Celanese

CELSTRAN® PP-GF50-04 Black | PP | Glass Reinforced

Description

Material code according to ISO 1043-1: PP

Heat stabilized polypropylene homopolymere reinforced with 50 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. (-0403 = heat stabilizerd, -0405 = UV-stabilized, -0453/-0455 = low emission)

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	**1340**	kg/m³	ISO 1183

Mechanical properties	Value	Unit	Test Standard
Tensile modulus (1mm/min)	**11600**	MPa	ISO 527-2/1A
Tensile modulus (80°C)	**8400**	MPa	ISO 527-2/1A
Tensile strength (80°C)	**85**	MPa	ISO 527-2/1A
Tensile stress at break (5mm/min)	**140**	MPa	ISO 527-2/1A
Tensile strain at break (5mm/min)	**1.8**	%	ISO 527-2/1A
Elongation at break (80°C)	**2.2**	%	ISO 527-2/1A
Flexural modulus (23°C)	**12000**	MPa	ISO 178
Flexural modulus (80°C)	**8250**	MPa	ISO 178
Flexural strength (23°C)	**220**	MPa	ISO 178
Flexural strength (80°C)	**125**	MPa	ISO 178
Charpy impact strength @ 23°C	**60.0**	kJ/m²	ISO 179/1eU
Charpy impact strength @ -30°C	**58.0**	kJ/m²	ISO 179/1eU
Charpy notched impact strength @ 23°C	**32.0**	kJ/m²	ISO 179/1eA
Charpy notched impact strength @ -30°C	**33.0**	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	**158**	°C	ISO 75-1/-2
DTUL @ 8.0 MPa	**132**	°C	ISO 75-1/-2

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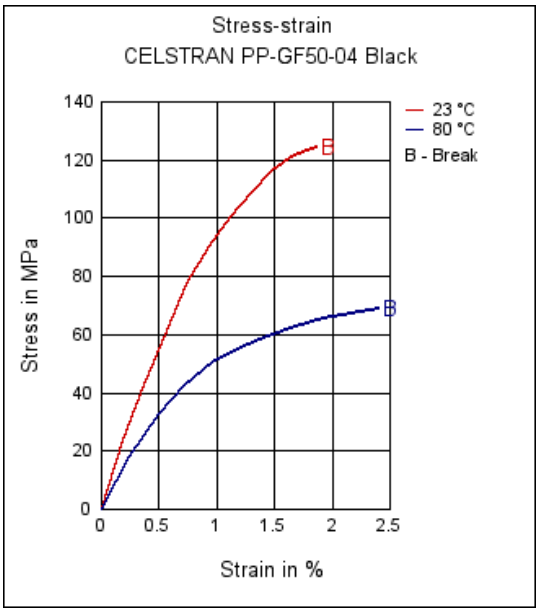
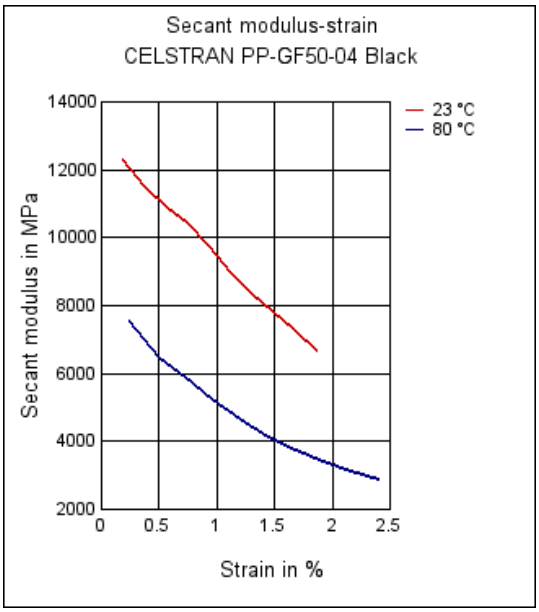
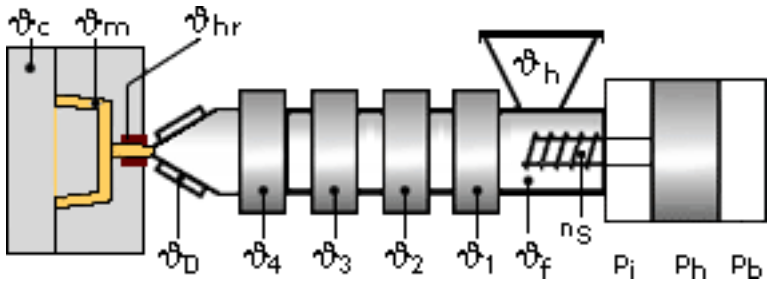
Stress-strain



Secant modulus-strain



Typical injection moulding processing conditions



Pre Drying:

Necessary low maximum residual moisture content: 0.2%

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.

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

Drying time: 4 h

Drying temperature: 90 - 100 °C

Temperature:

	ϑManifold	ϑMold	ϑMelt	ϑNozzle	ϑZone4	ϑZone3	ϑZone2	ϑZone1	ϑFeed
min (°C)	260	40	280	280	280	270	260	250	20
max (°C)	290	70	290	290	290	280	270	260	50

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Pressure:

	Inj press	Hold press	Back pressure
min (bar)	600	400	0
max (bar)	1200	800	30

Speed:

Injection speed: slow

Screw speed

Screw diameter (mm)	16	25	40	55	75
Screw speed (RPM)	-	-	50	35	25

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) 280-290 °C
Mold surface temperature 40-70 °C