

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® HR5330HF is a 30% glass reinforced PBT with high flow (HF), moderately toughened, hydrolysis resistant (HR) resin. Excellent balance of properties between terminal pullout and impact resistance. Developed for USCAR Class 3 and 4 environments.

Product information

Resin Identification Part Marking Code	PBT-IGF30 >PBT-IGF30<		ISO 1043 ISO 11469
Rheological properties			
Melt volume-flow rate Temperature Load Moulding shrinkage, parallel Moulding shrinkage, normal	8 250 2.16 0.3 1.0	kg %	ISO 1133 ISO 294-4, 2577 ISO 294-4, 2577
Typical mechanical properties			
Tensile modulus Tensile stress at break, 5mm/min Tensile strain at break, 5mm/min Flexural modulus Charpy impact strength, 23°C Charpy notched impact strength, 23°C Charpy notched impact strength, -30°C Izod notched impact strength, 23°C Izod notched impact strength, -40°C Izod impact strength, 23°C Poisson's ratio	3.2 7500 65 11 9 12 8.0	MPa	ISO 527-1/-2 ISO 527-1/-2 ISO 527-1/-2 ISO 178 ISO 179/1eU ISO 179/1eA ISO 179/1eA ISO 180/1A ISO 180/1A ISO 180/1U
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	225 65 207 221	°C °C	ISO 11357-1/-3 ISO 11357-1/-3 ISO 75-1/-2 ISO 75-1/-2

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Coefficient of linear thermal expansion	20 ^[DS]	E-6/K	ISO 11359-1/-2
(CLTE), parallel Coefficient of linear thermal expansion (CLTE), normal	150 ^[DS]	E-6/K	ISO 11359-1/-2
RTI, electrical, 0.75mm RTI, impact, 0.75mm RTI, strength, 0.75mm [DS]: Derived from similar grade	75	0° °C °C	UL 746B UL 746B UL 746B
Flammability			
Burning Behav. at thickness h Thickness tested UL recognition Glow Wire Flammability Index, 3.0mm Glow Wire Ignition Temperature, 3.0mm FMVSS Class Burning rate, Thickness 1 mm	0.75 yes 750 750 B	°C	IEC 60695-11-10 IEC 60695-11-10 UL 94 IEC 60695-2-12 IEC 60695-2-13 ISO 3795 (FMVSS 302) ISO 3795 (FMVSS 302)
Electrical properties			
Relative permittivity, 100Hz Relative permittivity, 1MHz Dissipation factor, 100Hz Dissipation factor, 1MHz Volume resistivity Surface resistivity Electric strength Comparative tracking index	180 >1E13 1E13	E-4 E-4 Ohm.m Ohm kV/mm	IEC 62631-2-1 IEC 62631-2-1 IEC 62631-2-1 IEC 62631-2-1 IEC 62631-3-1 IEC 62631-3-2 IEC 60243-1 IEC 60112
Physical/Other properties			
Humidity absorption, 2mm Water absorption, 2mm Density Density of melt			Sim. to ISO 62 Sim. to ISO 62 ISO 1183
Injection			
Drying Recommended Drying Temperature Drying Time, Dehumidified Dryer Processing Moisture Content Melt Temperature Optimum Min. melt temperature Max. melt temperature Mold Temperature Optimum Min. mould temperature Max. mould temperature Hold pressure range Hold pressure time Back pressure	30 130 ≥60	h % °C °C °C °C °C MPa s/mm	

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Ejection temperature

170 °C

Additional information

Injection molding

Use of hot-runners is possible with Crastin® HR resins. However we do not recommend temperature settings above 270°C and residence times at 265°C should be below 10 minutes. In case of longer residence times using hot-runners, for example after a shutdown, the complete system must be purged with glass reinforced Crastin® (type

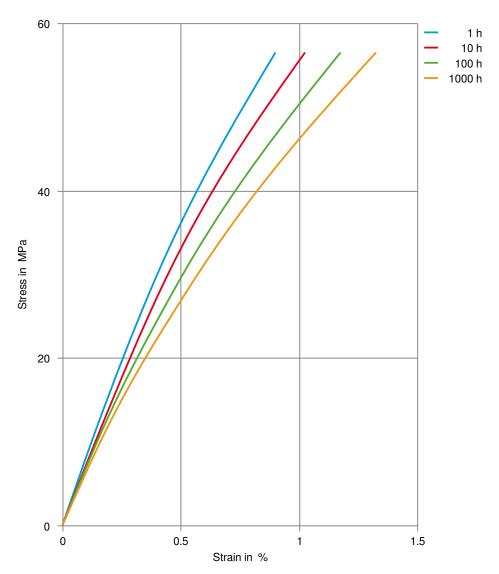
the complete system must be purged with glass reinforced Crastin® (type SK602/605) before starting up again.

For successful processing of Crastin® HR with hot-runners, care should be taken to maintain a uniform temperature, avoid hot-spots and long residence times.

Stress-strain (isochronous) 23°C



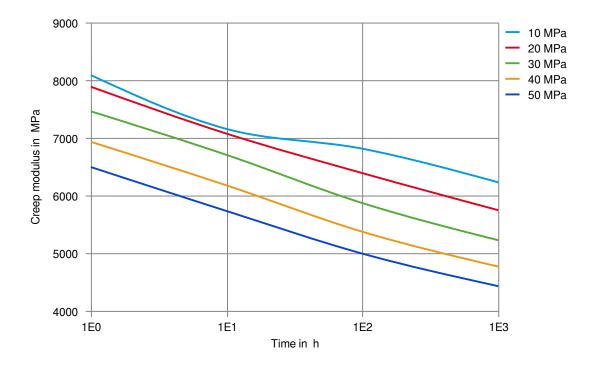
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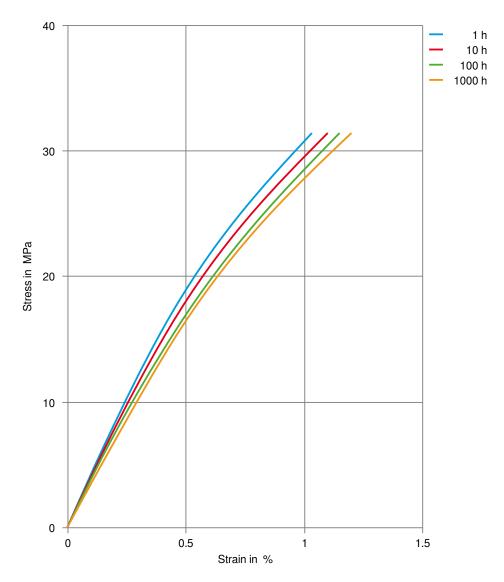
Creep modulus-time 23°C





THERMOPLASTIC POLYESTER RESIN

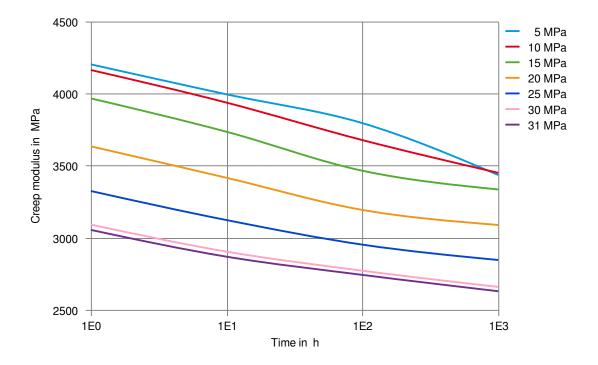
Stress-strain (isochronous) 90°C





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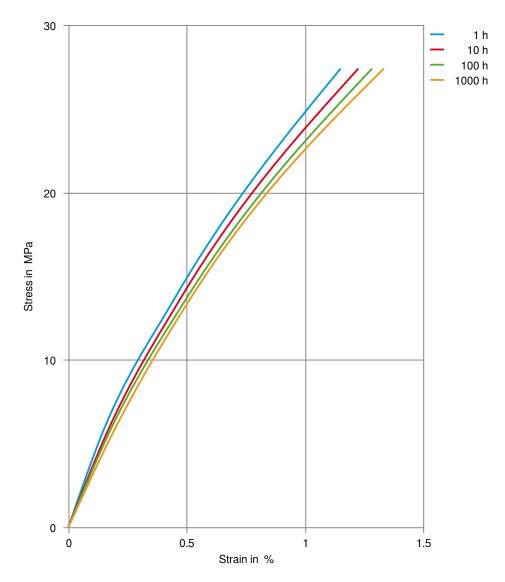
Creep modulus-time 90°C





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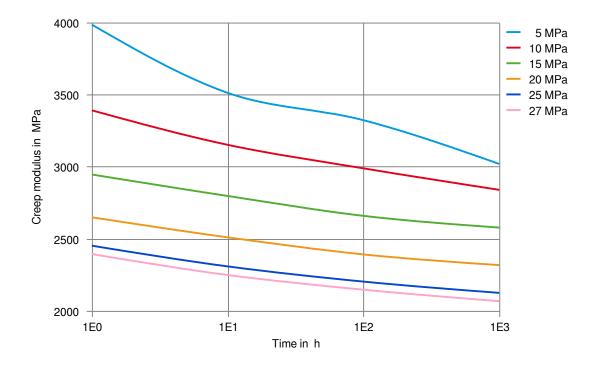
Stress-strain (isochronous) 120°C





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Creep modulus-time 120°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
- 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:

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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