

TECHNICAL DATA SHEET

GRILAMID L 20 LM

General product description

Grilamid L 20 LM is a medium viscosity Polyamide 12 (PA12) extrusion grade.

Grilamid L 20 LM is UV and heat stabilised and has been modified with a nucleation agent which results in a low post crystallisation and low post shrinkage.

The special features of Grilamid L 20 LM are:

- UV and heat stabilised
- High abrasion resistance
- Very good chemical resistance
- Very good resistance to oil
- High surface quality
- Good dimensional stability
- High processing speeds
- Low density, low weight

Application examples

Grilamid L 20 LM is especially suitable for high speed extrusion of thin walled sheathings for applications such as copper wire insulation or secondary tight coating of optical fibres providing resistance against attack from termites and ants.

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PROPERTIES

Mechanical Properties

		Standard	Unit	State	Grilamid L 20 LM
Tensile E-Modulus	1 mm/min	ISO 527	MPa	cond.	1100
Tensile strength at yield	50 mm/min	ISO 527	MPa	cond.	40
Elongation at yield	50 mm/min	ISO 527	%	cond.	12
Tensile strength at break	50 mm/min	ISO 527	MPa	cond.	50
Elongation at break	50 mm/min	ISO 527	%	cond.	> 50
Impact strength	Charpy, 23°C	ISO 179/2-1eU	kJ/m ²	cond.	no break
Impact strength	Charpy, -30°C	ISO 179/2-1eU	kJ/m ²	cond.	no break
Notched impact strength	Charpy, 23°C	ISO 179/2-1eA	kJ/m ²	cond.	4
Notched impact strength	Charpy, -30°C	ISO 179/2-1eA	kJ/m ²	cond.	3
Shore-D hardness		ISO 868	-	cond.	70

Thermal Properties

Melting point	DSC	ISO 11357	°C	dry	178
Heat deflection temperature HDT/A	1.80 MPa	ISO 75	°C	dry	50
Heat deflection temperature HDT/B	0.45 MPa	ISO 75	°C	dry	125
Thermal expansion coefficient long.	23-55°C	ISO 11359	10 ⁻⁴ /K	dry	1.2
Thermal expansion coefficient trans.	23-55°C	ISO 11359	10 ⁻⁴ /K	dry	1.4
Maximum usage temperature	long term	ISO 2578	°C	dry	90 - 110
Maximum usage temperature	short term	ISO 2578	°C	dry	150

Electrical Properties

Dielectric strength		IEC 60243-1	kV/mm	cond.	32
Comparative tracking index	CTI	IEC 60112	-	cond.	600
Specific volume resistivity		IEC 60093	Ω · m	cond.	10 ¹¹
Specific surface resistivity		IEC 60093	Ω	cond.	10 ¹²

General Properties

Density		ISO 1183	g/cm ³	dry	1.01
Flammability (UL94)	0.8 mm	ISO 1210	rating	-	HB
Water absorption	23°C/sat.	ISO 62	%	-	1.5
Moisture absorption	23°C/50% r.h.	ISO 62	%	-	0.7
Linear mould shrinkage	long.	ISO 294	%	dry	0.80
Linear mould shrinkage	trans.	ISO 294	%	dry	0.85

Product-nomenclature acc. ISO 1874: PA12, MHLR, 18- 010N
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Processing information for the extrusion of Grilamid L 20 LM

This technical data sheet for Grilamid L 20 LM provides you with useful information on material preparation, machine requirements, tooling and processing.

MATERIAL PREPARATION

Grilamid L 20 LM is delivered dry and ready for processing in sealed, air tight packaging. Pre-drying is not necessary.

Storage

Sealed, undamaged bags can be kept over a long period of time in storage facilities which are dry, protected from the influence of weather and where the bags can be protected from damage.

Handling and safety

Detailed information can be obtained from the "Material Safety Data Sheet" (MSDS) which can be requested with every material order.

Drying

Grilamid L 20 LM is dried and packed with a moisture content of less than 0.10 %. Should the packaging become damaged or the material is left open too long, then the material must be dried. A too high moisture content reduces the optical (streaks) and mechanical (embrittlement) qualities of the final product.

Drying can be done as follows:

Desiccant dryer

Temperature:	max. 80°C
Time:	4 - 12 hours
Dew point of the dryer:	-30°C

Vacuum oven

Temperature:	max. 100°C
Time:	4 - 12 hours

Drying temperature

Polyamides are subject to the effects of oxidation at temperatures above 80°C in the presence of oxygen. Visible yellowing of the material is an indication of oxidation hence temperatures above 80°C for desiccant dryers and temperatures above 100°C for vacuum ovens should be avoided. In order to detect oxidation it is advised to keep a small amount of granulate (light colour only !) as a comparison sample.

With longer residence times (over 1 hour) hopper heating or a hopper dryer (80°C) is useful.

MACHINE REQUIREMENTS

Grilamid L 20 LM can be processed economically and without problems on all machines suitable for polyamides.

Screw

Wear protected, universal screws are recommended (3 zones).

Screw

Length:	24 D - 25 D
Compression ratio:	2.5 - 3.1

Grooved Feeding Zone

A grooved bush is not usually recommended for the extrusion of polyamides grades. In order to obtain a higher through-put by using a grooved bush its depth should not exceed 0.5 mm. It is recommended to maintain a constant temperature of 60 - 90 °C in the hopper zone.

PROCESSING

Basic machine settings

In order to start up the machines for processing Grilamid L 20 LM, following basic settings are recommended:

Temperatures

Hopper zone	60 - 90°C
Feeding zone	160 - 170°C
Compression zone	190 - 200°C
Metering zone	200 - 220°C
Head	200 - 220°C
Nozzle	200 - 220°C
Melt	200 - 220°C
Cooling bath temperature	15 - 40 °C

CUSTOMER SERVICES

EMS-GRIVORY is a specialist for polyamide synthesis and polyamide-processing. Our customer services are not only concerned with the manufacturing and supply of engineering thermoplastics but also provide a full of technical support program:

- Rheological design calculation / FEA
- Material selection
- Processing support
- Tool and component design

For further details concerning extrusion please refer to our Technical Information Booklet "Tube Extrusion" available from your EMS-GRIVORY specialist.

We are happy to advice you. Simply call one of our sales offices.

The recommendations and data given are based on our experience to date, however, no liability can be assumed in connection with their usage and processing.

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