

PTFE



**HaloPolymer**  
**Polytetrafluoroethylene**

## ABOUT US

### HALOPOLYMER IS A RENOWN FLUOROchemical PRODUCER WITH 80-YEARS OF MANUFACTURING HISTORY

#### PEOPLE and OFFICES



- 4 000 employees
- HQ in Moscow, Russia
- Trading subsidiaries in Russia, Germany, South Korea and US

#### PRODUCTION



- Full cycle production since 1956
- 2 production facilities in Russia
- 5% share of global PTFE market

#### R&D



- Own R&D laboratories
- More than 50-years experience in fluoroorganic chemistry
- Cooperation with international scientific centers

### OUR KEY PRODUCT GROUPS:

#### Fluoropolymers

PTFE, PVDF, FEP, ETFE and other

#### Refrigerants and Special gases

R-14, R-22, R-125, R-318c, R-23, R-218, SF<sub>6</sub>, WF<sub>6</sub>

#### Multi-purpose Fluorinated Products

Fluorinated monomers, Heat-transfer fluids, Liquid dielectrics, Fluorinated solvents and surfactants, Substances for medicine and cosmetology, Custom synthesis

#### Fluoroelastomers

FKM & FFKM

#### Inorganic Chemistry Chlorine Chemistry

Calcium chloride, Hydrochloric acid, Sodium hydroxide, Methylene chloride, Ethyl chloride

### CERTIFICATES OF QMS:

ISO 9001:2015 and GOST R ISO 9001:2015  
AS/EN 9100, IATF 16949

## LOCATIONS



# HISTORY



1949-1954

- Halopolymer Kirovo-Chepetsk facility was put into operation.
- Uranium tetrafluoride production launched at Halopolymer Kirovo-Chepetsk laid the foundation of the construction of Russian «nuclear shield».

1956-1961

- First ever Russian batch of PTFE was produced at Halopolymer Kirovo-Chepetsk. The product was called «Fluoroplast».

1962-1964

- Halopolymer Perm facility was put into operation. Hydrogen fluoride production start-up.
- Refrigerants production was launched at Halopolymer Perm.

1966-1971

- First batch of PTFE was produced at Halopolymer Perm.
- PTFE processing and PTFE articles production were started at Halopolymer Kirovo-Chepetsk.

1982-1985

- Sulfur hexafluoride (SF<sub>6</sub> gas) production was launched at Halopolymer Perm.
- Production of fluorinated telomeric alcohols was started at Halopolymer Perm.

2005-2009

- Halopolymer introduces an international quality control system under MS ISO 9001:2000.
- Launch of PTFE compounds production.

2013-2015

- Electrochemical fluorination unit was launched at Halopolymer Perm
- New technology of Chloroform production was implemented at Halopolymer Kirovo – Chepetsk

2016-2017

- Start of propellant blend and high-purity Perfluorodecaline production at Halopolymer Kirovo – Chepetsk
- Start of Perchloroethylene production at Halopolymer Perm



# FLUOROPLAST® (PTFE)

Fluoroplast® is a trade name for PTFE, fluoropolymer possessing with unique combination of frictional, chemical, thermal, and electrical properties. It has a non-stick nature, is non-wetting and is self-lubricating.

PTFE has outstanding chemical resistance and is unaffected by all known chemicals except alkali metals and under certain conditions, fluorine. PTFE has an excellent weather resistance and has an extremely wide working temperature range. It is the best of the solid dielectrics and an excellent insulator.

There are two main methods of producing PTFE. One is suspension polymerization. In this method, the TFE is polymerized in water, resulting in grains of PTFE. The grains can be further processed into pellets which can be molded. In the dispersion method, the resulting PTFE is a milky emulsion which can be processed into a fine powder or aqueous dispersion.

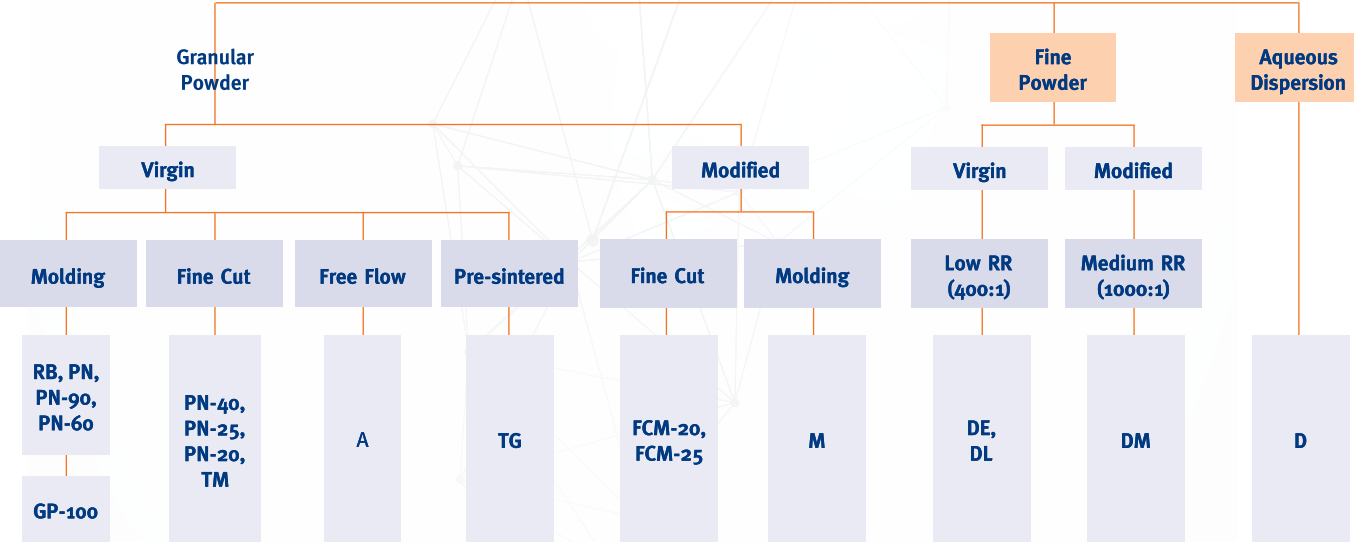
Product range of Halopolymer Fluoroplast® products include virgin and modified grades of suspension and emulsion origin and aqueous dispersion.

Halopolymer offers a wide range of PTFE resins under the brand name Fluoroplast including low – flow and free – flow compounds and aqueous dispersion.

All products are PFOA – free.

For more information on the product range of various compounds check our PTFE compounds data sheet.

## PRODUCT RANGE



# FLUOROPLAST-4 MOLDING GRADES

Grades PN, PN90 are fully fluorinated resins which have an excellent chemical stability, electrical and mechanical properties. The material is a granular powder product designed for usage from small to medium billet compression molding, which is well suited to thin skived film applications requiring excellent physical and electrical properties.

PN60 (60 microns – the size of the particles) is used for the production of electrotechnical articles of enhanced reliability, as well as for the production of electrical insulation, insulation and porous, rolled films, tape gaskets.

GP-100 is a granular powder product designed for production of big billets and general purpose compression molding. This fully fluorinated resin has an excellent chemical stability, electrical and mechanical properties. GP-100 resin offers an improved handling and better productivity. Narrow particle size of this grade is of the high quality that allows to eliminate voids formation in billets at reduced molding pressure. Typical applications: Big billets, skived sheets, skived films. General purpose: pipes, tubes, spacers, O-rings, insulating tape, laboratory and chemical equipment.

TYPICAL APPLICATIONS	RB	PN	PN90	PN60	GP-100
Further milling	+	+	+	+	+
Preparing the pre-sintered material	+	+	+	+	+
Production of articles (rods, pipes, bushings, small billets) by compression and isostatic molding		+	+	+	+
Production of big billets, rolled films				+	+

FLUOROPLAST-4 MOLDING GRADES



Parameters	Molding			Test method
	RB	PN	PN90	
Appearance	White, easily lumping powder, without visible inclusions			Visual (internal method)
Water content, %, max	0.02	0.02	0.02	internal method <sup>2)</sup>
Density (SSD), g/cm³, max	2.17	2.17	2.17	internal method <sup>2)</sup>
Bulk density, g/l	550±35	560±40	560±35	internal method <sup>2)</sup>
Tensile strength at break, MPa, min	22-32	25	25	internal method <sup>2)</sup>
Elongation at break, %, min	240-290	350	350	internal method <sup>2)</sup>
Dielectric strength [specimen thickness (0,100 ± 0,005) mm] at constant voltage, kV/mm, min	-	50	80	internal method <sup>2)</sup>
Particle size, average diameter (d <sub>50</sub> ), µm	150-300	150±40	90±25	Laser-diffraction analyses internal method <sup>2)</sup>
Mould shrinkage, %	1.6-2.0	1.8-2.8	1.8-2.8	internal method <sup>2)</sup>
Melting points, °C	327±10			ASTM D4591 (DSC)

Notes:

1)Typical properties are not suitable for specification purposes. For the detailed specification please contact the commercial department

2) The value of the parameters are per GOST, because the manufactured products are analyzed according to GOST (Russian State Standard). The sample preparation procedure has a difference with the ASTM. The standard of the company is GOST 10007-80 (Specific molding pressure is 29.4 MPa with dwell time of 1 minute, temperature of heat treatment of plates for the samples is 380-390 °C, and time of heat treatment is 13 hours).

3)Fluoroplast-4RB can be classified as type I, ASTM D 4894 standard, Fluoroplast-4PN can be classified as type I, ASTM D 4894 standard, Fluoroplast-4PN90 can be classified as type II, ASTM D 4894 standard



Parameters	Molding				Test method
	PN	PN90	PN60	GP 100	
Appearance	White, easily lumping powder, without visible inclusions				Visual (internal method)
Water content, %, max	0,02	0,02	0,02	0,02	internal method <sup>2)</sup>
Density (SSD), g/cm³, max	2,17	2,17	2,19	2,17	ASTM D4894
Bulk density, g/l	550-650	550	-	-	internal method <sup>2)</sup>
Tensile strength at break, MPa, min	30	30	25	32	ASTM D4894
Elongation at break, %, min	250	270	350	430	ASTM D4894
Dielectric strength [specimen thickness (0,100 ± 0,005) mm] at constant voltage, kV/mm, min	60	100	50	100	internal method <sup>2)</sup>
Particle size, average diameter (d <sub>50</sub> ), µm	140-220	80-100	55-65	100-200	ASTM D4894

Notes:

1)Typical properties are not suitable for specification purposes. For the detailed specification please contact the commercial department

2) The value of the parameters are per GOST, because the manufactured products are analyzed according to GOST (Russian State Standard). The sample preparation procedure has a difference with the ASTM. The standard of the company is GOST 10007-80 (Specific molding pressure is 29.4 MPa with dwell time of 1 minute, temperature of heat treatment of plates for the samples is 380-390 °C, and time of heat treatment is 13 hours).

## FLUOROPLAST® GP-100

Keeping up with the market demands addition to a wide range of Fluoroplast® products Halopolymer has introduced new advanced grades into the product range:

### Fluoroplast® GP-100

Halopolymer PTFE grade GP-100 is a granular powder product designed for big billets production and general purpose compression molding. This fully fluorinated resin has an excellent chemical stability, electrical and mechanical properties. GP-100 resin offers improved handling and better productivity. Narrow particle size distribution value of this grade allows to eliminate voids formation in billets at reduced molding pressure and skive films of up to 25 µm thickness.



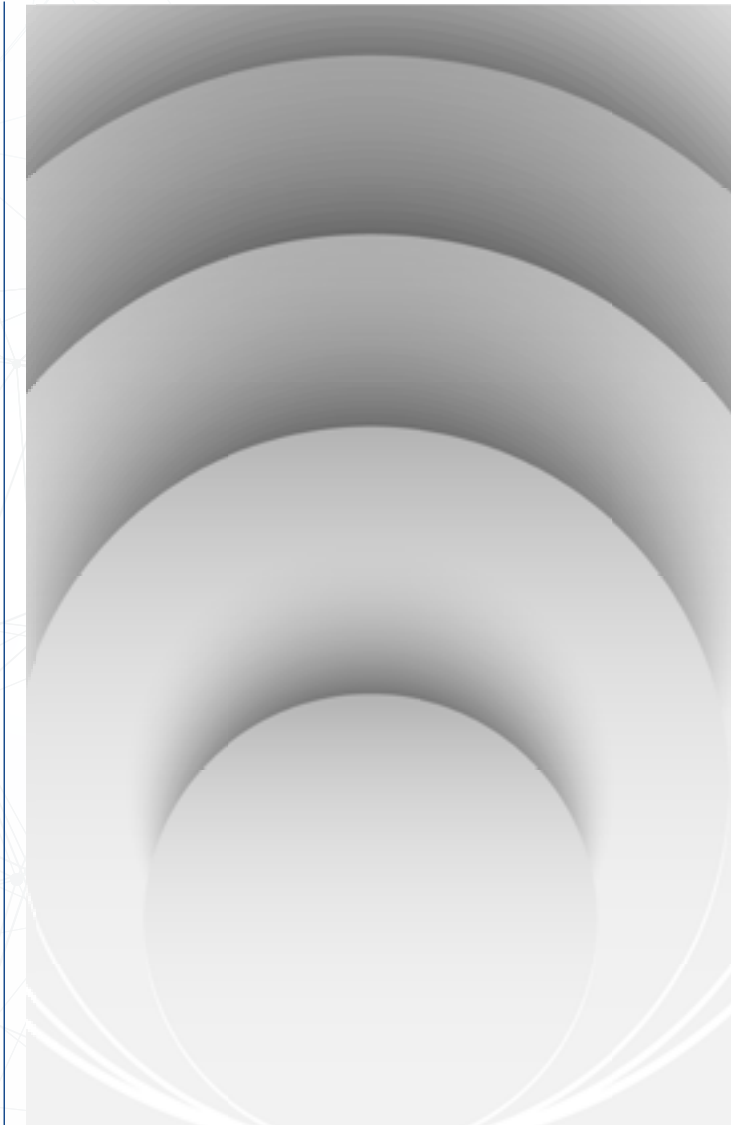
## FLUOROPLAST-4 FINE CUT GRADES

Fluoroplast-4 fine cut grade is a fully fluorinated resin which has an excellent chemical stability, electrical and mechanical properties. This material is a granular powder product designed for usage from small to medium billet compression molding, well suited to thin skived film applications requiring excellent physical and electrical properties and also can be used as a raw material grade - for manufacturing of filled and color compounds used in chemical and other industries. Because of the small particle size and sharp particle size distribution, molding articles show excellent properties.

production of small articles by automatic pressing (molding).

compression (direct) molding and isostatic pressing

suitable for compound with various fillers as the base powder





FLUOROPLAST-4 FINE CUT GRADES



Parameters	Fine cut		Test method
	PN40	PN20	
Appearance	White, easily lumping powder, without visible inclusions		Visual (internal method)
Water content, %, max	0.02	0.02	ASTM D4894
Density (SSD), g/cm³, max	2.19	2.18	internal method <sup>2)</sup>
Bulk density, g/l	470±35	450±35	ASTM D4894
Tensile strength at break, MPa, min	25	30	internal method <sup>2)</sup>
Elongation at break, %, min	380	390	internal method <sup>2)</sup>
Dielectric strength [specimen thickness (0.100 ± 0.005) mm] at constant voltage, kV/mm, min	100	100	internal method <sup>2)</sup>
Particle size, average diameter (d <sub>50</sub> ), µm	21-45	6-20	laser-diffraction analyses internal method <sup>2)</sup>
Maximum particle size D <sub>99.9</sub> max, µm	200	100	
Mould shrinkage, %	3.5-3.8	3.5-3.8	internal method <sup>2)</sup>
Mould shrinkage, %		2.0-3.0	ASTM D4894
Melting points, oC	327±10	327±10	ASTM D4591 (DSC)

Notes:

1) Typical properties are not suitable for specification purposes. For the detailed specification, please contact the commercial department.

2) 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, ISO, DIN.

3) Fluoroplast-4 PN40, PN20 can be classified as type II, ASTM D 4894 standard.



Parameters	Fine cut			Test method
	PN40	PN25	TM (H) (for the compounds)	
Appearance	White, easily lumping powder, without visible inclusions			Visual (internal method)
Water content, %, max	0.02	0.02	0.02	internal method <sup>2)</sup>
Density (SSD), g/cm³, max	2.17	2.17	2.17	ASTM D4894
Bulk density <sup>3)</sup> , g/l	370-470	370-470	370-470	internal method <sup>2)</sup>
Tensile strength at break, MPa, min	25	30	35	ASTM D4894
Elongation at break, %, min	390	390	420	ASTM D4894
Dielectric strength [specimen thickness (0.100 ± 0.005) mm] at constant voltage, kV/mm, min	60	60	100	internal method <sup>2)</sup>
Particle size, average diameter (d <sub>50</sub> ), µm	31-40	15-30	15-21	ASTM D4894
Particle size above, µm	D 99 < 200	> 100, max 10 % > 200, do not contain (for compounding)	D 99 < 160	ASTM D4894

Notes:

1) Typical properties are not suitable for specification purposes. For the detailed specification, please contact the commercial department.

2) 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, ISO, DIN.

FLUOROPLAST-4 FREE FLOW GRADES

Fluoroplast-4 A is a free-flowing polymer; it has all properties of PTFE. F-4A is the most manufacturable during processing, is not got lumped and conglomerated during transportation.

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



Parameters	A1	Test method
Appearance	White, easily lumping powder, without visible inclusions	Visual (internal method)
Water content, %, max	0.02	gravimetric analysis internal method <sup>2)</sup>
Density (SSD), g/cm³, max	2.18	ASTM D4894
Bulk density, g/l	850±50	ASTM D4894
Tensile strength at break, MPa, min	30	internal method <sup>2)</sup>
Elongation at break, %, min	300	ASTM D4894
Granylometric composition, max <ul style="list-style-type: none"><li>- 1K sieve residue, %</li><li>- Undersize (sieve No.0.20K), %</li></ul>	15 5	gravimetric analysis internal method <sup>2)</sup>
Mould shrinkage, %	1.9-2.4	ASTM D4894

Notes:

1) Typical properties are not suitable for specification purpose. For the detailed specification, please contact the commercial department.

2) 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.

3) Fluoroplast-4 A can be classified as type IV, grade 2 ASTM D 4894 standard.



Parameters	A2	Test method
Appearance	White, easily lumping powder, without visible inclusions	Visual (internal method)
Water content, %, max	0.02	internal method <sup>2)</sup>
Density (SSD), g/cm³, in range	2.15-2.17	ASTM D4894
Bulk density, g/l	800	internal method <sup>2)</sup>
Tensile strength at break, MPa, min	28	ASTM D4894
Elongation at break, %, min	250	ASTM D4894
Granulometric composition of polymer, max, % <ul style="list-style-type: none"><li>- Mass content of residue after sieve 0.20mm</li><li>- Mass content of residue on sieve 1 mm</li></ul>	7 20	ISO 12086
Average particle size (d <sub>50</sub> ), µm, in range	520	ASTM D4894
Mould shrinkage, %	1.9-2.3	internal method <sup>2)</sup>
Dielectric strength [specimen thickness (0.100 ± 0.005) mm] at constant voltage, kV/mm, min	100	internal method <sup>2)</sup>

Notes:

1) Typical properties are not suitable for specification purposes. For the detailed specification, please contact the commercial department.

2) 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, ISO, DIN



## FLUOROPLAST-4 PRE-SINTERED GRADE

Fluoroplast-4 TG grade 1 (F-4 TG1), is a granulated product designed for manufacturing of articles by ram extrusion. This perfluorinated resin has excellent chemical and mechanical properties. Fluoroplast-4TG is not got lumped during transportation, offering improved handling properties and better productivity.

Ram extrusion of pipes, tubes, rods of simple shape.



KIROVO-CHEPETSK

Parameters	TG1	Test method
Appearance	White free-flowing powder	Visual (internal method)
Water content, %, max	0.02	internal method <sup>2)</sup>
Particle size, average diameter (d <sub>50</sub> ), µm	600-800	internal method <sup>2)</sup>
Bulk density, g/l	500-800	internal method <sup>2)</sup>
Flow index, s	12-16	internal method <sup>2)</sup>

Notes:

- 1) Typical properties are not suitable for specification purposes. For the detailed specification please contact the commercial department.
- 2) 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, ISO, DIN.
- 3) Fluoroplast- TG grade 1 can be classified as type V of ASTM D 4894 standard.

## FLUOROPLAST-4 MODIFIED GRADES

### GRANULAR MOLDING

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

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

### FINE CUT

Fluoroplast-4 FCM is a fully fluorinated resin, which has an excellent chemical stability, electrical and mechanical properties. This material is a granular powder product designed for usage from small to medium billet compression molding, well suited to thin skived film applications requiring excellent physical and electrical properties and also can be used as a raw material grade - for manufacturing of filled and color compounds used in chemical and other industries



## FLUOROPLAST-4 MODIFIED GRADES



KIROVO-CHEPETSK

Parameters	Modified Granular molding	Modified Fine cut		Test method
	PN-M1	FCM-20	FCM-25	
Appearance	White, easily lumping powder, without visible inclusions			Visual (internal method)
Water content, %, max	0.02	0.02	0.02	internal method <sup>2)</sup>
Density (SSD), g/sm <sup>3</sup>	2.17	2.15-2.19	2.15-2.19	internal method <sup>2)</sup>
Bulk density, g/l	555±40	440-520	410-490	internal method <sup>2)</sup>
Tensile strength at break, MPa, min	27-35	30	30	internal method <sup>2)</sup>
Elongation at break, %, min	270-350	440	420	internal method <sup>2)</sup>
Dielectric strength [specimen thickness (0.100 ± 0.005) mm] at constant voltage, kV/mm, min		100	100	internal method <sup>2)</sup>
Particle size, average diameter (d <sub>50</sub> ), µm	110±25	10-25	10-25	internal method <sup>2)</sup>
Mould shrinkage, min, %	4-5	-	-	internal method <sup>2)</sup>

Notes:

- 1) Typical properties are not suitable for specification purposes. For the Detailed specification, please contact the commercial department.
- 2) 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.
- 3) Fluoroplast-4PN-M1 can be classified as type III of ASTM D 4894 standard.

## FLUOROPLAST-4 FINE POWDER GRADES

### VIRGIN

Fluoroplast-4 D is a polytetrafluoroethylene fine powder resin used for paste extrusion and has been designed to manufacture an unsintered tape, a sintered tape and a tubing at low reduction ratios.

Fluoroplast-4 DL – used to manufacture an unsintered calendered film.

Fluoroplast-4 DE – used in paste extrusion: pipes, tubes, unsintered tape.

### MODIFIED

Fluoroplast-4 DM is a PTFE fine powder designed for extrusion of thin-walled pipes, hoses, rods, cable insulation and other articles which are used in chemical, electrical engineering, food and other industries. The resin is designed to manufacture the articles having high dielectric properties, resistant to aggressive environments and operating at temperatures from minus 60°C to plus 250°C.

- manufacturing of aircraft hoses and cable insulation, electrically insulating and heat-shrinkable tubes
- manufacturing of pipes, rods and other industrial articles
- manufacturing of sealing materials and other general-purpose articles



FLUOROPLAST-4 FINE POWDER GRADES



Parameters	Fine powder Virgin		Fine powder Modified	Test method
	DL	DE	DM	
Appearance	Fine friable white powder without visible inclusions		White, easily lumping powder, without visible inclusions	Visual (internal method)
Water content, %, max	0.02	0.02	0.02	internal method <sup>2)</sup>
Density (SSD), g/cm³, max	2.23	2.21	2.21	
Bulk density, g/l		430-510		
Tensile strength at break, MPa, min	20.6	22.5	21.0 (214)	
Elongation at break, %, min	330	340	330	gravimetric analysis internal method <sup>2)</sup>
Particle size, average diameter (d <sub>50</sub> ), µm		400-650	350-650	
Granulametric composition of powder, max - Over 2 mm particle size fraction - Under 0,25 mm particle size fraction	2 10	2 10		
Dielectric dissipation factor at a frequency of 106 Hz, max			0.0002	
Dielectric permittivity at a frequency of 106 Hz, max			2.1	
Volume resistivity, min, Ohm•cm			1*10 <sup>16</sup>	

Notes:

1) Typical properties are not suitable for specification purposes. For the detailed specification, please contact the commercial department.

2) 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, ISO, DIN.

3) The surface of objects from F-4 D can be an easy cream color. The surface of the plate from F-4 DM shall be white. Color and purity of plates shall correspond to the specimen approved with the established procedure.



Parameters	Fine powder Virgin		Fine powder Modified	Test method
	DL	DE	DM	
Appearance	Fine friable white powder without visible inclusions			Visual (internal method)
Water content, %, max	0.02	0.02	0.02	ASTM D4895
Density (SSD), g/cm³, max	2.16-2.20	2.18-2.21	2.18-2.20	ASTM D4895
Bulk density, g/l	450-550	450-550	450-550	internal method <sup>2)</sup>
Tensile strength at break, MPa, min	25	25	27	ASTM D4895
Elongation at break, %, min	300	300	350	ASTM D4895
Particle size, average diameter (d <sub>50</sub> ), µm	400-650	400-650	400-650	ASTM D4894
Extrusion pressure	at RR 100:1 7-11 MPa		at RR 400:1 10-45 MPa	internal method <sup>2)</sup>

Notes:

1) Typical properties are not suitable for specification purposes. For the detailed specification, please contact the commercial department

2) 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, ISO, DIN.

3) The surface of objects from F-4 D can be an easy cream color.



# FLUOROPLAST-4 AQUEOUS DISPERSION

Fluoroplast-4D Aqueous Suspension AD-100 is an aqueous dispersion of PTFE fine powder (Fluoroplast-4D), aqueous dispersion is stabilized by surfactant.

Preparation of industrial compositions for coating the metals, impregnation of glass fabrics and other materials, such as belt conveyors, kitchenware, electronics, textile industry, architecture, mechanical engineering.



Parameters	AD-100	Test method
Appearance	Liquid of white to light-yellow color precipitation and dark sediment formed on the suspension surface and eliminated by shaking or swinging are allowed	Visual
Mass fraction of non-volatile substances, min, %	58-64	internal method <sup>2)</sup>
Mass fraction of a stabilizing agent (on dry basis), within, %	7-9	internal method <sup>2)</sup>
Hydrogen ion concentration (pH)	8-10	internal method <sup>2)</sup>

Notes:

1) Typical properties are not suitable for specification purposes. For the detailed specification, please contact the commercial department.

2) 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, ISO, DIN.

3) Packaging:

- PE drums (of 40 liters' volume of each drum) on 1 wooden pallet
- PE containers (of 1000 liters' volume) in metal frame on 1 wooden pallet



CERTIFICATION

PTFE	CAS No: 9002-84-0
PARTIAL TEST ON PLASTIC MATERIALS ACCORDING TO THE COMMISSION REGULATION (EU) NO 10/2011 OF 12 JANUARY 2011 AND ITS MODIFICATIONS	<p>Plastic materials and articles intended to come into contact with foodstuffs. Certified by SGS Multilab France.</p> <p><u>TESTS COVERED</u> Overall Migration to:</p> <ul style="list-style-type: none"><li>• 3% acetic acid,</li><li>• 50% ethanol,</li><li>• olive oil.</li></ul>
FOOD & DRUGS ADMINISTRATION (FDA) DIRECTIVE 21 CFR 177.1550 AND 21 CFR 177.1380	<p>Articles or components of articles intended to come into contact with foodstuffs. Certified by Intertek Polychemlab, USA.</p> <p><u>TESTS COVERED</u></p> <ul style="list-style-type: none"><li>• Determination of amount of Extractives</li></ul>
3-A SANITARY STANDART PROCEDURE NO, 20-27 (LATEST REVISION) - USE PLASTIC MATERIALS	<p>Certified by element Material technology, USA.</p> <p><u>TESTS COVERED</u></p> <ul style="list-style-type: none"><li>• Cleanability Response;</li><li>• Product Treatment;</li><li>• Cleanability Comparison.</li></ul>
ROHS 10E 2015/863/EU AMINDING ANNEX II TO DIRECTIVE 2011/65/EU	<p>Restriction of Hazardous Substance in Electrical &amp; Electronic Equipment. Certified by SGS Hong Kong Ltd.</p> <p><u>TESTS COVERED</u></p> <ul style="list-style-type: none"><li>• Determination of Cadmium content,</li><li>• Determination of Lead content,</li><li>• Determination of Mercury content,</li><li>• Determination of Hexavalent Chromium (Cr VI) content,</li><li>• Determination of sum of PBBs (Polybrominated Biphenyls) and PBDEs (Polybrominated Diphenyl Ethers), Bis(2-Ethylhexyl) phthalate (DEHP), Benzyl butyl phthalate (BBP), Dibutyl phthalate (DBP), Diisobutyl phthalate (DIBP)</li></ul>

UNITED STATES PHARMACOPOEIA (USP) CLASS VI	<p>Certified by Pacific BioLabs, USA .</p> <p><u>TESTS COVERED</u></p> <ul style="list-style-type: none"><li>• Systemic test to evaluate the impairment or activation of a system—rather than the impairment of individual cells or organs;</li><li>• Intracutaneous test to evaluate the potential of test materials—or their extracts—to cause irritation on the exposed part of the body;</li><li>• Implant tests to evaluate the pathological effects on living tissue, at both the gross and microscopic level.</li></ul>
NO ANIMAL ORIGIN	<p>Halopolymer Granular Virgin PTFE neither contains, nor manufactured with, any animal products, animal fats, material of animal origin or grain alcohols.</p> <p>Certified by ELTEL Labs, USA .</p> <p><u>COMPLIES WITH ALL THE REQUIREMENTS OF FOLLOWING STANDARD:</u></p> <ul style="list-style-type: none"><li>• IEC 60112 Comparative Tracking Index of Solid Insulating Materials Under Moist Conditions (CTI);</li><li>• UL 746-A Sec. 25: High-Voltage Arc-Tracking-Rate;</li><li>• UL 746-A Sec. 33 High-Current Arc Ignition;</li><li>• UL 746-A Sec. 32 Hot Wire Ignition;</li><li>• UL 94 Flammability of Plastic Materials Sec. 8 Vertical – Vo – V1 and V2.</li></ul> <p><u>MERL (Material Engineering Research Laboratory):</u></p> <ul style="list-style-type: none"><li>• Blister Testing of Polymeric Materials to API 17).</li></ul> <p><b>EVALUATE THE BLISTER RESISTANCE OF PTFE.</b></p>
PHIS-CHEM TESTS	
QMS	<p><u>Quality Management system:</u></p> <ul style="list-style-type: none"><li>• ISO 9001:2015,</li><li>• IATF 16949:2016</li><li>• AS/EN/ JISQ 9100:2016</li></ul>

## STORAGE AND HANDLING

Storage and Handling Preforming is easier 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.

Molding powders tend to form agglomerates easily; therefore, do not store large quantities of powder in deep containers; avoid strong vibrations and shock.

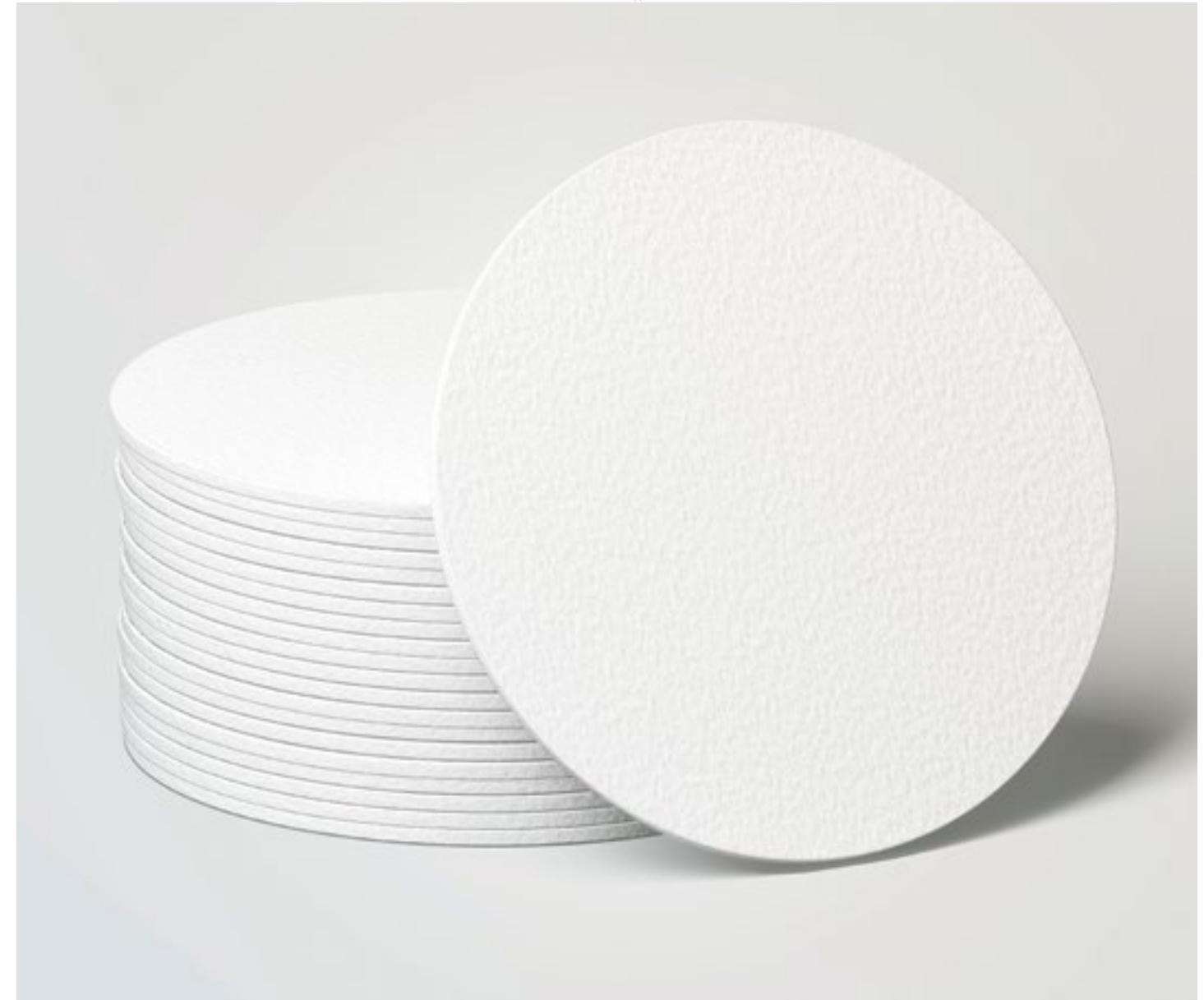
Storage at temperatures above 19°C tends to promote agglomerate formation. Should agglomerates form, keep the powder at less than 19°C (ideally 15°C or below) for two days then sift through a coarse screen and allow to come to room temperature before molding.

Cleanliness is a critical requirement for successful usage 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.

### **WARNING!**

**VAPORS CAN BE LIBERATED THAT MAYBE HAZARDOUS IF INHALED.**

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





# CONTACTS

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