

PLASTIC-CRAFT Torlon®

PAI — Polyamide-imide

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The highest-performing melt-processable plastic. Torlon® PAI delivers the strength of metals at high temperatures, with exceptional wear resistance and dimensional stability. Bridges the performance gap between conventional engineering plastics and ceramics or metals.

STOCK AVAILABILITY

Rods, sheets, and tubes in multiple grades. Custom machined parts available. Contact for current stock and lead times.

KEY HIGHLIGHTS

Highest strength of any plastic
500°F continuous service
Metal-replacement performance
Superior wear & friction
Excellent creep resistance
Broad chemical resistance

✓ Retains properties at 500°F — the ultimate high-temp plastic

COMMON APPLICATIONS

Jet engine components
Bearings & bushings
Seal rings & piston parts
Compressor vanes
Semiconductor fixtures
Oil & gas downhole tools
Transmission components

GRADES AVAILABLE

4203 (unfilled, best ductility)
4301 (glass-filled, structural)
4275 (bearing grade)
4435 (carbon/PTFE wear)
5030 (30% glass, high strength)
7130 (30% carbon fiber)

MATERIAL PROPERTIES — TYPICAL VALUES (4203 UNFILLED)

PROPERTY	ASTM	TYPICAL VALUE	UNITS
PHYSICAL			
Specific Gravity	D792	1.38	—
Water Absorption, 24h	D570	0.28	%
MECHANICAL			
Tensile Strength, Ultimate	D638	18,000	psi (124 MPa)
Tensile Modulus	D638	620,000	psi (4,275 MPa)
Elongation at Break	D638	12	%
Flexural Strength	D790	24,000	psi (165 MPa)
Flexural Modulus	D790	620,000	psi (4,275 MPa)
Compressive Strength (10%)	D695	28,000	psi (193 MPa)
Impact, Izod Notched	D256	2.5	ft-lb/in (133 J/m)
Hardness, Rockwell	D785	E78	—
THERMAL			
Heat Deflection @ 264 psi	D648	532	°F (278°C)
Max Continuous Service	—	500	°F (260°C)
Glass Transition (Tg)	—	537	°F (275°C)
CTE (Linear)	D696	1.7 × 10 ⁻⁵	in/in/°F
Thermal Conductivity	C177	1.9	BTU-in/hr-ft²-°F
ELECTRICAL			
Volume Resistivity	D257	2 × 10 ¹⁷	ohm-cm
Dielectric Strength	D149	460	V/mil (18 kV/mm)
Dielectric Constant, 1MHz	D150	3.9	—
FLAMMABILITY			
UL Flammability Rating	UL 94	V-0	—
Limiting Oxygen Index	D2863	45	%

PROCESSING / FABRICATION NOTES: Requires post-cure (curing schedule) after molding for full property development | Excellent machinability — use carbide tooling | Pre-dry 24h at 300°F | Anneal machined parts to relieve stress

CHEMICAL RESISTANCE: Excellent resistance to hydrocarbons, most acids, and harsh industrial chemicals. **AVOID:** steam above 400°F, strong caustics (NaOH, KOH), and hot concentrated acids.

Typical values; not to be used as specifications. Actual values may vary by grade, manufacturer, and processing conditions. Contact Plastic-Craft for grade-specific data.