Duratron U1000 PEI is an amber translucent (non-optical quality) amorphous thermoplastic material, offering high strength and heat resistance. It performs continuously to 170 °C, making it ideal for high strength / high heat applications, and also for applications requiring consistent dielectric properties over a wide frequency and temperature range.

### Physical properties (indicative values)

<table>
<thead>
<tr>
<th>Properties</th>
<th>Test methods</th>
<th>Units</th>
<th>VALUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td></td>
<td>-</td>
<td>natural (amber, translucent)</td>
</tr>
<tr>
<td>Density</td>
<td>ISO 1183-1</td>
<td>g/cm³</td>
<td>1.27</td>
</tr>
<tr>
<td>Water absorption:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- after 24/96 h immersion in water of 23 °C (1)</td>
<td>ISO 62</td>
<td>mg</td>
<td>16 / 34</td>
</tr>
<tr>
<td>- at saturation in air of 23 °C / 50 % RH</td>
<td>ISO 62</td>
<td>%</td>
<td>0.19 / 0.40</td>
</tr>
<tr>
<td>- at saturation in water of 23 °C</td>
<td>-</td>
<td>%</td>
<td>0.70</td>
</tr>
<tr>
<td>- at saturation in water of 23 °C</td>
<td>-</td>
<td>%</td>
<td>1.30</td>
</tr>
</tbody>
</table>

### Melting temperature (DSC, 10 °C/min)

- ISO 11357-1/3 °C NA

### Glass transition temperature (DSC, 20 °C/min) - (3)

- ISO 11357-1/2 °C 215

### Thermal conductivity at 23 °C

- W/(m.K) 0.24

### Max. allowable service temperature in air:

- for short periods (4) °C 200
- for continuous use (5) °C 170
- Min. service temperature (6) °C -50

### Flammability (7):

- "Oxygen Index" ISO 4589-1/2 % 47
- according to UL 94 (1.5 / 3 mm thickness) - V-0 / V-0

### Mechanical Properties at 23 °C (6)

#### Tension test (9):
- tensile stress at yield / tensile stress at break (10) ISO 527-1/2 MPa 129 / -
- tensile stress (9) ISO 527-1/2 MPa 129
- tensile strain at yield(10) ISO 527-1/2 % 7
- tensile strain at break (10) ISO 527-1/2 % 13
- tensile modulus of elasticity (11) ISO 527-1/2 MPa 3500

#### Compression test (12):
- compressive stress at 1 / 2 / 5 % nominal strain (11) ISO 604 MPa 31 / 61 / 137

#### Charpy impact strength - unnotched (13)

- ISO 179-1/1EU kJ/m² no break

#### Charpy impact strength - notched ISO 179-1/1En kJ/m² 3.5

#### Ball indentation hardness (14)

- ISO 2039-1 N/mm² 165

#### Rockwell hardness (14)

- ISO 2039-2 N/mm² M 115

### Electrical Properties at 23 °C

- Electric strength (15) IEC 60243-1 kV/mm 27
- Volume resistivity IEC 60093 Ohm.cm > 10¹⁰
- Surface resistivity ANSI/ESD STM 11.11 Ohm/sq. > 10¹⁰
- Relative permittivity εr - at 100 Hz IEC 60250 3.0
- at 1 MHz IEC 60250 - 3.0
- Dielectric dissipation factor tan δ - at 100 Hz IEC 60250 - 0.002
- at 1 MHz IEC 60250 - 0.002
- Comparative tracking index (CTI) IEC 60112 - 175

Note: 1 g/cm³ = 1,000 kg/m³ ; 1 MPa = 1 N/mm² ; 1 kV/mm = 1 MV/m. NA: not applicable

### Availability:

see "Guide to Diameter/Sheet Tolerances and Weights" or contact us

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**Legend:**

1. According to method 1 of ISO 62 and done on discs Ø 50 mm x 3 mm.
2. The figures given for these properties are for the most part derived from raw material supplier data and other publications.
3. Values for this property are only given here for amorphous materials and for materials that do not show a melting temperature (PEI & PFI).
4. Only for short time exposure (a few hours) in applications where no or only a very low load is applied to the material.
5. Temperature resistance over a period of min. 20,000 hours. After this period of time, there is a decrease in tensile strength – measured at 23 °C – of about 50 % as compared with the original value.
6. The temperature value given here is thus based on the thermal-oxidative degradation which takes place and causes a reduction in properties. Note, however, that the maximum allowable service temperature depends in many cases essentially on the duration and the magnitude of the mechanical stresses to which the material is subjected.
7. Impact strength decreasing with decreasing temperature, the minimum allowable service temperature is practically mainly determined by the extent to which the material is subjected to impact. The value given here is based on unfavourable impact conditions and may consequently not be considered as being the absolute practical limit.
8. These estimated ratings, derived from raw material supplier data and other publications, are not intended to reflect hazards presented by the material under actual fire conditions. There is no UL-Lite Number available for Duratron U1000 PEI stock shapes.
9. Most of the figures given for the mechanical properties are average values of tests run on test specimens machined out of rod Ø 40 - 60 mm. Except for the hardness tests, the test specimens were then taken from an area mid between centre and outside diameter, with their length in longitudinal direction (parallel to the extrusion direction).
10. Most of the figures given for mechanical properties are average values of tests run on test specimens machined out of rod Ø 40 - 60 mm. Except for the hardness tests, the test specimens were then taken from an area mid between centre and outside diameter, with their length in longitudinal direction (parallel to the extrusion direction).
11. Test speed: 1 mm/min.
12. Test specimens: cylinders Ø 8 mm x 16 mm
13. Pendulum used: 4 J.
14. Measured on 10 mm thick test specimens (discs), mid between centre and outside diameter.
15. Electrode configuration: Ø 25 mm / Ø 75 mm coaxial cylinders ; in transformer oil according to IEC 62096 ; 1 mm thick test specimens.

This table, mainly to be used for comparison purposes, is a valuable help in the choice of a material. The data listed here fall within the normal range of product properties. However, they are not guaranteed and they should not be used to establish material specification limits nor used alone as the basis of design.