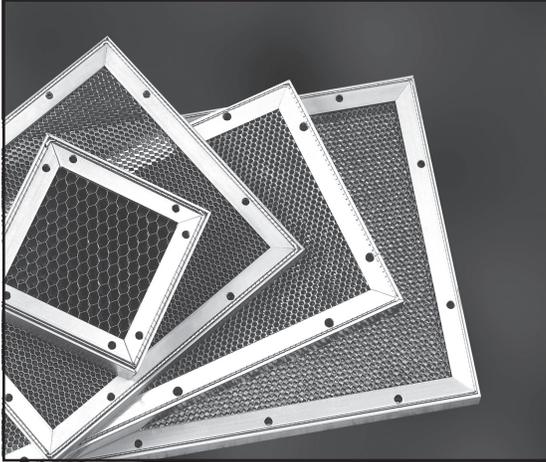


# Shielded Air Vent Honeycomb Filters



Spira's Shielded Air Vent Honeycomb Filters are designed to provide consistent and reliably high levels of shielding while allowing cooling air to penetrate an electrical equipment cabinet. Air vent filters are available in Spira-Cell or Brass-Cell for different applications and levels of shielding. (See page 35 for our Shielded Honeycomb Fan Filters).

## Design Advantages (All Types)

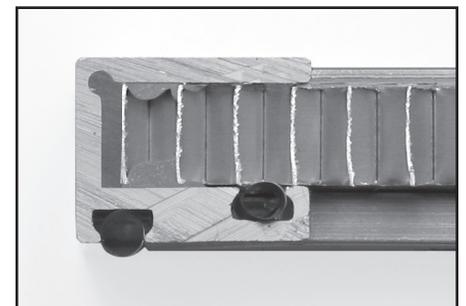
Due to their construction and materials, our honeycomb filters offer several cost-effective advantages over the other honeycomb filters on the market.

**Competitive Cost** A fully automated machine is used to cut the frame to size. This machine is coupled with several automated and semi-automated processes used to apply epoxy to the frame/honeycomb panel interface for mechanical strength of the filter, and to install the electromagnetic (EM) bonding spiral gasket to the extrusion. These machines and processes significantly reduce the time required to manufacture and assemble the filters, and we pass that savings on to our customers.

**Shielding Advantage** The honeycomb panels we use offer high, reliable levels of shielding. The Brass-Cell uses brass foils soldered together which provide extremely high, reliable shielding. The aluminum panels used for Spira-Cell filters are processed using our patented blending process that ensures a reliable conductive path across the epoxy joints of the honeycomb cells. Tests have shown as much as a 40 dB improvement for single panel filters and 70 dB improvement for double panel filters over the use of panel material which has not been processed. See pages 29 and 32 for complete performance data.

**Reliable Joint Surfaces** We use 6061 aluminum for our frame members because of its high surface conductivity and corrosion resistant properties. We augment this with tin or tin/lead plating (when specified) to meet higher levels of shielding and/or corrosion compatibility requirements. Chemical film plating can also be employed when the high levels of shielding associated with tin plating are not required. Any plating is done prior to assembly which guarantees that the acids and other chemicals used in the pre-plating etch process are totally removed from the components, thus ensuring a long, reliable life of the filter.

**Spiral Bonding** Spira EMI gasket materials are used to obtain an excellent, reliable frame-to-chassis bond on all types of filters. The gaskets are also employed for the honeycomb panel-to-frame electromagnetic bond on the Spira-Cell and Brass-Cell filters. The spiral gaskets are employed for the purpose of absorbing thermal expansion and contraction, shock, and vibration to insure an excellent electromagnetic bond throughout the life of the filter.



*The only shielded air vent filter with spiral bonding.  
(1 panel configuration shown)*

## Available Options (All Types)

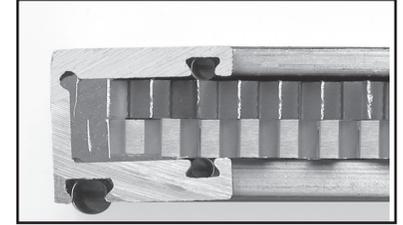
### **Frame Style**

The honeycomb panel frames are used to hold the honeycomb panel material in place and to reference the honeycomb panels to equipment chassis ground potential. The frame comes with a spiral EMI gasket for panel bonding on either Spira-Cell or Brass-Cell filters.

### **Spiral-Bonding Frame**

The extrusions used for the Spira-Cell and Brass-Cell filters have built-in dovetail grooves. These grooves are used to hold the spiral EM bonding gasket in place during the manufacturing process and allow the gasket to move unrestricted during compressed applications. This unrestricted movement allows the gasket to absorb movement of the joint surfaces during thermal expansion and contraction, vibration and shock. This results in reliable EM bonding between the honeycomb panel and the frame throughout the life of the filter.

*"C" Frame Spiral Bonding  
(2 panel configuration shown)*



*Dovetail groove holds gasket in place during manufacturing.*

### **Cell Width**

All of the standard filters use a 1/8" cell. Other cell sizes are available through special order. Contact us for availability.

### **Cell Thickness**

The standard panel thicknesses are 1/8" (Aluminum only), 1/4", 1/2" or 1". Contact us for availability.

### **Threaded Inserts**

Filters can be made either with through holes of varying sizes or fitted with threaded inserts. For cost efficiency, we recommend even spacing of holes. Threaded inserts are not available on the 1/8" thick panels.

*Filters are available in RoHS compliant versions on request.*

Please see the Ordering Information section on page 33. Items are custom order. Contact us for availability, assistance and custom quotes.

## Spira-Cell

The Spira-Cell filter is a high reliability air vent filter supplying moderate to high levels of shielding at a relatively low cost. It features an EMI gasket to achieve the honeycomb panel-to-frame EM bond. It comes in both single and double panel configurations with a 6061-T4 aluminum frame and stainless steel gasket or tin plated frame with tin plated stainless steel gasket for the EM bond between the panel and frame and frame-to-chassis. A version is also available for high humidity and salt spray environments.

## Brass-Cell

The Brass-Cell filter gets its name by using brass honeycomb panels. The brass foil is soldered together ensuring consistent, reliable shielding of the filter. The filter offers a reliable, high level of shielding at a relatively low cost. The Brass-Cell filter consists of a tin plated aluminum frame, tin plated stainless steel gasket and brass honeycomb panels. The filter is designed to operate in a relatively low humidity environment due to potential material incompatibilities. A version is also available for high humidity and salt spray environments.

*Filters are available in RoHS compliant versions on request.*

## Salt-Fog

Filters are available in Salt-Fog compliant versions on request.

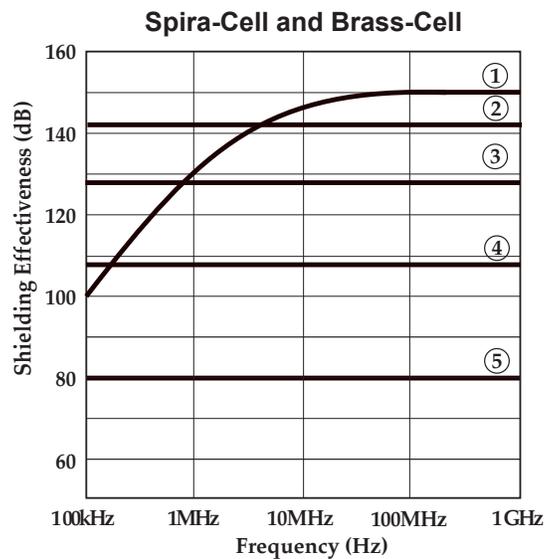
The high humidity/salt spray versions use our edge tin/lead plated beryllium copper gaskets and are available in the following configurations:

**Spira-Cell:** Tin plated aluminum frame and honeycomb panel.  
(or chem-film plated for "light" salt-fog.)

**Brass-Cell:** Tin plated brass honeycomb panel with tin plated aluminum frame.  
RoHS compliant versions also available on request.

## Shielding Effectiveness of Shielded Air Vent Honeycomb Filters

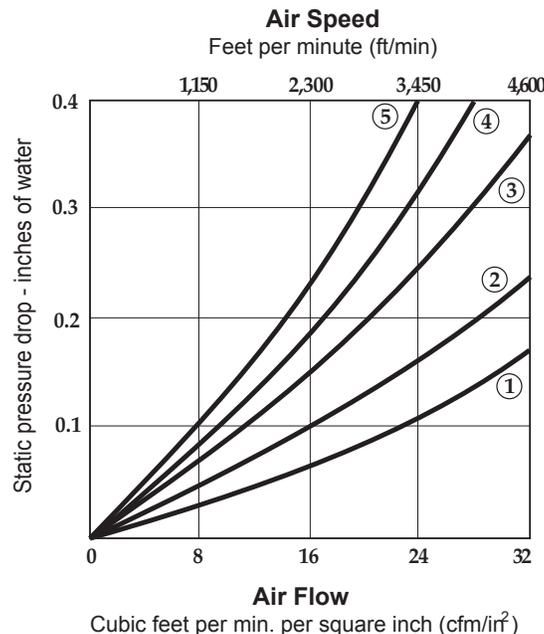
The shielding effectiveness testing of Spira's honeycomb filters is performed by generating an electromagnetic field through a hole in an enclosure and recording the field strength. The honeycomb filter under test is then attached to the enclosure and a second field strength measurement is recorded. The shielding effectiveness is the difference in the recorded field strength readings in dB.



1. Threshold Test Limit
2. Brass-Cell, 1/8" cell x 1" deep
3. Brass-Cell, 1/8" cell x 1/2" deep;  
Spira-Cell, 2 panel, 1/8" cell x 1/4" deep
4. Brass-Cell, 1/8" cell x 1/4" deep;  
Spira-Cell, 2 panel, 1/8" cell x 1/8" deep
5. Spira-Cell, 1/8" cell x 1/4" deep

This data is representative of the test data we have obtained. Your results will vary depending on the applicable variables.

## Static Pressure Drop Versus Air Speed

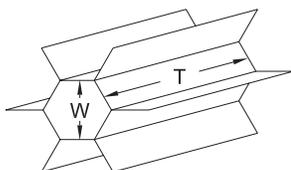


1. 1/8" x 1/8" aluminum
2. 1/8" x 1/4" aluminum
3. 2 panel 1/8" x 1/8" aluminum & Brass Cell 1/8" x 1/4"
4. 2 panel 1/8" x 1/4" aluminum & Brass Cell 1/8" x 1/2"
5. Brass Cell 1/8" x 1"

# Honeycomb Filter Specifications

If you would like assistance or any custom configurations, contact us with your requirements. RoHS compliant versions are available on request.

Honeycomb Filter Options and Shielding					
Type of Filter	Panel & Frame Options	Panel Thickness			
		1/8"	1/4"	1/2"	1"
<b>Spira-Cell</b> • Gasket inside Frame	1 Aluminum Panel 2 Aluminum Panels Tin Plated Frame	60dB 110dB	80dB 130dB	80dB --	-- --
<b>Spira-Cell, Salt-Fog</b>	1 Aluminum Panel Tin Plated Frame & Panel 2 Aluminum Panels Tin Plated Frame & Panel	60dB 110dB	80dB 130dB	80dB --	-- --
<b>Spira-Cell, "Light" Salt-Fog</b>	1 Aluminum Panel Chem-Film Frame & Panel 2 Aluminum Panels Chem-Film Frame & Panel	60dB 90dB	80dB 90dB	80dB --	-- --
<b>Brass-Cell</b>	1 Brass Panel Tin Plated Frame	--	110dB	130dB	140dB
<b>Brass-Cell, Salt-Fog</b>	1 Brass Panel, Tin Plated Frame & Panel	--	110dB	130dB	140dB



Note: The shielding specified (in dB) is typical of the data we have obtained. Results may vary depending on application. See below for ordering information and page 32 for complete performance data.

W = Honeycomb panel cell width = 1/8" standard. Other cell sizes are available through special order.  
T = Panel Thickness as shown above. The filter thickness will double for 2 panel configurations.

Custom and RoHS compliant Honeycomb Filters are available on request. Contact us for more information.

## Ordering Information

To order, please send a drawing and specify the following information:

### 1. Size of Filter

- Length and Width

### 2. Type of Honeycomb Panel

- Aluminum or Brass

### 3. Thickness of Honeycomb Panel

- 1/8" (Aluminum only), 1/4", 1/2", or 1" (Brass only)

### 4. Number of Honeycomb Panels

- One or Two Panels

### 5. Plating and Environmental Concerns

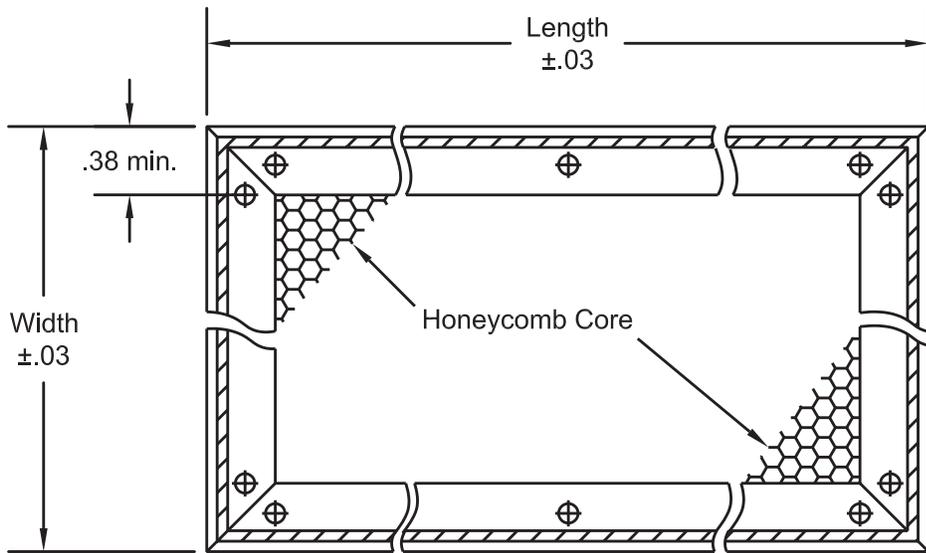
- No Plating, Salt-Fog, or Max Shielding (Specify RoHS if needed.)

### 6. Mounting Hole Information

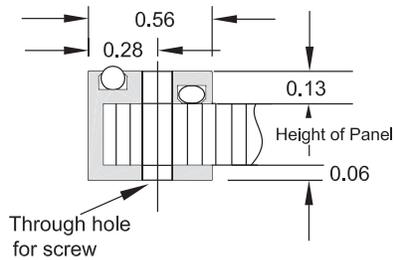
- Quantity of Holes
- Location of Holes
- Through Holes or Threaded Inserts
- Hole or Thread Size

### 7. Outside Spiral Selection

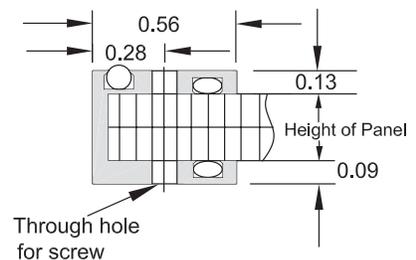
- Spira-shield (standard)
- Optional Flexi-Shield adds extra protection for the spiral gasket during handling.



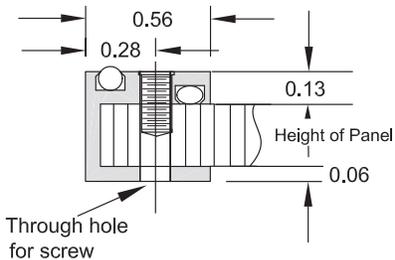
Standard Sizes	
Holes	Screw Sizes
.120"	4-40
.147"	6-32
.173"	8-32
.204"	10-24



Single panel Spira-Cell or Brass-Cell with through holes



2 panel Spira-Cell with through holes



Single panel Spira-Cell or Brass-Cell with threaded inserts

Standard tolerances are:  
 XX +/- .03  
 XXX +/- .015  
 Unless noted otherwise.

All dimensions in inches.