

DuPont™ Teflon® PFA TE-7224

Aqueous Fluoropolymers
made with
Echelon™ Dispersion Technology

Product Information

Aqueous Dispersion

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 products under license from DuPont should contact (800) 262-2745 in the US or the regional sales office listed at the back of this brochure. Without a license, customers may not identify their product as containing Teflon®, but may refer to the resin as PFA fluoropolymer dispersion TE-7224.

Description

DuPont™ Teflon® PFA TE-7224 is a negatively charged, hydrophobic colloid, containing approximately 60% (by total weight) of 0.05 to 0.5 µm perfluoroalkoxy (PFA) resin particles suspended in water. A milky white liquid, Teflon® PFA TE-7224 also contains approximately 5% by weight of a non-ionic wetting agent and stabilizer (based on the weight of the PFA solids). Viscosity at room temperature is approximately 20 cP. Nominal pH is 10.

Unlike Teflon® PTFE dispersions, the resin in Teflon® PFA TE-7224 is a true thermoplastic and will exhibit some flow above its melting point.

When properly processed, the PFA resin in Teflon® PFA TE-7224 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

Teflon® PFA TE-7224 is a general-purpose product used in a variety of coating applications. It can also be used as a heat sealable topcoat.

FDA Compliance

Properly processed products (sintered or melted at high temperatures common to the industry) made from Teflon® PFA TE-7224 can qualify for use in contact with food in compliance with FDA Regulation 21 CFR 177.1550 and the German BGA. Products made from unsintered dispersion do not comply.



The miracles of science™

Processing

Conventional coating techniques, such as dip, spray, spin, or roller coating, can be used with Teflon® PFA TE-7224. Thin coats, usually less than 5 µm (0.2 mil), are applied to prevent mud cracking of the coating as it dries. The water is normally removed at 100–120°C (212–248°F), followed by heating around 250–290°C (482–554°F) to remove the wetting agent. Final consolidation is done above the 305°C (581°F) melting point. Typically final temperatures are around 340°C (644°F). Prolonged heating above 370°C (698°F) should be avoided as this could lead to thermal degradation of the Teflon® PFA.

Other solid or liquid ingredients can be added to Teflon® PFA TE-7224 to provide specific processing or finished product behavior.

Safety Precautions

WARNING!

VAPORS CAN BE LIBERATED THAT MAY BE HAZARDOUS IF INHALED.

Before using DuPont™ Teflon® FEP TE-7224, 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 or the “Safe handling of Fluoropolymer dispersions” published by the APME. These documents are 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 TE-7224, 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.

Teflon® PFA TE-7224 fluoropolymer resin 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 Teflon® PFA TE-7224 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 10.5.

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, 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.

Packaging

Teflon® PFA TE-7224 is packaged in 19- and 114-L (5- and 30-gal) nonreturnable drums.

Freight Classification

Teflon® PFA TE-7224 when shipped by rail or express is classified “Plastics, Synthetic, Liquid, NOIBN.” Resin shipped by truck is classified “Plastics, Materials, Liquid, NOI.”

Table 1
Typical Property Data for DuPont™ Teflon® PFA Fluoropolymer Resin Dispersion Grade TE-7224

Property	Test Method ⁽¹⁾		Unit	Typical Value
General				
Melt Flow Rate of Resin (MFR 372/5.0)	ISO 12086	D 2116	g/10 min	1–3
Density of Dispersion	ISO 8962	–	g/cm ³	1.5
Average Dispersion Particle Size, diameter		–	µm	0.20
pH of Dispersion	ISO 1148	E 70	–	10.0
Solids Content	ISO 12086	D 4441	%	60
Resin Dry Weight (60% solids)		–	g/l (lbs/gal)	898 (7.5)
Viscosity of Dispersion	ISO 2555	D 2196	mPa·s (cP)	25 (25)
Thermal				
Melting Point of Resin		D2116	°C (°F)	305 (581)

Typical properties are not suitable for specification purposes.

Decimal point represented by a period (.)

⁽¹⁾ ASTM unless otherwise specified.

For more information call (302) 479-7731

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

