

## DESCRIPTION

Apex Polymer Solutions Thermoplastic Polyurethane (TPU) has excellent abrasion and impact properties at a wide range of temperatures. It has very good chemical resistance, and has good elasticity in a large temperature window. It has good resistance to weathering and high radiant energy. It has outstanding abrasion resistant qualities and has excellent welding and bonding properties.

## APPLICATIONS

Wear linings, belting, conveyors, chutes, cyclones, mills, magnetic separators, cones, hoppers, crushers, feeders, sorters, screens, skip, bins, slurry channels and launders to name a few.

## KEY FEATURES

### Certification/Approvals

The certification is available on request and must be specified during ordering.

### Coating and Metalizing

Both coating and metalizing is possible. Further technical data is required.

### Printing/Painting

Hot embossing / Hot stamping, Ink jet printing and pad printing is all effective. Laser printing is not effective.

### Machining

Sawing, drilling, turning, milling, planing, punching, thread cutting and grinding.

### Conversion

**Glueing:** Cyano-acrylate-based gluing systems. Welding preferred option. Polyurethane adhesives take longer to cure but are flexible and elastic. Perspex SA youtube page has a gluing guide.

**Welding:** Hot air and nitrogen, hot plate, heated tool and heat impulse, high frequency, friction, vibration and ultrasonic welding. Welding rod is available on request for extrusion welding as well. Currently only stock X8100 welding rod. Perspex SA youtube page has a welding guide

## PRODUCT SPECIFICATIONS

### Colour

Standard Royal Blue (Pantone 294C) 5mm - 10mm  
Standard Red (RAL3013), 1.5mm - 5mm  
Other colours available on request (MOQ 5 tons)

### Thickness

2mm to 10mm

### Grades

x8100 is an Ester grade.

### Finish

Gloss as standard and Sand

### Sheet Size Specifications

Gauge	Width
Available on request	1500 mm

NB: Available sizes vary depending on gauge, colours, and order size, please ask confirmation to sales department.

## TYPICAL PHYSICAL PROPERTIES\*

Properties	Unit	Standard	Method	Value
Density #	g/cm <sup>3</sup>	ISO 1183		1,2
Stress at Maximum Load	MPa	ASTM D638		56,45
Strain at Maximum Load	%	ASTM D638		1175%
Stress at 100% Elongation	MPa	ASTM D638		4,6
Stiffness	N/m	ISO 178		4483
Young's Modulus	MPa	ASTM D638		10,87
Shore A		ISO 868		86
Shore D		ISO 868		41
Compression set		ASTM D395-03	Method B	0,86
Abrasion resistance	mm <sup>3</sup>	DIN ISO4649	Method A	<45
Abrasion Scuff mass loss	%	Sutherland Rub test		0,014
Abrasion Scuff mass loss	grams	Sutherland Rub test		0,0034
Tear resistance	N/mm thickness	ASTM D1004-2009		206
Vicat softening point	°C	ISO 306		95

#The density quoted should only be used as a guide. This value can change depending upon the type and quantity of pigments or additives used.

## PRODUCT AVAILABILITY

### Fabrication

TPU can be fabricated in a number of ways. It is possible to bond the materials with adhesives, weld the product together and printing is possible. TPU can also be coated and metallized if required. It is also possible to machine the product with a variety of wood-working and metal cutting tools.

**Adhesives:** TPU can be glued and has similar bonding application compared to other products like rubber. It bonds very well to both metal and rubber. The ideal glue system to use is a Cyano-acrylate-based system. Polyurethane adhesives take longer to cure but, like TPU they are flexible and elastic. They are ideal for long-lasting bonded joints. When bonding to metals, the metal surface must first be treated with adhesion promoters. This is normally applied as a solution by spraying, coating or immersion. Please see our detailed gluing video on the Perspex Youtube page.

**Welding:** It is possible to weld TPU sheet together. There is a wide variety of different welding options that are available. Suitable methods include Hot air and nitrogen welding, hot plate welding, heated tool and heat impulse welding, high-frequency welding, friction welding and vibration welding. In all cases, an efficient extractor must be provided for any carbonization gases. Extrusion welding is possible and welding rod is available on certain grades ex stock. Perspex SA Youtube page has a welding guide.

### Cleaning and Maintenance

Typical detergents and soaps dissolved in warm water can be used to effectively clean contamination from the surface. For the more stubborn marks organic solvents such as isopropyl alcohol and n-heptane will be more effective.

## Machining

Sharp cutting tools are needed. TPU is tough and elastic and this needs to be taken into consideration when machining the material. Excessive heat generation should be avoided and efficient removal of the shavings must be ensured. The tools must cut and not exert pressure. It is possible to machine TPU in the following way: Sawing, drilling, turning, milling, planing, punching, thread cutting and grinding.

#Please contact the sales office to discuss any further requirements.

## CHEMICAL RESISTANCE

Chemical resistance is influenced by many factors, including concentration, temperature, exposure time and material stress. Therefore the data below should only be used as a guide. Please request any further information if required.

Reagent	Chemical Resistance	Reagent	Chemical Resistance
Acetone	Short Term contact	Nitric Acid	Not resistant
Acid - weak	Not resistant	Hydrochloric acid	Not resistant
Acid - strong	Not resistant	Sea Water	Excellent
Alcohol	Can break down through Alcoholysis	Water	Excellent
Petrol	Resistant over prolonged period	Alkaline Solutions	Not resistant
Diesel	Resistant over prolonged period	Hydrocarbons	Swelling occurs
Ammonia	Resistant over prolonged period	Solvents	Swelling occurs
Mineral Oil	Resistant over prolonged period	Lubricating oils/grease	Good

**\*NOTE** The information contained in this leaflet is based on our present technical knowledge and experience. In view of the large number of factors that may influence the processing and use of our products, the information does not relieve the processors and manufacturers of the need to carry out their own tests and experiments. Our information does not constitute a legally binding assurance of product availability, of properties or of a suitability for a particular end use. Patent rights that may exist must be duly observed.

## ADDITIONAL INFORMATION

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*\*Previously trading as Perspex SA*