Texin® 270

Thermoplastic Polyurethane Elastomer (Polyester)

Covestro - PUR

Message:

Texin 270 resin is an aromatic polyester-based thermoplastic polyurethane with a Shore hardness of approximately 70D. It can be processed by injection molding; extrusion processes are not recommended.

General Information			
Features	Rigidity, high Good tear strength Fuel resistance Oil resistance		
Uses	Wheels Gear Sporting goods		
Agency Ratings	FDA 21 CFR 177.1680 FDA 21 CFR 177.2600		
Appearance	Natural color		
Processing Method	Injection molding		
Physical	**Nominal Value**	**Unit**	**Test Method**
Specific Gravity	1.24	g/cm³	ASTM D792, ISO 1183
Molding Shrinkage			
Flow: 2.54mm	0.80	%	ASTM D955
Transverse flow: 2.54mm	0.80	%	ASTM D955
Vertical flow direction: 2.54mm	0.80	%	ISO 2577
Flow direction: 2.54mm	0.80	%	ISO 2577
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	2910	MPa	ASTM D790, ISO 178
23°C	724	MPa	ASTM D790, ISO 178
70°C	103	MPa	ASTM D790, ISO 178
Taber Abrasion Resistance			
1000 Cycles, 1000g, H-18 wheel	90.0	mg	ISO 4649
1000 Cycles, 1000g, H-18 wheel	90.0	mg	ASTM D1044
Elastomers	**Nominal Value**	**Unit**	**Test Method**

Tensile Stress			
50% strain	28.3	MPa	ISO 37, ASTM D412
100% strain	29.0	MPa	ASTM D412, ISO 37
300% strain	42.8	MPa	ASTM D412, ISO 37
Tensile Strength (Yield)	56.6	MPa	ASTM D412, ISO 37
Tensile Elongation (Break)	400	%	ASTM D412, ISO 37
Tear Strength			
-- [1]	228	kN/m	ASTM D624
--	230	kN/m	ISO 34-1
Compression Set			ASTM D395B, ISO 815
23°C, 22 hr [2]	30	%	ASTM D395B, ISO 815
23°C, 22 hr	50	%	ASTM D395B, ISO 815
70°C, 22 hr [3]	45	%	ASTM D395B, ISO 815
70°C, 22 hr	85	%	ASTM D395B, ISO 815
Bayshore Resilience	55	%	ASTM D2632

Aging	Nominal Value	Unit	Test Method
Change in Tensile Strength in Air			
100°C, 70 hr	17	%	ASTM D573, ISO 216
100% strain, 100°C, 70 hr	10	%	ASTM D573
300% strain, 100°C, 70 hr	12	%	ASTM D573
100°C, 168 hr	10	%	ASTM D573, ISO 216
100% strain, 100°C, 168 hr	2.0	%	ASTM D573
300% strain, 100°C, 168 hr	6.0	%	ASTM D573
100°C, 336 hr	9.0	%	ASTM D573, ISO 216
100% strain, 100°C, 336 hr	2.0	%	ASTM D573
300% strain, 100°C, 336 hr	4.0	%	ASTM D573
100°C, 504 hr	21	%	ASTM D573, ISO 216
100% strain, 100°C, 504 hr	1.0	%	ASTM D573
300% strain, 100°C, 504 hr	2.0	%	ASTM D573
100% strain 100°C, 70 hr	10	%	ISO 216
300% strain 100°C, 70 hr	12	%	ISO 216
100% strain 100°C, 168 hr	2.0	%	ISO 216
300% strain 100°C, 168 hr	6.0	%	ISO 216
100% strain 100°C, 336 hr	2.0	%	ISO 216
300% strain 100°C, 336 hr	4.0	%	ISO 216
100% strain 100 c, 504 hr	1.0	%	ISO 216
300% strain 100 c, 504 hr	2.0	%	ISO 216
Change in Ultimate Elongation in Air			ASTM D573, ISO 216
100°C, 70 hr	3.0	%	ASTM D573, ISO 216
100°C, 168 hr	3.0	%	ASTM D573, ISO 216
100°C, 336 hr	3.0	%	ASTM D573, ISO 216
100°C, 504 hr	15	%	ASTM D573, ISO 216

Change in Durometer Hardness in Air			ASTM D573, ISO 216
Support d, 100°C, 70 hr	1.0		ASTM D573, ISO 216
Support d, 100°C, 168 hr	-6.0		ASTM D573, ISO 216
Support d, 100 c, 336 hr	-5.0		ASTM D573, ISO 216
Support d, 100 c, 504 hr	-1.0		ASTM D573, ISO 216
Change in Tensile Strength			
23°C, 70 hr, Class C Standard Fuel	10	%	ASTM D471
100% strain, 23°C, 70 hr, Class C standard fuel	-4.0	%	ASTM D471
300% strain, 23°C, 70 hr, Class C standard fuel	-1.0	%	ASTM D471
23°C, 70 hr, in reference fuel A	-4.0	%	ASTM D471
100% strain, 23°C, 70 hr, in reference fuel A	-4.0	%	ASTM D471
300% strain, 23°C, 70 hr, in reference fuel A	-2.0	%	ASTM D471
23°C, 168 hr, Class C Standard Fuel	3.0	%	ASTM D471
100% strain, 23°C, 168 hr, Class C standard fuel	-6.0	%	ASTM D471
300% strain, 23°C, 168 hr, Class C standard fuel	10	%	ASTM D471
23°C, 168 hr, in reference fuel A	-5.0	%	ASTM D471
100% strain, 23°C, 168 hr, in reference fuel a	-3.0	%	ASTM D471
300% strain, 23°C, 168 hr, in reference fuel a	-4.0	%	ASTM D471
23°C, 336 hr, Class C Standard Fuel	8.0	%	ASTM D471
100% strain, 23°C, 336 hr, Class C standard fuel	-18	%	ASTM D471
300% strain, 23°C, 336 hr, Class C standard fuel	-4.0	%	ASTM D471
23°C, 336 hr, in reference fuel A	0.0	%	ASTM D471
100% strain, 23°C, 336 hr, in reference fuel A	-3.0	%	ASTM D471
300% strain, 23°C, 336 hr, in reference fuel A	4.0	%	ASTM D471
23°C, 504 hr, Class C Standard Fuel	9.0	%	ASTM D471
100% strain, 23°C, 504 hr, Class C standard fuel	-21	%	ASTM D471
300% strain, 23°C, 504 hr, Class C standard fuel	-2.0	%	ASTM D471
23°C, 504 hr, in reference fuel A	-2.0	%	ASTM D471
100% strain, 23°C, 504 hr, in reference fuel A	-1.0	%	ASTM D471
300% strain, 23°C, 504 hr, in reference fuel A	-1.0	%	ASTM D471
100°C, 70 hr, in ASTM #1 oil	20	%	ASTM D471, ISO 175

100% strain, 100°C, 70 hr, in ASTM #1 oil	2.0	%	ASTM D471, ISO 175
300% strain, 100°C, 70 hr, in ASTM #1 oil	8.0	%	ASTM D471, ISO 175
100°C, 70 hr, in ASTM #3 oil	13	%	ASTM D471, ISO 175
100% strain, 100°C, 70 hr, in ASTM #3 oil	0.0	%	ASTM D471, ISO 175
300% strain, 100°C, 70 hr, in ASTM #3 oil	8.0	%	ASTM D471, ISO 175
100°C, 168 hr, in ASTM #1 oil	7.0	%	ASTM D471, ISO 175
100% strain, 100°C, 168 hr, in ASTM #1 oil	-1.0	%	ASTM D471, ISO 175
300% strain, 100°C, 168 hr, in ASTM #1 oil	7.0	%	ASTM D471, ISO 175
100°C, 168 hr, in ASTM #3 oil	29	%	ASTM D471, ISO 175
100% strain, 100°C, 168 hr, in ASTM #3 oil	-1.0	%	ASTM D471, ISO 175
300% strain, 100°C, 168 hr, in ASTM #3 oil	4.0	%	ASTM D471, ISO 175
100°C, 336 hr, in ASTM #1 oil	2.0	%	ASTM D471, ISO 175
100% strain, 100°C, 336 hr, in ASTM #1 oil	-3.0	%	ASTM D471, ISO 175
300% strain, 100°C, 336 hr, in ASTM #1 oil	-3.0	%	ASTM D471, ISO 175
100°C, 336 hr, in ASTM #3 oil	32	%	ASTM D471, ISO 175
100% strain, 100°C, 336 hr, in ASTM #3 oil	-2.0	%	ASTM D471, ISO 175
300% strain, 100°C, 336 hr, in ASTM #3 oil	-2.0	%	ASTM D471, ISO 175
100°C, 504 hr, in ASTM #1 oil	8.0	%	ASTM D471, ISO 175
100% strain, 100°C, 504 hr, in ASTM #1 oil	-6.0	%	ASTM D471, ISO 175
300% strain, 100°C, 504 hr, in ASTM #1 oil	-11	%	ASTM D471, ISO 175
100°C, 504 hr, in ASTM #3 oil	20	%	ASTM D471, ISO 175
100% strain, 100°C, 504 hr, in ASTM #3 oil	-8.0	%	ASTM D471, ISO 175
300% strain, 100°C, 504 hr, in ASTM #3 oil	-11	%	ASTM D471, ISO 175
23°C, 70 hr, in Reference Fuel C	10	%	ISO 175
100% strain, 23 c, 70 hr, in Reference Fuel C	-4.0	%	ISO 175
300% strain, 23 c, 70 hr, in Reference Fuel C	-1.0	%	ISO 175
23°C, 70 hr, in reference fuel A (isooctane)	-4.0	%	ISO 175
100% strain, 23°C, 70 hr, in reference fuel A (isooctane)	-4.0	%	ISO 175
300% strain, 23°C, 70 hr, in reference fuel A (isooctane)	-2.0	%	ISO 175
23°C, 168 hr, in Reference Fuel C	3.0	%	ISO 175

100% strain, 23 c, 168 hr, in Reference Fuel C	-6.0	%	ISO 175
300% strain, 23 c, 168 hr, in Reference Fuel C	10	%	ISO 175
23°C, 168 hr, in reference fuel A (isooctane)	-5.0	%	ISO 175
100% strain, 23°C, 168 hr, in reference fuel A (isooctane)	-3.0	%	ISO 175
300% strain, 23°C, 168 hr, in reference fuel A (isooctane)	-4.0	%	ISO 175
23°C, 336 hr, in Reference Fuel C	8.0	%	ISO 175
100% strain, 23 c, 336 hr, in Reference Fuel C	-18	%	ISO 175
300% strain, 23 c, 336 hr, in Reference Fuel C	-4.0	%	ISO 175
23°C, 336 hr, in reference fuel A (isooctane)	0.0	%	ISO 175
100% strain, 23°C, 336 hr, in reference fuel A (isooctane)	-3.0	%	ISO 175
300% strain, 23°C, 336 hr, in reference fuel A (isooctane)	4.0	%	ISO 175
23°C, 504 hr, in Reference Fuel C	9.0	%	ISO 175
100% strain, 23 c, 504 hr, in Reference Fuel C	-21	%	ISO 175
300% strain, 23 c, 504 hr, in Reference Fuel C	-2.0	%	ISO 175
23°C, 504 hr, in reference fuel A (isooctane)	-2.0	%	ISO 175
100% strain, 23°C, 504 hr, in reference fuel A (isooctane)	-1.0	%	ISO 175
300% strain, 23°C, 504 hr, in reference fuel A (isooctane)	-1.0	%	ISO 175
Change in Ultimate Elongation			
23°C, 70 hr, Class C Standard Fuel	15	%	ASTM D471
23°C, 70 hr, in reference fuel A	0.0	%	ASTM D471
23°C, 168 hr, Class C Standard Fuel	-17	%	ASTM D471
23°C, 168 hr, in reference fuel A	0.0	%	ASTM D471
23°C, 336 hr, Class C Standard Fuel	12	%	ASTM D471
23°C, 336 hr, in reference fuel A	-7.0	%	ASTM D471
23°C, 504 hr, Class C Standard Fuel	10	%	ASTM D471
23°C, 504 hr, in reference fuel A	-1.0	%	ASTM D471
100°C, 70 hr, in ASTM #1 oil	8.0	%	ASTM D471, ISO 175
100°C, 70 hr, in ASTM #3 oil	4.0	%	ASTM D471, ISO 175
100°C, 168 hr, in ASTM #1 oil	-4.0	%	ASTM D471, ISO 175
100°C, 168 hr, in ASTM #3 oil	19	%	ASTM D471, ISO 175
100°C, 336 hr, in ASTM #1 oil	4.0	%	ASTM D471, ISO 175
100°C, 336 hr, in ASTM #3 oil	36	%	ASTM D471, ISO 175

100°C, 504 hr, in ASTM #1 oil	17	%	ASTM D471, ISO 175
100°C, 504 hr, in ASTM #3 oil	51	%	ASTM D471, ISO 175
23°C, 70 hr, in Reference Fuel C	15	%	ISO 175
23°C, 70 hr, in reference fuel A (isooctane)	0.0	%	ISO 175
23°C, 168 hr, in Reference Fuel C	-17	%	ISO 175
23°C, 168 hr, in reference fuel A (isooctane)	0.0	%	ISO 175
23°C, 336 hr, in Reference Fuel C	12	%	ISO 175
23°C, 336 hr, in reference fuel A (isooctane)	-7.0	%	ISO 175
23°C, 504 hr, in Reference Fuel C	10	%	ISO 175
23°C, 504 hr, in reference fuel A (isooctane)	-1.0	%	ISO 175
Change in Durometer Hardness			
Support D, 23°C, 70 hr, in Reference Fuel C	0.0		ASTM D471, ISO 175
Support D, 23°C, 70 hr, in reference fuel A	-1.0		ASTM D471
Support D, 23°C, 168 hr, in Reference Fuel C	-1.0		ASTM D471, ISO 175
Support D, 23°C, 168 hr, in reference fuel A	-5.0		ASTM D471
Support d, 23 c, 336 hr, in Reference fuel c	-4.0		ASTM D471, ISO 175
Support D, 23°C, 336 hr, in reference fuel A	-1.0		ASTM D471
Support D, 23°C, 504 hr, in Reference Fuel C	-5.0		ASTM D471, ISO 175
Support D, 23°C, 504 hr, in reference fuel A	2.0		ASTM D471
Support D, 100°C, 70 hr, in ASTM #1 oil	-1.0		ASTM D471
Support D, 100°C, 70 hr, in ASTM #3 oil	-4.0		ASTM D471
Support D, 100°C, 168 hr, in ASTM #1 oil	-3.0		ASTM D471
Support D, 100°C, 168 hr, in ASTM #3 oil	-5.0		ASTM D471
Support D, 100°C, 336 hr, in ASTM #1 oil	-4.0		ASTM D471
Support D, 100°C, 336 hr, in ASTM #3 oil	-2.0		ASTM D471
Support D, 100°C, 504 hr, in ASTM #1 oil	-2.0		ASTM D471
Support D, 100°C, 504 hr, in ASTM #3 oil	-5.0		ASTM D471
Support D, 23°C, 70 hr, in reference fuel A (isooctane)	-1.0		ISO 175
Support D, 23°C, 168 hr, in reference fuel A (isooctane)	-5.0		ISO 175
Support D, 23°C, 336 hr, in reference fuel A (isooctane)	-1.0		ISO 175
Support D, 23°C, 504 hr, in reference fuel A (isooctane)	2.0		ISO 175

Support D, 100°C, 70 hr, in ASTM #1 oil	-1.0		ISO 175
Support D, 100°C, 70 hr, in ASTM #3 oil	-4.0		ISO 175
Support D, 100°C, 168 hr, in ASTM #1 oil	-3.0		ISO 175
Support D, 100°C, 168 hr, in ASTM #3 oil	-5.0		ISO 175
Support D, 100°C, 336 hr, in ASTM #1 oil	-4.0		ISO 175
Support D, 100°C, 336 hr, in ASTM #3 oil	-2.0		ISO 175
Support D, 100°C, 504 hr, in ASTM #1 oil	-2.0		ISO 175
Support D, 100°C, 504 hr, in ASTM #3 oil	-5.0		ISO 175
Change in Volume			
23°C, 70 hr, Class A standard fuel	0.0	%	ASTM D471
23°C, 70 hr, Class C Standard Fuel	1.0	%	ASTM D471
23°C, 168 hr, Class A standard fuel	0.0	%	ASTM D471
23°C, 168 hr, Class C Standard Fuel	2.0	%	ASTM D471
23°C, 336 hr, Class A standard fuel	0.0	%	ASTM D471
23°C, 336 hr, Class C Standard Fuel	2.0	%	ASTM D471
23°C, 504 hr, Class A standard fuel	0.0	%	ASTM D471
23°C, 504 hr, Class C Standard Fuel	2.0	%	ASTM D471
100°C, 70 hr, ASTM Standard Oil (No.1)	0.0	%	ASTM D471
100°C, 70 hr, ASTM Standard Oil (No.3)	0.0	%	ASTM D471
100°C, 168 hr, ASTM Standard Oil (No.1)	0.0	%	ASTM D471
100°C, 168 hr, ASTM Standard Oil (No.3)	1.0	%	ASTM D471
100°C, 336 hr, ASTM Standard Oil (No.1)	0.0	%	ASTM D471
100°C, 336 hr, ASTM Standard Oil (No.3)	2.0	%	ASTM D471
100°C, 504 hr, ASTM Standard Oil (No.1)	0.0	%	ASTM D471
100°C, 504 hr, ASTM Standard Oil (No.3)	2.0	%	ASTM D471
23°C, 70 hr, in reference fuel A	0.0	%	ISO 175
23°C, 70 hr, in reference fuel C	1.0	%	ISO 175
23°C, 168 hr, in reference fuel A	0.0	%	ISO 175
23°C, 168 hr, in reference fuel C	2.0	%	ISO 175
23°C, 336 hr, in reference fuel A	0.0	%	ISO 175
23°C, 336 hr, in reference fuel C	2.0	%	ISO 175
23°C, 504 hr, in reference fuel A	0.0	%	ISO 175
23°C, 504 hr, in reference fuel C	2.0	%	ISO 175
100°C, 70 hr, in ASTM #1 oil	0.0	%	ISO 175
100°C, 70 hr, in ASTM #3 oil	0.0	%	ISO 175
100°C, 168 hr, in ASTM #1 oil	0.0	%	ISO 175
100°C, 168 hr, in ASTM #3 oil	1.0	%	ISO 175
100°C, 336 hr, in ASTM #1 oil	0.0	%	ISO 175
100°C, 336 hr, in ASTM #3 oil	2.0	%	ISO 175
100°C, 504 hr, in ASTM #1 oil	0.0	%	ISO 175
100°C, 504 hr, in ASTM #3 oil	2.0	%	ISO 175

Thermal	Nominal Value	Unit	Test Method

Deflection Temperature Under Load			
0.45 MPa, not annealed	46.0	°C	ASTM D648, ISO 75-2/B
1.8 MPa, not annealed	38.0	°C	ASTM D648, ISO 75-2/A
Brittleness Temperature	< -68.0	°C	ASTM D746, ISO 974
Glass Transition Temperature	0.00	°C	DMA
Vicat Softening Temperature	158	°C	ISO 306/50, ASTM D1525 [4]
CLTE - Flow	9.9E-5	cm/cm/°C	ASTM D696

Additional Information	Nominal Value	Unit	Test Method
Compressive Load			ASTM D575
10% Deflection	21.7	MPa	ASTM D575
15% Deflection	25.9	MPa	ASTM D575
2% Deflection	3.79	MPa	ASTM D575
20% Deflection	29.3	MPa	ASTM D575
25% Deflection	33.8	MPa	ASTM D575
5% Deflection	13.1	MPa	ASTM D575
50% Deflection	65.8	MPa	ASTM D575

Injection	Nominal Value	Unit
Drying Temperature - Desiccant Dryer	100 - 110	°C
Drying Time - Desiccant Dryer	2.0	hr
Suggested Max Moisture	< 0.030	%
Suggested Shot Size	40 - 80	%
Suggested Max Regrind	20	%
Rear Temperature	210 - 235	°C
Middle Temperature	210 - 240	°C
Front Temperature	215 - 240	°C
Nozzle Temperature	215 - 240	°C
Processing (Melt) Temp	220 - 240	°C
Mold Temperature	15.0 - 40.0	°C
Injection Pressure	41.4 - 103	MPa
Injection Rate	Slow-Moderate	
Back Pressure	< 1.38	MPa
Screw Speed	40 - 80	rpm
Clamp Tonnage	4.1 - 6.9	kN/cm^2
Cushion	< 3.18	mm
Screw L/D Ratio	20.0:1.0	
Screw Compression Ratio	2.5:1.0 - 3.0:1.0	

Injection instructions
Hold Pressure: 60 to 80% of Injection PressureTimers (per 0.125 in cross section): Boost: 5 to 10 sec 2nd Stage: 10 to 20 sec Cool: 20 to 30 sec

NOTE	
1.	C mould

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

Recommended distributors for this material

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