

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 • 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 | | | ASTM D3702 |
| Lubricated: 0.375 m/s, 6.9 MPa (75 fpm, 1000 psi) | 1.60 | in ³ ·min ⁻¹ / 10/ft·lb·hr | |
| 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)

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For assistance with an emergency involving this product, such as spill, leak, fire or explosion, call day or night:

Emergency Health Information

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Emergency Spill Information

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+1.703.527.3887 (CHEMTREC)
Europe +44.208.762.8322 (CARECHEM)
China +86.10.5100.3039
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For additional product information, technical assistance and Material Safety Data Sheets (MSDS), call:

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