

Product Comparison

Product Description

Torlon®
4203L

Torlon® 4203L is an unreinforced, lubricated, pigmented grade of polyamide-imide (PAI) resin. It has the best impact resistance and greatest elongation of all the Torlon® grades. 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.

Torlon® 4203L resin offers outstanding electrical properties, which makes it ideal for high performance parts such as connectors, switches and relays. In addition Torlon® 4203L polyamide-imide can be used in applications such as thrust washers, spline liners, valve seats, bushings, bearings, wear rings, cams and other applications requiring strength at high temperature and resistance to wear.

- High Flow: Torlon® 4203L-HF
- Low Flow: Torlon® 4203L-LF

Torlon®
5030

Torlon® 5030 is a 30% glass-fiber reinforced grade of polyamide-imide (PAI) resin. It offers high strength and modulus and exceptional creep resistance. It has thermal expansion characteristics similar to aluminum and therefore excellent dimensional stability.

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.

The mechanical properties of Torlon® 5030 resin make it a candidate for metal replacement in high temperature, high stress applications. In addition, it offers outstanding electrical properties, which makes it ideal for high performance parts such as connectors, switches and relays.

- High Flow: Torlon® 5030-HF
- Low Flow: Torlon® 5030-LF
- Extrusion Grade: Torlon® 5030-E

Product Comparison

Torlon® 7130 is an 30% carbon-fiber reinforced grade of polyamide-imide (PAI) resin. It offers high strength and modulus, exceptional creep resistance, and good fatigue resistance. It has thermal expansion characteristics similar to steel, and therefore excellent dimensional stability.

Torlon®
7130

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.

The potential applications for this resin include metal replacement, sliding vanes, aerospace parts, impellers, shrouds, pistons, and housings.

It is available in injection molding and extrusion (E) grades.

General	Torlon® 4203L	Torlon® 5030	Torlon® 7130
Manufacturer / Supplier	• Solvay Specialty Polymers	• Solvay Specialty Polymers	• Solvay Specialty Polymers
Generic	• PAI	• PAI	• PAI
Material Status	• Commercial: Active	• Commercial: Active	• Commercial: Active
Availability	• Africa & Middle East • Asia Pacific • Europe • Latin America • North America	• Africa & Middle East • Asia Pacific • Europe • Latin America • North America	• Africa & Middle East • Asia Pacific • Europe • Latin America • North America
Filler / Reinforcement	--	• Glass Fiber, 30% Filler by Weight	• Carbon Fiber, 30% Filler by Weight
Additive	• PTFE Lubricant	--	--
Features	• Ductile • Fatigue Resistant • Flame Retardant • Good Chemical Resistance • Good Creep Resistance • Good Electrical Properties • Good Wear Resistance • High Heat Resistance • High Temperature Strength • Low Temperature Toughness • Ultra High Impact Resistance	• Flame Retardant • Good Chemical Resistance • Good Compressive Strength • Good Creep Resistance • Good Dimensional Stability • High Heat Resistance • High Stiffness • High Temperature Strength	• Fatigue Resistant • Flame Retardant • Good Chemical Resistance • Good Compressive Strength • Good Creep Resistance • Good Dimensional Stability • High Heat Resistance • High Stiffness • High Temperature Strength • Semi Conductive

Product Comparison

General	Torlon® 4203L	Torlon® 5030	Torlon® 7130
Uses	<ul style="list-style-type: none"> • Aircraft Applications • Automotive Applications • Bushings • Connectors • Electrical Parts • Electrical/Electronic Applications • Fasteners • Film • Machine/Mechanical Parts • Oil/Gas Applications • Semiconductor Molding Compounds • Thrust Washer 	<ul style="list-style-type: none"> • Aerospace Applications • Aircraft Applications • Automotive Applications • Business Equipment • Connectors • Electrical Housing • Electrical Parts • Electrical/Electronic Applications • Housings • Industrial Applications • Industrial Parts • Machine/Mechanical Parts • Metal Replacement • Oil/Gas Applications • Sealing Devices • Switches • Valves/Valve Parts 	<ul style="list-style-type: none"> • Aerospace Applications • Aircraft Applications • Business Equipment • Connectors • Electrical/Electronic Applications • Film • Gears • Housings • Industrial Applications • Industrial Parts • Machine/Mechanical Parts • Metal Replacement • Oil/Gas Applications • Semiconductor Molding Compounds
RoHS Compliance	• RoHS Compliant	• RoHS Compliant	• RoHS Compliant
Automotive Specifications	<ul style="list-style-type: none"> • ASTM D4000 PAI000 R03 A56316 GA140 Z1Z2Z3Z4Z5Z6, Dwg YC3P-7E195-AA • CHRYSLER MS-DB-405 CPN3373 Color: Natural 	--	--
Forms	• Pellets	• Pellets	• Pellets
Processing Method	<ul style="list-style-type: none"> • Injection Molding • Machining • Profile Extrusion 	<ul style="list-style-type: none"> • Injection Molding • Machining • Profile Extrusion 	<ul style="list-style-type: none"> • Injection Molding • Machining • Profile Extrusion
Multi-Point Data	<ul style="list-style-type: none"> • Isothermal Stress vs. Strain (ISO 11403-1) • Viscosity vs. Shear Rate (ISO 11403-2) 	<ul style="list-style-type: none"> • Isothermal Stress vs. Strain (ISO 11403-1) • Viscosity vs. Shear Rate (ISO 11403-2) 	<ul style="list-style-type: none"> • Isothermal Stress vs. Strain (ISO 11403-1)

Product Comparison

Physical	Torlon® 4203L	Torlon® 5030	Torlon® 7130 Unit	Test method
Specific Gravity	1.42	1.61	1.48	ASTM D792
Molding Shrinkage - Flow	0.60 to 0.85	0.10 to 0.25	0.0 to 0.15 %	ASTM D955
Water Absorption (24 hr)	0.33	0.24	0.26 %	ASTM D570
Mechanical	Torlon® 4203L	Torlon® 5030	Torlon® 7130 Unit	Test method
Tensile Modulus				
--	4900	--	22300 MPa	ASTM D1708
--	--	14500	16500 MPa	ASTM D638
-- ¹	4480	--	-- MPa	ASTM D638
Tensile Strength				ASTM D638
--	--	221	221 MPa	
-- ¹	152	--	-- MPa	
Tensile Stress	192	205	203 MPa	ASTM D1708
Tensile Elongation				
Break	15	--	-- %	ASTM D1708
Break ²	--	7.0	6.0 %	ASTM D1708
Break	--	2.3	1.5 %	ASTM D638
Break ¹	7.6	--	-- %	ASTM D638
Flexural Modulus				ASTM D790
23°C	5030	11700	19900 MPa	
232°C	3590	9860	15700 MPa	
Flexural Strength				ASTM D790
23°C	241	333	350 MPa	
232°C	118	181	174 MPa	
Compressive Modulus	4000	7930	9860 MPa	ASTM D695
Compressive Strength	221	264	254 MPa	ASTM D695
Poisson's Ratio	0.45	--	--	ASTM E132

Product Comparison

Impact	Torlon® 4203L	Torlon® 5030	Torlon® 7130 Unit	Test method
Notched Izod Impact	140	80	48 J/m	ASTM D256
Unnotched Izod Impact	--	--	320 J/m	ASTM D256
--	1100	530	-- J/m	ASTM D4812
Thermal	Torlon® 4203L	Torlon® 5030	Torlon® 7130 Unit	Test method
Deflection Temperature Under Load 1.8 MPa, Unannealed	278	282	282 °C	ASTM D648
Glass Transition Temperature ³	277	--	-- °C	DSC
CLTE - Flow	3.1E-5	--	-- cm/cm/°C	ASTM E831
Thermal Conductivity	0.26	0.36	0.52 W/m/K	ASTM C177
Electrical	Torlon® 4203L	Torlon® 5030	Torlon® 7130 Unit	Test method
Surface Resistivity	5.0E+18	1.0E+18	-- ohms	ASTM D257
Volume Resistivity	2.0E+17	2.0E+17	-- ohms·cm	ASTM D257
Dielectric Strength	23	33	-- kV/mm	ASTM D149
Dielectric Constant				ASTM D150
60 Hz	4.20	4.40	--	
1 MHz	3.90	4.20	--	
Dissipation Factor				ASTM D150
60 Hz	0.026	0.022	--	
1 MHz	0.031	0.050	--	
Additional Information	Torlon® 4203L	Torlon® 5030	Torlon® 7130 Unit	Test method
Coefficient of Linear Thermal Expansion	--	1.6E-5	9.0E-6 cm/cm/°C	ASTM D696

Product Comparison

Injection	Torlon® 4203L	Torlon® 5030	Torlon® 7130 Unit
Drying Temperature	177	177	177 °C
Drying Time	3.0	3.0	3.0 hr
Suggested Max Moisture	0.050	0.050	0.050 %
Rear Temperature	304	304	304 °C
Nozzle Temperature	371	371	371 °C
Mold Temperature	199 to 216	199 to 216	199 to 216 °C
Back Pressure	6.89	6.89	6.89 MPa
Screw Speed	50 to 100	50 to 100	50 to 100 rpm
Screw L/D Ratio	18.0:1.0 to 24.0:1.0	18.0:1.0 to 24.0:1.0	18.0:1.0 to 24.0:1.0

Injection Notes

Minimum drying conditions: 3 hours at 350°F (177°C), 4 hours at 300°F (149°C), or 16 hours at 250°F (121°C).

Compression Ratio: 1:1 to 1.5:1

Torlon®
7130

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.

Product Comparison

Notes

Typical properties: these are not to be construed as specifications.

¹ Type I

² ASTM Test Method D1708 has been used to measure the tensile properties of PAI and similar materials because the small test specimen conserved material. Today the most widely used specimen is the Type 1 bar of ASTM D638. These D1708 values are included for historical purposes and they should not be compared to the D638 values.

³ Tg, onset, Solvay method, 2nd heat. Method is equivalent to ISO 11357-2.

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