

3M™ Dyneon™ PTFE Granules TF 1645

Product Description

Free-flowing suspension PTFE for general compression moulding of applications like seals, shaped parts and automatically or isostatically moulded articles.

Special Features

- Meets ASTM D 4894 Type IV, Grade 2 classification
- Produced by suspension polymerisation
- Good mould filling behaviour
- Very good free-flowing properties
- Good mechanical properties
- Low shrinkage
- Excellent chemical inertness
- Low friction behaviour
- Good flame retardance
- Exceptional temperature resistance

Properties	Test method	Unit	Value*
Bulk Density	DIN EN ISO 60	g/l	840
Average Particle Size	ISO 13320	µm	450
Powder Flow Properties			Very good free-flowing
Specific Gravity	DIN EN ISO 12086	g/cm ³	2.15
Tensile Strength (0.2 mm film)	DIN EN ISO 527-3	MPa	37
Elongation at Break (0.2 mm film)	DIN EN ISO 527-3	%	400
Hardness Shore D	DIN EN ISO 868	-	56
Shrinkage, Cylinder 45 mm diameter	Internal Dyneon method	%	2.5
Tensile Modulus	DIN EN ISO 527	MPa	600
Deformation Under Load (15 MPa)	Similar to ASTM D 621, 24 h	%	16
	Similar to ASTM D 621, 100 h	%	17
	Similar to ASTM D 621, permanent	%	10
Thermal Conductivity	DIN 52 612	W/m • K	0.22
Coefficient of Linear Expansion (parallel to moulding direction)	DIN 53 752, 30 - 100 °C	K ⁻¹	12 • 10 ⁻⁵
	DIN 53 752, 30 - 200 °C	K ⁻¹	14 • 10 ⁻⁵
	DIN 53 752, 30 - 260 °C	K ⁻¹	17 • 10 ⁻⁵
Flammability	UL 94	-	V-0
Dielectric Strength (0.2 mm film)	DIN EN ISO 12086	kV/mm	55
Volume Resistivity	IEC 60093	Ω • cm	10 ¹⁸
Surface Resistance	IEC 60093	Ω	10 ¹⁷

* typical values

3M™ Dyneon™ PTFE Granules TF 1645

Typical Properties

PTFE moulding powder with very good free-flowing and feeding properties consisting of relatively large particles with high bulk density.

Typical Applications

3M™ Dyneon™ PTFE Granules TF 1645 is a free-flowing compression moulding powder for applications like shaped parts, moulded cylinders or blocks, automatically and isostatically moulded articles – e.g. lined pipes or valves – and for the production of semi-finished products.

Processing Recommendations

3M™ Dyneon™ PTFE Granules TF 1645 can be processed by compression and isostatic moulding and in the next step by sintering the moulded part. This type of free-flowing product needs a relatively low compression ratio compared to non-free-flowing materials. Furthermore it has good feeding properties, which are required for the homogeneous filling of isostatic or automatic moulds with narrow cavities.

To achieve optimum properties, compression moulding should be carried out within a temperature range of 23 °C to 26 °C at a recommended pressure of 30 MPa. The sintering temperature should be in the range of 375 °C to 380 °C.

The necessary pressure holding time varies with the size of moulded part. Lower moulding pressures usually result in inferior physical properties. For the following sintering process step a programmable oven is a prerequisite for good physical properties of the moulded part. In this sintering cycle the temperature is raised slowly from room temperature up to 375 °C and then cooled down at a certain rate. Sintering time, interim holding steps at lower temperature levels and cooling rate depend on the dimension of the compressed mould and determine the quality of the finished product.

Storage and Handling

3M™ Dyneon™ PTFE Granules TF 1645 can be stored for a relatively long period of time. It should preferably be stored in a clean, dry place at a temperature of less than 30 °C. Before processing it is advisable to store the material in a sealed container for 24 hours in the production area. This is particularly important if ambient temperature is low; in such cases the material should be conditioned for up to 72 hours in the production area.

If transport or storage temperatures are too high, the material may agglomerate in its container. In such cases, it is advisable to store the material for 48 hours at below 23 °C and then sieve it (mesh size 4 mm) before filling the mould.

Safety Instructions

Follow the normal precautions observed with all fluoropolymer materials.

Please consult the Material Safety Data Sheet and Product Label for information regarding the safe handling of the material. By following all precautions and safety measures, processing these products poses no known health risks. General handling/processing precautions include: 1) Process only in well-ventilated areas. 2) Do not smoke in areas contaminated with powder/residue from these products. 3) Avoid eye contact. 4) If skin comes into contact with these products during handling, wash with soap and water afterwards. 5) Avoid contact with hot fluoropolymer.

Potential hazards, including release of toxic vapours, can arise if processing occurs under excessively high temperature conditions. Vapour extractor units should be installed above processing equipment. When cleaning processing equipment, do not burn off any of this product with a naked flame or in a furnace.

Delivery Form

3M™ Dyneon™ PTFE Granules TF 1645 is delivered in granular form.

Packaging sizes are:

- 25 kg plastic drum
- 50 kg plastic drum

3M™ Dyneon™ PTFE Granules TF 1645

Important Notice

All information set forth herein is based on our present state of knowledge and is intended to provide general notes regarding products and their uses. It should not therefore be construed as a guarantee of specific properties of the products described or their suitability for a particular application. Because conditions of product use are outside Dyneon's control and vary widely, user must evaluate and determine whether a Dyneon product will be suitable for user's intended application before using it.

The quality of our products is warranted under our General Terms and Conditions of Sale as now are or hereafter may be in force.

Technical information, test data, and advice provided by Dyneon personnel are based on information and tests we believe are reliable and are intended for persons with knowledge and technical skills sufficient to analyze test types and conditions, and to handle and use raw polymers and related compounding ingredients.

No license under any Dyneon or third party intellectual rights is granted or implied by virtue of this information.

General recommendations on health and safety in processing, on work hygiene and on measures to be taken in the event of accident are detailed in our material safety data sheets.

You will find further notes on the safe handling of fluoropolymers in the brochure "[Guide for the safe handling of Fluoropolymers Resins](#)" (download link) by PlasticsEurope, Box 3, B-1160 Brussels, Tel. +32 (2) 676 17 32.

You can also download it with your smartphone using the QR code below.



Customer Service

Europe
Phone: 00 800 396 366 27
Fax: 00 800 396 366 39
Italy
Phone: 800 7 910 18
Fax: 800 7 810 19
USA
Phone: +1 800 810 8499
Fax: +1 800 635 8061

Technical Service Fluoroplastics

Dyneon GmbH
3M Advanced Materials Division
Industrieparkstraße 1
84508 Burgkirchen
Germany
Phone: +49 8679 7 4709
Fax: +49 8679 7 5037

Technical Service Fluoroelastomers & Polymer Processing Additives

3M Belgium N.V.
3M Advanced Materials Division
Canadastraat 11,
Haven 1005
2070 Zwijndrecht
Belgium
Phone: +32 3 250 7868
Fax: +32 3 250 7905

Technical Service PTFE Compounds

Dyneon B.V.
3M Advanced Materials Division
Tunnelweg 95
6468 EJ Kerkrade
The Netherlands
Phone: +31 45 567 9600
Fax: +31 45 567 9619

We will gladly supply further contact details for our full network of global sales offices. Alternatively, find them [here](#).



Web Site: www.dyneon.eu

Printed in Germany
© Dyneon 2013
Status: Jul. 2013

3M, Dyneon and Dynamar are Trademarks of 3M Company.
All Rights reserved. The present edition replaces all previous versions. Its content is being continuously adjusted to reflect the current level of knowledge. Please make sure and inquire if in doubt whether you have the latest edition.