

# CELANEX® 2406MT GF20

20% glass fiber reinforced, tribological-modified medical grade, for applications with improved slip and wear characteristics  
 Celanex 2406MT GF20 is a 20% glass fiber reinforced, tribologically-modified, medium flow PBT + PET blend grade for injection molding processing.

Celanex 2406MT GF20 is a special grade developed for medical industry applications and complies with:

- CFR 21 (177.1660) of the Food and Drug Administration (FDA) and is listed in the Drug Master File (DMF 10047 (US) / 10033 (EU)) and the Device Master File (MAF 443 (US) / 1078 (EU))
- the corresponding EU and national registry regulatory requirements
- biocompatibility in tests corresponding to USP 23 Class VI/ISO 10993
- low residual monomers
- no animal products

## Product information

Part Marking Code	> (PBT+PET)-GF20 <	ISO 11469
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## Rheological properties

Melt volume-flow rate	13 cm <sup>3</sup> /10min	ISO 1133
Temperature	265 °C	
Load	2.16 kg	
Moulding shrinkage range, parallel	0.3 - 0.5 %	ISO 294-4, 2577
Moulding shrinkage range, normal	0.7 - 0.9 %	ISO 294-4, 2577

## Typical mechanical properties

Tensile Modulus	7600 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 Modulus	7500 MPa	ISO 178
Flexural Strength	190 MPa	ISO 178
Charpy impact strength, 23°C	65 kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30°C	55 kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23°C	10 kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -30°C	9.5 kJ/m <sup>2</sup>	ISO 179/1eA
Izod notched impact strength, 23°C	10 kJ/m <sup>2</sup>	ISO 180/1A
Izod impact strength, 23°C	47 kJ/m <sup>2</sup>	ISO 180/1U

## Thermal properties

Melting temperature, 10°C/min	255 °C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	205 °C	ISO 75-1/-2

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## Flammability

Burning Behav. at 1.5mm nom. thickn.	HB class	UL 94
Thickness tested	1.6 mm	UL 94
Burning Behav. at thickness h	HB class	UL 94
Thickness tested	0.80 mm	UL 94

## Other properties

Humidity absorption, 2mm	0.15 %	Sim. to ISO 62
Water absorption, 2mm	0.4 %	Sim. to ISO 62
Density	1470 kg/m³	ISO 1183

## Injection

Drying Temperature	120 - 140 °C	
Drying Time, Dehumidified Dryer	2 - 4 h	
Processing Moisture Content	0.02 %	
Melt Temperature Optimum	263 °C	Internal
Screw tangential speed	0.12 - 0.17 m/s	
Max. mould temperature	90 - 100 °C	
Injection speed	fast	

## Characteristics

Additives	Release agent
Food contact	FDA 21 CFR

## Additional information

Injection molding	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.

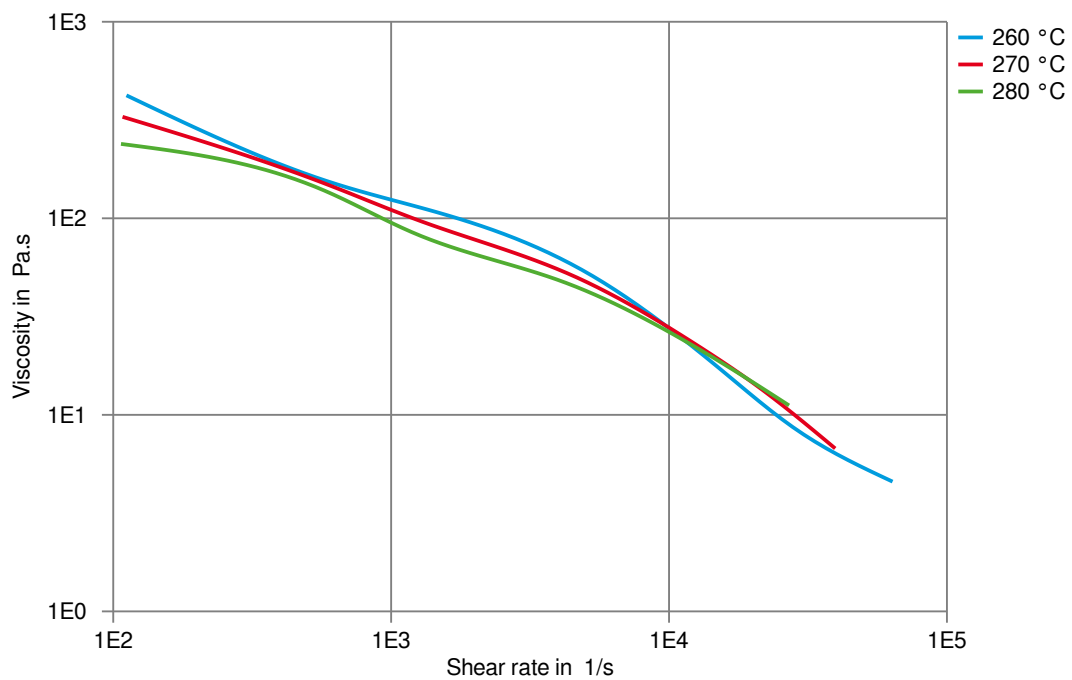
\*) For moulded parts with especially high requirements to the surface quality or

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dimensional stability, a mold temperature of up to 110 °C can be advantageous.

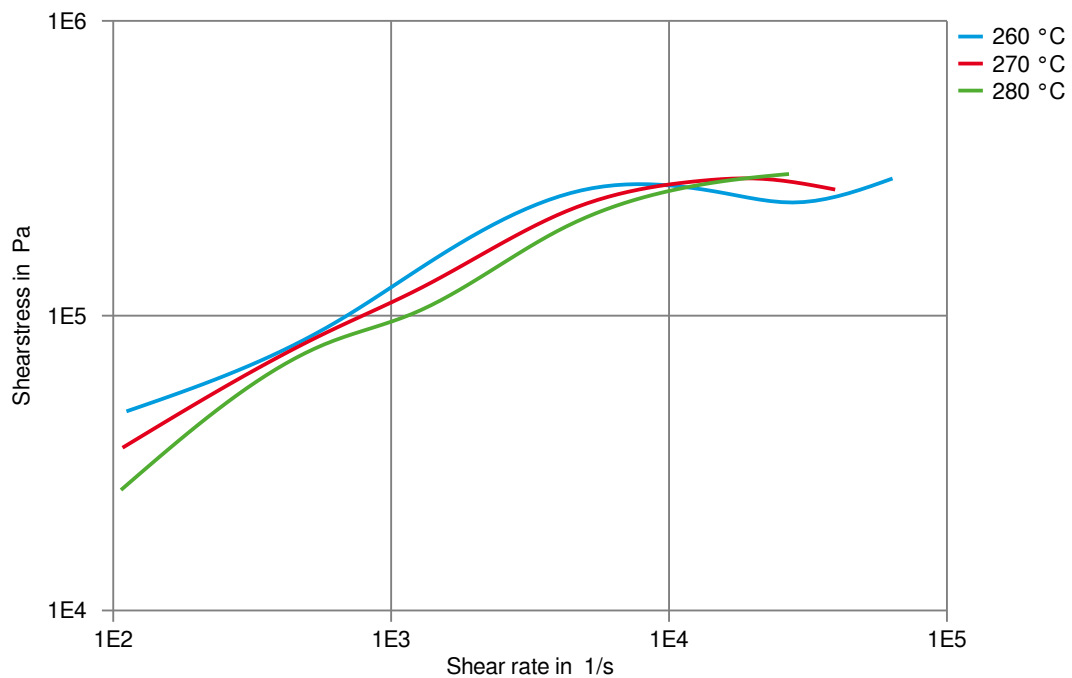
\*\*) If the cylinder temperatures are higher than the recommended maximum temperatures, the max. residence time in the barrel has to be reduced.

## Viscosity-shear rate



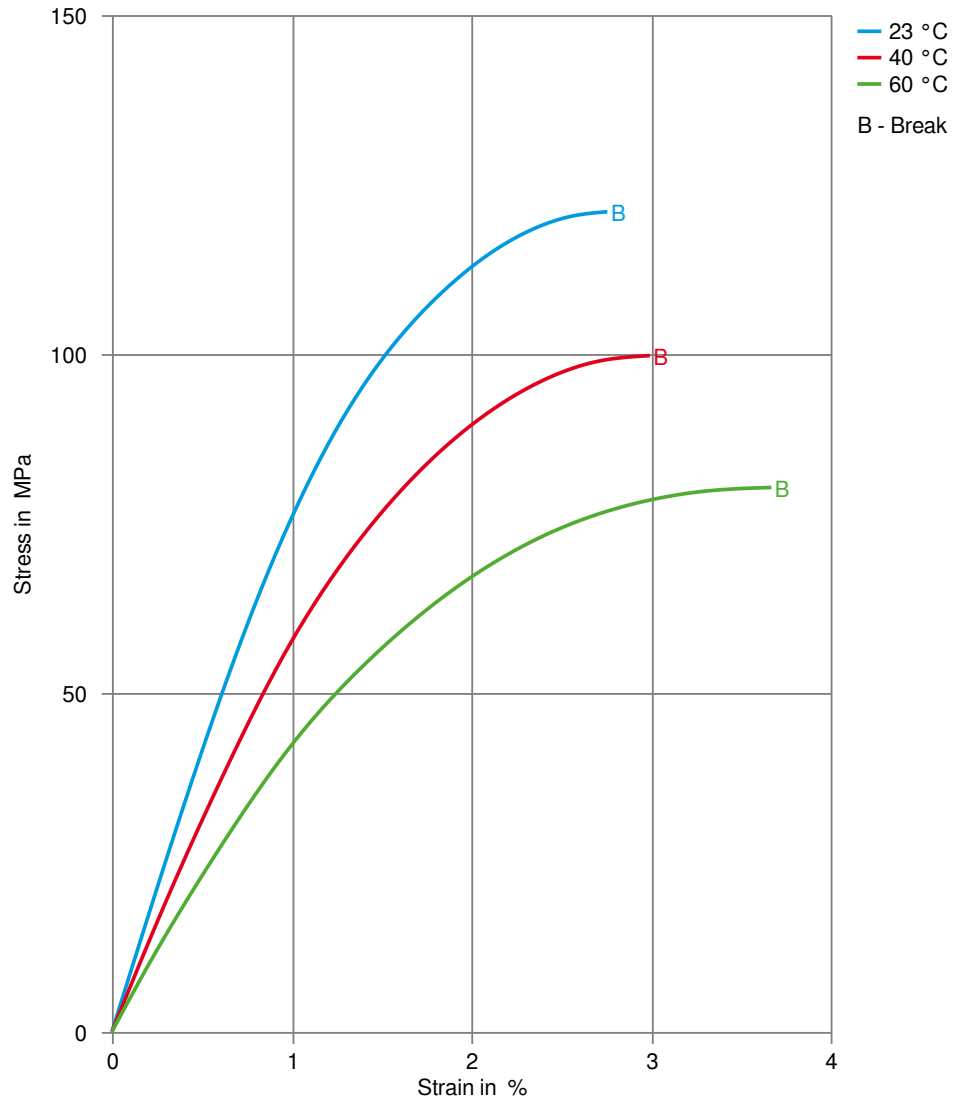
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## Shearstress-shear rate



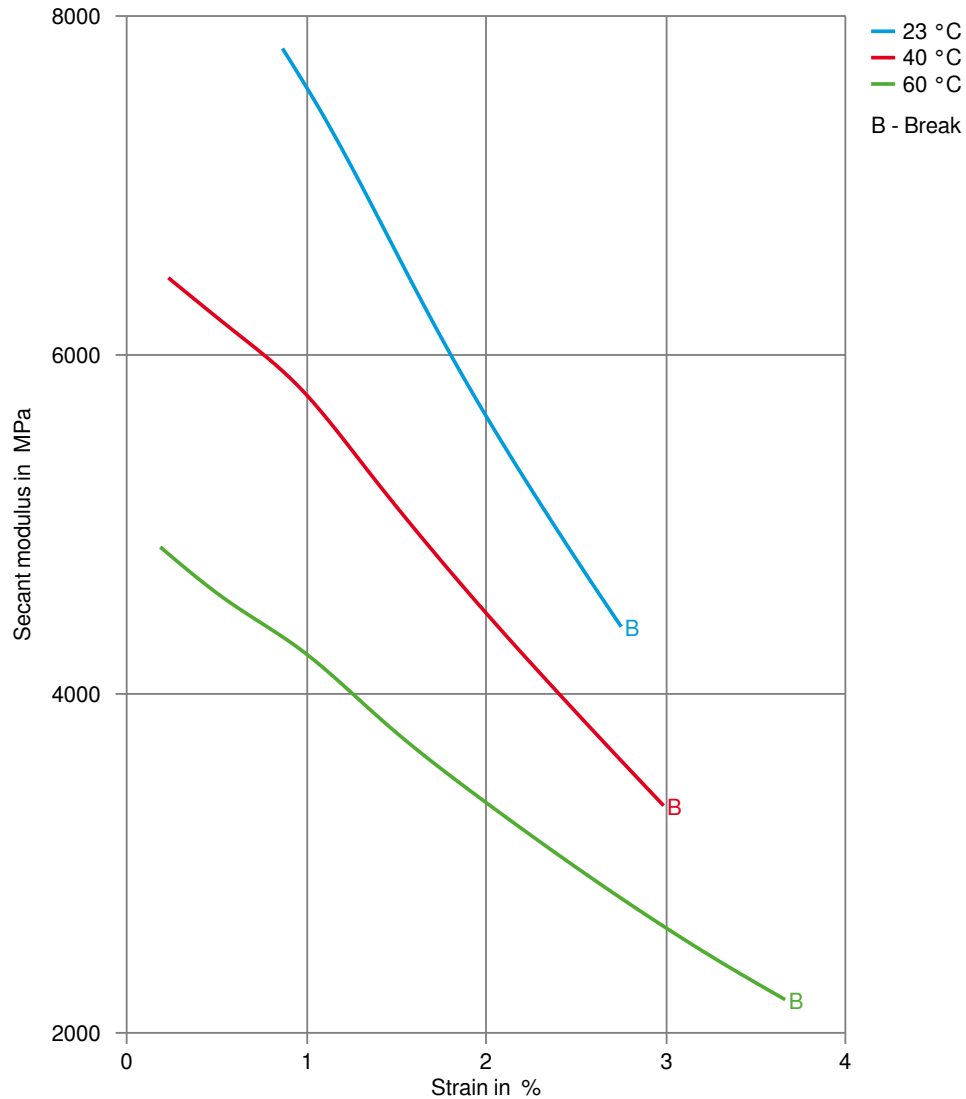
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## Stress-strain



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## Secant modulus-strain



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## 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  $100^{\circ}\text{C}$ .

### Injection molding

Melt Temperature  $265\text{--}275^{\circ}\text{C}$   
Mold Temperature \*)  $90\text{--}100^{\circ}\text{C}$   
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.

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  $110^{\circ}\text{C}$  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  $2\text{ to }4\text{ hours}$ . In case of longer residence times in the dry-air dryer, the temperature should be reduced to  $100^{\circ}\text{C}$ .  
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.