

# Crastin® LW9020 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® LW9020 NC010 is a 20% glass fiber reinforced polybutylene terephthalate blend for injection moulding. It has improved surface aesthetics, excellent dimensional stability and low warpage characteristics.

### Product information

Resin Identification	PBT+ASA-GF20	ISO 1043
Part Marking Code	>PBT+ASA-GF20<	ISO 11469

### Rheological properties

Melt mass-flow rate	15 g/10min	ISO 1133
Melt mass-flow rate, Temperature	250 °C	
Melt mass-flow rate, Load	5 kg	
Intrinsic viscosity	0.93	ISO 307, 1157, 1628
Moulding shrinkage, parallel	0.3 %	ISO 294-4, 2577
Moulding shrinkage, normal	0.7 %	ISO 294-4, 2577
Postmoulding shrinkage, normal, 48h at 80°C	0.25 %	ISO 294-4
Postmoulding shrinkage, parallel, 48h at 80°C	0.2 %	ISO 294-4

### Typical mechanical properties

Tensile Modulus	7000 MPa	ISO 527-1/-2
Stress at break, 5mm/min	110 MPa	ISO 527-1/-2
Strain at break, 5mm/min	2.9 %	ISO 527-1/-2
Flexural Modulus	6300 MPa	ISO 178
Flexural Strength	170 MPa	ISO 178
Tensile creep modulus, 1h	6500 MPa	ISO 899-1
Tensile creep modulus, 1000h	4800 MPa	ISO 899-1
Charpy impact strength, 23°C	60 kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30°C	43 kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23°C	9.5 kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -30°C	7.5 kJ/m <sup>2</sup>	ISO 179/1eA
Izod notched impact strength, 23°C	8 kJ/m <sup>2</sup>	ISO 180/1A
Izod notched impact strength, -30°C	7 kJ/m <sup>2</sup>	ISO 180/1A

# Crastin® LW9020 NC010

## THERMOPLASTIC POLYESTER RESIN

Izod impact strength, 23°C	50 kJ/m <sup>2</sup>	ISO 180/1U
Izod impact strength, -30°C	50 kJ/m <sup>2</sup>	ISO 180/1U
Poisson's ratio	0.35	

### Thermal properties

Melting temperature, 10°C/min	225 °C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	120 °C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	150 °C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	210 °C	ISO 75-1/-2
Vicat softening temperature, 50°C/h, 50N	145 °C	ISO 306
Ball pressure test	190 °C	IEC 60695-10-2
Coeff. of linear therm. expansion, parallel	30 E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	100 E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.25 W/(m K)	Internal
Spec. heat capacity of melt	1850 J/(kg K)	Internal
RTI, electrical, 0.75mm	130 °C	UL 746B
RTI, electrical, 1.5mm	130 °C	UL 746B
RTI, electrical, 3mm	130 °C	UL 746B
RTI, electrical, 6mm	130 °C	UL 746B
RTI, impact, 0.75mm	125 °C	UL 746B
RTI, impact, 1.5mm	125 °C	UL 746B
RTI, impact, 3mm	130 °C	UL 746B
RTI, impact, 6mm	130 °C	UL 746B
RTI, strength, 0.75mm	130 °C	UL 746B
RTI, strength, 1.5mm	130 °C	UL 746B
RTI, strength, 3mm	130 °C	UL 746B
RTI, strength, 6mm	130 °C	UL 746B
TGA curve	available	ISO 11359-1/-2

### Flammability

Burning Behav. at 1.5mm nom. thickn.	HB class	UL 94
Thickness tested	1.5 mm	UL 94
UL recognition	yes	UL 94
Burning Behav. at thickness h	HB class	UL 94
Thickness tested	0.75 mm	UL 94
UL recognition	yes	UL 94
Oxygen index	19 %	ISO 4589-1/-2
Glow Wire Flammability Index, 3mm	650 °C	IEC 60695-2-12
Glow Wire Ignition Temperature, 3mm	700 °C	IEC 60695-2-13
FMVSS Class	B	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	38 mm/min	ISO 3795 (FMVSS 302)

# Crastin® LW9020 NC010

## THERMOPLASTIC POLYESTER RESIN

### Electrical properties

Relative permittivity, 100Hz	3.7	IEC 62631-2-1
Relative permittivity, 1MHz	3.4	IEC 62631-2-1
Dissipation factor, 100Hz	20.1 E-4	IEC 62631-2-1
Dissipation factor, 1MHz	180 E-4	IEC 62631-2-1
Volume resistivity	>1E13 Ohm.m	IEC 62631-3-1
Surface resistivity	1E14 Ohm	IEC 62631-3-2
Electric strength	35 kV/mm	IEC 60243-1
Comparative tracking index	550	IEC 60112
Electric Strength, Short Time, 1mm	35 kV/mm	IEC 60243-1
Electric Strength, Short Time, 2mm	20 kV/mm	IEC 60243-1

### Other properties

Humidity absorption, 2mm	0.26 %	Sim. to ISO 62
Water absorption, 2mm	0.78 %	Sim. to ISO 62
Density	1350 kg/m <sup>3</sup>	ISO 1183
Density of melt	1190 kg/m <sup>3</sup>	Internal

### VDA Properties

Emission of organic compounds	100 µgC/g	VDA 277
Odour	3.5 class	VDA 270

### 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	Internal
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	Internal

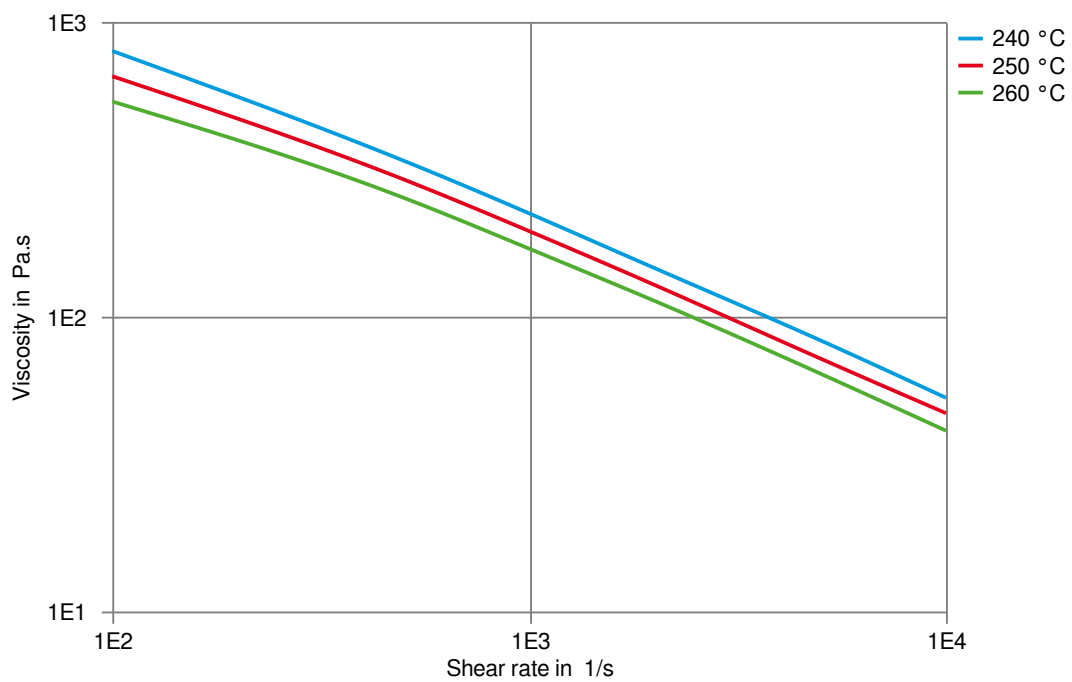
### Characteristics

Additives	Release agent
-----------	---------------

# Crastin® LW9020 NC010

THERMOPLASTIC POLYESTER RESIN

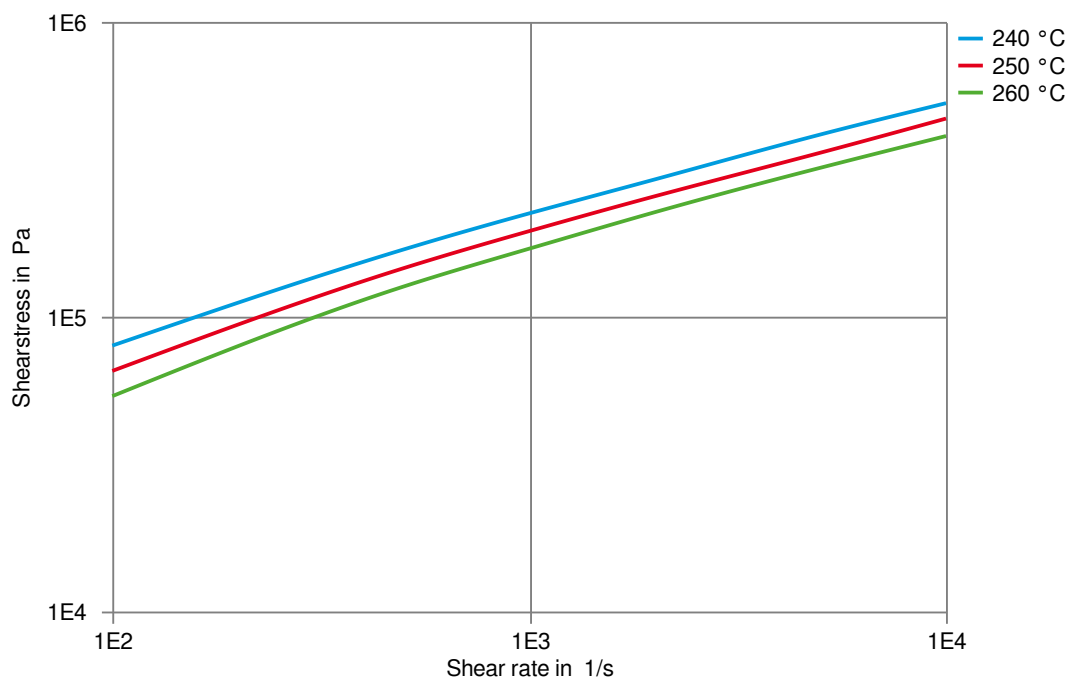
## Viscosity-shear rate



# Crastin® LW9020 NC010

THERMOPLASTIC POLYESTER RESIN

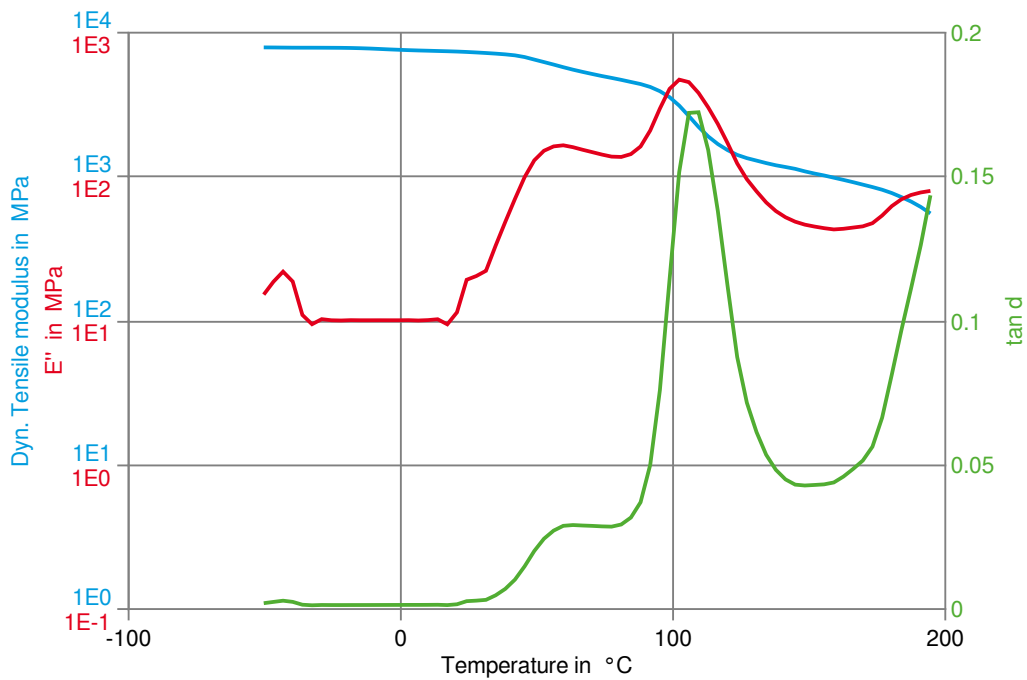
## Shearstress-shear rate



# Crastin® LW9020 NC010

THERMOPLASTIC POLYESTER RESIN

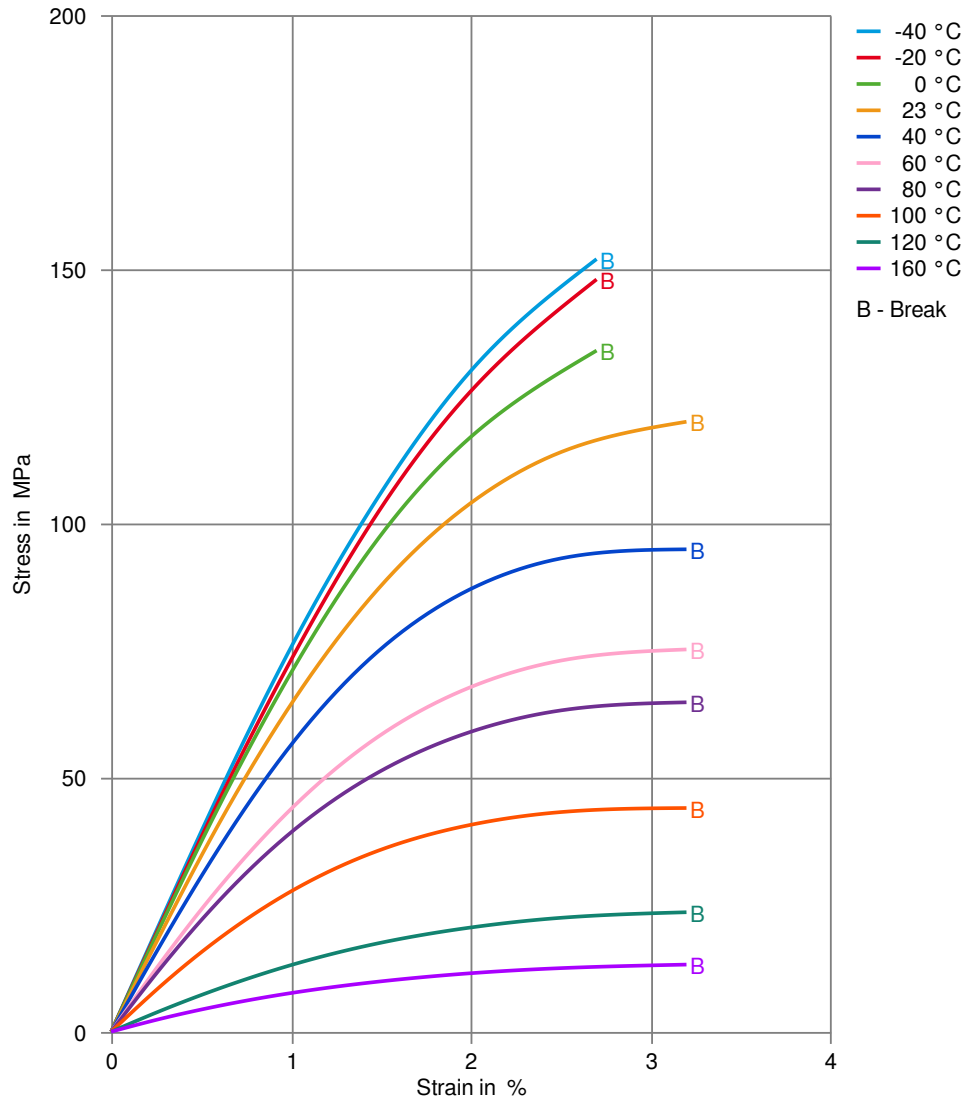
Dynamic Tensile modulus-temperature



# Crastin® LW9020 NC010

THERMOPLASTIC POLYESTER RESIN

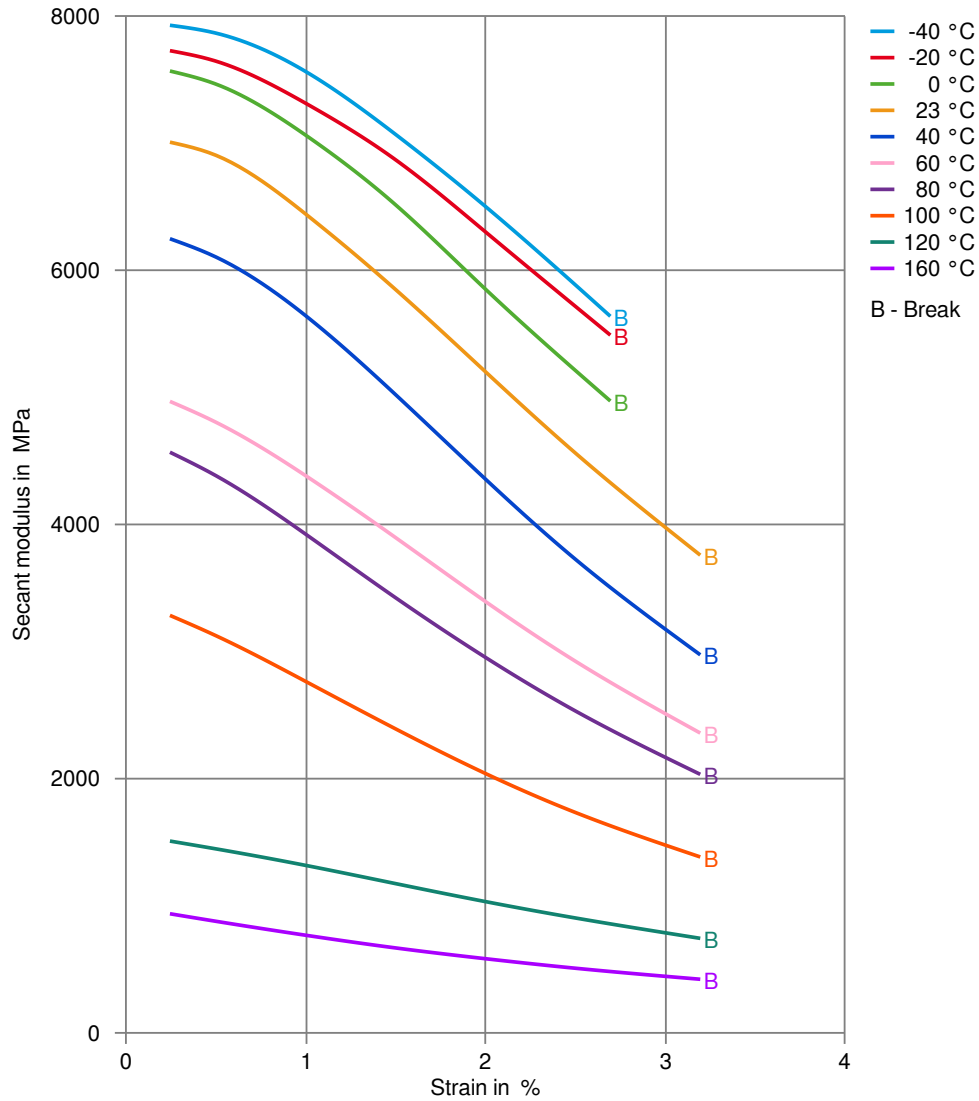
## Stress-strain



# Crastin® LW9020 NC010

THERMOPLASTIC POLYESTER RESIN

## Secant modulus-strain

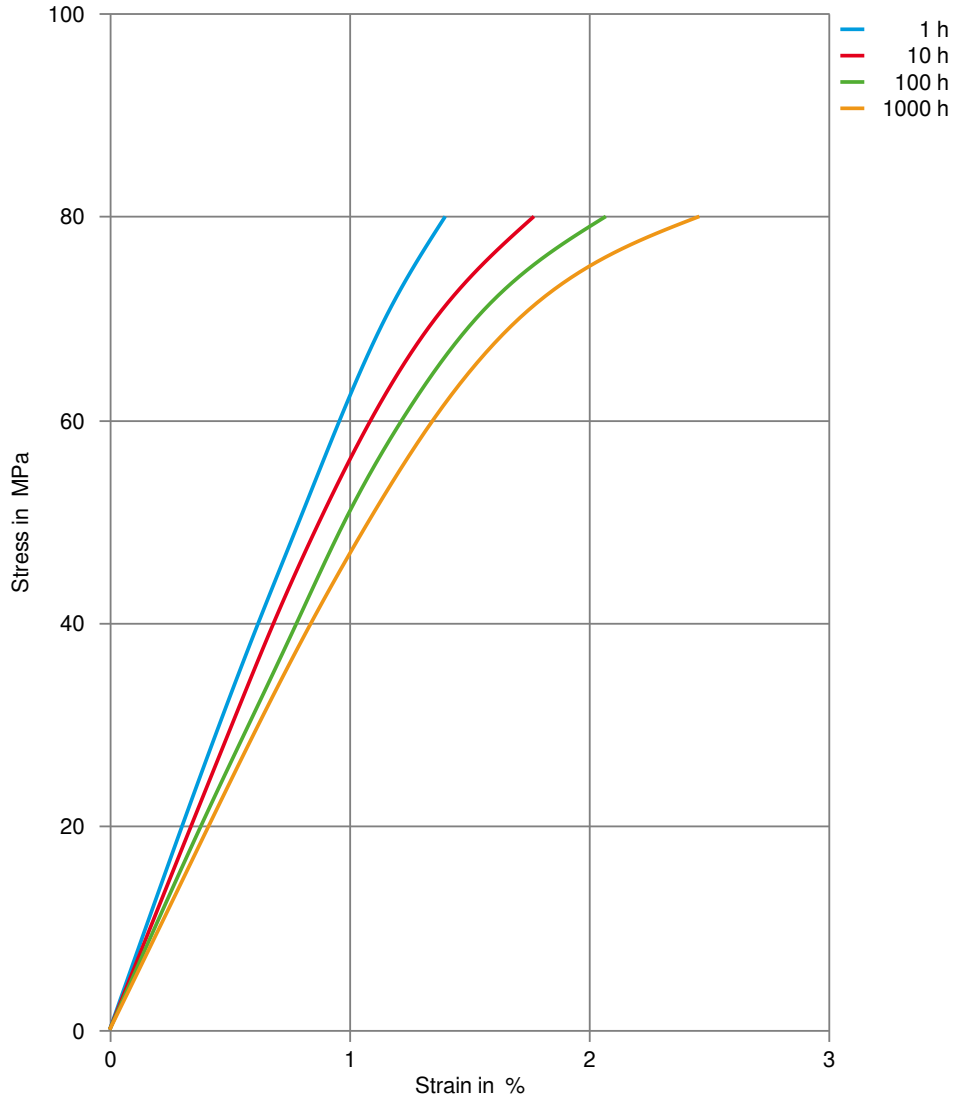




# Crastin® LW9020 NC010

THERMOPLASTIC POLYESTER RESIN

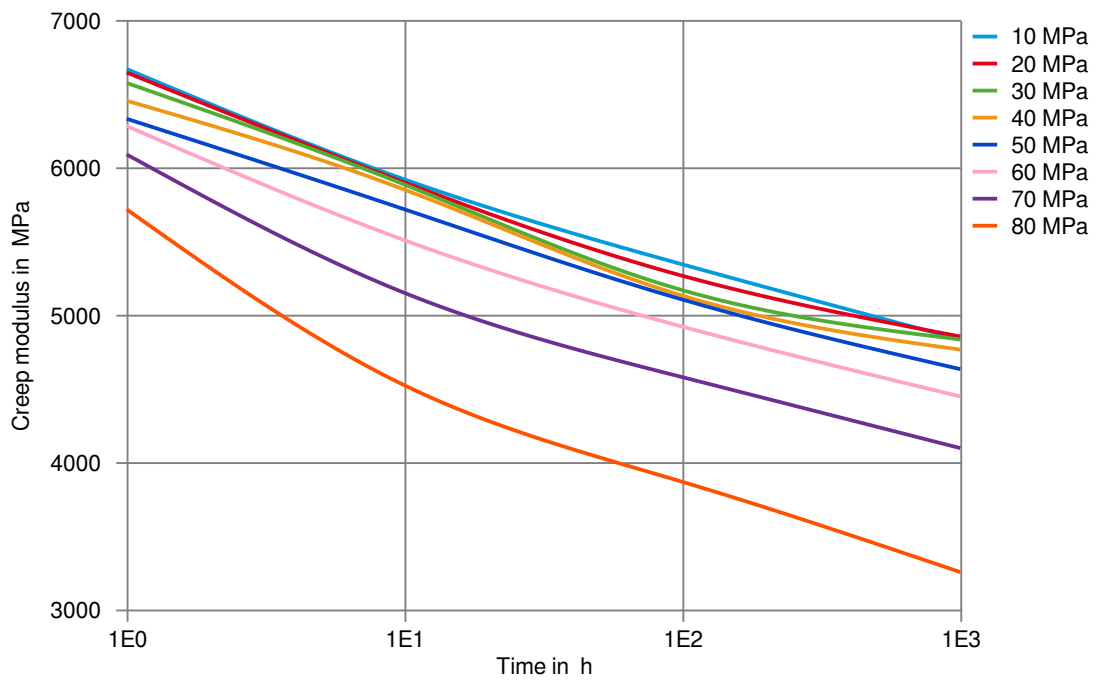
Stress-strain (isochronous) 23°C



# Crastin® LW9020 NC010

THERMOPLASTIC POLYESTER RESIN

Creep modulus-time 23°C



# Crastin® LW9020 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

# Crastin® LW9020 NC010

## THERMOPLASTIC POLYESTER RESIN

### 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).