

# TECHNICAL DATA SHEET

## GRILON BM 17 NATURAL

### Product Description

Grilon BM 17 natural is a medium viscosity multi-polyamide with a low melting point.

Grilon BM 17 natural has the following features:

- High flexibility and toughness
- Very good orientation and thermoforming properties
- High shrinkage
- Very good transparency
- Low melting point (169 °C)
- Low glass transition point (43 °C)

### Application Examples

Grilon BM 17 natural has been specially developed for cast and blown films coextruded with temperature sensitive polymers (PVDC, EVOH).

Grilon BM 17 natural is suitable for flexible packaging for foodstuffs e.g. (shrinkable) film for consumer packaging of meat, cheese, sausage or fish.

**GRILON**<sup>®</sup>  
**EMS**

## PROPERTIES

### Thermal Properties

		Norm	Unit	State	Grilon BM 17 natural
Melting point	DSC	ISO 11357	°C	-	169
Melt volume rate (MVR)	275°C / 5 kg	ISO 1133	cm <sup>3</sup> /10 min	dry	100

### General Properties

Density		ISO 1183	g/cm <sup>3</sup>	dry	1.09
Water absorption	23°C/sat.	ISO 62	%	-	10
Moisture absorption	23°C/50 % r.h.	ISO 62	%	-	3
Shrink <sup>1)</sup>		EMS	%	-	50
Gloss	60°	ISO 2813	-	-	64
Haze		ISO 14782	%	-	19

### Barrier Properties (50 µm films)

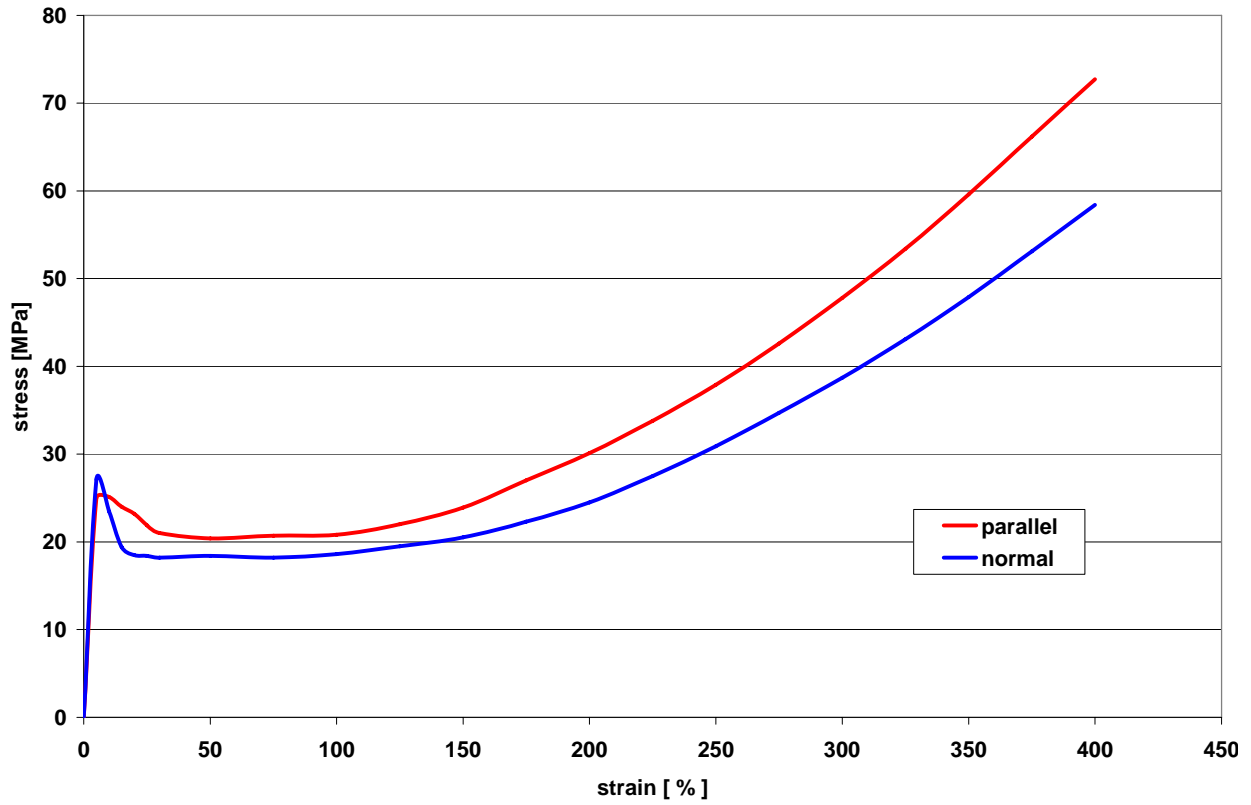
O <sub>2</sub> -Transmission rate	23°C/ 0 % r.h.	DIS/ISO 15105-1	cm <sup>3</sup> /m <sup>2</sup> 24h bar	-	110
	23°C/85 % r.h.		cm <sup>3</sup> /m <sup>2</sup> 24h bar	-	75
CO <sub>2</sub> -Transmission rate	23°C/ 0 % r.h.	DIS/ISO 15105-2	cm <sup>3</sup> /m <sup>2</sup> 24h bar	-	275
	23°C/85 % r.h.		cm <sup>3</sup> /m <sup>2</sup> 24h bar	-	290
Moisture vapour transmission rate	23°C/85 % r.h.	DIS/ISO 15106-1	g/m <sup>2</sup> 24h	-	15

### Mechanical Properties

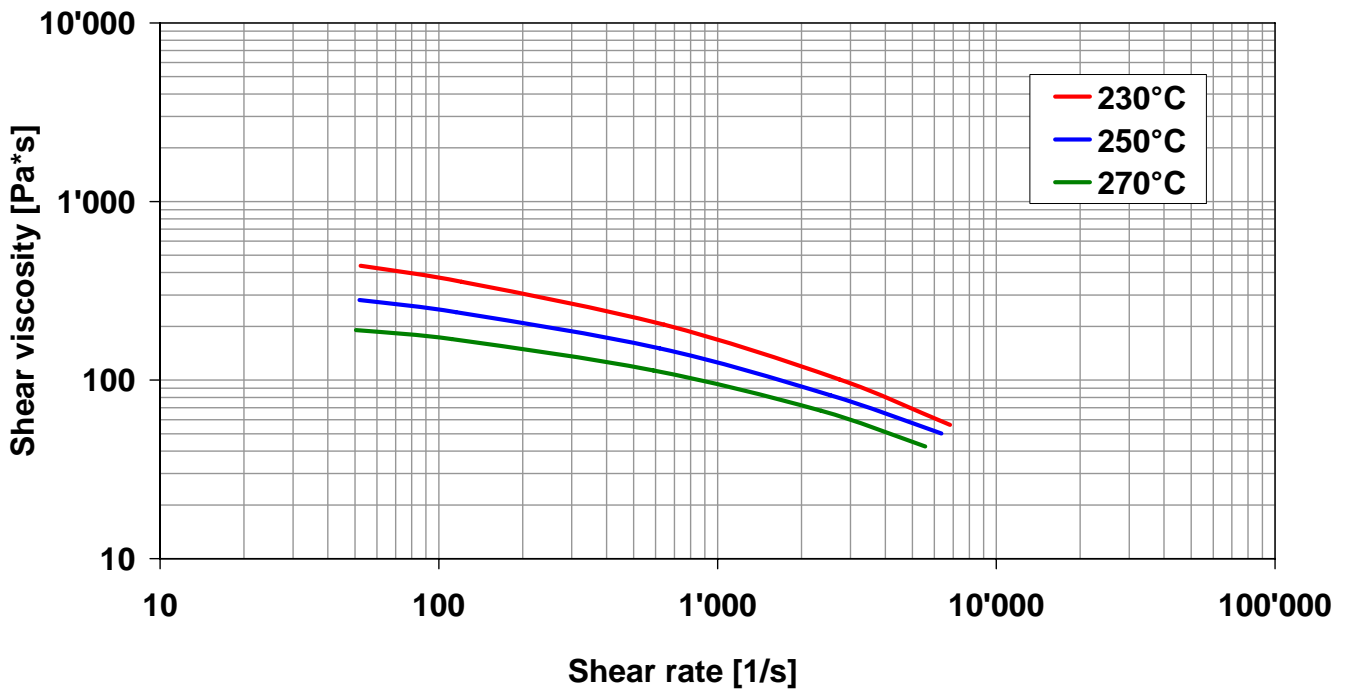
Tensile E-modulus	4 mm test bar	ISO 527-2	MPa	cond.	650
Stress at yield	parallel	ISO 527-3	MPa	cond.	25
	normal				25
Strain at yield	parallel	ISO 527-3	%	cond.	7
	normal				6
Stress at break	parallel	ISO 527-3	MPa	cond.	70
	normal				60
Strain at break	parallel	ISO 527-3	%	cond.	400
	normal				400
Tear resistance	parallel	ISO 6383-1	MPa	cond.	40
	normal				80
Dynamic coefficient of friction	parallel	ISO 8295	-	cond.	0.8

<sup>1)</sup> 50 µm 7 layer-film, biaxially oriented (draw ratio 3.5-4 :1), afterwards shrinkage in water at 90°C

### Stress & Strain of Grilon BM 17 natural (50 µm films)



### Viscosity function of Grilon BM 17 natural



# Information for Extrusion Processing of Grilon BM 17 natural

This technical data sheet for Grilon BM 17 natural provides you with useful information on material preparation, machine requirements and processing.

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

## MATERIAL PREPARATION

Grilon BM 17 natural is delivered dry and ready for processing in sealed packaging. Predrying 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

Grilon BM 17 natural is dried and packed with a moisture content of less than 0.10 %. The processing of moist material reduces the optical and mechanical quality of the application. A too high moisture content can result in fish eyes, streaks and brittleness.

Drying can be done as follows:

#### Desiccant dryer

Temperature	max. 80°C
Time	4 - 12 hours
Dew point	-30°C

#### Vacuum oven

Temperature	max. 100°C
Time	4 - 12 hours

### Drying time

If there is only slight evidence of foaming of the melt or just traces of silver streaks on the part, then the above mentioned minimal drying time will be sufficient. Material, which is stored open over days, which shows strong foaming, is unusually easy flowing or shows streaks on the article, requires the maximal drying time.

### 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.

## MACHINE REQUIREMENTS

Grilon BM 17 natural can be processed economically and without problems on all extrusion lines suitable for polyamides.

### Screw

Wear protected, 3-zone universal screws are recommended.

#### Screw

Length	24 D - 32 D
Compression ration	2.5 - 3.5

### Heating

At least three separately controllable heating zones, capable of reaching cylinder temperatures of up to 270°C are recommended. The cylinder flange and adapter must be able to be heated.

## PROCESSING

### Temperatures

For the start up of processing Grilon BM 17 natural the following parameters can be recommended:

#### Temperatures

Hopper	15 - 60°C
Zone 1	160 - 180°C
Zone 2	180 - 200°C
Zone 3	180 - 200°C
Adapter	180 - 200°C
Die	180 - 200°C
Melt	180 - 200°C

In the case of grooved feed zones it is recommended to temper these zones between 80 and 180°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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