

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.

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.

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

General

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

Physical	Typical Value	Unit	Test method
Density / Specific Gravity	1.57		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	

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Mechanical	Typical Value	Unit	Test method
Coefficient of Friction			ASTM D1894
-- 1	0.090		
-- 2	0.070		
Wear Factor			ASTM D3702
Lubricated: 0.375 m/s, 6.9 MPa (75 fpm, 1000 psi)	1.60	in ³ ·min ⁻¹⁰ /ft·lb·hr	
Lubricated: 4 m/s, 5.2 MPa (800 fpm, 750 psi)	0.300	in ³ ·min ⁻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 D4812

Thermal	Typical Value	Unit	Test method
Deflection Temperature Under Load			ASTM D648
1.8 MPa, Unannealed	281	°C	
Coefficient of Linear Thermal Expansion	1.4E-5	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: 0.25 m/s, 6.9 MPa (75 fpm, 1000 psi)

² Lubricated: 4 m/s, 5.2 MPa (800 fpm, 750 psi)



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