# BMC 940-15252A

## Bulk Molding Compound

### PRODUCT DESCRIPTION

Vinyl ester BMC suitable for stationary fuel cells. This material was specifically formulated to mold bipolar plates for use in electro-chemical devices capable of generating electricity from oxygen and hydrogen.

### GENERAL

| | | | |
|---|---|---|---|
| **Material Status** | • Commercial: Active | | |
| **Availability** | • North America<br>• Asia Pacific | • Europe<br>• South America | |
| **Filler/Reinforcement** | • Conductive fiber and conductive filler | | |
| **Features** | • Medium conductivity | • Excellent corrosion resistance | • Cost effective |
| **Resin** | • Vinyl ester Composite | | |

### Processing Method

| | | |
|---|---|---|
| **Mold Temperature** | 380-400 | F |
| **Cure Time (<3.0mm thick)** | 30-60 | Seconds |
| **Recommend Press Tonnage** | 3-4 | Tons/in2 on Projected Area |
| **Final Press Closure Speed (Start of material flow to close)** | 1-3 | Seconds |
| **Time to Full Press Tonnage (Close to full tonnage)** | <1.0 | Second |

| PHYSICAL | Typical | Unit | Test Method |
|---|---|---|---|
| **Density** | 1.75-1.89 | g/cm$^3$ | ASTM D792 |
| **Mold Shrinkage (RT mold/RT part)** | 0.00015-0.00045 | in/in | ASTM D955 |
| **Water Absorption, 24 hrs, 23°C** | <0.10 | % | ASTM D570 |
| **CLTE, X-Y plane** | 13 | ppm/°C | ASTM E831 |
| **CLTE, Z plane** | 25 | ppm/°C | ASTM E831 |
| **Poisson's Ratio** | 0.32 | | ASTM D638 |

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| MECHANICAL (As molded) | Typical | Unit | Test Method |
|---|---|---|---|
| **Tensile Strength** | 4,000 (27.6) | psi (MPa) | ASTM D638 |
| **Tensile Modulus** | 1.5 x $10^6$ (10.3) | psi (GPa) | ASTM D638 |
| **Flexural Modulus (RT)** | 2.5 x $10^6$ (17.25) | psi (GPa) | ASTM D790 |
| **Flexural Strength** | 5,500 (37.9) | psi (MPa) | ASTM D790 |
| **Compressive Strength** | 11,000 (75.9) | psi (MPa) | ASTM D695 |
| **Compressive Creep, 200 psi** | | | ASTM D2990 |
| **200 hr at 80°C** | 0.025 | % | |
| **1000 hr at 80°C** | 0.040 | % | |

| IMPACT | Typical | Unit | Test Method |
|---|---|---|---|
| **Unnotched Impact Strength** | 0.16 (8.5) | ft-lb/in (J/m) | ASTM D4812 |
| **Instrumented Impact at 23°C** | | | ASTM D3763 |
| **Max Load** | 752 | N | |
| **Total Energy** | 3.57 | N-M | |
| **Energy to Max Load** | 0.75 | N-M | |

| THERMAL | Typical | Unit | Test Method |
|---|---|---|---|
| **Glass Transition $T_g$** | 323 (162) | °F (°C) | ASTM D4065 |
| **Thermal Conductivity, 25°C** | | W/m-°K | ASTM E1461 |
| **In Plane/Through Plane at 25°C** | 46.2/19.2 | | |
| **In Plane/Through Plane at 85°C** | 43.7/18.5 | | |
| **Diffusivity** | | cm2/s | ASTM E1461 |
| **In Plane/Through Plane at 25°C** | 0.302/0.125 | | |
| **In Plane/Through Plane at 85°C** | 0.231/0.054 | | |
| **Specific Heat Capacity** | | J/kg-K | ASTM E1461 |
| **At 25°C** | 0.841 | | |
| **At 85°C** | 1.04 | | |

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| ELECTRICAL<br>Conductivity | Typical | Unit | Test Method<br>Vendor |
|---|---|---|---|
| Through Plane (Z direction) | 36 | S/cm | |
| In Plane (X, Y direction) | 75 | S/cm | |

| Typical Process Settings | | |
|---|---|---|
| Mold Temperature | 380-400 | F |
| Cure Time (<3.0mm thick) | 30-60 | Seconds |
| Recommend Press Tonnage | 3-4 | Tons/in2 on Projected Area |
| Final Press Closure Speed (Start of material flow to close) | 1-3 | Seconds |
| Time to Full Press Tonnage (Close to full tonnage) | <1.0 | Second |

For additional information, please contact:

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