

THERMOPLASTIC POLYESTER RESIN

ASTM D5927-17 Number TPES 011G20 A1221

Common features of Crastin® thermoplastic polyester resin include mechanical and physical properties such as stiffness and toughness, heat resistance, friction and wear resistance, excellent surface finishes and good colourability. Crastin® thermoplastic polyester resin has excellent electrical insulation characteristics and high arc-resistant grades are available. Many flame retardant grades have UL recognition (class V-0). Crastin® thermoplastic polyester resin typically has high chemical and heat ageing resistance.

The good melt stability of Crastin® thermoplastic polyester resin normally enables the recycling of properly handled production waste. If recycling is not possible, we recommend, as the preferred option, incineration with energy recovery (-24 kJ/g of base polymer) in appropriately equipped installations. For disposal, local regulations have to be observed.

Crastin® thermoplastic polyester resin typically is used in demanding applications in the electronics, electrical, automotive, mechanical engineering, chemical, domestic appliances and sporting goods industry.

Crastin® SO653 NC010 is a 20% glass bead filled polybutylene terephthalate resin for injection molding. It has isotropic properties and low warpage characteristics.

Product information

Resin Identification Part Marking Code	PBT-GB20 >PBT-GB20<		ISO 1043 ISO 11469
Rheological properties			
Melt mass-flow rate Melt mass-flow rate, Temperature Melt mass-flow rate, Load	13 250 2.16	-	ISO 1133
Viscosity number Intrinsic viscosity	135 1.05 1.8	cm ³ /g	ISO 307, 1628 ISO 307, 1628
Moulding shrinkage, parallel Moulding shrinkage, normal Postmoulding shrinkage, normal, 48h at 80°C Postmoulding shrinkage, parallel, 48h at 80°C	1.6 1.6 0.4 0.5	% %	ISO 294-4, 2577 ISO 294-4, 2577 ISO 294-4 ISO 294-4
Typical mechanical properties			
Tensile modulus	3500	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	47	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	10	%	ISO 527-1/-2
Flexural strength	90	MPa	ISO 178
Tensile creep modulus, 1h	3500		ISO 899-1
Tensile creep modulus, 1000h	2400		ISO 899-1
Charpy impact strength, 23°C		kJ/m ²	ISO 179/1eU
Charpy impact strength, -30°C		kJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23°C		kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -30 °C		kJ/m ²	ISO 179/1eA
Izod notched impact strength, 23°C		kJ/m² kJ/m²	ISO 180/1A
Izod notched impact strength, -30°C		kJ/m ²	ISO 180/1A ISO 180/1U
Izod impact strength, 23°C Izod impact strength, -30°C		kJ/m ²	ISO 180/10
Poisson's ratio	0.37	NU/111	130 180/10

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Thermal properties

	005		
Melting temperature, 10°C/min	225		ISO 11357-1/-3
Glass transition temperature, 10°C/min		°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	65	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	165	°C	ISO 75-1/-2
Vicat softening temperature, 50 ° C/h 50N	195	°C	ISO 306
Coefficient of linear thermal expansion		E-6/K	ISO 11359-1/-2
•	110	L-0/1	100 11000 1/2
(CLTE), parallel	110		
Coefficient of linear thermal expansion (CLTE),	110	E-6/K	ISO 11359-1/-2
normal			
Thermal conductivity of melt	0.25	W/(m K)	ISO 22007-2
Specific heat capacity of melt	1850	J/(kg K)	ISO 22007-4
RTI, electrical, 0.75mm	120		UL 746B
RTI, electrical, 1.5mm	120		UL 746B
RTI, electrical, 3.0mm	120		UL 746B
RTI, electrical, 6mm	120		UL 746B
RTI, impact, 0.75mm	115		UL 746B
RTI, impact, 1.5mm	115		UL 746B
RTI, impact, 3.0mm	115	°C	UL 746B
RTI, impact, 6mm	115	°C	UL 746B
RTI, strength, 0.75mm	120	°C	UL 746B
RTI, strength, 1.5mm	120		UL 746B
RTI, strength, 3.0mm	120		UL 746B
u	120		UL 746B
RTI, strength, 6mm		0	
TGA curve	available		ISO 11359-1/-2
Flammability			
-	חוו	class	IEC 60695-11-10
Burning Behav. at 1.5mm nom. thickn.			
Thickness tested		mm	IEC 60695-11-10
UL recognition	yes		UL 94
Burning Behav. at thickness h		class	IEC 60695-11-10
Thickness tested	3	mm	IEC 60695-11-10
UL recognition	yes		UL 94
Oxygen index	22	%	ISO 4589-1/-2
Glow Wire Flammability Index, 3.0mm	750		IEC 60695-2-12
FMVSS Class	SE/B	•	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm		mm/min	ISO 3795 (FMVSS 302)
Burning rate, mickness r min	24		130 37 33 (1 10 03 302)
Electrical properties			
Relative permittivity, 100Hz	4		IEC 62631-2-1
	3.7		IEC 62631-2-1
Relative permittivity, 1MHz			
Dissipation factor, 100Hz		E-4	IEC 62631-2-1
Dissipation factor, 1MHz		E-4	IEC 62631-2-1
Volume resistivity		Ohm.m	IEC 62631-3-1
Electric strength	25	kV/mm	IEC 60243-1
Comparative tracking index	250		IEC 60112
Electric Strength, Short Time, 2mm	17	kV/mm	IEC 60243-1

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Physical/Other properties

Humidity absorption, 2mm Water absorption, 2mm Density Density of melt				Sim. to ISO 62 Sim. to ISO 62 ISO 1183
VDA Properties				
Fogging, G-value (condensate)		0.1	mg	ISO 6452
Injection				
Drying Recommended		yes		
Drying Temperature		120		
Drying Time, Dehumidified Dryer		2 - 4		
Processing Moisture Content		≤0.04		
Melt Temperature Optimum		245		
Min. melt temperature		232		
Max. melt temperature		260		
Mold Temperature Optimum Min. mould temperature			°C °C	
Max. mould temperature			°C	
Hold pressure range			MPa	
Hold pressure time			s/mm	
Back pressure		As low as		
•		possible		
Ejection temperature		195	°C	
Characteristics				
Processing	Injection Moulding			
Delivery form	Pellets			
Additives	Release agent			
Automotive				

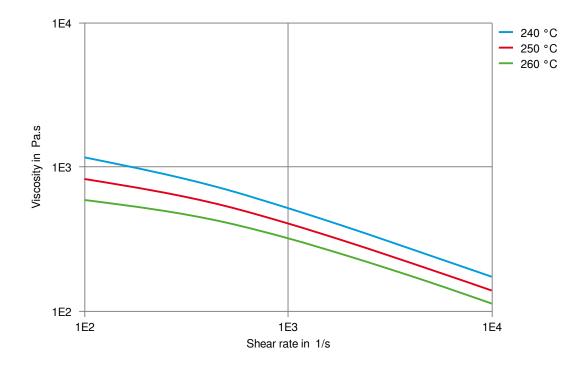
OEM BMW STANDARD GS93016-PBT-GB20





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Viscosity-shear rate

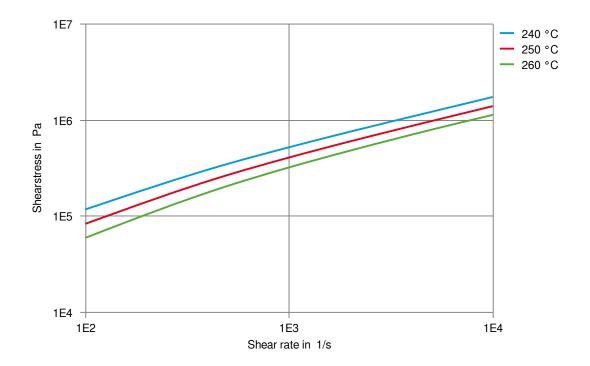






THERMOPLASTIC POLYESTER RESIN

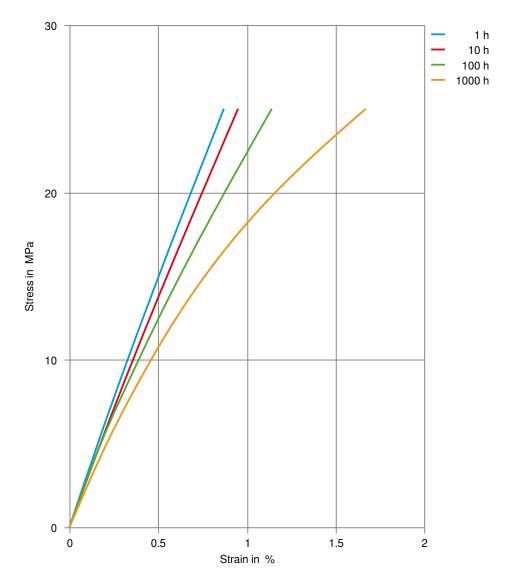
Shearstress-shear rate





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Stress-strain (isochronous) 23°C

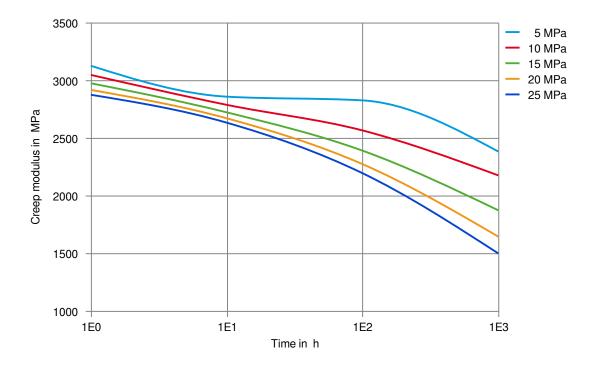






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Creep modulus-time 23°C





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Chemical Media Resistance

Acids

- ✓ Acetic Acid (5% by mass), 23°C
- ✓ Citric Acid solution (10% by mass), 23°C
- ✓ Lactic Acid (10% by mass), 23°C
- ★ Hydrochloric Acid (36% by mass), 23°C
- X Nitric Acid (40% by mass), 23°C
- X Sulfuric Acid (38% by mass), 23 °C
- X Sulfuric Acid (5% by mass), 23°C
- X Chromic Acid solution (40% by mass), 23°C

Bases

- ✗ Sodium Hydroxide solution (35% by mass), 23°C
- ✓ Sodium Hydroxide solution (1% by mass), 23°C
- Ammonium Hydroxide solution (10% by mass), 23°C

Alcohols

- ✓ Isopropyl alcohol, 23°C
- ✓ Methanol, 23°C
- ✓ Ethanol, 23°C

Hydrocarbons

- ✓ n-Hexane, 23°C
- ✓ Toluene, 23°C
- ✓ iso-Octane, 23°C

Ketones

✓ Acetone, 23°C

Ethers

✓ Diethyl ether, 23°C

Mineral oils

- ✓ SAE 10W40 multigrade motor oil, 23°C
- X SAE 10W40 multigrade motor oil, 130°C
- X SAE 80/90 hypoid-gear oil, 130 °C
- ✓ Insulating Oil, 23°C

Standard Fuels

- X ISO 1817 Liquid 1 E5, 60°C
- ¥ ISO 1817 Liquid 2 M15E4, 60°C
- ¥ ISO 1817 Liquid 3 M3E7, 60°C
- ¥ ISO 1817 Liquid 4 M15, 60°C
- ✓ Standard fuel without alcohol (pref. ISO 1817 Liquid C), 23°C
- ✓ Standard fuel with alcohol (pref. ISO 1817 Liquid 4), 23°C
- ✓ Diesel fuel (pref. ISO 1817 Liquid F), 23°C
- ✓ Diesel fuel (pref. ISO 1817 Liquid F), 90°C
- ➤ Diesel fuel (pref. ISO 1817 Liquid F), >90°C

Salt solutions

- ✓ Sodium Chloride solution (10% by mass), 23°C
- Sodium Hypochlorite solution (10% by mass), 23°C

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Crastin[®] SO653 NC010

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- ✓ Sodium Carbonate solution (20% by mass), 23°C
- Sodium Carbonate solution (2% by mass), 23°C
- Zinc Chloride solution (50% by mass), 23°C

Other

- Ethyl Acetate, 23°C
- X Hydrogen peroxide, 23°C
- X DOT No. 4 Brake fluid, 130°C
- ✗ Ethylene Glycol (50% by mass) in water, 108°C
- 1% nonylphenoxy-polyethyleneoxy ethanol in water, 23°C
- ✓ 50% Oleic acid + 50% Olive Oil, 23°C
- ✓ Water, 23°C
- X Water, 90°C
- ✓ Phenol solution (5% by mass), 23°C

Symbols used:

possibly resistant

Defined as: Supplier has sufficient indication that contact with chemical can be potentially accepted under the intended use conditions and expected service life. Criteria for assessment have to be indicated (e.g. surface aspect, volume change, property change).

X not recommended - see explanation

Defined as: Not recommended for general use. However, short-term exposure under certain restricted conditions could be acceptable (e.g. fast cleaning with thorough rinsing, spills, wiping, vapor exposure).

Printed: 2025-05-30

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Revised: 2025-04-17 Source: Celanese Materials Database

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