



# Teflon® PTFE 8

fluoropolymer resin

## Granular Compression Molding 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 8.

### Description

*Teflon*® PTFE 8 is a free-flowing white powder composed of relatively large particles. Its most unique features are high bulk density and excellent powder flow.

The high bulk density and low compression ratio of *Teflon*® PTFE 8 permit the use of shallow molds for small parts and complex shapes. Good powder flow is necessary for use in equipment that feeds resin automatically.

*Teflon*® PTFE 8 is used for general-purpose, high-speed automatic preforming of small parts and ram extrusion of large diameter rod and tubing.

Properly processed products made from neat *Teflon*® PTFE 8 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. Molded products have moderate stiffness and high ultimate elongation.

In a flame situation, products of *Teflon*® PTFE 8 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

Many end products are molded or fabricated from moldings of *Teflon*® PTFE 8, including small parts such as ball valve seats, seals, discs, and lab ware. Large-diameter rods and tubing made from *Teflon*® PTFE 8 are stock shapes that are machined into parts such as electrical insulators, mechanical bushings, and seal rings.

### FDA Compliance

Properly processed products (sintered at high temperatures common to the industry) made from *Teflon*® PTFE 8 resin can qualify for use in contact with food in compliance with FDA Regulation 21 CFR 177.1550.

## Processing

*Teflon*<sup>®</sup> PTFE 8 is usually processed in two steps: preforming and sintering.

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

*Teflon*<sup>®</sup> PTFE 8 can be preformed by machines that automatically fill-and-press small shapes. Automatic preforming requires resins that flow well, have high bulk density, and have particles that break up readily under pressure to provide void-free moldings.

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 neat powder.

The properties of a finished molding are dependent on preform pressure, sintering time and temperature, and cooling rate.

*Teflon*<sup>®</sup> PTFE 8 is also used for ram extrusion, a process that combines preforming and sintering in one continuous operation. Large-diameter rods and tubing are made by forcing successive charges of powder down a cylinder heated to a specified temperature profile. 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*<sup>®</sup> PTFE 8, 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*<sup>®</sup> PTFE 8, 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.

**Table 1**  
**Typical Property Data for *Teflon*<sup>®</sup> PTFE Fluoropolymer Resin Grade 8\***

Property	ASTM Test Method	Unit	Nominal Value
<b>General</b>			
Average Bulk Density	D4894	g/L	725
Average Mold Shrinkage (at preform pressure of 35 MPa [5,000 psi])	D4894	%	2.8
Powder Flow	Modified D1855	g/min	300
Average Particle Size	D4894	μm	600
Standard Specific Gravity	D4894	—	2.16
Melting, Peak Temperature	D4894		
Initial		°C (°F)	342 ±10 (648 ±18)
Second		°C (°F)	327 ±10 (621 ±18)
<b>Mechanical</b>			
Tensile Strength	D4894	MPa (psi)	27.6 (4,000)
Elongation at Break	D4894	%	300

\* *Teflon*<sup>®</sup> PTFE 8 is ASTM D4894, Type IV, Grade 1.

**Note:** Typical properties are not suitable for specification purposes.

## 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*<sup>®</sup> PTFE 8. 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*<sup>®</sup> PTFE 8, 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*<sup>®</sup> PTFE 8 is packaged in 100-lb (45-kg) drums. Each drum has a bag liner made of polyethylene resin.

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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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