

Technical Information

INOFLON® 640 is virgin granular fine cut grade. It is designed for compression moulding of billets and specially made for blending with fillers even for lowest filler particle size. Low particle size of INOFLON® 640 helps to minimize the void content in the part at a relatively low moulding pressure. Many end products are fabricated by moulding of INOFLON® 640 and its compound and machining them into desired shapes. Examples include large billets for low thickness skived films and sheets, gaskets, mechanical seals, bridge bearing pads, shaft bearings, electrical insulators, piston rings,

Product Features

- ◆ Non free flowing powder
- ◆ Excellent chemical resistance
- ◆ Service temperature: -250°C (-418°F) to +250°C (482°F)
- ◆ Fine particle size with narrow distribution
- ◆ Excellent electrical and very good mechanical properties

Typical Properties of INOFLON® 640

Properties	Test Method	Unit	Nominal Value
Bulk density	ASTM D 4894	g/l	325
Average particle size (d50)	ASTM D 4894	µm	23
Mould shrinkage	ASTM D 4894	%	4.0
Std. specific gravity	ASTM D 4894	-	2.155
Melting points	ASTM D 4894	°C (°F)	342 (648) (Initial) 327 (621) (Final)
Tensile strength	ASTM D 4894	MPa (psi)	35 (5076)
Elongation	ASTM D 4894	%	350

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

FDA Compliance

When products made from INOFLON®640 are correctly processed, that is sintered at high temperature practiced by industries, they may comply with FDA Regulation 21 CFR 177.1550 for use in contact with food.

Packaging

INOFLON®640 is packed in 25Kgs plastic drums or corrugated boxes.

Handling and storage

Preforming at temperatures in the range of 23–28°C (73.4–82.4°F) is most preferable. Resin temperature must be above 19 °C (66.2°F) during moulding because of a special molecular transition of PTFE at 19°C (66.2°F). PTFE molecule, which has a helical shape, tightens up by transition from a helix where 15 carbons are required for 180 turn to 13 carbons. Below 19 °C (66.2°F), PTFE molecule becomes stiff and less conformable, thus there is a chance that moulded parts could end up cracked. PTFE powder becomes sticky, forms lumps and loses all flow at temperatures above 28°C (82.4°F).

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 white 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. It is, therefore, not unusual to encounter discoloration inside a part away from the surface where hardly any oxygen is present.

Processing

Before using, the powder must be conditioned above 19°C (66.2°F). First the mould is filled with the resin. Next, it is compacted into a preform that has a shape similar to the final shape of the desired moulding. The preform is then sintered in an oven where it undergoes heating and cooling cycles, in which heating and cooling rates and dwell times are defined and programmed. The two cycles together are commonly called sintering cycle. The preform is heated to a temperature above the crystalline melting point of the resin during the sintering cycle. The cooling cycle is used to control the crystallinity of the part. The properties of a part are functions of preforming pressure, dwell time, sintering time and temperature and cooling rate.

Safety precautions

Handling and processing of PTFE must be done in ventilated areas to prevent personnel exposure to the fumes liberated during sintering and heating of the resin. Fumes should not be inhaled and eye and skin contact must be avoided. In case of skin contact wash with soap and water immediately. 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 until a few hours after exposure has taken place.

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 Fluoropolymer Resins" published by the Fluoropolymer Division of The Society of the Plastics Industry available at www.fluoropolymers.org

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Note warning: Do not use any of INOFロン® 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.

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