

# Crastin® HR5330HFS BK591

## 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	PBT-IGF30	ISO 1043
Part Marking Code	>PBT-IGF30<	ISO 11469

### Rheological properties

Melt volume-flow rate	8 cm <sup>3</sup> /10min	ISO 1133
Temperature	250 °C	
Load	2.16 kg	
Melt mass-flow rate	13 g/10min	ISO 1133
Melt mass-flow rate, Temperature	250 °C	
Melt mass-flow rate, Load	2.16 kg	
Viscosity number	107 <sup>[C, 1]</sup> cm <sup>3</sup> /g	ISO 307, 1628
Intrinsic viscosity	0.87 <sup>[2]</sup>	ISO 307, 1628
Moulding shrinkage, parallel	0.3 %	ISO 294-4, 2577
Moulding shrinkage, normal	1.1 %	ISO 294-4, 2577
Melt viscosity, @ 1000 sec <sup>-1</sup> , 250 °C	230 Pa.s	ISO 11443

[C]: Calculated

[1]: VNphenol/1,2-dichlorobenzene = (141.84 \* IV) - 16.00

[2]: phenol/1,2-dichlorobenzene

### Typical mechanical properties

Tensile modulus	8500 MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	120 MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	3.2 %	ISO 527-1/-2
Flexural modulus	7500 MPa	ISO 178
Flexural strength	180 MPa	ISO 178
Charpy impact strength, 23 °C	70 kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30 °C	70 <sup>[PV]</sup> kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23 °C	12 kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -30 °C	8 <sup>[PV]</sup> kJ/m <sup>2</sup>	ISO 179/1eA
Poisson's ratio	0.34	

[PV]: Preliminary Value

### 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	205 °C	ISO 75-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	22 E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	190 E-6/K	ISO 11359-1/-2

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Temperature index, tensile strength, 20 000h	153 °C	IEC 60216-1
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
FMVSS Class	B	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 Ohm	IEC 62631-3-2
Electric strength	34 kV/mm	IEC 60243-1
Comparative tracking index	525 <sup>[3]</sup>	IEC 60112
Comparative tracking index, 23 °C	1 PLC	UL 746A

[OT]: One time tested

[3]: PTI = 500V

### Physical/Other properties

Humidity absorption, 2mm	0.15 %	Sim. to ISO 62
Water absorption, 2mm	0.35 %	Sim. to ISO 62
Density	1500 kg/m <sup>3</sup>	ISO 1183

### VDA Properties

Weather stability delta I	-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

### 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

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Mold Temperature Optimum	80 °C
Min. mould temperature	60 °C
Max. mould temperature	130 °C
Hold pressure range	≥60 MPa
Hold pressure time	3 s/mm
Back pressure	As low as possible MPa
Ejection temperature	170 °C

### Characteristics

Processing	Injection Moulding
Delivery form	Pellets
Additives	Release agent
Special characteristics	Hydrolysis resistant, High Flow

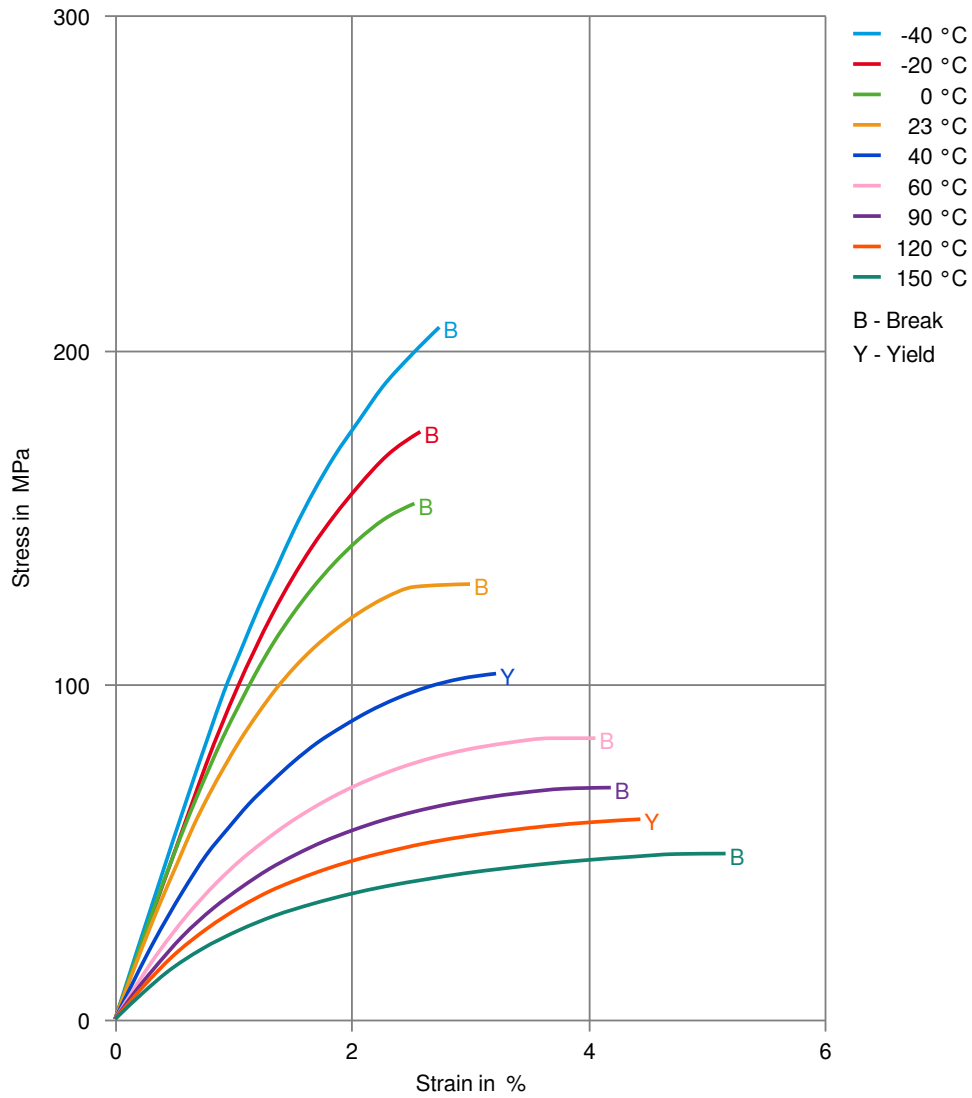
### Automotive

OEM	STANDARD	ADDITIONAL INFORMATION
General Motors	Black/BK591; Special Parts Approval, See Your CE Account Representative for Further Details.	
Hyundai	MS216-03 Type F-2	
Renault-Nissan	UB02d, No Spec, Special Part Approval, See Your CE Account Manager.	
Renault-Nissan	UB25a, No Spec, Special Part Approval, See Your CE Account Manager.	
Renault-Nissan	UB27b, No Spec, Special Part Approval, See Your CE Account Manager.	
Stellantis	B62 0300 / 61/U4/220E/218M/13/C1B/C5	01994_15_00092, BK591
VW Group	VW 50136-PBT-7-A	

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THERMOPLASTIC POLYESTER RESIN

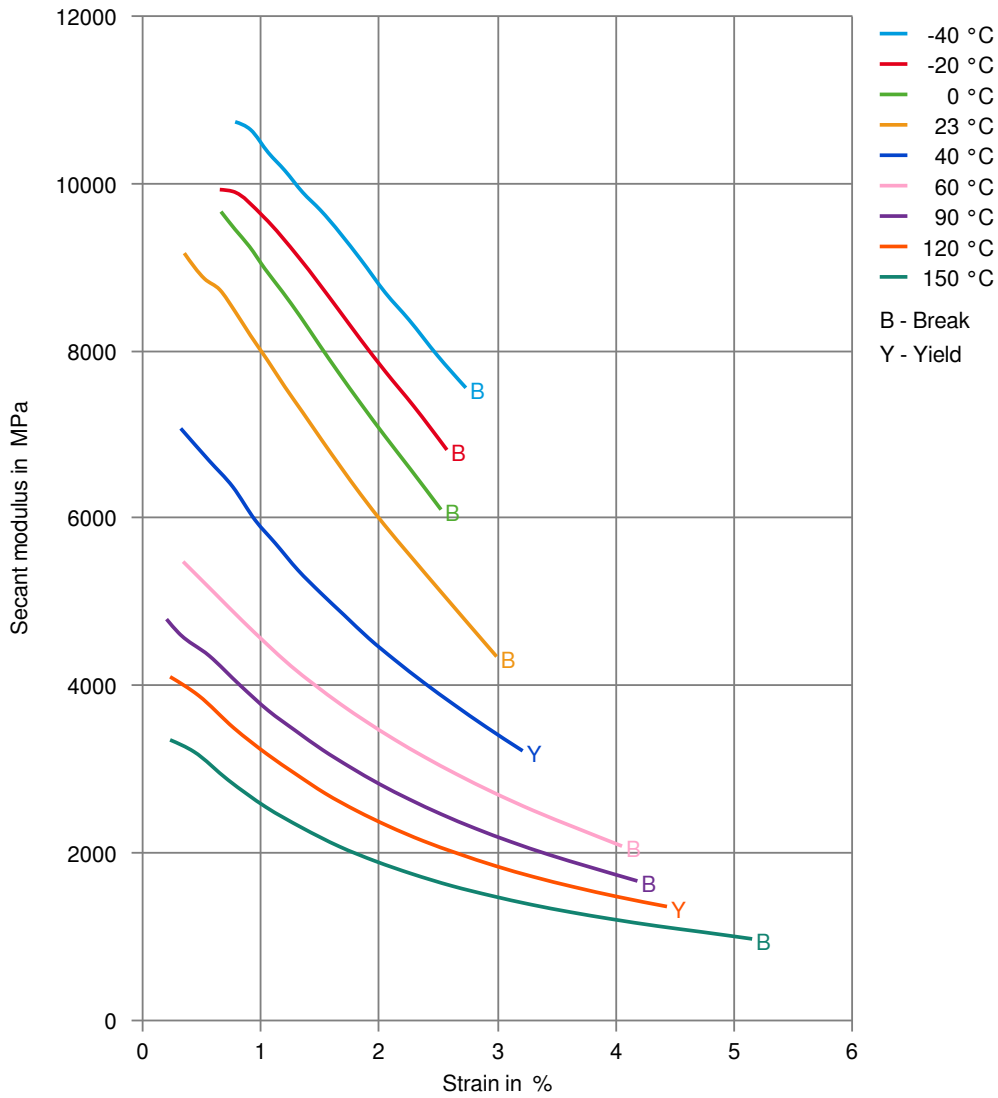
## Stress-strain



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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
- ✗ 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
- ✓ 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
- ✗ 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

### 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).