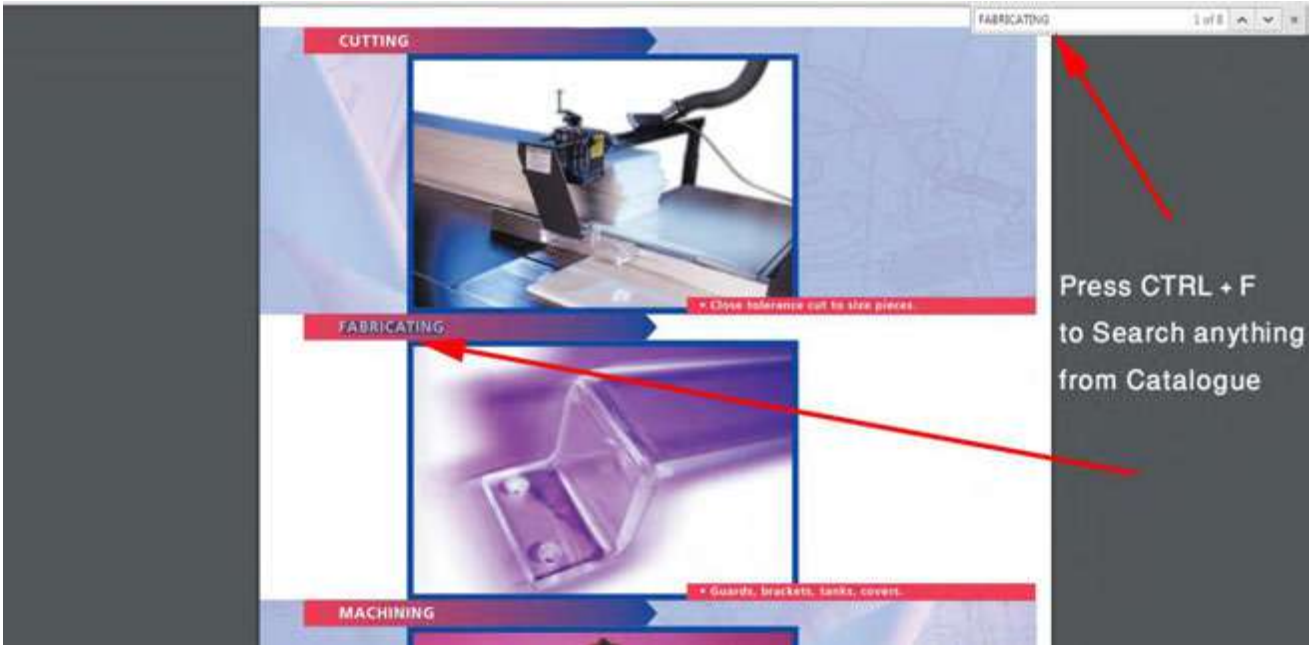


USER GUIDE



USER GUIDE



PLASTICS

FOR INDUSTRY

JOHNSTON INDUSTRIAL PLASTICS LIMITED

 Johnston industrial plastics
LIMITED

CUTTING



- Close tolerance cut to size pieces.

FABRICATING



- Guards, brackets, tanks, covers.

MACHINING



- Rollers, guides, spacers, wear parts, nozzles, screw machine parts, gears and many other finished parts.

T A B L E O F C O N T E N T S

INTRODUCTION — SELECTION GUIDE 2 — 4

MECHANICAL PLASTICS 5 — 34

Nylon,
MC901[®],
Nylatron[®],
Acetal,
Delrin AF[®],
Ertalyte[®],
High Density Polyethylene,
Low Density Polyethylene,
UHMW Polyethylene,
Tivar 88[®],
Industrial Laminates.

CORROSION RESISTANT PLASTICS 35 — 56

PVC,
CPVC,
Polypropylene,
PTFE.

GLAZING, GRAPHICS, GUARDS 57 — 78

Acrylic,
Polycarbonate,
Copolyester,
Flexible Vinyl,
Foam PVC,
ABS,
High Impact Polystyrene,
Acetate,
Polyester,
FRP.

FLEXIBLE TUBINGS 79 — 88

Nylon,
Low Density Polyethylene,
Vinyl (Jayon, Jayflex, Jayflex Braid Reinforced),
PVC Hose,
PTFE,
Heat Shrinkable.

HOT AIR TOOLS, CEMENTS 89 — 98

Leister,
Welding Information,
Weld-On Adhesives,
Cements.

HIGH PERFORMANCE MATERIALS 98 — 101

PVDF,
PEEK,
Torlon[®],
Semitron[®],
Fluorosint[®],
Vespel[®],
Ultem[®],
PPS,
Celazole[®],
Noryl[®],
Polysulfone,
PCTFE[®],
FEP,
PFA,
Halar[®],
Tefzel[®],
Cross Linked Polystyrene,
Polyurethane.

TECHNICAL SECTION 102 — 142

Properties Explained,
Property Charts,
Properties Ranked,
Conversion Chart,
Yield Factors,
Plastic Identification Chart,
Chemical & Environmental Resistance,
Chemical Resistance Charts,
Machining Instructions,
Military, Federal
and AMS Specifications.

INDEX 143 — 148

Registered Trademarks.

TERMS AND CONDITIONS

Inside back cover

CUTTING, MACHINING AND FABRICATING

Inside front cover

WELCOME TO JOHNSTON INDUSTRIAL PLASTICS

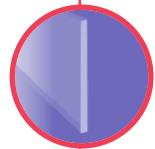
As the oldest Canadian distributor of plastics shapes, we feel that we have the experience to offer the best of everything to our many customers. We have a track record of providing great service, quality materials and close tolerance cutting, machining and fabricating since 1942.

Our commitment to the future is tied in with our philosophy of constant improvement. We are registered, in Toronto and Montreal, to ISO 9001:2008. Always seeking ways to better serve our customers, our ability to meet your needs quickly is aided by our very large inventories coupled with our experienced and knowledgeable staff.

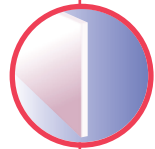
This catalogue is designed to assist you in reaching informed decisions about the best material for your application. The icons described on the following page and evident throughout are meant to give guidance in a very preliminary way. The property and application information included on each page is meant to be a first step in product selection. The technical section starting on page 102 will give you more detailed physical and chemical properties to aid in the selection process. If more information is required, please call our closest branch location.



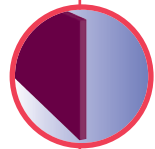
O U R P R O D U C T S



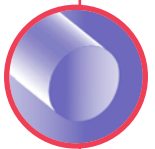
Clear Sheet



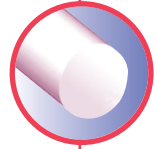
White Sheet



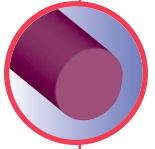
Coloured Sheet
Represents all colours.
Check listing.



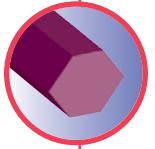
Clear Rod



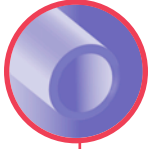
White Rod



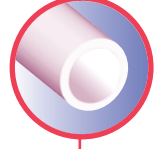
Coloured Rod
Represents all colours.
Check listing.



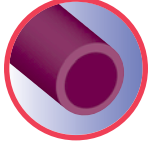
Hexagonal Rod
In solid colours.



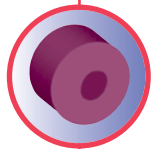
Clear Rigid Tubing



White Rigid Tubing



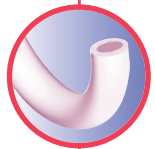
Coloured Rigid Tubing
Represents all colours.
Check listing.



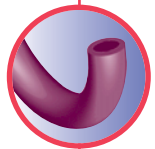
Cylinder
In solid colours.



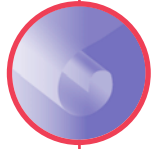
Clear Flexible Tubing
Includes braid reinforced.



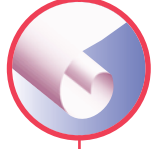
White Flexible Tubing



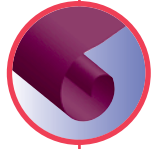
Coloured Flexible Tubing
Represents all colours.
Check listing.



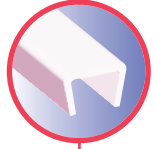
Clear Flexible Roll



White Flexible Roll



Coloured Flexible Roll
Represents all colours.
Check listing.



White Profile



Coloured Profile
Represents range of profile configurations.



Temperature

A scale of continuous operating temperature from 60°C (1) to 260°C and over (10).



Electrical

A scale of dielectric strength from less than 300 volts/mil (1) to over 800 volts/mil (10).



Chemical

A very general blended ranking from poor (1) to fair (4) to good (7) to excellent (10). Some agents may attack a plastic which is otherwise very chemically resistant.



Impact

A scale of notched izod impact strength (Ft. Lbs./In.) from less than 1 (1) to over 25 (10). Some materials are notch sensitive so may perform better in unnotched tests.



Wear

A blended ranking of wear resistant characteristics like abrasion resistance which is useful in sliding applications and PV valves which are helpful in bearing applications.



Cost

A general scale from the least expensive materials such as Polyethylene to the most expensive high performance materials such as Polyimide. Engineering materials like Nylon will fall somewhere in between.

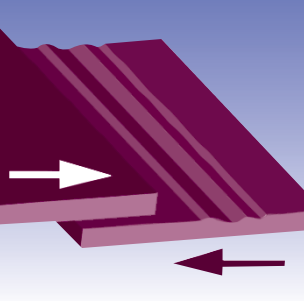


Food

This symbol indicates material that can be produced from resin which meets standards for direct food contact. Many stock plastics are made from food compatible resins. Others can be specially ordered.

MATERIAL SELECTION

WEAR



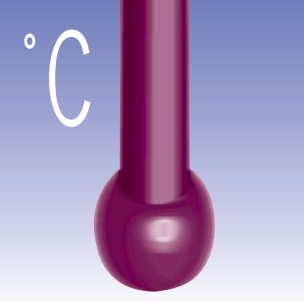
NYLON,
ACETAL,
UHMW,
PTFE,
ERTALYTE,
TORLON,
DELTRIN AF,
POLYIMIDE.

IMPACT



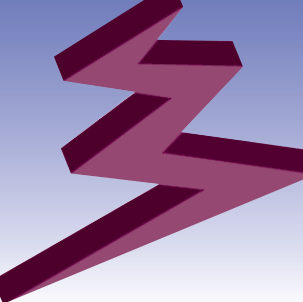
POLYCARBONATE,
UHMW,
LOW DENSITY POLYETHYLENE,
HIGH DENSITY POLYETHYLENE,
TYPE II PVC,
PVDF,
NORYL,
PTFE,
GLASS LAMINATES.

HIGH TEMPERATURE



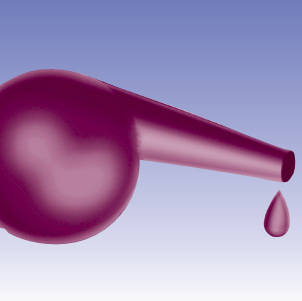
PTFE,
PPS,
ULTEM,
PEEK,
POLYSULFONE,
TORLON,
POLYIMIDE,
GLASS LAMINATES,
POLYCARBONATE.

ELECTRICAL



PTFE,
POLYIMIDE,
TORLON,
PRESSURE LAMINATES,
ULTEM,
CAST NYLON,
POLYPROPYLENE,
POLYETHYLENE,
PPS.

CHEMICAL



PTFE,
POLYPROPYLENE,
PVC,
CPVC,
PVDF,
PPS,
HIGH DENSITY POLYETHYLENE,
PEEK,
POLYIMIDE.

M E C H A N I C A L

NYLONS

Nylon is the generic name for a family of long-chain polymeric amides. General characteristics of the nylons include toughness, strength, abrasion and fatigue resistance, low coefficient of friction, resiliency and heat resistance. Many of these properties can be enhanced by the addition of fillers such as molybdenum disulphide. Nylons are resistant to hydrocarbons, alkalis, ketones and esters, but are attacked by most acids and oxidizing agents. The hygroscopic nature of all nylons should be considered when working with these materials. Moisture absorption will effect dimensional change and alter many physical properties. The moisture content of nylon 6 and 6/6 under normal atmospheric conditions is approximately 3% and in equilibrium with water 8%. The moisture content of nylon 11 under the same conditions is considerably lower.

TYPE 6 NYLON:

Outstanding tensile strength and abrasion resistance, very high impact strength, low coefficient of friction and good shock and vibration dampening qualities make extruded type 6 extremely versatile for general applications.

Cast nylon type 6 exhibits improved tensile and compressive strengths, better abrasion resistance, improved dimensional stability, lower cold flow, greater hardness and superior electrical properties. Casting type 6 nylon also allows for a much greater variety of possible shapes and sizes.

TYPE 6/6 NYLON:

The strongest of the unmodified, extruded nylons, type 6/6 possesses great versatility. It can replace a wide range of materials including steel, bronze, brass, aluminum, phenolics, wood and rubber in many applications. Natural type 6/6 conforms to FDA requirements, making it acceptable to the food processing industry.

TYPE 11 NYLON:

Because it absorbs a great deal less moisture than other nylons, type 11 can be employed in applications where dimensional stability in the presence of moisture is critical.

MOLYBDENUM DISULPHIDE-FILLED NYLON:

The addition of MoS₂, a solid lubricant, to nylons reduces the coefficient of friction and improves many mechanical thermal properties. The lower coefficient of friction permits the nylon to operate with little or no lubrication. Nylatron GS is a molybdenum disulphide-filled nylon type 6/6, extruded. Nylatron GSM is a molybdenum disulphide-filled nylon type 6, cast.

OTHER FILLED NYLONS:

Glass-filled nylon exhibits greater hardness and lower moisture absorption than unfilled nylons. Carbon-filled nylon markedly diminishes the effect of ultra-violet rays.

ACETAL

Acetal is a highly crystalline form of polymerised formaldehyde. Standard shapes are produced from copolymer (Celcon) or homopolymer (Delrin) resins. Acetal has great strength, stiffness and toughness. It is characterized by a low coefficient of friction and good bearing characteristics.

Physical properties remain constant in a variety of environments since it absorbs only minimum amounts of moisture. Under conditions of high moisture, acetal bearings can out perform nylon by 4 to 1. However, under conditions of average humidity, nylons are superior to acetals in impact strength and abrasion resistance. Dimensional stability of acetal allows for the machining of close tolerance parts.

Acetal has good resistance to organic solvents and other chemicals but is attacked by strong acids and bases. It has a relatively high melting point and can be used in continuous exposure to temperatures of 82°C and in intermittent exposure to 93°C. It has high dielectric strength so can be used in many electrical applications.

Most acetals are FDA compliant for applications involving contact with food.

DELRIN AF BLEND:

Delrin AF is a combination of 22% PTFE fibers uniformly dispersed in Delrin Acetal resin. This combination produces a material that has the strength, toughness, dimensional stability and good machinability which approaches that of Delrin, plus the surface characteristics of PTFE. Delrin AF is commonly supplied as Delrin AF Blend (2 parts Delrin AF to 1 part Delrin). It can also be supplied as 1 to 1 blend. Delrin AF Blend is ideal for moving parts where low friction and long wear are important. Bearings have excellent sliding/friction properties and will sustain high loads when operating at high speeds while showing reduced wear. Although Delrin AF Blend retains much of the strength of Delrin, some properties are changed due to the addition of the less stiff and softer PTFE fiber.

M E C H A N I C A L

ERTALYTE® PET-P

Ertalyte® is an unreinforced, partly crystalline thermoplastic polyester based on polyethylene terephthalate (PET-P). It is characterized as having excellent wear resistance and a low coefficient of friction, together with high modulus, low creep and superior dimensional stability. Ertalyte's specific properties make it especially suitable for the manufacture of mechanical precision parts which are capable of sustaining high loads and wear conditions. Ertalyte's continuous service temperature is approximately 10% higher than acetals, and its melting point is almost 150° F higher.

In addition, Ertalyte® PET-P offers good strength combined with good chemical and abrasion resistance. Its low moisture absorption enables its mechanical and electrical properties to remain virtually unaffected by ambient moisture. These qualities, combined with FDA compliance, make Ertalyte® PET-P an excellent candidate for food contact applications. Ertalyte® PET-P can be intricately machined on standard metal working equipment.

POLYETHYLENES

Polyethylene materials are divided into categories based on their specific gravity:

- (a) low density polyethylene having specific gravity of 0.910 — 0.925,
- (b) medium density polyethylene, specific gravity of 0.926 — 0.940, and
- (c) high density (linear) polyethylene, specific gravity 0.941 — 0.965.

The major advantages of polyethylenes are light weight, excellent chemical resistance, low moisture absorption, good impact strength, excellent low temperature properties, superb dielectric properties and low coefficient of friction. Unmodified polyethylenes can be produced from resins which are approved for food applications.

Increases in density result in: improved chemical resistance, greater hardness and tensile strength, better gas barrier properties, greater creep and temperature resistance.

Polyethylenes can be shaped and formed by standard heat forming techniques. If polyethylene is heated to within 5°C of its melting point, it can be shaped easily and will retain its imposed form on cooling. High density polyethylene for instance should be heated to a range of 130°C — 135°C for forming.

Polyethylenes are very sensitive to the influence of oxygen in the air. The material becomes brittle and breakable after long exposure to air. The damaging effect of oxygen in the air is accelerated by ultra-violet rays. It is for this reason that articles made of polyethylenes which are exposed to sunlight and air must be protected by special additives. Carbon black is the most effective additive for this purpose. In all other respects polyethylenes are very stable.

Polyethylenes can be readily welded with HOT AIR. However, since oxygen at high temperatures has a tendency to degrade these materials, inert gas such as nitrogen should be used to weld this material.

LOW DENSITY POLYETHYLENE:

Softest of the polyethylenes with lowest tensile strength but highest impact strength. Recommended for use in temperatures ranging from -70° C to 80° C. Common mill shapes are: film, sheet, rod, tubing and lay flat tubing.

HIGH DENSITY POLYETHYLENE:

Very versatile material used in many food contact, chemical and wear resistant applications. Recommended for use at temperatures ranging from -70°C to 82°C. Standard mill shapes are: sheet, rod, tubing and pipe.

ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE:

UHMW has a very low coefficient of friction. Frictional wear on unlubricated surfaces in contact with UHMW is less than with any other plastic. UHMW also displays extraordinary resistance to abrasive wear by gritty materials. It is recommended for use at temperatures ranging from -30°C to 82°C. Not recommended for thermo forming. Standard mill shapes are: sheet, rod, tubular bars and profiles.

TIVAR 88®:

Tivar 88® is a premium grade UHMW. A special low coefficient of friction, excellent shock strength and high abrasion and corrosion resistance help solve material flow, abrasion and corrosion problems.

PRODUCT CODE:

CAST NYLON SHEET

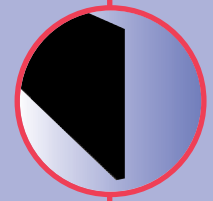
MC 901®	COLOUR: BLUE	SHEET SIZE: 24" X 48", 48" X 120"	4500
NYLATRON GSM®	COLOUR: GREY	SHEET SIZE: 24" X 48", 48" X 120"	4300
NYLATRON GSM®	COLOUR: BLUE	SHEET SIZE: 24" X 48"	4310

MC 901® STOCK NUMBER	NYLATRON GS® STOCK NUMBER	NYLATRON STOCK NUMBER	THICKNESS APPROX.	LBS./SQ.FT. APPROX.
4500 0187	4300 0187	-----	3/16	1.12
4500 0250	4300 0250	4310 0250	1/4	1.50
4500 0375	4300 0375	4310 0375	3/8	2.25
4500 0500	4300 0500	4310 0500	1/2	2.99
4500 0625	4300 0625	4310 0625	5/8	3.75
4500 0750	4300 0750	4310 0750	3/4	4.49
4500 1000	4300 1000	4310 1000	1	5.99
4500 1250	4300 1250	-----	1-1/4	7.48
4500 1500	4300 1500	-----	1-1/2	8.99
4500 1750	4300 1750	-----	1-3/4	10.48
4500 2000	4300 2000	-----	2	11.98
4500 2250	4300 2250	-----	2-1/4	13.48
4500 2500	4300 2500	-----	2-1/2	14.98
4500 2750	4300 2750	-----	2-3/4	16.47
4500 3000	4300 3000	-----	3	17.97
4500 3250	4300 3250	-----	3-1/4	19.47
4500 3500	4300 3500	-----	3-1/2	20.97
4500 3750	4300 3750	-----	3-3/4	22.46
4500 4000	4300 4000	-----	4	23.96

PROPERTIES

- Wear resistance.
- Low coefficient of friction.
- High tensile strength.
- Excellent impact resistance.
- High heat distortion temperature.
- Excellent vibration, peening resistance.
- High fatigue resistance.
- Easy machining.
- Corrosion resistant.
- Lightweight.
- Direct food contact*.

*MC 907® Natural only - complies with section 177.15000 of Food Additive regulations. USDA approved.



NYLATRON NSM®	COLOUR: GREY	SHEET SIZE: 24" X 48"	4800
---------------	--------------	-----------------------	------

STOCK NUMBER	THICKNESS INCHES	LBS./FT APPROX
4800 02502448	1/4	1.60
4800 03752448	3/8	2.36
4800 05002448	1/2	3.13
4800 06252448	5/8	3.89
4800 07502448	3/4	4.65
4800 10002448	1	6.18
4800 15002448	1-1/2	9.23
4800 20002448	2	12.28

- TYPICAL APPLICATIONS**
- Bearings
 - Bushings
 - Wear parts
 - Gears
 - Valve seats
 - Liners
 - Sheaves
 - Tooling fixtures

- MC901® is a general purpose, high strength Nylon type 6, Monomer cast. NYLATRON GSM® is a Molybdenum Disulfide Filled, high-strength Nylon Type 6, Monomer cast. Both are produced to meet U.S. Federal specification LP-410B. Unfilled Monomer cast nylon type 6 is available in natural colour.
- NYLATRON GSM® BLUE is the first cast nylon to combine both molybdenum disulphide and oil for the load capacity of Nylatron GSM nylon, plus improved frictional characteristics. It is dark blue in colour. Available in thickness ranging from 3/16" to 4" in sheet sizes of 24" x 48" and 48" x 120".
- Thickness tolerance + 0.025", - 0.000".
- Inquire about our cut to size abilities.
- Gear blanks in both MC 901® and NYLATRON GSM® are available in diameters ranging from 2" to over 20" in thicknesses from 1/2" to 3".
- Gear ring blanks in both MC 901® and NYLATRON GSM® are available in O.D.'s ranging from 2" to over 18" with wall thicknesses from 1/4" to 3".

NYLATRON LIG/LFG® SHEET

- NYLATRON LIG® combines the toughness of cast nylon with an oil-based lubricant that is encapsulated within the nylon matrix. It increases the load bearing performance of the material when compared to unfilled nylons and reduces the coefficient of friction.
- NYLATRON LFG® takes the performance of NYLATRON LIG® and adds FDA compliance for applications where food contact is possible.
- Thickness available range from 1/4" to 4".
- Sheet sizes are 24" x 48" and 48" x 120".



PRODUCT CODE:

NYLON SHEET (TYPE 6 CAST)

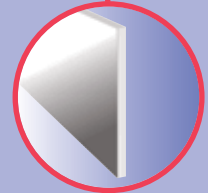
COLOUR: NATURAL

4010

STOCK NUMBER	NOMINAL THICKNESS INCHES	ACTUAL THICKNESS		LBS./SQ.FT. APPROX.	KG/SQ.M APPROX.
		INCHES	MM		
4010 0250 4997	1/4	0.250	6.35	1.45	7.08
4010 0375 4997	3/8	0.393	10.0	2.31	11.32
4010 0500 4997	1/2	0.511	12.0	3.00	14.70
4010 0625 4997	5/8	0.629	16.0	3.70	18.12
4010 0750 4997	3/4	0.787	20.0	4.63	22.68
4010 1000 4997	1	0.984	25.0	5.79	28.35
4010 1250 4997	1-1/4	1.181	30.0	6.94	34.03
4010 1500 4997	1-1/2	1.574	40.0	9.26	45.35
4010 2000 4997	2	1.968	50.0	11.57	56.70
4010 2250 4997	2-1/4	2.240	57.0	13.19	64.64
4010 2500 4997	2-1/2	2.559	65.0	15.05	73.7
4010 3000 4997	3	3.149	80.0	18.52	90.7
4010 4000 4997	4	3.937	100.0	23.15	113.4

PROPERTIES

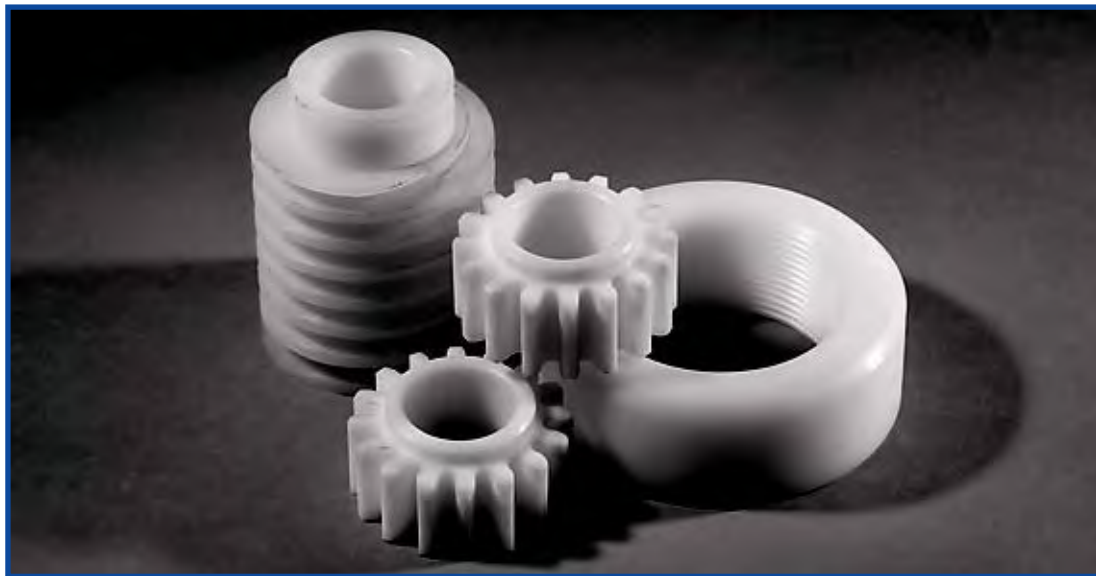
- Wear resistance.
- Low coefficient of friction.
- High tensile strength.
- Excellent impact resistance.
- High heat distortion temperature.
- High fatigue resistance.
- Easy machining.
- Corrosion resistant.
- Lightweight.



TYPICAL APPLICATIONS

- Bearings
- Gears
- Tooling fixtures
- Wear parts
- Liners
- Guides

- Sheet size: Up to 2" — 49" x 97"
Over 2" — 24" x 48". Available in 49" x 97".
- Tolerances: 6.35mm - 10mm +1.5mm, +0.2mm
12mm - 25mm +1.5mm, +0.3mm
30mm - 50mm +2.5mm, +0.5mm
55mm - 60mm +3.5mm, +0.5mm
70mm - 100mm +5.0mm, +0.5mm
- Inquire about our cut to size abilities.
- Type 6 NYLON is a general purpose nylon. It meets or exceeds specifications MIL-M206 93A and LP410A.



PRODUCT CODE:

NYLON SHEET (TYPE 6/6 AND NYLATRON GS®)

TYPE 6/6	COLOUR: NATURAL	SHEET SIZE: 24" X 48"	4200
NYLATRON GS®	COLOUR: GREY	SHEET SIZE: 24" X 48"	4100

TYPE 6/6 STOCK NUMBER	NYLATRON GS® STOCK NUMBER	THICKNESS INCHES	TYPE 6/6 LBS./SQ.FT. APPROX.	NYLATRON GS® LBS./SQ.FT. APPROX.
4200 0062 2448	4100 0062 2448	1/16	0.368	0.371
4200 0093 2448	4100 0093 2448	3/32	0.551	0.556
4200 0125 2448	4100 0125 2448	1/8	0.741	0.748
4200 0187 2448	4100 0187 2448	3/16	1.109	1.112
4200 0250 2448	4100 0250 2448	1/4	1.482	1.495
4200 0375 2448	4100 0375 2448	3/8	2.224	2.244
4200 0500 2448	4100 0500 2448	1/2	2.965	2.992
4200 0625 2448	4100 0625 2448	5/8	3.71	3.74
4200 0750 2448	4100 0750 2448	3/4	4.45	4.49
4200 0875 2448	4100 0875 2448	7/8	5.19	5.24
4200 1000 2448	4100 1000 2448	1	5.93	5.98
4200 1250 2448	4100 1250 2448	1-1/4	7.41	7.48
4200 1500 2448	4100 1500 2448	1-1/2	8.90	8.98
4200 1750 2448	4100 1750 2448	1-3/4	10.38	10.47
4200 2000 2448	4100 2000 2448	2	11.86	11.97

6/6 NYLON PROPERTIES

- High wear and abrasion resistance.
- Low coefficient of friction.
- Non-abrasive to other materials.
- Good electrical insulating properties.
- FDA compliant.
- Ease of fabrication.

NYLATRON GS® PROPERTIES

- Greater wear resistance.
- Low surface friction.
- Higher strength and rigidity.
- Superior heat resistance.
- Improved dimensional stability.



TYPICAL APPLICATIONS

- Bearings
- Bushings
- Rollers
- Gears
- Guides
- Valve sets

- Thickness tolerances: Up to 1/8": ± 0.005"
3/16" to 3": + 0.025", - 0.000".
- Nylon Type 6/6 meets or exceeds specification MIL M-20693A Type 1 and LP-410A. It is an FDA approved material.
- Nylatron GS® is a MOLYBDENUM DISULPHIDE-filled Type 6/6 nylon.
- Nylon Type 6/6 available to 3" thickness.
- Inquire about our cut to size abilities.

NYLATRON NSB® SHEET

NYLATRON NSB® is a self-lubricating Type 6/6 Nylon. Special additives allow this material to give superior bearing performance while retaining most of the desired properties of Nylon 6/6. Available in thicknesses ranging from 1/4" to 2" in sheets 12" x 48".

NYLON STRIP (TYPE 6/6 AND MDS NYLON)

Thickness: 0.020" to 0.125" from stock.
Widths: 12" and 24" from stock.
Custom widths available.



PRODUCT CODE:

CAST NYLON ROD

MC 901® COLOUR: BLUE

4520

NYLATRON GSM® COLOUR: GREY

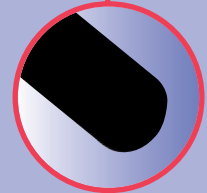
4320

MC901® STOCK NUMBER	NYLATRON GSM® STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
4520 02000	4320 02000	2	1.544
4520 02125	4320 02125	2-1/8	1.743
4520 02250	4320 02250	2-1/4	1.954
4520 02500	4320 02500	2-1/2	2.413
4520 02750	4320 02750	2-3/4	2.919
4520 03000	4320 03000	3	3.474
4520 03250	4320 03250	3-1/4	4.077
4520 03500	4320 03500	3-1/2	4.729
4520 03750	4320 03750	3-3/4	5.43
4520 04000	4320 04000	4	6.18
4520 04250	4320 04250	4-1/4	6.97
4520 04500	4320 04500	4-1/2	7.82
4520 04750	4320 04750	4-3/4	8.71
4520 05000	4320 05000	5	9.65
4520 05250	4320 05250	5-1/4	10.64
4520 05500	4320 05500	5-1/2	11.68
4520 05750	4320 05750	5-3/4	12.76
4520 06000	4320 06000	6	13.90
4520 06250	4320 06250	6-1/4	15.08
4520 06500	4320 06500	6-1/2	16.31
4520 06750	4320 06750	6-3/4	17.59
4520 07000	4320 07000	7	18.91
4520 07250	4320 07250	7-1/4	20.29
4520 07500	4320 07500	7-1/2	21.71
4520 08000	4320 08000	8	24.70
4520 08500	4320 08500	8-1/2	27.89
4520 09000	4320 09000	9	31.27
4520 09500	4320 09500	9-1/2	34.84
4520 10000	4320 10000	10	38.60
4520 11000	4320 11000	11	46.71
4520 12000	4320 12000	12	55.58

PROPERTIES

- Wear resistance.
- Low coefficient of friction.
- High tensile strength.
- Excellent impact resistance.
- High heat distortion temperature.
- Excellent vibration, peening resistance.
- High fatigue resistance.
- Easy machining.
- Corrosion resistant.
- Lightweight.
- Direct food contact*.

*MC 907® Natural only - complies with section 177.15000 of Food Additive regulations. USDA approved.



TYPICAL APPLICATIONS

- Bearings
- Bushings
- Valve seats
- Washers, Seals
- Cams, Gears
- Sleeves wheels
- Guides
- Tooling fixtures
- Insulators
- Wear parts

- Tolerances: 2" to 5" Diameter: + .250", - .000"
Over 5" Diameter: + .500", - .000".
- Standard lengths: Up to 5-3/4" Diameter, the standard length is 24" (Nominal).
Over 6" Diameter, the standard length is 12" (Nominal).
Longer lengths quoted on request.
- MC901® Cast Nylon is a general purpose, high strength Nylon Type 6, Monomer cast.
- NYLATRON GSM® is a Molybdenum Disulphide-Filled, high strength Nylon Type 6, Monomer cast. Both are produced to meet U.S. Federal specification LP-410A.
- Gear blanks in both MC901 NYLON® and NYLATRON GSM® are available in diameters ranging from 2" to 48", with thicknesses from 1/2" to 10".
- NYLATRON NSM® is a self-lubricating Type 6 NYLON possessing superior wear-resistance characteristics. This material was developed for demanding applications where parts of a larger size are required. Available from 2-1/8" to 28".
- NYLATRON GSM® BLUE is the first cast nylon to combine both molybdenum disulphide and oil for the load capacity of Nylatron GSM® nylon, plus improved frictional characteristics. It is dark blue in colour. Available in diameters from 2" to 38".



PRODUCT CODE:

CAST NYLON TYPE 6 ROD

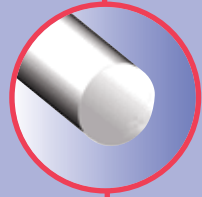
4020

COLOUR: NATURAL (WHITE)

STOCK NUMBER	NOMINAL DIAMETER	ACTUAL DIAMETER		TOLERANCE MM	APPROX. WEIGHT KG/M
		MM	INCHES		
4020 02000	2	50	1.97	+1.3, +0.3	2.4
4020 02250	2-1/4	55	2.17	+1.3, +0.3	2.9
4020 02375	2-3/8	60	2.36	+1.6, +0.3	3.5
4020 02500	2-1/2	65	2.56	+1.6, +0.3	4.1
4020 02750	2-3/4	70	2.76	+1.6, +0.3	4.7
4020 03000	3	75	2.95	+2.0, +0.4	5.4
4020 03125	3-1/8	80	3.15	+2.0, +0.4	6.2
4020 03375	3-3/8	85	3.35	+2.2, +0.5	7.0
4020 03500	3-1/2	90	3.54	+2.2, +0.5	7.8
4020 03750	3-3/4	95	3.74	+2.2, +0.5	8.7
4020 04000	4	100	3.94	+2.5, +0.6	10.0
4020 04375	4-3/8	110	4.33	+3.0, +0.7	12.0
4020 04500	4-1/2	115	4.53	+4.0, +0.6	13.0
4020 04750	4-3/4	120	4.72	+4.2, +0.6	14.0
4020 05000	5	125	4.92	+3.5, +0.8	15.0
4020 05375	5-3/8	135	5.32	+3.8, +0.9	18.0
4020 05500	5-1/2	140	5.51	+4.9, +0.7	19.0
4020 06000	6	150	5.91	+4.2, +1.0	22.0
4020 06500	6-1/2	165	6.50	+4.5, +1.1	24.34
4020 07000	7	180	7.09	+5.0, +1.2	31.0
4020 08000	8	200	7.87	+5.5, +1.3	39.0

PROPERTIES

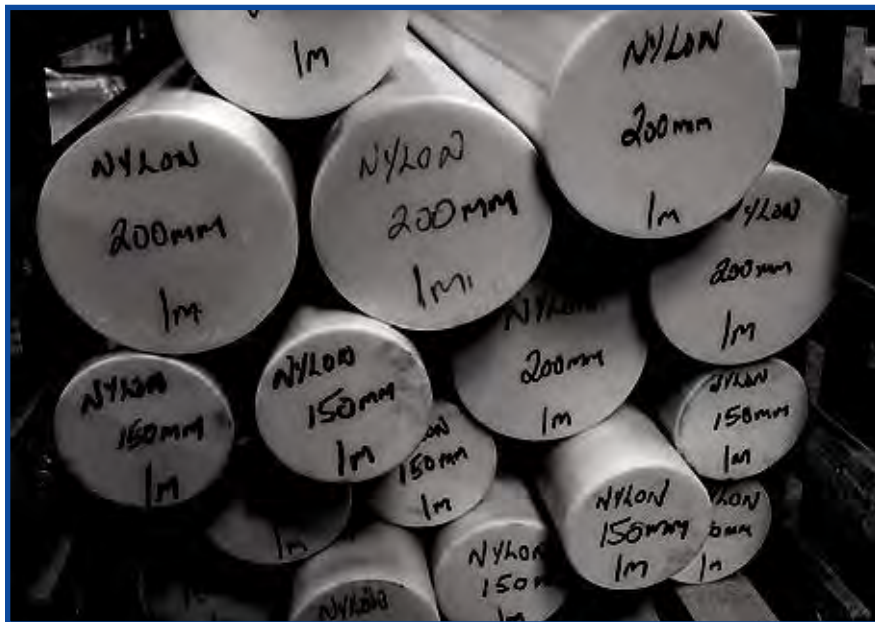
- Wear resistance.
- Low coefficient of friction.
- High tensile strength.
- Excellent impact resistance.
- High heat distortion temperature.
- Excellent vibration, peening resistance.
- High fatigue resistance.
- Easy machining.
- Corrosion resistant.
- Lightweight.



TYPICAL APPLICATIONS

- Bearings
- Bushings
- Valve seats
- Washers, Seals
- Cams, Gears
- Sleeves wheels
- Guides
- Tooling fixtures
- Insulators
- Wear parts

- Standard length: Up to 125mm — 3m
135mm and over — 1m.
- Threaded rod available in sizes ranging from 1/4" to 1" diameter in Extruded Nylon Type 6 or 6/6.



PRODUCT CODE:

NYLON ROD (GS AND 6/6)

NYLATRON GS® ROD COLOUR: GREY STANDARD LENGTH: 8 FEET

4120

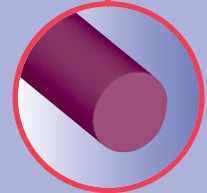
NYLON TYPE 6/6 ROD (JAYTRON 6/6) COLOUR: NATURAL (CREAM) STANDARD LENGTH: 8 FEET

4220

NYLATRON GS STOCK NUMBER	JAYTRON 6/6 STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
—	4220 0062	1/16	0.015
—	4220 0093	3/32	0.034
—	4220 0125	1/8	0.0061
4120 0187	4220 0187	3/16	0.0138
4120 0250	4220 0250	1/4	0.0244
4120 0312	4220 0312	5/16	0.0380
4120 0375	4220 0375	3/8	0.0550
4120 0437	4220 0437	7/16	0.0750
4120 0500	4220 0500	1/2	0.098
4120 0562	4220 0562	9/16	0.124
4120 0625	4220 0625	5/8	0.152
4120 0750	4220 0750	3/4	0.218
4120 0875	4220 0875	7/8	0.297
4120 1000	4220 1000	1	0.388
4120 1125	4220 1125	1-1/8	0.490
4120 1250	4220 1250	1-1/4	0.610
4120 1375	4220 1375	1-3/8	0.740
4120 1500	4220 1500	1-1/2	0.880
4120 1625	4220 1625	1-5/8	1.030
4120 1750	4220 1750	1-3/4	1.194
4120 1875	4220 1875	1-7/8	1.371
4120 2000	4220 2000	2	1.560
—	4220 2250	2-1/4	1.974
—	4220 2500	2-1/2	2.437
—	4220 3000	3	3.510
—	4020 4000	4	6.240

PROPERTIES

- High wear and abrasion resistance.
- Ease of fabrication.
- Noise dampening characteristics.
- Direct food contact (6/6).
- Low coefficient of friction.
- Resilience and impact resistance.
- Non-abrasive to other materials.



TYPICAL APPLICATIONS

- Rollers
- Gears
- Bearings
- Bushings
- Insulators
- Thrust washers

- Larger rods available on request.
- Intermediate sizes supplied by centreless grinding standard diameter.
- Square rods from 1/4" to 1".
- Hexagonal rods in 1/16" increments from 3/16" to 1".
- Tolerances: 1/16" to 1" diameter — + 0.003", -0.000"
1-1/8" to 2" diameter — + 0.005", - 0.000"
2" to 3" diameter — + 0.015, - 0.000".
- Military specifications: Nylon type 6/6 rod is produced to meet LP-410A.



PRODUCT CODE:

NYLATRON GS® BUSHING STOCK

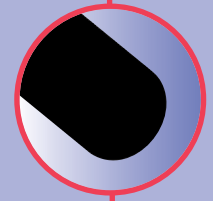
4170

COLOUR: GREY STANDARD LENGTH: 8 FEET

STOCK NUMBER	O.D. INCHES	I.D. INCHES	LBS./FT. APPROX.
4170 0500 0375	1/2	3/8	0.054
4170 0625 0375	5/8	3/8	0.110
4170 0750 0500	3/4	1/2	0.138
4170 0875 0375	7/8	3/8	0.259
4170 0875 0625	7/8	5/8	0.167
4170 1000 0500	1	1/2	0.312
4170 1000 0750	1	3/4	0.195
4170 1250 0750	1-1/4	3/4	0.421
4170 1250 1000	1-1/4	1	0.255
4170 1500 1000	1-1/2	1	0.528
4170 1500 1250	1-1/2	1-1/4	0.313
4170 1750 1250	1-3/4	1-1/4	0.639
4170 1750 1500	1-3/4	1-1/2	0.374
4170 2000 1500	2	1-1/2	0.747

PROPERTIES

- High wear and abrasion resistance.
- Low coefficient of friction.
- Ease of fabrication.
- Noise dampening characteristics.
- Non-abrasive to other materials.
- Able to operate with or without lubrication.
- Resilience and impact resistance.

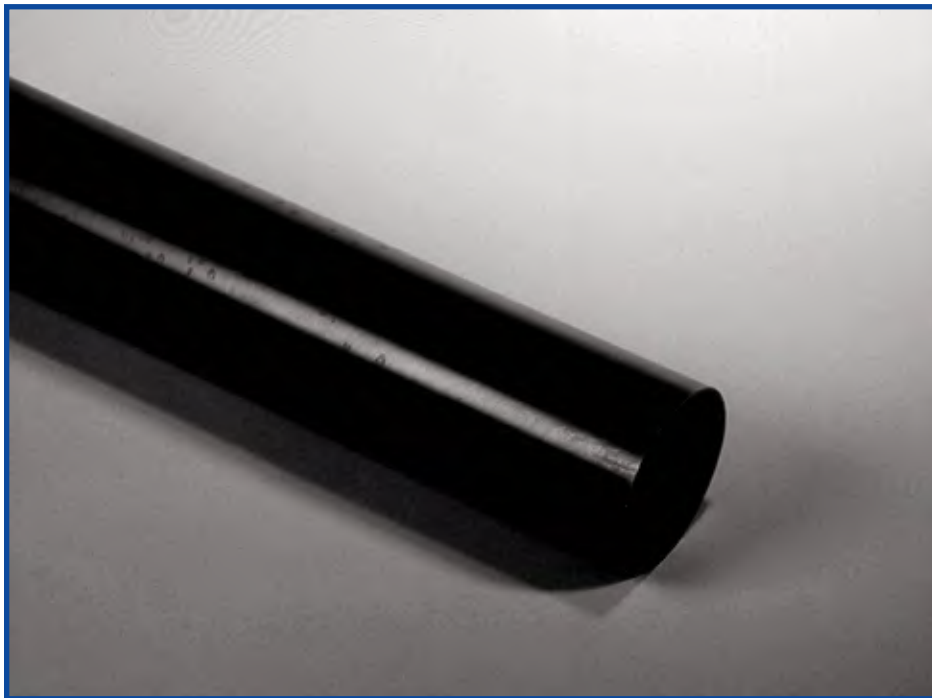


TYPICAL APPLICATIONS

- Bushings
- Bearings
- Sleeves
- Rollers

- Sold only in standard lengths.
- NYLATRON GS® is a general purpose, high strength 6/6 NYLON with MOLYBDENUM DISULPHIDE added to increase wear resistance. It is produced to meet federal specification LP-410A.
- Tolerances: O.D. 1/2" to 1" +/-0.001"
 Over 1" to 1-1/2" +0.005"/-0.000"
 Over 1-1/2" to 2" +0.010"/-0.000".
 I.D. Supplied sufficiently undersize to finish to fractional ID listed.

NYLON 6/6 BUSHING STOCK available in standard and thick walls.



PRODUCT CODE:

CAST NYLON TUBULAR BAR

MC 901® COLOUR: BLUE

NYLATRON GSM® COLOUR: GREY

STANDARD LENGTH 26 INCHES

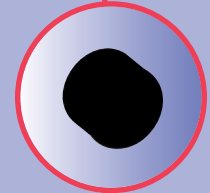
4525

4325

MC901® STOCK NUMBER	NYLATRON GSM® STOCK NUMBER	O.D. INCHES	I.D. INCHES
4525 02000 01000	4325 02000 01000	2	1
4525 02000 01125	4325 02000 01125	2	1-1/8
4525 02000 01250	4325 02000 01250	2	1-1/4
4525 02250 01000	4325 02250 01000	2-1/4	1
4525 02250 01250	4325 02250 01250	2-1/4	1-1/4
4525 02250 01500	4325 02250 01500	2-1/4	1-1/2
4525 02500 01000	4325 02500 01000	2-1/2	1
4525 02500 01500	4325 02500 01500	2-1/2	1-1/2
4525 02500 01750	4325 02500 01750	2-1/2	1-3/4
4525 02750 01250	4325 02750 01250	2-3/4	1-1/4
4525 02750 01750	4325 02750 01750	2-3/4	1-3/4
4525 02750 02000	4325 02750 02000	2-3/4	2
4525 03000 01000	4325 03000 01000	3	1
4525 03000 01500	4325 03000 01500	3	1-1/2
4525 03000 02000	4325 03000 02000	3	2
4525 03000 02250	4325 03000 02250	3	2-1/4
4525 03250 01250	4325 03250 01250	3-1/4	1-1/4
4525 03250 01750	4325 03250 01750	3-1/4	1-3/4
4525 03250 02250	4325 03250 02250	3-1/4	2-1/4
4525 03250 02750	4325 03250 02750	3-1/4	2-3/4
4525 03500 01500	4325 03500 01500	3-1/2	1-1/2
4525 03500 02000	4325 03500 02000	3-1/2	2
4525 03500 02500	4325 03500 02500	3-1/2	2-1/2
4525 03500 02750	4325 03500 02750	3-1/2	2-3/4
4525 03750 01750	4325 03750 01750	3-3/4	1-3/4
4525 03750 02250	4325 03750 02250	3-3/4	2-1/4
4525 03750 02750	4325 03750 02750	3-3/4	2-3/4
4525 03750 03000	4325 03750 03000	3-3/4	3
4525 04000 02000	4325 04000 02000	4	2
4525 04000 02500	4325 04000 02500	4	2-1/2
4525 04000 03000	4325 04000 03000	4	3
4525 04000 03250	4325 04000 03250	4	3-1/4
4525 04250 01250	4325 04250 01250	4-1/4	1-1/4
4525 04250 01500	4325 04250 01500	4-1/4	1-1/2
4525 04250 01750	4325 04250 01750	4-1/4	1-3/4
4525 04250 02000	4325 04250 02000	4-1/4	2
4525 04250 02250	4325 04250 02250	4-1/4	2-1/4
4525 04250 02750	4325 04250 02750	4-1/4	2-3/4
4525 04250 03250	4325 04250 03250	4-1/4	3-1/4
4525 04250 03500	4325 04250 03500	4-1/4	3-1/2
4525 04500 01500	4325 04500 01500	4-1/2	1-1/2
4525 04500 02000	4325 04500 02000	4-1/2	2
4525 04500 02500	4325 04500 02500	4-1/2	2-1/2
4525 04500 03000	4325 04500 03000	4-1/2	3
4525 04500 03500	4325 04500 03500	4-1/2	3-1/2
4525 04500 03750	4325 04500 03750	4-1/2	3-3/4
4525 04750 02000	4325 04750 02000	4-3/4	2
4525 04750 02750	4325 04750 02750	4-3/4	2-3/4
4525 04750 03250	4325 04750 03250	4-3/4	3-1/4
4525 04750 03750	4325 04750 03750	4-3/4	3-3/4
4525 04750 04000	4325 04750 04000	4-3/4	4

PROPERTIES

- Wear resistance.
 - Low coefficient of friction.
 - High tensile strength.
 - Excellent impact resistance.
 - High heat distortion temperature.
 - Excellent vibration, peening resistance.
 - High fatigue resistance.
 - Easy machining.
 - Corrosion resistant.
 - Lightweight.
 - Direct food contact*.
- *MC 907* Natural only - complies with section 177.15000 of Food Additive regulations. USDA approved.



TYPICAL APPLICATIONS

- Bearings
- Bushings
- Valve seats
- Thrust washers
- Back up rings



PRODUCT CODE:

CAST NYLON TUBULAR BAR

MC 901® COLOUR: BLUE

4525

NYLATRON GSM® COLOUR: GREY

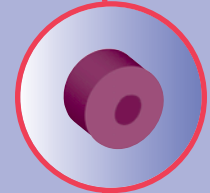
4325

STANDARD LENGTH 26 INCHES

MC901® STOCK NUMBER	NYLATRON GSM® STOCK NUMBER	O.D. INCHES	I.D. INCHES
4525 05000 02000	4325 05000 02000	5	2
4525 05000 02250	4325 05000 02250	5	2-1/4
4525 05000 02500	4325 05000 02500	5	2-1/2
4525 05000 03000	4325 05000 03000	5	3
4525 05000 03500	4325 05000 03500	5	3-1/2
4525 05000 04000	4325 05000 04000	5	4
4525 05000 04250	4325 05000 04250	5	4-1/4
4525 05250 02000	4325 05250 02000	5-1/4	2
4525 05250 02250	4325 05250 02250	5-1/4	2-1/4
4525 05250 03000	4325 05250 03000	5-1/4	3
4525 05250 03250	4325 05250 03250	5-1/4	3-1/4
4525 05250 03750	4325 05250 03750	5-1/4	3-3/4
4525 05250 04250	4325 05250 04250	5-1/4	4-1/4
4525 05250 04500	4325 05250 04500	5-1/4	4-1/2
4525 05500 01500	4325 05500 01500	5-1/2	1-1/2
4525 05500 02250	4325 05500 02250	5-1/2	2-1/4
4525 05500 03000	4325 05500 03000	5-1/2	3
4525 05500 03500	4325 05500 03500	5-1/2	3-1/2
4525 05500 04000	4325 05500 04000	5-1/2	4
4525 05500 04500	4325 05500 04500	5-1/2	4-1/2
4525 05500 04750	4325 05500 04750	5-1/2	4-3/4
4525 05750 02000	4325 05750 02000	5-3/4	2
4525 05750 02250	4325 05750 02250	5-3/4	2-1/4
4525 05750 02750	4325 05750 02750	5-3/4	2-3/4
4525 05750 03000	4325 05750 03000	5-3/4	3
4525 05750 03750	4325 05750 03750	5-3/4	3-3/4
4525 05750 04250	4325 05750 04250	5-3/4	4-1/4
4525 05750 04750	4325 05750 04750	5-3/4	4-3/4
4525 05750 05000	4325 05750 05000	5-3/4	5
4525 06000 02000	4325 06000 02000	6	2
4525 06000 02500	4325 06000 02500	6	2-1/2
4525 06000 03000	4325 06000 03000	6	3
4525 06000 03500	4325 06000 03500	6	3-1/2
4525 06000 04000	4325 06000 04000	6	4
4525 06000 04500	4325 06000 04500	6	4-1/2
4525 06000 05000	4325 06000 05000	6	5
4525 06000 05250	4325 06000 05250	6	5-1/4

PROPERTIES

- Wear resistance.
 - Low coefficient of friction.
 - High tensile strength.
 - Excellent impact resistance.
 - High heat distortion temperature.
 - Excellent vibration, peening resistance.
 - High fatigue resistance.
 - Easy machining.
 - Corrosion resistant.
 - Lightweight.
 - Direct food contact*.
- *MC 907® Natural only - complies with section 177.15000 of Food Additive regulations. USDA approved.



TYPICAL APPLICATIONS

- Bearings
- Bushings
- Valve seats
- Thrust washers
- Back up rings

- Diameters ranging up to 59" O.D. and 52" I.D. available on request.
- Much larger sizes are technically feasible. Call for information. Sizes not listed can be quoted on request. Lengths longer or shorter than the standard also quoted on request.
- Many tubular bars up to 6" O.D. available in 78" lengths.
- TOLERANCES: Over on O.D. and under on I.D. to machine finish to size. This characteristic allows many sizes to be compatible with common metric sizes. Standard length±.50". The same tolerance will also apply to lengths other than standard.
- SPECIFICATIONS: Cast Nylon Tubular bars are produced to meet federal specification LP-410A. MC901 NYLON® is a general purpose, high strength, monomer cast type 6 Nylon. NYLATRON GSM® is a general purpose, high strength, monomer cast type 6 Nylon with Molybdenum Disulphide added for greater wear resistance.

NYLATRON NSM® TUBULAR BAR

- Standard length: 26 inches.
- All sizes quoted on request. Sizes range from 2" to 59" on outside diameter and from 1" to 52" on inside diameter. Larger sizes are also technically feasible.
- NYLATRON NSM® is a self-lubricating type 6 Nylon possessing superior wear-resistant characteristics.



PRODUCT CODE:

NYLATRON GS® PROFILES

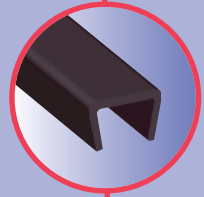
4190

COLOUR: GREY See illustrations below for profile shapes and measurements.

STOCK NUMBER	STANDARD LENGTH	MINIMUM ORDER
4190 28812	1000 Ft	100 Ft
4190 30613	500 Ft	100 Ft
4190 28714	500 Ft	100 Ft
4190 28916	500 Ft	100 Ft
4190 27215	500 Ft	100 Ft
4190 29011	500 Ft	100 Ft
4190 30723	12 Ft	12 Ft
4190 30824	12 Ft	12 Ft
4190 30922	12 Ft	12 Ft

PROPERTIES

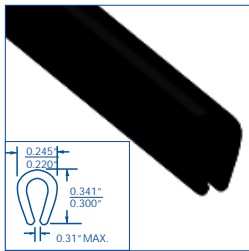
- Wear resistant.
- Low surface friction.
- High strength and rigidity.



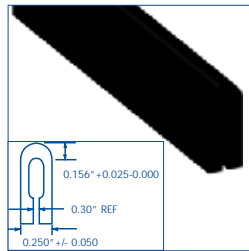
TYPICAL APPLICATIONS

- Wear surfaces on conveyor rails
- Edge protectors on metal parts
- Bottling lines

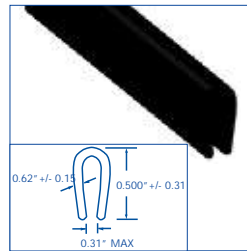
- Other sizes and additional profiles available on request, subject to minimum order requirements.
- Nylatron GS® Profiles are produced as a special flexible formulation, stabilized at 2-1/2 per cent moisture content.



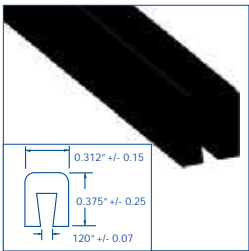
40-101
(#288-12)



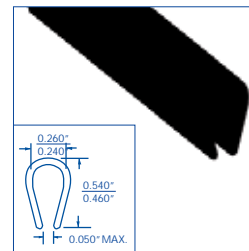
40-105
(#306-13)



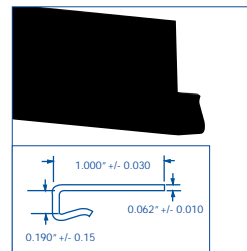
40-106
(#287-14)



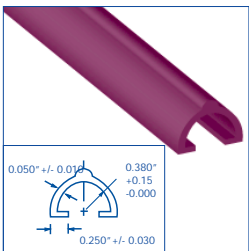
40-137
(#289-16)



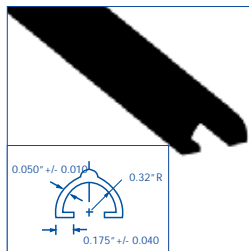
40-175
(#272-15)



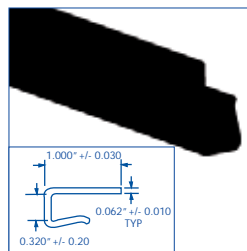
40-226
(#290-11)



40-238
(#307-23)



40-241
(#308-24)



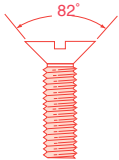
40-242
(#309-22)



NYLON SCREWS, BOLTS & NUTS

NYLON SCREWS

- Common sizes.
- Standard package: 100 pieces.
- Metric screws available.
- Sizes available: 2-56, 4-40, 6-32, 8-32, 10-24, 10-32, 1/4-20.



Flat



Binding



Set



Slotted Hex



Fillister



Hex



Pan



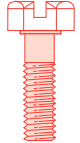
Round

PROPERTIES

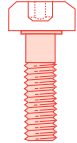
- Anti-corrosive.
- Non-marring.
- Tough.
- Lightweight.

NYLON BOLTS

- Common sizes.
- Standard package: 100 pieces.
- Metric bolts available.
- Sizes available: 1/4-20, 5/16-18, 3/8-16, 1/2-13, 5/8-11.
- Minimum order for head styles other than standard Hex is 1000 pieces.
- Lengths up to 6" available.
- Also available on request: Nylon Hex head bolts in sizes larger than 5/8-11.
- Hex head bolts made from other materials, such as PVC, Delrin, PTFE, Acrylic.
- Washers are available on request in Nylon and other materials.



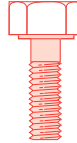
Slotted Hex



Hex Socket



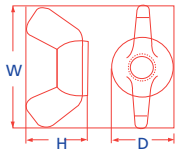
Socket Set



Hex

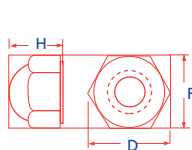
NYLON NUTS

- With sizes available for each.
- Dimensions supplied on request.
- Standard package: 100 pieces.
- Metric screws available.



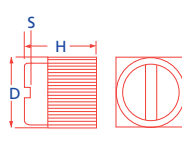
WING

Sizes available:
4-40, 6-32, 8-32,
10-24, 10-32, 1/4-20,
1/4-28, 5/16-18,
3/8-16, 1/2-13.



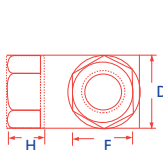
CAP

Sizes available:
4-40, 6-32, 8-32,
10-24, 10-32, 1/4-20,
5/16-18, 3/8-16,
1/2-13, 5/8-11.



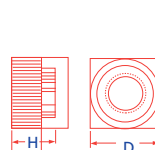
SLOTTED THUMB NUT

Sizes available:
4-40, 6-32, 8-32,
10-24, 10-32, 1/4-20.



LOCKING HEX NUT

Sizes available:
4-40, 6-32, 8-16,
10-24, 10-32,
1/4-20, 5/16-18,
3/8-16, 1/2-13.



THROUGH THUMB NUT

Sizes available:
4-40, 6-32, 8-32,
10-32, 1/4-20.

Also: Washers available.

: All of the above are available in many other plastics on custom order.



TYPICAL APPLICATIONS

- Conform to irregular surfaces
- Electrical insulation
- Thermal insulation
- Useful against brittle surfaces such as glass, ceramic or enamel

PRODUCT CODE:

ACETAL SHEET

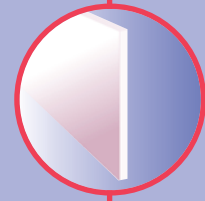
7000

COLOUR: NATURAL WHITE

STOCK NUMBER	THICKNESS INCHES	TOLERANCE	LBS./SQ.FT. APPROX.
7000 00118 2448	1/8	+0.005/-0.005	0.94
7000 00187 2448	3/16	+0.025/-0.000	1.50
7000 00250 48120	1/4	+0.025/-0.000	1.97
7000 00375 48120	3/8	+0.025/-0.000	2.92
7000 00500 48120	1/2	+0.025/-0.000	3.86
7000 00625 48120	5/8	+0.025/-0.000	4.80
7000 00750 48120	3/4	+0.025/-0.000	5.74
7000 00100 48120	1	+0.025/-0.000	7.62
7000 01250 48120	1-1/4	+0.025/-0.000	9.50
7000 01500 48120	1-1/2	+0.025/-0.000	11.38
7000 02000 48120	2	+0.050/-0.000	15.14
7000 02500 2448	2-1-2	+0.050/-0.000	19.00
7000 03000 2448	3	+0.050/-0.000	22.70
7000 04000 2448	4	+0.125/-0.000	30.20
7000 05000 2448	5	+0.125/-0.000	37.85
7000 06000 2448	6	+0.125/-0.000	45.43

PROPERTIES

- Wear resistant.
- Low water absorption.
- Non-abrasive.
- Low coefficient of friction.
- Excellent strength and toughness.
- Produced from resin approved for direct food contact.



TYPICAL APPLICATIONS

- Bearings
- Gears
- Screw machine parts
- Machine fittings
- Electrical components
- Low-friction components

- Sheet sizes: 1/8" + 3/16"
1/4" — 2" 48" x 120"
2-1/2" — 6" 24" x 48"
Available in 24" x 48"
- Inquire about our cut to size abilities.
- ACETAL STRIP: Available in gauges: 0.010" — 0.125"
widths: 250" — 24"



PRODUCT CODE:

ACETAL SHEET

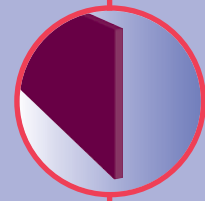
7010

COLOUR: BLACK SHEET SIZE: 24" X 48", 48" X 120"

STOCK NUMBER	THICKNESS INCHES	TOLERANCE	LBS./SQ.FT. APPROX.
7010 0062	1/16	+0.005/-0.005	0.47
7010 0125	1/8	+0.005/-0.005	0.94
7010 0187	3/16	+0.025/-0.000	1.50
7010 0250	1/4	+0.025/-0.000	1.97
7010 0375	3/8	+0.025/-0.000	2.92
7010 0500	1/2	+0.025/-0.000	3.86
7010 0625	5/8	+0.025/-0.000	4.80
7010 0750	3/4	+0.025/-0.000	5.74
7010 1000	1	+0.025/-0.000	7.62
7010 1250	1-1/4	+0.025/-0.000	9.50
7010 1500	1-1/2	+0.025/-0.000	11.38
7010 1750	1-3/4	+0.050/-0.000	13.26
7010 2000	2	+0.050/-0.000	15.14
7010 2250	2-1/4	+0.050/-0.000	17.15
7010 2500	2-1/2	+0.050/-0.000	19.00
7010 3000	3	+0.500/-0.000	22.70
7010 3500	3-1/2	+0.125/-0.000	26.50
7010 4000	4	+0.125/-0.000	30.20
7010 5000	5	+0.125/-0.000	37.85
7010 6000	6	+0.125/0.000	45.43

PROPERTIES

- Wear resistant.
- Low water absorption.
- Non-abrasive.
- Low coefficient of friction.
- Excellent strength and toughness.



TYPICAL APPLICATIONS

- Bearings
- Gears
- Screw machine parts
- Machine fittings
- Electrical components
- Low-friction components

- Inquire about our cut to size abilities.

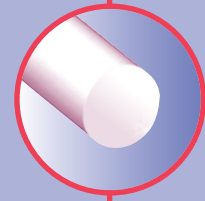


PRODUCT CODE:

ACETAL ROD

7020

COLOUR: NATURAL WHITE



TYPICAL APPLICATIONS

- Bearings
- Gears
- Anti-friction parts
- Electrical components
- High moisture situations

PROPERTIES

- High modulus of elasticity.
- Low coefficient of friction.
- Good abrasion and impact resistance.
- High strength and stiffness.
- Low moisture absorption.
- Produced from resin approved for food contact.
- Excellent machinability.
- Excellent dimensional stability.

STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX
7020 00125	1/8	0.008
7020 00187	3/16	0.017
7020 00250	1/4	0.030
7020 00312	5/16	0.046
7020 00375	3/8	0.067
7020 00437	7/16	0.092
7020 00500	1/2	0.121
7020 00562	9/16	0.153
7020 00625	5/8	0.189
7020 00750	3/4	0.271
7020 00812	13/16	0.320
7020 00875	7/8	0.370
7020 01000	1	0.482
7020 01125	1-1/8	0.611
7020 01250	1-1/4	0.755
7020 01375	1-3/8	0.914
7020 01500	1-1/2	1.087
7020 01625	1-5/8	1.276
7020 01750	1-3/4	1.480
7020 01875	1-7/8	1.700
7020 02000	2	1.930
7020 02125	2-1/8	2.180
7020 02375	2-3/8	2.720
7020 02500	2-1/2	3.020
7020 02750	2-3/4	3.650
7020 03000	3	4.350
7020 03250	3-1/4	5.100
7020 03500	3-1/2	5.920
7020 04000	4	7.730
7020 04500	4-1/2	9.950
7020 05000	5	12.10
7020 05500	5-1/2	14.62
7020 06000	6	17.40
7020 06500	6-1/2	21.06
7020 07000	7	23.68
7020 08000	8	30.93
7020 10000	10	49.00

- Standard lengths: up to 6" 8" — 10 Ft.
over 6" — 3 Ft.
- Tolerances: 1/8" to 3/4" — +0.002"/- 0.000"
7/8" to 1-1/2" — +0.004/-0.000"
1-5/8" to 2" — +0.008"/-0.000"
2-1/8" to 3" — +0.025"/-0.000"
3-1/4" to 4" — +0.187"/-0.000"
over 4" — +0.250/-0.000"
- Intermediate sizes available.
- Other lengths available.
- ACETAL TUBULAR BARS available: from 1" x 3/8" to 12" x 3-1/2".



PRODUCT CODE:

BLACK ACETAL ROD

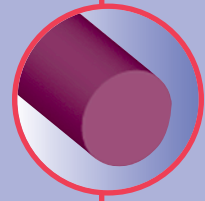
7320

COLOUR: BLACK

STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.	STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
7320 00250	1/4	0.030	7320 02000	2	1.93
7320 00312	5/16	0.046	7320 02250	2-1/4	2.45
7320 00375	3/8	0.067	7320 02500	2.56	3.02
7320 00500	1/2	0.121	7320 02750	2.76	3.65
7320 00625	5/8	0.189	7320 03000	3	4.35
7320 00750	3/4	0.271	7320 03500	3-1/2	5.92
7320 00875	7/8	0.370	7320 04000	4	7.73
7320 01000	1	0.482	7320 05000	5	12.10
7320 01125	1-1/8	0.611	7320 05500	5-1/2	14.62
7320 01250	1-1/4	0.755	7320 06000	6	17.40
7320 01375	1-3/8	0.914	7320 06500	6-1/2	21.06
7320 01500	1-1/2	1.087	7320 07000	7	23.68
7320 01750	1-3/4	1.480	7320 08000	8	30.93

PROPERTIES

- High modulus of elasticity.
- Low coefficient of friction.
- Good abrasion and impact resistance.
- High strength and stiffness.
- Low moisture absorption.
- Excellent machinability.
- Excellent dimensional stability.



TYPICAL APPLICATIONS

- Bearings
- Anti-friction parts
- Submerged applications
- Electrical insulators
- Rollers

- Standard length: 6" – 8' and 10'
Over 6" – 3'
- Tolerances: 1/8" to 3/4" — +0.002"/-0.000"
7/8" to 1-1/2" — +0.004"/-0.000"
1-5/8" to 2" — +0.008"/-0.000"
2-1/8" to 3" — +0.025"/-0.000"
3-1/4" to 4" — +0.187"/-0.000"
over 4" — +0.250"/-0.000"
- Intermediate sizes available.



PRODUCT CODE:

DELTRIN AF[®] ROD

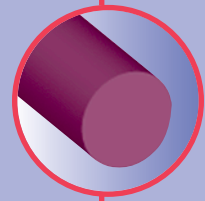
7120

COLOUR: DARK BROWN

STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
7120 00125	1/4	0.062
7120 00375	3/8	0.074
7120 00500	1/2	0.132
7120 00625	5/8	0.205
7120 00750	3/4	0.296
7120 01000	1	0.526
7120 01250	1-1/4	0.822
7120 01375	1-3/8	0.994
7120 01500	1-1/2	1.18
7120 01750	1-3/4	1.61
7120 02000	2	2.10
7120 02500	2-1/2	3.29
7120 03000	3	4.73
7120 03500	3-1/2	6.98
7120 04000	4	9.04
7120 04500	4-1/2	11.36
7120 0500	5	13.95

PROPERTIES

- PTFE fibers uniformly distributed in homopolymer acetal resin.
- 2 to 1 blend.
- Low coefficient of friction.
- Wear resistant.
- Low water absorption.
- Excellent strength and toughness.
- Dimensionally stable.



TYPICAL APPLICATIONS

- Bushings
- Low friction parts
- Electrical components
- Housings

- Standard length: 10 Ft.
- Tolerance: up to 1" — +0.002"/-0.000"
1-1/8" to 2" — +0.005"/-0.000"
2-1/4" to 3" — +0.030"/-0.000"
Over 3" — oversize

- Larger and intermediate sizes available.
- 1 to 1 blend available.

DELTRIN AF SHEET available in 24" x 48" sheet size, 1/32" to 2" thickness.



PRODUCT CODE:

ERTALYTE® SHEET

ERTALYTE NATURAL

COLOUR: WHITE

WIDTH: 24" X 48"

7900

ERTALYTE TX

COLOUR: LIGHT GREY

WIDTH: 24" X 39.4"

7910

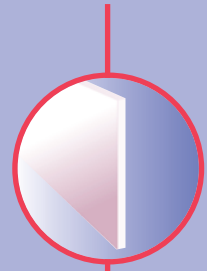
NATURAL STOCK NUMBER	THICKNESS INCHES	LBS./SQ.FT. APPROX.	TX STOCK NUMBER	THICKNESS INCHES	LBS./SQ.FT. APPROX.
7900 0250 2448	1/4	1.97	7910 0250 2439	1/4	2.04
7900 0375 2448	3/8	2.92	7910 0375 2439	3/8	3.01
7900 0500 2448	1/2	3.86	7910 0500 2439	1/2	3.98
7900 0625 2448	5/8	4.80	7910 0750 2439	3/4	5.91
7900 0750 2448	3/4	5.74	7910 1000 2439	1	7.85
7900 1000 2448	1	7.62	7910 1500 2439	1-1/2	11.73
7900 1250 2448	1-1/4	9.50	7910 2000 2439	2	15.61
7900 1500 2448	1-1/2	11.38			
7900 1750 2448	1-3/4	13.26			
7900 2000 2448	2	15.14			
7900 2250 2448	2-1/4	17.11			
7900 2250 2448	2-1/2	18.99			
7900 3000 2448	3	22.75			
7900 3500 2448	3-1/2	26.79			
7900 4000 2448	4	30.55			

- Tolerances: Thickness 1/4" to 2" — +0.025"/-0.000"
 2-1/4" to 3" — +0.050"/-0.000"
 Over 3" — oversize
- Width +0.500"/-0.000"
- Length +1.50"/-0.000".

- Available in black.
- Inquire about our cut to size abilities.

PROPERTIES

- Polyethylene terephthalate (PET).
- High strength and rigidity.
- Low moisture absorption.
- Produced from resin which is approved for use in contact with food.
- Excellent dimensional stability.
- Superior resistance to acidic and chlorinated solutions compared to nylon and acetal.
- Good abrasion resistance.
- ErtalYTE TX is internally lubricated and has enhanced wear properties



TYPICAL APPLICATIONS

- Food contact parts
- Insulators
- Valve parts
- Bearings
- Seals

ERTALYTE® NATURAL

PRODUCT CODE:

ERTALYTE NATURAL

COLOUR: WHITE

7920

ERTALYTE TX

COLOUR: LIGHT GREY

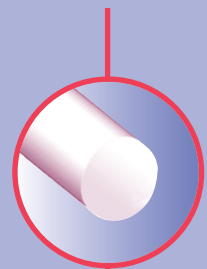
7921

NATURAL STOCK NUMBER	TX STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
7920 00500	7921 0500	1/2	0.12
7920 00625	7921 0625	5/8	0.19
7920 00750	7921 0750	3/4	0.27
7920 01000	7921 1000	1	0.48
7920 01125	-----	1-1/8	0.61
7920 01250	7921 1250	1-1/4	0.75
7920 01375	-----	1-3/8	0.91
7920 01500	7921 1500	1-1/2	1.08
7920 01625	-----	1-5/8	1.27
7920 02000	7921 2000	2	1.92
7920 02500	7921 2500	2-1/2	3.01
7920 02750	-----	2-3/4	3.68
7920 03000	7921 3000	3	4.58
7920 03500	7921 3500	3-1/2	6.20
7920 04000	7921 4000	4	8.03
7920 04500	-----	4-1/2	10.11
7920 05000	-----	5	12.58
7920 06000	-----	6	17.97
7920 07000	-----	7	23.47

- Tolerances: Up to 1" — +0.003"/-0.000"
 Over 1" — 2" — +0.005"/-0.000"
 Over 2" — 2-3/4" — +0.015"/-0.000"
 Over 2-3/4" — +0.250"/-0.000"
- Available in black.

PROPERTIES

- Polyethylene terephthalate (PET).
- High strength and rigidity.
- Low moisture absorption.
- Produced from resin which is approved for use in contact with food.
- Excellent dimensional stability.
- Superior resistance to acidic and chlorinated solutions compared to nylon and acetal.
- Good abrasion resistance.
- ErtalYTE TX is internally lubricated and has enhanced wear properties.



TYPICAL APPLICATIONS

- Food contact parts
- Bushings
- Rollers
- Bearings
- Valve parts



PRODUCT CODE:

HIGH DENSITY POLYETHYLENE SHEET (STRESS RELIEVED)

COLOUR:	NATURAL WHITE	SHEET SIZE:	48" X 96", 48" X 120", 60" X 120"	5110
COLOUR:	BLACK	SHEET SIZE:	48" X 96"	5113
TYPE:	BLACK PIPE GRADE	SHEET SIZE:	48" X 96"	5117

NATURAL STOCK NUMBER	BLACK STOCK NUMBER	PIPE GRADE STOCK NUMBER	THICKNESS INCHES	LBS/SHT. APPROX.
5110 0062	—	-----	1/16	10
5110 0093	—	-----	3/32	15
5110 0125	5113 0125	-----	1/8	20
5110 0187	5113 0187	-----	3/16	30
5110 0250	5113 0250	5117 0250	1/4	40
5110 0375	5113 0375	5117 0375	3/8	60
5110 0500	5113 0500	5117 0500	1/2	80
5110 0625	5113 0625	-----	5/8	100
5110 0750	5113 0750	5117 0750	3/4	120
5110 1000	5113 1000	5117 1000	1	160
5110 1250	5113 1250	-----	1-1/4	200
5110 1500	5113 1500	5117 1500	1-1/2	240
5110 1750	—	-----	1-3/4	280
5110 2000	—	5117 2000	2	320
5110 3000	—	-----	3	480

PROPERTIES

- Lightweight.
- Excellent chemical resistance.
- Low moisture absorption.
- Good impact strength.
- Excellent low temperature properties.
- Natural polyethylene is produced from resin approved for direct food contact.



TYPICAL APPLICATIONS

- Tanks
- Exhaust hoods
- Spacers
- Scraper blades
- Direct food contact

- Tolerance: +/-10%.
- Additional thicknesses and sheet sizes available.
- Inquire about our cut to size abilities.
- Produced from resin which meets federal spec LP 390L, Type I, Class H, Grade 5.
- HMW Sheets available in white and black



POLYETHYLENE ROLL STOCK

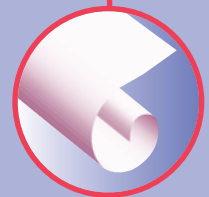
PRODUCT CODE:

HIGH DENSITY POLYETHYLENE	COLOUR:	NATURAL	WIDTH:	48"	5102
LOW DENSITY POLYETHYLENE	COLOUR:	NATURAL	WIDTH:	48"	5002

STOCK NUMBER	THICKNESS INCHES	SQ.FT./ROLL APPROX.
5102 030	0.030	645
5102 040	0.040	485
5102 060	0.060	325
5002 020	0.020	1040
5002 030	0.030	695
5002 060	0.060	350

PROPERTIES

- Impact resistant.
- Corrosion resistant.
- Lightweight.
- Low moisture absorption.



TYPICAL APPLICATIONS

- Washers
- Low speed bearings
- Construction forms
- Tank, chute and bin linings

- Standard rolls weigh approximately 100 lbs.
- Non standard widths, thicknesses and colours available.
- Inquire about our cut to size abilities.



PRODUCT CODE:

**HIGH DENSITY POLYETHYLENE SHEET
(NON STRESS RELIEVED)**

5111

ARENA / PUCK BOARD

5114

COLOUR: NATURAL WHITE, BLACK, YELLOW, GREEN, GOLD

SHEET SIZE: 48" X 96"

STOCK NUMBER	THICKNESS INCHES	LBS/SHT. APPROX.
5111 0110	.110	18
5111 0220	.220	35
5111 0375	.375	60
5111 0440	.440	70
5111 0500	.500	80

PROPERTIES

- Lightweight.
- Good impact strength.
- Low moisture absorption.
- Cost effective.
- Excellent low temperature properties.



TYPICAL APPLICATIONS

- Barn liners
- Arena board
- Concrete moulds
- Washers
- Tank linings

- Tolerance: +/-10%.
- Available in 48" x 120" and other sheet sizes.
- Available in other thicknesses.
- Inquire about our cut to size abilities.



PRODUCT CODE:

**HIGH DENSITY POLYETHYLENE SHEET
(CUTTING BOARDS)**

5112

COLOUR: NATURAL WHITE

SHEET SIZE: 48" X 96", 48" X 120", 60" X 120"

STOCK NUMBER	THICKNESS INCHES	LBS/SHT. APPROX.
5112 0500	1/2	2.50
5112 0750	3/4	3.75
5112 1000	1	5.00

PROPERTIES

- Pebble finish surface.
- Meets FDA, Federal specs.
- Accepted by USDA and Canada Department of Agriculture.
- Acid resistant.
- Will not chip, peel or crack.
- Will not absorb moisture, odours or bacteria.



TYPICAL APPLICATIONS

- Cheese
- Fruit
- Meat
- Vegetables
- Bread
- Fish

- Tolerances: +/-10% thickness.
- Inquire about our cut to size abilities.
- Available in colours.



PRODUCT CODE:

LOW DENSITY POLYETHYLENE SHEET

5010

COLOUR: NATURAL WHITE

SHEET SIZE: 48" X 96"

STOCK NUMBER	THICKNESS INCHES	LBS./SHEET APPROX.
5010 0062 4896	1/16	10
5010 0125 4896	1/8	20
5010 0187 4896	3/16	30
5010 0250 4896	1/4	40
5010 0375 4896	3/8	60
5010 0500 4896	1/2	80
5010 0625 4896	5/8	100
5010 0750 4896	3/4	120
5010 1000 4896	1	160

PROPERTIES

- Corrosion resistant.
- Lightweight.
- Good impact resistance.
- Extremely flexible.
- Easily cleaned.
- Weldable.



TYPICAL APPLICATIONS

- Vacuum formed parts
- Fabricated parts
- Prosthetic devices
- Water treatment parts
- Steel pickling
- Food processing

- Tolerance: +/-10% thickness.
- Additional sheet sizes available.
- Inquire about our cut to size abilities.
- Black and other colours available.
- Produced from resin which meets Federal spec LP 390C, Type 1, Class L, Grade 2.



PRODUCT CODE:

LOW DENSITY POLYETHYLENE ROD

5020

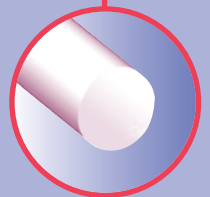
COLOUR: NATURAL

STANDARD LENGTH: 8 FEET; OVER 6" DIA.: 6 FEET

STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.	STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
5020 00250	1/4	0.020	5020 03000	3	2.82
5020 00375	3/8	0.044	5020 03500	3-1/2	3.83
5020 00500	1/2	0.078	5020 04000	4	5.01
5020 00875	7/8	0.240	5020 04500	4-1/2	6.34
5020 01000	1	0.313	5020 05000	5	7.83
5020 01125	1-1/8	0.396	5020 05500	5-1/2	9.47
5020 01250	1-1/4	0.489	5020 06000	6	11.27
5020 01500	1-1/2	0.704	5020 07000	7	15.34
5020 01750	1-3/4	0.96	5020 08000	8	20.03
5020 02000	2	1.25	5020 09000	9	25.35
5020 02250	2-1/4	1.58	5020 10000	10	31.30
5020 02500	2-1/2	1.96	5020 11000	11	37.87
5020 02750	2-3/4	2.37	5020 12000	12	45.07

PROPERTIES

- Excellent impact resistance.
- Lightweight.
- Low moisture absorption.
- High tensile strength.
- Non-toxic.



TYPICAL APPLICATIONS

- Rollers
- Food processing machinery
- Packaging equipment

- All diameters are oversized, suitable to finish to diameters listed.
- Black rods available.
- Larger sizes available.



PRODUCT CODE:

HIGH DENSITY POLYETHYLENE ROD

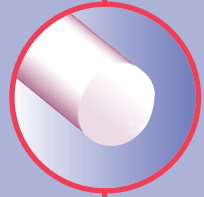
5120

COLOUR: NATURAL STANDARD LENGTH: 8 FEET; OVER 6" DIA.: 6 FEET

STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.	STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
5120 00250	1/4	0.020	5120 02750	2-3/4	2.46
5120 00375	3/8	0.046	5120 03000	3	2.93
5120 00500	1/2	0.081	5120 03500	3-1/2	3.98
5120 00625	5/8	0.127	5120 04000	4	5.20
5120 00750	3/4	0.183	5120 04500	4-1/2	6.58
5120 00875	7/8	0.249	5120 05000	5	8.13
5120 01000	1	0.325	5120 05500	5-1/2	9.83
5120 01125	1-1/8	0.411	5120 06000	6	11.70
5120 01250	1-1/4	0.508	5120 07000	7	15.93
5120 01500	1-1/2	0.731	5120 08000	8	20.80
5120 01750	1-3/4	1.00	5120 09000	9	26.33
5120 02000	2	1.30	5120 10000	10	32.50
5120 02225	2-1/4	1.65	5120 11000	11	39.33
5120 02500	2-1/2	2.03	5120 12000	12	46.80

PROPERTIES

- Very good impact resistance.
- Lightweight.
- Low moisture absorption.
- High tensile strength.
- Non-toxic.
- Easily machined.



TYPICAL APPLICATIONS

- Rollers
- Nuclear measuring equipment
- Food processing machinery
- Packaging equipment

- All diameters are oversized, suitable to finish to diameters listed.
- Colours other than natural available.
- Larger sizes available.



PRODUCT CODE:

POLYETHYLENE WELDING ROD

5024

LOW DENSITY COLOUR: NATURAL

5124

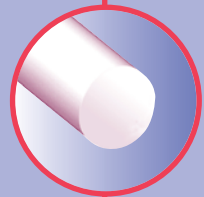
HIGH DENSITY COLOUR: SEE BELOW

STOCK NUMBER	DIAMETER INCHES	COLOUR	FT./LB. APPROX.
5024 125	1/8	NATURAL	200
5024 156	5/32	NATURAL	130
5024 187	3/16	NATURAL	90

PROPERTIES

- Easily welded using hot air or inert gas.

STOCK NUMBER	DIAMETER INCHES	COLOUR	FT./LB. APPROX.
5124 125	1/8	NATURAL	198
5124 156	5/32	NATURAL	127
5124 187	3/16	NATURAL	87
5124 125 05	1/8	BLACK	198
5124 156 05	5/32	BLACK	127
5124 187 05	3/16	BLACK	87



TYPICAL APPLICATIONS

- Tanks
- Flanges
- Repairs

- Standard size: 10lb. coil.
- Available in 48" length.
- For welding tools and accessories see page 90.



PRODUCT CODE:

POLYETHYLENE FILM (EXTRUDED)

5001

COLOUR: NATURAL (CLEAR)

STOCK NUMBER	ROLL SIZE	SQ.FT./ROLL
5001 00103500	LIGHT 3' X 500'	1500
5001 00104360	LIGHT 50" X 360'	1500
5001 00106250	LIGHT 6' X 250'	1500
5001 00108176	LIGHT 100' X 180'	1500
5001 00110150	LIGHT 10' X 150'	1500
5001 00120100	LIGHT 20' X 100'	2000
5001 00206250	MEDIUM 6' X 250'	1500
5001 00208176	MEDIUM 100" X 180'	1500
5001 00210100	MEDIUM 10' X 100'	1000
5001 00210150	MEDIUM 10' X 150'	1500
5001 00212100	MEDIUM 12' X 100'	1200
5001 00216100	MEDIUM 16' X 100'	1600
5001 00220100	MEDIUM 20' X 100'	2000
5001 00224100	MEDIUM 24' X 100'	2400
5001 00306250	HEAVY 6' X 200'	1200
5001 00310100	HEAVY 10' X 100'	1000
5001 00310150	HEAVY 10' X 150'	1500
5001 00312100	HEAVY 12' X 100'	1200
5001 00316100	HEAVY 16' X 100'	1600
5001 00320100	HEAVY 20' X 100'	2000
5001 00324100	HEAVY 24' X 100'	2400
5001 00615100	EX. HEAVY 15' X 100'	1500
5001 00620100	EX. HEAVY 20' X 100'	2000
5001 00632100	EX. HEAVY 32' X 100'	3200
5001 00640100	EX. HEAVY 40' X 100'	4000

PROPERTIES

- Water resistant.
- Lightweight.
- Flexible.
- Chemically resistant.
- Can be UV stabilized.



TYPICAL APPLICATIONS

- Painting drop sheets
- Spill containment
- Product tarping
- Vapour barrier
- Equipment covers

- Sheets are rolled for ease of handling.
- Additional sizes available.
- Reinforced Polyethylene film available.
- Black film available in many sizes.
- Polyethylene layflat tubing and bags available.



PRODUCT CODE:

UHMW POLYETHYLENE SHEET — JAYTREX

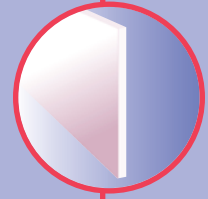
9900

COLOUR: NATURAL WHITE

STOCK NUMBER	THICKNESS INCHES	SHEET SIZE INCHES	LBS./SHEET APPROX.
9900 0062 48120	1/16	48 X 120	13
9900 0125 48120	1/8	48 X 120	25
9900 0125 4896	1/8	48 X 96	20
9900 0187 48120	3/16	48 X 120	38
9900 0187 4896	3/16	48 X 96	30
9900 0250 48120	1/4	48 X 120	50
9900 0250 4896	1/4	48 X 96	40
9900 0375 48120	3/8	48 X 120	75
9900 0375 4896	3/8	48 X 96	60
9900 0500 48120	1/2	48 X 120	100
9900 0500 4896	1/2	48 X 96	80
9900 0625 48120	5/8	48 X 120	125
9900 0625 4896	5/8	48 X 96	100
9900 0750 48120	3/4	48 X 120	150
9900 0750 4896	3/4	48 X 96	120
9900 1000 48120	1	48 X 120	200
9900 1000 4896	1	48 X 96	160
9900 1250 48120	1-1/4	48 X 120	250
9900 1250 4896	1-1/4	48 X 96	200
9900 1500 48120	1-1/2	48 X 120	300
9900 1500 4896	1-1/2	48 X 96	240
9900 1750 48120	1-3/4	48 X 120	350
9900 1750 4896	1-3/4	48 X 96	280
9900 2000 48120	2	48 X 120	400
9900 2000 4896	2	48 X 96	320
9900 2250 48120	2-1/4	48 X 120	450
9900 2250 4896	2-1/4	48 X 96	360
9900 2500 48120	2-1/2	48 X 120	500
9900 2500 4896	2-1/2	48 X 96	400
9900 3000 48120	3	48 X 120	600
9900 3000 4896	3	48 X 96	480
9900 4000 48120	4	48 X 120	800
9900 4000 4896	4	48 X 96	640
9900 5000 4896	5	48 X 96	800

PROPERTIES

- Low coefficient of friction.
- Extremely good wear resistance.
- Very high impact strength.
- No water absorption.
- Very good chemical resistance.
- FDA approval USDA approval.
- Can operate at cryogenic temperatures.
- Good dielectric properties.



TYPICAL APPLICATIONS

- Wear strips
- Chain guides
- Linings for chutes and hoppers
- Star wheels
- Scraper blades
- Slides
- Transfer tables
- Drag conveyor flights

- Tolerances:
 Thickness 1/16" +0.030/-0.010"
 1/8" — 3/8" +/-0.020"
 1/2" and over +/-10%
 Width & length: +1/2" /-1/4"
- Inquire about our cut to size abilities.
- Meets ASTM D-4020-81 of 4.0 to 5.4 million molecular weight.
- COLOURED SHEET AVAILABLE.

SPECIALITY GRADES AVAILABLE:

- Tivar Ceram P With premium additives as a shatter-proof alternative to sintered ceramics. Lime green colour.
- Tivar Oil Filled Enhanced dynamic coefficient of friction for food handling. Dark brown or grey colour.
- Tivar MD Metal Detectable.
- Tivar Rubber Backed Combines .060" thick rubber backing and Tiver 1000.
- Tivar H.O.T. Lasts up to 10 times longer than standard UHMW in higher temperature environments (up to 135°C).

- **TAPE AVAILABLE:**
 : 0.005" — 0.125" Thick.
 : 1" — 18" Wide.
 : 54Ft. Long.
 : Pressure sensitive adhesive or non adhesive.
 : Colour: Natural or Black.



PRODUCT CODE:

UHMW POLYETHYLENE SHEET — JAYTREX

9902

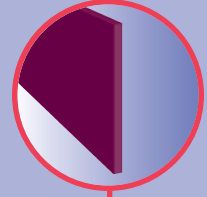
COLOUR: BLACK

SHEET SIZE: 48" x 120"

STOCK NUMBER	THICKNESS INCHES	LBS./SHEET APPROX.
9902 0250 48120	1/4	50
9902 0375 48120	3/8	75
9902 0500 48120	1/2	100
9902 0625 48120	5/8	125
9902 0750 48120	3/4	150
9902 1000 48120	1	200
9902 1250 48120	1-1/4	250
9902 1500 48120	1-1/2	300
9902 1750 48120	1-3/4	350
9902 2000 48120	2	400

PROPERTIES

- Can be UV stabilized.
- Can be static reduced.
- Low coefficient of friction.
- Extremely good wear resistance.
- No water absorption.
- Very good chemical resistance.



TYPICAL APPLICATIONS

- Mining chutes
- Grain handling
- Bottling plants
- Wear strips
- Chain guides
- Electronic assembly conveyor parts
- Marine dock fender facings

- Additional thicknesses available.
- Produced from resin which meets ASTM 4020-81.
- Inquire about our cut to size abilities.

SPECIALTY GRADES AVAILABLE:

- Tivar CleanStat: Designed to eliminate static build-up problems in food and pharmaceutical handling.
- Tivar DrySlide: Modified with special dry lubricants providing extremely low coefficient of friction.
- Tivar AntiStatic: Protects products sensitive to build-up of electrical charge. Surface resistivity ranges from 10⁵ to 10⁹ (ohms/cm²).
- Tivar UV Resistant: For outdoor applications. Retains key properties up to three times longer.



PRODUCT CODE:

UHMW POLYETHYLENE SHEET — TIVAR 88®

9904

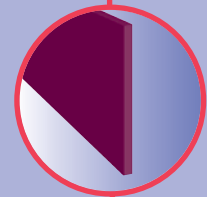
COLOUR: BLUE

SHEET SIZE: 48" X 120"

STOCK NUMBER	THICKNESS INCHES	LBS./SHEET APPROX.
9904 0250 48120	1/4	50
9904 0375 48120	3/8	75
9904 0500 48120	1/2	100
9904 0625 48120	5/8	125
9904 0750 48120	3/4	150
9904 1000 48120	1	200

PROPERTIES

- Outwears steel 6:1.
- Low coefficient of friction.
- Easily machined.
- Good chemical resistance.
- No water absorption.
- Lightweight.
- High shock strength.



TYPICAL APPLICATIONS

- Liner for bulk materials
- Protects substrate from corrosion and sliding abrasion wear
- Mining dragline buckets
- Plow blades

- Additional thicknesses available.
- Produced from resin which meets ASTM 4020-81.
- Available in Anti-Static and U-V Resistant grades.
- Inquire about our cut to size abilities.
- Tivar 88-2 (weldable).



PRODUCT CODE:

UHMW POLYETHYLENE ROD

COLOUR: NATURAL WHITE

STANDARD LENGTH: 10 FEET

9920

COLOUR: BLACK

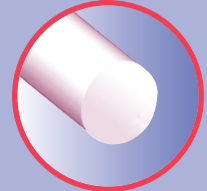
STANDARD LENGTH: 10 FEET

9921

NATURAL STOCK NUMBER	BLACK STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
9920 00500	9921 00500	1/2	0.080
9920 00750	9921 00750	3/4	0.118
9920 01000	9921 01000	1	0.321
9920 01250	9921 01250	1-1/4	0.502
9920 01500	9921 01500	1-1/2	0.722
9920 01750	9921 01750	1-3/4	0.988
9920 02000	9921 02000	2	1.28
9920 02250	9921 02250	2-1/4	1.63
9920 02500	9921 02500	2-1/2	2.01
9920 02750	9921 02750	2-3/4	2.42
9920 03000	9921 03000	3	2.89
9920 03500	9921 03500	3-1/2	3.93
9920 04000	9921 04000	4	5.14
9920 04500	9921 04500	4-1/2	6.50
9920 05000	9921 05000	5	8.03
9920 05500	9921 05500	5-1/2	9.71
9920 06000	9921 06000	6	11.56
9920 07000	9921 07000	7	15.73
9920 08000	9921 08000	8	20.55
9920 09000	9921 09000	9	26.00
9920 10000	9921 10000	10	32.10

PROPERTIES

- Ultra high molecular weight, 4.0 million or greater.
- Very low coefficient of friction.
- Excellent abrasion resistance.
- Good impact strength.
- Noise abatement.
- Lightweight.
- Chemical and corrosion resistant.



TYPICAL APPLICATIONS

- Rollers
- Timing screws
- Sprockets
- Pistons
- Valves
- Gears

- Tolerance: Oversized to allow finishing to nominal diameter.
- Annealed rod in close tolerance (+/- 0.010") available.
- Coloured rod available.
- Produced from resin which meets ASTM 4020-81.

EXTRUDED TUBING

Available in a wide range of diameters from 0.875" O.D. x 0.250" I.D. to 9.50" O.D x 8.25" I.D.

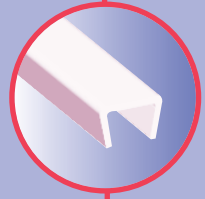


PRODUCT CODE:

UHMW POLYETHYLENE PROFILES

COLOUR: NATURAL WHITE

9975



TYPICAL APPLICATIONS

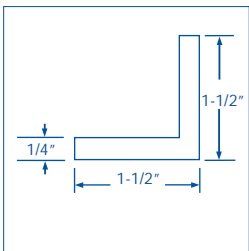
- Material handling
- Conveyor guide rails
- Food plants wear surfaces
- Bottle handling
- Edge protectors

STOCK NUMBER	STANDARD LENGTH		MINIMUM ORDER (FT.)
	STRAIGHT(FT.)	COIL(FT.)	
9975 201	10		10
9975 202	10		10
9975 301		100	100
9975 302	10	100	10 OR 100
9975 304		100	100
9975 351		100	100
9975 501	10		10
9975 602	10	100	10 OR 100
9975 801		100	100
9975 803		100	100
9975 804		100	100
9975 851		100	100

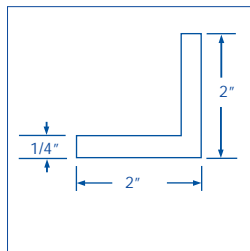
PROPERTIES

- Good impact resistance.
- Excellent abrasion resistance.
- Very low moisture absorption.
- Excellent chemical and corrosion resistance.
- Low coefficient of friction.
- Odourless, tasteless and non toxic.

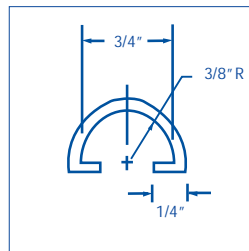
- Many other profiles available.
- Other straight lengths and coils available.
- Produced from resin which meets ASTM 4020-81.



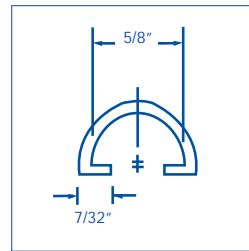
9975 201



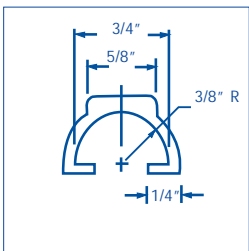
9975 202



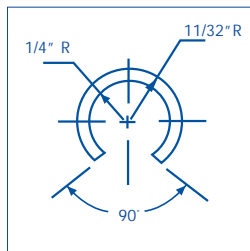
9975 301



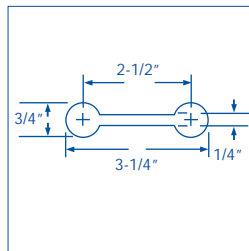
9975 302



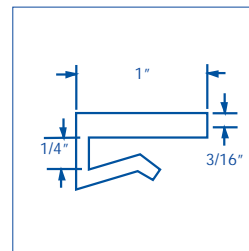
9975 304



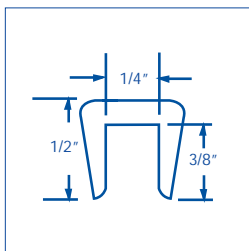
9975 351



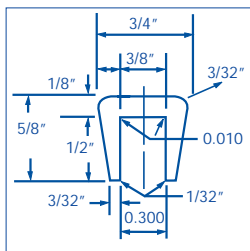
9975 501



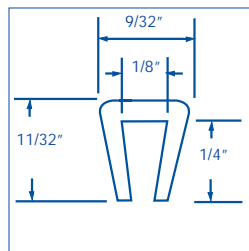
9975 602



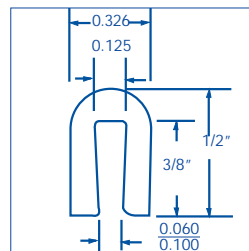
9975 801



9975 803



9975 804



9975 851



INDUSTRIAL LAMINATES

DESCRIPTIONS OF TYPICAL LAMINATE GRADES

Industrial laminates generally refers to a class of electrical insulating materials produced by impregnating fibrous webs of material with thermosetting resins, then fusing multiple layers together under high temperature and pressure. The result is an infusible laminate structure having a versatile combination of electrical, mechanical and chemical properties.

Grade X. Hard, strong, paper-reinforced laminates; good tensile compression and flexural strengths; widely used for mechanical applications when electrical requirements are not severe; should be used with discretion under high humidity conditions.

Grade XX. Hard paper-reinforced laminate with phenolic resin binder; good mechanical properties, high dielectric strength and resistance to moisture suit it for many usual electrical applications; good machinability.

Grade XXX. Paper-reinforced laminate with a phenolic resin binder; has approximately the same mechanical properties as Grade XX but is considerably better electrically due to its high resin content; desirable for use at radio frequencies and under high humidity conditions (e.g., in telephone jacks where dimensional stability is important); minimum cold flow.

Grade XP. Paper-reinforced laminate with phenolic resin binder and addition of a plasticizer; similar to Grade X but more flexible and slightly better electrically (not as strong mechanically); may be punched readily at room temperature in thicknesses up to 1/16-in; hot-punched up to 3/32 in.

Grade XPC. Paper-reinforced laminate with plasticized phenolic resin binder; primarily intended for cold punching and shearing; more flexible than Grade XP.

Grade XXP. Paper-reinforced laminate with plasticized phenolic resin binder; similar to Grade XX in electrical and moisture-resistant properties and to Grade XP in punchability; for electrical or electronic parts, especially those punched.

Grade XXXP. Paper-reinforced laminate similar to Grade XXX, but bonded with plasticized resin; low in dielectric losses; low cold flow; recommended for punching of parts requiring high insulation resistance at high frequencies and high humidity; should be punched hot.

Grade XXXP-C, FR-2. Paper-reinforced laminates similar to XXXP in mechanical properties, dielectric strength, dissipation factor and dielectric constant, but with better resistance to moisture and high insulation resistance; indicated for high humidity conditions; XXXP-C is recommended for punching and shearing at room temperature; FR-2 is a flame-retarded grade.

Grade C. Fabric-reinforced laminate produced from cotton fabric weighing over 4 oz./sq.yd; thread count not more than 72/in. in filler direction, not over 140 total in warp and filler directions; Grade C is tough and strong, has high impact strength, machines readily and is good for a wide variety of mechanical applications such as gears, pulleys, and sheaves.

Grade CE. Similar to Grade C in weight of fabric and thread count; greater resistance to moisture than grade C and controlled electrical properties; easy to machine; used in electrical applications requiring mechanical strength.

Grade L. Fine-weave cotton fabric-reinforced grade with phenolic binder, made from fabric weighing not over 4 oz./sq. yd.; minimum thread count/in. in any ply is 72 in filler direction and 140 total in both warp and filler directions; has good mechanical properties; machines easily and cleanly; recommended for fine punching or threading; suited for close-tolerance machining; fine pitch gears are typical uses.

INDUSTRIAL LAMINATES (CONT.)

DESCRIPTIONS OF TYPICAL LAMINATE GRADES

Grade LE. Fine-weave cotton fabric-reinforced grade of same thread count as Grade L; similar to Grade L in mechanical and machining characteristics but superior in moisture resistance, dissipation factor, and other electricals; used where good electrical and mechanical property combinations are needed.

Grade FR-3. Paper-reinforced laminate bonded with epoxy resin; superior in electrical characteristics to Grade XXXP; good mechanical properties; suitable for punching at room temperature; FR-3 is flame retardant recommended for printed circuit boards and electrical insulation requiring low loss.

Grade N-1. Staple fiber-nylon grade impregnated with phenolic resin; electrical properties of Grade XXXP and mechanical toughness of Grade C; improved insulation resistance for high humidity applications; high-voltage electrical insulators where low dielectric loss, high insulation resistance plus fungus resistance are required.

Grade G-3. Continuous-filament woven glass-fabric grade with a phenolic resin binder; good thermal endurance; good mechanical strength, especially flexural, compressive, shear, and impact; very low dissipation factor.

Grade G-5. Continuous-filament woven glass-fabric grade impregnated with melamine resin; high mechanical strength and arc resistance; excellent electrical properties under dry conditions; flame retardant.

Grade G-7. Continuous-filament glass-cloth reinforcement with a silicone resin binder; good dielectric loss factor and insulation resistance under humid conditions over a wide temperature range; good heat and arc resistance.

Grade G-9. Continuous-filament woven glass-fabric grade impregnated with melamine resin; high mechanical strength and arc resistance; good electric strength properties under wet conditions; flame retardant.

Grade G-10, G-11, FR-4, FR-5. Continuous-filament woven glass-fabric grades impregnated with epoxy resin; particularly noted for good electrical values; possess low moisture absorption and low dissipation factor, and maintains electrical characteristics over a wide range of humidities and temperatures; G-10 and FR-4 retain 20% of their flexural strength at 300° F when tested at this temperature; G-11 and FR-5 retain 50% of their flexural strength when tested at the same temperature; FR-4 and FR-5 are flame retardant.

Vulcanized fibre; commercial, bone, and insulation grades. Somewhat similar to Grade C laminate but with much higher moisture pickup; tough and resilient, with high resistance to arc, impact, abrasion and wear; used as washers, terminal block covers, insulating plates and switch covers, slot insulation, arc barriers, abrasive disks, railroad track insulation, trunks and materials-handling cases.

Polyester/glass-mat sheet laminates. Polyester glass-mat sheets are made from a mat of random-laid glass fibres which is saturated with a polyester resin combined with suitable fillers and cured under heat and pressure. Three typical grades are:

GPO-1, suited for general-purpose mechanical and electrical applications.

GPO-2, for mechanical and electrical applications where low flammability is required.

GPO-3, for mechanical and electrical applications requiring resistance to carbon tracking and low flammability properties.

PRODUCT CODE:

INDUSTRIAL LAMINATE SHEET

0010

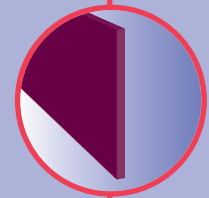
GRADE: CE

COLOUR: NATURAL BROWN

STOCK NUMBER	THICKNESS INCHES	SHEET SIZE INCHES	LBS./SQ.FT. APPROX.	THICKNESS TOLERANCE +/-
0010 0062 4848	1/16	48 X 48	0.44	0.0075
0010 0125 4848	1/8	48 X 48	0.88	0.010
0010 0125 4896	1/8	48 X 96	0.88	0.010
0010 0187 4848	3/16	48 X 48	1.32	0.0125
0010 0187 4896	3/16	48 X 96	1.32	0.0125
0010 0250 4848	1/4	48 X 48	1.76	0.015
0010 0250 4896	1/4	48 X 96	1.76	0.015
0010 0375 4848	3/8	48 X 48	2.64	0.020
0010 0375 4896	3/8	48 X 96	2.64	0.020
0010 0500 4848	1/2	48 X 48	3.52	0.024
0010 0500 4896	1/2	48 X 96	3.52	0.024
0010 0625 4848	5/8	48 X 48	4.40	0.027
0010 0625 4896	5/8	48 X 96	4.40	0.027
0010 0750 4848	3/4	48 X 48	5.28	0.029
0010 0750 4896	3/4	48 X 96	5.28	0.029
0010 1000 4848	1	48 X 48	7.04	0.033
0010 1000 4896	1	48 X 96	7.04	0.033
0010 1250 4848	1-1/4	48 X 48	8.80	0.037
0010 1500 4848	1-1/2	48 X 48	10.56	0.041
0010 2000 4848	2	48 X 48	14.08	0.049

PROPERTIES

- Good punching and machining.
- Excellent resistance to dilute acid solutions.
- High impact strength.
- Good electrical properties.
- Good moisture resistance.



TYPICAL APPLICATIONS

- Gears
- Pinions
- Bearings
- Bushings
- Drilled and tapped parts
- Pulleys

- Available in Grade C.
- Available in 36" X 48".
- Inquire about our cut to size abilities.



INDUSTRIAL LAMINATE SHEET

0014

GRADE: G-10/FR4

COLOUR: GREEN

SHEET SIZE: 36" X 48"

STOCK NUMBER	THICKNESS INCHES	LBS./SQ.FT. APPROX.	THICKNESS TOLERANCE +/-
0014 0031 3648	1/32	0.31	0.0065
0014 0062 3648	1/16	0.62	0.0075
0014 0125 3648	1/8	1.23	0.012
0014 0187 3648	3/16	1.86	0.019
0014 0250 3648	1/4	2.46	0.022
0014 0375 3648	3/8	3.72	0.019
0014 0500 3648	1/2	4.92	0.036
0014 0750 3648	3/4	7.44	0.043
0014 1000 3648	1	9.84	0.049

PROPERTIES

- Minimum water absorption.
- Superior chemical resistance.
- High impact strength.
- Good dielectric loss and electrical strength under both dry and humid conditions.



TYPICAL APPLICATIONS

- Terminal boards
- ARC shields
- Gaskets
- Armature barriers
- Line switch actuators
- Wear blocks

- Available in 48" X 48" and 48" x 96".
- Inquire about our cut to size abilities.
- Other Grades Available: see pages 31 + 32



PRODUCT CODE:

INDUSTRIAL LAMINATE ROD GRADE CE

0020

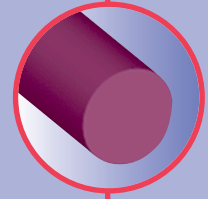
COLOUR: NATURAL

STANDARD LENGTH: 4FT.

STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.	STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
0020 0250	1/4	0.028	0020 1625	1-5/8	1.20
0020 0312	5/16	0.044	0020 1750	1-3/4	1.39
0020 0375	3/8	0.064	0020 2000	2	1.82
0020 0500	1/2	0.114	0020 2250	2-1/4	2.30
0020 0625	5/8	0.177	0020 2500	2-1/2	2.84
0020 0750	3/4	0.255	0020 3000	3	4.09
0020 0875	7/8	0.348	0020 3500	3-1/2	5.56
0020 1000	1	0.454	0020 4000	4	7.26
0020 1125	1-1/8	0.575	0020 4500	4-1/2	9.19
0020 1250	1-1/4	0.709	0020 5000	5	11.35
0020 1375	1-3/8	0.858	0020 6000	6	16.34
0020 1500	1-1/2	1.02			

PROPERTIES

- Excellent wear resistance.
- High strength and toughness.
- Good machinability.



TYPICAL APPLICATIONS

- Gears
- Rollers
- Bearings
- Piston rings
- Pulleys

- Other diameters available.
- Tolerances: Up to 1-1/4" +/-0.001"
Over 1-1/4" +/-0.003"
- Produced to meet or exceed Mil P 15035 Type FBG.



PRODUCT CODE:

INDUSTRIAL LAMINATE ROD GRADE G-10/FR4

0021

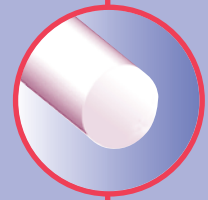
COLOUR: GREEN

STANDARD LENGTH: 4FT.

STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
0021 0375	3/8	0.087
0021 0500	1/2	0.155
0021 0750	3/4	0.349
0021 0625	5/8	0.243
0021 0750	3/4	0.349
0021 1000	1	0.621
0021 1250	1-1/4	0.970
0021 1500	1-1/2	1.40
0021 2000	2	2.48
0021 2500	2-1/2	3.88
0021 3000	3	5.59
0021 3500	3-1/2	7.61
0021 4000	4	9.94
0021 4500	4-1/2	12.58
0021 5000	5	15.53
0021 6000	6	22.36

PROPERTIES

- High temperature resistance.
- Excellent electrical properties.
- Highest strength.
- Good machinability.



TYPICAL APPLICATIONS

- Insulating components
- High humidity areas
- Mechanical/electrical components

- **OTHER GRADES AVAILABLE:**
 XXX Up to 2" diameter.
 LE Up to 6" diameter.
 G7 Up to 1-1/2" diameter.
 G9 Up to 2-1/2" diameter.
 G11 Up to 2-1/2" diameter.
 Black colour in XXX, LE and CE.
 Check for other NEMA grades.

- Other diameters available up to 6".
- Tolerances: Up to 1-1/4" +/-0.001"
Over 1-1/4" +/-0.003"
- Produced to meet or exceed Mil P 15035 Type FBG.



CORROSION RESISTANT

POLYVINYL CHLORIDE (PVC)

Polyvinyl Chloride (PVC) is a thermoplastic material having outstanding corrosion resistance, excellent electric insulating properties and good mechanical strength. The properties of the material can be varied by the addition of fillers, plasticizers, stabilizers and colourants. The material most commonly used in electrical and chemical industries is unplasticized since plasticizers affect adversely chemical and electrical properties. It is a dark grey colour and available in basic shapes such as sheets, rods, hollow bars, pipes and specialty profiles. PVC materials are easily cemented and welded using hot air.

UPVC — TYPE I:

A rigid, unplasticized PVC offering excellent chemical resistance. Self extinguishing. Suitable for applications not exceeding 71° C. Available in white.

UPVC — TYPE II:

Offers significantly higher impact strength than type 1. Chemical resistance, while considered good, is not as good as UPVC Type I.

CHLORINATED POLYVINYL CHLORIDE (CPVC):

A rigid PVC offering the same general properties of UPVC with additional temperature and chemical resistance. Suitable for applications up to 100° C.

POLYPROPYLENE:

Polypropylene has excellent dielectric strength, excellent chemical resistance and outstanding heat resistance. Its moisture absorption is practically nil and unsurpassed in flexural strength. Unlike polyethylene, polypropylene is not prone to environmental stress cracking. It is harder than polyethylene and has greater tensile strength. Although its heat resistance allows usage up to 80° C, it does tend to become brittle below 0° C.

The chemical resistance of polypropylene is outstanding. At room temperature it is essentially insoluble in common solvents. Polypropylene resists acids, alkalies, moisture and salt solutions. It is attacked by strong oxidizing agents such as concentrated nitric acid, hydrogen peroxide and wet chlorine especially at higher temperatures. Ultra violet light and direct sunlight degrade polypropylene unless it is modified by additives.

Welding of polypropylene should be done with nitrogen or dry air as oxygen at high temperatures tends to degrade the material. Common mill shapes are: sheet, rod, pipe, tubing and spheres.

PTFE :

The best known member of the Fluoroplastic family. It is inert to almost all chemicals and can be used continuously at temperatures ranging from -200° C to 260° C. TFE is completely unaffected by outdoor weathering. It has outstanding electrical properties at both high and low temperatures. The slipperiest substance known, TFE has the lowest static and dynamic coefficient of friction of any solid material. It absorbs essentially no moisture. It is cementable only after undergoing special treatment and cannot be successfully welded. Unmodified TFE is available as skived tape, moulded sheets, rods, tubes, flexible and heat-shrink tubing and threadseal tape.

FILLED TFE COMPOSITIONS:

The addition of fillers such as glass, bronze, carbon or mica to TFE will upgrade some mechanical properties. Fillers will enhance TFE's resistance to deformation, wear and creep and increase the material's hardness and dimensional stability. Fillers will reduce chemical resistance, tensile strength and di-electric values.

PRODUCT CODE:

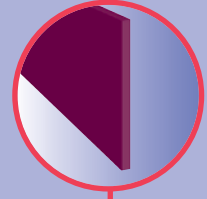
PVC SHEET (JAYCOR®)

(TYPE I, GRADE 1, NORMAL IMPACT)

SHEET SIZE: 48" X 96", 48" X 120"

COLOUR: DARK GREY

2411



TYPICAL APPLICATIONS

- Acid tanks
- Ducts
- Flanges
- Shelving
- Machine Guards
- Industrial waste equipment
- Spraying equipment

STOCK NUMBER	THICKNESS INCHES	LBS/SQFT. APPROX.
2411 0031	1/32	0.24
2411 0062	1/16	0.48
2411 0125	1/8	0.96
2411 0 87	3/16	1.44
2411 0250	1/4	1.92
2411 0375	3/8	2.88
2411 0500	1/2	3.84
2411 0625	5/8	4.80
2411 0 750	3/4	5.76
2411 1000	1	7.68
2411 1250	1-1/4	9.60
2411 1500	1-1/2	11.52
2411 1750	1-3/4	13.44
2411 2000	2	15.36
2411 2250	2-1/4	17.28
2411 2500	2-1/2	19.20
2411 3000	3	23.04
2411 4000	4	30.72

PROPERTIES

- High corrosion resistant.
- Not recommended for thermoforming.
- Lightweight.
- Machinable.
- Cementable.
- Excellent electrical properties.
- Weldable.
- Rigid.

- Available in 60" X 120" up to 1".
- Tolerance: +/-10% (Thickness).
- Inquire about our cut to size abilities.
- Type I, Grade 1, Normal Impact PVC sheet conforms to ASTM D 1784-81.



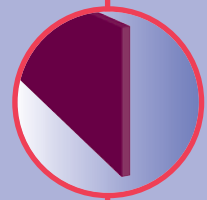
PRODUCT CODE:

PVC SHEET (JAYCOR®) TYPE II

(TYPE II, GRADE 1, HIGH IMPACT)

COLOUR: LIGHT GREY SHEET SIZE: 48" X 96"

2409



TYPICAL APPLICATIONS

- Acid tanks and linings
- Ducts and vents
- Chemical apparatus
- Electronic equipment
- Mass transport vehicles
- Machined flanges
- Fume scrubbers

STOCK NUMBER	THICKNESS INCHES	LBS/SQFT. APPROX.
2409 0125 4896	1/8	0.96
2409 0187 4896	3/16	1.44
2409 0250 4896	1/4	1.92
2409 0375 4896	3/8	2.88
2409 0500 4896	1/2	3.84

PROPERTIES

- High impact resistance.
- Corrosion resistant.
- Easily formable.
- UL94VO.
- Excellent electrical insulator.
- Good abrasion resistance.
- Weldable.
- Machinable.

- Tolerance: +/-10% (Thickness).
- Inquire about our cut to size abilities.
- Type II, Grade 1, High Impact PVC sheet conforms to ASTM D 1784-81(Class 16444-D) Type 2, Grade 1.



PRODUCT CODE:

PERFORATED PVC SHEET (JAYCOR®)

2414

COLOUR: GREY SHEET SIZE: 48" X 96"

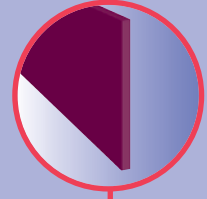
PERFORATION: 1/8" DIAMETERS ON 7/32" STAGGERED CENTRES

STOCK NUMBER	THICKNESS INCHES
2414 0062 4896	1/16
2414 0125 4896	1/8

- Tolerance: +/-10% (Thickness).
- Inquire about our cut to size abilities.
- Other perforation patterns available.

PROPERTIES

- Chemically resistant.
- Lightweight.
- Weldable.
- Cementable.



TYPICAL APPLICATIONS

- Plating baskets
- Mesh screens
- Filters
- Tumbling barrels



PRODUCT CODE:

CLEAR PVC SHEET (JAYCOR®)

2410

COLOUR: CLEAR SHEET SIZE: 48" X 96"

STOCK NUMBER	THICKNESS INCHES	LBS./SHEET APPROX.
2410 0125 4896	1/8	30
2410 0187 4896	3/16	45
2410 0250 4896	1/4	60
2410 0375 4896	3/8	90
2410 0500 4896	1/2	120

- Tolerance: +/-10% (Thickness).
- Inquire about our cut to size abilities.
- All sheets supplied with protective masking both sides.
- Clear PVC sheets are extruded Type I PVC conforming to ASTM D 1784-81 (Class 12453-B).
- Clear High Impact PVC sheets available on request.

PROPERTIES

- Clear.
- Corrosion resistant.
- Easily formed.
- Weldable.



TYPICAL APPLICATIONS

- Acid tank covers
- Viewing ports
- Scientific apparatus
- Water treatment equipment



PRODUCT CODE:

WHITE PVC SHEET (JAYCOR®)

2412

COLOUR: **WHITE**

SHEET SIZE: **48" X 96"**

STOCK NUMBER	THICKNESS INCHES	LBS./SHEET APPROX.
2412 0062 4896	1/16	15
2412 0125 4896	1/8	30
2412 0187 4896	3/16	45
2412 0250 4896	1/4	60
2412 0375 4896	3/8	90
2412 0500 4896	1/2	120
2412 0750 4896	3/4	180

PROPERTIES

- Good chemical resistance.
- Impact resistant.
- Weldable.



TYPICAL APPLICATIONS

- Chemical tanks
- Electronic apparatus
- Covers
- Machine guards
- Laboratory equipment

- Tolerance: +/-10% (Thickness).
- Available in thicker gauges and larger sheet sizes.
- Inquire about our cut to size abilities.
- White PVC sheets are high gloss extruded Type I, Grade 1, Normal Impact, high corrosion resistant and conform to ASTM D 1784-81 (Class 12453-B).
- Masked one side.

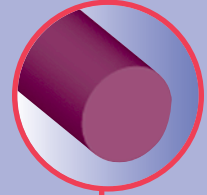


PRODUCT CODE:

UPVC ROD (JAYCOR®)

2420

COLOUR: GREY



TYPICAL APPLICATIONS

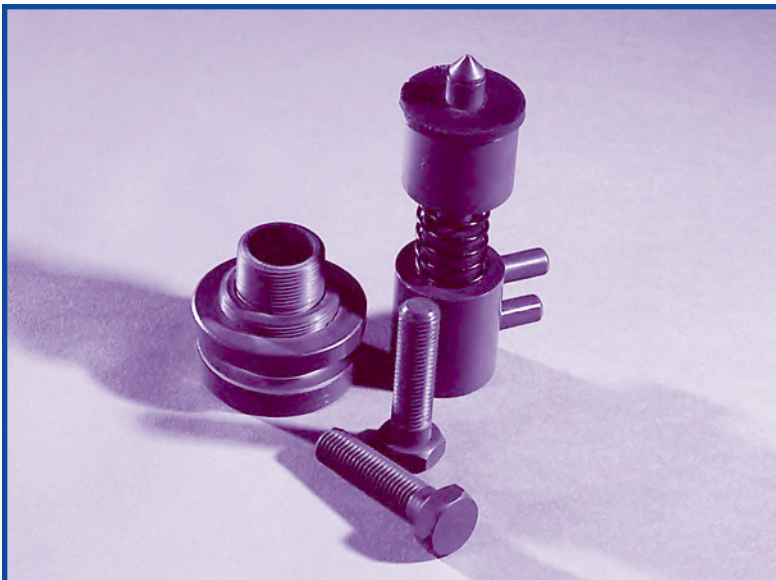
- Valves
- Bushings
- Bottle fillers
- Flanges
- Plugs
- Fittings

PROPERTIES

- Chemically resistant.
- Readily machined.
- Cementable.
- Weldable.
- Good thermal insulation.

STOCK NUMBER	DIAMETER		LBS./FT. APPROX.
	INCHES	MM	
2420 00250	1/4	6.35	0.031
2420 00375	3/8	9.52	0.071
2420 00500	1/2	12.70	0.126
2420 00625	5/8	15.87	0.196
2420 00750	3/4	19.05	0.283
2420 00875	7/8	22.22	0.385
2420 01000	1	25.40	0.503
2420 01250	1-1/4	31.75	0.786
2420 01375	1-3/8	34.92	0.951
2420 01500	1-1/2	38.10	1.132
2420 01750	1-3/4	44.45	1.540
2420 02000	2	50.80	2.01
2420 02375	2-3/8	60.63	2.84
2420 02500	2-1/2	63.50	3.14
2420 02750	2-3/4	70.00	3.80
2420 03000	3	76.20	4.53
2420 03500	3-1/2	88.90	6.16
2420 04000	4	101.60	8.05
2420 04250	4-1/4	107.95	9.09
2420 04500	4-1/2	114.30	10.19
2420 04750	4-3/4	120.65	11.35
2420 05000	5	130	13.20
2420 05500	5-1/2	140	15.30
2420 06000	6	150	17.50
2420 07000	7	180	25.30
2420 08000	8	200	31.20
2420 09000	9	225	39.50
2420 10000	10	250	48.70
2420 12000	12	300	72.40

- Standard lengths: Up to 4-1/2" — Nominal 10 Ft.
5" to 250mm — Nominal 5 Ft.
300mm — Nominal 0.5M.
- Tolerance: Oversized diameter.
- Available in colours on request.



PRODUCT CODE:

PVC (JAYCOR®) HEXAGONAL ROD

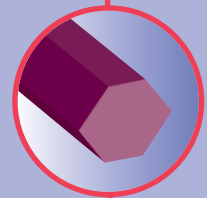
2421

COLOUR: GREY STANDARD LENGTH: 2 AND 3 METRES

STOCK NUMBER	ACROSS FLATS	
	MM	INCHES
2421 0 10	10	0.394
2421 0 12	12	0.472
2421 0 14	14	0.551
2421 0 17	17	0.669
2421 0 19	19	0.748
2421 0 25	25	0.984
2421 0 28	28	1.102
2421 0 32	32	1.260

PROPERTIES

- Readily machined.
- Chemically resistant.
- Cementable.
- Weldable.



TYPICAL APPLICATIONS

- Nuts
- Bolts
- Fittings



PRODUCT CODE:

PVC (JAYCOR®) L-SHAPED ANGLES

2444

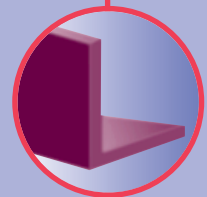
COLOUR: GREY STANDARD LENGTH: 10 FEET

STOCK NUMBER	DIMENSIONS IN INCHES		
	HEIGHT	WIDTH	THICKNESS
2444 1000	1	1	1/8
2444 1250	1-1/4	1-1/4	3/16
2444 1500	1-1/2	1-1/2	3/16
2444 2000	2	2	1/4

- A complete line of metric sizes is available on request.
- Other profile shapes (T-profiles, U-channels) are available on request.

PROPERTIES

- Readily machined.
- Chemically resistant.
- Rigid.
- Cementable.



TYPICAL APPLICATIONS

- Stiffeners
- Flanges
- Electrical insulation



PVC WELDING ROD (JAYCOR®)

COLOUR: GREY STANDARD LENGTH: 48" PRODUCT CODE: 2424

COLOUR: WHITE STANDARD LENGTH: 48" PRODUCT CODE: 2425

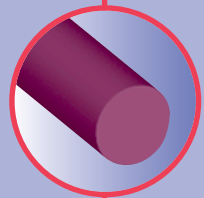
COLOUR: CLEAR STANDARD LENGTH: 48" PRODUCT CODE: 2426

TYPE: CPVC STANDARD LENGTH: 48" PRODUCT CODE: 2427

STOCK NUMBER	DIAMETER INCHES	FT./LB. APPROX.	TYPE
2424 125	1/8	125	GREY
2424 156	5/32	100	GREY
2424 187	3/16	57	GREY
2425 125	1/8	125	WHITE
2425 156	5/32	100	WHITE
2425 187	3/16	57	WHITE
2426 125	1/8	125	CLEAR
2426 156	5/32	100	CLEAR
2427 125	1/8	125	CPVC
2427 156	5/32	100	CPVC

PROPERTIES

Easily welded using hot air process.



TYPICAL APPLICATIONS

- Complex parts
- Tanks
- Flanges

- Triangular and oval rods available.
- Type II, Grade 1, High Impact welding rod available.
- For welding guns and accessories see page 89.



PRODUCT CODE:

FLEXIBLE PVC TANK LINING

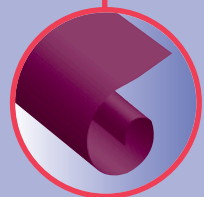
2439

COLOUR: BLACK

STOCK NUMBER	DESCRIPTION	SIZE
2439 125 4860	LINING MATERIAL	1/8" X 48" X 60'
2439 125625	FLAT WELDING SPLINE	5/8" X 1/8" X 150'

PROPERTIES

- High resistance to strong corrosives.
- Flexible.
- Bondable to steel.
- Good tear and abrasion resistance.
- Not recommended above 150°F.



TYPICAL APPLICATIONS

- Plating tanks
- Pickling tanks

- Available in 1/16" — 1/8" thickness in 36" and 48" widths.
- Other seaming strips available.
- Information on installation of PVC lining material is available on request.



PRODUCT CODE:

PVC PIPE

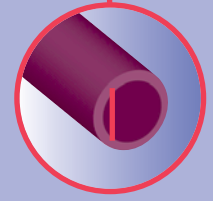
COLOUR: GREY STANDARD LENGTH: 10 FEET

2440

COLOUR: CLEAR STANDARD LENGTH: 10 FEET

2442

STOCK NUMBER	PIPE	OUTSIDE DIAMETER INCHES	AVERAGE INSIDE DIAMETER INCHES	AVERAGE WALL THICKNESS INCHES	WEIGHT PER 100 FEET LBS.	WORKING PRESSURE PSI% @ 22° C
2440 050 040	1/2" SCH 40	0.840	0.622	0.109	16.4	590
2440 050 080	1/2" SCH 80	0.840	0.546	0.147	21.7	480
2440 075 080	3/4" SCH 80	1.050	0.742	0.154	27.7	680
2440 100 040	1" SCH 40	1.315	1.049	0.133	31.9	450
2440 100 080	1" SCH 80	1.315	0.957	0.179	40.7	370
2440 125 080	1-1/4" SCH 80	1.660	1.278	0.191	56.4	520
2440 150 040	1-1/2" SCH 40	1.900	1.610	0.145	51.5	330
2440 150 080	1-1/2" SCH 80	1.900	1.500	0.200	68.2	470
2440 200 040	2" SCH 40	2.375	2.069	0.154	69.1	280
2440 200 080	2" SCH 80	2.375	1.939	0.218	94.3	400
2440 250 040	2-1/2" SCH 40	2.875	2.469	0.203	108.9	300
2440 250 080	2-1/2" SCH 80	2.875	2.323	0.276	144.1	420
2440 300 040	3" SCH 40	3.500	3.068	0.216	142.6	260
2440 300 080	3" SCH 80	3.500	2.900	0.300	192.7	370
2440 400 040	4" SCH 40	4.500	4.026	0.237	203.1	220
2440 400 080	4" SCH 80	4.500	3.826	0.337	281.7	320



TYPICAL APPLICATIONS

- Potable liquids
- Chemicals
- Drain lines
- Sewage treatment
- Air lines
- Irrigation
- Vacuum lines

- Some sizes available in 20 foot lengths.
- Larger sizes available.

PVC TUBULAR BAR AVAILABLE

From 1.625" O.D. x 0.562" I.D. to 8.625" O.D. x 5.750" I.D.



OTHER PIPE AVAILABLE

- PVC:** Series 160,200 — 1/2" to 12".
- Clear PVC:** Stocked in SCH 40 — 3/4", 1", 1-1/2", 2", 3". Available from 1/2" to 8".
- White PVC:** SCH 40 — 1/2" to 3".
- Polypropylene:** SCH 40 + 80, Black + Natural — 1/2" to 12".
- High Density Polyethylene:** Series 45-200 — 1-1/2" to 18".
- PVDF:** SCH 80 — 1/2" to 2".

- Fittings for all materials are available.

PRODUCT CODE:

CPVC SHEET

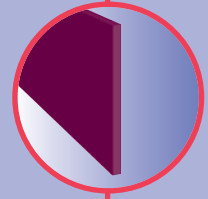
2416

COLOUR: GREY SHEET SIZE: 48" X 96"

STOCK NUMBER	THICKNESS INCHES	LBS/SHEET APPROX.
2416 0015 5199	1/64	4.2
2416 0031 4896	1/32	8.4
2416 0125 4896	1/8	33
2416 0187 4896	3/16	50
2416 0250 4896	1/4	65
2416 0375 4896	3/8	98
2416 0500 4896	1/2	130
2416 0750 4896	3/4	195
2416 1000 4896	1	260
2416 1250 4896	1-1/4	325
2416 1500 4896	1-1/2	390
2416 2000 4896	2	520

PROPERTIES

- High heat resistance.
- Excellent corrosion resistance.
- Easily fabricated.
- Will not support combustion.
- Good electrical insulation.
- Cementable.
- Weldable.



TYPICAL APPLICATIONS

- Chemical tanks
- Spacers
- Drip racks
- Stiffeners
- Waste treatment
- Insulators

- Tolerance: +/-10% (Thickness).
- Inquire about our cut to size abilities.
- CPVC is Type IV Normal Impact, high temperature corrosion resistant Chlorinated Polyvinyl Chloride with a smooth industrial finish.
- Complies with ASTM specification D 1784 (Class 23447-B).



PRODUCT CODE:

CPVC ROD

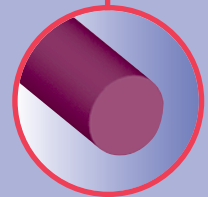
2422

COLOUR: GREY STANDARD LENGTH: 10 FEET

STOCK NUMBER	DIAMETER INCHES	LBS/FT APPROX.
2422 0500	1/2	0.134
2422 0750	3/4	0.283
2422 1000	1	0.540
2422 1250	1-1/4	0.800
2422 1500	1-1/2	1.250
2422 2000	2	2.000
2422 2250	2-1/4	2.627
2422 2500	2-1/2	3.243
2422 3000	3	4.860
2422 3500	3-1/2	3.358
2422 4000	4	8.640
2422 5000	5	12.98

PROPERTIES

- Chemically resistant.
- Readily machined.
- High temperature.
- Cementable.
- Weldable.



TYPICAL APPLICATIONS

- Fittings
- Bushings
- Valves
- Spacers
- Pump components
- Caps
- Flanges

- Tolerance: Oversized diameter.



PRODUCT CODE:

POLYPROPYLENE SHEET

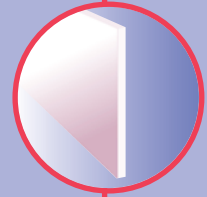
5210

COLOUR: NATURAL

STOCK NUMBER	THICKNESS INCHES	LBS./SQ.FT. APPROX.
5210 0062	1/16	0.30
5210 0093	3/32	0.45
5210 0125	1/8	0.60
5210 0187	3/16	0.90
5210 0250	1/4	1.20
5210 0375	3/8	1.80
5210 0500	1/2	2.40
5210 0625	5/8	3.00
5210 0750	3/4	3.60
5210 1000	1	4.80
5210 1250	1-1/4	6.00
5210 1500	1-1/2	7.20
5210 1750	1-3/4	8.40
5210 2000	2	9.60
5210 2250	2-1/4	10.80
5210 2500	2-1/2	12.00
5210 3000	3	15.40

PROPERTIES

- Homopolymer.
- Rigid.
- Excellent chemical resistance.
- Resists stress cracking.
- Lightweight.
- Low moisture absorption.
- Good impact resistance.
- Good electrical properties.
- Easily fabricated.



TYPICAL APPLICATIONS

- Structural tanks & covers
- Plating barrels
- Prosthetic devices
- Ducts & hoods
- Vacuum formed parts
- Valve & pump components

- Sheet sizes: 48" x 96", 48" x 120", 60" x 120". Others available.
- Tolerance: +/-10%.
- Inquire about our cut to size abilities.
- Produced from resin which meets ASTM D4101 Group 1, Class 1, Grade 2.



PRODUCT CODE:

POLYPROPYLENE SHEET

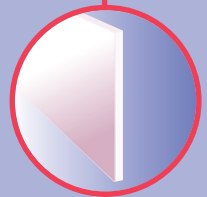
5212

COLOUR: WHITE SHEET SIZE: 48" X 96"

STOCK NUMBER	THICKNESS INCHES	LBS./SHEET APPROX.
5212 0062 4896	1/16	9.4
5212 0125 4896	1/8	18.8
5212 0187 4896	3/16	28.2
5212 0250 4896	1/4	37.6
5212 0375 4896	3/8	56.4
5212 0500 4896	1/2	75.7
5212 0750 4896	3/4	112.8

PROPERTIES

- Homopolymer.
- High gloss finish.
- Excellent chemical resistance.
- Rigid.
- Lightweight.
- Resists stress cracking.
- Good impact strength.
- Good electrical properties.



TYPICAL APPLICATIONS

- Lab tables
- Light tables
- Rinse & etch housing for electronics industry
- Fume hoods
- Plating tanks

- Available in 60" x 120"
- Tolerance: +/- 10%.
- Inquire about our cut to size abilities.
- Masked one side to protect against scratches.
- Conforms to ASTM D 4101 Group 1, Class 1, Grade 2.



PRODUCT CODE:

POLYPROPYLENE SHEET

5213

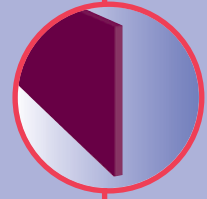
COLOUR: **BLACK** SHEET SIZE: **48" X 96"**

STOCK NUMBER	THICKNESS INCHES	LBS./SHEET APPROX.
5213 0125 4896	1/8	18.8
5123 0187 4896	3/16	28.4
5213 0250 4896	1/4	37.6
5213 0375 4896	3/8	56.4
5213 0500 4896	1/2	75.7
5213 0750 4896	3/4	112.8
5213 1000 4896	1	151.4

- Tolerance: +/- 10%.
- Inquire about our cut to size abilities.
- Masked one side to protect against scratches.
- Conforms to ASTM D 4101 Group 1, Class 1, Grade 2.

PROPERTIES

- Homopolymer.
- Excellent chemical resistance.
- Rigid.
- Can be UV stabilized.
- Good electrical properties.
- Lightweight.
- Resists stress cracking.



TYPICAL APPLICATIONS

- Plating tanks
- Fume hoods
- Ducts
- Covers



POLYPROPYLENE SHEET — COPOLYMER

PRODUCT CODE:

5211

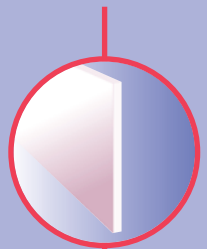
COLOUR: **NATURAL AND BLACK** SHEET SIZE: **48" X 96", 48" X 120", 60" X 120"**

STOCK NUMBER	THICKNESS INCHES	LBS./SHEET APPROX.
5211 0125	1/8	0.59
5211 0187	3/16	0.88
5211 0250	1/4	1.18
5211 0375	3/8	1.77
5211 0500	1/2	2.36
5211 0750	3/4	3.54
5211 1000	1	4.72

- Tolerance: +/-10%.
- Inquire about our cut to size abilities.
- Produced from resin which meets ASTM D 4101 Group 2, Class 1, Grade 1.

PROPERTIES

- Improved impact strength.
- Better resistance to cracking at low temperatures.
- Good chemical resistance.
- Meets the requirements of U.S. FDA as specified in 21 CFR 177 1520.



TYPICAL APPLICATIONS

- Prosthetic devices
- Vacuum formed parts
- Structural tanks & covers
- Plating tanks



PRODUCT CODE:

POLYPROPYLENE ROD

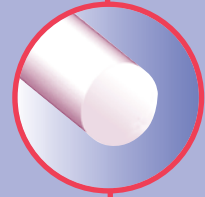
5220

COLOUR: NATURAL STANDARD LENGTH: 8 FEET; OVER 6" DIA.: 6 FEET

STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.	STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
5220 00250	1/4	0.019	5220 02500	2-1/2	1.93
5220 00375	3/8	0.043	5220 02750	2-3/4	2.34
5220 00500	1/2	0.077	5220 03000	3	2.78
5220 00625	5/8	0.121	5220 03500	3-1/2	3.79
5220 00750	3/4	0.174	5220 04000	4	4.94
5220 00875	7/8	0.237	5220 04500	4-1/2	6.26
5220 01000	1	0.309	5220 05000	5	7.73
5220 01125	1-1/8	0.391	5220 05500	5-1/2	9.35
5220 01250	1-1/4	0.483	5220 06000	6	11.12
5220 01500	1-1/2	0.695	5220 07000	7	15.14
5220 01750	1-3/4	0.95	5220 08000	8	19.78
5220 02000	2	1.24	5220 09000	9	25.03
5220 02250	2-1/4	1.56	5220 10000	10	30.90

PROPERTIES

- Excellent chemical resistance.
- Lightweight.
- Low moisture absorption.
- Resists stress cracking.
- Rigid.



TYPICAL APPLICATIONS

- Chemical apparatus
- Pump parts
- Rollers
- Fittings

- Colours other than natural available.
- Larger sizes available.
- All diameters are oversized, suitable to finish to diameters listed.



PRODUCT CODE:

POLYPROPYLENE WELDING ROD

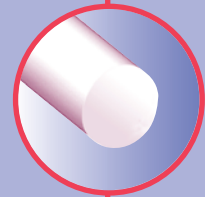
5224

COLOUR: SEE BELOW

STOCK NUMBER	DIAMETER INCHES	COLOUR	FT./LB. APPROX.
5224 125	1/8	NATURAL	205
5224 156	5/32	NATURAL	132
5224 187	3/16	NATURAL	91
5224 12500	1/8	WHITE	205
5224 15600	5/32	WHITE	132
5224 18700	3/16	WHITE	91
5224 12505	1/8	BLACK	205
5224 15605	5/32	BLACK	132
5224 18705	3/16	BLACK	91

PROPERTIES

- Easily welded using hot air or inert gas.



TYPICAL APPLICATIONS

- Tanks
- Flanges
- Repairs

- Standard size: 10lb. coil.
- Available in 48" length.
- For welding tools and accessories see page 89.



PRODUCT CODE:

PTFE SHEET — VIRGIN

9110

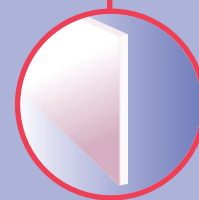
COLOUR: NATURAL WHITE

SHEET SIZE: 48" X 48"

STOCK NUMBER	THICKNESS INCHES	TOLERANCE +/-	LBS./SQ. FT APPROX.
9110 0031 4848	1/32	0.002"	0.38
9110 0062 4848	1/16	0.005"	0.75
9110 0093 4848	3/32	0.005"	1.13
9110 0125 4848	1/8	0.010"	1.50
9110 0187 4848	3/16	10%	2.25
9110 0250 4848	1/4	10%	3.00
9110 0312 4848	5/16	10%	3.75
9110 0375 4848	3/8	10%	4.50
9110 0500 4848	1/2	10%	6.00
9110 0625 4848	5/8	10%	7.50
9110 0750 4848	3/4	10%	9.00
9110 1000 4848	1	10%	12.0
9110 1250 4848	1-1/4	10%	15.00
9110 1500 4848	1-1/2	10%	18.00
9110 2000 4848	2	10%	24.00
9110 2500 4848	2-1/2	10%	30.00
9110 3000 4848	3	10%	36.00

PROPERTIES

- Low coefficient of friction.
- Stability at low temperatures.
- Resistant to corrosive reagents.
- Long term weatherability.
- Excellent dielectric strength.
- Low dielectric constant.
- Meets or exceeds Mil P22241A.
- Produced from resin compatible with food contact.



TYPICAL APPLICATIONS

- Gaskets
- Valve components
- Bearings
- Seals
- Chemical equipment parts
- Washers
- Insulators

- Sheets up to 1/8" are skived, over 1/8" are moulded.
- Additional sheet sizes: 24" x 24", 30" x 30", 36" x 36", 40 x 40".
- Also in skived only: 60" x 60" and 72" x 72".
- Inquire about our cut to size abilities.



PRODUCT CODE:

PTFE SHEET — 25% GLASS-FILLED

9111

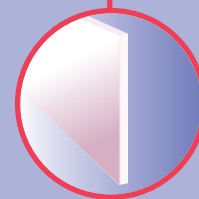
COLOUR: WHITE

SHEET SIZE: 48" X 48"

STOCK NUMBER	THICKNESS INCHES	TOLERANCE +/-	LBS./SQ. FT APPROX.
9111 0062 4848	1/16	0.005"	0.78
9111 0125 4848	1/8	0.010"	1.55
9111 0187 4848	3/16	10%	2.32
9111 0250 4848	1/4	10%	3.09
9111 0375 4848	3/8	10%	4.64
9111 0500 4848	1/2	10%	6.18
9111 0625 4848	5/8	10%	7.73
9111 0750 4848	3/4	10%	9.27

PROPERTIES

- Similar to Virgin PTFE.
- Reduced coefficient of thermal expansion.
- Reduced cold flow under load.
- Increased PV value.
- Can be attacked by alkali.



TYPICAL APPLICATIONS

- Bearings
- Slides
- Gaskets
- Washers
- Electrical components

- Available in thicker gauges
- Sheets up to 1/8" are skived, over 1/8" are moulded.
- Additional sheet sizes: 24" x 24", 30" x 30", 36" x 36", 40 x 40".
- Also in skived only: 60" x 60" and 72" x 72".
- Inquire about our cut to size abilities.



PRODUCT CODE:

PTFE SKIVED TAPE — VIRGIN

COLOUR: NATURAL WHITE

9150

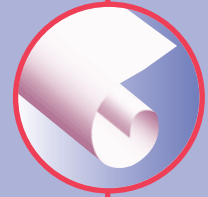
COLOUR: NATURAL ONE SIDE, ETCHED ONE SIDE

9151

STOCK NUMBER	THICKNESS INCHES	WIDTH INCHES	TOLERANCE + / -	LBS./SQ.FT. APPROX.
9150 002 12	0.002	12	0.0002	0.024
9150 003 12	0.003	12	0.0002	0.036
9150 003 24	0.003	24	0.0005	0.036
9150 005 12	0.005	12	0.0005	0.060
9150 005 24	0.005	24	0.0005	0.060
9150 010 12	0.010	12	0.001	0.120
9150 010 24	0.010	24	0.001	0.120
9150 015 12	0.015	12	0.001	0.180
9150 015 24	0.015	24	0.001	0.180
9150 020 12	0.020	12	0.0015	0.240
9150 020 24	0.020	24	0.0015	0.240
9150 031 12	0.031	12	0.002	0.360
9150 031 24	0.031	24	0.002	0.360
9150 031 48	0.031	48	0.002	0.360
9150 062 12	0.062	12	0.005	0.720
9150 062 24	0.062	24	0.005	0.720
9150 062 48	0.062	48	0.005	0.720
9150 093 12	0.093	12	0.005	1.120
9150 093 24	0.093	24	0.005	1.120
9150 125 12	0.125	12	0.010	1.500
9150 125 24	0.125	24	0.010	1.500
9150 125 48	0.125	48	0.010	1.500
9151 031 48	0.031	48" Roll	0.002	0.36
9151 062 48	0.060	48" Roll	0.005	0.72
9151 125 48	0.125	48" Roll	0.010	1.50

PROPERTIES

- Excellent dielectric strength.
- Low coefficient of friction.
- Essentially chemically inert.
- Virtually unaffected by weather.
- Continuous service at -450°F to 500°F.
- Bondable as etched one side.
- Produced from resin compatible with food contact.
- Meets or exceeds Mil P22241A.



TYPICAL APPLICATIONS

- Gaskets
- Antistick linings
- Curling shoe soles
- Electronic equipment
- Seals

- Available up to 72" wide.
- Available in glass filled.
- Additional thickness from 0.001" to 1/4".
- Slit widths available from 1/2" to 72".



PRODUCT CODE:

PTFE THREADSEAL TAPE — JAYSEAL

9153

COLOUR: WHITE

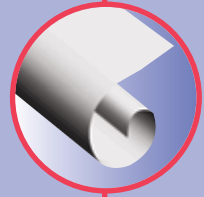
STANDARD ROLL LENGTH: 520"

STOCK NUMBER	GAUGE INCHES	WIDTH INCHES
9153 050 520	0.0035	1/2
9153 075 520	0.0035	3/4
9153 100 520	0.0035	1

- Available in other widths, gauges, lengths and colours.

PROPERTIES

- Virgin PTFE.
- Exceeds Mil spec T-27730A.
- Temperature range -450°F to +550°F.



TYPICAL APPLICATIONS

- Water lines
- Oil lines
- Chemical lines
- Food processing



PRODUCT CODE:

PTFE COATED GLASS FABRIC

9290

STANDARD ROLL WIDTH:

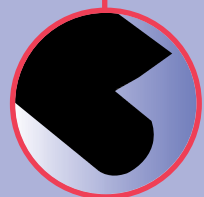
37-1/2"

STOCK NUMBER	THICKNESS INCHES	LBS./SQ. YD. APPROX.	DIELECTRIC STRENGTH V/M	BREAKING STRENGTH LBS./IN. WIDTH
9290 3T 108A	0.003	0.25	750	70
9290 5T 116A	0.005	0.44	600	120
9290 6T 116A	0.006	0.54	800	120
929010T 128A	0.010	0.90	500	200
ADHESIVE BACKED				
9290 3T 108AP	0.003	0.25	750	70
9290 5T 116AP	0.005	0.44	600	120
9290 6T 116AP	0.006	0.54	800	120
929010T 128AP	0.010	0.90	500	200

- Continuous belts available in various grades and splices.
- Slit rolls available as tapes from 1/4" to 36" in 18 or 36yd. lengths.

PROPERTIES

- Non stick.
- Non toxic — food handling approved.
- Chemically resistant.
- Operational from — 400°F to +500°F.
- Electrical insulator.



TYPICAL APPLICATIONS

- Release sheets
- Non-stick surfaces
- Gaskets and seals
- Covers



PRODUCT CODE:

MOULDED PTFE ROD — VIRGIN

9120

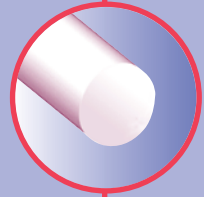
COLOUR: WHITE

STANDARD LENGTH: 12"

STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
9120 02000	2	3.50
9120 02250	2-1/4	4.40
9120 02500	2-1/2	5.40
9120 02750	2-3/4	6.40
9120 03000	3	7.50
9120 03250	3-1/4	8.75
9120 03500	3-1/2	10.00
9120 03750	3-3/4	11.50
9120 04000	4	12.95
9120 04250	4-1/4	14.50
9120 04500	4-1/2	16.15
9120 04750	4-3/4	17.19
9120 05000	5	20.70
9120 05500	5-1/2	23.75
9120 06000	6	29.15
9120 06500	6-1/2	32.75
9120 07000	7	40.35
9120 08000	8	51.78

PROPERTIES

- Outstanding chemical resistance.
- Excellent weatherability.
- Low coefficient of friction.
- Low dielectrical properties.
- Excellent heat and low temperature resistance.



TYPICAL APPLICATIONS

- Pump components
- Bushings
- Electrical parts
- Valve components
- Rings
- Seals

- Available from 1" to 20" diameter.
- Tolerance: Oversized, suitable to machine to dimension listed.



PRODUCT CODE:

MOULDED PTFE ROD — 25% GLASS-FILLED

9121

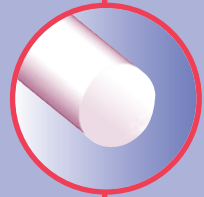
COLOUR: WHITE

STANDARD LENGTH: 12"

STOCK NUMBER	DIAMETER INCHES	LBS./SHEET APPROX.
9121 02000	2	2.94
9121 02250	2-1/4	4.53
9121 02500	2-1/2	5.56
9121 03000	3	6.59
9121 03500	3-1/2	9.33
9121 04000	4	13.34
9121 05000	5	21.32
9121 06000	6	30.02

PROPERTIES

- Similar to Virgin PTFE.
- Improved PV valve.
- Improved dimensional stability.
- Can be attacked by alkali.



TYPICAL APPLICATIONS

- Bushings
- Seals
- Wear parts
- Valve seats

- Available from 1" to 20" diameter.
- Tolerance: Oversized, suitable to finish to dimension listed.



PRODUCT CODE:

EXTRUDED PTFE ROD

VIRGIN: COLOUR: WHITE STANDARD LENGTH: 6 FT.

9020

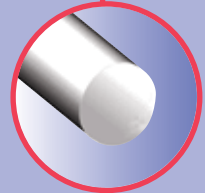
MECHANICAL: COLOUR: WHITE STANDARD LENGTH: 6 FT.

9022

STOCK NUMBER		DIAMETER INCHES	TOLERANCE INCHES	LBS./FT. APPROX.
VIRGIN	MECHANICAL			
9020 0125	----	1/8	+0.002/-0.000	0.012
9020 0187	90220187	3/16	+0.002/-0.000	0.028
9020 0250	90220250	1/4	+0.002/-0.000	0.049
9020 0312	90220312	5/16	+0.002/-0.000	0.076
9020 0375	90220375	3/8	+0.002/-0.000	0.111
9020 0437	90220437	7/16	+0.002/-0.000	0.115
9020 0500	90220500	1/2	+0.002/-0.000	0.196
9020 0562	90220562	9/16	+0.002/-0.000	0.248
9020 0625	90220625	5/8	+0.004/-0.000	0.307
9020 0750	90220750	3/4	+0.004/-0.000	0.441
9020 0875	90220875	7/8	+0.004/-0.000	0.601
9020 1000	90221000	1	+0.010/-0.000	0.785
9020 1125	90221125	1-1/8	+0.010/-0.000	0.924
9020 1250	90221250	1-1/4	+0.010/-0.000	1.227
9020 1375	90221375	1-3/8	+0.010/-0.000	1.480
9020 1500	90221500	1-1/2	+0.010/-0.000	1.770
9020 1625	90221625	1-5/8	+0.010/-0.000	2.080
9020 1750	90221750	1-3/4	+0.010/-0.000	2.400
9020 2000	90222000	2	OVERSIZED	3.140
9020 2500	—	2-1/2	OVERSIZED	4.906
9020 2750	—	2-3/4	OVERSIZED	5.936
9020 3000	—	3	OVERSIZED	7.065
9020 3500	—	3-1/2	OVERSIZED	9.616
9020 4000	—	4	OVERSIZED	12.560
9020 4500	—	4 -1/2	OVERSIZED	15.890

PROPERTIES

- Chemical inertness.
- Heat resistance.
- Low coefficient of friction.
- Non adhesive.
- Excellent dielectric strength.



TYPICAL APPLICATIONS

- Pump parts
- Valves
- Laboratory equipment
- Capacitors
- Bushings
- Spacers in co-axial cable
- Bearings

- Intermediate and larger sizes available. 12 Ft. lengths available.
- Produced from resin which meets AMS 3651.



PRODUCT CODE:

EXTRUDED PTFE ROD

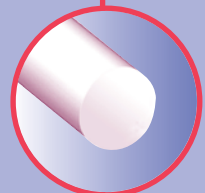
25% GLASS FILLED: COLOUR: WHITE STANDARD LENGTH: 6 FT.

9021

STOCK NUMBER	DIAMETER INCHES	TOLERANCE INCHES	LBS./FT. APPROX.
9021 0500	1/2	+0.002/-0.000	0.202
9021 0562	9/16	+0.002/-0.000	0.255
9021 0625	5/8	+0.004/-0.000	0.316
9021 0750	3/4	+0.004/-0.000	0.454
9021 1000	1	+0.010/-0.000	0.808
9021 1250	1-1/4	+0.010/-0.000	1.264
9021 1500	1-1/2	+0.010/-0.000	1.823
9021 1750	1-3/4	+0.010/-0.000	2.472
9021 2000	2	OVERSIZED	3.234

PROPERTIES

- Similar to Virgin PTFE.
- Improved PV valve.
- Improved dimensional stability.
- Can be attacked by alkali.



TYPICAL APPLICATIONS

- Bushings
- Seals
- Wear parts
- Valve seats

- Available from 1/8" – 4" diameter. Available in 12 Ft. lengths.
- Carbon and other fills available.



PRODUCT CODE:

PTFE CYLINDERS — FILLED

9132

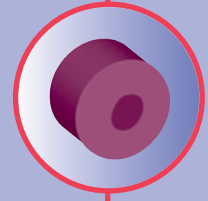
PTFE 138 — 25% CARBON GRAPHITE

COLOUR: DARK GREY

STOCK NUMBER	FINISHED SIZE (INCHES)			LBS./PIECE APPROX.
	O.D.	I.D.	LENGTH	
9132 01375 00500	1.375	0.50	12	1.43
9132 02375 01250	2.375	1.25	12	3.35
9132 02750 02125	2.75	2.125	12	3.20
9132 02875 01625	2.875	1.625	12	4.54
9132 03125 02000	3.125	2.00	12	5.27
9132 03000 02625	3.00	2.625	12	2.62
9132 03375 02125	3.375	2.125	12	6.52
9132 03250 02625	3.25	2.625	12	3.83
9132 03750 02500	3.75	2.50	12	6.95
9132 04125 02250	4.125	2.25	12	9.26
9132 04125 02875	4.125	2.875	12	7.80
9132 04125 03500	4.125	3.50	12	4.91
9132 04500 03000	4.50	3.00	12	9.66
9132 04750 03500	4.75	3.50	12	9.08
9132 04875 03875	4.875	3.875	12	7.12
9132 05000 03500	5.00	3.50	12	10.91
9132 05250 04125	5.25	4.125	12	9.43
9132 05375 03875	5.375	3.875	12	10.85
9132 05500 04000	5.50	4.00	12	12.16
9132 05500 04500	5.50	4.50	12	7.49
9132 05750 04500	5.75	4.50	12	11.22
9132 06000 04750	6.00	4.75	12	11.75
9132 06000 05250	6.00	5.25	12	8.20
9132 06125 04375	6.125	4.375	12	15.31
9132 06125 05000	6.125	5.00	12	10.02
9132 06250 04750	6.25	4.75	12	14.03
9132 06250 05000	6.25	5.00	12	12.29
9132 06250 05500	6.25	5.50	12	8.56
9132 06500 04750	6.50	4.75	12	16.38
9132 06500 05250	6.50	5.25	12	12.82
9132 06500 05750	6.50	5.75	12	8.90
9132 06750 05000	6.75	5.00	12	17.09
9132 06750 05250	6.75	5.25	12	15.26
9132 07000 05500	7.00	5.50	12	15.89
9132 07000 06000	7.00	6.00	12	11.80
9132 07000 06250	7.00	6.25	12	9.62
9132 07250 05750	7.25	5.75	12	16.51
9132 07500 05750	7.50	5.75	12	19.22
9132 07500 06000	7.50	6.00	12	17.14
9132 07500 06500	7.50	6.50	12	12.68
9132 07500 07000	7.50	7.00	12	7.88
9132 07750 06250	7.75	6.25	12	17.76
9132 07750 06750	7.75	6.75	12	13.13
9132 08000 06500	8.00	6.50	12	18.38
9132 08250 06500	8.25	6.50	12	21.36
9132 08500 06750	8.50	6.75	12	22.08
9132 08750 07000	8.75	7.00	12	22.79
9132 09000 07250	9.00	7.25	12	23.50

PROPERTIES

- Similar to Virgin PTFE.
- Good compressive strength.
- Better wear resistance.
- Low coefficient of thermal expansion.
- Increased stiffness.
- Higher creep resistance.



TYPICAL APPLICATIONS

- Compressor parts
- Valve seats
- Bushings
- Gaskets
- Wear parts
- Seal rings
- Electrical parts
- Chemical equipment



PRODUCT CODE:

PTFE CYLINDERS — FILLED

9132

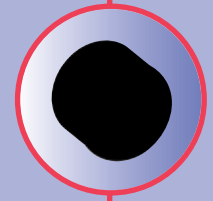
PTFE 138 — 25% CARBON GRAPHITE

COLOUR: DARK GREY

STOCK NUMBER	FINISHED SIZE (INCHES)			LBS./PIECE APPROX.
	O.D.	I.D.	LENGTH	
9132 09250 07750	9.25	7.75	12	21.60
9132 09750 08000	9.75	8.00	8	17.26
9132 09750 08500	9.75	8.50	8	13.31
9132 10000 09000	10.00	9.00	12	17.14
9132 10250 08500	10.25	8.50	12	27.06
9132 10500 08750	10.50	8.75	12	27.77
9132 11000 09000	11.00	9.00	8	21.85
9132 11000 09500	11.00	9.50	8	17.42
9132 11250 09250	11.25	9.25	8	22.39
9132 11375 10000	11.375	10.00	12	25.02
9132 11625 10000	11.625	10.00	8	21.10
9132 11625 10500	11.625	10.50	8	16.18
9132 11750 09750	11.75	9.75	8	23.47
9132 12250 10250	12.25	10.25	6	19.74
9132 12375 10750	12.375	10.75	6	15.92
9132 12875 10750	12.875	10.75	8	28.80
9132 12875 11750	12.875	11.75	8	17.98
9132 13750 11750	13.75	11.75	8	27.78
9132 13875 12875	13.875	12.875	8	17.89
9132 14250 10750	14.25	10.75	6	35.72
9132 14250 11750	14.25	11.75	6	22.07
9132 14250 12750	14.25	12.75	6	18.65
9132 15125 12750	15.125	12.75	12	55.32
9132 15125 13500	15.125	13.50	8	27.82
9132 15125 14000	15.125	14.00	8	21.22
9132 15875 13500	15.875	13.50	8	39.23
9132 16125 14000	16.125	14.00	8	37.37
9132 15875 14500	15.875	14.50	8	25.81
9132 16750 15750	16.75	15.75	4	12.23
9132 17250 14000	17.25	14.00	4	29.41
9132 17625 15875	17.625	15.875	6	29.44
9132 18000 14500	18.00	14.50	4	32.61
9132 19500 16875	19.50	16.875	4	28.46
9132 20125 18000	20.125	18.00	4	26.32
9132 20875 18875	20.875	18.875	4	23.54
9132 21750 18875	21.75	18.875	4	34.28
9132 23750 20750	23.75	20.75	4	40.75

PROPERTIES

- Similar to Virgin PTFE.
- Good compressive strength.
- Better wear resistance.
- Low coefficient of thermal expansion.
- Increased stiffness.
- Higher creep resistance.



TYPICAL APPLICATIONS

- Compressor parts
- Valve seats
- Bushings
- Gaskets
- Wear parts
- Seal rings
- Electrical parts
- Chemical equipment

- Finished size dimensions are sufficiently oversize to machine to the size listed.
- Many other sizes available. Selection of proper mould size requires our knowing your finished size.
- Cylinders can be factory supplied with a wood mounting block. This allows for chucking in the lathe to enable PTFE to be machined right down to the end of the tube.
- Other fills available in various combinations: glass, bronze, carbon, calcium fluoride, graphite, coke flour, ceramic and mica.

- **PTFE CYLINDERS — VIRGIN**
Available in sizes from 1-1/4" O.D. x 3/8" I.D. to 34-1/2" O.D. x 30-1/8" I.D.



PRODUCT CODE:

PTFE CYLINDERS — FILLED

9133

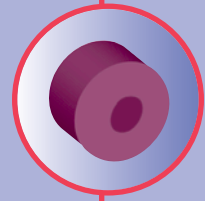
PTFE 152 — 20% GLASS, 5% MDS, 5% CARBON GRAPHITE

COLOUR: DARK GREY

STOCK NUMBER	FINISHED SIZE (INCHES)			LBS./PIECE APPROX.
	O.D.	I.D.	LENGTH	
9133 02500 01500	2.50	1.50	12	4.25
9133 03000 02000	3.00	2.00	12	5.00
9133 03500 02500	3.50	2.50	12	6.00
9133 04000 02500	4.00	2.50	8	6.25
9133 04500 03000	4.50	3.00	8	7.00
9133 05000 03500	5.00	3.50	8	8.00
9133 05500 04000	5.50	4.00	8	9.00
9133 06000 04500	6.00	4.50	8	9.75
9133 06500 05000	6.50	5.00	8	10.50
9133 07000 05500	7.00	5.50	8	11.50
9133 07000 06000	7.00	6.00	8	12.75
9133 07500 06000	7.50	6.00	8	12.50
9133 08000 06500	8.00	6.50	8	13.50
9133 08500 07000	8.50	7.00	8	14.25
9133 09000 07500	9.00	7.50	8	15.25
9133 09500 08000	9.50	8.00	8	16.25
9133 10000 08500	10.00	8.50	8	17.00
9133 10500 09000	10.50	9.00	8	18.00
9133 11000 09500	11.00	9.50	8	18.75
9133 11500 10000	11.50	10.00	8	23.00
9133 12000 10500	12.00	10.50	8	24.50
9133 12500 10750	12.50	10.75	6	23.50
9133 14000 12000	14.00	12.00	8	41.00
9133 14375 12250	14.375	12.25	6	24.50
9133 14500 12500	14.50	12.50	8	43.50

PROPERTIES

- Similar to Virgin PTFE.
- Good compressive strength.
- Better wear resistance.
- Low coefficient of thermal expansion.
- Increased stiffness.
- Higher creep resistance.



TYPICAL APPLICATIONS

- Compressor parts
- Valve seats
- Bushings
- Gaskets
- Wear parts
- Seal rings
- Electrical parts
- Chemical equipment

- Finished size dimensions are sufficiently oversized to machine to the size listed.
- Many other sizes available. Selection of proper mould size requires our knowing your finished size.
- Cylinders can be factory supplied with a wood mounting block. This allows for chucking in the lathe to enable PTFE to be machined right down to the end of the tube.
- Other fills available in various combinations: glass, bronze, carbon, calcium fluoride, graphite, coke flour, ceramic and mica.

• **PTFE CYLINDERS — VIRGIN**

Available in sizes from 1-1/4" O.D. x 3/8" I.D. to 34-1/2" O.D. x 30-1/8" I.D.



PRODUCT CODE:

EXTRUDED PTFE HEAVY WALL TUBING

9038

COLOUR: NATURAL WHITE

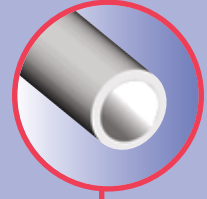
STANDARD LENGTH: 6 FEET

STOCK NUMBER	INCHES		STOCK NUMBER	INCHES	
	O.D.	I.D.		O.D.	I.D.
9038 0250 0061	1/4	1/16	9038 1125 0375	1-1/8	3/8
9038 0250 0125	1/4	1/8	9038 1125 0500	1-1/8	1/2
9038 0312 0187	5/16	3/16	9038 1125 0625	1-1/8	5/8
9038 0375 0125	3/8	1/8	9038 1125 0750	1-1/8	3/4
9038 0375 0187	3/8	3/16	9038 1125 0875	1-1/8	7/8
9038 0375 0250	3/8	1/4	9038 1125 1000	1-1/8	1
9038 0437 0187	7/16	3/16	9038 1250 0250	1-1/4	1/4
9038 0437 0250	7/16	1/4	9038 1250 0375	1-1/4	3/8
9038 0437 0312	7/16	5/16	9038 1250 0500	1-1/4	1/2
9038 0500 0250	1/2	1/4	9038 1250 0625	1-1/4	5/8
9038 0500 0375	1/2	3/8	9038 1250 0750	1-1/4	3/4
9038 0562 0187	9/16	3/16	9038 1250 0875	1-1/4	7/8
9038 0562 0250	9/16	1/4	9038 1250 1000	1-1/4	1
9038 0562 0437	9/16	7/16	9038 1250 1125	1-1/4	1-1/8
9038 0625 0125	5/8	1/8	9038 1375 0250	1-3/8	1/4
9038 0625 0250	5/8	1/4	9038 1375 0500	1-3/8	1/2
9038 0625 0312	5/8	5/16	9038 1375 0625	1-3/8	5/8
9038 0625 0375	5/8	3/8	9038 1375 0750	1-3/8	3/4
9038 0625 0437	5/8	7/16	9038 1375 0875	1-3/8	7/8
9038 0625 0500	5/8	1/2	9038 1375 1000	1-3/8	1
9038 0687 0437	11/16	7/16	9038 1375 1125	1-3/8	1-1/8
9038 0687 0562	11/16	9/16	9038 1375 1250	1-3/8	1-1/4
9038 0750 0375	3/4	3/8	9038 1500 0375	1-1/2	3/8
9038 0750 0437	3/4	7/16	9038 1500 0500	1-1/2	1/2
9038 0750 0500	3/4	1/2	9038 1500 0625	1-1/2	5/8
9038 0750 0625	3/4	5/8	9038 1500 0750	1-1/2	3/4
9038 0812 0437	13/16	7/16	9038 1500 0875	1-1/2	7/8
9038 0812 0562	13/16	9/16	9038 1500 1000	1-1/2	1
9038 0812 0687	13/16	11/16	9038 1500 1250	1-1/2	1-1/4
9038 0875 0375	7/8	3/8	9038 1500 1375	1-1/2	1-3/8
9038 0875 0500	7/8	1/2	9038 1625 0625	1-5/8	5/8
9038 0875 0625	7/8	5/8	9038 1625 1125	1-5/8	1-1/8
9038 0875 0750	7/8	3/4	9038 1625 1250	1-5/8	1-1/4
9038 1000 0250	1	1/4	9038 1625 1375	1-5/8	1-3/8
9038 1000 0375	1	3/8	9038 1625 1500	1-5/8	1-1/2
9038 1000 0500	1	1/2	9038 1750 0500	1-3/4	1/2
9038 1000 0625	1	5/8	9038 1750 0750	1-3/4	3/4
9038 1000 0750	1	3/4	9038 1750 0875	1-3/4	7/8
9038 1000 0875	1	7/8	9038 1750 1000	1-3/4	1
			9038 1750 1125	1-3/4	1-1/8
			9038 1750 1250	1-3/4	1-1/4
			9038 1750 1375	1-3/4	1-3/8
			9038 1750 1500	1-3/4	1-1/2

(CONTINUED)

PROPERTIES

- Virgin PTFE (Polytetrafluoroethylene).
- Chemical inertness.
- Excellent dielectric strength.
- Low coefficient of friction.
- Useful mechanical properties are maintained from -450°F to 500°F.
- Unaffected by outdoor weathering.



TYPICAL APPLICATIONS

- Bushings
- Back up rings
- Liners
- Insulators
- Seals



PRODUCT CODE:

EXTRUDED PTFE HEAVY WALL TUBING (CONT.)

9038

COLOUR: NATURAL WHITE

STANDARD LENGTH: 6 FEET

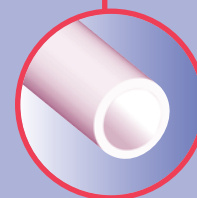
STOCK NUMBER	INCHES	
	O.D.	I.D.
9038 1875 1125	1-7/8	1-1/8
9038 1875 1250	1-7/8	1-1/4
9038 1875 1375	1-7/8	1-3/8
9038 1875 1625	1-7/8	1-5/8
9038 2000 0750	2	3/4
9038 2000 0875	2	7/8
9038 2000 1000	2	1
9038 2000 1125	2	1-1/8
9038 2000 1250	2	1-1/4
9038 2000 1375	2	1-3/8
9038 2000 1500	2	1-1/2
9038 2000 1750	2	1-3/4

TOLERANCES	I.D.	O.D.
UP TO 1"	+0.000"/-0.025"	+0.032"/-0.000"
OVER 1" TO 2"	+0.000"/-0.032"	+0.062"/-0.000"

- Intermediate sizes available.
- Longer lengths available.
- Mechanical grade available.
- Various % glass filled rod available.

PROPERTIES

- Virgin PTFE (Polytetrafluoroethylene).
- Chemical inertness.
- Excellent dielectric strength.
- Low coefficient of friction.
- Useful mechanical properties are maintained from -450°F to 500°F.
- Unaffected by outdoor weathering.



TYPICAL APPLICATIONS

- Bushings
- Back up rings
- Liners
- Insulators
- Seals



PRODUCT CODE:

EXTRUDED PTFE HEAVY WALL TUBING -COILS

9039

COLOUR: NATURAL

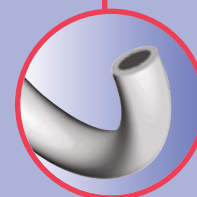
STANDARD LENGTH: MINIMUM 25 FT. COILS

STOCK NUMBER	INCHES		TOLERANCE	
	O.D.	I.D.	O.D.	I.D.
9039 0250 0125	1/4	1/8	+/-0.005	+/-0.005
9039 0500 0375	1/2	3/8	+/-0.005	+/-0.005
9039 0375 0250	0.375	0.250	+/-0.005	+/-0.005
9039 0385 0260	0.385	0.260	+/-0.005	+/-0.005
9039 0500 0375	0.500	0.250	+/-0.005	+/-0.005
9039 0510 0390	0.510	0.390	+/-0.005	+/-0.005
9039 0625 0390	0.625	0.390	+0.025 - 0.000	+0.010 - 0.015
9039 0640 0525	0.640	0.525	+/-0.005	+/-0.005
9039 0750 0525	0.750	0.525	+0.025 - 0.000	+0.000 - 0.025

- Orange and other colours available.
- Many other sizes available (Including Metric).
- Coils up to 100 Ft.

PROPERTIES

- Paste Extruded.
- Virgin PTFE (Polytetrafluoroethylene).
- Chemical inertness.
- Excellent dielectric strength.
- Low coefficient of friction.
- Useful mechanical properties are maintained from -450°F to 500°F.
- Unaffected by outdoor weathering.



TYPICAL APPLICATIONS

- Bushings
- Back up rings
- Liners
- Insulators
- Seals



GLAZING , GRAPHICS , GUARDS

Johnston Industrial Plastics stocks many materials used in the graphics industry. You will find information about those plastics on their product pages. We supply many others on an as needed basis. If you do not see a product you are looking for listed here, please ask for availability.

ACRYLIC

Acrylic is a crystal clear thermoplastic material possessing excellent mechanical and chemical properties. Outstanding optical qualities and resistance to both sunlight and outdoor weathering make acrylic an ideal glazing material. Acrylic can be easily cemented, welded, thermoformed and machined, making it an extremely versatile material. It has FDA approval.

CEMENTING:

Solvent cementing using such cements as ethylene di-chloride, methylene di-chloride and glacial acetic acid can be used to produce corner or edge joints. The surfaces to be joined should be machined square and smooth (not polished). The capillary or the soak method of application should be used to soften the surfaces sufficiently to allow a strong bond to form. Insufficient softening or inadequate pressure could result in air bubbles. Excessive pressure is likely to cause stress crazing and/or cracking. Inadequate ventilation could result in crazing of the acrylic due to the presence of solvent vapours. Bodied cements, consisting of acrylic syrup and a catalyst, are generally used for larger area bonds or for greater bond strength especially when surfaces to be joined do not mate exactly.

FABRICATING AND MACHINING:

Acrylic can be machined easily to close tolerances using standard wood or metal working equipment. Transparency can be restored to machined material by polishing. Acrylic is notch sensitive. If it is to be affixed by screws or bolts, holes should be polished. If it is to be affixed within a frame, edges should be radiused. These procedures should significantly reduce the possibility of stress cracking. Forming or bending of acrylic can be achieved between 160° to 176°C (Cast) or 150° to 160°C (Acrylite FF). Uniform heating is important as excessive bowing may result from uneven heating. Overheating will tend to produce small bubbles in the material.

POLYCARBONATE

Polycarbonate offers an unusual combination of features including: good transparency, very high impact strength, dimensional stability, high and low temperature capabilities, good electrical characteristics and excellent fire rating.

MACHINING:

Polycarbonate should be machined with very sharp cutting tools. Power saws fitted with band, hack or circular blades can be used. Blade speeds are not as critical as with other thermoplastics due to high heat deflection and melting points. Band saw blades with 10 to 18 teeth per inch are satisfactory. Cutting speeds are 2500 to 3000 feet per minute up to 1/4" thick and 2000-2500 feet per minute over 1/4" thick. Tooth spacing for circular saw blades ranges from large for cutting thick sections to very small for thin ones. Blades with 10 to 12 teeth per inch are best for cutting 1/8" to 1/4" thick stock. Suggested speed range for circular saws is 6000 to 8000 feet per minute for sections less than 1/8" thick, bandsaws, routers, rotating knives, slotting cutters and shears are all preferred to circular saw cutting.

FORMING:

Polycarbonate sheet must be pre-dried at 125°C before it can be thermoformed. Drying time varies with thickness: 0.060" to 0.080" — 2 hours, 0.100" to 0.125" — 5 hours, 0.187" — 13 hours and 0.250" — 24 hours. The accuracy of drying temperatures is critical: ± 3°C. Excessively high temperature could cause distortion, excessively low temperature may have little or no effect. Thermoforming is normally characterized by higher than usual forming temperature 190°C to -218°C and rapid cooling. Its cooling or freezing performance is so fast that the sheet must be preclamped in place under the heaters. Transporting heated sheet from an oven to a mould and clamping device is not usually possible. Formed parts can be readily trimmed by punching, shearing, sawing or routing. Polycarbonate can be welded using Leister hot air equipment or cemented using MDC or Weld-On adhesives.

PRODUCT CODE:

ACRYLIC SHEET

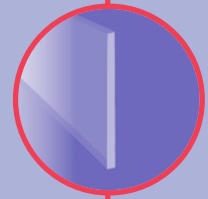
1011

COLOUR: CLEAR

STOCK NUMBER	THICKNESS		TOLERANCE MM
	MM	INCHES	
1011 0060	1.5	0.060	+/- 0.15
1011 0080	2	0.080	+/- 0.20
1011 0100	2.5	0.098	+/- 0.25
1011 0118	3	0.118	+/- 0.30
1011 0177	4.5	0.177	+/- 0.22
1011 0236	6	0.236	+/- 0.30
1011 0354	9.5	0.375	+/- 0.47
1011 0472	12.7	0.500	+/- 0.63

PROPERTIES

- Weather resistant.
- Lightweight.
- Easily formed, sawed, machined and cemented.
- Excellent light transmission.



TYPICAL APPLICATIONS

- Standard sheet sizes: 49" x 97", 51" x 100", 61" x 97", 61" x 124", 73" x 97", 75" x 100, 75" x 124".
- Inquire about our cut to size abilities.
- All sheets supplied with protective paper masking on both sides. Polyethylene masking available on request.

- Signs
- Store displays
- Furniture
- Glazing
- Skylights
- Boutique items



PRODUCT CODE:

COLOURED ACRYLIC SHEET

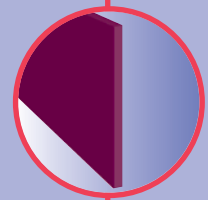
1015

COLOUR: SEE BELOW

STOCK NUMBER	THICKNESS		TOLERANCE MM
	MM	INCHES	
1015 0118	3	0.118	+/- 0.30
1015 0177	4.5	0.177	+/- 0.22
1015 0236	6	0.236	+/- 0.30

PROPERTIES

- Weather resistance.
- Lightweight.
- Easily formed, sawed, machined and cemented.
- Excellent light transmission.



TYPICAL APPLICATIONS

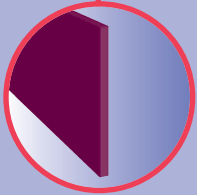
- Sheet sizes: 49" x 97", 61" x 97", 75" x 100", 75" x 124".
- Inquire about our cut to size abilities.
- Colours available: see pg 59
- Cements for acrylics are listed on pages 95 – 97.
- All sheets supplied with protective masking on both sides.

- Signs
- Store displays
- Furniture
- Glazing
- Skylights
- Boutique items



ACRYLIC SHEET STANDARD COLOURS

COLOUR	COLOUR NUMBERS
WHITE	7328
WHITE	2447
WHITE	7508
WHITE	2371/3015
IVORY	2146
TRANSPARENT GRAY	2064
TRANSPARENT GRAY	2074
TRANSPARENT BRONZE	2404
TRANSPARENT BRONZE	2412
TRANSPARENT BRONZE	2370
BLACK	2022
BLACK	2025
RED	2662
RED	2157
RED	2415
TRANSPARENT RED	2444
RED	2283
FLUORESCENT RED	2085
TRANSPARENT RED	2423
RED	2793
ORANGE	2119
BROWN	2418
YELLOW	2016
YELLOW	2037
TRANSPARENT YELLOW	2208
GREEN	2030
GREEN	2108
GREEN	3030
BLUE	2114
BLUE	2050
BLUE	2051
BLUE	2648/2326
TRANSPARENT BLUE	2069
TRANSPARENT BLUE	2424



* The listing of two colour numbers does not imply that these colours are identical. They can, however, be used interchangeably without appreciably changing the desired effect.

Many custom sheets available including:

- EXOTIC EDGE
- FLUORESCENT COLOURS
- CRYSTAL ICE
- RESIST 65

PRODUCT CODE:

1010

CAST ACRYLIC SHEET

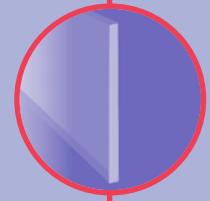
COLOUR: CLEAR

SHEET SIZE: 48" X 96"

STOCK NUMBER	THICKNESS		TOLERANCE INCHES	LBS./SQ.FT. APPROX.
	INCHES	MM		
1010 0125	1/8	3.17	+0.030; -0.040	0.73
1010 0187	3/16	4.75	+0.027; -0.043	1.10
1010 0250	1/4	6.35	+0.025; -0.045	1.47
1010 0375	3/8	9.53	+0.030; -0.060	2.31
1010 0500	1/2	12.70	+0.030; -0.070	3.08
1010 0625	5/8	15.87	+0.033; -0.077	3.85
1010 0750	3/4	19.05	+0.030; -0.080	4.62
1010 1000	1	25.40	+0.023; -0.087	6.16
1010 1250	1-1/4	31.75	+0.052; -0.094	7.70
1010 1500	1-1/2	38.10	+0.039; -0.121	9.24
1010 2000	2	50.80	+0.058; -0.152	12.32
1010 2500	2-1/2	63.50	+0.079; -0.181	15.40
1010 3000	3	76.20	+0.102; -0.208	18.48
1010 3500	3-1/2	88.90	+0.121; -0.239	21.42
1010 4000	4	101.60	+0.142; -0.268	24.64

PROPERTIES

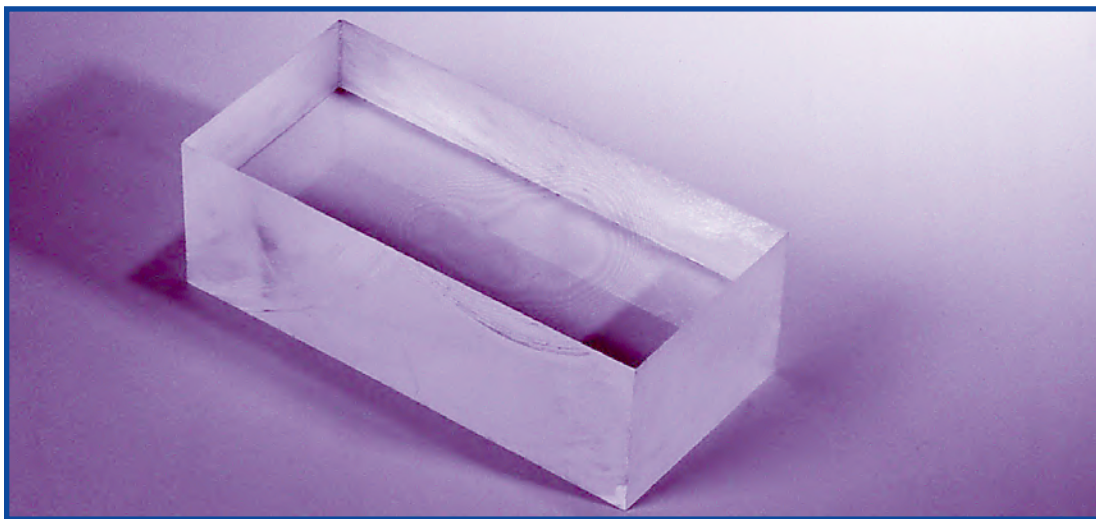
- Weather resistant.
- Lightweight.
- Easily formed, sawed, machined and cemented.
- Excellent light transmission.



TYPICAL APPLICATIONS

- Signs
- Store displays
- Furniture
- Glazing
- Skylights
- Boutique items

- All sheets supplied with protective paper masking on both sides.
- Available sheet sizes: 48" x 96", 49" x 97", 48" x 72", 61" x 97", 73" x 97", 75" x 100", 75" x 124".
- Other sheet sizes available.
- For information on cements for bonding acrylics, see pages 95 – 97.
- Do not use abrasives when cleaning.
- Produced to meet military specification MIL-P-21105 and U.S. Federal specification LP-391 Type 1 and 2, Grade C.
- Colours: Many available.
For colour reference see page 59.
Standard sheet size: 49" x 97".



ACRYLIC SHEET

Other Acrylic Sheets available on special quotation:

- **PATTERNED ACRYLIC SHEET**

Various raised finishes: Matte (P-95, P-99), Prismatic [FFU, FFX (PIN HEAD)], others.

- **UVT**

Ultra-violet transmitting sheet. This sheet has the same general physical properties as the standard type of cast acrylic sheet, but gives increased transmittance of ultra-violet light in the wave lengths between 280 and 360 millimicrons.

- **UVF**

Ultra-violet filtering sheet. This sheet has the same general physical properties as UVT sheet except it absorbs radiation in the ultra-violet range just below the visible spectrum. Suitable for protection of objects which are damaged by ultra-violet light.

- **UVA TYPE II**

Ultra-violet absorbing sheet. This sheet has the same general physical properties as the standard cast acrylic sheet except its optical properties and thickness tolerances are superior. Military specification: MIL-P-5425 Finish A.

- **ABRASION-RESISTANT SHEET**

Specially-coated general purpose cast acrylic sheet displaying much greater resistance to abrasion than uncoated acrylic sheet. Federal specification: LP-391D, item D, Type III, Grade C.

- **SECURITY GLAZING**

Bullet-resisting, abrasion-resistant acrylic sheet with excellent optical properties and good impact strength. It is one-half the weight of bullet-resisting glass and can be machined or fabricated using standard tools. Available in 1-1/4" thick sheets in sheet sizes 48" x 96", 60" x 96" and 72" x 96".

- **PRE-SHRUNK ACRYLIC SHEET**

Manufactured to satisfy more exacting standards of optical and surface quality and to meet closer tolerances, pre-shrunk acrylic's other physical properties are identical to cast acrylic. Being a pre-shrunk material, for practical purposes, no shrinkage will occur when it is heated to forming temperature. Military specification: Mil-P-5425C.

- **MIRRORED ACRYLIC SHEET**

Clear acrylic sheet with reflecting backing specially applied to give a mirrorized finish. Stocked in 1/8" x 48" x 96". Available in 3/16" and 1/4" thicknesses. Colours available.

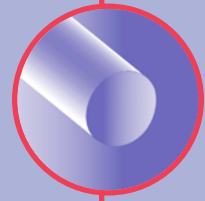


PRODUCT CODE:

CAST ACRYLIC ROD

1020

COLOUR: CLEAR



TYPICAL APPLICATIONS

- Furniture
- Displays
- Lenses
- Electrical parts
- Models

STOCK NUMBER	DIAMETER INCHES	TOLERANCE INCHES	LBS./FT. APPROX.
1020 00250	0.250	+/- 0.005	0.026
1020 00312	0.312	+/- 0.005	0.039
1020 00375	0.375	+/- 0.005	0.056
1020 00500	0.500	+/- 0.005	0.100
1020 00625	0.625	+/- 0.010	0.158
1020 00750	0.750	+/- 0.010	0.227
1020 00875	0.875	+/- 0.010	0.309
1020 01000	1.000	+/- 0.010	0.403
1020 01125	1.125	+/- 0.015	0.511
1020 01250	1.250	+/- 0.015	0.630
1020 01375	1.375	+/- 0.015	0.762
1020 01500	1.500	+/- 0.015	0.901
1020 01625	1.625	+/- 0.015	1.070
1020 01750	1.750	+/- 0.015	1.240
1020 01875	1.875	+/- 0.015	1.420
1020 02000	2.000	+/- 0.015	1.610
1020 02250	2.250	+/- 0.030	2.040
1020 02500	2.500	+/- 0.030	2.520
1020 02750	2.750	+/- 0.030	3.050
1020 03000	3.000	+/- 0.030	3.630
1020 03500	3.500	+/- 0.045	5.19
1020 04000	4.000	+/- 0.045	6.78
1020 04500	4.500	+/- 0.045	8.58
1020 05000	5.000	+/- 0.045	10.60
1020 06000	6.000	+/- 0.045	15.26
1020 06500	6.500	+/- 0.050	17.91

PROPERTIES

- Optical quality.
- Lightweight.
- Water resistant.
- Outstanding weatherability.
- High resistance to heat distortion.
- Good machinability.

Standard Lengths: Up to 2.000" – 8 Ft.
 2.125" to 3.000" – 6 Ft.
 3.250" to 6.000" – 4 Ft.
 Over 6.000" – 2-4 Ft.

Sizes larger than 6.500" available.



PRODUCT CODE:

EXTRUDED ACRYLIC ROD

1120

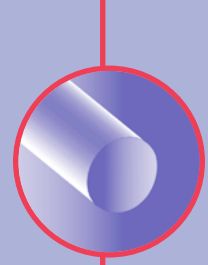
COLOUR: CLEAR

STANDARD LENGTH: 6 FEET

STOCK NUMBER	DIAMETER INCHES	TOLERANCE INCHES	LBS./FT. APPROX.
1120 0062	1/16	+/- 0.005	0.015
1120 0125	1/8	+/- 0.005	0.063
1120 0187	3/16	+/- 0.007	0.014
1120 0250	1/4	+/- 0.010	0.025
1120 0312	5/16	+/- 0.010	0.040
1120 0375	3/8	+/- 0.010	0.060
1120 0437	7/16	+/- 0.010	0.080
1120 0500	1/2	+/- 0.012	0.101
1120 0562	9/16	+/- 0.012	0.128
1120 0625	5/8	+/- 0.015	0.160
1120 0750	3/4	+/- 0.025	0.230
1120 0875	7/8	+/- 0.030	0.310
1120 1000	1	+/- 0.030	0.410
1120 1125	1-1/8	+/- 0.035	0.513
1120 1250	1-1/4	+/- 0.035	0.633
1120 1375	1-3/8	+/- 0.035	0.770
1120 1500	1-1/2	+/- 0.040	0.912
1120 2000	2	+/- 0.040	1.640

PROPERTIES

- High light transmittance.
- Water resistance.
- Weatherability.
- Chemical resistance.
- Easily fabricated.
- Lightweight.
- Non-toxic.



TYPICAL APPLICATIONS

- Furniture
- Lighting fixtures
- Towel bars
- Displays

- Lengths other than the standard can be supplied. Subject to minimum order.
- Coloured Rods available. Subject to minimum order, in opaque black, opaque white and the following transparent colours: yellow, blue, green, red and amber.



PRODUCT CODE:

ACRYLIC SHAPES

SQUARE ROD: COLOUR: CLEAR STANDARD LENGTH: 6 FT.

1121

PROFILE: COLOUR: CLEAR STANDARD LENGTH: 6 FT.

1122

SQUARE TUBE: COLOUR: CLEAR STANDARD LENGTH: 6 FT.

1131

STOCK NUMBER	DESCRIPTION	
1121 0125	EXT. ACRYLIC SQUARE ROD	1/8" X 1/8"
1121 0250	EXT. ACRYLIC SQUARE ROD	1/4" X 1/4"
1121 0500	EXT. ACRYLIC SQUARE ROD	1/2" X 1/2"
1121 1000	EXT. ACRYLIC SQUARE ROD	1" X 1"

- Available up to 1-1/4" X 1-1/4".

STOCK NUMBER	DESCRIPTION	
1122 001	EXT. ACRYLIC PROFILE	J BAR
1122 002	EXT. ACRYLIC PROFILE	U CHANNEL
1122 003	EXT. ACRYLIC PROFILE	STEP STRIP
1122 004	EXT. ACRYLIC PROFILE	Z BAR

- Available: W Bar, T Bar, Step Strip, Rectangular Strip.

STOCK NUMBER	DESCRIPTION	
1131 02404	EXT. ACRYLIC SQUARE TUBE	3/8" O.D. X 1/16" WALL
1131 03204	EXT. ACRYLIC SQUARE TUBE	1/2" O.D. X 1/16" WALL

- Available also from 3/4" O.D. X 1/16" Wall to 2-1/4" O.D. x 1/8" Wall.

- Acrylic shapes available: Spiral twist tube
Spiral twist rod
Right triangle (Isosceles) rod
Half round rod
Tri-Prism rod
Equilateral triangle rod

- Hexagonal rod
Quad-Prism rod
Cabochons
Spheres
Cubes
Hinge

- For cements see pages 95 – 97.



PRODUCT CODE:

CAST ACRYLIC TUBE

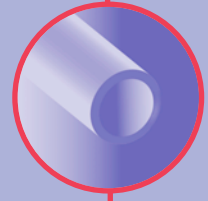
1030

COLOUR: CLEAR STANDARD LENGTH: NOMINAL 6 FEET

STOCK NUMBER	O.D. INCHES	I.D. INCHES	WALL INCHES	LBS./FT. APPROX.	WORKING PRESSURE UP TO 22°C (P.S.I.)
1030 01500 125	1-1/2	1/1/4	1/8	0.277	270
1030 01500 250	1-1/2	1	1/4	0.504	575
1030 01750 125	1-3/4	1-1/2	1/8	0.326	229
1030 01750 250	1-3/4	1-1/4	1/4	0.605	485
1030 02000 125	2	1-3/4	1/8	0.378	199
1030 02000 250	2	1-1/2	1/4	0.706	420
1030 02250 125	2-1/4	2	1/8	0.429	475
1030 02250 187	2-1/4	1-7/8	3/16	0.624	270
1030 02250 250	2-1/4	1-3/4	1/4	0.807	365
1030 02375 187	2-3/8	2	3/16	0.662	255
1030 02375 250	2-3/8	1-7/8	1/4	0.857	345
1030 02500 125	2-1/2	2-1/4	1/8	0.479	157
1030 02500 250	2-1/2	2	1/4	0.906	325
1030 02750 125	2-3/4	2-1/2	1/8	0.529	150
1030 02750 250	2-3/4	2-1/4	1/4	1.008	295
1030 02875 250	2-7/8	2-3/8	1/4	1.059	280
1030 03000 125	3	2-3/4	1/8	0.580	135
1030 03000 250	3	2-1/2	1/4	1.109	260
1030 03250 125	3-1/4	3	1/8	0.630	125
1030 03250 250	3-1/4	2-3/4	1/4	1.210	248
1030 03500 125	3-1/2	3-1/4	1/8	0.681	115
1030 03500 250	3-1/2	3	1/4	1.311	229
1030 04000 125	4	3-3/4	1/8	0.781	100
1030 04000 250	4	3-1/2	1/4	1.512	199

PROPERTIES

- Optical quality.
- Easy machining.
- Lightweight.
- Weatherability.
- Water resistance.



TYPICAL APPLICATIONS

- Medical devices
- Sight gauges
- Displays
- Filter housings
- Pneumatic systems
- Furniture

All lengths supplied with protective packaging to minimize scratches.



PRODUCT CODE:

CAST ACRYLIC TUBE

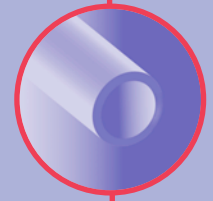
1030

COLOUR: CLEAR STANDARD LENGTH: NOMINAL 6 FEET

STOCK NUMBER	O.D. INCHES	I.D. INCHES	WALL INCHES	LBS./FT. APPROX.	WORKING PRESSURE UP TO 22°C (P.S.I.)
1030 04250 125	4-1/4	4	1/8	0.833	93
1030 04250 187	4-1/4	3-7/8	3/16	1.230	144
1030 04250 250	4-1/4	3-3/4	1/4	1.614	185
1030 04500 125	4-1/2	4-1/4	1/8	0.833	88
1030 04500 250	4-1/2	4	1/4	1.715	175
1030 04750 187	4-3/4	4-3/8	3/16	1.381	125
1030 04875 250	4-7/8	4-3/8	1/4	1.865	161
1030 05000 125	5	4-3/4	1/8	0.983	78
1030 05000 250	5	4-1/2	1/4	1.915	160
1030 05250 125	5-1/4	5	1/8	1.034	75
1030 05250 250	5-1/4	4-3/4	1/4	2.017	157
1030 05500 125	5-1/2	5-1/4	1/8	1.084	71
1030 05500 250	5-1/2	5	1/4	1.957	150
1030 06000 125	6	5-3/4	1/8	1.184	65
1030 06000 250	6	5-1/2	1/4	2.319	135
1030 06500 125	6-1/2	6-1/4	1/8	1.286	60
1030 06500 250	6-1/2	6	1/4	2.522	125
1030 07000 125	7	6-3/4	1/8	1.386	55
1030 07000 250	7	6-1/2	1/4	2.722	115
1030 07500 125	7-1/2	7-1/4	1/8	1.488	50
1030 07500 250	7-1/2	7	1/4	2.925	105
1030 08000 125	8	7-3/4	1/8	1.508	50
1030 08000 250	8	7-1/2	1/4	3.125	100

PROPERTIES

- Optical quality.
- Easy machining.
- Lightweight.
- Weatherability.
- Water resistance.



TYPICAL APPLICATIONS

- Medical devices
- Sight gauges
- Displays
- Filter housings
- Pneumatic systems
- Furniture

All lengths supplied with protective packaging to minimize scratches.



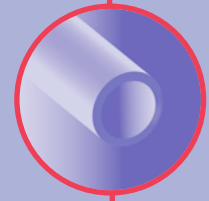
PRODUCT CODE:

CAST ACRYLIC TUBE (CONTINUED)

1030

COLOUR: CLEAR

STANDARD LENGTH: NOMINAL 6 FEET



TYPICAL APPLICATIONS

- Medical devices
- Sight gauges
- Displays
- Filter housings
- Pneumatic systems
- Furniture

STOCK NUMBER	O.D. INCHES	I.D. INCHES	WALL INCHES	LBS./FT. APPROX.	WORKING PRESSURE UP TO 22°C (P.S.I.)
1030 08500 250	8-1/2	8	1/4	3.329	92
1030 09000 125	9	8-3/4	1/8	1.789	42
1030 09000 250	9	8-1/2	1/4	3.529	88
1030 09500 250	9-1/2	9	1/4	3.732	83
1030 10000 125	10	9-3/4	1/8	1.989	38
1030 10000 250	10	9-1/2	1/4	3.932	78
1030 12000 125	12	11-3/4	1/8	2.394	31
1030 12000 250	12	11-1/2	1/4	4.739	65

PROPERTIES

- Optical quality.
- Easy machining.
- Lightweight.
- Weatherability.
- Water resistance.

OUTSIDE DIAMETER	TOLERANCE ON OUTSIDE DIAMETER (PLUS OR MINUS) INCHES	WALL THICKNESS	TOLERANCE ON WALL THICKNESS (PLUS OR MINUS) INCHES	CIRCULARITY	
				MAXIMUM VARIATION OF OUTSIDE DIAMETER INCHES	OUTSIDE DIAMETER (NOMINAL)
1-1/2" to 3"	0.020	1/8"	0.018	0.025	1-1/2" to 3"
3-1/8" to 3-7/8"	0.025	3/16"	0.019	0.040	3-1/8" to 3-7/8"
4" to 6-3/32"	0.030	1/4"	0.025	0.060	4" to 6-3/32"
6-1/2" to 8-3/4"	0.040	3/8"	0.035	0.080	6-1/2" to 8-3/4"
9" to 12"	0.050	1/2"	0.045	0.090	9" to 12"

- Other wall thicknesses available.
- Sizes up to 96" outside diameter with wall thickness up to 1-1/2" available on request. Coloured cast acrylic tubes available on request.
- Tubes fitted with flanges fabricated to customer specifications are available. Quotations provided on request.
- Tubes fabricated from sheets in diameters greater than 12" can also be quoted on request. These tubes are available in thicknesses up to 3/8" and have one seam running along the length.

All lengths supplied with protective packaging to minimize scratches.



PRODUCT CODE:

EXTRUDED ACRYLIC TUBE

1130

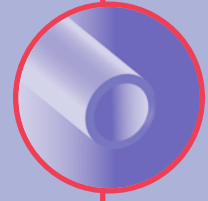
COLOUR: CLEAR

STANDARD LENGTH: 6 FEET

STOCK NUMBER	I.D. INCHES	O.D. INCHES	WALL INCHES	LBS./FT. APPROX.
1130 0125 0250	1/8	1/4	1/16	0.019
1130 0125 0375	1/8	3/8	1/8	0.051
1130 0187 0312	3/16	5/16	1/16	0.026
1130 0250 0375	1/4	3/8	1/16	0.032
1130 0250 0500	1/4	1/2	1/8	0.076
1130 0375 0500	3/8	1/2	1/16	0.044
1130 0375 0625	3/8	5/8	1/8	0.100
1130 0500 0625	1/2	5/8	1/16	0.058
1130 0500 0750	1/2	3/4	1/8	0.128
1130 0625 0750	5/8	3/4	1/16	0.070
1130 0625 0875	5/8	7/8	1/8	0.152
1130 0750 0875	3/4	7/8	1/16	0.083
1130 0750 1000	3/4	1	1/8	0.185
1130 0875 1000	7/8	1	1/16	0.095
1130 1000 1250	1	1-1/4	1/8	0.228
1130 1000 1500	1	1-1/2	1/4	0.507
1130 1125 1250	1-1/8	1-1/4	1/16	0.121
1130 1125 1375	1-1/8	1-3/8	1/8	0.225
1130 1250 1500	1-1/4	1-1/2	1/8	0.280
1130 1375 1625	1-3/8	1-5/8	1/8	0.305
1130 1500 1750	1-1/2	1-3/4	1/8	0.330
1130 1500 2000	1-1/2	2	1/4	0.709
1130 1750 2000	1-3/4	2	1/8	0.380
1130 2000 2250	2	2-1/4	1/8	0.430
1130 2000 2500	2	2-1/2	1/4	0.912
1130 2250 2500	2-1/4	2-1/2	1/8	0.482
1130 2500 2750	2-1/2	2-3/4	1/8	0.532
1130 2500 3000	2-1/2	3	1/4	1.114
1130 2750 3000	2-3/4	3	1/8	0.583
1130 3000 3250	3	3-1/4	1/8	0.634
1130 3000 3500	3	3-1/2	1/4	1.317
1130 3250 3500	3-1/4	3-1/2	1/8	0.685
1130 3500 3750	3-1/2	3-3/4	1/8	0.735
1130 3500 4000	3-1/2	4	1/4	1.520
1130 3750 4000	3-3/4	4	1/8	0.786
1130 4000 4500	4	4-1/2	1/4	1.724
1130 4250 4500	4-1/4	4-1/2	1/8	0.885
1130 4500 5000	4-1/2	5	1/4	1.925
1130 4750 5000	4-3/4	5	1/8	0.987
1130 5000 5500	5	5-1/2	1/4	2.256
1130 5500 6000	5-1/2	6	1/4	2.460
1130 5750 6000	5-3/4	6	1/8	1.190

PROPERTIES

- Easy machining.
- Lightweight.
- Weatherability.
- Water resistance.
- Manufactured with FDA approved ingredients.



TYPICAL APPLICATIONS

- Outdoor displays
- Flow gauges
- Laboratory fixtures
- Lighting fixtures
- Towel bars

- Note: sold only in standard lengths.
- Non-standard lengths available subject to minimum order.
- Larger sizes quoted on request.
- Coloured tubes are available on request. Subject to minimum order.
- Square tubes stocked in some sizes.

TOLERANCES (APPLY TO BOTH O.D. AND I.D.)

DIAMETER INCHES	TOLERANCE INCHES
1/16-3/16	+/- 0.005
1/4-7/16	+/- 0.010
1/2-1	+/- 0.015
1-2	+/- 0.020
2-3	+/- 0.030
3-1/4-5	+/- 0.045



PRODUCT CODE:

POLYCARBONATE SHEET

8010

COLOUR: CLEAR

STOCK NUMBER	NOMINAL SIZE	ACTUAL THICKNESS		LBS./SQ.FT. APPROX.
		INCHES	MM	
8010 0030	1/32	0.030	0.76	0.19
8010 0040	0.040	0.040	1.02	0.25
8010 0060	1/16	0.060	1.52	0.38
8010 0093	3/32	0.093	2.36	0.60
8010 0118	1/8	0.118	3.00	0.75
8010 0177	3/16	0.177	4.50	1.12
8010 0236	1/4	0.236	6.00	1.50
8010 0375	3/8	0.375	9.52	2.40
8010 0500	1/2	0.500	12.70	3.18
8010 0750	3/4	0.750	19.05	4.75
8010 1000	1	1.000	25.40	6.36

- Tolerance: +/-10%, over 1/2" plus only.
- Standard sizes: 12" x 48", 24" x 48", 48" x 72", 48" x 96", 48" x 120", 60" x 96", 60" x 120", 72" x 96", 72" x 120". Other sheet sizes available.
- Thicker sheets available.
- All sheets supplied with protective masking to minimize scratches.
- Inquire about our cut to size abilities.
- Available: **TEXTURED SHEET** : Matte and pebbled surface.
ENHANCED UV RESISTANT SHEET.
FDA COMPLIANT SHEET.
FLAME INHIBITING SHEET.
BALLISTICS GRADE SHEET.

PROPERTIES

- Exceptional impact strength.
- Optical clarity.
- High service temperature.
- Easily sawed & formed.
- Easily painted & cemented.
- Lightweight.
- Excellent fire rating.
- Can be produced from resin approved for food contact.



TYPICAL APPLICATIONS

- Glazing
- Machine Guards
- Freight Doors
- Signs



PRODUCT CODE:

POLYCARBONATE SHEET COLOURED

8015

SHEET SIZE: 48" X 96", WHITE 51" X 100"

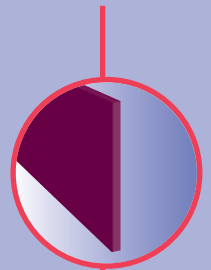
COLOUR: WHITE-01, BLACK-05, D.GREY-35, L.GREY-36, BRONZE-45

STOCK NUMBER	NOMINAL SIZE	ACTUAL THICKNESS		LBS./SHEET APPROX.
		INCHES	MM	
8015 0118	1/8	0.118	3	25
8015 0177	3/16	0.177	4.5	38
8015 0236	1/4	0.236	6	50
8015 0375	3/8	0.375	9.5	75

- Tolerance: +/- 10% (thickness).
- Additional sheet sizes: 24" x 48", 48" x 72", 48" x 120", 60" x 96", 60" x 120", 72" x 96", 72" x 120".
- All sheets supplied with protective masking to minimize scratches.
- Other colours available.
- Inquire about our cut to size abilities.

PROPERTIES

- Exceptional impact strength.
- High service temperature.
- Excellent fire rating.
- Can be produced from resin approved for food contact.
- Easily sawed and formed.
- Lightweight.



TYPICAL APPLICATIONS

- Glazing machine guards
- Signs
- Vehicle windshields



PRODUCT CODE:

POLYCARBONATE SHEET, ABRASION RESISTANT

8014

COLOUR: CLEAR SHEET SIZE: 48" X 96"

COLOUR: BLACK-05, BRONZE-45 SHEET SIZE: 48" X 96"

STOCK NUMBER	NOMINAL SIZE	ACTUAL THICKNESS		LBS./SHT. APPROX.
		INCHES	MM	
8014 0118 4896	1/8	0.118	3.0	25
8014 0177 4896	3/16	0.117	4.5	38
8014 0236 4896	1/4	0.236	6.0	50
8014 0375 4896	3/8	0.375	9.5	75
8014 0500 4896	1/2	0.500	12.7	100

- All sheets are coated both sides.
- Tolerance: +/-10% (thickness).
- Sheet size: 60" x 96" available.
- Protective masking both sides
- Inquire about our cut to size abilities.

PROPERTIES

- Hard coated surface resists abrasion.
- Enhanced UV resistance.
- Improved chemical resistance.
- Clarity.
- Great impact strength.



TYPICAL APPLICATIONS

- Street level windows
- Transportation glazing
- Detention windows
- Arcade games



POLYCARBONATE ELECTROSTATICALLY DISSIPATING SHEET

8013

COLOUR: CLEAR SHEET SIZE: 48" X 96"

COLOURS: BLACK-05, BRONZE-45

STOCK NUMBER	NOMINAL SIZE	ACTUAL THICKNESS		LBS./SHT. APPROX.
		INCHES	MM	
8013 0062 4896	1/16	0.060	1.5	13
8013 0118 4896	1/8	0.118	3.0	25
8013 0177 4896	3/16	0.177	4.5	38
8013 0236 4896	1/4	0.236	6.0	50
8013 0375 4896	3/8	0.375	9.5	75
8013 0500 4896	1/2	0.500	12.7	100

- Tolerance: +/- 10% (thickness).
- Sheet Size: 60" x 96" available.
- Protective masking both sides.

PROPERTIES

- Resists tribocharging when properly grounded.
- Prevents electrostatic discharge events.
- Controls particle attraction.



TYPICAL APPLICATIONS

- Guards, covers, doors and windows
- Access panels for electronic equipment
- Control of spark discharge in explosive environments
- Semi-conductor and micro-manufacturing industries



PRODUCT CODE:

POLYCARBONATE ROD

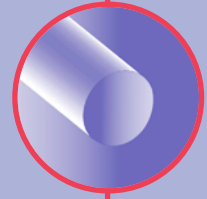
8020

COLOUR: TRANSLUCENT

STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
8020 00250	1/4	0.026
8020 00375	3/8	0.058
8020 00500	1/2	0.103
8020 00625	5/8	0.160
8020 00750	3/4	0.231
8020 00875	7/8	0.314
8020 01000	1	0.410
8020 01125	1-1/8	0.52
8020 01250	1-1/4	0.64
8020 01500	1-1/2	0.92
8020 01750	1-3/4	1.26
8020 02000	2	1.64
8020 02250	2-1/4	2.08
8020 02500	2-1/2	2.56
8020 03000	3	3.69
8020 03500	3-1/2	5.02
8020 04000	4	6.56
8020 04500	4-1/2	8.30
8020 05000	5	10.25
8020 05500	5-1/2	12.40
8020 06000	6	14.76

PROPERTIES

- High impact strength.
- Excellent high temperature resistance.
- Easily machined.
- Can be produced to meet FDA requirements.
- Excellent fire rating.
- Good electrical insulation.

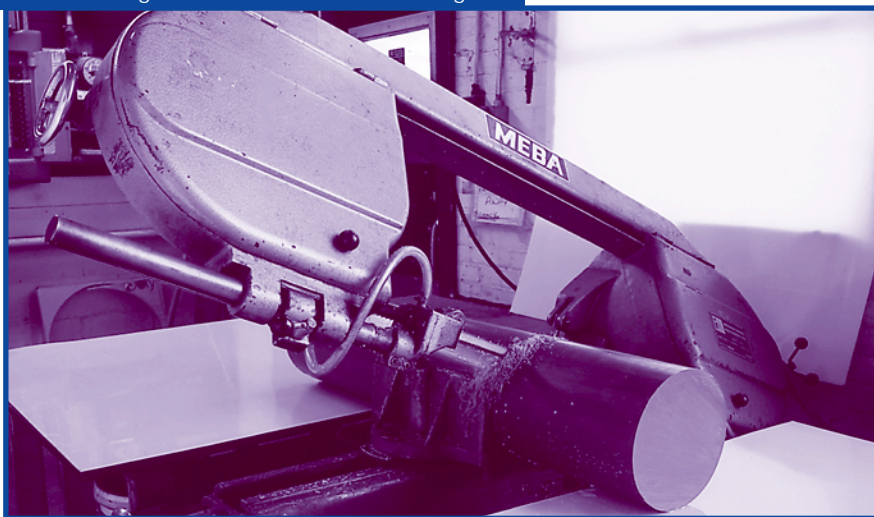


TYPICAL APPLICATIONS

- Lighting
- Laboratory equipment
- Aircraft components
- Medical equipment

- Diameter Tolerances:
 - Up to 2" +0.002" /-0.000"
 - 2-1/4" to 3" +0.005" /-0.000"
 - Over 3" oversized for machining.
- Standard Lengths:
 - Up to 2" 8 Ft.
 - 2-1/4" to 4" 4 Ft.
 - Over 4" 2 Ft.
- Intermediate sizes available on request.

PVC rod being cut. All rods will be cut to length.



PRODUCT CODE:

POLYCARBONATE TUBE

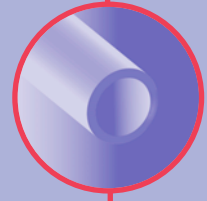
8030

COLOUR: CLEAR STANDARD LENGTH: 8 FEET

STOCK NUMBER	I.D. INCHES	O.D. INCHES	WALL INCHES	LBS./FT. APPROX.
8030 0125 0250	1/8	1/4	1/16	0.020
8030 0250 0375	1/4	3/8	1/16	0.032
8030 0250 0500	1/4	1/2	1/8	0.080
8030 0375 0500	3/8	1/2	1/16	0.045
8030 0375 0625	3/8	5/8	1/8	0.107
8030 0500 0625	1/2	5/8	1/16	0.057
8030 0500 0750	1/2	3/4	1/8	0.134
8030 0625 0750	5/8	3/4	1/16	0.070
8030 0625 0875	5/8	7/8	1/16	0.154
8030 0750 0875	3/4	7/8	1/16	0.083
8030 0750 1000	3/4	1	1/8	0.179
8030 0875 1000	7/8	1	1/16	0.096
8030 1000 1125	1	1-1/8	1/16	0.109
8030 1000 1250	1	1-1/4	1/8	0.230
8030 1125 1250	1-1/8	1-1/4	1/16	0.121
8030 1250 1500	1-1/4	1-1/2	1/8	0.281
8030 1375 1500	1-3/8	1-1/2	1/16	0.147
8030 1500 1625	1-1/2	1-5/8	1/16	0.167
8030 1500 1750	1-1/2	1-3/4	1/8	0.332
8030 1625 1750	1-5/8	1-3/4	1/16	0.172
8030 1750 2000	1-3/4	2	1/8	0.383
8030 1875 2000	1-7/8	2	1/16	0.200
8030 2000 2250	2	2-1/4	1/8	0.434
8030 2125 2250	2-1/8	2-1/4	1/16	0.224
8030 2250 2500	2-1/4	2-1/2	1/8	0.485
8030 2375 2500	2-3/8	2-1/2	1/16	0.249
8030 2500 2750	2-1/2	2-3/4	1/8	0.536
8030 2625 2750	2-5/8	2-3/4	1/16	0.275
8030 2750 3000	2-3/4	3	1/8	0.587
8030 2875 3000	2-7/8	3	1/16	0.300
8030 3000 3250	3	3-1/4	1/8	0.639
8030 3500 4000	3-1/2	4	1/4	1.537
8030 3750 4000	3-3/4	4	1/8	0.792

PROPERTIES

- High impact strength.
- Excellent high temperature resistance.
- Excellent fire rating.
- Easily machinable.
- Can be produced to meet FDA requirements.
- Transparent.
- Good electrical insulation.



TYPICAL APPLICATIONS

- Lighting
- Bird feeders
- Sight glasses

- Sold in standard lengths only. Non-standard lengths available. Subject to minimum order requirements.
- Tolerances: Up to 1" — +/- 0.015"
 - 1-1/8" to 1-1/2" — +/- 0.020"
 - 1-5/8" to 2-1/4" — +/- 0.025"
 - Over 2-1/4" — Plus, +/- 0.030"
- Tolerances apply to both I.D. and O.D. dimensions.



PRODUCT CODE:

COPOLYESTER SHEET VIVAK®

2610

COLOUR: CLEAR

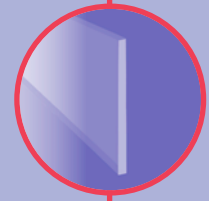
SHEET SIZE: 48" X 96"

STOCK NUMBER	THICKNESS INCHES	LBS/SHEET APPROX.
2610 0020 4896	0.020	4.3
2610 0030 4896	0.030	6.4
2610 0040 4896	0.040	8.5
2610 0060 4896	0.060	12.8
2610 0080 4896	0.080	17.0
2610 0100 4896	0.100	21.4
2610 0118 4896	0.118	25.6
2610 0177 4896	0.177	37.7
2610 0236 4896	0.236	51.2
2610 0375 4896	0.375	75.4
2610 0500 4896	0.500	102.4

- Tolerance: Thickness +/-10%
Length -0/+1/2"
Width -0/+1"
- Polyfilm masked both sides.
- Custom colours and other sheet sizes available.
- Inquire about our cut to size abilities.
- UV Stabilized sheets available.

PROPERTIES

- PETG — glycol modified polyethylene terephthalate.
- Easily thermoformed with fast cycle time at low forming temperatures.
- Clarity.
- Die cuts and punches easily.
- Virtually odourless.
- Printable.
- UL 94 HB flammability rating.
- Not recommended for outdoor applications unless UV stabilized.
- High impact resistance.
- Gamma radiation stable.
- FDA approved.



TYPICAL APPLICATIONS

- Point of purchase displays
- Machine guards
- Medical fixtures
- Tote boxes for electrical components
- Prosthetic and orthopaedic devices



PRODUCT CODE:

FOAM PVC SHEET

2415

COLOUR: VARIOUS

SHEET SIZE: 48" X 96"

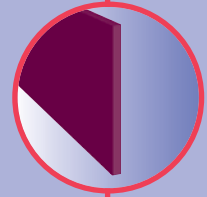
STOCK NUMBER	THICKNESS MM	LBS./SHEET APPROX.
2415 0040 4896	1	5
2415 0080 4896	2	10
2415 0118 4896	3	15
2415 0157 4896	4	20
2415 0197 4896	5	25
2415 0236 4896	6	30
2415 0315 4896	8	40
2415 0393 4896	10	50
2415 0512 4896	12	60
2415 0748 4896	19	69
2415 0984 4896	25	91

- Available in 48" x 120", 39" x 96", 60" x 120".

STOCK NUMBER SUFFIX	COLOUR
00	WHITE
05	BLACK
10	RED
12	BURGUNDY
15	LIGHT GREEN
16	GREEN
20	BLUE
25	YELLOW
35	GREY
36	COOL GREY
40	BEIGE

PROPERTIES

- Rigid.
- Lightweight.
- Uniform fine closed cell structure.
- Excellent impact strength.
- Low water absorption.
- High corrosion resistance.
- Low flammability.
- Easy to trim, diecut, saw, drill, bolt, glue, nail, rout, hot stamp.



TYPICAL APPLICATIONS

- Screen printing
- Signs and displays
- Model making
- Exhibit booths
- Photo mounting
- Thermo forming



PRODUCT CODE:

HIGH IMPACT POLYSTYRENE SHEET

3510

COLOUR: WHITE

SHEET SIZE: 48" X 96"

STOCK NUMBER	THICKNESS INCHES	LBS./SHEET APPROX.
3510 030 4896	0.030	5.24
3510 060 4896	0.060	10.47
3510 125 4896	0.125	21.82

- Available in other thicknesses, sheet sizes and colours.
- Inquire about our cut to size abilities.

PROPERTIES

- High impact resistance.
- Rigid.
- Good electrical properties.
- Resistant to most mineral oils, organic acids, alkalines, salts and alcohols.
- Made from resin approved by FDA.



TYPICAL APPLICATIONS

- Signs
- Trays
- Models
- Lighting fixtures
- Packaging



PRODUCT CODE:

ABS SHEET

COLOUR: SEE BELOW

SHEET SIZE: 48" X 96"

2310

COLOUR: BLACK

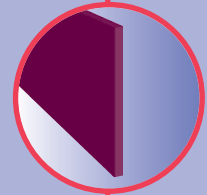
SHEET SIZE: 48" X 96"

2311

STOCK NUMBER	COLOUR	THICKNESS INCHES	LBS./SHEET APPROX.
2310 0125 489600	WHITE	1/8	21.60
2310 0125 489636	GREY	1/8	21.60
2310 0187 489600	WHITE	3/16	32.30
2310 0250 489600	WHITE	1/4	43.20
2310 0250 489635	GREY	1/4	43.20
2311 0056 4896	BLACK	.056	9.70
2311 0125 4896	BLACK	1/8	21.60
2311 0187 4896	BLACK	3/16	32.30
2311 0250 4896	BLACK	1/4	43.20
2311 0375 4896	BLACK	3/8	64.60

PROPERTIES

- Good rigidity.
- High gloss surface.
- One side haircell.
- Good impact strength.
- Chemically resistant.



TYPICAL APPLICATIONS

- Vehicle instrument panels
- Motorcycle fairings
- Luggage shells

- Available in other thicknesses, sheet sizes and colours.
- Inquire about our cut to size abilities.

- ABS ROD available from 1/4" to 6" diameter.



ABS WELDING ROD

STANDARD LENGTH: 48"

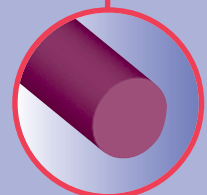
PRODUCT CODE:

2324

STOCK NUMBER	DIAMETER INCHES	COLOUR	FT./LBS. APPROX.
2324 12500	1/8	WHITE	180
2324 12505	1/8	BLACK	180
2324 15600	5/32	WHITE	115
2324 15605	5/32	BLACK	115
2324 18700	3/16	WHITE	80
2324 18705	3/16	BLACK	80

PROPERTIES

- Easily weldable using hot air.



TYPICAL APPLICATIONS

- Flanges
- Repairs
- Sports equipment

- Available in coils.
- Available in other colours.
- For welding tools and accessories see pages 90 – 93.



PRODUCT CODE:

CELLULOSE ACETATE SHEET

CAST:	COLOUR: CLEAR	SHEET SIZE: 20" X 50"	3010
EXTRUDED:	COLOUR: CLEAR	SHEET SIZE: 20" X 50"	3011

STOCK NUMBER	THICKNESS INCHES	LBS./SHEET APPROX.
3010 003 2050	0.003	0.17
3010 005 2050	0.005	0.28
3010 007 2050	0.0075	0.42
3010 010 2050	0.010	0.56
3010 015 2050	0.015	0.85
3010 020 2050	0.020	1.12

• Available in colours: red, blue, green and yellow.

STOCK NUMBER	THICKNESS INCHES	LBS./SHEET APPROX.
3011 030 2050	0.030	1.69
3011 040 2050	0.040	2.26
3011 050 2050	0.050	2.81
3011 060 2050	0.060	3.37

PROPERTIES

- Clarity and brilliance.
- Waste vapour permeable.
- Easily fabricated.
- Excellent printability.



TYPICAL APPLICATIONS

- Packaging
- Graphic arts
- Index tabs
- Book covers



PRODUCT CODE:

POLYESTER SHEET

6001

COLOUR: CLEAR

SHEET SIZE: 20" X 50"

STOCK NUMBER	TYPE	GAUGE	THICKNESS INCHES
6001 002 2050A	A	200	0.002
6001 003 2050A	A	300	0.003
6001 005 2050A	A	500	0.005
6001 010 2050A	A	1000	0.010
6001 014 2050A	A	1400	0.014
6001 001 2050D	D	100	0.001
6001 002 2050D	D	200	0.002
6001 003 2050D	D	300	0.003
6001 005 2050D	D	500	0.005
6001 007 2050D	D	700	0.007
6001 010 2050D	D	1000	0.010

PROPERTIES

- Type A:**
 Low electrical fault unit.
 Translucent.
 Extremely strong and tough.
 Good dimensional stability.
- Type D:**
 Highly transparent.
 Superior surface characteristics.



TYPICAL APPLICATIONS

- Type A:**
- Stationery supplies
 - Apparel stays
 - Labels
- Type D:**
- Graphic arts
 - Engineering reproduction
 - Over laminating

- Available: – Other gauges.
 – Other grades including mirrorized.
 – 40" wide rolls and slit widths.



ADDITIONAL GRAPHICS PRODUCTS

- Vinyl Sheets Plate pressed.
0.010" to 0.060".
Sheet size 21" x 51".
Polished or matte finish.
Wide range of colours.
- Engraving Stock Sandwich-like construction of PVC with layers of different colours.
Engraving through top layer exposes letters of contrasting background.
- Kydex Acrylic/PVC alloy sheet.
Many colours and gauges.
Rigid, chemically resistant.
Easily formed, cut and machined.

PRODUCT CODE:

CLEAR VINYL DOOR STRIP

2500

COLOUR: CLEAR

STOCK NUMBER	ROLL DIMENSIONS	WEIGHT LBS./ROLL	TYPE	AREA OF USE
2500 060	0.060" x 6" x 400'	62	CLEAR	INDOOR/OUTDOOR
2500 080	0.080" x 8" x 300'	100	CLEAR	INDOOR/OUTDOOR
2500 120	0.120" x 12" x 200'	150	CLEAR	INDOOR/OUTDOOR
2500 160	0.160" x 16" x 100'	133	CLEAR	INDOOR/OUTDOOR
2501 080	0.080" x 48" x 60'	120	CLEAR	INDOOR/OUTDOOR
2501 120	0.120" x 48" x 60'	180	CLEAR	INDOOR/OUTDOOR
2502 080	0.080" x 8" x 300'	100	CLEAR POLAR	INDOOR
2502 120	0.120" x 12" x 200'	150	CLEAR POLAR	INDOOR
2503 080	0.080" x 8" x 300'	100	CLEAR POLAR REINFORCED	INDOOR
2503 120	0.120" x 12" x 200'	150	CLEAR POLAR REINFORCED	INDOOR
2504 080	0.080" x 8" x 300'	100	GOLD WELD SCREEN	INDOOR
2504 120	0.120" x 12" x 200'	150	GOLD WELD SCREEN	INDOOR

PROPERTIES

- Optical clarity.
- Rounded edges.
- Concave/convex construction.
- Fire rated UL 94VO above 0.080" thickness.
- Resists conductance of heat and cold.
- Energy saving through reduction of air movement.



TYPICAL APPLICATIONS

- Strip doors
- Machine enclosures
- Flexible windows
- Noise abatement
- Dust barriers
- Clean room enclosures
- Welding screens

- Other widths, thicknesses, roll lengths and colours available.
- All clear door strip is USDA compliant for incidental contact with meat, poultry and dairy products.
- Operating temperature range — Standard: 0°F / 150°F.
Polar: -20°F / -140°F.
- Recommended size of strip to be used in the installation of doors:
Doors to 8 Ft high, use 8" strips,
Doors to 14 Ft high, use 12" strips,
Doors to 20 Ft high, use 16" strips,
Doors over 20 Ft high, use 16" reinforced strips.
- Overlap: generally two-thirds is sufficient. Noise control, full overlap is recommended.
- Also available — Safety strip: Bright orange to outline hazardous areas.
Weld screen: Gold colour protects against the incidental effects of ultra violet light in welding.
Ribbed surface: Triangular shape of ribbing helps prevent scratching from truck and cargo. Traffic reduced abrasion of strip rubbing against itself.



PRODUCT CODE:

FLEXIBLE VINYL ROLLSTOCK

2510

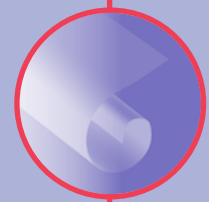
COLOUR: CLEAR, POLISHED SURFACE

ROLL WIDTH: 54"

STOCK NUMBER	THICKNESS INCHES	ROLL LENGTH YARDS
2510 010	0.010	125
2510 016	0.016	75
2510 020	0.020	60

PROPERTIES

- Clear.
- Flexible.
- Excellent fire rating.



TYPICAL APPLICATIONS

- Signs
- Windows
- Luggage tags

- Can be supplied with tissue interleaved.



PRODUCT CODE:

FIBERGLASS REINFORCED PLASTIC SHEET

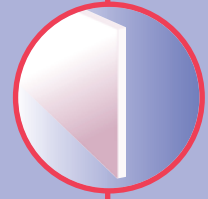
6500

COLOUR: WHITE

STOCK NUMBER	THICKNESS INCHES	SHEET SIZE INCHES
6500 060 4896	0.060	48 X 96
6500 060 48120	0.060	48 X 120
6500 090 4896	0.090	48 X 96
6500 090 48120	0.090	48 X 120

PROPERTIES

- Good impact strength.
- Stay clean surface texture.
- Very chemically resistant.
- Light reflective.
- Easily installed.
- Accepted by Agriculture Canada.



TYPICAL APPLICATIONS

- Breweries
- Car washes
- Dairies and cheese plants
- Kitchens and restaurants
- Meat packers
- Frozen food processing plants
- Laboratories

ACCESSORIES:

STOCK NUMBER	DESCRIPTION	LENGTH
6501 001	JOINER STRIP	10 FEET
6501 002	INSIDE CORNER	10 FEET
6501 003	OUTSIDE CORNER	10 FEET
6501 004	CAP STRIP	10 FEET
6501 005	NYLON DRIVE RIVETS	3/4"

- Available: Custom widths, lengths and colours.
- Various levels of fire retardancy.



TUBINGS

PRODUCT CODE:

NYLON 6 TUBING SEMI-RIGID

THIN WALL

COLOUR: NATURAL WHITE

BURST PRESSURE: 1000 P.S.I.

4440

HEAVY WALL

COLOUR: NATURAL WHITE

BURST PRESSURE: 2500 P.S.I.

4450

STOCK NUMBER	O.D. INCHES	I.D. INCHES	WALL INCHES
4440 125096	1/8	0.096	0.0145
4440 187138	3/16	0.138	0.0247
4440 250190	1/4	0.190	0.030
4440 312242	5/16	0.242	0.035
4440 375295	3/8	0.295	0.040
4440 500400	1/2	0.400	0.050

STOCK NUMBER	O.D. INCHES	I.D. INCHES	WALL INCHES
4450 125078	1/8	0.078	0.0235
4450 187110	3/16	0.110	0.0387
4450 250150	1/4	0.150	0.050
4450 312188	5/16	0.188	0.062
4450 375225	3/8	0.225	0.075
4450 500375	1/2	0.375	0.062

- Coloured tubing available.
- **NYLON 6/6** tubing available.



PROPERTIES

- Good abrasion resistance.
- Stiffness and strength at high temperatures.
- Excellent resistance to flexural fatigue.



TYPICAL APPLICATIONS

- Air conditioner lines
- Hydraulic hose
- Vacuum lines
- Oil or fuel lines

PRODUCT CODE:

NYLON II TUBING FLEXIBLE

4430

COLOUR: NATURAL WHITE

BURST PRESSURE: 1000 P.S.I.

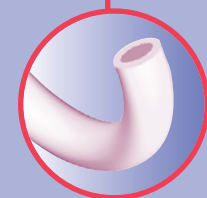
STOCK NUMBER	O.D. INCHES	I.D. INCHES	WALL INCHES
4430 125079	1/8	0.079	0.0230
4430 125096	1/8	0.096	0.0145
4430 187138	3/16	0.138	0.0247
4430 250170	1/4	0.170	0.030
4430 250190	1/4	0.190	0.040
4430 312242	5/16	0.242	0.035
4430 375265	3/8	0.265	0.040
4430 375295	3/8	0.295	0.055
4430 500375	1/2	0.375	0.062

- Coloured tubing available.



PROPERTIES

- Excellent flexibility.
- Low moisture absorption.
- Better chemical resistance than nylon 6 or 6/6.



TYPICAL APPLICATIONS

- Lubrication lines
- Vacuum lines
- Air lines
- Automotive fuel lines

PRODUCT CODE:

JAYON® TUBING

2034

COLOUR: CLEAR

STOCK NUMBER	I.D. INCHES	O.D. INCHES	WALL INCHES	MAX. WORKING PRESSURE (P.S.I. AT 22°C)	WEIGHT LBS./100FT
2034 0062031	1/16	1/8	1/32		
2034 0093031	3/32	5/32	1/32	55	0.77
2034 0125031	1/8	3/16	1/32	45	0.83
2034 0125062	1/8	1/4	1/16	70	2.00
2034 0125093	1/8	5/16	3/32	85	3.50
2034 0125125	1/8	3/8	1/8	95	5.33
2034 0187031	3/16	1/4	1/32	35	1.18
2034 0187062	3/16	5/16	1/16	55	2.67
2034 0187093	3/16	3/8	3/32	70	4.50
2034 0187125	3/16	7/16	1/8	80	6.78
2034 0250031	1/4	5/16	1/32	25	1.50
2034 0250062	1/4	3/8	1/16	45	3.34
2034 0250093	1/4	7/16	3/32	60	5.50
2034 0250125	1/4	1/2	1/8	70	8.00
2034 0250187	1/4	5/8	3/16	85	14.00
2034 0312031	5/16	3/8	1/32	20	1.83
2034 0312062	5/16	7/16	1/16	40	4.00
2034 0312093	5/16	1/2	3/32	50	6.50
2034 0312125	5/16	9/16	1/8	65	9.35
2034 0375031	3/8	7/16	1/32	18	2.17
2034 0375062	3/8	1/2	1/16	35	4.67
2034 0375093	3/8	9/16	3/32	45	7.40
2034 0375125	3/8	5/8	1/8	55	10.80
2034 0375187	3/8	3/4	3/16	70	18.00
2034 0437062	7/16	9/16	1/16	30	5.34
2034 0437093	7/16	5/8	3/32	40	8.50
2034 0437125	7/16	11/16	1/8	50	12.20
2034 0500062	1/2	5/8	1/16	25	6.00
2034 0500093	1/2	11/16	3/32	35	9.50
2034 0500125	1/2	3/4	1/8	45	13.75
2034 0500187	1/2	7/8	3/16	60	21.85
2034 0500250	1/2	1	1/4	70	32.03
2034 0500312	1/2	1-1/8	5/16	80	43.37
2034 0500375	1/2	1-1/4	3/8	85	56.04
2034 0562062	9/16	11/16	1/16	25	6.67
2034 0562093	9/16	3/4	3/32	35	10.50
2034 0562125	9/16	13/16	1/8	40	14.65
2034 0562156	9/16	7/8	5/32	50	19.20
2034 0625062	5/8	3/4	1/16	20	7.34
2034 0625093	5/8	13/16	3/32	30	11.50
2034 0625125	5/8	7/8	1/8	40	16.00
2034 0625156	5/8	15/16	5/32	45	20.75
2034 0625187	5/8	1	3/16	50	26.00
2034 0687093	11/16	7/8	3/32	30	12.50
2034 0687125	11/16	15/16	1/8	35	17.10
2034 0687156	11/16	1	5/32	40	22.40

PROPERTIES

- Non-toxic.
- Clear PVC.
- Smooth polished surfaces.
- Highly flexible.
- Chemically inert.
- Sterilizable by open end steam or bactericides.



TYPICAL APPLICATIONS

- Handling fluid food products like milk, ice-cream, salad dressing, syrups
- Disposing machines for beer, soft drinks, coffee and hot soups
- Use in wineries, bottling plants, distillation lines, brine pickling units
- Handling photographic chemicals and cosmetics



PRODUCT CODE:

JAYON® TUBING

2034

COLOUR: CLEAR

STOCK NUMBER	I.D. INCHES	O.D. INCHES	WALL INCHES	MAX. WORKING PRESSURE (P.S.I. AT 22°C)	WEIGHT LBS./100FT.
2034 0750062	3/4	7/8	1/16	18	8.67
2034 0750125	3/4	1	1/8	35	18.60
2034 0750156	3/4	1-1/16	5/32	40	24.00
2034 0750187	3/4	1-1/8	3/16	45	29.80
2034 0750250	3/4	1-1/4	1/4	55	42.70
2034 0875125	7/8	1-1/8	1/8	30	21.40
2034 1000125	1	1-1/4	1/8	25	24.10
2034 1000187	1	1-3/8	3/16	35	38.30
2034 1000250	1	1-1/2	1/4	45	56.20
2034 1125125	1-1/8	1-3/8	1/8	25	26.69
2034 1250125	1-1/4	1-1/2	1/8	20	29.36
2034 1250187	1-1/4	1-5/8	3/16	30	46.00
2034 1250250	1-1/4	1-3/4	1/4	40	64.00
2034 1375125	1-3/8	1-5/8	1/8	20	32.03
2034 1375250	1-3/8	1-7/8	1/4	35	69.39
2034 1500125	1-1/2	1-3/4	1/8	18	34.69
2034 1500187	1-1/2	1-7/8	3/16	25	54.00
2034 1500250	1-1/2	2	1/4	35	75.00
2034 1750187	1-3/4	2-1/8	3/16	25	62.00
2034 1750250	1-3/4	2-1/4	1/4	30	85.00
2034 2000250	2	2-1/2	1/4	25	96.00
2034 2250250	2-1/4	2-3/4	1/4	25	107.00
2034 2500187	2-1/2	2-7/8	1/4	15	100.00
2034 2500250	2-1/2	3	3/16	20	110.00
2034 2750250	2-3/4	3-1/4	1/4	20	130.00
2034 3000250	3	3-1/2	1/4	18	140.00

PROPERTIES

- Non-toxic.
- Clear PVC.
- Smooth polished surfaces.
- Highly flexible.
- Chemically inert.
- Sterilizable by open end steam or bactericides.



TYPICAL APPLICATIONS

- Handling fluid food products like milk, ice-cream, salad dressing, syrups
- Disposing machines for beer, soft drinks, coffee and hot soups
- Use in wineries, bottling plants, distillation lines, brine pickling units
- Handling photographic chemicals and cosmetics

- Sold in multiples of 100 feet up to 1/4" I.D. in multiples of 50 feet from to 5/16" I.D. to 7/16" I.D. in multiples of 25 feet from to 1/2" I.D. to 1" I.D. in multiples of 5 feet over 1" I.D.
- Jayon® Tubing is guaranteed to be composed of non-toxic ingredients that have been recognized as safe by the food and drug administration, U.S. Department of Health and Human Services. For the conveyance of food products, it is odourless and tasteless with no leachable waxes or stabilizers to affect foods.
- Jayon® surgical tubing is available in all the sizes listed for Jayon® food tubing.
- For pressures too great for Jayon® Tubing, see Jayflex Braid Reinforced Tubing, page 83.
- Some sizes are available with thicker walls.



PRODUCT CODE:

JAYFLEX® TUBING

2130

COLOUR: CLEAR

STOCK NUMBER	I.D. INCHES	O.D. INCHES	WALL INCHES	WORKING PRESSURE (PSI)	
				@70°F	@122°F
2130 01250250	1/8	1/4	1/16	65	25
2130 01870312	3/16	5/16	1/16	55	20
2130 01870375	3/16	3/8	3/32	60	25
2130 02500375	1/4	3/8	1/16	55	20
2130 02500562	1/4	7/16	3/32	60	25
2130 02500500	1/4	1/2	1/8	60	25
2130 03120437	5/16	7/16	1/16	50	15
2130 03120500	5/16	1/2	3/32	55	20
2130 03120562	5/16	9/16	1/8	60	25
2130 03750500	3/8	1/2	1/16	45	12
2130 03750562	3/8	9/16	3/32	50	15
2130 03750625	3/8	5/8	1/8	55	20
2130 05000625	1/2	5/8	1/16	30	7
2130 05000687	1/2	11/16	3/32	40	10
2130 05000750	1/2	3/4	1/8	45	12
2130 06250812	5/8	13/16	3/32	35	8
2130 06250875	5/8	7/8	1/8	40	10
2130 07501000	3/4	1	1/8	35	8
2130 07501125	3/4	1-1/8	3/16	45	10
2130 07501250	3/4	1-1/4	1/4	40	12
2130 08751125	7/8	1-1/8	1/8	30	7
2130 10001250	1	1-1/4	1/8	25	5
2130 10001375	1	1-3/8	3/16	30	7
2130 10001500	1	1-1/2	1/4	35	8
2130 12501500	1-1/4	1-1/2	1/8	20	5
2130 12501625	1-1/4	1-5/8	3/16	30	7
2130 12501750	1-1/4	1-3/4	1/4	40	10
2130 15001875	1-1/2	1-7/8	3/16	30	7
2130 15002000	1-1/2	2	1/4	35	8
2130 20002500	2	2-1/2	1/4	35	8

PROPERTIES

- Clear PVC.
- Flexible.
- NSF51 Certified.
- Chemically resistant.



TYPICAL APPLICATIONS

- Food and beverage
- Laboratory
- Photographic
- Drain lines

- Sold in multiples of 100 feet up to 5/8" I.D.
- Sold in multiples of 50 feet from above 5/8" I.D.
- Can be cut to custom lengths.
- For greater working pressures, see Jayflex Braid Reinforced Tubing.



PRODUCT CODE:

JAYFLEX BRAID REINFORCED TUBING

2033



TYPICAL APPLICATIONS

- Pneumatic lines
- Potable water transfer lines
- Air lubrication lines
- Food and beverage dispensing
- Transfer of powdered foods

STOCK NUMBER	I.D. INCHES	O.D. INCHES	WORKING PRESSURE P.S.I.	
			@70°F	@122°F
2033 01870375	3/16	0.375	250	150
2033 02500438	1/4	0.438	250	150
2033 03120531	5/16	0.531	250	135
2033 03750594	3/8	0.594	225	125
2033 05000750	1/2	0.750	200	100
2033 06250891	5/8	0.891	200	100
2033 07501031	3/4	1.031	150	85
2033 10001300	1	1.300	125	75
2033 12501620	1-1/4	1.620	100	55
2033 15001938	1-1/2	1.938	100	50
2033 20002490	2	2.490	75	35

PROPERTIES

- Clear PVC with longitudinal nylon braided reinforcing.
- Smooth interior.
- NSF certified under standard 51.
- Chemically resistant.
- Lightweight.

- Tubing with larger O.D. available for greater working pressure.



PVC HOSE

MANY AVAILABLE GRADES:

- Food transfer (Dry)
- Food transfer (Wet)
- Milk transfer
- Abrasive material transfer
- Lightweight dust collection and blower
- General purpose suction
- Low temperature suction and transfer
- Vapour recovery.

GENERAL APPLICATIONS:

- Pneumatic conveying systems for powder, pellets or granular material
- Food transfer systems
- Transfer of dairy products, juice, syrup, milk
- Grain handling
- Fume and light dust ducting
- Construction and mining
- Septic tank cleaning
- Irrigation pumping.

SIZES AVAILABLE:

I.D. range 3/4" to 16" depending on grade.

COLOURS:

Clear, various solid colours.

AVAILABLE FEATURES:

Smooth bore, static wire, Polyurethane lining, convoluted cover, food approval.

PRODUCT CODE:

LOW DENSITY POLYETHYLENE TUBING

COLOUR: NATURAL WHITE

5030

STOCK NUMBER	I.D. INCHES	O.D. INCHES	WALL INCHES	LBS./100 FT. APPROX.	COLOUR
5030 01250250	0.125	1/4	1/16	1.5	NATURAL
5030 01700250	0.170	1/4	0.040	1.2	NATURAL
5030 01870312	0.187	5/16	1/16	1.96	NATURAL
5030 02500375	0.250	3/8	1/16	2.66	NATURAL
5030 02500500	0.250	1/2	1/8	5.86	NATURAL
5030 03120437	0.312	7/16	1/16	2.93	NATURAL
5030 03750500	0.375	1/2	1/16	3.44	NATURAL
5030 05000625	0.500	5/8	1/16	4.40	NATURAL
5030 06000750	0.600	3/4	0.075	6.33	NATURAL
5030 07501000	0.750	1	1/8	13.69	NATURAL
5030 10001250	1.000	1-1/4	1/8	17.60	NATURAL
5030 12501500	1.250	1-1/2	1/8	21.50	NATURAL
5030 15001750	1.500	1-3/4	1/8	25.40	NATURAL
5030 20002250	2.000	2-1/4	1/8	33.20	NATURAL
5030 170025005	0.170	1/4	0.040	1.2	BLACK
5030 170025010	0.170	1/4	0.040	1.2	RED
5030 170025015	0.170	1/4	0.040	1.2	GREEN
5030 170025020	0.170	1/4	0.040	1.2	BLUE
5030 170025025	0.170	1/4	0.040	1.2	YELLOW
5030 170025030	0.170	1/4	0.040	1.2	ORANGE
5030 250037505	0.250	3/8	1/16	2.66	BLACK

PROPERTIES

- Food grade (Natural).
- Lightweight.
- Chemically inert.
- Economical.
- Excellent environmental stress crack resistance.
- Solvent resistant.
- UV resistant (Black).

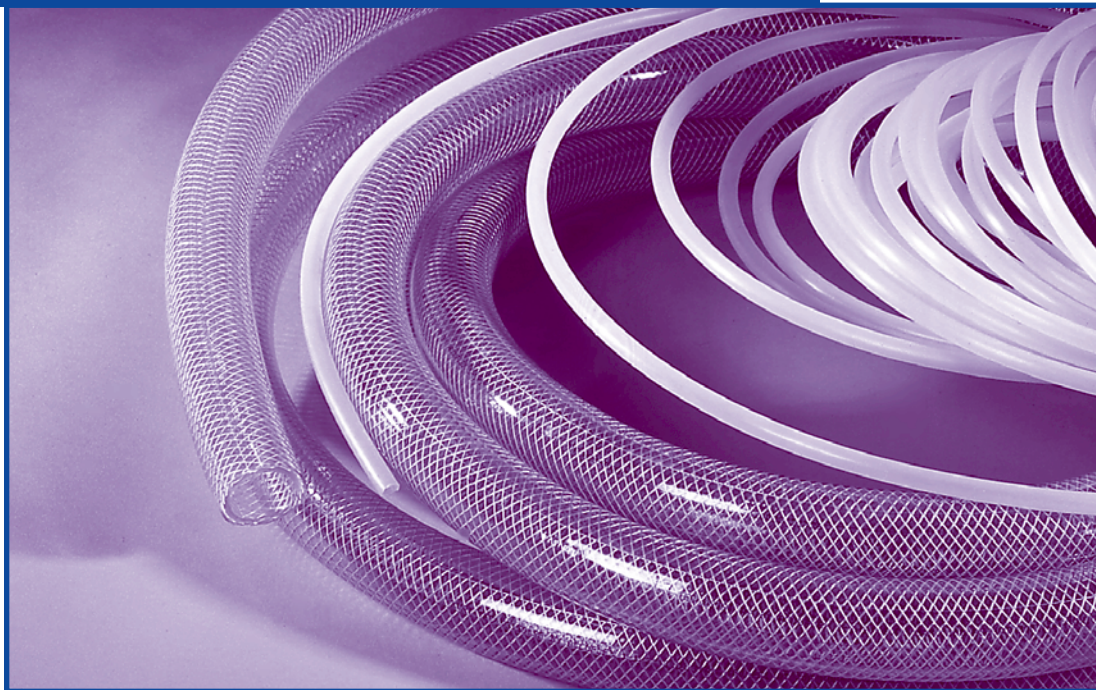


TYPICAL APPLICATIONS

- Water lines
- Vending equipment
- Transfer of air and liquid in industrial applications
- Water softener lines
- Pneumatic logic control lines

• Additional sizes and colours available.

Jayflex Braid Reinforced (pg. 83) and Low Density Polyethylene Tubings



PRODUCT CODE:

FLEXIBLE PTFE TUBING

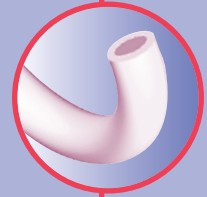
9030

COLOUR: NATURAL WHITE

STOCK NUMBER	INCHES		TOLERANCE (+/-)
	I.D.	WALL	I.D. AND O.D.
9030 0031015	1/32	0.016	0.005"
9030 0063030	1/16	0.030	0.004"
9030 0094030	3/32	0.030	0.005"
9030 0125030	1/8	0.030	0.005"
9030 0188030	3/16	0.030	0.005"
9030 0250030	1/4	0.030	0.005"
9030 0313030	5/16	0.030	0.005"
9030 0375030	3/8	0.030	0.005"
9030 0438030	7/16	0.030	0.006"
9030 0500030	1/2	0.030	0.006"
9030 0563030	9/16	0.030	0.006"
9030 0625030	5/8	0.030	0.006"
9030 0688030	11/16	0.030	0.006"
9030 0750040	3/4	0.040	0.007"
9030 0875045	7/8	0.045	0.007"
9030 1000050	1	0.050	0.010"

PROPERTIES

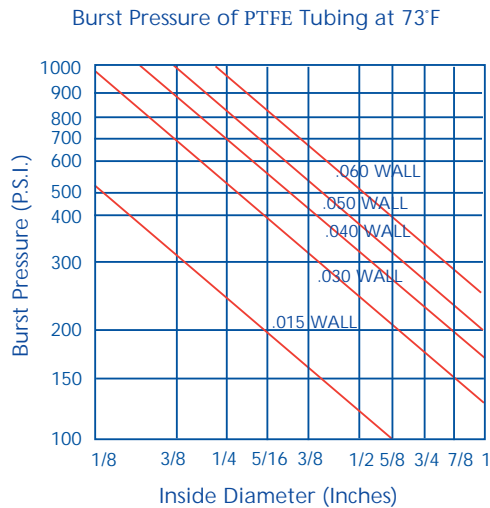
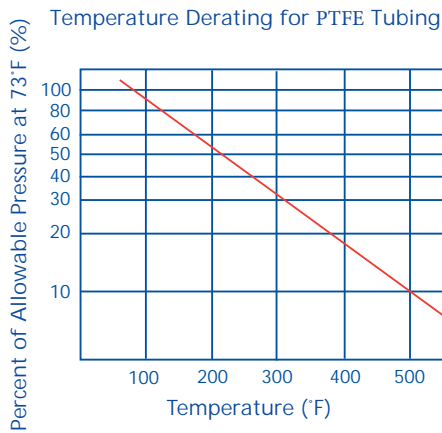
- Virgin TFE.
- Paste extruded.
- Chemically inert.
- High temperature resistance.
- Excellent electrical properties.
- Low coefficient of friction.
- Flexible at cryogenic temperatures.
- Unaffected by UV.



TYPICAL APPLICATIONS

- Liquid or gas transfer systems
- Electric insulators
- Food processing
- Medical equipment

- Other sizes and colours available.
- Meets ASTM D 3295.



PTFE SPIRAL-CUT WRAP TUBING

COLOUR: NATURAL

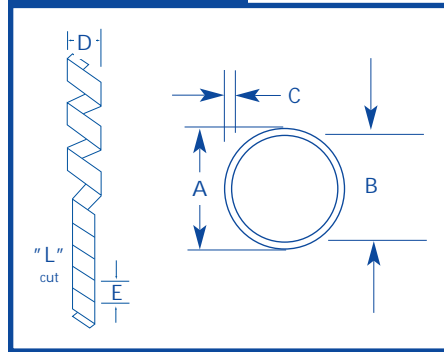
O.D. INCHES	I.D. INCHES	WALL INCHES	MAXIMUM BUNDLE DIAMETER INCHES	PITCH OF HELICAL CUT INCHES
1/8	1/16	0.030	1/2	1/4
3/16	1/8	0.030	1	1/4
1/4	3/16	0.030	2	3/8
5/16	1/4	0.030	2-1/2	3/8
3/8	5/16	0.030	3	7/16
1/2	7/16	0.030	4	9/16
5/8	9/16	0.030	5	5/8
3/4	11/16	0.040	6	7/8
1	15/16	0.040	8	1

- A — O.D. of Tubing
 B — I.D.
 C — Wall thickness
 D — Maximum bundle diameter
 E — Pitch
- Right or left cut.
 - Available in PTFE, FEP, PFA, ETFE.

PROPERTIES

- Expandable cable wrap.
- Installed over wire bundles.
- Harness assemblies can be channelled, bent and flexed.

Spiral-Cut Cable Wrap



TYPICAL APPLICATIONS

- Harness assemblies
- Insulating wires, cables and bundles

PTFE TFE CONVOLUTED TUBING

COLOUR: NATURAL TRANSLUCENT

MAXIMUM LENGTH: 12 FT.

INSIDE DIAMETER INCHES	CUFF LENGTH INCHES	WALL THICKNESS INCHES	BURST PRESSURE PSI @ 20°C
1/4	3/4	0.015	250
5/16	1	0.015	190
3/8	1	0.020	210
1/2	1	0.020	160
5/8	1-1/4	0.025	160
3/4	1-1/2	0.025	125
1	2	0.030	125
1-1/4	2-1/2	0.035	100
1-1/2	2-1/2	0.040	80
2	2-1/2	0.040	60
2-1/2	2-1/2	0.062	60
3	2-1/2	0.062	55
4	2-1/2	0.062	50

- A — Inside diameter
 B — Standard cuff
 C — Wall thickness
 D — Specified at time of order

PROPERTIES

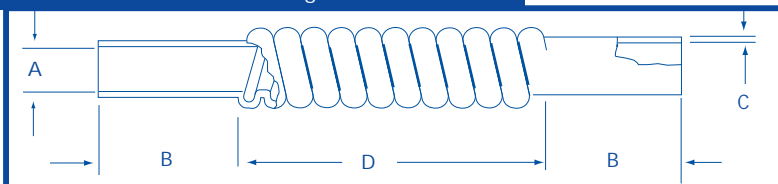
- Chemical inertness.
- High temperature operating capability.
- Low wall friction.
- Non stick qualities.
- Much more flexibility than smooth bore tubing.
- Excellent electrical insulator.

- Additional diameters available.
- Available in FEP, PFA, ECTFE.
- Can be supplied with wire-reinforced I.D. or O.D., flanged or flared cuff.

TYPICAL APPLICATIONS

- Electrical conduit
- Fluid transfer
- Air transfer

Flexible convoluted TFE Tubing



PTFE FEP CORRUGATED TUBING

COLOUR: NATURAL TRANSLUCENT

MAXIMUM LENGTH: 12 FT.

INSIDE DIAMETER INCHES	CUFF LENGTH INCHES	WALL THICKNESS INCHES	BURST PRESSURE PSI @ 70°F
0.250	3/4	0.015	250
0.375	1	0.020	200
0.500	1	0.025	170
0.625	1	0.025	150
0.750	1-1/2	0.030	120
0.875	1-1/2	0.030	100
1.000	2	0.035	80
1.250	2	0.035	70
1.500	2	0.035	60
2.000	2	0.040	50

PROPERTIES

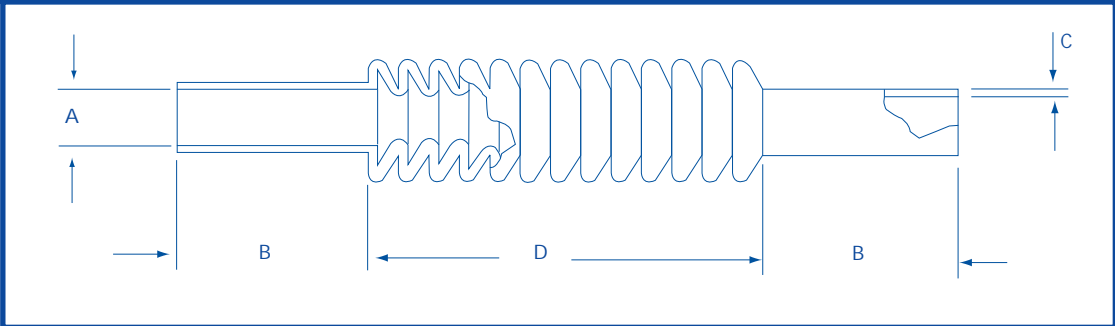
- Shapes and flexes easily.
- Very small bend diameters do not reduce I.D.
- Resists chemicals and elevated temperatures (200°C).
- Extension — compression length ratio is 2:1.

TYPICAL APPLICATIONS

- Electrical conduit
- Fluid transfer
- Air and vacuum

- A — Inside diameter
- B — Standard cuff
- C — Wall thickness
- D — Specified at time of order
- Tolerance on wall thickness +/- 0.005".
- Available in PFA.

Flexible Corrugated FEP Tubing

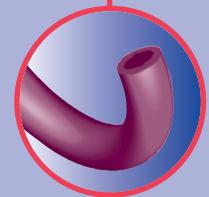


ADDITIONAL FLUOROPOLYMER TUBINGS

- TFE spaghetti and fractional
Available in: Standard wall meets AMS 3653
Light wall meets AMS 3654
Thin wall meets AMS 3655
Sizes: I.D. from 0.012" (AWG 30) through 1-1/2".
- FEP
Available from AWG sizes to 27" diameter.
- PFA
Available from 1/32" I.D. to 2" I.D.
- TEFZEL® (ETFE)
Available from 0.010" I.D. to 5/8" I.D.
- PCTFE
Available from 1/8" I.D. to 7/8" I.D.
- PVDF
Available from 1/16" I.D. to 1" I.D.

HEAT-SHRINKABLE TUBING (VARIOUS MATERIALS)

MATERIAL	SHRINK TEMP	MAXIMUM OPERATING TEMP	SHRINK RATIO	DIELECTRIC STRENGTH (V/MIL)	VOLUME RESISTIVITY (OHM-CM)	STANDARD SIZE RANGE (EXPANDED I.D.)	WALL THICKNESS RANGE (RECOVERED)
PTFE (TFE)-AWG	340°C	260°C	2:1	1,400	10 ¹⁸	0.034" — 0.470"	0.006" — 0.020"
PTFE (TFE) PTFE	340°C	260°C	2:1	1,400	10 ¹⁸	0.215" — 1.500"	0.015" — 0.050"
(TFE) PTFE (FEP)-	340°C	260°C	4:1	1,400	10 ¹⁸	0.078" — 4.000"	0.009" — 0.025"
AWG PTFE (FEP)	175°C	205°C	4:3	1,400	2 X 10 ¹⁸	0.031" — 0.440"	0.006" — 0.016"
PTFE (PFA) TFE/FEP	175°C	205°C	4:3	1,400	2 X 10 ¹⁸	0.500" — 2.000"	0.011" — 0.039"
DUAL	190°C	260°C	4:3	1,400	10 ¹⁸	0.080" — 1.300"	0.010" — 0.030"
	—	230°C	—	1,400	10 ¹⁸	0.036" — 0.950"	0.015" — 0.065"
FLEX. POLYOLEFIN	120°C	135°C	2:1	900	10 ¹⁵	0.046" — 5.000"	0.016" — 0.060"
FLEX.CLEAR							
POLYOLEFIN	120°C	135°C	2:1	900	10 ¹⁶	0.046" — 5.000"	0.016" — 0.060"
GEN.PURPOSE							
POLYOLEFIN	120°C	125°C	2:1	550	10 ¹⁵	0.046" — 2.000"	0.016" — 0.045"
EXTRA FLEX.							
POLYOLEFIN	100°C	135°C	2:1	650	10 ¹⁴	0.046" — 4.000"	0.016" — 0.055"
EX. FLEX. CLEAR							
POLYOLEFIN	100°C	135°C	2:1	650	10 ¹⁴	0.046" — 4.000"	0.016" — 0.055"
SEMI-RIGID							
POLYOLEFIN	135°C	135°C	2:1	800	10 ¹⁵	0.046" — 0.500"	0.020" — 0.030"
MULTIPLE-WALL							
POLYOLEFIN	135°C	110°C	5:2	600	10 ¹⁵	0.125" — 1.000"	0.038" — 0.075"
POLYVINYL							
CHLORIDE (PVC)	175°C	105°C	2:1	450 - 700	10 ¹¹	0.046" — 2.000"	0.020" — 0.062"
POLYVINYLIDENE							
FLUORIDE	175°C	175°C	2:1	800	10 ¹⁴	0.046" — 1.500"	0.010" — 0.020"
FLUORO-							
ELASTOMER							
(VITON)	175°C	200°C	2:1	250	10 ¹⁶	0.125" — 2.000"	0.030" — 0.065"



TYPICAL APPLICATIONS

- Protective covering
- Electrical insulating
- Thermal insulating

TYPICAL APPLICATIONS

- TEFLONS — Insulation of micro-miniature wire, internal wiring, coaxial cable cores; as connector and terminal sleeves, anti-stick covers for rollers, automotive cables; to encase automotive parts.
- POLYOLEFINS — Insulation applications, electronic component coverings, terminal insulation, aircraft wiring, protection of components, sealing of electrical connections, wire splices, components.
- POLYVINYLIDENE FLUORIDE (KYNAR) — Insulation and/or protection in electronic and appliance applications.
- FLUOROELASTOMER (VITON) — Insulation and/or protection of cables exposed to synthetic fuels, hydraulic oils.
- POLYVINYL CHLORIDE (PVC) — Insulation applications, protective coverings.

SHRINKABLE ROLL COVERS

- PTFE FEP roll covers are available in diameters of 1/2" to 12" in lengths from 3 feet to 20 feet or more.
- Wall thickness is 0.020".
- Shrink temperature is 175°C.
- Use temperature is 200°C.
- Shrinkage is approximately 20%.

TYPICAL APPLICATIONS

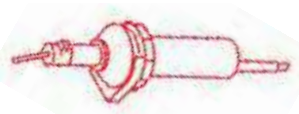








- Carrying rollers in manufacture of textiles, paper, food, packaging

H O T A I R T O O L S , C E M E N T S

PRODUCT CODE:

LEISTER HOT AIR EQUIPMENT

2900

PART NUMBER	ILLUSTRATION NOT TO SCALE	DESCRIPTION
2900 100859		Hot-Jet "S" hot-air welding tool.
2900 100726		Triac hot-air welding tool.
2900 100751		Triac PID hot-air welding tool.
2900 101891		Ghibli hot-air welding tool.
2900 107781		Electron hot-air blower.
2900 101291		Diode S hot-air welding pistol without blower.
2900 101669		Labor S hot-air welding pistol.
2900 102581		Hot air blower type Hotwind-S 220V.
2900 102609		Hot air blower type Hotwind 110V.
2900 106966		Hand Grooving tool with six blades in handle.
2900 106968		10 replacement blades for grooving tool.

TYPICAL APPLICATIONS

- Welding and shrinking thermoplastics
- Soldering and desoldering electronic components
- Drying and Heating processes
- Activating and loosening of melt adhesives
- Deicing of pipes and surfaces
- Paint stripping
- Disinfecting
- Art conservation
- Hot air coagulation


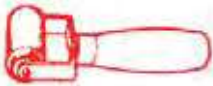
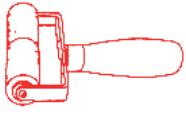

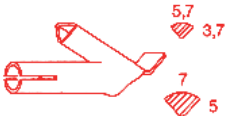



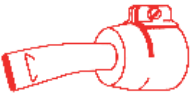
PRODUCT CODE:

LEISTER HOT AIR EQUIPMENT

2900

TYPICAL APPLICATIONS

- Welding and shrinking thermoplastics
- Soldering and desoldering electronic components
- Drying and Heating processes
- Activating and loosening of melt adhesives
- Deicing of pipes and surfaces
- Paint stripping
- Disinfecting
- Art conservation
- Hot air coagulation

PART NUMBER	ILLUSTRATION NOT TO SCALE	DESCRIPTION
2900 106969		Spatula for removing soft welding beads.
2900 106975		40mm wide band pressure roller.
2900 106974		80mm wide Silicon tape pressure roller.
2900 106989 2900 106990 2900 106991		Speed welding nozzle for 3mm welding rod. Speed welding nozzle for 4mm welding rod. Speed welding nozzle for 5mm welding rod.
2900 106992 2900 106993		Speed welding nozzle for 5.7 or 7mm profiled welding rod. Push-fit on standard 5mm diameter nozzle.
2900 106994		Speed welding nozzle for profiled welding rod, 20mm fillet weld.
2900 106995		Speed welding nozzle for profiled welding rod, 15 x 13mm butt seam.
2900 106996		Tacking nozzle for sheets and pipes. Push-fit on standard 5mm diameter nozzle.
2900 107123		Wide-slot nozzle 20mm for overlap welding.





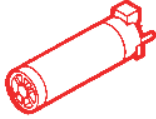
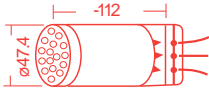
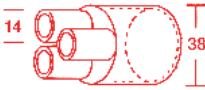
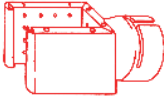
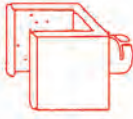

PRODUCT CODE:

LEISTER HOT AIR EQUIPMENT (continued)

2900

TYPICAL APPLICATIONS

- Welding and shrinking thermoplastics
- Soldering and desoldering electronic components
- Drying and Heating processes
- Activating and loosening of melt adhesives
- Deicing of pipes and surfaces
- Paint stripping
- Disinfecting
- Art conservation
- Hot air coagulation

PART NUMBER	ILLUSTRATION NOT TO SCALE	DESCRIPTION
2900 107132		Wide-slot nozzle 40mm for overlap welding.
2900 100303		Standard nozzle — 5mm.
2900 103588		High temperature element, plug-in for Electron, 110V, 2200W.
2900 100702		High temperature element, plug-in for Triac and Diode, 110V, 1400W.
2900 101643		Element for Labor "S".
2900 102569		Element for 9C4. Various voltages and wattages.
2900 107281		Hose connection adaptor. Push-fit on Longlife or Robust blower to connect hoses (Order No. 43B8) for three Labor "S" or Diodes
2900 107327		Sieve reflector 75mm dia., for shrinking. Use with #9C4.
2900 107333		Shell reflector, 110mm dia., for shrinking. Use with #9C4.
2900 107334		Welding mirror, dia. 135mm, PTFE-coated for butt welding. PE and PP pipes, profiles and foams. Use with #7.

TECHNICAL DATA: LEISTER WELDERS AND BLOWERS

MODEL NUMBER	VOLTAGES AVAILABLE	TEMPERATURE RANGE (CELSIUS)	NOISE LEVEL dB(A)	AIRFLOW CAPACITY (L/MIN.)	WEIGHT/UNIT (KG)
100859	120V, 400W	20-600	59	10 TO 60	0.58
100726	110V, 1460W	20-700	65	50 TO 230	1.35
101891	120V, 1560W, 50/60Hz	20-600	67	40 TO 300	1.20
107781	110V, 1460W	20-650	65	400 TO 500	1.50
101291	110V, 1400W	20-700	—	20 TO 250	0.42
101669	120V, 400W	20-600	—	max. 150	0.16
102581	220V, 3400W	20-650	—	240 TO 550	3.20
102609	110V, 2250W	20-560	—	240 TO 450	3.20

- Many other accessories and parts are available.
- When ordering electrical components, please indicate voltage and wattage required.
- Welders and blowers available as 220V units.

WEGENER WELDING EQUIPMENT

- Hot Air/ Hand Welders
- Extrusion Welders
- Sheet Bending Equipment
- Hot Plate/Sheet Butt Welders
- Spark Testers
- Plastic Pipe Band Saws
- Pipe Fusion Equipment
- CALL FOR DETAILS

WELDING THERMOPLASTICS

The main difference between thermoplastic and metal welding is that in metal welding, the welding rod and the parent material become molten and flow together to fuse into the welded joint. In thermoplastics, however, the materials do not melt and flow, they soften and the welder must apply pressure of about 4-1/2 pounds to the welding rod to force the softened surface into the joint in order to create the required permanent bond.

The types of welded joints used in hot air thermoplastic welding are similar to those used in metal welding, the same preparation i.e. fit-up, root gap and beveling are required in plastics welding as metal welding.

Certain thermoplastics materials may produce obnoxious fumes when being welded so welding operations should be carried out in well ventilated areas.

Welding guns such as Leister Triac (No. 1G3) or Diode (No. 7) are very suitable for pendulum welding. This frequently used welding method is accomplished by holding the welding rod with its end in the carefully prepared welding groove at an angle of 90° to the groove. The pendulum movement (from top to bottom, not in a circle) directs hot air at the welding rod and a larger measure of hot air into the groove. Important considerations during the welding operation are: correct temperature setting, even welding speed (approximately 4 — 12" per minute) and even pressure. The clean side wash along the weld will present a visual positive judgment of the weld.

Tack welding is used to hold pieces in place prior to final welding. It can be effective in reducing or eliminating the need for clamps, jigs or additional manpower during assembly.

The speed of making welds can be greatly increased through the use of speed welding nozzles. The welding rod is fed into the nozzle just prior to starting of the weld. The gun is held at approximately 45° angle to the substrate and a light pressure is applied to the welding rod as the nozzle is pulled along the weld line. If the gun travel has to be stopped for any reason, it should be lifted so that the welding rod is pulled out of the nozzle. If this is not done, the rod will melt in the nozzle. Care must be taken not to pull the gun too fast since this will cause the rod to stretch.

The factors responsible for the strength of a hot air plastics weld may be briefly stated as follows:

- 1) strength of base material
- 2) temperature of air
- 3) pressure on rod during weld
- 4) type of weld
- 5) preparation of material before welding
- 6) skill of the welder.

Causes of faulty welds are:

- 1) overheating
- 2) underheating
- 3) improper root penetration
- 4) air inclusion and the weld
- 5) stretching of the welding rod
- 6) incorrect handling by the welder
 - a) wrong angle
 - b) too slow or too fast motion
 - c) lack of fanning motion
 - d) heat located either too close to or far from the work
- 7) improper or lack of bevel preparation.

To ensure complete root penetration, the welder must make certain that the proper gap is maintained at the weld root on both single "V" and double "V" butt joints.

Overheating is a common fault. When PVC is overheated it will begin to discolour from a yellowish tinge to brown and eventually will char. When polyethylene or polypropylene is overheated, it will become transparent and eventually will flow away like hot wax from a candle. Underheating of the welding rod, the base material or both will also result in a poor weld. Whatever the cause, a poor weld bead must be removed from the weld bed and a new weld has to be made. Under no circumstances should a new pass be laid over a burned weld or one that is not properly bonded.

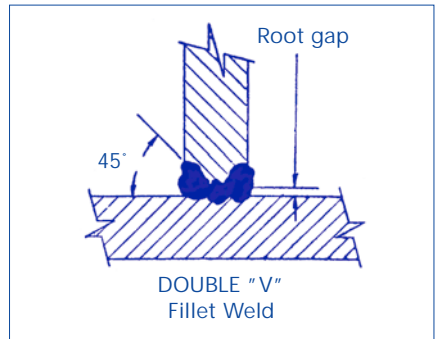
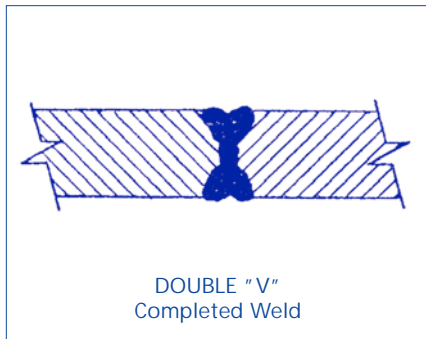
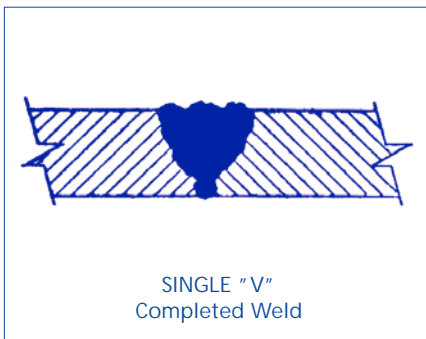
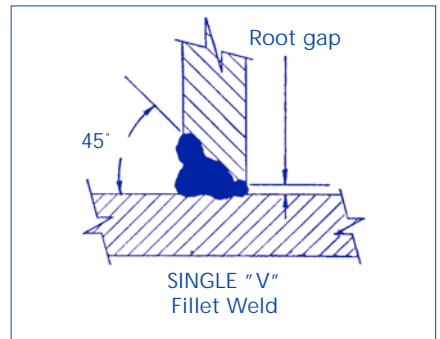
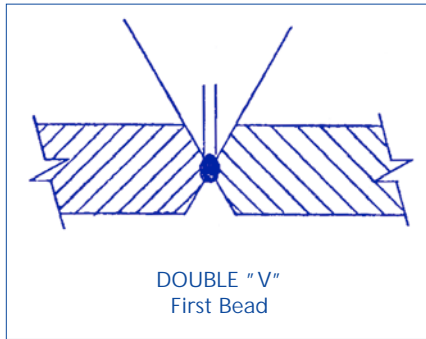
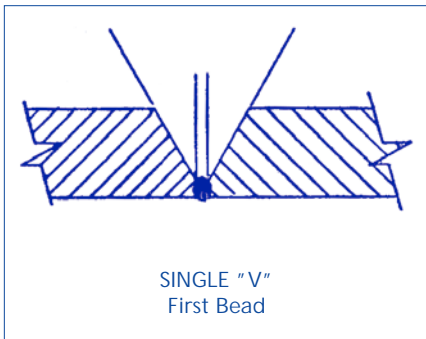
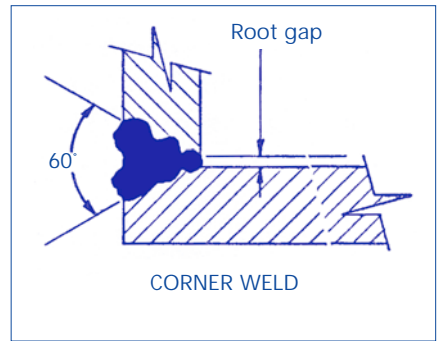
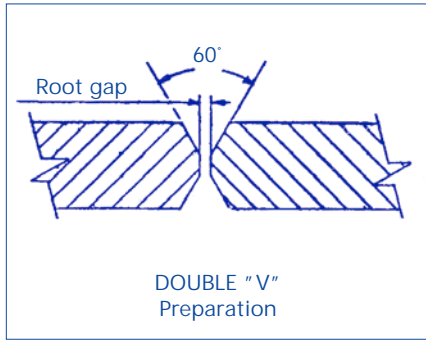
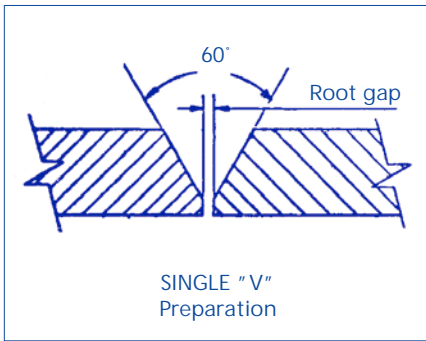
Butt welding of pipes and profiles is quickly and simply accomplished through the use of PTFE coated welding mirrors fitted on Leister Hot Air welding equipment.

WELDING THERMOPLASTICS

Welding temperatures for various plastics:

- | | |
|------------------|--------------|
| 1) UPVC | 220 — 300 °C |
| 2) HDPE | 250 — 280 °C |
| 3) LDPE | 270 — 300 °C |
| 4) Acrylic | 350 °C |
| 5) Polycarbonate | 350 °C |
| 6) ABS | 350 °C |
| 7) Polypropylene | 300 °C |

Although polyethylenes and polypropylene can be readily welded with hot air, inert gases such as nitrogen should be used to form the strongest weld joints. This is because oxygen at high temperatures has a tendency to degrade these materials.



ADHESIVE SELECTION GUIDE — IPS WELD-ON®

	ABS	ACRYLIC CELL CAST	ACRYLIC CROSS-LINKED	ACRYLIC EXTRUDED	BUTYRATE	CONCRETE	FIBERGLASS	METAL	NORYL	NYLON
ABS	2354 1707/4707 55	40 1802	40	40 1802	55 66 1802	10 1950	10	10 1001	52/4052	—
ACRYLIC CELL CAST	40 1802	40 4 16	40	40	16	10	10	10 1001	52/4052	—
ACRYLIC CROSS-LINKED	40 28	40 28	40 28	40 28	40 28	10	10	10	—	—
ACRYLIC EXTRUDED	40 1802	40	40 28	40 5	40 16	10	10	10 1001	52/4052	—
BUTYRATE	55 66 1802	16	40	40 16	3 16 55	10	10	10	—	—
CONCRETE	10 1950	10	10	10	10	10 1950	10	10 1950	—	—
FIBERGLASS	10	10	10	10	10	10	10	10	—	—
METAL	10 1001	10 1001	10	10 1001	10	10 1950	10	10 1950	—	—
NORYL	52/4052	52/4052	—	52/4052	—	—	—	—	4 52/4052	—
NYLON	—	—	—	—	—	—	—	—	—	1701
PETG	55 40*	40*	40*	40*	55 40*	—	—	—	—	—
POLYCARBONATE	55 40	16 40	40	40 16	55 16	10	10	10	52/4052	—
POLYESTER	40 10	40 10	40 10	40 10	40 10	10	10	10	—	—
POLYURETHANE	66 1784	66 1784	40 10	66 1784	66 1784	10	10	10	—	—
PVC(rigid)	10 52/4052 66	40 52/4052	40 10	40 52/4052	10 1802	10 1950	10	10 1001	52/4052	—
PVC (flexible)	66 1784	66 1784	40 10	66 1784	10 1802	10	10	10 1001	52/4052	—
PVC (foamed)	10 1001	40 52/4052	40 10	40 52/4052	10 1802	10 1950	10	10 1001	52/4052	—
STYRENE	10 1802	16 52/4052	40 10	52/4052 16	16	10	10	10	52/4052	—
WOOD	10 1001	40 1001	40 10	40	40 66	10 1950	10	10 1001	—	—

* PETG to dissimilar materials — lightly sand both surfaces before bonding.

WELD-ON® ADHESIVES AND CEMENTS

ACRYLICS

- 3 Non-flammable, water thin, very fast-setting solvent cement for acrylics. Also bonds styrene, butyrate and polycarbonate to themselves. Will not bond to cross-linked acrylics.
- 4 Non-flammable, water thin, moderately fast-setting solvent cement for acrylics. Also bonds styrene, butyrate and polycarbonate to themselves.
- 5 Water-thin, slow-setting solvent cement for Plex MC®, Cyro FF® and ICI Perspex®. Also forms strong bonds with cell cast acrylics.
- 16 Fast-drying, high-strength acrylic cement. Also bonds styrene, butyrate, polycarbonate and other plastics and porous surfaces.
- 1802 Medium-setting, light-bodied cement for bonding acrylic, styrene, rigid PVC, ABS and butyrate to themselves and each other.
- 10 Two-part, high-strength structural adhesive for bonding PVC, acrylic, styrene, ABS and polycarbonate. Also bonds well to steel, non-anodized aluminum, etc.
- 28 Three-part, reactive, high-strength cement with good weatherability. Meets Mil Spec A-8576 Type II.

- 40 Two-part, reactive, high-strength cement for bonding all acrylics to each other and to polyester, butyrate, PVC, styrene, wood, etc. Meets Mil Spec A-8576 Type III.

POLYCARBONATE/PETG

- 55 VOC-free, two-part, reactive, urethane-based adhesive for bonding polycarbonate, butyrate, ABS and PETG. Excellent UV light resistance.
- 52 Multipurpose, medium-bodied cement for bonding PVC, CPVC, ABS, styrene, Noryl®, polycarbonate and foamed PVC.
- 4052 Low VOC version of 52.
- 66 Thin-bodied, fast-curing contact cement for use on flexible vinyl, leather, urethane, wood and canvas.
- 1001 Thin-bodied, slow-setting cement for bonding flexible or rigid vinyl to aluminum, glass or wood.
- 1007 Thin-bodied, very fast-setting cement for bonding rigid vinyl, foamed PVC and Kydex.
- 4007 Low VOC version of 1007.

ADHESIVE SELECTION GUIDE — IPS WELD-ON®

	PETG	POLYCARBONATE	POLYESTER	POLYURETHANE	PVC (rigid)	PVC (flexible)	PVC (foamed)	STYRENE	WOOD
ABS	55 40*	55 40	10 40 10	66 1784	52/4052 66	66 1784	10 1001	10 1802	10 1001
ACRYLIC CELL CAST	40*	40 40	66 10	40 1784	66 52/4052	40 1784	16 52/4052	40 52/4052	1001
ACRYLIC CROSS-LINKED	16 40*	40 40	40 10	40 10	40 10	40 10	40 10	40 10	10
ACRYLIC EXTRUDED	40 40*	40 16	66 10	66 1784	40 52/4052	66 1784	52/4052 52/4052	40 16	10
BUTYRATE	55 40*	55 16	40 10	66 1784	10 1802	10 1802	10 1802	16	40 66
CONCRETE	—	10	10	10	10 1950	10	10 1950	10	10 1950
FIBERGLASS	—	10	10	10	10	10	10	10	10
METAL	—	10	10	10	10 1001	1001	10 1001	10	1001
NORYL	—	52/4052	—	—	52/4052	52/4052	52/4052	52/4052	—
NYLON	—	—	—	—	—	—	—	—	—
PETG	4 55	55 40*	40*	—	40*	—	40*	40*	40*
POLYCARBONATE	55 40*	55 4 16	40 10	40 10	10 52/4052	40 52/4052	40 52/4052	40 52/4052	10
POLYESTER	40 40*	40 10	40 10	10 1829	40 10	10 1829	10 40	40 10	10 1829
POLYURETHANE	10 —	10	10 1829	66 1784	66 1784	66 1784	66 1784	66 1784	66 1784
PVC(rigid)	40 40*	40 52/4052	66 10	52/4052 1784	10 1001 10	52/4052 66	40 1001	1001 52/4052	10
PVC(flexible)	10 —	10 52/4052	66 1829	10 1784	10 66 66	10 1829	10 66	66 52/4052	1001
PVC (foamed)	40 40*	40 52/4052	66 10	52/4052 1784	10 1001	10 66	52/4052 1001	10 40	1001
STYRENE	40 40*	40 52/4052	66 10	40 1784	10 52/4052	52/4052 52/4052	52/4052 40	40 1807	10
WOOD	40 40*	10 10	66 1829	66 1784	66 1001	66 1001	10 1001	10 10	66

* PETG to dissimilar materials — lightly sand both surfaces before bonding.

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1784 Medium-bodied, very fast-setting, weather-resistant cement for bonding flexible or rigid vinyl to itself or other plastics, as well as to some porous materials, such as wood, leather, etc.</p> <p>1909 Medium-bodied, fast-setting, weather-resistant cement for bonding flexible or rigid vinyl to itself or other plastics, as well as to some porous materials, such as wood, leather, etc.</p> <p>4909 Low VOC version of 1909.</p> <p>1910 Medium-bodied, slow-setting, weather-resistant cement for bonding flexible or rigid vinyl to itself or other plastics, as well as to some porous materials, such as wood, leather, etc.</p> <p>4909 Low VOC version of 1910.</p> <p>2007 Water thin, very fast-setting solvent cement for bonding PVC, foamed PVC and Kydex to themselves and to each other.</p> <p>ABS</p> <p>1707 Medium-bodied, fast-setting cement for ABS only.</p> <p>4707 Low VOC version of 1707.</p> | <p>2354 Thin-bodied, fast-setting cement for bonding ABS and styrene to themselves.</p> <p>STYRENE</p> <p>1807 Medium-bodied, fast-setting cement for joining styrene to itself.</p> <p>4807 Low VOC version of 1807.</p> <p>GENERAL-PURPOSE AND SPECIAL APPLICATIONS</p> <p>1701 Water thin, slow-setting solvent for bonding most types of nylon to themselves (nylon type 6, type 66, etc.). Not for use with other plastics.</p> <p>1823 High-strength adhesive sealant for forming weather-and water-resistant seals in aluminum doors and windows.</p> <p>1829 Medium-bodied, general-purpose, elastomer-based adhesive for plastics and non-plastics.</p> <p>1950 Two-part, reactive, high-strength thixotropic adhesive with gap filling capability. For bonding rigid PVC and ABS to concrete, clay pipe, metal, wood, ceramic and glass.</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

TYPICAL PROPERTIES OF WELD-ON® ADHESIVES AND CEMENTS

	WELD-ON® NUMBER	COLOUR	NUMBER OF COMPONENTS	TYPICAL SPECIFIC GRAVITY	MINIMUM EXPECTED SHELF LIFE @ 73°F (YR)	TYPICAL VISCOSITY (CPS)	EXPECTED POT LIFE AFTER MIXING @ 73°F (MINUTES)
ACRYLICS	3	CLEAR	1	1.33	2	WATER THIN	
	4	CLEAR	1	1.37	2	WATER THIN	
	5	CLEAR	1	1.19	2	WATER THIN	
	16	CLEAR	1	1.02	2	800	
	1802	CLEAR	1	0.88	3	150	
	10	WHITE	2	1.03	1*	40,000	30
	28	CLEAR	3	1.03	1*	3,200	25
	40	CLEAR	2	1.03	1*	2,500	25
POLYCARBONATE/PETG	55	CLEAR	2	0.94	1	4,000	10
VINYL	52	CLEAR	1	0.94	3	550	
	4052	CLEAR	1	0.99	3	850	
	66	CLEAR	1	0.85	2	250	
	1001	CLEAR	1	0.94	3	400	
	1007	CLEAR	1	0.90	3	100	
	4007	CLEAR	1	0.98	3	600	
	1784	CLEAR	1	0.93	3	400	
	1909	CLEAR	1	0.90	2	500	
	4909	CLEAR	1	0.97	2	700	
	1910	CLEAR	1	0.92	2	2,000	
	2007	CLEAR	1	0.85	3	WATER THIN	
	ABS	1707	MILKY	1	0.87	3	800
4707		CLEAR	1	0.87	3	2,900	
2354		CLEAR	1	0.81	3	WATER THIN	
STYRENE	1807	MILKY	1	0.86	3	400	
	4807	MILKY	1	0.88	3	720	
GENERAL-PURPOSE AND SPECIAL APPLICATIONS	1701	BLUE	1	1.00	1	20	
	1823	ALUM BROWN BLACK	1	1.00	1	700,000	
	1829	TAN	1	0.81	2	1,500	
	1950	AMBER	2	1.11	2	30,000	35

• Refrigeration is recommended to increase shelf life.

PRODUCT CODE:

CEMENTS AND TREATING AGENTS 9090

CEMENTS FOR PVC

STOCK NUMBER	DESCRIPTION	APPLICATION
9090-150	VC-1 SOLVENT	SOLVENT ADHESIVE
9090-155	VC-2 BODIED	BODIED ADHESIVE

- VC-1 Solvent: A fast-drying, special mixture of solvents which has a fast dissolving action on Vinyls. It quickly causes both surfaces to soften and fuse together.
- VC-2 Bodied: A slower drying adhesive than VC-1, VC-2 is the same formulation as VC-1, but the addition of Vinyl resins make it a more viscous material for use where VC-1 is not feasible.

CEMENTS FOR ACRYLICS

STOCK NUMBER	DESCRIPTION	APPLICATION	UNIT
9090-140	MDC CEMENT	SOLVENT CEMENT	4 LITRE
9090-170	REZ-N-BOND	SOLVENT CEMENT	4 LITRE

- MDC CEMENT: A fast evaporating solvent (Methylene Dichloride) cement. Suitable for soak, dip and capillary methods of cementing.
- EDC CEMENT: A slower evaporating solvent than MDC, EDC (Ethylene Dichloride) is suitable for soak and dip methods of cementing.
- REZ-N-BOND: A fast evaporating, specially-formulated solvent cement suitable for soak, dip and capillary methods of cementing. Has the added characteristic of being non-flammable.

PRODUCT CODE:

CEMENTS AND TREATING AGENTS

9090

CEMENTS AND TREATING AGENTS FOR PTFE

STOCK NUMBER	DESCRIPTION	APPLICATION	UNIT
9090-120	TREATING AGENT	PREPARE PTFE FOR BONDING	PINT
9090-130	CHEMGRIP	SEE TABLE BELOW	SET (2 PINTS)
9090-135	CHEMGRIP HT	SEE TABLE BELOW	SET (2 PINTS)
9090-110	BONDING KIT	COMBINATION TREATING AGENT, 2-PART CEMENT	KIT

- "Chemgrip" cements are specially formulated epoxy adhesives that will bond treated "PTFE" to all common materials, (Wood, Metals, Glass, Ceramics, etc.) with a strength approaching that of the Fluorocarbons themselves.
- "Chemgrip" is a two part, room-temperature curing, Thixotropic material. Part "A" is Red; part "B" is Amber. Either rubbery or hard glue lines can be achieved by varying the one-to-one standard proportions of the mix, without significantly affecting the cured strength of the bond. "Chemgrip" is recommended for all applications where service temperature ranges from 0 to 200°F.
- "Chemgrip" HT is a two part, heat curing material notable for its high strength at extremes of temperature and its exceptional chemical resistance. Part "A" is a resin paste and part "B" a curing powder. "Chemgrip" HT is recommended for applications where service temperatures range from 200°F to 500°F.
- "Chemgrip" bonding kits for "PTFE" consist of one set (2 tubes) of "Chemgrip" cement, one bottle of "Chemgrip" treating agent for preparing surfaces of PTFE for bonding, and complete instructions. All are packaged in a durable cylindrical case.
- "Chemgrip" treating agent is a high-flash-point solution of Sodium which removes Fluorine atoms from PTFE and other Fluorocarbons, exposing a carbonaceous surface which will accept adhesives.

PEEK SHEET

9500

COLOUR: NATURAL SHEET SIZE: 24" x 48"

STOCK NUMBER	THICKNESS INCHES	LBS./SQ.FT. APPROX.
9500 02502448	1/4	1.67
9500 03752448	3/8	2.78
9500 05002448	1/2	3.34
9500 07502448	3/4	5.57

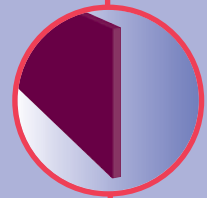
- Inquire about our cut to size abilities

PROPERTIES

- Excellent chemical resistance.
- Very low moisture absorption.
- Good wear and abrasion resistance.
- Unaffected by continuous exposure to hot water or steam.

TYPICAL APPLICATIONS

- Bushings
- Bearings
- Seals
- Valve seats



PVDF SHEET

9200

COLOUR: NATURAL SHEET SIZE: 48" x 96"

STOCK NUMBER	THICKNESS INCHES	LBS./SQ.FT. APPROX.
9200 00624896	1/16	0.58
9200 01254896	1/8	1.16
9200 02504896	1/4	2.32
9200 03754896	3/8	3.47
9200 05004896	1/2	4.63
9200 07504896	3/4	6.95
9200 10004896	1	9.26

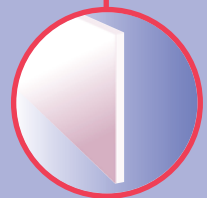
- Available in thicknesses of 1/32" to 2"
- Tolerance: +/- 10%
- Inquire about our cut to size abilities

PROPERTIES

- Excellent corrosion and chemical resistance.
- High temperature resistance.
- Tough and abrasion resistant.
- Stable to UV and weathering.
- Non-flammable.

TYPICAL APPLICATIONS

- Chemical process vessels
- Chlorine resistant spray headers
- Fluid handling equipment
- Pump parts
- Plating and etching tanks



PRODUCT CODE:

TORLON 4301 ROD

9620

COLOUR: BROWN STANDARD LENGTH: 8 FEET

STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.	STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
9600 00250	1/4	.04	9620 01000	1	.48
9620 00375	3/8	.07	9620 01250	1-1/4	.80
9620 00500	1/2	.14	9620 01375	1-3/8	.97
9620 00625	5/8	.21	9620 01500	1-1/2	1.081
9620 00750	3/4	.27	9620 02000	2	1.93

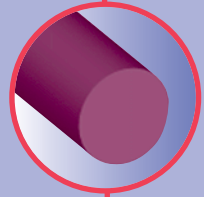
- Polyamide-imide.
- Available from 2" to 5" diameter.
- All sizes supplied oversize.
- Also other grades: 4203, 5030, 7130, 4503, 4501, 4540, 5530.
- Available in SHEET 3/16" to 1" thick, 12" x 48" sheet size.
- Available in TUBULAR BARS.

PROPERTIES

- Superior temperature resistance (500°F).
- Low coefficient of thermal expansion.
- High creep resistance.
- Excellent compressive strength.
- High impact strength.

TYPICAL APPLICATIONS

- Non-lubricated bearings
- Seals
- Reciprocating compressor parts
- Bearing cages



PEEK ROD

9520

COLOUR: NATURAL STANDARD LENGTH: 8 FEET

STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.	STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
9520 00250	1/4	.028	9520 01500	1-1/2	1.02
9520 00312	5/16	.043	9520 01750	1-3/4	1.37
9520 00375	3/8	.064	9520 02000	2	1.81
9520 00500	1/2	.113	9520 02500	2-1/2	2.84
9520 00625	5/8	.176	9520 02750	2-3/4	3.41
9520 00750	3/4	.254	9520 03000	3	3.82
9520 01000	1	.452	9520 03500	3-1/2	5.53
9520 01250	1-1/4	.709	9520 04000	4	7.23

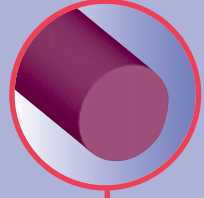
- Available in Black.
- Tolerances: up to 1" +/- .001"
over 1" — 2" + .005"/-.000"
over 2" — 3" + .015"/-.000"
- Available up to 8" diameter.
- Available in SHEET 1/4" to 2" thick, also available in TUBULAR BARS.

PROPERTIES

- Excellent chemical resistance.
- Very low moisture absorption.
- Good wear and abrasion resistance.
- Unaffected by continuous exposure to hot water or steam.

TYPICAL APPLICATIONS

- Bushings
- Seals
- Bearings
- Valve seats



PVDF ROD

9220

COLOUR: NATURAL STANDARD LENGTH: 8 FEET

- Tolerances: up to 1-1/4" + .003"/-.000"
over 1-1/4" oversized
- Length up to 2-1/2" 8 foot over 2-1/2" 4 foot

- Available from 1/4" to 6" diameter.
- Available in black.
- Available in SHEET: Thickness: 1/32" — 4"; Size: 48" x 96", 24" x 48"
- FILM: Thickness: .003" — .020"; Width: 24" — 26"
- TUBULAR BARS

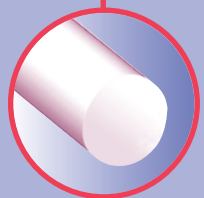
STOCK NUMBER	DIAMETER INCHES	LBS./FT. APPROX.
9220 00625	5/8	.24
9220 00750	3/4	.35
9220 01000	1	.61
9220 01250	1-1/4	.96
9220 01500	1-1/2	1.37
9220 01750	1-3/4	1.87
9220 02000	2	2.44
9220 02750	2-3/4	4.61
9220 03125	3-1/8	5.96
9220 04000	4	9.76
9220 05000	5	15.25

PROPERTIES

- Excellent corrosion and chemical resistance.
- High temperature resistance.
- Tough and abrasion resistant.
- Stable to UV and weathering.
- Non-flammable.

TYPICAL APPLICATIONS

- Chemical process vessels
- Chlorine resistant spray headers
- Fluid handling equipment
- Pump parts
- Plating and etching tanks



HIGH PERFORMANCE MATERIALS

		PROPERTIES	TYPICAL APPLICATIONS
SEMITRON:	Static Dissipative Products Sheet: Thickness: 1/4" — 3" Size: 24" x 48" Rod: Diameter: 1/4" — 3"	ESD 225 ACETAL (TAN) • Surface resistivity 10 ¹⁰ -10 ¹² Ω/SQ. • Good wear resistance. • Thermal performance to 225°F (107°C). ESD 410C PEI (BLACK) • Surface resistivity 10 ⁴ -10 ⁶ Ω/SQ. • High strength and stiffness • Thermal performance to 410°F (210°C) ESD 500HR PTFE (WHITE) • Surface resistivity 10 ¹⁰ -10 ¹² Ω/SQ. • Broad chemical resistance • Thermal performance to 500°F (260°C)	<ul style="list-style-type: none"> • Fixturing used in manufacturing of hard drives. • Handling in-process silicon wafers. • Handling integrated circuits through the test handler environment. • Where controlled bleed off of static charges is critical.
FLUOROSINT:	Mica filled TFE Sheet: Thickness: 1/4" — 3" Size: 12" x 12" Rod: Diameter: 1/2" — 8-3/4" Tubular Bar: Diameter: 1/2" I.D. — 26" O.D. Tape: Thickness: 0.010" — 0.031" Width: 1/2" — 3-1/2"	<ul style="list-style-type: none"> • Similar to PTFE plus; • Very low coefficient of thermal expansion. • Better wear resistance. • Resistance to deformation under load. • FDA compliant (F207 grade). 	<ul style="list-style-type: none"> • Valve seats. • Bearings, Bushings. • Wear parts. • Seal rings. • Packings, Gaskets. • Washers. • Insulator wear parts.
VESPEL:	Polyimide Sheet: Thickness: 1/16" — 2" Size: 10" x 10", 10" x 5", 5" x 5" Rod: Diameter: 1/4" — 3-1/4" Tubular Bar: Diameter: 1" I.D. — 7" O.D.	<ul style="list-style-type: none"> • Can be used at temperatures from cryogenic to 288°C. • Excellent resistance to radiation with no retention. • Low creep. • Low coefficient of thermal expansion. • Excellent resistance to dilute acids and solvents. • Attacked by basic solutions and subject to degradation in the presence of steam. • Low outgassing. 	<ul style="list-style-type: none"> • Electrical and thermal insulators. • Gaskets. • Valve seats. • Unlubricated bearings. • Thrust washers. • Components in vacuum or radioactive environments. • Wear strips. • Structural parts.
CELAZOLE:	Polybenzimidazole (PBI) Sheet: Thickness: 1/2" — 1-1/2" Size: 12" x 12", 12" x 24", 13.25" x 14.25" Rod: Diameter: 3/8" — 4-3/4" Tubular Bar: Diameter: 3/4" I.D. — 15" O.D. Disc: Diameter: 3-1/2" — 15"	<ul style="list-style-type: none"> • Highest mechanical properties of any plastic above 400°F (204°C). • Highest heat deflection temp. 800°F (427°C). • Short-term exposure potential to 1000°F (538°C). • Lowest coefficient of thermal expansion. • Highest compressive strength of all unfilled plastics. 	<ul style="list-style-type: none"> • High heat insulator bushings. • Electrical connectors. • Ball valve seats. • Clamp rings. • Vacuum cups, fingers and holders.
ULTEM:	Polyetherimide Sheet: Thickness: 1/32" — 3" Size: 48" x 96", 24" x 48" Rod: Diameter: 3/16" — 8"	<ul style="list-style-type: none"> • High heat resistance. • Exceptional fame retardance – UL 94-V-0 rated. • Low smoke. • High dielectric strength. • Low dissipation factor. • Stable dielectric constant. • Outstanding mechanical properties. • Broad chemical resistance. • Excellent machinability. • Transparent (Amber). 	<ul style="list-style-type: none"> • Aircraft components. • Electrical/electronic components. • Circuit boards. • Microwave applications. • Computer circuitry. • Automotive applications. • Pump and valve parts. • Medical devices and components.
PPS:	Polyphenylene Sulfide Sheet: Thickness: 1/4" — 2" Size: 24" x 48" Rod: Diameter: 3/8" — 3" Tubular Bar: Diameter: 1" I.D. — 40" O.D.	<ul style="list-style-type: none"> • High heat resistance. • Exceptional chemical resistance. • Superior dimensional stability. • Excellent electrical and mechanical properties. • Flame resistance. • High rigidity. 	<ul style="list-style-type: none"> • High Pressure Liquid Chromatography. • Chemical processing. • Automotive. • Electrical/electronic components. • Industrial parts. • Consumer goods. • Medical and diagnostic devices. • Replacing metal and steel in a variety of applications.

HIGH PERFORMANCE MATERIALS

		PROPERTIES	TYPICAL APPLICATIONS
NORYL:	Modified phenylene oxide Sheet: Thickness: 1/16" — 1" Size: 48" x 96", 24" x 48" Rod: Diameter: 1/4" — 6"	<ul style="list-style-type: none"> Stable under load under wide temperature range. Low thermal conductivity and expansion. High impact strength. Resists creep and deformation under load. Low water absorption. Excellent electrical properties. High tensile strength. 	<ul style="list-style-type: none"> Pump components. Gauges and instrument parts. Surgical instruments. Terminal boards. Plated and vacuum metallized parts. Mist and scrubber eliminator blades.
POLY-SULFONE:	Sheet: Thickness: 1/32" — 4" Size: 48" x 96", 24" x 48", 12" x 48" Rod: Diameter: 3/16" — 8" Film: Thickness 0.003" — 0.020" Width: 24" — 26"	<ul style="list-style-type: none"> Exceptional heat and steam resistance. Excellent dimensional stability. Toughness, Rigidity. Chemical and Radiation resistance. FDA compliant. 	<ul style="list-style-type: none"> Medical tubing, trays, handles and trials. Food & beverage contact parts. Dairy equipment. Aerospace components. Circuit boards & connectors.
PCTFE:	Chlorotrifluoroethylene Sheet: Thickness: 0.005" - 1-1/4" Size: 12" x 12", 14" x 14", 15" x 15" Rod: Diameter: 1/8" — 6"	<ul style="list-style-type: none"> Excellent chemical resistance. Dimensional stability over a wide temperature range (-240°C to +200°C). Gas barrier properties. Excellent electrical properties. High optical transparency. 	<ul style="list-style-type: none"> Liquid oxygen handling. Cryogenic applications. Chemical processing equipment. Gaskets. Seals. Electrical components.
FEP:	Fluorinated ethylene propylene Sheet: Thickness: 1/32" — 2" Size: 12" x 12", 14" x 14", 15" x 15" Rod: Diameter: 1/8" - 6" Film: Thickness: 0.0005" — 0.020" Width: 1/2" — 60"	<ul style="list-style-type: none"> Weldable. Chemically inert. Low dielectric constant. Good weatherability. Useful from cryogenic temperatures up to 200°C. Relatively soft with lower tensile strength, wear resistance and creep resistance than other engineering plastics. 	<ul style="list-style-type: none"> Roll covers. Pipe linings. Wire and cable applications.
PFA:	Perfluoroalkoxy Sheet: Thickness: 0.002" — 1/2" Size: 12" x 12" Rod: Diameter: 1/8" — 1 3/4" Film: Thickness: 0.0005" — 0.125" Width: 1/2" — 48"	<ul style="list-style-type: none"> Similar to TFE and FEP. Better mechanical properties than FEP above 150°C. Can be used to 260°C. About equal to TFE in chemical resistance. 	<ul style="list-style-type: none"> Roll covers. Pipe linings. Wire and cable applications.
HALAR:	Ethylene - Chlorotrifluoroethylene Sheet: Thickness: 1/16" — 4" Size: 48" x 96", 12" x 48" Rod: Diameter: 1/8" — 5" Film: Thickness: 0.0005" — 0.125" Width: 24" — 26"	<ul style="list-style-type: none"> Excellent chemical resistance. Extremely low permeability to liquids, gases and vapours. Best abrasion resistance of all fluoropolymers. Useful properties from cryogenic temperatures to 165°C. Ultra pure, non contaminating. 	<ul style="list-style-type: none"> Valves. Pumps. Tank and tank linings. Cables. Chemical processing.
TEFZEL:	Ethylene-tetrafluoroethylene Sheet: Thickness: 1/16" — 3/4" Size: 12" x 12" Rod: Diameter: 1/8" — 4" Film: Thickness: 0.0005" — 0.125" Width: 1/2" — 60"	<ul style="list-style-type: none"> High impact resistance. Useful mechanical properties from cryogenic temperatures to 180°C. Excellent electrical properties. Melts and decomposes upon exposure to flame. Excellent chemical resistance and weatherability. 	<ul style="list-style-type: none"> Pump components. Chemical process equipment. Electrical components.
CROSS LINKED POLY-STRYENE	Sheet: Thickness: 1/32" — 6" Size: 24" x 48", 36" x 36" Rod: Diameter: 1/16" — 8"	<ul style="list-style-type: none"> Excellent electrical properties including low loss and stable dielectric constant. High resistance to cold flow. Close machining tolerances possible. Rigidity and dimensional stability. Excellent radiation resistance. 	<ul style="list-style-type: none"> Microwave lenses and insulators. Aerospace components. Electronic equipment.
POLY-URETHANE:	Castable urethane elastomer Sheet: Thickness: 1/32" — 4" Rod: Diameter 1/4" — 6" Tubular Bar: Diameter 1/4" I.D. — 25" O.D. Hardness ranges from 10 — 15 shore "A" which is softer than a gum eraser to 80 shore "D" which is harder than a bowling ball.	<ul style="list-style-type: none"> Outstanding abrasion resistance. Great load carrying characteristics. Flexibility even at low temperatures. Resistant to degradation by oxygen and ozone. Superior sound dampening properties. Useful mechanical properties are maintained from -60°C to 90°C. Very high impact strength. Very low water absorption. Bondable to other materials. 	<ul style="list-style-type: none"> Chute liners. Agitator blades. Pulleys. Conveyor rollers. Forming rolls. Graphic Arts rollers. Wear strips. Car wash rollers. Gears, sprockets. Wheels.

TECHNICAL SECTION

MECHANICAL PROPERTIES

TENSILE STRENGTH

The word tensile means "to pull apart". Tensile strength is the resistance of material to being pulled apart and is expressed in lbs. per square inch. One square inch of marshmallow would require very little force or total lbs. to pull apart. Because plastics have much greater strength, the force required to pull apart 1 square inch of plastic may range from 1,000 to 50,000 psi. Steel and other structural alloys have tensile strengths that run as high as hundreds of thousands of pounds per square inch.



Applying Elongation

Consider the application of TFE tape applied by wrapping with considerable tension in the wire and cable field. Actually, these tensions represent portions of the tensile strength of the material. Consequently, elongation occurs. In order to obtain a tight, void-free interface between overlapping layers of tape, both the tension and the elongation are important factors. Tensile strength and elongation are also important where toughness is required. A material which has a high tensile, and a relatively high degree of elongation, is a tougher material than one having a high tensile with low elongation. Toughness is required in such applications as insulators where a piece of nylon tubing is slipped over a wire lug and crimped with force so that the tubing is mechanically fastened to the wire lug and in cases where snap fits are to be made between parts.

Applying Tensile Strength

To illustrate the use of tensile strength, picture a circular cross-section of tubing. Assume that the internal pressure exerted equally in all directions along the I.D. is 1,000 psi. Since the tubing wall must be strong enough to support the internal pressure, the strength of the 2 walls must at least equal the force exerted inside the tube. In other words, at burst, the I.D. of the tube times the pressure of the fluid contained must equal the sum of the wall thickness times the tensile strength of the material. Since the material must have at least 1,000 psi tensile strength, the choice would be nylon since a greater safety factor exists, over materials with a lower tensile such as TFE.



MODULUS

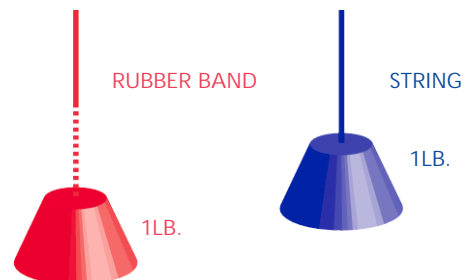
The term modulus may be applied to either tensile, compressive, flexural or torsional actions. It defines the number of lbs. per square inch required to cause deformation, elongation, flexure, etc. in material. In other words, it represents stiffness. Imagine a rubber band and a piece of string 4" long. Placing a 1 lb. weight on the rubber band will cause stretching or elongation; whereas the same weight on the string would cause little or no visual elongation. Assume the rubber band stretched to double its original length. The relative modulus of this material is found by dividing the 1 lb. force by the elongation in terms of percentage. We therefore have 1 lb. over percentage in decimal form of 1/1 = 1. Assume the 4" length of string has stretched 0.040". This represents an elongation of 1%. Dividing this into the 1 lb. load we have 1/0.01 = 100. The relative modulus of the string is 100 times higher than that of the rubber band. In actual practice, the modulus would be expressed in psi; consequently, the modulus for a material like string might be about 100,000 psi.



In determining the compressive or flexural modulus, the same type of units are involved except that we are dealing with compressive deformation and flexural displacement.

ELONGATION

This property which is always associated with tensile strength, is the increase in original length at fracture, expressed as a percentage. For example, a strip of writing paper can be pulled apart with almost no visual stretching or "elongation". On the other hand, a piece of taffy may be stretched several times its original length before breaking. Assume that the taffy is 4" long and stretches to a total length of 12" before breaking. The elongation would be 200%.

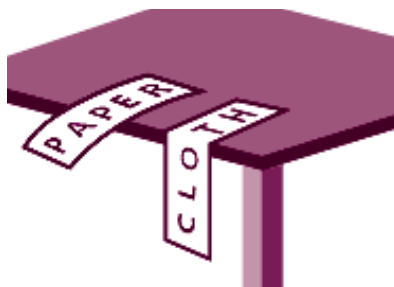


Applying Modulus

Consider a nylon bearing having a 1/2" wall which is going to support a load of 2,000 psi. One of the considerations is how much additional clearance will be developed due to elasticity of the bearing. In this case, the modulus of the material is found by dividing the load by the resulting deformation which is expressed in percentage. The modulus of nylon 6/6 in compression, is approximately 400,000 psi. To find the percentage of deformation, divide the 2,000 psi. load by 400,000 with the resulting answer of .5%. Multiply this by the 1/2" wall thickness and find that a deformation of 2-1/2 mils will occur. Tensile modulus is important in the design of a hydraulic system utilizing Nyaflo[®] pressure tubing. During pressure build-up the tubing stretches slightly and causes a slight lag in pressure build-up over what might be expected if the tube was rigid.

FLEXURAL STRENGTH

This property is also expressed in lbs. per square inch and is the same type of force applied in folding a sheet of paper. The extended paper illustrated assumes a slight downward curvature while a piece of cloth will hang almost perpendicular. This means the flexural strength of the paper is considerably higher since it resists bending under its own weight.



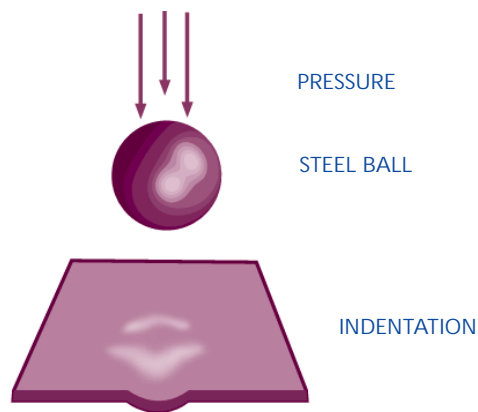
Applying Flexural Strength

This property is applied in applications where the plastic is being bent or continually flexed as in plastic gearing. In determining the load which a single gear tooth must carry, consider the flexural strength of the material selected.



HARDNESS

There is really very little that can be said about this property since there is no exact term which defines values of hardness. In some cases the diameter of the indentation of a small ball on the material being tested is taken as a hardness measurement. In other cases it is the penetration of a sharp point. Generally a harder surface provides better wear and abrasion resistance in a material.



TENSILE IMPACT

The test involves breaking the sample in tension at very high speeds. The sample is normally broken before any apparent elongation occurs. In certain applications, the tensile impact test can be more readily correlated to field experience and engineering requirements. The speed of impacting has a very definite effect on impact strength. Some materials increase in impact strength with increasing speed while others decrease.

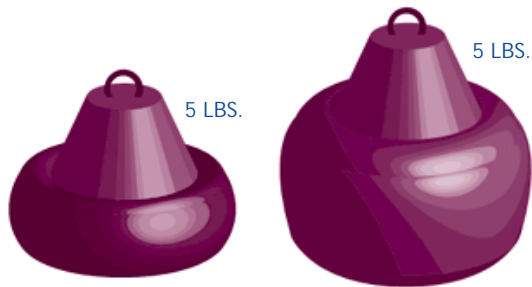
COMPRESSIVE STRENGTH

This property is the maximum load in lbs. which a 1" square section of material will support without fracturing. It is a less meaningful term than tensile strength; primarily because some of the malleable materials, TFE for example, really do not exhibit fracturing. Consequently, compressive strength will continue to increase as deformation of the sample occurs.

The meaningful compressive properties would be better expressed in terms of the force in lbs. per square inch required to deform a given material prior to reaching its yield point. As an example of the differences in compressive strength, a 5 lb. weight placed on a 1" cube of marshmallow would seriously deform it; whereas the same weight on a 1" cube of taffy will cause only slight deformation.

Applying Compressive Strength

Compressive strength is important in plastic bearing applications. The load to be carried by the bearing must be well within the compressive strength characteristics of the material. However, at this point one must consider other properties such as the modulus and deformation under load of the bearing material. It is apparent what would happen if nylon (with a compressive strength of approximately 15,000 psi) was selected to support a load of 12,000 psi. Recalling that compressive strength is a value at failure, the 12,000 psi load would crush the bearing beyond use. Compressive strength can be used to distinguish the better of 2 materials, but, once the material has been selected, other considerations must be made.



YIELD POINT

There are various types of yield points — compressive, tensile, flexural and torsional. The term simply means the point at which material under compression, tension, etc. will no longer return to its original dimensions after removal of the stress. You can visualize yield point by taking a wooden matchstick and gently bending until a slight fracture occurs. Prior to this fracture, for all visual purposes, a matchstick will return to its original straightness. In actual practice, plastic materials under tension, compression, etc. show a small degree of fracture at the yield point. They consequently will not return to their original dimensions because the internal physical structure has now been slightly modified.

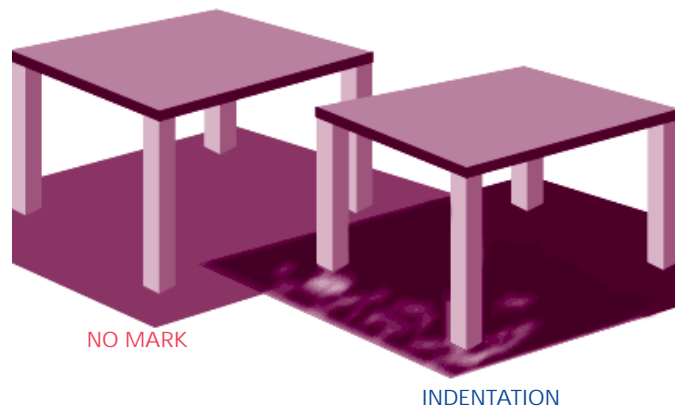
DEFORMATION UNDER LOAD

This property tells us what percentage of deformation will occur in a material under a given load in a given period of time. The time element is critical. While 1% deformation might be indicated under the standard 24 or 48 hour exposure,

leaving the sample under the load for a 2 week period may show substantially higher deformation. The lower the deformation under load, the more likelihood there is that the value will not change with increased time. After placing the piece of furniture on a rug and immediately removing it, little or no indentation can be seen. However, after allowing the object to stand overnight, a substantial indentation is present. This property indicates the major portion of the creep which will occur over long periods of time, but, which would not be evident in a short test. Plastics exhibit creep characteristics which are uncommon in other engineering materials. When measuring properties consider that differences would be seen if the tests were carried out over long periods of time.

Applying Deformation Under Load

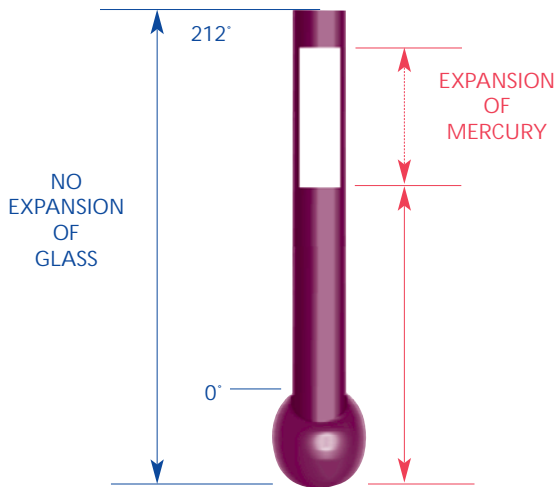
In a bearing application, deformation under load contributes to total bearing clearance. For example, a Fluorosint® bearing having a 1/2" wall, operating at 200°F, under a 1,200 psi load, will deform .2%. Multiplying this .2% by the wall thickness tells us the bearing clearance will be increased by a factor of 1 mil. If you had recommended TFE for this application, not taking into consideration the deformation under load, the effect on clearance would be approximately 28 times as great, and a clearance of 28 mils would result within the first day of operation.



THERMAL PROPERTIES

COEFFICIENT OF LINEAR THERMAL EXPANSION

This term deals with the amount of growth which occurs in a material when it is heated and is normally expressed in terms of in./in./°F. Visualize a mercury thermometer where a few degrees temperature rise causes a very substantial growth in the column of mercury but has no visual effect on the glass container.



Applying Coefficient of Linear Thermal Expansion

Thermal expansion for plastics is 4 to 8 times higher than other engineering materials. This requires close attention in certain design areas. Materials which exhibit high thermal expansion could cause instability in electronic tuning devices where a change in temperature could cause inaccurate tuning due to thermal expansion of components. Fluorosint® exhibits a coefficient of thermal expansion that matches aluminum, and makes an ideal insulating companion to aluminum.

Thermal expansion must also be considered in bearings at elevated temperatures. Bearings which are completely housed will show a closing-in of the I.D., and, for proper bearing performance, this close-in must be considered in order to prevent seizure of the rotating shaft.

HEAT DISTORTION

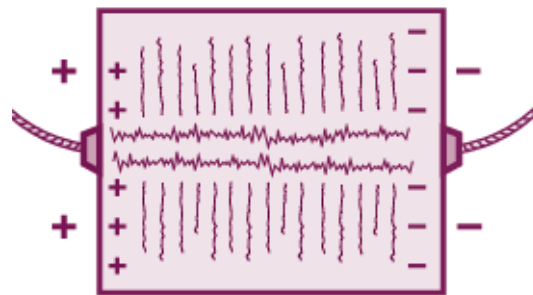
This property has little or no practical engineering meaning. It is simply a comparison of various materials. It is the temperature at which a sample bends a given number of mils under a given load. This value can only be used to separate materials having widely different heat distortion points. For example, two materials having a heat distortion point of 150°F. and 175°F. are not very much different. You should consider other properties such as deformation under load and modulus.

ELECTRICAL PROPERTIES

DIELECTRIC STRENGTH

Dielectric strength differs from tensile or compressive strength in that the force is applied electrically rather than mechanically. This electrical force, rather than acting on the entire mass, acts upon portions of the molecules. Dielectric strength is expressed in volts per mil and represents the number of volts required to cause an electrical breakthrough of the sample. As the voltage increases, the molecule approaches a failure point. Portions of the molecule fly off and carry a charge or conduct a current. You may have had the experience of placing a piece of paper between the electrodes on a spark generating machine in a high school laboratory, and finding that upon removal the paper was perforated with small blackened holes. You may also have experienced placing other materials between the electrodes, and found that such perforations did not appear. Assuming that the materials were of the same thickness, the one which was not perforated would have a higher dielectric strength.

insulation increases, the dielectric strength in volts per mil increases at a different rate for each material. Consequently, in thin sections, TFE exhibits a higher dielectric strength than nylon. Keep this in mind when recommending insulating materials.



Applying Dielectric Strength

Dielectric strength is of primary importance in the application of plastics in wire or cable covering. Normally, the heavy sections encountered in other applications are more than adequate to withstand the voltage. As thickness of

VOLUME RESISTIVITY

The volume resistivity of a material is its ability to impede the flow of electricity expressed in ohms per centimeter. This measurement is always made on a 1 centimeter cube. Wire, for example, is a conductor having negligible volume resistivity and electrical current occurs instantaneously.

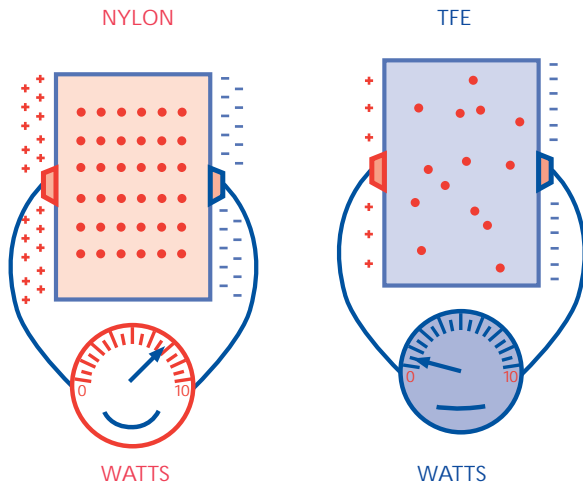
This electrical current can be simply defined as motion of electrons. As one electron moves, the next one moves in turn to carry the electrical current. This could be pictured as a series of dominoes standing on end, spaced so that if one falls the next will fall in turn. Electron movement in plastics is virtually impossible due to the complex nature of the molecule. The more readily the current flows, the lower the volume resistivity. Copper wire would have a very low volume resistivity, while insulating materials are considerably higher.

Applying Volume Resistivity

The volume resistivity of almost all plastics is extremely high, and need not be considered in most applications. However, it must be considered when dealing with sensitive electronic measuring equipment. There are instruments which will measure voltages and currents as small as 10^{-12} . This value is close to the value for volume resistivity of plastics. If you were to apply nylon as an insulator in such an instrument, the resistivity of the plastic itself could cause serious errors in the equipment. Therefore, it is important to have a material with considerably higher volume resistivity than 10^{12} . You should consider material such as TFE.

DIELECTRIC CONSTANT

This property describes the ability of a material to store an electric charge and is sometimes referred to as specific capacitance. This value is commonly associated with electronic capacitors which are nothing more than 2 metallic electrodes separated by an insulating material such as TFE or nylon. Picture dielectric constant as a larger build-up of electrons on the surface of the nylon capacitor than on that of the TFE capacitor since the dielectric constant of nylon is several times that of TFE. If we use the same voltage source to charge the capacitors, upon shorting them out we would expect twice the work out of the capacitor having the higher dielectric constant due to the fact that current x volts = watts or, work equivalent.



DIELECTRIC LOSS TANGENT

In order to discuss dielectric loss tangent, it is necessary to look inside of the plastic molecule to understand why it has a higher dielectric constant. Picture the molecules as a random arrangement of small magnets. Under applied voltage these molecules will attempt to arrange themselves in a uniform fashion. Materials having a higher dielectric constant therefore organize themselves more uniformly than those having a lower dielectric constant. The dielectric loss tangent is the ease or difficulty with which molecular ordering occurs. Materials having a higher dielectric loss tangent have molecules which must move in an atmosphere of higher viscosity. Consider a material which stores 1,000 electrons. This material will actually require 1,000 plus a certain percentage of electrons more due to dielectric loss. The product of dielectric constant and dielectric loss is directly proportional to the energy lost in charging a material. In other words if 2 different materials both have a dielectric loss of .001 but one has a dielectric constant of 2 and the other 4 the second material will actually use twice the energy of the first.

Applying Dielectric Constant and Dielectric Loss Tangent

Dielectric constant and loss must be considered together. The dielectric loss of materials should be as low as possible to prevent excess power consumption. When a customer is concerned with dielectric loss, consider TFE or Fluorosint®. Nylons are almost never used. In some cases it is desirable to have a low dielectric constant. In other cases, a high dielectric constant is desirable, assuming that the dielectric loss in both cases is relatively low. An example where a low dielectric constant is desirable is insulating material for coaxial cable. Imagine a coaxial cable many hundreds of feet long. Even though power losses per foot may be extremely low, as the cable becomes longer, this power loss becomes a very important factor. Therefore, as low a dielectric constant as possible must be utilized in order to minimize energy losses. TFE is best for this application due to its extremely low dielectric constant coupled with an almost unmatched low dielectric loss. Finally, going to the other extreme, assume you are interested in selling a material for capacitor construction. As you recall, a capacitor is nothing more than a reservoir for an electric charge. The dielectric constant is a measure of the degree of chargeability. Consequently, a high dielectric constant would be preferable as an insulating material in capacitors.

Used with permission of Quadrant Engineered Plastic Products.

PROPERTY DATA FOR VARIOUS TYPES OF NYLON

PROPERTY	TEST METHOD ASTM	UNITS	NYLON TYPE 66	NYLATRON® GS	MC® 901	NYLATRON® GSM	NYLATRON® NSB	NYLATRON® NSM	NYLON TYPE 6
MECHANICAL									
TENSILE STRENGTH — 23°C	D638	PSI	11,000	12,500	12,000	11,500	10,500	11,500	11,900
MODULUS OF ELASTICITY — 23°C	D638	PSI (X 10 ⁵)	4.0	4.8	4	4	4.0	4.1	4.7
ELONGATION — 23°C	D638	%	50	25	20	30	10	20	40
IMPACT STRENGTH — NOTCHED	D256	FT. LBS./IN.	0.6	0.5	0.4	0.5	0.4	0.5	0.8
HARDNESS — SHORE	—	D SCALE	80	80	85	85	83	80	80
		R SCALE	110	110	115	110	115	110	110
FLEXURAL STRENGTH — 23°	D790	PSI	19,500	17,500	16,500	16,500	14,500	—	13,750
COMPRESSIVE STRENGTH — 23°C 10% DEFORMATION	D695	PSI	12,000	16,000	15,000	14,000	12,000	14,000	—
SHEAR STRENGTH — 23°C	D732	PSI	10,000	10,500	11,000	10,500	9,000	10,000	—
COEFFICIENT OF FRICTION DYNAMIC, DRY			0.25	0.20	0.20	0.20	0.16	0.18	0.40
THERMAL									
CONTINUOUS SERVICE TEMPERATURE IN AIR (MAX.)		°C	104	104	93	93	104	82	100
MELTING POINT	D3418	°C	260	260	215	215	260	215	220
DEFLECTION TEMPERATURE 264 PSI	D648	°C	93	93	93	93	93	93	—
COEFFICIENT OF LINEAR EXPANSION	E831	IN./IN./°C	9.9X10 ⁻⁵	6.3X10 ⁻⁵	6.3X10 ⁻⁵	6.3X10 ⁻⁵	9.9X10 ⁻⁵	—	—
THERMAL CONDUCTIVITY		CAL/SEC/ CM ² /°C/CM	5.9X10 ⁻⁴	—	5.9X10 ⁻⁴	—	—	—	—
ELECTRICAL									
DIELECTRIC STRENGTH	D149(2)	VOLTS/MIL	400	350	500	400	350	400	—
DIELECTRIC CONSTANT 10 ⁶ CYCLES	D150(2)		4.1	—	3.7	3.7	—	—	4
VOLUME RESISTIVITY	D257	OHM/CM	4.5X10 ¹³	2.5X10 ¹³	2.5X10 ¹³	2.5X10 ¹³	2.5X10 ¹³	2.5X10 ¹³	—
PHYSICAL									
SPECIFIC GRAVITY	D792	GM/CM ³	1.15	1.16	1.15	1.16	1.18	1.15	1.16
WATER ABSORPTION SATURATION	D570(1)	%	7	7	7	7	7	7	7

Note: Although the information contained here has been obtained from sources believed to be reliable, no warranty (expressed or implied) can be made as to its accuracy. Where no value is listed, sufficient details are not available to present a usable figure. Property data shown are typical average values and will vary on specific production lots and by size and configuration of product. They should be used only as a guide to primary selection for application of a given material and not serve as a substitute for careful testing of prototype parts in typical operating environments. Final determination of the suitability of any material for a specific application is the sole responsibility of the user.

PROPERTIES OF ACETAL, DELRIN AF® & ERTALYTE®

PROPERTY	TEST METHOD ASTM	UNITS	ACETAL	DELRIN* AF	ERTALYTE®
MECHANICAL					
TENSILE STRENGTH — 25°	D638	PSI	10,000	6,700	12,400
MODULUS OF ELASTICITY — 25°C	D638	PSI	4.1 X 10 ⁵	4.2 X 10 ⁵	4.6 X 10 ⁵
ELONGATION — 25°C	D638	%	75	15	20
IMPACT STRENGTH — NOTCHED 25°C	D256	FT. LBS./IN. NOTCH	1.0	0.5	0.50
HARDNESS — ROCKWELL	D785	R SCALE	120	115	125
FLEXURAL STRENGTH — 25°C	D790	PSI	14,000	10,500	18,000
COMPRESSIVE STRENGTH — 25°C	D695	PSI	16,000	15,000	15,000
SHEAR STRENGTH — 25°C	D732	PSI	8,600	8,000	8,000
DEFORMATION UNDER LOAD 2,000 PSI AT 50°C	D621	%	0.5	0.6	—
COEFFICIENT OF FRICTION DYNAMIC (NO LUBRICANT) 25°C			0.35	0.14	0.20
THERMAL					
CONTINUOUS SERVICE TEMPERATURE IN AIR (MAX)		°C	82	82	100
DEFLECTION TEMPERATURE 66 PSI 264 PSI	D648	°C °C	177 121	168 118	— 115
COEFFICIENT OF LINEAR EXPANSION +29 TO + 60°C	D696	CM/CM/°C	8.5 X 10 ⁻⁵	9 X 10 ⁻⁵	6 X 10 ⁻⁵
THERMAL CONDUCTIVITY		CAL/SEC/CM ² /°C/CM	5.5 X 10 ⁻⁴	3.3 X 10 ⁻⁴	3.4 X 10 ⁻⁴
ELECTRICAL					
DIELECTRIC STRENGTH (90 MIL TEST SPECIMEN)	D149	VOLT/MIL	450	400	385
DIELECTRIC CONSTANT -10 ⁶ CYCLES	D150		3.7	3.1	3.37
VOLUME RESISTIVITY	D257	OHM/CM	10 ¹⁵	3 X 10 ¹⁶	5.5 X 10 ¹⁴
DISSIPATION POWER FACTOR -10 ⁶ CYCLES	D150		0.0048	0.010	0.0208
ARC RESISTANCE	D495	SEC.	129 (NO TRACKING)	183	—
PHYSICAL					
SPECIFIC GRAVITY	D792	GM/CM ³	1.42	1.54	1.41
WATER ABSORPTION 24 HRS AT 25°C	D570	%	0.20	0.18	0.07
SATURATION AT 25°C	D570	%	0.90	0.88	0.90

Note: Although the information contained here has been obtained from sources believed to be reliable, no warranty (expressed or implied) can be made as to its accuracy. Where no value is listed, sufficient details are not available to present a usable figure. Property data shown are typical average values and will vary on specific production lots and by size and configuration of product. They should be used only as a guide to primary selection for application of a given material and not serve as a substitute for careful testing of prototype parts in typical operating environments. Final determination of the suitability of any material for a specific application is the sole responsibility of the user.

PROPERTIES OF POLYETHYLENE (LOW DENSITY, HIGH DENSITY, UHMW) AND POLYPROPYLENE

PROPERTY	TEST METHOD ASTM	UNITS	LOW-DENSITY POLYETHYLENE	HIGH-DENSITY POLYETHYLENE	UHMW POLYETHYLENE	POLYPROPYLENE
MECHANICAL						
TENSILE STRENGTH	D638	PSI	2,000	3500	3,500	4800
MODULUS OF ELASTICITY	D638	PSI	3.4 X 10 ⁴	1.5 X 10 ⁵	1.7 X 10 ⁵	2.0 X 10 ⁵
ELONGATION (ULTIMATE)	D638	%	300	600	400	200
IMPACT STRENGTH — NOTCHED AT 20°C	D256	FT. LBS./IN. NOTCH	NO BREAK	3	30	1.0
HARDNESS — SHORE ROCKWELL	D785	D SCALE	50	69	67	75
		R SCALE	—	65	64	90
FLEXURAL STRENGTH	D790	PSI	—	—	3,800	6,900
FLEXURAL MODULUS	D790	PSI	2.4 X 10 ⁴	1.4 X 10 ⁵	1.1 X 10 ⁶	2.5 X 10 ⁶
COMPRESSIVE STRENGTH	D695	PSI	4,000	4,500	—	6,000
SHEAR STRENGTH	D732	PSI	2,400	3,400	3,500	3,800
WATER ABSORPTION	D570	%	<0.01	<0.01	<0.01	<0.01
THERMAL						
CONTINUOUS SERVICE TEMPERATURE IN AIR (MAX.)		°C	70	80	80	80
VICAT SOFTENING TEMPERATURE	D1525	°C	95	112-114	136	150-165
BRITTLINESS TEMPERATURE	D746	°C	<-118	<-75	<-200	0 TO -9
HEAT DISTORTION TEMPERATURE — 66 PSI — 264 PSI	D648	°C	44	60-70	80	102
	D648	°C	—	60	47	57-100
COEFFICIENT OF LINEAR EXPANSION	D696	CM/CM/°C	1.6 X 10 ⁻⁴	1.25 X 10 ⁻⁴	1.6 X 10 ⁻⁴	9.0 X 10 ⁻⁵
SPECIFIC HEAT		CAL/GM/°C	0.67	0.52	0.45	0.46
THERMAL CONDUCTIVITY	C177	CAL/SEC/CM ² /°C/CM	2.9 X 10 ⁻⁴	5.2 X 10 ⁻⁴	9 X 10 ⁻⁴	5.3 X 10 ⁻⁴
ELECTRICAL						
DIELECTRIC STRENGTH	D149	VOLTS/MIL	500	500	—	660
DIELECTRIC CONSTANT — 10 ⁶ CYCLES	D150		2.2	2.32-2.50	2.3	2.1-2.3
VOLUME RESISTIVITY	D257	OHM/CM	>8 X 10 ¹⁴	>10 ¹⁵	>10 ¹⁸	6.5 X 10 ¹⁶
DISSIPATION POWER FACTOR — 10 ⁶ CYCLES	D150		<5 X 10 ⁻⁴	<5 X 10 ⁻⁴	<2 X 10 ⁻⁴	3 X 10 ⁻⁴
PHYSICAL						
SPECIFIC GRAVITY	D792	GM/CM ³	0.920	0.955	0.940	0.905

- With the exception of UHMW Polyethylene, the materials listed above can be welded with our Leister welding equipment. For details, see pages 90 — 95.

Note: Although the information contained here has been obtained from sources believed to be reliable, no warranty (expressed or implied) can be made as to its accuracy. Where no value is listed, sufficient details are not available to present a usable figure. Property data shown are typical average values and will vary on specific production lots and by size and configuration of product. They should be used only as a guide to primary selection for application of a given material and not serve as a substitute for careful testing of prototype parts in typical operating environments. Final determination of the suitability of any material for a specific application is the sole responsibility of the user.

PROPERTIES OF INDUSTRIAL LAMINATES (COMMON GRADES)

PROPERTY	TEST METHOD	UNITS	GRADE CE CANVAS BASED PHENOLIC	GRADE LE LINEN BASED PHENOLIC	GRADE XX PAPER BASED PHENOLIC	GRADE G-7 GLASS BASED SILICONE	GRADE G-10 GLASS BASED EPOXY
MECHANICAL							
TENSILE STRENGTH	ASTM D229	PSI	13,000	13,000	13,500	20,500	50,000
LENGTHWISE			9,000	9,000	12,000	18,500	38,000
CROSSWISE							
IMPACT STRENGTH	ASTM D256	FT. LBS./ IN. NOTCH	2.30	1.80	1.30	6.50	7.00
NOTCHED AT 20°			1.40	1.00	0.35	5.50	5.50
FLATWISE							
EDGEWISE							
HARDNESS — ROCKWELL	ASTM D785	M SCALE	105	105	100	105	110
FLEXURAL STRENGTH	NEMA L1 1-1971	PSI	19,000	25,000	17,000	25,000	65,000
LENGTHWISE			16,000	16,000	14,000	18,000	40,000
CROSSWISE							
COMPRESSIVE STRENGTH	ASTM D695	PSI	37,000	38,000	30,000	41,000	60,000
FLATWISE			24,500	25,000	23,000	14,000	40,000
EDGEWISE							
SHEAR STRENGTH	ASTM D732	PSI	10,000	14,000	10,000	17,000	22,000
THERMAL							
MAXIMUM OPERATING TEMPERATURE	RECOMMENDED	°C	120	120	140	220	150
COEFFICIENT OF LINEAR EXPANSION	ASTM D696	CM/CM/°C	2 X 10 ⁻⁵	2 X 10 ⁻⁵	2 X 10 ⁻⁵	1 X 10 ⁻⁵	1 X 10 ⁻⁵
THERMAL CONDUCTIVITY	ASTM C177	CAL/SEC/CM ² /°C/CM	7 X 10 ⁻⁴	7 X 10 ⁻⁴	7 X 10 ⁻⁴	7 X 10 ⁻⁴	7 X 10 ⁻⁴
ELECTRICAL							
DIELECTRIC STRENGTH	ASTM D229	VOLTS/MIL	550	625	700	400	800
1/16" TEST SPECIMEN			300	500	600	350	750
1/8" TEST SPECIMEN							
DIELECTRIC CONSTANT			5.5	5.3	5.5	4.2	5.2
— 10 ⁶ CYCLES							
VOLUME RESISTIVITY	ASTM D229	OHM/CM	—	7 X 10 ¹⁰	4 X 10 ¹¹	5 X 10 ¹³	6 X 10 ¹²
DISSIPATION POWER FACTOR	NEMA L1 1-1971		5.5 X 10 ⁻⁸	5.5 X 10 ⁻⁸	4.5 X 10 ⁻⁸	3 X 10 ⁻⁹	2.5 X 10 ⁻⁸
— 10 ⁶ CYCLES							
ARC RESISTANCE	ASTM D495	SECONDS	—	—	—	180	100
PHYSICAL							
SPECIFIC GRAVITY	ASTM D792	GM/CM ³	1.33	1.33	1.34	1.68	1.82
WATER ABSORPTION	ASTM D570	%	1.1	1.0	0.5	0.03	0.05

Note: Although the information contained here has been obtained from sources believed to be reliable, no warranty (expressed or implied) can be made as to its accuracy. Where no value is listed, sufficient details are not available to present a usable figure. Property data shown are typical average values and will vary on specific production lots and by size and configuration of product. They should be used only as a guide to primary selection for application of a given material and not serve as a substitute for careful testing of prototype parts in typical operating environments. Final determination of the suitability of any material for a specific application is the sole responsibility of the user.

PROPERTIES OF POLYVINYL CHLORIDE (PVC)

TYPE I NORMAL IMPACT TYPE II HIGH IMPACT CPVC

PROPERTY	TEST METHOD ASTM	UNITS	GREY TYPE I, GR.I	WHITE TYPE I, GR.I	CLEAR TYPE I, GR.I	GREY TYPE II, GR.I	CPVC
MECHANICAL							
TENSILE STRENGTH	D638	PSI	7,820	7,500	7,500	6,070	8100
MODULUS OF ELASTICITY	D638	PSI	4.1 X 10 ⁵	4.1 X 10 ⁵	4.26 X 10 ⁵	3.96 X 10 ⁵	4.0 X 10 ⁵
ELONGATION (ULTIMATE)	D638	%	60	25	36	60	37
IMPACT STRENGTH — NOTCHED	D256	FT. LBS./IN. NOTCH	1.0	1.3	0.9	18	1.65
HARDNESS — ROCKWELL	D785	R SCALE	113	112	115	106	118
FLEXURAL STRENGTH	D790	PSI	12,800	12,000	12,000	10,000	11,000
COMPRESSIVE STRENGTH	D695	PSI	11,100	10,300	—	7,400	11,400
SHEAR STRENGTH	D732	PSI	7,990	—	—	5,300	9,220
THERMAL							
CONTINUOUS SERVICE TEMPERATURE IN AIR (MAX)		°C	60	60	60	60	82
VICAT SOFTENING TEMPERATURE	D1525	°C	83	86	82	83	105
HEAT DISTORTION TEMPERATURE — 66 PSI	D648	°C	82	71	74	82	—
264 PSI		°C	80	67	68	80	100
COEFFICIENT OF LINEAR EXPANSION	D696	CM/CM/°C	5.8 X 10 ⁻⁵	7.3 X 10 ⁻⁵	6.7 X 10 ⁻⁵	6.3 X 10 ⁻⁵	6.7 X 10 ⁻⁵
THERMAL CONDUCTIVITY	C177	CAL/SEC/CM ² /°C/CM	2.8 X 10 ⁻⁴	2.8 X 10 ⁻⁴	—	2 X 10 ⁻⁴	2.2 X 10 ⁻⁵
ELECTRICAL							
DIELECTRIC STRENGTH	D149	VOLTS/MIL	410	410	—	350	—
DIELECTRIC CONSTANT — 60 CYCLES	D150	3.18	3.72	—	3.03	—	—
VOLUME RESISTIVITY	D257	OHM/CM	>10 ¹⁵	10 ¹⁶	>10 ¹⁵	>10 ¹⁵	>10 ⁵
PHYSICAL							
SPECIFIC GRAVITY	D792	GM/CM ³	1.42	1.39	1.4	1.35	1.52
WATER ABSORPTION	D570	%	0.06	0.10	0.04	0.16	0.06

• The Polyvinyl Chloride materials listed above can be welded using our Leister welding equipment. For details, see pages 90 — 95.

Note: Although the information contained here has been obtained from sources believed to be reliable, no warranty (expressed or implied) can be made as to its accuracy. Where no value is listed, sufficient details are not available to present a usable figure. Property data shown are typical average values and will vary on specific production lots and by size and configuration of product. They should be used only as a guide to primary selection for application of a given material and not serve as a substitute for careful testing of prototype parts in typical operating environments. Final determination of the suitability of any material for a specific application is the sole responsibility of the user.

PROPERTIES OF PTFE® FILLED & UNFILLED,

VESPEL® SP1, TORLON® 4203 AND TORLON® 4301

PROPERTY	TEST METHOD ASTM	UNITS	PTFE (UNFILLED)	25% GLASS FILLED PTFE	VESPEL® SP1	TORLON® 4203	TORLON® 4301
MECHANICAL							
TENSILE STRENGTH — 25°C	D638	PSI	4,000	2500	12,500	18,000	15,000
MODULUS OF ELASTICITY	D638	PSI	8 X 10 ⁴	8 X 10 ⁴	—	7.0 X 10 ⁵	9.5 X 10 ⁵
ELONGATION	D638	%	100-200	40	7.5	12	6
IMPACT STRENGTH — NOTCHED AT 20°C	D256	FT. LBS./IN. NOTCH	3.0	2.2	1.5	2.7	1.2
HARDNESS — DUROMETER ROCKWELL	D676 D785	D SCALE AS INDICATED	51 R15	57 —	— M97	— M49	— M106
FLEXURAL STRENGTH — 25°C	D790	PSI	3,700	2,800	19,000	34,900	31,200
COMPRESSIVE STRENGTH — 25°C AT 10% DEF.	D695	PSI	3,700	3,000	19,300	32,000	30,000
COMPRESSIVE CREEP 25°C, 2,000 PSI, 24 HRS. 260°C, 2,000 PSI, 24 HRS.	D621	%	16 30	— —	14 —	— —	— —
COEFFICIENT OF FRICTION DRY STATIC DRY DYNAMIC LUBRICATED			0.04-0.16 0.09-0.21 0.04-0.06	0.10-0.13 0.17-0.24 —	— — —	— — —	— 0.13-0.25 —
THERMAL							
CONTINUOUS SERVICE TEMPERATURE IN AIR (MAX.)		°C	260	260	280	245	245
COEFFICIENT OF LINEAR EXPANSION	D696	CM/CM/°C	13.5 X 10 ⁻⁵	7.6 X 10 ⁻⁵	5.4 X 10 ⁻⁵	3.6 X 10 ⁻⁵	2.7-10 ⁻⁵
THERMAL CONDUCTIVITY	C177	CAL/SEC/CM ² /°C/CM	2.1 X 10 ⁻⁴	3.9 X 10 ⁻⁴	8.28 X 10 ⁻⁴	6.1 X 10 ⁻⁴	1.3 X 10 ⁻³
ELECTRICAL							
DIELECTRIC STRENGTH TEST SAMPLE 0.010" TEST SAMPLE 0.080"	D149	VOLTS/MIL VOLTS/MIL	1,100-1,300 400-500	— —	— 560	600 —	— —
DIELECTRIC CONSTANT 60-10 ¹⁰ CYCLES	D150	2.0	—	2.5	3.55	3.9	5.4
VOLUME RESISTIVITY	D257	OHM-CM	>10 ¹⁸	10 ¹⁵	10 ¹⁴ -10 ¹⁵	3 X 10 ¹⁷	—
DISSIPATION POWER FACTOR 10 ³ -10 ¹⁰ CYCLES	D150		0.0003	—	0.0036	—	—
ARC RESISTANCE	D495	SEC.	NO TRACKING	—	—	—	—
PHYSICAL							
SPECIFIC GRAVITY	0792	GM/CM ³	2.18	2.24	1.43	1.40	1.45
WATER ABSORPTION 24 HRS.	D570	%	<0.01	0.013	0.24	0.33	0.28

Note: Although the information contained here has been obtained from sources believed to be reliable, no warranty (expressed or implied) can be made as to its accuracy. Where no value is listed, sufficient details are not available to present a usable figure. Property data shown are typical average values and will vary on specific production lots and by size and configuration of product. They should be used only as a guide to primary selection for application of a given material and not serve as a substitute for careful testing of prototype parts in typical operating environments. Final determination of the suitability of any material for a specific application is the sole responsibility of the user.

PROPERTIES OF CAST ACRYLIC, ACRYLITE FF, ABS, STYRENE, VIVAK®, POLYCARBONATE

PROPERTY	TEST METHOD ASTM	UNITS	CAST ACRYLIC	ACRYLITE FF®	ABS	STYRENE	VIVAK®	POLYCARBONATE
MECHANICAL								
TENSILE STRENGTH	D638	PSI	10,500	10,000	4,500	3,500	6,990	9,500
MODULUS OF ELASTICITY	D638	PSI	4.5 X 10 ⁵	4.8 X 10 ⁵	2.9x10 ⁵	2.39x10 ⁵	3 X 10 ⁵	3.45 X 10 ⁵
ELONGATION (ULTIMATE)	D638	%	3.0-5.0	4.5	—	—	75	110
IMPACT STRENGTH — NOTCHED	D256	FT. LBS./IN. NOTCH	0.3-0.4	0.4	5.0	2.0	1.7	12-16
HARDNESS — ROCKWELL	D785		R125	M93	R105	R95	R105	R118
FLEXURAL STRENGTH	D790	PSI	15,000-16,000	17,000	3.1x10 ⁵	6,900	11,240	13,500
FLEXURAL MODULUS	D790	PSI	4.5 X 10 ⁵	4.8 X 10 ⁵	8,000	2.77x10 ⁵	3 X 10 ⁵	3.4 X 10 ⁵
COMPRESSIVE STRENGTH	D695	PSI	18,000	17,000	—	14,500	—	12,500
SHEAR STRENGTH	D732	PSI	9,000	—	—	—	—	10,000
THERMAL								
CONTINUOUS SERVICE TEMPERATURE IN AIR (MAX.)		°C	85	71	60	65	60	122
HEAT DEFLECTION TEMPERATURE 66 PSI 264 PSI	D648	°C	110 100	— 91	— 102	— 95	71 63	138 133
COEFFICIENT OF LINEAR EXPANSION	D696	CM/CM/°C	6.1 X 10 ⁻⁵	6.4 X 10 ⁻⁵	9.5x10 ⁻⁵	7.2x10 ⁻⁵	5.45 X 10 ⁻⁵	6.75 X 10 ⁻⁵
THERMAL CONDUCTIVITY		CAL/SEC/CM ² /°C/CM	4.8 X 10 ⁻⁴	—	—	—	—	4.6 X 10 ⁻⁴
SPECIFIC HEAT		CAL/GM/°C	0.35	0.35	—	—	—	0.30
ELECTRICAL								
DIELECTRIC STRENGTH	D149	VOLTS/MIL	500	430	—	460	400	380
DIELECTRIC CONSTANT 60 CYCLES 10 ¹⁵ CYCLES	D150		4.0 3.0	3.6 2.8	— —	2.5 —	3.2 —	3.17 2.96
VOLUME RESISTIVITY	D257	OHM/CM	>10 ¹⁵	10 ¹⁶	10 ¹⁵	>10 ¹⁶	6 X 10 ¹⁵	2.1 X 10 ¹⁶
ARC RESISTANCE	D495	SEC	NO TRACKING	—	—	—	—	10-11
PHYSICAL								
SPECIFIC GRAVITY	D792	GM/CM ³	1.18-1.19	1.19	1.05	1.04	1.27	1.25
LIGHT TRANSMITTANCE PARALLEL TOTAL HAZE	D1003	%	91 92 1	— 92 —	— — —	— — —	— 90 —	86-87 88-89 1-2
REFRACTIVE INDEX	D542		1.49	1.49	—	—	—	1.62
WATER ABSORPTION (24 HRS. AT 22°C)	D570	%	0.3	0.2	0.3	0.3	0.5	0.15

Note: Although the information contained here has been obtained from sources believed to be reliable, no warranty (expressed or implied) can be made as to its accuracy. Where no value is listed, sufficient details are not available to present a usable figure. Property data shown are typical average values and will vary on specific production lots and by size and configuration of product. They should be used only as a guide to primary selection for application of a given material and not serve as a substitute for careful testing of prototype parts in typical operating environments. Final determination of the suitability of any material for a specific application is the sole responsibility of the user.

PROPERTIES OF PVDF, ULTEM, PPS, PEEK, NORYL & POLYSULFONE

	PROPERTY	TEST METHOD ASTM	UNITS	PVDF POLY- VINYLIDENE FLUORIDE	ULTEM POLY- ETHERIMIDE	PPS POLY- PHENYLENE SULFIDE	PEEK POLY- ETHERETHER- KETONE	NORYL POLY- PHENYLENE OXIDE	POLYSULFONE	
MECHANICAL	1	SPECIFIC GRAVITY, 23°C	D792	—	1.77	1.27	1.35	1.32	1.10	1.24
	2	TENSILE STRENGTH, 23°C	D638	PSI	7,200	16,000	13,500	16,000	9600	10,200
	3	TENSILE MODULUS OF ELASTICITY, 23°C	D638	PSI	170,000	475,000	500,000	600,000	380,000	360,000
	4	ELONGATION, 23°C	D638	%	15	75	15	20	55	30
	5	FLEXURAL STRENGTH, 23°C	D790	PSI	—	22,000	21,000	25,000	13,200	15,000
	6	FLEXURAL MODULUS OF ELASTICITY, 23°C	D790	PSI	200,000	500,000	575,000	600,000	325,000	400,000
	7	SHEAR STRENGTH, 23°C	D732	PSI	—	15,000	9,000	8,000	—	9,000
	8	COMPRESSIVE STRENGTH, 10% DEFORMATION, 23°C	D695	PSI	8,700	22,000	21,500	17,000	16,000	13,000
	9	COMPRESSIVE MODULUS OF ELASTICITY, 23°C	D695	PSI	—	480,000	430,000	600,000	—	375,000
	10	COEFFICIENT OF FRICTION (DRY vs. STEEL) DYNAMIC	—	—	—	0.25	0.4	0.4	0.39	0.37
	11	HARDNESS, ROCKWELL, SCALE AS NOTED, 23°C	D785	—	—	M85 (R125)	M95 (R125)	M99 (R125)	R117	M70 (R120)
	12	HARDNESS, DUROMETER, SHORE "D" SCALE, 23°C	D2240	—	—	D86	D85	D85	—	D80
	13	TENSILE IMPACT, 23°C	D1822	ft.lb./in. ²	—	80	55	40	—	150
	14	IZOD IMPACT, 23°C	Type "S" D256 Type "A"	ft.lb./in. of notch	3.8	0.5	0.6	1.0	5.0	1.3
THERMAL	15	COEFFICIENT OF LINEAR THERMAL EXPANSION	E-831 (TMA)	in./in./°C	11X10 ⁻¹¹	3.1 X 10 ⁻⁵	2.8 X 10 ⁻⁵	2.6 X 10 ⁻⁵	7.2 X 10 ⁻⁵	3.1 X 10 ⁻⁵
	16	DEFLECTION TEMPERATURE 264 psi	D648	°C	85	200	121	160	88	171
	17	Tg-GLASS TRANSITION (AMORPHOUS)	—	°C	—	215	—	—	—	90
	18	MELTING POINT (CRYSTALLINE) PEAK	D3418	°C	170	—	282	340	—	—
	19	CONTINUOUS SERVICE TEMPERATURE IN AIR (MAX.)	—	°C	149	160	218	249	104	149
ELECTRICAL	20	DIELECTRIC STRENGTH, SHORT TIME	D149 (2)	Volts/mil	260	830	540	480	500	425
	21	VOLUME RESISTIVITY	D257	ohm-cm	—	6.7 x 10 ¹⁷	4.5 x 10 ¹⁶	4.9 x 10 ¹⁶	—	5.0 x 10 ¹⁶
	22	DIELECTRIC CONSTANT, 60Hz	D150 (2)	—	10.0	3.15	3.0	3.30	2.69	3.14
	23	DISSIPATION FACTOR, 60Hz	D150 (2)	—	0.018	0.0013	0.0013	0.003	—	0.0008
FLAMMA-BILITY	24	UL-94 @ 3.1 mm (1/8 in.) ESTIMATED RATING BASED ON AVAILABLE DATA	UL - 94		V-0	V-0	V-0	V-0	V-1	HB
CHEMICAL	25	WATER ABSORPTION IMMERSION, 24 HOURS	D570 (1)	% by wt.	0.05	0.25	0.01	0.1	0.07	0.3
	26	WATER ABSORPTION IMMERSION, SATURATION	D570 (1)	% by wt.	—	1.25	0.03	0.50	0.20	0.6

- (1) Specimens 1/8" thick x 2" dia. or square.
(2) Values apply to natural product only.

Note: Although the information contained here has been obtained from sources believed to be reliable, no warranty (expressed or implied) can be made as to its accuracy. Where no value is listed, sufficient details are not available to present a usable figure. Property data shown are typical average values and will vary on specific production lots and by size and configuration of product. They should be used only as a guide to primary selection for application of a given material and not serve as a substitute for careful testing of prototype parts in typical operating environments. Final determination of the suitability of any material for a specific application is the sole responsibility of the user.

RANKED PROPERTIES

CONTINUOUS USE TEMPERATURE

MATERIALS	°C
POLYVINYL CHLORIDE (PVC)	60
POLYETHYLENE TETRAPHTHALITE GYLCOL (PETG)	60
POLYETHYLENE (LDPE)	70
ACRYLITE FF	71
CYROLITE HP	71
POLYETHYLENE (HDPE)	80
POLYETHYLENE (UHMW)	80
POLYPROPYLENE	80
CHLORINATED POLYVINYL CHLORIDE (CPVC)	82
ACETAL	82
DELRIN AF	82
CAST ACRYLIC	85
CAST NYLON	93
ERTALYTE (PET)	100
NYLON 6/6	104
LAMINATE CE	120
LAMINATE LE	120
POLYCARBONATE	122
LAMINATE XX	140
PVDF	140
POLYSULFONE	148
LAMINATE G10	150
ULTEM POLYETHERIMIDE	170
POLYPHENYLENE SULPHIDE (PPS)	218
LAMINATE G-7	220
TORLON (POLYAMIDE-IMIDE)	245
POLYETHERETHERKETONE (PEEK)	249
PTFE	260
POLYIMIDE	280

DENSITY

MATERIALS	G/CC
POLYPROPYLENE	0.903
POLYETHYLENE (LLDPE)	0.918
POLYETHYLENE (LDPE)	0.925
POLYETHYLENE (UHMW)	0.930
POLYETHYLENE (HDPE)	0.954
ACRYLONITRILE-BUTADIENE-STYRENE (ABS)	1.025
POLYSTYRENE	1.050
STYRENE-ACRYLONITRILE	1.080
POLYPHENYLENE OXIDE (PPO)	1.080
NYLON 6	1.130
NYLON 6/6	1.140
POLYMETHYL METHACRYLATE (ACRYLIC)	1.180
CELLULOSE BUTYRATE	1.180
POLYURETHANE (THERMOPLASTIC)	1.200
POLYCARBONATE	1.200
POLYSULFONE	1.240
EPOXY CAST	1.250
POLYURETHANE (THERMOSET)	1.270
POLYETHER-IMIDE	1.270
CELLULOSE ACETATE	1.280
POLYETHERETHERKETONE	1.320
THERMOPLASTIC POLYESTER (PET)	1.400
POLYAMIDE IMIDE	1.400
PHENOLICS	1.400
ACETAL, COPOLYMER	1.410
ACETAL, HOMOPOLYMER	1.420
POLYVINYL CHLORIDE, FLEXIBLE	1.440
POLYVINYL CHLORIDE, RIGID	1.450
POLYPHENYLENE SULFIDE	1.570
FLUOROCARBON POLYMERS (ETFE)	1.700
POLYVINYLIDINE CHLORIDE (SARAN)	1.700
FLUOROCARBON POLYMERS (PVDF)	1.770
FLUOROCARBON POLYMERS (PCTFE)	2.130
FLUOROCARBON POLYMERS (PFA)	2.130
FLUOROCARBON POLYMERS (FEP)	2.150
FLUOROCARBON POLYMERS (PTFE)	2.200

TENSILE STRENGTH

MATERIALS	PSI
POLYETHYLENE (LDPE)	2,000
ETHYLENE VINYL ACETATE	2,500
POLYVINYL CHLORIDE (FLEXIBLE)	2,500
POLYETHYLENE (LLDPE)	2,500
FLUOROCARBON POLYMERS (PTFE)	3,000
FLUOROCARBON POLYMERS (FEP)	3,000
POLYETHYLENE (HDPE)	3,500
POLYSTYRENE	4,000
POLYETHYLENE (UHMW)	4,500
CELLULOSE BUTYRATE	4,500
FLUOROCARBON POLYMERS (PFA)	4,500
POLYVINYLIDINE CHLORIDE (SARAN)	5,000
POLYPROPYLENE	5,000
ACRYLONITRILE-BUTADIENE-STYRENE (ABS)	5,500
CELLULOSE ACETATE	5,800
FLUOROCARBON POLYMERS (PVDF)	6,700
POLYVINYL CHLORIDE (RIGID)	6,800
PHENOLICS	7,000
POLYPHENYLENE OXIDE (PPO)	7,000
FLUOROCARBON POLYMERS (ETFE)	7,000
EPOXY CAST	8,500
ACETAL COPOLYMER	8,800
POLYCARBONATE	9,000
POLYMETHYL METHACRYLATE (ACRYLIC)	9,000
STYRENE-ACRYLONITRILE	10,000
ACETAL HOMOPOLYMER	10,000
POLYSULFONE	10,000
NYLON 6	11,600
POLYETHERSULFONE	12,200
POLYPHENYLENE SULFIDE	12,500
NYLON 6/6	13,000
POLYURETHANE (THERMOSET)	13,000
POLYETHERETHERKETONE	13,300
POLYETHERIMIDE	15,200
THERMOPLASTIC POLYESTER (PET)	18,000
POLYAMIDE-IMIDE	27,000

TENSILE MODULUS

MATERIALS	PSI
POLYURETHANE (THERMOPLASTIC)	900
POLYVINYL CHLORIDE (FLEXIBLE)	1,000
POLYETHYLENE (LLDPE)	24,000
POLYETHYLENE (LDPE)	32,500
FLUOROCARBON POLYMERS (PTFE)	60,000
POLYURETHANE THERMOSET	60,000
POLYVINYLIDINE CHLORIDE (SARAN)	75,000
FLUOROCARBON POLYMERS (PFA)	80,000
FLUOROCARBON POLYMERS (FEP)	80,000
FLUOROCARBON POLYMERS (ETFE)	120,000
CELLULOSE BUTYRATE	125,000
POLYPROPYLENE	200,000
FLUOROCARBON POLYMERS (PCTFE)	207,000
FLUOROCARBON POLYMERS (PVDF)	230,000
ACRYLONITRILE-BUTADIENE-STYRENE (ABS)	280,000
POLYSTYRENE	310,000
POLYCARBONATE	345,000
POLYPHENYLENE OXIDE (PPO)	360,000
POLYSULFONE	360,000
POLYMETHYL METHACRYLATE (ACRYLIC)	398,000
ACETAL COPOLYMER	410,000
NYLON 6	430,000
POLYETHERIMIDE	430,000
ACETAL HOMOPOLYMER	450,000
THERMOPLASTIC POLYESTER (PET)	450,000
POLYPHENYLENE SULFIDE	480,000
NYLON 6/6	493,000
POLYETHERETHERKETONE	520,000
STYRENE-ACRYLONITRILE	520,000
POLYAMIDE-IMIDE	650,000
PHENOLICS	1,200,000

RANKED PROPERTIES

ENGLONGATION TO FAILURE

POLYSTYRENE	2
POLYPHENYLENE SULFIDE	2
ACRYLONITRILE-BUTADIENE-STYRENE (ABS)	3
STYRENE-ACRYLONITRILE	3
POLYAMIDE-IMIDE	3
FLUOROCARBON POLYMERS (PCTFE)	5
THERMOPLASTIC POLYESTER (PET)	7
POLYETHERIMIDE	8
FLUOROCARBON POLYMERS (PVDF)	15
NYLON 6/6	20
POLYVINYLIDINE CHLORIDE (SARAN)	25
FLUOROCARBON POLYMERS (PFA)	30
FLUOROCARBON POLYMERS (FEP)	35
CELLULOSE ACETATE	38
FLUOROCARBON POLYMERS (PTFE)	40
POLYETHERETHERKETONE	50
ACETAL HOMOPOLYMER	50
POLYVINYL CHLORIDE (RIGID)	60
ACETAL COPOLYMER	60
POLYETHERSULFONE	60
CELLULOSE BUTYRATE	64
NYLON 6	75
POLYSULFONE	75
POLYCARBONATE	110
POLYVINYL CHLORIDE (FLEXIBLE)	300
POLYETHYLENE (UHMW)	300
POLYPROPYLENE	400
POLYETHYLENE (LDPE)	400
POLYETHYLENE (HDPE)	600
POLYETHYLENE (LLDPE)	700
ETHYLENE VINYL ACETATE	800
POLYURETHANE (THERMOPLASTIC)	800
POLYURETHANE (THERMOSET)	1000

DIELECTRIC STRENGTH

MATERIALS	V/MIL
PHENOLICS	230
POLYURETHANE, THERMOSET	230
POLYCARBONATE	380
POLYETHERSULFONE	400
POLYVINYL CHLORIDE (FLEXIBLE)	400
STYRENE-ACRYLONITRILE	400
POLYSULFONE	420
POLYETHERETHERKETONE	480
POLYSTYRENE	500
ACETAL HOMOPOLYMER	500
ACETAL COPOLYMER	500
POLYETHYLENE (UHMW)	500
POLYAMIDE-IMIDE	500
POLYMETHYL METHACRYLATE (ACRYLIC)	500
NYLON 6	500
NYLON 6/6	600
POLYETHYLENE (HDPE)	600
POLYPHENYLENE SULFIDE	600
ACRYLONITRILE-BUTADIENE-STYRENE (ABS)	600
POLYPHENYLENE OXIDE (PPO)	640
FLUOROCARBON POLYMERS (PTFE)	640
THERMOPLASTIC POLYESTER (PET)	650
POLYPROPYLENE	700
POLYETHERIMIDE	830
FLUOROCARBON POLYMERS (FEP)	1300
FLUOROCARBON POLYMERS (PVDF)	1300
FLUOROCARBON POLYMERS (ETFE)	1500
FLUOROCARBON POLYMERS (PCTFE)	2600
FLUOROCARBON POLYMERS (PFA)	2600

NOTCHED IZOD IMPACT STRENGTH

MATERIALS	FT. LBS./IN. NOTCH
PHENOLICS	0.30
STYRENE-ACRYLONITRILE	0.35
POLYPHENYLENE SULFIDE	0.40
POLYMETHYL METHACRYLATE (ACRYLIC)	0.60
POLYVINYLIDINE CHLORIDE (SARAN)	0.70
POLYPROPYLENE	0.70
NYLON 6/6	0.70
NYLON 6	1.00
POLYETHERIMIDE	1.00
POLYSULFONE	1.30
ACETAL COPOLYMER	1.30
POLYETHERETHERKETONE	1.60
POLYETHYLENE (HDPE)	1.70
ACETAL HOMOPOLYMER	1.80
POLYCARBONATE	2.30
POLYSTYRENE	2.50
CELLULOSE BUTYRATE	2.90
POLYAMIDE-IMIDE	3.00
CELLULOSE ACETATE	3.50
FLUOROCARBON POLYMERS (PCTFE)	5.00
FLUOROCARBON POLYMERS (PVDF)	6.40
POLYPHENYLENE OXIDE (PPO)	7.00
ACRYLONITRILE-BUTADIENE-STYRENE (ABS)	8.30
POLYVINYL CHLORIDE (RIGID)TYPE II	12.00
POLYETHYLENE (UHMW)	30.00

CONVERSION CALCULATIONS

UNITS GIVEN IN	ENGLISH UNITS REQUIRED	METRIC UNITS REQUIRED	USAGE
FAHRENHEIT CENTIGRADE	(MET. X 1.8)+32 —	— (ENG.-32) X 0.5555	1.PROCESSING TEMP. 2.MELTING POINT 3.VICAT SOFT POINT 4.BRITTLE TEMP. 5.CONTINUOUS SERVICE 6.DEFLECTION TEMP.
LB./FT ³ G/CM ²	— MET. X 62.43	ENG. X 0.01602 —	1.DENSITY
LB/IN ² KG/CM ²	— MET. X 14.22	ENG. X 0.07030 —	1.TENSILE STRENGTH 2.TENSILE MODULUS 3.FLEXURAL STRENGTH 4.FLEXURAL MODULUS 5.COMPRESSIVE STRENGTH
FT. LB/IN KG. CM/CM	— MET. X 0.1838	ENG. X 5.440 —	1.IZOD NOTCHED
BTU IN/HR. FT ² °F CAL CM/SEC CM ² °C	— MET. X 2899	ENG. X 0.000345 —	1.THERMAL CONDUCTIVITY
IN/IN °F CM/CM °C	— MET. X 0.5555	ENG. X 1.80 —	1.LINEAR THERMAL EXPANSION
V/10 ⁻³ IN V/MM	— MET. X 0.02540	ENG. X 39.37 —	1.DIELECTRIC STRENGTH

ENG. = Given English Units
MET. = Given Metric Units

YIELD FACTORS

	TUBING OR TUBULAR BARS LBS./FT.	ROD LBS./FT.	SHEET LBS./SQ.FT. PER INCH THICKNESS
ABS	0.355 (O.D. ² — I.D. ²)	0.355 X D ²	5.40
ACETAL	0.485 (O.D. ² — I.D. ²)	0.485 X D ²	7.40
ACRYLIC	0.406 (O.D. ² — I.D. ²)	0.406 X D ²	6.20
CAB	0.406 (O.D. ² — I.D. ²)	0.406 X D ²	6.20
CPVC	0.519 (O.D. ² — I.D. ²)	0.519 X D ²	7.93
DELTRIN AF	0.526 (O.D. ² — I.D. ²)	0.526 X D ²	8.03
ERTALYTE — PET	0.467 (O.D. ² — I.D. ²)	0.467 X D ²	7.12
INDUSTRIAL LAMINATE CE	0.454 (O.D. ² — I.D. ²)	0.454 X D ²	6.94
INDUSTRIAL LAMINATE G-10	0.621 (O.D. ² — I.D. ²)	0.621 X D ²	9.49
NYLON 6	0.386 (O.D. ² — I.D. ²)	0.386 X D ²	5.88
NYLON 6/6	0.390 (O.D. ² — I.D. ²)	0.390 X D ²	5.93
NYLON 11	0.356 (O.D. ² — I.D. ²)	0.356 X D ²	5.45
POLYCARBONATE	0.410 (O.D. ² — I.D. ²)	0.410 X D ²	6.25
POLYETHYLENE — HIGH DENSITY	0.325 (O.D. ² — I.D. ²)	0.325 X D ²	4.96
POLYETHYLENE — LOW DENSITY	0.313 (O.D. ² — I.D. ²)	0.313 X D ²	4.77
POLYIMIDE	0.477 (O.D. ² — I.D. ²)	0.477 X D ²	7.28
POLYPROPYLENE	0.309 (O.D. ² — I.D. ²)	0.309 X D ²	4.70
POLYSTYRENE	0.365 (O.D. ² — I.D. ²)	0.365 X D ²	5.55
PVC FLEXIBLE	0.413 (O.D. ² — I.D. ²)	0.413 X D ²	6.30
PVC RIGID	0.503 (O.D. ² — I.D. ²)	0.503 X D ²	7.65
PTFE — VIRGIN	0.742 (O.D. ² — I.D. ²)	0.742 X D ²	11.25
PTFE — 25% GLASS FILLED	0.762 (O.D. ² — I.D. ²)	0.762 X D ²	11.65
UHMW POLYETHYLENE	0.321 (O.D. ² — I.D. ²)	0.321 X D ²	4.90

- All values are approximate.
- O.D. = Outside Diameter of Tubing in inches.
- I.D. = Inside Diameter of Tubing in inches.
- D = Diameter of Rod in inches.

THIN-WALLED AND THICK-WALLED CYLINDERS UNDER PRESSURE

In calculating the internal pressures that tubes or cylinders can withstand the following two formulas are used:

$$\text{Formula 1} \quad t = \frac{PD}{2S} \qquad \text{Formula 2} \quad P = \frac{S(1-R^2)}{1+R^2}$$

Formula 1 is used when the ratio of inner radius to outer radius is greater than 0.9 and formula 2 when the ratio is under 0.9.

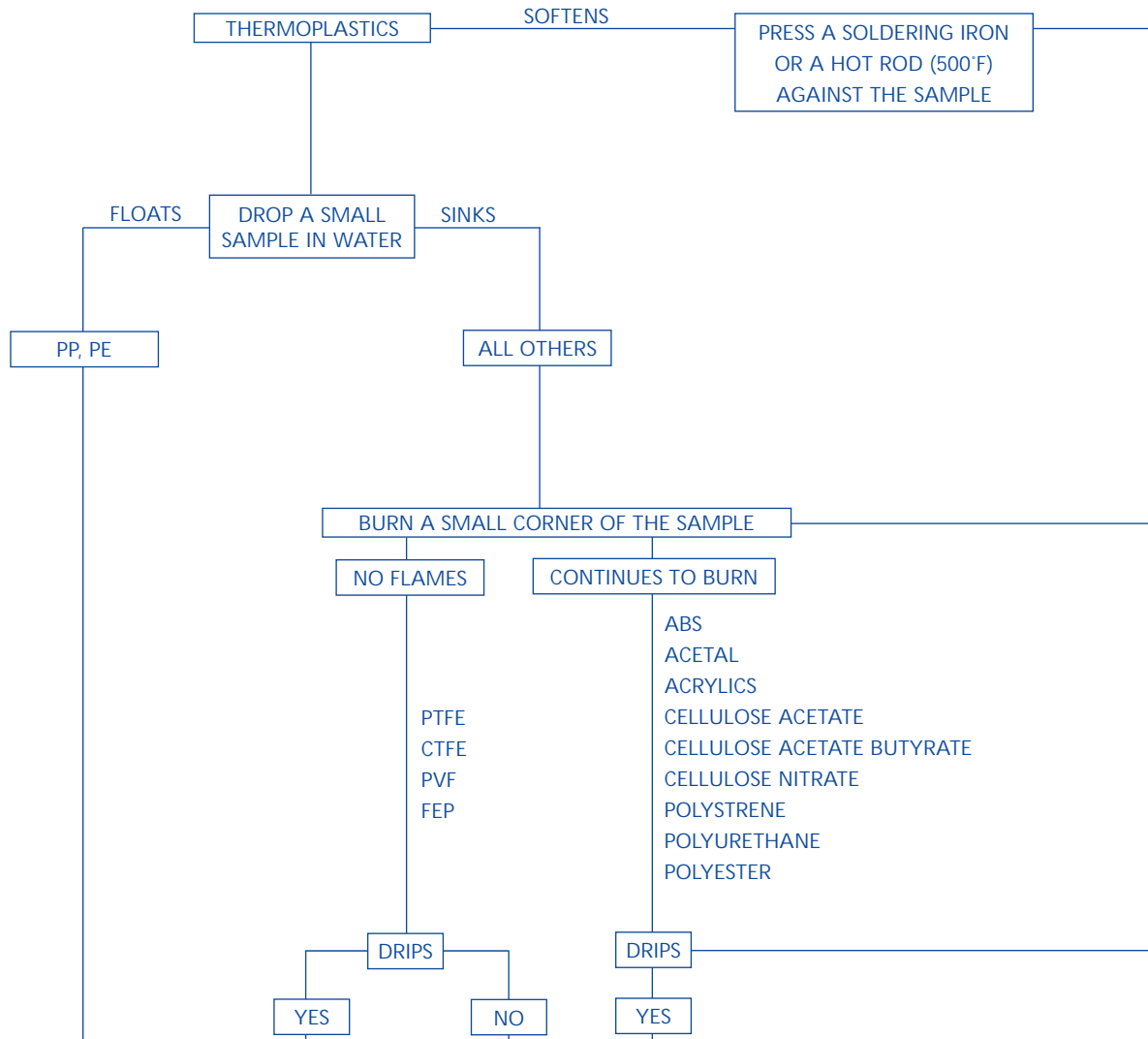
In the above formulas:

- P = internal pressure in the tube or cylinder, psi
- t = wall thickness of the tube in inches
- R = ratio of inner radius to outer radius
- S = working stress in psi of the material out of which the tubing or cylinder is made
- D = inside diameter of tubing in inches

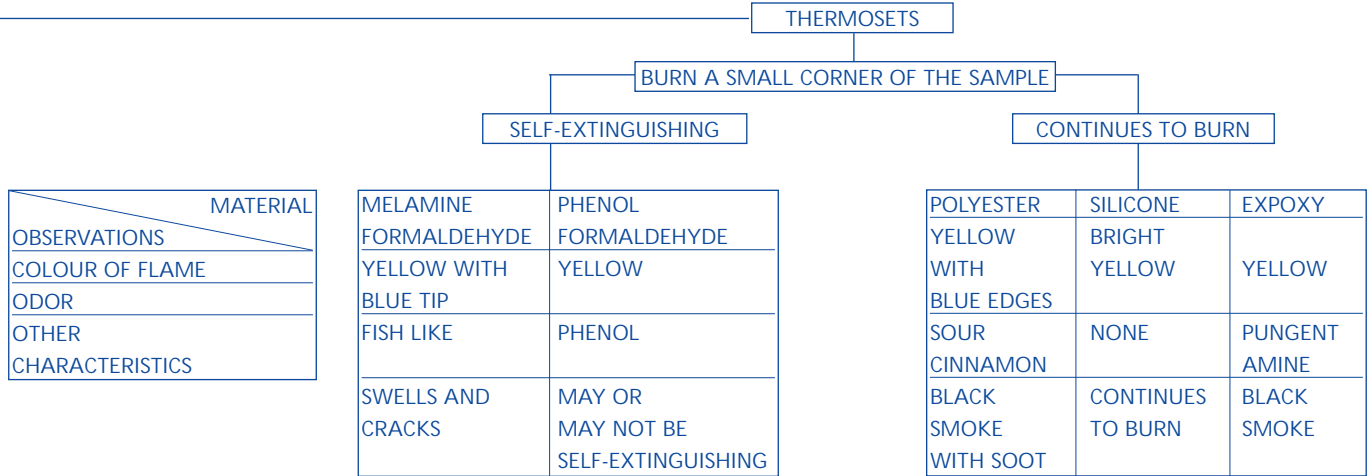
In applying the above formulas it is very important to remember that the working stress is the yield point of the material divided by a number known as the safety factor. A factor between 4 and 10 is considered good design practice. It is equally important to be aware of the fact that the working stress of plastics materials decreases significantly at high temperatures and this must be taken into account when using the above formulas. Another important consideration is that plastics under stress over a long period of time will flow and consequently the safety factors would have to be higher if the tubing is used on a continuous basis.

PLASTICS IDENTIFICATION CHART

PLASTICS MATERIALS



MATERIAL	PE	PP	FEP	CTFE	PTFE	PVF	ABS	ACETAL	ACRYLIC
OBSERVATIONS									
COLOUR OF FLAME	BLUE WITH YELLOW TIP	BLUE WITH YELLOW TIP	—	—	—	—	BLUE WITH YELLOW EDGES	BLUE	BLUE WITH YELLOW TIP
ODOR	PARAFFIN	ACRID OR DIESEL FUMES	BURNT HAIR	ACETIC ACID	BURNT HAIR	ACIDIC	ACRID	FORMALDEHYDE	FRUITY
SPEED OF BURNING SLOW < 3 INCHES FAST > 3 PER MIN.	FAST	SLOW	—	—	—	—	SLOW	SLOW	SLOW
OTHER CHARACTERISTICS	MELTS & DRIPS	—	—	—	—	—	BLACK SMOKE WITH SOOT	NO SMOKE	FLAME MAY SPURT IF RUBBER MODIFIED



	MATERIAL
OBSERVATIONS	
COLOUR OF FLAME	
ODOR	
OTHER CHARACTERISTICS	

SELF-EXTINGUISHING

- NYLON
- POLYCARBONATE
- PPO
- POLYSULFONE
- PVC

DRIPS

NO

YES

NO

CELLULOSE ACETATE	CELLULOSE ACETATE BUTYRATE	POLYSTYRENE	POLYESTER	CELLULOSE NITRATE	POLY- URETHANE	NYLON	POLY- SULFONE	POLY- CARBONATE	PPO	PVC
YELLOW WITH SPARKS	YELLOW WITH BLUE TIP	YELLOW	YELLOW WITH BLUE EDGES	PALE YELLOW	YELLOW	BLUE WITH YELLOW TIP	ORANGE	ORANGE OR YELLOW	YELLOWISH ORANGE	YELLOW WITH GREEN EDGES
VINEGAR	RANCID BUTTER	ILLUMINATING GAS OR MARIGOLD	BURNING RUBBER	CAMPHOR	FAINT APPLE	BURNT WOOL OR HAIR	ODOR OF SULPHUR	PHENOL	PHENOL	HYDRO- CHLORIC ACID
SLOW	SLOW	FAST	FAST	FAST	FAST	SLOW	FAST	SLOW	SLOW	SLOW
BLACK SMOKE WITH SOOT	SOME SMOKE WITH SOOT	DENSE SMOKE WITH SOOT	BLACK SMOKE WITH SOOT	SAMPLE BURNS COMPLETELY	SLIGHT BLACK SMOKE	FROTHS	BLACK SMOKE WITH SOOT	BLACK SMOKE WITH SOOT	DIFFICULT TO IGNITE SMOKE	WHITE SMOKE

CHEMICAL & ENVIRONMENTAL RESISTANCE

GENERAL CONSIDERATIONS

The collection and tabulation of chemical resistance data is difficult because of the diversity of reagents to which resin suppliers choose to expose their materials. Conditions of concentration, temperature, stress, and time are not standardized. The reporting methods found in the various sources vary from a descriptive word or two about the specific reagent's effect, all the way to a reported value of volume swell, weight pickup, or change in a mechanical property.

In the table shown on the following pages, a selection of the more common agents has been used to present the comparative information. The descriptive words — poor, fair, good, and excellent — have been used to give a generalized assessment of suppliers' information and other technical sources. An effort has been made to use the same guidelines in establishing the comparative rating; however, because of the variation in reporting methods, undoubtedly some inconsistencies will appear.

The comparative information presented in the table takes into consideration the environmental and stress cracking tendencies of the polymeric material.

The one frequent shortcoming of plastic materials that has caused more grief with consumers, as well as fabricators, is the phenomenon of cracking due to environment and/or stress. It has been a significant deterrent to increased acceptance of plastic materials in industry and the consumer marketplace. However, proper selection of polymer grades and processing conditions can accomplish a great deal in avoiding such cracking and extending the service life.

The actual mechanism of cracking is not completely understood, but failure in the main polymer chain is obvious. This failure is brought on by intrinsic or included stress, or a combination of both in the resin matrix. On a molecular scale, the mechanical failure of one chemical bond in a stressed area, in effect, creates a crack and the tip of that crack consists of more bonds that are subject to a concentrated strain which they cannot survive — and the failure propagates.

The resistance of a given polymer to such cracking is dependent upon all of the cohesive forces operating in the tangled mass of molecules, including the formal chemical bonds, as well as dipole interactions, hydrogen bonding, crystalline forces and van der Waals forces. Certainly a number of these cohesive forces are reduced by the invasion of foreign non-polymeric molecules. Solvents, by definition, have a specific ability to weaken these cohesive forces.

Sunlight also can be destructive because of its ability to cleave mainchain bonds. A number of UV stabilizers have been developed which help, but several polymers are more effectively protected by the intimate addition of 2% to 3% carbon black.

Chemical or solvent degradation of a plastic may be a combination of destructive modes — and may be evidenced by discolouration, swelling, cracking or crazing, wrapping, dissolving, etching, embrittlement, or simply a loss of mechanical properties.

INTERPRETATION OF COMPARATIVE RATINGS

Poor	The use of the plastic in the presence of the indicated agent is not recommended. The effect varies from a catastrophic failure (such as dissolution) to a severe degradation (such as cracking) which results in a sufficient loss of integrity that the plastic is unacceptable for even a short time.
Fair	The use of the plastic is marginal in these environments and may be considered for short exposures at lower temperatures and in situations where appreciable loss of mechanical properties is not critical.
Good	The use of the plastic is quite acceptable in ordinary exposure to the particular reagent. Long term exposures may result in some minor loss of properties, but exposures at elevated temperatures may result in significant property losses.
Excellent	The use of the plastic is unaffected by the reagent and compares similarly to unexposed material in its acceptable performance with regard to time, temperature, and stress.

* Used with permission of International Plastics Selector.

CHEMICAL & ENVIRONMENTAL RESISTANCE

GENERIC TYPE	ALIPHATIC HYDRO-CARBONS	AROMATIC HYDRO-CARBONS	OILS, FATS WAXES	FULLY HALOGENATED HYDROCARBONS	PARTLY HALOGENATED HYDROCARBONS	ALCOHOLS MONOHYDRIC	ALCOHOLS POLYHYDRIC	PHENOLS	KETONES	ESTERS
ABS	FAIR	POOR	GOOD	POOR	POOR	FAIR	GOOD	POOR	POOR	POOR
ACRYLIC	GOOD	POOR	GOOD	POOR	POOR	POOR	GOOD	POOR	POOR	POOR
CTFE	EXC.	EXC.	EXC.	FAIR	GOOD	EXC.	EXC.	GOOD	EXC.	EXC.
EPOXY	EXC.	GOOD	EXC.	EXC.	GOOD	EXC.	EXC.	FAIR	FAIR	GOOD
FEP	EXC.	EXC.	EXC.	EXC.	GOOD	EXC.	EXC.	EXC.	EXC.	EXC.
PERFLUORO-ALKOXY (PFA)	EXC.	EXC.	EXC.	EXC.	GOOD	EXC.	EXC.	EXC.	EXC.	EXC.
PHENOLIC	EXC.	EXC.	EXC.	EXC.	EXC.	GOOD	EXC.	EXC.	GOOD	GOOD
POLYACETAL	GOOD	GOOD	GOOD	GOOD	FAIR	GOOD	GOOD	POOR	GOOD	GOOD
POLYAMIDE (NYLON)	GOOD	FAIR	GOOD	FAIR	POOR	GOOD	GOOD	POOR	GOOD	FAIR
POLYCARBONATE	POOR	POOR	POOR	GOOD	POOR	GOOD	GOOD	POOR	POOR	POOR
POLYESTER	GOOD	POOR	—	POOR	POOR	GOOD	EXC.	POOR	POOR	POOR
POLYETHYLENE	FAIR	FAIR	EXC.	POOR	POOR	FAIR	GOOD	EXC.	GOOD	GOOD
POLYIMIDE	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	GOOD	EXC.	EXC.
POLYPHENYLENE SULFIDE	EXC.	GOOD	—	FAIR	POOR	EXC.	EXC.	GOOD	GOOD	EXC.
POLYPROPYLENE	FAIR	FAIR	GOOD	POOR	POOR	GOOD	EXC.	GOOD	GOOD	GOOD
POLYSTYRENE	FAIR	POOR	POOR	POOR	POOR	GOOD	GOOD	POOR	POOR	POOR
POLYSULFONE	POOR	POOR	FAIR	POOR	POOR	POOR	GOOD	POOR	POOR	POOR
POLYURETHANE	FAIR	POOR	GOOD	POOR	POOR	POOR	FAIR	POOR	POOR	POOR
POLYVINYL-CHLORIDE	GOOD	POOR	GOOD	POOR	POOR	GOOD	GOOD	POOR	POOR	POOR
POLYVINYLIDENE FLUORIDE	EXC.	GOOD	EXC.	GOOD	FAIR	EXC.	EXC.	FAIR	FAIR	FAIR
SILICONE	FAIR	FAIR	EXC.	POOR	POOR	GOOD	EXC.	POOR	GOOD	FAIR
TFE	EXC.	EXC.	EXC.	EXC.	GOOD	EXC.	EXC.	EXC.	EXC.	EXC.

GENERIC TYPE	INORGANIC ACIDS		BASES		SALTS			ORGANIC ACIDS		OXIDIZING ACIDS		SUNLIGHT & WEATHERING
	CONC.	DILUTE	CONC.	DILUTE	ACID	NEUTRAL	BASIC	CONC.	DILUTE	CONC.	DILUTE	
ABS	GOOD	GOOD	GOOD	GOOD	GOOD	EXC.	GOOD	POOR	FAIR	POOR	GOOD	FAIR
ACRYLIC	POOR	GOOD	FAIR	GOOD	GOOD	GOOD	GOOD	POOR	FAIR	POOR	FAIR	GOOD
CTFE	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.
EPOXY	FAIR	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	FAIR	GOOD	POOR	FAIR	GOOD
FEP	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	GOOD	EXC.	EXC.	EXC.	EXC.
PERFLUORO-ALKOXY (PFA)	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.
PHENOLIC	FAIR	FAIR	POOR	POOR	EXC.	EXC.	FAIR	GOOD	FAIR	POOR	POOR	GOOD
POLYACETAL	POOR	POOR	POOR	POOR	FAIR	GOOD	GOOD	POOR	FAIR	POOR	POOR	FAIR
POLYAMIDE (NYLON)	POOR	GOOD	GOOD	EXC.	POOR	GOOD	FAIR	POOR	FAIR	POOR	POOR	FAIR
POLYCARBONATE	FAIR	GOOD	POOR	POOR	GOOD	EXC.	FAIR	FAIR	FAIR	POOR	GOOD	GOOD
POLYESTER	GOOD	GOOD	POOR	POOR	GOOD	GOOD	POOR	POOR	GOOD	POOR	FAIR	GOOD
POLYETHYLENE	GOOD	EXC.	GOOD	GOOD	EXC.	EXC.	EXC.	EXC.	EXC.	POOR	GOOD	POOR
POLYIMIDE	FAIR	GOOD	POOR	FAIR	GOOD	GOOD	POOR	GOOD	EXC.	POOR	GOOD	EXC.
POLYPHENYLENE SULFIDE	GOOD	GOOD	GOOD	EXC.	GOOD	GOOD	GOOD	GOOD	GOOD	POOR	FAIR	GOOD
POLYPROPYLENE	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	GOOD	EXC.	POOR	GOOD	POOR
POLYSTYRENE	FAIR	GOOD	FAIR	EXC.	GOOD	EXC.	GOOD	POOR	FAIR	POOR	FAIR	FAIR
POLYSULFONE	GOOD	GOOD	GOOD	EXC.	GOOD	EXC.	GOOD	FAIR	GOOD	POOR	GOOD	GOOD
POLYURETHANE	POOR	FAIR	GOOD	GOOD	GOOD	EXC.	EXC.	POOR	FAIR	POOR	POOR	FAIR
POLYVINYL-CHLORIDE	GOOD	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	POOR	GOOD	GOOD	EXC.	GOOD
POLYVINYLIDENE FLUORIDE	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	GOOD	EXC.	GOOD	EXC.	EXC.
SILICONE	POOR	GOOD	GOOD	EXC.	EXC.	EXC.	EXC.	FAIR	GOOD	POOR	EXC.	EXC.
TFE	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	EXC.	GOOD	EXC.	EXC.	EXC.	EXC.

CHEMICAL RESISTANCE

AGENT (INCLUDING CONCENTRATION, °C)	NYLON*	ACETAL	POLYETHYLENES			POLY- PRO- PYLENE	PVC	CPVC	PTFE	ACRYLIC	POLY- CARBO- NATE	
			LOW DENSITY	HIGH DENSITY	UHMW							
ACETALDEHYDE	40% 20°	—	—	—	L	—	U	U	S	—	—	
	100% 20°	L	L	L	L	L	U	U	S	U	—	
	100% 60°	L	L	U	U	U	U	U	S	U	—	
ACETIC ACID	10%	20°	S	S	S	S	S	S	S	S	S	
		60°	L	U	S	S	S	S	L	S	S	
	20%	20°	L	U	S	S	—	S	S	S	—	L
		60°	U	U	L	L	—	L	S	L	S	—
	50%	20°	U	U	L	S	S	S	S	S	S	—
		60°	U	U	L	L	S	L	S	U	S	—
80-100%	20°	U	U	L	L	S	S	U	U	S	U	
60°	U	U	U	U	U	L	U	U	U	S	U	
ACETIC ACID-GLACIAL	20°	U	U	S	S	S	S	U	U	S	U	—
	60°	U	U	S	S	L	U	U	U	S	U	—
ACETIC ANHYDRIDE	20°	U	—	U	U	U	U	U	U	S	L	U
	60°	U	—	U	U	U	U	U	U	S	U	U
ACETONE	20°	S	L	S	S	S	S	U	U	S	U	U
	60°	S	L	S	S	S	S	U	U	S	U	U
ACETOPHENONE	20°	—	—	—	—	L	L	U	—	S	U	—
	60°	—	—	—	—	L	L	U	—	S	U	—
ACETYLENE	20°	S	—	U	L	—	L	S	S	S	—	—
	60°	—	—	U	U	—	U	S	S	S	—	—
ADIPIC ACID	20°	—	—	S	S	S	S	S	S	S	—	—
	60°	—	—	L	L	S	L	S	S	S	—	—
ALLYL ALCOHOL 96%	20°	L	L	S	S	S	S	S	S	S	U	S
	60°	—	—	S	S	L	S	L	L	S	U	—
ALLYL CHLORIDE	20°	L	—	S	S	S	S	U	U	S	—	—
	60°	—	—	S	S	—	S	U	U	S	—	—
ALUM	20°	—	—	S	S	S	S	S	S	S	—	—
	60°	—	—	S	S	S	S	S	S	S	—	—
ALUMINUM CHLORIDE	20°	L	—	S	S	S	S	S	S	S	S	S
	60°	—	—	S	S	S	S	S	S	S	S	—
ALUMINUM FLUORIDE	20°	—	—	S	S	S	S	S	S	—	S	—
	60°	—	—	S	S	S	S	S	S	—	—	—
ALUMINUM HYDROXIDE	20°	—	—	S	S	S	S	S	S	S	—	—
	60°	—	—	S	S	S	S	S	S	S	—	—
ALUMINUM NITRATE	20°	—	—	S	S	S	S	S	S	S	—	—
	60°	—	—	S	S	S	S	S	S	S	—	—
ALUMINUM OXYCHLORIDE	20°	—	—	S	S	S	S	S	S	S	—	—
	60°	—	—	S	S	S	S	S	S	S	—	—

S = Satisfactory
L = Limited resistance (some attack)
U = Unsatisfactory
— = Not available

CHEMICAL RESISTANCE

AGENT (INCLUDING CONCENTRATION, °C)	NYLON*	ACETAL	POLYETHYLENES			POLY- PRO- PYLENE	PVC	CPVC	PTFE	ACRYLIC	POLY- CARBO- NATE
			LOW DENSITY	HIGH DENSITY	UHMW						
ALUMINUM SULPHATE	20°	S	S	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	L	—
AMMONIA - DRY GAS	20°	L	S	S	S	S	S	S	S	S	U
	60°	U	—	S	S	S	S	S	S	—	U
AMMONIA LIQUID 100%	20°	S	S	S	S	S	L	—	S	U	U
	60°	—	S	L	L	—	L	U	—	S	U
AMMONIUM CARBONATE	20°	S	—	S	S	S	S	S	S	S	U
	60°	—	—	S	S	S	S	S	S	—	U
AMMONIUM CHLORIDE	20°	S	S	S	S	S	S	S	S	S	S
	60°	L	S	S	S	S	S	S	S	S	—
AMMONIUM FLUORIDE 25%	20°	—	—	S	S	S	S	S	—	—	—
	60°	—	—	S	S	S	L	L	S	—	—
AMMONIUM HYDROXIDE 28%	20°	S	U	S	S	S	S	S	S	S	U
	60°	U	U	S	S	S	S	S	S	—	U
AMMONIUM NITRATE	20°	—	—	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	—	—
AMMONIUM PERSULFATE	20°	—	—	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	—	S
AMMONIUM PHOSPHATE	20°	S	—	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	—	—
AMMONIUM SULPHATE	20°	S	—	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	—	—
AMYL ACETATE 100%	20°	S	—	U	L	L	U	U	—	U	—
	60°	—	—	U	U	U	U	U	—	U	—
AMYL ALCOHOL 100%	20°	—	—	S	S	S	S	S	S	S	S
	60°	—	—	S	S	S	S	—	S	—	L
ANILINE	20°	L	—	L	S	S	S	U	U	S	U
	60°	—	L	U	L	L	L	U	U	S	U
ANTIMONY TRICHLORIDE	20°	U	—	S	S	S	S	S	U	S	—
	60°	U	—	S	S	S	S	U	U	S	—
AQUA REGIA	20°	—	—	U	L	L	L	L	U	S	—
	60°	—	—	U	U	L	L	U	U	S	—
BARIUM CHLORIDE	20°	U	—	S	S	S	S	S	S	S	—
	60°	U	—	S	S	S	S	S	S	S	—
BARIUM HYDROXIDE	20°	—	—	S	S	S	S	S	S	S	L
	60°	—	—	S	S	S	S	S	S	—	—
BEER	20°	S	—	S	S	S	S	S	S	S	S
	60°	—	—	S	S	S	S	S	S	—	—

S = Satisfactory
 L = Limited resistance (some attack)
 U = Unsatisfactory
 — = Not available

CHEMICAL RESISTANCE

AGENT (INCLUDING CONCENTRATION, °C)	NYLON*	ACETAL	POLYETHYLENES			POLY- PRO- PYLENE	PVC	CPVC	PTFE	ACRYLIC	POLY- CARBO- NATE	
			LOW DENSITY	HIGH DENSITY	UHMW							
BENZALDEHYDE	20°	L	L	U	U	L	U	U	S	U	—	
	60°	U	—	U	U	U	U	U	S	U	—	
BENZENE	20°	S	L	U	U	L	U	U	S	U	U	
	60°	—	L	U	U	L	U	U	S	U	U	
BENZYL CHLORIDE	20°	—	—	—	—	—	S	L	—	S	U	—
	60°	—	—	—	—	—	S	U	—	S	U	—
BENZOIC ACID	20°	U	—	S	S	S	S	S	S	S	L	—
	60°	U	—	S	S	S	U	L	S	S	—	—
BENZYL ALCOHOL	20°	L	S	—	—	S	S	U	U	S	—	—
	60°	U	S	—	—	S	L	U	U	S	—	—
BORAX	20°	—	—	S	S	S	S	S	S	S	S	S
	60°	—	—	S	S	S	S	S	S	S	—	—
BORIC ACID	20°	U	U	S	S	S	S	S	S	S	S	—
	60°	U	U	S	S	S	S	S	S	S	S	—
BROMIC ACID 10%	20°	—	—	S	S	S	S	S	S	S	—	—
	60°	—	—	S	S	S	S	S	S	S	—	—
BROMINE LIQUID 100%	20°	U	—	U	L	L	U	U	U	S	—	—
	60°	U	—	U	U	U	U	U	U	S	—	—
BUTANE	20°	S	—	U	U	S	S	S	S	—	—	—
	60°	S	—	U	U	—	L	S	S	—	—	—
BUTYL ACETATE	20°	S	L	U	L	L	S	U	U	S	U	—
	60°	S	L	U	U	U	U	U	U	S	U	—
BUTYL ALCOHOL	20°	S	—	S	S	S	S	S	S	S	U	—
	60°	S	—	S	S	S	S	L	L	S	U	—
BUTYRIC ACID 20%	20°	L	S	U	U	L	S	U	S	S	U	—
	60°	—	—	U	U	U	S	U	U	S	U	—
CALCIUM CHLORIDE	20°	L	—	S	S	S	S	S	S	S	S	S
	60°	U	—	S	S	S	S	S	S	S	U	—
CALCIUM HYDROXIDE	20°	—	S	S	S	S	S	S	S	S	—	S
	60°	—	S	S	S	S	S	S	S	S	—	—
CALCIUM NITRATE	20°	—	—	S	S	S	S	S	S	S	—	—
	60°	—	—	S	S	S	S	S	S	S	—	—
CALCIUM SULFATE	20°	—	—	S	S	S	S	S	S	S	—	—
	60°	—	—	S	S	S	S	S	S	S	—	—
CARBON BISULPHIDE	20°	—	—	U	U	U	U	U	U	S	—	U
	60°	—	—	U	U	U	U	U	U	S	—	—
CARBON DISULPHIDE	20°	S	S	U	U	U	U	U	U	S	U	—
	60°	—	—	U	U	U	U	U	U	S	U	—
CARBON TETRACHLORIDE	20°	S	L	U	U	U	U	L	L	S	L	L
	60°	—	—	U	U	U	U	U	U	S	U	—

S = Satisfactory
 L = Limited resistance (some attack)
 U = Unsatisfactory
 — = Not available

CHEMICAL RESISTANCE

AGENT (INCLUDING CONCENTRATION, °C)	NYLON*	ACETAL	POLYETHYLENES			POLY- PRO- PYLENE	PVC	CPVC	PTFE	ACRYLIC	POLY- CARBO- NATE
			LOW DENSITY	HIGH DENSITY	UHMW						
CARBONIC ACID	20°	S	S	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	—	—
CASTOR OIL	20°	S	S	S	S	S	S	S	S	S	S
	60°	S	—	S	S	S	S	S	S	—	—
CHLORAL HYDRATE	20°	U	—	U	U	U	S	S	S	U	—
	60°	U	—	U	U	U	S	S	S	U	—
CHLORINE GAS	20°	U	U	L	L	L	S	S	S	L	S
	60°	U	U	U	U	U	L	L	L	—	—
CHLORINE LIQUID	20°	U	—	U	U	U	U	U	S	U	—
	60°	U	—	U	U	U	U	U	S	U	—
CHLORINE WATER 2%	20°	U	U	L	S	S	S	S	S	L	—
	60°	U	U	U	S	S	S	S	S	—	—
CHLORO BENZENE	20°	S	L	U	L	L	U	U	U	S	U
	60°	S	—	U	U	U	U	U	U	S	U
CHLOROFORM	20°	L	U	U	L	L	U	U	U	S	U
	60°	—	U	U	U	U	U	U	U	S	U
CHLOROSULFONIC ACID	20°	U	—	U	U	U	L	L	L	S	U
	60°	U	—	U	U	U	U	U	U	S	U
CHROMIC ACID 10%	20°	U	U	S	S	S	S	U	U	S	L
	60°	U	U	L	S	S	S	U	U	S	U
CHROMIC ACID 50%	20°	U	U	L	S	S	S	U	U	S	U
	60°	U	U	U	S	S	L	U	U	S	U
CITRIC ACID 10%	20°	S	S	S	S	S	S	S	S	S	S
	60°	—	—	S	S	S	S	S	S	S	—
COPPER CHLORIDE	20°	U	S	S	S	S	S	S	S	S	S
	60°	U	—	S	S	S	S	S	S	S	—
COPPER SULPHATE	20°	L	S	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	S	—
CRESOL	20°	U	—	U	U	U	U	U	S	S	U
	60°	U	—	U	U	U	U	U	U	S	U
CRUDE OIL	20°	S	S	U	U	S	S	S	S	S	—
	60°	S	—	U	U	L	L	S	S	S	—
CYCLOHEXANOL	20°	S	—	L	S	S	S	U	U	S	U
	60°	S	—	L	S	S	L	U	U	S	U
CYCLOHEXANONE	20°	S	S	U	U	L	U	U	U	S	U
	60°	S	—	U	U	U	U	U	U	S	U

S = Satisfactory
L = Limited resistance (some attack)
U = Unsatisfactory
— = Not available

CHEMICAL RESISTANCE

AGENT (INCLUDING CONCENTRATION, °C)	NYLON*	ACETAL	POLYETHYLENES			POLY- PRO- PYLENE	PVC	CPVC	PTFE	ACRYLIC	POLY- CARBO- NATE	
			LOW DENSITY	HIGH DENSITY	UHMW							
DIBUTYL PHTHALATE	20°	S	S	—	—	S	S	U	U	S	L	—
	60°	—	—	—	—	S	L	U	U	S	U	—
DIOXANE	20°	S	L	U	U	—	S	U	U	S	U	—
	60°	—	L	U	U	—	U	U	U	S	U	—
ETHER	20°	—	—	U	U	L	U	U	U	—	U	S
	60°	—	—	U	U	U	U	U	U	—	U	—
ETHYL ACETATE	20°	S	L	L	L	S	S	U	U	S	U	U
	60°	—	L	U	L	L	S	U	U	S	U	U
ETHYL ALCOHOL 30%	20°	S	L	S	S	S	S	S	S	S	L	L
	60°	—	L	S	S	S	S	S	S	S	—	—
ETHYL ALCOHOL 100%	20°	S	L	S	S	S	S	S	S	S	U	L
	60°	S	L	S	S	S	S	S	S	S	U	—
ETHYL ETHER	20°	—	—	U	L	L	L	L	U	S	U	—
	60°	—	—	U	U	U	U	U	U	S	U	—
ETHYLENE BROMIDE	20°	—	—	U	U	—	U	U	U	S	U	—
	60°	—	—	U	U	—	U	U	U	S	U	—
ETHYLENE DICHLORIDE	20°	S	L	U	U	U	U	U	U	S	U	U
	60°	S	L	U	U	U	U	U	U	S	U	U
ETHYLENE GLYCOL	20°	S	—	S	S	S	S	S	S	S	S	S
	60°	U	—	S	S	S	S	S	S	S	—	—
FERRIC CHLORIDE	20°	S	L	S	S	S	S	S	S	S	S	S
	60°	—	—	S	S	S	S	S	S	S	—	S
FERROUS CHLORIDE	20°	L	S	S	S	S	S	S	S	—	S	—
	60°	—	—	S	S	S	S	S	S	—	S	—
FERROUS SULPHATE	20°	—	—	S	S	S	S	S	S	—	S	—
	60°	—	—	S	S	S	S	S	S	—	L	—
FLUORINE GAS	20°	U	U	U	L	L	U	U	L	U	—	—
	60°	U	U	U	U	U	U	U	U	U	—	—
FORMALDEHYDE 30%	20°	L	S	S	S	S	S	S	S	S	S	—
	60°	—	—	L	S	S	S	S	S	S	—	—
FORMIC ACID 10%	20°	U	U	S	S	S	S	S	S	S	S	L
	60°	U	U	S	S	S	S	L	S	S	L	—
FORMIC ACID 50%	20°	U	U	S	S	S	S	S	S	S	L	L
	60°	U	U	S	S	S	S	U	S	S	U	—
FREON 12	20°	S	S	S	S	—	S	S	S	S	—	U
	60°	—	—	L	S	—	S	S	S	S	—	U

S = Satisfactory
 L = Limited resistance (some attack)
 U = Unsatisfactory
 — = Not available

CHEMICAL RESISTANCE

AGENT (INCLUDING CONCENTRATION, °C)	NYLON*	ACETAL	POLYETHYLENES			POLY- PRO- PYLENE	PVC	CPVC	PTFE	ACRYLIC	POLY- CARBO- NATE
			LOW DENSITY	HIGH DENSITY	UHMW						
GAS - NATURAL	20°	—	—	U	L	—	S	S	S	S	—
	60°	—	—	U	U	—	L	L	S	S	—
GASOLINE (PETROL)	20°	S	L	U	L	L	U	S	S	S	U
	60°	—	L	U	U	L	U	—	S	S	U
GLYCEROL (GLYCERINE)	20°	S	S	S	S	S	S	S	S	S	S
	60°	—	—	S	S	S	S	S	S	S	—
GLYCOL	20°	S	—	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	S	—
HEPTANE	20°	S	S	U	L	S	L	L	S	S	S
	60°	S	S	U	U	L	U	L	S	S	—
HEXANE	20°	S	L	U	U	S	L	S	S	S	S
	60°	—	L	U	U	—	U	L	L	S	—
HYDROCHLORIC ACID 20%	20°	U	U	S	S	S	S	S	S	S	S
	60°	U	U	S	S	S	S	S	S	S	—
	80°	U	U	—	—	S	—	L	S	S	L
HYDROCHLORIC ACID 40%	20°	U	U	S	S	S	S	S	S	S	S
	60°	U	U	S	S	S	S	S	S	S	L
HYDROCYANIC ACID	20°	—	—	S	S	S	S	S	S	S	U
	60°	—	—	S	S	S	S	S	S	S	U
HYDROFLUORIC ACID 25%	20°	U	—	S	S	S	S	S	S	S	—
	60°	U	—	L	S	S	S	L	L	S	—
HYDROFLUORIC ACID 40%	20°	U	—	S	S	S	S	S	S	S	L
	60°	U	—	L	S	S	S	L	L	S	—
HYDROFLUORIC ACID CONC.	20°	U	—	—	S	S	S	S	S	S	U
	60°	U	—	—	—	S	—	L	L	S	U
HYDROGEN PEROXIDE 30%	20°	U	U	S	S	S	S	S	S	S	S
	60°	U	U	L	S	S	S	S	S	S	—
HYDROGEN PEROXIDE 90%	20°	U	U	U	S	S	S	S	S	S	U
	60°	U	U	U	L	L	L	S	S	S	U
IODINE (IN ALCOHOL)	20°	U	—	U	U	L	S	U	U	S	U
	60°	U	—	U	U	L	L	U	U	S	U
ISOPROPYL ALCOHOL	20°	L	S	S	S	S	S	S	S	S	L
	60°	—	—	S	S	S	S	S	S	S	—
KEROSENE	20°	S	S	U	L	L	L	S	S	S	S
	60°	S	S	U	U	L	U	S	S	S	—
LUBRICATING OILS	20°	S	S	U	L	S	L	S	S	S	S
	60°	S	S	U	L	L	U	S	S	S	—

S = Satisfactory
L = Limited resistance (some attack)
U = Unsatisfactory
— = Not available

CHEMICAL RESISTANCE

AGENT (INCLUDING CONCENTRATION, °C)	NYLON*	ACETAL	POLYETHYLENES			POLY- PRO- PYLENE	PVC	CPVC	PTFE	ACRYLIC	POLY- CARBO- NATE
			LOW DENSITY	HIGH DENSITY	UHMW						
MAGNESIUM CHLORIDE	20°	S	S	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	—	—
MAGNESIUM SULPHATE	20°	S	S	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	S	—
MERCURIC CHLORIDE	20°	S	—	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	—	—
MERCURY	20°	S	—	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	—	—
METHYL ALCOHOL 100%	20°	S	L	S	S	S	S	S	S	S	U
	60°	U	L	S	S	S	S	S	S	S	U
METHYL ETHYL KETONE	20°	S	L	U	U	U	U	U	U	S	U
	60°	—	L	U	U	U	U	U	U	S	U
METHYL SALICYLATE	20°	—	S	—	—	S	S	S	S	U	U
METHYL SULPHATE	20°	L	—	U	U	—	L	S	S	—	—
	60°	—	—	—	—	—	U	S	S	—	—
METHYLENE CHLORIDE	20°	L	L	U	U	U	S	U	U	S	U
	60°	—	—	U	U	U	L	U	U	S	U
MINERAL OILS	20°	S	S	L	S	S	L	S	S	S	S
	60°	S	S	U	U	U	U	S	S	S	—
NAPHTHA	20°	S	—	U	L	S	U	U	S	S	U
	60°	—	—	U	L	U	U	U	—	S	U
NAPHTHALENE	20°	S	—	L	S	L	L	U	U	S	L
	60°	—	—	U	U	U	L	U	U	S	—
NICKEL CHLORIDE	20°	—	—	S	S	S	S	S	S	S	S
	20°	—	—	S	S	S	S	S	S	S	S
NICKEL SULPHATE	20°	S	—	S	S	S	S	S	S	S	S
	60°	—	—	S	S	S	S	S	S	S	S
NITRIC ACID 10%	20°	U	U	S	S	S	S	S	S	S	S
	60°	U	U	S	S	S	S	S	S	S	L
NITRIC ACID 50%	20°	U	U	S	S	L	L	S	S	S	L
	60°	U	U	U	L	L	U	L	L	S	—
NITRIC ACID CONC.	20°	U	U	U	U	U	L	U	U	S	U
	60°	U	U	U	U	U	U	U	U	S	U
NITROBENZENE	20°	L	L	U	U	U	S	U	U	S	U
	60°	—	—	U	U	U	S	U	U	S	U
OLEIC ACID	20°	S	L	S	S	S	S	S	S	S	—
	60°	S	L	S	S	S	S	S	S	S	—
OLIVE OIL	20°	S	S	S	S	S	S	S	S	S	L
	60°	S	S	L	—	S	S	S	S	S	L

S = Satisfactory
 L = Limited resistance (some attack)
 U = Unsatisfactory
 — = Not available

CHEMICAL RESISTANCE

AGENT (INCLUDING CONCENTRATION, °C)	NYLON*	ACETAL	POLYETHYLENES			POLY- PRO- PYLENE	PVC	CPVC	PTFE	ACRYLIC	POLY- CARBO- NATE	
			LOW DENSITY	HIGH DENSITY	UHMW							
OXALIC ACID 10%	20°	L	U	S	S	S	S	S	S	S	S	
	60°	—	—	S	S	S	S	S	S	S	L	
OXYGEN	20°	L	—	S	S	S	L	S	S	S	S	
	60°	L	—	S	S	S	U	S	S	—	S	
OZONE	20°	U	U	U	U	S	L	S	S	S	U	
	60°	U	U	U	U	L	U	L	L	S	—	U
PERCHLOROETHYLENE	20°	L	L	—	—	U	—	U	U	S	L	—
	60°	—	L	—	—	U	—	U	U	S	U	—
PETROLEUM ETHER 100%	20°	S	—	U	U	S	L	S	S	S	S	—
	60°	—	—	U	U	U	L	L	S	S	—	—
PHENOL	20°	U	U	U	—	L	L	L	—	S	U	U
	60°	U	U	U	—	U	U	U	—	S	U	U
PHOSPHORIC ACID 10%	20°	U	U	S	S	S	S	S	S	S	S	S
	60°	U	U	S	S	S	S	L	S	S	—	—
PHOSPHORIC ACID 75%	20°	U	U	S	S	S	S	S	S	S	L	—
	60°	U	U	L	S	S	S	S	S	S	—	—
PHOSPHORUS, YELLOW	20°	—	—	L	S	S	L	S	S	—	U	—
		—	—	L	—	S	U	S	S	—	U	—
PHOSPHORUS PENTOXIDE	20°	—	—	L	S	S	S	S	S	S	—	S
		—	—	L	S	S	L	L	L	S	—	L
PHOSPHORUS TRICHLORIDE	20°	—	—	L	—	S	L	U	U	S	L	—
	60°	—	—	U	—	S	U	U	U	S	—	—
PHOTOGRAPHIC CHEMICALS	20°	—	—	S	S	S	S	S	S	S	S	S
	60°	—	—	S	S	S	S	S	S	S	—	L
PLATING SOLUTIONS CHROMIUM	20°	—	—	U	S	L	S	S	S	S	S	—
	60°	—	—	U	S	L	S	L	S	S	S	—
OTHERS	20°	—	—	S	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	S	S	—
POTASSIUM BICARBONATE	20°	S	—	S	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	S	—	—
POTASSIUM CARBONATE	20°	S	—	S	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	S	—	—
POTASSIUM CHLORIDE	20°	S	—	S	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	S	S	—
POTASSIUM HYDROXIDE 10%	20°	S	S	S	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	S	L	—
POTASSIUM HYDROXIDE 50%	20°	L	S	S	—	S	—	S	S	S	—	—
	60°	—	—	L	—	S	—	S	S	S	—	—

S = Satisfactory
 L = Limited resistance (some attack)
 U = Unsatisfactory
 — = Not available

CHEMICAL RESISTANCE

AGENT (INCLUDING CONCENTRATION, °C)	NYLON*	ACETAL	POLYETHYLENES			POLY- PRO- PYLENE	PVC	CPVC	PTFE	ACRYLIC	POLY- CARBO- NATE
			LOW DENSITY	HIGH DENSITY	UHMW						
POTASSIUM NITRATE	20°	S	L	S	S	S	S	S	S	S	—
	60°	—	-	S	S	S	S	S	S	—	—
POTASSIUM PERMANGANATE 10%	20°	U	S	S	S	S	S	S	S	S	—
	60°	U	S	S	S	S	S	S	S	—	—
POTASSIUM SULPHATE	20°	S	—	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	S	—
PROPANE	20°	S	—	U	U	L	L	S	S	S	—
	60°	—	—	U	U	—	U	S	S	S	—
PROPYL ALCOHOL	20°	—	—	S	S	S	S	S	S	S	U
	60°	—	—	S	S	S	S	S	S	S	U
PROPYLENE DICHLORIDE	20°	—	—	U	U	U	L	U	U	—	U
	60°	—	—	U	U	U	U	U	U	—	U
PYRIDINE	20°	S	L	S	S	S	L	U	U	S	—
	60°	—	L	L	L	L	L	U	U	S	—
SALT (SEA) WATER	20°	S	S	S	S	S	S	S	S	S	S
	60°	S	S	S	S	S	S	S	S	S	—
SILICONE OIL	20°	S	—	—	—	S	S	S	S	S	L
	60°	—	—	—	—	L	S	L	S	S	—
SILVER NITRATE	20°	S	—	S	S	S	S	S	S	S	S
	60°	—	—	S	S	S	S	S	S	S	—
SOAPS (IN SOLUTION)	20°	S	S	S	S	S	S	S	S	S	S
	60°	S	S	S	S	S	S	S	S	S	—
SODIUM ACETATE	20°	S	—	S	S	S	S	S	S	S	S
	60°	L	—	S	S	S	S	S	S	S	S
SODIUM BICARBONATE 10%	20°	S	—	S	S	S	S	S	S	S	S
	60°	—	—	S	S	S	S	S	S	S	—
SODIUM BISULPHITE	20°	S	U	S	S	S	S	S	S	S	S
	60°	—	U	S	S	S	S	S	S	S	—
SODIUM CARBONATE	20°	S	S	S	S	S	S	S	S	S	S
	60°	S	S	S	S	S	S	S	S	S	—
SODIUM CHLORATE	20°	S	S	S	S	S	S	S	S	S	S
	60°	—	—	S	S	S	S	S	S	S	—
SODIUM CHLORIDE	20°	S	S	S	S	S	S	S	S	S	S
	60°	S	S	S	S	S	S	S	S	S	—
SODIUM HYDROXIDE 10%	20°	S	L	S	S	S	S	S	S	S	L
	60°	U	L	S	S	S	S	S	S	S	L
SODIUM HYDROXIDE 50%	20°	L	U	S	S	S	S	S	S	S	L
	60°	U	U	S	S	S	S	S	S	S	L
SODIUM HYPOCHLORITE 20%	20°	L	U	S	S	S	S	S	S	S	S
	60°	—	U	S	S	S	L	S	S	S	—

S = Satisfactory
 L = Limited resistance (some attack)
 U = Unsatisfactory
 — = Not available

CHEMICAL RESISTANCE

AGENT (INCLUDING CONCENTRATION, °C)	NYLON*	ACETAL	POLYETHYLENES			POLY- PRO- PYLENE	PVC	CPVC	PTFE	ACRYLIC	POLY- CARBO- NATE
			LOW DENSITY	HIGH DENSITY	UHMW						
SODIUM NITRATE	20°	S	S	S	S	S	S	S	S	S	L
	60°	—	—	S	S	S	S	S	S	S	—
SODIUM SULPHATE	20°	S	S	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	S	—
SODIUM SULPHIDE	20°	S	S	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	—	—
SODIUM THIOSULPHATE 25%	20°	S	S	S	S	S	S	S	S	S	S
	60°	—	S	S	S	S	S	S	S	—	—
STANNOUS CHLORIDE	20°	—	U	S	S	S	S	S	S	—	—
	60°	—	U	S	S	S	S	L	S	—	—
STEARIC ACID 100%	20°	S	—	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	—	—
SULPHUR	20°	S	S	S	S	S	S	S	S	S	—
	60°	S	S	S	S	S	S	S	S	—	—
SULPHUR DIOXIDE DRY GAS	20°	L	L	S	S	S	S	S	S	S	S
	60°	—	—	S	S	S	L	S	S	S	—
SULPHUR DIOXIDE WET GAS	20°	—	—	S	S	S	S	S	S	—	—
	60°	—	—	S	L	S	L	L	L	—	—
SULPHURIC ACID 10%	20°	U	U	S	S	S	S	S	S	S	S
	60°	U	U	S	S	S	S	S	S	L	S
SULPHURIC ACID 50%	20°	U	U	L	S	S	S	S	S	L	S
	60°	U	U	L	L	S	S	S	S	U	—
SULPHURIC ACID 95%	20°	U	U	U	L	L	S	S	S	U	U
	60°	U	U	U	U	U	L	S	S	U	U
SULPHUROUS ACID 10%	20°	U	L	S	S	S	S	S	S	S	—
	60°	U	—	S	S	S	S	S	S	S	—
SULPHUROUS ACID CONC.	20°	U	—	S	S	S	S	S	S	L	—
	60°	U	—	S	S	S	S	S	S	—	—
TARTARIC ACID	20°	L	S	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	S	S	S	—
Tetrahydrofuran	20°	S	L	U	L	L	L	U	U	S	—
	60°	—	—	U	U	L	L	U	U	S	—
Thionyl chloride	20°	U	L	U	U	U	U	U	U	S	—
	60°	U	—	U	U	U	U	U	U	S	—
Titanium tetrachloride	20°	—	—	—	—	—	U	U	S	—	S
	60°	—	—	—	—	—	U	U	U	—	U

S = Satisfactory
 L = Limited resistance (some attack)
 U = Unsatisfactory
 — = Not available

CHEMICAL RESISTANCE

AGENT (INCLUDING CONCENTRATION, °C)	NYLON*	ACETAL	POLYETHYLENES			POLY- PRO- PYLENE	PVC	CPVC	PTFE	ACRYLIC	POLY- CARBO- NATE
			LOW DENSITY	HIGH DENSITY	UHMW						
TOLUENE	20°	S	L	U	U	U	U	U	S	U	U
	60°	S	—	U	U	U	U	U	S	U	U
TRICHLOROETHYLENE	20°	L	L	U	U	L	U	U	S	U	—
	60°	—	—	U	U	U	U	U	S	U	—
TRICRESYL PHOSPHATE	20°	S	—	L	S	—	S	U	S	U	—
	60°	S	—	L	L	—	L	U	S	U	—
TRIETHANOLAMINE	20°	S	S	S	S	S	S	S	S	—	—
	60°	—	—	L	L	L	L	S	S	—	—
TRIETHYLAMINE	20°	—	S	—	—	—	L	S	—	S	—
	60°	—	L	—	—	—	U	S	—	—	—
TRISODIUM PHOSPHATE	20°	S	—	S	S	S	S	S	S	S	L
	60°	—	—	S	S	S	S	S	S	—	—
TURPENTINE	20°	S	—	U	U	L	L	S	S	L	U
	60°	—	—	U	U	U	U	L	S	—	U
UREA	20°	S	S	S	S	S	S	S	S	—	—
	60°	—	—	S	S	S	S	S	S	—	—
URINE	20°	—	—	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	L	S	—	—
VINEGAR	20°	—	L	S	S	S	S	S	S	S	—
	60°	—	—	S	S	S	S	L	S	—	—
WATER (DISTILLED)	20°	S	S	S	S	S	S	S	S	S	S
	60°	S	S	S	S	S	S	L	S	—	—
XYLENE	20°	S	S	U	U	U	U	U	S	U	—
	60°	S	—	U	U	U	U	U	S	U	—
ZINC CHLORIDE 10%	20°	L	U	S	S	S	S	S	S	S	S
	60°	—	U	S	S	S	S	L	S	S	—
ZINC SULPHATE	20°	S	—	S	S	S	S	S	S	L	—
	60°	—	—	S	S	S	S	S	S	L	—

* The figures for nylon are for types 6 and 6/6. Types 11 and 12 are generally more resistant.

PTFE — Although our chart shows some chemicals not tested with PTFE, most can be regarded as having no significant effect on PTFE. PTFE resins are inert to most chemical reactants. The exceptions are Molten Alkali Metals, Elemental Fluorine, and Fluorine Percursors such as Oxygen Difluoride and Chlorine Trifluoride.

POLYPROPYLENE - It should be noted that contact between Polypropylene and Copper or Copper salts may result in a “Poisoning” of the Polypropylene. This poisoning occurs when copper ions attach themselves to the Polypropylene, and may cause cracking of the Polypropylene.

- S = Satisfactory
- L = Limited resistance (some attack)
- U = Unsatisfactory
- = Not available

Note: Although the information contained here has been obtained from sources believed to be reliable, no warranty (expressed or implied) can be made as to its accuracy. Where no value is listed, sufficient details are not available to present a usable figure. Property data shown are typical average values and will vary on specific production lots and by size and configuration of product. They should be used only as a guide to primary selection for application of a given material and not serve as a substitute for careful testing of prototype parts in typical operating environments. Final determination of the suitability of any material for a specific application is the sole responsibility of the user.

PLASTICS MACHINING

Johnston Industrial Plastics is pleased to assist our customers with technical information on all aspects of the use of our products. For machining operations such as drilling, turning, milling, sawing etc, we have details available on recommended operational parameters such as speed (ft./min.), feed (in./rev.) and pitch (teeth/in.) for various plastics.

This information is compiled from many sources including the manufacturers of our sheets, rods and tubes. We have included some excellent general guidelines supplied by Quadrant Engineering Plastic Products.

The demand for parts fabricated of industrial thermoplastics has increased dramatically in recent years to meet the needs of today's complex industrial market. Parts of industrial thermoplastics are found in thousands of applications once considered the exclusive territory of metals. Industrial thermoplastic parts offer the advantages of extended wear life, lower cost, lighter weight, reduced downtime and simplified maintenance for every major industry.

As synthetics, thermoplastics can easily be adapted to fit the demands of a particular industrial application. Fabrication is similar to metals, and can usually be accomplished on standard wood and metalworking equipment. There are, however, some differences in the way plastics and metals react to machining and it is important that these be considered when fabricating thermoplastics materials.

FRictionAL HEAT

The most common of these differences is the degree of heat generated by the cutting friction between the plastic material and the metal cutting tool. Although the softening temperature of nylon, Fluorosint® acetal and Torlon is high compared to most other thermoplastics, it is still relatively low when compared to metals. Most of the heat generated by fabrication will be absorbed by the cutting tool, as it is slow to leave the surface of the plastic material. However, if the heat generated is allowed to build, the surface of the plastic will expand and increase the friction and the heat. This results in inconsistent tolerances, poor finish, oxidation and discoloration. Therefore, adequate cutting tool clearances are essential. To provide excessive thermal expansion of the part being machined, air or other coolants must be used to keep the temperature at a minimum.

RESILIENCY

Plastics are relatively resilient when compared to metals. Machining procedures should be adjusted accordingly and stock materials properly supported to minimize distortion.

ELASTICITY

Elastic recovery occurs in plastic materials both during and after machining. To provide adequate relief and sufficient clearance, special provisions should be made in the tool

geometry. The expansion of compressed material due to elastic recovery causes increased friction between the recovered cut surface and the cutting tool, generating excessive heat. This abrasive action also causes excessive tool wear and poor tolerance control.

NYLONS

Nylon 101, Nylatron® GS, GSM, NSB, NSM and MC® 901 are the "hard" nylons and possess basically the same machining characteristics. Machining tools must be kept extremely sharp and should have sufficient clearance so that only the cutting edge makes contact with the material. Any rubbing action will affect finish and tolerances. The part surface must be kept cool, enlisting the benefits of mist spray, air, soluble-oil, or light cutting oils as coolants in high-speed and automatic operations. Dimensions of the finished product should be checked at room temperature to insure accuracy. This can be accomplished only by maintaining a vat of water (68-72°F) near the machine to accelerate cooling. The part is placed into the water for approximately five minutes then checked for size.

GENERAL MACHINING INSTRUCTIONS

The Machining Instructions on the following pages are applicable for:

Quadrant Nylon 101 and other type 6/6 nylons
Monocast® Nylon, MC® 901 and other type 6 nylons
Nylatron® GS, GSM, NSB and NSM nylons
Acetal
Acrylic
Delrin AF®

DRILLING

Note: *Because it is so easily accomplished, drilling is the most used machining operation. It is also the most abused. Correct drilling parameters follow.*

More heat is generated in drilling than in any other machining operation causing difficulties not usually associated with fabricating metals. Extra care must be taken to prevent problems such as gumming, melted surfaces, crazing, and cracks around the drill hole.

A slow spiral drill (low helix angle, 14°-17°) with polished flutes is recommended for drilling industrial thermoplastics. This type drill with a large flute area permits a free flow of chips and minimizes the chances of overheating and gumming. High speed twist drills with standard spiral flutes (30° helix) also have been used satisfactorily, see Figure 1-C, Helix Angle.

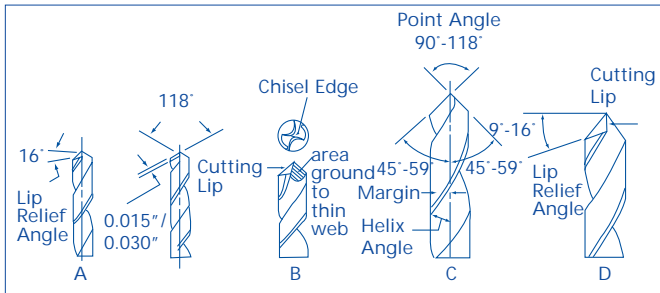
Chip ejection is an important consideration in drilling. If chips are not removed from the flutes as quickly as possible, frictional heat will develop resulting in poor finish, dimensional change, oxidation and discoloration.

PLASTICS MACHINING

Drill Design

Drills should be designed with a sharp point angle (90°-118°) and lip clearance of 9° to 15° for heavy walled or large diameter work. (Figure 1-D).

Fig. 1: Drill Designs



- A — Ground Cutting Lip (Dubbed Off)
- B — Reduced Chisel Edge (Lip Point)
- C — Drill Point Angle
- D — Lip Relief Angle

Blunt angles (115°-130°) are recommended for thin-walled pieces since this design prevents expansion of the Outside Diameter of the stock piece.

For both thin-wall and heavy-wall work the cutting lip should be ground so one cutting edge is approximately 0.005" to 0.010" longer than the other. The web also should be thinned (Figure 1-B).

Operating Instructions

Drilling thermoplastics requires a very sharp drill for best results. Do not use old drills or drills previously used on metal as the margin may be worn sufficiently to cause walking as the drill is advanced. Coolants such as mist spray, soluble-oil and light cutting oil are essential for optimum results and the drill should be retracted frequently to prevent chip build-up in the flutes.

When drilling through holes the feed should be reduced near the end of the cut to prevent the drill from pulling through at the exit side, breaking out or causing chipping. When drilling deep holes retract the drill frequently to assist the cooling process and to clear chips from the drill flutes. This procedure is called peck drilling. A rule of thumb for peck drilling frequency is never allow the drill depth to exceed 3 or 4 times the drill diameter before withdrawal.

Fig. 2: Drill Speed/Size Chart

Drill Sizes	RPM
NO. 60 thru 33	5,000
32 thru 17	3,000
16 thru 1	2,500
1/16"	5,000
1/8"	3,000
3/16"	2,500
1/4"	1,700
5/16"	1,700
3/8"	1,300
7/16"	1,000
1/2"	1,000
A thru D	2,500
E thru M	1,700
N thru Z	1,300

Fig. 3: Drill Feed & Geometry Chart

	Inches per rev.	Rake Angle*	Helix Angle*	Point Angle*	Lip Relief Angle*
Nylon: 101 NSB GS GSM MC 901	0.004" to 0.015"	Positive 0-5°	14°-17°	90°-110° (under 1/2") 118° (over 1/2")	9°-15° (under 1/2") 10°-16° (over 1/2")
Acetal	0.004" to 0.015"	Positive 0-10°	20°-30°	118°	10°-25°
Acrylic	0.004" to 0.010"	0-5°	20°-30°	118°	15°

IMPORTANT: Large Diameter Holes

A slow spiral (low helix) drill or a general purpose drill ground to a point angle of 118° with a lip clearance of 9° to 15° is recommended. In both instances, the lip rake should be ground off (i.e. dubbed off) and the web thinned (figure 1-A).

Spade drills have been used very successfully in drilling large diameter holes. They are best used in increments of 1" to enlarge the hole from pilot to finished size.

To prevent excessive stress in the thermoplastic materials, a trueing cut is recommended on the O.D. of the material on the chucking end. Use standard chuck jaws that have been radiused to the contour of the O.D. or a step collet for maximum contact on the holding surface. Chuck the rod as lightly as possible on the trued end applying only enough pressure to prevent slipping. Keep a generous flow of coolant on the drill tip as it is advanced into the part.

Drill a small (maximum 1/2" diameter) hole at a speed of 600 to 1000 rpm using a positive feed of approximately 0.005" per revolution. (Note: Avoid hand feeding the drill because "Grab" can occur and stress or cracks may develop. If hand feeding is the only alternative, grind (dub) the cutting edge (rake angle) of the drill as shown in Figure 1-A. Also, if a pilot hole is being hand drilled, reduce the chisel edge of the drill by thinning the web (Figure 1-B). A secondary drilling at a drill speed of 400 to 500 rpm is required to expand the hole to 1".

Finally, bore to the desired I.D. using a single point boring tool. Follow the boring and turning points outlined on page 6. Recommended turning speeds and tool angles are found on page 6.

REAMING

Although Quadrant Engineering Plastic Products fabricates parts to very close tolerance, reaming is sometimes necessary for specialty items when tolerance is a critical factor. Satisfactory results are obtained on thermoplastics with standard high speed stub machine reamers using a reamer 0.001" to 0.002" over the size of the finished hole to allow for "fall in". Tolerances of ± 0.0005" can be held in through-holes 1/4" in diameter or less, where the length of the holes does not exceed one drill diameter. Reamer speeds should approximate those used for drilling — 250 to 450 fpm —

PLASTICS MACHINING

and feed rates of 0.010" to 0.020" per revolution are generally accepted. Properly sharpened fluted reamers insure accurate trouble-free side wall shearings. A helical flute reamer with right hand spiral cuts is recommended when interrupted cuts such as holes with keyways and splines are desired. The amount of the material removed per cut will vary with the hardness of the plastic. To insure a measurable degree of accuracy, at least 0.005" to 0.010" should be removed in final reaming. Reaming can be done dry, but using coolants will produce a better finish. Water soluble oil is preferred as a coolant for this operation although light cutting oil may be used.

TURNING/BORING/FACING/MILLING

Single point turning tools ground and firmly supported (as indicated in Figures 4 & 5 below) provide the best results. Sharp tools with generous clearances are a necessity for proper turning, boring, facing and milling. High speed tools can be used for short runs only if the cutting edges are kept sharp. For long production runs diamond tip or tungsten carbide tools honed with a fine 400 to 600 grit diamond wheel are preferred. Carbide tools should always be used in turning Nylatron GS, GSM, NSB, NSM and MC 901 at speeds greater than 600 fpm. In turning large diameters of all nylons, light cuts 1/16" to 1/8" deep and light feeds 0.003" to 0.007" per revolution, are suggested. However, satisfactory results can be achieved using heavy cuts up to 3/8" deep and feeds of 0.015" per revolution. Rubbing action between sides of the cutting tool and the stock shape is detrimental to finish and tolerance. Refer to Figure 5 (below), for tool geometry clearance on front and sides. A 0° to 5° negative rake on the tool is generally preferred to balance cutting tool pressures. Smooth surfaces are easily achieved on both heavy and light cuts. Consequently, roughing cuts are rarely required if recommended tool geometry is followed. This saves production time and contributes to the low unit cost for machined thermoplastic parts.

Fig. 4: Definition of Cutting Tool Angles

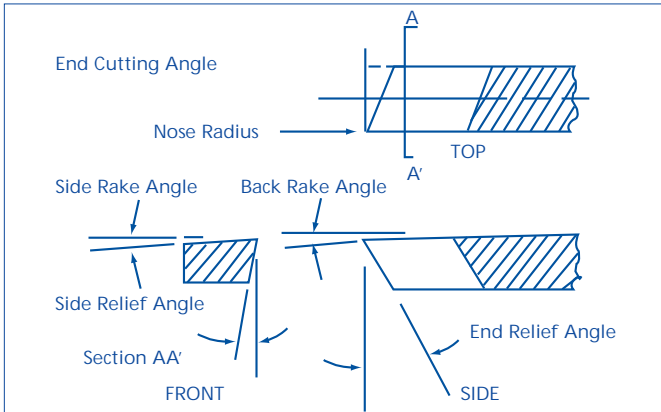
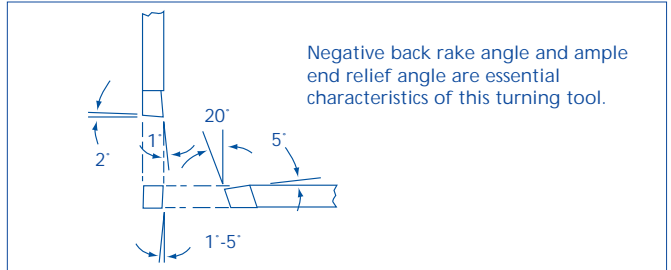


Fig. 5: Tool Geometry



Vertical Milling

Vertical milling — using face mills, shell mills, end mills and fly cutters — is probably the most common method of milling thermoplastics materials. High spindle speeds and fast table travel are possible with the use of adequate holding fixtures, but because of the degree of flexibility inherent with thermoplastics, care when holding and clamping is necessary to prevent deformation. When milling parts with thin cross sections, the entire part should be encased within the holding fixture, leaving only enough opening for the cutter. This prevents the part from deflecting away from the cutter. The staggered tooth roughing end mill works well on a vertical mill. Cutters should be kept at their sharpest at all times to eliminate burrs on the edge of the part being milled. Square cornered cutters are preferred over those with chamfered corners as fewer burrs develop at the end of the cut. If horizontal milling techniques are required, staggered tooth side milling cutters produce clean accurate slots and grooves with minimum difficulty. Slab mills also can be used, but greater care is necessary. Chatter marks can develop and chips may accumulate in front of the cutter and get pulled into the cutting surface. Degradation of the surface could result as chips are pulled over the machined surface, therefore, a slower spindle speed is used with slab mills. Burrs at the end of a run-out can be eliminated when a piece of slightly harder material, i.e. brass or aluminum, is placed at the end of the work where the cutter will run out. The cutter can then continue past the work piece and into the harder material. Also, burrs can be removed easily with a razor sharp knife or router. Coolants are not usually necessary in milling although mists of water-soluble oils are recommended to minimize the possibility of thermal expansion due to excessive heat. A mist coolant air system can be used to blow chips from the work area and the cutters.

CUT-OFF

Cut-off operations are performed with conventional tools modified for thermoplastics (Figure 7). The blade must be set square. A side clearance ample enough to prevent rubbing and to keep heat at a minimum is required and the setup should result in a minimum of tool overhang for greater rigidity and less deflection.

PLASTICS MACHINING

A slight burr can be raised by the cut-off blade at point of entry unless the work piece is chamfered (Figure 8). Prior to cut-off a "V" should be cut into the work surface by a cutter mounted on the machine cross slide. In this way, both ends of the work piece will become chamfered, eliminating burrs on the O.D.

To prevent burrs at the end of the cut, tools must be kept extremely sharp. An angle of 15° to 30° across the cutting edge permits the cut-off part to fall free with no

router is attached to a tabletop or angleplate. For a particular routing or shaping application with adjustable speeds and a permanently mounted piece of drive equipment, special fixturing is required. The speeds on these cutting heads range from 1,000 to 10,000 rpm, depending on the cutter size and the amount of material being removed. Usually, the cutters are specially form ground for use as a fly cutter. The special fixturing either holds the part rigid or guides it past the cutter.

Fig. 7: General Purpose Cut-Off Tool

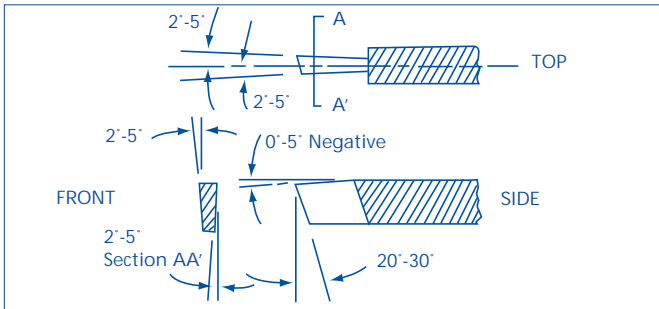
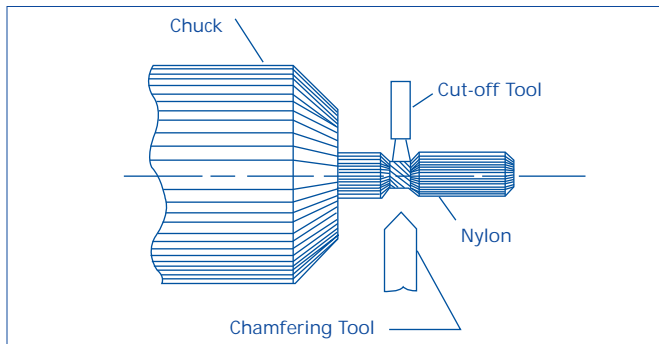


Fig. 8: Chamfering



protrusion on the face. Also, the stock end is usually free of any extending material.

High speed cut-off operations require a coolant to compensate for the low heat absorption of thermoplastics. Although a variety of mixtures and methods can be used as coolants, the basic types are: water/soap; water-soluble cutting oil; air jet; and mist.

Where clamping is required, grip the material tight enough to prevent slipping in the collet or chuck so the clamping force is distributed evenly and symmetrically over the material. Smooth collet and chuck jaws with sand-blasted surfaces are recommended to avoid marking the plastic surface.

ROUTING/SHAPING

Smooth routing of chamfers, edge radii and slots is possible on standard woodworking equipment at speeds from 10,000 to 20,000 rpm. Two fluted carbide cutters are recommended although high speed cutters perform well on short run applications.

Most routing is performed manually using a guide rail for location stability over the router cutter. The portable

BLANKING/PIERCING

Quality parts can be cut from thermoplastic stock strip on conventional punch press equipment. With properly designed punches and dies, 0.006" to 0.125" thick strip stock can be blanked and pierced at speeds to 600 strokes per minute.

In all blanking operations, special consideration must be given to die design to prevent material extrusion at the edges of the cut. Clearance between the punch and die should be minimal — less than 0.001". Best results are obtained with compound die sets.

Because thermoplastics extrude and recover more than metals, the die design must allow for recovery. The size of the produced part will be slightly different than the dimensions of the die. A test die can be made to check actual recovery for a specific configuration prior to full production.

Parts such as washers, grommets and cams 1/8" thick or less can be produced more efficiently by stamping, punching or blanking from profile extrusions. Rule dies and clicker dies have been used successfully for short run blanked parts or prototypes.

SHEARING

Power operated guillotine squaring shears and work supports are recommended to produce clear, sure cuts. Blade angle should be parallel when practical, but a variance of 1-1/2° is acceptable. Nylons to 1/8" thick, acetal to 1/16", polycarbonate to 1/4" and UHMW to 1/2" can be sheared. With the harder, more brittle thermoplastics it may be necessary to preheat the strip or otherwise condition it to approximately 2% moisture content to eliminate cracking.

SAWING

The greatest single problem in sawing thermoplastics is the dissipation of heat. Because of relatively low softening temperatures, the use of water soluble coolants is recommended. An air jet or venturi suction hose can be used for chip removal during operation.

Most band saws used to cut metal also may be used for plastics. However, a saw blade which has been used to cut metal or other abrasive material should not be used with plastics because the cutting edge will be worn and dull. A worn blade will generate rapid frictional heat causing the surface of the plastic to melt or otherwise degrade. Conventional radial or swing saws are used for sawing rod, bar, bushing stock, plates and other shapes and parts.

PLASTICS MACHINING

Circular saws are ideal for straight cuts in sheet and plate while traveling circular saws or panel saws work very well with stacks of sheets. Reciprocating action saws, however, generate considerable heat which could result in melting, cracking or rough surfaces.

Band saws are preferred for irregular and curved configurations but also can be used for straight cuts. Also, the length of the band saw blade reduced the possibility of overheating. Band saws should have enough kerf set to provide sufficient clearance to the back of the blade as plastics tend to "close-in" behind the cutting edge. A wedge may be placed in the saw cut behind the blade to prevent it from binding but precautions are needed. If the cut is widened beyond the saw kerf, the material may split through.

An HSS Buttress or Skip Tooth blade is preferred for cutting heavy plate (more than 1" thick) or thick cross sectional cast parts. The blade width should be 3/4" to 1" with 2 to 4 teeth per inch, depending on the thickness of the material being sawed. It is good practice to use blades that will permit at least two teeth to be in contact with material. Hook or Claw Tooth HSS blades may be used if Buttress or Skip Tooth blades are not available. However, these blades have a tendency to grab, causing broken edges on the exit side of the work.

To saw material to 3/4" thick, a 10" table saw is satisfactory. For thicker plate a larger (12-24") circular saw is recommended for its power and control. Rip and combination blades with a 0° tooth rake and a 3 to 10° tooth set are used most frequently.

A hollow ground circular saw blade without set produces a very smooth cut in material as thick as 3/4". However, to minimize frictional heat between the saw and the work piece, a hollow ground blade with a set is recommended. Hollow ground blades have little side clearance and fine teeth. They wear more rapidly, creating an unsatisfactory finish in a short time. Tungsten carbide type blades wear well and produce a good finish.

Feeding pressures will vary according to the length and depth of the cut and the machinability of the material. Combined with proper speed, a steady, moderate feed pressure is essential to good cutting and blade life of any saw.

Excessive pressure on band saws may cause the blade to bind as the teeth dig into work. The blade also may kink, twist, or break. Excessive pressure on circular saws will either cause the machine to stall or the material to break out on the exit side of the cut.

Too light a feed pressure may cause the blade to heat and melted material to build in the saw tooth. The melted, gummy material will bind the band saw blade causing it to fly off the drive wheel, break or cause the saw to stall. Melted material may build in the teeth and on each side of a circular saw blade. The saw may stall or the blade may become wavy from the excessive heat.

Best results are obtained with a power feed that can be adjusted as required. It is necessary to reduce the feed rate at the end of the cut to avoid chipping or breakout of the material being cut.

ABRASIVE WHEELS

Abrasive wheels 0.02" to 0.125" containing a silicone carbide abrasive in the range of No. 36 to No. 50 will produce clean cuts in rod, tubing and plate. A copious flow of coolant should be used for high speed cutting. A burr may form on the outgoing side of the cut.

TAPPING/THREADING

Most thermoplastics materials are "notch sensitive", therefore, sharp V threads should be avoided. A thread with a rounded root, such as a British Standard series (Whitworth thread), or American Standard Unified thread form with a rounded root, is recommended.

In tapping holes, use high speed oversize taps such as H-3 oversize for small diameters; H-5 oversize for larger diameters. Although standard size taps can be increased through plating, best results occur when taps, purchased in the proper sizes are used. It is imperative that taps or dies be extremely sharp (never used on metal) if quality tapped holes are desired.

When tapping deep holes — over 3:1 — the tap flute area should be enlarged for greater chip clearance. Four flute taps are generally preferred because the greater the flute area, the better the chip clearance. Bottom taps, modified by grinding a 50° chamfer angle on the face measured from the axis of the tap, are recommended unless a tight fit is required.

Spindle speeds for tapping and threading should be less than those used for drilling and turning or the first few threads of material may tear. Chance of tearing can be further reduced by chamfering the hole prior to tapping and by providing a positive feed for the first few threads. A leadscrew threading attachment on the tapping head is recommended to assure quality threads.

THREADING

Threads may be cut with a single point tool. Heavy cuts can be used for the initial pass while the depth of the cut for the final pass should be reduced to 0.007"-0.010". Class I and II threads can be cut with one pass.

In threading nylon a slightly oversize tap is recommended to overcome the tendency toward memory or recovery. However, this memory may be used to produce a self-locking thread with standard taps.

AUTOMATIC THREADING

Threading is easily accomplished on conventional lathes, chuckers or automatic screw machines. Self opening die heads should be avoided as these tend to tear the threads. Threads should be cut with a positive feed and an external trip is recommended to open the die head.

CENTERLESS GRINDING

The outside diameter of thermoplastic rod can readily be reduced by centerless grinding. A standard non-metallic bar grinding fixture is suggested and the work center

PLASTICS MACHINING

should be 1/8" below the center line of the wheels. Tubes are needed on the entrance and exit side of the wheels to keep stock from "whipping" at high speeds. The tubes serve also to maintain alignment of the blade with the work as the stock passes between the wheels.

The regulating wheel set over is approximately 3-1/2'. The entrance angle of the grinding wheel should be 1/2' to 3' with speeds dependent upon the diameter of the rod and the amount of stock to be removed. For smooth finishes and close tolerances as much of the grinding wheel width as possible should be used. TFE is relatively soft, so a soft grade wheel with open grain is usually recommended.

Fig. 9:

RECOMMENDED GEOMETRY FOR TANGENTIAL CHASERS	
Rake Angle	— 5° to 10°
Throat Angle	— 50°
Cutting Portion	— 0.019" to 0.021" Above Center
Lead Nut Portion	— 0.031" to 0.036" Above Center

Although tangential chasers are recommended, other types are sometimes used when these are not available. When radial chasers are necessary, the tool geometry given in Figure 10 is recommended.

Fig. 10:

RECOMMENDED GEOMETRY FOR RADIAL CHASERS	
Rake Angle	— 0° to 5°
Throat Angle	— 50°
Speeds	— Threading ratio, spindle speed to threading speed — 3:1.

AUTOMATIC SCREW MACHINING

Quadrant thermoplastics — Nylon 101, MC® 901, Nylatron® GS, GSM, NSB, NSM nylons and acetal, — lend themselves ideally to automatic screw machine work where production rates range from 750 to 1,800 parts per hour. General machining instructions referred to in this brochure for drilling, reaming, tapping, threading, and cut-off operations have proven most satisfactory when used with automatic screw machines. Additional instructions for automatic screw machines work follow.

TURNING

Because thermoplastics are inherently flexible, turning should be performed by box tools to prevent the possibility of deflection. Tangent type box tools with roller or V-rests produce the best results. The cutter should be exactly on center and ground with a 0° or neutral back rake angle. Carbide insert tools with a positive rake to 5° have performed satisfactorily.

PLUNGE-FORMING

Plunge-forming operations are used where the width of the tool cutting surface is no wider than the minimum

diameter of the work. Longer areas can be formed by using two (or more) tools with a front clearance of 10-15°. As little as 5° clearance, however, has proven satisfactory. Back rake of 0-3° negative is suggested.

The feed rate of the forming tool is determined to some extent by the deflection of the stock — usually between 0.004" and 0.010" per spindle revolution. With screw machine work, serrated cams produce a momentary interruption of the feed. This is helpful in breaking up the chip ribbon. To obtain a clean accurate surface, reduce the feed rate near the very end of the tool travel.

Surface finish of the machined part is directly related to the cutting edge of the tool. Good quality (C-2 or C-5) carbide tools can produce a finish of 16 RMS or better. However, the tool should not dwell at the point of termination as surface melting will occur.

KNURLING

A diamond-pattern knurl can be produced with excellent results on an automatic screw machine if the knurling is done from the turret. A Brown & Sharpe No.185 adjustable knurl holder (or equivalent), utilizing two opposed knurl rolls is recommended.

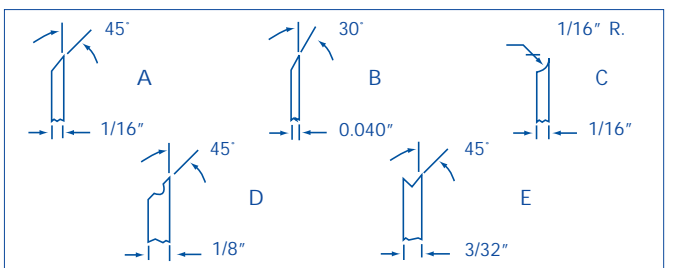
Knurling with this tool is limited only by the capabilities of the machine and holder. A straight pattern knurl can be produced by stopping the spindle and broaching the part with a special die.

CUT-OFF

The cut off operation information contained in this brochure under general machining instructions can produce satisfactory results with automatic screw machines. The blade styles below are suggested for optimum efficiency. Blade A is a general purpose blade. Blade B is recommended for thin wall bushings while C eliminates formation of a nib at point of cut-off. To produce large diameter rods or thick-walled bushings, Blade D is recommended. Blade E, in addition to parting the stock, also faces the work piece and is used where a separate facing tool is not included in the set-up.

As in all machining operations it is imperative that the blade be extremely sharp to avoid the possibility of burrs. Causing the cut-off tool to dwell near the point of termination permits the work to fall, and on automatic screw machines, the cam for the cut off tool can be designed for this purpose.

Fig. 11: Blade Styles



PLASTICS MACHINING

Fig. 12: Cut-Off

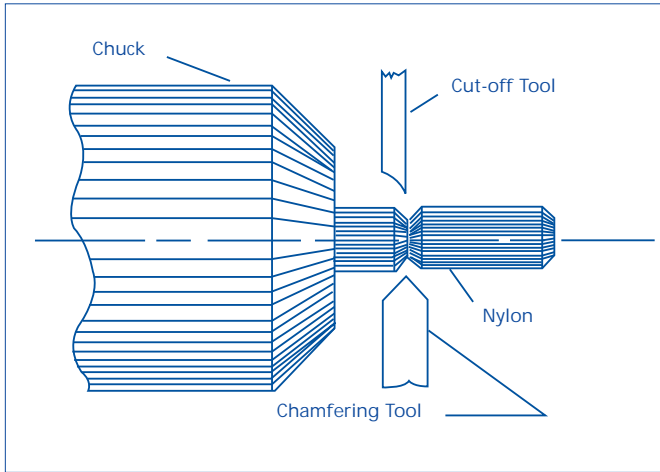


Fig. 13:

TOOL GEOMETRY FOR CARBIDE & HSS TOOLS	
Back rake angle	0°-5°
Side rake angle	0°
Side relief angle	2°-5°
End relief angle	15°-20°
End cutting edge angle	2°-5°
Side cutting edge angle	0°
Nose radius	Optional

Fig. 14:

OPERATIONAL INFORMATION FOR TURNING AND FORMING	
Surface speed 600 to 800 (sfpm)	Feeds(ipr)
Cut-off	0.003" to 0.006"
Plunge cut	0.002" to 0.004"
Skiving	0.015" to 0.025"
Rough turning	0.005" to 0.010"
Finish turning	0.001" to 0.003"

MACHINING DIFFICULTIES AND CAUSES CHECK LIST

DIFFICULTY	COMMON CAUSES
TAPERED HOLE	1. INCORRECTLY SHARPENED DRILL. 2. INSUFFICIENT CLEARANCE. 3. FEED TOO HEAVY.
BURNT OR MELTED SURFACE	1. WRONG TYPE DRILL. 2. INCORRECTLY SHARPENED DRILL. 3. FEED TOO LIGHT. 4. DRILL DULL. 5. WEB TOO THICK.
CHIPPING OF SURFACE	1. FEED TOO HEAVY. 2. CLEARANCE TOO GREAT. 3. TOO MUCH RAKE (THIN WEB AS DESCRIBED).
CHATTER	1. TOO MUCH CLEARANCE. 2. FEED TOO LIGHT. 3. DRILL OVERHANG TOO GREAT. 4. TOO MUCH RAKE (THIN WEB AS DESCRIBED).
FEED MARKS OR SPIRAL LINES ON INSIDE DIAMETER	1. FEED TOO HEAVY. 2. DRILL NOT CENTERED. 3. DRILL GROUND OFF-CENTER.
OVERSIZE HOLES	1. DRILL GROUND OFF-CENTER. 2. WEB TOO THICK. 3. INSUFFICIENT CLEARANCE. 4. FEED RATE TOO HEAVY. 5. POINT ANGLE TOO GREAT.
UNDERSIZE HOLES	1. DRILL DULL. 2. TOO MUCH CLEARANCE. 3. POINT ANGLE TOO SMALL.
HOLES NOT CONCENTRIC	1. FEED TOO HEAVY. 2. SPINDLE SPEED TOO SLOW. 3. DRILL ENTERS NEXT PIECE TOO FAR. 4. CUT-OFF TOOL LEAVES NIB, WHICH DEFLECTS DRILL. 5. WEB TOO THICK. 6. DRILL SPEED TOO HEAVY AT THE START. 7. DRILL NOT MOUNTED ON CENTER. 8. DRILL NOT SHARPENED CORRECTLY.
BURR AT CUT-OFF	1. CUT-OFF TOOL DULL. 2. DRILL DOES NOT PASS COMPLETELY THROUGH PIECE.
RAPID DULLING OF DRILL	1. FEED TOO LIGHT. 2. SPINDLE SPEED TOO FAST. 3. INSUFFICIENT LUBRICATION FROM COOLANT.

DIFFICULTY	COMMON CAUSES
MELTED SURFACE	1. TOOL DULL. 2. INSUFFICIENT CLEARANCE. 3. INSUFFICIENT COOLANT SUPPLY.
ROUGH FINISH	1. FEED TOO HEAVY. 2. TOOL IMPROPERLY SHARPENED. 3. CUTTING EDGE NOT HONED.
SPIRAL MARKS	1. TOOL RUBS DURING ITS RETREAT (USE SAME FALL ON CAM AS RISE). 2. BURR ON POINT OF TOOL.
CONCAVE OR CONVEX SURFACE	1. POINT ANGLE TOO GREAT. 2. TOOL NOT PERPENDICULAR TO SPINDLE. 3. TOOL DEFLECTING (USE NEGATIVE RAKE). 4. FEED TOO HEAVY. 5. TOOL MOUNTED ABOVE OR BELOW CENTER.
NIBS OR BURRS AT CUT-OFF POINT	1. POINT ANGLE NOT GREAT ENOUGH. 2. TOOL DULL OR NOT HONED. 3. FEED TOO HEAVY.
BURRS ON OUTSIDE DIAMETER	1. NO CHAMFER BEFORE CUT-OFF. 2. TOO DULL.
TURNING & BORING	
MELTED SURFACE	1. TOOL DULL OR HEEL RUBBING. 2. INSUFFICIENT SIDE CLEARANCE. 3. FEED RATE TOO SLOW. 4. SPINDLE SPEED TOO FAST.
ROUGH FINISH	1. FEED TOO HEAVY. 2. INCORRECT CLEARANCE ANGLES. 3. SHARP POINT ON TOOL (SLIGHT NOSE RADIUS REQUIRED). 4. TOOL NOT MOUNTED ON CENTER.
BURRS AT EDGE OF CUT	1. NO CHAMFER PROVIDED AT SHARP CORNERS. 2. TOO DULL. 3. INSUFFICIENT SIDE CLEARANCE. 4. LEAD ANGLE NOT PROVIDED ON TOOL (TOOL SHOULD EASE OUT OF CUT GRADUALLY, NOT SUDDENLY).
CRACKING OR CHIPPING OF CORNERS	1. TOO MUCH POSITIVE RAKE ON TOOL (USE NEGATIVE RAKE). 2. TOOL NOT EASED INTO CUT. (TOOL SUDDENLY HITS WORK). 3. DULL TOOL. 4. TOOL MOUNTED BELOW CENTER. 5. SHARP POINT ON TOOL (SLIGHT NOSE RADIUS REQUIRED).
CHATTER	1. TOO MUCH NOSE RADIUS ON TOOL. 2. TOOL NOT MOUNTED SOLIDLY ENOUGH. 3. MATERIAL NOT SUPPORTED PROPERLY. 4. WIDTH OF CUT TOO WIDE (USE TWO CUTS).

This information, based on our experience, is in line with accepted engineering practice and is believed to be reliable. However, we do not warrant the conformity of our materials to the listed properties of our materials for a particular purpose. This publication is not to be taken as a license to operate under, or a recommendation to infringe any existing patents.

MILITARY SPECIFICATIONS

MIL-P-77	Cast Polyester or Diallylphthalate sheet and rod.	MIL-P-19904	Plastic Sheet ABS Copolymer, Rigid.
MIL-P-78A	Engraving Stock Rigid Laminated sheet.	MIL-M-20693A	Plastic Molding Material, Rigid, Polyamide.
MIL-P-79C	Thermoset Rod and Tube, Melamine and Phenolic, Glass, Cotton and Paper Reinforced.	MIL-P-21094A	Cellulose Acetate, Optical Quality.
MIL-P-80	Acrylic Sheet, Anti-Electrostatic Coated.	MIL-P-21105C	Plastic Sheet, Acrylic, Utility Grade.
MIL-I-631	Electrical Insulation Tubing, Film, Sheet and Tape, Vinyl, Polyethylene and Polyester.	MIL-P-21347B	Plastic Molding Material, Polystyrene, Glass Fiber Reinforced.
MIL-I-742C	Fiberglass Thermal Insulation board.	MIL-M-21470	Polychlorotrifluoroethylene Resin for Molding.
MIL-P-997C	Thermoset Silicone Resin Sheets, Glass Reinforced.	MIL-I-21557B	Insulation Sleeving, Electrical, Flexible Vinyl Treated Glass Fiber.
MIL-Y-1140E	Fiber Glass Yarn, Cord Sleeving, Tape and Cloth.	MIL-P-21922A	Plastic Rods and Tubes Polyethylene.
MIL-P-3054A	Polyethylene Special Material.	MIL-P-22035	Plastic Sheet, Polyethylene.
MIL-P-3086	Non-Rigid Polyamide (Nylon) Resin.	MIL-P-22076A	Insulation Sleeving, Electrical, Flexible Low Temperature.
MIL-P-3115B	Thermoset Phenolic Sheet, Paper Reinforced.	MIL-P-22096A	Plastic, Polyamide (Nylon) Flexible Molding and Extrusion Material.
MIL-P-3158C	Insulation Tape and Cord Glass, Resin Filled.	MIL-I-22129C	Insulation Sleeving, Electrical, Non-Rigid PTFE TFE Resin.
MIL-I-3190B	Insulation Sleeving, Flexible, Treated.	MIL-P-22241A	Plastic Sheet and Film, PTFE TFE.
MIL-I-3825A	Insulation Tape, Electrical, Self-Fusing.	MIL-P-22242	Cancelled — Refer to MIL-P-22241.
MIL-P-4640A	Polyethylene Film for balloon use.	MIL-P-22270	Plastic Film, Polyester, Polyethylene Coated (For I.D. Cards).
MIL-P-5425B	Acrylic Sheet, Heat Resistant.	MIL-P-22296	Plastic Tubes and Tubing, Heavy Wall, PTFE TFE Resin.
MIL-P-5431A	Phenolic, Graphite Filled Sheet, Rods, Tubes and Shapes.	MIL-P-22324A	Thermoset Epoxy Resin Sheet, Paper Reinforced.
MIL-P-6264B	Vinyl Copolymers, Unplasticized unpigmented and unfilled.	MIL-T-22742	Insulation Tape, Electrical, Pressure Sensitive, PTFE TFE Resin.
MIL-I-7444B	Insulation Sleeving, Flexible Electrical.	MIL-P-22748A	Plastic Material for Molding and Extrusion, High Density Polyethylene and Copolymers.
MIL-I-7798A	Insulation Tape, Electrical, Pressure Sensitive.	MIL-I-23053A	Insulation Sleeving, Electrical, Flexible, Heat-Shrinkable. Film Tape, Pressure Sensitive.
MIL-P-8059A	Thermoset Phenolic Resin Sheets and Tubes. Asbestos Paper and Cloth Reinforced.	MIL-T-23142	Plastic Sheets, Virgin and Borated Polyethylene.
MIL-P-8184	Acrylic Plastic Sheet, Modified.	MIL-P-23536	Insulation Tape, Electrical, High Temperature, PTFE, Pressure Sensitive.
MIL-P-8257	Polyester Base, Cast Transparent Sheet, Thermosetting.	MIL-I-23594A	Nomex Film.
MIL-P-8587A	Cellulose-Acetate Sheet Coloured, Transparent.	MIL-I-24204	Plastic Sheet, Acrylic, Coloured and White, Heat Resistant Shipboard Application.
MIL-P-8655A	Thermoset Phenolic Sheet, Postforming Cotton Reinforced.	MIL-P-24191	Plastic Sheet, Acrylic, Modified, Laminated.
MIL-P-1394C	Laminated Plastic Sheet, Copper-Clad.	MIL-P-25374A	Heat-Resistant, Glass Fiber Base Polyester Resin, Low Pressure Laminated Plastic.
MIL-P-9969	Polyurethane, Rigid, unicellular, Foam-In-Place for packaging.	MIL-P-25395A	Glass Fiber Base — Epoxy Resin Low Pressure Laminated Plastic.
MIL-P-13436A	Filled Phenolic Sheet, Uncured.	MIL-P-25421A	Silicone Resin, Glass Fiber Base, Low Pressure Laminated Plastic.
MIL-P-13491	Polystyrene Sheet, Rod and Tube.	MIL-P-25518A	Plastic Sheets and Parts, Modified Acrylic Base.
MIL-P-13949D	Copper-Clad, Laminated Plastic Sheets (Paper base and Glass Base).	MIL-P-25690A	Monolithic, Crack Propagation Resistant — Covers Stretched Acrylic 0.060" Thru 0.675" in Thickness. Thermoset Phenolic Resin Sheet, Asbestos Reinforced. Plastic Tubes and Tubing, Polyethylene.
MIL-P-14591B	Plastic Film, Non Rigid, Transparent.	MIL-P-25770A	Plastic Sheet FEP Fluorocarbon unfilled, Copper-Clad.
MIL-P-15035C	Thermoset Phenolic Sheet, Cotton Reinforced.	MIL-P-26692	Tape, Anti-Seizing, PTFE TFE.
MIL-P-15037E	Thermoset Melamine Resin Sheet, Glass Reinforced.	MIL-P-27538	Plastic Material, Cellular, Polystyrene.
MIL-P-15047B	Thermoset Phenolic Resin Sheet, Nylon Reinforced.	MIL-P-27730A	Thermoset Phenolic Resin Rod, Nylon Reinforced.
MIL-I-15126F	Insulation Tape, Electrical, Pressure Sensitive and Thermoset Adhesive.	MIL-P-40619	Tape, Pressure Sensitive, Filament Reinforced Plastic Film.
MIL-P-16413	Methyl Methacrylate Molding Materials.	MIL-P-43037	Plastic Low-Molecular Weight Polyethylene.
MIL-P-16414	Cellulose Acetate Butyrate Molding Materials.	MIL-T-43036	Chlorotrifluoroethylene Polymer — Sheets, Rods and Tubes (Plaskon).
MIL-P-16416	Cellulose Acetate Molding Materials.	MIL-P-43081	Phenolic Sheet, Heat Resistant, Glass Fabric Reinforced.
MIL-P-17091B	Polyamide (Nylon) resin Rods, Sheets and Parts.	MIL-P-46036	Plastic Sheet, Flexible Vinyl.
MIL-P-17276	Cellulose Acetate Sheet.	MIL-P-46041	Plastic Material Nylon.
MIL-P-17549C	Fibrous Glass Reinforced Plastic Laminates. For Marine Applications.	MIL-P-46060	Plastic Sheet and Strip, Polyimide H-Film.
MIL-P-18057A	Insulation Sleeving, Flexible Silicone Rubber Coated Glass.	MIL-P-46112	Plastic Molding and Extrusion Material,
MIL-P-18080	Vinyl, Flexible, Transparent, Optical Quality.	MIL-P-46115	Polyphenylene Oxide PPO.
MIL-P-18177C	Thermoset Epoxy Sheet, Glass Reinforced.	MIL-P-46120	Plastic Molding and Extrusion Material Polysulfone.
MIL-P-18324C	Thermoset Phenolic, Cotton Reinforced, Moisture Resistant.	MIL-P-46122	Plastic Molding Material, Polyvinylidene Fluoride — Kynar.
MIL-N-18352	Nylon Plastic, Flexible Molded or Extruded.	MIL-P-46129	Plastic Molding and Extrusion Material,
MIL-I-18622A	Insulation Tape, Electrical, Pressure Sensitive Silicone Rubber Treated Glass.	MIL-P-46131	Polyphenylene Oxide, Modified — Noryl.
MIL-I-18746A	Insulation Tape, Glass Fabric TFE Coated.	MIL-P-52189	Polyphenylene Oxide, Modified, Glass Filled.
MIL-M-19098	Molding Plastics, Polyamide (Nylon), and Molded and Extruded Polyamide Plastic.	MIL-P-55010	Thermoset Phenolic Resin Tube, Nylon Reinforced.
MIL-I-19161A	Plastic Sheet, PTFE TFE and Glass Cloth Laminated. Insulation Tape Electrical, Pressure Sensitive, High Temperature Glass.	MIL-P-81390	Plastic Sheet, Polyethylene Terephthalate.
MIL-I-19166A	Plastic Sheets, Polyethylene, Virgin and Borated, Neutron Shielding.	MIL-P-82540	Plastic Molding Material, Polycarbonate, Glass Fiber Reinforced.
MIL-P-19336C	Plastic Rods Molded and Extruded PTFE TFE.		Polyester Resin, Glass Fiber Base, Filament Wound Tube.
MIL-P-19468A	Molding, Acrylic, Coloured and White, Heat Resistant, for Lighting Fixtures.		
MIL-P-19735B	Glass Filled Diallylphthalate Resin.		
MIL-P-19833B			

FEDERAL SPECIFICATIONS

L-P-315	Polyethylene Pipe.	L-P-505B	Shatter-Resistant, Rigid, Reinforced, Translucent, Corrugated Sheet, Polyester, Acrylic or Combination.
L-P-349A	Cellulose Acetate Butyrate, Molding and Extrusions.	L-P-506	Polystyrene, Biaxially Oriented Sheet and Film.
L-P-350	PVC Sheet type 1, Normal Impact.	L-P-507	Acrylic Sheet, Extruded.
L-P-370	Copolymer of Vinyl and Vinylidene Chloride plastic Film.	L-P-508	Laminated, Decorative and Non-Decorative Plastic Sheet.
L-P-375B	Vinyl Chloride Plastic Film, Flexible.	L-P-509A	Thermoset Sheet, Rod and Tube.
L-P-377A	Polyethylene Terephthalate Plastic Film.	L-P-511	Thermoset Phenolic Sheet, Cotton Reinforced, Post-Forming.
L-P-378A	Polyethylene Plastic Film, Thin Gage.	L-P-512A	Polyethylene Sheet.
L-P-380	Methacrylate Molding Material.	L-P-513A	Thermoset Phenolic Sheet, Paper Reinforced.
L-P-383	Glass Fiber Base, Low Pressure Polyester Resin Laminated.	L-P-514A	Adhesive Coated, Paper-Backed, Plastic Sheet.
L-P-385A	Polychlorotrifluoroethylene (KEL-F) Molding Material.	L-P-516A	Thermosetting Resins Cast from Monomers Sheet and Rods.
L-P-386	Cellular Urethane, Flexible.	L-P-517A	Scribe-Coated Plastic Sheet.
L-P-387	Polyethylene Low and Medium Density — Molding Material.	L-P-519B	Tracing, Glazed and Matted Finish Plastic Sheet.
L-P-389A	FEP Fluorocarbon for Molding and Extrusion.	L-P-523	FEP Fluorocarbon Extruded Sheet and Film.
L-P-390A	Low and Medium Density Polyethylene Molding Material.	L-P-524	Polyethylene, Laminated, Nylon reinforced Sheet.
L-P-391A	Methacrylate Sheets, Rods, and Tubes, Cast.	L-P-526	Styrene Acrylonitrile Sheet.
L-P-392A	Acetal Material, Injection Molding and Extrusion.	L-P-527A	Styrene-Butadiene Sheet.
L-P-393A	Polycarbonate Material, Molding and Extrusion.	L-P-528A	Cellulose Acetate and Polyester Sheet Adhesive Coated.
L-P-394A	Polypropylene Material for Injection Moldings and Extrusion.	L-P-535	Polyvinylchloride and PVC-Vinyl Acetate Copolymer Film Rigid.
L-P-395A	Polyamide (nylon) Molding Material, Glass Fiber Filled.	L-P-535E	Polyvinyl-Chloride Sheet, Rigid, High Impact.
L-P-396	Polystyrene Molding Material.	L-P-540	Polyvinylchloride Tube Heavy Wall Rigid.
L-P-397	Cellulose Acetal, Molding Material.	L-P-545	Polyethylene Tubing, Flexible.
L-P-398	Styrene Butadiene Molding Material.	L-P-590	Polyethylene Sheets, Rods, Tubing.
L-P-399	Styrene-Acrylonitrile Molding Material.	L-P-1036	Polyvinylchloride Heavy Wall.
L-P-401	Urea-Formaldehyde Molding Material.	L-P-1040	Polyvinylfluoride Sheets and Strips.
L-P-403	Polytetrafluoroethylene (PTFE TFE) Molding Material.	L-P-1125	Phenolic Resin Molding Material.
L-P-410	Polyamide (Nylon), Rigid, Sheets, Rods, Tubes, and Molded Parts.	L-P-1174	Chlorotrifluoroethylene Copolymer Extruded.
L-P-501	Polyvinylidene Chloride (Saran) Molded.	L-P-1183	ABS Rigid Molding Material.
L-P-503	Polyvinyl Chloride Rod, Solid and Rigid.		
L-P-504B	Cellulose Acetate Sheet and Film.		

AMS SPECIFICATIONS

3564B	Fibre Sheet — Vulcanized.	3623	Elastomeric Tubing — Electric Insulation, Irradiated
3570A	Polyurethane Foam, Flexible — Open Cell Medium Flexibility, 2.5lb. per cu. ft.		Polychloroprene, Flexible, Heat Shrinkable, 1.750 to 1 Shrink Ratio.
3580	Plastic Castings — Methyl Methacrylate, General Purpose.	3624A	Plastic Moldings & Extrusions — Cellulose Acetate Butyrate.
3581	Plastic Castings — Methyl Methacrylate, Heat Resistant.	3625	Elastomeric Tubing — Electrical Insulation, Crosslinked Silicone, Pigmented, Flexible, Heat Shrinkable, 1.750 to 1.
3590A	Plastic Sheet, Copper Faced — Paper Reinforced Phenol-Formaldehyde.	3626C	Plastic Moldings & Extrusions — Methyl Methacrylate.
3598A	Plastic Sheet, Copper Faced — Glass Fabric Reinforced Polytetrafluoroethylene.	3627	Plastic Moldings & Extrusions — Methyl Methacrylate, Heat Resistant.
3601B	Plastic Sheet, Copper Faced — Glass Fabric Reinforced Epoxy Resin.	3628A	Plastic Moldings & Extrusions — Polycarbonate.
3605D	Plastic Sheet — Post Forming, Cotton Fabric Reinforced Phenol-Formaldehyde.	3629	Tubing — Extruded — Polyvinyl Chloride, High Temperature, Electrical Insulation.
3607C	Plastic Sheet and Plate — Cotton Fabric Reinforced Phenol-Formaldehyde.	3630C	Plastic Extrusions — Flexible — Polyvinyl Chloride.
3608	Plastic Sheet — Methyl Methacrylate, General Purpose.	3631	Plastic Extrusions — Flexible — High Temperature, Polyvinyl Chloride.
3609	Plastic Sheet — Methyl Methacrylate, Heat Resistant.	3632B	Plastic Tubing — Electrical Insulation, Irradiated Polyvinylidene Fluoride, Heat Shrinkable, Semi-Rigid, 2 to 1 Shrink Ratio.
3610C	Sheet — Water Vapor Resistant, Flexible, Transparent.	3633	Plastic Tubing — Electrical Insulation, Irradiated Polyolefin, Heat Shrinkable.
3611A	Plastic Sheet — Polycarbonate.	3634	Plastic Tubing — Electrical Insulation, Polyolefin, Dual Wall, Semi-Rigid, Heat Shrinkable.
3612	Polyester Film, Electrical Grade, General Purpose.	3635A	Plastic Sheet — Cellular, Shock Absorbing, Closed Cell, Foamed, Modified Vinyl Sheet.
3615B	Plastic Tubing — Cotton Fabric Reinforced Phenol-Formaldehyde.		
3617	Plastic Moldings & Extrusions — Polyamide (Nylon).		
3620B	Plastic Moldings & Extrusions — Polystyrene.		
3622A	Plastic Moldings & Extrusions — Cellulose Acetate, General Purpose.		

AMS SPECIFICATIONS

3636B	Plastic Tubing — Electrical Insulation, Irradiated Polyolefin, Heat Shrinkable, Pigmented, Flexible, 2 to 1 Shrink Ratio.	3690	Adhesive Compound — Epoxy, Room Temperature Curing.
3637B	Plastic Tubing — Electrical Insulation, Irradiated Polyolefin, Clear, Flexible, Heat Shrinkable, 2 to 1 Shrink Ratio.	3691	Adhesive Compound — Epoxy, Medium Temperature Application.
3638B	Plastic Tubing — Electrical Insulation, Irradiated Polyolefin, Semi-Rigid, Pigmented, Heat Shrinkable, 2 to 1 Shrink Ratio.	3692	Adhesive Compound — Epoxy, High Temperature Application.
3639B	Plastic Tubing — Electrical Insulation, Irradiated Polyolefin, Clear, Semi-Rigid, Heat Shrinkable, 2 to 1 Shrink Ratio.	3693	Adhesive Modified Epoxy — Mod. Heat Resist., 250°F Curing, Film Type.
3640B	Plastic Moldings — Melamine-Formaldehyde, Mineral Filled.	3710	Sandwich Structures — Glass Fabric-Resin, Low Pressure Molded, Heat Resistant.
3641A	Plastic Moldings, Thermosetting — Phenol-Formaldehyde, Macerated Fabric Filled.	3720	Paper Honeycomb — 60lb. Paper.
3642A	Plastic Moldings — Laminated, Thermosetting Resin, Glass fabric Reinforced Heat Resistant, 500°F.	3722	Paper Honeycomb — 125lb. Paper.
3643	Plastic Moldings, Thermosetting — Glass Roving Filled Silicone, Heat Resistant.	3730	Potting Compound — Foamed Epoxy Type, Amine Hardened.
3645	Polytrifluorochloroethylene, Compression Molded — Heavy Sections, Unplasticized (Kel-F).	3734	Potting Compound — Epoxy, Unfilled, General Purpose — Room Temperature Cure.
3646	Polytrifluorochloroethylene Molded Sheet, Unplasticized.	3735A	Potting Compound — Epoxy, Filled, 10-15 CTE, 225 HDT.
3647	Polyfluoroethylenepropylene Film and Sheet.	3736	Potting Compound — Epoxy, Filled, 25-30 CTE, 175 HDT, Room Temperature Cure.
3648	Polytrifluorochloroethylene — Tubing, Unplasticized, (Kel-F).	3737	Potting Compound — Epoxy, Unfilled, 35-40 CTE, 160 HDT, Room Temperature Cure.
3649A	Polytrifluorochloroethylene — Film, Unplasticized, (Kel-F).	3738A	Potting Compound — Epoxy, Filled, 15-20 CTE, 180 HDT.
3650A	Polytrifluorochloroethylene — Unplasticized, (Kel-F).	3739A	Potting Compound — Epoxy, Filled, 9-12 CTE, 250 HDT.
3651C	Polytetrafluoroethylene, (PTFE).	3740A	Potting Compound — Epoxy, Filled, 15-20 CTE, 225 HDT, Free Machining.
3652A	Polytetrafluoroethylene Film, (PTFE).	3750	Potting Compound — Epoxy, Flexible, Durometer 75-85.
3653C	Extruded Polytetrafluoroethylene — Tubing, Electrical Insulation, Standard Wall, (PTFE).	3780	Copper Wire — Polytetrafluoroethylene Covered, Miniature.
3654A	Extruded Polytetrafluoroethylene — Tubing, Electrical Insulation, Light Wall, (PTFE).	3781	Copper Wire — Magnet, Single Film Insulated, High Temperature.
3655	Extruded Polytetrafluoroethylene — Tubing, Electrical Insulation, Thin Wall, (PTFE).	3802B	Cloth — Airplane Cotton, Mercerized, 50 lb. Breaking Strength.
3656A	Polytetrafluoroethylene Extrusions, Radiographically Inspected, Normal Strength — As Sintered.	3804A	Cloth — Airplane Cotton, Mercerized, 65 lb. Breaking Strength.
3657	Polytetrafluoroethylene Extrusions, Radiographically Inspected, Premium Strength — As Sintered.	3806B	Cloth — Airplane Cotton, Mercerized, 80 lb. Breaking Strength.
3658	Polytetrafluoroethylene Extrusions, Radiographically Inspected, Premium Strength, Stress Relieved.	3810A	Tape — Adhesive — Cloth Back.
3659	Polytetrafluoroethylene Extrusions, Premium Strength, Stress Relieved.	3815A	Braid, Flat, Nylon-Electrical-Tying, Synthetic Rubber Coated.
3660	Polytetrafluoroethylene Moldings, As Sintered — General Purpose Grade.	3816	Braid, Flat, Nylon — Electrical Tying, Wax Coated.
3661	Polytetrafluoroethylene Film Premium Grade.	3817A	Braid, Flat, Nylon — Electrical Tying, Resin Coated.
3662	Polytetrafluoroethylene Film, General Purpose Grade.	3825	Fabric Glass (181) — Chrome Treated.
3663	Fabric, Glass — Vinyl Coated, Porous.	3828	Glass Roving, Epoxy Resin Preimpregnated, Type E Glass.
3664	Fabric, Glass — Vinyl Coated.	3830	Cloth-Silica, "B" Stage Phenolic Resin Impregnated High Pressure Molding.
3666	Polytetrafluoroethylene Sheet, Glass Fabric Reinforced.	3835	Fabric, Glass (181) — Decorative Grade.
3667	Polytetrafluoroethylene Sheet — Molded, As Sintered — General Purpose Grade.	3839	Fabric, Asbestos Wire Reinforced, Polytetrafluoroethylene Impregnated, Sintered.
3668	Polytetrafluoroethylene — Moldings, Premium Grade, As Sintered.	3840	Asbestos-Polytetrafluoroethylene Impregnated, Sintered.
3676A	Insulation, Sound & Thermal — Resin-Bonded Glass Fiber, Medium Filament.	3842	Asbestos Fiber Reinforced — Polytetrafluoroethylene Sheet, TFE Fluorocarbon Resin.
3680	Insulation, Thermal — Silica Fiber.	3843	Asbestos Fiber Reinforced — Polytetrafluoroethylene Sheet, TFE Fluorocarbon Resin — High Compressibility.
3681	Adhesive, Electrically Conductive — Silver — Organic Resin.	3851A	Fire Resistant Properties for Aircraft Materials.
3682	Coating, Electrically Conductive — Silver — Organic Resin.	3852A	Flame Resistant Properties for Aircraft Materials.
3685A	Adhesive — Synthetic Rubber — Buna N Type.	3855A	Flame Resistance Treatment of Inferior Fabrics.
		3858	Asbestos Felting — "B" Stage Phenolic Resin Impregnated, Low Pressure Molding.
		3870A	Ceramic — Moldings and Extrusions, Dense, Ultra-High Alumina (99% Al ₂ O ₃).
		3880	Crystallized Glass Ceramic.

I N D E X

ABS		CELCON — see Acetal		Sheet	101
Rod	74			Tubing, corrugated	87
Sheet	74	CELLULOSE ACETATE		Tubing, heat-shrink	88
Welding Rod	74	Sheet, cast	75	Tubing, flexible	88
		Sheet, extruded	75		
ACETAL		CEMENT	95-98	FRP PANELS	78
Rod, black	19			FILM	
Rod, natural	20	CHEMICAL		FEP	101
Sheet, black	18	RESISTANCE CHART	120-132	Halar	101
Sheet, natural	18			PFA	101
Strip	18	COPOLYESTER		Polyethylene	26
Tube	19	Sheet	72	Polysulfone	101
				PVDF	99
ACETATE		CPVC		Tefzel	101
— See Cellulose Acetate		Rod, round	43		
		Rod, welding	41	FLUOROSINT	99
ACRYLIC		Sheet	43		
Colour chart	59	CUTTING	Inside Front Cover	FOAM PVC	
Rod, cast	62			Sheet	73
Rod, extruded	63	CUTTING BOARDS, HIGH-DENSITY			
Sheet, cast, clear	60	POLYETHYLENE	23	GEAR BLANKS, NYLON	7
Sheet, cast, colours	60			GEAR RING BLANKS, NYLON	7
Sheet, Acrylic, clear	58	CYLINDERS — see Tubes,			
Sheet, Acrylic, colours	58	Tubular Bars		GLAZING SHEETS	
Sheet, other	61			Acrylic	58-61
Tube, cast	64-66	DELTRIN — see Acetal		PVC, clear	37
Tube, extruded	67			Polycarbonate	68-69
Additional products	61,63	DELTRIN AF			
		Rod	20	HALAR	101
ACRYLITE — see Acrylic		Sheet	20	HOSE	83
ADHESIVES	95-98	DOOR STRIP, FLEXIBLE PVC	77	HOT AIR TOOLS	
ANGLES — see Profiles		ENGRAVING STOCK	76	Leister	89-91
				Wegener	92
ARBORITE		ERTALYTE			
— see Industrial Laminates		Rod	21	HYZOD — see Polycarbonate	
		Sheet	21		
BAR — see Rod		ETCHING SOLUTION,		INDUSTRIAL LAMINATES	
		FOR PTFE	98	Rod CE	34
BELTS, GLASS FABRIC,				Rod G10	34
TFE COATED	49	FABRICATING	Inside Front Cover	Sheet CE	33
				Sheet G10	33
BOLTS, NYLON	17	FEP		JAYCOR — see PVC	
BONDING KIT, PTFE	98	Film	101	JAYFLEX TUBING	82
		Rod	101	JAYFLEX BRAID TUBING	83
BUSHING STOCK		Roll covers, shrinkable	88	JAYON TUBING	80-81
Nylatron GS	13				
Nylon Type 6/6	13				

I N D E X

JAYSEAL THREADSEAL TAPE	49	NYLATRON GS — See Nylon, Type 66, MDS-Filled	NYLON 101 — see Nylon Type 66
JAYTREX — see Polyethylene, ultra-molecular weight		NYLATRON GSM — See Nylon, Type 6, MDS-Filled	PCTFE — See Kel-F 101
JAYTRON — see Nylon		NYLATRON NSM	PEEK
KYDEX	76	Rod 10	Sheet 98
KYNAR		Sheet 7	Rod 99
Film 99		Tubular Bar 15	PERFORATED SHEETS 37
Rod 99		NYLON	PFA 101
Sheet 98		TYPE 6, CAST	PHENOLICS — see Industrial Laminates
Tubing, heat-shrink 88		Gear blanks 7	PIPE — see PVC
Flexible 88		Gear ring blanks 7	PLATE — see Sheet
LEISTER WELDING EQUIPMENT	89-92	Rod 10	PLEXIGLAS — see Acrylic
LEXAN — see Polycarbonate		Sheet GSM, GSM Blue +MC901 7	POLYAMIDES — see Nylon
LUCITE — see Acrylic		Sheet, Natural 8	POLYCARBONATE
MACHINING Inside Front Cover		Tubular Bar 14-15	Rod 70
MACHINING INSTRUCTIONS 133		TYPE 6 EXTRUDED	Sheet 68-69
MAKROLON — see Polycarbonate		Rod 11	Tubing 71
MC901 — see Nylon, Type 6, cast		Sheet 8	POLYESTER
METHYLENE DICHLORIDE 97		Tubing 79	Roll 76
MICARTA — see Industrial Laminates		Tubular Bar 11	Sheet 76
MIRRORED ACRYLIC SHEET 61		TYPE 6, MDS-FILLED	POLYETHYLENE, HIGH DENSITY
MYLAR — see Polyester		Rod, cast 10	Cutting board 23
NEMA GRADES, INDUSTRIAL LAMINATES 31-32		Sheet, cast 7	Rod 25
NORYL 101		Tubular Bar, cast 14-15	Roll stock 22
NUTS, NYLON 17		TYPE 6/6	Sheet, natural 22,23
		Bushing stock 13	Sheet, black 22
		Rod 12	Welding rod 25
		Sheet 9	LOW DENSITY
		Strip 9	Film 26
		Tubing 79	Rod 24
		TYPE 6/6, MDS-FILLED	Roll stock 22
		Bushing stock 13	Sheet 24
		Profiles 16	Tubing 84
		Rod 12	Welding rod 25
		Sheet 9	
		Strip 9	
		TYPE 11	
		Flexible tubing 79	

I N D E X

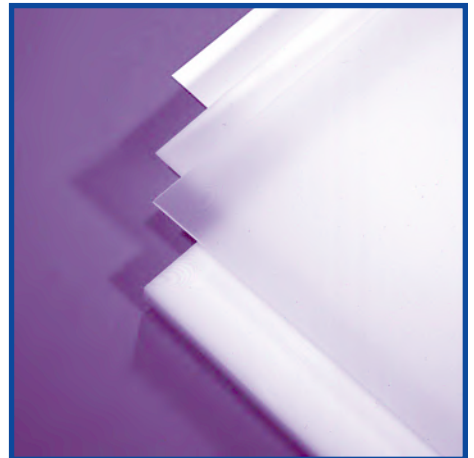
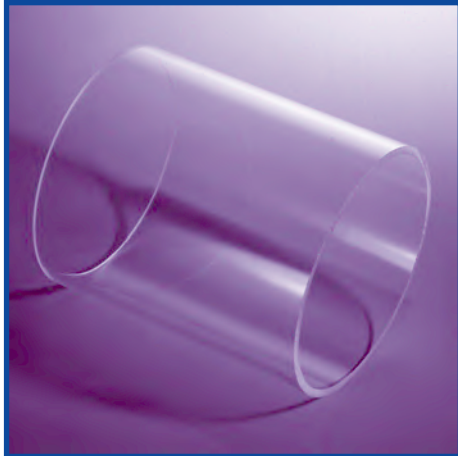
ULTRA HIGH MOLECULAR WEIGHT		PVC		PFA	101
Angles	30	RIGID		Polyimide	100
Dogbone	30	Angles	40	Polycarbonate	70
Profiles	30	Pipe	42	Polyethylene, high-density	25
Rod	29	Rod, hexagonal	40	Polyethylene, low-density	24
Sheet, black	28	Rod, round	39	Polyethylene, UHMW	29
Sheet, natural	27	Rod, welding	41	Polypropylene	46
Tape	27	Sheet, clear	37	Polystyrene, cross linked	101
Tivar 88	28	Sheet, foam	73	Polysulfone	101
Tubular Bar	29	Sheet, grey type 1	36	Polyurethane	101
		Sheet, grey type 2 (high-impact)	36	PPS	100
POLYIMIDE — see Vespel		Sheet, perforated	37	PVC	39
		Sheet, white	38	PVDF	99
POLYOLEFIN				PTFE, glass-filled, extruded	51
HEAT SHRINK TUBING	88	FLEXIBLE		PTFE, glass-filled, moulded	50
		Door strip	77	PTFE, reprocessed, extruded	51
POLYPHENYLENE SULFIDE	100	Roll stock	77	PTFE, virgin, extruded	51
		Tank lining	41	PTFE, virgin, moulded	50
POLYPROPYLENE		Tubing	80-83	Tefzel	101
Rod	46			Torlon	99
Sheet, black	45	PVDF — see Kynar		Ultem	100
Sheet, copolymer	45				
Sheet, natural	44	REZ-N-BOND	97		
Sheet, white	44			RODS, THREADED, NYLON	11
Welding rod	46				
POLYSTYRENE, CROSS LINKED	101	RODS, HEXAGONAL			
		Nylon	12		
POLYSTYRENE, HIGH IMPACT	73	PVC	40	RODS, WELDING	
				ABS	74
POLYSULFONE	101	RODS, ROUND		CPVC	41
		ABS	74	PVC	41
POLYURETHANE	101	Acetal	19,20	Polyethylene, high-density	25
		Acrylic, cast	62	Polyethylene, low-density	25
POLYVINYL CHLORIDE — see PVC		Acrylic, extruded	63	Polypropylene	46
		CPVC	43		
		Delrin AF	20	ROLLCOVERS, PTFE FEP, HEAT SHRINKABLE	88
		Ertalyte	21		
		FEP	101		
		Fluorosint	100	ROLLS	
		Industrial Laminates CE	34	Flexible PVC tank liner	77
		Industrial Laminates G10	34	Mylar	76
		MC901	10	PTFE coated glass fabric	49
		Nylatron GS	12		
		Nylatron GSM	10	ROLLSTOCK	
		Nylatron NSB	12	Flexible vinyl	77
		Nylatron NSM	10	Polyethylene, high-density	22
		Nylon Type 6	11	Polyethylene, low-density	22
		Nylon Type 6/6	12		
		PCTFE	101		
		PEEK	99	SANALITE	
				— see Polyethylene, high-density, cutting board	

I N D E X

SDP SHEETS	61	SHRINKABLE TUBING	88	Tubing, heavywall	55-56
SCREWS, NYLON	17	SILICON, HEAT-SHRINK TUBING	88	Tubing, shrinkable	88
SHEETS		SLEEVES, HEAT-SHRINKABLE	88	Tubing, spiral-cut wrap	86
ABS	74	STRIP		Tubular Bar	52-54
Acetal	18	Acetal	18	TEFZEL	101
Acrylic, cast	60	Nylatron GS	9	THREADSEAL TAPE	49
Acrylic	58	Nylon Type 66	9	TIVAR 88 SHEET	28
CPVC	43	TFE — see PTFE		TREATING AGENT	98
Cellulose Acetate	75	TFE/FEP DUAL WALL		TORLON	99
Cellulose Acetate Butyrate	75	SHRINK TUBING	88	TUBES	
Copolyester	72	TANK LINERS, FLEXIBLE PVC	41	Acetal	19
Engraving Stock	76	TAPES		Acrylic, cast	64-66
Ertalyte	21	Fluorosint	100	Acrylic, extruded	67
FEP	101	PTFE skived PTFE	48	Polycarbonate	71
Fluorosint	100	threadseal PTFE	49	Polyimide	100
Foam PVC	73	glass fabric		Polyurethane	101
Halar	101	adhesive backed	49	TUBING	
Industrial Laminates CE	33	UHMW	27	Braid-reinforced,	
Industrial Laminates G10	33	TECHNICAL DATA	102	flexible PVC	83
Kydex	76	PTFE FLUOROPLASTICS		Convoluted TFE	86
MC901	7	Cylinders	52-54	Corrugated, PTFE FEP	87
Noryl	101	Film, FEP	101	Heavy-wall, PTFE TFE	55-56
Nylatron GS	9	Glass fabric, TFE coated	49	Jayflex	82
Nylatron GSM	7	Rod, extruded, glass-filled	51	Jayon	80-81
Nylatron NSB	9	Rod, extruded, mechanical	51	Jayflex Braid	83
Nylatron NSM	7	Rod, extruded, virgin	51	Nylon	79
Nylon Type 6	8	Rod, moulded, glass-filled	50	Polyethylene, low-density	84
Nylon Type 6/6	9	Rod, moulded, virgin	50	Shrinkable	88
PCTFE	101	Roll covers, FEP	88	Spaghetti, PTFE TFE Spiral	88
PEEK	98	Sheets, TFE, filled	47	wrap TFE	86
PFA	101	Sheets, TFE, mechanical	47	PTFE FEP	88
Polycarbonate	68-69	Sheets, TFE, virgin	47	PTFE TFE	85
Polyimide	100	Tape, skived	48	TUBULAR BARS	
Polyester, Mylar	76	Tape, threadseal	49	Acetal	19
Polyethylene, high-density	22,23	Tubing, convoluted	86	Fluorosint	100
Polyethylene, low-density	24	Tubing, corrugated	87	MC901	14-15
Polyethylene, UHMW	27,28	Tubing, flexible, FEP	88	Nylatron GSM	14-15
Polypropylene	44,45	Tubing, flexible, PFA	88	Nylon, cast	14-15
Polystyrene, cross linked	101	Tubing, flexible, TFE	85	Nylon, extruded	11
Polystyrene, high impact	73	Tubing, flexible, Tefzel	88	PVC	42
Polysulfone	101			Polyethylene, UHMW	29
Polyurethane	101			Polyimide	100
PPS	100			Polyurethane	101
PVC	36-38			PPS	100
PVDF	98			PTFE, moulded	52-54
SDP	61				
PTFE	47				
Tefzel	101				
Tivar 88	28				
Torlon	99				
Ultem	100				
Vinyl	76				

I N D E X

TUFFAK — see Polycarbonate	URETHANE 101	WELDING INFORMATION 93-94
TYGON — see Jayon	VESPEL POLYIMIDE 100	WELDING ROD
UHMW — see Polyethylene, ultra-high molecular weight	VINYL — see PVC	ABS 74
ULTEM 100	VITON HEAT-SHRINK TUBING 88	CPVC 41
UVA ACRYLIC SHEET 61	VIVAK — see Copolyester	PVC 41
UVF ACRYLIC SHEET 61	WELDING EQUIPMENT, LEISTER 89-92	Polyethylene, high-density 25
UVT ACRYLIC SHEET 61	WEGENER 92	Polyethylene, low-density 24
		Polypropylene 46
		WELD-ON 95-97



REGISTERED TRADEMARKS

ACRYLITE — ACRYLIC SHEETS CYRO INDUSTRIES	LUCITE — ACRYLIC RESIN LUCITE INTERNATIONAL
CELAZOLE — POLYBENZIMIDAZOLE CELANESE ACETATE	MAKROLON — POLYCARBONATE SHEETS BAYER CORPORATION
CELCON — ACETAL COPOLYMERS CELANESE PLASTICS & SPECIALTIES CO.	MC 901 — MONOMER CAST NYLON QUADRANT ENGINEERING PLASTIC PRODUCTS
CHEMGRIP — ADHESIVES AND AGENTS FOR PTFE CHEMPLAST, INC.	MC 907 — MONOMER CAST NYLON, FOOD GRADE QUADRANT ENGINEERING PLASTIC PRODUCTS
DELRIN — ACETAL HOMOPOLYMERS DUPONT CO.	MICARTA — INDUSTRIAL LAMINATES NORPLEX
DELRIN AF — DELRIN/TFE BLEND DUPONT CO.	MYLAR — POLYESTER FILM, SHEET DUPONT CO.
ERTALYTE — PET QUADRANT ENGINEERING PLASTIC PRODUCTS	NORYL — MODIFIED PHENYLENE OXIDE SABIC INNOVATIVE PLASTICS
EXCELINER — FRP FOODGRADE SHEETS GRAHAM PRODUCTS LTD.	NYLATRON — FILLED NYLONS QUADRANT ENGINEERING PLASTIC PRODUCTS
EXCELON — VINYL TUBING THERMOPLASTIC PROCESSES, INC.	PERSPEX — ACRYLIC LUCITE INTERNATIONAL
FLUOROSINT — TFE — MICA FILLED QUADRANT ENGINEERING PLASTIC PRODUCTS	PLEXIGLAS — ACRYLIC DEGUSSA
HALAR — ECTFE SOLVAY SOLEXIS	REZ-N-BOND — SOLVENT CEMENT SCHWARTZ CHEMICALS
HYGARD — POLYCARBONATE LAMINATES SHEFFIELD PLASTICS	SEMITRON — STATIC DISSIPATIVE PRODUCTS QUADRANT ENGINEERING PLASTIC PRODUCTS
HYZOD — POLYCARBONATE SHEETS SHEFFIELD PLASTICS	PTFE — TFE, FEP AND PFA FLUOROCARBONS DUPONT CO.
JAYCOR — PVC SHEET, ROD, TUBE JOHNSTON INDUSTRIAL PLASTICS	TEFZEL — FLUOROPOLYMER RESIN DUPONT
JAYFLEX — FLEXIBLE PVC TUBING JOHNSTON INDUSTRIAL PLASTICS	TIVAR 88 — PREMIUM UHMW SHEET QUADRANT ENGINEERING PLASTIC PRODUCTS
JAYON — FLEXIBLE PVC TUBING JOHNSTON INDUSTRIAL PLASTICS	TORLON — POLYAMIDE-IMIDE AMOCO CHEMICALS CORP.
JAYSEAL — PTFE THREADSEAL TAPE JOHNSTON INDUSTRIAL PLASTICS	TYGON — FLEXIBLE PVC TUBING SAINT-GOBAIN PERFORMANCE PLASTICS
JAYTREX 1000 — UHMW POLYETHYLENE JOHNSTON INDUSTRIAL PLASTICS	ULTEM — POLYETHERIMIDE SABIC INNOVATIVE PLASTICS
JAYTRON — NYLON SHEET, ROD, TUBE JOHNSTON INDUSTRIAL PLASTICS	VESPEL — POLYIMIDES DUPONT CO.
KYDEX — ACRYLIC/PVC SHEET KLEERDEX	VITON — FLUOROELASTOMERS DUPONT CO.
KYNAR — POLYVINYLIDENEFLUORIDE ARKEMA CANADA INC	VIVAK — COPOLYESTER SHEFFIELD PLASTICS
LEXAN — POLYCARBONATE SABIC INNOVATIVE PLASTICS	WELD-ON — CEMENTS IPS CORPORATION

TERMS AND CONDITIONS

- 1) PRICES:** Unless otherwise specified, all prices quoted by Johnston Industrial Plastics are subject to change without notice. Prices are exclusive of taxes and any applicable tax will be billed as a separate item to be paid by the Purchaser. Minimum order on account is \$50.00. A \$10.00 service charge will be applied to orders under \$50. Minimum may be higher on custom orders.
- 2) DELIVERY:** Unless otherwise specifically indicated in writing, all sales are made F.O.B. point of shipment with title then passing to the Purchaser. In the case of damage in transit, it will be the responsibility of the Purchaser to file a claim with the carrier whether that carrier was preselected or chosen by Johnston Industrial Plastics. Shipping dates are approximate and shall not be taken as being fixed or guaranteed. Johnston Industrial Plastics shall not be liable for failure to deliver or for delay in delivery due to causes beyond its reasonable control including, but not limited to: acts of God, acts of the Purchaser, acts of civil or military authority, fire, strike, delay in transportation, manufacturing difficulties or any other commercial problem.
- 3) CREDIT and PAYMENTS:** Goods will be supplied on account after credit has been established. Normal company policy is for the first three orders to be on C.O.D basis after which time credit history and requirements will be analyzed. Each shipment shall be considered a separate transaction with payment being made accordingly. If, in the judgement of Johnston industrial Plastics, the financial condition of the Purchaser at the time of the shipment or manufacture does not justify the terms of payment specified on order (unless otherwise specified Net 30 days), Johnston Industrial Plastics may require full or partial payment in advance of completion of the order.
- 4) RETURNS and CANCELLATIONS:** Return of goods will only be accepted after written authorization has been given by Johnston Industrial Plastics. Material modified by the customer or cut up for shipping purposes, custom fabricated parts or specially run material will not be accepted. Goods returned prepaid in original condition will be subject to a 25% restocking charge. The Purchaser may cancel an order upon providing written notice to Johnston Industrial Plastics and agrees to any reasonable cancellation charges that might arise.
- 5) TECHNICAL INFORMATION:** We believe that our technical information is the best currently available. However, it is not intended to be used as design data but is to be used as a guide to material selection. It is suggested that users conduct their own tests to determine the suitability of any product. The product information contained in this publication or any other technical advice furnished by any representative of Johnston Industrial Plastics concerning the use or application of any product is believed to be reliable but no warranty, written or oral, express or implied, including any warranty of merchantability or fitness of purpose, is made. This information is not licence to operate under or intended to suggest infringement of any existing patents.
- 6) WARRANTY:** Product distributed by Johnston Industrial Plastics is sold in accordance with the tolerance and quality standards of the manufacturer of the goods. Product which proves to be defective will be repaired or replaced subject to the warranty of that specific manufacturer.
- 7) LIMITATION OF LIABILITY:** Any claim for loss shall be limited to the value of the product supplied or part thereof involved in the claim. Johnston Industrial Plastics shall not be liable for any: labour charges, downtime costs, costs of claims arising from the Purchaser's customers, loss of profits or revenue, cost of substitute materials or any other consequential damages.
- 8) GENERAL:** Any order or statement of intent to purchase product shall constitute agreement with the above terms and conditions. Any additional or different terms or conditions set out by the Purchaser, written or oral, or expressed verbally by any representative of Johnston Industrial Plastics, will not be binding upon Johnston Industrial Plastics unless agreed to in writing by an authorized management representative of Johnston Industrial Plastics. Unless otherwise agreed to, we reserve the right to under or over ship up to 10% of the quantity of any order.

TORONTO

20 Fleeceline Road,
Toronto, Ontario M8V 2K3
Phone: (416) 252-9551
Fax: (416) 255-7706 **1-800-268-2220**

MONTREAL

1916 - 32e Avenue,
Lachine, Quebec H8T 3J7
Phone: (514) 636-5055
Fax: (514) 636-5797 **1-800-363-8742**

WINNIPEG

81 Paramount Road,
Winnipeg, Manitoba R2X 2W6
Phone: (204) 633-9256
Fax: (204) 633-4929 **1-800-665-7455**

EDMONTON

4724-91 Avenue,
Edmonton, Alberta T6B 2L1
Phone: (780) 465-0431
Fax: (780) 466-9641 **1-800-661-5658**

