Radel® R-5000 is a transparent polyphenylsulfone (PPSU) which offers exceptional hydrolytic stability, and toughness superior to other commercially-available, high-temperature engineering resins. This resin also offer high deflection temperatures and outstanding resistance to environmental stress cracking. Radel® polymers are inherently flame retardant, provide excellent thermal stability and possess good electrical properties.

### General

<table>
<thead>
<tr>
<th>Material Status</th>
<th>Commercial: Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability</td>
<td>Asia Pacific, Europe, Latin America, North America</td>
</tr>
</tbody>
</table>

### Features

- Acid Resistant
- Autoclave Sterilizable
- Base Resistant
- Biocompatible
- Chemical Resistant
- Detergent Resistant
- E-beam Sterilizable
- Ethylene Oxide Sterilizable
- Flame Retardant
- General Purpose
- Good Dimensional Stability
- Good Electrical Properties
- Good Sterilizability
- Good Thermal Stability
- Heat Sterilizable
- High ESCR (Stress Crack Resist.)
- High Heat Resistance
- Hydrolytically Stable
- Radiation (Gamma) Resistant
- Radiation Sterilizable
- Radiotranslucent
- Steam Resistant
- Steam Sterilizable
- Thermal Aging Resistant
- Ultra High Toughness

### Uses

- Automotive Applications
- Dental Applications
- Food Service Applications
- Hospital Goods
- Medical Devices
- Medical/Healthcare Applications
- Membranes
- Surgical Instruments

### Agency Ratings

- FAA FAR 25.853a
- ISO 10993
- NSF STD-51
- NSF STD-61

### RoHS Compliance

- RoHS Compliant

### Automotive Specifications

- ASTM D6394 SP0312

### Appearance

- Clear/Transparent

### Forms

- Pellets

### Processing Method

- Blow Molding
- Extrusion
- Film Extrusion
- Injection Molding
- Machining
- Profile Extrusion
- Sheet Extrusion
- Thermoforming

### Physical

<table>
<thead>
<tr>
<th></th>
<th>Typical Value</th>
<th>Unit</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density / Specific Gravity</td>
<td>1.29</td>
<td>g/cm³</td>
<td>ASTM D792</td>
</tr>
<tr>
<td>Melt Mass-Flow Rate (MFR) (365°C/5.0 kg)</td>
<td>14 to 20</td>
<td>g/10 min</td>
<td>ASTM D1238</td>
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<tr>
<td>Molding Shrinkage - Flow (3.18 mm)</td>
<td>0.70 %</td>
<td></td>
<td>ASTM D955</td>
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<tr>
<td>Physical</td>
<td>Typical Value</td>
<td>Unit</td>
<td>Test method</td>
</tr>
<tr>
<td>-------------------</td>
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</tr>
<tr>
<td>Water Absorption</td>
<td>0.37 %</td>
<td></td>
<td>ASTM D570</td>
</tr>
<tr>
<td></td>
<td>1.1 %</td>
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</tr>
<tr>
<td>Mechnical</td>
<td></td>
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</tr>
<tr>
<td>Tensile Modulus</td>
<td>2340 MPa</td>
<td></td>
<td>ASTM D638</td>
</tr>
<tr>
<td>(3.18 mm)</td>
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<td></td>
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<tr>
<td>Tensile Strength</td>
<td>69.6 MPa</td>
<td></td>
<td>ASTM D638</td>
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<td>(3.18 mm)</td>
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<tr>
<td>Tensile Elongation</td>
<td></td>
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<td>ASTM D638</td>
</tr>
<tr>
<td>Yield, 3.18 mm</td>
<td>7.2 %</td>
<td></td>
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<tr>
<td>Break, 3.18 mm</td>
<td>60 to 120 %</td>
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<tr>
<td>Flexural Modulus</td>
<td>2410 MPa</td>
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<td>ASTM D790</td>
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<tr>
<td>(3.18 mm)</td>
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<tr>
<td>Flexural Strength</td>
<td>91.0 MPa</td>
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<td>ASTM D790</td>
</tr>
<tr>
<td>(5.0% Strain, 3.18 mm)</td>
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<td></td>
<td></td>
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<tr>
<td>Impact</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Notched Izod Impact</td>
<td>690 J/m</td>
<td></td>
<td>ASTM D256</td>
</tr>
<tr>
<td>Tensile Impact Strength (3.18 mm)</td>
<td>399 kJ/m²</td>
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<td>ASTM D1822</td>
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<tr>
<td>Thermal</td>
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<tr>
<td>Deflection Temp. Under Load</td>
<td>207 °C</td>
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<td>ASTM D648</td>
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<tr>
<td>1.8 MPa, Unannealed, 3.18 mm</td>
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<tr>
<td>Glass Transition Temperature</td>
<td>220 °C</td>
<td></td>
<td>ASTM E1356</td>
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<tr>
<td>CLTE - Flow (3.18 mm)</td>
<td>5.6E-5 cm/cm/°C</td>
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<td>ASTM D696</td>
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<tr>
<td>Electrical</td>
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<tr>
<td>Volume Resistivity</td>
<td>9.0E+15 ohms-cm</td>
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<td>ASTM D257</td>
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<tr>
<td>Dielectric Strength</td>
<td>&gt; 200 kV/mm</td>
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<td>ASTM D149</td>
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<tr>
<td>0.0254 mm</td>
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<tr>
<td>3.18 mm</td>
<td>15 kV/mm</td>
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<tr>
<td>Dielectric Constant (3.18 mm, 60 Hz)</td>
<td>3.44</td>
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<td>ASTM D150</td>
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<tr>
<td>Flammability</td>
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<tr>
<td>Flame Rating&lt;sup&gt;3&lt;/sup&gt; (0.76 mm)</td>
<td>V-0</td>
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<td>UL 94</td>
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<tr>
<td>Optical</td>
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<tr>
<td>Refractive Index</td>
<td>1.672</td>
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<td>ASTM D542</td>
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<td>Additional Information</td>
<td>Typical Value</td>
<td>Unit</td>
<td>Test method</td>
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<tr>
<td>Steam Sterilization - w/ Morpholine&lt;sup&gt;4&lt;/sup&gt;</td>
<td>&gt; 1000 Cycles</td>
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<tr>
<td>Injection</td>
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<tr>
<td>Drying Temperature</td>
<td>149 °C</td>
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<tr>
<td>Drying Time</td>
<td>2.5 hr</td>
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<tr>
<td>Processing (Melt) Temp</td>
<td>360 to 391 °C</td>
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<tr>
<td>Mold Temperature</td>
<td>138 to 163 °C</td>
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<tr>
<td>Screw Compression Ratio</td>
<td>2.2:1.0</td>
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<tr>
<td>Extrusion</td>
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<tr>
<td>Drying Temperature</td>
<td>171 °C</td>
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</tr>
<tr>
<td>Drying Time</td>
<td>4.0 hr</td>
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<tr>
<td>Cylinder Zone 1 Temp.</td>
<td>338 to 388 °C</td>
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<tr>
<td>Extrusion</td>
<td>Typical Value</td>
<td>Unit</td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
<td>---------------</td>
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</tr>
<tr>
<td>Cylinder Zone 2 Temp.</td>
<td>338 to 388</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Cylinder Zone 3 Temp.</td>
<td>338 to 388</td>
<td>°C</td>
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<tr>
<td>Cylinder Zone 4 Temp.</td>
<td>338 to 388</td>
<td>°C</td>
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<tr>
<td>Cylinder Zone 5 Temp.</td>
<td>338 to 388</td>
<td>°C</td>
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<tr>
<td>Adapter Temperature</td>
<td>327 to 371</td>
<td>°C</td>
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<tr>
<td>Melt Temperature</td>
<td>343 to 399</td>
<td>°C</td>
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<tr>
<td>Die Temperature</td>
<td>327 to 371</td>
<td>°C</td>
<td></td>
</tr>
</tbody>
</table>

**Isothermal Stress vs. Strain (ISO 11403-1)**

![Isothermal Stress vs. Strain Graph](image)
Secant Modulus vs. Strain (ISO 11403-1)

-20°C
23°C
120°C
Viscosity vs. Shear Rate (ISO 11403-2)
Notes
Typical properties: these are not to be construed as specifications.
1 NSF STD-51 compliant for NT only.
2 Tested at 82 °C (180 °F) (Commercial Hot)
3 These flammability ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions.
4 Cycles passed without cracking, crazing, or rupture.
Steam Autoclave Conditions:
- Temperature: 270°F (132°C)
- Time: 30 minutes/cycle
- Steam Pressure: 27 psig (0.19 MPa)
- Stress Level: 1000 psi (7.0 MPa) in flexure
- Additive: Morpholine at 50 ppm

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