

# DuPont™ Crastin® S600F20 NC010

## 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® S600F20 NC010 is an unreinforced, lubricated, medium viscosity polybutylene terephthalate resin for injection molding.**

General information	Value	Unit	Test Standard
Resin Identification	PBT	-	-
Part Marking Code	>PBT<	-	ISO 11469
Rheological properties	Value	Unit	Test Standard
Melt mass-flow rate	19.1	g/10min	ISO 1133
Melt mass-flow rate, Temperature	250	°C	-
Melt mass-flow rate, Load	2.16	kg	-
Viscosity number	130	cm <sup>3</sup> /g	ISO 307, 1157, 1628
Moulding shrinkage, parallel	1.7	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.6	%	ISO 294-4, 2577
Mechanical properties	Value	Unit	Test Standard
Tensile Modulus	2600	MPa	ISO 527-1/-2
Yield stress	58	MPa	ISO 527-1/-2
Yield strain	7	%	ISO 527-1/-2
Nominal strain at break	40	%	ISO 527-1/-2
Strain at Break, 23°C, 50mm/min	>50	%	ISO 527-1/-2
Flexural Modulus	2200	MPa	ISO 178
Flexural Strength	85	MPa	ISO 178
Tensile creep modulus			ISO 899-1
1h	2600	MPa	
1000h	1800	MPa	
Charpy impact strength			ISO 179/1eU
23°C	N	kJ/m <sup>2</sup>	
-30°C	N	kJ/m <sup>2</sup>	
Charpy notched impact strength			ISO 179/1eA
23°C	5	kJ/m <sup>2</sup>	
-30°C	4	kJ/m <sup>2</sup>	
Izod notched impact strength, 23°C	4.5	kJ/m <sup>2</sup>	ISO 180/1A
Izod impact strength, 23°C	N	kJ/m <sup>2</sup>	ISO 180/1U
Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	225	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	55	°C	ISO 11357-1/-2
Temp. of deflection under load			ISO 75-1/-2
1.8 MPa	50	°C	
0.45 MPa	115	°C	
0.45 MPa, annealed	180	°C	
1.8 MPa, annealed	60	°C	
Vicat softening temperature, 50°C/h, 50N	175	°C	ISO 306
Coeff. of linear therm. expansion, parallel	110	E-6/K	ISO 11359-1/-2

To find out more, visit [DuPont Performance Polymers](#) or contact nearest DuPont location.

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Coeff. of linear therm. expansion, normal	120	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.21	W/(m K)	-
Spec. heat capacity of melt	2110	J/(kg K)	-
RTI, electrical, 0.8mm	130	°C	UL 746B
RTI, impact, 0.8mm	115	°C	UL 746B
RTI, strength, 0.8mm	120	°C	UL 746B
<b>Flammability</b>	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
Burning Behav. at 1.5mm nom. thickn.	HB	class	IEC 60695-11-10
Thickness tested	1.5	mm	IEC 60695-11-10
UL recognition	UL	-	-
Burning Behav. at thickness h	HB	class	IEC 60695-11-10
Thickness tested	0.8	mm	IEC 60695-11-10
UL recognition	UL	-	-
Oxygen index	22	%	ISO 4589-1/-2
Glow Wire Flammability Index, 3mm	750	°C	IEC 60695-2-1/2
Glow Wire Ignition Temperature			IEC 60695-2-1/3
0.75mm	750	°C	
1mm	750	°C	
2mm	750	°C	
<b>Electrical properties</b>	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
Relative permittivity			IEC 60250
100Hz	3.8	-	
1MHz	3.2	-	
Dissipation factor			IEC 60250
100Hz	20	E-4	
1MHz	200	E-4	
Volume resistivity	>1E13	Ohm*m	IEC 60093
Electric strength	26	kV/mm	IEC 60243-1
Comparative tracking index	600	-	IEC 60112
Dissipation Factor			ASTM D 150
100 Hz	20	-	
1000 Hz	200	-	
<b>Other properties</b>	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
Humidity absorption, 2mm	0.2	%	Sim. to ISO 62
Water absorption, 2mm	0.4	%	Sim. to ISO 62
Density	1310	kg/m <sup>3</sup>	ISO 1183
Density of melt	1110	kg/m <sup>3</sup>	-
<b>VDA Properties</b>	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
Burning rate, Thickness 1 mm	0 <sup>(1)</sup>	mm/min	ISO 3795 (FMVSS 302)
Thermal desorption analysis of organic emissions	1	µg/g	VDA 278
Odour	3	class	VDA 270
Fogging, G-value (condensate)	0	mg	ISO 6452

1: SE AMax: Assessed (Max) DS: Derived from similar grade

### Characteristics

Processing	• Injection Moulding
Delivery form	• Pellets
Additives	• Release agent
Regional Availability	• North America
	• Europe
	• Asia Pacific
	• South and Central America
	• Near East/Africa
	• Global

### Processing Texts

#### Injection molding

##### PREPROCESSING

Drying recommended = Yes

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## THERMOPLASTIC POLYESTER RESIN

Drying temperature = 110-130 °C

Drying time, dehumidified dryer = 2-4 h

Processing moisture content = <0.04 %

### PROCESSING

Melt temperature optimum = 250 °C

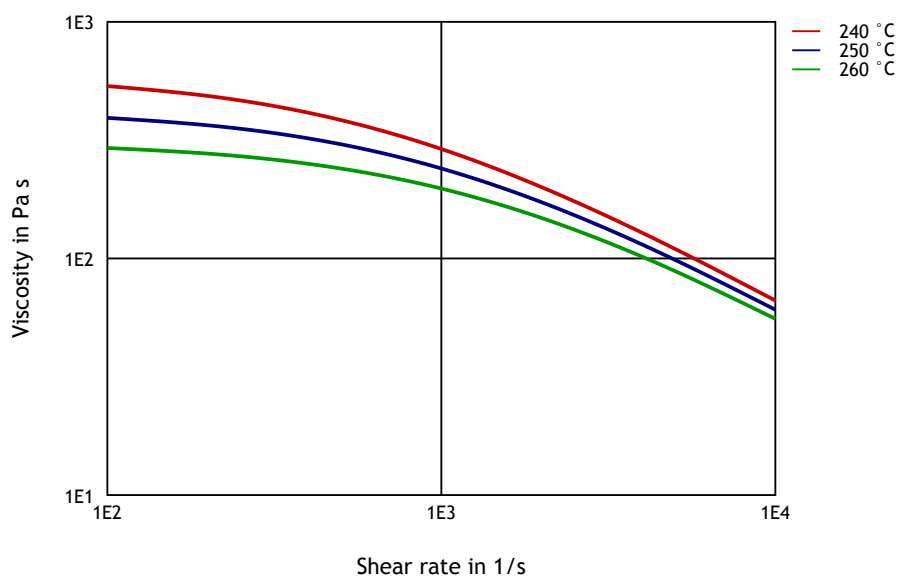
Melt temperature range = 240-260 °C

Mould temperature optimum = 80 °C

Mould temperature range = 30-130 °C

### Diagrams

#### Viscosity-shear rate



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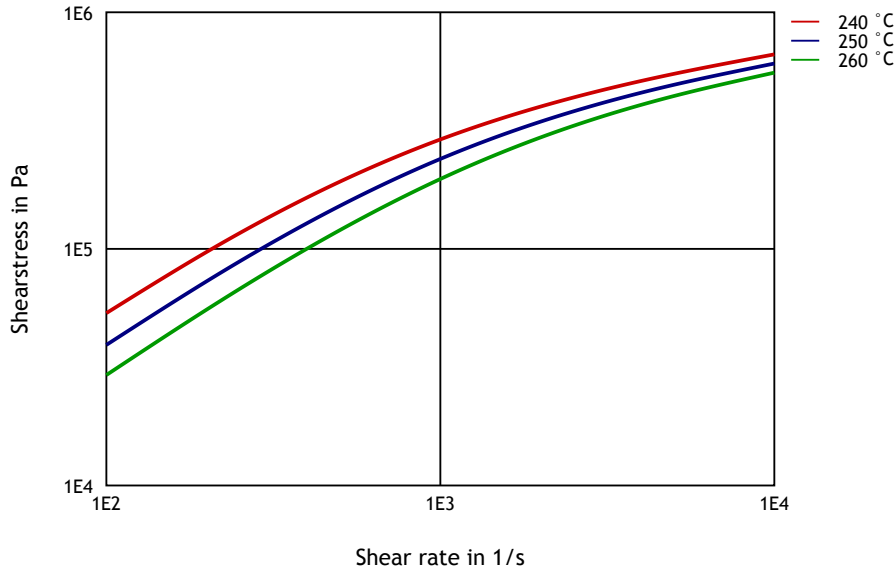
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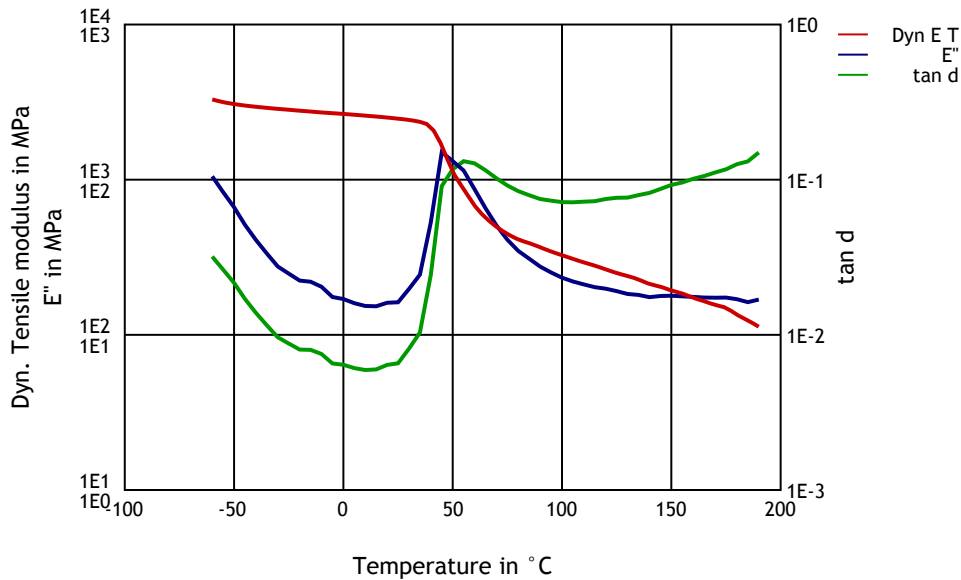
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## THERMOPLASTIC POLYESTER RESIN

### Shearstress-shear rate



### Dynamic Tensile modulus-temperature



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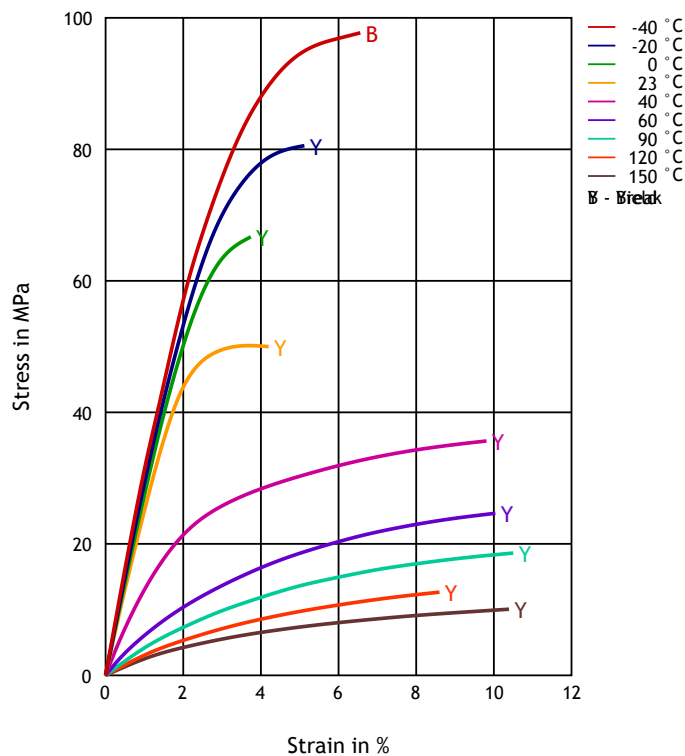
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## THERMOPLASTIC POLYESTER RESIN

Stress-strain



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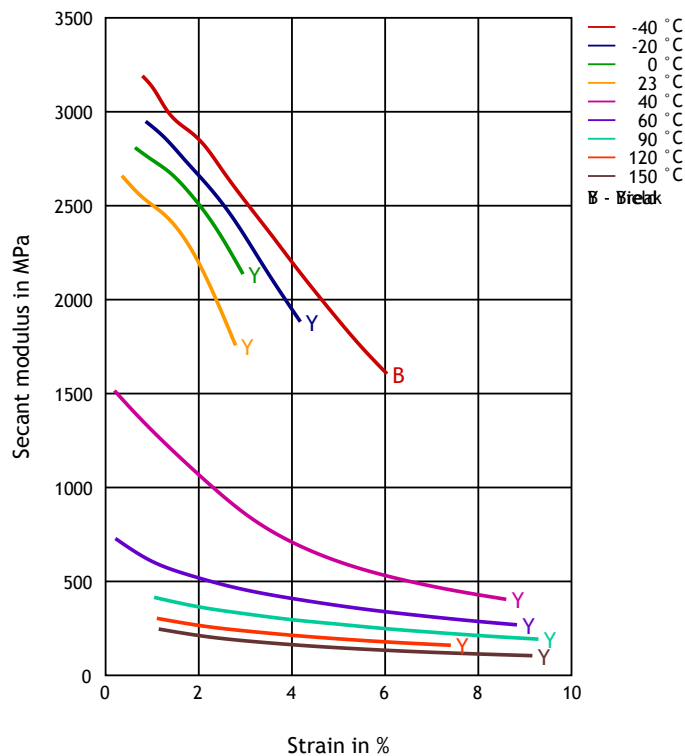
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## THERMOPLASTIC POLYESTER RESIN

Secant modulus-strain



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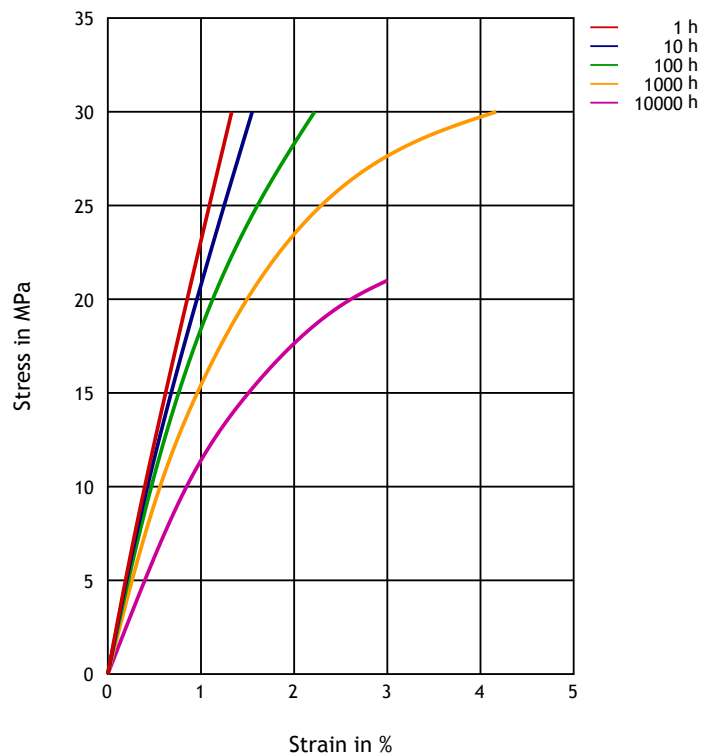
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# DuPont™ Crastin® S600F20 NC010

## THERMOPLASTIC POLYESTER RESIN

Stress-strain (isochronous) 23 °C



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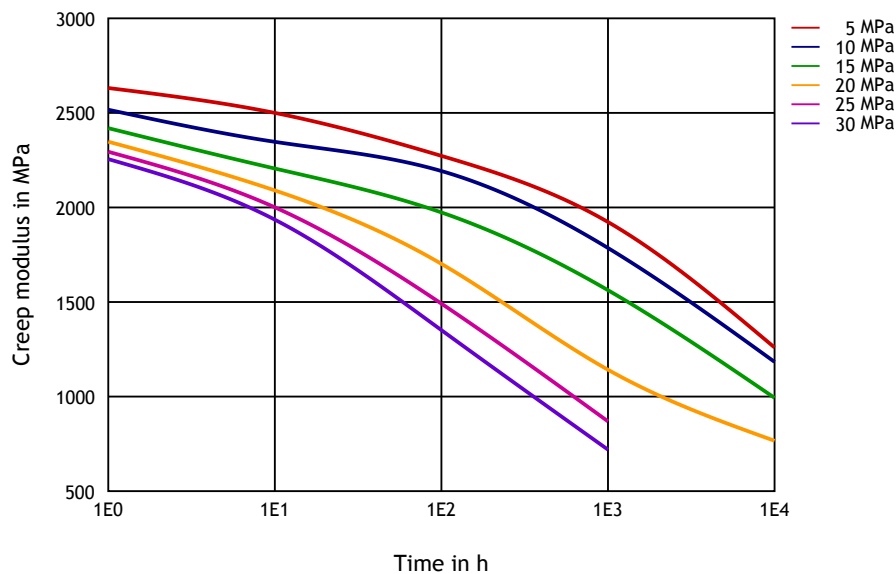
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# DuPont™ Crastin® S600F20 NC010

## THERMOPLASTIC POLYESTER RESIN

Creep modulus-time 23 °C



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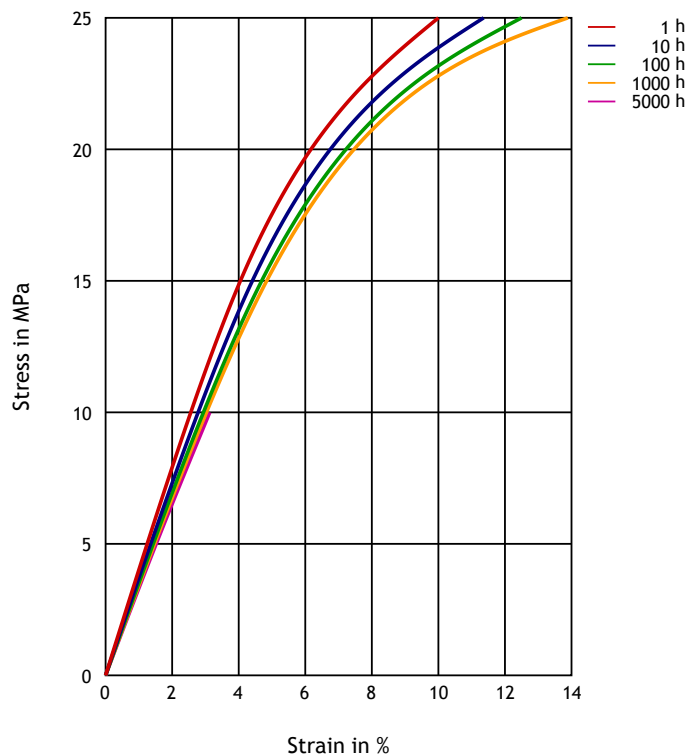




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## THERMOPLASTIC POLYESTER RESIN

Stress-strain (isochronous) 60°C



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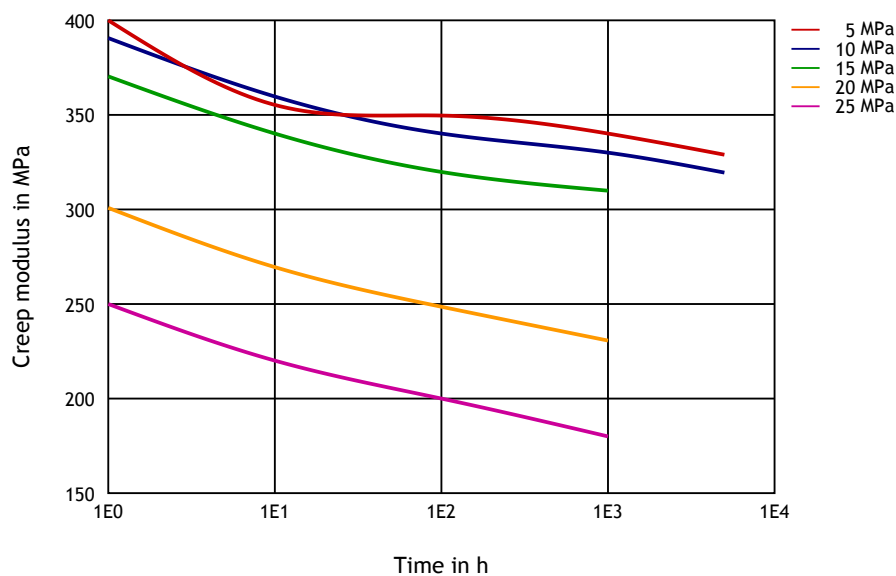
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## THERMOPLASTIC POLYESTER RESIN

Creep modulus-time 60 °C



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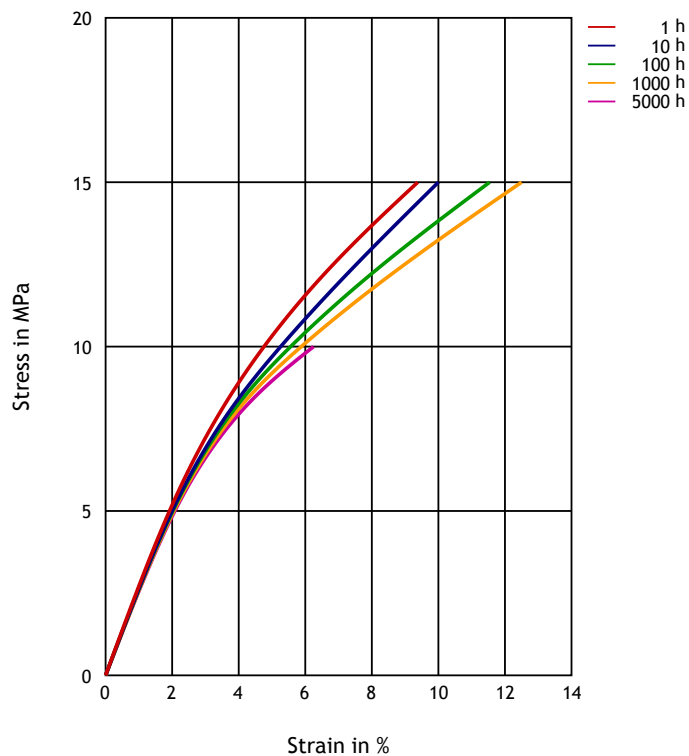
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# DuPont™ Crastin® S600F20 NC010

## THERMOPLASTIC POLYESTER RESIN

Stress-strain (isochronous) 110°C



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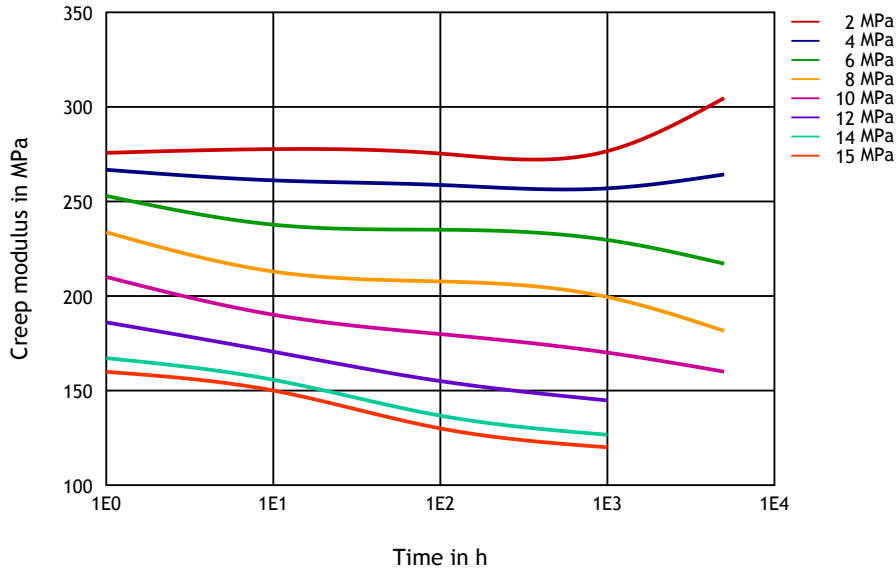
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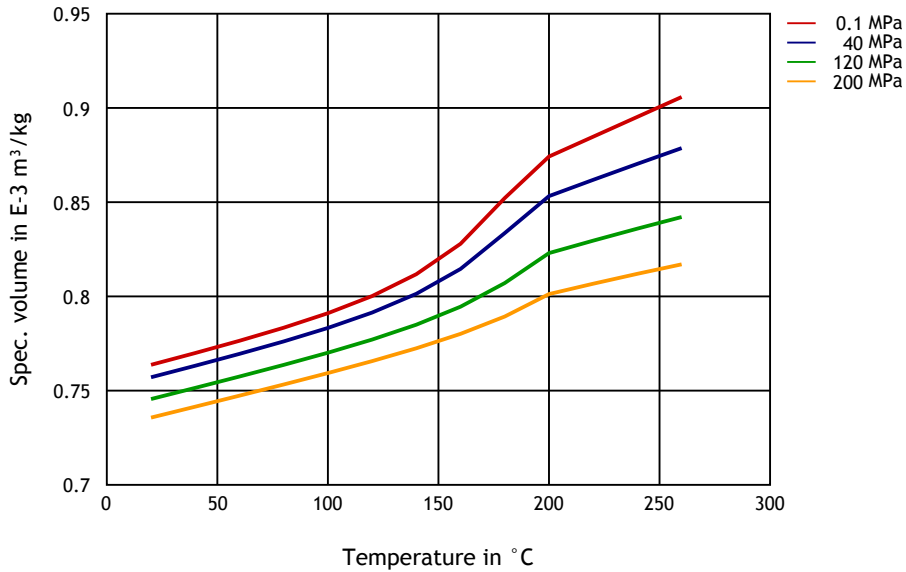
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## THERMOPLASTIC POLYESTER RESIN

Creep modulus-time 110°C



Specific volume-temperature (pvT)



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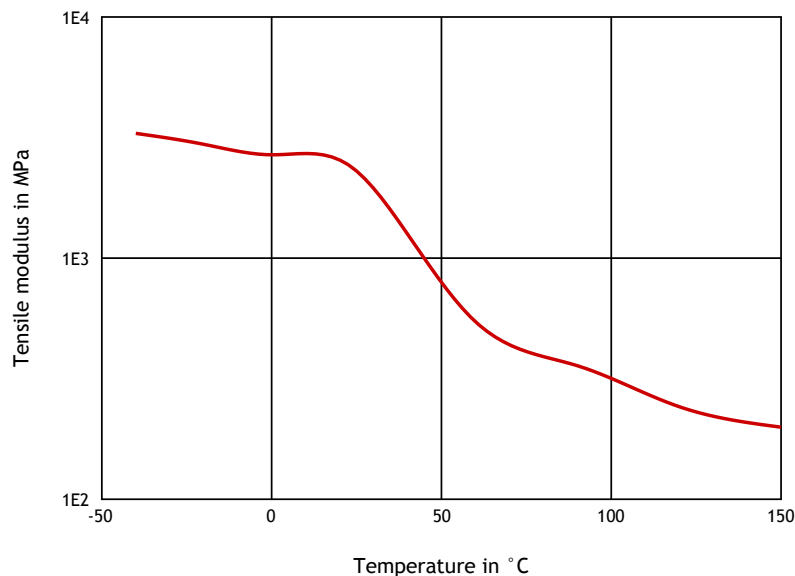
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# DuPont™ Crastin® S600F20 NC010

## THERMOPLASTIC POLYESTER RESIN

### Tensile modulus-temperature



### 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)

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## THERMOPLASTIC POLYESTER RESIN

✓ 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 (60°C)
- ✗ ISO 1817 Liquid 2 (60°C)
- ✗ ISO 1817 Liquid 3 (60°C)
- ✗ ISO 1817 Liquid 4 (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)

### 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).

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## THERMOPLASTIC POLYESTER RESIN

**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).

Contact DuPont for Material Safety Data Sheet, general guides and/or additional information about ventilation, handling, purging, drying, etc. ISO Mechanical properties measured at 4.0mm (Hytrel® measured at 2 mm), IEC Electrical properties measured at 2.0mm, all ASTM properties measured at 3.2mm, and test temperatures are 23° C unless otherwise stated.

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