

PPSU 1000 stock shapes are produced from RADEL® R resin.

This material offers a better impact strength and chemical resistance than PEI 1000 and PSU 1000. PPSU 1000 also has superior hydrolysis resistance as measured by steam autoclaving cycles to failure. In fact, this material has virtually unlimited steam sterilisability which makes it an excellent choice for devices that are subjected to repeated steam autoclaving. Additionally, the raw material used for the production of PPSU 1000 stock shapes is USP Class VI compliant, making it a very popular material for medical\* and pharmaceutical industries.

## Physical properties (indicative values\*)

PROPERTIES	Test methods ISO/(IEC)	Units	VALUES
Colour	—	—	black
Density	1183	g/cm <sup>3</sup>	1.29
<b>Water absorption:</b>			
- after 24h/96h immersion in water of 23°C (1)	62	mg	26/55
	62	%	0.35/0.72
- at saturation in air of 23°C / 50% RH	—	%	0.60
- at saturation in water of 23°C	—	%	1.20
<b>Thermal Properties</b>			
Melting temperature	—	°C	NA
Glass transition temperature	—	°C	220
Thermal conductivity at 23°C	—	W/(K·m)	0.55
<b>Coefficient of linear thermal expansion:</b>			
- average value between 23 and 100°C	—	m/(m·K)	55·10 <sup>-6</sup>
- average value between 23 and 150°C	—	m/(m·K)	55·10 <sup>-6</sup>
- average value above 150°C	—	m/(m·K)	55·10 <sup>-6</sup>
<b>Temperature of deflection under load:</b>			
- method A: 1.8 MPa	75	°C	200
<b>Max. allowable service temperature in air:</b>			
- for short periods (2)	—	°C	210
- continuously: for min. 20,000h (3)	—	°C	180
<b>Flammability (4):</b>			
- "Oxygen index"	45.9	%	44
- according to UL 94 (1.5/3 mm thickness)	—	—	V-0/V-0
<b>Mechanical Properties at 23°C</b>			
<b>Tension test (5):</b>			
- tensile stress at yield (6)	527	MPa	76
- tensile strain at break (6)	527	%	30
- tensile modulus of elasticity (7)	527	MPa	2,500
<b>Compression test (8):</b>			
- compressive stress at 1% nominal strain (7)	604	MPa	18
- compressive stress at 2% nominal strain (7)	604	MPa	35
Charpy impact strength - Unnotched (9)	179/1eU	kJ/m <sup>2</sup>	no break
Charpy impact strength - Notched	179/1eA	kJ/m <sup>2</sup>	10
Rockwell hardness (10)	2039/2	—	M 80
<b>Electrical Properties at 23°C</b>			
Volume resistivity	(60093)	Ω·cm	> 10 <sup>14</sup>
Surface resistivity	(60093)	Ω	> 10 <sup>13</sup>
<b>Relative permittivity ε<sub>r</sub> :</b>			
- at 100 Hz	(60250)	—	3.4
- at 1 MHz	(60250)	—	3.5
<b>Dielectric dissipation factor tan δ :</b>			
- at 100 Hz	(60250)	—	0.001
- at 1 MHz	(60250)	—	0.005

### Legend

- (1) According to method 1 of ISO 62 and done on discs Ø 50 x 3mm.
- (2) Only for short time exposure (a few hours) in applications where no or only a very low load is applied to the material.
- (3) Temperature resistance over a period of min. 20,000 hours. After this period of time, there is a decrease in tensile strength of about 50% as compared with the original value. 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.
- (4) These mostly estimated ratings, derived from raw material supplier data, are not intended to reflect hazards presented by the materials under actual fire conditions. There is no UL yellow card available for PPSU 1000 stock shapes.
- (5) Test specimens: Type 1 B.
- (6) Test speed: 5 mm/min.
- (7) Test speed: 1 mm/min.
- (8) Test specimens: cylinders Ø 12 x 30 mm.
- (9) Pendulum used: 4 J.
- (10) 10 mm thick test specimens.

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

Note: 1 g/cm<sup>3</sup> = 1,000 kg/m<sup>3</sup>; 1 MPa = 1 N/mm<sup>2</sup>; 1 kV/mm = 1 MV/m

NA: not applicable

## Availability

**Round Rods:** Ø 5-150 mm - **Plates:** Thicknesses 10-50 mm

\* Quadrant Engineering Plastic Products does not allow, approve or support human implantable applications utilising its materials.

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