

Technical Information

INOFLON® 510 is virgin free flowing presintered resin grade. This resin has been produced using PTFE that has been melted once. It is processable by ram extrusion method for manufacturing of small rods and thin wall tubes. More complex profiles are also processed using this resin. The extrudate of this resin are machined into parts and components used as electrical insulators, fluid handling seal rings and bearings, bushings and many other parts.

Product Features

- ◆ Excellent chemical resistance
- ◆ Service temperature: -250°C (-418°F) to +250°C (482°F)
- ◆ Processable by ram extrusion process
- ◆ For making continuous profiles rods and tubes

Typical Properties of INOFLON® 510

Properties	Test Method	Unit	Nominal Value
Bulk density	ASTM D 4894	g/l	500
Average particle size (d50)	ASTM D 4894	µm	575
Powder flow	ASTM D 1895	g/min	300
Std. specific gravity (SSG)	ASTM D 4894	-	2.155
Melting points	ASTM D 4894	°C (°F)	327 (621)
Tensile strength	GFL Internal Method	MPa (psi)	20 (2900)
Elongation	GFL Internal Method	%	200

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

FDA Compliance

When products made from INOFLON®510 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®510 is packed in 25 & 35Kgs plastic drums.

Handling and storage

Extrusion 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

Ram extrusion is a continuous process which combines the preforming and sintering of PTFE into a single operation. The feed resin is forced to move down by a reciprocating ram through the heated section of the extruder die which is followed by a cooling zone. Compaction, heating and cooling are carried out in series within a single extruder die. The temperature of the heated section of the die is above the crystalline melting point of the resin to weld the successive charges of the powder. The advantage of ram extrusion, over compression moulding is the possibility of obtaining very long parts suitable for automatic machining. The design of extruder, extrusion rate, back pressure generated by the resin itself and the temperature must be carefully controlled. Variation in these parameters affect the quality of extrudate.

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

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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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