



# Teflon® PTFE 8A

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 8A.

### Description

*Teflon*® PTFE 8A is a free-flowing white powder composed of relatively large particles. It has high bulk density and good powder flow. Its most unique features are improved moldability at lower pressure and improved surface smoothness of finished parts.

The high bulk density and low compression ratio of *Teflon*® PTFE 8A 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, and for filling deep and narrow molds that are pressed isostatically. Reduced pressure is an advantage for moldings with large surface area and for isostatic molding.

*Teflon*® PTFE 8A is often preferred for molding thick sheets and for isostatic moldings. It is sometimes used for ram extrusion of rod and tubing with thicker cross sections.

Properly processed products made from neat *Teflon*® PTFE 8A 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 8A 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 fabricated from moldings of *Teflon*® PTFE 8A, including small parts such as ball valve seats, seals, discs, and lab ware. Thick molded sheets are stock shapes made from *Teflon*® PTFE 8A. It is also chosen for lining pipes, valves, and valve plugs—and for ducting, expansion bellows, piston rings, and other large complex moldings.

### FDA Compliance

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

## Processing

*Teflon*® PTFE 8A 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*® PTFE 8A is often preferred for isostatic molding which uses hydrostatic pressure on a diaphragm positioned over or around the complex object to be preformed. The resin must have good moldability and flow easily into complex or narrow molds.

*Teflon*® PTFE 8A is also chosen for large surface area sheets and slab moldings, because it has adequate flow for uniform filling over large areas without sacrificing moldability at relatively low pressure.

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*® PTFE 8A is also used for ram extrusion, a process which combines preforming and sintering in one continuous operation. Rods and tubes 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*® PTFE 8A, 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*® PTFE 8A, 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 8A\***

<b>Property</b>	<b>ASTM Test Method</b>	<b>Unit</b>	<b>Nominal Value</b>
<b>General</b>			
Average Bulk Density	D4894	g/L	690
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	480
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 8A is ASTM D4894, Type IV, Grade I.

**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 8A. 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 8A, 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 8A 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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