



Teflon® PTFE 7A

fluoropolymer resin

Granular Compression Molding Resin

Brand

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Description

Teflon® PTFE 7A is a white powder with very small particle size. Its most unique feature is high bulk density.

The small particle size of *Teflon*® PTFE 7A helps to minimize voids even at relatively low molding pressure. High bulk density increases the size of moldings possible from a given mold or press opening.

Teflon® PTFE 7A is preferred for large moldings, such as billets, requiring optimum mechanical and electrical properties. It is also used in a mixture with fillers when they are added to modify the mechanical properties of moldings.

Properly processed products made from neat *Teflon*® PTFE 7A 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 7A 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 7A, including skived film and sheet, gaskets, packings, mechanical seals, bridge or pipeline bearing pads, shaft bearings, electrical insulators, piston rings, expansion bellows, diaphragms, and chemical linings. The use of fillers provides a wide choice of modified mechanical properties.

FDA Compliance

Properly processed products (sintered at high temperatures common to the industry) made from *Teflon*® PTFE 7A resin can qualify for use in contact with food in compliance with FDA Regulation 21 CFR 177.1550.

Processing

Teflon[®] PTFE 7A usually is processed in two steps: preforming and sintering. The powder is first compacted into a preformed shape approximating that of the desired molding. A precise heating (sintering) and cooling cycle is then used to consolidate the molding 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 7A is used to make relatively large objects in molds that can be filled manually. Small-particle resins do not flow properly in automatic feeding systems. 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 7A, 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 7A, 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 7A. 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.

Table 1
Typical Property Data for *Teflon*[®] PTFE Fluoropolymer Resin Grade 7A*

Property	ASTM Test Method	Unit	Nominal Value
General			
Average Bulk Density	D4894	g/L	460
Average Mold Shrinkage (at preform pressure of 35 MPa [5,000 psi])	D4894	%	3.4
Average Particle Size	D4894	µm	34
Standard Specific Gravity	D4894	—	2.16
Melting, Peak Temperature	D4894		
Initial		°C	342 ±10
		(°F)	(648 ±18)
Second		°C	327 ±10
		(°F)	(621 ±18)
Mechanical			
Tensile Strength	D4894	MPa (psi)	34.5 (5,000)
Elongation at Break	D4894	%	375

* *Teflon*[®] PTFE 7A is ASTM D4894, Type II.

Note: Typical properties are not suitable for specification purposes.

Freight Classification

Teflon[®] PTFE 7A, 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 7A 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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