D-I1.5-12	1.062	11.0200	1.500	1.024	13.190	.142	2.76	TOGT 12..
GD-DH 1.062-15D-I1.5-12	1.062	16.5400	1.500	1.024	18.700	.142	2.76	TOGT 12..
GD-DH 1.062-25D-I1.5-12	1.062	27.7000	1.500	1.024	29.330	.142	2.76	TOGT 12..
GD-DH 1.125-10D-I1.5-13	1.125	11.5970	1.500	1.063	14.170	.180	2.72	TOGT 13..
GD-DH 1.125-15D-I1.5-13	1.125	17.3060	1.500	1.063	19.880	.180	2.72	TOGT 13..
GD-DH 1.125-20D-I1.5-13	1.125	23.0140	1.500	1.063	25.590	.180	2.72	TOGT 13..
GD-DH 1.25-10D-I1.5-13	1.250	12.7780	1.500	1.181	15.550	.180	2.72	TOGT 13..
GD-DH 1.25-20D-I1.5-13	1.250	25.3760	1.500	1.181	28.150	.180	2.72	TOGT 13..

- Note: Gundrills can be supplied with up to 95" length on request. • Inserts and guide pads to be ordered separately (not included with the tools).
 - For user guide and cutting conditions, see pages 350-353
 - Preventative measures: Do NOT operate the deep hole drill at full speed before engaging the guide hole. Enter the guide hole slowly at a speed of 50 - 100 rpm.
 - (1) Master insert identification
- For inserts, see pages:** TOGT-DT (246) • TOGT-GF (246)

Universal Marking for Deep Drilling Tools



D.****

L/D**

d**

X**

XX

D

L/D

d1

d2

Driver Type

***** [Lot no.]



Driver Type

M	Machining	M20,M25,M32,M40 U19.05,U25.4,U31.75 U38.1,FM32,FM40 FU31.75,FU38.1	
WD	Weldon	22,23,24,25,26,99	
WN	Whistle Notch	U03,U04,U05,U06 34,35,36	
F	Flat	FD50C25, FD37C25 C25	
C	Cylindrical	95	

Example:

Metric: D14.00 L/D15 d25X56M
Inch: D0.551 L/D15 d0.984X2.205M

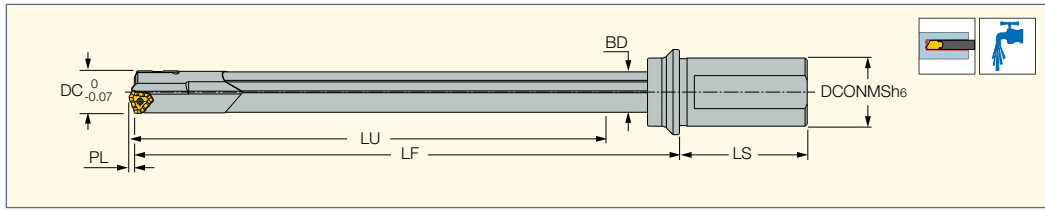
Spare Parts

Diameter Range	Insert	Insert Clamping Screw	Key	lbf*in	Solid Carbide Guide Pad	Guide Pad Clamping Screw	Key
.551-.629	TOGT 070304-DT/GF	SR 14-560/S M2.5X0.45	T-8/5	10.6	GPS-05-18-060-DC	SR 34-508 M2.2X0.45	T-7/5
.630-.709	TOGT 080305-DT/GF		T-8/5	10.6	GPS-05-18-075-DC		
.710-.787	TOGT 090305-DT/GF		T-8/5	10.6	GPS-06-20-085-DC		
.788-.826	TOGT 100305-DT/GF	SR 34-506 M3X0.5	T-9/5	17.7	GPS-06-20-085-DC	SR 34-508 M2.2X0.45	T-7/5
.827-.866	TOGT 100305-DT/GF				GPS-06-20-100-DC		
.867-.984	TOGT 110405-DT/GF	SR 14-571/S M3.5X0.6	T-15/5	42.5	GPS-06-20-100-DC	SR 34-508 M2.2X0.45	T-7/5
.985-1.101	TOGT 120405-DT/GF				GPS-06-20-120-DC		
1.102-1.180	TOGT 130408-DT/GF	SR 16-212/L10 M5X0.8	T20/5	88.5	GPS-06-20-120-DC	SR 34-508 M2.2X0.45	T-7/5
1.181-1.259	TOGT 130408-DT/GF				GPS-07-20-120-DC		
1.260-1.535	TOGT 140510-DT/GF				GPS-07-20-120-DC		
1.536-1.575	TOGT 140510-DT/GF				GPS-08-25-155-DC	CSTB-3L065 M2.2X0.45	T-9/5



GD-DH

Gundrills Carrying Triangular Inserts with 3 Chip Splitting Cutting Edges and a Wiper for High Hole Surface Quality



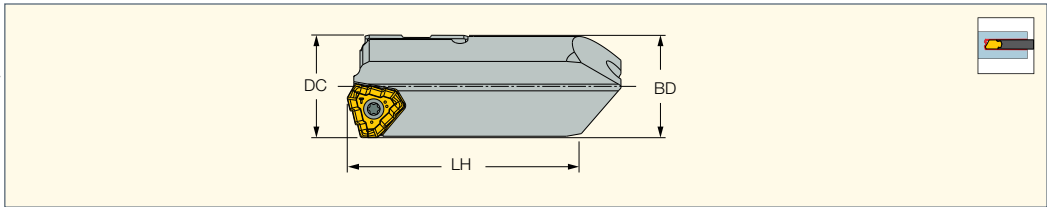
M E T R I C								
Designation	DC	LU	DCONMS	BD	LF	PL	LS	Insert
GD-DH 14.00-15D-M25-07	14.00	227.00	25.00	13.50	261.0	1.95	56.0	TOGT 07..
GD-DH 14.00-20D-M25-07	14.00	302.00	25.00	13.50	336.0	1.95	56.0	TOGT 07..
GD-DH 14.00-25D-M25-07	14.00	377.00	25.00	13.50	411.0	1.95	56.0	TOGT 07..
GD-DH 14.50-15D-M25-07	14.50	227.00	25.00	14.00	262.0	1.95	56.0	TOGT 07..
GD-DH 14.50-20D-M25-07	14.50	302.00	25.00	14.00	337.0	1.95	56.0	TOGT 07..
GD-DH 14.50-25D-M25-07	14.50	377.00	25.00	14.00	412.0	1.95	56.0	TOGT 07..
GD-DH 15.00-15D-M25-07	15.00	242.00	25.00	14.50	278.0	1.95	56.0	TOGT 07..
GD-DH 15.00-20D-M25-07	15.00	322.00	25.00	14.50	358.0	1.95	56.0	TOGT 07..
GD-DH 15.00-25D-M25-07	15.00	402.00	25.00	14.50	438.0	1.95	56.0	TOGT 07..
GD-DH 16.00-10D-M25-08-N	16.00	172.20	25.00	15.50	209.0	2.20	56.0	TOGT 08..
GD-DH 16.00-15D-M25-08-N	16.00	257.20	25.00	15.50	294.0	2.20	56.0	TOGT 08..
GD-DH 16.00-25D-M25-08-N	16.00	427.20	25.00	15.50	464.0	2.20	56.0	TOGT 08..
GD-DH 16.50-10D-M25-08-N	16.50	172.20	25.00	15.50	209.0	2.20	56.0	TOGT 08..
GD-DH 16.50-15D-M25-08-N	16.50	257.20	25.00	15.50	294.0	2.20	56.0	TOGT 08..
GD-DH 16.50-25D-M25-08-N	16.50	427.20	25.00	15.50	464.0	2.20	56.0	TOGT 08..
GD-DH 17.00-10D-M25-08-N	17.00	182.20	25.00	16.20	220.0	2.20	56.0	TOGT 08..
GD-DH 17.00-15D-M25-08-N	17.00	272.20	25.00	16.20	310.0	2.20	56.0	TOGT 08..
GD-DH 17.00-25D-M25-08-N	17.00	452.20	25.00	16.20	490.0	2.20	56.0	TOGT 08..
GD-DH 17.50-15D-M25-08-N	17.50	272.20	25.00	16.20	310.0	2.20	56.0	TOGT 08..
GD-DH 17.50-25D-M25-08-N	17.50	452.20	25.00	16.20	490.0	2.20	56.0	TOGT 08..
GD-DH 18.00-10D-M25-08-N	18.00	193.00	25.00	16.20	232.0	2.20	56.0	TOGT 08..
GD-DH 18.00-15D-M25-08-N	18.00	288.00	25.00	17.20	327.0	2.20	56.0	TOGT 08..
GD-DH 18.00-25D-M25-08-N	18.00	478.00	25.00	17.20	517.0	2.20	56.0	TOGT 08..
GD-DH 18.50-15D-M25-09	18.50	288.00	25.00	17.20	327.0	3.00	56.0	TOGT 09..
GD-DH 18.50-25D-M25-09	18.50	478.00	25.00	17.20	517.0	3.00	56.0	TOGT 09..
GD-DH 19.00-10D-M25-09	19.00	203.00	25.00	18.20	243.0	3.00	56.0	TOGT 09..
GD-DH 19.00-15D-M25-09	19.00	303.00	25.00	18.20	343.0	3.00	56.0	TOGT 09..
GD-DH 19.00-25D-M25-09	19.00	503.00	25.00	18.20	543.0	3.00	56.0	TOGT 09..
GD-DH 19.50-15D-M25-09	19.50	303.00	25.00	18.20	343.0	3.00	56.0	TOGT 09..
GD-DH 19.50-25D-M25-09	19.50	503.00	25.00	18.20	543.0	3.00	56.0	TOGT 09..
GD-DH 20.00-10D-M32-09	20.00	213.20	32.00	19.00	255.0	3.00	60.0	TOGT 09..
GD-DH 20.00-15D-M32-09	20.00	318.20	32.00	19.00	360.0	3.00	60.0	TOGT 09..
GD-DH 20.00-25D-M32-09	20.00	528.20	32.00	19.00	570.0	3.00	60.0	TOGT 09..
GD-DH 21.00-10D-M32-10	21.00	223.20	32.00	20.00	266.0	3.20	60.0	TOGT 10..
GD-DH 21.00-15D-M32-10	21.00	333.20	32.00	20.00	376.0	3.20	60.0	TOGT 10..
GD-DH 21.00-25D-M32-10	21.00	553.20	32.00	20.00	596.0	3.20	60.0	TOGT 10..
GD-DH 22.00-10D-M32-11	22.00	233.40	32.00	21.00	278.0	3.40	60.0	TOGT 11..
GD-DH 22.00-15D-M32-11	22.00	348.40	32.00	21.00	393.0	3.40	60.0	TOGT 11..
GD-DH 22.00-25D-M32-11	22.00	578.40	32.00	21.00	623.0	3.40	60.0	TOGT 11..
GD-DH 23.00-10D-M32-11	23.00	243.40	32.00	22.00	289.0	3.40	60.0	TOGT 11..
GD-DH 23.00-15D-M32-11	23.00	363.40	32.00	22.00	409.0	3.40	60.0	TOGT 11..
GD-DH 23.00-25D-M32-11	23.00	603.40	32.00	22.00	649.0	3.40	60.0	TOGT 11..
GD-DH 24.00-10D-M32-11	24.00	253.40	32.00	23.00	301.0	3.40	60.0	TOGT 11..
GD-DH 24.00-15D-M32-11	24.00	378.40	32.00	23.00	426.0	3.40	60.0	TOGT 11..
GD-DH 24.00-25D-M32-11	24.00	628.40	32.00	23.00	676.0	3.40	60.0	TOGT 11..
GD-DH 25.00-10D-M32-11	25.00	263.60	32.00	24.00	312.0	3.40	60.0	TOGT 11..
GD-DH 25.00-15D-M32-11	25.00	393.60	32.00	24.00	442.0	3.40	60.0	TOGT 11..
GD-DH 25.00-25D-M32-11	25.00	653.60	32.00	24.00	702.0	3.40	60.0	TOGT 11..
GD-DH 26.00-10D-M40-12	26.00	273.60	40.00	25.00	324.0	3.60	70.0	TOGT 12..
GD-DH 26.00-15D-M40-12	26.00	408.60	40.00	25.00	459.0	3.60	70.0	TOGT 12..
GD-DH 26.00-25D-M40-12	26.00	678.60	40.00	25.00	729.0	3.60	70.0	TOGT 12..
GD-DH 27.00-10D-M40-12	27.00	283.60	40.00	26.00	335.0	3.60	70.0	TOGT 12..
GD-DH 27.00-15D-M40-12	27.00	423.60	40.00	26.00	475.0	3.60	70.0	TOGT 12..
GD-DH 27.00-25D-M40-12	27.00	703.60	40.00	26.00	755.0	3.60	70.0	TOGT 12..
GD-DH 28.00-10D-M40-12	28.00	283.60	40.00	27.00	337.0	3.60	70.0	TOGT 12..
GD-DH 28.00-15D-M40-12	28.00	423.60	40.00	27.00	477.0	3.60	70.0	TOGT 12..
GD-DH 28.00-25D-M40-12	28.00	703.60	40.00	27.00	757.0	3.60	70.0	TOGT 12..

- Note: Gundrills can be supplied with up to 2400 mm length on request. • Inserts and guide pads to be ordered separately (not included with the tools).
 - For user guide and cutting conditions, see pages 350-353
 - Preventative measures: Do NOT operate the deep hole drill at full speed before engaging the guide hole. Enter the guide hole slowly at a speed of 50 - 100 rpm.
- For inserts, see pages:** TOGT-DT (246) • TOGT-GF (246)



GDH-MKT

Gundrill Heads Carrying Triangular Inserts with 3 Chip Splitting Cutting Edges and a Wiper for High Hole Surface Quality



Designation	DC	BD	LH
GDH-0.500 MKT	.500	.480	1.724
GDH-0.563 MKT	.563	.539	2.015
GDH-0.626 MKT	.626	.598	2.015
GDH-0.689 MKT	.689	.677	2.019
GDH-0.752 MKT	.752	.724	2.055
GDH-0.811 MKT	.811	.783	2.059
GDH-0.874 MKT	.874	.862	2.059
GDH-0.937 MKT	.937	.921	2.059
GDH-1.000 MKT	1.000	.980	2.059
GDH-1.126 MKT	1.126	1.090	2.078
GDH-1.251 MKT	1.251	1.200	2.078

• Inserts and guide pads to be ordered separately (not included with the tools). • For user guide and cutting conditions, see pages 350-353
 For inserts, see pages: TOGT-DT (246) • TOGT-GF (246)

Spare Parts



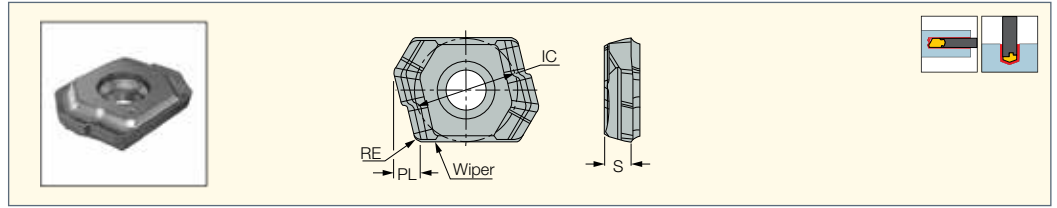
Gundrill Head	Solid carbide Guide pad	Guide pad screw		Guide pad key	Insert screw		Insert Key
Description	Description	Description	Qty.	Description	Description	Qty.	Description
GDH-0.500 MKT	GPS-05-18-060-DC	SR 34-508 M2.2X0.45	2	T-7/5	SR 14-560/S M2.5X0.45	1	T-8/5
GDH-0.563 MKT	GPS-05-18-060-DC	SR 34-508 M2.2X0.45	2	T-7/5	SR 14-560/S M2.5X0.45	1	T-8/5
GDH-0.626 MKT	GPS-05-18-060-DC	SR 34-508 M2.2X0.45	2	T-7/5	SR 14-560/S M2.5X0.45	1	T-8/5
GDH-0.689 MKT	GPS-05-18-075-DC	SR 34-508 M2.2X0.45	2	T-7/5	SR 14-560/S M2.5X0.45	1	T-8/5
GDH-0.752 MKT	GPS-06-20-085-DC	SR 34-508 M2.2X0.45	2	T-7/5	SR 14-560/S M2.5X0.45	1	T-8/5
GDH-0.811 MKT	GPS-06-20-085-DC	SR 34-508 M2.2X0.45	2	T-7/5	SR 34-506 M3X0.5	1	T-9/5
GDH-0.874 MKT	GPS-06-20-100-DC	SR 34-508 M2.2X0.45	2	T-7/5	SR 14-571/S M3.5X0.6	1	T-10/5
GDH-0.937 MKT	GPS-06-20-100-DC	SR 34-508 M2.2X0.45	2	T-7/5	SR 14-571/S M3.5X0.6	1	T-10/5
GDH-1.000 MKT	GPS-06-20-120-DC	SR 34-508 M2.2X0.45	2	T-7/5	SR 14-571/S M3.5X0.6	1	T-15/5
GDH-1.126 MKT	GPS-06-20-120-DC	SR 34-508 M2.2X0.45	2	T-7/5	SR 16-212/L10 M5X0.8	1	T-20/5
GDH-1.252 MKT	GPS-07-20-120-DC	CSTB-3L065 M2.2X0.45	2	T-9/5	SR 16-212/L10 M5X0.8	1	T-20/5





LOGT

Deep Drilling Inserts with 2 Chip Splitting Cutting Edges, Positive Rake Chipbreaker and a Wiper



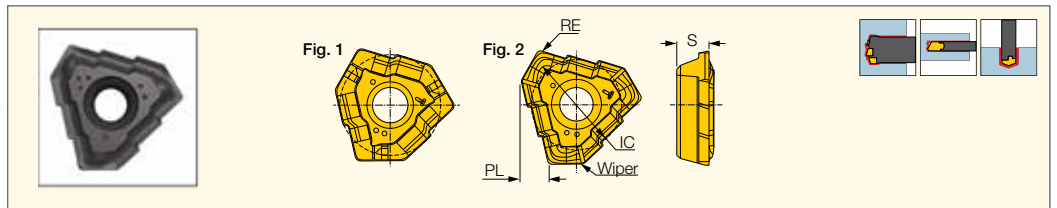
Dimensions						IC908
Designation	IC	RE	PL	S		
LOGT 060204R-DT	.276	.0157	.071	.079		

For tools, see pages: GD-DH (.500) (341) • GD-DH (12-13.5) (342) • GD-DHL (343)



TOGT-DT

Deep Drilling Inserts with 3 Chip Splitting Cutting Edges, a Positive Rake Chipbreaker and a Wiper



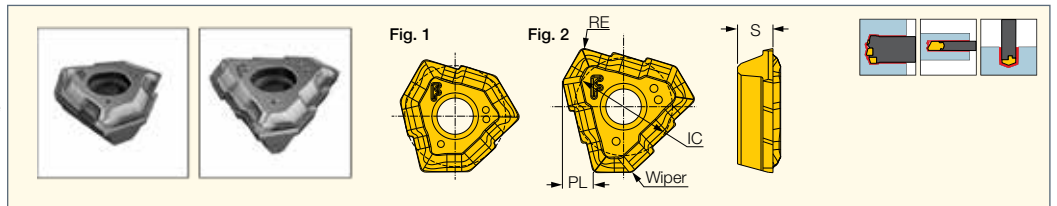
Dimensions							IC908
Designation	IC	RE	PL	S	Fig.		
TOGT 070304-DT	.303	.0157	.077	.091	1	●	
TOGT 080305-DT	.337	.0197	.087	.110	1	●	
TOGT 090305-DT	.328	.0197	.118	.118	2	●	
TOGT 100305-DT	.363	.0197	.126	.130	2	●	
TOGT 110405-DT	.409	.0197	.134	.150	2	●	
TOGT 120405-DT	.456	.0197	.142	.169	2	●	
TOGT 130408-DT	.506	.0315	.180	.187	2	●	
TOGT 140510-DT	.663	.0394	.214	.207	2	●	

For tools, see pages: GD-DH (344) • GDH-MKT (348) • IDD-EF-FT (245) • ISD-EF-FT (244) • ISD-IF-FT (244)



TOGT-GF

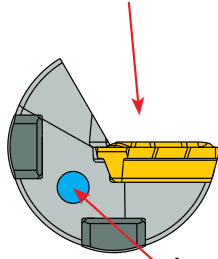
Deep Drilling Inserts with 3 Chip Splitting Cutting Edges, a Positive Rake Chipbreaker and a Wiper



Dimensions							IC908
Designation	IC	RE	PL	S	Fig.		
TOGT 070304-GF	.303	.0157	.077	.091	1	●	
TOGT 080305-GF	.337	.0197	.087	.110	1	●	
TOGT 090305-GF	.328	.0197	.118	.118	2	●	
TOGT 100305-GF	.363	.0197	.126	.130	2	●	
TOGT 110405-GF	.409	.0197	.134	.150	2	●	
TOGT 120405-GF	.456	.0197	.142	.169	2	●	
TOGT 130408-GF	.506	.0315	.180	.187	2	●	

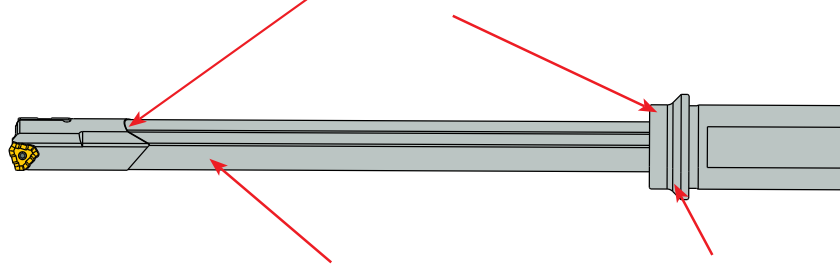
For tools, see pages: GD-DH (344) • GDH-MKT (348) • IDD-EF-FT (245) • ISD-EF-FT (244) • ISD-IF-FT (244)

Wide flute angle
• Smooth chip evacuation



Large oil hole
• Efficient lubrication
• Longer tool life for inserts and guide pads

Brazed body



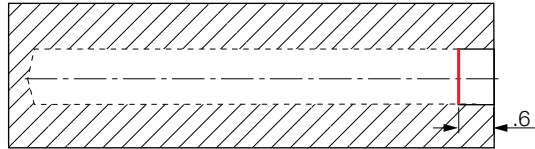
Steel body tool
• Extremely high rigidity
• Simple direct mounting setup

Flange
• Superior rigidity for higher speeds and feeds

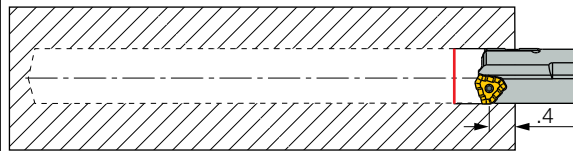
Drilling Process on Machining Centers And Lathe Machines

- 1 Drill a .6" pilot hole $D^{+.0020}_{+.0012}$ flat bottom
- 2 Set the TRIDEEP drill into the pilot hole (.4" depth). $V_c=16-35$ SFM $f=.020-.039$ IPR
- 3 Initial cutting at a 1.0" DOC (80% feed rate), verify activated coolant ($V_c=100\%$).
- 4 In case of through hole, drill the full hole to a depth of +.2"
- 5 Retract with slow rotation (15-35 SFM)

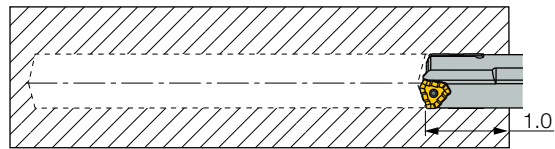
1 Drill a .6" pilot hole flat bottom



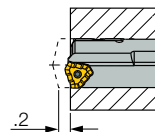
2 Slow rotation and feed while entering the pre-hole



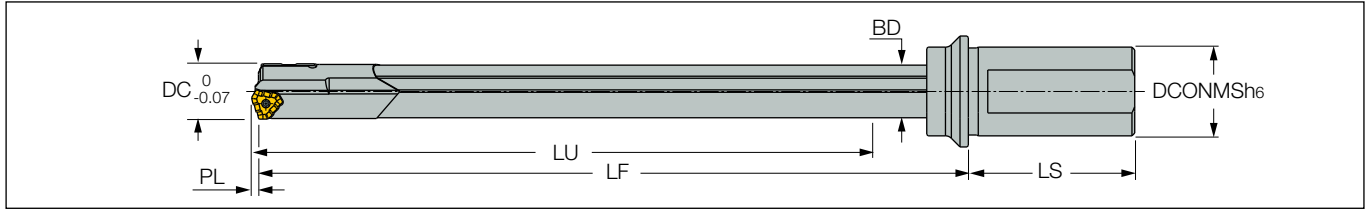
3 Maintain for 2-3 seconds and activate the cooling system



4 Drill +.2" depth through hole



Inquiry Form



1. Tool

Quantity _____

Nominal diameter and tolerance _____

Please fill in dimensions on the sketch.

Driver

For standard drivers please use codes from page 353 _____

- Code No.
- Special, please attach sketch and specifications.

2. Workpiece

(If possible, attach a drawing)

2.1 Material

Material description
(DIN material number or any other standard):

Hardness and Properties:

2.2 Hole Type

- Blind Hole Drilling into Pre-hole
- Angled Entry
- Drilling into Solid Boring Angled Exit

Drilling Depth _____ inch Hole Tolerance _____

2.3 Application:

- Workpiece: Stationary Rotating
- Tool: Stationary Rotating

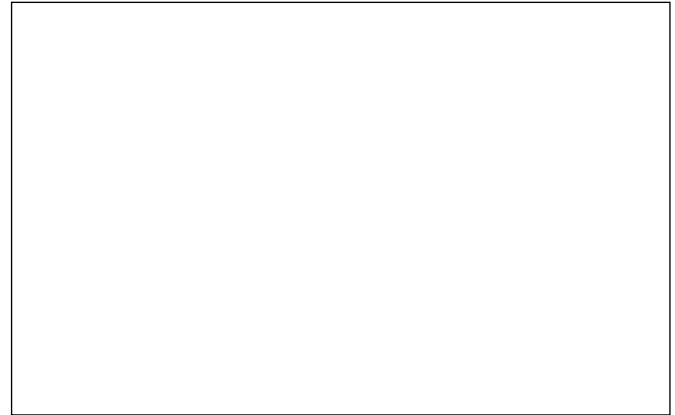
3. Machine

3.1 Technical Data

Machine Type _____

Power _____ kW _____

Sketch of drilling application



Note: It may be necessary to change several of the parameters that you indicated, based on our experience with your application.

3.2 Cutting Data:

Cutting Speed V_c _____ SFM

Revolutions N_{min} _____ RPM, N_{max} _____ RPM

Feed F_{min} _____ IPR,

F_{max} _____ IPR

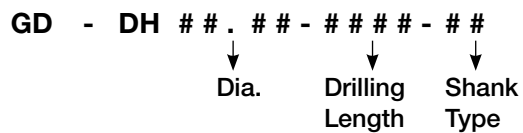
Feed Rate V_F _____ IPM

Coolant:

- Oil Soluble Oil Other

Coolant Pressure: _____ PSI

Specially Tailored TRIDEEP Code Key



Machining Recommendations for TRIDEEP Drills

ISO	Material	Condition	Tensile Strength [ksi]	Hardness HB	Material Group No.	V SFM	LOGT/TOGT						
							Feed Per Insert Size "GF" & "DT"						
							06	07	08	09	10	11	12
P	Non-alloy steel and cast steel, free cutting steel	<0.25% C	Annealed	61	125	1	260-395						
		≥0.25% C	Annealed	94	190	2							
		<0.55% C	Quenched and tempered	123	250	3							
			Annealed	109	220	4							
		≥0.55% C	Quenched and tempered	145	300	5							
	Low alloy and cast steel (less than 5% of alloying elements)	Annealed	87	200	6								
		Quenched and tempered	135	275	7								
			145	300	8								
			174	350	9								
	High alloyed steel, cast steel and tool steel	Annealed	99	200	10								
		Quenched and tempered	160	325	11								
	Stainless steel and cast steel	Ferritic/martensitic	99	200	12								
		Martensitic	119	240	13								
M	Stainless steel and cast steel	Austenitic, duplex	87	180	14	165-330	.001-.002 .002-.005	.001-.002 .002-.005	.001-.002 .002-.005	.001-.002 .002-.005	.001-.002 .002-.005		
K	Gray cast iron (GG)	Ferritic/pearlitic		180	15	165-330 260-395							
		Pearlitic/martensitic		260	16								
	Nodular cast iron (GGG)	Ferritic	160	17									
		Pearlitic	250	18									
	Malleable cast iron	Ferritic	130	19									
Pearlitic		230	20										
N	Aluminum-wrought alloys	Not hardenable		60	21	260-525							
		Hardenable		100	22								
	Aluminum-cast alloys	≤12% Si	Not hardenable		75								23
			Hardenable		90								24
		>12% Si	High temperature		130								25
	Copper alloys	>1% Pb	Free cutting		110								26
			Brass		90								27
			Electrolytic copper		100								28
Non metallic		Duroplastics, fiber plastics			29								
		Hard rubber			30								
S	High temperature alloys	Fe based	Annealed		200	31	65-165						
			Hardened		280	32							
		Ni or Co based	Annealed		250	33							
			Hardened		350	34							
			Cast		320	35							

Standard Gundrill Drivers for Machining Centers, Lathes, Etc.

Drivers

Drivers are available for dedicated and CNC machines, for any specified diameter and length. Below are the driver codes and technical data.

Standard Drivers for Gundrill Machines

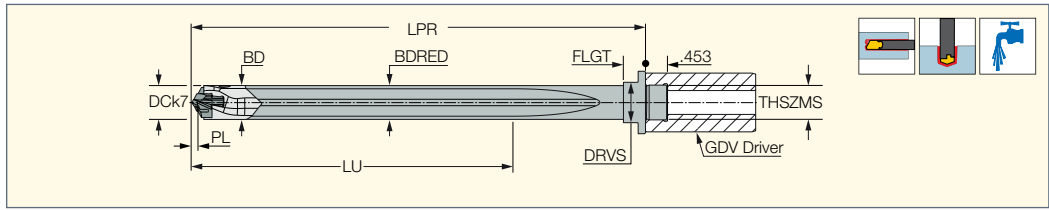
Driver type	Drawing	∅D x L	Driver code
Cylindrical DIN1835A DIN6535HA		.75x2.03"	95
		20x50	10
		25x56	11
		1.00x2.28"	96
		1.25x2.28"	97
		32x60	12
Weldon DIN1835B DIN6535HB		.75x2.03"	99
		20x50	22
		25x56	23
		1.00x2.28"	100
		1.25x2.28"	101
		32x60	24
Whistle Notch DIN1835E		20x50	34
		25x56	35
		32x60	36
		40x70	37
DIN228AK		CM1	45
		CM2	46
		CM3	47
		CM4	48
DIN228BK		CM1	49
		CM2	50
		CM3	51
		CM4	52

Driver type	Drawing	∅D x L	Driver code
Central Clamping Surface 15°		.750x2.75"	56
		25x70	57
		1.00x2.75"	58
		1.25x2.75"	59
		1.50x2.75"	60
Frontal Clamping Surface 15°		16x50	61
Cylindrical with Thread		25x100 M16x1.5	66
		36x120 M24x1.5	67
		25x112 M16x1.5	70
VDI Design		36x135 M24x1.5	71
		25x70	72
Central Clamping Hexagonal		32x70	73
Central Clamping Tapered		.75x2.75"	76
		20x70	77
Frontal Clamping Surface 2°		1.00x2.75"	80
		1.00x3.94"	81
		1.25x2.75"	82
		1.25x3.94"	83
		1.50x2.75"	84
Trapezoidal Thread		28x126 Tr 28x2	88
		36x162 Tr 36x2	89
		25x50	91
Spraymist Driver		35x60	92

SUMOGUN

MNSNT

Indexable SUMOCHAM Inserts and Modular Shank Gundrills



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	LU	PL	THSZMS	BD	BDRED	LPR	FLGT	DRVS ⁽³⁾	SSC ⁽⁴⁾	MIID ⁽⁵⁾	
MNSNT 0394-0787-MF16X1	.394	.409	7.8740	.10708	MF16X1	.382	.378	10.787	.394	.630	10.0	HCP 100	K DCN 10-13.99
MNSNT 0413-0787-MF16X1	.413	.429	7.8740	.10708	MF16X1	.402	.398	10.787	.394	.630	10.0	HCP 105	K DCN 10-13.99
MNSNT 0433-0787-MF16X1	.433	.449	7.8740	.10826	MF16X1	.421	.417	10.827	.394	.630	11.0	HCP 110	K DCN 10-13.99
MNSNT 0453-0787-MF16X1	.453	.469	7.8740	.10826	MF16X1	.441	.437	10.827	.394	.630	11.0	HCP 115	K DCN 10-13.99
MNSNT 0472-0787-MF16X1	.472	.488	7.8740	.12440	MF16X1	.461	.457	10.827	.394	.630	12.0	HCP 120	K DCN 10-13.99
MNSNT 0492-0787-MF16X1	.492	.508	7.8740	.12440	MF16X1	.480	.476	10.827	.472	.630	12.0	HCP 125	K DCN 10-13.99
MNSNT 0512-0787-MF16X1	.512	.528	7.8740	.13818	MF16X1	.500	.496	10.866	.472	.630	13.0	HCP 130	K DCN 10-13.99
MNSNT 0531-0787-MF16X1	.531	.547	7.8740	.13818	MF16X1	.520	.516	10.866	.472	.630	13.0	HCP 135	K DCN 10-13.99
MNSNT 0551-0787-MF16X1	.551	.567	7.8740	.14291	MF16X1	.539	.535	10.866	.472	.630	14.0	HCP 140	K DCN 14-17.99
MNSNT 0571-0787-MF16X1	.571	.587	7.8740	.14291	MF16X1	.559	.555	10.866	.472	.630	14.0	HCP 145	K DCN 14-17.99
MNSNT 0512-0984-MF16X1	.512	.528	9.8425	.13818	MF16X1	.500	.496	12.835	.472	.630	13.0	HCP 130	K DCN 10-13.99
MNSNT 0531-0984-MF16X1	.531	.547	9.8425	.13818	MF16X1	.520	.516	12.835	.472	.630	13.0	HCP 135	K DCN 10-13.99
MNSNT 0551-0984-MF16X1	.551	.567	9.8425	.14291	MF16X1	.539	.535	12.835	.472	.630	14.0	HCP 140	K DCN 14-17.99
MNSNT 0571-0984-MF16X1	.571	.587	9.8425	.14291	MF16X1	.559	.555	12.835	.472	.709	14.0	HCP 145	K DCN 14-17.99
MNSNT 0394-1574-MF16X1	.394	.409	15.7480	.10708	MF16X1	.382	.378	18.661	.394	.630	10.0	HCP 100	K DCN 10-13.99
MNSNT 0413-1574-MF16X1	.413	.429	15.7480	.10708	MF16X1	.402	.398	18.661	.394	.630	10.0	HCP 105	K DCN 10-13.99
MNSNT 0433-1574-MF16X1	.433	.449	15.7480	.10826	MF16X1	.421	.417	18.661	.394	.630	11.0	HCP 110	K DCN 10-13.99
MNSNT 0453-1574-MF16X1	.453	.469	15.7480	.10826	MF16X1	.441	.437	18.661	.394	.630	11.0	HCP 115	K DCN 10-13.99
MNSNT 0472-1574-MF16X1	.472	.488	15.7480	.12440	MF16X1	.461	.457	18.701	.394	.630	12.0	HCP 120	K DCN 10-13.99
MNSNT 0492-1574-MF16X1	.492	.508	15.7480	.12440	MF16X1	.480	.476	18.701	.472	.630	12.0	HCP 125	K DCN 10-13.99
MNSNT 0512-1574-MF16X1	.512	.528	15.7480	.13818	MF16X1	.500	.496	18.740	.472	.630	13.0	HCP 130	K DCN 10-13.99
MNSNT 0531-1574-MF16X1	.531	.547	15.7480	.13818	MF16X1	.520	.516	18.740	.472	.630	13.0	HCP 135	K DCN 10-13.99
MNSNT 0551-1574-MF16X1	.551	.567	15.7480	.14291	MF16X1	.539	.535	18.740	.472	.630	14.0	HCP 140	K DCN 14-17.99
MNSNT 0571-1574-MF16X1	.571	.587	15.7480	.14291	MF16X1	.559	.555	18.740	.472	.709	14.0	HCP 145	K DCN 14-17.99
MNSNT 0591-1574-MF16X1	.591	.626	15.7480	.15275	MF16X1	.579	.575	19.055	.472	.709	15.0	HCP 150	K DCN 14-17.99
MNSNT 0630-1574-MF20X1	.630	.665	15.7480	.15393	MF20X1	.610	.606	19.055	.472	.709	16.0	HCP 160	K DCN 14-17.99
MNSNT 0669-1574-MF20X1	.669	.705	15.7480	.17992	MF20X1	.650	.646	19.094	.472	.866	17.0	HCP 170	K DCN 14-17.99
MNSNT 0709-1574-MF20X1	.709	.744	15.7480	.18346	MF20X1	.689	.685	19.134	.472	.866	18.0	HCP 180	K DCN 18-21.99
MNSNT 0748-1574-MF20X1	.748	.783	15.7480	.18346	MF20X1	.728	.724	19.134	.472	.866	19.0	HCP 190	K DCN 18-21.99
MNSNT 0787-1574-MF20X1	.787	.823	15.7480	.18937	MF20X1	.768	.764	19.173	.472	.866	20.0	HCP 200	K DCN 18-21.99
MNSNT 0827-1574-MF20X1	.827	.862	15.7480	.19448	MF20X1	.807	.803	19.803	.827	1.102	21.0	HCP 210	K DCN 18-21.99
MNSNT 0866-1574-MF20X1	.866	.902	15.7480	.20472	MF20X1	.846	.843	19.843	.827	1.102	22.0	HCP 220	K DCN 22-26.99
MNSNT 0906-1574-MF20X1	.906	.941	15.7480	.20787	MF20X1	.886	.882	19.843	.827	1.102	23.0	HCP 230	K DCN 22-26.99
MNSNT 0945-1574-MF20X1	.945	.980	15.7480	.22165	MF20X1	.925	.921	19.882	.827	1.102	24.0	HCP 240	K DCN 22-26.99
MNSNT 0984-1574-MF20X1	.984	1.020	15.7480	.22440	MF20X1	.965	.961	19.921	.827	1.102	25.0	HCP 250	K DCN 22-26.99

• For user guide and cutting conditions, see pages 356-358

(1) Do not mount smaller drilling heads than the specified range of the drill body

(2) Cutting diameter maximum

(3) Torque key size

(4) Seat size code

(5) Master insert identification

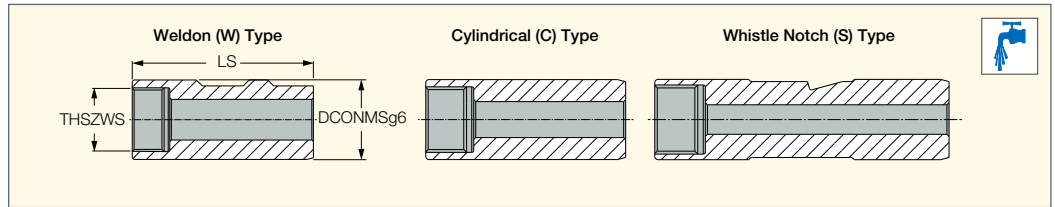
For inserts, see pages: HCP-IQ (56) • ICG (66) • ICK (37) • ICK-2M (41) • ICP (27) • ICP-2M (33) • QCP-2M (52)

For holders, see pages: GDV (355)



GDV

Shanks for SUMOGUN Modular Gundrills with Threaded Connection



Designation	THSZWS	DCONMS	Shank ⁽¹⁾	LS
GDV56-MF16X1-I-WN.75"	MF16X1	.750	S	2.75
GDV99-MF16X1-I-W.75"	MF16X1	.750	W	2.75
GDV10-MF16X1-M-C20	MF16X1	.787	C	1.97
GDV22-MF16X1-M-W20	MF16X1	.787	W	1.97
GDV80-MF16X1-I-WN1.00"	MF16X1	1.000	WN	2.75
GDV11-MF20X1-M-C25	MF20X1	.984	C	2.20
GDV23-MF20X1-M-W25	MF20X1	.984	W	2.20
GDV57-MF20X1-M-WN25	MF20X1	.984	S	2.76
GDV100-MF20X1-I-W1.00"	MF20X1	1.000	W	2.28
GDV58-MF20X1-I-WN1.00"	MF20X1	1.000	S	2.75
GDV101-MF20X1-I-W1.25"	MF20X1	1.250	W	2.28
GDV97-MF20X1-I-C1.25"	MF20X1	1.250	C	2.28
GDV12-MF20X1-M-C32	MF20X1	1.260	C	2.36
GDV24-MF20X1-M-W32	MF20X1	1.260	W	2.36
GDV13-MF20X1-M-C40	MF20X1	1.575	C	2.76
GDV25-MF20X1-M-W40	MF20X1	1.575	W	2.76

⁽¹⁾ W-Weldon, C-Cylindrical, S-Whistle notch 15°, WN-Whistle notch

For tools, see pages: MNSNT (354)

Machining Conditions for MNSNT

ISO	Material	Condition	Tensile Strength [ksi]	Hardness HB	Material Group No.	V SFM	SUMOGUN					
							Feed vs. Drill Diameter					
							D = .394-.469	D = .472-.547	D = .551-.625	D = .630-.763	D = .787-1.020	
P	Non-alloy steel and cast steel, free cutting steel	<0.25% C	Annealed	61	125	1	260-360-460					
		≥0.25% C	Annealed	94	190	2	260-345-425	.0059	.0071	.0079	.0098	.0098
		<0.55% C	Quenched and tempered	123	250	3	260-325-390	.0071	.0083	.0091	.0118	.0118
			Annealed	109	220	4	230-295-360	.0083	.0094	.0106	.0138	.0138
		≥0.55% C	Quenched and tempered	145	300	5	165-230-295					
	Low alloy and cast steel (less than 5% of alloying elements)		Annealed	87	200	6	260-325-390	.0055	.0063	.0071	.0091	.0098
		Quenched and tempered		135	275	7	230-295-360	.0067	.0079	.0087	.0106	.0118
				174	350	9	130-180-230	.0083	.0094	.0102	.0122	.0138
	High alloyed steel, cast steel, and tool steel		Annealed	99	200	10	165-230-260	.0047	.0059	.0071	.0079	.0087
		Quenched and tempered	160	325	11	130-195-260	.0055	.0067	.0079	.0087	.0094	
Stainless steel and cast steel		Ferritic/martensitic	99	200	12	130-180-230	.0047	.0055	.0063	.0063	.0071	
	Martensitic	119	240	13	.0051		.0059	.0071	.0075	.0083		
K	Gray cast iron (GG)	Ferritic/pearlitic		180	15	295-410-525						
		Pearlitic/martensitic		260	16	260-360-460						
	Nodular cast iron (GGG)	Ferritic		160	17	295-440-590	.0079	.0098	.0118	.0138	.0138	
		Pearlitic		250	18	260-360-460	.0091	.0110	.0130	.0157	.0165	
	Malleable cast iron	Ferritic		130	19	295-410-525	.0106	.0126	.0146	.0177	.0185	
Pearlitic			230	20	260-360-460							
N	Aluminum-wrought alloys	Not cureable		60	21	295-505-720	.0098	.0118	.0138	.0157	.0177	
		Cured		100	22		.0110	.0130	.0150	.0177	.0197	
	Aluminum-cast alloys	≤12% Si	Not cureable		75		23	.0126	.0146	.0165	.0197	.0224
		>12% Si	Cured		90		24					
		>12% Si	High temperature		130		25	260-390-525				

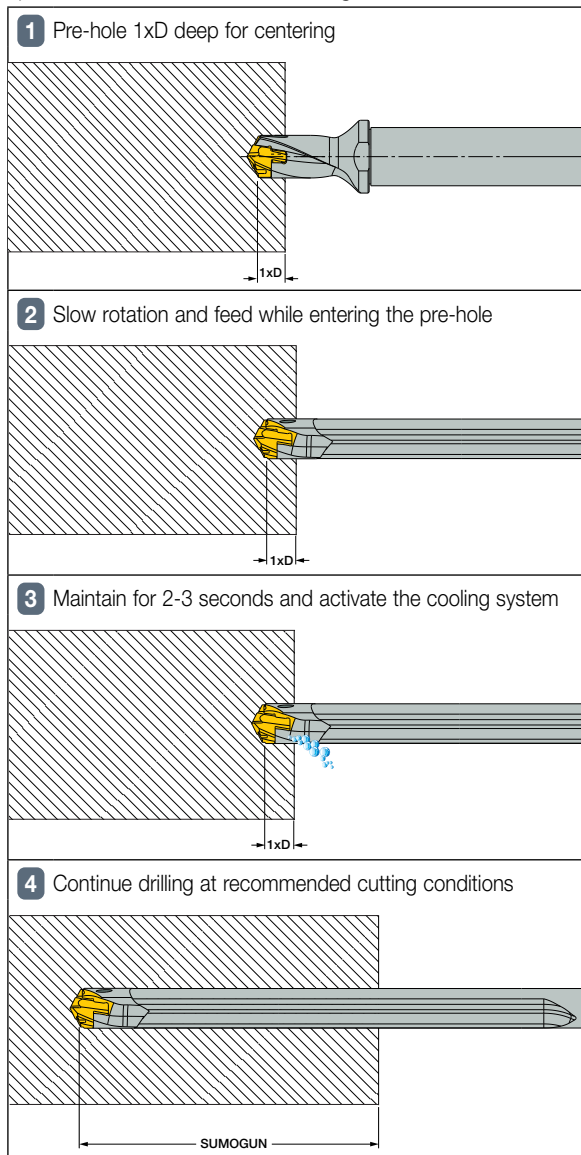
- Mandatory use of emulsion or oil when drilling
- For the 15.748" long tools reduce the cutting speed by 20%.

Recommended cutting data

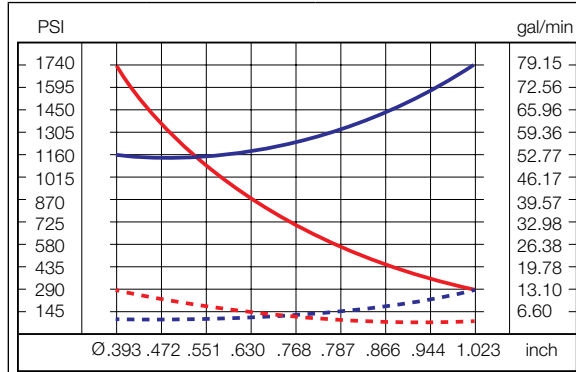
Drill Penetration Instructions on Horizontal Milling and Lathe Machines

Note: The following procedure (1-4) is recommended for up to 15.75" hole depths using MNSNT ...-1574... drill.

- 1 Drill a pilot hole 1xD deep with a short drill in the same diameter as of the **SUMOGUN** drill.
- 2 Enter the pre-hole at slow speed, feed and 50 RPM until .04-.079" before reaching the bottom.
- 3 Activate the cooling system and increase rotation speed to recommended drilling speed, maintain for 2-3 seconds, then continue at recommended drilling feed. **No pecking is required.** Apply maximum possible coolant flow rate.
- 4 After having reached the required depth, reduce speed to 50-100 RPM while exiting from the hole.



Pressure and Coolant Flow Rate for SUMOGUN



SUMOGUN Drilling Range

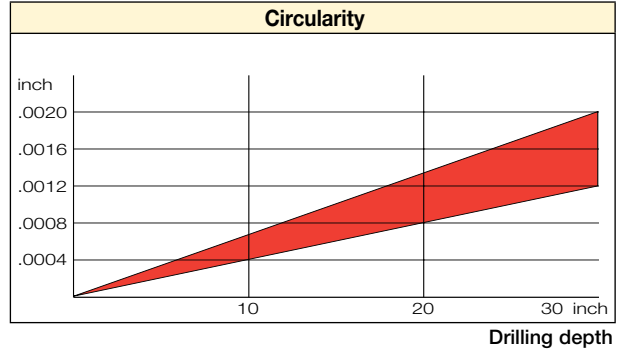
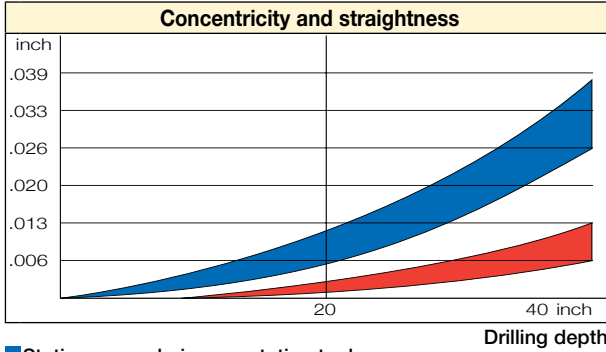
Q gallon/min P PSI
 ———— ———— GUNDRILL Machines
 - - - - - - - - - - Milling and Turning Machines

Gundrill Lubrication and Cooling

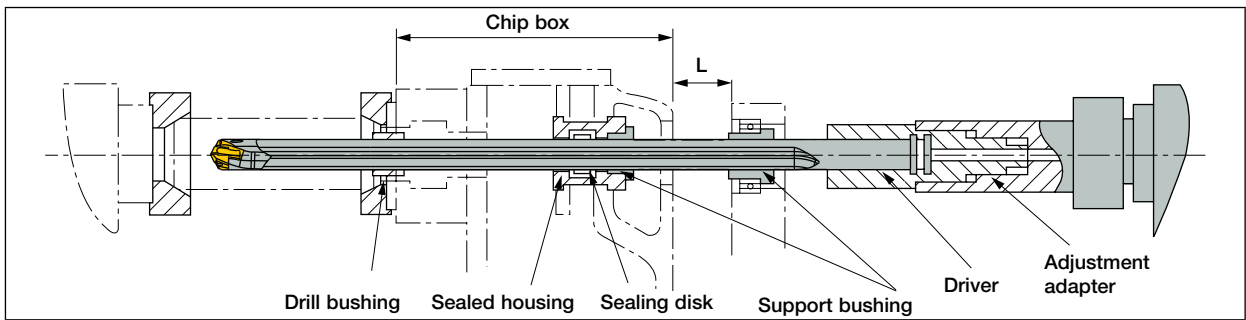
The best performance is obtained by using oil. On equipment that uses water-soluble fluids (i.e. machining centers and CNC machines) a concentration between 10% and 15% is recommended.

Guidelines for Optimal Gundrill Performance

- Coolant pressure and flow
- It is recommended to use a strong coolant flow for efficient chip flushing and cooling of the cutting edge.
- Filtration It is recommended to use a filter under 787 μinch.
- **Note:** Improper filtration may result in interrupted flow of the lubricating oil. This creates a sticky surface on the bearing pads and leads to premature wear of the tool and overloading the coolant pump and spindle seals.
- Temperature of the coolant The coolant temperature should be between 68°F and 71.6°F.
Note: Above 122°F the viscosity of the coolant is reduced by 50% and becomes ineffective.



■ Stationary workpiece – rotating tool
 ■ Rotating workpiece – stationary tool

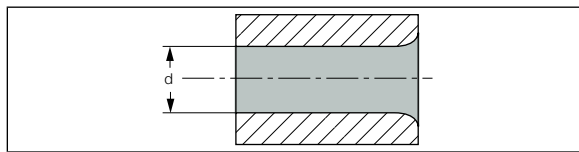


L = 20xD

1- The support bushing should be according to tube diameter (D3) (see below)

Bushing

Based on modified DIN 179 specify the "d" diameter of the drill head. Carbide bushing is delivered only on request.



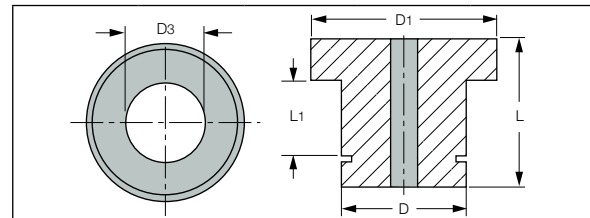
d = Drill diameter +.0008"

Guide Bushing

A guide bushing is an essential component for a proper gundrill operation. The function of the guide bushing is to direct the Sumogun into the material during penetration. The diameter of the guide bushing should be within 800 μinch larger than the diameter of the drill. Dedicated gundrill machines are equipped with a guide bushing system.

Support Bushing

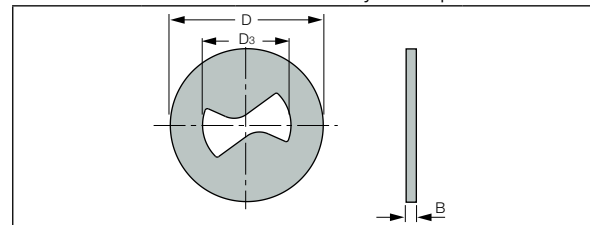
D3 indicate the tube diameter



| Support bushing | | | | |
|-----------------|----------|-------------|------------|-------------|
| Tool Ø "d1" | Ext. Ø D | Ext. Ø "D1" | Length "L" | Length "L1" |
| .074 to .645 | .787 | 1.02 | .787 | .492 |
| .074 to 1.02 | 1.18 | 1.49 | 1.02 | .630 |
| .074 to 1.33 | 1.77 | 1.96 | 1.02 | .630 |

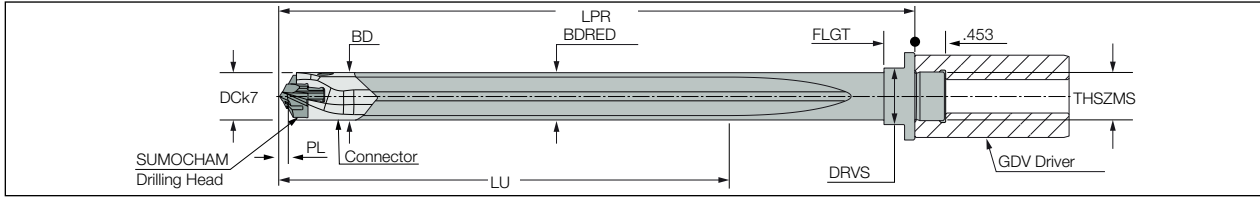
Sealing Disk

Indicate the dimensions needed for your requirements



| Support bushing with "V" form | | | | |
|-------------------------------|----------|-------------|------------|-------------|
| Tool Ø "d1" | Ext. Ø D | Ext. Ø "D1" | Length "L" | Length "L1" |
| .074 to .645 | .787 | 1.02 | .787 | .492 |
| .074 to .936 | 1.18 | 1.49 | 1.02 | .630 |

SUMOGUN Inquiry Form



1. Tool

Quantity _____

Nominal diameter and tolerance _____
Please fill in dimensions on the sketch.

Driver

For standard drivers please use designation from page 355

Special Driver

- Code No. _____
- Special, please attach sketch and specifications.

Sketch of Drilling Application



Note: It may be necessary to change several of the parameters that you indicated, based on our experience with your application.

2. Workpiece

(If possible, please attach a drawing)

2.1 Material

Material description (DIN material number or any other standard): _____

Hardness and Properties: _____

- Short Chips
- Long Chips

2.2 Hole Type

- Blind Hole
- Drilling into Pre-hole
- Angled Entry
- Drilling into Solid
- Boring
- Angled Exit

Drilling Depth _____ inch Hole Tolerance _____

2.3 Application:

- Workpiece: Stationary Rotating
- Tool: Stationary Rotating

3. Machine

3.1 Technical Data

Machine Type _____

Power: _____ kW

3.2 Cutting Data:

- Cutting Speed V_c _____ SFM
- Revolutions N_{min} _____ RPM, N_{max} _____ RPM
- Feed F_{min} _____ IPR
- F_{max} _____ IPR
- Feed Rate V_F _____ IPM

Coolant:

- Oil Soluble Oil Other

Coolant Pressure: _____ PSI

| Drill Body Type | | Hole Diameter | Length | Metric Fine pitch | Dwg. number |
|-----------------|--------------|---------------|----------------|-------------------|---------------|
| SNT | Steel body | Ø.394-1.023" | Drilling Depth | 1=M16 | 4 last digits |
| GDT | For Gundrill | | Total length | 2=M20 | |

| Tool Type | |
|-----------|-------------------------|
| Code | Type |
| No code | Standard shape and size |
| GP | Guide Pads |
| SC | Special Connector |
| PT | P-Tube |

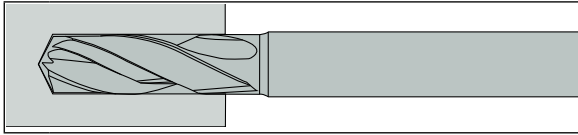
MN ### - XXX - XXX - MF 1 GP - XXXX

Drilling Head Mounting Procedure

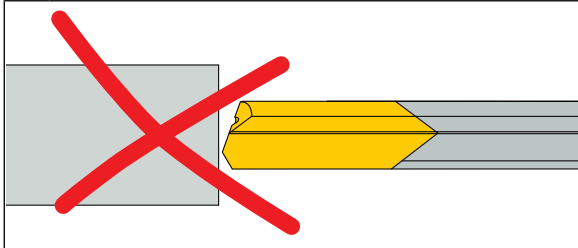


When using a gundrill on a lathe machine, a short solid carbide centering drill should be used prior to the gundrill. Once the gundrill enters the pre-drilled hole, it is self-guided.

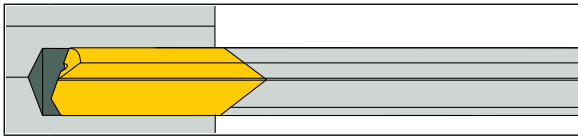
1 Drilling a pre-hole (drill diameter +.0008")



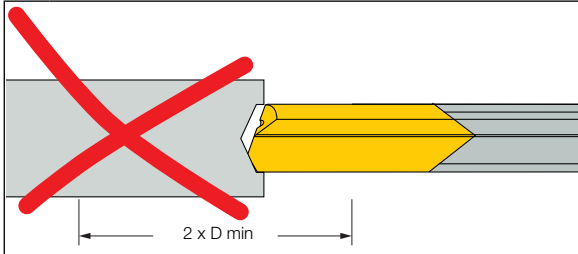
Never try to penetrate the workpiece by using a gundrill



2 Gundrill penetration through the pre-hole

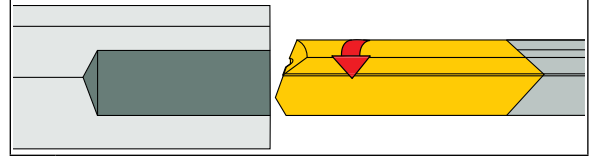


A shallow pre-hole will not guide an unbalanced gundrill

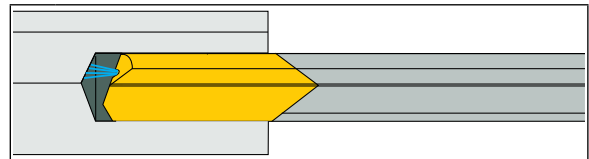


Drill Penetration Instructions

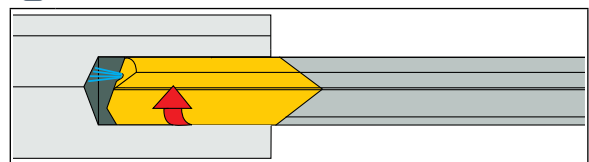
1 Rotate the drill counterclockwise prior to and during hole penetration



2 Stop the drill rotation and start the coolant



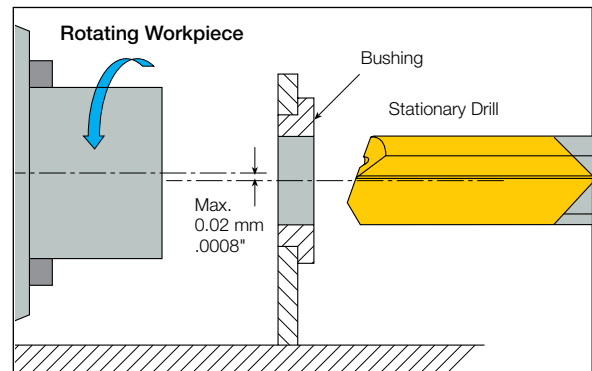
3 Rotate the drill clockwise prior to drilling operation



The Influence of a Tool Vs. Workpiece Rotation

| Rotating tool | Rotating workpiece | Rotating tool & workpiece |
|---------------|--------------------|---------------------------|
| | | |
| | | |
| Worst | Medium | Best |

The maximum misalignment between the drill bushing and the workpiece center line should not exceed .0008".



Single Flute Gundrill

ISCAR's gundrill consists of a single-piece carbide head, a streamlined shank and a driver through which coolant flows to the working end where it is most needed. Chips are evacuated along the V-shaped external flute.

Drilling Head

The carbide head is tapered on its length to reduce friction. The taper angle depends on the type of material to be drilled. For high precision drilling, the taper should be reduced to a minimum.

Note that when the head is resharpened, the diameter of the drill changes, affecting the hole tolerance.

Shank

The cross-section of the shank is V-shaped with coolant holes. It is made of hardened steel that is highly resistant to twisting. This cross-section provides the optimal conditions for twist resistance, coolant flow and chip evacuation.

Driver

The driver ensures the connection between the gundrill and the machine tool, (see page 362 for detailed driver information).

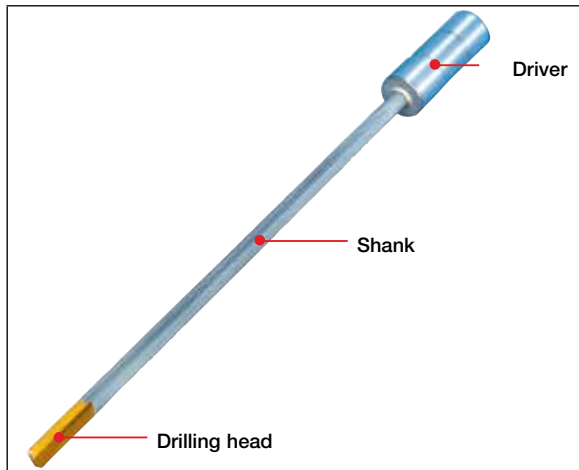
Advantages

- Drilling precision of IT7 to IT9 tolerances can be reached
- Excellent straightness and concentricity
- Maintains high precision hole center alignment
- Surface roughness of Ra 16-63µin is easily obtained
- Reboring operations are often unnecessary

Carbide Tipped Gundrill Range

| Drill diameter | Max. flute length |
|----------------|-------------------|
| .098 to .121 | 43.30 |
| .122 to .235 | 98.42 |
| .236 to .448 | 118.1 |
| .449 to 1.57 | 137.8 |

Overall length=flute length+driver length (see page 365)



ISCAR's advanced gundrill technology provides superior geometric and dimensional quality for both deep and shallow drilling. The drills are available in the range of .098 to 1.57".

Single Flute Solid Carbide Gundrills

Another type of gundrill is made with integral tip and shank, made of solid carbide with either a steel or a carbide driver. These drills are designed for conventional machines, machining centers and lathes. This style of gundrill is available from .035-.630" and can be used on various types of materials. It provides superior rigidity and optimal coolant flow rates. As a result of its rigidity, up to 100% higher feed rate can be reached.

When using the small diameter drills, it is crucial to adhere closely to the recommended drilling parameters.

Solid Carbide Gundrill Range

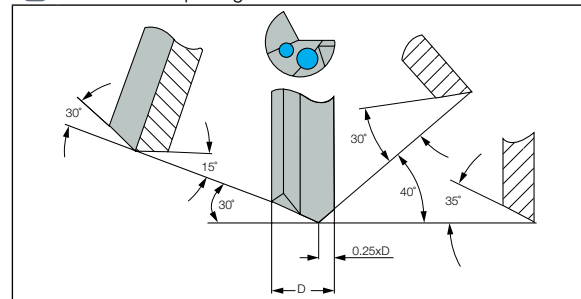
(with or without brazed steel driver)

| Drill diameter | Max. flute length |
|----------------|-------------------|
| .035 to .630 | 11.81 inch |

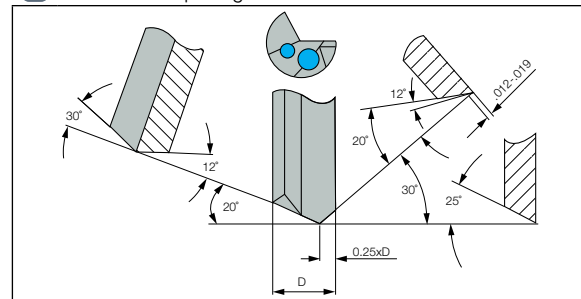
Standard Gundrill Head Sharpening Angles

Subject to the required tolerance, cutting performance and desired chip shape, the following standard sharpening angles are recommended (shown in figures 1 and 2).

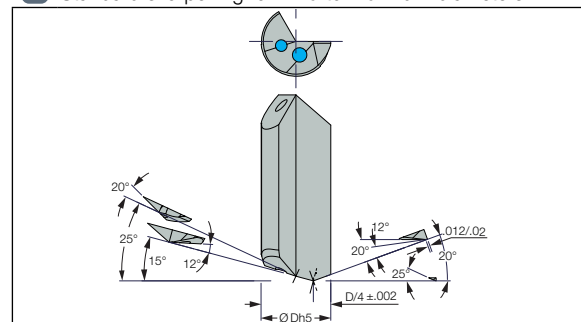
1 Standard sharpening for .035 to .157" drill diameters



2 Standard sharpening for .157 to 1.25" drill diameters



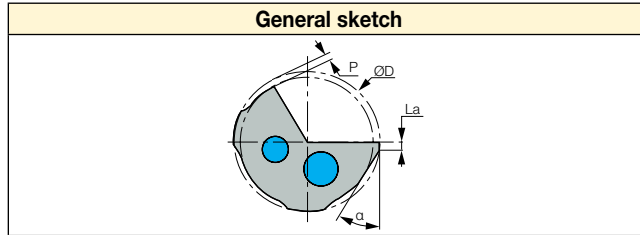
3 Standard sharpening for 1.25 to 1.57" drill diameters



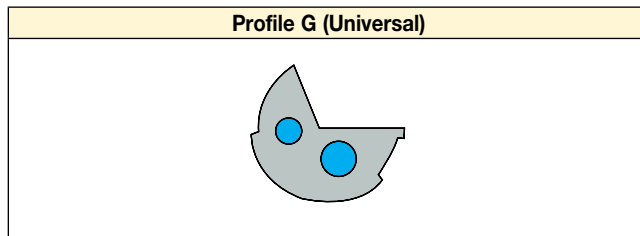
Note: For special or semi-standard gundrills, special geometries will be offered to match the application.

Standard Gundrill Head Profiles

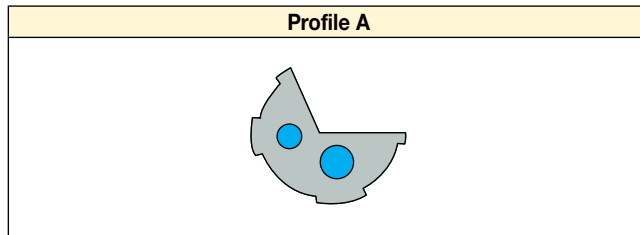
Drilling capacity and finish of the drilled hole are dependent on the geometrical shape of the drill head. Both the profile and the sharpening must be matched to the workpiece material. The profile is defined when the tool is manufactured. Although regrinding may change the cutting geometry, the profile should remain the same.



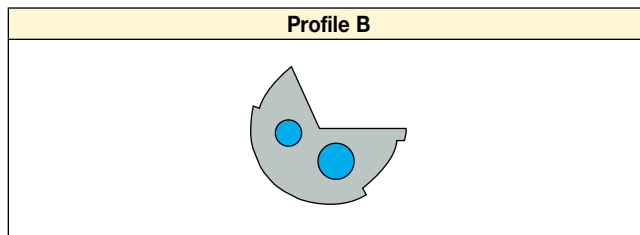
All cross section profile parameters such as: P, La and must be precisely matched to the workpiece material properties.



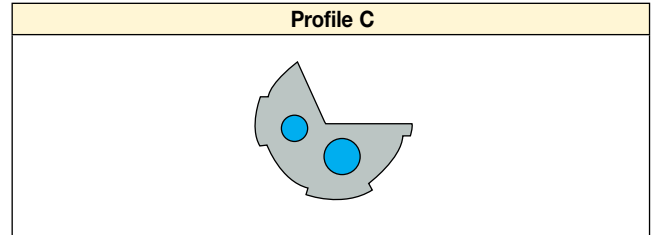
Standard form for most material types, particularly for materials with a tendency to shrink. Recommended for high precision bore tolerance and straightness. Maintains precise exit hole size. Recommended when extra burnishing is required.



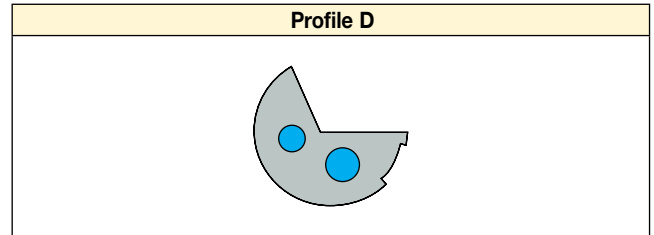
Suitable for cast iron (usually coated) and aluminum alloys. Can be used for cross drilling, angular entry or exit and for interrupted cut. Large coolant gaps between pads.



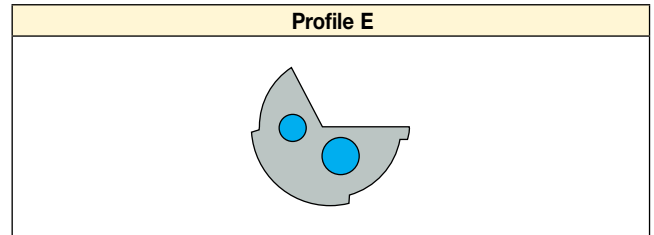
Excellent size control, for high precision hole tolerance. Used for cast iron and aluminum alloys.



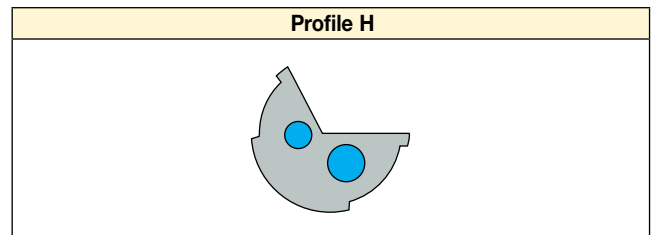
Used for angled entry or exit. Large back taper, for shrinking materials such as types of alloys and stainless steel. Large coolant gaps between pads.



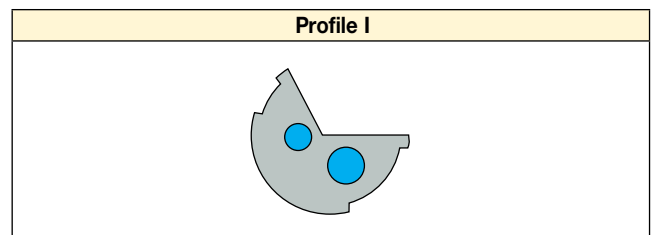
Suitable for cast iron only. Very effective in grey cast iron (usually coated).



General use, for alloys and stainless steel. This profile eliminates the problem of the tool sticking in the hole after the outer corner dulls. Especially suitable for crankshaft and other forged materials. Recommended for accurate hole straightness.



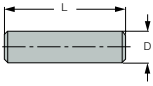
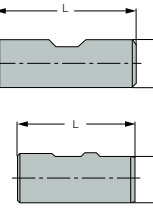
Recommended for all nonferrous and cast iron materials up .197" diameter. Sometimes used for wood and plastic with larger back taper.



Used for aluminum and brass for best hole finish. For intersecting holes and interrupted cut or when extra outer diameter support and burnishing is required.

Standard Gundrill Drivers for Machining Centers, Lathes, Etc.

Drivers are available for dedicated and CNC machines for any specified diameter and length.
Below are the driver codes and technical data.

| Driver type | Drawing | DXL | Driver code | BRAZED GUNDRILL | | | SOLID CARBIDE GUNDRILL |
|--------------------------------------|---|------------|-------------|-----------------------|--|-------------------------|-----------------------------|
| | | | | Max. cutting diameter | F = CYLINDRICAL TUBE | | F = straightening extension |
| | | | | | Equal or less than max. cutting diameter | More than max. diameter | |
| Cylindrical
DIN1835A
DIN6535HA |  | .157x1.102 | N°1 | .1082 | .39 | .79 | .71 |
| | | .197x1.102 | N°2 | .1279 | .39 | .79 | .59 |
| | | .236x1.417 | N°3 | .1673 | .39 | .79 | .55 |
| | | .315x1.417 | N°4 | .2263 | .39 | .79 | .55 |
| | | .394x1.575 | N°5 | .2874 | .39 | .79 | .59 |
| | | .472x1.772 | N°6 | .3543 | .39 | .79 | .59 |
| | | .50x1.78 | N°94 | .3819 | .39 | .79 | .59 |
| | | .551x1.772 | N°7 | .4330 | .39 | .79 | .59 |
| | | .630x1.890 | N°8 | .4881 | .39 | .79 | .59 |
| | | .709x1.890 | N°9 | .5669 | .39 | .79 | .59 |
| | | .75x2.03 | N°95 | .5866 | .39 | .79 | .59 |
| | | .787x1.968 | N°10 | .6259 | .39 | .79 | .59 |
| | | .984x2.205 | N°11 | .7681 | .39 | .98 | .59 |
| | | 1.00x2.28 | N°96 | .7681 | .39 | .98 | .59 |
| | | 1.25x2.28 | N°97 | 1.0082 | .39 | .98 | .59 |
| 1.260x2.362 | N°12 | 1.0082 | .39 | .98 | .59 | | |
| 1.575x2.756 | N°13 | 1.2838 | .39 | .98 | .59 | | |
| 1.969x3.150 | N°14 | 1.5748 | .39 | .98 | .59 | | |
| 2.480x3.543 | N°15 | 1.5748 | .39 | .98 | .59 | | |
| Weldon
DIN1835B
DIN6535HB |  | .236x1.417 | N°16 | .1082 | .39 | .79 | .59 |
| | | .315x1.417 | N°17 | .1279 | .39 | .79 | .59 |
| | | .394x1.575 | N°18 | .2874 | .39 | .79 | .59 |
| | | .472x1.772 | N°19 | .3543 | .39 | .79 | .59 |
| | | .50x1.78 | N°98 | .3819 | .39 | .79 | .59 |
| | | .630x1.890 | N°20 | .4881 | .39 | .79 | .59 |
| | | .709x1.890 | N°21 | .5669 | .39 | .79 | .59 |
| | | .75x2.73 | N°99 | .5866 | .39 | .79 | .59 |
| | | .787x1.968 | N°22 | .6259 | .39 | .79 | .59 |
| | | .984x2.205 | N°23 | .7681 | .39 | .98 | .59 |
| | | 1.00x2.28 | N°100 | .7681 | .39 | .98 | .59 |
| | | 1.25x2.28 | N°101 | 1.0082 | .39 | .98 | .59 |
| 1.260x2.362 | N°24 | 1.0082 | .39 | .98 | .59 | | |
| 1.575x2.756 | N°25 | 1.2838 | .39 | .98 | .59 | | |
| 1.968x3.150 | N°26 | 1.5748 | .39 | .98 | .59 | | |
| 2.48x3.543 | N°27 | 1.5748 | .39 | .98 | .59 | | |

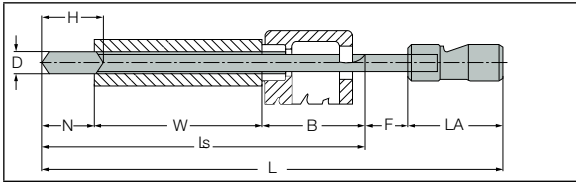
Standard Drivers for Gundrill Machines

| Driver type | Drawing | DXL | Driver code | BRAZED GUNDRILL | | | SOLID CARBIDE GUNDRILL |
|---------------------------------|---------|-------------|-------------|-----------------------|--|-------------------------|-----------------------------|
| | | | | Max. cutting diameter | F = CYLINDRICAL TUBE | | F = straightening extension |
| | | | | | F = CYLINDRICAL TUBE | | |
| | | | | | Equal or less than max. cutting diameter | More than max. diameter | |
| Whistle Notch
DIN1835E | | .236x1.417 | N°28 | .1082 | .39 | .79 | |
| | | .315x1.417 | N°29 | .1279 | .39 | .79 | |
| | | .394x1.575 | N°30 | .2874 | .39 | .79 | .59 |
| | | .472x1.772 | N°31 | .3543 | .39 | .79 | .59 |
| | | .630x1.890 | N°32 | .4881 | .39 | .79 | .59 |
| | | .709x1.890 | N°33 | .5669 | .39 | .79 | .59 |
| | | .787x1.968 | N°34 | .6259 | .39 | .79 | .59 |
| | | .984x2.205 | N°35 | .7681 | .39 | .98 | |
| | | 1.26x2.362 | N°36 | 1.0082 | .39 | .98 | |
| | | 1.575x2.756 | N°37 | 1.2838 | .39 | .98 | |
| Whistle Notch
DIN6535HE | | .236x1.417 | N°38 | .1082 | .39 | .79 | .59 |
| | | .315x1.417 | N°39 | .1279 | .39 | .79 | .59 |
| | | .394x1.575 | N°40 | .2874 | .39 | .79 | .59 |
| | | .472x1.772 | N°41 | .3543 | .39 | .79 | .59 |
| | | .630x1.890 | N°42 | .4881 | .39 | .79 | .59 |
| | | .709x1.890 | N°43 | .5669 | .39 | .79 | .59 |
| | | .787x1.968 | N°44 | .6259 | .39 | .79 | .59 |
| DIN228AK | | CM1 | N°45 | .3779 | .39 | .79 | |
| | | CM2 | N°46 | .5748 | .39 | .79 | |
| | | CM3 | N°47 | .8464 | .39 | .98 | |
| | | CM4 | N°48 | 1.1614 | .39 | .98 | |
| DIN228BK | | CM1 | N°49 | .3779 | .39 | .79 | |
| | | CM2 | N°50 | .5748 | .39 | .79 | |
| | | CM3 | N°51 | .8464 | .39 | .98 | |
| | | CM4 | N°52 | 1.1614 | .39 | .98 | |
| Central Clamping
Surface 15° | | .236x1.181 | N°53 | .1082 | .39 | .79 | .79 |
| | | .394x1.575 | N°54 | .2874 | .39 | .79 | .59 |
| | | .630x1.772 | N°55 | .4881 | .39 | .79 | |
| | | .750x2.748 | N°56 | .5866 | .39 | .79 | |
| | | .984x2.756 | N°57 | .7681 | .39 | .98 | |
| | | 1.00x2.748 | N°58 | .7681 | .39 | .98 | |
| | | 1.25x2.748 | N°59 | 1.0082 | .39 | .98 | |
| | | 1.50x2.748 | N°60 | 1.2838 | .39 | .98 | |
| Frontal Clamping
Surface 15° | | .630x1.968 | N°61 | .4881 | .39 | .79 | |

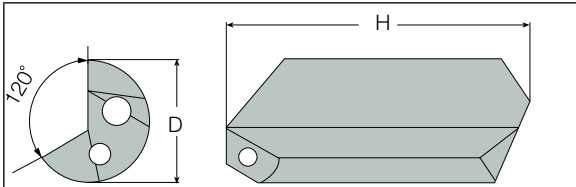
Standard Gundrill Drivers for Machining Centers, Lathes, Etc.

| Driver type | Drawing | DXL | Driver code | BRAZED GUNDRILL | | SOLID CARBIDE GUNDRILL | |
|-----------------------------|---------|-------------------------|-------------|-----------------------|--|-------------------------|-----------------------------|
| | | | | Max. cutting diameter | F = CYLINDRICAL TUBE | | F = straightening extension |
| | | | | | Equal or less than max. cutting diameter | More than max. diameter | |
| Cylindrical with Thread | | .394x1.968
M6X0.5 | N°62 | .2874 | .39 | .79 | .59 |
| | | .394x2.362
M6X0.5 | N°63 | .2874 | .39 | .79 | .59 |
| | | .500x1.968
M6x0.5 | N°64 | .3543 | .39 | .79 | .59 |
| | | .630x3.150
M10X1 | N°65 | .4881 | .39 | .79 | .59 |
| | | .984x3.937
M16x1.5 | N°66 | .7681 | .39 | .98 | .59 |
| | | 1.417x4.724
M24x1.5 | N°67 | 1.2051 | .39 | .98 | .59 |
| VDI Design | | .394x2.677
M6x0.5 | N°68 | .2657 | .39 | .79 | .59 |
| | | .630x3.543
M10x1 | N°69 | .4252 | .39 | .79 | .59 |
| | | .984x4.409
M16x1.5 | N°70 | .7681 | .39 | .98 | .59 |
| | | 1.417x5.315
M24x1.5 | N°71 | 1.2051 | .39 | .98 | .59 |
| Central Clamping Hexagonal | | .984x2.756 | N°72 | .7681 | .39 | .98 | .59 |
| | | 1.26x2.756 | N°73 | 1.0082 | .39 | .98 | .59 |
| Central Clamping Tapered | | .500x1.500 | N°74 | .3385 | .39 | .79 | .59 |
| | | .630x2.756 | N°75 | .4763 | .39 | .79 | .59 |
| | | .750x2.748 | N°76 | .5551 | .39 | .79 | .59 |
| | | .787x2.756 | N°77 | .6338 | .39 | .79 | .59 |
| Frontal Clamping Surface 2° | | .500x1.500 | N°78 | .3819 | .39 | .79 | .59 |
| | | .750x2.748 | N°79 | .5866 | .39 | .79 | .59 |
| | | 1.00x2.748 | N°80 | .7681 | .39 | .98 | .59 |
| | | 1.00x3.937 | N°81 | .7681 | .39 | .98 | .59 |
| | | 1.25x2.748 | N°82 | 1.0082 | .39 | .98 | .59 |
| | | 1.25x3.937 | N°83 | 1.0082 | .39 | .98 | .59 |
| | | 1.50x2.748 | N°84 | 1.2838 | .39 | .98 | .59 |
| | | 1.50x3.937 | N°85 | 1.2838 | .39 | .98 | .59 |
| Trapezoidal Thread | | .630x4.409
Tr 16x1.5 | N°86 | .5354 | .39 | .79 | .59 |
| | | .787x4.960
Tr 20x2 | N°87 | .6732 | .39 | .79 | .59 |
| | | 1.102x4.960
Tr 28x2 | N°88 | 1.0078 | .39 | .98 | .59 |
| | | 1.417x6.378
Tr 36x2 | N°89 | 1.2834 | .39 | .98 | .59 |
| Spraymist Driver | | .630x1.575 | N°90 | .4881 | .39 | .79 | .59 |
| | | .984x1.968 | N°91 | .7681 | .39 | .98 | .59 |
| | | 1.378x2.362 | N°92 | 1.0472 | .39 | .98 | .59 |

Standard Gundrill Length Calculations



Standard Gundrill Carbide Head Length



- D= Cutting diameter
- H= Carbide length
- N= Regrinding area = H-D
- W= Hole depth
- B= Chip evacuation area = For typical gundrill machines, 10"
= For machining centers, 2xD (minimum .59")
- F= .394"
- LA = Driver length
- LS = Flute length
- L= Overall length

Example

Drilling of a .394x19.7" depth hole on a gundrill machine with .984x2.756" driver code No. 57 (See page 363)
 D=.394 W=19.7 LA=2.755 B=9.84 (or per experience)
 $L=N+W+B+F+LA$
 $L=(1.378-(.06 \times .394))+19.7+9.84+.394+2.755=33.464$ (OAL)
 $Ls=N+W+B=30.315$ (flute length)

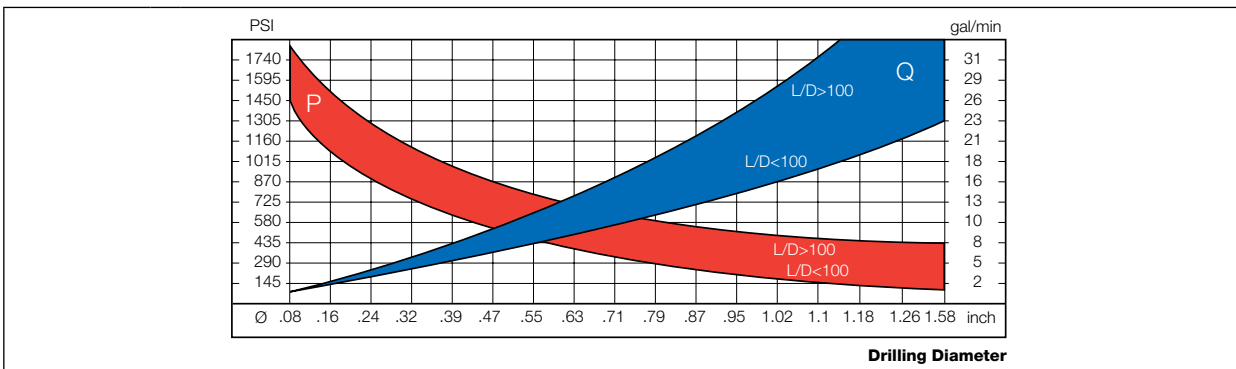
Ordering Code

For example:
 D and Ls are available as standard
 STGD-10000-0858-57-IC08

| Diameter range | Head length |
|----------------|-------------|
| .098-.149 | .787 |
| .150-.159 | .905 |
| .160-.216 | .984 |
| .217-.257 | 1.18 |
| .258-.435 | 1.37 |
| .436-.722 | 1.57 |
| .723-.840 | 1.77 |
| .841-.919 | 1.96 |
| .920-1.02 | 2.16 |
| 1.02-1.26 | 2.55 |

Note: regrindable length=H-D

Pressure and Coolant Flow Rate for Gundrills



■ Q gal/min ■ P PSI

Gundrill Lubrication and Cooling

The best performance is obtained by using oil. On equipment that uses water-soluble fluids (i.e. machining centers and CNC machines), a concentration between 10% and 15% is recommended.

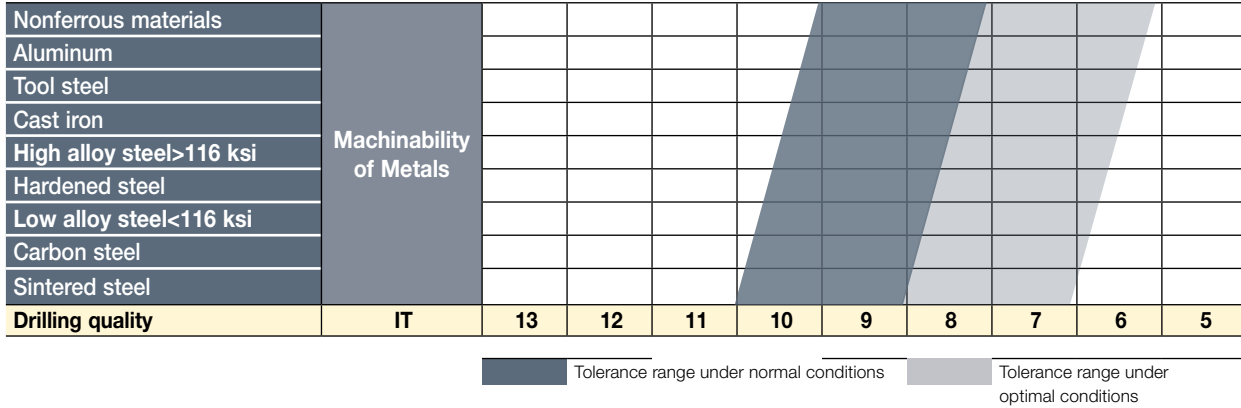
Guidelines for Optimal Gundrill Performance

- It is recommended to use a strong coolant flow for efficient chip flushing and cooling of the cutting edge
- It is recommended to use a filter under 800 μinch
- Note: Improper filtration may result in interrupted flow of lubricating oil. This creates a sticky surface on the bearing pads and leads to premature wear of the tool and overloading the coolant pump and spindle seals
- The coolant temperature should be between 68 and 71.6°F.
Note: Above 122°F C the viscosity of the coolant is reduced by 50% and becomes ineffective.

Drilling Tolerances Obtainable In Deep Hole Drilling

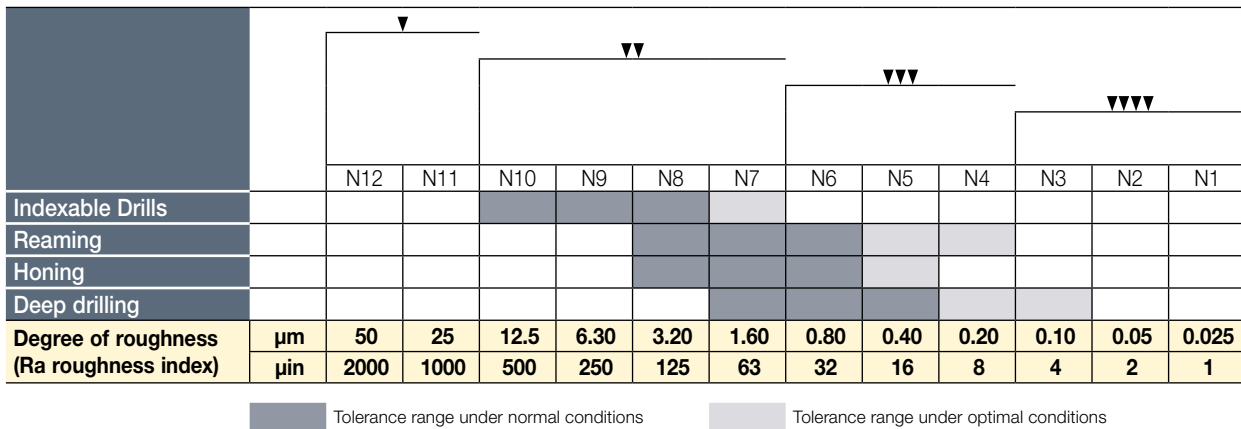
Deep Drilling Tolerances

Gundrill configurations when used under recommended conditions can produce holes with tolerances of IT8-IT9. When operating under optimal conditions, even better tolerances can be achieved.



Surface Quality

Surface quality of 8 Ra can be achieved when using gundrills under recommended conditions.



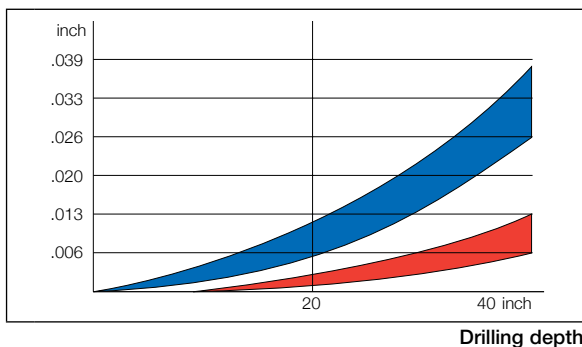
Concentricity and Straightness

The resulting quality depends on different factors such as:

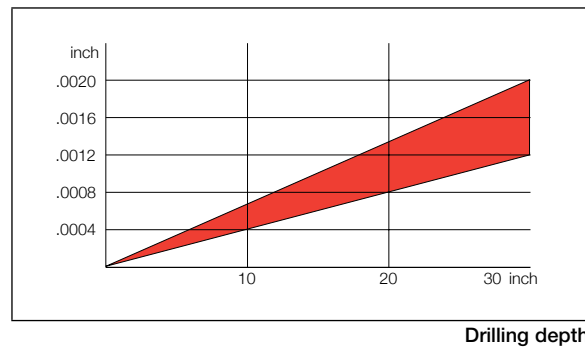
- Drilling depth and diameter
- Type of machining and cutting parameters
- Quality and uniformity of the workpiece material
- Machine tool conditions
- Gundrill support

Circularity

The geometric quality of bores obtained from deep hole drill bits is clearly higher than that obtained with the use of twist drills. It is possible to obtain precision with deviations of less than 160 μinch.



■ Stationary workpiece – rotating tool
■ Rotating workpiece – stationary tool



Delivery Schedule Based on Drill Dimensions for Carbide Tipped Gundrills

Single Flute Carbide Tipped Gundrill Designations **New Tools**

Standard⁽¹⁾ Brazed Drill (Carbide Tipped):

Ordering Example:

| | | | | |
|-------------|----------------|----------------|--------------------------|------------------------|
| STGD | - 05500 | - 0500 | - 57 | - IC08 |
| | Drill Diameter | Overall Length | Offer No. or Drawing No. | Version No. or Drawing |

Ø.098 to Ø.787 each .004" and Ø.787 to Ø1.26 each .04"

Standard geometry suitable in any material

Standard driver from the table (page 362)

1-2 weeks delivery

Semi-Standard⁽¹⁾ Brazed Drill (Carbide Tipped):

Ordering Example:

| | | | | |
|-----------|----------------|----------------|--------------------------|------------------------------|
| GD | - 05520 | - 0500 | - ER | - IC908 ⁽²⁾ |
| | Drill Diameter | Overall Length | Offer No. or Drawing No. | carbide grade ⁽²⁾ |

Diameter out of standard range

Standard geometry and/or head profile from page 361 and/or coating

Standard driver from the table (page 362)

3-4 weeks delivery

Special⁽¹⁾ Gundrill Carbide Tipped:

Ordering Example:

| | | | | |
|-------------|----------------|----------------|--------------------------|-------------|
| SPGD | - 05520 | - 0500 | - 02051 | - 01 |
| | Drill Diameter | Overall Length | Offer No. or Drawing No. | Version No. |

Any special specification (special geometry, special driver, etc.) 3-4 weeks delivery

Repair (Replacement of the Carbide Tip)

Repair of Standard⁽¹⁾ Drills

Ordering Example:

| | | | |
|--------------|----------------|----------------|------------------------------------|
| RSTGD | - 05520 | - 0500 | - IC08 |
| | Drill Diameter | Overall Length | (The only available carbide grade) |

Repair of Semi-Standard⁽¹⁾

Ordering Example:

| | | | | |
|------------|----------------|----------------|--|--------------------------------|
| RGD | - 05520 | - 0500 | - GR | - IC508 ⁽²⁾ |
| | Drill Diameter | Overall Length | G=Drill Profile
R=Rough
(P=Polished) | (carbide grade) ⁽²⁾ |

Repair of Special⁽¹⁾ Drills

Ordering Example:

| | | | | |
|--------------|----------------|----------------|--------------------------|------------------------|
| RSPGD | - 05520 | - 0500 | - 02051 | - 01 |
| | Drill Diameter | Overall Length | Offer No. or Drawing No. | Version No. or Drawing |

⁽¹⁾ Standard gundrills: delivery within 1-2 weeks from order (shipment time not included). Semi-standard gundrills: delivery within 2-4 weeks from order (shipping time not included) Special gundrills: delivery within 8-10 weeks from order (shipping time not included)

⁽²⁾ Available carbide grades: IC08 – uncoated grade used as a substrate for the following coated grades: IC908 (TiAlN); IC508 (TiCN+TiN); IC308 (TiCN); IC208 (TiN)

NOTE: Drill ordering dimensions are metric

Single Flute Solid Carbide Gundrill Designation **New Tools**

4-6 weeks delivery for any kind of solid carbide gundrill

Standard⁽¹⁾ Solid Carbide Drills

Ordering Example:

| | | | |
|--------------|----------------|----------------|-------------|
| STCGD | - 05500 | - 0200 | - 05 |
| | Drill Diameter | Overall Length | Driver Type |

Semi-Standard⁽¹⁾ Solid Carbide Drills

Ordering Example:

| | | | | |
|------------|----------------|----------------|-------------|--|
| CGD | - 05520 | - 0200 | - 05 | - CPIC08 |
| | Drill Diameter | Overall Length | Driver Type | C=Drill Profile
P=Polished (R=Rough)
IC08=Carbide Grade ⁽²⁾ |

Special⁽¹⁾ Solid Carbide Gundrills

Ordering Example:

| | | | | |
|--------------|----------------|----------------|--------------------------|-------------|
| SPCGD | - 05520 | - 0500 | - 02051 | - 01 |
| | Drill Diameter | Overall Length | Offer No. or Drawing No. | Version No. |

Repair of a solid carbide drill is not possible

Special⁽¹⁾ Two Flute Carbide Tipped Gundrill Designations

Ordering Example:

| | | | | |
|-------------|----------------|----------------|--------------------------|-------------|
| GD2L | - 05520 | - 0500 | - 02051 | - 01 |
| | Drill Diameter | Overall Length | Offer No. or Drawing No. | Version No. |

Standard Geometry Resharpener of Carbide Tipped Or Solid Gundrills

(See page 360)

Ordering Example:

| | |
|----------------|----------------|
| STGRIND | - 05520 |
| | Drill Diameter |

Special Geometry Resharpener

Ordering Example:

| | | | | |
|----------------|----------------|----------------|-----------|-------------|
| SPGRIND | - 05520 | - 0205 | - 02051 | - 01 |
| | Drill Diameter | Overall Length | Offer No. | Version No. |

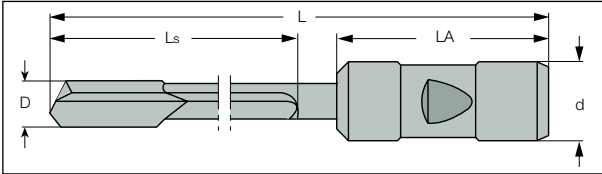
Gundrill Inquiry Form

1. Tool

Quantity _____

Nominal diameter and tolerance _____

Please fill in dimensions on the sketch below.



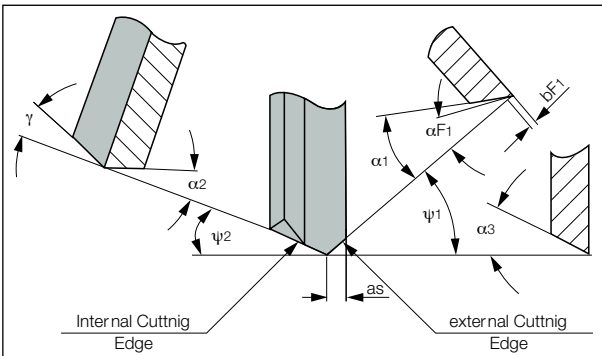
Driver

For standard drivers please use codes from page 362

Code No.

Special, please attach sketch and specifications.

Grind: special (fill in the dimensions and angles below).



$\alpha 1 =$ _____ $\alpha F1 =$ _____ $\psi 1 =$ _____

$\alpha 2 =$ _____ $bF1 =$ _____ $\psi 2 =$ _____

$\alpha 3 =$ _____ $as =$ _____ $\gamma =$ _____

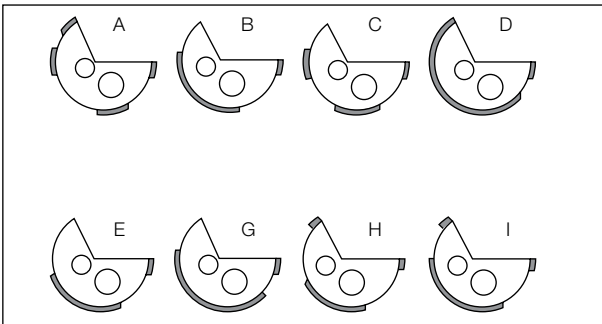
Standard (see page 360)

Coating:

- TiN TiCN TiN+TiCN Other
- IC208 (TiN) IC308 (TiCN) IC508 (TiCN+TiN)
- IC908 (TiAlN) TiAlN

Type:

Please circle the required type. See page 361.



2. Workpiece

(If possible, please attach a drawing)

2.1 Material

Material description (DIN material number or any other standard): _____

Hardness and Properties: _____

- Short Chips Long Chips

2.2 Hole Type

- Blind Hole Drilling into Pre-hole
- Angled Entry Drilling into Solid
- Boring Angled Exit

Drilling Depth _____ inch Hole Tolerance _____

2.3 Application:

Workpiece: Stationary Rotating

Tool: Stationary Rotating

3. Machine

3.1 Technical Data

Machine Type. _____

Power _____ kW

3.2 Cutting Data:

Cutting Speed V_c _____ SFM

Revolutions N_{min} _____ RPM, N_{max} _____ RPM

Feed F_{min} _____ IPR

F_{max} _____ IPR

Feed Rate V_f _____ IPM

Coolant:

- Oil Soluble Oil Other

Coolant Pressure _____ PSI

Sketch of drilling application



Note: It may be necessary to change several of the parameters that you indicated based on our experience with your application.

**Typical Gundrill Applications -
Main Drilling Methods**

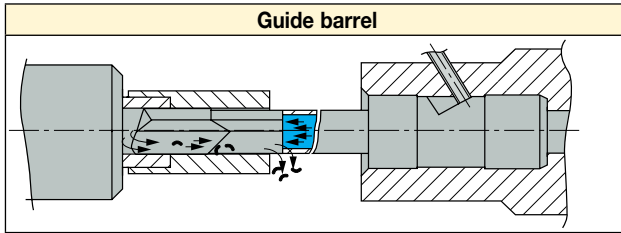


Figure 1

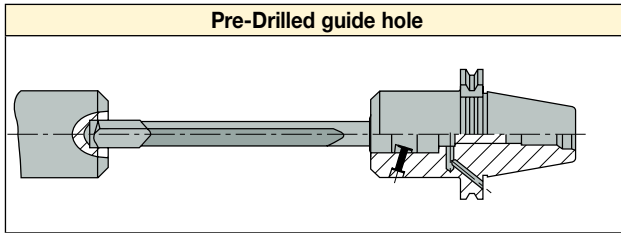


Figure 2

User Guide

The gundrill is not a self-centering tool. Therefore, an external means must be used to guide it to the point of entry into the workpiece. It is recommended that the machine tool be equipped with a means for guiding the gundrill, preferably during the entire drilling process.

An alternative method is a pre-drilled guide hole (figure 2), which is common for machining centers. Once the drill has been fully engaged into this hole, it continues to be self-guided. The guide pads contribute to the high degree of calibration and provide burnishing of the drilled hole.

**Typical Gundrill Applications -
Chip Evacuation and Coolant Flow**

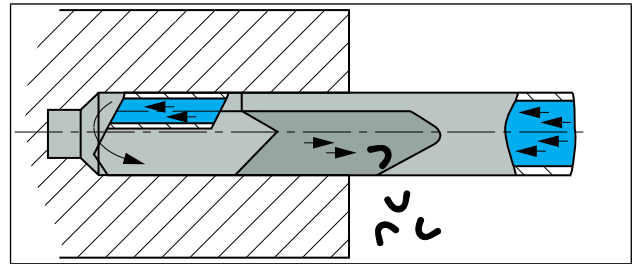


Figure 3

Boring with chip evacuation and coolant flowing opposite the boring direction

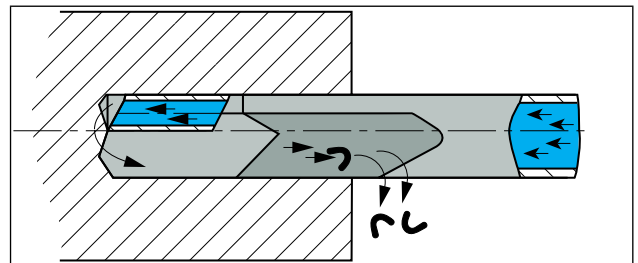


Figure 4

Drilling of solid material with chip evacuation and coolant flow opposite the drilling direction

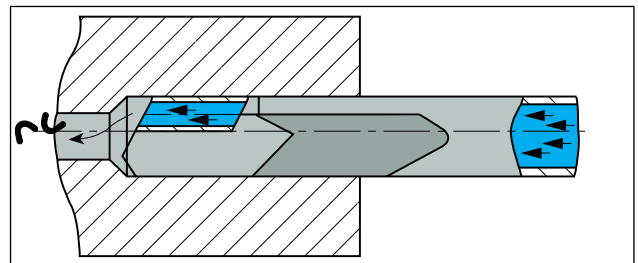


Figure 5

Boring with chip evacuation in the boring direction

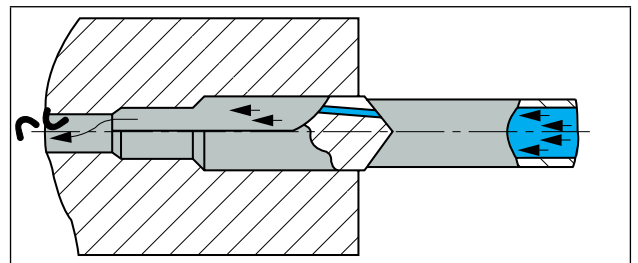
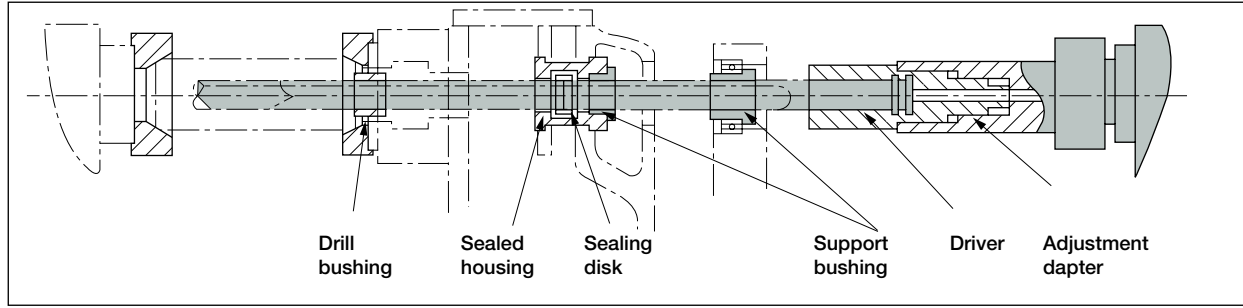


Figure 6

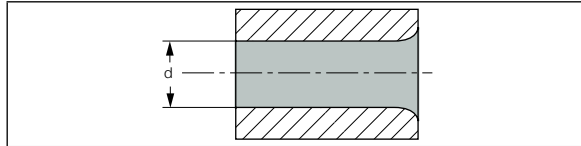
Boring with a staged tool chip evacuation and coolant flow in the boring direction

Deep Hole Machine Accessories



Bushing

Based on modified DIN 179 specify the "d" diameter of the drill. Carbide bushing is delivered only on request.



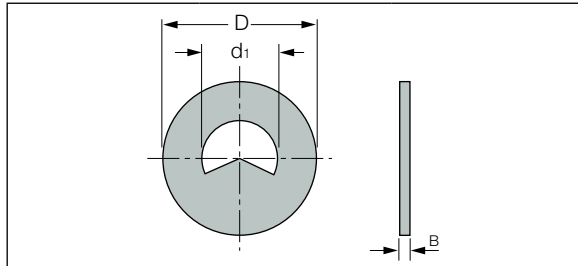
$d = \text{drill diameter} + .0008''$

Guide Bushings

As the gundrill is not a self-centering tool and its radial rigidity is low (due to diameter to length ratio), a guide bushing is an essential component for a proper gundrill operation. The function of the guide bushing is to direct the gundrill into the material during penetration. The diameter of the guide bushing should be within 800 pinch larger than the diameter of the drill. Dedicated gundrill machines are equipped with a guide bushing system.

Sealing Disk

Supplied with a single sealing disk or a protection sheet. Indicate the dimensions needed for your requirements.



Sealing disk

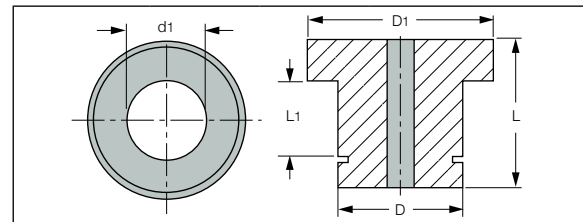
| Tool Ø "d" | Ext. Ø "D" | Thick. "B" |
|--------------|------------|------------|
| .078 to .236 | .787 | .118 |
| .122 to .612 | 1.26 | .157 |
| .613 to 1.02 | 1.57 | .157 |
| 1.03 to 1.57 | 3.54 | .157 |

Sealing disk with protection

| Tool Ø "d" | Ext. Ø "D" | Thick. "B" |
|--------------|------------|------------|
| .114 to .206 | .787 | .275 |
| .207 to .568 | 1.26 | .433 |
| .569 to 1.02 | 1.57 | .492 |
| 1.03 to 1.61 | 3.54 | .492 |

Support Bushing

Indicate the "d" diameter of the drill

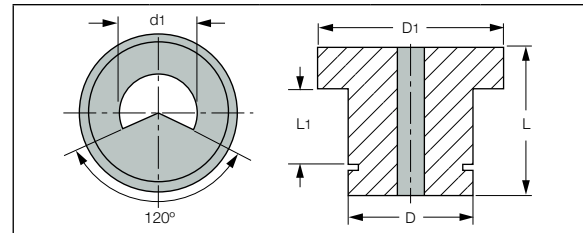


Support bushing

| Tool Ø "d1" | Ext. Ø "D" | Ext. Ø "D1" | Length "L" | Length "L1" |
|--------------|------------|-------------|------------|-------------|
| .074 to .645 | .787 | 1.02 | .787 | .492 |
| .074 to 1.02 | 1.18 | 1.49 | 1.02 | .630 |
| .074 to 1.33 | 1.77 | 1.96 | 1.02 | .630 |

Support Bushing With "V" Form

Indicate the "d" diameter of the drill



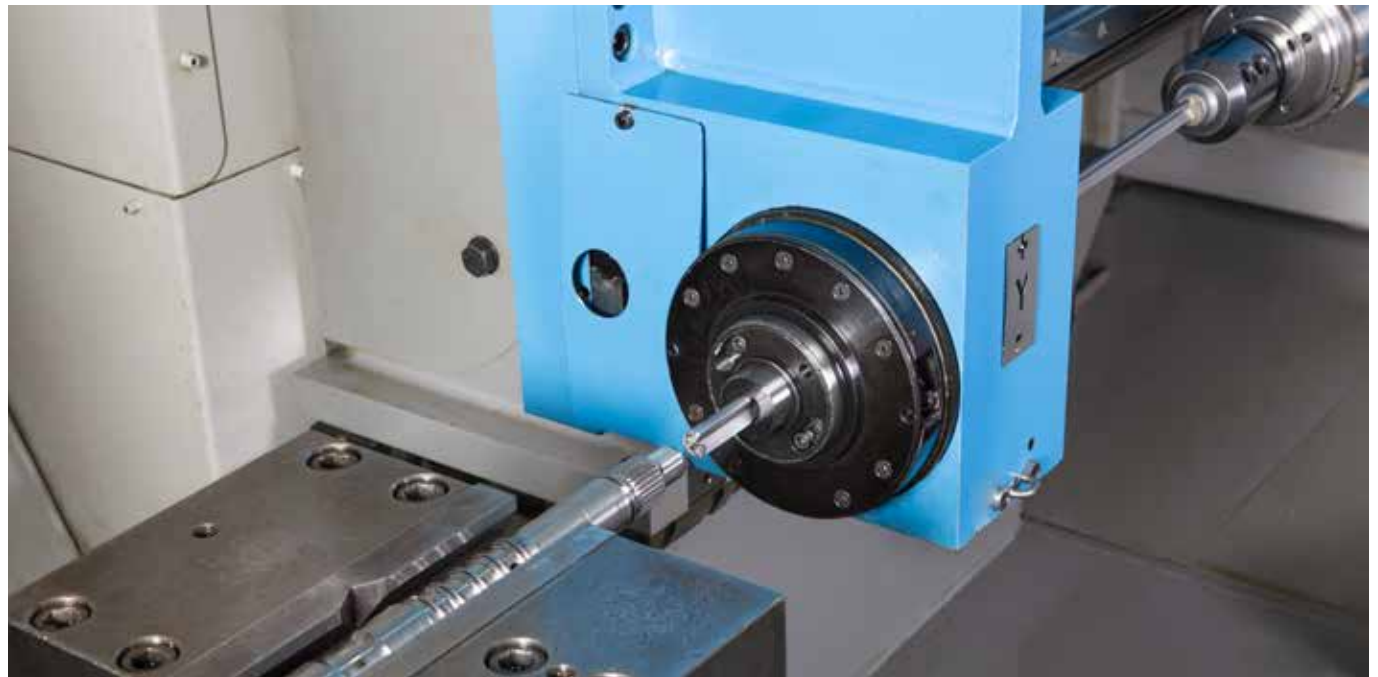
Support bushing with "V" form

| Tool Ø "d1" | Ext. Ø "D" | Ext. Ø "D1" | Length "L" | Length "L1" |
|--------------|------------|-------------|------------|-------------|
| .074 to .645 | .787 | 1.02 | .787 | .492 |
| .074 to .936 | 1.18 | 1.49 | 1.02 | .630 |

Gundrill Troubleshooting Guide

| | Possible causes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------|-----------------|---------------------------|----------------------|------------------------|-------------------|---------------|--------------|------------------------|-----------------------|--------------------|--------------------------------|-----------------------------|--------------|-----------------|---------------------------|---------------|---------------|-----------------------|---------------------------|-------------------------|-----------------------|------------|-------------------|-------------------------------------|-------------------|--------------------------|-----------------------|---------------------|----------------------|----------------------------------|-----------------------------------|------------------------|----------------|----------------------|---|---|
| Hole problems | Poor clamping | Insufficient coolant flow | Low coolant pressure | Incorrect coolant type | Feed fluctuations | Too high feed | Too low feed | Spindle speed too high | Spindle speed too low | Material structure | Material shrinking due to heat | Workpiece thin wall section | Misalignment | Undersized hole | Rough cutting edge finish | Built up edge | Worn out edge | Interrupted chip flow | Too small flute clearance | Incorrect drill profile | Incorrect head angles | Vibrations | Oversized bushing | A gap between bushing and workpiece | Bushing undersize | Loss of coolant pressure | High coolant pressure | Overheating coolant | Insufficient coolant | Head inside angle excessive wear | Head outside angle excessive wear | Too short carbide head | Tool heal drag | Worn supporting pads | | |
| Oversize | + | + | | | | + | | | | | | | + | | | + | | + | | + | + | + | + | + | + | | + | | + | + | + | + | + | + | + | |
| Undersize | | | + | | | | | | | | + | | | | | | | | | + | + | + | | + | + | + | | | | | | | | | | |
| Rough surface finish | | + | + | + | + | + | | | | + | + | | | + | | + | + | + | | + | + | + | + | + | + | + | | + | | | | | | | | |
| Runout | + | | | | + | + | | | + | + | + | + | + | | + | + | + | + | + | + | + | + | + | + | + | + | | | | | | | | | | + |
| Conical entrance | | | | | | + | | | | | | | | | | | | | | | + | + | + | + | + | + | | | | | | | | | | |
| Curved hole axis | + | | | | + | + | | | | + | | + | + | | + | + | + | + | + | + | + | + | + | + | + | + | + | | | | | | | | | |

| Drill problems | Poor clamping | Insufficient coolant flow | Low coolant pressure | Incorrect coolant type | Feed fluctuations | Too high feed | Too low feed | Spindle speed too high | Spindle speed too low | Material structure | Material shrinking due to heat | Workpiece thin wall section | Misalignment | Undersized hole | Rough cutting edge finish | Built up edge | Worn out edge | Interrupted chip flow | Too small flute clearance | Incorrect drill profile | Incorrect head angles | Vibrations | Oversized bushing | A gap between bushing and workpiece | Bushing undersize | Loss of coolant pressure | High coolant pressure | Overheating coolant | Insufficient coolant | Head inside angle excessive wear | Head outside angle excessive wear | Too short carbide head | Tool heal drag | Worn supporting pads | | | | | | |
|-----------------------|---------------|---------------------------|----------------------|------------------------|-------------------|---------------|--------------|------------------------|-----------------------|--------------------|--------------------------------|-----------------------------|--------------|-----------------|---------------------------|---------------|---------------|-----------------------|---------------------------|-------------------------|-----------------------|------------|-------------------|-------------------------------------|-------------------|--------------------------|-----------------------|---------------------|----------------------|----------------------------------|-----------------------------------|------------------------|----------------|----------------------|---|---|---|---|---|---|
| Breakage | + | + | + | | + | + | | + | | + | + | + | + | + | + | + | + | + | | + | + | + | + | + | + | + | | | | | | | + | + | + | + | | | | |
| Chipping | | | | | + | | + | | | | + | | | | + | | + | | + | | + | + | + | + | + | + | | | | | | | | | | + | + | | | |
| Poor drill life | | + | + | + | + | + | + | + | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Excessive margin wear | + | | | + | | | | + | | | | | | + | + | | + | + | + | + | + | + | + | + | + | + | + | | | | | | | | | | + | + | | |
| Excessive corner wear | | | | + | | | | + | | + | + | | | | + | + | + | + | + | + | + | + | + | + | + | + | + | | | | | | | | | | | + | + | |
| Excessive flank wear | | + | + | | + | | + | + | | | | | | + | + | | | | + | + | + | + | + | + | + | + | + | | | | | | | | | | | + | + | |
| Drill heat | | + | | | + | | + | + | | | + | | | + | + | | | | + | + | + | + | + | + | + | + | + | | | | | | | | | | | + | + | |
| Flute bending | | | | | + | + | | + | | | | | | + | | | | | + | + | + | + | + | + | + | + | + | | | | | | | | | | | + | + | |
| Damaged wear pad | | | | + | | | + | | + | + | + | | + | + | | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Built-up edge | | | | + | + | + | + | | + | + | | | | | + | | + | | + | + | + | + | + | + | + | + | + | | | | | | | | | | | | + | + |
| Cratering | | | | + | | + | | + | | + | + | | | | + | | + | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |



Gundrill Recommended Machining Conditions

| ISO | Material | Condition | Tensile Strength [ksi] | Hardness HB | Material Group No. ⁽¹⁾ | Cutting Speed V _c SFM | Feed (IPR) Vs. Drill Diameter (inch) | | | | | | |
|--------------|--|-----------------------|-----------------------------|--------------|-----------------------------------|----------------------------------|--------------------------------------|-------------|-------------|-------------|-------------|-------------|---------|
| | | | | | | | .079-.385 | .386-.460 | .461-.519 | .520-.637 | .638-1.575 | | |
| P | Non-alloy steel and cast steel, free cutting steel | <0.25% C | Annealed | 61 | 125 | 1 | 230 - 360 | .0004-.0012 | .0012-.002 | .0014-.0024 | .0016-.0028 | .0008-.0039 | |
| | | ≥0.25% C | Annealed | 94 | 190 | 2 | 260 - 360 | | | | | | |
| | | <0.55% C | Quenched and tempered | 123 | 250 | 3 | 230 - 330 | | | | | | |
| | | ≥0.55% C | Annealed | 109 | 220 | 4 | 230 - 360 | | | | | | |
| | Low alloy and cast steel (less than 5% of alloying elements) | Quenched and tempered | Annealed | 87 | 200 | 6 | 260-360 | .0004-.0012 | .0012-.002 | .0014-.0024 | .0016-.0028 | .0008-.0039 | |
| | | | 135 | 275 | 7 | 230-360 | | | | | | | |
| | | | 145 | 300 | 8 | 195-295 | | | | | | | |
| | High alloyed steel, cast steel and tool steel | Quenched and tempered | 174 | 350 | 9 | 165-260 | .0004-.0012 | .001-.0016 | .0012-.0018 | .0014-.002 | .0008-.0039 | | |
| | | | 99 | 200 | 10 | 165-230 | | | | | | | |
| | Stainless steel and cast steel | Ferritic/martensitic | Martensitic | 99 | 200 | 12 | 130-230 | .0004-.0012 | .001-.0016 | .0012-.0018 | .0014-.002 | .0008-.0039 | |
| 119 | | | | 240 | 13 | | | | | | | | |
| M | Stainless steel and cast steel | Austenitic, duplex | 87 | 180 | 14 | 130 - 260 | .0004-.0012 | .001-.0016 | .0012-.0018 | .0014-.002 | .0008-.0039 | | |
| K | Gray cast iron (GG) | Ferritic/pearlitic | Pearlitic/martensitic | 180 | 15 | 230-330 | .0004-.0016 | .0016-.004 | .002-.0047 | .0024-.0055 | .002-.008 | | |
| | | | | 260 | 16 | 230-330 | | | | | | | |
| | Nodular cast iron (GGG) | Ferritic | 160 | 17 | 260-360 | | | | | | | | |
| | | Pearlitic | 250 | 18 | 260-360 | | | | | | | | |
| | Malleable cast iron | Ferritic | 130 | 19 | 295-375 | | | | | | | | |
| Pearlitic | 230 | 20 | 295-375 | | | | | | | | | | |
| N | Aluminum-wrought alloys | Not hardenable | Hardenable | 60 | 21 | 260-525 | .0008-.0012 | .0012-.0067 | .0012-.0071 | .0014-.0075 | .0012-.0059 | | |
| | | | | 100 | 22 | | | | | | | | |
| | Aluminum-cast alloys | ≤12% Si | Not hardenable | Hardenable | 75 | | | | | | | 23 | |
| | | | | | 90 | | | | | | | 24 | |
| | Copper alloys | >12% Si | High temperature | Free cutting | 130 | | | | | | | 25 | 260-395 |
| | | | | | 110 | | | | | | | 26 | |
| Non metallic | Duroplastics, fiber plastics | Hard rubber | | 90 | 27 | 260-590 | .0008-.0012 | .0008-.0052 | .0012-.0063 | .0016-.0071 | .0012-.0059 | | |
| | | | | 100 | 28 | | | | | | | | |
| S | High temperature alloys | Fe based | Ni or Co based | Annealed | Hardened | 80-195 | .0004-.0012 | .001-.0012 | .0012-.0014 | .0012-.0016 | .0008-.0039 | | |
| | | | | | | | | | | | | 200 | 31 |
| | | | | | | | | | | | | 280 | 32 |
| | | | | | | | | | | | | 250 | 33 |
| | | | | | | | | | | | | 350 | 34 |
| | Titanium alloys | Pure | Alpha+Beta alloys, hardened | 58 | 36 | | | | | | | | |
| | | | | 152 | 37 | | | | | | | | |
| H | Hardened steel | Hardened | Hardened | 55 HRC | 38 | 65-165 | .0004-.0012 | .001-.0012 | .0012-.0014 | .0012-.0016 | .0008-.0039 | | |
| | | | | 60 HRC | 39 | | | | | | | | |
| | Chilled cast iron | Cast | 400 | 40 | | | | | | | | | |
| Cast iron | Hardened | 55 HRC | 41 | | | | | | | | | | |

⁽¹⁾ For workpiece materials list, see pages 573-604