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CELANEX® 2300 GV1/20 ECO-B

general purpose, 20% glass-fiber reinforced grade, lubricated and stabilized, with partially bio-based PBT
Chemical abbreviation according to ISO 1043-1: PBT Moulding compound ISO 7792- PBT, MGHR, 08-070N, GF20
Polybutylene terephthalate, 20 % glass fibre reinforced. Flammability UL 94 HB minimum thickness 1.2 mm. Recognition by Underwriters Laboratories, USA (UL)

- Celanex ECO-B is a PBT with the same properties and performance as standard grades, but produced with sustainability in mind.
- Using a mass-balance approach, 40% of biogenic feedstocks are used to offset the use of fossil-based raw materials and decrease greenhouse gas emissions in the production of the PBT base resin.
- The process will be audited and certified according to the REDcert mass balance approach.

Product information

Part Marking Code	> PBT-GF20 <	ISO 11469

Rheological properties

Melt volume-flow rate	14	cm^3/10min	ISO 1133
Temperature	250	°C	
Load	2.16	kg	
Viscosity number	80	cm^3/g	ISO 307, 1157, 1628
Moulding shrinkage range, parallel	0.4 - 0.5	%	ISO 294-4, 2577
Moulding shrinkage range, normal	1.0 - 1.2	%	ISO 294-4, 2577

Typical mechanical properties

Tensile Modulus	7400	MPa	ISO 527-1/-2
Stress at break, 5mm/min	125	MPa	ISO 527-1/-2
Strain at break, 5mm/min	3	%	ISO 527-1/-2
Flexural Strength	170	MPa	ISO 178
Tensile creep modulus, 1h	6200	MPa	ISO 899-1
Tensile creep modulus, 1000h	4800	MPa	ISO 899-1
Charpy impact strength, 23°C	46	kJ/m^2	ISO 179/1eU
Charpy impact strength, -30°C	43	kJ/m^2	ISO 179/1eU
Charpy notched impact strength, 23°C	7.5	kJ/m^2	ISO 179/1eA
Charpy notched impact strength, -30°C	7	kJ/m^2	ISO 179/1eA
Ball indentation hardness, H 358/30	190	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	195	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	220	°C	ISO 75-1/-2
Temp. of deflection under load, 8 MPa	100	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h, 50N	215	°C	ISO 306
Ball pressure test	210	°C	IEC 60695-10-2
Coeff. of linear therm. expansion, parallel	35	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.156	W/(m K)	Internal

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Spec. heat capacity of melt	1840	J/(kg K)	Internal

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	4.2		IEC 62631-2-1
Relative permittivity, 1MHz	4.1		IEC 62631-2-1
Dissipation factor, 100Hz	16	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	31	kV/mm	IEC 60243-1
Comparative tracking index	PLC 1	PLC	UL 746A

Other properties

Humidity absorption, 2mm	0.15	%	Sim. to ISO 62
Water absorption, 2mm	0.4	%	Sim. to ISO 62
Density	1450	kg/m³	ISO 1183
Density of melt	1230	kg/m³	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

Additional information

Injection molding	Melt Temperature 260-270 °C Mold Temperature *) 75-85 °C Maximum Barrel Residence Time **) 5-10 min Injection Speed fast

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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. For grades containing flame retardants, a maximum temperature of 265 °C should not be exceeded.

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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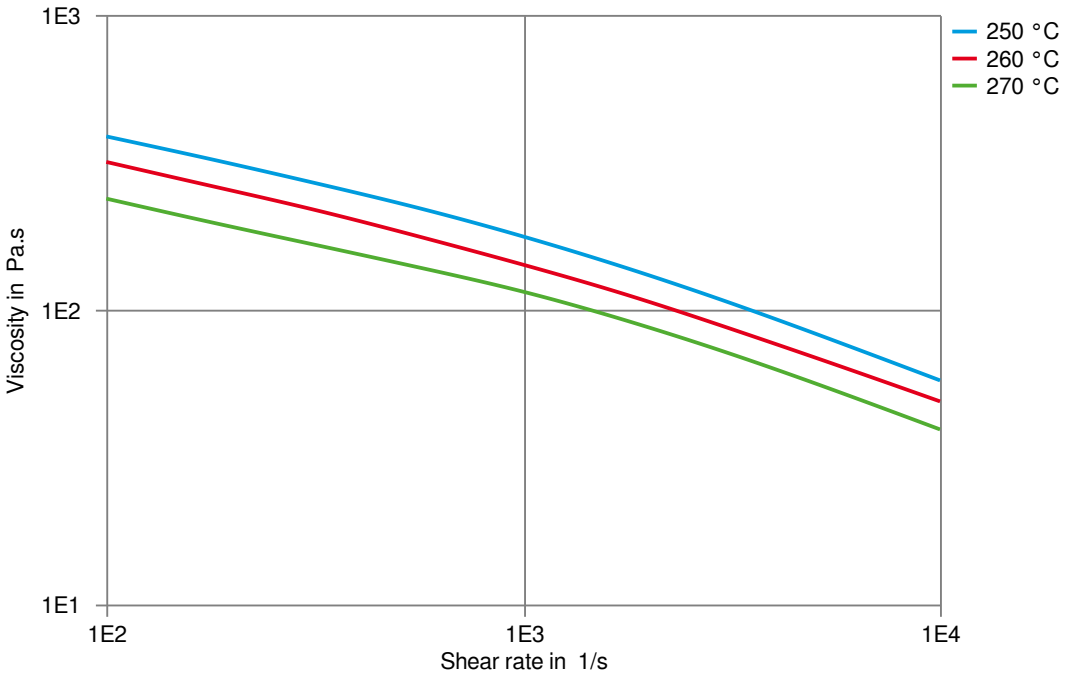
Viscosity-shear rate



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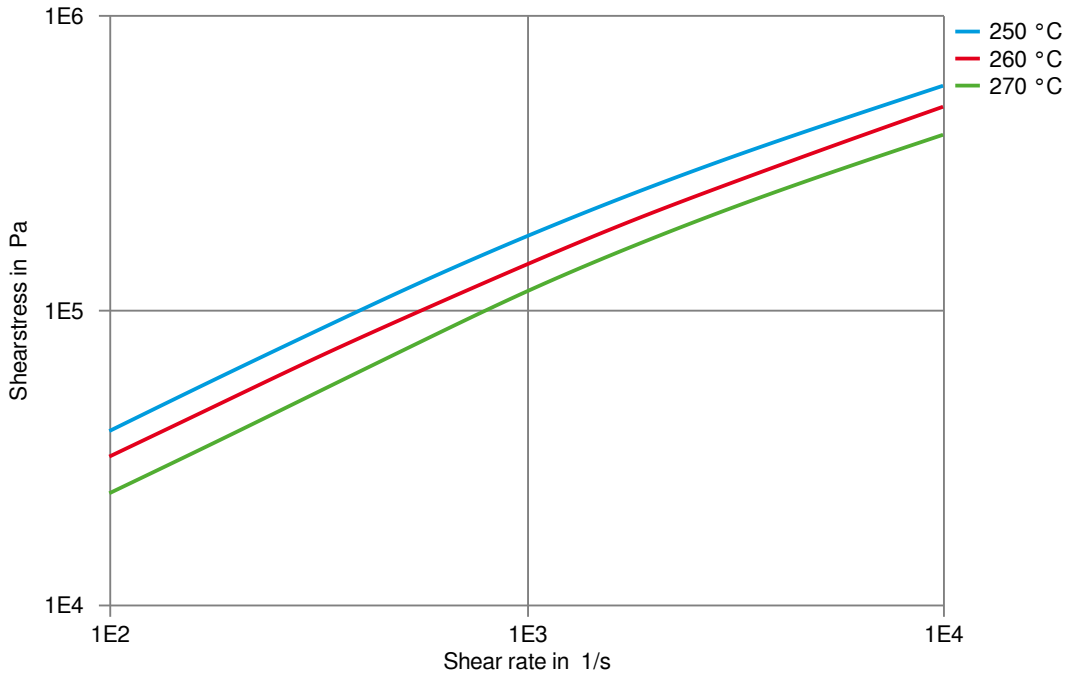
Shearstress-shear rate



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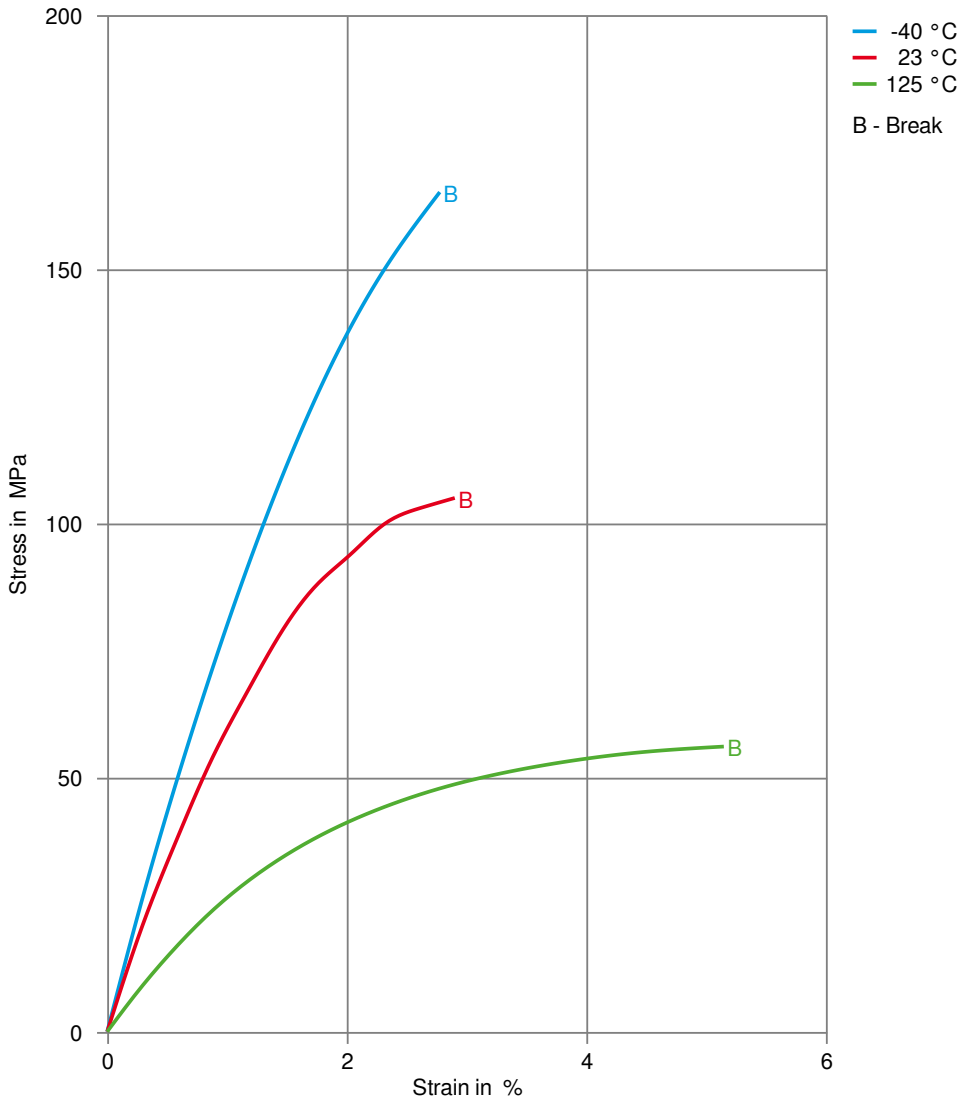
Stress-strain



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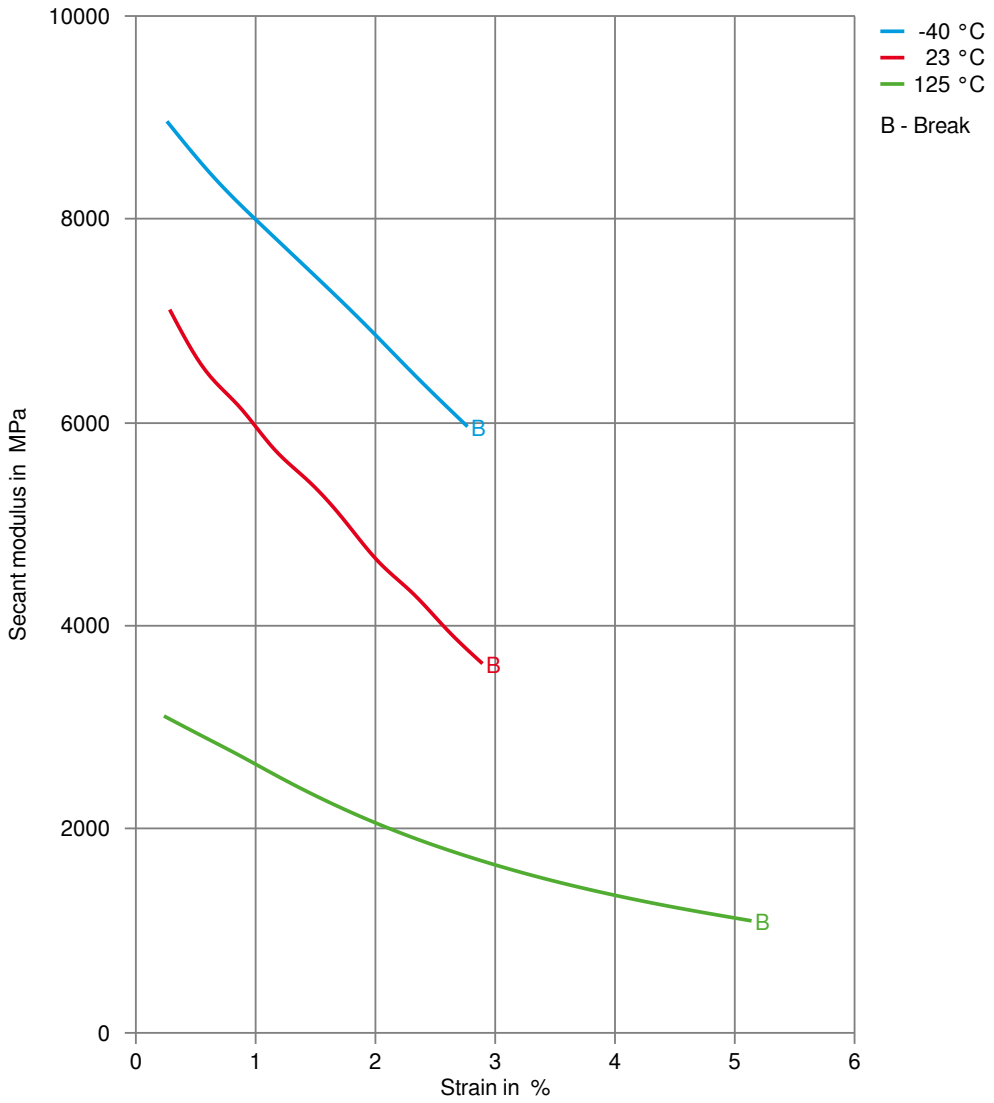
Secant modulus-strain



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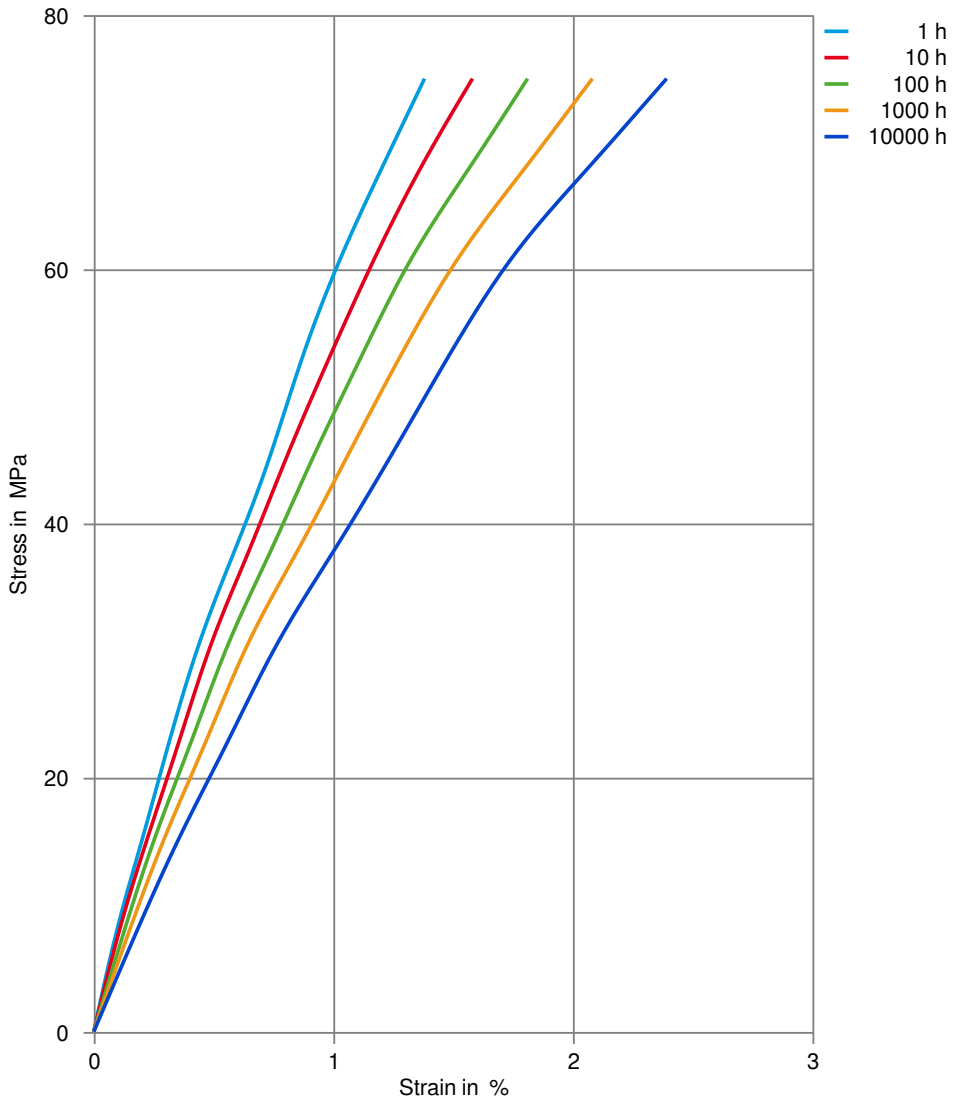
Stress-strain (isochronous) 23 °C



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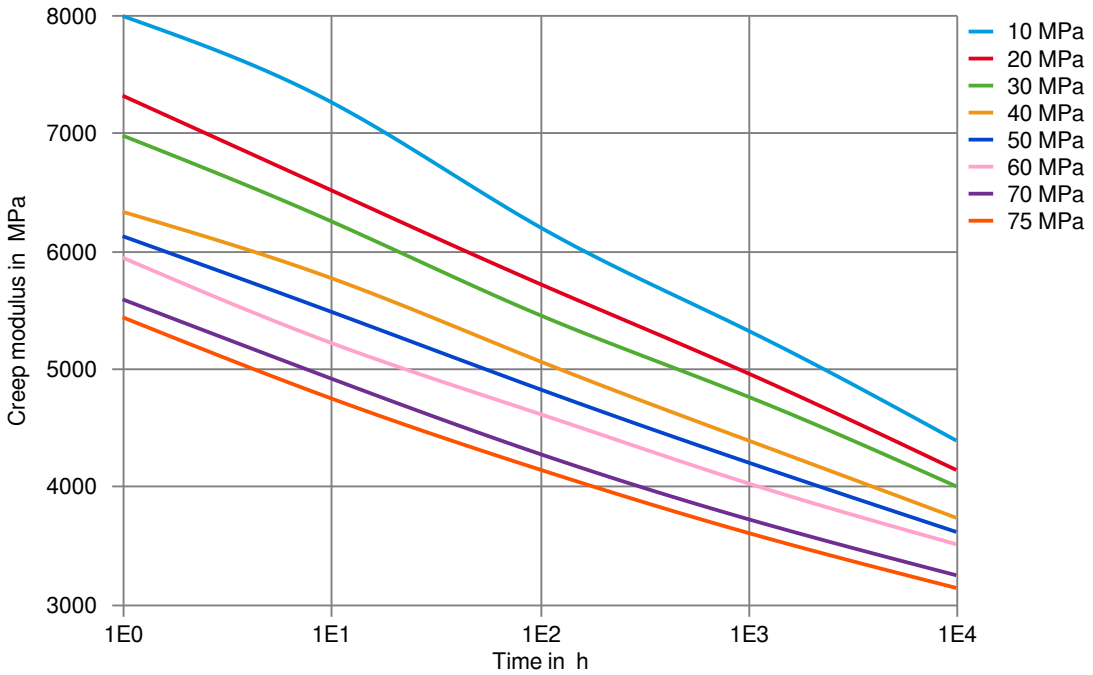
Creep modulus-time 23 °C



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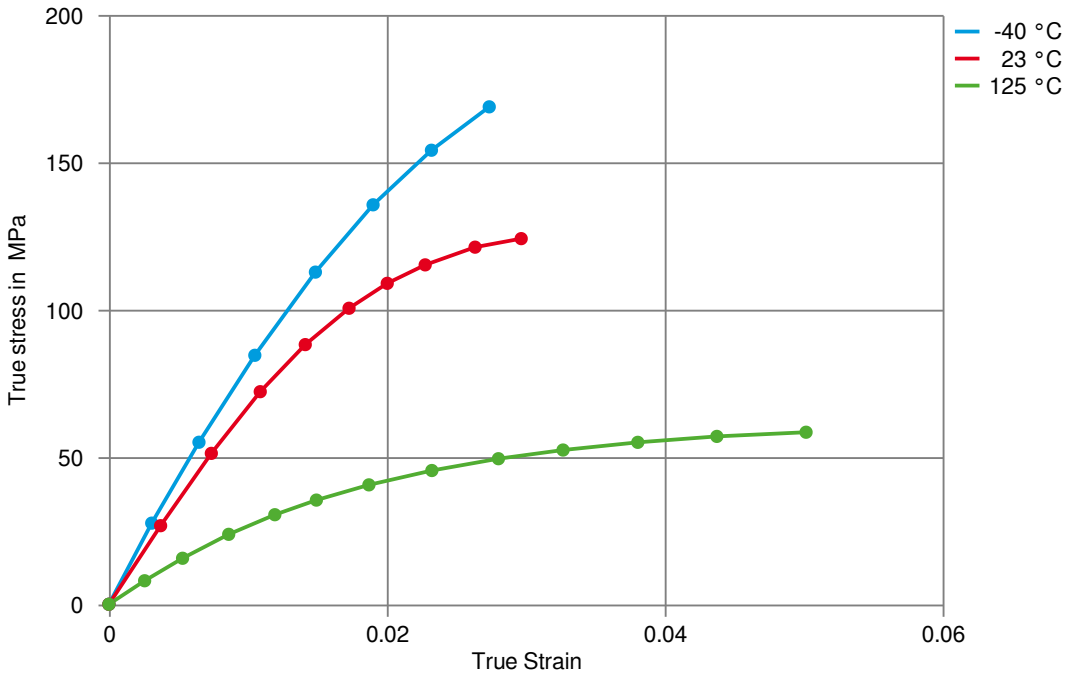
True stress-strain



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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 =< - 30° 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 (<= 60 h) it is necessary to lower the temperature to 100° C.
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 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. 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°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.