

## 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: Functional/structural parts for automotive

| Physical properties | Value       | Unit              | Test Standard |
|---------------------|-------------|-------------------|---------------|
| Density             | <b>1220</b> | kg/m <sup>3</sup> | ISO 1183      |

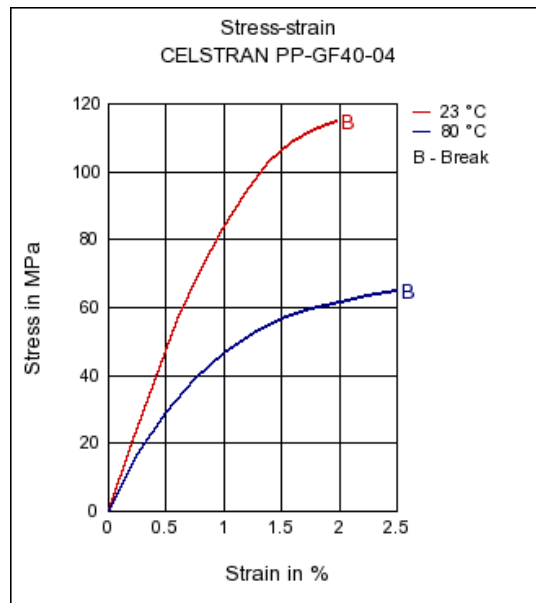
| Mechanical properties                  | Value       | Unit              | Test Standard |
|----------------------------------------|-------------|-------------------|---------------|
| Tensile modulus (1mm/min)              | <b>9100</b> | MPa               | ISO 527-2/1A  |
| Tensile stress at break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

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

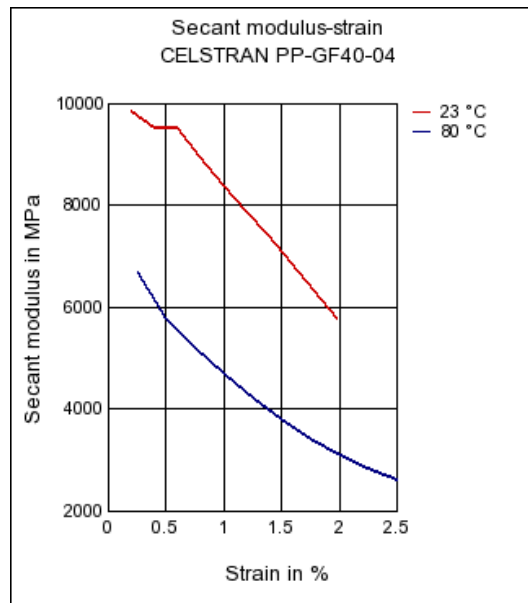
| Test specimen production              | Value      | Unit | Test Standard |
|---------------------------------------|------------|------|---------------|
| Injection molding melt temperature    | <b>270</b> | °C   | ISO 294       |
| Injection molding mold temperature    | <b>70</b>  | °C   | ISO 294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

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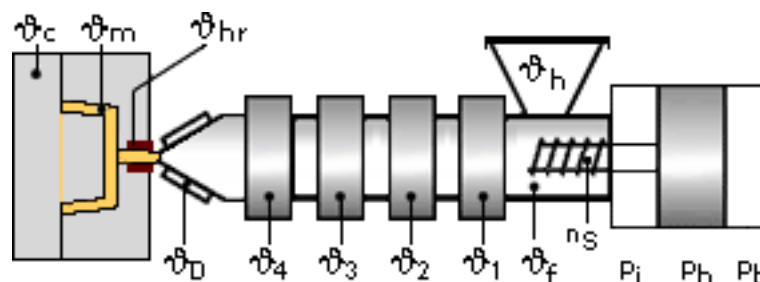
### Stress-strain



### Secant modulus-strain



### Typical injection moulding processing conditions



Maximum residual moisture content: 0.2000%

#### Processing Temperatures:

|          | ϕ <sub>Cavity</sub> | ϕ <sub>Melt</sub> | ϕ <sub>Hot Runner</sub> | ϕ <sub>Die</sub> | ϕ <sub>4</sub> | ϕ <sub>3</sub> | ϕ <sub>2</sub> | ϕ <sub>1</sub> | ϕ <sub>Feeding</sub> | ϕ <sub>Hopper</sub> |
|----------|---------------------|-------------------|-------------------------|------------------|----------------|----------------|----------------|----------------|----------------------|---------------------|
| 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            |

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

**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 continuous plastification performance and thus a homogeneous melt.
- Apply higher temperature settings than for short fiber compounds

Melt temperature (in the screw chamber) 260-290 °C  
Mold surface temperature 40-70 °C