Teflon™ FEP 9835

Fluoroplastic Resin

Product Information

For inventory control purposes, product name may be followed by an X.

Products labeled FEP 9835 and FEP 9835 X are equivalent, and all information in this document is applicable to both.

Typical Applications

Applications for Teflon™ FEP 9835 include small diameter, thin wall wire and cable insulation; industrial film; and intricate or thin wall parts made by injection molding.

Description

Teflon™ FEP 9835 is a melt-processible fluoroplastic resin available in pellet form. It is a copolymer of tetrafluoroethylene and hexafluoropropylene, without additives, that meets the requirements of ASTM D 2116 Type II. With a relatively high melt flow rate and excellent electrical properties, Teflon™ FEP 9835 has been specifically designed for high-speed extrusion of thin coatings on small-gauge wires for twisted-pair constructions. Table 1 shows the typical property data for Teflon™ FEP 9835.

As shown in Table 1, this resin provides the electrical and mechanical properties needed for low voltage applications. In addition, Teflon™ FEP 9835 has a higher melt flow rate than most other fluoroplastic resins. This permits higher extrusion speeds and easier processing, making Teflon™ FEP 9835 a cost-effective alternative for producing thin-wall extrusions.

Teflon™ FEP 9835 is designed and made to have improved adhesion to copper wire under specific wireline process conditions, low dissipation factor at high frequencies, and significant plate-out resistance in melt extrusion. It is suitable as a solid insulator and as a foamed insulator, when used with an appropriate nucleant in a nitrogen gas injection process.

Teflon™ FEP 9835 is used when traditional extrusion and molding processes are required for producing products with the superior properties of a fluoroplastic resin. Compared to other thermoplastics, the high melt strength and thermal stability of Teflon™ FEP 9835 can be used to improve processing rates. Compared with other fluoroplastics, creep resistance at high service temperatures provides a superior balance and level of end-use properties. Teflon™ FEP 9835 combines the processing ease of conventional thermoplastics with many properties similar to those of polytetrafluoroethylene.

Properly processed products made from neat Teflon™ FEP 9835 resin provide the superior properties characteristic of fluoroplastic resins: chemical inertness, exceptional dielectric properties, heat resistance, toughness and flexibility, low coefficient of friction, non-stick characteristics, negligible moisture absorption, low flammability, performance at temperature extremes, and excellent weather resistance.

In a flame situation, products of Teflon™ FEP 9835 resist ignition and do not promote flame spread. When ignited by flame from other sources, their contribution of heat is very small and added at a slow rate with very little smoke.

Processing

Teflon™ FEP 9835 can be processed by conventional melt extrusion, and by injection, compression, and transfer molding processes. High melt strength and heat stability permit the use of relatively large die openings and high temperature draw-down techniques that increase production rates. Reciprocating screw injection molding machines are preferred. Corrosion-resistant metals should be used in contact with molten fluoroplastic resin. Extruder barrel should be long, relative to diameter, to provide residence time for heating the resin to approximately 400 °C (750 °F). For more detailed processing information, including recommended draw-down ratios, consult your Chemours sales representative.

Safety Precautions

Before using Teflon™ FEP 9835 resin, refer to the Material 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 of Teflon™ FEP 9835 should be exhausted completely from the work area. Contamination of tobacco with these polymers must be avoided. Vapors and fumes liberated during hot processing that are not properly exhausted, or from smoking tobacco or cigarettes contaminated with Teflon™ FEP 9835, may cause flu-like symptoms, such as chills, fever, and sore throat. This may not occur until several hours after exposure and will typically pass within about 24 hours.

Mixtures of Teflon™ fluoroplastic resin with some finely divided metals, such as magnesium or aluminum, can be flammable or explosive under some conditions.

Storage and Handling

The properties of Teflon™ FEP 9835 resin are not affected by storage time. Ambient storage conditions should be designed to avoid airborne contamination and water condensation on the resin when it is removed from containers.

Packaging

Teflon™ FEP 9835 is supplied as pellets and is available in 25-kg single layer plastic bags and in 1,000-kg bulk containers.

Table 1: Typical Property Data for Teflon™ FEP 9835 Fluoroplastic Resin

Property	Test Method[1]		Unit	Typical Value
PROCESSING				
Melt Flow Rate (MFR at 372 °C [702 °F]/5.0 kg)	ISO 12086	D 2116	g/10 min	20
Specific Gravity	ISO 1183	D 792	—	2.15
Critical Shear Rate (372 °C/702 °F)	—	Chemours	1/s	150
MECHANICAL				
Tensile Strength, 23 °C (73 °F)	ISO 12086	D 638	MPa (psi)	24 (3,500)
Ultimate Elongation, 23 °C (73 °F)	ISO 12086	D 638	%	300
Flexural Modulus, 23 °C (73 °F)	ISO 178	D 790	MPa (psi)	520 (75,500)
MIT Folding Endurance (0.20 mm, 8 mil film)	—	D 2176[2]	Cycles	12,000
Hardness, Shore Durometer	ISO 868	D 2240	—	D 55
ELECTRICAL				
Dielectric Constant, 1 MHz	IEC 250	D 150	—	2.03
Dielectric Constant, 1 GHz	IEC 250	D 2520	—	2.03
Dissipation Factor, 1 MHz	IEC 250	D 150	—	0.0006
Dissipation Factor, 1 GHz	IEC 250	D 2520	—	0.0005
Dielectric Strength, Short Time, 0.25 mm (0.010 in) Film	IEC 243	D 149	kV/mm (V/mil)	80 (2,000)
THERMAL				
Melting Point	—	D 4591	°C (°F)	255 (491)
Limiting Oxygen Index	ISO 4589	D 2863	%	> 95
Flammability Classification[3, 4]	—	UL 94	—	V-0
OTHER				
Water Absorption, 24 hr	—	D 570	%	<0.01
Weather and Chemical Resistance	—	—	—	Excellent

Note: Teflon™ FEP 9835 meets the requirements of ASTM D 2116, Type II.
Typical properties are not suitable for specification purposes.
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.
[1] ASTM method unless otherwise specified.
[2] Historical standard.
[3] These results are based on laboratory tests, under controlled conditions, and do not reflect performance under actual fire conditions.
[4] Current rating is a typical theoretical value.

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