

# BMC 940-8649

## 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

<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>	• High conductivity	• Excellent corrosion resistance	• Cost effective
<b>Resin</b>	• Vinyl ester Composite		

### Processing Method

<b>Mold Temperature</b>	310-330	F
<b>Cure Time (&lt;3.0mm thick)</b>	30-90	Seconds
<b>Recommend Press Tonnage</b>	3-4	Tons/in <sup>2</sup> on Projected Area
<b>Final Press Closure Speed (Start of material flow to close)</b>	1-3	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>
<b>Density</b>	1.80-1.84	g/cm <sup>3</sup>	ASTM D792
<b>Mold Shrinkage (RT mold/RT part)</b>	0.00094-0.0012	in/in	ASTM D955
<b>Water Absorption, 24 hrs, 23°C</b>	<0.10	%	ASTM D570
<b>CLTE, X-Y plane</b>	30	ppm/°C	ASTM E831
<b>Poisson's Ratio</b>	0.32		ASTM D638

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MECHANICAL (As molded)	Typical	Unit	Test Method
Tensile Modulus	1.6 x 10 <sup>6</sup> (11)	psi (GPa)	ASTM D638
Tensile Strength	4,400 (30)	psi (MPa)	ASTM D638
Flexural Modulus (RT)	1.5 x 10 <sup>6</sup> (10.35)	psi (GPa)	ASTM D790
Flexural Strength	5,800 (40)	psi (MPa)	ASTM D790
Compressive Strength	11,000 (75)	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	0.3 (16)	ft-lb/in (J/m)	ASTM D4812
Instrumented Impact at 23°C			ASTM D3763
Max Load	169	lbs	
Total Energy	2.63	ft-lb	
Energy to Max Load	0.55	ft-lb	

THERMAL	Typical	Unit	Test Method
Glass Transition T <sub>g</sub>	392 (200)	°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		cm <sup>2</sup> /s	ASTM E1461
In Plane/Through Plane at 25°C	0.302/0.125		
In Plane/Through Plane at 85°C	0.231/0.098		
Specific Heat Capacity		J/kg-K	ASTM E1461
In Plane	1.04		
Through Plane	0.841		

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<b>ELECTRICAL</b>	<b>Typical</b>	<b>Unit</b>	<b>Test Method</b>
<b>Conductivity</b>			<b>Vendor</b>
Through Plane (Z direction)	50	S/cm	
In Plane (X, Y direction)	100	S/cm	

<b>Typical Process Settings</b>			
<b>Mold Temperature</b>	310-330	F	
<b>Cure Time (&lt;3.0mm thick)</b>	30-90	Seconds	
<b>Recommend Press Tonnage</b>	3-4	Tons/in <sup>2</sup> on Projected Area	
<b>Final Press Closure Speed (Start of material flow to close)</b>	1-3	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	

For additional information, please contact:

**A. Schulman Inc., Engineered Composites**  
1600 Powis Ct, West Chicago, IL 60185  
p: 630-377-1065  
f: 630-377-7395  
[www.aschulman.com](http://www.aschulman.com)

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