

# PTFE FLUOROPLAST-4 grade PN-M



**Manufacturer:**  
"HaloPolymer Kirovo-Chepetsk", LLC

QMS for production is certified:  
ISO 9001:2015, EN 9100:2016, IATF 16949:2016

**Chemical name:** Poly(tetrafluoroethylene) (IUPAC)  
**Structural formula:**  $(C_2F_4)_n$   
**CAS No.** 9002-84-0  
**HS code** 39 0461 0000

Modified Fluoroplast-4 grade PN-M is a powder product having the same applications as conventional PTFE, with 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.



PROPERTIES	UNITS	TYPICAL VALUE		TEST METHOD
		M1	M2	
Appearance		White, easily lumping powder, without visible inclusions		Visual (internal method <sup>1</sup> )
Particle size, average diameter (d <sub>50</sub> )	µm	110±25	110±25	Laser-diffraction analyses (internal method <sup>1</sup> )
Water content, max	% wt	0,02	0,02	internal method <sup>1</sup>
Bulk density	g/l	555±40	555±40	internal method <sup>1</sup>
Density (SSG)	g/sm <sup>3</sup>	2,15-2,17	2,15-2,17	internal method <sup>1</sup>
Tensile strength at break	MPa	27-35	24-30	internal method <sup>1</sup>
Elongation at break	%	270-350	240-350	internal method <sup>1</sup>
Mould shrinkage	%	4-5	4-5	internal method <sup>1</sup>
Melting point	°C	327±5	327±5	ASTM D4894

Note:

<sup>1</sup>) The parameters are indicated according to the Technical Specifications (TU), because the manufactured products are analyzed in accordance with the TU (internal company standard). The procedure of sample preparation differs from that in ASTM.



## Main application:

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



## Package:

28 kg (net) card boxes with 2×14 kg polyethylene inserts on wooden pallet boards.  
Gross weight per pallet is 926 kg.



## Guarantee storage life:

24 months from the date of manufacture.

# PTFE FLUOROPLAST-4 grade PN-M



## 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:

1. heating,
2. dwell before melting,
3. complete melting of a billet,
4. dwell above melting point,
5. cooling to crystallization point,
6. crystallization of the melt of PTFE,
7. final cooling.

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



## Storage and handling:

Storage and handling preforming is the easiest when the resin is uniformly between 21–27°C (70–80°F). As the 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.



## Quality data:

Fluoroplast-4PN-M can be classified as type III, ASTM D 4894 standard. Typical properties are not suitable for specification purposes. For the detailed specification please contact the commercial department.

**HaloPolymer does not use PFOA/APFO or its salts/LCPFAC in the 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 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.