DuPont Fluoroproducts

DuPont™ Teflon® PFA RM1 HP *Plus*
fluoropolymer resin

Rotational Molding Fluoropolymer 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 RM1 HP *Plus*.

Description

Teflon® PFA RM1 HP *Plus* is a premium rotomolding resin. Its most unique feature is the advanced chemistry of *Teflon*® PFA HP *Plus* that will provide superiorprocessibility, products, and smooth surface. In addition, *Teflon@* PFA RM1 HP *Plus* is chemically modified to yield enhanced resin purity, lower extractable fluorides, and freedom from other foreign materials. This product contains no additives and is designed for hostile chemical environments where purity in the parts-per-billion range is needed.

The properties of *Teflon*® PFA RM1 HP *Plus* in molded form are similar to other grades of *Teflon*® PFA HP *Plus* (perfluoroalkoxy) fluoropolymer resin. Many properties are similar to those of polytetrafluoroethylene.

Rotational molding is a favored process for making large, hollow parts or for lining objects with complex inside surfaces. Applications for *Teflon*® PFA RM1 HP *Plus* include linings molded in place using the object to be lined as the mold. *Teflon*® PFA RM1 HP *Plus* is preferred when high performance is a major requirement.

Properly processed rotational moldings made from neat *Teflon*® PFA RM1 HP *Plus* resin provide the superior properties typical of fluoropolymer resins: retention of physical properties after service at 250°C (482°F), useful properties at -196°C (-320°F), and chemical inertness to nearly all industrial chemicals and solvents. Dielectricproperties are excellent. Molded products have moderate stiffness and high ultimate elongation. Refer to **Table 1** for typical property data.

In a flame situation, products of *Teflon*® PFA RM1 HP *Plus* resist ignition and do not themselves promote flame spread. When ignited by flame from other sources, their contribution of heat is very small and added at a slow rate with very little smoke.

Typical End Products

Teflon® PFA RM1 HP *Plus* is ideal for many end products for fluid handling in the chemical processingindustries, including pump housings, vessels, columns, elbows, tees, and pipe sections with unusual shapes. In addition, any hollow structure with internal contours that permit uniform and smooth coating by the PFA HP *Plus* resin flow is a candidate for lining, provided it can withstand high temperatures. Because of its enhanced resin purity, *Teflon*® PFA RM1 HP *Plus* is suitable for use in semiconductor manufacture and fluid handling systems for industry or life sciences.

Processing

For rotational molding, *Teflon*® PFA RMl HP *Plus* resin is placed inside a hollow metal structure that is slowly rotated biaxially and heated above the melting point of the resin (285°C) [545°F]). As the resin melts, it is deposited on the inner surface of the structure. Resin flow and distribution are critical because the high melt viscosity of *Teflon*® PFA HP *Plus* limits the lateral flow of melted resin. A cooling step then causes the molten resin to solidify and densify in place, creating an integral lining or a removable, hollow plastic part.

Good moldings require close attention to many details such as choice of metals for the mold, preparation of the metal surface, rate of rotation, venting, and heating/cooling cycles. The equipment must operate at high temperature and resist thermal shock.

Safety Precautions

WARNING!

VAPORS CAN BE LIBERATED THAT MAY BE HAZARDOUS IF INHALED.

Before using *Teflon*® PFA RM1 HP *Plus,* 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 RM1 HP *Plus,* may cause flu-like symptoms (chills, fever, sore throat) that may not occur until several hours after exposure and 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.

During rotational molding, a large volume of air is used to melt *Teflon*® PFA RM1 HP *Plus* resin and to cool the molten resin. Vapors from molten resin should not be allowed to enter the operating area. Negative pressure should be maintained in the oven chamber so that off-gas will be exhausted to the outside. The same is true for the cooling chamber where exhaust blower rating should exceed that of the cooling air blower. Hot molds should be disassembled in a well-ventilated area. Vent tubes should be used on all molds to avoid pressure buildup.

Storage and Handling

The properties of *Teflon*® PFA RM1 HP *Plus* are not affected by storage time. Ambient storage conditions should be designed to avoid airborne contamination and the formation of water condensation on the powder when it is removed from containers.

Packaging

Teflon® PFA RM1 HP *Plus* is packaged in drums containing 45.4 kg (100 lb) net weight.

Freight Classification

Teflon® PFA RM1 HP *Plus* is classified as "Plastics, Materials, Granules."

Table 1

Typical Property Data for DuPontTM *Tef/on*® PFA RM1 HP *Plus* Fluopolymer Resin

Property	ASTM Test Method	Unit	Nominal Value
Thermal			
Nominal Melting Point	DTA-El68	°C	285-300
Flow Rate	D3307	g/10 min	17-26
Upper Service Temperature	--	°C (°F)	250 (482)
Mechanical			
Linear Coefficient of Expansion, 0-100°C (32-212°F)	D696	µm/m/°C (µm/m/°F)	140 (78)
Specific Gravity	D792	--	2.15
Tensile Strength, Room Temperature	D3307	MPa (psi)	27 (3,900)
Ultimate Elongation, Room Temperature	D3307	%	780
Electrical			
Dielectric Strength, 0.25 mm (0.010 in.)	D149	kV/mm (V/O.001 in.)	25 (600)
General			
Water Absorption, 24 hr	D570	%	<0.03
Weather and Chemical Resistance	--	--	Outstanding
Limiting Oxygen Index	D2863	%	>95

Notes: Teflon® PFA RM1 HP Plus is ASTM D3307, Type III.
Typical propertiesare notsuitableforspecification purposes.
Statements or data regarding behavior in aflame situation are not intended to reflect hazards presented by this or any other material when underactualfireconditions.

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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.

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