



Teflon® PTFE 9B

fluoropolymer resin

Granular Ram 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 PTFE 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 9B.

Description

Teflon® PTFE 9B is a free-flowing white powder composed of premelted resin. It is designed for use in the ram extrusion process. Compared with other DuPont resins suitable for ram extrusion, *Teflon*® PTFE 9B provides outstanding resistance to charge fracture (poker-chipping) caused by excessive back-pressure during the extrusion of small-diameter rods, thin-wall tubing, and complicated profiles. Its uniform particle characteristics make it well suited for difficult feeding conditions.

Properly processed products made from neat *Teflon*® PTFE 9B 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.

In a flame situation, products of *Teflon*® PTFE 9B 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.

Typical End Products

Thin-wall tubing and small-diameter rods are popular shapes that are used as extruded, or machined into parts, such as electrical insulators, fluid handling components, seal rings, bushings, and bearings.

FDA Compliance

Properly processed products (sintered at high temperatures common to the industry) made from *Teflon*® PTFE 9B resin can qualify for use in contact with food in compliance with FDA Regulation 21 CFR 177.1550.

Processing

Teflon® PTFE 9B is usually processed in two steps: preforming and sintering.

The powder is first compacted into a preformed shape approximating that of the desired molding.

The preformed shapes are usually sintered in batches using a precise heating and cooling cycle, which consolidates them at temperatures above the crystalline melting point of the premelted resin.

The ram extrusion process combines the two steps for processing PTFE (preforming and sintering) into one continuous operation. Successive charges of powder are forced down a heated barrel by a reciprocating ram. Compaction and heating above the crystalline melting point are done in series, to produce a continuous rod or tube.

The properties of a finished molding are dependent on the back-pressure generated by the resin itself, rate of extrusion, and the temperature profile of the extruder barrel plus cooling plate. Refer to the typical property data in **Table 1**.

Safety Precautions

WARNING!

VAPORS CAN BE LIBERATED THAT MAY BE HAZARDOUS IF INHALED.

Before using *Teflon*® PTFE 9B, 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.

Table 1
Typical Property Data for *Teflon*® PTFE Fluoropolymer Resin Grade 9B*

| Property | ASTM Test Method | Unit | Nominal Value |
|---------------------------|------------------|------------|------------------------|
| Average Bulk Density | D4894 | g/L | 575 |
| Average Particle Size | D4894 | μm | 550 |
| Melting, Peak Temperature | D4894 | °C (°F) | 327 ± 10 (621 ± 18) |
| Flow | D4894 | g/min | 50 |

* *Teflon*® PTFE 9B is ASTM D4894, Type V.

Note: Typical properties are not suitable for specification purposes.

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*® PTFE 9B, 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 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

Preforming is easiest when the resin is uniformly between 21–27°C (70–80°F). As temperature declines below this range, the resin will be increasingly difficult to mold without cracks and problems with condensed

moisture. Higher temperatures inhibit flow and promote lumping. Storage conditions should be set accordingly.

Cleanliness is a critical requirement for successful use of *Teflon*® PTFE 9B. The white resin and high sintering temperatures cause even very small foreign particles to become visible in finished moldings. Keep resin drums closed and clean. Good housekeeping and careful handling are essential.

Freight Classification

Teflon® PTFE 9B, 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 9B is packaged in 100-lb (45-kg) drums. Each drum has a bag liner made of polyethylene resin.

For more information on Fluoroproducts:

(302) 479-7731

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

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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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