

# 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. The typical application is for fuel cells for transportation applications that require maximum power and minimum stack weight and volume. Generally the thin molded plates are stacked and bonded together for increased strength and rigidity. A unique characteristic of this product is improved material flow and mold fill performance.

### GENERAL

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

### Processing Method

<b>Mold Temperature</b>	380-400	F
<b>Cure Time (&lt;3.0mm thick)</b>	15-60	Seconds
<b>Recommend Press Tonnage</b>	3-4	Tons/in2 on Projected Area
<b>Final Press Closure Speed (Start of material flow to close)</b>	2-4	Seconds
<b>Time to Full Press Tonnage (Close to full tonnage)</b>	<1.0	Second
<b>Post Bake Temperature</b>	180-200	C
<b>Post Bake Time at Temperature</b>	>20	Minutes

<b>PHYSICAL</b>	<b>Typical</b>	<b>Unit</b>	<b>Test Method</b>
Density	1.79-1.82	g/cm <sup>3</sup>	ASTM D792
Mold Shrinkage (RT mold/RT part)	0.00025-0.00050	in/in	ASTM D955
Water Absorption, 24 hrs, 23°C	<0.10	%	ASTM D570
CLTE, X-Y plane	9.2	ppm/°C	ASTM E831
CLTE, Z plane	30	ppm/°C	ASTM E831
Poisson's Ratio	0.32		ASTM D638

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<b>MECHANICAL (As molded)</b>	<b>Typical</b>	<b>Unit</b>	<b>Test Method</b>
Tensile Strength	4,000 (27)	psi (MPa)	ASTM D638
Flexural Modulus (RT)	2.5 x 10 <sup>6</sup> (17.2)	psi (GPa)	ASTM D790
Flexural Strength	8,250 (56)	psi (MPa)	ASTM D790
Compressive Strength	9,500 (65)	psi (MPa)	ASTM D695
Compressive Creep, 200 psi			ASTM D2990
200 hr at 80°C	0.02	%	
1000 hr at 80°C	0.02	%	

<b>IMPACT</b>	<b>Typical</b>	<b>Unit</b>	<b>Test Method</b>
Unnotched Impact Strength	0.69 (36.8)	ft-lb/in (J/m)	ASTM D4812
Instrumented Impact at 23°C			ASTM D3763
Max Load	244	N	
Total Energy	0.57	N-M	
Energy to Max Load	1.00	N-M	

<b>THERMAL</b>	<b>Typical</b>	<b>Unit</b>	<b>Test Method</b>
Glass Transition T <sub>g</sub>	384 (196)	°F (°C)	ASTM D4065
Thermal Conductivity, 25°C		W/m-°K	ASTM E1461
In Plane/Through Plane at 25°C	47.2/10.7		
In Plane/Through Plane at 85°C	44.6/10.2		
Diffusivity		cm <sup>2</sup> /s	ASTM E1461
In Plane/Through Plane at 25°C	0.302/0.69		
In Plane/Through Plane at 85°C	0.24/0.054		
Specific Heat Capacity		J/kg-K	ASTM E1461
At 25°C	1.04		
At 85°C	0.841		

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<b>ELECTRICAL</b>	<b>Typical</b>	<b>Unit</b>	<b>Test Method</b>
Conductivity			Vendor
Through Plane (Z direction)	25	S/cm	
In Plane (X, Y direction)	133	S/cm	

<b>Typical Process Settings</b>			
Mold Temperature	380-400	F	
Cure Time (<3.0mm thick)	15-60	Seconds	
Recommend Press Tonnage	3-4	Tons/in <sup>2</sup> on Projected Area	
Final Press Closure Speed (Start of material flow to close)	2-4	Seconds	
Time to Full Press Tonnage (Close to full tonnage)	<1.0	Second	
Post Bake Temperature	180-200	C	
Post Bake Time at Temperature	>20	Minutes	

For additional information, please contact:

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