

TECHNICAL DATA SHEET

GRILON F 47 NL

General product description

Grilon F 47 NL is a nucleated, high viscosity polyamide 6.

This product exhibits the following features:

- Good gas barrier
- Good mechanical properties
- Good barrier against oils and fats
- Good optical properties

Application examples

Grilon F 47 NL is suitable for the production of mono- or co-extruded blown film.

Grilon F 47 NL is used as barrier layer for multilayer vacuum bags and thermoformed pouches for various products such as food and medical applications.

GRILON®
EMS

PROPERTIES

Thermal Properties

		Standard	Unit	Grilon F 47 NL
Melting point	DSC	ISO 11357	°C	222
Melt volume rate (MVR)	275°C / 5 kg	ISO 1133	cm ³ /10 min	15

General Properties

Density		ISO 1183	g/cm ³	1.14
Water absorption	23°C/sat.	ISO 62	%	9
Moisture absorption	23°C/50 % RH	ISO 62	%	3
Shrink ¹⁾		EMS	%	--
Gloss	60°	ISO 2813	-	100
Haze		ISO 14782	%	--

Barrier Properties (50 µm films)

O ₂ -Transmission rate	23°C/ 0 % RH	DIS/ISO 15105-1	cm ³ /m ² 24h bar	25
	23°C/85 % RH		cm ³ /m ² 24h bar	50
CO ₂ -Transmission rate	23°C/ 0 % RH	DIS/ISO 15105-2	cm ³ /m ² 24h bar	80
	23°C/85 % RH		cm ³ /m ² 24h bar	250
Moisture vapour transmission rate	23°C/85 % RH	DIS/ISO 15106-1	g/m ² 24h	15

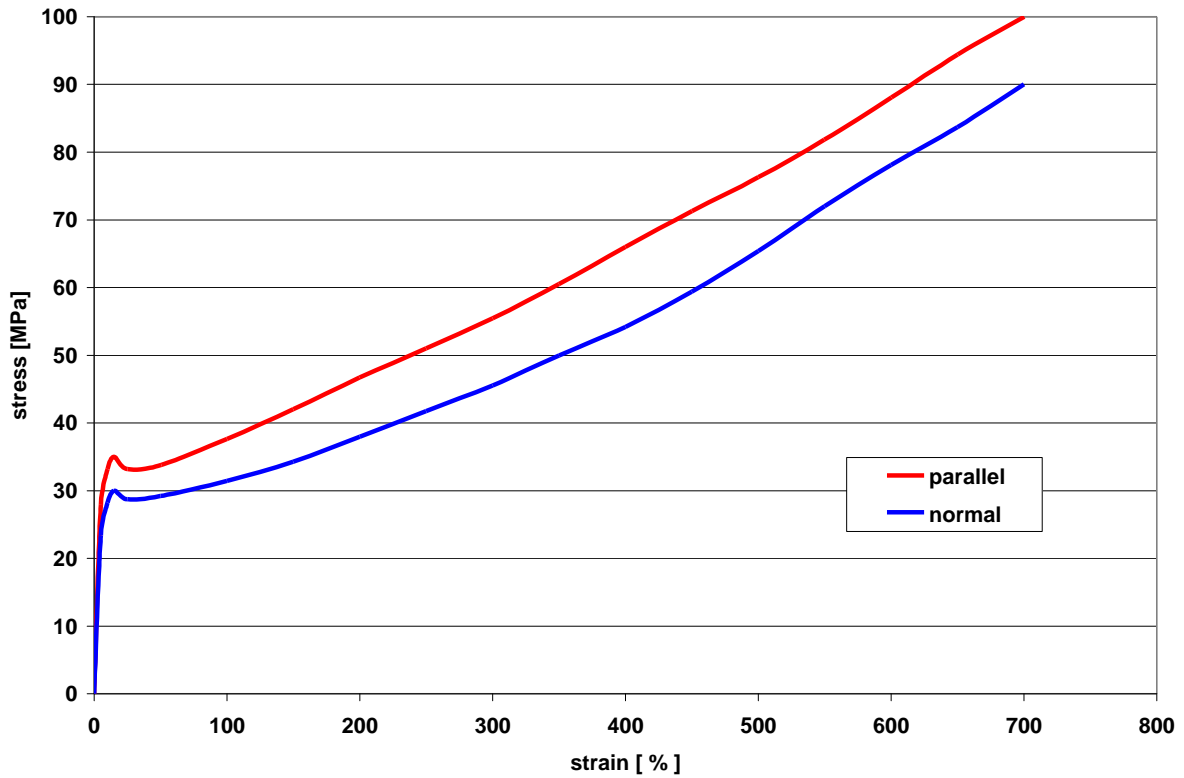
Mechanical Properties

Tensile E-Modulus		ISO 527-2	MPa	750
Stress at yield	parallel	ISO 527-3	MPa	35
	normal			30
Strain at yield	parallel	ISO 527-3	%	15
	normal			15
Stress at break	parallel	ISO 527-3	MPa	100
	normal			90
Strain at break	parallel	ISO 527-3	%	700
	normal			700
Tear resistance	parallel	ISO 6383-1	N/mm	30
	normal			30
Elmendorf tear resistance	parallel	ISO 6383-2	N	10
	normal			10
Dart drop impact	A	ISO 7765-1	g	--
	B			--
Gelboflectest	900 cycles	EMS	holes/ m ²	900
Dynamic Coefficient of friction	parallel	ISO 8295	-	0.25

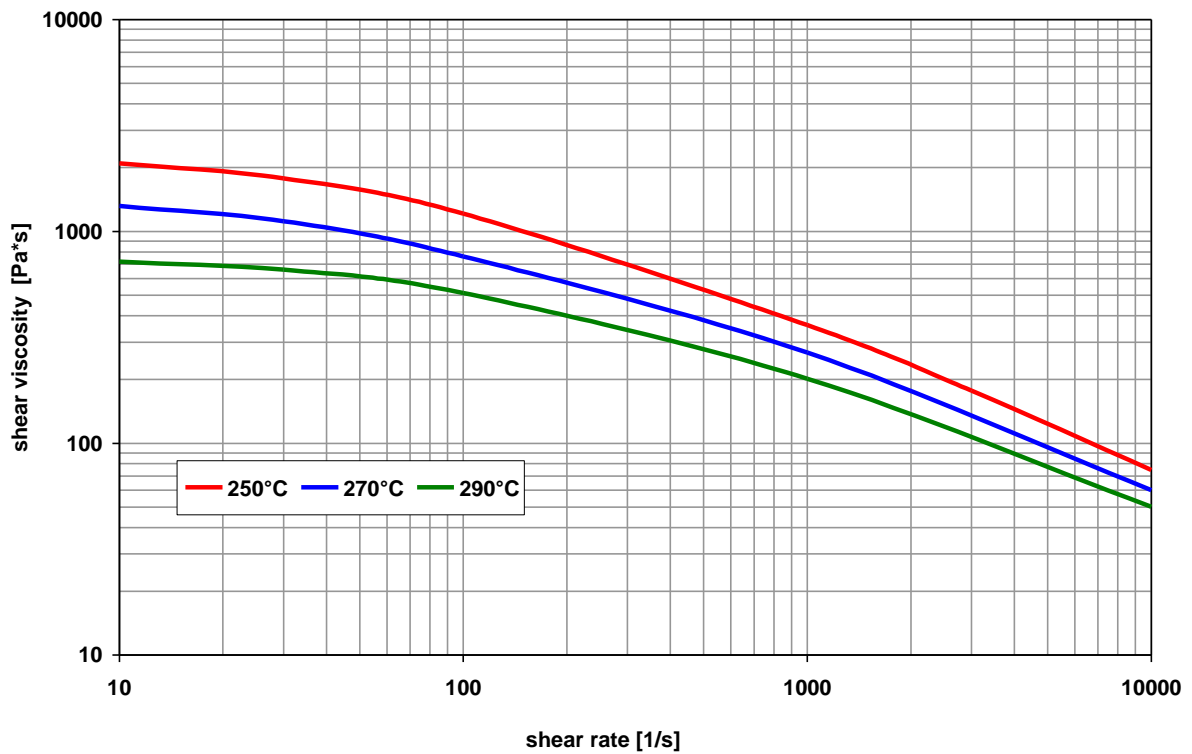
Product nomenclature acc. ISO 1874: PA 6, FS, 32-030/N

¹⁾ 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 F 47 NL



Viscosity function Grilon F 47 NL



Processing information for the extrusion of Grilon F 47 NL

This technical data sheet for Grilon F 47 NL provides you with useful information on material preparation, machine requirements and processing.

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

MATERIAL PREPARATION

Grilon F 47 NL 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 F 47 NL 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.

MACHINE REQUIREMENTS

Grilon F 47 NL 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 F 47 NL the following parameters can be recommended:

Temperatures

Hopper	15 - 60°C
Zone 1	240 - 250°C
Zone 2	240 - 255°C
Zone 3	245 - 265°C
Adapter	245 - 265°C
Mould	245 - 265°C
Die	250 - 265°C
Melt	250 - 265°C

In cases where the use of grooved feed zones is employed it is recommended to temper this zone 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.