

CELANEX® 2500 ECO-B

unfilled easy flowing nucleated, with partially bio-based PBT, lubricated and stabilized grade

Chemical abbreviation according to ISO 1043-1: PBT Moulding compound ISO 7792- PBT, MGHR, 08-030N Polybutylene terephthalate, easy flow, nucleated grade Flammability UL 94 HB Minimum thickness 1.0 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 <	ISO 11469
-------------------	---------	-----------

Rheological properties

Melt volume-flow rate	40 cm ³ /10min	ISO 1133
Temperature	250 °C	
Load	2.16 kg	
Viscosity number	85 cm ³ /g	ISO 307, 1157, 1628
Moulding shrinkage range, parallel	1.8 - 2.3 %	ISO 294-4, 2577
Moulding shrinkage, normal	1.9 %	ISO 294-4, 2577
Moulding shrinkage range, normal	1.8 - 2.1 %	ISO 294-4, 2577

Typical mechanical properties

Tensile Modulus	2700 MPa	ISO 527-1/-2
Yield stress, 50mm/min	62 MPa	ISO 527-1/-2
Yield strain, 50mm/min	4 %	ISO 527-1/-2
Stress at break, 50mm/min	56 MPa	ISO 527-1/-2
Nominal strain at break	15 %	ISO 527-1/-2
Flexural Strength	90 MPa	ISO 178
Flexural Stress at 3.5%	80 MPa	ISO 178
Tensile creep modulus, 1h	2400 MPa	ISO 899-1
Tensile creep modulus, 1000h	1600 MPa	ISO 899-1
Charpy impact strength, 23°C	135 kJ/m ²	ISO 179/1eU
Charpy impact strength, -30°C	130 kJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23°C	5 kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -30°C	4.5 kJ/m ²	ISO 179/1eA
Ball indentation hardness, H 358/30	145 MPa	ISO 2039-1

CELANEX® 2500 ECO-B

Thermal properties

Melting temperature, 10 °C/min	225 °C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	60 °C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	160 °C	ISO 75-1/-2
Vicat softening temperature, 50 °C/h, 50N	190 °C	ISO 306
Coeff. of linear therm. expansion, parallel	110 E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.133 W/(m K)	Internal
Spec. heat capacity of melt	1920 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	22 %	ISO 4589-1/-2

Electrical properties

Relative permittivity, 100Hz	3.9	IEC 62631-2-1
Relative permittivity, 1MHz	3.8	IEC 62631-2-1
Dissipation factor, 100Hz	13 E-4	IEC 62631-2-1
Dissipation factor, 1MHz	200 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	23 kV/mm	IEC 60243-1
Comparative tracking index	PLC 0 PLC	UL 746A

Other properties

Humidity absorption, 2mm	0.2 %	Sim. to ISO 62
Water absorption, 2mm	0.45 %	Sim. to ISO 62
Density	1310 kg/m ³	ISO 1183
Density of melt	1110 kg/m ³	Internal

Injection

Drying Temperature	120 - 140 °C	
Drying Time, Dehumidified Dryer	2 - 4 h	
Processing Moisture Content	0.02 %	
Melt Temperature Optimum	250 °C	Internal
Max. mould temperature	75 - 85 °C	
Injection speed	fast	
Ejection temperature	219 °C	Internal

CELANEX® 2500 ECO-B

Characteristics

Additives

Release agent

Additional information

Injection molding

Melt Temperature 250-260 °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

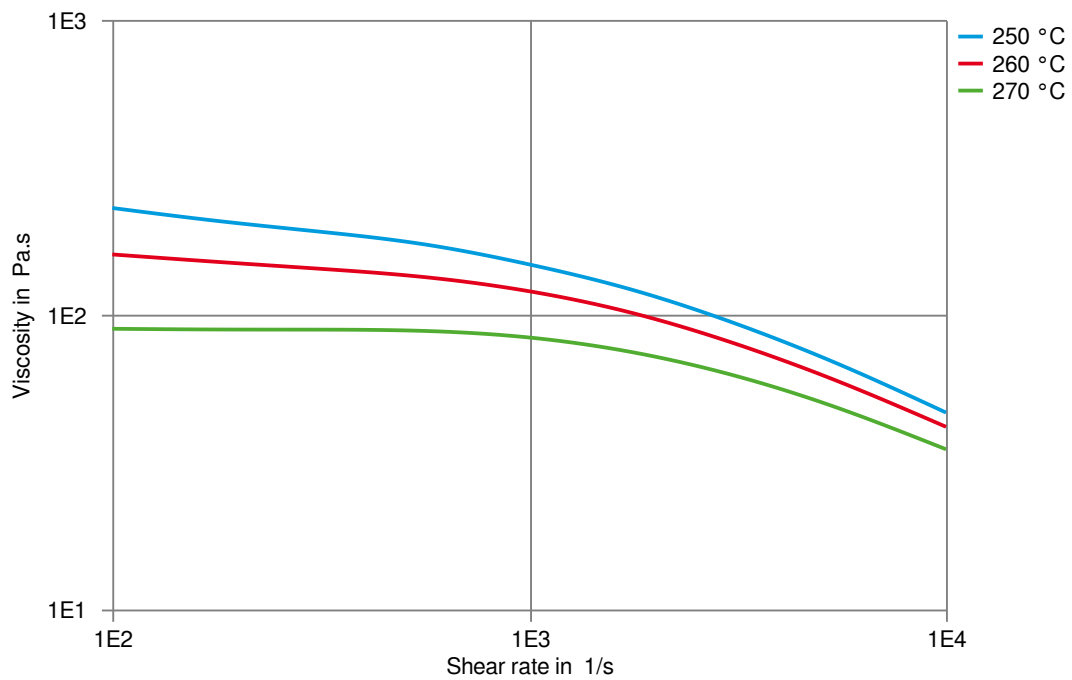
Injection speed, injection pressure and holding pressure have to be optimized to the individual article geometry. To avoid material degradation during processing low back pressure and minimum screw speed have to be used. Overheating of the material has to be avoided. For grades containing flame retardants, a maximum temperature of 265 °C should not be exceeded.

Celanese recommends only externally heated hot runner systems.

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

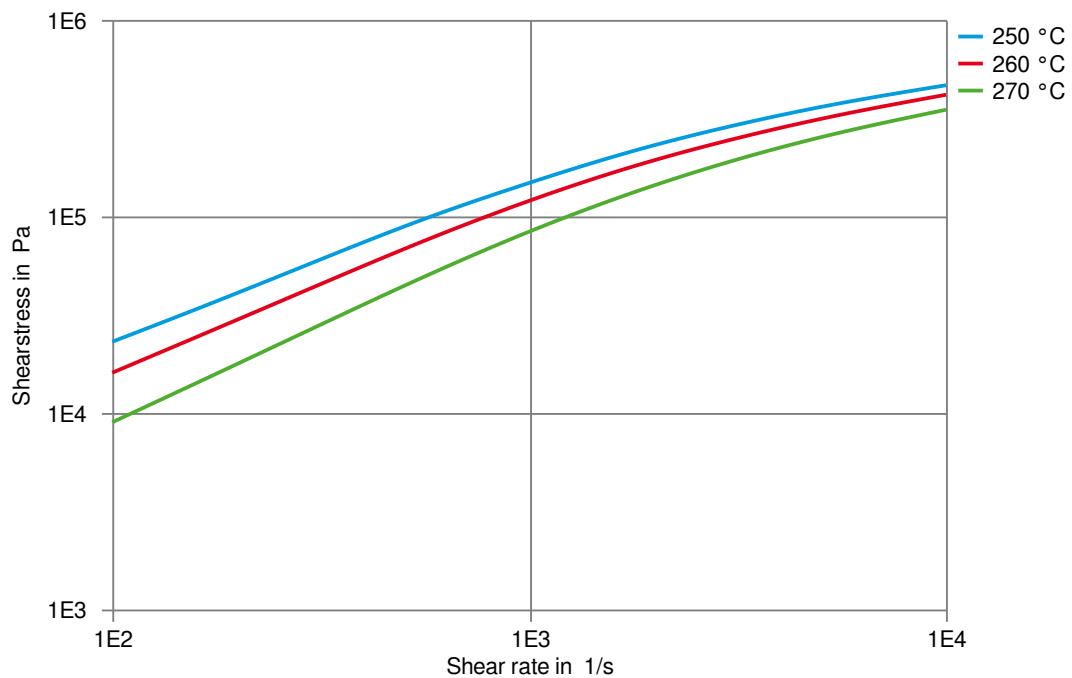
CELANEX® 2500 ECO-B

Viscosity-shear rate



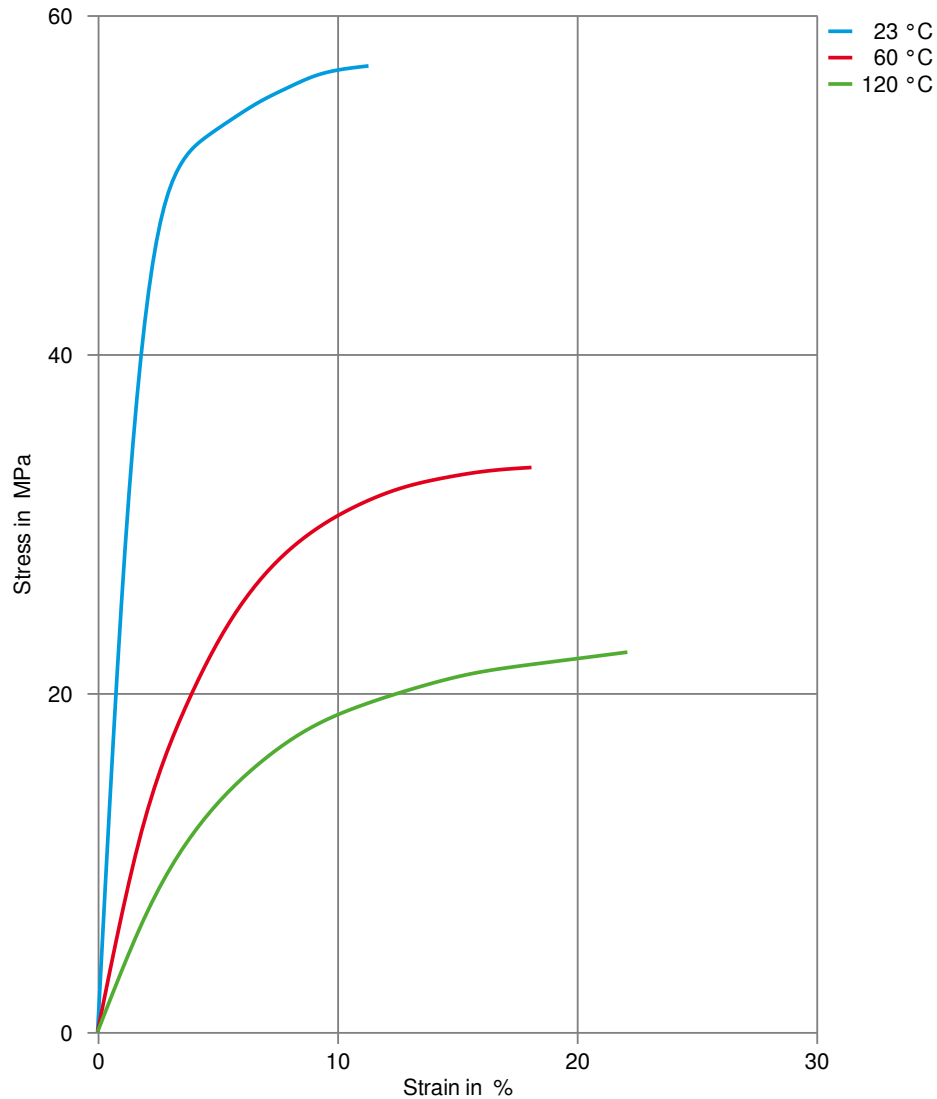
CELANEX® 2500 ECO-B

Shearstress-shear rate



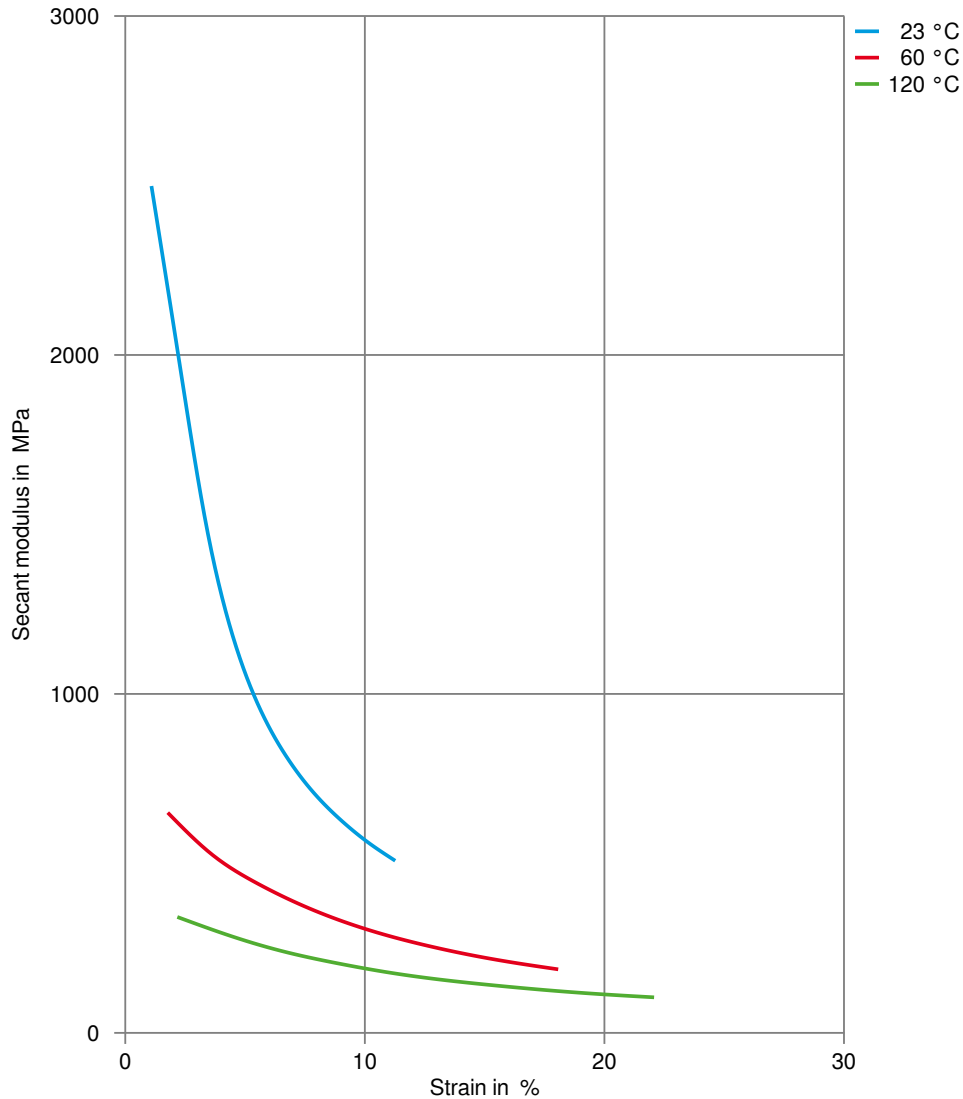
CELANEX® 2500 ECO-B

Stress-strain



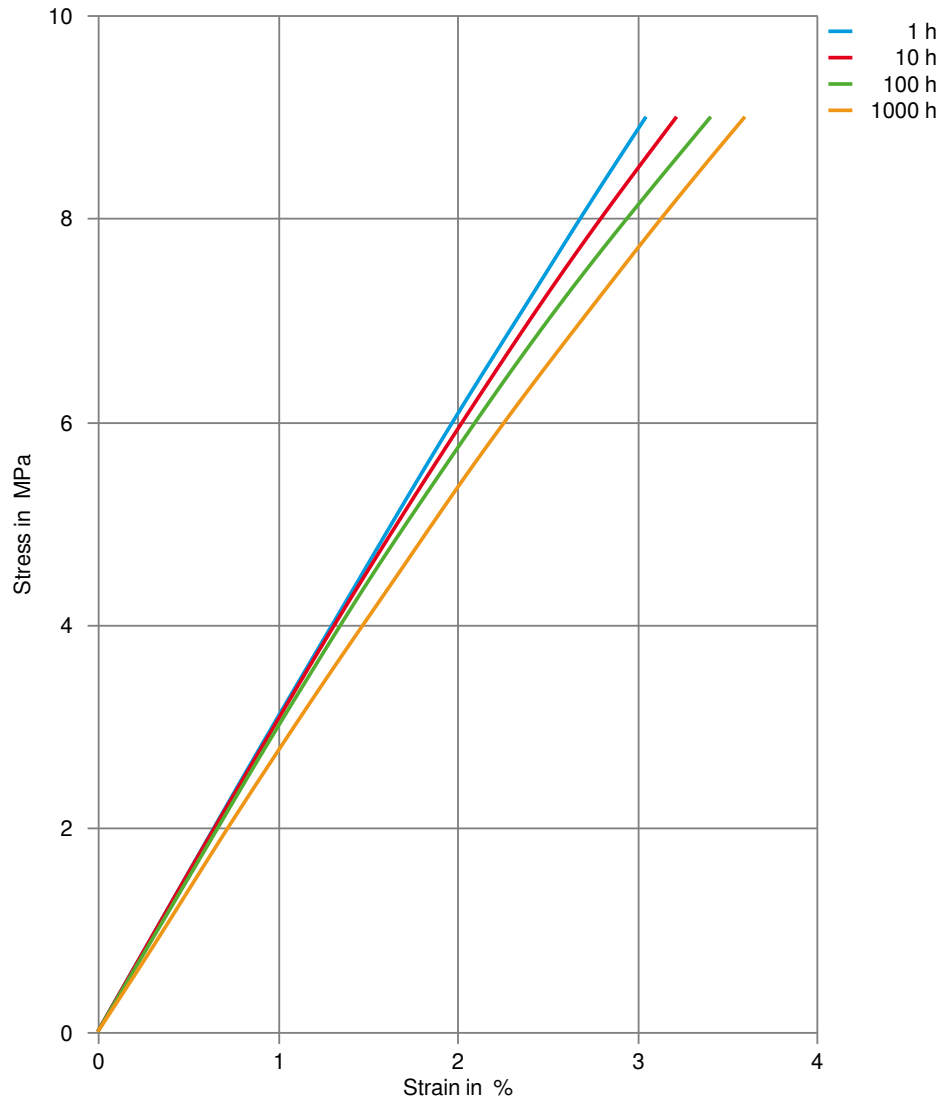
CELANEX® 2500 ECO-B

Secant modulus-strain



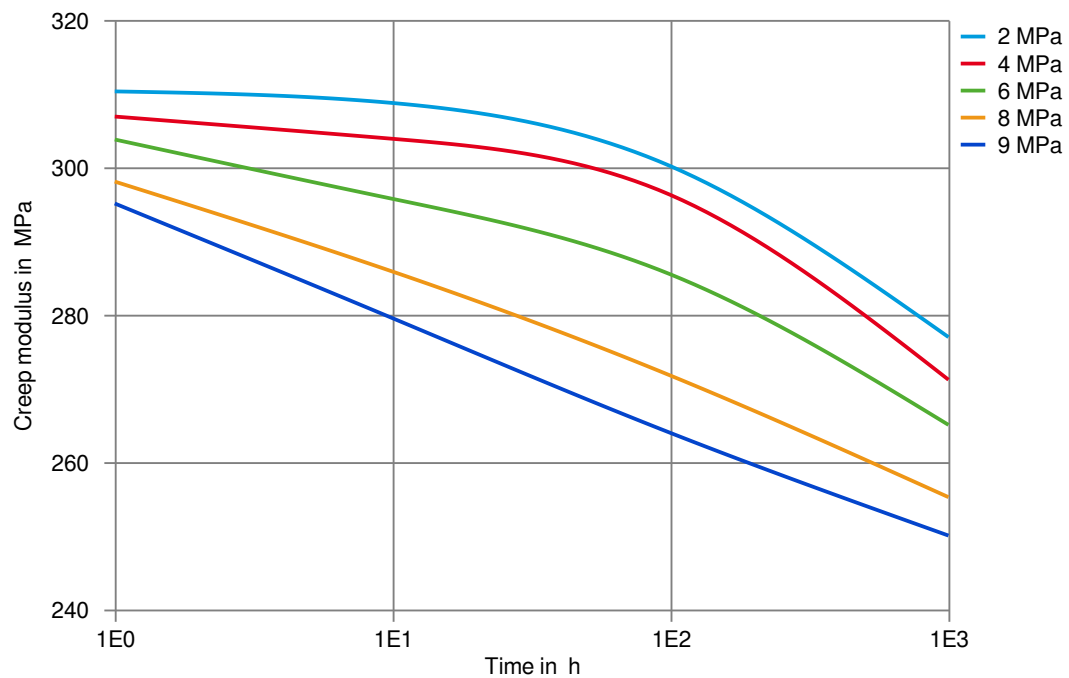
CELANEX® 2500 ECO-B

Stress-strain (isochronous) 100°C



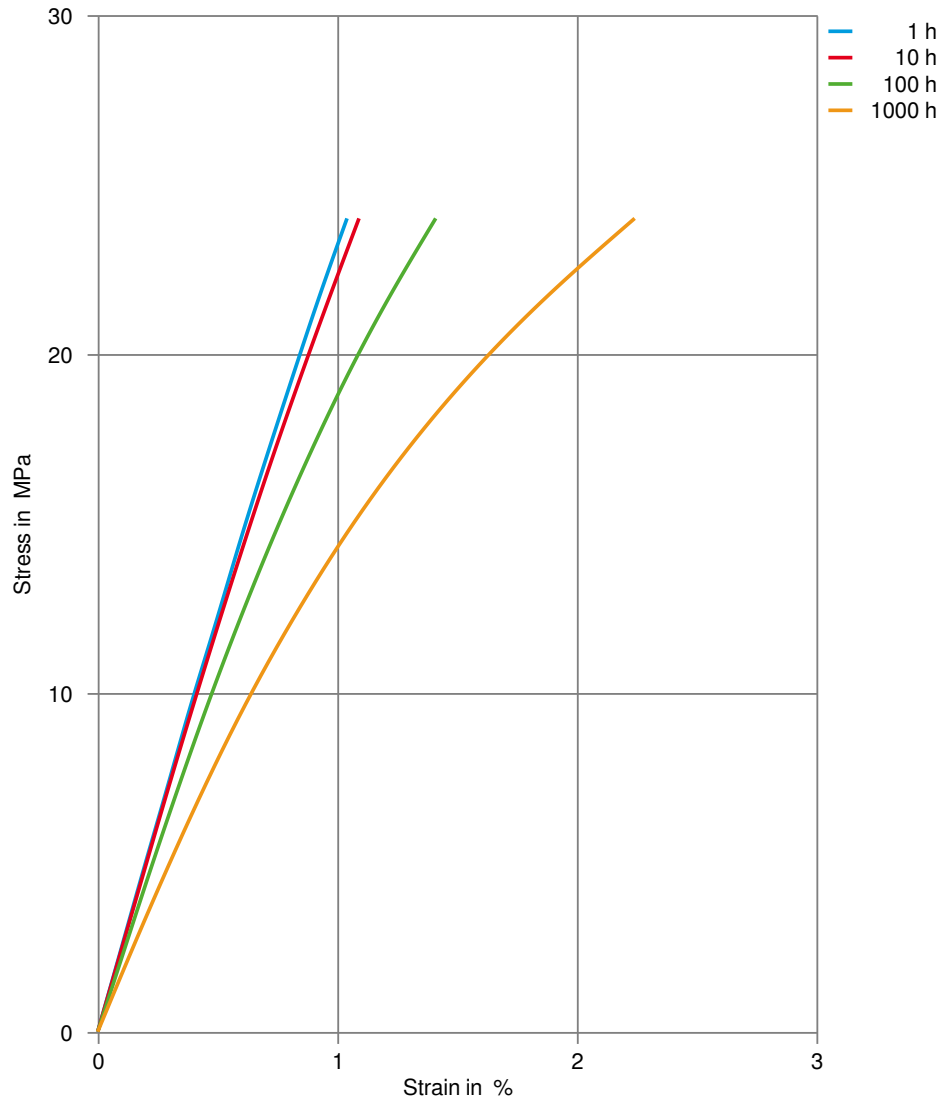
CELANEX® 2500 ECO-B

Creep modulus-time 100°C



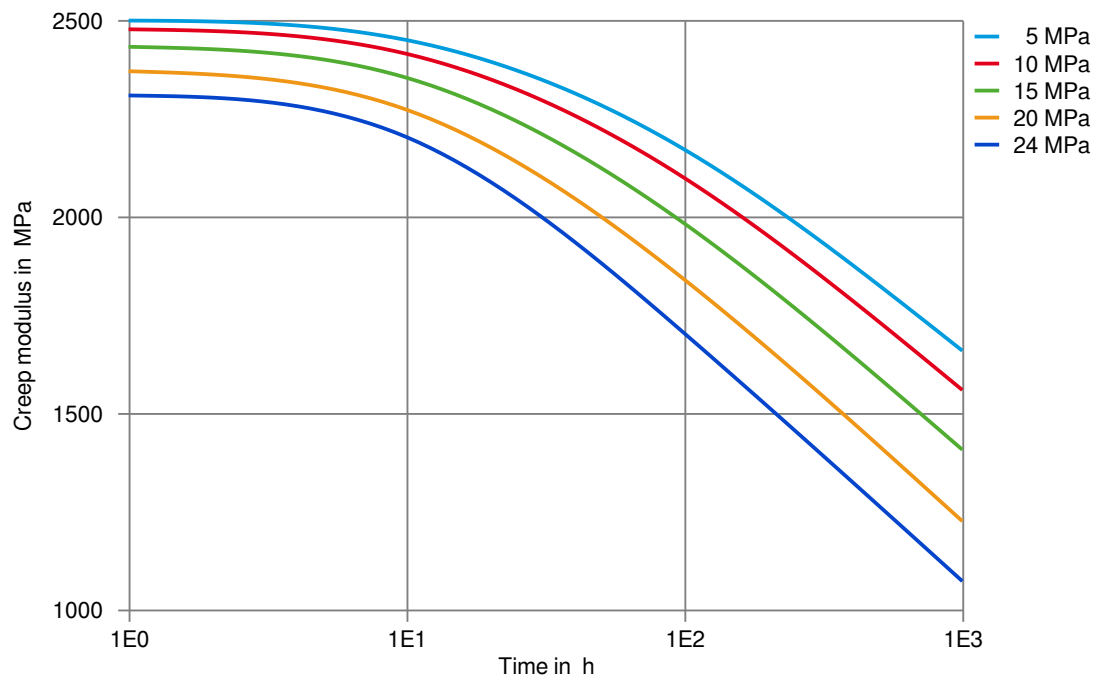
CELANEX® 2500 ECO-B

Stress-strain (isochronous) 23°C



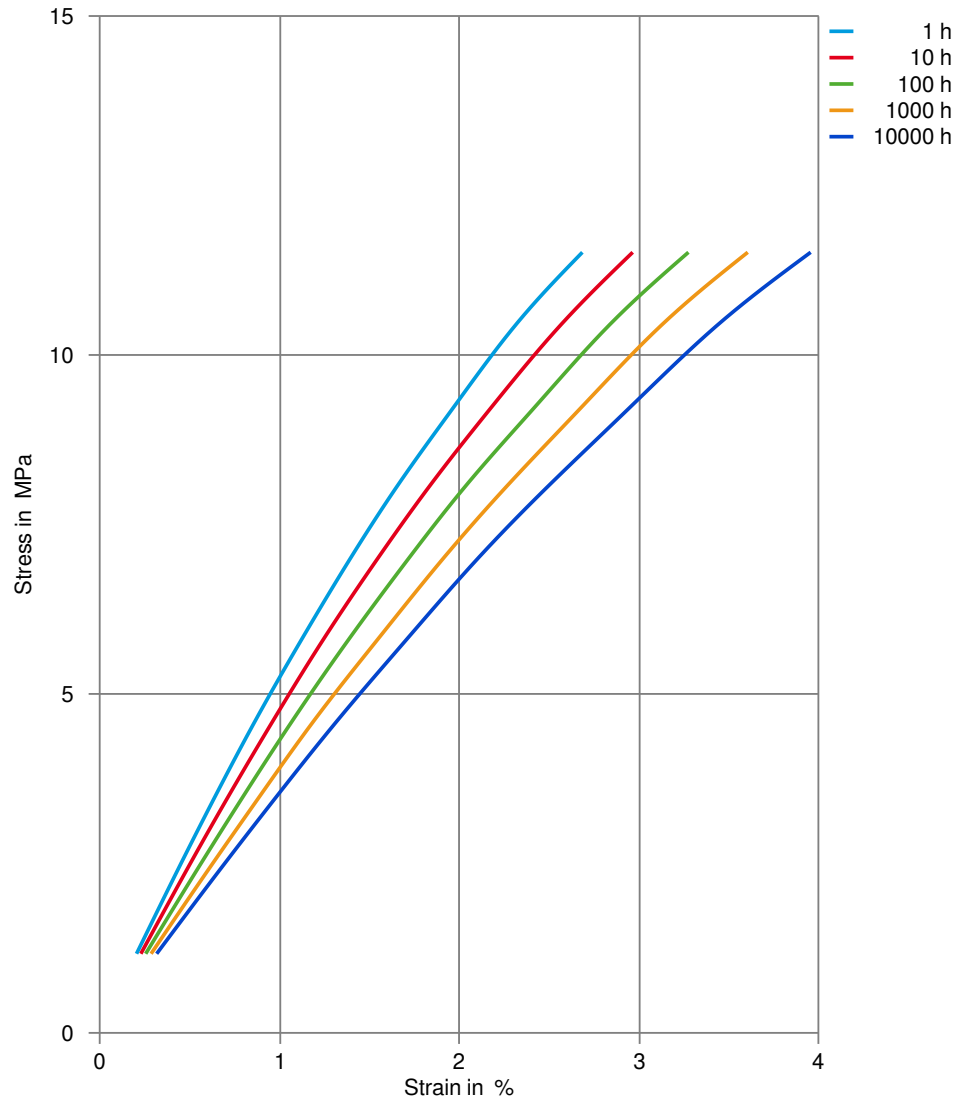
CELANEX® 2500 ECO-B

Creep modulus-time 23°C



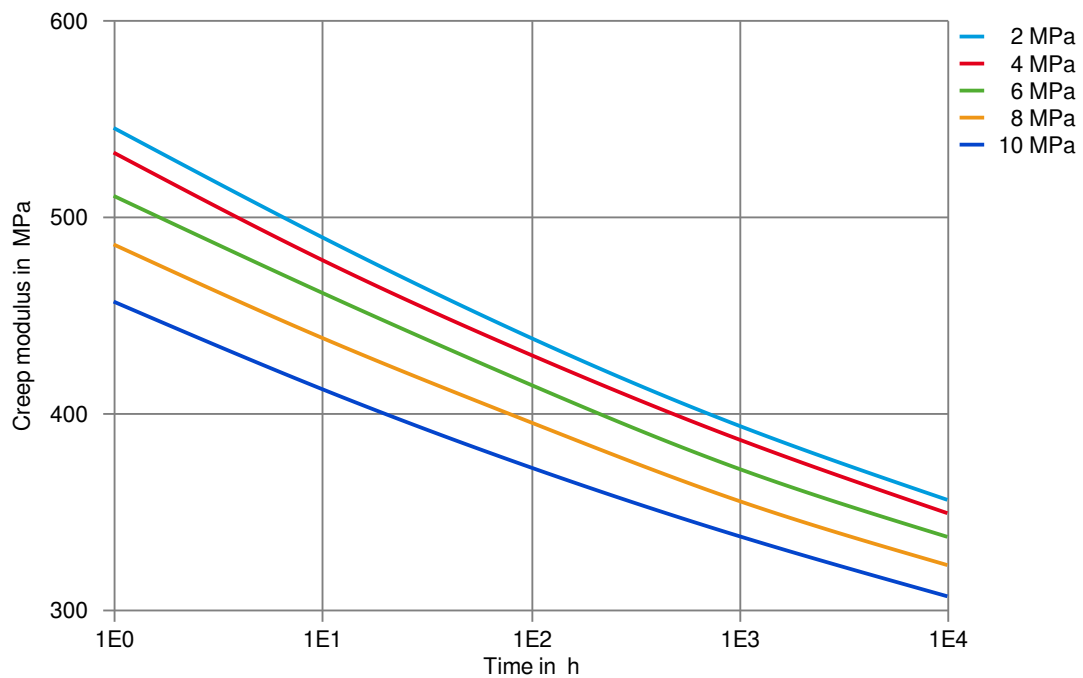
CELANEX® 2500 ECO-B

Stress-strain (isochronous) 60°C



CELANEX® 2500 ECO-B

Creep modulus-time 60°C



CELANEX® 2500 ECO-B

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 $250\text{--}260^{\circ}\text{C}$
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.

Celanese recommends only externally heated hot runner systems.

*) 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 $2\text{ to }4\text{ hours}$. 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.