

DuPont™ Teflon® PFA 350

fluoropolymer resin

Extrusion and Molding Resin

Brand

Teflon® is a registered trademark of DuPont for its brand of fluoropolymer resins, which can only be licensed by DuPont for use in approved applications. Customers who wish to use the *Teflon*® trademark in connection with DuPont PFA products under license from DuPont should contact (800) 262-2745. Without a license, customers may not identify their product as containing *Teflon*®, but may refer to the resin as PFA 350.

Description

DuPont™ *Teflon*® PFA 350 is a general-purpose resin available in clear, 2.5-mm (0.1-in.) pellets. Compared with other grades of *Teflon*® PFA, its most unique features are a relatively low flow rate, greatly increased flex life, and enhanced resistance to environmental stress cracking.

Teflon® PFA 350 and the other *Teflon*® PFA (perfluoroalkoxy) fluoropolymer resins combine the processing ease of conventional thermoplastics with properties similar to those of polytetrafluoroethylene (PTFE). They have high melt strength, stability at high processing temperatures, and resistance to creep at high service temperature.

Teflon® PFA 350 is preferred when extended service is required in hostile environments involving chemical, thermal, and mechanical stress. For a given process, its high melt strength and thermal stability can be used to improve rates. Compared with other fluoropolymers, its creep resistance at its high service temperatures provides a superior balance and level of end-use properties.

Properly processed products made from neat *Teflon*® PFA 350 resin provide the superior properties typical of the fluoropolymer resins: retention of properties after service at 260°C (500°F), useful

properties at -196°C (-320°F), and chemical inertness to nearly all industrial chemicals and solvents. Dielectric constant and dissipation factor are exceptionally low. Molded products have moderate stiffness and high ultimate elongation.

In a flame situation, products of *Teflon*® PFA 350 resist ignition and do not themselves promote flame spread. When ignited by flame from other sources, their contribution of heat is small and with very little smoke.

Statements, or data, regarding behavior in a flame situation are not intended to reflect hazards presented by this or any other material when under actual fire conditions.

Typical End Products

Applications for *Teflon*® PFA 350 include extruded tubing in hose for handling aggressive fluids at high pressures; chemical linings for pipes, valves, and fittings used in the chemical processing industries; film for high flex service; traditional extruded injection or blow-molded articles requiring the unique performance of *Teflon*® PFA 350.

Processing

Teflon® PFA 350 can be processed by conventional melt extrusion and by injection, compression, and transfer and blow-molding processes. High melt strength and heat stability permit the use of relatively large die openings and high-temperature draw-down techniques that increase production rates. Reciprocating screw injection molding machines are preferred. Corrosion-resistant metals should be used in contact with molten resin. Extruder barrels should be long, relative to diameter, to provide residence time for heating the resin to approximately 395°C (730°F).



Safety Precautions

WARNING!

VAPORS CAN BE LIBERATED THAT MAY BE HAZARDOUS IF INHALED.

Before using *Teflon*[®] PFA 350, read the Material Safety Data Sheet and the detailed information in the “Guide to the Safe Handling of Fluoropolymer Resins,” latest edition, published by the Fluoropolymers Division of The Society of the Plastics Industry—available from DuPont.

Open and use containers only in well-ventilated areas using local exhaust ventilation (LEV). Vapors and fumes liberated during hot processing, or from smoking tobacco or cigarettes contaminated with *Teflon*[®] PFA 350, may cause flu-like symptoms (chills, fever, sore throat) that may not occur until several hours after exposure and 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

The properties of *Teflon*[®] PFA 350 resin are not affected by storage time. Ambient storage conditions should be designed to avoid airborne contamination and water condensation on the resin when it is removed from containers.

Freight Classification

Teflon[®] PFA 350 is classified as “Plastics, Materials, Granules.”

Packaging

Teflon[®] PFA 350 is packaged in 24.9-kg (55-lb) bags with a polyethylene inner lining. Special packages containing 2.3 kg (5 lb) and 11.3 kg (25 lb) are also available.

Table 1
Typical Property Data for DuPont™ Teflon® PFA Fluoropolymer Resin Grade 350

Property	ASTM Test Method	Unit	Nominal Value
Thermal			
Nominal Melting Point	D3418	°C (°F)	302–310 (575–590)
Coefficient of Linear Thermal Expansion, 21–100°C (70–212°F) 100–149°C (212–300°F) 149–208°C (300–408°F)	D696	mm/mm/°C (in./in./°F)	14 x 10 ⁻⁵ (7.8 x 10 ⁻⁵)
		mm/mm/°C (in./in./°F)	18 x 10 ⁻⁵ (9.8 x 10 ⁻⁵)
		mm/mm/°C (in./in./°F)	22 x 10 ⁻⁵ (12.1 x 10 ⁻⁵)
		mm/mm/°C (in./in./°F)	22 x 10 ⁻⁵ (12.1 x 10 ⁻⁵)
Upper Service Temperature	—	°C (°F)	260 (500)
Flow Rate	D3307	g/10 min	2.0
Mechanical			
Tensile Strength, 23°C (73°F) 250°C (482°F)	D3307	MPa (psi)	28 (4,00)
		MPa (psi)	14 (2,00)
Specific Gravity	D792	—	2.12–2.17
Tensile Yield Strength, 23°C (73°F)	D3307	MPa (psi)	15.2 (2,200)
Ultimate Elongation, 23°C (73°F) 250°C (482°F)	D3307	%	300
		%	500
Flexural Modulus, 23°C (73°F) 250°C (482°F)	D790	MPa (psi)	625 (90,000)
		MPa (psi)	69 (10,000)
Hardness Durometer	D2240	—	D55
MIT Folding Endurance 0.18–0.20 mm (0.007–0.008 in.)	D2176	cycles	500,000*
Electrical			
Dielectric Strength Short Time, 0.25 mm (0.010 in.)	D149	kV/mm (V/mil)	80 (2,000)
			80 (2,000)
Dielectric Constant, 60–10 ⁶ Hz	D150	—	2.03
Dissipation Factor, 60–10 ⁶ Hz	D150	—	0.0001
Volume Resistivity	D257	ohm.cm	10 ¹⁸
General			
Water Absorption, 24 hr	D570	%	<0.03
Weather and Chemical Resistance	—	—	Outstanding
Limiting Oxygen Index	D2863	%	>95

*Depending on fabrication conditions

Note: Typical properties are not suitable for specification purposes.

Teflon® PFA 350 is ASTM D3307, Type II.

For more information on Fluoroproducts:**(302) 479-7731**

DuPont Fluoroproducts
P.O. Box 80713
Wilmington, DE 19880-0713
www.teflon.com

Europe

DuPont de Nemours Int'l SA
DuPont Fluoroproducts
2, chemin du Pavillon
P.O. Box 50
CH-1218 Le Grand-Saconnex
Geneva, Switzerland
(022) 7175111

Japan

DuPont Mitsui
Fluorochemicals Co., Ltd.
Chiyoda Honsha Building
5-18, Sarugaku-cho 1-chome
Chiyoda-ku, Tokyo 101 Japan
81-3-5281-5872

Asia Pacific

DuPont China, Limited
1122 New World Office Bldg.
(East Wing)
24 Salisbury Road
Tsim She Tsui
Kowloon
Hong Kong
(852) 27341948
Tim-S.T.Leung@hkg.dupont.com

Canada

DuPont Canada, Inc.
DuPont Fluoroproducts
P.O. Box 2200, Streetsville
7070 Mississauga Road
Mississauga, Ontario, Canada
L5M 2H3
(905) 821-5194

South America

DuPont do Brasil S/A
Fluoropolymers
Alameda Itapecuru, 506
06454-080 - Alphaville
P.O. Box 263
Barueri, Sao Paulo, Brazil
0800-171715
Produtos.Brazil@bra.dupont.com

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CAUTION: Do not use in medical applications involving permanent implantation in the human body. For other medical applications, see "DuPont Medical Caution Statement," H-50102.

