

Torlon® 4645

polyamide-imide

Torlon 4645, an injection-moldable, wear-resistant grade of polyamide-imide (PAI), has been formulated to give outstanding wear resistance in lubricated wear applications.

Potential applications for Torlon 4645 polyamide-imide include thrust washers, seal rings, sliding vanes, bobbins, bushings, clutch rollers and pistons.

Torlon PAI has the highest strength and stiffness of any thermoplastic up to 275°C (525°F). It has outstanding resistance to wear, creep and chemicals.

General

Material Status	• Commercial: Active		
Availability	• Africa & Middle East • Asia Pacific	• Europe • North America	• South America
Additive	• Carbon Fiber + PTFE Lubricant		
Features	• Flame Retardant • Good Chemical Resistance • Good Creep Resistance • Good Wear Resistance	• High Heat Resistance • High Stiffness • High Temperature Strength • Low Friction	• Self Lubricating • Semi Conductive
Uses	• Automotive Applications • Bearings	• Bobbins • Bushings	• Seals • Thrust Washer
RoHS Compliance	• Contact Manufacturer		
Forms	• Pellets		
Processing Method	• Injection Molding	• Machining	• Profile Extrusion

Physical

	Typical Value	Unit	Test Method
Specific Gravity	1.57	g/cm ³	ASTM D792
Water Absorption (24 hr)	0.25	%	ASTM D570

Mechanical

	Typical Value	Unit	Test Method
Tensile Modulus	18600	MPa	ASTM D638
Tensile Strength	114	MPa	ASTM D638
Tensile Elongation (Break)	0.80	%	ASTM D638
Flexural Modulus	12400	MPa	ASTM D790
Flexural Strength	154	MPa	ASTM D790
Compressive Strength	157	MPa	ASTM D695
Shear Strength			ASTM D732
23°C	85.5	MPa	
150°C	60.7	MPa	
Coefficient of Friction			ASTM D1894
-- 1	0.070		
-- 2	0.090		

Wear Factor

	Typical Value	Unit	Test Method
Lubricated: 0.375 m/s, 6.9 MPa (75 fpm, 1000 psi)	1.60	in ³ ·min ⁻¹ / 10/ft·lb·hr	ASTM D3702
Lubricated: 4 m/s, 5.2 MPa (800 fpm, 750 psi)	0.300	in ³ ·min ⁻¹ / 10/ft·lb·hr	

Impact

	Typical Value	Unit	Test Method
Notched Izod Impact	37	J/m	ASTM D256
Unnotched Izod Impact	110	J/m	ASTM D256

Thermal	Typical Value Unit	Test Method
Deflection Temperature Under Load 1.8 MPa, Unannealed	281 °C	ASTM D648
Coefficient of Linear Thermal Expansion	0.000014 cm/cm/°C	ASTM D696

Injection	Typical Value Unit
Drying Temperature	177 °C
Drying Time	3.0 hr
Suggested Max Moisture	0.050 %
Rear Temperature	304 °C
Nozzle Temperature	371 °C
Mold Temperature	199 to 216 °C
Back Pressure	6.89 MPa
Screw Speed	50 to 100 rpm
Screw L/D Ratio	18.0:1.0 to 24.0:1.0

Injection Notes

Minimum drying times are: 3 hours at 350°F (177°C), 4 hours at 300°F (149°C), or 16 hours at 250°F (121°C).

Compression Ratio between 1:1 and 1.5:1

Begin hold pressure at a high setting 6,000-8,000 psi (41.37-55.16 MPa), for several seconds, then drop off to 3,000-5,000 psi (20.69-34.48 MPa), for the duration of the hold pressure sequence.

Molded parts must be post cured.

Notes

Typical properties: these are not to be construed as specifications.

¹ Lubricated: 4 m/s, 5.2 MPa (800 fpm, 750 psi)

² Lubricated: 0.25 m/s, 6.9 MPa (75 fpm, 1000 psi)

www.SolvaySpecialtyPolymers.com

Contact Solvay Specialty Polymers

Europe, Middle East and Africa SpecialtyPolymers.EMEA@solvay.com

Americas SpecialtyPolymers.Americas@solvay.com

Asia and Australia SpecialtyPolymers.Asia@solvay.com

In Case of Accident

Europe & South America +44(0).1235.239.670 (CareChem 24)

North America +1.703.527.3887 (Chemtrec)
+1.800.424.9300 (Toll Free Chemtrec)

China & Taiwan +86.10.5100.3039 (CareChem 24)

East/South East Asia +65.3158.1074 (CareChem 24)

Product Information, Technical Assistance and MSDS

Europe +39.02.3835.1

Americas +1.770.772.8760
+1.800.621.4557

Japan +81.3.5425.4300

China & South East Asia +86.21.5080.5080

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