

CELANEX® 2300 GV1/30

general purpose, 30% glass-fiber reinforced grade, lubricated and stabilized

Chemical abbreviation according to ISO 1043-1: PBT Moulding compound ISO 7792- PBT, MGHR, 08-100N, GF30

Polybutylene terephthalate, 30 % glass fibre reinforced.

Flammability UL 94 HB minimum thickness 1.2 mm.

Recognition by Underwriters Laboratories, USA (UL)

Product information

Part Marking Code	> PBT-GF30 <	ISO 11469
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Rheological properties

Melt volume-flow rate	9 cm ³ /10min	ISO 1133
Temperature	250 °C	
Load	2.16 kg	
Viscosity number	112 cm ³ /g	ISO 307, 1157, 1628
Moulding shrinkage range, parallel	0.3 - 0.4 %	ISO 294-4, 2577
Moulding shrinkage range, normal	1.0 - 1.2 %	ISO 294-4, 2577

Typical mechanical properties

Tensile Modulus	10300 MPa	ISO 527-1/-2
Stress at break, 5mm/min	150 MPa	ISO 527-1/-2
Strain at break, 5mm/min	2.5 %	ISO 527-1/-2
Flexural Strength	210 MPa	ISO 178
Tensile creep modulus, 1h	9200 MPa	ISO 899-1
Tensile creep modulus, 1000h	6500 MPa	ISO 899-1
Charpy impact strength, 23 °C	60 kJ/m ²	ISO 179/1eU
Charpy impact strength, -30 °C	60 kJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23 °C	9.5 kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -30 °C	9 kJ/m ²	ISO 179/1eA
Ball indentation hardness, H 358/30	215 MPa	ISO 2039-1

Thermal properties

Melting temperature, 10 °C/min	225 °C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	210 °C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	225 °C	ISO 75-1/-2
Temp. of deflection under load, 8 MPa	150 °C	ISO 75-1/-2
Vicat softening temperature, 50 °C/h 50N	220 °C	ISO 306
Ball pressure test	215 °C	IEC 60695-10-2
Coeff. of linear therm. expansion, parallel	25 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	0.166 W/(m K)	Internal
Spec. heat capacity of melt	1720 J/(kg K)	Internal

CELANEX® 2300 GV1/30

Flammability

Burning Behav. at 1.5mm nom. thickn.	HB class	UL 94
Thickness tested	1,5 mm	UL 94
Burning Behav. at thickness h	HB class	UL 94
Thickness tested	1,00 mm	UL 94
UL recognition	yes	UL 94
Oxygen index	20 %	ISO 4589-1/-2

Electrical properties

Relative permittivity, 100Hz	4,4	IEC 62631-2-1
Relative permittivity, 1MHz	4,3	IEC 62631-2-1
Dissipation factor, 100Hz	20 E-4	IEC 62631-2-1
Dissipation factor, 1MHz	190 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	33 kV/mm	IEC 60243-1
Comparative tracking index, 23 °C	PLC 1 PLC	UL 746A

Physical/Other properties

Humidity absorption, 2mm	0,15 %	Sim. to ISO 62
Water absorption, 2mm	0,4 %	Sim. to ISO 62
Density	1550 kg/m ³	ISO 1183
Density of melt	1320 kg/m ³	Internal

Injection

Drying Temperature	120 - 140 °C	
Drying Time, Dehumidified Dryer	2 - 4 h	
Processing Moisture Content	0,02 %	
Screw tangential speed	0,12 - 0,17 m/s	
Max. mould temperature	75 - 100 °C	
Injection speed	fast	
Ejection temperature	220 °C	Internal

Characteristics

Additives	Release agent
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Additional information

Injection molding	Melt Temperature 260-270 °C
	Mold Temperature *) 75-85 °C
	Maximum Barrel Residence Time **) 5-10 min
	Injection Speed fast
	Peripheral screw speed max. 0,3 m/sec
	Back Pressure 10-30 bar

CELANEX® 2300 GV1/30

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. For grades containing flame retardants, a maximum temperature of 265 °C should not be exceeded. Up to 25% clean and dry regrind may be used.

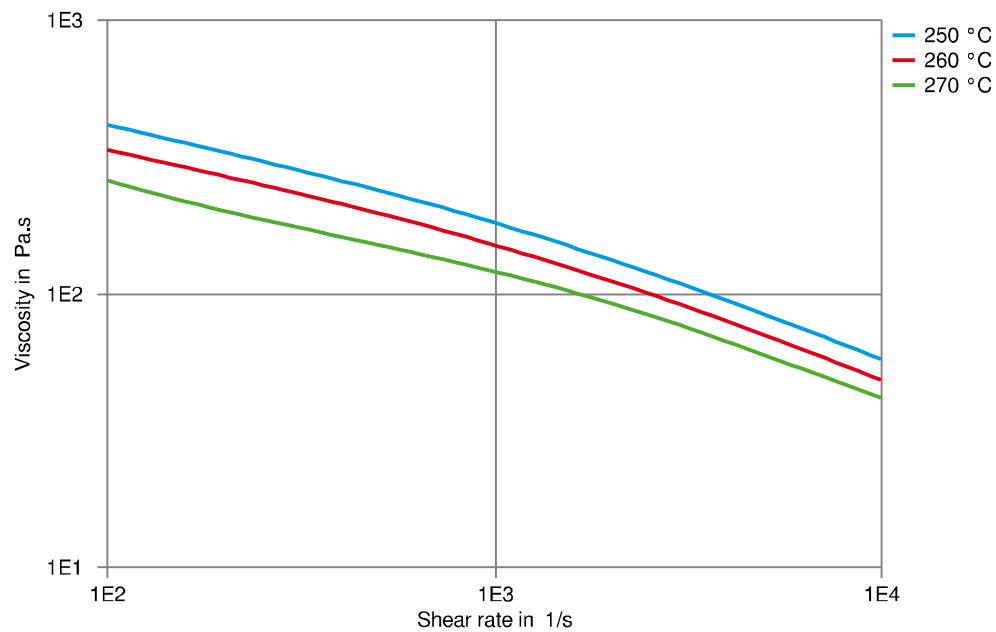
Celanese recommends only externally heated hot runner systems.

*) 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.

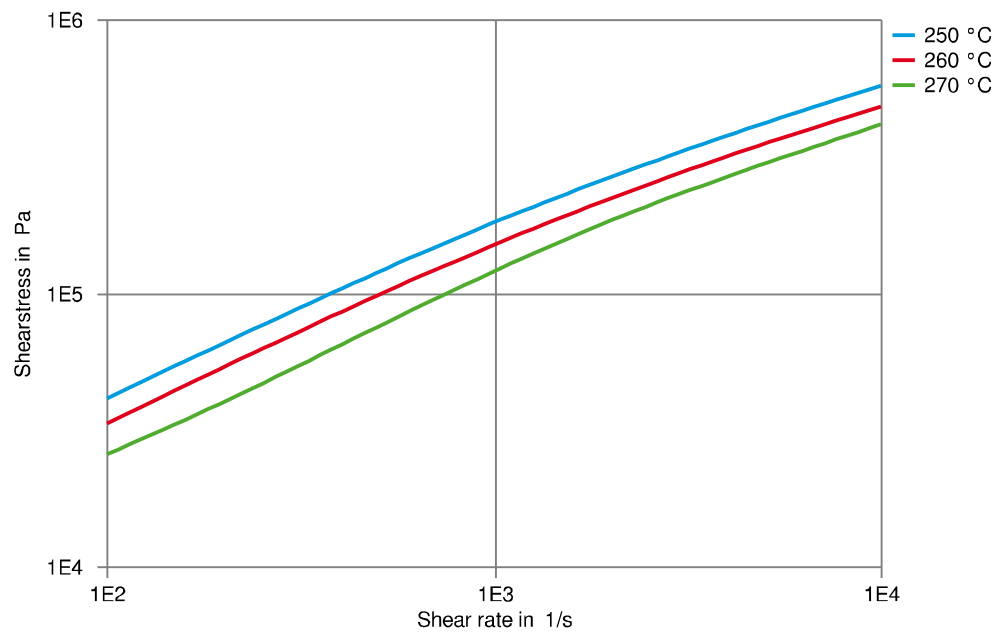
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Viscosity-shear rate



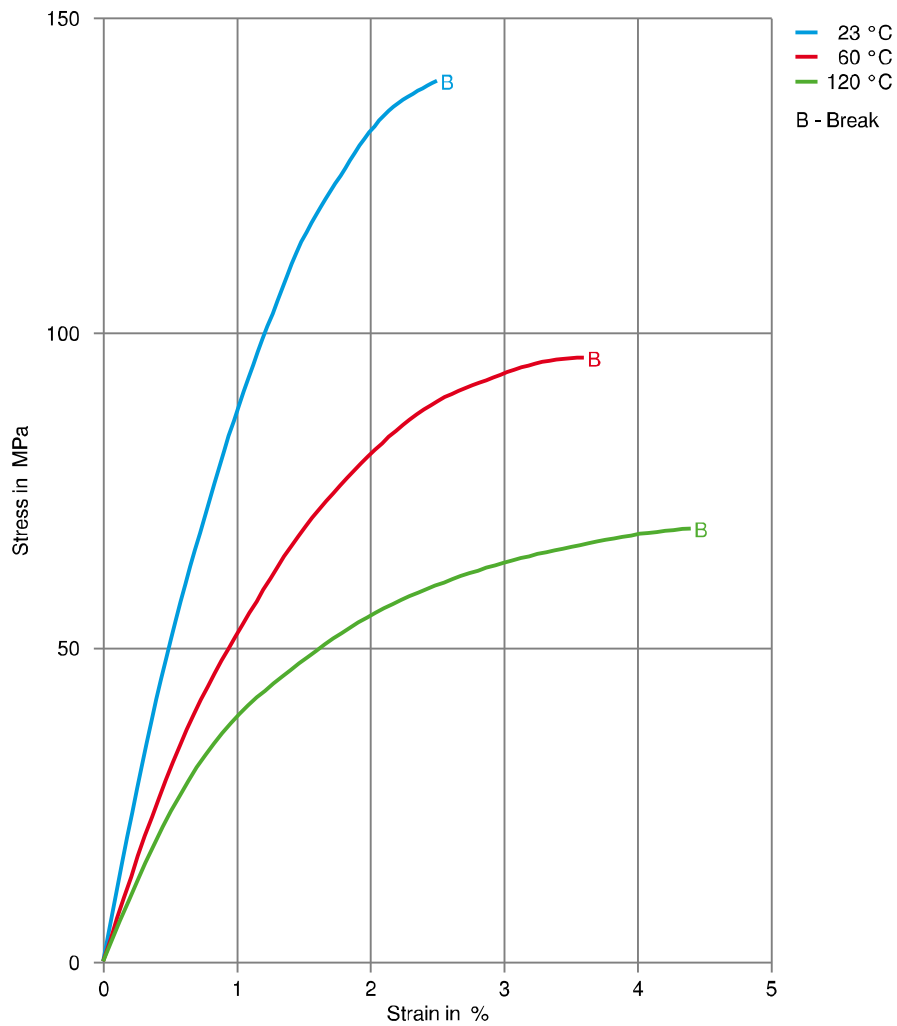
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Shearstress-shear rate



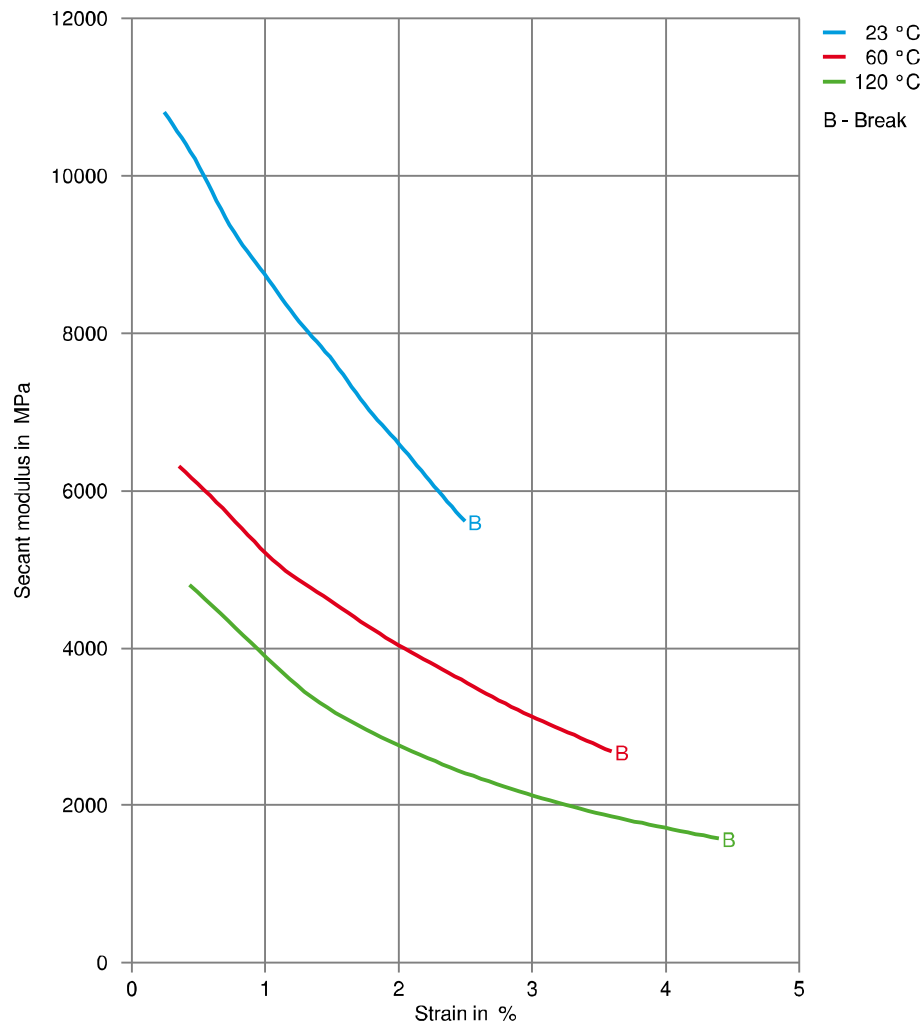
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Stress-strain



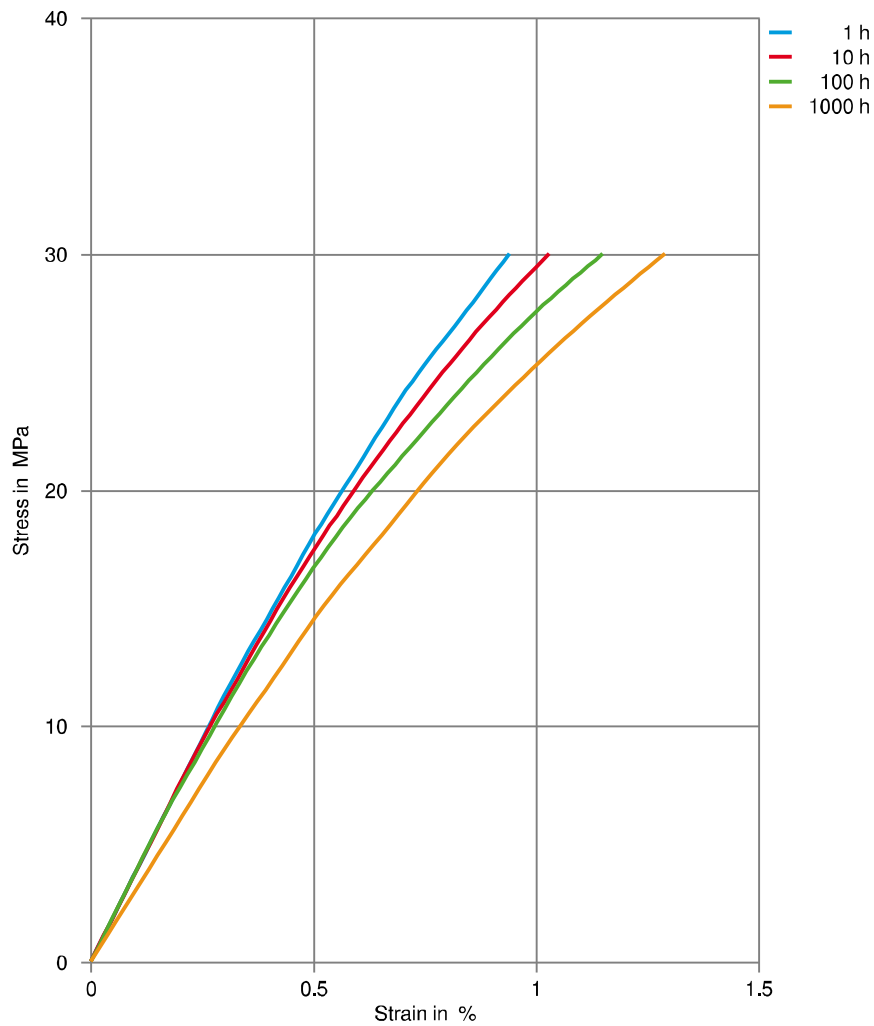
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Secant modulus-strain



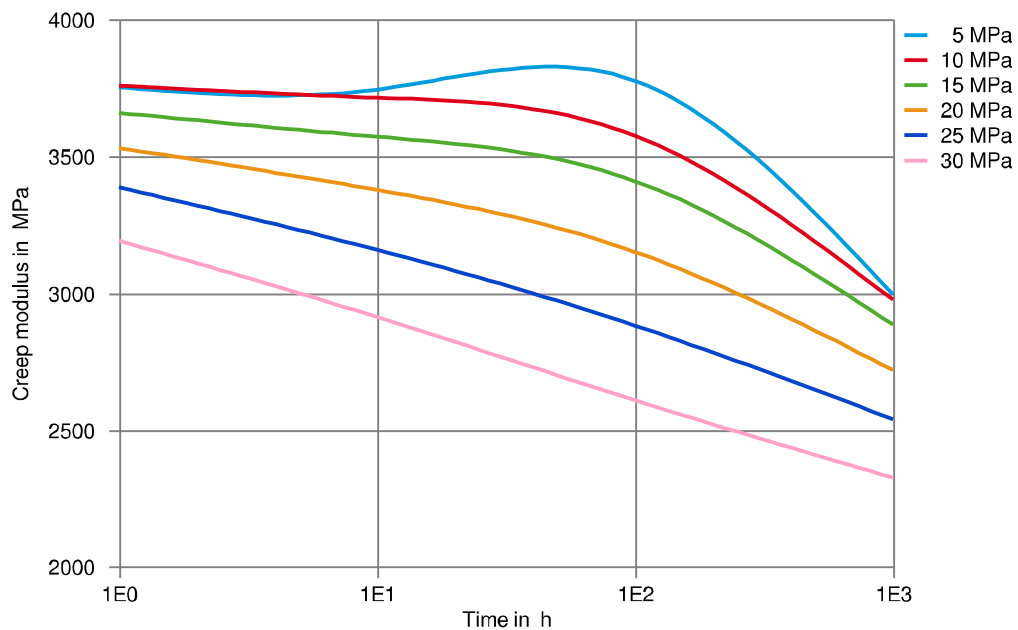
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Stress-strain (isochronous) 100°C



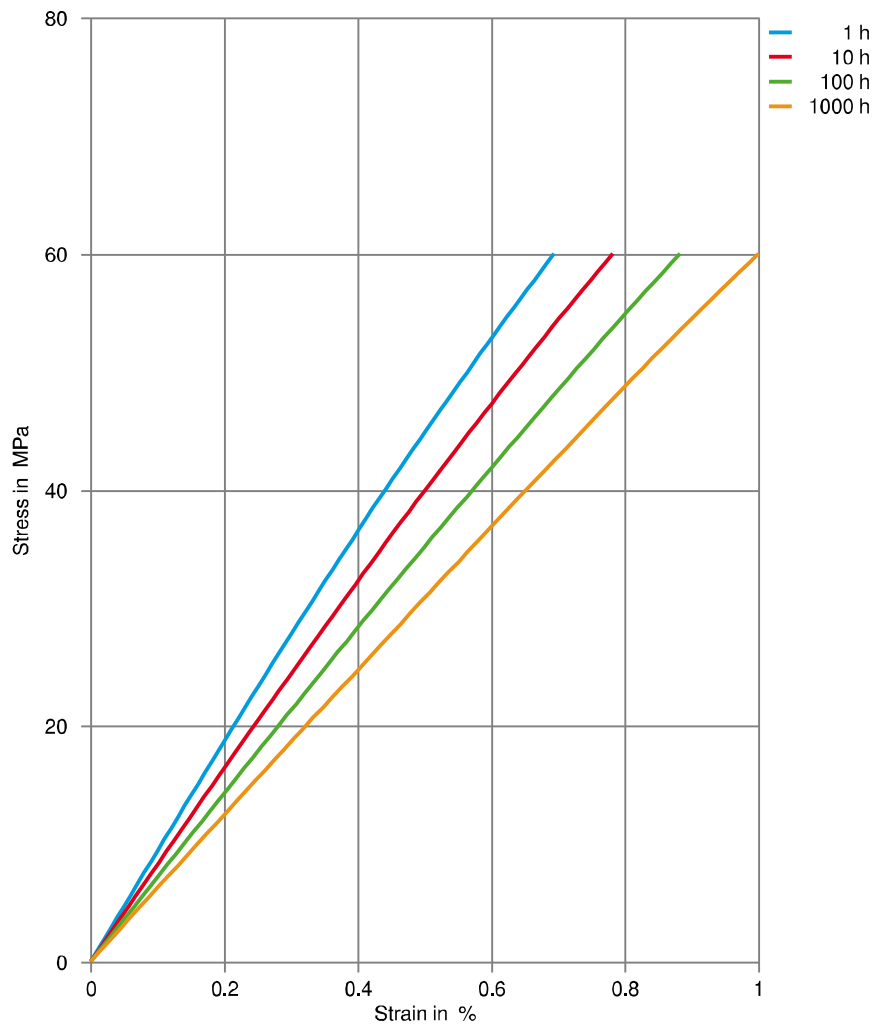
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Creep modulus-time 100°C



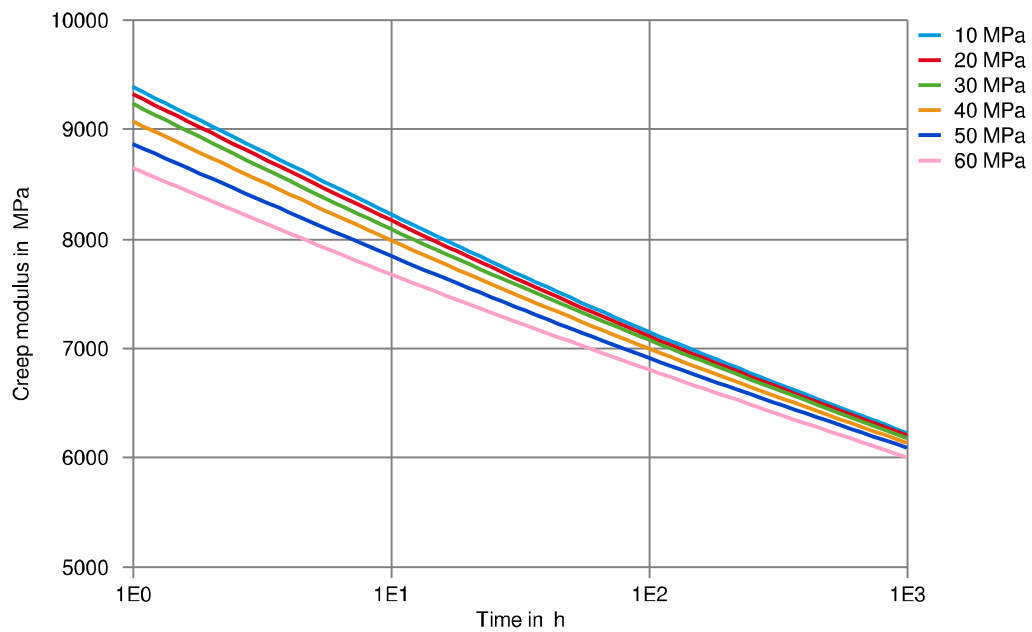
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Stress-strain (isochronous) 23°C



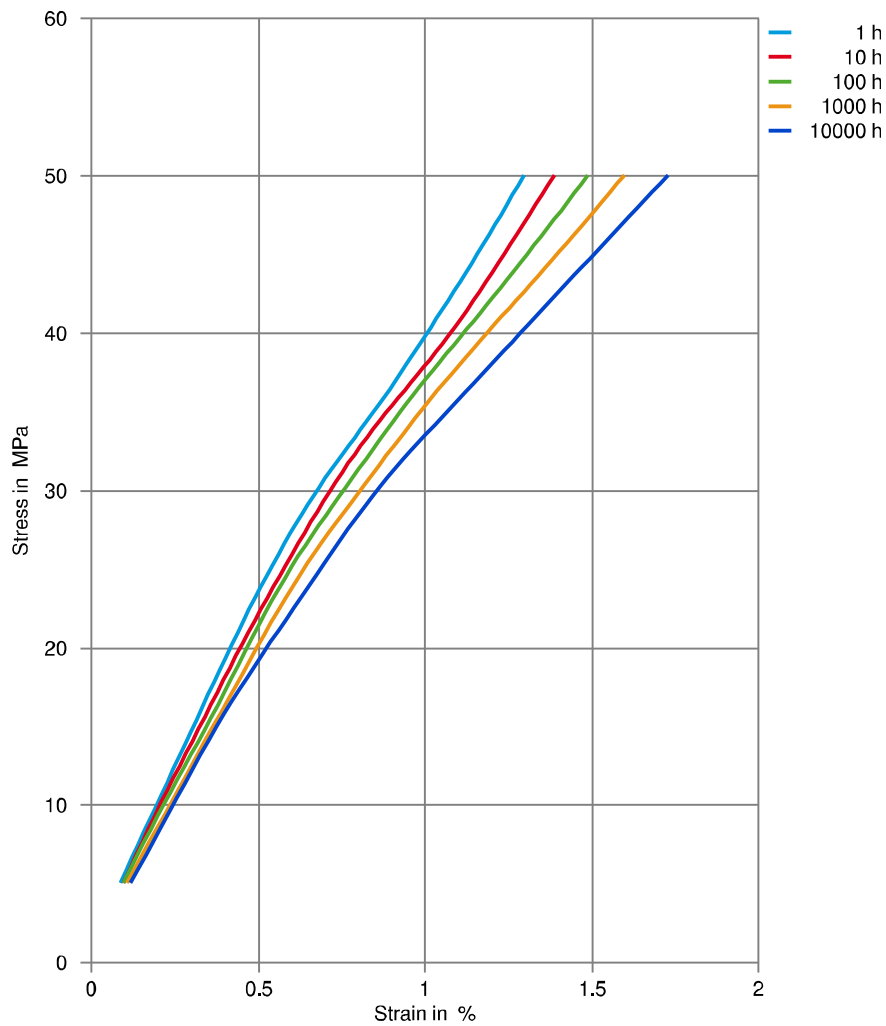
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Creep modulus-time 23 °C



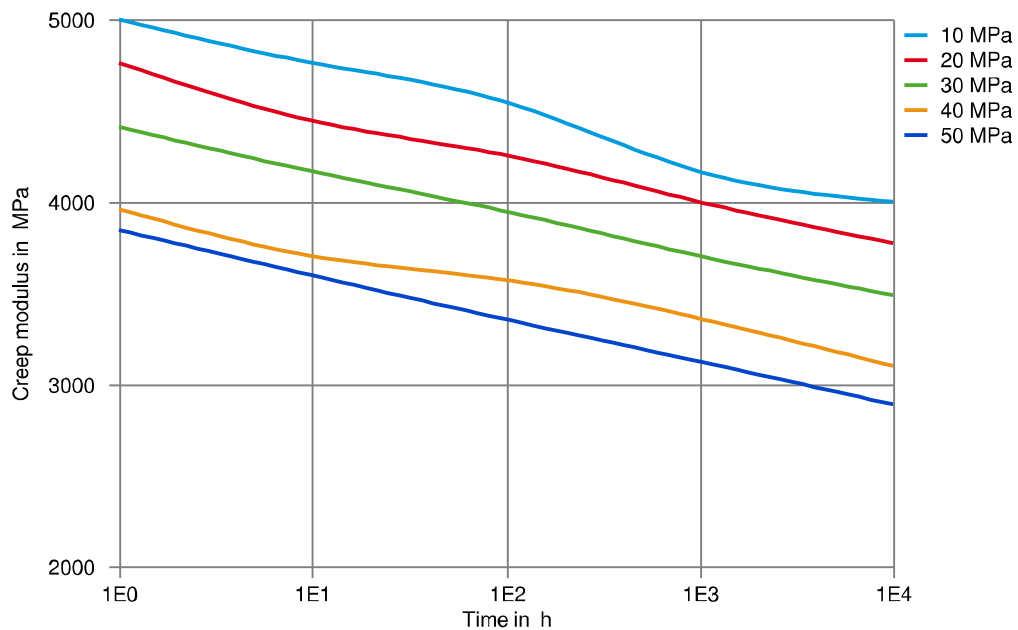
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Stress-strain (isochronous) 60°C



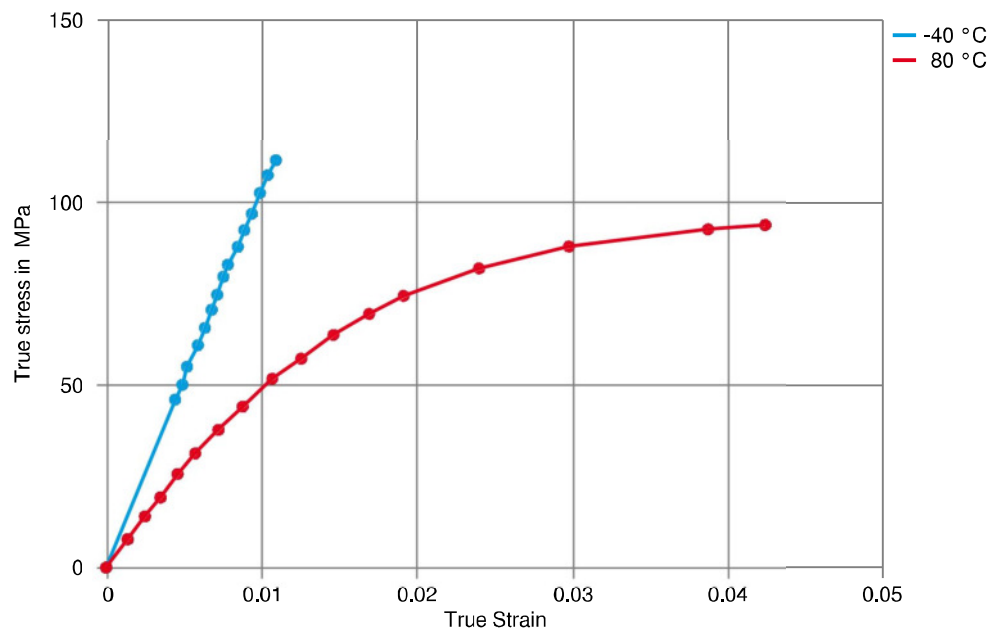
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Creep modulus-time 60 °C



CELANEX® 2300 GV1/30

True stress-strain



CELANEX® 2300 GV1/30

Processing Texts

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 $\leq -30^{\circ}\text{C}$. The time between drying and processing should be as short as possible.

Longer pre-drying times/storage

For subsequent storage of the material in the dryer until processed ($\leq 60\text{ h}$) it is necessary to lower the temperature to 100°C .

Injection molding

Melt Temperature $260\text{--}270^{\circ}\text{C}$
 Mold Temperature *) $75\text{--}85^{\circ}\text{C}$
 Maximum Barrel Residence Time **) $5\text{--}10\text{ min}$
 Injection Speed fast
 Peripheral screw speed max. $0,3\text{ m/sec}$
 Back Pressure $10\text{--}30\text{ bar}$
 Injection Pressure $600\text{--}1000\text{ bar}$
 Holding Pressure $400\text{--}800\text{ bar}$
 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. For grades containing flame retardants, a maximum temperature of 265°C should not be exceeded. Up to 25% clean and dry regrind may be used.

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.

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 $< -30^{\circ}\text{C}$) with a temperature of $120\text{ to }140^{\circ}\text{C}$ 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.

CELANEX® 2300 GV1/30

Other Approvals

Other Approvals

OEM	Specification	Additional Information
Bosch	N28 BN07-GF032	Natural & Black
Continental	TST N 055 47.12	(TST N 055 47.12-000)
Nissan	PBTP(G)-1X-30	
Renault		No spec listed
Toyota	TSM5604G-1A	
Toyota	TSM5604G-1B	
VW Group	VW50136	

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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