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Engineering Polymers

CELSTRAN® PP-GF40-04 | PP | Glass Reinforced

Description

Material code according to ISO 1043-1: PP

Heat stabilized polypropylene reinforced with 40 weight percent long glass fibers. The fibers are chemically coupled to the polypropylene matrix. The pellets are cylindrical and normally as well as the embedded fibers 10 mm long.

Parts molded of CELSTRAN have outstanding mechanical properties such as high strength and stiffness combined with high heat deflection. The notched impact strength is increased at elevated and low temperatures due to the fiber skeleton built in the parts. The long fiber reinforcement reduces creep significantly.

The very isotropic shrinkage in the molded parts minimizes the warpage. Complex parts can be manufactured with high reproducibility by injection molding.

Application field: Functionial/structural parts for automotive

Physical properties	Value	Unit	Test Standard
Density	**1220**	kg/m³	ISO 1183

Mechanical properties	Value	Unit	Test Standard
Tensile modulus (1mm/min)	**9100**	MPa	ISO 527-2/1A
Tensile stress at break (5mm/min)	**110**	MPa	ISO 527-2/1A
Tensile strain at break (5mm/min)	**2**	%	ISO 527-2/1A
Flexural modulus (23°C)	**9500**	MPa	ISO 178
Flexural strength (23°C)	**190**	MPa	ISO 178
Charpy impact strength @ 23°C	**59**	kJ/m²	ISO 179/1eU
Charpy impact strength @ -30°C	**55**	kJ/m²	ISO 179/1eU
Charpy notched impact strength @ 23°C	**16**	kJ/m²	ISO 179/1eA
Charpy notched impact strength @ -30°C	**13**	kJ/m²	ISO 179/1eA

Thermal properties	Value	Unit	Test Standard
Melting temperature (10°C/min)	**162**	°C	ISO 11357-1,-2,-3
DTUL @ 1.8 MPa	**152**	°C	ISO 75-1/-2
DTUL @ 8.0 MPa	**128**	°C	ISO 75-1/-2

Test specimen production	Value	Unit	Test Standard
Injection molding melt temperature	**270**	°C	ISO 294
Injection molding mold temperature	**70**	°C	ISO 294
Injection molding flow front velocity	**80**	mm/s	ISO 294
Injection molding hold pressure	**83**	MPa	ISO 294

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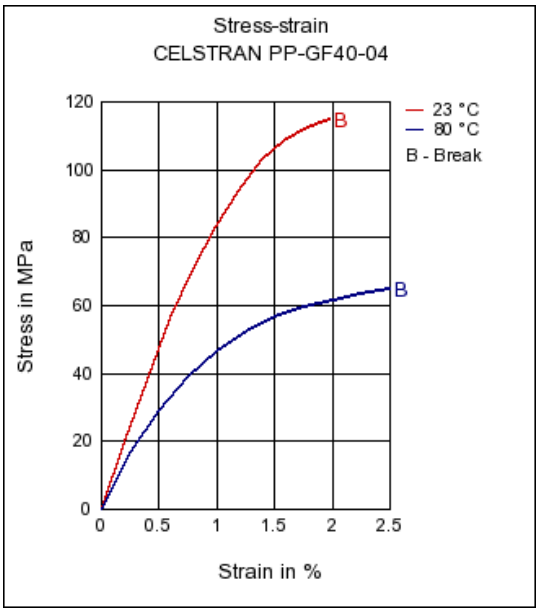
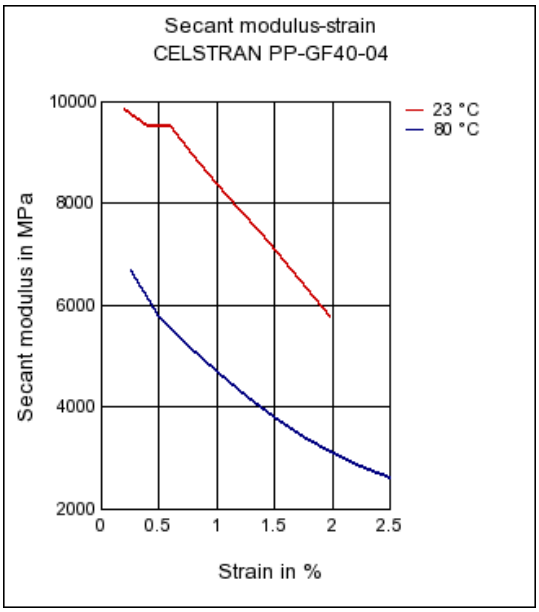
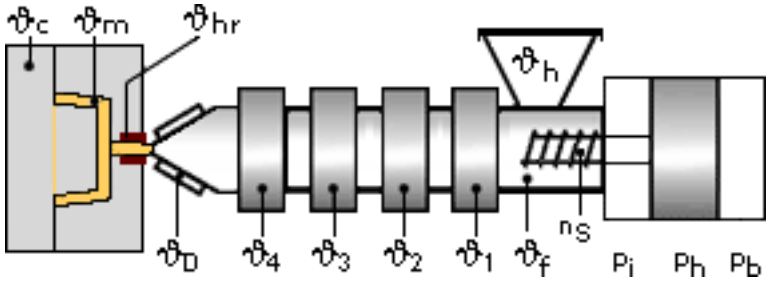
Stress-strain



Secant modulus-strain



Typical injection moulding processing conditions



Maximum residual moisture content: 0.2000%

Processing Temperatures:

	ϑ Cavity	ϑ Melt	ϑ Hot Runner	ϑ Die	ϑ 4	ϑ 3	ϑ 2	ϑ 1	ϑ Feeding	ϑ Hopper
min (°C)	40	260	260	260	280	270	260	250	20	N/A
max (°C)	70	290	290	290	290	280	270	260	50	N/A

Processing Pressures:

	Injection Pressure	Holding Pressure	Back Pressure
min (bar)	600	400	0
max (bar)	1200	800	30

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Injection speed: langsam

Screw speed:

Screw diameter (mm)	40	55	75
Screw speed (rpm)	50	35	25

Pre-drying conditions:

It is normally not necessary to dry CELSTRAN PP. However, should there be surface moisture (condensate) on the molding compound as a result of incorrect storage, drying is required. A circulating air drying cabinet can be used for this purpose if the gran

The product can then be stored in standard conditions until processed.

Drying time: 4 h

Drying temperature: 90 - 100 °C

Special information:

Celstran TPU:

Melt temperature < 275 °C (527 °F)!

Injection Molding

During the processing of CELSTRAN it is important to watch and control melt shear, for excessive shear reduces fiber length and mechanical performance as well.

Processing recommendation:

- Conventional 3 zone screw, screw diameter minimum 40 mm
- Design flow channels for low melt shear
- Back pressure and screw rotation to realize a continous plastification performance and thus a homogeneous melt.
- Apply higher temperature settings than for short fiber compounds

Melt temperature (in the srew anteroom)	260-290	°C
Mold surface temperature	40-70	°C

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General Disclaimer

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. Colorants or other additives may cause significant variations in data values.
Properties of molded 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. 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.
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