



## BIPOLAR AND MONOPOLAR PLATE STANDARD PROPERTIES



*Entegris compression molds highly conductive carbon composite blank bipolar plates.*

### Standard Bipolar Plates

Entegris bipolar plates are compression molded from a highly conductive carbon-loaded composite. Standard blank plates are made from Bulk Molding Corporation's 940-8649 material. Each plate is 508 mm × 305 mm (20" × 12") in size and can be provided from stock.

### For More Information

To learn more about our cell stack plates or how Entegris can help your fuel cell development from concept to commercialization,<sup>SM</sup> contact Entegris Fuel Cells at 952-556-4048. To review Entegris' complete offering for the Fuel Cell industry, visit Entegris' Web site at [www.entegrisfuelcells.com](http://www.entegrisfuelcells.com).

### Ordering Information

Part Number	Thickness (X)	Conductivity
FCBLK-508305-00001	2.41 mm (0.095")	50 S/cm
FCBLK-508305-00002	6.86 mm (0.270")	50 S/cm
FCBLK-508305-00003	6.35 mm (0.250")	50 S/cm
FCBLK-508305-00004	3.55 mm (0.140")	50 S/cm

### Terms and Conditions of Sale

All purchases are subject to Entegris' "Terms and Conditions of Sale."

# Standard Properties

The properties that follow reflect performance in an “as molded” condition, i.e., no surface sanding/preparation has been applied.

## Typical Property Data for Entegris Standard Bipolar Plate Blanks

PROPERTY	METRIC	ENGLISH	TEST METHOD
<b>Dimensional Properties</b>			
Length × Width	508 mm × 305 mm	20.0" × 12.0"	
<b>Mechanical Properties</b>			
Density	1.82 g/cm <sup>3</sup>	0.0657 lb/in <sup>3</sup>	
Tensile strength @ 25°C	30 MPa	4.4 × 10 <sup>3</sup> PSI	ASTM D-638
Tensile strength @ 90°C	21 MPa	3.0 × 10 <sup>3</sup> PSI	ASTM D-638
Tensile modulus @ 25°C	17 GPa	2.4 × 10 <sup>6</sup> PSI	ASTM D-638
Tensile modulus @ 90°C	12 GPa	1.7 × 10 <sup>6</sup> PSI	ASTM D-638
Flexural strength @ 25°C	43 MPa	6.2 × 10 <sup>3</sup> PSI	ASTM D-790
Flexural strength @ 90°C	32 MPa	4.6 × 10 <sup>3</sup> PSI	ASTM D-790
Flexural modulus @ 25°C	11 GPa	1.60 × 10 <sup>6</sup> PSI	ASTM D-790
Flexural modulus @ 90°C	8 GPa	1.18 × 10 <sup>6</sup> PSI	ASTM D-790
Impact strength, notched	0.16 N•m/cm	0.30 ft lb/in	ASTM D-256
Compressive strength	95 MPa	14 × 10 <sup>3</sup> PSI	
Compressive creep	0.035% @ 200 hours, 200 PSI, 90°C	–	
<b>Electrical Properties</b>			
Electrical conductivity/resistivity (Z Plane)	50 ±10 S/cm (Conductivity) 0.02 +.005/-.003Ω - cm (Resistivity)	–	Entegris Test Method
<b>Thermal Properties</b>			
Thermal conductivity (Z Plane) @ 25°C	15.8 W/(m-°K)	3.3 Btu/(ft <sup>2</sup> -hr-°F)	ASTM E1461-92
Thermal conductivity (Z Plane) @ 85°C	12.2 W/(m-°K)	3.2 Btu/(ft <sup>2</sup> -hr-°F)	ASTM E1461-92
Coefficient of thermal expansion	30 × 10 <sup>-6</sup> m/(m-°C)	16 × 10 <sup>-6</sup> in/(in-°F)	ASTM E831
Operating temperature range	-40°C – +85°C	-40°F – +185°F	
<b>Permeability</b>			
Hydrogen gas	2 × 10 <sup>-7</sup> cm <sup>3</sup> /sec*cm <sup>2</sup>		1 PSIA; 1 mm thick
<b>Fire Resistance</b>			
Flammability		94V0	UL94

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From concept to commercialization<sup>SM</sup> is a service mark of Entegris, Inc.

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