



Teflon® PTFE 7C

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 7C.

Description

Teflon® PTFE 7C is a white powder with very small particle size. Its most unique feature is the irregular, fibrous character of the particles.

The small particle size of *Teflon*® PTFE 7C helps to minimize voids even at relatively low molding pressure. The fibrous particles promote good capture and uniform distribution of inorganic fillers when they are added to modify the mechanical properties of moldings. *Teflon*® PTFE 7C exhibits relatively high mold shrinkage.

Teflon® PTFE 7C is preferred for moldings requiring optimum mechanical and electrical properties. Its relatively low bulk density limits the size of moldings from a given mold or press opening. It is often preferred for making filled compounds, especially with metal powders that are difficult to mix because of density differences.

Properly processed products made from neat *Teflon*® PTFE 7C 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 7C 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 7C—or made with filled compounds based on *Teflon*® PTFE 7C. The filled compounds provide a wide choice of modified mechanical properties. End products using *Teflon*® PTFE 7C include skived film and sheet, gaskets, bridge or pipeline bearing pads, piston rings, and diaphragms.

FDA Compliance

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

Processing

Teflon[®] PTFE 7C usually is processed in two steps: preforming and sintering. The powder or filled compound 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 7C is used to make 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 7C, 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 7C, 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 7C. 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 7C*

Property	ASTM Test Method	Unit	Nominal Value
General			
Average Bulk Density	D4894	g/L	250
Average Mold Shrinkage (at preform pressure of 35 MPa [5,000 psi])	D4894	%	6.0
Average Particle Size	D4894	μm	28
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)	37.9 (5,500)
Elongation at Break	D4894	%	400

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

Note: Typical properties are not suitable for specification purposes.

Freight Classification

Teflon[®] PTFE 7C, 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 7C 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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