**Udel® P-1700**

**Polysulfone**

**Solvay Specialty Polymers**

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### Technical Data

#### Product Description

Udel® P-1700 polysulfone (PSU) is a tough, rigid, high-strength thermoplastics suitable for continuous use up to 300°F (149°C). It is resistant to oxidation and hydrolysis and withstand prolonged exposure to high temperatures and repeated sterilization. Udel® P-1700 polysulfone is highly resistant to mineral acids, alkali and salt solutions. Resistance to detergents and hydrocarbon oils is good, but the resin may be attacked by polar solvents such as ketones, chlorinated hydrocarbons and aromatic hydrocarbons.

These resins are also highly resistant to degradation by gamma or electron beam radiation. Electrical properties of Udel® P-1700 polysulfones are stable over a wide temperature range and after immersion in water or exposure to high humidity.

The resins comply with FDA 21 CFR 177.1655 and may be used in articles intended for repeated use in contact with foods. Additionally, they are approved by the NSF, by the Department of Agriculture for contact with meat and poultry and by the 3-A Sanitary Standards of the Dairy Association.

- **Transparent:** Udel® P-1700 CL 2611 CMP
- **Transparent:** Udel® P-1700 NT 06
- **Transparent:** Udel® P-1700 NT 11
- **Opaque Black:** Udel® P-1700 BK 937
- **Opaque White:** Udel® P-1700 WH 6417
- **Opaque White:** Udel® P-1700 WH 7407
- **Opaque Gray:** Udel® P-1700 GY 8057

#### General

**Material Status**
- Commercial: Active

**Literature**
- **Technical Datasheet**

**UL Yellow Card**
- **E36098-231084**

**Search for UL Yellow Card**
- **Solvay Specialty Polymers**
- **Udel®**

**Availability**
- Asia Pacific
- Europe
- Latin America
- North America
- **Hydrocarbon Resistant**
- **Hydrolytically Stable**
- **Radiation (Gamma) Resistant**
- **Radiation Sterilizable**
- **Radiotranslucent**
- **Steam Resistant**
- **Steam Sterilizable**

**Features**
- **Acid Resistant**
- **Alcohol Resistant**
- **Alkali Resistant**
- **Autoclave Sterilizable**
- **Biocompatible**
- **Chemical Resistant**
- **Detergent Resistant**
- **E-beam Sterilizable**
- **Ethylene Oxide Sterilizable**
- **Food Contact Acceptable**
- **Good Dimensional Stability**
- **Good Sterilizability**
- **Good Surface Finish**
- **Good Toughness**
- **Heat Sterilizable**
- **High Heat Resistance**
- **Hydrocarbon Resistant**
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- **Steam Resistant**
- **Steam Sterilizable**
- **Medical/Healthcare Applications**
- **Medical Devices**
- **Piping**
- **Plumbing Parts**
- **Surgical Instruments**
- **Valves/Valve Parts**
- **Appliance Components**
- **Appliances**
- **Automotive Electronics**
- **Dental Applications**
- **Electrical Parts**
- **Electrical/Electronic Applications**
- **Food Service Applications**
- **Hospital Goods**
- **Industrial Parts**
- **Medical Devices**
- **Medical/Healthcare Applications**
- **Microwave Cookware**
- **Piping**
- **Plumbing Parts**
- **Surgical Instruments**
- **Valves/Valve Parts**

**Agency Ratings**
- FDA 21 CFR 177.1655
- ISO 10993

**RoHS Compliance**
- RoHS Compliant

**Appearance**
- Colors Available
- **Transparent - Slight Yellow**

**Forms**
- Pellets

**Processing Method**
- **Extrusion**
- **Extrusion Blow Molding**
- **Film Extrusion**
- **Injection Blow Molding**
- **Injection Molding**
- **Machining**
- **Pipe Extrusion**
- **Profile Extrusion**
- **Sheet Extrusion**
- **Thermoforming**

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- Solvay Specialty Polymers
- Udel®

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**Features**
- Acid Resistant
- Alcohol Resistant
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- Good Sterilizability
- Good Surface Finish
- Good Toughness
- Heat Sterilizable
- High Heat Resistance

**Uses**
- **Application Components**
- **Appliances**
- **Automotive Electronics**
- **Dental Applications**
- **Electrical Parts**
- **Electrical/Electronic Applications**
- **Food Service Applications**
- **Hospital Goods**
- **Industrial Parts**
- **Medical Devices**
- **Medical/Healthcare Applications**
- **Microwave Cookware**
- **Piping**
- **Plumbing Parts**
- **Surgical Instruments**
- **Valves/Valve Parts**

**Agency Ratings**
- FDA 21 CFR 177.1655
- ISO 10993
- NSF STD-51
- NSF STD-61

**RoHS Compliance**
- RoHS Compliant

**Appearance**
- Colors Available
- Transparent - Slight Yellow

**Forms**
- Pellets

**Processing Method**
- Extrusion
- Extrusion Blow Molding
- Film Extrusion
- Injection Blow Molding
- Injection Molding
- Machining
- Pipe Extrusion
- Profile Extrusion
- Sheet Extrusion
- Thermoforming
<table>
<thead>
<tr>
<th>Physical</th>
<th>Nominal Value (English)</th>
<th>Nominal Value (SI)</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density / Specific Gravity</td>
<td>1.24</td>
<td>1.24 g/cm³</td>
<td>ASTM D792</td>
</tr>
<tr>
<td>Melt Mass-Flow Rate (MFR) (343°C/2.16 kg)</td>
<td>6.5 g/10 min</td>
<td>6.5 g/10 min</td>
<td>ASTM D1238</td>
</tr>
<tr>
<td>Molding Shrinkage - Flow</td>
<td>7.0E-3 in/in</td>
<td>0.70 %</td>
<td>ASTM D955</td>
</tr>
<tr>
<td>Water Absorption (24 hr)</td>
<td>0.30 %</td>
<td>0.30 %</td>
<td>ASTM D570</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical</th>
<th>Nominal Value (English)</th>
<th>Nominal Value (SI)</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Modulus</td>
<td>360000 psi</td>
<td>2480 MPa</td>
<td>ASTM D638</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>10200 psi</td>
<td>70.3 MPa</td>
<td>ASTM D638</td>
</tr>
<tr>
<td>Tensile Elongation (Break)</td>
<td>50 to 100 %</td>
<td>50 to 100 %</td>
<td>ASTM D638</td>
</tr>
<tr>
<td>Flexural Modulus</td>
<td>390000 psi</td>
<td>2690 MPa</td>
<td>ASTM D790</td>
</tr>
<tr>
<td>Flexural Strength</td>
<td>15400 psi</td>
<td>106 MPa</td>
<td>ASTM D790</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impact</th>
<th>Nominal Value (English)</th>
<th>Nominal Value (SI)</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notched Izod Impact</td>
<td>1.3 ft·lb/in</td>
<td>69 J/m</td>
<td>ASTM D256</td>
</tr>
<tr>
<td>Tensile Impact Strength</td>
<td>200 ft·lb/in²</td>
<td>420 kJ/m²</td>
<td>ASTM D1822</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thermal</th>
<th>Nominal Value (English)</th>
<th>Nominal Value (SI)</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deflection Temperature Under Load</td>
<td>345 °F</td>
<td>174 °C</td>
<td>ASTM D648</td>
</tr>
<tr>
<td>CLTE - Flow</td>
<td>3.1E-5 in/in/°F</td>
<td>5.6E-5 cm/cm/°C</td>
<td>ASTM D696</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical</th>
<th>Nominal Value (English)</th>
<th>Nominal Value (SI)</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume Resistivity</td>
<td>3.0E+16 ohms·cm</td>
<td>3.0E+16 ohms·cm</td>
<td>ASTM D257</td>
</tr>
<tr>
<td>Dielectric Strength</td>
<td>430 V/mil</td>
<td>17 kV/mm</td>
<td>ASTM D149</td>
</tr>
<tr>
<td>Dielectric Constant</td>
<td></td>
<td></td>
<td>ASTM D150</td>
</tr>
<tr>
<td>60 Hz</td>
<td>3.03</td>
<td>3.03</td>
<td></td>
</tr>
<tr>
<td>1 kHz</td>
<td>3.04</td>
<td>3.04</td>
<td></td>
</tr>
<tr>
<td>1 MHz</td>
<td>3.02</td>
<td>3.02</td>
<td></td>
</tr>
<tr>
<td>Dissipation Factor</td>
<td></td>
<td></td>
<td>ASTM D150</td>
</tr>
<tr>
<td>60 Hz</td>
<td>7.0E-4</td>
<td>7.0E-4</td>
<td></td>
</tr>
<tr>
<td>1 kHz</td>
<td>1.0E-3</td>
<td>1.0E-3</td>
<td></td>
</tr>
<tr>
<td>1 MHz</td>
<td>6.0E-3</td>
<td>6.0E-3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flammability</th>
<th>Nominal Value (English)</th>
<th>Nominal Value (SI)</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flame Rating</td>
<td>HB</td>
<td>HB</td>
<td>UL 94</td>
</tr>
<tr>
<td>0.06 in (1.5 mm), ALL</td>
<td>HB</td>
<td>HB</td>
<td></td>
</tr>
<tr>
<td>0.18 in (4.5 mm), NC</td>
<td>V-0</td>
<td>V-0</td>
<td></td>
</tr>
<tr>
<td>Glow Wire Flammability Index</td>
<td></td>
<td></td>
<td>IEC 60695-2-12</td>
</tr>
<tr>
<td>0.031 in (0.8 mm)</td>
<td>1560 °F</td>
<td>850 °C</td>
<td></td>
</tr>
<tr>
<td>0.06 to 0.24 in (1.6 to 6.0 mm)</td>
<td>1760 °F</td>
<td>960 °C</td>
<td></td>
</tr>
<tr>
<td>Glow Wire Ignition Temperature</td>
<td></td>
<td></td>
<td>IEC 60695-2-13</td>
</tr>
<tr>
<td>0.031 in (0.8 mm)</td>
<td>1610 °F</td>
<td>875 °C</td>
<td></td>
</tr>
<tr>
<td>0.06 to 0.24 in (1.6 to 6.0 mm)</td>
<td>1560 °F</td>
<td>850 °C</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Injection</th>
<th>Nominal Value (English)</th>
<th>Nominal Value (SI)</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drying Temperature</td>
<td>275 to 325 °F</td>
<td>135 to 163 °C</td>
<td></td>
</tr>
<tr>
<td>Drying Time</td>
<td>3.5 hr</td>
<td>3.5 hr</td>
<td></td>
</tr>
<tr>
<td>Suggested Shot Size</td>
<td>50 to 75 %</td>
<td>50 to 75 %</td>
<td></td>
</tr>
<tr>
<td>Processing (Melt) Temp</td>
<td>625 to 725 °F</td>
<td>329 to 385 °C</td>
<td></td>
</tr>
<tr>
<td>Mold Temperature</td>
<td>250 to 325 °F</td>
<td>121 to 163 °C</td>
<td></td>
</tr>
</tbody>
</table>
Notes

1 These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

2 A UL Yellow Card contains UL-verified flammability and electrical characteristics. UL Prospector continually works to link Yellow Cards to individual plastic materials in Prospector, however this list may not include all of the appropriate links. It is important that you verify the association between these Yellow Cards and the plastic material found in Prospector. For a complete listing of Yellow Cards, visit the UL Yellow Card Search.

3 Only Udel P-1700 NT 06 and Udel P-1700 NT 11 are NSF 51 listed. Maximum Temperature of Use: 149°C (300°F)

4 Only Udel P-1700 NT 11, Udel P-1700 BK 937, Udel P-1700 WH 6417 and Udel P-1700 WH 7407 are NSF 61 listed. Tested at 82 °C (180 °F) (Commercial Hot)

5 Typical properties: these are not to be construed as specifications.