

Semitron® MDS 100 was developed specifically to provide a highly rigid, stable, moisture-resistant platform for precision structural applications. Its unique, proprietary polymer matrix makes it ideal for use in parts where fine machining and precise tolerances are critical.

Physical properties (indicative values)

PROPERTIES	Test methods	Units	VALUES	Test methods	Units	VALUES
Colour	-	-	Light gray	-	-	Light gray
Density	ISO 1183-1	g/cm ³	1.51			
Specific Gravity				ASTM D792	-	1.51
- after 24/96 h immersion in water of 23 °C (73°F)	ISO 62	%	NT	ASTM D570	%	0.10 / NT
- at saturation in air of 23 °C (73°F)/ 50 % RH	-	%	NT	-	%	-
- at saturation in water of 23 °C (73°F)	-	%	NT	ASTM D570	%	0.58
Thermal Properties (1)						
Melting temperature (DSC, 10 °C/min)	ISO 11357	°C	340	ASTM D3418	°F	635
Glass transition temperature (DSC, 20 °C/min) - (2)	ISO 11357	°C	NA	ASTM D3418	°F	NA
Thermal conductivity at 23 °C (73°F)	-	W/(K.m)	0.249	-	BTU in./hr.ft ² .°F	1.73
Coefficient of linear thermal expansion:						
- average value between -40 and 150 °C (-40°F to 300°F)	ASTM E-831 (TMA)	m/(m.K)	20 x 10 ⁻⁶	ASTM E-831 (TMA)	in./in./°F	11 x 10 ⁻⁶
- average value between 23 and 100 °C (73°F to 212°F)	ASTM E-831 (TMA)	m/(m.K)	20 x 10 ⁻⁶	ASTM E-831 (TMA)	in./in./°F	-
- average value between 23 and 150 °C (73°F to 302°F)	ASTM E-831 (TMA)	m/(m.K)	21 x 10 ⁻⁶	ASTM E-831 (TMA)	in./in./°F	-
Temperature of deflection under load:						
- method A: 1.8 MPa (264 psi)	ISO 75-1/2	°C	NT	ASTM D648	°F	410
Max. allowable service temperature in air:						
- for short periods	-	°C	-	-	°F	-
- continuously : for min. 20,000 h (3)	-	°C	249	-	°F	480
Flammability (4):						
- "Oxygen Index"	ISO 4589-1/2	%	NT	ISO 4589-1/2	%	NT
- according to UL 94 [3.1 mm (1/8 in.) thickness]	-	-	NT	-	-	NT
Mechanical Properties at 23 °C (73°F) (5)						
Tension test:						
- tensile stress at yield / tensile stress at break	ISO 527-1/-2 /1B	MPa	NYP / 118	ASTM D638	psi	NT
- tensile strength	ISO 527-1/-2 /1B	MPa	119	ASTM D638	psi	14,700
- tensile strength at 150 °C (300 °F)	ISO 527-1/-2 /1B	MPa	NT	ASTM D638	psi	10,000
- tensile strength at 65 °C (150 °F)	ISO 527-1/-2 /1B	MPa	NT	ASTM D638	psi	12,000
- tensile strain at yield	ISO 527-1/-2 /1B	%	NYP	ASTM D638	%	NT
- tensile strain at break	ISO 527-1/-2 /1B	%	2	ASTM D638	%	1.5
- tensile modulus of elasticity	ISO 527-1/-2 /1B	MPa	11,000	ASTM D638	psi	1,500,000
Compression test:						
- compressive stress at 1 / 2 / 5 / 10 % nominal strain	ISO 604	MPa	73 / 125 / - / -	ASTM D695	psi	- / - / - / 24,400
- compressive modulus of elasticity	ISO 604	MPa	7,600	ASTM D695	psi	1,100,000
Flexural test :						
- flexural strength	ISO 178	MPa	177	ASTM D790	psi	20,500
- flexural modulus of elasticity	ISO 178	MPa	9,500	ASTM D790	psi	1,420,000
Shear Strength						
-	-	-	-	ASTM D732	psi	12,000
Charpy impact strength - unnotched						
-	ISO 179-1/1eA	kJ/m ²	21	-	-	-
Charpy impact strength - notched						
-	ISO 179-1/1eA	kJ/m ²	2	-	-	-
Izod impact						
-	-	-	NT	ASTM D256 Type "A"	ft.lb./in.	0.4
Ball indentation hardness						
-	ISO 868	-	275	ASTM D2240	-	NT
Rockwell hardness						
-	ISO 2039-2	-	M106	ASTM D785	-	R121
Sliding Properties						
Wear rate	ISO 7148-2:1999 (6)	µm/km	NT	QTM 55010 (7)	in ³ .min/ft.lbs.hr	NT
Dynamic Coefficient of Friction (-)	ISO 7148-2:1999 (6)	-	NT	QTM 55007 (8)	-	NT
Electrical Properties at 23 °C (73°F)						
Electric strength	IEC 60243-1	kV/mm	NT	ASTM D149	kV/in	362
Volume resistivity	IEC 60093	Ohm.cm	NT	IEC 60093	Ohm.cm	NT
Surface resistivity	ANSI/ESD STM 11.11	Ohm/sq.	10 ¹²	ANSI/ESD STM 11.11	Ohm/sq.	> 10 ¹³
Relative permittivity ε _r : - at 100 Hz						
- at 1 MHz	IEC 60250	-	NT	-	-	-
- at 1 MHz	IEC 60250	-	NT	ASTM D150	-	3.37
Dielectric dissipation factor tan δ: - at 100 Hz						
- at 1 MHz	IEC 60250	-	NT	-	-	-
- at 1 MHz	IEC 60250	-	NT	ASTM D150	-	0.007
Comparative tracking index (CTI)						
-	IEC 60112	-	NT	IEC 60112	-	NT

NA: Not Applicable

NT: Not Tested

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Legend:

- The figures given for these properties are for some part derived from raw material supplier data and other publications.
- Values for this property are only given here for amorphous materials and for materials that do not show a melting temperature (PBI & PI).
- 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. 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.
- 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 File Number' available for these stock shapes.
- Most of the figures given for the mechanical properties of the materials (stock shapes) are average values of tests run on dry test samples
- Test procedure similar to Test Method A: "Pin-on-disk" as described in ISO 7148-2:1999, Load 3MPa, sliding velocity= 0.33 m/s, mating plate steel Ra= 0.7-0.9 µm, tested at 23°C, 50%RH.
- Test using journal bearing system, 200 hrs, 118 ft/min, 42 PSI, steel shaft roughness 16±2 RMS micro inches with Hardness Brinell of 180-200
- Test using Plastic Thrust Washer rotating against steel, 20 ft/min and 250 PSI, Stationary steel washer roughness 16±2 RMS micro inches with Rockwell C 20-24

All statements, technical information and recommendations contained in this publication are presented in good faith based upon tests believed to be reliable and practical field experience. The reader is cautioned, however, that QUADRANT Engineering Plastic Products cannot guarantee the accuracy or completeness of this information, and it is the customer's responsibility to determine the suitability of Quadrant's products in any given application.