

## TECHNICAL DATA SHEET

## MODIFIED PTFE FLUOROPLAST-4PN-M type 2

### PRODUCT OVERVIEW

Modified PTFE grade PN-M type 1 is a powder product having the same applications as conventional PTFE, improved electrical, mechanical properties and reduced porosity. This material can be used to manufacture products that are resistant to strong aggressive environments and have high cryptographic stability at temperatures up to 260 ° C for chemical, mechanical, low friction and electrical applications

### TYPICAL APPLICATIONS

- production of articles (rods, pipes, bushings) by molding and ram extrusion.
- production of of small articles by automatic pressing (molding).
- compression (direct) molding and isostatic pressing

### PAKING

28 kg cardboxes with 2×14 kg polyethylene inserts on wooden pallet boards

### Typical properties

| Properties                            | Units             | Typical Value <sup>1)</sup>                              | Test Method   |
|---------------------------------------|-------------------|--|---|
| Appearance <sup>4)</sup>              | -                 | White, easily lumping powder, without visible inclusions | Visual <sup>2)</sup><br>(internal method)                     |
| Water content, max                    | % wt              | 0.02   | ASTM D4894  |
| Bulk density                          | g/l               | 555±40   | ASTM D4894  |
| Particle size, average diameter (d50) | µm                | 110±25   | Laser-diffraction analyses <sup>2)</sup><br>(internal method) |
| Mould shrinkage, min                  | %                 | 4.5  | internal method <sup>2)</sup>                                 |
| Density (SSG)                         | g/sm <sup>3</sup> | 2.145-2.165  | internal method <sup>2)</sup>                                 |
| Tensile strength at break, min        | MPa               | 24-30  | internal method <sup>2)</sup>                                 |
| Elongation at brake, min              | %                 | 240-350  | internal method <sup>2)</sup>                                 |

#### Note:

- 1) Typical properties are not suitable for specification purposes. Detailed specification please contact the commercial department
- 2) The parameters are indicated according to Technical Specifications (TU), because the manufactured products are analyzed in accordance with TU (internal company standard). The procedure of sample preparation differs from that in ASTM
- 3) Fluoroplast-4PN-M type 1 can be classified as type III of ASTM D 4894 standard
- 4) Film have heterogeneities, a small number of color inclusions

**REGULATIONS:** HaloPolymer do not use PFOA/APFO or its salts/LCPFAC in our process of polymerization of TFE  
HaloPolymer PTFE is compliant with

RoHS Directive 2011/65/EU

FDA 21 CFR 177.1380 & FDA 21 CFR 177.1550

Class VI acc. USP 35 <88>

3-A Sanitary Standard for Multiple-Use Plastic Materials 20-27

## SAFETY PRECAUTIONS

### WARNING!

VAPORS CAN BE LIBERATED THAT MAYBE HAZARDOUS IF INHALED.

Before using Halopolymer Fluoroplast-4 (PTFE) read the Material Safety Data Sheet.

Open and use containers only in well-ventilated areas using local exhaust ventilation. Vapors and fumes liberated during hot processing, or from smoking tobacco or cigarettes contaminated with Halopolymer Fluoroplast may cause flu-like symptoms (chills, fever, sore throat) that may not occur until several hours after exposure and that typically pass within about 24 hours. Vapors and fumes liberated during hot processing should be exhausted completely from the work area; contamination of tobacco with polymers should be avoided. Mixtures with some finely divided metals, such as magnesium or aluminum, can be flammable or explosive under some conditions.

**STORAGE AND HANDLING PREFORMING** is easiest when the resin is uniformly 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. Higher temperatures inhibit flow and promote lumping. Storage conditions should be set accordingly. Cleanliness is a critical requirement for successful use of PTFE. The white resin and high sintering temperatures cause even very small foreign particles to become visible in finished moldings. Keep resin boxes closed and clean. Good housekeeping and careful handling are essential.

## PROCESSING

PTFE is usually processed in two steps: preforming and sintering.

The powder is first compacted into a preformed shape approximating that of the desired molding.

### SINTERING

The preformed PTFE powder is sintered under a temperature program generally containing 7 temperature steps including:

- heating,
- dwell before melting,
- complete melting of a billet,
- dwell above melting point,
- cooling to crystallization point,
- crystallization of the melt of PTFE,
- final cooling.

Annealing steps are also required for bigger billets sintering in order to reduce article distortion.

### MACHINING

PTFE billets are machined in the same way that mild metals are. Sharp steel cutting tools are suitable for the machining process. PTFE billets designed for further skived films production are processed at elevated temperatures.

QMS for production is certified:

*ISO 9001:2015*

*AS/EN/JISQ 9100 (OIN: 6147662240)*

*IATF 16949*

*For additional information please contact with Commercial Department:*

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