

# ETFE 4003

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## Everflon™ Fluoropolymers

Ethylene-tetra-fluoro-ethylene  
Molding Pellets

## DESCRIPTION

Everflon™ ETFE 4003 is a premium fluoroplastic resin available in translucent, 2.5-mm (0.1-in) pellets. Compared with other grades of Everflon™ ETFE , its most unique features are relatively low flow rate, greatly enhanced flex life, and resistance to environmental stress.

Everflon™ ETFE 4003 and the other Everflon™ 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.

Everflon™ ETFE 4003 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 Everflon™ ETFE 4003 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.

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# DATA LIST

## Typical Property Data for Everflon™ ETFE 4003 Fluoroplastic Resin

### Melt Flow Rate

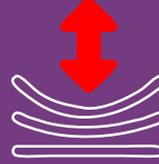
ASTM D3159



2 ~ 4  
g/10 min 5kg

### Tensile Strength

ASTM D3159



> 45  
Mpa

### Elongation

ASTM D3159



> 350  
%

### Melting Point

ASTM D3159



255  
°C

## General Property Data for Everflon™ ETFE 4003 Fluoroplastic Resin

Property	Test Method		Unit	Typical Value
<b>MECHANICAL</b>				
Flexural Modulus	ISO 178	ASTM D790	MPa (psi)	1,200 (170,000)
Impact Strength, 23 °C (73 °F)		ASTM D256	J/m (ft-lb/in)	No Break
Compressive Strength		ASTM D659	MPa (psi)	38 (5,500)
Specific Gravity	—	ASTM D792	—	1.7
Hardness Durometer	ISO 868	ASTM D2240	—	D72
<b>ELECTRICAL</b>				
Dielectric Strength, Short Time, 0.25 mm (0.010 in)	IEC 243	ASTM D149	kV/mm (V/mil)	70 (1,800)
Dielectric Constant, 1 MHz (10 <sup>6</sup> Hz)	IEC 250	ASTM D1531	—	2.5–2.6
Dissipation Factor, 1 MHz (10 <sup>6</sup> Hz)	IEC 250	ASTM D1531	—	0.0072
Volume Resistivity	ISO 1325	ASTM D257	ohm-cm	10 <sup>17</sup>
Arc Resistance		ASTM D495	second	122
<b>OTHER</b>				
Water Absorption, 24 hr	—	ASTM D570	%	<0.03
Weather and Chemical Resistance	—	—	—	Excellent
Limiting Oxygen Index	ISO 4589	ASTM D2863	%	30–32
Continuous Service Temperature	—	—	°C (°F)	150 (302)
Flammability Classification	—	UL 94	—	V-0

Note: For more information of ETFE properties, please visit [www.everflon.com](http://www.everflon.com) or ETFE Tech Book. These results are based on laboratory tests, under controlled conditions, and do not reflect performance under actual fire conditions.

## TYPICAL APPLICATIONS

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Everflon™ ETFE 4003 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.

## PROCESSING GUIDE

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Everflon™ ETFE 4003 can be processed by conventional, melt-extrusion techniques and injection, compression, transfer, and blow molding processes. Compared with other grades of Everflon™ ETFE, it can be processed with greater ease and speed because of its high flow rate. Also, the melt viscosity of Everflon™ ETFE is reduced with increasing shear rate; thus, permitting the use of pressure extrusions through narrow dies without requiring appreciable drawdown. Reciprocating screw injection molding machines are preferred. Corrosion-resistant metals are recommended for 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).

## HANDLING & PACKAGE

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The properties of Everflon™ ETFE 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.

Everflon™ ETFE fluoroplastic resins are packaged in 20-kg (44-lb) plastic bags.

## PRECAUTION

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Equipment used to process at melt temperatures should be provided with local exhaust ventilation (LEV) to completely remove all fumes and vapors from the processing area. In addition, care should be exercised to avoid the contamination of cigarettes and other forms of smoking tobacco when using fluoroplastic resins. Before processing any fluoroplastics, read the Material Safety Data Sheet.



## ABOUT EVERFLON+



Reap the benefits of excellent pigment dispersion in your final polymer mix with Everflon+™ masterbatch formulations for ETFE polymers. Pigment concentration and viscosity can be tailored to your specific application, and formulations are suitable for end-products with wall thicknesses that are as thin as one millimeter or 25 microns.

## Color Concentrate

Conductive ETFE Resins are manufactured as ready-to-use products and used in self-regulating or constant wattage heater cables, static dissipative fuel lines, and other applications where conductivity or static dissipation is required.

Everflon+ ETFE Conductive compounds can also be customized for unique application requirements. Customization of products includes melt flow rate and physical properties of final compound as well as conductivity needed for the application.

Consistency and processability are the key factors in developing these compounds. In addition, Everflon+ ETFE Conductive compounds show stable conductivity over a range of shear rates.

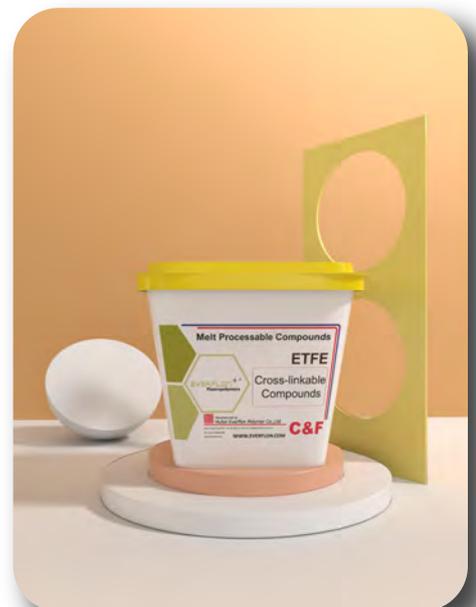
## Conductive/anti-static



## ETFE Cross-linkable Compounds



contain a cross-linking agent, which is used to enhance the toughness of ETFE. commonly required in automotive or aerospace cables. Cross-linking ETFE increases its mechanical properties such as abrasion resistance, cut-through resistance, and tensile strength, especially at elevated temperatures.



# ABOUT C&F AND EVERFLON FLUOROPOLYMERS

Everflon™ is brand of C&F Group dealing in fluoropolymers materials including PTFE.FEP.PFA.ETFE and PVDF. On the basis of Everflon, C&F also developing the fluoropolymer applications including tubing,coating and films.

More information could visit [www.everflon.com](http://www.everflon.com) or Everflon™ Fluoropolymers Introduction and C&F Chemicals Book



For more information, visit [www.everflon.com](http://www.everflon.com)  
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