

MAKRILEN

**Long glass fibre reinforced polypropylene
for highest demands**

General

MAKRILEN is a long glass fibre reinforced polypropylene with excellent mechanical, thermal and chemical properties.

The glass fibres run parallelly, are evenly distributed in the polymer and have a high degree of impregnation. According to the length of the pellets, they are 11 mm long.

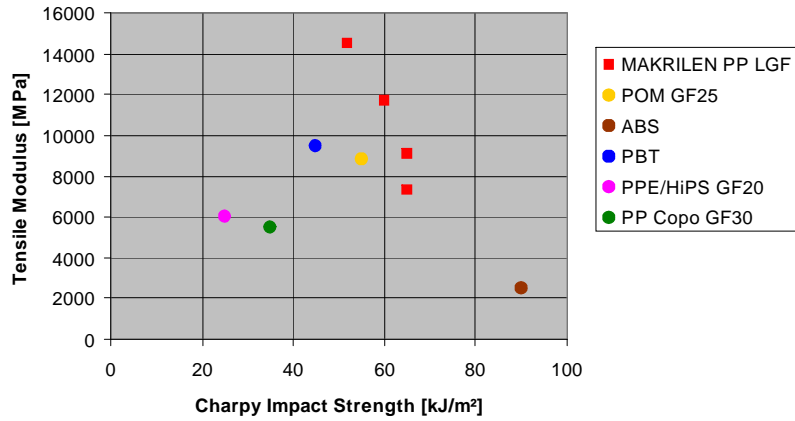
The ratio of the glass fibres can be set to a value between 20 and 60%, as required.

Due to its matrix, MAKRILEN is a favourable alternative to other construction materials like the short glass fibre reinforced PA GF or PBT GF.

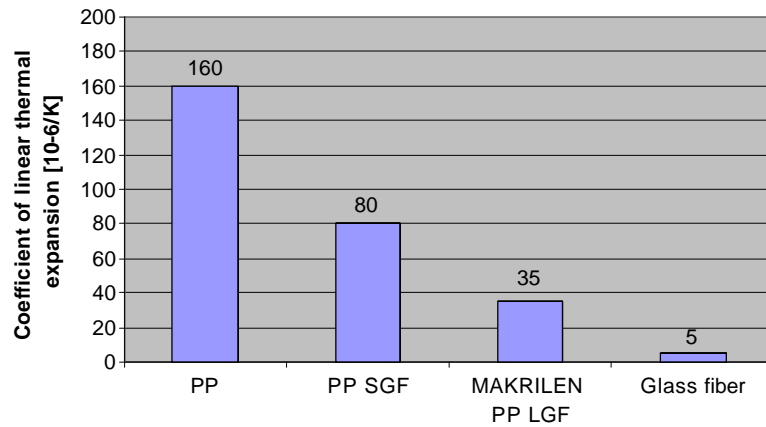
Properties

- high stability and rigidity also at high temperatures
- very good impact resistance also at low temperatures
- very good chemical resistance
- very good heat resistance (HDT) and dimensional stability
- distortion tendency considerably reduced compared with PP short glass fibre
- good surface quality (similar to PP that is not reinforced)
- high shatter resistance
- high creep resistance
- no water intake
- good acoustic dampening ability
- good weldability

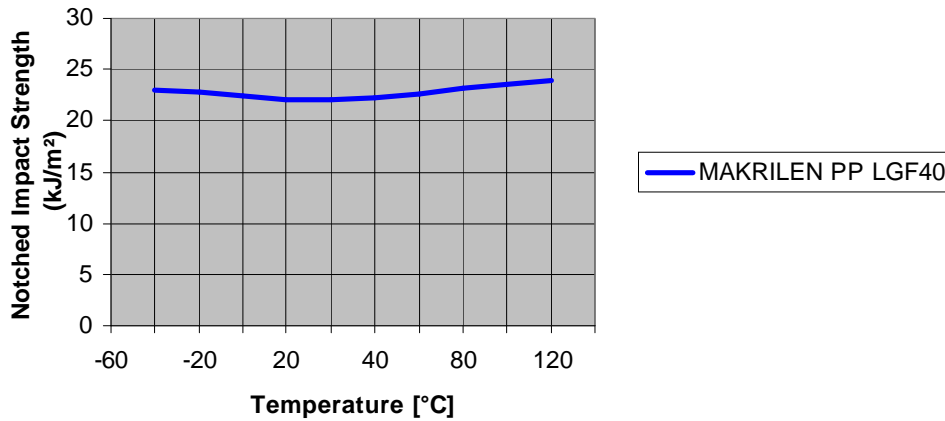
**Diagram Impact Strength/ Tensile Modulus of MAKRILEN
Compared to other Thermoplastic Materials**



The Linear Coefficient of Thermal Expansion by Comparison



Notch Impact Resistance/ Temperature Diagram



Data Overview

Properties	Norme	Unit	PP LGF20	PP LGF30	PP LGF40	PP LGF50	PP LGF60
Density	ISO 1183	g/cm ³	1,04	1,12	1,21	1,32	1,42
Tensile strength	ISO 527	MPa	80	110	120	130	120
Tensile Modulus	ISO 527	MPa	5000	7300	9100	11700	14500
Elongation at break	ISO 527	%	3,3	2,4	2,6	1,9	1,4
Flexural strength	ISO 178	MPa	110	160	175	190	225
Flexural Modulus	ISO 178	MPa	4800	7500	9200	11500	14500
Flexural elongation at break	ISO 178	%	3,1	2,8	2,6	2,3	1,3
Charpy- Impact strength	ISO 179	kJ/m ²	50	65	65	60	52
HDT A	ISO 75	°C	> 145	> 150	> 155	> 155	> 155

Examples of Applications

- **Automotive**
Battery holder, fan wheel, pedal carrier, suction module, exterior mirror foot, speaker grid
- **Engineering**
Gearshift lever, gear parts, blower hood, pump housing, coupling parts
- **Sports-/Leisure Industry**
Snowboard binding, bicycle rim, paddle, garden equipment parts
- **Household**
Water filter parts, furnace base, pot lid, housing for vacuum cleaner, fan parts, humidifier
- **Other**
Packaging container, chair frame, hose coupling

Processing Instructions

The processing of MAKRILEN should be as careful as possible so that the maximum fibre length in the component is maintained.

Thus, the screw speed, the processing pressure, the dynamic pressure and the injection speed should be kept as low as possible.

For the realisation of very good results, commercial installations are sufficient.

In high fibre ratios, the screw diameter should be at least 40 mm.

Constrictions in the plasticizing unit (mixing nozzles, etc.) are to be avoided in order to not damage the fibres. In the tool design, sprue gate is to be preferred to pin or film gate.

Usual processing parameters are:

Dynamic pressure:	10 - 30 bar	Tool temperature ca. 35 – 65°C
Injection pressure:	500 - 1100 bar	
Post pressure:	400 - 800 bar	

Subsequently, you'll find an example of the temperature sequence:

Zone 1 (feeder):	230°C	Bulk temperature: ca. 270°C
Zone 2:	245°C	
Zone 3:	260°C	
Zone 4:	270°C	
Nozzle:	275°C	

Pre-drying is generally not necessary as the material does not take up any water.

Preheating at 100-120°C for 1-2 hours is recommended. It causes the pellets to melt more quickly and thus allows for a gentle plastification.

Application technology service

The GODIPLAST application technology service provides you with advice and support with regard to:

- your choice of materials
- the construction of tools
- the optimisation of the processing conditions

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The values stated are average values which can be changed due to many possible influences. A guarantee of the stated values can generally not therefore be given. They do not release the producer from the obligation of the suitability testing of the product for the respective usage purpose.