Tefzel™ ETFE 200

Fluoroplastic Resin

Product Information

Description

Tefzel™ ETFE 200 is a general-purpose fluoroplastic resin available in translucent, 2.5-mm (0.1-in.) pellets. Compared to other grades of Tefzel™, its most unique features are an intermediate flow rate and a balance of properties that make it suitable for a variety of processes and demanding end uses.

Tefzel™ ETFE 200 and the other Tefzel™ fluoroplastics are melt processible, modified copolymers of ethylene and tetrafluoroethylene. They are high-performance resins that can be processed at relatively high rates, compared to fluorocarbon resins. They are mechanically tough and offer an excellent balance of properties. Tefzel™ ETFE 200 can perform successfully in applications where other thermoplastics are lacking in mechanical toughness, broad thermal capability, ability to meet difficult environmental conditions, or limited by fabricating problems.

Properly processed products made from virgin Tefzel™ ETFE 200 are inert to most solvents and chemicals, hydrolytically stable, and weather-resistant. 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. High energy radiation resistance meets IEEE 383, and the resin is approved for nuclear power plant use.

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.

Processing

Tefzel™ ETFE 200 can be processed by conventional, melt-extrusion techniques and injection, compression, transfer, and blow molding processes. Compared to other grades of Tefzel™, Tefzel™ ETFE 200 provides intermediate processing rates. Also, the melt viscosity of all grades 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 345 °C (650 °F).

Typical End Products

Tefzel™ ETFE 200 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 dishes; battery or instrument components that require chemical inertness; chemical service items, such as valve components, seal glands, pipe plugs, and corrugated tubing; and film.

Safety Precautions

Before using Tefzel™ ETFE 200 resin, refer to the Safety Data Sheet and the latest edition of "The Guide to the Safe Handling of Fluoropolymer Resins," published by The Society of the Plastics Industry, Inc. (www.fluoropolymers.org) or by PlasticsEurope (www.plasticseurope.org).

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™ ETFE 200, may cause flu-like symptoms (chills, fever, sore throat) that may not occur until several hours after exposure and typically pass within about 24 hr. 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™ ETFE 200 resins are not affected by storage time. Ambient storage conditions should be designed to avoid airborne contamination and the formation of water condensation on the resin when it is removed from containers.

Packaging

Tefzel™ fluoroplastic resins are packaged in 20.3-kg (45-lb) plastic bags.

Table 1. Typical Property Data for Tefzel™ ETFE 200 Fluoroplastic Resin

Property	Test Method*	Unit	Value
Thermal			
Nominal Melting Point	D3159	°C (°F)	255–280 (491–536)
Flow Rate	D3159	g/10 min	7
Upper Service Temperature	UL746	°C (°F)	150 (302)
Mechanical			
Tensile Strength, 23 °C (73 °F)	D3159	MPa (psi)	45 (6,500)
Specific Gravity	D792	—	1.7
Ultimate Elongation, 23 °C (73 °F)	D3159	%	300
Flexural Modulus, 23 °C (73 °F)	D790	MPa (psi)	1,200 (170,000)
Impact Strength, 23 °C (73 °F)	D256	J/m (ft·lb/in)	No Break
Hardness Durometer	D2240	Shore D	67
Compressive Strength	D695	MPa (psi)	38 (5,500)
Linear Coefficient of Expansion, 0–100 °C (32–212 °F)	E 831	mm/mm/°C (in/in/°F)	13.1×10^{-5} (7.3×10^{-5})
Electrical			
Dielectric Strength, 0.25 mm (0.010 in)	D149	kV/mm (V/0.001 in)	70 (1,800)
Dielectric Constant, 1 MHz, 23 °C (73 °F)	D1531	—	2.5–2.6
Dissipation Factor, 1 MHz, 23 °C (73 °F)	D1531	—	0.008
Volume Resistivity	D257	ohm·m (ohm·cm)	1×10^{15} (1×10^{17})
Arc Resistance	D495	seconds	122
General			
Water Absorption, 24 h	D570	%	0.007
Weather and Chemical Resistance	—	—	Excellent
Limiting Oxygen Index	D2863	%	30–32

*ASTM method, unless otherwise specified
Typical properties are not suitable for specification purposes.
Tefzel™ ETFE 200 meets the requirements of ASTM D3159 Type I, Grade 1.

HOW TO USE THE TEFZEL™ BRAND NAME WITH YOUR PRODUCT

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Replaces: K-27019
C-10187 (8/23)