Tefzel™ ETFE HT-2185
Fluoroplastic Resin

Product Information

Description

Tefzel™ ETFE HT-2185 is a special purpose fluoroplastic resin available in translucent, 2.5-mm (0.1-in) pellets. Compared with other grades of Tefzel™, it has a higher flow rate.

Tefzel™ ETFE HT-2185 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. Table 1 shows typical property data for Tefzel™ ETFE HT-2185.

The relatively high flow rate of Tefzel™ ETFE HT-2185 makes it uniquely suitable for high-speed processing, especially for extruded coatings and injection molding of slender, thin-walled, or intricate shapes. Molded or extruded products made from Tefzel™ ETFE HT-2185 are preferred for uses that do not involve significant flexural or tensile stress at elevated temperatures. Higher viscosity products such as Tefzel™ ETFE HT-2181 and Tefzel™ ETFE HT-2183 are preferred for these applications.

Properly processed products made from neat Tefzel™ ETFE HT-2185 are inert to most solvents and chemicals, hydrolytically stable, and weather-resistant. The 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.

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 HT-2185 can be processed by conventional melt extrusion techniques and injection, compression, transfer, and blow-molding processes. Compared with other grades of Tefzel™, it can be processed with greater ease and speed, because of its high flow rate. Also, the melt viscosity 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 HT-2185 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 fasteners; battery or instrument components that require chemical inertness; and mechanical parts.

Safety Precautions


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-2185, 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 HT-2185 resins 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.

Table 1. Typical Property Data for Tefzel™ ETFE HT-2185 Fluoroplastic Resin

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method*</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal Melting Point</td>
<td>D3418</td>
<td>°C (°F)</td>
<td>255–280 (491–536)</td>
</tr>
<tr>
<td>Flow Rate</td>
<td>D3159</td>
<td>g/10 min</td>
<td>11</td>
</tr>
<tr>
<td>Upper Service Temperature</td>
<td>UL746</td>
<td>°C (°F)</td>
<td>155 (311)</td>
</tr>
<tr>
<td>Mechanical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tensile Strength, 23°C (73°F)</td>
<td>D638</td>
<td>MPA (psi)</td>
<td>40 (6,000)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>D792</td>
<td></td>
<td>1.7</td>
</tr>
<tr>
<td>Ultimate Elongation, 23°C (73°F)</td>
<td>D638</td>
<td>%</td>
<td>300</td>
</tr>
<tr>
<td>Flexural Modulus, 23°C (73°F)</td>
<td>D790</td>
<td>MPA (psi)</td>
<td>1,000 (145,000)</td>
</tr>
<tr>
<td>Impact Strength, 23°C (73°F)</td>
<td>D256</td>
<td>J/m (ft·lb/in)</td>
<td>No Break</td>
</tr>
<tr>
<td>Comprehensive Strength</td>
<td>D695</td>
<td>MPA (psi)</td>
<td>38 (5,500)</td>
</tr>
<tr>
<td>Linear Coefficient of Expansion, 0–100 °C (32–212 °F)</td>
<td>D696</td>
<td>mm/mm/°C (in/in/°F)</td>
<td>12.6 x 10⁻⁶ (7.0 x 10⁻³)</td>
</tr>
<tr>
<td>Electrical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dielectric Strength, 0.25 mm (0.010 in)</td>
<td>D150</td>
<td>kW/mm (V/0.001 in)</td>
<td>70 (1,800)</td>
</tr>
<tr>
<td>Dielectric Constant, 1 MHz, 23 °C (73 °F)</td>
<td>D1531</td>
<td>—</td>
<td>2.5–2.6</td>
</tr>
<tr>
<td>Dissipation Factor, 1 MHz, 23 °C (73 °F)</td>
<td>D1531</td>
<td>—</td>
<td>0.0054</td>
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<tr>
<td>Volume Resistivity</td>
<td>D257</td>
<td>ohm·m (ohm·cm)</td>
<td>1 x 10¹⁵ (1 x 10¹³)</td>
</tr>
<tr>
<td>General</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Water Absorption, 24 hr</td>
<td>D270</td>
<td>%</td>
<td>0.007</td>
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<tr>
<td>Weather and Chemical Resistance</td>
<td></td>
<td></td>
<td>Excellent</td>
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<tr>
<td>Limiting Oxygen Index</td>
<td>D2863</td>
<td>%</td>
<td>30–32</td>
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<tr>
<td>Bulk Density</td>
<td>Chemours</td>
<td>g/L</td>
<td>1,300</td>
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<tr>
<td>Flame Rating</td>
<td>UL94</td>
<td>—</td>
<td>V-0</td>
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</tbody>
</table>

*ASTM method, unless otherwise specified

Typical properties are not suitable for specification purposes.

Tefzel™ ETFE HT-2185 meets the requirements of ASTM D3159, Type I, Grade 1.

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