Aliphatic Thermoplastic Polyether Polyurethane (ATPU)

DSM
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A medical grade polymer with exceptional physical and biocompatibility properties

DSM ATPU polymers are light stable and have been designed for lower processing temperatures. The combination of high strength and elongation makes them ideal materials for temporary implant applications.

Flexible

Adaptable to many different processing techniques, ATPU polymers can be extruded, compression or injection molded, dip coated and sprayed. These materials can also be used for solvent bonding.

Drug Diffusion

The ATPU polymers have been used for a wide variety of applications, which can include, but are not limited to, drug diffusion. With a wide range of diffusion characteristics, these materials can be used as rate controlling membranes or as biostable matrix structures to enable localized drug delivery. DSM ATPU polymers have been formulated for use with hydrophobic and hydrophilic drugs.

Tailor Made

DSM ATPU polymers have been enhanced with SME® and SAME® technology to incorporate end groups that address requirements of specific device applications. This eliminates the need for additional surface processing steps after the device component is fabricated.

Summary of Product Benefits

- **Biocompatible**
- **Excellent mechanical properties**
- **Adaptable with SME® and SAME® technology**
- **Established FDA Master File**
- **Tunable drug delivery**

Physical Properties

Typical Property	Testing Method	ATPU 75A
Color	Visual	clear
Hardness, Durometer	ASTM D2240	73A
Ultimate Tensile Strength	ASTM D1708	4568 psi / 31.5 MPa
Elongation (%)	ASTM D1708	739
Tensile Stress at 50% elongation at 100% elongation at 300% elongation	ASTM D1708	 401 psi / 2.8 MPa 596 psi / 4.1 MPa 1311 psi / 9.0 MPa
Flexural Modulus, 1% Secant Modulus	ASTM D790	2370 psi / 16.3 MPa
Flexural Stress at 5% Deflection	ASTM D790	84.2 psi / .6 MPa
Water Absorption (%)	ASTM D570	1.29
Tear Strength, Die C (pli)	ASTM D624	N/A
Compression Set (%)	ASTM D395	43.1
Coefficient of Linear Thermal Expansion x 10-6/˚C x 10-6/˚F	ASTM E831	N/A
Dielectric Strength, (V/mil)	ASTM D149	400
Dielectric Constant, k', 60 hz	ASTM D150	5.27
Coefficient of Friction (Kinetic)	ASTM D1894	.8
Taber Abrasion, 1000g wt. Weight Loss, mg/1000 cycles	ASTM D1044 H-18 wheel	40
Melt Flow Rate, g/10 min	ASTM D1238	10 (at 175˚C)
Glass Transition Temperature, Tg (˚C)	ASTM E1356	-70
Melting Point, Tm (˚C)	ASTM E1356	117
Mold Shrinkage, %	ASTM D955	-1.5 – 8.1
Recommended Extrusion Conditions ˚F ˚C		 320-360 140-160

Note: Typical physical property values are not to be construed as sales specifications.

Representative Biological Test Results

Biological test	Results	Biological test	Results
Genotoxicity	Non-mutagenic	Irritation	Non-irritant
Hemocompatibility	Non-hemolytic	Pyrogenicity	Non-pyrogenic
Cytotoxicity	Non-cytotoxic	Sensitization	No evidence of sensitization; not considered a sensitizer
Systemic Toxicity	No evidence of systemic toxicity		

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