

MAKROMID

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

General

MAKROMID is a long glass fibre reinforced polyamide distinguishing itself by excellent mechanical and thermal characteristics.

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.

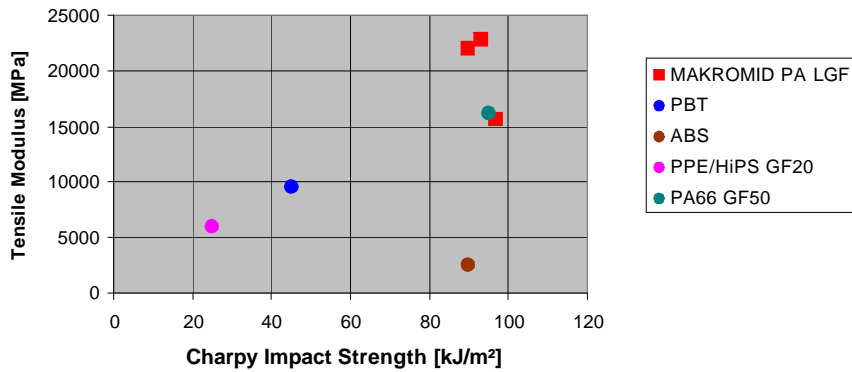
The ratio of the glass fibres can be set to a value between 20 and 60%, as required.

Due to its high stability and rigidity at a simultaneous high impact resistance and good temperature resistance, MAKROMID is a good alternative to high-performance plastics and is more and more often used in the substitution of metal die-casting.

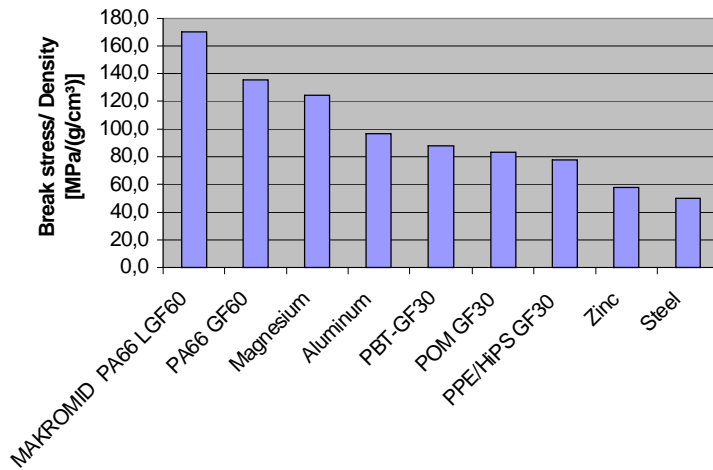
Properties

- very good stability and rigidity also at high temperatures
- very good impact resistance also at low temperatures
- very good heat resistance (HDT)
- good dimensional stability
- considerably better surface quality compared with PA short glass fibre
- very good fluidity
- very low distortion
- permanent load at high temperatures
- high shatter resistance
- very high abrasion resistance at PA66
- high energy absorption

Diagram Impact Strength/ Tensile Modulus MAKROMID Compared to other Thermoplastic Materials



Breakage Stress/ Density Ratio of Different Materials



Data Overview

Properties	Norme	Unit	PA6 LGF30	PA6 LGF40	PA6 LGF50	PA6 LGF60	PA66 LGF30	PA66 LGF40	PA66 LGF50	PA66 LGF60
Density	ISO 1183	g/cm ³	1,32	1,39	1,51	1,69	1,36	1,50	1,55	1,68
Tensile strength	ISO 527	MPa	170	215	230	255	190	210	260	285
Tensile Modulus	ISO 527	MPa	9600	14500	15600	22700	11000	13000	17000	22000
Elongation at break	ISO 527	%	2,7	2,4	2,1	2,1	2,5	2,2	2,4	2,2
Flexural strength	ISO 178	MPa	260	300	345	360	270	325	400	420
Flexural Modulus	ISO 178	MPa	9100	10200	12700	15000	10000	10900	14500	17300
Flexural elongation at break	ISO 178	%	3,6	3,1	2,8	2,2	3,7	3,6	3	2,9
Charpy- Impact strength	ISO 179	kJ/m ²	75	88	97	93	65	70	83	90
HDT A	ISO 75	°C	> 190	> 190	> 200	> 200	> 245	> 240	> 240	> 245

Examples of Applications

- **Automotive**
Casings, housing for safety belt, luggage rack support, mounting plate for water pump
- **Electro-technics**
Housing parts, handle for control cabinet, housing for measuring device
- **Engineering**
Valves, fans, gear wheels, pistons, bearing block
- **Sports-/Leisure Industry**
Ski bindings, axis for skateboards, bicycle stands
- **Household**
Refrigerator parts, carrier plate for bathroom scales
- **Other**
Tool handles, slatted frame suspension, replacement of die-casting

Processing Instructions

On commercial injection moulding machines, MAKROMID can be processed very well. Standard plasticizing units having 3 zones and a diameter starting as of 40 mm are particularly suitable as they allow for the necessary protection of the fibres. Constrictions in the material flow, e.g. by melting screens or mixing nozzles damage the long fibres and should therefore be avoided.

In the tool design, sprue gate is to be preferred to pin or film gate. Processing should be as careful as possible. Thus, the screw speed, the processing pressure, the dynamic pressure and the injection speed should be kept as low as possible.

Subsequently, you'll find in each case one example of the temperature settings of PA6 and PA66:

	MAKROMID PA6 LGF	MAKROMID PA66 LGF
Zone 1 (feeder):	265°C	320°C
Zone 2:	280°C	315°C
Zone 3:	290°C	300°C
Zone 4:	290°C	310°C
Nozzle:	300°C	320°C
Bulk temperature:	295°C	320°C
Tool temperature:	70-110°C	70-120°C

Predrying (2-4 hours at 80°C) of the pellets is recommendable. Preheating supports a quicker melting in the feed causing less damage at the fibres.

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

Contact

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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.