Bayer MaterialScience

Product Information

TEXIN® STX

High Modulus Thermoplastic Polyurethane

Description and Applications

Texin STX resin is an opaque, high performance thermoplastic polyurethane which possesses the stiffness and modulus of standard engineering thermoplastics. This resin exhibits excellent heat and chemical resistance. Other key attributes of Texin STX TPU include good impact resistance, low moisture absorption, low mold shrinkage, a low coefficient of thermal expansion, and good heat and abrasion resistance. It can be processed by injection molding or extrusion.

Typical applications include couplings, valves, fittings, sunglass frames, and housings for personal electronic devices. As with any product, use of Texin STX resin in a given application must be tested (including field testing, etc.) in advance by the user to determine suitability.

Storage, Drying and Regrind Usage

Texin thermoplastic resins are hygroscopic and will absorb ambient moisture. The presence of moisture can adversely affect processing characteristics and the quality of parts. Therefore, the resins should remain in their sealed containers and be stored under cool and dry conditions until used. Storage temperatures should not exceed 95°F (35°C). Unused resin from opened containers, or reground material that is not to be used immediately, should be stored in sealed containers.

Prior to processing, Texin STX resin must be thoroughly dried in a desiccant dehumidifying hopper dryer for a minimum of 4 hours. Hopper inlet air temperature should be 220 - 250°F (104-121°C). To achieve the recommended moisture content of less than 0.03%, the inlet air dew point should be -20°F(-29°C) or lower.

Where end-use requirements permit, up to 20% Texin resin regrind may be used with virgin material. Regrind material must be generated from properly molded/extruded parts, sprues, runners, trimmings, and/or films.

Degraded or discolored material may not be used for regrind. All regrind material must be free of contamination and thoroughly blended with virgin material prior to drying and processing. Finished parts containing regrind must be tested to ensure that end-use requirements are fully met.

Injection Molding and Extrusion Conditions

Typical starting conditions for injection molding and extrusion are noted below. Actual processing conditions will depend on machine size, mold design, material residence time, shot size, part geometry, etc.

Typical Injection Molding Conditions	
Barrel Temperatures:	
Rear	455º-475ºF (235º-246ºC)
Middle	460º-480ºF (238º-249ºC)
Front	460º-480ºF (238º-249ºC)
Nozzle	470º-490ºF (243º-254ºC)
Melt Temperature	455º-482ºF (235º-250ºC)
Mold Temperature	110º-150ºF (43º-66ºC)
Injection Pressure	6,000-14,000 psi
Hold Pressure	60-80% of Injection Pressure
Back Pressure	800 psi max.
Screw Speed	40-80 rpm
Injection Speed	Moderate
Cushion	1/8 inch max

Typical Conditions for Extrusion	
Rear (Feed)	437º - 482ºF (225º - 250ºC)
Middle (Transition)	437º - 464ºF (225º - 240ºC)
Front (Meter)	437º - 464ºF (225º - 240ºC)
Die	446º - 464ºF (230º - 240ºC)
Melt	446ºF (230ºC)

** These items are provided as general information only. They are approximate values and are not part of the product specifications.*

Regulatory Compliance Information

Some of the end uses of the products described in this bulletin must comply with applicable regulations, such as the FDA, NSF, USDA, and CPSC. If you have any questions on the regulatory status of these products, contact your Bayer MaterialScience representative or Bayer's Regulatory Affairs Manager in Pittsburgh, PA.

Health and Safety Information

Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling Texin STX resin. Before working with this product, you must read and become familiar with the available information on its hazards, proper use and handling. This cannot be overemphasized. Information is available in several forms, e.g., material safety data sheets and product labels. Consult your Bayer MaterialScience representative or contact Bayer's Product Safety and Regulatory Affairs Department in Pittsburgh, PA.

Note: The information contained in this bulletin is current as of March 2010. Please contact Bayer MaterialScience for additional information or to determine whether this publication has been revised.

The purchaser/user agrees that Bayer MaterialScience reserves the right to discontinue this product without prior notice.

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Typical Properties* For Natural Resin	ASTM Test Method (Other)	Units U.S. Conventional	Units SI Metric	Texin STX TPU U.S. Conventional	Texin STX TPU SI Metric
General					
Specific Gravity	D 792 (ISO 1183)			1.22	
Rockwell Hardness	D 785	M Scale/R Scale		50/110	
Water Absorption, 24 hours	D 570 (ISO 62)	%		0.23	
Mold Shrinkage at 100-mil Thickness:	D 955 (ISO 2577)				
Flow Direction		in/in (mm/mm)		0.005	
Mechanical					
Tensile Stress at Yield	D 638	lb/in^2	MPa	8,900	62
Tensile Stress at Break	D 638	lb/in^2	MPa	6,800	47
Tensile Elongation at Yield	D 638	%		7.3	
Tensile Elongation at Break	D 638	%		85	
Tensile Modulus	D 638	lb/in^2	MPa	280,000	1,930
Flexural Stress at 5% Strain	D 790 (ISO 178)	lb/in^2	MPa	12,000	83
Flexural Modulus	D 790 (ISO 178)	lb/in^2	MPa	290,000	2,000
Flexural Stress (Maximum)	D 790 (ISO 178)	lb/in^2	MPa	13,400	93
Strain at Maximum Stress	D 790 (ISO 178)	%		6.8	
Un-notched Izod Impact Strength	D 4812				
73ºF (23ºC) 0.125 in thickness		ft•lb/in	J/m	62 (no break)	3,300 (no break)
Notched Izod Impact Strength	D 256				
73ºF (23ºC) 0.125 in thickness		ft•lb/in	J/m	16	850
-22ºF (-30ºC) 0.125 in thickness		ft•lb/in	J/m	3.5	187
Thermal					
Heat Deflection Temperature,	D 648				
0.125 in thickness					
264 psi (1.82 MPa)		ºF	ºC	163	73
66 psi (0.46 MPa)		ºF	ºC	190	88
Vicat Softening Temperature,	D 1525 (ISO 306)				
(10 N,50 ºC/hr)		ºF	ºC	221	105
Coefficient of Linear Thermal	D 696				
Expansion (CLTE)		in/in/ºF	mm/mm/ ºC	4.2E-5	7.5E-5

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Bayer MaterialScience LLC

100 Bayer Road • Pittsburgh, PA 15205-9741 • TPUinfo@bayer.com • www.BayerMaterialScienceNAFTA.com

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