

Crastin® HR5330HFS NC010

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 terephthalate 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, 1157, 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

Tensile Modulus	8500 MPa	ISO 527-1/-2
Stress at break, 5mm/min	125 MPa	ISO 527-1/-2
Strain at break, 5mm/min	3.3 %	ISO 527-1/-2
Flexural Strength	195 MPa	ISO 178
Charpy impact strength, 23°C	70 kJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23°C	13 kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -40°C	10 kJ/m ²	ISO 179/1eA
Poisson's ratio	0.34	



Crastin® HR5330HFS NC010

THERMOPLASTIC POLYESTER RESIN

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
Temp. of deflection under load, 1.8 MPa	207 °C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	222 °C	ISO 75-1/-2
Coeff. of linear therm. expansion, parallel	22 ^[DS] E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, 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	HB class	UL 94
Thickness tested	0.75 mm	UL 94
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 °C	IEC 60695-2-12
Glow Wire Flammability Index, 1mm	775 °C	IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	775 °C	IEC 60695-2-12
Glow Wire Flammability Index, 3mm	800 °C	IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	800 °C	IEC 60695-2-13
Glow Wire Ignition Temperature, 0.4mm	825 °C	IEC 60695-2-12
Glow Wire Ignition Temperature, 1mm	800 °C	IEC 60695-2-13
Glow Wire Ignition Temperature, 1.5mm	800 °C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3mm	825 °C	IEC 60695-2-13
FMVSS Class	B	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	PLC	UL 746A



Crastin® HR5330HFS NC010

THERMOPLASTIC POLYESTER RESIN

Other properties

Humidity absorption, 2mm	0.15 %	Sim. to ISO 62
Water absorption, 2mm	0.35 %	Sim. to ISO 62
Density	1500 kg/m ³	ISO 1183
Density of melt	1290 kg/m ³	Internal

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	Internal
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 possible	
Ejection temperature	170 °C	Internal

Characteristics

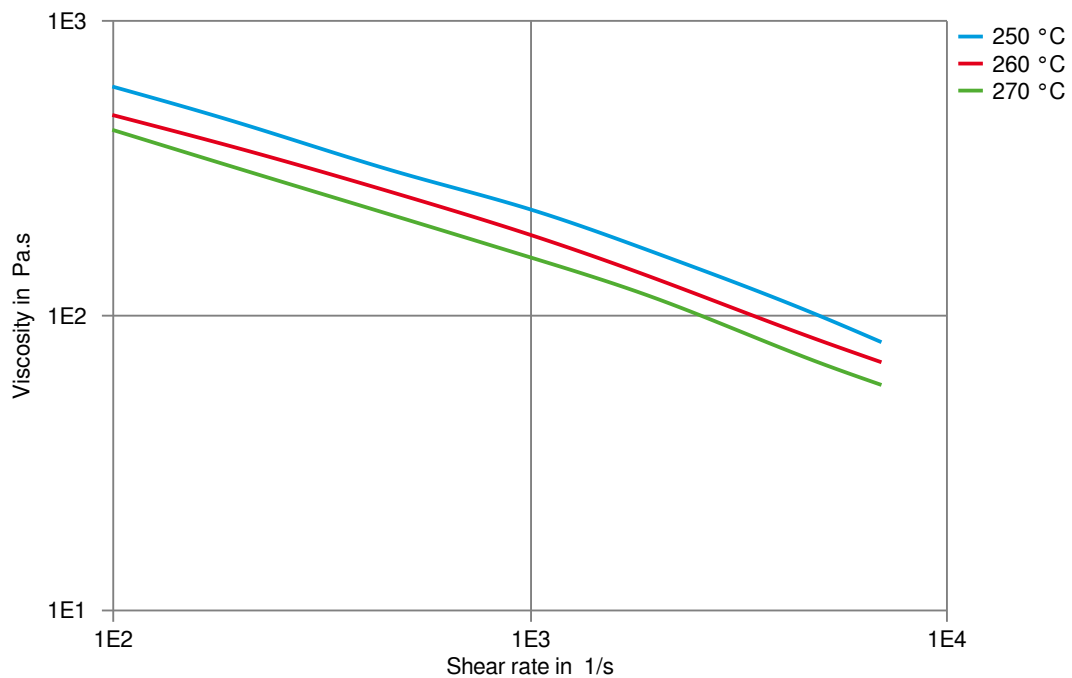
Additives	Release agent
-----------	---------------



Crastin® HR5330HFS NC010

THERMOPLASTIC POLYESTER RESIN

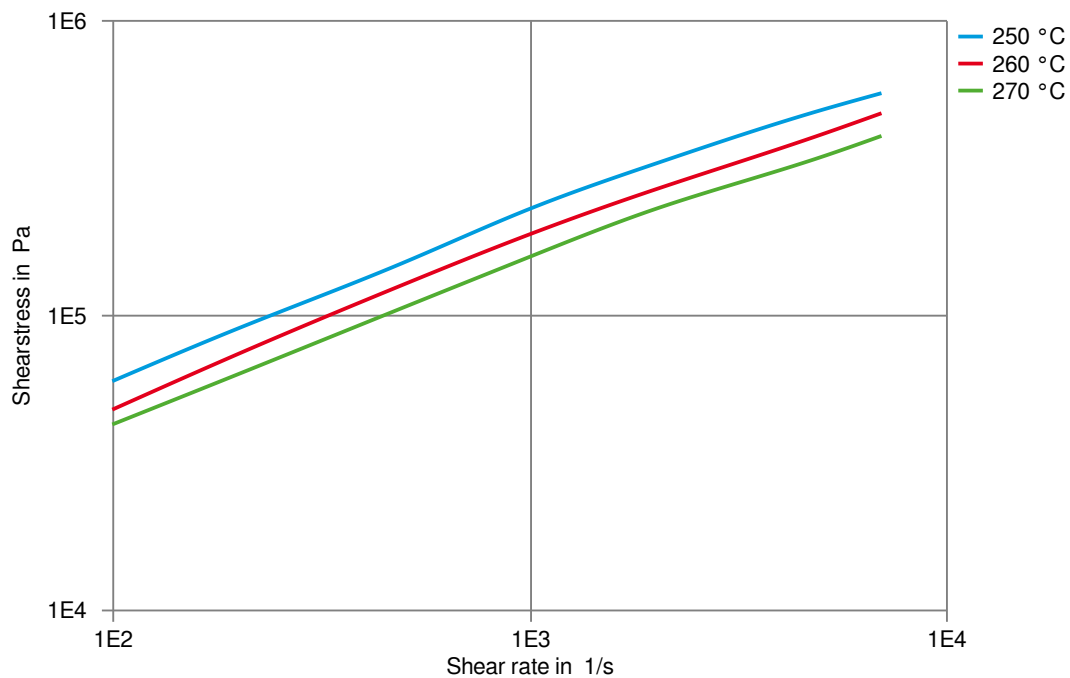
Viscosity-shear rate



Crastin® HR5330HFS NC010

THERMOPLASTIC POLYESTER RESIN

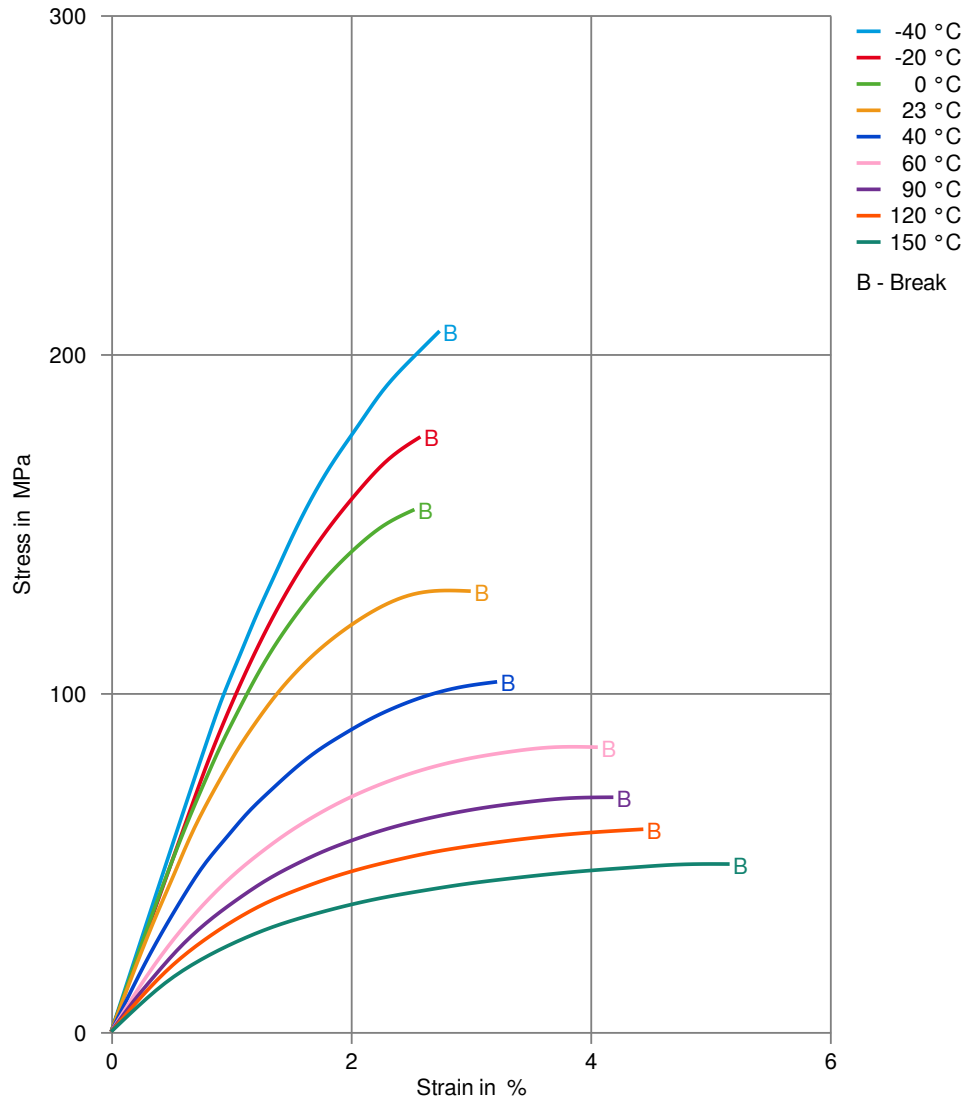
Shearstress-shear rate



Crastin® HR5330HFS NC010

THERMOPLASTIC POLYESTER RESIN

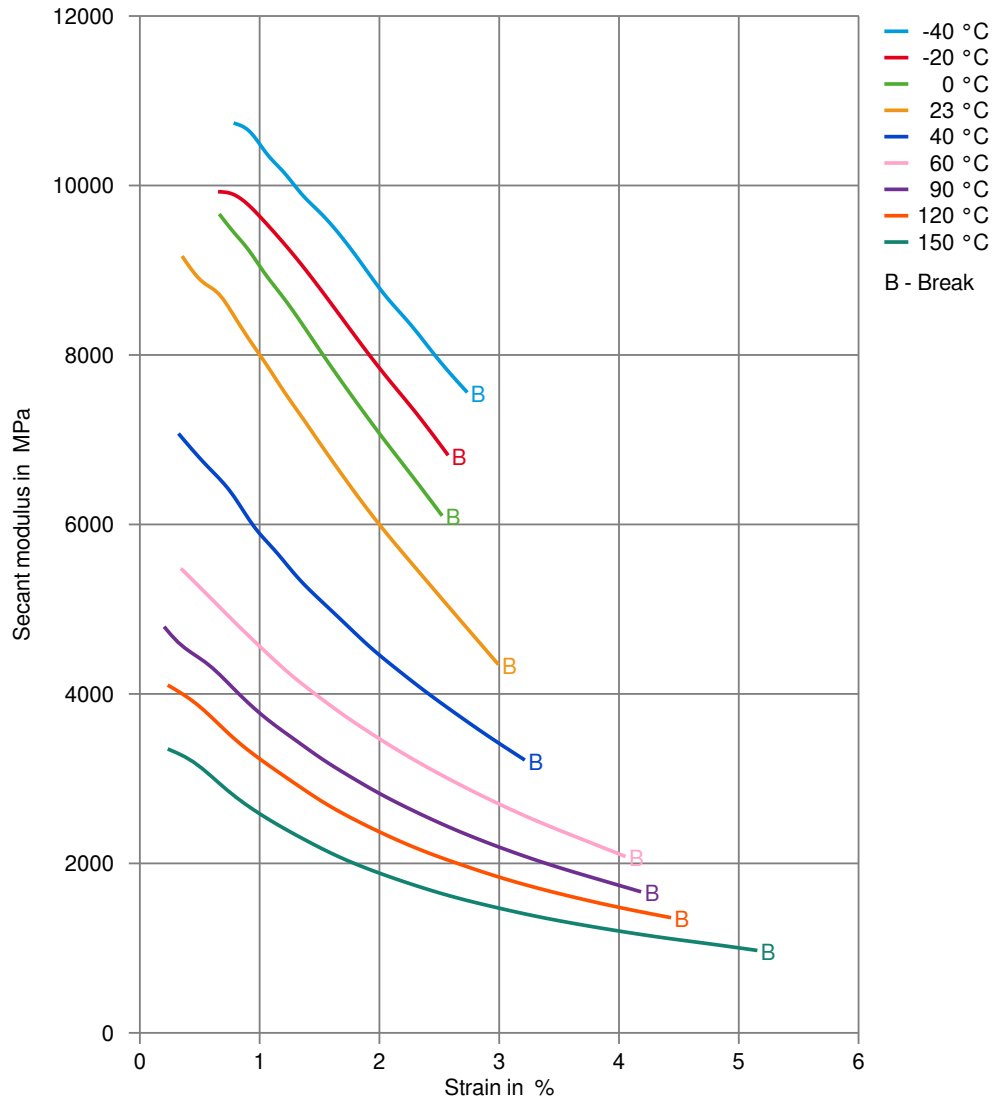
Stress-strain



Crastin® HR5330HFS NC010

THERMOPLASTIC POLYESTER RESIN

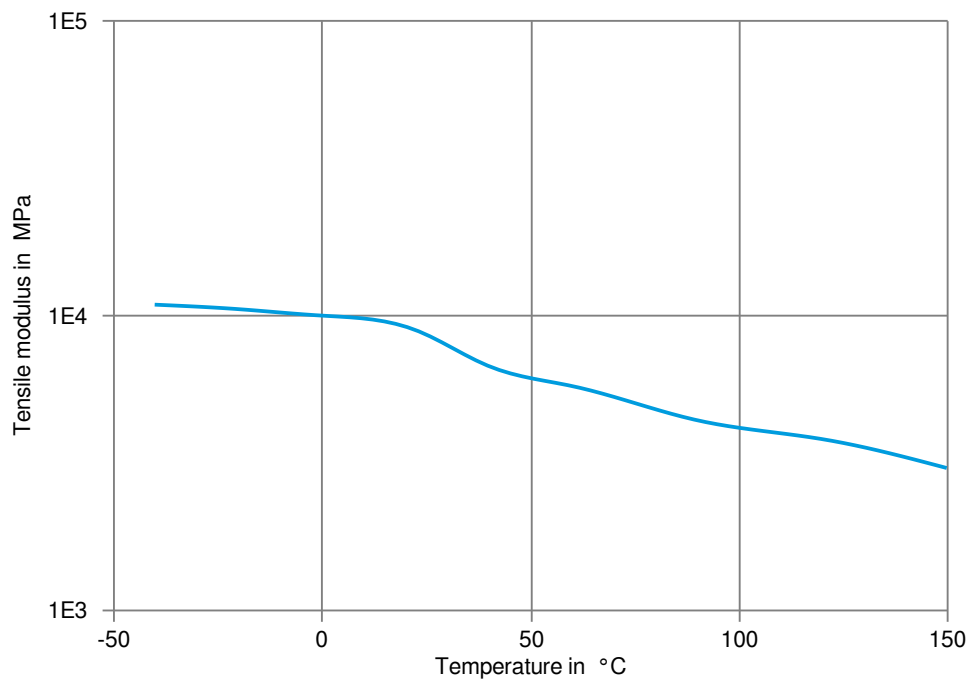
Secant modulus-strain



Crastin® HR5330HFS NC010

THERMOPLASTIC POLYESTER RESIN

Tensile modulus-temperature



Crastin® HR5330HFS NC010

THERMOPLASTIC POLYESTER RESIN

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
- ✗ Nitric Acid (40% by mass), 23 °C
- ✗ Sulfuric Acid (38% by mass), 23 °C
- ✗ Sulfuric Acid (5% by mass), 23 °C
- ✗ 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
- ✓ 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

- ✗ 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



Crastin® HR5330HFS NC010

THERMOPLASTIC POLYESTER RESIN

- ✓ 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
- ✓ 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
- ✗ Hydrogen peroxide, 23°C
- ✗ 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).
- ✗ 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).

