

Technical Information

INOFLON[®] 220 is virgin granular free flow resin grade. This compression moulding grade is designed for high bulk density, low mold shrinkage and excellent flow which make INOFLON[®] 220 an ideal candidate for automatic and isostatic moulding. Many end products are fabricated by moulding INOFLON[®] 220 and machining them into desired shapes. Examples include parts such as seals, discs, ball valve seats and lab ware, large diameter rods, mechanical bushings, electrical insulators, seal rings, etc.

Product Features

- ◆ High bulk density
- ◆ Excellent chemical resistance
- ◆ Service temperature: -250°C (-418°F) to +250°C (482°F)
- ◆ Good mould filling behavior
- ◆ Good electrical and mechanical properties

Typical Properties of INOFLON[®] 220

| Properties | Test Method | Unit | Nominal Value |
|------------------------------|-------------|-----------|--|
| Bulk density | ASTM D 4894 | g/l | 775 |
| Average particle size (d50) | ASTM D 4894 | µm | 500 |
| Mould shrinkage | ASTM D 4894 | % | 2.25 |
| Powder flow | ASTM D 1895 | g/min | 400 |
| Std. specific gravity (SSG) | 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) | 30 (4351) |
| Elongation | ASTM D 4894 | % | 275 |

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

FDA Compliance

When products made from INOFLON[®]220 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[®]220 is packed in 25 & 40Kgs plastic drums.

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

INOFLON® 220 is processed using automatic, isostatic and compression moulding methods. A two-step process is used to fabricate parts from INOFLON® 220. 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.plasticseurope.org

INOFLON® is the brand name of Gujarat Fluorochemicals Limited (GFL) used for its brand of fluoropolymer resin. INOFLON® can be used in applications duly approved by GFL. Customers who plan to use the word INOFLON® as the trade mark on or relation to their own fluoropolymer parts and other products in any style or combination or in any manner whatsoever must contact GFL for prior permission for such use. No consumer/user of GFL fluoropolymer resin is permitted to claim that their products contain INOFLON® without prior permission from GFL.

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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.

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