Tefzel™ ETFE 280

Fluoroplastic Resin

Product Information

Description

Tefzel™ ETFE 280 is a premium fluoroplastic resin available in translucent, 2.5-mm (0.1-in) pellets. Compared with other grades of Tefzel™, its most unique features are relatively low flow rate, greatly enhanced flex life, and resistance to environmental stress.

Tefzel™ ETFE 280 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 with fluorocarbon resins. They are mechanically tough and offer an excellent balance of properties.

Tefzel™ ETFE 280 is preferred for applications where other thermoplastics are lacking in mechanical toughness; broad thermal capability; ability to meet unusual thermal, mechanical, and chemical environmental extremes; or limited by fabricating problems. Examples are components and linings for the chemical industry and molded parts with metal inserts of thick sections for use at high temperatures.

Properly processed products made from neat Tefzel™ ETFE 280 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. They are resistant to environmental stress cracking and have 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 280 can be processed by conventional melt-extrusion techniques and injection, compression, transfer, and blow molding processes. Compared with other grades of Tefzel™, processing will be at a slower rate. 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 340 °C (640 °F).

Typical End Products

Tefzel™ ETFE 280 is ideal for many end products, including chemical service items, such as lined valves and fittings, pump housings and impellers, column packings, and other abrasion-resistant linings; high temperature electrical components and insulation; fasteners, corrugated tubing, and duct work; and film.

Safety Precautions

Before using Tefzel™ ETFE 280, 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 280, 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 280 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 280 Fluoroplastic Resin

Property	Test Method*	Unit	Value
Thermal			
Nominal Melting Point	D3159	°C (°F)	255–280 (491–536)
Flow Rate	D3159	g/10 min	4
Upper Service Temperature	UL746	°C (°F)	150 (302)
Mechanical			
Tensile Strength, 23 °C (73 °F)	D3159	MPa (psi)	47 (6,700)
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	72
Compressive Strength	D695	MPa (psi)	38 (5,500)
Linear Coefficient of Expansion, 0–100 °C (32–212 °F)	E831	mm/mm/°C (in/in/°F)	13.3×10^{-5} (7.4×10^{-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	—	0.0072
Volume Resistivity	D257	ohm·m (ohm·cm)	1×10^{15} (1×10^{17})
Arc Resistance	D495	seconds	122
General			
Water Absorption, 24 hr	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 280 meets the requirements of ASTM D3159 Type I, Grade 1.

HOW TO USE THE TEFZEL™ BRAND NAME WITH YOUR PRODUCT

Tefzel™ is a registered trademark of Chemours for its brand of ETFE fluoroplastic resins. The Tefzel™ brand name is licensed by Chemours in association with approved applications. Without a trademark license, customers may not identify their product with the Tefzel™ brand name as Chemours does not sell such offerings with the Tefzel™ trademark. Unlicensed customers may refer to the Chemours product offering with only the Chemours name and product code number descriptor as Chemours sells its product offerings. There are no fair use rights or exhaustion of rights to use the Tefzel™ trademark from buying from Chemours, a Chemours customer or a distributor without a trademark license from Chemours.

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