TECHNICAL DATA SHEET

GRIVORY G 16

General product description

Grivory G 16 is a low viscosity amorphous copolyamide. It is suitable for injection - stretch blow moulding, injection blow moulding, extrusion blow moulding, the manufacture of coextruded blown film and mono or coex cast film and extrusion of mono- and multilayer tubes. Grivory G 16 is also used as an additive for polyamide 6 and different copolyamides to improve film properties.

- Highly transparent and high surface gloss
- Very good chemical resistance
- Very good abrasion resistance
- Excellent resistance to heat distortion
- Excellent flavour and aroma barrier
- Low transmission of UV-radiation
- Improved gas and aroma barrier at elevated relative humidity

Application examples

Barrier layer for mono- or co-extruded for packaging of cosmetics and foodstuffs. modifier of polyamide 6 barrier layers for flexible packaging of meat, cheese or any other foodstuff.

GRIVORY®

EMS

PROPERTIES

Thermal Properties

		Standard	Unit	Grivory G 16
Glass transition temperature	DSC	ISO 11357	°C	125
Melt volume rate (MVR)	275°C / 5 kg	ISO 1133	ml/10 min	100

General Properties

Density		ISO 1183	g/cm³	1.18
Water absorption	23°C/sat.	ISO 62	%	7
Moisture absorption	23°C/50 % RH	ISO 62	%	2
Shrink[1)]		EMS	%	--
Gloss	60°	ISO 2813	-	160
Haze		ISO 14782	%	--

Barrier Properties (50 µm films)

O_2-Transmission rate	23°C/ 0 % RH	DIS/ISO 15105-1	cm³/m² 24h bar	30
	23°C/85 % RH		cm³/m² 24h bar	10
CO_2-Transmission rate	23°C/ 0 % RH	DIS/ISO 15105-2	cm³/m² 24h bar	90
	23°C/85 % RH		cm³/m² 24h bar	40
Moisture vapour transmission rate	23°C/85 % RH	DIS/ISO 15106-1	g/m² 24h	7

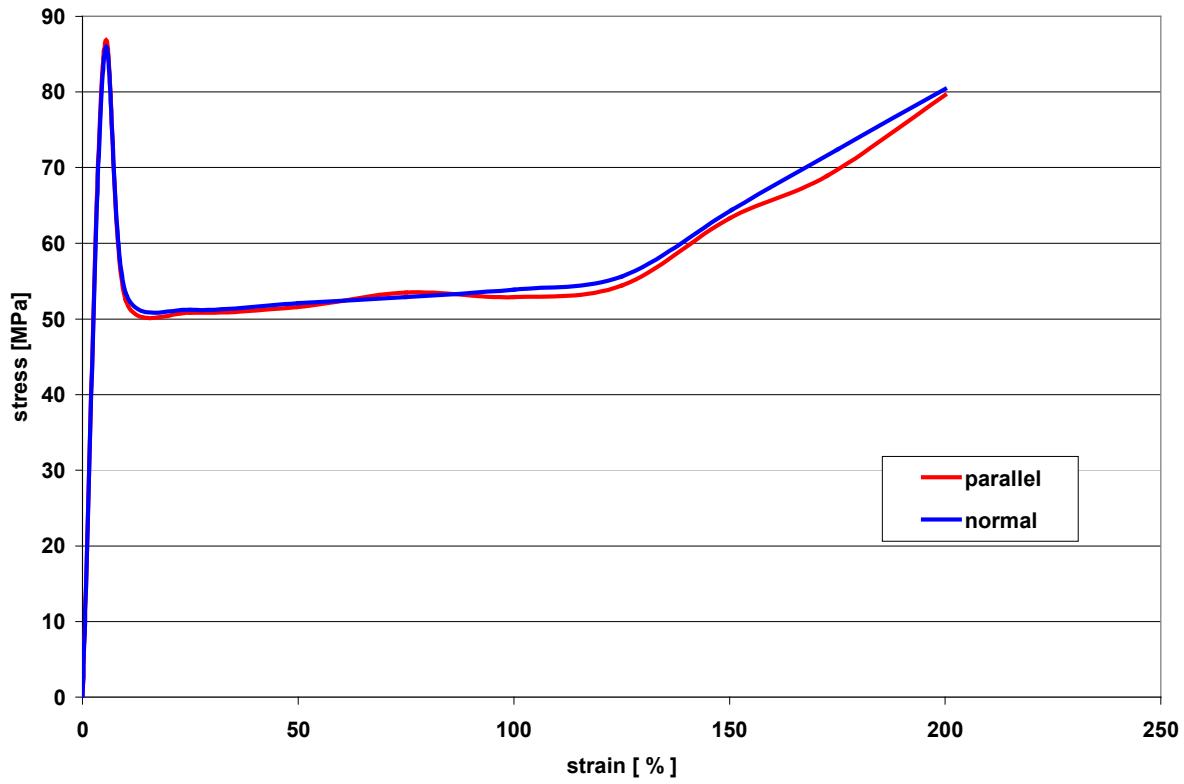
Mechanical Properties

Tensile E-Modulus		ISO 527-2	Mpa		3000
Stress at yield	parallel normal	ISO 527-3	Mpa		85 85
Strain at yield	parallel normal	ISO 527-3	%		5 5
Stress at break	parallel normal	ISO 527-3	Mpa		80 80
Strain at break	parallel normal	ISO 527-3	%		200 200
Tear resistance	parallel normal	ISO 6383-1	N/mm		5 5
Elmendorf tear resistance	parallel normal	ISO 6383-2	N		10 10
Dart drop impact	A B	ISO 7765-1	G		-- --
Notched impact strength	Charpy, 23°C	ISO 179 /2-1eA	kJ/m²	dry cond.	8 8
Notched impact strength	Charpy, -30°C	ISO 179 /2-1eA	kJ/m²	dry cond.	8 2
Gelboflextest	900 cycles	EMS	holes/ m²		--

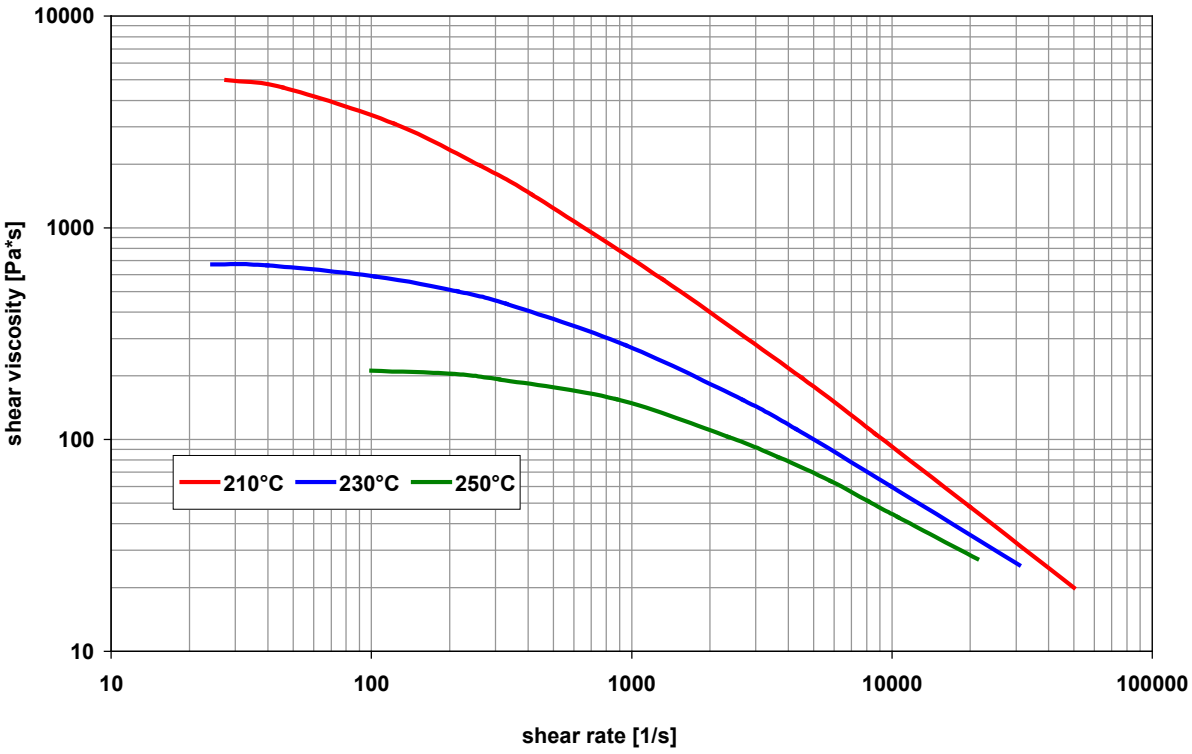
Product nomenclature acc. ISO 1874: PA 6I/6T, FT, 09-030

[1)] 80 µm film applicated on 160 µm Iononmer, biaxially oriented at 70°C (draw ratio 2:1), afterwards shrinkage in water at 85°C

Stress & Strain Grivory G 16



Viscosity function Grivory G 16



Processing information for the extrusion of Grivory G 16

This technical data sheet for Grivory G 16 provides you with useful information on material preparation, machine requirements and processing.

MATERIAL PREPARATION

Grivory G 16 is delivered dry and ready for processing in sealed, air tight packaging. Predrying is not necessary.

Storage
Sealed, undamaged bags can be kept for 6 months 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
Grivory G 16 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

Grivory G 16 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 Grivory G 16 the following parameters are recommended:

Temperatures

Hopper	15 - 60°C
Zone 1	220 - 230°C
Zone 2	225 - 235°C
Zone 3	235 - 245°C
Adapter	235 - 245°C
Mould	235 - 245°C
Die	235 - 250°C
Melt	235 - 250°C

In cases where the use of grooved feed zones is employed it is recommended to temper this zone between 80 and 160°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.

TOO/08.2002
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