

# Crastin® FG6131 NC010

## 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® FG6131 NC010 is an unreinforced, low viscosity polybutylene terephthalate resin for extrusion and injection molding. It has been developed for consideration into applications such as parts for the food industry.

### Product information

Resin Identification	PBT	ISO 1043
Part Marking Code	>PBT<	ISO 11469

### Rheological properties

Melt volume-flow rate	45 cm <sup>3</sup> /10min	ISO 1133
Temperature	250 °C	
Load	2.16 kg	
Melt mass-flow rate	48 g/10min	ISO 1133
Melt mass-flow rate, Temperature	250 °C	
Melt mass-flow rate, Load	2.16 kg	
Viscosity number	110 cm <sup>3</sup> /g	ISO 307, 1628
Intrinsic viscosity	0.9	ISO 307, 1628
Moulding shrinkage, parallel	1.6 %	ISO 294-4, 2577
Moulding shrinkage, normal	1.6 %	ISO 294-4, 2577

### Typical mechanical properties

Tensile modulus	2600 MPa	ISO 527-1/-2
Tensile stress at yield, 50mm/min	59 MPa	ISO 527-1/-2
Tensile strain at yield, 50mm/min	5 %	ISO 527-1/-2
Nominal strain at break	30 %	ISO 527-1/-2
Tensile strain at break, 50mm/min	65 %	ISO 527-1/-2
Flexural strength	85 MPa	ISO 178
Charpy impact strength, 23°C	N kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30°C	N kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23°C	4 kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -30°C	4 kJ/m <sup>2</sup>	ISO 179/1eA
Izod notched impact strength, 23°C	3.5 kJ/m <sup>2</sup>	ISO 180/1A
Poisson's ratio	0.38	

# Crastin® FG6131 NC010

## THERMOPLASTIC POLYESTER RESIN

### Thermal properties

Melting temperature, 10°C/min	225 °C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	55 °C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	50 °C	ISO 75-1/-2
Temperature of deflection under load, 1.8 MPa, annealed	60 °C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	115 °C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa, annealed	180 °C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	175 °C	ISO 306
Coefficient of linear thermal expansion (CLTE), parallel	108 E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	144 E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.25 W/(m K)	ISO 22007-2
Specific heat capacity of melt	2050 J/(kg K)	ISO 22007-4
RTI, electrical, 0.75mm	75 °C	UL 746B
RTI, impact, 0.75mm	75 °C	UL 746B
RTI, strength, 0.75mm	75 °C	UL 746B

### Flammability

Burning Behav. at 1.5mm nom. thickn.	HB class	IEC 60695-11-10
Thickness tested	1.5 mm	IEC 60695-11-10
UL recognition	yes	UL 94
Burning Behav. at thickness h	HB class	IEC 60695-11-10
Thickness tested	0.88 mm	IEC 60695-11-10
Oxygen index	22 %	ISO 4589-1/-2
FMVSS Class	B	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80 mm/min	ISO 3795 (FMVSS 302)

### Electrical properties

Volume resistivity	>1E13 Ohm.m	IEC 62631-3-1
Surface resistivity	1E12 Ohm	IEC 62631-3-2
Electric strength	26 kV/mm	IEC 60243-1
Comparative tracking index	600	IEC 60112

### Physical/Other properties

Humidity absorption, 2mm	0.2 %	Sim. to ISO 62
Water absorption, 2mm	0.4 %	Sim. to ISO 62
Density	1300 kg/m <sup>3</sup>	ISO 1183
Density of melt	1110 kg/m <sup>3</sup>	

### Injection

Drying Recommended	yes
Drying Temperature	140 °C
Drying Time, Dehumidified Dryer	4 - 6 h
Processing Moisture Content	≤0.01 %

# Crastin® FG6131 NC010

## THERMOPLASTIC POLYESTER RESIN

Melt Temperature Optimum	240 °C
Min. melt temperature	240 °C
Max. melt temperature	250 °C
Mold Temperature Optimum	80 °C
Min. mould temperature	60 °C
Max. mould temperature	120 °C
Hold pressure range	≥60 MPa
Hold pressure time	4 s/mm
Back pressure	As low as possible MPa
Ejection temperature	170 °C

### Extrusion

Drying Temperature	110 - 130 °C
Drying Time, Dehumidified Dryer	2 - 4 h
Processing Moisture Content	≤0.04 %
Melt Temperature Range	240 - 260 °C

### Characteristics

Processing	Injection Moulding, Film Extrusion, Extrusion, Sheet Extrusion, Other Extrusion, Coatable, Casting
Delivery form	Pellets

### Additional information

Injection molding	To minimize the volatile content in the final product, dry the resin to ≤0.01% water content. In injection molding, use the lowest possible melt temperature (recommended 240 °C) and shortest feasible residence time (recommended 2-3 minutes). Store the parts in a ventilated, clean area before use. If assistance is needed please contact your Celanese account representative.
-------------------	--

These recommendations are based on internal Celanese testing. For drying and injection molding conditions outside the above parameters, customer must test for and verify suitably low volatiles emissions on molded articles to confirm the final product is suitably pure for its intended use.

#### Processing Notes

#### Pre-Drying

To avoid hydrolytic degradation during processing, CRAFTIN resins have to be dried to a moisture level equal to or less than 0.01%. Drying should be done in a dehumidifying hopper dryer capable of dewpoints <-40 °C (-40 °F) at 140 °C (284 °F) for 4-6 hours.

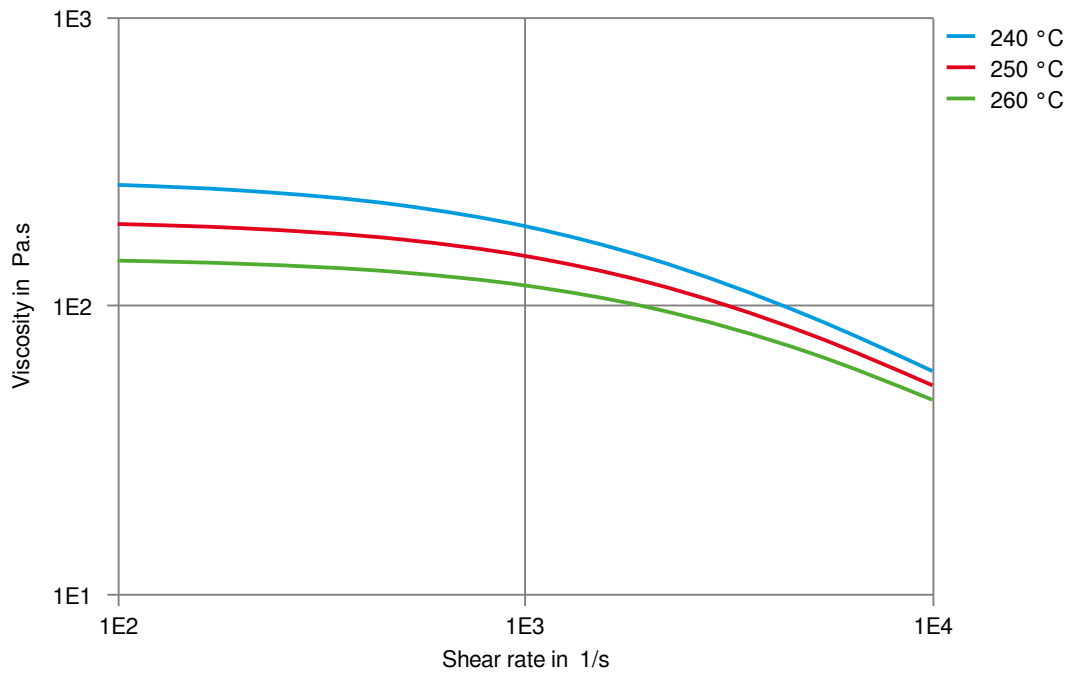
#### Storage

For subsequent storage of the material in the dryer until processed (≤ 60 h) it is necessary to lower the temperature to 100 °C.

# Crastin® FG6131 NC010

THERMOPLASTIC POLYESTER RESIN

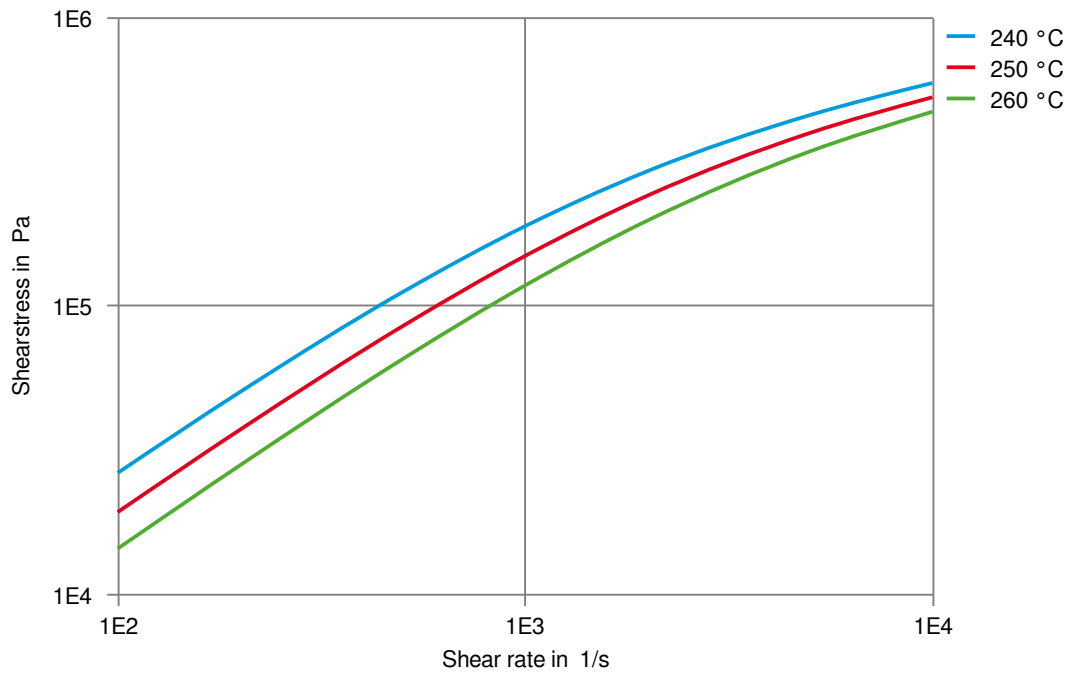
Viscosity-shear rate



# Crastin® FG6131 NC010

THERMOPLASTIC POLYESTER RESIN

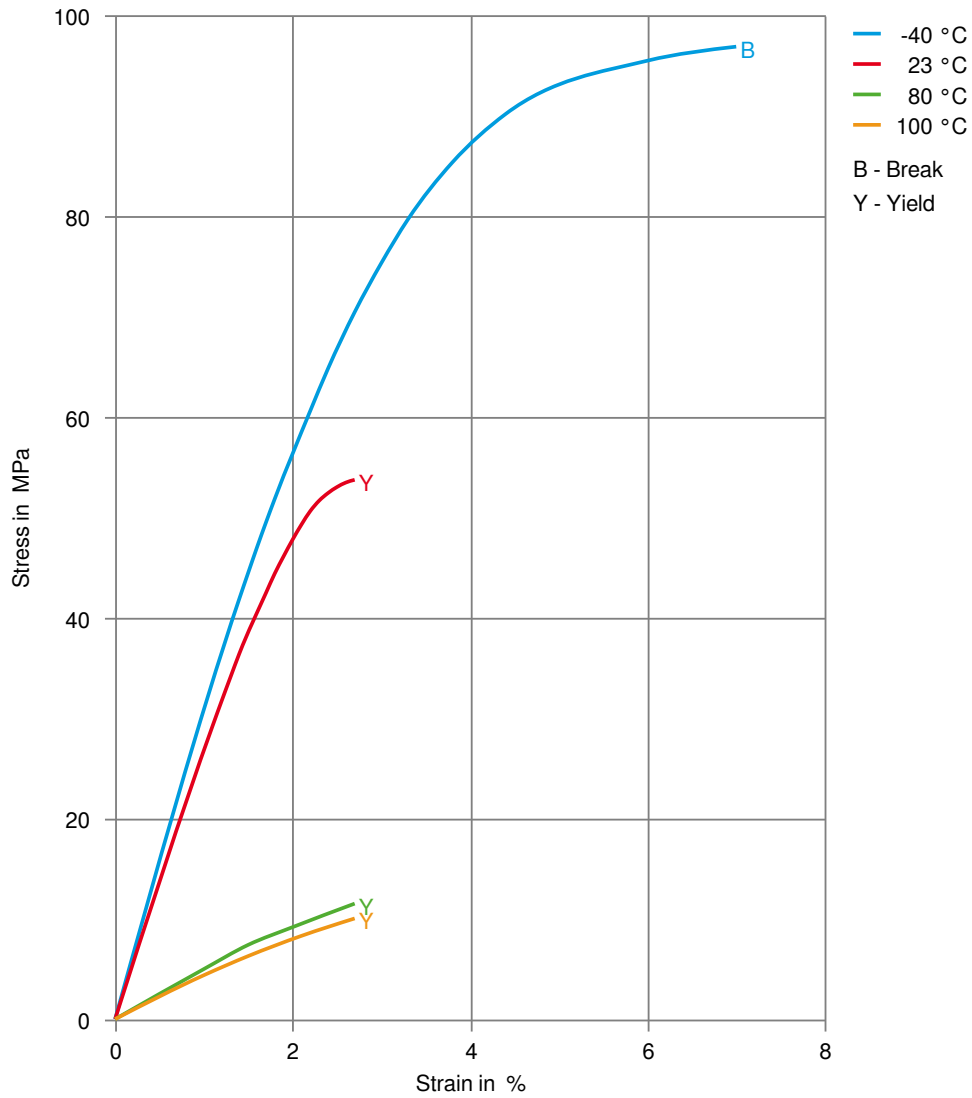
Shearstress-shear rate



# Crastin® FG6131 NC010

THERMOPLASTIC POLYESTER RESIN

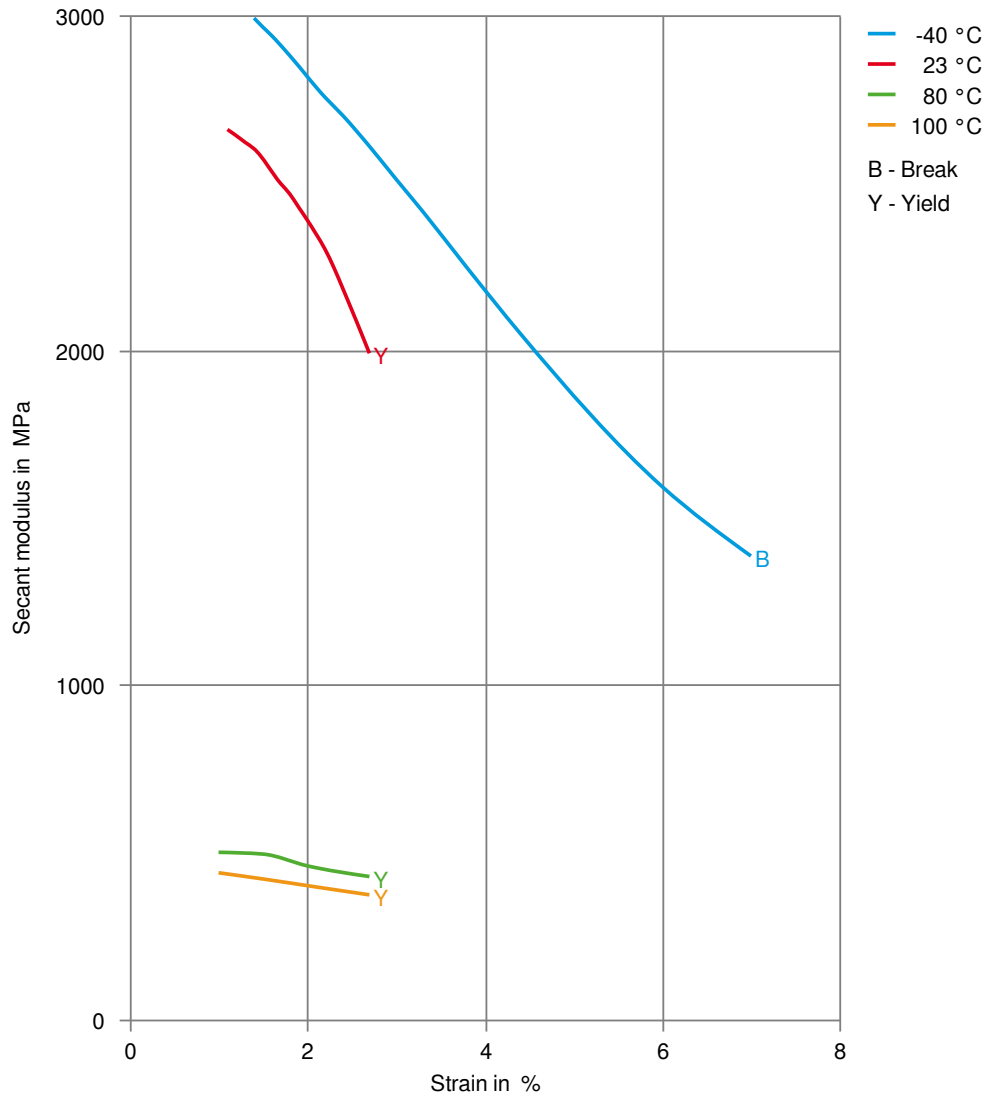
Stress-strain  
(measured on Crastin® S600F40 NC010)



# Crastin® FG6131 NC010

THERMOPLASTIC POLYESTER RESIN

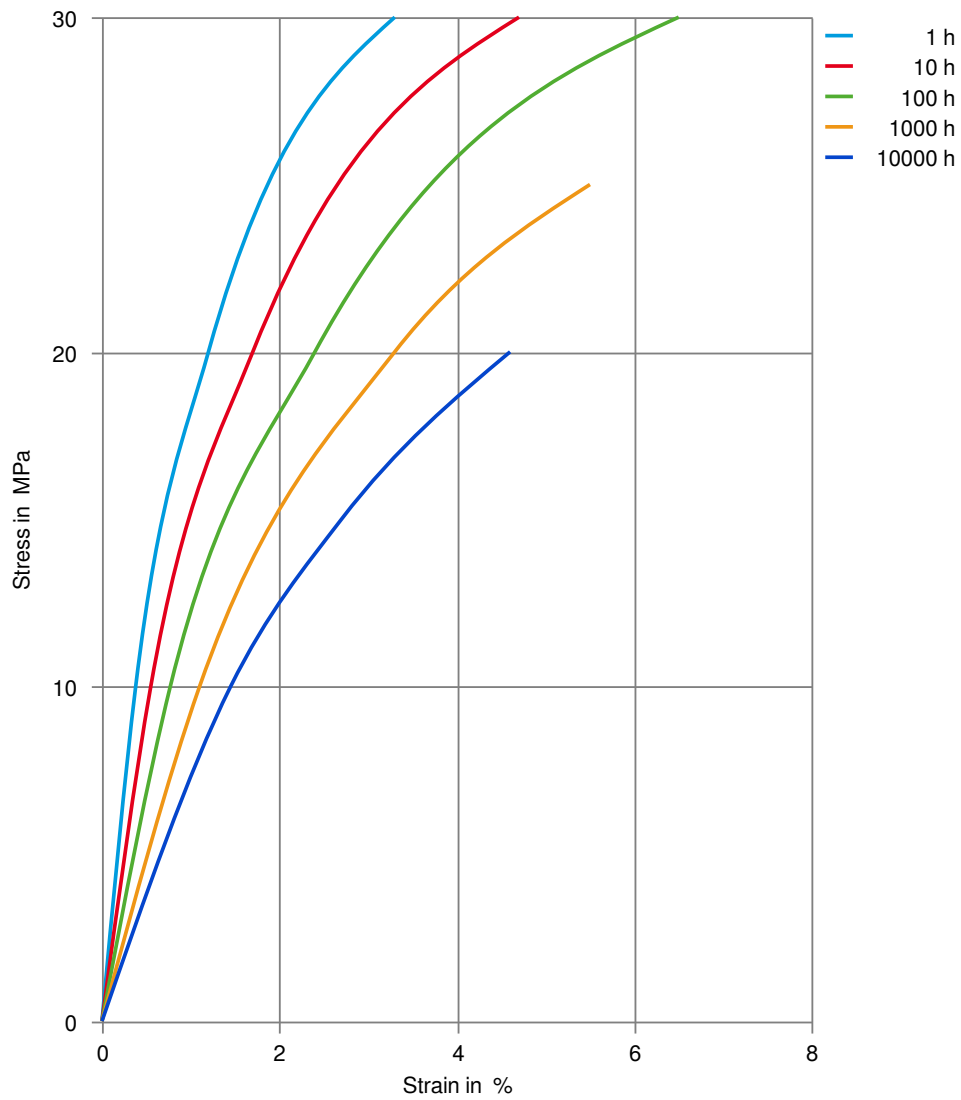
Secant modulus-strain  
(measured on Crastin® S600F40 NC010)



# Crastin® FG6131 NC010

THERMOPLASTIC POLYESTER RESIN

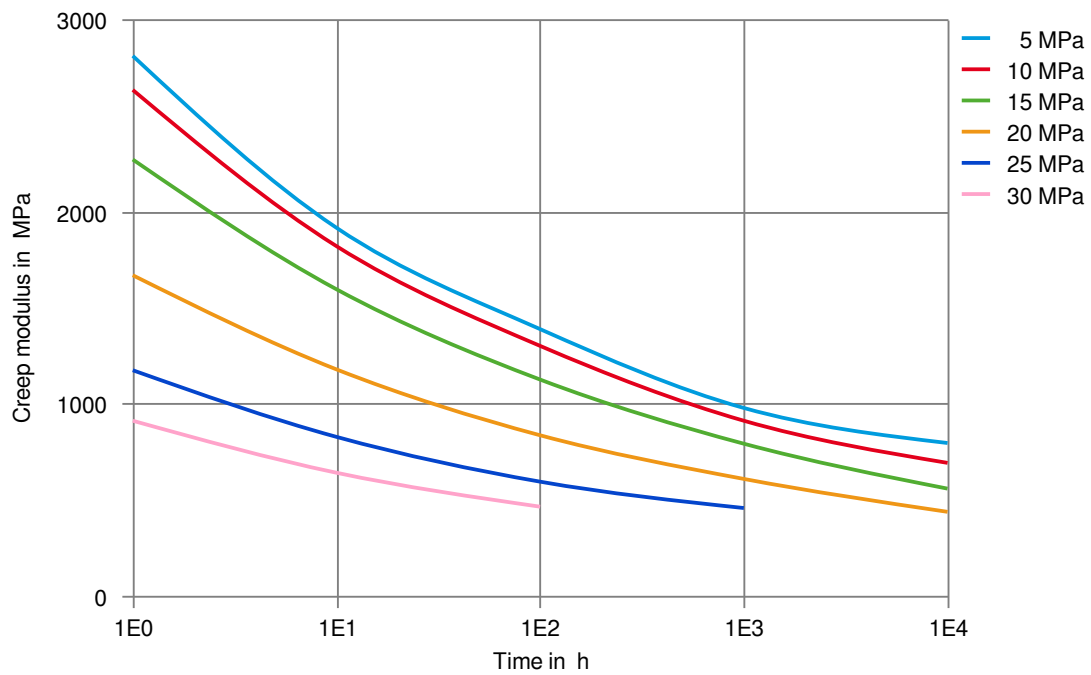
Stress-strain (isochronous) 23°C



# Crastin® FG6131 NC010

THERMOPLASTIC POLYESTER RESIN

Creep modulus-time 23°C



# Crastin® FG6131 NC010

## THERMOPLASTIC POLYESTER RESIN

### 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
- ✓ 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

# Crastin® FG6131 NC010

## THERMOPLASTIC POLYESTER RESIN

- ✓ 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).