HaloPolymer

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TECHNICAL DATA

Pre-sintered PTFE FLUORPLAST® TG

HaloPolymer PTFE grade TG is a pre-sintered powder product designed for manufacturing of articles by ram extrusion process. This fully fluorinated resin has excellent chemical and mechanical properties. PTFE grade TG resin does not get caked during transportation, offering improved handling and better productivity.

- Product overview: Pre-sinterd PTFE for ram extrusion of simple shaped rods, tubes.
- Typical applications: Ram extrusion of simple shaped pipes, tubes, rods.
- Availability: 30 kg cardbox with 2x15 kg polyethylene inserts.
- Technical and Application Assistance: Contact our customer support team:
  Tel. +7 495 725 44 00
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TYPICAL PROPERTIES OF PTFE GRADE TG (Data not for specification purposes)

Properties	Test Method	Units	Typical Value, TG
ASTM Type/Grade	ASTM D4894	-	V
Bulk density	ASTM D4894	g/l	700
Average particle size (d_{50})	Internal, Laser Scatt.	µm	600
Std. specific gravity (SSG)	ASTM D4894	g/cm³	2,17
Sintering temperature	Internal	°C (°F)	360-380 (680-716)
Tensile strength	ASTM D4894	MPa (psi)	22 (3190)
Elongation at break	ASTM D4894	%	220

CERTIFICATION

Certificate of conformity FDA 21 CFR 177.1380 & FDA 21 CFR 177.1550	PTFE	Intertek Polychemlab	USA
Certificate of conformity Class VI acc. USP 35 <88>	PTFE	Pacific BioLabs	USA
Declaration of Compliance commission reg. (EU) 10/2011	PTFE	SGS Multilab	EU

PRODUCT DESCRIPTION

PTFE free flow powder grade TG is a product of suspension polymerization of TFE subjected to pre-sintering, grinding and fractioning. Relatively coarse particles have good flowability and repeatable form filling ability.

PROCESSING BASICS

Conventional plastics processing techniques are not suitable for PTFE resin processing due to its high melting temperature and very high melt viscosity.

PTFE grade TG is processed by ram-extrusion which includes compacting of powder by pressing, sintering at a temperature maximum of 360-380°C followed by subsequent controlled cooling. Ram-extrusion processing is suitable for production of tubes and rods.

STORAGE AND HANDLING

Bags with PTFE powder should be stored in a cold dry place. Recommended storage temperature range is 15-20 °C. Bags with powder stored below this range should be kept closed until warmed to room temperature. Optimal temperature range for PTFE compression moulding is 20-25°C. Below this temperature PTFE changes its crystalline structure with volume variation of 1-2%, causing formation of cracks in preforms.

Mechanical manipulations with PTFE powders should be reduced. At the temperature higher than 30°C PTFE tends to form clumps.

PTFE powders attract dust and moisture from ambience and should be processed at clean and dry conditions.

Sintering of PTFE is linked to an emission of toxic gaseous products. Therefore sintering process should be performed in a ventilated area. Air from the processing zone must be evacuated.

PROCESSING

Ram-extrusion processing of PTFE requires uniform and repeatable powder feed. Ram-extruder usually includes vibratory feeder of powder, optional batching scales and a revolving hopper for tube filling.

Product is pressed into an extruded tube by repeating ram movement.

Ram pressure determines the overall process pressure. Lack of pressure may lead to formation of voids in articles produced. Excessive pressure and ram speed leads to non-uniform dimensions of articles produced. Pressing speed may be adjusted to provide sufficient pressure and to allow filling the tube with smaller-sized powder charges.

SINTERING

Pressed PTFE powder charges follow through the tube into sintering zone. During sintering process PTFE melts into a solidly shaped article. The pressure applied by the ram leads to compaction and removing of voids from PTFE melt.

Sintering program time periods are defined by the size of article produced. Low thermal conductivity of PTFE results in a significant amount of time during which an article needs to be kept in a sintering zone.

COOLING

Cooling rate depends on article diameter. Excessive rates of cooling may lead to formation of mechanical distortions and dimensional instability. Lower cooling rates are recommended for billets of bigger diameters.

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