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# Crastin® HR5315HF 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® 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.

## Product information

| | | |
|---|---|---|
| Resin Identification | PBT-IGF15 | ISO 1043 |
| Part Marking Code | >PBT-IGF15< | ISO 11469 |

## Rheological properties

| | | | |
|---|---|---|---|
| Melt volume-flow rate | 12 | $cm^3$/10min | ISO 1133 |
| Temperature | 250 | °C | |
| Load | 2.16 | kg | |
| Melt mass-flow rate | 27 | g/10min | ISO 1133 |
| Melt mass-flow rate, Temperature | 250 | °C | |
| Melt mass-flow rate, Load | 2.16 | kg | |
| Viscosity number | 95 | $cm^3$/g | ISO 307, 1628 |
| Moulding shrinkage, parallel | 0.5 | % | ISO 294-4, 2577 |
| Moulding shrinkage, normal | 1.1 | % | ISO 294-4, 2577 |
| Flow length | 430 | mm | |
| Flow length - pressure | 80 | MPa | |
| Flow length - width/thickness | 2 | mm | |

## Typical mechanical properties

| | | | |
|---|---|---|---|
| Tensile modulus | 5200 | MPa | ISO 527-1/-2 |
| Tensile stress at break, 5mm/min | 95 | MPa | ISO 527-1/-2 |
| Tensile strain at break, 5mm/min | 3.3 | % | ISO 527-1/-2 |
| Flexural modulus | 4700 | MPa | ISO 178 |
| Flexural strength | 150 | MPa | ISO 178 |
| Tensile creep modulus, 1h | 5000 | MPa | ISO 899-1 |
| Tensile creep modulus, 1000h | 4200 | MPa | ISO 899-1 |
| Charpy impact strength, 23°C | 60 | $kJ/m^2$ | ISO 179/1eU |
| Charpy impact strength, -30°C | 30 | $kJ/m^2$ | ISO 179/1eU |
| Charpy notched impact strength, 23°C | 10 | $kJ/m^2$ | ISO 179/1eA |
| Charpy notched impact strength, -30°C | 7 | $kJ/m^2$ | ISO 179/1eA |
| Izod notched impact strength, 23°C | 10 | $kJ/m^2$ | ISO 180/1A |

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| | | | |
|---|---|---|---|
| Izod notched impact strength, -30 °C | 10.0 | kJ/m² | ISO 180/1A |
| Izod notched impact strength, -40 °C | 6.0 | kJ/m² | ISO 180/1A |
| Izod impact strength, 23 °C | 45 | kJ/m² | ISO 180/1U |
| Izod impact strength, -30 °C | 40 | kJ/m² | ISO 180/1U |
| Izod impact strength, -40 °C | 30 | kJ/m² | ISO 180/1U |
| Hardness, Rockwell, R-scale | 115 | | ISO 2039-2 |
| Poisson's ratio | 0.35 | | |

## Thermal properties

| | | | |
|---|---|---|---|
| Melting temperature, 10 °C/min | 225 | °C | ISO 11357-1/-3 |
| Glass transition temperature, 10 °C/min | 60 | °C | ISO 11357-1/-3 |
| Temperature of deflection under load, 1.8 MPa | 200 | °C | ISO 75-1/-2 |
| Temperature of deflection under load, 0.45 MPa | 220 | °C | ISO 75-1/-2 |
| Coefficient of linear thermal expansion (CLTE), parallel | 41 | E-6/K | ISO 11359-1/-2 |
| Coefficient of linear thermal expansion (CLTE), normal | 110 | E-6/K | ISO 11359-1/-2 |
| Thermal conductivity of melt | 0.26 | W/(m K) | ISO 22007-2 |
| Specific heat capacity of melt | 1860 | J/(kg K) | ISO 22007-4 |

## Flammability

| | | | |
|---|---|---|---|
| Burning Behav. at 1.5mm nom. thickn. | HB | class | IEC 60695-11-10 |
| Thickness tested | 1.5 | mm | IEC 60695-11-10 |
| Oxygen index | 20 | % | ISO 4589-1/-2 |
| Glow Wire Flammability Index, 3.0mm | 700 | °C | IEC 60695-2-12 |
| Glow Wire Ignition Temperature, 3.0mm | 775 | °C | IEC 60695-2-13 |
| FMVSS Class | B | | ISO 3795 (FMVSS 302) |
| Burning rate, Thickness 1 mm | <80 | mm/min | ISO 3795 (FMVSS 302) |

## Electrical properties

| | | | |
|---|---|---|---|
| Relative permittivity, 100Hz | 3.8 | | IEC 62631-2-1 |
| Relative permittivity, 1MHz | 3.6 | | IEC 62631-2-1 |
| Dissipation factor, 100Hz | 100 | E-4 | IEC 62631-2-1 |
| Dissipation factor, 1MHz | 100 | E-4 | IEC 62631-2-1 |
| Volume resistivity | >1E13 | Ohm.m | IEC 62631-3-1 |
| Surface resistivity | 1E13 | Ohm | IEC 62631-3-2 |
| Electric strength | 42 | kV/mm | IEC 60243-1 |
| Comparative tracking index | 350 | | IEC 60112 |

## Physical/Other properties

| | | | |
|---|---|---|---|
| Humidity absorption, 2mm | 0.15 | % | Sim. to ISO 62 |
| Water absorption, 2mm | 0.4 | % | Sim. to ISO 62 |
| Density | 1370 | kg/m³ | ISO 1183 |
| Density of melt | 1140 | kg/m³ | |

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## 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 | 60 | °C |
| Max. mould temperature | 130 | °C |
| Hold pressure range | ≥60 | MPa |
| Hold pressure time | 3 | s/mm |
| Back pressure | As low as possible | MPa |
| Ejection temperature | 172 | °C |

## Characteristics

| | |
|---|---|
| Processing | Injection Moulding |
| Delivery form | Pellets |
| Additives | Release agent |
| Special characteristics | Hydrolysis resistant |

## Additional information

**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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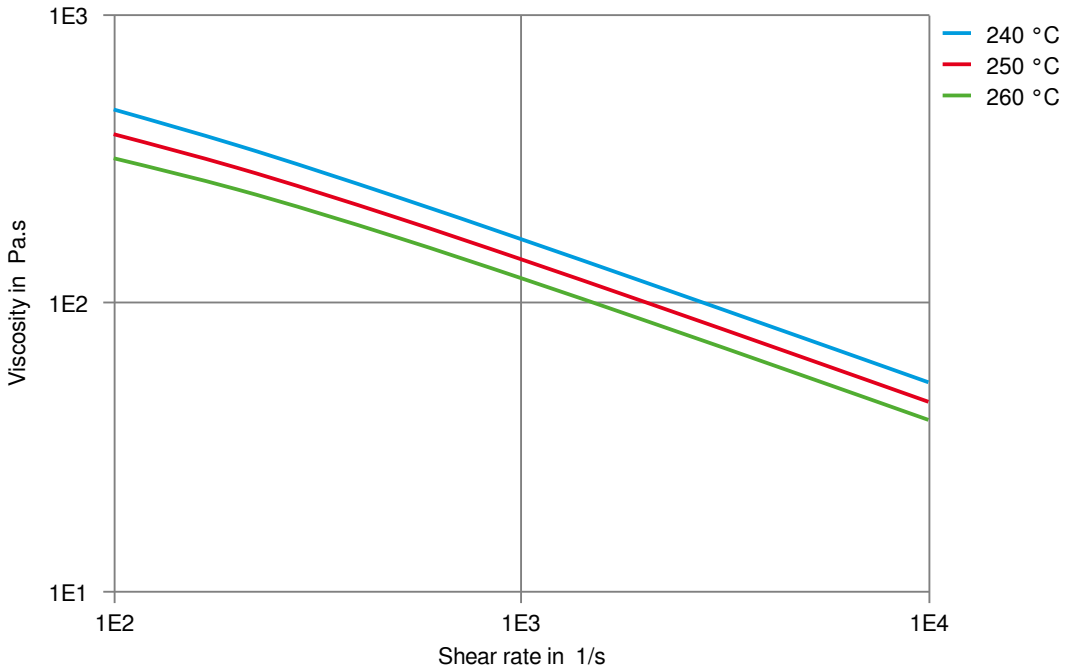
## Viscosity-shear rate



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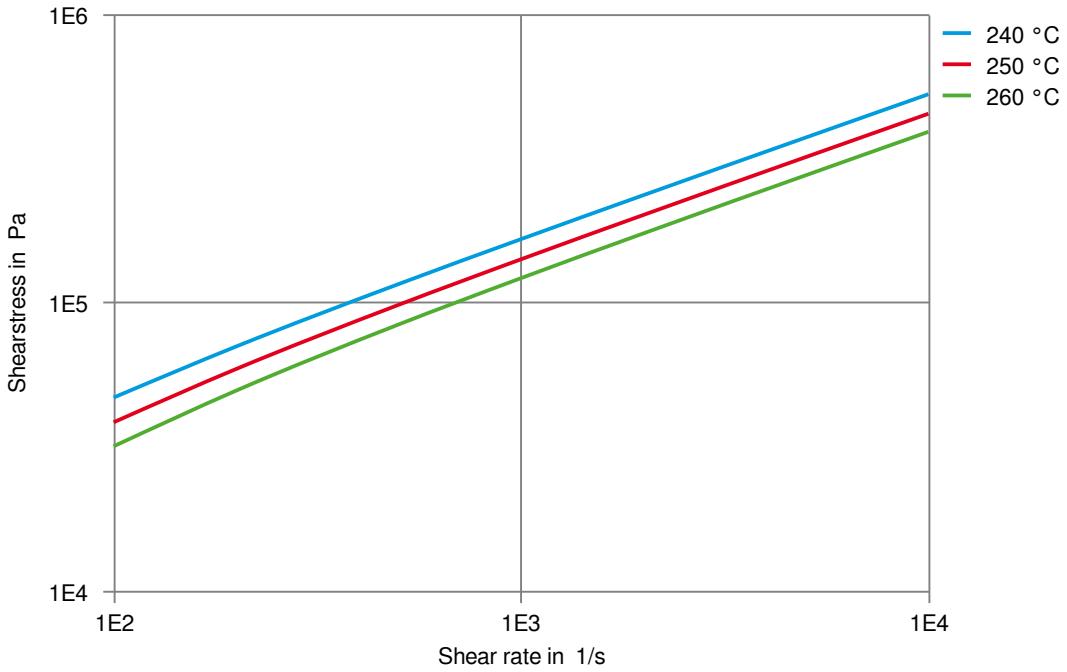
## Shearstress-shear rate



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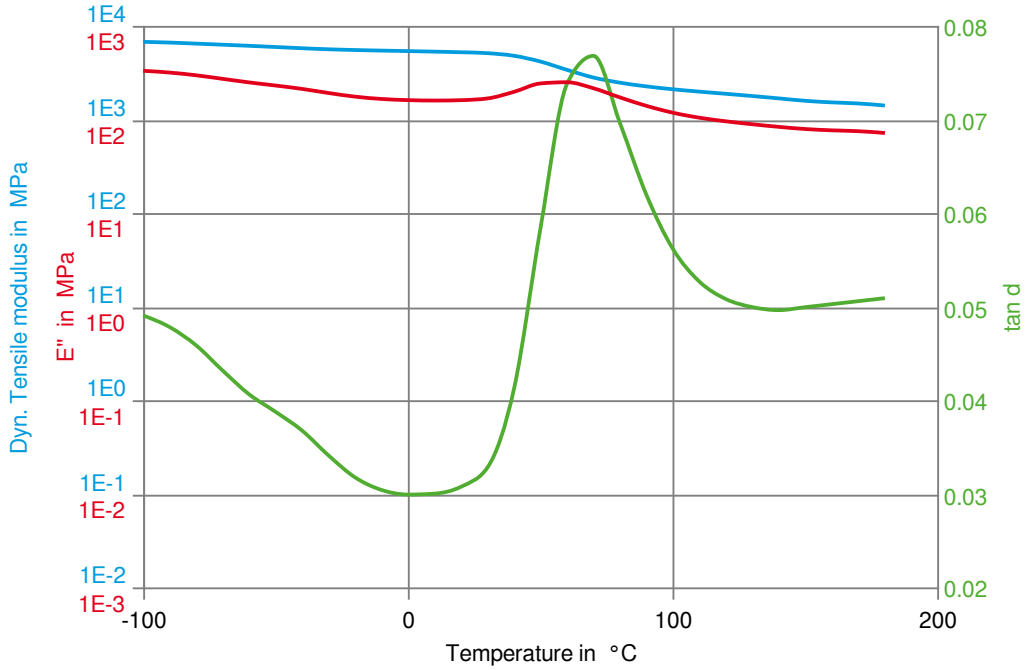
## Dynamic Tensile modulus-temperature



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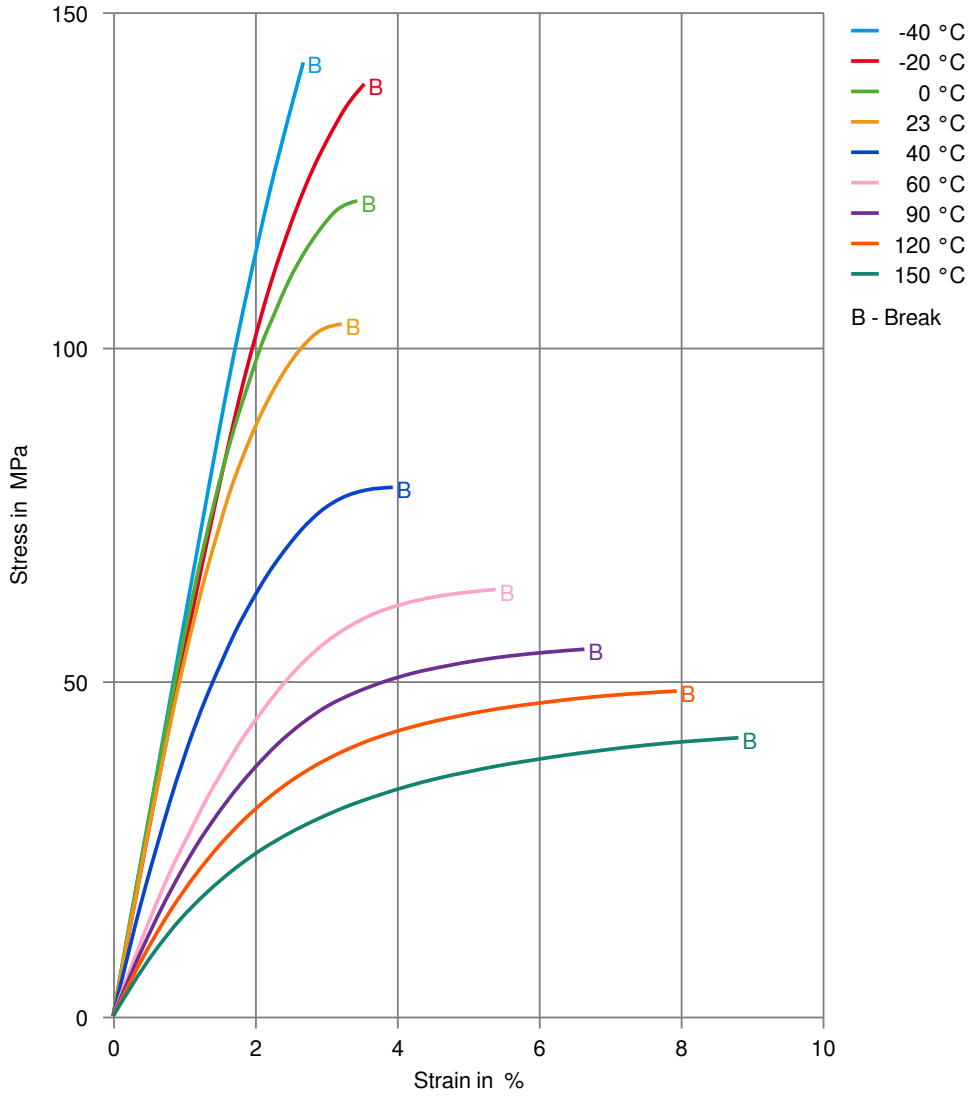
## Stress-strain



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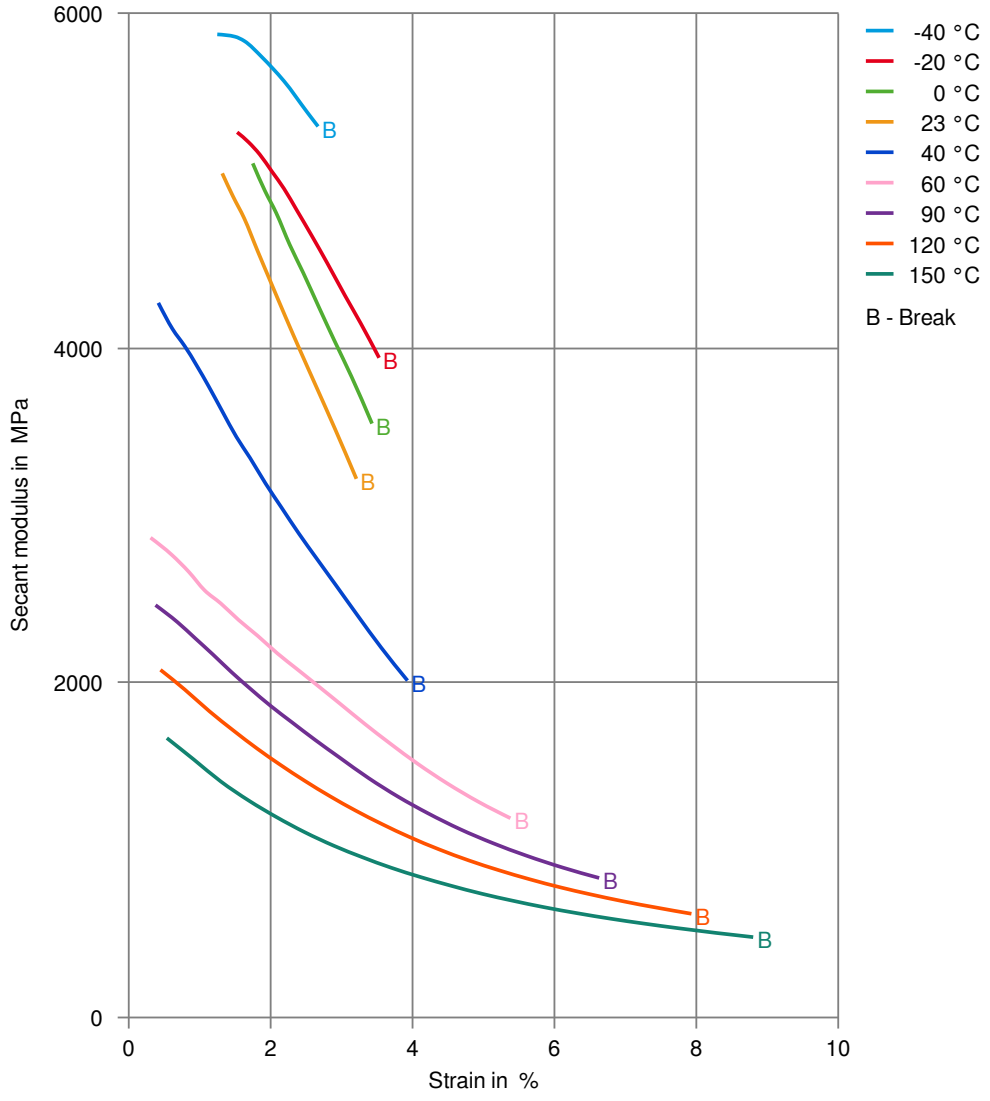
## Secant modulus-strain



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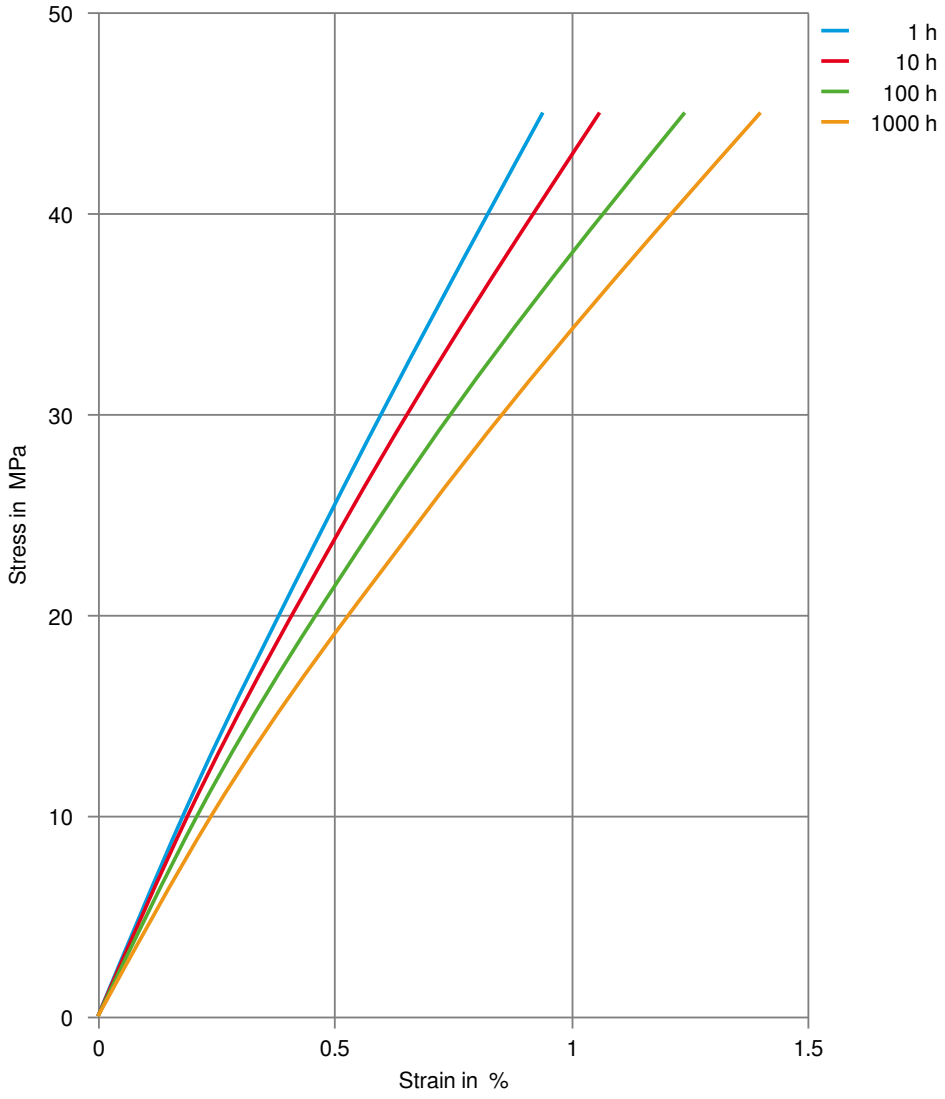
## Stress-strain (isochronous) 23 °C



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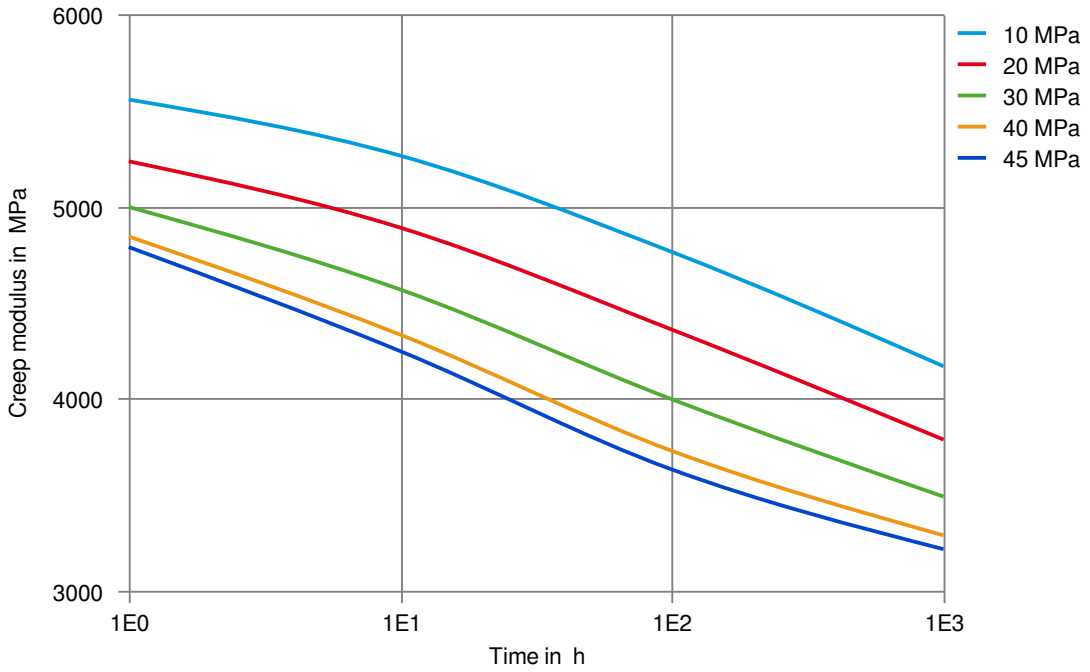
## Creep modulus-time 23 °C



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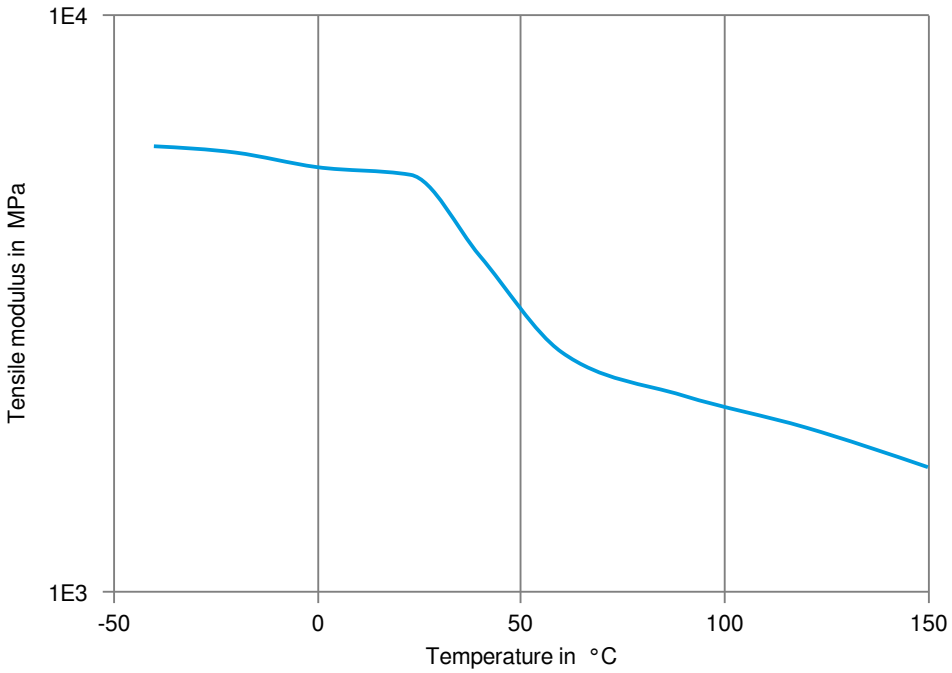
## Tensile modulus-temperature



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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).



Revised: 2025-04-22 Source: Celanese Materials Database