

THERMOPLASTIC POLYESTER RESIN

Crastin® HR5330HFS BK591 is a 30% Glass Reinforced Polybutylene Terephthalate with high flow, moderately toughened, and hydrolysis resistant (HR) for injection moulding. Crastin® HR5330HFS BK591 can also be laser marked at 355, 532 and 1064 nm.

Product information Resin Identification Part Marking Code	PBT-IGF30 >PBT-IGF30<		ISO 1043 ISO 11469
Rheological properties			
Melt volume-flow rate Melt mass-flow rate Temperature		cm³/10min g/10min °C	ISO 1133 ISO 1133
Load Melt mass-flow rate, Temperature Melt mass-flow rate, Load	2.16 250 2.16	kg °C	
Viscosity number Intrinsic viscosity Moulding shrinkage, parallel	107 <sup>[C, 1]</sup> 0.87 <sup>[2]</sup> 0.3	cm <sup>3</sup> /g	ISO 307, 1628 ISO 307, 1628 ISO 294-4, 2577
Moulding shrinkage, normal Melt viscosity, @ 1000 sec-1, 250 °C [C]: Calculated	1.1		ISO 294-4, 2577 ISO 11443
[0]. Calculated [1]: VNphenol/1,2-dichlorobenzene = (141.84 * IV) - 16.00 [2]: phenol/1,2-dichlorobenzene			
Typical mechanical properties			
Tensile modulus Tensile stress at break, 5mm/min Tensile strain at break, 5mm/min Flexural strength Charpy impact strength, 23°C Charpy impact strength, -30°C Charpy notched impact strength, 23°C Charpy notched impact strength, -30°C Poisson's ratio [PV]: Preliminary Value	3.2 180 70 70 <sup>[PV]</sup> 12	MPa	ISO 527-1/-2 ISO 527-1/-2 ISO 527-1/-2 ISO 178 ISO 179/1eU ISO 179/1eU ISO 179/1eA ISO 179/1eA
Thermal properties			
Melting temperature, 10°C/min Glass transition temperature, 10°C/min Temperature of deflection under load, 1.8 MPa Coefficient of linear thermal expansion	205	°C	ISO 11357-1/-3 ISO 11357-1/-3 ISO 75-1/-2 ISO 11359-1/-2
(CLTE), parallel Coefficient of linear thermal expansion (CLTE), normal		E-6/K	ISO 11359-1/-2
Temperature index, tensile strength, 20 000h	153	°C	IEC 60216-1

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Temperature index, tensile strength, 5000h	192	°C	IEC 60216-1
Flammability			
Burning Behav. at thickness h	HB	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	775	°C	IEC 60695-2-12
Glow Wire Flammability Index, 0.75mm	775	°C	IEC 60695-2-12
Glow Wire Flammability Index, 1.0mm	775	°C	IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	750	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	800	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	800	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 0.4mm	800	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 1.0mm	800	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 1.5mm	775	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	775	°C	IEC 60695-2-13
FMVSS Class	В		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	39	mm/min	ISO 3795 (FMVSS 302)
Electrical properties			
Relative permittivity, 1000Hz	4.19 <sup>[OT]</sup>		IEC 62631-2-1
Dissipation factor, 1000Hz	68 <sup>[OT]</sup>	E-4	IEC 62631-2-1
Volume resistivity	>1E13	Ohm.m	IEC 62631-3-1
Surface resistivity	>1E15		IEC 62631-3-2
Electric strength		kV/mm	IEC 60243-1
Comparative tracking index	525 <sup>[3]</sup>		IEC 60112
Comparative tracking index, 23°C		PLC	UL 746A
[OT]: One time tested			
[3]: PTI = 500V			
Physical/Other properties			
	0.15	0/	Sim. to ISO 62
Humidity absorption, 2mm Water absorption, 2mm	0.15		Sim. to ISO 62
•		kg/m <sup>3</sup>	ISO 1183
Density	1500	Kg/III*	150 1 165
VDA Properties			
Weather stability delta l	-9		DIN 53236
Weather stability delta a	-0.1		DIN 53236
Weather stability delta b	-2.7		DIN 53236
Weather stability delta E	9		DIN 53236
Weather stability grey scale	3-4		ISO 105-A02



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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	170	°C

#### Characteristics

Additives

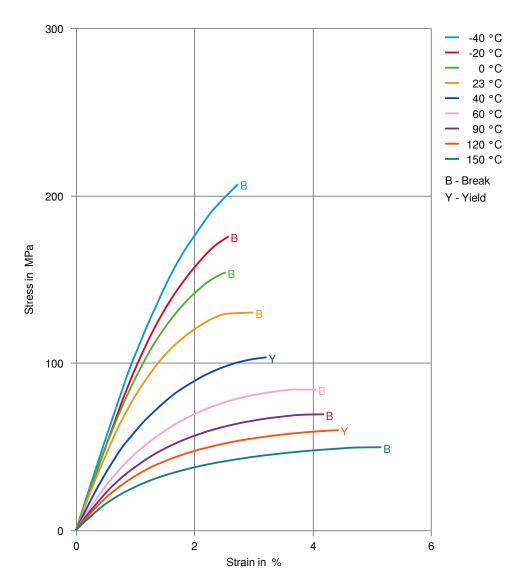
Release agent

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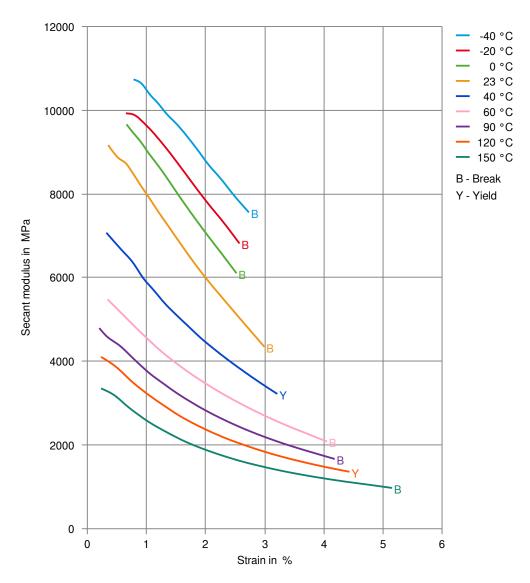
#### Stress-strain





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#### Secant modulus-strain





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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
- ✓ 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
- ¥ 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

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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
- 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).

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