

Description

INOFLON® M685 is a white powder with nominal particle size of 35 µm. This next generation fine cut resin is chemically modified to give superior performance than standard PTFE. This new material offer engineering products with higher permeation resistance, lower creep, longer flex life, smoother surfaces with higher transparency and better high-voltage dielectric properties and weldability with higher mechanical properties. Modified PTFE has the same performance characteristics of standard PTFE, viz. exceptional chemical resistance, high and low temperature capabilities, anti-stick performance and low friction.

Its significantly lower melt viscosity than standard PTFE gives better particle fusion during sintering and smoother surfaces results improved performance. Manufacturing components of INOFLON® M685 is easier and more efficient than ever before, due to the high-strength welding and thermoforming capabilities. Parts and shapes made of modified PTFE can be assembled by heat welding and shaped by thermoforming. They can be joined without adhesives using moderate pressure in an oven, developing bonds with strength approaching that of the parts themselves. Welded sections can be subsequently thermoformed with no significant loss of strength.

Typical End Use Products

INOFLON® M685 is a fine-cut resin designed for compression molding of blocks and sheets and for use as a base resin for compounds. Due to its significantly reduced cold flow properties, it can be used preferably in application such as seal rings, valve seats or bearing pads. The usage as compounds makes this reduced cold flow benefit even more beneficial.

The improved barrier properties, a consequence of the reduced permeation, makes the material to be the ideal solution for diaphragms, bellows, pressure house bearings, linings and encapsulations.

Processing

Before using, the powder must be conditioned below 21°C (70°F). First mold is filled with resin and compacted into preform that is similar to final shape of desired molding. Preforming is easiest when the resin temperature is uniform between 21-27°C (70-80°F). As temperature declines below this range, the resin will be increasingly difficult to mold without cracks and problems with condensed moisture.

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The preform is then sintered in an oven where it undergoes controlled heating and cooling cycle. The two cycles together are commonly called sintering cycle and peak holding temperature is called sintering temperature. The sintering temperature should be in the range of 370-375 °C (698-707°F).

Safety Precautions

Handling and processing of PTFE must be done in ventilated area to prevent personnel exposure to the fumes liberated during sintering and heating of the resin.

Fumes should not be inhaled, eye and skin contact must be avoided. In case of skin contacts wash with soap and water. In case of eye contact flush with water immediately and seek medical help. Smoking tobacco or cigarettes contaminated with PTFE may result in a flu-like condition including chills, fever and sore throat that may not occur for a few hours after exposure has taken place. This symptom usually passes within about 24 hours. Vapors and gases generated by PTFE during sintering must be completely removed from the factory areas. Mixtures of some metal powders such as magnesium or aluminum are flammable and explosive under some conditions. Please read the Material Safety Data Sheet and the detailed information in the *"Guide to the safe handling of Fluoropolymers Resins"* published by the fluoropolymer division of the Society of the Plastic Industries available at www.fluoropolymers.org.

Handling and Storage

For INOFLON® M685 is being produced in a clean environment and therefore the ideal resin for all applications, where superior cleanliness is required, especially such as production, storage and transportation of ultrapure chemicals for semiconductor production. Therefore for best results the powder processing areas should be kept clean and free of all contamination. Organic contamination and foreign matter usually appear as dark spots often easily visible against the translucent Modified PTFE background. Organic contamination material degrades at the sintering temperatures and forms discolored spots. They oxidize away as carbon dioxide wherever sufficient oxygen exposure takes place. To avoid contamination and discoloration throughout the whole INOFLON products, it is recommended to process the modified INOFLON grades under special cleanliness precautions. This is required for those production areas, where the product is handled as a powder. As soon as the billet is moulded the cleanliness of the powder can be considered to be 'protected'. Storage of PTFE at 23°C (73°F) or lower prevents lump formation as a result of movement and transportation.

Packaging

INOFLON® M685 is packed in plastic or fiber drums. Inside of this, resin is filled in double liner bags & closed with plastic tie.

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NOTE warning: Do not use any of INOFLON® PTFE resins in medical devices that are designed for permanent implantation in the human body. For other medical uses, prior permission of GFL may be sought.

Table 1- Typical properties of INOFLON® M 685

Properties	Test Method	Unit	Nominal Value
Bulk Density	ASTM D 4894	g/L	350-450
Avg Particle size	ASTM D 4894	µm	35
Mold shrinkage	ASTM D 4894	%	4-6
Std. Specific Gravity	ASTM D 4894	-	2.15-2.18
Melting Point	ASTM D 4894	°C (°F)	327 (621)
Tensile Strength	ASTM D 4894	MPa(Psi)	33 (4786)
Elongation	ASTM D 4894	%	450

Note-These are typical properties and not to be used for specification purpose