

DuPont™ Teflon® PFA 345T

FLUOROPOLYMER RESIN

Extrusion and Molding Resin for High Temperature Applications

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 345T.

Description

Teflon® PFA345T is a special-purpose resin available in clear, 2.5 mm (0.1 in) pellets. This resin is a chemically modified form of Teflon® PFA345 that combines many of the benefits of the parent resin with several new ones. Like Teflon® PFA345, it offers great flex life and resistance to environmental stress cracking. The additional benefits are improved thermal stability and color while processing.

The improved thermal stability of Teflon® PFA345T results in reduced amounts of bubbles in final parts and decreased corrosion of processing equipment. This resin can be processed at higher temperatures and higher rates than Teflon® PFA345. Teflon® PFA345T combines the processing ease of conventional thermoplastics with properties similar to those of polytetrafluoroethylene. Refer to Table 1 for typical property data. Properly processed products made from Teflon® PFA345T resin provide the superior properties typical of the fluoropolymer resins: retention of physical properties at -196°C (-320°F), and chemical inertness to nearly all industrial chemicals and solvents. Dielectric properties are excellent. Molded products have moderate stiffness and high ultimate elongation.

In a flame situation, products of Teflon® PFA345T resist ignition and do not themselves promote flame spread. When ignited by flame from other sources, the contribution of heat is very small and added at a low rate with very little smoke.

Typical End Products

Applications for Teflon® PFA345T include tubing, unsupported pipe linings for production of corrosive chemicals, and wire and cable insulation for chemical environments.

Processing

Teflon® PFA345T can be processed by conventional melt extrusion and by injection, compression, 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, which increase production rates. Reciprocating screw injection molding machines are preferred. Corrosion-resistant metals should be used in contact with molten resin. Extruder barrel should be long, relative to diameter, to provide residence time for heating the resin to approximately 390°C (730°F).

Safety Precautions

VAPORS CAN BE LIBERATED THAT MAY BE HAZARDOUS IF INHALED. Before using Teflon® PFA345T, 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® PFA345T 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

Special product isolation and packaging procedures are used by DuPont to eliminate external contamination of Teflon® PFA345T resin.

The properties of Teflon® PFA345T resins 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.



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Freight Classification

Teflon® PFA345T, when shipped by rail or express, is classified "Plastics, Synthetic, OTL, NOIBN." Resin shipped by truck is classified "Plastics, Materials OTFCE or S. Granules."

Packaging

Teflon® PFA345T is packaged in 45.4 kg (100 lb) quantities in drums, each containing two 22.7 kg (50 lb) polyethylene bags. Special packages containing 2.3 kg (5 lb) and 11.3 kg (25 lb) are also available.

Table 1
Typical Property Data for Teflon® PFA Fluoropolymer Resin Grade 345T

Property	ASTM Test Method	Unit	Nominal Value
Thermal			
Nominal Melting Point	DTA-E168	°C	302-310
Coefficient of Linear Thermal Expansion, 20-100°C (58-212°F)	D696	mm/mm/°C (in/in/°F)	13 x 10 ⁻⁴
Upper Service Temperature	–	°C (°F)	260 (500)
Flow Rate	D3307	g/10 min	5
Mechanical			
Tensile Strength, 23°C (73°F) 250°C (482°F)	D3307	MPa (psi) MPa (psi)	26.2 (3,800) 9.6 (1400)
Tensile Yield Strength, 23°C (73°F) 250°C (482°F)	D3307	MPa (psi)	26.2 (3,800)
Ultimate Elongation, 23°C (73°F) 250°C (482°F)	D3307	% %	320 480
Specific Gravity	D792	00	2.12-2.17
Flexural Modulus, 23°C (73°F) 250°C (482°F)	D790	MPa(psi) MPa(psi)	551 (80,000) 55 (8000)
Hardness Durometer	D2240	–	D55
Electrical			
Dielectric Strength	D149	kV/mm (V/mil)	52 (1300)
Dielectric Constant, 60-106 Hz	D150	–	2.1
Dissipation Factor	D150	00	0.0001
Volume Resistivity	D257	ohm-cm	>1015
General			
Water Absorption, 24 hr	D570	%	<0.01
Weather and Chemical Resistance	–	–	outstanding
Limiting Oxygen Index	D2863	%	>95

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