

## TECHNICAL DATA SHEET

### GRILAMID L 25 W 40 HLX

#### General product description

Grilamid L 25 W 40 HLX is a flexible Polyamide 12 grade with an excellent cold impact strength and heat stability.

Grilamid L 25 W 40 HLX is specially suitable for flexible tubes (e.g. under the bonnet) which have to resist elevated temperatures. Direct contact with gasoline/petrol should be avoided. This material is especially suited for use in high temperature Diesel lines.

**Grilamid<sup>®</sup>**  
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## PROPERTIES

### Mechanical Properties

		Standard	Unit	State	Grilamid L 25 W 40 HLX
Tensile E-Modulus	1 mm/min	ISO 527	MPa	cond.	360
Tensile strength at yield	50 mm/min	ISO 527	MPa	cond.	25
Elongation at yield	50 mm/min	ISO 527	%	cond.	20
Tensile strength at break	50 mm/min	ISO 527	MPa	cond.	40
Elongation at break	50 mm/min	ISO 527	%	cond.	> 50
Impact strength	Charpy, 23°C	ISO 179/2-1eU	kJ/m <sup>2</sup>	cond.	no break
Impact strength	Charpy, -30°C	ISO 179/2-1eU	kJ/m <sup>2</sup>	cond.	no break
Notched impact strength	Charpy, 23°C	ISO 179/2-1eA	kJ/m <sup>2</sup>	cond.	no break
Notched impact strength	Charpy, -30°C	ISO 179/2-1eA	kJ/m <sup>2</sup>	cond.	10
Shore D hardness		ISO 868	-	cond.	63

### Thermal Properties

Melting point	DSC	ISO 11357	°C	dry	173
Heat deflection temperature HDT/A	1.80 MPa	ISO 75	°C	dry	45
Heat deflection temperature HDT/B	0.45 MPa	ISO 75	°C	dry	95
Thermal expansion coefficient long.	23-55°C	ISO 11359	10 <sup>-4</sup> /K	dry	1.4
Thermal expansion coefficient trans.	23-55°C	ISO 11359	10 <sup>-4</sup> /K	dry	1.8
Maximum usage temperature	long term	ISO 2578	°C	dry	80 - 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 <sup>11</sup>
Specific surface resistivity		IEC 60093	Ω	cond.	10 <sup>12</sup>

### General Properties

Density		ISO 1183	g/cm <sup>3</sup>	dry	1.02
Flammability (UL94)	0.8 mm	ISO 1210	rating	-	HB
Water absorption	23°C/sat.	ISO 62	%	-	1.4
Moisture absorption	23°C/50% r.h.	ISO 62	%	-	0.7
Linear mould shrinkage	long.	ISO 294	%	dry	0.90
Linear mould shrinkage	trans.	ISO 294	%	dry	1.25

Product-nomenclature acc. ISO 1874: PA12-HIP, EHL, 22-004

## Processing information for the extrusion of Grilamid L 25 W 40 HLX

This technical data sheet for Grilamid L 25 W 40 HLX provides you with useful information on material preparation, machine requirements, tooling and processing.

### MATERIAL PREPARATION

Grilamid L 25 W 40 HLX is delivered dry and ready for processing in sealed, air tight packaging. Pre-drying is not necessary provided the packaging is undamaged.

#### 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 25 W 40 HLX is dried and packed with a moisture content of  $\leq 0.10\%$ . Should the packaging become damaged or be left open too long, then the material must be dried. A too high moisture content can be shown by a foaming melt, excessive nozzle drool and silver streaks on the moulded part.

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 affected by 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 colours 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 25 W 40 HLX 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 usually not recommended for the extrusion of polyamides grades. Anyhow, in order to obtain a higher through-put by using a grooved bush it's depth should not exceed 0.5 mm.

### PROCESSING

#### Basic machine settings

In order to start up the machine for processing Grilamid L 25 W 40 HLX, the following basic settings can be recommended:

##### Temperatures

Hopper zone	60 - 90°C
Feeding zone	190 - 210°C
Compression zone	200 - 220°C
Metering zone	200 - 220°C
Head	200 - 220°C
Nozzle	190 - 210°C
Melt	220 - 250°C

### CUSTOMER SERVICES

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

- Rheological design calculation / FEA
- Prototype tooling
- Material selection
- Processing support
- Mould and component design

We are happy to advise 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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