



# 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
- Automotive Applications
- Bearings
- Contact Manufacturer
- Pellets
- High Heat Resistance
- High Stiffness
- High Temperature Strength
- Low Friction
- Bobbins
- Bushings
- Self Lubricating
- Semi Conductive

#### Uses

- Automotive Applications
- Bearings
- Contact Manufacturer
- Pellets
- 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/cm³	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

150°C

#### Coefficient of Friction

-- 1	0.070		ASTM D1894
-- 2	0.090		

#### Wear Factor

ASTM D3702

Lubricated: 0.375 m/s, 6.9 MPa (75 fpm, 1000 psi)

1.60 in³·min⁻¹·  
10/ft·lb·hr

Mechanical	Typical Value	Unit	Test Method
Lubricated: 4 m/s, 5.2 MPa (800 fpm, 750 psi)	0.300	in <sup>3</sup> ·min <sup>-1</sup> · 10/ft <sup>2</sup> ·lb·hr	
Impact			
Notched Izod Impact	37	J/m	ASTM D256
Unnotched Izod Impact	110	J/m	ASTM D256
Thermal			
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			
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.

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

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