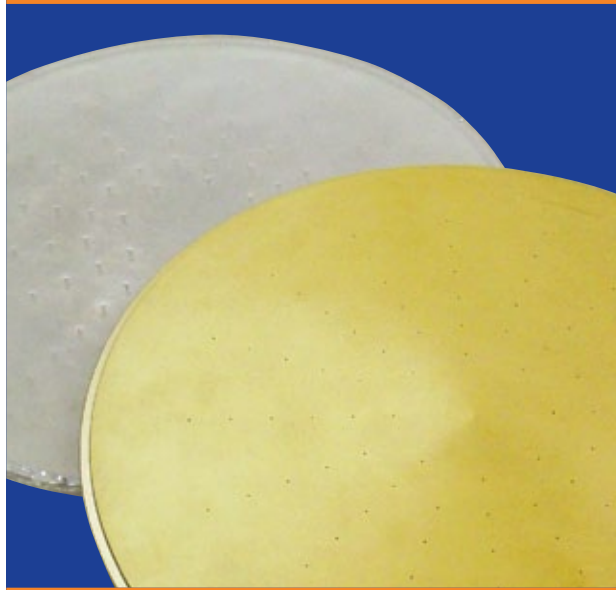


NEW
from Quadrant

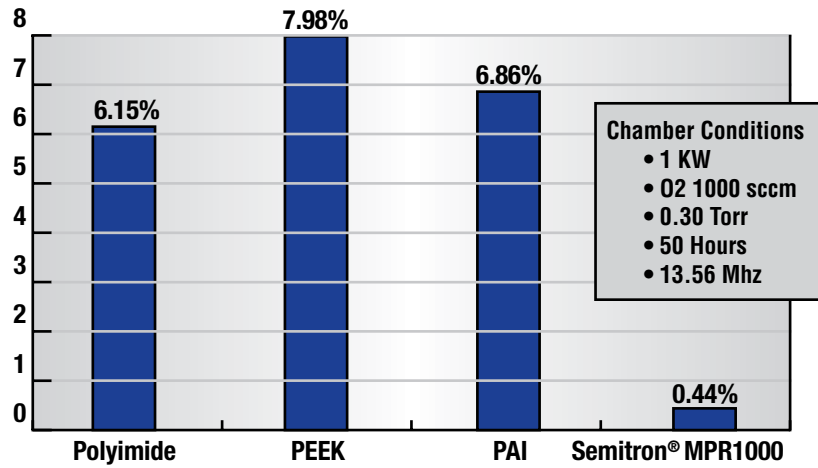
For Use in Vacuum Chambers

**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⁾ |
| | 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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