



TPU Thermoplastic Polyurethane

Description

TPU has a high Modulus of Elasticity making it flexible and still retaining its hardness. Offering excellent abrasion and chemical resistance. It also offers very good impact and flexibility at low temperatures. This is a very high performance material. There are two distinct types of polyurethane, ether based and ester based materials. Ether based TPU's have slightly better durability, hydrolysis resistance and are less susceptible to microbiological attack than Ester based grades although they do tend to be more expensive.

Applications

Ski boots, Cable covering. Conveyor belts, leather replacement in shoes, skateboard wheels, automotive parts and medical parts.

Types of grade available

Polyester Shore A 65 - 78
 Polyether Shore A 72 -95
 Transparent grades

General Processing

Drying Time	3 to 4 hours
Drying Temperature	90C to 100C
Type of Drier	Hot air/desiccant
Purging	DYNAPURGE K
Moisture Absorption	Material is hydroscopic 0.4%
Other Considerations	Paste like gel when melted processes similar to PVC/P

Processing Injection Moulding

Barrel Settings	180 to 220C
Injection speed	Medium
Injection Pressure	Medium
Back Pressure	Low
Screw Speed	Low to Medium
Tool Temperature	25 to 80C
Melt Temperature	170 to 235C
Processing Stability	Good melt stability
Gate Considerations	Use pin and sub gates only for small parts. Edge, fan, tab and disc gates have all been successfully used.
Sprue & Runner	Full round recommended

Considerations	
Processing Extrusion	
Barrel Settings	170C to 200C
Screw Speed	50 to 60 rpm
Screen Packs	20, 60, 80, 20 mesh
Haul-off / Cooling	10c water cooling
Calibration	Good melt strengths calibration plates and vacuum suitable
Mechanical Properties	
Shrinkages	0.5% to 0.7%
Flexural Strength	5.1 MPa
Tensile strength at Yield	1.7 -38 MPa
Physical Properties	
Density	1.2
Cold Bend	-38 c
Cold Flex	-50c
Elongation at Break	350- 740 MPa
Modulus of Elasticity	11MPa at 100%
General Impact Strength	Very Good
Material Finish	High gloss
Thermal Properties	
Vicat Softening Temperature	117C
Heat Deflection Temperature	N/A
Flammability	
Flammability Rating	HB
Weatherability	
Suitability for outdoor use	TPU has excellent UV stability
Fillers & Additives	Glass filled, PVC Blends
Chemical Resistance	
Resistant to	Excellent resistance Oils, fuel, grease and solvents
Not resistant to	
Food Contact Status	Food approved grades are available

Colouring	Universal Masterbatch
REACH & ROHS Compliance	YES
Bonding	Solvents can be used to bond TPU
Welding	Very suitable: Hot air, hot plate, High frequency, Ultrasonic welding

This information has been provided as a general guide and we suggest that you carry out your own specific tests to be sure that this material is suitable for your application.