



DuPont PTFE FPD3584

fluoropolymer resin

Aqueous Dispersion

Description

DuPont PTFE FPD3584 is a negatively charged, hydrophobic colloid, containing approximately 60% (by total weight) of 0.05 to 0.5 μm polytetrafluoroethylene (PTFE) resin particles suspended in water. Seen as a milky white liquid, it also contains approximately 6% (by weight of PTFE) of a nonionic wetting agent and stabilizer. Viscosity at room temperature is approximately 20 cP. Nominal pH is 10.

DuPont PTFE FPD3584 dispersion is a general-purpose impregnation grade of dispersion.

When properly processed, the PTFE resin in DuPont PTFE FPD3584 exhibits the superior properties typical of the fluoropolymer resins: retention of properties after service at 260°C (500°F), useful properties at -240°C (-400°F), chemical inertness to nearly all industrial chemicals and solvents, and low friction and antistick surfaces. Dielectric properties are outstanding and stable with frequency and temperature.

Typical End Products

DuPont PTFE FPD3584 is normally used to impregnate packings for sealing and low friction applications. The small particle size, low surface tension and low viscosity aid in wetting of the braided yarn bundles. Typical substrates that can be impregnated include PTFE fibers, aramid, flax, glass, etc.

FDA Compliance

Normally impregnated packings are not sintered and, therefore, would not be suitable for food contact applications. Products that have been sintered at the high temperatures normally used to process (melt and fuse) PTFE can qualify for use in contact with food in compliance with FDA regulation 21 CFR 177.1550.

Processing

PTFE resin does not respond to solvent or melt processes. A dispersion of PTFE particles provides an alternate method for making coated or impregnated products.

Conventional dip or flow techniques can be used for coating or impregnating other products with DuPont PTFE FPD3584 fluoropolymer resin. The resin particles can be consolidated by heat into a coherent matrix or coating or left as particles to influence the properties of a finished product. The dispersion can be diluted with demineralized water, if desired, to help reduce the amount of PTFE absorbed on the substrate.

Products utilizing entrained PTFE resin particles only for their lubricating or hydrophobic properties are dried and baked, but not heated above the crystalline melting point of the particles. For example, rope-like products, such as shaft packings, can be made from braided fabrics in a variety of cross

sections. The dispersion wets internal surfaces and promotes penetration of the extremely small particles. The unmelted particles are sheared and retained as an impregnant, even when compressed in service and exposed to steam or chemicals. Unmelted particles also can improve flexibility and flex life. High-temperature resistant fibers are not necessarily required in these applications.

Other solid or liquid ingredients can be added to DuPont PTFE FPD3584 to provide specific processing or finished product behavior.

Safety Precautions

WARNING!

VAPORS CAN BE LIBERATED THAT MAY BE HAZARDOUS IF INHALED.

Before using, read the Material Safety Data Sheet and the detailed information in the “Guide to the Safe Handling of Fluoropolymer Resins, 2nd 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 DuPont PTFE FPD3584, may cause flu-like symptoms (chills, fever, sore throat) that may not occur until several hours after exposure and that typically pass within about 24 hr. 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.

DuPont PTFE FPD3584 contains additives in the aqueous phase that are irritants. In case of skin contact, flush with water immediately. In case of eye contact, flush with water immediately and get medical help.

Storage and Handling

The dispersion particles in DuPont PTFE FPD3584 will settle on prolonged standing or on heating above 66°C (150°F). They usually can be redispersed by mild agitation. Drums may be rolled or the product stirred gently just prior to use. The dispersion must be protected from freezing, which will cause irreversible settling.

Ammonium hydroxide is used by DuPont to set pH to approximately 10 at the time of shipment. High ambient temperatures can deplete the ammonia level and reduce the pH. Declining pH eventually favors bacterial growth, which causes odor and scum. The pH should be measured and maintained between 9.5 and 10.

Both very high and very low temperatures may be detrimental. Dispersions must not be allowed to freeze. The optimum storage temperature range is 7–24°C (45–75°F), with temperatures low in the range preferred. Storage at 7–32°C (45–90°F) is acceptable within nominal shelf life for standard dispersions. If dispersions are to be stored for extended periods beyond their nominal shelf life, low-temperature storage is especially desirable because the particles are harder at lower temperatures and, therefore, are less likely to stick together as they settle.

High-speed stirring, pumping, or any other violent agitation must be avoided to minimize sheared particles or coagulation and to minimize foaming. Ideally, the dispersion should be conveyed by gravity from storage to processing stations.

Storage and handling areas should be clean. Keep dispersion drums closed and clean to avoid both contamination and coagulation by drying at the liquid surface. High processing temperatures will cause even very small foreign particles to become visible or to make defects in finished products. Good housekeeping and careful handling are essential.

Table 1
Typical Property Data for DuPont PTFE Fluoropolymer Resin Dispersion Grade FPD3584

Property	ASTM Standard	Unit	Nominal Value
Percent PTFE Resin Solids	D4441	%	60
Weight of PTFE Resin Solids	D4441	kg/m ³ (lb/gal)	900 (7.5)
Specific Gravity of Dispersion	D4441	—	1.5
Average Dispersion Particle Size	—	μm	0.2
pH (min.) of Dispersion	E70	—	9.5
Viscosity of Dispersion (at 25°C [77°F])	D2196	cP (Pa·sec)	20 (0.02)
Melting, Peak Temperature			
Initial	D1457	°C (°F)	337 (639)
Second	D1457	°C (°F)	327 (621)

Note: Typical properties are not suitable for specification purposes.

Packaging

DuPont PTFE FPD3584 is packaged in 114-L (30-gal) nonreturnable drums and in 1,037-L (275-gal) recyclable containers.

Freight Classification

DuPont PTFE FPD3584 when shipped by rail or express is classified “Plastics, Synthetic, Liquid, NOIBN.” Resin shipped by truck is classified “Plastics, Materials, Liquid, NOI.”

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

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

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 and Asia Pacific

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

Canada

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

Latin America

Du Pont Fluoroproducts
Latin America Regional Office
P.O. Box 80711
Wilmington, DE 19880-0711
(302) 999-3582

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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.

