

Texin® 970 U

Thermoplastic Polyurethane Elastomer (Polyether)

Covestro - PUR

Message:

Texin 970U resin is an aromatic polyether-based thermoplastic polyurethane with a Shore hardness of approximately 70D. It can be processed by injection molding, extrusion, or blow molding.

General Information			
Additive	Heat Stabilizer		
	UV Stabilizer		
Features	Fuel Resistant		
	Good Stiffness		
	Good Tear Strength		
	Heat Stabilized		
	Hydrolysis Resistant		
	Oil Resistant		
Uses	Agricultural Applications		
	Bushings		
	Housings		
	Industrial Applications		
	Marine Applications		
	Wheels		
Processing Method	Blow Molding		
	Extrusion		
	Injection Molding		
Physical	Nominal Value	Unit	Test Method
Specific Gravity	1.18	g/cm ³	ASTM D792, ISO 1183
Molding Shrinkage			ASTM D955, ISO 2577
Flow : 2.54 mm	0.80	%	
Across Flow : 2.54 mm	0.80	%	
Hardness	Nominal Value	Unit	Test Method
Durometer Hardness (Shore D)	70		ASTM D2240, ISO 868
Mechanical	Nominal Value	Unit	Test Method
Flexural Modulus			ASTM D790, ISO 178
-30°C	2020	MPa	
23°C	538	MPa	

70°C	117	MPa	
Taber Abrasion Resistance			
1000 Cycles, 1000 g, H-18 Wheel	75.0	mg	ISO 4649
1000 Cycles, 1000 g, H-18 Wheel	75.0	mg	ASTM D1044
Elastomers	Nominal Value	Unit	Test Method
Tensile Stress			
50% Strain	20.7	MPa	ISO 37, ASTM D412
100% Strain	25.5	MPa	ASTM D412, ISO 37
300% Strain	39.3	MPa	ASTM D412, ISO 37
Tensile Strength (Yield)	47.6	MPa	ASTM D412, ISO 37
Tensile Elongation (Break)	320	%	ASTM D412, ISO 37
Tear Strength			
-- ¹	193	kN/m	ASTM D624
--	190	kN/m	ISO 34-1
Compression Set			ASTM D395B, ISO 815
23°C, 22 hr ²	25	%	
23°C, 22 hr	40	%	
70°C, 22 hr ³	45	%	
70°C, 22 hr	75	%	
100°C, 22 hr ⁴	65	%	
100°C, 22 hr	90	%	
Bayshore Resilience	50	%	ASTM D2632
Aging	Nominal Value	Unit	Test Method
Change in Tensile Strength in Air			
100°C, 70 hr	-6.0	%	ASTM D573, ISO 216
100% Strain, 100°C, 70 hr	-7.0	%	ASTM D573
300% Strain, 100°C, 70 hr	-4.0	%	ASTM D573
100°C, 168 hr	-32	%	ASTM D573, ISO 216
100% Strain, 100°C, 168 hr	1.0	%	ASTM D573
300% Strain, 100°C, 168 hr	6.0	%	ASTM D573
100°C, 336 hr	-4.0	%	ASTM D573, ISO 216
100% Strain, 100°C, 336 hr	1.0	%	ASTM D573
300% Strain, 100°C, 336 hr	-5.0	%	ASTM D573
100°C, 504 hr	-9.0	%	ASTM D573, ISO 216
100% Strain, 100°C, 504 hr	-10	%	ASTM D573
300% Strain, 100°C, 504 hr	-12	%	ASTM D573
125°C, 70 hr	0.0	%	ASTM D573, ISO 216
100% Strain, 125°C, 70 hr	6.0	%	ASTM D573
300% Strain, 125°C, 70 hr	4.0	%	ASTM D573
125°C, 168 hr	-17	%	ASTM D573, ISO 216
100% Strain, 125°C, 168 hr	-8.0	%	ASTM D573
300% Strain, 125°C, 168 hr	-16	%	ASTM D573

125°C, 336 hr	-24	%	ASTM D573, ISO 216
100% Strain, 125°C, 336 hr	-10	%	ASTM D573
300% Strain, 125°C, 336 hr	-19	%	ASTM D573
125°C, 504 hr	-32	%	ASTM D573, ISO 216
100% Strain, 125°C, 504 hr	-15	%	ASTM D573
300% Strain, 125°C, 504 hr	-25	%	ASTM D573
100% Strain 100°C, 70 hr	-7.0	%	ISO 216
300% Strain 100°C, 70 hr	-4.0	%	ISO 216
100% Strain 100°C, 168 hr	1.0	%	ISO 216
300% Strain 100°C, 168 hr	6.0	%	ISO 216
100% Strain 100°C, 336 hr	1.0	%	ISO 216
300% Strain 100°C, 336 hr	-5.0	%	ISO 216
100% Strain 100°C, 504 hr	-10	%	ISO 216
300% Strain 100°C, 504 hr	-12	%	ISO 216
100% Strain 125°C, 70 hr	6.0	%	ISO 216
300% Strain 125°C, 70 hr	4.0	%	ISO 216
100% Strain 125°C, 168 hr	-8.0	%	ISO 216
300% Strain 125°C, 168 hr	-16	%	ISO 216
100% Strain 125°C, 336 hr	-10	%	ISO 216
300% Strain 125°C, 336 hr	-19	%	ISO 216
100% Strain 125°C, 504 hr	-15	%	ISO 216
300% Strain 125°C, 504 hr	-25	%	ISO 216
Change in Ultimate Elongation in Air			ASTM D573, ISO 216
100°C, 70 hr	18	%	
100°C, 168 hr	15	%	
100°C, 336 hr	22	%	
100°C, 504 hr	18	%	
125°C, 70 hr	12	%	
125°C, 168 hr	33	%	
125°C, 336 hr	33	%	
125°C, 504 hr	17	%	
Change in Durometer Hardness in Air			ASTM D573, ISO 216
Shore D, 100°C, 70 hr	-2.0		
Shore D, 100°C, 168 hr	-3.0		
Shore D, 100°C, 336 hr	-4.0		
Shore D, 100°C, 504 hr	-5.0		
Shore D, 125°C, 70 hr	-2.0		
Shore D, 125°C, 168 hr	-2.0		
Shore D, 125°C, 336 hr	-2.0		
Shore D, 125°C, 504 hr	-1.0		
Change in Tensile Strength			ASTM D471, ISO 175

23°C, 70 hr, in Reference Fuel A (Isooctane)	1.0	%
100% Strain, 23°C, 70 hr, in Reference Fuel A (Isooctane)	-2.0	%
300% Strain, 23°C, 70 hr, in Reference Fuel A (Isooctane)	2.0	%
23°C, 70 hr, in Reference Fuel C	5.0	%
100% Strain, 23°C, 70 hr, in Reference Fuel C	-31	%
300% Strain, 23°C, 70 hr, in Reference Fuel C	-10	%
23°C, 168 hr, in Reference Fuel A (Isooctane)	-1.0	%
100% Strain, 23°C, 168 hr, in Reference Fuel A (Isooctane)	-7.0	%
300% Strain, 23°C, 168 hr, in Reference Fuel A (Isooctane)	1.0	%
23°C, 168 hr, in Reference Fuel C	2.0	%
100% Strain, 23°C, 168 hr, in Reference Fuel C	-34	%
300% Strain, 23°C, 168 hr, in Reference Fuel C	-12	%
23°C, 336 hr, in Reference Fuel A (Isooctane)	13	%
100% Strain, 23°C, 336 hr, in Reference Fuel A (Isooctane)	-1.0	%
300% Strain, 23°C, 336 hr, in Reference Fuel A (Isooctane)	21	%
23°C, 336 hr, in Reference Fuel C	-12	%
100% Strain, 23°C, 336 hr, in Reference Fuel C	-45	%
300% Strain, 23°C, 336 hr, in Reference Fuel C	-23	%
23°C, 504 hr, in Reference Fuel A (Isooctane)	9.0	%
100% Strain, 23°C, 504 hr, in Reference Fuel A (Isooctane)	-1.0	%
300% Strain, 23°C, 504 hr, in Reference Fuel A (Isooctane)	31	%
23°C, 504 hr, in Reference Fuel C	-10	%
100% Strain, 23°C, 504 hr, in Reference Fuel C	-46	%
300% Strain, 23°C, 504 hr, in Reference Fuel C	-15	%
100°C, 70 hr, in ASTM #1 Oil	3.0	%
100% Strain, 100°C, 70 hr, in ASTM #1 Oil	6.0	%
300% Strain, 100°C, 70 hr, in ASTM #1 Oil	4.0	%

100°C, 70 hr, in ASTM #3 Oil	6.0	%
100% Strain, 100°C, 70 hr, in ASTM #3 Oil	-1.0	%
300% Strain, 100°C, 70 hr, in ASTM #3 Oil	2.0	%
100°C, 168 hr, in ASTM #1 Oil	3.0	%
100% Strain, 100°C, 168 hr, in ASTM #1 Oil	11	%
300% Strain, 100°C, 168 hr, in ASTM #1 Oil	10	%
100°C, 168 hr, in ASTM #3 Oil	9.0	%
100% Strain, 100°C, 168 hr, in ASTM #3 Oil	-70	%
300% Strain, 100°C, 168 hr, in ASTM #3 Oil	-4.0	%
100°C, 336 hr, in ASTM #1 Oil	15	%
100% Strain, 100°C, 336 hr, in ASTM #1 Oil	12	%
300% Strain, 100°C, 336 hr, in ASTM #1 Oil	19	%
100°C, 336 hr, in ASTM #3 Oil	14	%
100% Strain, 100°C, 336 hr, in ASTM #3 Oil	-2.0	%
300% Strain, 100°C, 336 hr, in ASTM #3 Oil	0.0	%
100°C, 504 hr, in ASTM #1 Oil	9.0	%
100% Strain, 100°C, 504 hr, in ASTM #1 Oil	11	%
300% Strain, 100°C, 504 hr, in ASTM #1 Oil	18	%
100°C, 504 hr, in ASTM #3 Oil	5.0	%
100% Strain, 100°C, 504 hr, in ASTM #3 Oil	2.0	%
300% Strain, 100°C, 504 hr, in ASTM #3 Oil	8.0	%
Change in Ultimate Elongation	ASTM D471, ISO 175	
23°C, 70 hr, in Reference Fuel A (Isooctane)	1.0	%
23°C, 70 hr, in Reference Fuel C	0.0	%
23°C, 168 hr, in Reference Fuel A (Isooctane)	-2.0	%
23°C, 168 hr, in Reference Fuel C	-1.0	%
23°C, 336 hr, in Reference Fuel A (Isooctane)	-14	%
23°C, 336 hr, in Reference Fuel C	-5.0	%
23°C, 504 hr, in Reference Fuel A (Isooctane)	-23	%
23°C, 504 hr, in Reference Fuel C	-13	%

100°C, 70 hr, in ASTM #1 Oil	13	%	
100°C, 70 hr, in ASTM #3 Oil	15	%	
100°C, 168 hr, in ASTM #1 Oil	10	%	
100°C, 168 hr, in ASTM #3 Oil	18	%	
100°C, 336 hr, in ASTM #1 Oil	-7.0	%	
100°C, 336 hr, in ASTM #3 Oil	-5.0	%	
100°C, 504 hr, in ASTM #1 Oil	-11	%	
100°C, 504 hr, in ASTM #3 Oil	-12	%	
Change in Durometer Hardness			ASTM D471, ISO 175
Shore D, 23°C, 70 hr, in Reference Fuel A (Isooctane)	2.0		
Shore D, 23°C, 70 hr, in Reference Fuel C	-9.0		
Shore D, 23°C, 168 hr, in Reference Fuel A (Isooctane)	2.0		
Shore D, 23°C, 168 hr, in Reference Fuel C	-10		
Shore D, 23°C, 336 hr, in Reference Fuel A (Isooctane)	2.0		
Shore D, 23°C, 336 hr, in Reference Fuel C	-16		
Shore D, 23°C, 504 hr, in Reference Fuel A (Isooctane)	1.0		
Shore D, 23°C, 504 hr, in Reference Fuel C	-11		
Shore D, 100°C, 70 hr, in ASTM #1 Oil	0.0		
Shore D, 100°C, 70 hr, in ASTM #3 Oil	2.0		
Shore D, 100°C, 168 hr, in ASTM #1 Oil	1.0		
Shore D, 100°C, 168 hr, in ASTM #3 Oil	1.0		
Shore D, 100°C, 336 hr, in ASTM #1 Oil	0.0		
Shore D, 100°C, 336 hr, in ASTM #3 Oil	0.0		
Shore D, 100°C, 504 hr, in ASTM #1 Oil	0.0		
Shore D, 100°C, 504 hr, in ASTM #3 Oil	3.0		
Change in Volume			
23°C, 70 hr, in Reference Fuel A	0.0	%	ASTM D471, ISO 175
23°C, 70 hr, in Reference Fuel C	6.0	%	ASTM D471, ISO 175
23°C, 168 hr, in Reference Fuel A	0.0	%	ASTM D471, ISO 175
23°C, 168 hr, in Reference Fuel C	10	%	ASTM D471, ISO 175
23°C, 336 hr, in Reference Fuel A	0.0	%	ASTM D471, ISO 175
23°C, 336 hr, in Reference Fuel C	14	%	ASTM D471, ISO 175
23°C, 504 hr, in Reference Fuel A	0.0	%	ASTM D471, ISO 175
23°C, 504 hr, in Reference Fuel C	16	%	ASTM D471, ISO 175
100°C, 70 hr, in ASTM Oil #1	-1.0	%	ASTM D471
100°C, 70 hr, in ASTM Oil #3	3.0	%	ASTM D471
100°C, 168 hr, in ASTM Oil #1	-1.0	%	ASTM D471

100°C, 168 hr, in ASTM Oil #3	5.0	%	ASTM D471
100°C, 336 hr, in ASTM Oil #1	-2.0	%	ASTM D471
100°C, 336 hr, in ASTM Oil #3	4.0	%	ASTM D471
100°C, 504 hr, in ASTM Oil #1	-2.0	%	ASTM D471
100°C, 504 hr, in ASTM Oil #3	5.0	%	ASTM D471
100°C, 70 hr, in ASTM #1 Oil	-1.0	%	ISO 175
100°C, 70 hr, in ASTM #3 Oil	3.0	%	ISO 175
100°C, 168 hr, in ASTM #1 Oil	-1.0	%	ISO 175
100°C, 168 hr, in ASTM #3 Oil	5.0	%	ISO 175
100°C, 336 hr, in ASTM #1 Oil	-2.0	%	ISO 175
100°C, 336 hr, in ASTM #3 Oil	4.0	%	ISO 175
100°C, 504 hr, in ASTM #1 Oil	-2.0	%	ISO 175
100°C, 504 hr, in ASTM #3 Oil	5.0	%	ISO 175
Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load			
0.45 MPa, Unannealed	68.0	°C	ASTM D648, ISO 75-2/B
1.8 MPa, Unannealed	45.0	°C	ASTM D648, ISO 75-2/A
Brittleness Temperature	< -70.0	°C	ASTM D746, ISO 974
Glass Transition Temperature	0.00	°C	DMA
Vicat Softening Temperature	140	°C	ISO 306/50, ASTM D1525 ⁵
CLTE - Flow	1.2E-4	cm/cm/°C	ASTM D696
Additional Information	Nominal Value	Unit	Test Method
Compressive Load			ASTM D575
10% Deflection	13.1	MPa	
15% Deflection	16.5	MPa	
2% Deflection	1.03	MPa	
20% Deflection	19.3	MPa	
25% Deflection	22.8	MPa	
5% Deflection	5.52	MPa	
50% Deflection	48.3	MPa	
Injection	Nominal Value	Unit	
Drying Temperature - Desiccant Dryer	93.0 to 104	°C	
Drying Time - Desiccant Dryer	2.0	hr	
Suggested Max Moisture	< 0.030	%	
Suggested Shot Size	40 to 80	%	
Suggested Max Regrind	20	%	
Rear Temperature	210 to 235	°C	
Middle Temperature	213 to 238	°C	
Front Temperature	216 to 238	°C	
Nozzle Temperature	218 to 241	°C	
Processing (Melt) Temp	218 to 241	°C	
Mold Temperature	16.0 to 43.0	°C	

Injection Pressure	41.4 to 103	MPa
Injection Rate	Moderate	
Holding Pressure	27.6 to 55.2	MPa
Back Pressure	0.345 to 1.38	MPa
Screw Speed	40 to 80	rpm
Clamp Tonnage	4.1 to 6.9	kN/cm ²
Cushion	3.18 to 6.35	mm
Screw L/D Ratio	20.0:1.0	
Screw Compression Ratio	2.5:1.0 to 3.0:1.0	

Extrusion	Nominal Value	Unit
Drying Temperature	93.0 to 104	°C
Drying Time	2.0	hr
Cylinder Zone 1 Temp.	213 to 221	°C
Cylinder Zone 2 Temp.	216 to 224	°C
Cylinder Zone 3 Temp.	216 to 232	°C
Melt Temperature	210 to 227	°C
Die Temperature	216 to 232	°C

NOTE

1. Die C
2. Post-cured 16 hr at 230°F
3. Post-cured 16 hr at 230°F
4. Post-cured 16 hr at 230°F
5. Rate A (50°C/h)

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