

# PTFE FLUOROPLAST-4 grade A1



**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

Fluoroplast-4 grade A1 (F-4A1) is fully fluorinated resin which has an excellent chemical stability, electrical and mechanical properties. This grade is created for high bulk density, low mold shrinkage and excellent flow which makes it an ideal for automatic and isostatic molding.



PROPERTIES	UNITS	TYPICAL VALUE	TEST METHOD
Appearance	Free-flowing white powder		Visual (internal method <sup>1</sup> )
Water content, max	% wt	max 0.02	internal method <sup>1</sup>
Bulk density	kg/m <sup>3</sup>	800	internal method <sup>1</sup>
Density	g/cm <sup>3</sup>	2.19	internal method <sup>1</sup>
<b>Granulometric composition:</b>			
- mass content of residue after sieve 0.20 mm	%	5	internal method <sup>1</sup>
- mass content of residue on sieve 1 mm	%	10	internal method <sup>1</sup>
Tensile strength at break, min	MPa	30	internal method <sup>1</sup>
Elongation at break, min	%	300	internal method <sup>1</sup>

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:

- for processing into articles by automatic, compression molding and isostatic pressing, and by ram extrusion;
- fabricating of seals, discs, ball valve seats and lab ware, large diameter rods, mechanical bushings, electrical insulators, seal rings.



### Package:

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



### Guarantee storage life:

24 months from the date of manufacture.



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## 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.

F-4A1 tends to form agglomerates easily; therefore, do not store large quantities of powder in deep containers; avoid strong vibrations and shock. Storage at temperatures above 19°C tends to promote agglomerate formation. Should agglomerates form, keep the powder at less than 19°C (ideally 15°C or below) for two days then sift through a coarse screen and allow to come to room temperature before molding.



## Quality data:

Fluoroplast-4A1 can be classified as type IV, 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.