

DuPont™ Teflon® PTFE 62

fluoropolymer resin

Fine Powder Lubricated Extrusion 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 Fine Powder 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 PTFE 62.

Description

DuPont™ *Teflon*® PTFE 62 is a white powder composed of agglomerate particles. As with other grades of *Teflon*® polytetrafluoroethylene (PTFE) fine powders, it can be lubricated and extruded by pressure alone. This provides the capability for long lengths of products, such as tubing, and wire insulation, which cannot be melt extruded from PTFE resin.

Compared with other grades of PTFE fine powder, *Teflon*® PTFE 62 is a premium resin that has increased thermal stability, flex life, stress-crack resistance, and clarity. It is one of the most consistent processing resins, and can be used in the most demanding service conditions. It is most suitable for products with medium cross sections made by low- to medium-reduction ratio extrusions.

Properly processed products made from neat *Teflon*® PTFE 62 provide 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. Products have moderate stiffness and high ultimate elongation.

In a flame situation, products of *Teflon*® PTFE 62 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.

Teflon® PTFE 62 is ASTM D4895, Type I, Grade 4, Class B (ASTM D1457, Type III, Grade 2, Class B).

Typical End Products

Applications for *Teflon*® PTFE 62 include reinforced hose requiring the ultimate in reliability and performance in chemical service or with steam, hydraulic fluid, hydrocarbon fuel, or reactive gas; chemical linings for pipe and valves; and film and tape fabricated into products such as flexible tubing, ducts, or diaphragms for chemical service.

FDA Compliance

Properly processed products (sintered at high temperatures common to the industry) made from *Teflon*® PTFE 62 resin can qualify for use in contact with food in compliance with FDA Regulation 21 CFR 177.1550.



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Processing

Teflon[®] PTFE 62 is prepared for extrusion by mixing with a liquid extrusion aid. The damp powder is compressed into a cylindrical preform slug and placed in the cylinder of a ram-type extruder. Under high pressure, the composition is forced through a finishing die to produce beading, tubing, or coatings. Dissimilar materials, such as metal wire or high-temperature fibers, can be coated by feeding them through the axis of the extruder barrel.

After extrusion, the product is a low-density, but coherent, fibrous structure. *Teflon*[®] PTFE 62 is usually processed further, with heat, into a solid resin product such as tubing.

Heat is applied in two steps, which may be taken in-line with extrusion or separately. The lubricant must be removed first, usually by heating within the range of 100–300°C (212–572°F). A sintering step follows to melt the neat resin above its crystalline melting point of approximately 342°C (648°F) and produce a void-free, solid product of PTFE resin. When performed in-line, the heating steps determine the maximum line speed.

Reduction ratio (RR) is the ratio of cross section of preform to that of extrudate; it is an extruder option also affecting the selection of resin grade.

Safety Precautions

WARNING!

VAPORS CAN BE LIBERATED THAT MAY BE HAZARDOUS IF INHALED

Before using *Teflon*[®] PTFE 62, 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 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*[®] PTFE 62, may cause flu-like symptoms (chills, fever, sore throat) that may not occur until several hours after exposure and pass within 36 to 48 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.

Flammable liquid extrusion aids can cause fires in ovens and in mixing areas. Before using, obtain manufacturer’s recommendations.

Storage and Handling

Teflon[®] PTFE 62 must be handled carefully to avoid shearing the powder prior to extrusion. Fibrillation by shearing is not reversible, and damaged particles can appear as defects in the finished product. As temperature is reduced, the powder becomes progressively less sensitive to mechanical damage or compaction in its containers.

Fine powder can withstand significantly more abuse when it is in the below room temperature transition state. For this reason, DuPont stores and delivers *Teflon*[®] PTFE 62 at or below 7°C (45°F). *Teflon*[®] PTFE 62 will remain in this cold transition state until it is warmed above 15°C (60°F). If this resin is allowed to go above 19°C (66°F) at any time, it must be cooled below about 8°C (47°F) to bring it back to the cold state.

Table 1
Typical Property Data for DuPont™ Teflon® PTFE 62 Fluoropolymer Resin

Property	ASTM Test Method	Unit	Nominal Value
Bulk Density	D4895	g/L	465
Average Particle Size	D4895	μm	490
Standard Specific Gravity	D4895	—	2.15
Rheometer Pressure*	D4895	MPa(psi)	26.9(3,900)
Melting, Peak Temperature			
Initial	D4895	°C (°F)	342 (648)
Second	D4895	°C (°F)	327 (621)

Typical properties are not suitable for specification purposes.

*Reduction Ratio 400:1

All processing steps prior to preforming are facilitated at reduced temperature, but ambient dew point must be controlled to prevent condensation on the resin.

Storage and handling facilities should be clean. The high sintering temperature causes even very small foreign particles to become visible or to make defects in finished products. Keep resin drums closed and clean. Good housekeeping and careful handling are essential.

Freight Classification

Teflon® PTFE 62, when shipped by rail or express, is classified “Plastics, Synthetic, O.T.L., NOIBN.” Resin shipped by truck is classified “Plastics, Materials Granules.”

Packaging

Teflon® PTFE 62 resin is packaged in 25-kg (55.1-lb) plastic containers.

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
26/F., Tower 6, The Gateway
9 Canton Road, Tsimshatsui
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
L5M2H3
(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.

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