

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	PBT-GB20		ISO 1043
Part Marking Code	>PBT-GB20<		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	135	cm ³ /g	ISO 307, 1628
Intrinsic viscosity	1.1		ISO 307, 1628
Moulding shrinkage, parallel	1.8		ISO 294-4, 2577
Moulding shrinkage, normal	1.6	%	ISO 294-4, 2577
Postmoulding shrinkage, normal, 48h at 80°C	0.4	%	ISO 294-4
Postmoulding shrinkage, parallel, 48h at 80°C Typical mechanical properties	0.5	%	ISO 294-4
Tensile modulus	3500	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	47		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	MPa	ISO 899-1
Tensile creep modulus, 1000h		MPa	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	3.5	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C		kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C		kJ/m²	ISO 180/1A
Izod notched impact strength, -30°C	4.0	kJ/m²	ISO 180/1A
Izod impact strength, 23°C	37	kJ/m²	ISO 180/1U
Izod impact strength, -30°C Poisson's ratio	34 0.37	kJ/m²	ISO 180/1U

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Thermal properties

Melting temperature, 10°C/min Glass transition temperature, 10°C/min Temperature of deflection under load, 1.8 MPa Temperature of deflection under load, 0.45 MPa Vicat softening temperature, 50°C/h 50N Coefficient of linear thermal expansion (CLTE), parallel	65 165 195	°C °C °C	ISO 11357-1/-3 ISO 11357-1/-3 ISO 75-1/-2 ISO 75-1/-2 ISO 306 ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE),	110	E-6/K	ISO 11359-1/-2
normal Thermal conductivity of melt Specific heat capacity of melt RTI, electrical, 0.75mm RTI, electrical, 1.5mm RTI, electrical, 3.0mm RTI, electrical, 6mm RTI, impact, 0.75mm RTI, impact, 1.5mm RTI, impact, 6mm RTI, strength, 0.75mm RTI, strength, 1.5mm RTI, strength, 3.0mm RTI, strength, 6mm TGA curve		ဝံ ဝံ ဝံ ဝံ ဝံ ဝံ ဝံ ဝံ ဝံ ဝံ ဝံ ဝံ ဝံ ဝံ ဝံ ဝံ ဝံ ဝံ	ISO 22007-2 ISO 22007-4 UL 746B UL 746B
Flammability			
Burning Behav. at 1.5mm nom. thickn. Thickness tested UL recognition Burning Behav. at thickness h Thickness tested UL recognition Oxygen index Glow Wire Flammability Index, 3.0mm FMVSS Class Burning rate, Thickness 1 mm	1.5 yes HB 3 yes 22 750 SE/B		IEC 60695-11-10 IEC 60695-11-10 UL 94 IEC 60695-11-10 IEC 60695-11-10 UL 94 ISO 4589-1/-2 IEC 60695-2-12 ISO 3795 (FMVSS 302) ISO 3795 (FMVSS 302)
Electrical properties Relative permittivity, 100Hz Relative permittivity, 1MHz Dissipation factor, 100Hz Dissipation factor, 1MHz Volume resistivity Electric strength Comparative tracking index Electric Strength, Short Time, 2mm	160 >1E13 25 250	E-4 E-4 Ohm.m kV/mm kV/mm	IEC 62631-2-1 IEC 62631-2-1 IEC 62631-2-1 IEC 62631-2-1 IEC 62631-3-1 IEC 60243-1 IEC 60112 IEC 60243-1

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Physical/Other properties

Humidity absorption 2mm	0.2	0/	Sim. to ISO 62
Humidity absorption, 2mm Water absorption, 2mm	0.2 0.35		Sim. to ISO 62
Density		kg/m ³	ISO 1183
Density of melt		kg/m ³	150 1105
Density of men	1250	Kg/III	
VDA Properties			
Fogging, G-value (condensate)	0.1	mg	ISO 6452
Injection			
Drying Recommended	yes		
Drying Temperature	120		
Drying Time, Dehumidified Dryer	2 - 4	h	
Processing Moisture Content	≤0.04	%	
Melt Temperature Optimum	245	°C	
Min. melt temperature	232	°C	
Max. melt temperature	260	°C	
Mold Temperature Optimum	80	°C	
Min. mould temperature	70	°C	
Max. mould temperature	90	°C	
Hold pressure range	≥60	MPa	
Hold pressure time	3	s/mm	
Back pressure	As low as	MPa	
	possible		
Ejection temperature	195	°C	

Characteristics

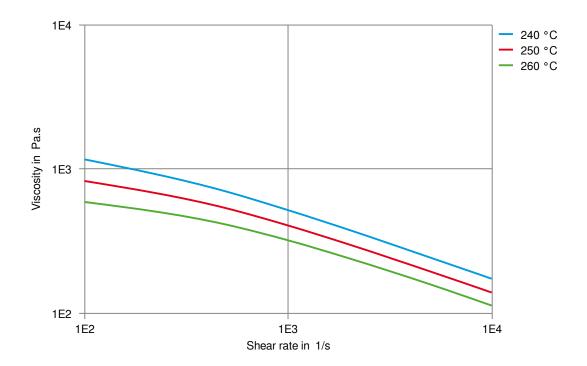
Additives

Release agent



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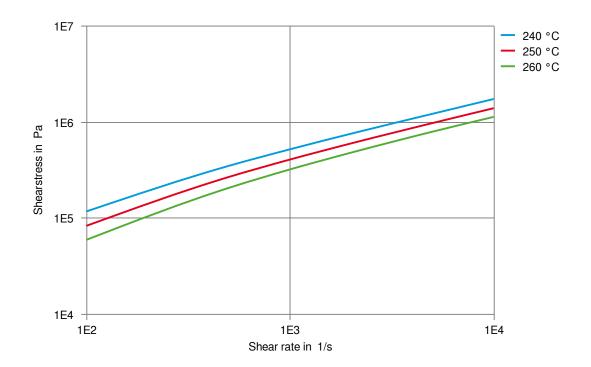
Viscosity-shear rate





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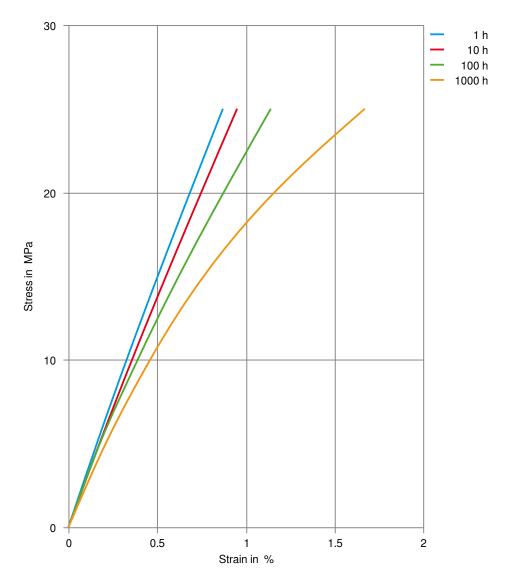
Shearstress-shear rate





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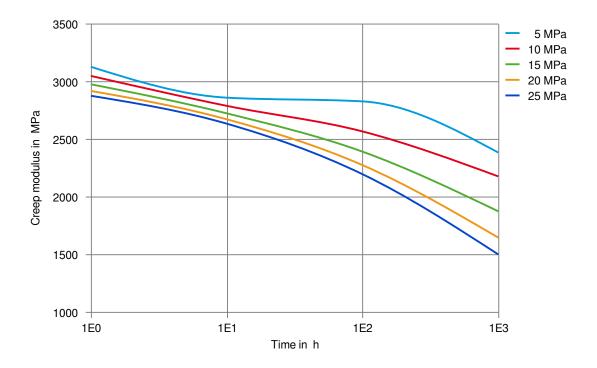
Stress-strain (isochronous) 23°C





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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
- X ISO 1817 Liquid 3 M3E7, 60°C
- X 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
- X 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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- 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
- ★ Water, 90°C
- ✓ Phenol solution (5% by mass), 23°C

Symbols used:

 \checkmark 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).

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