

DuPont™ Tefzel® HT-2185

fluoropolymer resin

Description

DuPont™ Tefzel® HT-2185 fluoropolymer resin is a special-purpose resin available in translucent, 2.5-mm (0.1-in) pellets. Compared with other grades of Tefzel®, it has a higher flow rate.

Tefzel® HT-2185 and the other Tefzel® fluoropolymers are melt processible, modified copolymers of ethylene and tetrafluoroethylene. They are high-performance resins that can be processed at relatively high rates compared with fluorocarbon resins. They are mechanically tough and offer an excellent balance of properties. **Table 1** shows typical property data for Tefzel® HT-2185.

The relatively high flow rate of Tefzel® HT-2185 makes it uniquely suitable for high-speed processing, especially for extruded coatings and injection molding of slender, thin-walled, or intricate shapes. Molded or extruded products made from Tefzel® HT-2185 are preferred for uses that do not involve significant flexural or tensile stress at elevated temperatures. Higher viscosity products such as Tefzel® HT-2181 and Tefzel® HT-2183 are preferred for these applications.

Properly processed products made from neat Tefzel® HT-2185 are inert to most solvents and chemicals, hydrolytically stable, and weather-resistant. The recommended upper service temperature is 150°C (302°F); useful properties are retained at cryogenic ranges. The level and stability of dielectric properties are excellent, and the flame rating is V-0 by the UL94 method. Mechanical properties include outstanding impact strength, cut-through, and abrasion resistance.

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

Tefzel® HT-2185 is ideal for many end products, including electrical components, such as sleeving, coil forms, sockets, connectors, and switches; lab ware, such as tubing, valves, containers, and fasteners; battery or instrument components that require chemical inertness; and mechanical parts.

Processing

Tefzel® HT-2185 can be processed by conventional melt-extrusion techniques and by injection, compression, transfer, and blow-molding processes. Compared with other grades of Tefzel®, it can be processed with greater ease and speed because of its high flow rate. Also, the melt viscosity of Tefzel® is reduced with increasing shear rate, thus permitting the use of pressure extrusions through narrow dies without requiring appreciable draw-down. Reciprocating

screw injection molding machines are preferred. Corrosion-resistant metals should be used in contact with molten resin. Extruder barrels should be long, relative to diameter, to provide residence time for heating the resin to approximately 340°C (640°F).

Safety Precautions

WARNING!

VAPORS CAN BE LIBERATED THAT MAY BE HAZARDOUS IF INHALED.

Before using Tefzel® HT-2185, 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 Tefzel® HT-2185, 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

The properties of Tefzel® HT-2185 resins are not affected by storage time. Ambient storage conditions should be designed to avoid airborne contamination and formation of water on the resin when it is removed from containers.

Freight Classification

Tefzel® when shipped by rail or express is classified "Plastics, Synthetic, O.T.L., NOIBN." Resin shipped by truck is classified "Plastics, Materials O.T.F.C.E. or S. Granules."

Packaging

Tefzel® fluoropolymer resins are packaged 20.3 kg (45-lb) multilayer, kraft bags with an integral polyethylene liner.



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Table 1
Typical Property Data for DuPont™ Tefzel® Fluoropolymer Resin Grade HT-2185

Property	Test Method	Unit	Value
Thermal			
Nominal Melting Point	ASTM D3418	°C (°F)	255–280 (491–536)
Flow Rate	ASTM D3159	g/10 min	11
Upper Service Temperature	UL746	°C (°F)	155 (311)
Mechanical			
Tensile Strength, 23°C (73°F)	ASTM D638	MPa (psi)	40 (6,000)
Specific Gravity	ASTM D792	—	1.7
Ultimate Elongation, 23°C (73°F)	ASTM D638	%	300
Flexural Modulus, 23°C (73°F)	ASTM D790	MPa (psi)	1,000 (145,000)
Impact Strength, 23°C (73°F)	ASTM D256	J/m (ft-lb/in)	No Break
Compressive Strength	ASTM D695	MPa (psi)	38 (5,500)
Linear Coefficient of Expansion 0–100°C (32–212°F)	ASTM D696	mm/mm/°C (in/in/°F)	12.6 x 10 ⁻⁵ (7.0 x 10 ⁻⁵)
Electrical			
Dielectric Strength, 0.25 mm (0.010 in)	ASTM D149	kV/mm (V/0.001 in)	70 (1,800)
Dielectric Constant, 1 MHz, 23°C (73°F)	ASTM D1531	—	2.5–2.6
Dissipation Factor, 1 MHz, 23°C (73°F)	ASTM D1531	—	0.00540
Volume Resistivity	ASTM D257	ohm·m (ohm·cm)	1 x 10 ³ (1 x 10 ¹⁷)
General			
Water Absorption, 24 hr	ASTM D570	%	0.007
Weather and Chemical Resistance	—	—	Excellent
Limiting Oxygen Index	ASTM D2863	%	30–32
Bulk Density	DuPont	g/L	1,300
Flame Rating	UL94	—	V-0

Note: Typical properties are not suitable for specification purposes.

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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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