

THERMOPLASTIC POLYESTER RESIN

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® HR5330HFS is a 30% glass reinforced PBT with high flow, moderately toughened, hydrolysis resistant (HR) polybutylene terephtalate for injection moulding.

Product information

Resin Identification	PBT-IGF30	ISO 1043
Part Marking Code	>PBT-IGF30<	ISO 11469

Rheological properties

Melt volume-flow rate 8	cm ³ /10min ISO 1133
Temperature 250	°C
Load 2.16	kg
Intrinsic viscosity 0.87	ISO 307, 1628
Moulding shrinkage, parallel 0.3	% ISO 294-4, 2577
Moulding shrinkage, normal 1.1	% ISO 294-4, 2577
Flow length 330	mm
Flow length - pressure 80	MPa
Flow length - width/thickness 2	mm
Melt viscosity, @ 1000 sec-1, 250°C 230	Pa.s ISO 11443

Typical mechanical properties

8500	MPa	ISO 527-1/-2
120	MPa	ISO 527-1/-2
3.3	%	ISO 527-1/-2
200	MPa	ISO 178
70	kJ/m ²	ISO 179/1eU
13	kJ/m ²	ISO 179/1eA
10	kJ/m ²	ISO 179/1eA
0.34		
	120 3.3 200 70 13	8500 MPa 120 MPa 3.3 % 200 MPa 70 kJ/m² 13 kJ/m² 10 kJ/m² 0.34

Thermal properties

Melting temperature, 10°C/min	225 °C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	65 °C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	207 °C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	222 °C	ISO 75-1/-2

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Coefficient of linear thermal expansion	22 ^[DS]	E-6/K	ISO 11359-1/-2
(CLTE), parallel Coefficient of linear thermal expansion (CLTE), normal	190 ^[DS]	E-6/K	ISO 11359-1/-2
Temperature index, tensile strength, 20 000h	153	°C	IEC 60216-1
Temperature index, tensile strength, 5000h	192	°C	IEC 60216-1
TGA curve	available		ISO 11359-1/-2
[DS]: Derived from similar grade			
Flammability			
Burning Behav. at thickness h	НВ	class	IEC 60695-11-10
Thickness tested	0.75	mm	IEC 60695-11-10
UL recognition	yes		UL 94
Oxygen index	20	%	ISO 4589-1/-2
Glow Wire Flammability Index, 0.4mm	800	°C	IEC 60695-2-12
Glow Wire Flammability Index, 0.75mm	775		IEC 60695-2-12
Glow Wire Flammability Index, 1.0mm	775		IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	775		IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	800		IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	800		IEC 60695-2-13
Glow Wire Ignition Temperature, 0.4mm	825		IEC 60695-2-12
Glow Wire Ignition Temperature, 1.0mm	800		IEC 60695-2-13
Glow Wire Ignition Temperature, 1.5mm	800		IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	825	°C	IEC 60695-2-13
FMVSS Class	В		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	31	mm/min	ISO 3795 (FMVSS 302)
Electrical properties			
Relative permittivity, 100Hz	4.1		IEC 62631-2-1
Relative permittivity, 1MHz	3.9		IEC 62631-2-1
Dissipation factor, 100Hz	57	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	182	E-4	IEC 62631-2-1
Volume resistivity	>1E13	Ohm.m	IEC 62631-3-1
Surface resistivity	1E14	Ohm	IEC 62631-3-2
Electric strength	42	kV/mm	IEC 60243-1
Comparative tracking index	600		IEC 60112
Comparative tracking index, 23°C	0	PLC	UL 746A
Physical/Other properties			
Humidity absorption, 2mm	0.15	%	Sim. to ISO 62
Water absorption, 2mm	0.35		Sim. to ISO 62
Density	1500	kg/m³	ISO 1183
Density of melt		kg/m³	

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Injection

Drying Recommended	yes	
Drying Temperature	120	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.04	%
Melt Temperature Optimum	250	°C
Min. melt temperature	240	°C
Max. melt temperature	260	°C
Mold Temperature Optimum	80	°C
Min. mould temperature	30	°C
Max. mould temperature	130	°C
Hold pressure range	≥60	MPa
Hold pressure time	3	s/mm
Back pressure	As low as	MPa
	possible	
Ejection temperature	183	°C

Characteristics

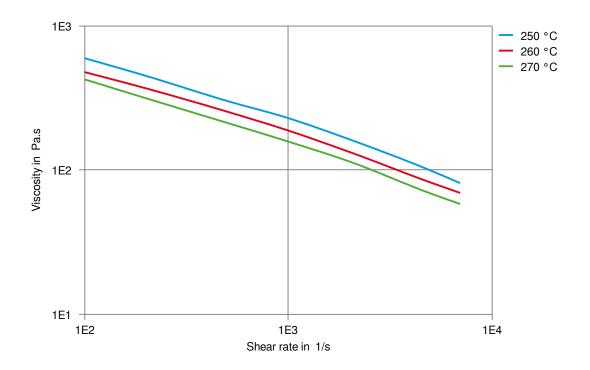
Additives Release agent

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Viscosity-shear rate

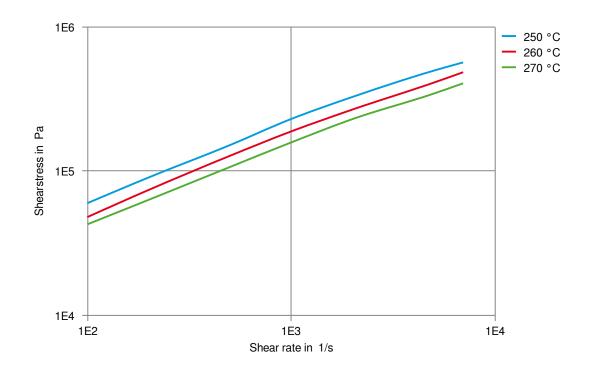


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Shearstress-shear rate

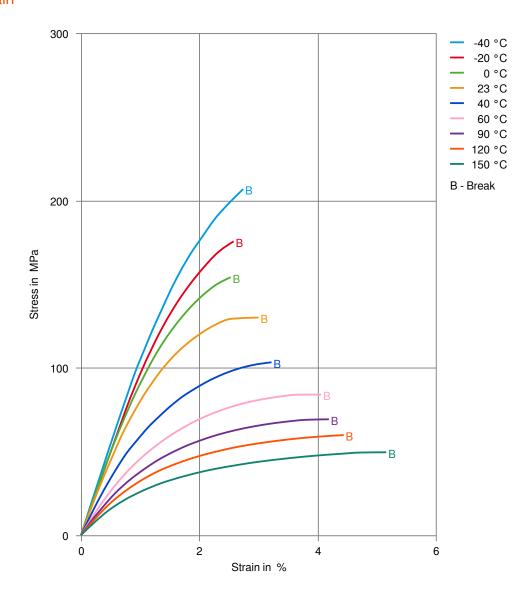


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Stress-strain

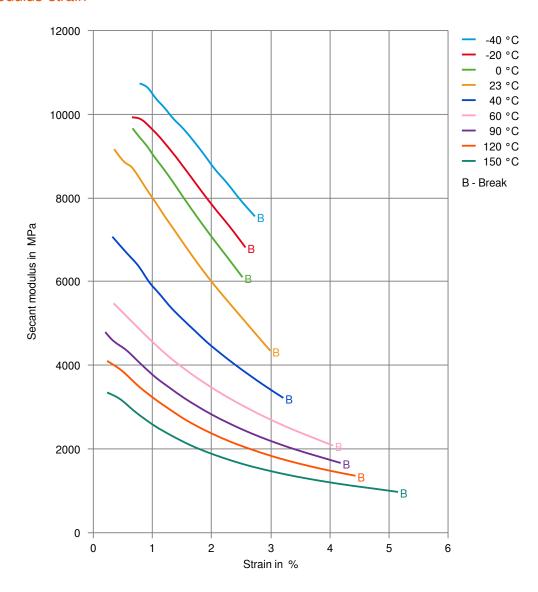


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Secant modulus-strain

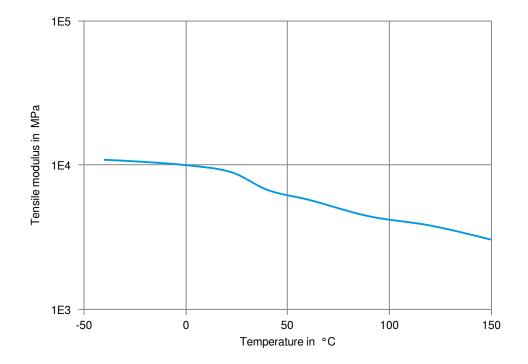


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Tensile modulus-temperature



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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
- X 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

- X 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
- ✓ SAE 10W40 multigrade motor oil, 130°C
- ✓ SAE 80/90 hypoid-gear oil, 130°C
- ✓ Insulating Oil, 23°C
- ✓ Motor oil OS206 304 Ref.Eng.Oil, ISP, 135°C
- ✓ Automatic hypoid-gear oil Shell Donax TX, 135°C
- ✓ Hydraulic oil Pentosin CHF 202, 125°C

Standard Fuels

- X ISO 1817 Liquid 1 E5, 60°C
- X 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
- ➤ Diesel fuel (pref. ISO 1817 Liquid F), >90°C

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Salt solutions

- ✓ Sodium Chloride solution (10% by mass), 23°C
- ✓ Sodium Hypochlorite solution (10% by mass), 23°C
- ✓ 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
- ★ Coolant Glysantin G48, 1:1 in water, 125°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).

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NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colourants or other additives may cause significant variations in data values. Properties of moulded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design conditions and environmental exposure. Other than those products expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards. We strongly recommend that users seek and adhere to the manufac

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