

## TECHNICAL DATA SHEET

### GRILON CF 6 S

#### General product description

Grilon CF 6 S is an extracted copolyamide with a low melting point.

- Very high flexibility and toughness
- Very good thermoforming and orientation properties
- High shrink
- Very good transparency
- Low melting point (130°C)

#### Application examples

Grilon CF 6 S is suitable for the manufacture of both flat and blown coextruded films with temperature sensitive polymers such as PVDC and EVOH.

Typical applications are cook in bag for meat, cheese, deep-draw consumer and medical packaging and asymmetric barrier film structures.

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## PROPERTIES

### Thermal Properties

|                        |              | Standard  | Unit       | Grilon CF 6 S |
|------------------------|--------------|-----------|------------|---------------|
| Melting point          | DSC          | ISO 11357 | °C         | 130           |
| Melt volume rate (MVR) | 275°C / 5 kg | ISO 1133  | cm³/10 min | 180           |

### General Properties

|                      |              |           |       |      |
|----------------------|--------------|-----------|-------|------|
| Density              |              | ISO 1183  | g/cm³ | 1.05 |
| Water absorption     | 23°C/sat.    | ISO 62    | %     | 5    |
| Moisture absorption  | 23°C/50 % RH | ISO 62    | %     | 2    |
| Shrink <sup>1)</sup> |              | EMS       | %     | 35   |
| Gloss                | 60°          | ISO 2813  | -     | 130  |
| Haze                 |              | ISO 14782 | %     | --   |

### Barrier Properties (50 µm films)

|                                    |              |                 |   |     |
|------------------------------------|--------------|-----------------|---|-----|
| O <sub>2</sub> -Transmission rate  | 23°C/ 0 % RH | DIS/ISO 15105-1 | cm <sup>3</sup> /m <sup>2</sup> 24h bar | 120 |
|                                    | 23°C/85 % RH |                 | cm <sup>3</sup> /m <sup>2</sup> 24h bar | 200 |
| CO <sub>2</sub> -Transmission rate | 23°C/ 0 % RH | DIS/ISO 15105-2 | cm <sup>3</sup> /m <sup>2</sup> 24h bar | 400 |
|                                    | 23°C/85 % RH |                 | cm <sup>3</sup> /m <sup>2</sup> 24h bar | 800 |
| Moisture vapour transmission rate  | 23°C/85 % RH | DIS/ISO 15106-1 | g/m <sup>2</sup> 24h                    | 15  |

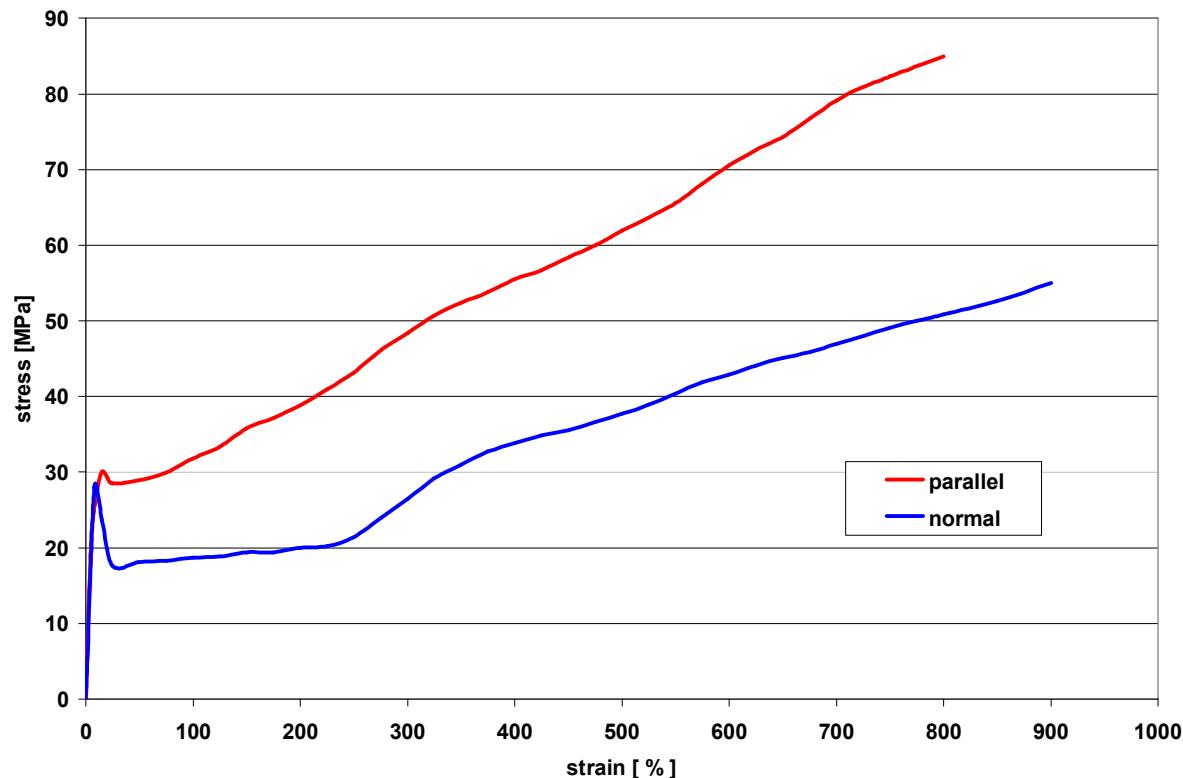
### Mechanical Properties

|                           |                    |            |                       |            |
|---------------------------|--------------------|------------|-----------------------|------------|
| Tensile E-Modulus         |                    | ISO 527-2  | MPa                   | 400        |
| Stress at yield           | parallel<br>normal | ISO 527-3  | MPa                   | 30<br>28   |
| Strain at yield           | parallel<br>normal | ISO 527-3  | %                     | 15<br>8    |
| Stress at break           | parallel<br>normal | ISO 527-3  | MPa                   | 85<br>55   |
| Strain at break           | parallel<br>normal | ISO 527-3  | %                     | 800<br>900 |
| Tear resistance           | parallel<br>normal | ISO 6383-1 | N/mm                  | 65<br>65   |
| Elmendorf tear resistance | parallel<br>normal | ISO 6383-2 | N                     | 80<br>80   |
| Dart drop impact          | A<br>B             | ISO 7765-1 | g                     | --<br>--   |
| Gelboflextest             | 900 cycles         | EMS        | holes/ m <sup>2</sup> | 100        |

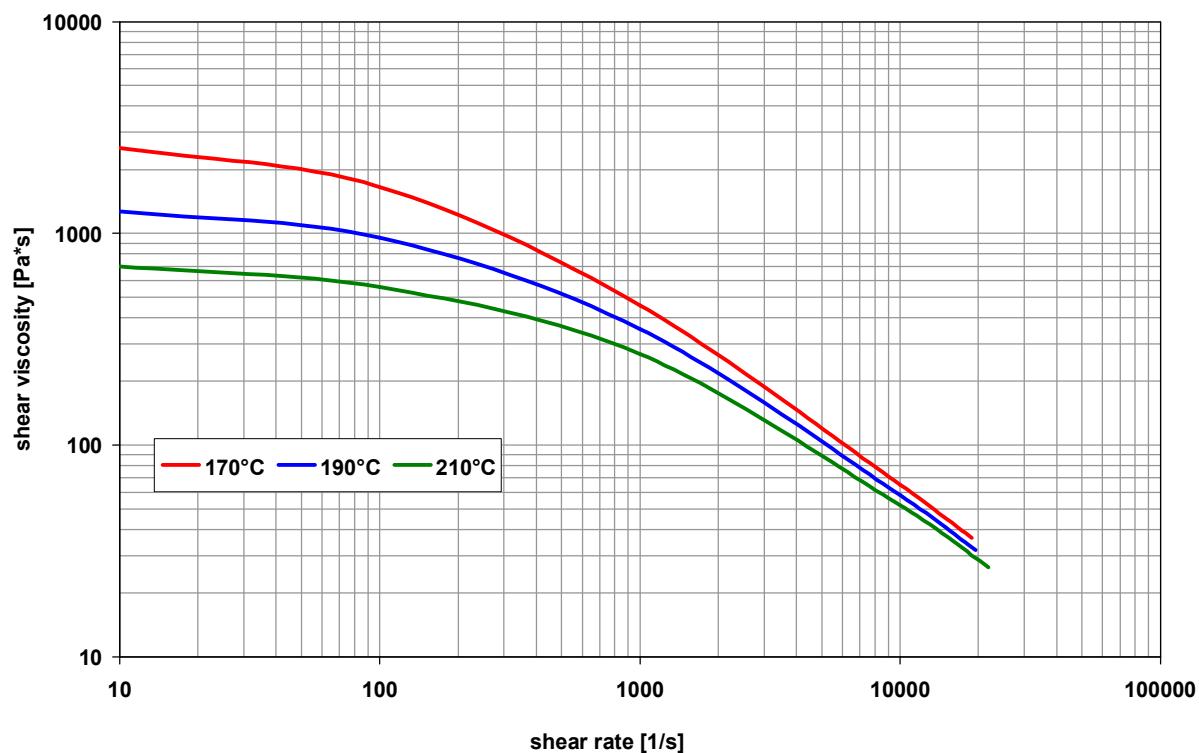
Product nomenclature acc. ISO 1874: PA 6/12, FT, 16-007

<sup>1)</sup> 80 µm film applied on 160 µm Ionomer, biaxially oriented at 70°C (draw ratio 2:1), afterwards shrinkage in water at 85°C

## Stress & Strain Grilon CF 6 S



## Viscosity function Grilon CF 6 S



# Processing information for the extrusion of Grilon CF 6 S

This technical data sheet for Grilon CF 6 S provides you with useful information on material preparation, machine requirements and processing.

## MATERIAL PREPARATION

Grilon CF 6 S is delivered dry and ready for processing in sealed, air tight 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 CF 6 S 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 of the dryer: | -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 in open over days, which shows strong foaming, is unusually easy flowing melt or streaks on the article, then the maximal drying time is required.

### Drying temperature

Polyamides are subjected to the affects 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.

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

## MACHINE REQUIREMENTS

Grilon CF 6 S can be processed economically and without problems on all extrusion lines suitable for polyamides.

### Screw

Wear protected, Universal 3 zone screws are recommended.

#### Screw

|                     |             |
|---------------------|-------------|
| Length:             | 24 D - 30 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 CF 6 S the following parameters can be recommended:

#### Temperatures

|         |             |
|---------|-------------|
| Hopper  | 15 - 60°C   |
| Zone 1  | 150 - 170°C |
| Zone 2  | 160 - 180°C |
| Zone 3  | 160 - 180°C |
| Adapter | 160 - 180°C |
| Mould   | 160 - 180°C |
| Die     | 160 - 180°C |
| Melt    | 160 - 180°C |

In cases where the use of grooved feed zones is employed it is recommended to temper this zone between 60 and 80°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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