



# MOMENTIVE

performance materials

## Boron Nitride for PVD Applications

**Boron Nitride (BN) is an ideal material for PVD insulators and arc shields, offering the following benefits:**

- Excellent electrical insulation properties - high dielectric strength, low dielectric constant, high volume resistivity
- High purity for vacuum applications
- Easy to machine
- Inert and chemically stable

Momentive offers several grades of hot-pressed BN and BN composite materials suitable for use in PVD applications.

**Grade BIN77** - Designed specifically for PVD applications, this BN/AlN composite is durable and offers longer life. The addition of aluminum nitride provides abrasion resistance allowing for cleaning of insulators, and the calcium-stabilized binder system provides resistance to moisture pickup, spalling, and cracking.

**Grade HBC** - Our highest purity grade, this material is binderless and extremely resistant to moisture, resulting in outstanding performance and properties at extremely high temperature or ultra-high vacuum conditions.

**Grade HBT** - This binderless grade has slightly lower density and therefore strength than HBC but may be a more economical alternative in certain applications.

**Grade HBR** - A calcium-stabilized hot-pressed BN, this standard grade is also resistant to moisture pickup and stronger than binderless grades.

Momentive Performance Materials is your complete source for hot-pressed BN and BN composites for PVD and vacuum processing applications, with total machining capabilities to meet your specifications.

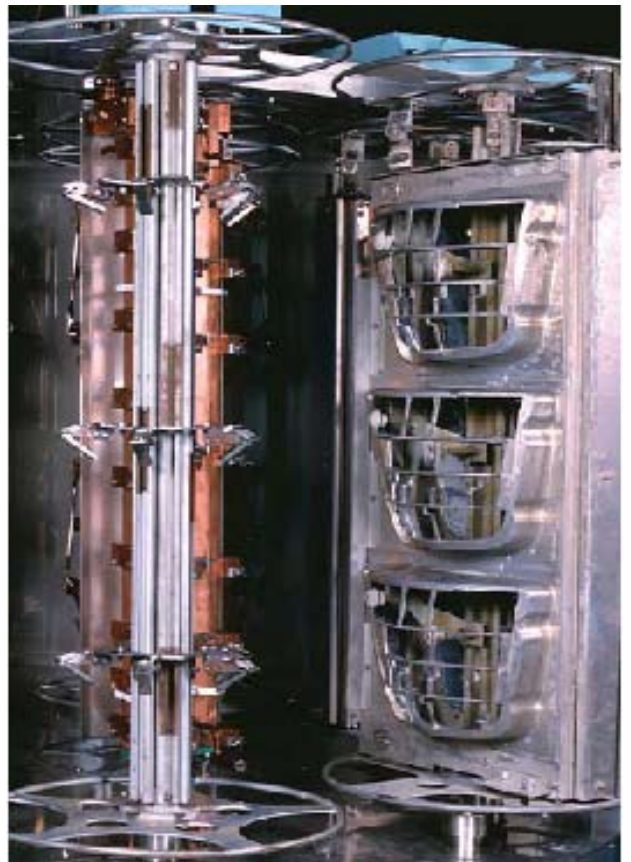


Photo courtesy of Galileo Vacuum Systems.

## Comparison of Typical Properties

	-----GRADE-----							
	HBR		HBT		HBC		BIN77	
Binder	Calcium Borate		None		None		Calcium Borate	
Density (g/cc)	2.00		1.75		1.95		2.43	
PRESSING DIRECTION		⊥		⊥		⊥		⊥
Flexural Strength (psi x 10 <sup>3</sup> )								
@ 25° C	7.5	6	2.8	2.5	3	2.5	11.4	18.2
@ 1500° C	3.1	2.7	3.5	2.7	7	4	3.6	4.7
Modulus of Elasticity (psi x 10 <sup>6</sup> )	9	7	6	3	7	3	5	7
CTE (ppm/K)								
25 to 1500° C	3	4	0.1	0.3	0.4	0.8	5.4	5.6
Thermal Conductivity, W/m-K								
@25° C	55	33	22	19	28	23	29	40
<b>ELECTRICAL PROPERTIES</b>								
Dielectric Strength (V/mm x 10 <sup>3</sup> )	53		34		54		43	
Dielectric Constant								
@ 1 GHz	4.2		3.9		4.1		6.2	
@ 9.3 GHz	4.3		3.9		4.3		5.9	
@ 1 MHz	4.1		3.8		4.1		6.4	
Volume Resistivity								
@ 25° C (ohm-cm)	>10 <sup>15</sup>		>10 <sup>15</sup>		>10 <sup>15</sup>		>10 <sup>15</sup>	
@ 700° C (ohm-cm)	1 x 10 <sup>8</sup>		1 x 10 <sup>10</sup>		1 x 10 <sup>10</sup>		7.4 x 10 <sup>6</sup>	

See Momentive Performance Materials Publication 81507 (Hot Pressed Boron Nitride Shapes) for more details on the full range of Momentive's hot-pressed BN products.

Momentive also offers boron-nitride coatings which are ideal for release, refractory, and lubrication applications in PVD processing; see Momentive Performance Materials Publication 81509 (Boron Nitride Coatings) for more details.

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