

# DuPont™ Crastin® HR5315HF BK503

## THERMOPLASTIC POLYESTER RESIN

### Product Information

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, DuPont recommends, 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® HR5315HF is a 15% 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.**

General information	Value	Unit	Test Standard
Resin Identification	PBT-IGF15	-	ISO 1043
Part Marking Code	PBT-IGF15	-	ISO 11469
Rheological properties	Value	Unit	Test Standard
Moulding shrinkage, parallel	0.5	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.1	%	ISO 294-4, 2577
Mechanical properties	Value	Unit	Test Standard
Tensile Modulus	5200	MPa	ISO 527-1/-2
Stress at break	92	MPa	ISO 527-1/-2
Strain at break	3.4	%	ISO 527-1/-2
Flexural Modulus	4700	MPa	ISO 178
Poisson's ratio	0.35	-	ISO 527-1/-2
Charpy impact strength, 23°C	50	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength			ISO 179/1eA
23°C	10	kJ/m <sup>2</sup>	
-30°C	6	kJ/m <sup>2</sup>	
Izod notched impact strength			ISO 180/1A
23°C	10	kJ/m <sup>2</sup>	
-40°C	6	kJ/m <sup>2</sup>	
Izod impact strength, 23°C	40	kJ/m <sup>2</sup>	ISO 180/1U
Hardness, Rockwell, R-scale	117	-	ISO 2039-2
Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	225	°C	ISO 11357-1/-3
Temp. of deflection under load			ISO 75-1/-2
1.8 MPa	200	°C	
0.45 MPa	220	°C	
Flammability	Value	Unit	Test Standard
Burning Behav. at thickness h	HB	class	IEC 60695-11-10
Thickness tested	0.75	mm	IEC 60695-11-10
Oxygen index	20	%	ISO 4589-1/-2
Glow Wire Flammability Index, 3mm	700	°C	IEC 60695-2-12
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	32	mm/min	ISO 3795 (FMVSS 302)
Electrical properties	Value	Unit	Test Standard
Relative permittivity			IEC 62631-2-1
100Hz	3.8	-	
1MHz	3.7	-	

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Dissipation factor			IEC 62631-2-1
100Hz	23	E-4	
1MHz	178	E-4	
Volume resistivity	>1E13	Ohm*m	IEC 62631-3-1
Surface resistivity	1E14	Ohm	IEC 62631-3-2
Electric strength	36	kV/mm	IEC 60243-1
Comparative tracking index	300	-	IEC 60112
<b>Other properties</b>	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
Density	1370	kg/m <sup>3</sup>	ISO 1183
Water Absorption, Immersion 24h	0.08	%	Sim. to ISO 62
<b>Injection</b>	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
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 possible		-
Ejection temperature	170	°C	-

### Characteristics

Processing	• Injection Moulding		
Regional Availability	• North America	• Asia Pacific	• Near East/Africa
	• Europe	• South and Central America	• Global

### Processing Texts

#### 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 shut-down, 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.

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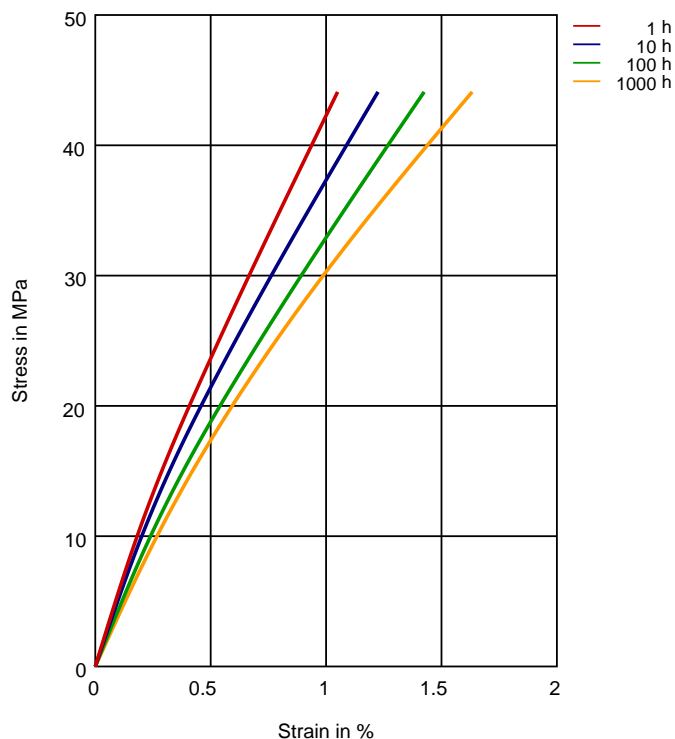


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## THERMOPLASTIC POLYESTER RESIN

Diagrams

Stress-strain (isochronous) 23 °C



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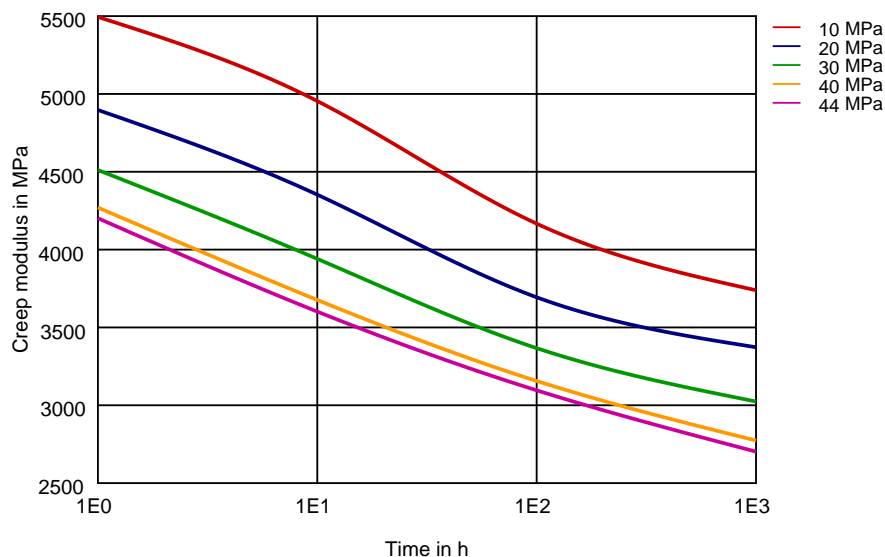
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## THERMOPLASTIC POLYESTER RESIN

Creep modulus-time 23 °C



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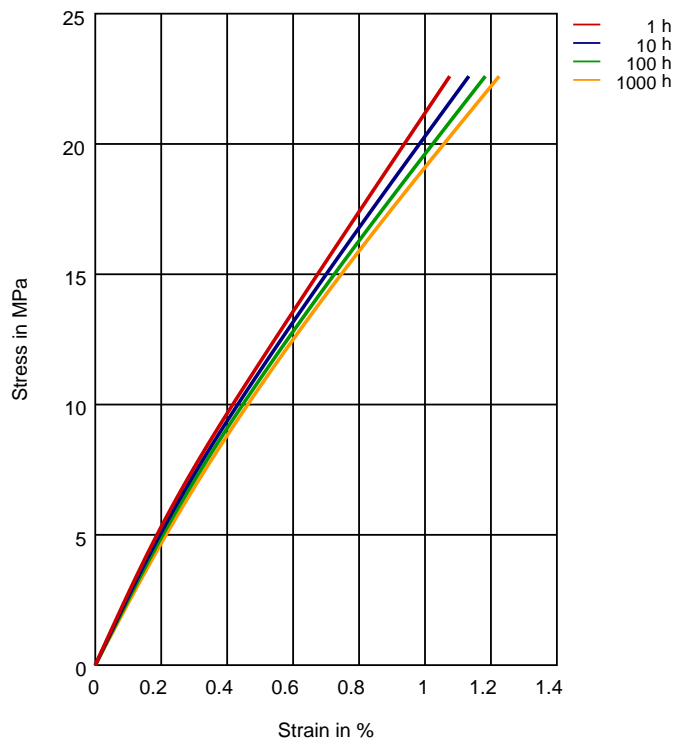
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## THERMOPLASTIC POLYESTER RESIN

Stress-strain (isochronous) 90°C



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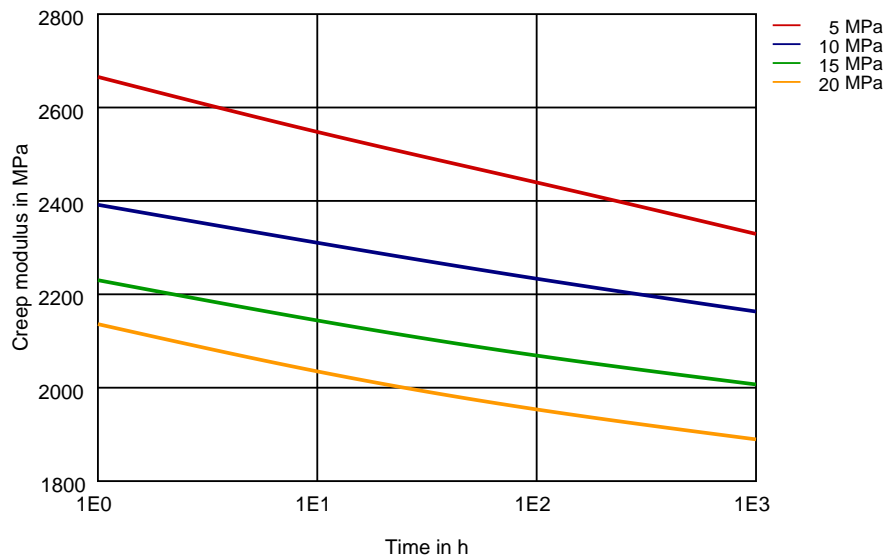


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## THERMOPLASTIC POLYESTER RESIN

Creep modulus-time 90 °C



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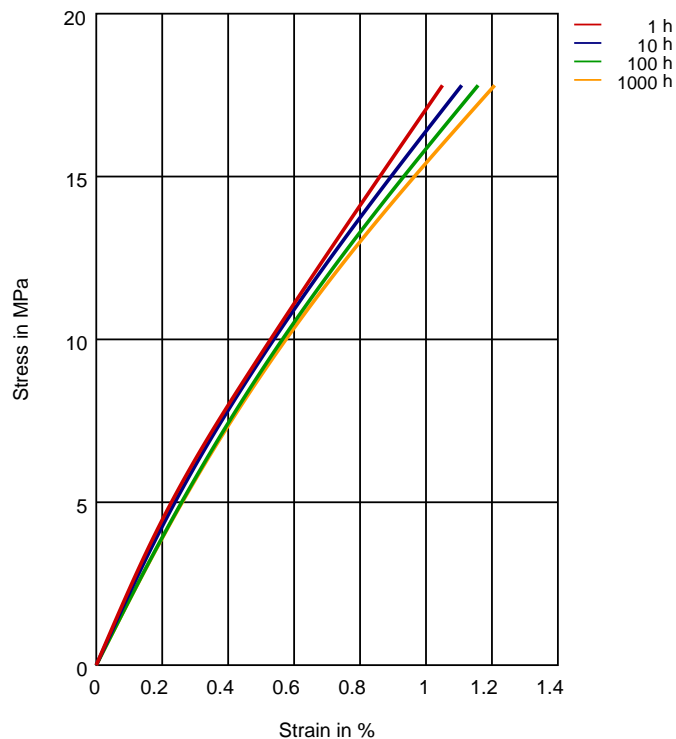
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## THERMOPLASTIC POLYESTER RESIN

Stress-strain (isochronous) 120°C



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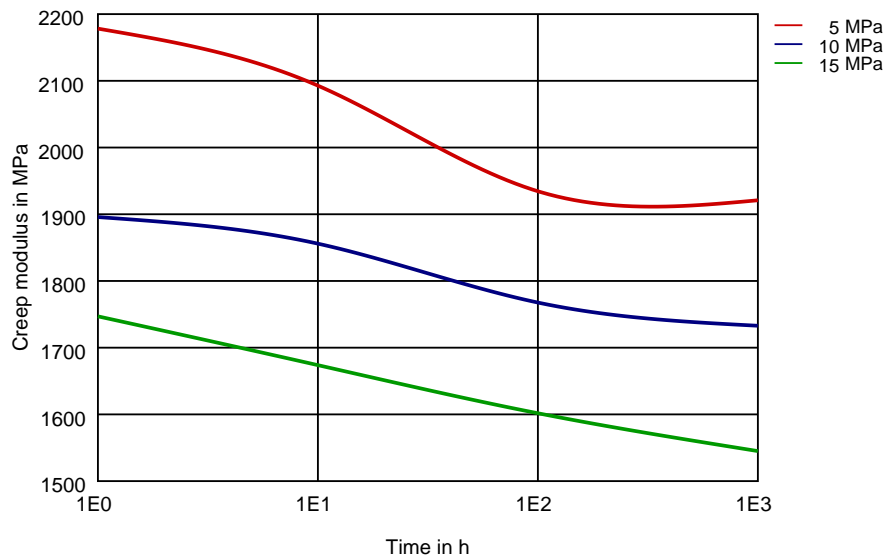
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## THERMOPLASTIC POLYESTER RESIN

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)
- ✗ 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)

#### 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)



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## 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)

#### 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).

Contact DuPont for Material Safety Data Sheet, general guides and/or additional information about ventilation, handling, purging, drying, etc. ISO Mechanical properties measured at 4mm (Hytrel® measured at 2 mm), IEC Electrical properties measured at 2mm, all ASTM properties measured at 3.2mm, and test temperatures are 23°C unless otherwise stated.

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