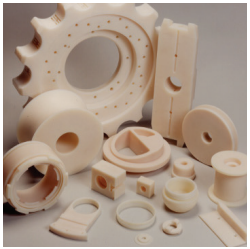
Engineering Plastics Product Catalogue



TEGNIKA TRADING CC
T/A INDUSTRIAL TOOLING & FASTENING

Industrial Tooling & Fastening specialises in professional tools and materials including tool attachments, engineering steel and plastics, and high-tensile fasteners. ITF is indeed proudly Namibian and have been in business for more than ten years. Our main objective is to supply professional Namibians with top quality specialty tools and materials to support the construction, mining, agricultural, automotive and engineering sectors.

ITF, in association with our trusted suppliers, aim to bring you the highest quality engineering plastics to suit the professional standard your industry requires.

Although this catalogue provides a brief overview of each plastic, you are welcome to request more detailed information at itf@iway.na

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PA 6 Natural “Nylon”

PA 6 Natural “Nylon” is available in a variety of colours or black colour. It is made by ionic polymerisation of e-caprolactam under anhydrius conditions in the presence of strong acids or bases. It has a higher tensile, compressive and flexural strength than extruded or injection moulding Nylon 6. This is because gravitationally cast Nylon 6 has a higher molecular weight and higher crystalinity.

» Nylon Round

INGREDIENTS
Chemical Characterization: Cast Polyamide 6, Cast Nylon 6, white/cream.
Description: Semi finished-product in sheet, rod, plate and tubes shapes and blocks, or as manufactured engineering components.
Composition: Polyamide 6.

PHYSICAL AND CHEMICAL PROPERTIES
Form: Solid
Appearance: Blocks, rods, tubes and sheets.
Colour: White/cream
Odour: Odourless
Melting temperature: 210-230°C
Flash point: Estimated to be around 370°C
Density: 1.13 – 1.15 g/cm^3
Solubility in water: Insoluble

PA 6 Natural “Nylon” is available in standard plate, rod and over thousands of tube OD/ID configurations in several different lengths.

BENEFITS OF PA 6 NATURAL “NYLON”

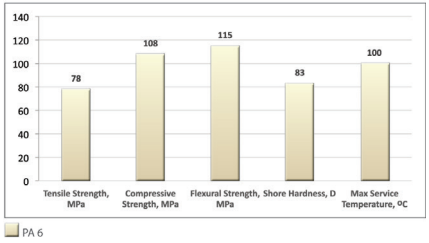
- Good mechanical, thermal and chemical resistance properties.
- Universally acknowledged as the primary engineering polymer.
- Good PV and load bearing capabilities.
- Improved characteristics over extruded polymides.
- Good wear and abrasion resistance.
- Good dimensional stability, largely free from internal stresses.
- FDA Compliance
- Available in a wide range of sizes and colours.

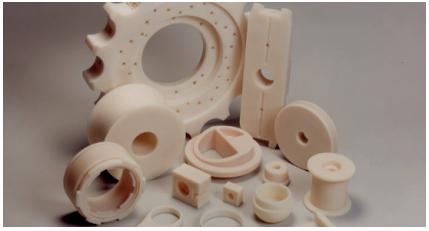
TYPICAL APPLICATIONS

- Rollers
- Switch collar
- Washers
- Bearings
- Load support
- Bushes
- Centralizers
- Cable drums
- Guide clutch
- Seals
- Blockers
- Wear pads
- Chain Guide
- Clamps
- Bespoke Components

INDUSTRY USES

- Petrochemical
- Aerospace
- Railways
- Ship building
- Food and drink packaging
- Bottling and canning
- Pharmaceuticals
- Steel mills
- Quarrying/mining
- Cranes
- Shoe manufacturing
- Conveyors





Cast Nylons are a range of polyamides produced by a casting process involving the anionic polymerisation of caprolactam. This process allows the production of semi-finished plate, rod, tube and custom castings that are largely free of internal stresses. Generally accepted as the primary engineering polymer, natural cast nylon is suitable for virtually any plain bearing application, not to mention a huge range of other applications for which this versatile grade finds a use. By varying the conditions of polymerisation the mechanical properties of cast nylon may be altered to suit specific applications and the performance of the basic polymer can be enhanced with the addition of various additives, fillers, lubricants and colourants.

Compared with injection moulding and extrusion grades of polyamide, cast nylons stand out with their improved mechanical, thermal and chemical resistance properties. Specifically as the material has a higher tensile, compressive and impact strength as well as an improved resistance to creep and heat ageing. The reasons for these improved characteristics are high crystalinity and a remarkably higher molecular weight. Due to low water absorption, mechanical properties and dimensions are more stable, making it suited for components that have to meet closer tolerances. Abrasion resistance and overall wear performance are probably the material's most important characteristics. For use in bearing applications and in applications where food contact is involved, cast nylons may be offered as a material conforming to FDA approvals.

Cast Nylon 6 has been shown to be physically and dimensionally stable for prolong use/exposure in sea water.

Natural cast nylon has the ability to operate effectively without the need for lubricants and has an increased resistance to wear of over 5 times that for plain bearings manufactured from non-ferrous metals. As is the case with virtually all nylons it is easy to machine, pleasant to work with and relatively light weight – one eighth that of brass – making the handling and fitting of large components manufactured in cast nylon a relatively easy matter.

PA 6 NATURAL “NYLON”

PROPERTY	TEST METHOD	NOTES	METRIC	UNITS	IMPERIAL	UNITS
GENERAL						
Colour	-	-	-	Natural, Black	-	Natural, Black
Density	ISO 1183:1997	Test Method A	g/cm^3	1.141	lb/inchE3	0.042
Moisture Absorption (Equilibrium)	ISO 62:1999 (modified)	50% RH, 23°C	%	2.5	%	2.5
Water Absorption @24 hrs	ISO 62:1999 (modified)	Immersion @ 23°C	%	0.3	%	0.3
Water Absorption @24 hrs Saturation	ISO 62:1999	Immersion @ 23°C	%	7	%	7
MECHANICAL						
Tensile Strength at Yield	ISO 527-1/2:1993	Sample Type 1B, 50mm/min	MPa	75-80	psi	11.6k
E-modulus	ISO 527-1/2:1993	Sample Type 1B, 50mm/min	MPA	3400-3600	psi	580k
Elongation at Break	ISO 527-1/2:1993	Sample Type 1B, 50mm/min	%	>20	%	>20
Compressive Strength	ISO 604:2002	Sample Type B, 5mm/min	MPa	95-120	psi	13.8k
Compressive Modulus	ISO 604:2002	Sample Type A, 1mm/min	MPa	2100-2700	psi	392k
Flexural Strength	ISO 178:2001	1.5mm/min	MPa	105-125	psi	15.3k
Flexural Modulus	ISO 178:2001	1.5mm/min	MPa	3300-3600	psi	478k
Izod Impact Strength	ISO 180:2000	Sample Type A (notched)	kJ/m^2	4.5-6.0	ft.lb/inE2	2.9
Dynamic Coefficient of Friction	-	31.4m/min, 1.75MPa	-	0.16	-	0.16
Limiting PV	-	-	MPa/m	100	psi.ft/min	2.9k
K-Factor (wear factor)	-	31.4m/min, 1.75MPa	m*3/Nm	4.3x10E-5	-	2.4x10E4
Hardness (Shore D)	ISO 868: 2003	Scale D	Shore D	83	Shore D	83

THERMAL						
Melting Temperature, Tg	-	-	°C	223	°F	433
Glass Transition Temperature	ISO 11359:1999	-	°C	65	°F	149
Heat Deflection Temperature, HDT/A	ISO 75	1.80MPa	°C	75	°F	167
Max/Min Continuous Service Temperatures	-	-	°C	100/-40	°F	212/-40
Max/Min Infermittent Service Temperatures	-	-	°C	170/-100	°F	338/-148
Coefficient of Linear Thermal Expansion	ISO 11359-2:1999	23-55°C	°C[1]	8x10E-5	°F,E-1	4.4x10E-5
Thermal Conductivity	ISO 8301:1991	Mean T = 20°C	W/moC	0.26	°F	0.15
Flammability	IEC 60695-11-10:2003-08	-	-	HB	-	HB
ELECTRICAL						
Dielectric Constant	IEC 60250:1969-01	1 & 100 Hz	-	3.7 & 4	-	3.7 & 4
Dissipation Factor	IEC 60250:1969-01	100 Hz	-	0.02	-	0.02
Dielectric Stength	IEC 60243:-1:1998-01	-	kV/m	25	kV/in	635
Volume Resistivity	IEC 60093:1980-01	-	ohm.m	>1x10E13	ohm.m	4x10E14
Surface Resistivity	IEC 60093:1980-01	-	ohm.m	>1x10E12	ohm.m	>1x10E12
Comparative Tracking Index	IEC 60112:2003-01	-	CTI	600	CTI	600
FDA Compatibility						
				YES		YES

PRODUCT AVAILABILITY

Rod	10mm-500mm DIA
Tube	50mm-1000mm OD
Plate	8mm-100mm THICKNESS
Custom Castings	Bespoke
Cut to size	Available upon request

NOTES

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Moly “Nylatron”

Moly “Nylatron” is part of the cast Nylon 6 family. Its improved crystallization occurs by the addition of Molybdenum Disulphide. It includes MoS_2, which is an extremely effective dry lubricant. This also improves the properties of wear and abrasion resistances, combined with lower water absorption.

» Nylatron Round & Hollow

PHYSICAL AND CHEMICAL PROPERTIES
Form: Solid
Appearance: Blocks, rods, tubes and sheets.
Colour: Black/grey
Odour: Odourless
Melting temperature: 210 - 230°C
Flash point: Estimated to be around 370°C
Density: 1.130 – 1.150 g/cm³
Solubility in water: Insoluble

INGREDIENTS
Chemical characterization: Cast Polyamide 6, (Cast Nylon 6)
Description: Semi finished-product in shapes such as sheet, rods, plates, tubes and blocks.
Composition: Contains small amounts of monomer Caprolactam (CAS No. 105-60-2)and Molybdenum Disulphide – CAS1317-33-5

Moly “Nylatron” is a cast nylon material in which improved crystallisation occurs by the addition of Molybdenum Disulphide. On account of this the superficial hardness increases (providing excellent machine ability) and simultaneously the general mechanical and anti-friction properties are improved. Due to the fact that the crystal structure breaks down immediately before the melting temperature is reached, the thermal properties of the material are improved over the basic grade.

MoS2 provides a degree of self lubrication leading to an improvement in the wear properties of the material. These improved properties, combined with lower water absorption, extend the range of applications that Moly has over Natural cast nylon. Dynamic bearing applications at elevated operating temperatures of up to 105ºC are particularly suited to this material.

STABILITY & REACTIVITY

Conditions to Avoid:
Temperatures above recommended service temperature may cause deformation of product.

Materials to Avoid: Strong acids, strong oxidizing agents and certain salts may have detrimental effect on product. A Chemical Resistance Chart can be obtained with technical data for the material. In general, contact with solutions of pH >12 and <2 will cause deterioration of the material.

Hazardous Decomposition Products: Thermal decomposition occurs at temperatures above the melting temperature. Combustion products are: carbon dioxide, CO2, carbon monoxide, CO, oxides of nitrogen, NOx and traces of hydrogen cyanide, HCN.

BENEFITS OF MOLY “NYLATRON”

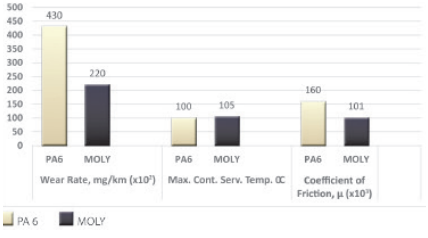
- Increased superficial hardness provides excellent machine ability.
- Improvement in wear properties as a result of dry lubricant.
- Improved anti-friction properties.
- Improved mechanical properties.
- Elevated operating temperatures.
- Lower water absorption.
- Improved dimensional stability.
- Excellent chemical resistance properties.
- Good PV and load bearing capabilities.
- Extended range of applications.

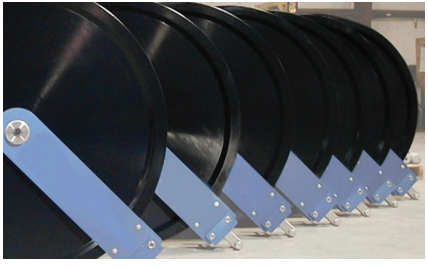
TYPICAL APPLICATIONS

- Sheaves
- Wear pads
- Rollers
- Bearings
- Spacers
- Bush
- Slide pads
- Chain Wheel
- Chain sheaves
- Hose Clamp
- Wear strips
- Wear plates
- Spacer
- Bespoke Components

INDUSTRY USES

- Aerospace
- Cranes
- Railways
- Conveyors
- Ship building
- Offshore
- Food and drink packaging
- Agriculture
- Steel mills
- Waste Management
- Quarrying and mining
- Construction





MOLY “NYLATRON”

PROPERTY	TEST METHOD	NOTES	METRIC	UNITS	IMPERIAL	UNITS
GENERAL						
Colour	-	-	-	Black	-	Black
Density	ISO 1183:1997	Test Method A	g/cm^3	1.15	lb/inchE3	0.041
Moisture Absorption (Equilibrium)	ISO 62:1999 (modified)	50% RH, 23°C	%	2.1	%	2.1
Water Absorption @24 hrs	ISO 62:1999 (modified)	Immersion @ 23°C	%	0.2	%	0.2
Water Absorption @24 hrs Saturation	ISO 62:1999	Immersion @ 23°C	%	6.3	%	6.3
MECHANICAL						
Tensile Strength at Yield	ISO 527-1/2:1993	Sample Type 1B, 50mm/min	MPa	75-80	psi	11.7k
E-modulus	ISO 527-1/2:1993	Sample Type 1B, 50mm/min	MPA	3800-4000	psi	629k
Elongation at Break	ISO 527-1/2:1993	Sample Type 1B, 50mm/min	%	>20	%	>20
Compressive Strength	ISO 604:2002	Sample Type B, 5mm/min	MPa	105	psi	15.3k
Compressive Modulus	ISO 604:2002	Sample Type A, 1mm/min	MPa	2500-2700	psi	348k
Flexural Strength	ISO 178:2001	1.5mm/min	MPa	100-110	psi	13.8k
Flexural Modulus	ISO 178:2001	1.5mm/min	MPa	3000-3200	psi	430k
Izod Impact Strength	ISO 180:2000	Sample Type A (notched)	kJ/mm^2	5.5-7.0	ft.lb/inE2	3.5
Dynamic Coefficient of Friction	-	31.4m/min, 1.75MPa	-	0.101	-	0.101
Limiting PV	-	-	MPa/m	100	psi.ft/min	2.9k
K-Factor (wear factor)	-	31.4m/min, 1.75MPa	m*3/Nm	2.2x10E-5	-	1.1x10E4
Hardness (Shore D)	ISO 868: 2003	Scale D	Shore D	80	Shore D	80

PROPERTY	TEST METHOD	NOTES	METRIC	UNITS	IMPERIAL	UNITS
THERMAL						
Melting Temperature, Tg	-	-	°C	221	°F	430
Glass Transition Temperature	ISO 11359:1999	-	°C	68	°F	154
Heat Deflection Temperature, HDT/A	ISO 75	1.80MPa	°C	80	°F	176
Max/Min Continuous Service Temperatures	-	-	°C	105/-40	°F	221/40
Max/Min Infermittent Service Temperatures	-	-	°C	170/-100	°F	338/-148
Coefficient of Linear Thermal Expansion	ISO 11359-2:1999	23-55°C	$°C^{-1}$	8.51E-05	°F,E-1	4.7x10E-5
Thermal Conductivity	ISO 8301:1991	Mean T = 20°C	W/moC	0.28	°F	0.17
Flammability	IEC 60695-11-10:2003-08	-	-	HB	-	HB
ELECTRICAL						
Dielectric Constant	IEC 60250:1969-01	1 & 100 Hz	-	3.7 & 4	-	3.7 & 4
Dissipation Factor	IEC 60250:1969-01	100 Hz	-	0.11	-	0.11
Dielectric Stength	IEC 60243:-1:1998-01	-	kV/m	25	kV/in	635
Volume Resistivity	IEC 60093:1980-01	-	ohm.m	>1x10E13	ohm.m	4x10E14
Surface Resistivity	IEC 60093:1980-01	-	ohm.m	>1x10E12	ohm.m	>1x10E12
Comparative Tracking Index	IEC 60112:2003-01	-	CTI	600	CTI	600
FDA Compatibility						
				NO		NO

Nylanite “Vesconite”

Nylanite is an unreinforced, self lubricating, semi-crystalline thermoplastic polyester, demonstrating dimensional stability similar to Acetal, combined with the comparable wear resistance of nylon.
Heavily loaded mechanical precision components subjected to sustained abrasive environments are particularly suited to this material.

» Nylanite Round & Hollow

BENEFITS
Excellent dimensional stability
High mechanical strength, hardness and rigidity
Good wear & creep resistance
Low moisture absorbtion
Low thermal expansion

PHYSICAL AND CHEMICAL PROPERTIES
Form: Solid
Appearance: Blocks, rods, tubes and sheets.
Colour: Grey
Odour: Odourless
Melting temperature: 247.94°C
Density: 1.38 g/cm^3
Solubility in water: Insoluble

TYPICAL APPLICATIONS
- Wear rings
- Thrust washers
- Split Bearings
- BushesVanes

INDUSTRY USES
- Construction
- Rail
- Pumps
- Marine
- Pneumatics

NYLANITE “VESCONITE”

PROPERTY	TEST METHOD	NOTES	METRIC	UNITS
GENERAL				
Colour	-	-	-	Grey
Density	ISO1183:1987	Test Method A	g/cm^3	1.38
Water Absorption @24 hrs	ISO 62:1999 (modified)	Immersion @ 23°C	%	0.06
Water Absorption @24 hrs Saturation	ISO 62:1999	Immersion @ 23°C	%	0.3
MECHANICAL				
Tensile Strength at Yield	ISO 527-1/2:1993	Sample Type 1B, 50mm/min	MPa	78
E-modulus	ISO 527-1/2:1993	Sample Type 1B, 50mm/min	MPA	3000
Elongation at Break	ISO 527-1/2:1993	Sample Type 1B, 50mm/min	%	9.16
Compressive Strength	ISO 604:2002	Sample Type B, 5mm/min	MPa	122.84
Compressive Modulus	ISO 604:2002	Sample Type A, 1mm/min	MPa	2252
Flexural Strength	ISO 178:2001	1.5mm/min	MPa	123.12
Flexural Modulus	ISO 178:2001	1.5mm/min	MPa	3550
Izod Impact Strength	ISO 180:2000	Sample Type A (notched)	kJ/mm^2	3.994
Dynamic Coefficient of Friction	-	31.4m/min, 1.75MPa	-	0.12
Hardness (Shore D)	ISO 868:2003	-	Shore D	79.9

NYLANITE “VESCONITE” continued

PROPERTY	TEST METHOD	NOTES	METRIC	UNITS
THERMAL				
Melting Temperature, Tg	-	-	°C	247.94
Max/Min Continuous Service Temperatures	-	-	°C	100/-40
Max/Min Infermittent Service Temperatures	-	-	°C	150/-60
Coefficient of Linear Thermal Expansion	ISO 11395-2:1999	23°C - 55°C	$°C^{-1}$	6 x 10-5
Flammability	IEC 60695-11-10:2003-08	-	-	HB
ELECTRICAL				
Dielectric Constant	IEC 60250:1969-01	1 & 100 Hz	-	3.7 & 4
Dielectric Stength	IEC 60243-1:1998-01	-	kV/m	25
Comparative Tracking Index	IEC 60112:2003-01	-	CTI	600

PRODUCT AVAILABILITY	
Rod	10mm-500mm DIA
Tube	50mm-1000mm OD
Plate	8mm-100mm THICKNESS
Custom Castings	Bespoke
Cut to size	Available upon request

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Keylon® PTFE “Teflon”

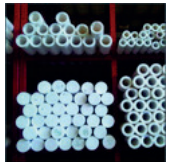
PTFE Virgin Grade has the lowest coefficient of all materials and is ideal in applications where lubricants are not desirable as KEYLON® PTFE functions without any lubricants. PTFE has the widest working temperature range of all plastics, from -260°C to 260°C. PTFE is excellent for use in cryogenic applications as shows no embrittlement. KEYLON® PTFE has very good sealing properties. PTFE is not flammable unless in 94% oxygen environment. KEYLON® PTFE is an excellent insulating material. KEYLON® PTFE is not ideal in high wear abrasive applications or in high loading applications. Here filled PTFE is used to improve resistance to load and wear.

» Teflon Round

KEYLON® PTFE is a unique thermoplastic and is resistant to almost all corrosive chemicals, except for alkali metals.

PHYSICAL AND CHEMICAL PROPERTIES

Form: Solid
Appearance: Rods, tubes and sheets.
Melting temperature: 327°C
Solubility in water: Insoluble



KEYLON® PTFE TEFLON

PROPERTY	TEST METHOD	NOTES	METRIC	UNITS
GENERAL				
Water Absorption	ASTM D570	-	%	0.0
MECHANICAL				
Tensile Strength	ASTM D1708	-	MPa	25-40
Specific Gravity	ASTM D792	-	-	2.13-2.19
Elongation at Break	ASTM D1708	-	%	280-450
Flexural Modulus	ASTM D790	-	MPa	490
Deformation @ 14.2 MPa, 1hr	ASTM D621	-	%	12-13
Deformation @ 14.2 MPa, 24hrs	ASTM D621	-	%	14-15
Impact Strength, 23°C	ASTM D256	-	J/m	185
Impact Strength, -54°C	ASTM D256	-	J/m	107
Coefficient of Friction	ASTM D1894	Static (500psi)	-	00.05-0.08
Coefficient of Friction	ASTM D1894	Dynamic (10 fpm)	-	0.1
Wear Factor	PIN ON DISC	-	mm3/Nm	0.5-2 x 10-3
Hardness (Shore D)	ASTM D2240	-	Shore D	54-59
THERMAL				
Melting Temperature	-	-	°C	327
Max/Min Continuous Service Temperatures	-	without load	°C	260/-260

Flame Rating	UL-94	-	-	94 V-0
Heat of Combustion	ASTM D240	23°C - 55°C	MJ/kg	5.1
Thermal Conductivity @ 35°C	ASTM C177	-	W/(mK)	0.24
ELECTRICAL				
Dielectric Constant	ASTM D150	-	106Hz	2.1
Dielectric Stength, in air	ASTM D150	-	kV/mm	59
Relative Permittivity	ASTM D150	-	103-106Hz	2.1

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BENEFITS OF KEYLON® PTFE

- Chemically inert to all known industrial chemicals;
- Low co-efficient of friction, non-stick & non-toxic;
- Wide temperature range (-260°C to +260 °C);
- Exhibits excellent permeation resistance;
- Excellent dielectric properties.
- Adding fillers to KEYLON® PTFE increases wear-life and hardness.

TYPICAL APPLICATIONS

- Chemical applications
- Sealing applications
- Insulating materials in demanding electrical applications, and low friction applications.

INDUSTRY USES

- Gaskets
- Bearing pads
- Chemical equipment
- Valve seats
- Valves in gas cylinders & bellows

Ertalyte®

Ertalyte® is an unreinforced, semi-crystalline thermoplastic polyester based on polyethylene terephthalate (PET-P). It is manufactured from proprietary resin grades. It is characterized as having the best dimensional stability coupled with excellent wear resistance, a low coefficient of friction, high strength, and resistance to moderately acidic solutions.

» Ertalyte PET-P Round

PHYSICAL AND CHEMICAL PROPERTIES
Form: Solid
Appearance: Rods, tubes and sheets.
Colour: Natural/black
Odour: Odourless
Solubility in water: Insoluble

BENEFITS
Good for both wet and dry environments.
High strength and rigidity - ideal for close tolerance parts.
Excellent stain resistance.
Good wear resistance and excellent dimensional stability.
Better resistance to acids than nylon or acetal.

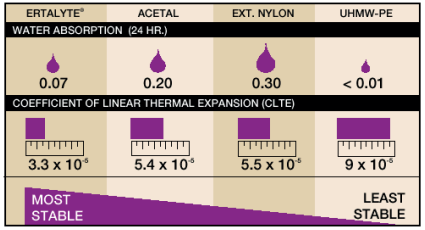
TYPICAL APPLICATIONS
- Manifolds
- Food Equipment Components
- Carousel, filter track, locating disk & ring

INDUSTRY USES
- Food Processing & Packaging

Ertalyte®'s properties make it especially suitable for the manufacture of precision mechanical parts which are capable of sustaining high loads and enduring wear conditions. Ertalyte®'s continuous service temperature is 210°F (100°C) and its melting point is almost 150°F higher than acetals. It retains significantly more of its original strength up to 180°F (85°C) than nylon or acetal.

In addition, Ertalyte® PET-P offers good chemical and abrasion resistance. Its low moisture absorption enables mechanical and electrical properties to remain virtually unaffected by moisture. Ertalyte® PET-P can be machined to precise detail on standard metal working equipment.

Fig. 11 - **STABILITY OF ENGINEERING MATERIALS**



Ertalyte® is available as a "Food Grade".

Ertalyte is FDA compliant in natural color and on request also in black. Natural colored Ertalyte® is also 3A-Dairy compliant. The material is an excellent candidate for parts used in the food processing and equipment industries.

Polyethylene (HDPE)

Polyethylene is well known in the polymer family and is often referred to as PE. High-density polyethylene (HDPE) is used in a variety of applications and industries where excellent impact resistance, high-tensile strength, low moisture absorption and chemical and corrosion resistance properties are required.

» High-Density Polyethylene (HDPE) Round

BENEFITS
Good toughness and flexibility.
Good resistance to chemical cracking.
Low heat resistance.
Low coefficient of friction.
High impact strength.
Adaptive thermoplastic.
Low moisture absorption.
Light Weight

PHYSICAL AND CHEMICAL PROPERTIES
Form: Solid
Appearance: Rods, tubes and sheets.
Colour: White; black; blue
Odour: Odourless
Melting temperature: 133°C
Density: 0.95 g/cm^3
Solubility in water: Insoluble

TYPICAL APPLICATIONS
- Rollers
- Tanks
- Chain guides
- Wear strips
- Sprockets
- Bearings

INDUSTRY USES
- Packaging applications
- Agricultural
- Paper mills
- Medical equipment
- Textiles equipment

POLYETHYLENE (HDPE)

PROPERTY	TEST METHOD	NOTES	METRIC	UNITS	IMPERIAL	UNITS
GENERAL						
Colour	-	-	-	Black|White|Blue	-	Black|White|Blue
Density	ISO 1183:1997	Test Method A	g/cm^3	0.95	$lb/inch^3$	0.052
Moisture Absorption (Equilibrium)	ISO 62:1999	50% RH, 23C	%	0.1	%	0.1
Water Absorption @24 hrs	ISO 62:1999 (modified)	Immersion @ 23°C	%	0.01	%	0.01
Water Absorption @24 hrs Saturation	ISO 62:1999	Immersion @ 23°C	%	0.01	%	0.01
MECHANICAL						
Tensile Strength at Yield	ISO 527-1/2:1993	Sample Type 1B, $50mm/min^{-1}$	MPa	36	psi	14058
E-modulus	ISO 527-1/2:1993	Sample Type 1B, $50mm/min^{-1}$	MPA	2700	psi	391603
Elongation at Break	ISO 527-1/2:1993	Sample Type 1B, $50mm/min^{-1}$	%	1000	%	1000
Compressive Strength	ISO 604:2002	Sample Type B, $5mm/min^{-1}$	MPa	110	psi	15954
Compressive Modulus	ISO 604:2002	Sample Type A, $1mm/min^{-1}$	MPa	2600	psi	377099
Flexural Strength	ISO 178:2001	$1.5mm/min^{-1}$	MPa	36	psi	14058
Flexural Modulus	ISO 178:2001	$1.5mm/min^{-1}$	MPa	1400	psi	5221
Izod Impact Strength	ISO 180:2000	Sample Type A (notched)	kJ/m^2	7.20	$ft.lb/in^2$	3.43
Dynamic Coefficient of Friction	-	3.14m/min, 1.75MPa	-	0.18	-	0.18
Limiting PV	-	-	MPa/m.min	6	psi.ft/min	2712
K-Factor (wear factor)	-	3.14m/min, 1.75MPa	mg/km	-	-	-
Hardness (Shore D)	-	Scale D	Shore D	65	Shore D	65

THERMAL						
Melting Temperature, Tg	-	-	°C	113	°F	271
Glass Transition Temperature	ISO 11359-2:1999	-	°C	-60	°F	-76
Heat Deflection Temperature, HDT/A	ISO 75	1.80MPa	°C	110	°F	230
Max Continuous Service Temperatures	-	5000 hours	°C	68	°F	154
Max Infermittent Service Temperatures	-	-	°C	140	°F	284
Coefficient of Linear Thermal Expansion	ISO 11359-2:1999	23-55°C	$°C^{-1}$	20 $x10^{-5}$	$°F^{-1}$	11.1 $x10^{-5}$
Thermal Conductivity	ISO 8301:1991	Mean T = 20°C	W/m°C	0.31	°F	0.18
Flammability	IEC 60695-11-10:2003-08	-	-	HB	-	HB
ELECTRICAL						
Dielectric Constant	IEC 60250:1969-01	1 & 100 Hz	-	2.18	-	2.18
Dissipation Factor	IEC 60250:1969-01	100 Hz	-	0.005	-	0.005
Dielectric Stength	IEC 60243-1:1998-01-01	-	kV/mm	16.5	kV/in	419.1
Volume Resistivity	IEC 60093:1980-01	-	ohm.m	$1x10^{13}$	ohm.m	$3.93x10^{14}$
Surface Resistivity	IEC 60093:1980-01	-	ohm.m	$1x10^{13}$	ohm.m	$1x10^{13}$
Comparative Tracking Index	IEC 60112:2003-01	-	CTI	600	CTI	600
FDA Compatibility						
				NO		**NO**

PRODUCT AVAILABILITY

Rod	16 - 400 DIA
Tube	20mm – 250mm
Plate	6mm – 100mm THICK
Custom Castings	-
Cut to size	Available upon request

NOTES

• All information contained in this literature correspond with our current knowledge of the products.
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ROUTE OF EXPOSURE & FIRST AID MEASURES

Routes of exposure:

Skin Contact: Dust and particles generated during machining in contact with skin may cause irritation. Hot or molten polymer can burn the skin.

Eye Contact: Dust and fine particles generated during machining may cause mechanical irritation. Vapor from hot/molten product can cause irritation.

Inhalation: Dust, particles and chips can be generated during machining of cast shapes. Dust may irritate the mucous membranes of the nose and throat. Vapour from hot/molten Hproduct can cause irritation.

Ingestion: Ingestion is not likely root of exposure, although the generated dust, particles and chips could be swallowed.

First Aid Measures:

Eye Contact: Wash affected eyes for at least 15 minutes under running water with eyelids open. If irritation develop or persists, obtain medical attention.

Skin contact: Wash thoroughly with soap and water. For irritation, flush the skin with cool running water. Wash the affected area with mild soap and water. Obtain medical attention if irritation develop or persists. If hot or molten polymer burns the skin, immerse the burned area in cold running water and obtain medical attention.

Inhalation: Remove person to a fresh air. If irritation develop or persists, obtain medical attention.

Ingestion: Use first aid techniques including coughing to remove obstruction. If swallowed, obtain medical attention.

PERSONAL PROTECTION

Respiratory Protection: Use suitable respiratory protection equipment (NIOSH approved mask) when airborne exposure limits are reached or exceeded.

Hand Protection: This product does not present particular skin concern requiring special protection beyond normal good industrial hygiene and safety practices which include wearing suitable gloves to protect from abrasion and cutting.

Eye Protection: Eye contact with this solid product is unlikely. However in machining areas adequate eye protection (safety goggles) should be worn to protect from small particles generated by machining.

Skin Protection: Minimize skin by following good industrial hygiene and safety practices, although this product does not present significant skin concern.

FIRE-FIGHTING MEASURES

Suitable Extinguishing Media: Water, foam, carbon dioxide

Special Exposure Hazards Arising from the Substance or Preparation Itself, Combustion Products and the Resulting Gases: In the event of fire, a toxic vapour can be released containing carbon dioxide, carbon monoxide, oxides of nitrogen and traces of HCN.

Special protective equipment for fire-fighters: Fire-fighters must use self-contained breathing apparatus.

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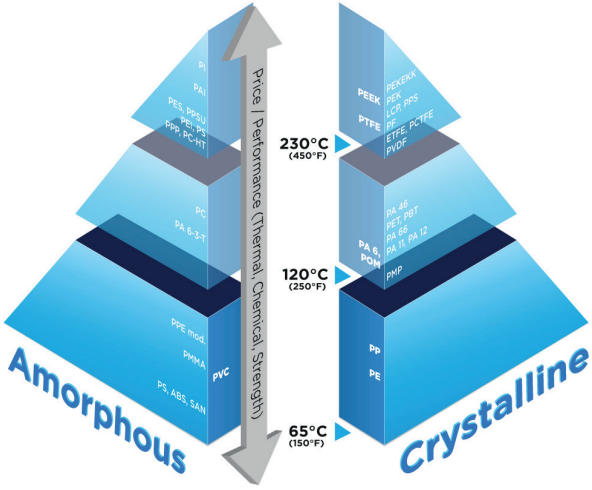

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