

# DuPont™ Tefzel® ETFE HT-2183

## FLUOROPLASTIC RESIN

### Product Information

#### Description

DuPont™ Tefzel® ETFE HT-2183 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 a greatly enhanced flex life and resistance to environmental stress.

Tefzel® ETFE HT-2183 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 other fluorocarbon resins. They are mechanically tough and offer an excellent balance of properties. Table 1 shows typical property data for Tefzel® ETFE HT-2183.

Tefzel® ETFE HT-2183 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 or thick sections for use at high temperatures.

Properly processed products made from neat Tefzel® ETFE HT-2183 are inert to most solvents and chemicals, hydrolytically stable, and weather-resistant. The recommended upper service temperature is 155°C (311°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, cutthrough, 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.

#### Processing

Tefzel® HT-2183 can be processed by conventional melt-extrusion techniques and by injection, compression, transfer, and blow-molding processes. Compared with other grades of Tefzel®, processing will be at a slower 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 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 HT-2183 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 HT-2183, 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](http://www.fluoropolymers.org)) or by PlasticsEurope ([www.plasticseurope.org](http://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 HT-2183, 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® ETFE HT-2183 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.

#### Packaging

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



*The miracles of science™*

**Table 1 - Typical Property Data for DuPont™ Tefzel® ETFE HT-2183 Fluoroplastic Resin**

Property	Test Method*	Unit	Value
<b>Thermal</b>			
Nominal Melting Point	D 3418	°C (°F)	255–280 (491–536)
Flow Rate	D 3159	g/10 min	6
Upper Service Temperature	UL746	°C (°F)	155 (311)
<b>Mechanical</b>			
Tensile Strength, 23°C (73°F)	D 638	MPa (psi)	40 (6,100)
Specific Gravity	D 792	—	1.7
Ultimate Elongation, 23°C (73°F)	D 638	%	300
Flexural Modulus, 23°C (73°F)	D 790	MPa (psi)	1,000 (145,000)
Impact Strength, 23°C (73°F)	D 256	J/m (ft-lb/in.)	No Break
Linear Coefficient of Expansion, 0–100°C (32–212°F)	D 696	mm/mm/°C (in./in./°F)	13.3 x 10 <sup>-5</sup> (7.4 x 10 <sup>-5</sup> )
<b>Electrical</b>			
Dielectric Strength, 0.25 mm (0.010 in.)	D 150	kV/mm (V/0.001 in.)	70 (1,800)
Dielectric Constant, 1 MHz, 23°C (73°F)	D 1531	—	2.5–2.6
Dissipation Factor, 1 MHz, 23°C (73°F)	D 1531	—	0.0072
Volume Resistivity	D 257	ohm•m (ohm•cm)	1 x 10 <sup>15</sup> (1 x 10 <sup>17</sup> )
<b>General</b>			
Water Absorption, 24 h	D 270	%	0.007
Weather and Chemical Resistance	—	—	Excellent
Limiting Oxygen Index	D 2863	%	30–32
Bulk Density	DuPont	g/L	1,300
Hardness	D 2240	Shore D	67
Flame Rating	UL94		V-0

\* ASTM method unless otherwise specified

**Note:** Typical properties are not suitable for specification purposes.

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

For sales and technical support contacts, visit  
[www.teflon.com/industrialglobalsupport](http://www.teflon.com/industrialglobalsupport)

This product is manufactured with technology that meets the goals of the U.S. Environmental Protection Agency (EPA) 2010/15 PFOA stewardship program. See [www.fluoropolymers.dupont.com](http://www.fluoropolymers.dupont.com) for more details.

**CAUTION:** Do not use DuPont materials in medical applications involving permanent implantation in the human body or contact with bodily fluids or tissues unless the material has been provided from DuPont under a written contract that is consistent with DuPont policy regarding medical applications and expressly acknowledges the contemplated use. For further information, please contact your DuPont representative. You may also visit [www.teflon.com/industrial](http://www.teflon.com/industrial) to download a copy of the “DuPont POLICY Regarding Medical Applications” H-50103 and “DuPont CAUTION Regarding Medical Applications” H-50102.

For medical emergencies, spills, or other critical situations, call (800) 441-7515 within the United States. For those outside of the United States, call (302) 774-1000.

The information set forth herein is furnished free of charge and is based on technical data that DuPont believes to be reliable. It is intended for use by persons having technical skill, at their own discretion and risk. The handling precaution information contained herein is given with the understanding that those using it will satisfy themselves that their particular conditions of use present no health or safety hazards. Because conditions of product use are outside our control, DuPont makes no warranties, express or implied, and assumes no liability in connection with any use of this information. As with any material, evaluation of any compound under end-use conditions prior to specification is essential. Nothing herein is to be taken as a license to operate under or a recommendation to infringe any patents.

NO PART OF THIS MATERIAL MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONIC, MECHANICAL, PHOTOCOPYING, RECORDING OR OTHERWISE WITHOUT THE PRIOR WRITTEN PERMISSION OF DUPONT.

#### HOW TO USE THE DUPONT™ TEFZEL® BRAND NAME WITH YOUR PRODUCT

Tefzel® is a registered trademark of DuPont for our brand of ETFE fluoroplastic resins. Customer use of the Teflon® brand name must be licensed by DuPont in association with approved applications. Without a license, customers may not identify their product with the DuPont™ Tefzel® brand name.

Unlicensed customers may refer to the DuPont product offering when used as an ingredient in their products by the DuPont product code number and generic descriptor. In this instance, when the product offering is to be sold and used without a license, the customer may refer to the ingredient as **DUPONT™ ETFE HT-2183** resin.

If you are interested in applying for a trademark licensing agreement for the DuPont™ Tefzel® brand, please contact us at (800) 207-0756 in the US or (302) 996-7906 (outside of the US).

