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	in³·min^-10/ ft·lb·hr	
Lubricated: 4 m/s, 5.2 MPa (800 fpm, 750 psi)	0.300	in³·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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