# Crastin® 6131 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® 6131 NC010 is an unreinforced, low viscosity polybutylene terephthalate resin for extrusion and injection moulding.

## Product information

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

## Rheological properties

| | | | |
|---|---|---|---|
| Melt volume-flow rate | 43 | $cm^3$/10min | ISO 1133 |
| Melt mass-flow rate | 48 | g/10min | ISO 1133 |
| Temperature | 250 | °C | |
| Load | 2.16 | kg | |
| Melt mass-flow rate, Temperature | 250 | °C | |
| Melt mass-flow rate, Load | 2.16 | kg | |
| Viscosity number | 110 | $cm^3$/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 | 6 | % | 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 | $kJ/m^2$ | ISO 179/1eU |
| Charpy impact strength, -30°C | N | $kJ/m^2$ | ISO 179/1eU |
| Charpy notched impact strength, 23°C | 4 | $kJ/m^2$ | ISO 179/1eA |
| Charpy notched impact strength, -30°C | 4 | $kJ/m^2$ | ISO 179/1eA |
| Izod notched impact strength, 23°C | 3.5 | $kJ/m^2$ | ISO 180/1A |
| Poisson's ratio | 0.38 | | |

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### 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, electrical, 1.5mm | 75 | °C | UL 746B |
| RTI, electrical, 3.0mm | 75 | °C | UL 746B |
| RTI, impact, 0.75mm | 75 | °C | UL 746B |
| RTI, impact, 1.5mm | 75 | °C | UL 746B |
| RTI, impact, 3.0mm | 75 | °C | UL 746B |
| RTI, strength, 0.75mm | 75 | °C | UL 746B |
| RTI, strength, 1.5mm | 75 | °C | UL 746B |
| RTI, strength, 3.0mm | 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 |
| UL recognition | yes | | UL 94 |
| 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 |

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## Physical/Other properties

| | | | |
|---|---|---|---|
| Humidity absorption, 2mm | 0.2 | % | Sim. to ISO 62 |
| Water absorption, 2mm | 0.4 | % | Sim. to ISO 62 |
| Density | 1300 | kg/m³ | ISO 1183 |
| Density of melt | 1110 | kg/m³ | |

## 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 |
| Mold Temperature Optimum | 80 | °C |
| Min. mould temperature | 30 | °C |
| Max. mould temperature | 130 | °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 |

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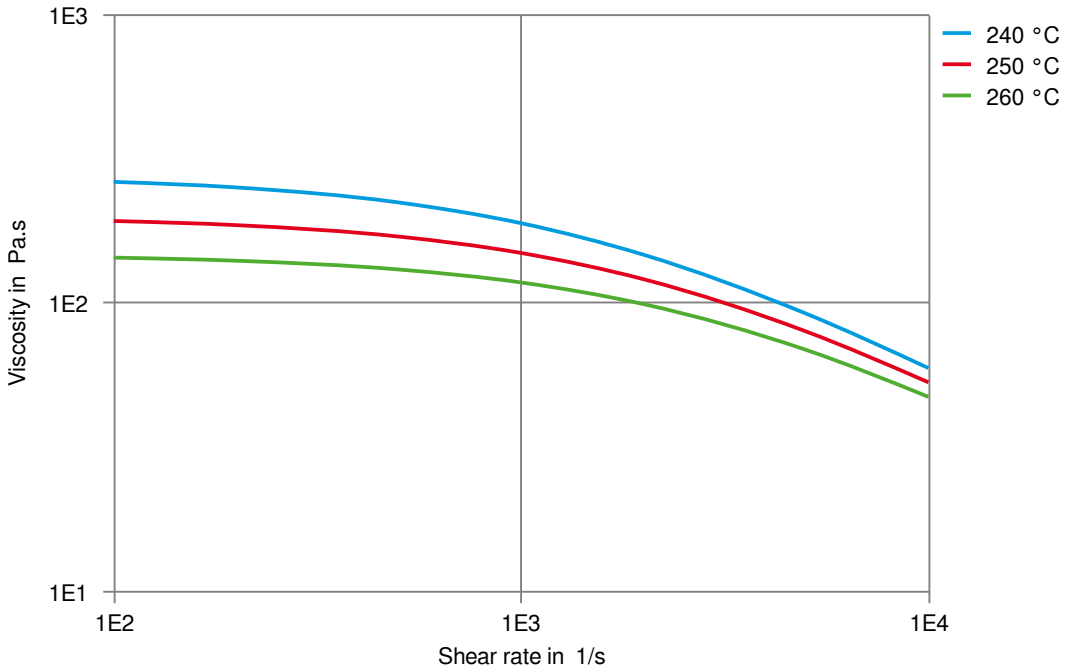
## Viscosity-shear rate



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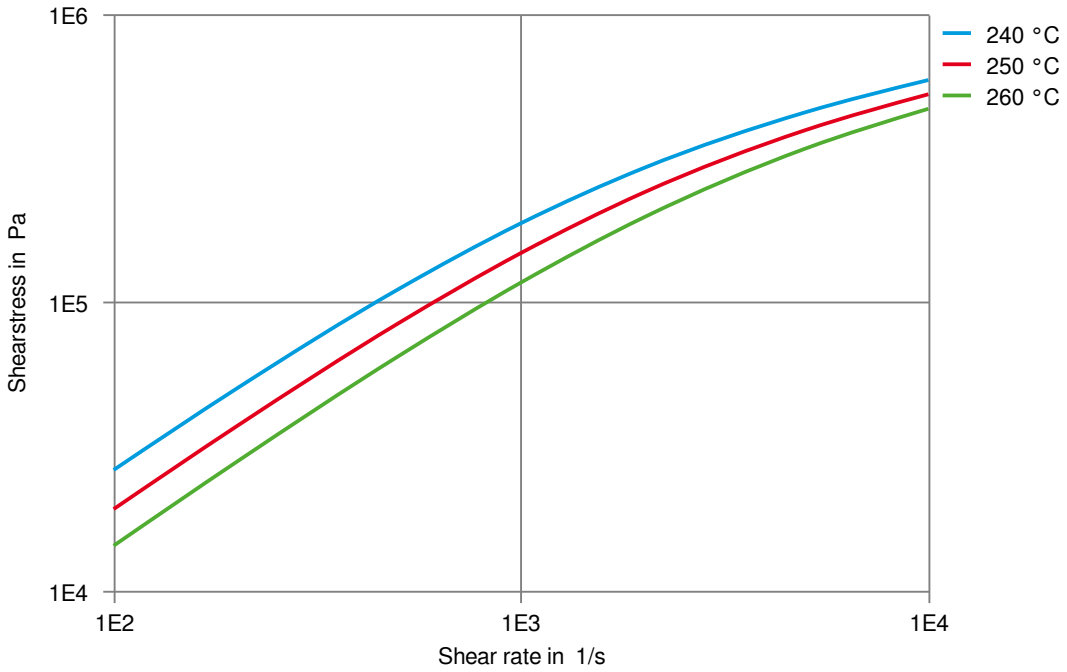
## Shearstress-shear rate



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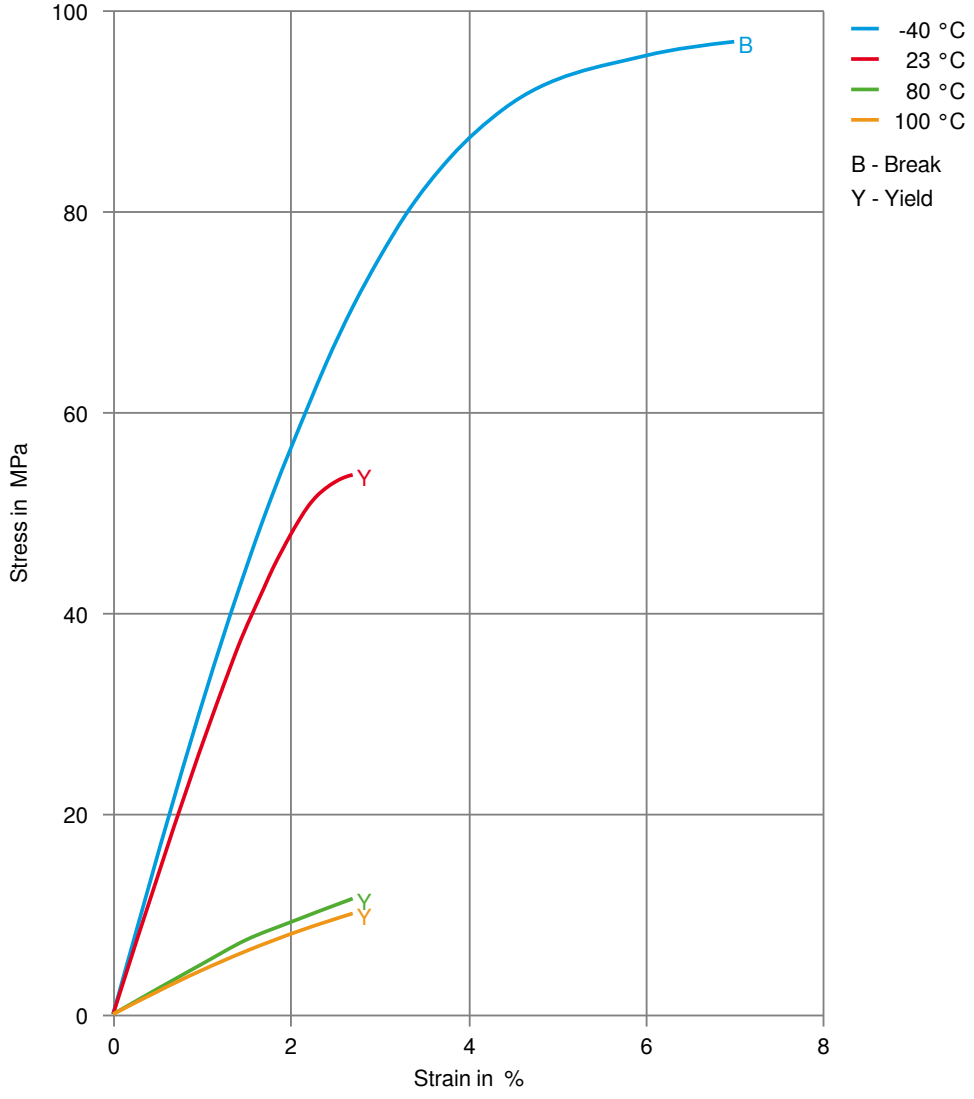
THERMOPLASTIC POLYESTER RESIN

## Stress-strain
(measured on Crastin® S600F40 NC010)






Revised: 2022-07-29 Source: Celanese Materials Database

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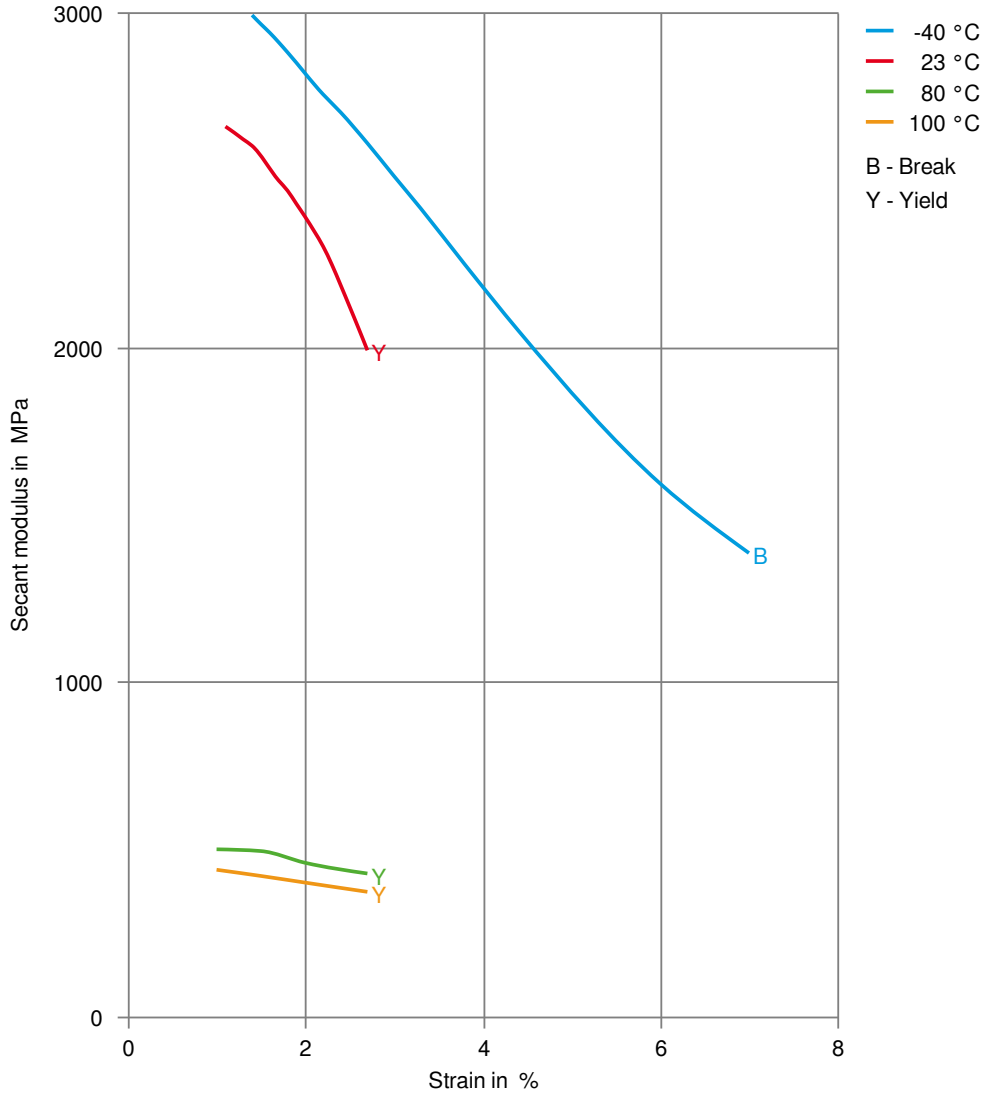
THERMOPLASTIC POLYESTER RESIN

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



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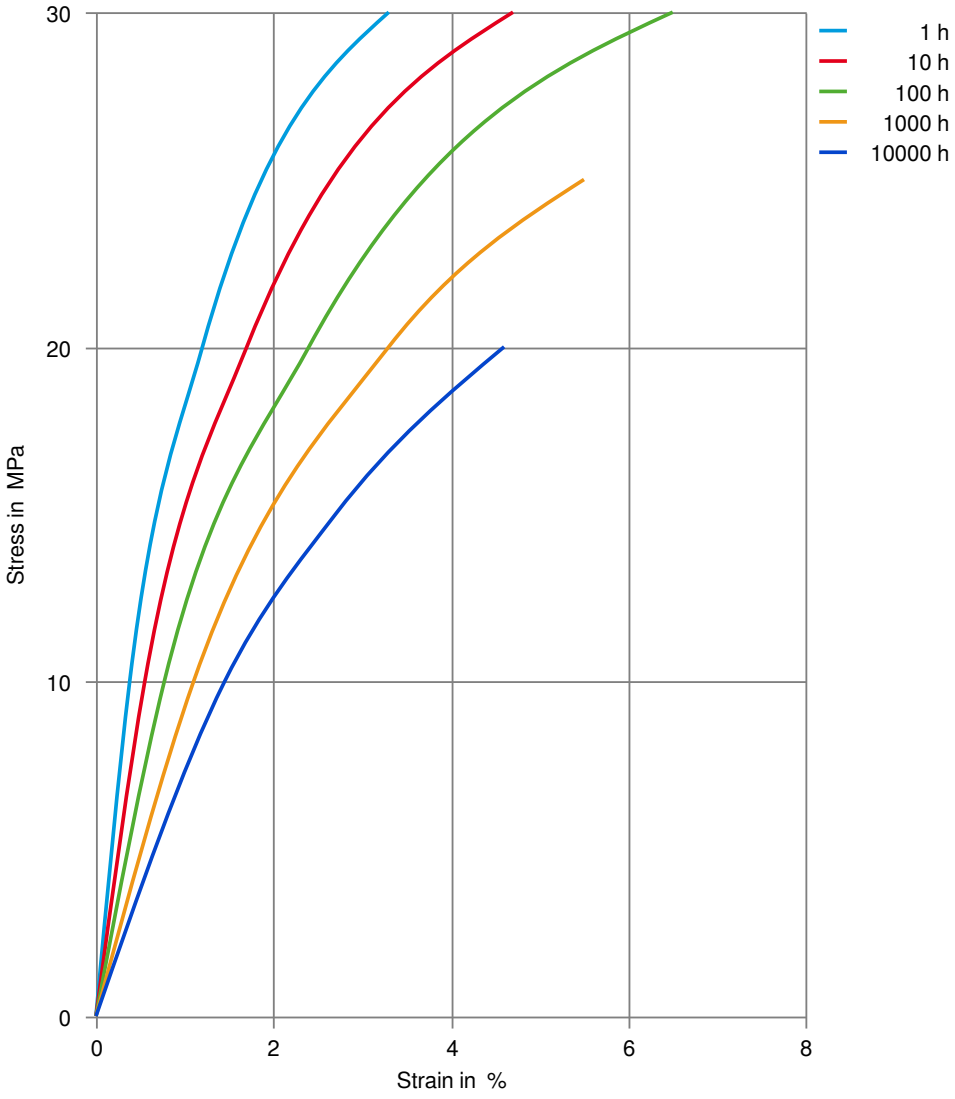
THERMOPLASTIC POLYESTER RESIN

## Stress-strain (isochronous) 23 °C



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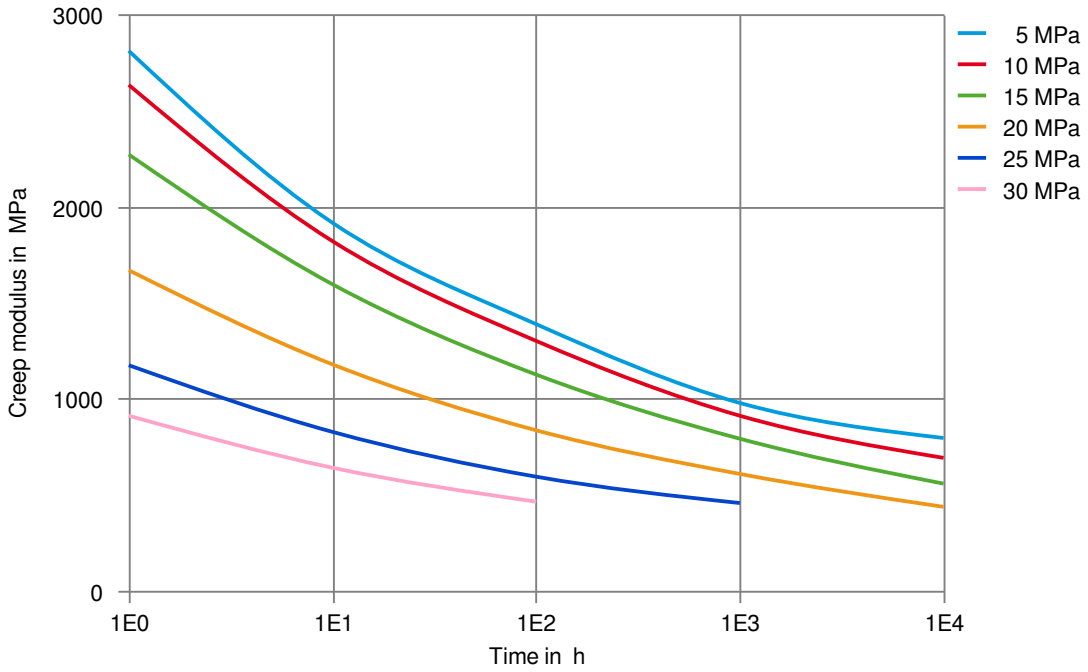
## Creep modulus-time 23 °C



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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
- ✔ 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

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- ✔ 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).



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NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colourants or other additives may cause significant variations in data values. Properties of moulded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Other than those products expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards. We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products.
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