

# Honeycomb Waveguide Panels

## EMI/RFI Shielded Ventilation Panels 3000 Series

MAJR's Honeycomb Waveguide panels are designed to provide optimum EMI/RFI shielding with minimum pressure drop while ventilating air.

The special honeycomb media is designed to allow air to flow into and out of EMI/RFI shielded areas, typically through standard or custom sized ducts and secure room apertures. This honeycomb media helps facilitate the cooling of electronics and sensitive equipment as well as providing needed air circulation for manned military shelters, SCIFS and secure rooms and buildings. Our Honeycomb Waveguide panels can be provided in a variety of materials and configurations to meet specific requirements such as ICS / ICD 705 compliance.



### Radiated emission testing of 12 in. x 12 in. x 0.5 in honeycomb vent panels:

Aluminum, chromate coated, (Plane Wave, 30 dB to 18 GHz)

Aluminum, tin plated, (Plane Wave, 60 dB to 18 GHz)

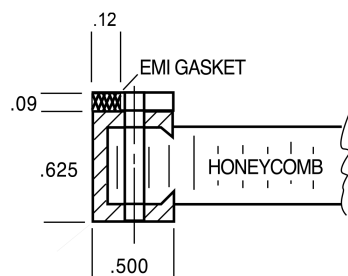
Steel, tin plated, (Plane Wave, 70 dB to 18 GHz) and (Magnetic H-Field, 45 dB at 10 kHz and 60 dB at 100 kHz)

Brass (Plane Wave, 65 dB to 18 GHz)

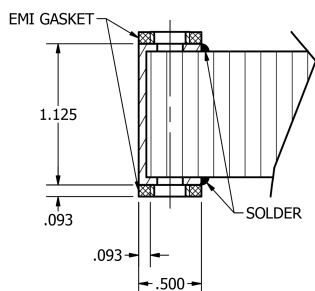
### Features

- Ease of Installation**  
Shielded air vents are supplied with EMI gasket and mounting holes or captive fasteners so as to be ready for installation into the cabinet.
- Special Designs**  
MAJR's engineering group can assist with applications requiring special mounting or shape.
- Painted Units**  
Vents mounted on the outside of cabinet can be supplied with exposed surfaces painted to meet the Military Standard color of the cabinet.
- Optimum Shielding and Air Flow**  
Installation of the honeycomb — with its 4:1 opening to depth ratio — provides the waveguide below cut-off effect required to attenuate EMI/RFI interference while not impeding the air flow required to cool the packaged enclosure.
- Standard Configurations**  
A broad selection of sizes provides the widest choice in meeting design objectives.
- RoHS compliant available**

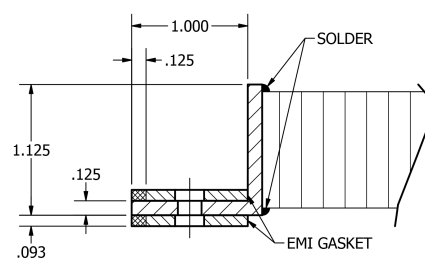
## Standard Mounting Frame Profiles



ALUMINUM SURFACE  
MOUNTING FRAME



STEEL & BRASS SURFACE  
MOUNTING FRAME



STEEL & BRASS RECESSED  
MOUNTING FRAME

## Shielding Effectiveness vs Frequency — Table 1

Shielding Effectiveness dB

| Field     | Aluminum Non-hexavalent Chromate Finish   Material Code – 90   0.5" thick x .125" cell |         |         |       |        |        |
|-----------|--|---------|---------|-------|--------|--------|
|           | Frequency  |         |         |       |        |        |
|           | 1 MHz  | 100 MHz | 500 MHz | 1 GHz | 10 GHz | 18 GHz |
| <b>E</b>  | 60   | 50      | 50      | —     | —      | —      |
| <b>PW</b> | —  | —       | —       | 45    | 40     | 40     |

| Field     | Aluminum – Tin Plate   Material Code – 42   0.5" thick x .125" cell |         |         |       |        |        |
|-----------|---|---------|---------|-------|--------|--------|
|           | Frequency   |         |         |       |        |        |
|           | 1 MHz   | 100 MHz | 500 MHz | 1 GHz | 10 GHz | 18 GHz |
| <b>E</b>  | 100   | 90      | 85      | —     | —      | —      |
| <b>PW</b> | —   | —       | —       | 80    | 70     | 60     |

| Field     | Brass   Material Code – 43   1.0" thick x .125" cell |         |         |       |        |        |
|-----------|--|---------|---------|-------|--------|--------|
|           | Frequency  |         |         |       |        |        |
|           | 1 MHz  | 100 MHz | 500 MHz | 1 GHz | 10 GHz | 18 GHz |
| <b>E</b>  | 75   | 95      | 110     | —     | —      | —      |
| <b>PW</b> | —  | —       | —       | 105   | 85     | 85     |

## Shielding Effectiveness vs Frequency — Table 1 (continued)

Shielding Effectiveness dB

| Field     | Brass   Material Code – 43   1.0" thick x .188" cell |         |         |       |        |        |
|-----------|--|---------|---------|-------|--------|--------|
|           | Frequency  |         |         |       |        |        |
|           | 1 MHz  | 100 MHz | 500 MHz | 1 GHz | 10 GHz | 18 GHz |
| <b>E</b>  | 70   | 80      | 80      | —     | —      | —      |
| <b>PW</b> | —  | —       | —       | 85    | 75     | 65     |

| Field     | Brass   Material Code – 43   0.5" thick x .125" cell |         |         |       |        |        |
|-----------|--|---------|---------|-------|--------|--------|
|           | Frequency  |         |         |       |        |        |
|           | 1 MHz  | 100 MHz | 500 MHz | 1 GHz | 10 GHz | 18 GHz |
| <b>E</b>  | 60   | 80      | 80      | —     | —      | —      |
| <b>PW</b> | —  | —       | —       | 80    | 75     | 70     |

| Field     | Steel – Tin Plate   Material Code – 44   1.0" thick x .125" cell |         |       |         |         |       |        |        |
|-----------|--|---------|-------|---------|---------|-------|--------|--------|
|           | Frequency  |         |       |         |         |       |        |        |
|           | 10 kHz   | 100 kHz | 1 MHz | 100 MHz | 500 MHz | 1 GHz | 10 GHz | 18 GHz |
| <b>H</b>  | 40   | 55      | —     | —       | —       | —     | —      | —      |
| <b>E</b>  | —  | —       | 75    | 100     | 120     | —     | —      | —      |
| <b>PW</b> | —  | —       | —     | —       | —       | 120   | 120    | 115    |

| Field     | Steel – Tin Plate   Material Code – 44   1.0" thick x .188 cell |         |       |         |         |       |        |        |
|-----------|---|---------|-------|---------|---------|-------|--------|--------|
|           | Frequency   |         |       |         |         |       |        |        |
|           | 10 kHz  | 100 kHz | 1 MHz | 100 MHz | 500 MHz | 1 GHz | 10 GHz | 18 GHz |
| <b>H</b>  | 40  | 55      | —     | —       | —       | —     | —      | —      |
| <b>E</b>  | —   | —       | 75    | 100     | 100     | —     | —      | —      |
| <b>PW</b> | —   | —       | —     | —       | —       | 110   | 110    | 110    |

Shielding Effectiveness vs Frequency — Table 1 (continued)

Shielding Effectiveness dB

| Field | (Corrosion Resistant) Painted Steel with Brass Frame   Material Code – 39   1.0" thick x .125" cell |         |       |         |         |       |        |        |
|-------|---|---------|-------|---------|---------|-------|--------|--------|
|       | Frequency   |         |       |         |         |       |        |        |
|       | 10 kHz  | 100 kHz | 1 MHz | 100 MHz | 500 MHz | 1 GHz | 10 GHz | 18 GHz |
| H     | 40  | 55      | —     | —       | —       | —     | —      | —      |
| E     | —   | —       | 75    | 110     | 110     | —     | —      | —      |
| PW    | —   | —       | —     | —       | —       | 110   | 95     | 85     |

The data in Table shows shielding characteristics for standard MAJR shielded vents. Note that the data indicated is tested under laboratory conditions per MIL-STD 285. This data is for comparison between shielded vent panel configurations and is not to be stated as a pass/fail specification for a manufactured EMI/RFI waveguide vent panel.

Yellow chromate (-32) finish available upon request. Tin Plated Steel (-44) data reflects a steel honeycomb and steel frame construction. Not all mounting frame options are available in steel.

Design Data: Airflow

