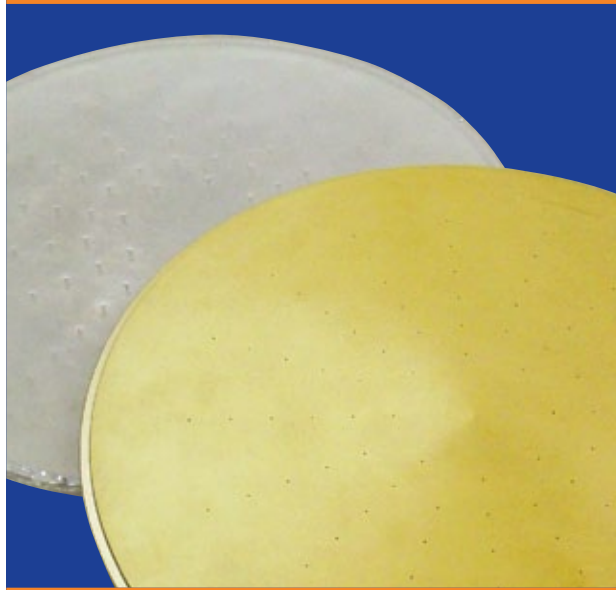


NEW
from Quadrant

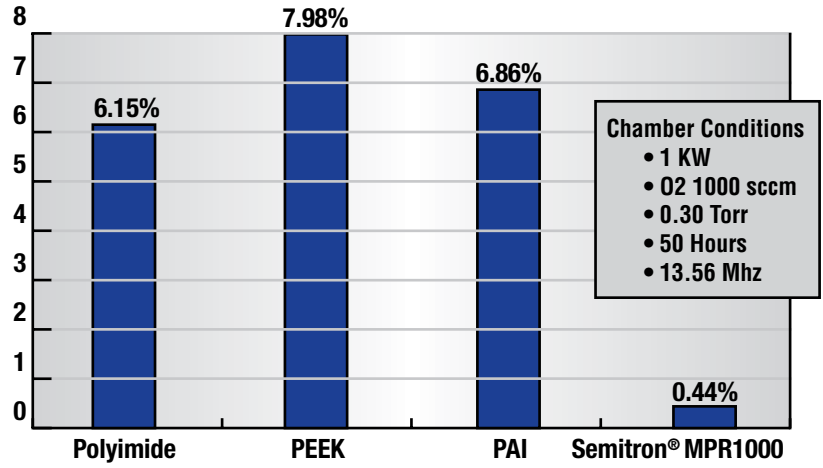
For Use in Vacuum Chambers

**SIMPLY NO
SUBSTITUTE**

Semitron® MPR1000



Percent Weight Loss in Oxygen Plasma - Lower Energy



Semitron® MPR1000 has less than 0.5% erosion in 1KW⁰², 13X better than PI

2 KW⁰³ PLASMA SAMPLES - DISPLAYS MASS LOSS - ALL SAMPLES STARTED AT APPROXIMATELY THE SAME SIZE



Competitive Advantage

Semitron® MPR1000 is a new engineering material developed for Semiconductor applications and more specifically for use in vacuum chamber applications such as these found in Etch, CVD and Ion Implant.

The material was developed based on three key premises:

- 1. Longevity** - Increased life in plasma chambers over traditional plastics such as polyimide (up to 25X over polyimide in ozone)
- 2. Clean** - Low ionic metal content and low out-gassing
- 3. Value** - Lower overall cost in use compared to traditional materials used in vacuum chamber applications such as quartz, ceramics, and engineering plastics



QUADRANT

Data Sheet - Semitron® MPR1000

	Property	Units	Test Method	Typical Average Value
Mechanical Properties	Specific Gravity, 73°F	—	ASTM D792	1.48
	Tensile Strength, 73°F	psi	ASTM D638	15,000
	Tensile Modulus of Elasticity, 73°F	psi	ASTM D638	1,000,000
	Tensile Elongation (at break), 73°F	%	ASTM D638	5.0
	Flexural Strength, 73°F	psi	ASTM D790	25,000
	Flexural Modulus of Elasticity, 73°F	psi	ASTM D790	1,100,000
	Shear Strength, 73°F	psi	ASTM D732	12,000
	Compressive Strength, 10% Deformation, 73°F	psi	ASTM D695	24,000
	Compressive Modulus of Elasticity, 73°F	psi	ASTM D695	475,000
	Hardness, Rockwell, Scale as noted, 73°F	—	ASTM D785	M106
	Hardness, Durometer, Shore "D" Scale, 73°F	—	ASTM D2240	—
	Izod Impact (notched)	ft. lb./in.	ASTM D256 Type "A"	1.3
	Izod Impact (double notch)	ft. lb./in. of notch	ASTM D4060	—
	Coefficient of Friction (Dry vs. Steel) Dynamic	—	QTM 55007	—
	Limiting PV (with 4:1 safety factor applied)	ft. lbs./in. ² min.	QTM 55007	6,000
Wear Factor "k" x 10 ⁻¹⁰	in ³ min./ft. lbs. hr	QTM 55010	—	
Thermal Properties	Coefficient of Linear Thermal Expansion (-40°F to 300°F)	in./in./°F	ASTM E-831 (TMA)	1.5 x 10 ⁻⁵
	Heat Deflection Temperature 264 psi	°F	ASTM D648	534
	Tg-Glass Transition (amorphous)	°F	ASTM D3418	527
	Melting Point (crystalline) peak	°F	ASTM D3418	—
	Continuous Service Temperature in Air (Max.) ⁽¹⁾	°F	—	500
	Thermal Conductivity	BTU in./(hr. ft. ² °F)	ASTM E 1530-11	3.54
	Electrical Properties	Dielectric Strength, Short Term	Volts/mil	ASTM D149
Surface Resistivity		ohms/square	EOS/ESD S11.11	>10 ¹³
Dielectric Constant, 10 ⁶ Hz		-	ASTM D150	3.68
Dissipation Factor, 10 ⁶ Hz		-	ASTM D150	0.008
Flammability @ 3.1 mm (1/8 in.) ⁽³⁾		-	UL 94	V0
Misc.	Water Absorption Immersion, 24 Hours	% by wt.	ASTM D570 ⁽²⁾	0.28
	Absorption Immersion, Saturation @ 73° F ⁽²⁾	% by wt.	ASTM D570 ⁽²⁾	3.4

Key Benefits

- Excellent heat resistance
- Low ionic content & low out-gassing
- Low rate of erosion in plasma chambers
- Excellent chip resistance, durability, and machinability
- Lowest cost plastic solution that also provides the highest level of performance in the chamber

Common Applications

- Ideally used in plasma based vacuum chambers
- Typically used in clamp rings, trench rings, screws, pins, and shower heads
- Centering pins, focus rings, insulators, vacuum pads, and wafer guides

(1) Data represents Quadrant's estimated maximum long-term service temperature based on practical field experience.

(2) Specimens: 1/8" thick x 2" diameter or square.

(3) Estimated rating based on available data. The UL 94 Test is a laboratory test and does not relate to actual fire hazard.

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 does not 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.

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