Texin® 945 U

Thermoplastic Polyurethane Elastomer (Polyether)

Covestro - PUR

Message:

Texin 945U resin is a polyether-based thermoplastic polyurethane with a Shore hardness of approximately 45D. It can be processed by injection molding, extrusion, or blow molding.

General Information	
Additive	heat stabilizer
	UV stabilizer
Features	Impact resistance, good
	Good flexibility
	Good wear resistance
	Hydrolysis resistance
	Thermal Stability
	Good toughness
	Medium transparency
Uses	Cable sheath
	Pipe fittings
	Seals
	Molded Ear Label
	Sheet
	Footwear
	Profile
Agency Ratings	NSF 61
Appearance	Natural color
Processing Method	Blow molding
	Extrusion
	Injection molding

Physical	Nominal Value	Unit	Test Method
Specific Gravity	1.14	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)	45		ASTM D2240, ISO 868
Mechanical	**Nominal Value**	**Unit**	**Test Method**
Flexural Modulus			ASTM D790, ISO 178
23°C	103	MPa	ASTM D790, ISO 178
70°C	34.5	MPa	ASTM D790, ISO 178
Taber Abrasion Resistance			
1000 Cycles, 1000g, H-18 wheel	60.0	mg	ISO 4649
1000 Cycles, 1000g, H-18 wheel	60.0	mg	ASTM D1044
Elastomers	**Nominal Value**	**Unit**	**Test Method**
Tensile Stress			
50% strain	9.70	MPa	ISO 37, ASTM D412
100% strain	12.4	MPa	ASTM D412, ISO 37
300% strain	27.6	MPa	ASTM D412, ISO 37
Tensile Strength (Yield)	46.2	MPa	ASTM D412, ISO 37
Tensile Elongation (Break)	400	%	ASTM D412, ISO 37
Tear Strength			
-- [1]	127	kN/m	ASTM D624
--	130	kN/m	ISO 34-1
Compression Set			ASTM D395B, ISO 815
23°C, 22 hr [2]	20	%	ASTM D395B, ISO 815
23°C, 22 hr	22	%	ASTM D395B, ISO 815
70°C, 22 hr [3]	40	%	ASTM D395B, ISO 815
70°C, 22 hr	75	%	ASTM D395B, ISO 815
Bayshore Resilience	35	%	ASTM D2632
Aging	**Nominal Value**	**Unit**	**Test Method**
Change in Tensile Strength in Air			
100°C, 70 hr	0.0	%	ASTM D573, ISO 216
100% strain, 100°C, 70 hr	7.0	%	ASTM D573
300% strain, 100°C, 70 hr	5.0	%	ASTM D573
100°C, 168 hr	-4.0	%	ASTM D573, ISO 216
100% strain, 100°C, 168 hr	6.0	%	ASTM D573
300% strain, 100°C, 168 hr	-1.0	%	ASTM D573
100°C, 336 hr	-4.0	%	ASTM D573, ISO 216
100% strain, 100°C, 336 hr	6.0	%	ASTM D573
300% strain, 100°C, 336 hr	-1.0	%	ASTM D573
100°C, 504 hr	-8.0	%	ASTM D573, ISO 216
100% strain, 100°C, 504 hr	5.0	%	ASTM D573
300% strain, 100°C, 504 hr	-3.0	%	ASTM D573
100% strain 100°C, 70 hr	7.0	%	ISO 216
300% strain 100°C, 70 hr	5.0	%	ISO 216
100% strain 100°C, 168 hr	6.0	%	ISO 216

300% strain 100°C, 168 hr	-1.0	%	ISO 216
100% strain 100°C, 336 hr	6.0	%	ISO 216
300% strain 100°C, 336 hr	-1.0	%	ISO 216
100% strain 100 c, 504 hr	5.0	%	ISO 216
300% strain 100 c, 504 hr	-3.0	%	ISO 216
Change in Ultimate Elongation in Air			ASTM D573, ISO 216
100°C, 70 hr	9.0	%	ASTM D573, ISO 216
100°C, 168 hr	14	%	ASTM D573, ISO 216
100°C, 336 hr	13	%	ASTM D573, ISO 216
100°C, 504 hr	17	%	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	0.0		ASTM D573, ISO 216
Support d, 100 c, 336 hr	-1.0		ASTM D573, ISO 216
Support d, 100 c, 504 hr	0.0		ASTM D573, ISO 216
Change in Tensile Strength			
23°C, 70 hr, Class C Standard Fuel	-25	%	ASTM D471
100% strain, 23°C, 70 hr, Class C standard fuel	-32	%	ASTM D471
300% strain, 23°C, 70 hr, Class C standard fuel	-33	%	ASTM D471
23°C, 70 hr, in reference fuel A	10	%	ASTM D471
100% strain, 23°C, 70 hr, in reference fuel A	-2.0	%	ASTM D471
300% strain, 23°C, 70 hr, in reference fuel A	-3.0	%	ASTM D471
23°C, 168 hr, Class C Standard Fuel	-26	%	ASTM D471
100% strain, 23°C, 168 hr, Class C standard fuel	-28	%	ASTM D471
300% strain, 23°C, 168 hr, Class C standard fuel	-30	%	ASTM D471
23°C, 168 hr, in reference fuel A	4.0	%	ASTM D471
100% strain, 23°C, 168 hr, in reference fuel a	8.0	%	ASTM D471
300% strain, 23°C, 168 hr, in reference fuel a	0.0	%	ASTM D471
23°C, 336 hr, Class C Standard Fuel	-28	%	ASTM D471
100% strain, 23°C, 336 hr, Class C standard fuel	-27	%	ASTM D471
300% strain, 23°C, 336 hr, Class C standard fuel	-30	%	ASTM D471
23°C, 336 hr, in reference fuel A	8.0	%	ASTM D471
100% strain, 23°C, 336 hr, in reference fuel A	1.0	%	ASTM D471
300% strain, 23°C, 336 hr, in reference fuel A	-5.0	%	ASTM D471

23°C, 504 hr, Class C Standard Fuel	-24	%	ASTM D471
100% strain, 23°C, 504 hr, Class C standard fuel	-27	%	ASTM D471
300% strain, 23°C, 504 hr, Class C standard fuel	-28	%	ASTM D471
23°C, 504 hr, in reference fuel A	7.0	%	ASTM D471
100% strain, 23°C, 504 hr, in reference fuel A	-4.0	%	ASTM D471
300% strain, 23°C, 504 hr, in reference fuel A	-8.0	%	ASTM D471
100°C, 70 hr, in ASTM #1 oil	-4.0	%	ASTM D471, ISO 175
100% strain, 100°C, 70 hr, in ASTM #1 oil	10	%	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	10	%	ASTM D471, ISO 175
100% strain, 100°C, 70 hr, in ASTM #3 oil	2.0	%	ASTM D471, ISO 175
300% strain, 100°C, 70 hr, in ASTM #3 oil	-1.0	%	ASTM D471, ISO 175
100°C, 168 hr, in ASTM #1 oil	-11	%	ASTM D471, ISO 175
100% strain, 100°C, 168 hr, in ASTM #1 oil	4.0	%	ASTM D471, ISO 175
300% strain, 100°C, 168 hr, in ASTM #1 oil	-4.0	%	ASTM D471, ISO 175
100°C, 168 hr, in ASTM #3 oil	9.0	%	ASTM D471, ISO 175
100% strain, 100°C, 168 hr, in ASTM #3 oil	-7.0	%	ASTM D471, ISO 175
300% strain, 100°C, 168 hr, in ASTM #3 oil	-10	%	ASTM D471, ISO 175
100°C, 336 hr, in ASTM #1 oil	-11	%	ASTM D471, ISO 175
100% strain, 100°C, 336 hr, in ASTM #1 oil	11	%	ASTM D471, ISO 175
300% strain, 100°C, 336 hr, in ASTM #1 oil	0.0	%	ASTM D471, ISO 175
100°C, 336 hr, in ASTM #3 oil	7.0	%	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	-7.0	%	ASTM D471, ISO 175
100°C, 504 hr, in ASTM #1 oil	-14	%	ASTM D471, ISO 175
100% strain, 100°C, 504 hr, in ASTM #1 oil	5.0	%	ASTM D471, ISO 175
300% strain, 100°C, 504 hr, in ASTM #1 oil	-9.0	%	ASTM D471, ISO 175
100°C, 504 hr, in ASTM #3 oil	-9.0	%	ASTM D471, ISO 175
100% strain, 100°C, 504 hr, in ASTM #3 oil	-4.0	%	ASTM D471, ISO 175
300% strain, 100°C, 504 hr, in ASTM #3 oil	-15	%	ASTM D471, ISO 175
23°C, 70 hr, in Reference Fuel C	-25	%	ISO 175

100% strain, 23 c, 70 hr, in Reference Fuel C	-32	%	ISO 175
300% strain, 23 c, 70 hr, in Reference Fuel C	-33	%	ISO 175
23°C, 70 hr, in reference fuel A (isooctane)	10	%	ISO 175
100% strain, 23°C, 70 hr, in reference fuel A (isooctane)	-2.0	%	ISO 175
300% strain, 23°C, 70 hr, in reference fuel A (isooctane)	-3.0	%	ISO 175
23°C, 168 hr, in Reference Fuel C	-26	%	ISO 175
100% strain, 23 c, 168 hr, in Reference Fuel C	-28	%	ISO 175
300% strain, 23 c, 168 hr, in Reference Fuel C	-30	%	ISO 175
23°C, 168 hr, in reference fuel A (isooctane)	4.0	%	ISO 175
100% strain, 23°C, 168 hr, in reference fuel A (isooctane)	8.0	%	ISO 175
300% strain, 23°C, 168 hr, in reference fuel A (isooctane)	0.0	%	ISO 175
23°C, 336 hr, in Reference Fuel C	-28	%	ISO 175
100% strain, 23 c, 336 hr, in Reference Fuel C	-27	%	ISO 175
300% strain, 23 c, 336 hr, in Reference Fuel C	-30	%	ISO 175
23°C, 336 hr, in reference fuel A (isooctane)	8.0	%	ISO 175
100% strain, 23°C, 336 hr, in reference fuel A (isooctane)	1.0	%	ISO 175
300% strain, 23°C, 336 hr, in reference fuel A (isooctane)	-5.0	%	ISO 175
23°C, 504 hr, in Reference Fuel C	-24	%	ISO 175
100% strain, 23 c, 504 hr, in Reference Fuel C	-27	%	ISO 175
300% strain, 23 c, 504 hr, in Reference Fuel C	-28	%	ISO 175
23°C, 504 hr, in reference fuel A (isooctane)	7.0	%	ISO 175
100% strain, 23°C, 504 hr, in reference fuel A (isooctane)	-4.0	%	ISO 175
300% strain, 23°C, 504 hr, in reference fuel A (isooctane)	-8.0	%	ISO 175
Change in Ultimate Elongation			
23°C, 70 hr, Class C Standard Fuel	-5.0	%	ASTM D471
23°C, 70 hr, in reference fuel A	5.0	%	ASTM D471
23°C, 168 hr, Class C Standard Fuel	-4.0	%	ASTM D471
23°C, 168 hr, in reference fuel A	1.0	%	ASTM D471
23°C, 336 hr, Class C Standard Fuel	-6.0	%	ASTM D471

23°C, 336 hr, in reference fuel A	4.0	%	ASTM D471
23°C, 504 hr, Class C Standard Fuel	-6.0	%	ASTM D471
23°C, 504 hr, in reference fuel A	6.0	%	ASTM D471
100°C, 70 hr, in ASTM #1 oil	11	%	ASTM D471, ISO 175
100°C, 70 hr, in ASTM #3 oil	19	%	ASTM D471, ISO 175
100°C, 168 hr, in ASTM #1 oil	21	%	ASTM D471, ISO 175
100°C, 168 hr, in ASTM #3 oil	32	%	ASTM D471, ISO 175
100°C, 336 hr, in ASTM #1 oil	20	%	ASTM D471, ISO 175
100°C, 336 hr, in ASTM #3 oil	25	%	ASTM D471, ISO 175
100°C, 504 hr, in ASTM #1 oil	24	%	ASTM D471, ISO 175
100°C, 504 hr, in ASTM #3 oil	30	%	ASTM D471, ISO 175
23°C, 70 hr, in Reference Fuel C	-5.0	%	ISO 175
23°C, 70 hr, in reference fuel A (isooctane)	5.0	%	ISO 175
23°C, 168 hr, in Reference Fuel C	-4.0	%	ISO 175
23°C, 168 hr, in reference fuel A (isooctane)	1.0	%	ISO 175
23°C, 336 hr, in Reference Fuel C	-6.0	%	ISO 175
23°C, 336 hr, in reference fuel A (isooctane)	4.0	%	ISO 175
23°C, 504 hr, in Reference Fuel C	-6.0	%	ISO 175
23°C, 504 hr, in reference fuel A (isooctane)	6.0	%	ISO 175
Change in Durometer Hardness			
Support D, 23°C, 70 hr, in Reference Fuel C	-6.0		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	-5.0		ASTM D471, ISO 175
Support D, 23°C, 168 hr, in reference fuel A	-1.0		ASTM D471
Support d, 23 c, 336 hr, in Reference fuel c	-7.0		ASTM D471, ISO 175
Support D, 23°C, 336 hr, in reference fuel A	0.0		ASTM D471
Support D, 23°C, 504 hr, in Reference Fuel C	-6.0		ASTM D471, ISO 175
Support D, 23°C, 504 hr, in reference fuel A	-1.0		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	2.0		ASTM D471
Support D, 100°C, 168 hr, in ASTM #3 oil	-4.0		ASTM D471
Support D, 100°C, 336 hr, in ASTM #1 oil	-1.0		ASTM D471
Support D, 100°C, 336 hr, in ASTM #3 oil	-4.0		ASTM D471

Support D, 100°C, 504 hr, in ASTM #1 oil	0.0		ASTM D471
Support D, 100°C, 504 hr, in ASTM #3 oil	-4.0		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)	-1.0		ISO 175
Support D, 23°C, 336 hr, in reference fuel A (isooctane)	0.0		ISO 175
Support D, 23°C, 504 hr, in reference fuel A (isooctane)	-1.0		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	2.0		ISO 175
Support D, 100°C, 168 hr, in ASTM #3 oil	-4.0		ISO 175
Support D, 100°C, 336 hr, in ASTM #1 oil	-1.0		ISO 175
Support D, 100°C, 336 hr, in ASTM #3 oil	-4.0		ISO 175
Support D, 100°C, 504 hr, in ASTM #1 oil	0.0		ISO 175
Support D, 100°C, 504 hr, in ASTM #3 oil	-4.0		ISO 175
Change in Volume			
23°C, 70 hr, Class A standard fuel	1.0	%	ASTM D471
23°C, 70 hr, Class C Standard Fuel	30	%	ASTM D471
23°C, 168 hr, Class A standard fuel	2.0	%	ASTM D471
23°C, 168 hr, Class C Standard Fuel	32	%	ASTM D471
23°C, 336 hr, Class A standard fuel	3.0	%	ASTM D471
23°C, 336 hr, Class C Standard Fuel	33	%	ASTM D471
23°C, 504 hr, Class A standard fuel	3.0	%	ASTM D471
23°C, 504 hr, Class C Standard Fuel	31	%	ASTM D471
100°C, 70 hr, ASTM Standard Oil (No.1)	1.0	%	ASTM D471
100°C, 70 hr, ASTM Standard Oil (No.3)	12	%	ASTM D471
100°C, 168 hr, ASTM Standard Oil (No.1)	-1.0	%	ASTM D471
100°C, 168 hr, ASTM Standard Oil (No.3)	13	%	ASTM D471
100°C, 336 hr, ASTM Standard Oil (No.1)	0.0	%	ASTM D471
100°C, 336 hr, ASTM Standard Oil (No.3)	17	%	ASTM D471
100°C, 504 hr, ASTM Standard Oil (No.1)	0.0	%	ASTM D471
100°C, 504 hr, ASTM Standard Oil (No.3)	16	%	ASTM D471
23°C, 70 hr, in reference fuel A	1.0	%	ISO 175
23°C, 70 hr, in reference fuel C	30	%	ISO 175
23°C, 168 hr, in reference fuel A	2.0	%	ISO 175
23°C, 168 hr, in reference fuel C	32	%	ISO 175
23°C, 336 hr, in reference fuel A	3.0	%	ISO 175
23°C, 336 hr, in reference fuel C	33	%	ISO 175
23°C, 504 hr, in reference fuel A	3.0	%	ISO 175
23°C, 504 hr, in reference fuel C	31	%	ISO 175

100°C, 70 hr, in ASTM #1 oil	1.0	%	ISO 175
100°C, 70 hr, in ASTM #3 oil	12	%	ISO 175
100°C, 168 hr, in ASTM #1 oil	-1.0	%	ISO 175
100°C, 168 hr, in ASTM #3 oil	13	%	ISO 175
100°C, 336 hr, in ASTM #1 oil	0.0	%	ISO 175
100°C, 336 hr, in ASTM #3 oil	17	%	ISO 175
100°C, 504 hr, in ASTM #1 oil	0.0	%	ISO 175
100°C, 504 hr, in ASTM #3 oil	16	%	ISO 175
Thermal	**Nominal Value**	**Unit**	**Test Method**
Brittleness Temperature	< -68.0	°C	ASTM D746, ISO 974
Glass Transition Temperature	-40.0	°C	DMA
Vicat Softening Temperature	116	°C	ISO 306/50, ASTM D1525 [4]
Additional Information	**Nominal Value**	**Unit**	**Test Method**
Compressive Load			ASTM D575
10% Deflection	3.79	MPa	ASTM D575
15% Deflection	5.34	MPa	ASTM D575
2% Deflection	0.896	MPa	ASTM D575
20% Deflection	6.89	MPa	ASTM D575
25% Deflection	8.38	MPa	ASTM D575
5% Deflection	2.10	MPa	ASTM D575
50% Deflection	21.5	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	180 - 200	°C	
Middle Temperature	180 - 205	°C	
Front Temperature	180 - 210	°C	
Nozzle Temperature	185 - 210	°C	
Processing (Melt) Temp	195 - 205	°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	24.0:1.0		
Screw Compression Ratio	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 30 sec
Cool: 30 to 50 sec

Extrusion	Nominal Value	Unit
Drying Temperature	100 - 110	°C
Drying Time	2.0	hr
Cylinder Zone 1 Temp.	180 - 200	°C
Cylinder Zone 3 Temp.	180 - 205	°C
Cylinder Zone 5 Temp.	180 - 210	°C
Adapter Temperature	180 - 210	°C
Melt Temperature	190 - 205	°C
Die Temperature	185 - 210	°C

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)

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