

TECHNICAL DATA SHEET

GRILAMID 2D 25 W 20 X NATURAL

General product description

Grilamid 2D 25 W 20 X natural is a semi-flexible high viscosity, plasticized, high impact, heat and UV resistant extrusion grade based on polyamide 612 (PA612).

Unique properties of Grilamid 2D 25 W 20 X natural are:

- High strength, high burst pressure in tube form
- Good heat resistance
- Significantly lower water absorption compared to standard polyamides
- Good chemical and hydrolysis resistance
- Low density
- Easy processing

Application examples

Grilamid 2D 25 W 20 X natural has been developed especially for media lines in passenger cars and trucks. Thanks to its excellent resistance it is particularly suitable for fuel, diesel, air brake, oil, cooling fluid or hydraulic tubes.

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PROPERTIES

Mechanical Properties

| | | Standard | Unit | State | Grilamid 2D 25 W 20 X natural |
|------------------------------------|---------------|---------------|-------------------|--------------|----------------------------------|
| Tensile E-Modulus | 1 mm/min | ISO 527 | MPa | dry cond. | 600 400 |
| Tensile strength at 50% elongation | 50 mm/min | ISO 527 | MPa | dry cond. | 30 25 |
| Elongation at break | 50 mm/min | ISO 527 | % | dry cond. | >50 >50 |
| Impact strength | Charpy, 23°C | ISO 179/2-1eU | kJ/m ² | dry cond. | no break no break |
| Impact strength | Charpy, -30°C | ISO 179/2-1eU | kJ/m ² | dry cond. | no break no break |
| Notched impact strength | Charpy, 23°C | ISO 179/2-1eA | kJ/m ² | dry cond. | no break no break |
| Notched impact strength | Charpy, -30°C | ISO 179/2-1eA | kJ/m ² | dry cond. | 15 13 |
| Ball indentation hardness | | ISO 2039-1 | MPa | dry cond. | 39 30 |

Thermal Properties

| | | | | | |
|--------------------------------------|----------|-----------|---------------------|-----|-----|
| Melting point | DSC | ISO 11357 | °C | dry | 210 |
| 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 | 115 |
| Thermal expansion coefficient long. | 23-55°C | ISO 11359 | 10 ⁻⁴ /K | dry | 2.0 |
| Thermal expansion coefficient trans. | 23-55°C | ISO 11359 | 10 ⁻⁴ /K | dry | 1.2 |

Electrical Properties

| | | | | | |
|------------------------------|-----|-------------|-------|--------------|------------------------------------|
| Dielectric strength | | IEC 60243-1 | kV/mm | dry cond. | 37 37 |
| Comparative tracking index | CTI | IEC 60112 | - | cond. | 600 |
| Specific volume resistivity | | IEC 60093 | Ω · m | dry cond. | 10 ⁸ 10 ⁸ |
| Specific surface resistivity | | IEC 60093 | Ω | cond. | 10 ¹⁰ |

General Properties

| | | | | | |
|---------------------|----------------|----------|-------------------|-----|------|
| Density | | ISO 1183 | g/cm ³ | dry | 1.04 |
| Flammability (UL94) | 0.8 mm | ISO 1210 | rating | - | HB |
| Water absorption | 23°C/sat. | ISO 62 | % | - | 2.1 |
| Moisture absorption | 23°C/50% r. h. | ISO 62 | % | - | 0.9 |

Product-nomenclature acc. ISO 1874: PA612-HIP, E, 22-005

Processing information for the extrusion of Grilamid 2D 25 W 20 X natural

This technical datasheet for Grilamid 2D 25 W 20 X natural provides you with information on material preparation, machine requirements, tooling and processing.

MATERIAL PREPARATION

Grilamid 2D 25 W 20 X natural is delivered dry in sealed, air tight packaging.

Storage

The sealed bags have to be stored dry and protected from any 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 2D 25 W 20 X natural is delivered 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 affects the processability and also the mechanical properties of the extruded tube. With longer residence times of the material in the hopper (over 0.5 hour) we recommend to use a smaller hopper or a hopper dryer (80°C).

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

The material should not be dried with temperatures above 80°C for desiccant dryers. Temperatures above 100°C for vacuum ovens should be avoided.

MACHINE REQUIREMENTS

Grilamid 2D 25 W 20 X natural can be processed on all machines suitable for polyamides.

Screw

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

Screw

| | |
|--------------------|---------------|
| Length: | 24 D - 26 D |
| Compression ratio: | 2.8:1 - 3.5:1 |

Grooved Feeding Zone

The material can be extruded with smooth or grooved feeding zone where the grooves do not exceed a depth of 0.5 mm. It is recommended to keep the hopper zone within a temperature range of 40 - 90 °C.

PROCESSING

Basic machine settings

As basic settings we recommend the following parameters for the processing Grilamid 2D 25 W 20 X natural:

Temperatures

| | |
|------------------|-----------|
| Hopper zone | 40-90°C |
| Feeding zone | 230-260°C |
| Compression zone | 230-260°C |
| Metering zone | 230-260°C |
| Head | 230-260°C |
| Nozzle | 230-260°C |
| Melt | 230-260°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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This version replaces all previous product specific data sheets.

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