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# CELANEX® 2302 GV1/15

## CELANEX® PBT

Chemical abbreviation according to ISO 1043-1: PBT Moulding compound ISO 7792- PBT+PET, MGHR, 08-060N, GF15; Polybutylene terephthalate polymer blend with PET, 15 % glass fibre reinforced, injection molded parts with superior gloss. Flammability UL 94 HB minimum thickness 0.85 mm. Recognition by Underwriters Laboratories, USA (UL)

## Product information

| | | |
|---|---|---|
| Resin Identification | (PBT+PET)-GF15 | ISO 1043 |
| Part Marking Code | >(PBT+PET)-GF15< | ISO 11469 |

## Rheological properties

| | | | |
|---|---|---|---|
| Melt volume-flow rate | 20 | $cm^3$/10min | ISO 1133 |
| Temperature | 265 | °C | |
| Load | 2.16 | kg | |
| Viscosity number | 105 | $cm^3$/g | ISO 307, 1628 |
| Moulding shrinkage range, parallel | 0.4 - 0.6 | % | ISO 294-4, 2577 |
| Moulding shrinkage range, normal | 0.8 - 1 | % | ISO 294-4, 2577 |

## Typical mechanical properties

| | | | |
|---|---|---|---|
| Tensile modulus | 6200 | MPa | ISO 527-1/-2 |
| Tensile stress at break, 5mm/min | 115 | MPa | ISO 527-1/-2 |
| Tensile strain at break, 5mm/min | 3.5 | % | ISO 527-1/-2 |
| Flexural strength | 160 | MPa | ISO 178 |
| Flexural strain at failure | 3 | % | ISO 178 |
| Tensile creep modulus, 1h | 5300 | MPa | ISO 899-1 |
| Tensile creep modulus, 1000h | 4300 | MPa | ISO 899-1 |
| Charpy impact strength, 23°C | 35 | $kJ/m^2$ | ISO 179/1eU |
| Charpy impact strength, -30°C | 35 | $kJ/m^2$ | ISO 179/1eU |
| Charpy notched impact strength, 23°C | 6.5 | $kJ/m^2$ | ISO 179/1eA |
| Charpy notched impact strength, -30°C | 6.5 | $kJ/m^2$ | ISO 179/1eA |
| Ball indentation hardness, H 961/30 | 190 | MPa | ISO 2039-1 |
| Poisson's ratio | 0.35[C] | | |

[C]: Calculated

## Thermal properties

| | | | |
|---|---|---|---|
| Melting temperature, 10°C/min | 255 | °C | ISO 11357-1/-3 |
| Temperature of deflection under load, 1.8 MPa | 190 | °C | ISO 75-1/-2 |
| Temperature of deflection under load, 8 MPa | 65 | °C | ISO 75-1/-2 |
| Vicat softening temperature, 50°C/h 50N | 210 | °C | ISO 306 |
| Coefficient of linear thermal expansion (CLTE), parallel | 35 | E-6/K | ISO 11359-1/-2 |
| Thermal conductivity of melt | 0.15 | W/(m K) | ISO 22007-2 |
| Specific heat capacity of melt | 1820 | J/(kg K) | ISO 22007-4 |

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## Flammability

| | | | |
|---|---|---|---|
| Burning Behav. at 1.5mm nom. thickn. | HB | class | IEC 60695-11-10 |
| Thickness tested | 1.4 | mm | IEC 60695-11-10 |
| Burning Behav. at thickness h | HB | class | IEC 60695-11-10 |
| Thickness tested | 0.85 | mm | IEC 60695-11-10 |
| UL recognition | yes | | UL 94 |
| Oxygen index | 19 | % | ISO 4589-1/-2 |

## Electrical properties

| | | | |
|---|---|---|---|
| Relative permittivity, 100Hz | 4.1 | | IEC 62631-2-1 |
| Relative permittivity, 1MHz | 4 | | IEC 62631-2-1 |
| Dissipation factor, 100Hz | 12 | 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 | >1E15 | Ohm | IEC 62631-3-2 |
| Electric strength | 28 | kV/mm | IEC 60243-1 |
| Comparative tracking index | 250 | | IEC 60112 |

## Physical/Other properties

| | | | |
|---|---|---|---|
| Humidity absorption, 2mm | 0.15 | % | Sim. to ISO 62 |
| Water absorption, 2mm | 0.45 | % | Sim. to ISO 62 |
| Density | 1430 | kg/m³ | ISO 1183 |
| Density of melt | 1220 | kg/m³ | |

## Injection

| | | |
|---|---|---|
| Drying Recommended | yes | |
| Drying Temperature | 120 | °C |
| Drying Time, Dehumidified Dryer | 4 | h |
| Processing Moisture Content | ≤0.02 | % |
| Melt Temperature Optimum | 260 | °C |
| Min. melt temperature | 255 | °C |
| Max. melt temperature | 275 | °C |
| Screw tangential speed | 0.1 - 0.3 | m/s |
| Mold Temperature Optimum | 100 | °C |
| Min. mould temperature | 90 | °C |
| Max. mould temperature | 130 | °C |
| Ejection temperature | 218 | °C |

## Characteristics

| | |
|---|---|
| Processing | Injection Moulding |
| Delivery form | Pellets |
| Additives | Release agent |
| Special characteristics | Heat stabilised or stable to heat, High Gloss |

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## Additional information

Injection molding

### Preprocessing

To avoid hydrolytic degradation during processing, CELANEX resins have to be dried to a moisture level equal to or less than 0,02%. The drying should be done in a dry-air dryer (dew point < -30°C) with a temperature of 120 to 140 °C and a drying time of 2 to 4 hours. In case of longer residence times in the dry-air dryer, the temperature should be reduced to 100°C.
The time between drying and processing should be kept as short as possible. The processing machine feed hopper should be closed during the processing operation.

### Processing

Melt Temperature 265-275 °C
Mold Temperature *) 90-100 °C
Maximum Barrel Residence Time **) 5-10 min
Injection Speed fast
Peripheral screw speed max.0,3 m/sec
Back Pressure 10-30 bar
Injection Pressure 600-1000 bar
Holding Pressure 400-800 bar
Nozzle Design open design preferred

Injection speed, injection pressure and holding pressure have to be optimized to the individual article geometry. To avoid material degradation during processing low back pressure and minimum screw speed have to be used. Overheating of the material has to be avoided.

Celanese recommends only externally heated hot runner systems.

*) For moulded parts with especially high requirements to the surface quality or dimensional stability, a mold temperature of up to 110 °C can be advantageous.

**) If the cylinder temperatures are higher than the recommended maximum temperatures, the max. residence time in the barrel has to be reduced.

Processing Notes

### Pre-Drying

CELANEX should in principle be predried. Because of the necessary low maximum residual moisture content the use of dry air dryers is recommended. The dew point should be =< - 30° C. The time between drying and processing should be as short as possible.

### Storage

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

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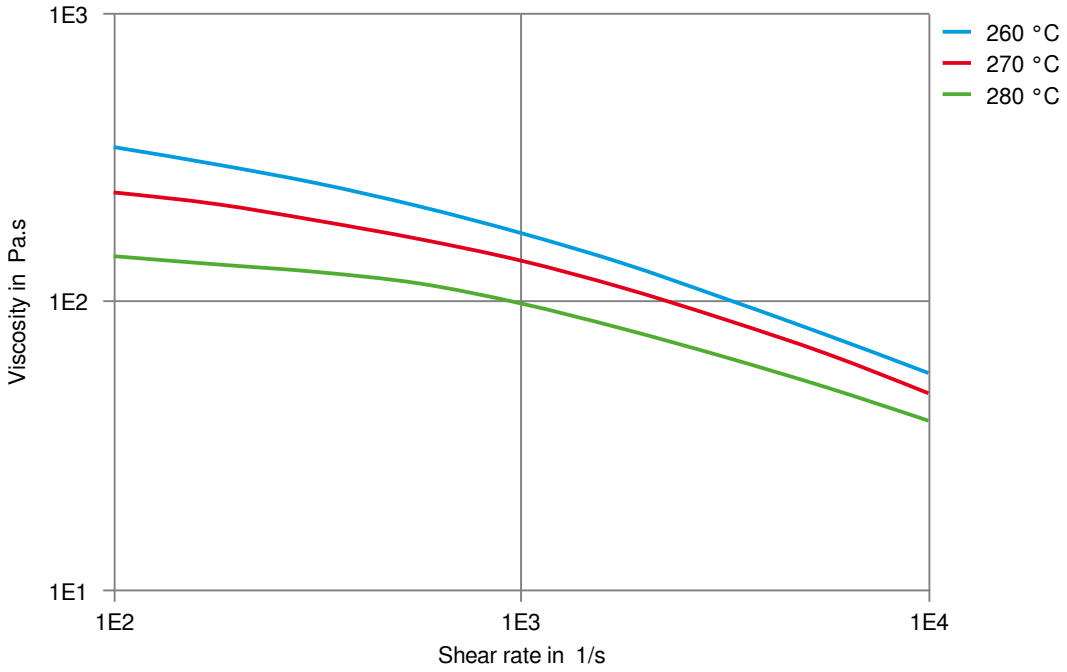
## Automotive

| OEM | STANDARD | ADDITIONAL INFORMATION |
|---|---|---|
| Bosch | N28 BN08-GF009 | Natural |
| Bosch | N28 BN08-GF009 | Black |

## Viscosity-shear rate



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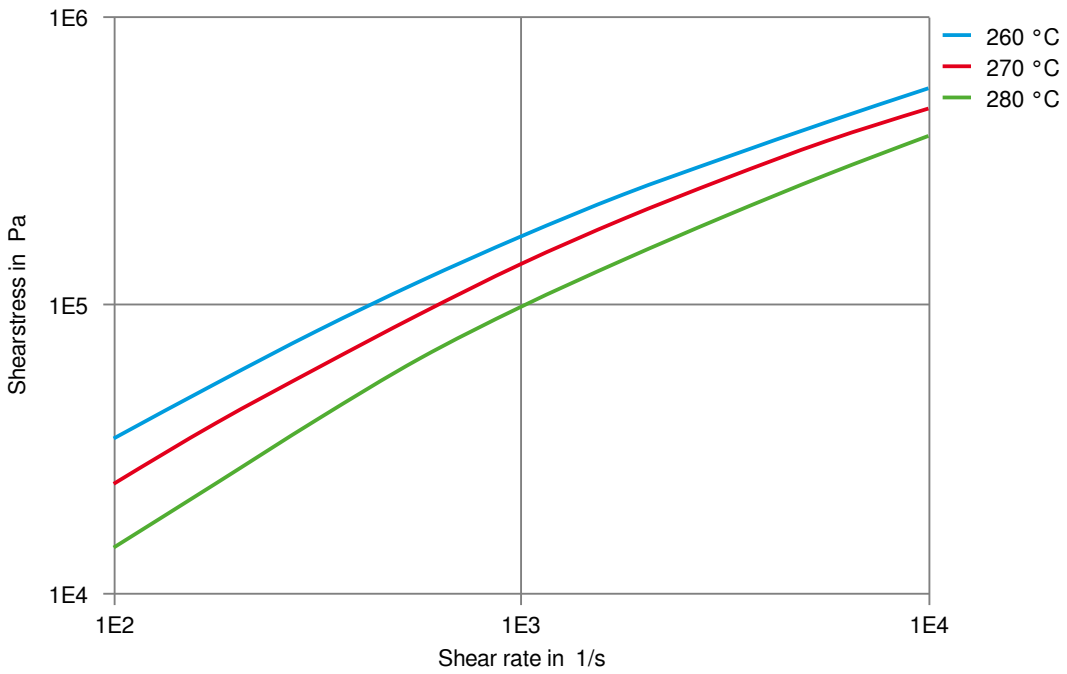
## Shearstress-shear rate



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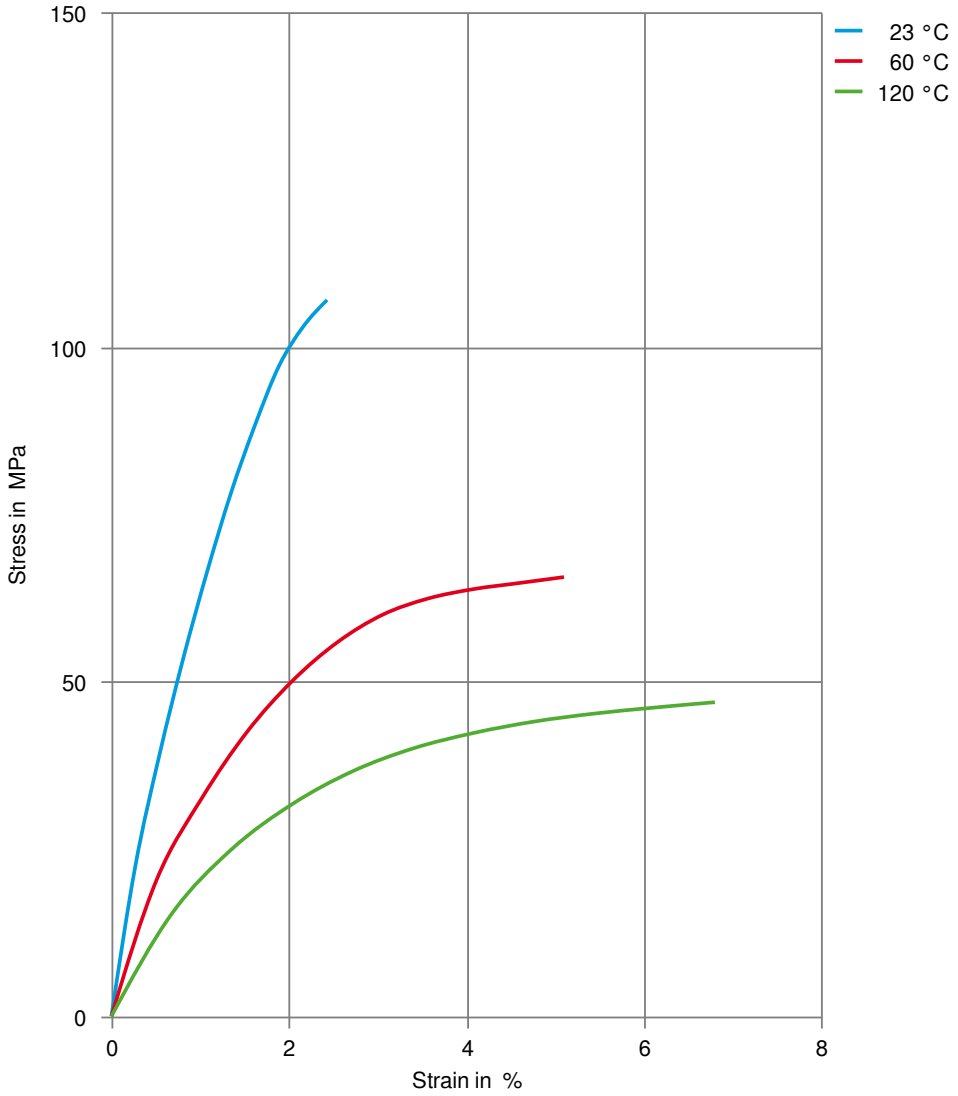
## Stress-strain



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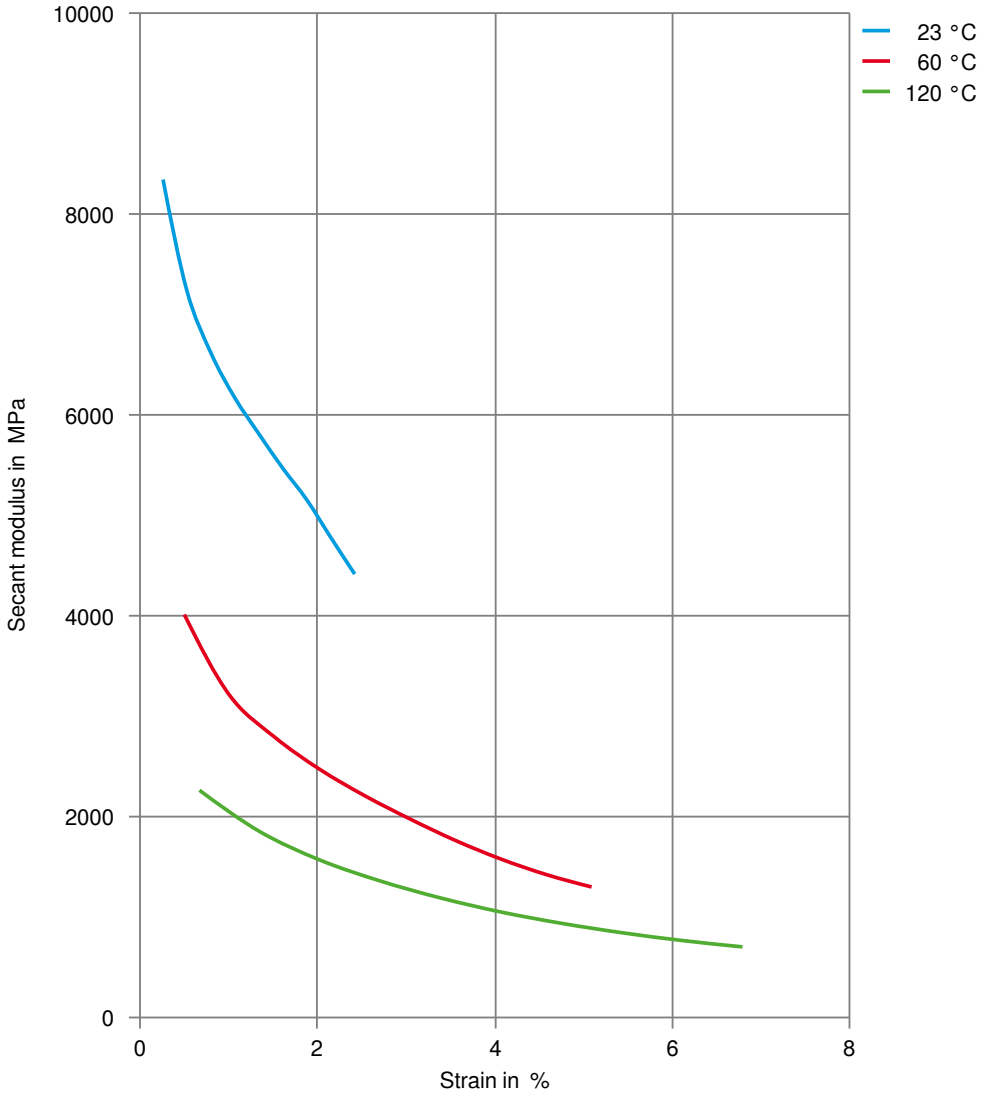
## Secant modulus-strain



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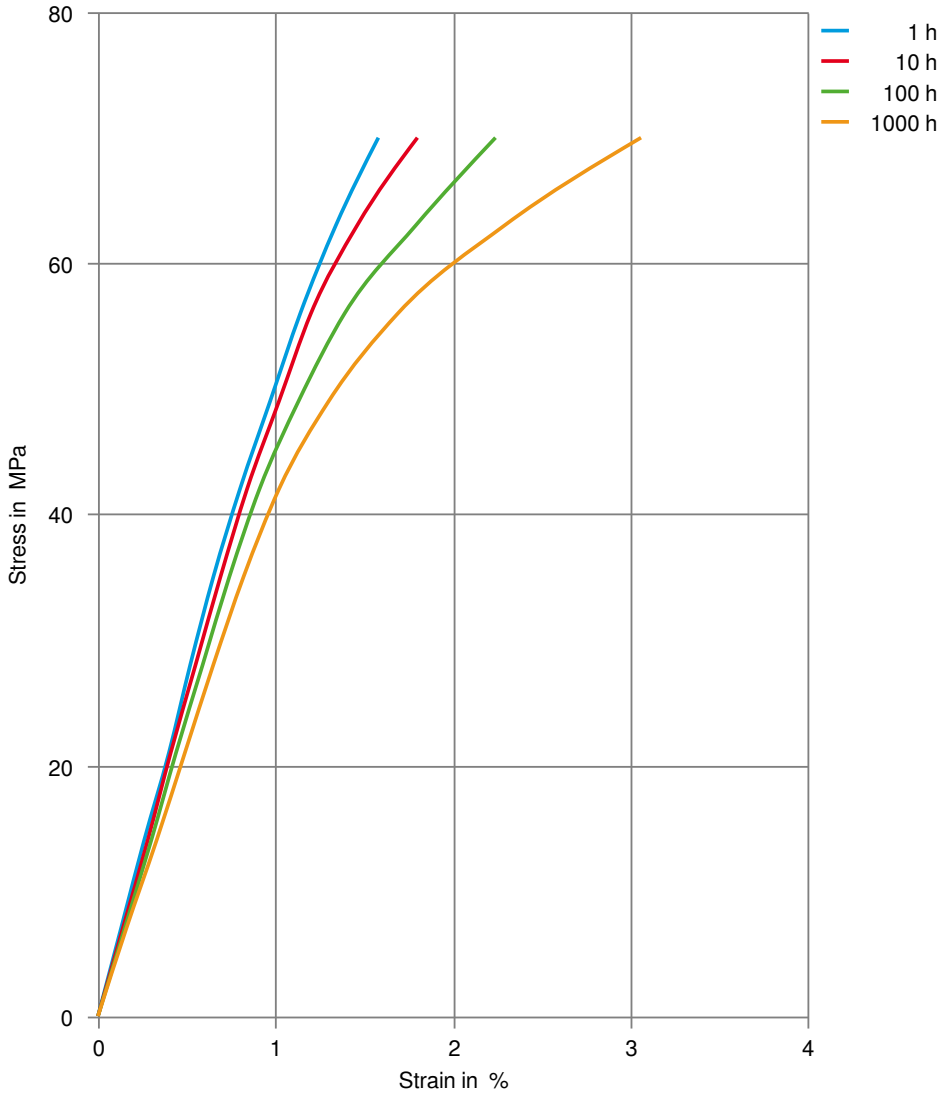
## Stress-strain (isochronous) 23°C



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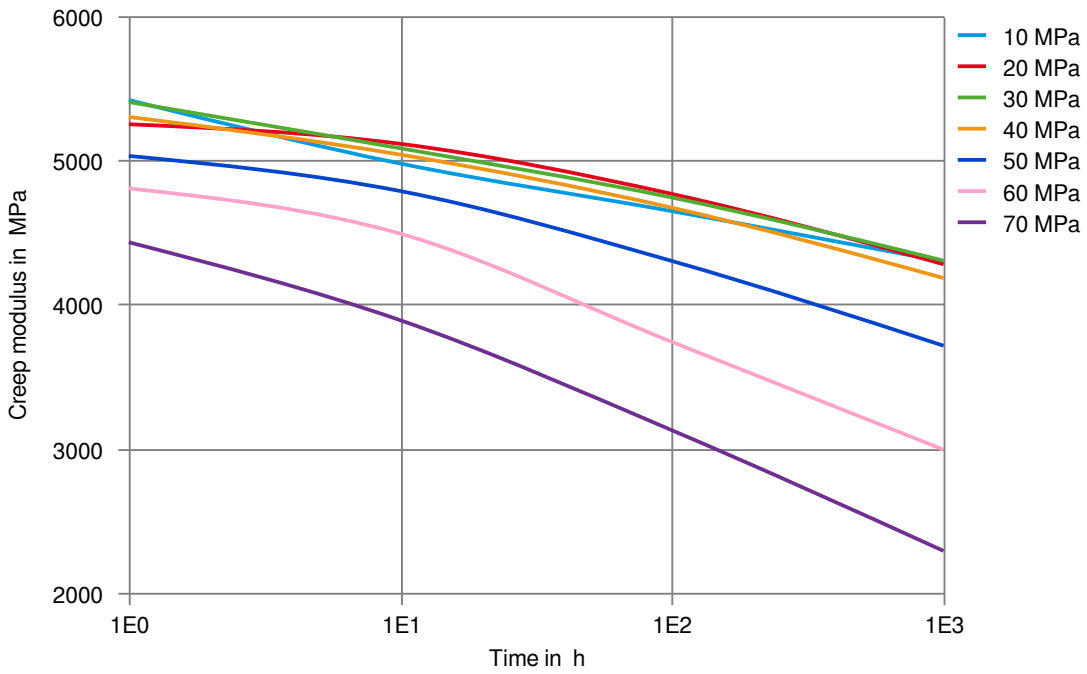
## Creep modulus-time 23 °C



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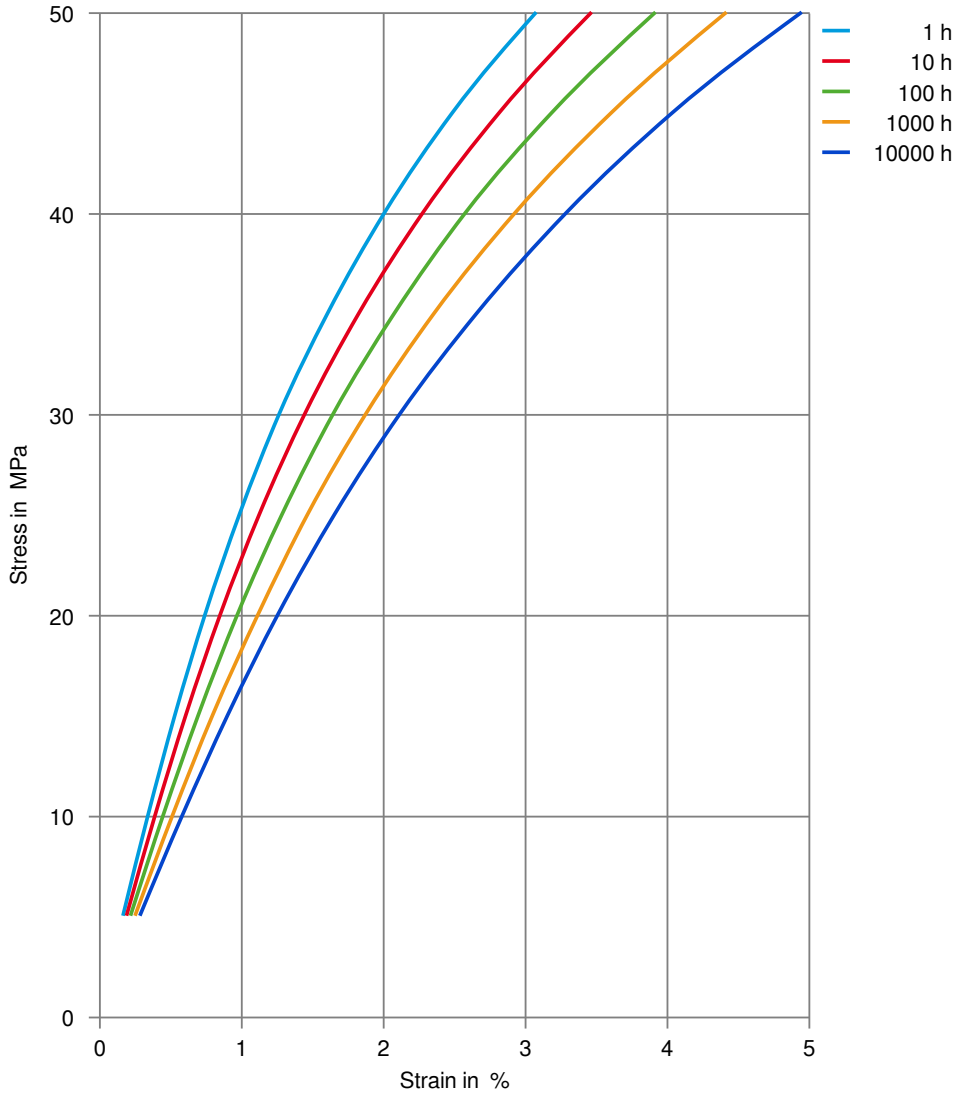
## Stress-strain (isochronous) 60°C



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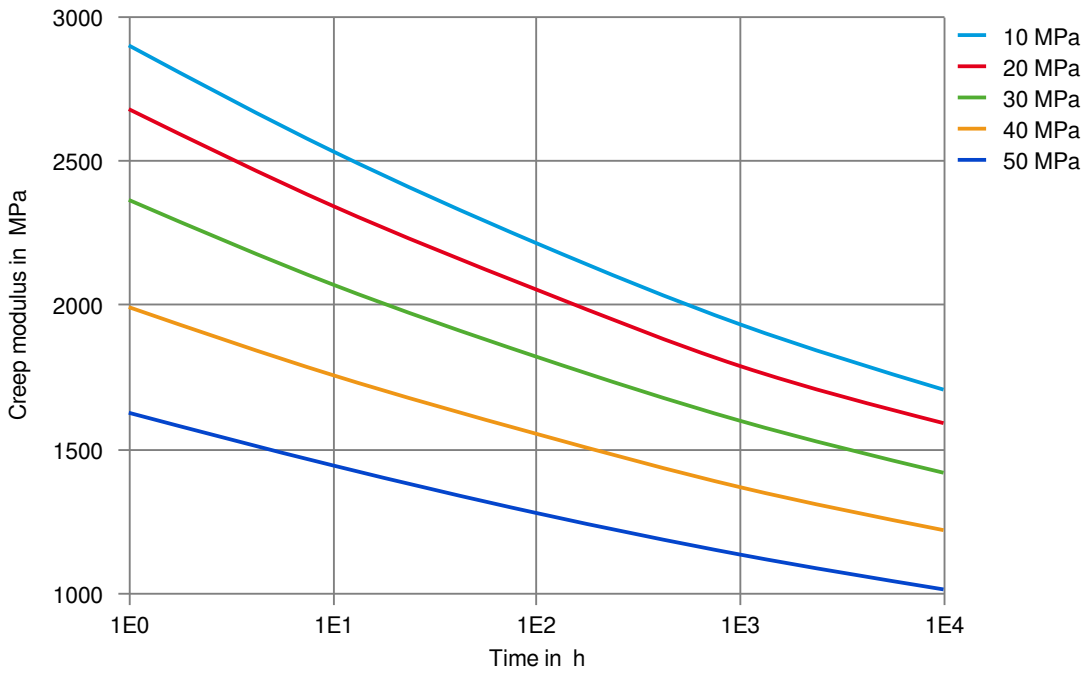
## Creep modulus-time 60 °C