



product information

Fluon® PFA Resins

DESCRIPTION

Fluon® PFA (perfluoroalkoxy) is a melt-processible copolymer of tetrafluoroethylene and a perfluorinated vinyl ether. Fluon® PFA has chemical, electrical, and thermal properties almost identical to its close chemical cousin, polytetrafluoroethylene (PTFE), yet can be processed by conventional extrusion, injection molding, blow molding, and transfer molding techniques. This unique material can be used over a wide range of temperatures (-200°C to 260°C). It is available as a 1/8" pellet.

BENEFITS

- High Resistance to Heat
- Excellent Chemical Resistance
- Low Smoke and Flame Characteristics. Fluon® PFA is rated 94V-0 by Underwriters Laboratories Inc.
- Outstanding Resistance to Weather and Aging
- Excellent Dielectric Properties
- Non-Stick Characteristics

APPLICATIONS

- Tubing and Pipe
- Film and Sheets
- Valves, Fittings, and Housings
- Wire and Cable

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The logo for AGC Chemicals Americas, Inc. consists of the letters "AGC" in a bold, blue, sans-serif font. The letter "G" has a red horizontal bar at its top right.

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Fluon[®] PFA Resins

FLUON[®] PFA GRADES AVAILABLE

Grade	Melt Flow Rate	Application
P-63P	7 – 18	General purpose extrusion / injection molding
P-65P	3 – 7	General purpose extrusion / injection molding; Better stress crack resistance over P-63P
P-66P	1 – 3	Extrusion, transfer, compression, and injection molding; Best resistance to stress cracking
P-62XP	24 – 36	High flow extrusion / injection molding

Melt flow rate tested according to ASTM D-3307

PROCESSING

Fluon PFA fluoropolymer resins can be processed by conventional melt-processable resin techniques including extrusion, injection molding, blow molding, compression molding, transfer molding, and rotolining/rotomolding. It is strongly recommended that process equipment exposed to molten resin be made of corrosion-resistant metals such as Monel[®], Inconel[®], or Hastelloy[®].

Extruder barrels should be long relative to diameter (24/1 up to 30/1 and beyond) and heaters should have the capacity to heat material to approximately 390°C. Temperature controllers should be of the proportional-integral-derivative (PID) type to insure precise temperature control. Extruder screws with 3/1 compression ratio, a relatively long feed zone, and ½ to 3 turn transition zone are recommended. Reciprocating screw injection molding machines are preferred.

Your AGC Chemicals Americas, Inc. technical service representative can provide specific recommendations for process equipment and process conditions.

HANDLING PRECAUTIONS

Heating Fluon products in excess of 750°F (399°C) can produce toxic fumes. It is, therefore, necessary to provide local exhaust ventilation in areas where Fluon products are exposed to high temperatures. Avoid breathing fumes or contaminating smoking tobacco with fumes, powder, or dust.

Thermal decomposition of this product will generate hydrogen fluoride, which is corrosive. Corrosion resistance materials are required for prolonged contact with molten resin.

For additional information and handling instructions read AGC Chemicals Americas, Inc. Material Safety Data Sheet. It is also recommended that the user consult the latest edition of the “Guide to the Safe Handling of Fluoropolymer Resins” published by the Fluoropolymers Division of the Society of the Plastics Industry (SPI) for important handling and ventilation recommendations. Both publications are available from your AGC Chemicals Americas representative.

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FLUON® PFA TYPICAL PROPERTIES

Property	Units	Test Method	P-66P	P-65P	P-63P	P-62XP
Melt Flow Rate	grams/10 minutes	D-3159	2	5	12	30
Melting Point	°C	D-3159	310	310	310	310
Specific Gravity		D-792	2.14	2.14	2.14	2.14
Hardness	Shore D	D-2240	60	60	60	60
Tensile Strength (23°C)	psi	D-638	5,655	5,220	4,640	4,640
Tensile Elongation (23°C)	%	D-638	340	390	410	410
Tensile Strength (250°C)	psi	D-638	2,000	1,740	1,300	1,000
Tensile Elongation (250°C)	%	D-638	740	680	600	580
Flexural Modulus (23°C)	psi	D-790	87,000	88,000	92,100	101,500
Heat Deflection Temp. (66 psi)	°C	D-648	91		92	93
Heat Deflection Temp. (264psi)	°C	D-648	56		57	57
Notched Izod Impact (23°C)	ft-lb/in	C-256	No Break	No Break	No Break	No Break
Embrittlement Temperature	°C	D-764				
CLTE (0 – 100°C)	in/in/°F	D-696	7.2×10^{-5}	7.2×10^{-5}	7.2×10^{-5}	7.2×10^{-5}
Water Absorption (24 hours)	%	D-570	less than 0.03	less than 0.03	less than 0.03	less than 0.03
Dielectric Constant (1 mHz at 23°C)		D-150	2.07	2.07	2.07	2.07
Volume Resistivity	Ω-cm	D-257	$>10^{18}$	$>10^{18}$	$>10^{18}$	$>10^{18}$
Dielectric Strength (10 mil film)	volts/mil	D-149	1,900	1,900	1,900	1,900
Heat of Combustion	BTU/lb	D-240	2,200	2,200	2,200	2,200
Specific Heat	cal/g-°C		0.25	0.25	0.25	0.25
Oxygen Index	%	D-2863	> 95	> 95	> 95	> 95
Flame Rating		UL-94	V-0	V-0	V-0	V-0
Upper Service Temperature	°C	UL-746	260	260	260	260
MIT Flex Life	cycles	D-2176	500,000	200,000	25,000	18,000

NOTE: The data listed here represents typical values for the stated grades of Fluon® PFA. This information should be used as a guide only and not to establish specification limits or design criteria. AGC Chemicals Americas assumes no obligation or liability for any advice furnished by us or for results obtained with respect to this product. All such advice is provided free of charge and the buyer assumes sole responsibility for results obtained in reliance thereon.

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SAFE HANDLING INFORMATION

The properties of Fluon PFA are not impacted by storage time. Storage and handling facilities should be designed to minimize contact with airborne contamination and the formulation of condensation on the resin. Fluoropolymers are not hygroscopic and will not typically need to be dried prior to use. However, masterbatches used to pigment fluoropolymers may contain materials that do absorb water and should be dried prior to use.

FREIGHT CLASSIFICATION

Fluon PFA when shipped by rail or express is classified "Plastics, Synthetic, O.T.L., NOIBN."
Resin shipped by truck is classified "Plastics, Materials O.T.F.C.E. or S. Granules."

ASTM CLASSIFICATIONS

Fluon PFA grade P-63P is classified as ASTM D-3307 Type I; grade P-66P is classified as ASTM D-3307 Type II; and grade P-65P is classified as ASTM D-3307 Type III. Your AGC Chemicals Americas representative can advise you of the ASTM classifications of the other PFA materials.

For more information and samples contact

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