

# Shielded Windows and Vent Panels



We practice environmental protection



**Laird**  
TECHNOLOGIES®



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## General Information

- All specifications herein mentioned are obtained according to standard MIL and DIN test methods, however, this does only apply partially in some cases.
- Laird Technologies can only give recommendations to the best of our knowledge based on the information given. The customer is responsible for choosing the right material and for correct installation.
- Due to various application possibilities and conditions which are beyond our control, customers should carry out their own tests to determine the suitability for individual applications.
- All dimensions shown are in inches (millimeters) unless otherwise specified.
- All information printed herein is true and correct to the best of our knowledge
- We reserve the right to change technical specifications without notice and take no responsibility for errors and misprints.
- Tolerances on inquiry.



## General Description

Shielded windows consist of one or more window layers with a conductive intermediate layer. They are applicable for all visual display systems, e.g. in meters and monitors.

Due to the variety of possibilities, our standard is custom-made production. The window should be selected according to following criteria:

- 1 window material
- 2 color of material
- 3 dimensions
- 4 anti-reflectivity
- 5 intermediate layers
- 6 construction
- 7 gasket type
- 8 frame finish

Shielded windows are generally used for all kinds of electric displays, e.g. LCD, LED, plasma and EL displays, etc.



## Orientation of the mesh

90° - 45° - 30° - 15°

## Tolerances

### 1. Outer dimensions

up to 23.622 inch (600 mm)  
> 23.622 inch (600 mm)

<b>Glass</b>	<b>Acrylic</b>
inch (mm)	inch (mm)
± 0.020 (± 0.5)	± 0.008 (± 0.2)
± 0.079 (± 2.0)	- -

### 2. Material thickness (per material sheet)

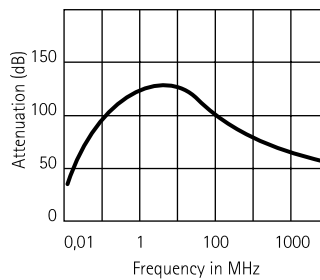
up to 0.158 inch (4 mm)  
> 0.158 inch (4 mm)

<b>Glass</b>	<b>Acrylic</b>
inch (mm)	inch (mm)
± 0.008 (± 0.2)	± 0.012 (± 0.3)
± 0.016 (± 0.4)	± 0.020 (± 0.5)

## Shielding Test Data

Measured on shielded window  
11.811 x 11.811 inch (300 x 300 mm).

Mesh: Blackened silver plated stainless steel 100 ophi.





## 1 Window Material

- Glass, plexiglass (acryl), makrolon (polycarbonate) and PVC can be selected.
- For further details see construction table on page 6.

## 2 Color

- Base color of all materials is transparent/clear. However, for some applications it may be more advantageous to color the material yellow, green, red or amber.
- The base material for acrylic windows is colored, whereas for glass windows, the adhesive foil between the panes is colored.
- Please consider that with colored materials, the light transmission will be affected.

## 3 Dimensions

- **Outer dimensions:**  
There is no standard outer dimension, all windows are custom-made.
- **Material thickness:**  
The material thickness for glass starts from 0,031 - 0,047 inch (0,8 - 1,2 mm), for acrylic from 0,031 inch (0,8 mm) and for polycarbonate from 0,059 inch (1,5 mm). The variety of available material thicknesses helps to meet almost all customer requirements. For a final glass-glass window, the shielding mesh and the adhesive add 0,031 inch (0,8 mm) to the thickness when laminated together.
- For further details see also construction table on page 6.

## 4 Anti-Reflectivity

- All materials can be supplied with anti reflective surface to avoid glaring and to enhance contrast. Different procedures can be used.

### Anti-reflectivity for glass:

- Multi-layer coating per MIL SPEC 675 B (less than 0,6% remaining reflection)
- Single-layer coating per DIN 58197 (less than 1,5% remaining reflection)
- Chemical etching:

5% reflection	(R11G or GW 80)
9% reflection	(R19G or GW 100)
13% reflection	(R27G or GW 120)

### Anti-reflectivity for plastics

- Chemical etching is the standard procedure for a good anti reflectivity with plastics which comes out very strong.
- A special coating, giving a scratch resistance in addition to anti reflectivity, can influence the intensity of reflectivity.

## 5 Intermediate Layers

- The intermediate layer for EMI/RFI shielding is a woven microstructure mesh. Mesh materials are copper, stainless steel or silver plated stainless steel.
- The mesh can be blackened so as to enhance contrast on the display. This does not affect the shielding performance. To avoid interferences between mesh grid pattern and monitor or display ("Moiré fringes"), simply change the orientation of the mesh by turning it a little. The number of openings per inch (opi) determine the shielding effectiveness, but also the light transmission.
- In applications with a very high resolution display which does not allow the use of a mesh, a highly conductive, transparent foil can be laminated onto the glass, or it can be equipped with a conductive ITO coating.
- **Note:**  
The mesh is also available as an individual part for other applications.



## Selection of mesh and its shielding performance

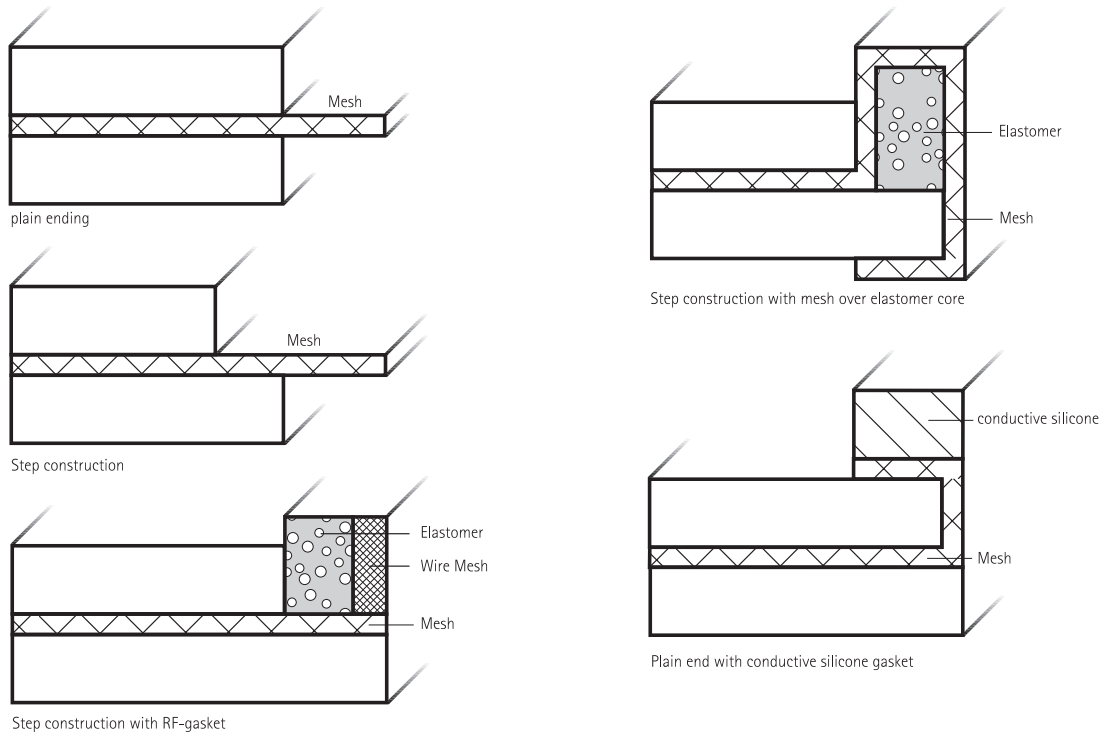
Mesh	Surface	Open. per inch	Wire Diameter	1 MHz	E-field 10 MHz	100 MHz	400 MHz	P-field 1 GHz	10 GHz	Max. size available	Open area %
Copper	blackened	70	0,07	110	111	98	68	64	38	47,24 x 39,37 inch (1200 x 1000 mm)	65
Copper	blackened	100	0,05	107	111	85	70	58	-	47,24 x 39,37 inch (1200 x 1000 mm)	64
Stainless steel	bright	100	0,025	110	105	88	76	62	-	47,24 x 39,37 inch (1200 x 1000 mm)	81
Silver plated stainless steel	blackened	100	0,025	128	112	92	86	80	74	27,56 x 27,56 inch (700 x 700 mm)	81
Silver plated stainless steel	blackened	165	0,05	130	124	106	100	81	61	27,56 x 27,56 inch (700 x 700 mm)	46
Silver plated stainless steel	blackened	200	0,025	128	108	98	88	86	68	27,56 x 27,56 inch (700 x 700 mm)	64

## 6 Construction

- The window consists of a carrier with a laminated mesh on the rear or laminated between two carriers, depending on the application.
- The mesh overlaps the carrier to serve as contact area for the gasket or installation.
- Plastic will be laminated either with adhesives or with high temperatures.
- Glass will be laminated in a vacuum with double sided adhesive foils. Please note that a fully laminated glass window using a PVB interlayer (PVB = Polyvinyl Butyral) as an adhesive cannot be cleaned with solvents, because the solvent will damage the PVB interlayer.



## Schematic illustration



All dimensions shown are in inches (millimeters) unless otherwise specified.



## Construction Table

Laminate	Total material thickness		Temp. range °C	Construction	Form	Conductive medium Mesh	Filter	Anti-reflectivity	
	min.	max.						Refraction of light	Anti-reflection
Glass / glass	2.4	on request	-55 ... ... +75	plain end. step constr.	flat, curved	see mesh selection	grey, green, red, orange	chem. etching	Multi layer
Polycarbonate / polycarbonate	3.8	on request	-55 ... ... +60	plain end. step constr.	flat, curved in 1 direction	see mesh selection	grey	chem. etching	-
Acrylic / acrylic	1.3	on request	-50 ... ... +60	plain end. step constr.	flat, curved	see mesh selection	different colours of acrylic glass	chem. etching	-

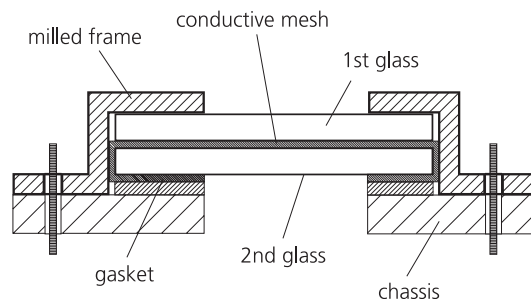
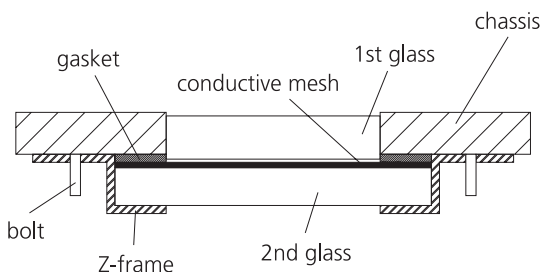
## 7 Gasket Type

- To achieve shielding effectiveness, a good contact between mesh and enclosure is required. The contact can either be established in a direct way or by means of a conductive gasket. When selecting the gasket, you should consider the environmental seal (IP-protection etc.) characteristics that have to be met by the finished product.
- For a choice of gasket and contact methods please contact our sales department.

## 8 Frame Finish

- Windows can be supplied from the factory as complete units. The finish is made according to customer specification and facilitates the assembly. The appropriate gasket is integrated in the frame to provide a good contact between mesh and enclosure.

## Assembly Examples

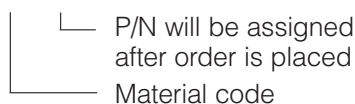


## Ordering Information

The ordering code consists of the material code, followed by a new assigned P/N (including all necessary dimensions, tolerances and process steps):

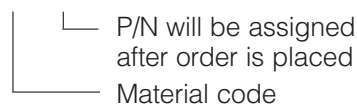
- For glass laminated windows

LT/FG/xxxx



- For polycarbonate laminated windows

LT/PG/xxxx



All dimensions shown are in inches (millimeters) unless otherwise specified.

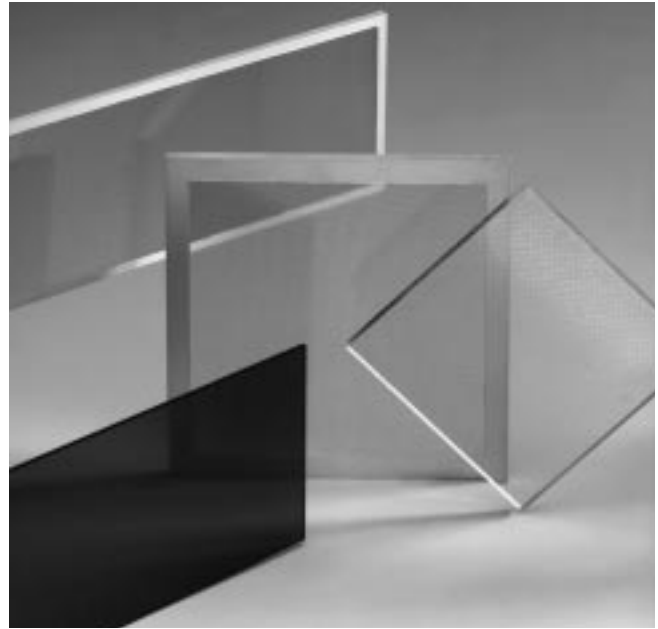


## General Description

A micro-structure wire mesh is stretched in a mould and then cast into acrylic. Due to a special moulding technique, the wire mesh is smoothly embedded in the sheet and will therefore only cause a minimum of optical disturbances. If the shielded window is placed in front of a data display, there might occur interference phenomena followed by varying light intensities on the screen (Moiré fringes). A turn of the mesh by a few degrees may reduce these disturbances.

Custom-made shielded windows with specific dimensions will be cut out of the sheet. Afterwards, a groove will be milled all the way around the edge of the sheet in a step construction. This groove will be plated with silver (silver busbar) and provides the contact to the wire mesh. The window can then be mounted on the chassis by means of a conductive gasket or by using a conductive adhesive. Shielded windows used in front of a display should be mounted in a way that the mesh side of the window is placed as close to the LED/LCD as possible.

New: UV-block with 390 nm excellent protection of LCDs.



## Material

### ■ Type of Plastic - Cast Acrylic:

- Max. size: 45.276 x 33.465 inch  
(1150 x 850 mm)
- Thickness: 0.079 in, 0.098 in, 0.118 in, 0.158 in  
(2 mm, 2.5 mm, 3 mm, 4 mm)
- Tolerances:  $\pm 0.008$  inch ( $\pm 0.2$  mm)
- Working Temp. Range:  $-40^{\circ}$  to  $+70^{\circ}$ C

### ■ Mesh - stainless steel, 100 OPI

- Surface: bright or blackened
- Wire diameter: 0.001 inch (0.025 mm)
- Light transmission: 78 %

### ■ Silver paint:

- Electrodag 1415

## Filter

In addition to being used as an EMI shield, the shielded window can be used as a contrast filter. More than 55 different transparent colours are available, making it possible to choose a contrast filter adapted to the wave length (colour) of the signal source (display). This allows for the greatest possible light transmission while simultaneously excluding secondary light to achieve a clear and easily read signal.





# Shielded Acrylic Window

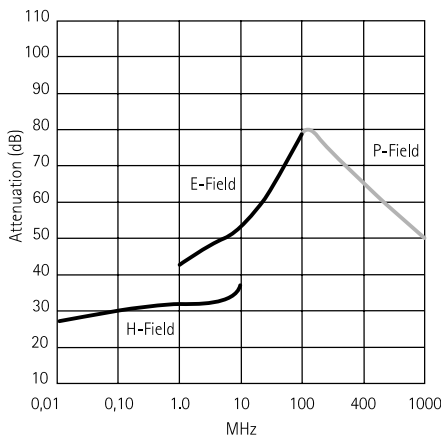
## Reflection

Reflections from shielded windows can be eliminated by using a uniquely developed surface treatment, consisting of optical micro-particles. The surface density can be applied in 5 standard types to suit the individual product, eliminating possible glare from surroundings without luminous loss or distortion of the visual signal. This surface treatment can be applied to the complete shielded window or to selected parts.

Material Finish	Reflection in %
A 1	64 - 65
A 2	61 - 62
A 3	58 - 59
A 4	55 - 56
A 5	49 - 50

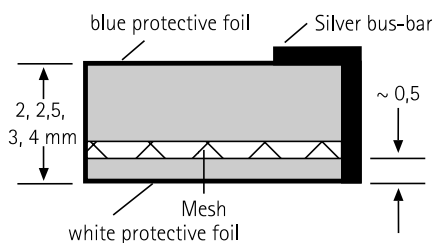
## Shielding Performance

Test Window:  
9,843 x 9,843 inch (250 x 250 mm) according to modified MIL-STD 285



## Construction

### ■ Butt edge with bus-bar



## Mechanical Properties

	Test	Unit	Values
Tensile strength	DIN 53455	N/mm <sup>2</sup>	65 - 68
Compressive strength	DIN 53454	-	125
Flexural strength	DIN 53452	-	120
Impact strength	DIN 53453	kJ/m <sup>2</sup>	12
Modulus of elasticity	DIN 53457	N/mm <sup>2</sup>	3000
Elongation at break	DIN 53455	%	3 - 4
Hardness	DIN 53456	N/mm <sup>2</sup>	175

## Thermal Properties

	Test	Unit	Values
Heat stability-Vicat	DIN 53460	°C	110
Forming temperature	-	°C	150 - 170
Coefficient of linear thermal expansion	VDE 0304	mm/m°C	0.08
Specific heat	-	kJ/kg K	1.46

## Other Properties

Test	Unit	Values	
Specific gravity	DIN 53479	g/cm <sup>3</sup>	1.18 - 1.19
Water absorption	at 20°C / 24 h	%	0.17

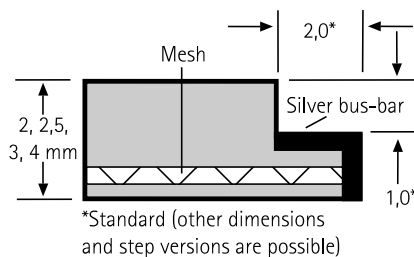
## Ordering Information

The ordering code consists of the material code, followed by a new assigned P/N (including all necessary dimensions, tolerances and process steps):

LT/DCA/xxxx

└─ New P/N will be assigned after order is placed  
└─ Material code

### ■ Step with bus-bar



All dimensions shown are in inches (millimeters) unless otherwise specified.





# ElectroVent Shielding Ventilation Panels

Laird Technologies offers ElectroVent EMI Shielding Ventilation Panels. Available in a wide choice of materials, platings, and mounting configurations, ElectroVent offers the designer new versatility to meet EMI, environmental, and mechanical requirements of system specifications.

## ElectroVent Advantages:

- Wide choice of materials and finishes to meet a broad range of shielding effectiveness requirements
- Varied mounting configurations to meet environmental and space considerations
- Protective grille can be supplied
- Panel supplied with 0.25 (6,4) thick or 0.50 (12,7) thick honeycomb
- Full EMI test of panel to MIL-STD-285 to aid in the early stages of equipment panel design

## Available Protective Grille

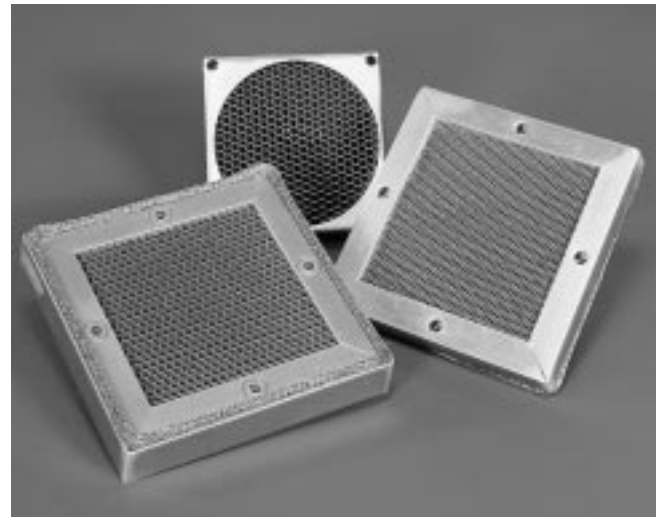
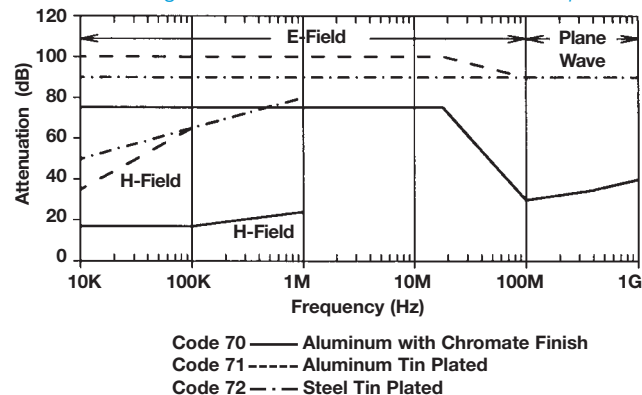
For high traffic areas, all EMI ventilation panels are available with grille installed to protect honeycomb from damage that could impede airflow or shielding effectiveness.

Table 1. Codes for Panel Materials and Plating Combinations

Code No.	Honeycomb Materials	Frame Materials	Plating	EMI Gasket
70	Aluminum Alloy MIL-C-7438	Aluminum Alloy 6063-T4	Chromate Coating MIL-C-5541 Class 3	<b>Wire Knit:</b> Monel QQ-N-281 Class A <b>Elastomer:</b> Neoprene MIL-R-6130 Type Grade A Medium
71	Aluminum Alloy MIL-C-7438	Aluminum Alloy 6063-T4	Tin Plating MIL-T-10727 Type 1	<b>Wire Knit:</b> Tin Coated Copper Clad Steel ASTM B 520 <b>Elastomer:</b> Neoprene MIL-R-6130 Type Grade A Medium
72	Steel SAE 1010	Aluminum Alloy 6063-T4* Chromate Coating	Honeycomb Only Tin Plate MIL-T-10727 Type 1	<b>Wire Knit:</b> Monel QQ-N-281 Class A <b>Elastomer:</b> Neoprene MIL-R-6130 Type Grade A Medium

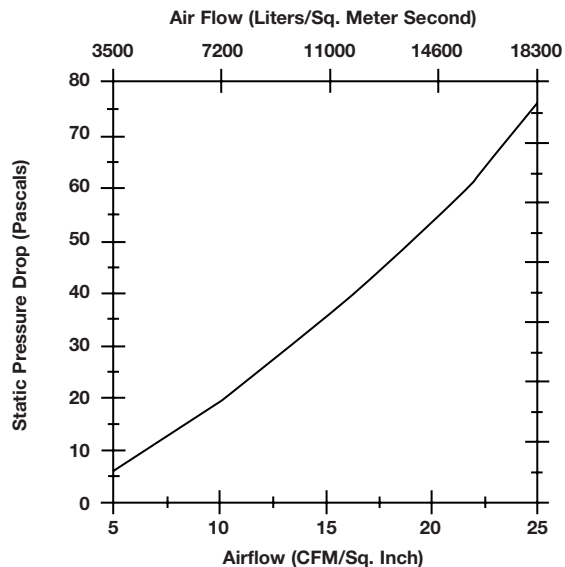
\*Available with tin plated steel frame if required.

Figure 1. Shielding Effectiveness for Various Materials and Plating Combinations at 10-12 Inch Lbs Torque



Vent panels range from 3 in. (76,2 mm) to 18 in. (457,2 mm) square in standard sizes, and can be ordered with either 0.50 in. (12,7 mm) thick or space-saving 0.25 in. (6,4 mm) thick honeycombs.

Figure 2. Air Flow vs. Resistance for Straight Honeycomb Panel



## Vent Panel Size Determination

1. Customer determines fan size and velocity based on their calculated cooling requirements.  
Example: Fan @ 240 CFM velocity with static pressure of 0.035 inches H<sub>2</sub>O.
2. Determine panel opening size so as not to impede airflow
  - A From Figure 2 graph intersect 0.035 inches on Y axis
  - B Draw line to curve—this intersects at 6 CFM/in<sup>2</sup>
  - C Required vent opening = (240 ÷ 6) = 40 sq. in. opening
  - D Choose vent size with 40 sq. in. opening or larger

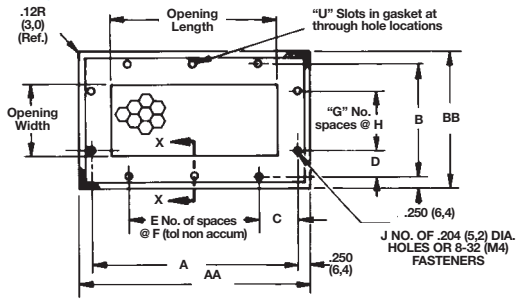
All dimensions shown are in inches (millimeters) unless otherwise specified.





# ElectroVent Shielding Ventilation Panels

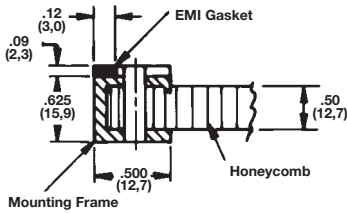
**Figure 3. Channel Mount**



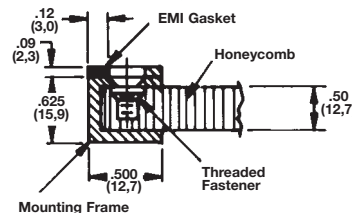
**Table 2. Tolerances**

Dimensional Location	Size Range with Tolerance		
	0-4 (0-101,6)	4.1-12.0 (104,1-304,8)	12.1 to 24.0 (307,3-609,6)
Length and Width	±.020 (±.51)	±.031 (±.79)	±.040 (±1.02)
Hole Location	±.010 (±.25)	±.015 (±.38)	±.020 (±.51)
Square	±.007 (±.178)	±.015 (±.38)	±.040 (± 1.02)

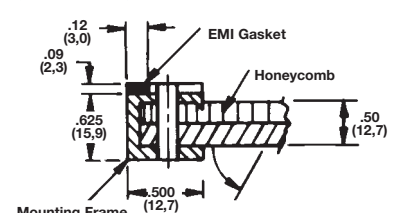
**Section X-X (Rotate 900) for 0.50 in. (12,7 mm) Thick Vent 0.125 in. (3,2 mm) Cell**



**Type 8620-Through Hole**

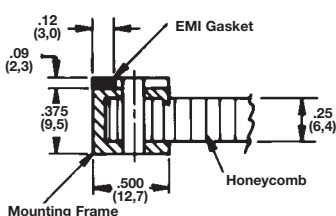


**Type 8621-Captive Fastener**

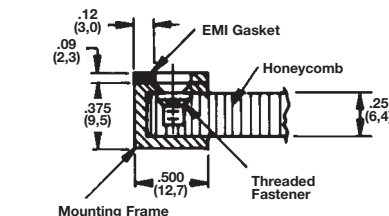


**\*Type 8622-Drip-Proof with Through Hole  
\*Type 8623-With Fastener**

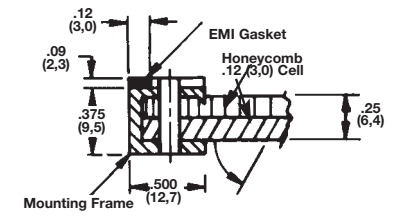
**Section X-X (Rotate 900) for 0.25 in. (6,4 mm) Thick Vent 0.062 in. (1,6 mm) Cell**



**\*Type 8624-Through Hole**



**\*Type 8625-Captive Fastener**



**\*Type 8626-Drip-Proof with Through Hole  
\*Type 8627-With Fastener**

**Table 3. Part No. and Dimension Tabulation**

Base Part No.	Opening		Frame Dimensions										
	Width	Length	AA	BB	A	B	C	D	E	F	G	H	J
XXXX-0303-ZZ	3.00 (76,2)	3.00 (76,2)	4.00 (101,6)	4.00 (101,6)	3.50 (88,9)	3.50 (88,9)	1.75 (44,5)	1.75 (44,5)	-	-	-	-	4
XXXX-0305-ZZ	3.00 (76,2)	5.00 (127,0)	6.00 (152,4)	4.00 (101,6)	5.50 (139,7)	3.50 (88,9)	1.00 (25,4)	1.75 (44,5)	1	3.50 (88,9)	-	-	6
XXXX-0311-ZZ	3.00 (76,2)	11.00 (279,4)	12.00 (304,8)	4.00 (101,6)	11.50 (292,1)	3.50 (88,9)	1.25 (31,8)	1.75 (44,5)	3	3.00 (76,2)	-	-	10
XXXX-0404-ZZ	4.00 (101,6)	4.00 (101,6)	5.00 (127,0)	5.00 (127,0)	4.50 (114,3)	4.50 (114,3)	0.75 (19,1)	2.25 (57,2)	1	3.00 (76,2)	-	-	6
XXXX-0409-ZZ	4.00 (101,6)	9.00 (228,6)	10.00 (254,0)	5.00 (127,0)	9.50 (241,3)	4.50 (114,3)	1.25 (31,8)	2.25 (57,2)	2	3.50 (88,9)	-	-	8
XXXX-0505-ZZ	5.00 (127,0)	5.00 (127,0)	6.00 (152,4)	6.00 (152,4)	5.50 (139,7)	5.50 (139,7)	1.00 (25,4)	1.00 (25,4)	1	3.50 (88,9)	1	3.50 (88,9)	8
XXXX-0511-ZZ	5.00 (127,0)	11.00 (279,4)	12.00 (304,8)	6.00 (152,4)	11.50 (292,1)	5.50 (139,7)	1.25 (31,8)	1.00 (25,4)	3	3.00 (76,2)	1	3.50 (88,9)	12
XXXX-0606-ZZ	6.00 (152,4)	6.00 (152,4)	7.00 (177,8)	7.00 (177,8)	6.50 (165,1)	6.50 (165,1)	1.50 (38,1)	1.50 (38,1)	1	3.50 (88,9)	1	3.50 (88,9)	8
XXXX-0609-ZZ	6.00 (152,4)	9.00 (228,6)	10.00 (254,0)	7.00 (177,8)	9.50 (241,3)	6.50 (165,1)	1.25 (31,8)	1.50 (38,1)	2	3.50 (88,9)	1	3.50 (88,9)	10
XXXX-0714-ZZ	7.00 (177,8)	14.00 (355,6)	15.00 (381,0)	8.00 (203,2)	14.50 (368,3)	7.50 (190,5)	0.75 (19,1)	0.75 (19,1)	4	3.25 (82,6)	2	3.00 (76,2)	16
XXXX-0909-ZZ	9.00 (228,6)	9.00 (228,6)	10.00 (254,0)	10.00 (254,0)	9.50 (241,3)	9.50 (241,3)	1.25 (31,8)	1.25 (31,8)	2	3.50 (88,9)	2	3.50 (88,9)	12
XXXX-1111-ZZ	11.00 (279,4)	11.00 (279,4)	12.00 (304,8)	12.00 (304,8)	11.50 (292,1)	11.50 (292,1)	1.25 (31,8)	1.25 (31,8)	3	3.00 (76,2)	3	3.00 (76,2)	16
XXXX-1414-ZZ	14.00 (355,6)	14.00 (355,6)	15.00 (381,0)	15.00 (381,0)	14.50 (368,3)	14.50 (368,3)	1.25 (31,8)	1.25 (31,8)	4	3.00 (76,2)	4	3.00 (76,2)	20
XXXX-1818-ZZ	18.00 (457,2)	18.00 (457,2)	19.00 (482,6)	19.00 (482,6)	18.50 (469,9)	18.50 (469,9)	1.75 (44,5)	1.75 (44,5)	5	3.00 (76,2)	5	3.00 (76,2)	24

Sizes and configurations not shown are available upon request.

\*Not available in Material Code 72.

All dimensions shown are in inches (millimeters) unless otherwise specified.



Figure 4. Groove Gasket Channel Mount

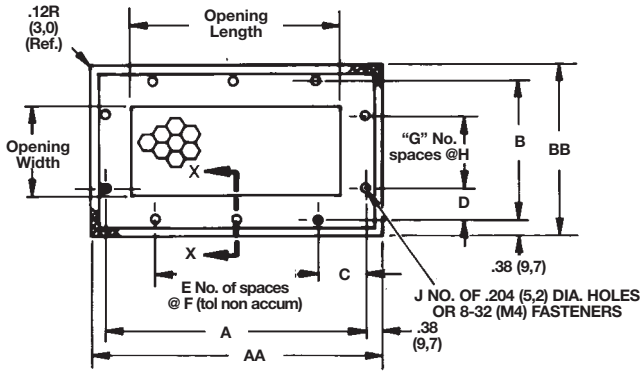
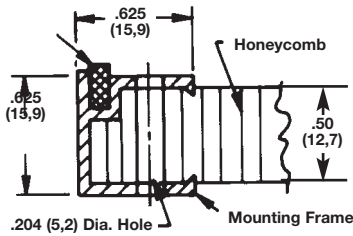


Table 4. Tolerances

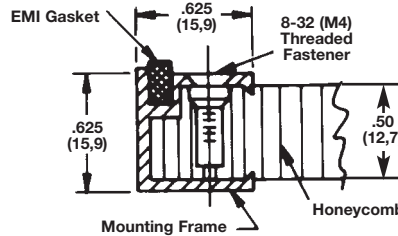
Dimensional Location	Size Range with Tolerance		
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Length and Width	±.020 (±.51)	±.031 (±.79)	±.040 (±1,02)
Hole Location	±.010 (±.25)	±.015 (±.38)	±.020 (±.51)
Square	±.007 (±.178)	±.015 (±.38)	±.040 (± 1,02)

Section X-X (Rotate 900) for 0.50 in. (12,7 mm) Thick Vent 0.125 in. (3,2 mm) Cell

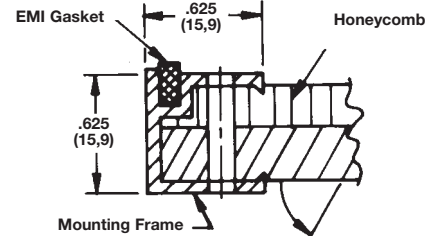
EMI Gasket



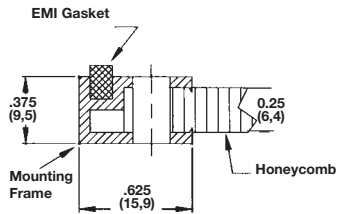
Type 8628



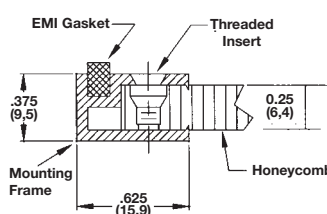
Type 8629-Captive Fastener



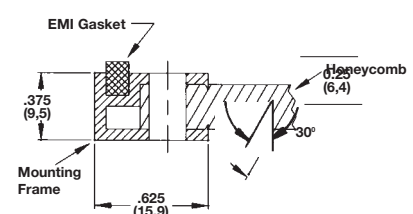
\*Type 8630- Drip-Proof with Through Hole  
\*Type 8631- Drip-Proof with Captive Fastener



Type 8677



Type 8678 - Captive Fastener



Type 8679 - Drip-Proof with Through Hole  
Type 8680 - Drip-Proof with Fastener

Table 5. Part No. and Dimension Tabulation

Base Part No.	Opening		Frame Dimensions										
	Width	Length	AA	BB	A	B	C	D	E	F	G	H	J
XXXX-0303-ZZ	3.00 (76,2)	3.00 (76,2)	4.25 (108,0)	4.25 (108,0)	3.50 (88,9)	3.50 (88,9)	1.75 (44,5)	1.75 (44,5)	-	-	-	-	4
XXXX-0305-ZZ	3.00 (76,2)	5.00 (127,0)	6.25 (158,8)	4.25 (108,0)	5.50 (139,7)	3.50 (88,9)	1.00 (25,4)	1.75 (44,5)	1	3.50 (88,9)	-	-	6
XXXX-0311-ZZ	3.00 (76,2)	11.00 (279,4)	12.25 (311,2)	4.25 (108,0)	11.50 (292,1)	3.50 (88,9)	1.25 (31,8)	1.75 (44,5)	3	3.00 (76,2)	-	-	10
XXXX-0404-ZZ	4.00 (101,6)	4.00 (101,6)	5.25 (133,4)	5.25 (133,4)	4.50 (114,3)	4.50 (114,3)	0.75 (19,1)	2.25 (57,2)	1	3.00 (76,2)	-	-	6
XXXX-0409-ZZ	4.00 (101,6)	9.00 (228,6)	10.25 (260,4)	5.25 (133,4)	9.50 (241,3)	4.50 (114,3)	1.25 (31,8)	2.25 (57,2)	2	3.50 (88,9)	-	-	8
XXXX-0505-ZZ	5.00 (127,0)	5.00 (127,0)	6.25 (158,6)	6.25 (158,6)	5.50 (139,7)	5.50 (139,7)	1.00 (25,4)	1.00 (25,4)	1	3.50 (88,9)	1	3.50 (88,9)	8
XXXX-0511-ZZ	5.00 (127,0)	11.00 (279,4)	12.25 (311,2)	6.25 (158,6)	11.50 (292,1)	5.50 (139,7)	1.25 (31,8)	1.00 (25,4)	3	3.00 (76,2)	1	3.50 (88,9)	12
XXXX-0606-ZZ	6.00 (152,4)	6.00 (152,4)	7.25 (184,2)	7.25 (184,2)	6.50 (165,1)	6.50 (165,1)	1.50 (38,1)	1.50 (38,1)	1	3.50 (88,9)	1	3.50 (88,9)	8
XXXX-0609-ZZ	6.00 (152,4)	9.00 (228,6)	10.25 (260,4)	7.25 (184,2)	9.50 (241,3)	6.50 (165,1)	1.25 (31,8)	1.50 (38,1)	2	3.50 (88,9)	1	3.50 (88,9)	10
XXXX-0714-ZZ	7.00 (177,8)	14.00 (355,6)	15.25 (387,4)	8.25 (209,6)	14.50 (368,3)	7.50 (190,5)	0.75 (19,1)	0.75 (19,1)	4	3.25 (82,6)	2	3.00 (76,2)	16
XXXX-0909-ZZ	9.00 (228,6)	9.00 (228,6)	10.25 (260,4)	10.25 (260,4)	9.50 (241,3)	9.50 (241,3)	1.25 (31,8)	1.25 (31,8)	2	3.50 (88,9)	2	3.50 (88,9)	12
XXXX-1111-ZZ	11.00 (279,4)	11.00 (279,4)	12.25 (311,2)	12.25 (311,2)	11.50 (292,1)	11.50 (292,1)	1.25 (31,8)	1.25 (31,8)	3	3.00 (76,2)	3	3.00 (76,2)	16
XXXX-1414-ZZ	14.00 (355,6)	14.00 (355,6)	15.25 (387,4)	15.25 (387,4)	14.50 (368,3)	14.50 (368,3)	1.25 (31,8)	1.25 (31,8)	4	3.00 (76,2)	4	3.00 (76,2)	20
XXXX-1818-ZZ	18.00 (457,2)	18.00 (457,2)	19.25 (489,0)	19.25 (489,0)	18.50 (469,9)	18.50 (469,9)	1.75 (44,5)	1.75 (44,5)	5	3.00 (76,2)	5	3.00 (76,2)	24

Sizes and configurations not shown are available upon request.

\*Not available in Material Code 72.

All dimensions shown are in inches (millimeters) unless otherwise specified.



Figure 5. Recess Mount

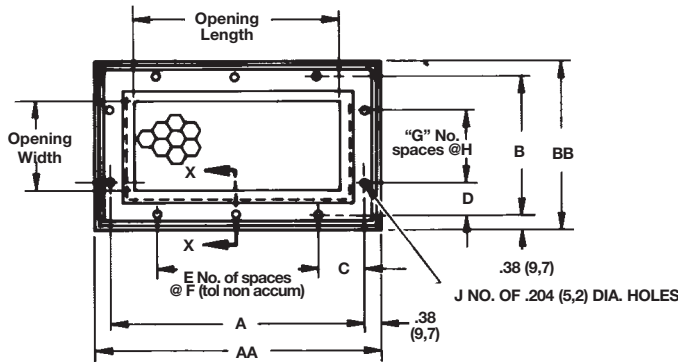
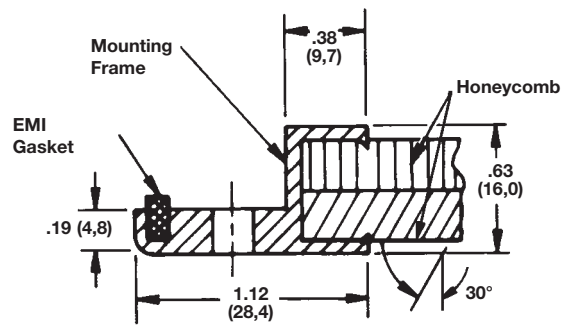
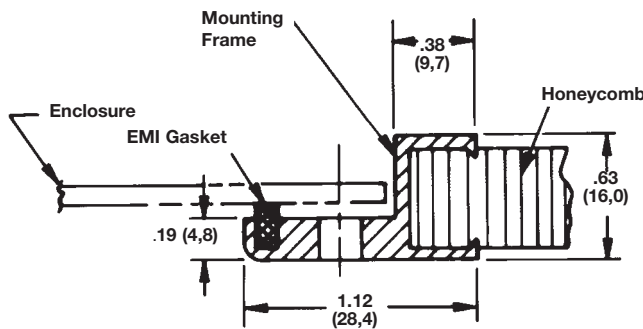


Table 6. Tolerances

Dimensional Location	Size Range with Tolerance		
	0-4 (0-101,6)	4.1-12.0 (104,1-304,8)	12.1 to 24.0 (307,3-609,6)
Length and Width	±.020 (±.51)	±.031 (±.79)	±.040 (±1,02)
Hole Location	±.010 (±.25)	±.015 (±.38)	±.020 (±.51)
Square	±.007 (±.178)	±.015 (±.38)	±.040 (±1,02)

Section X-X (Rotate 900) for 0.50 in. (12,7 mm) Thick Vent 0.125 in. (3,2 mm) Cell



Type 8632

\*Type 8633 - Drip-Proof

Table 7. Part No. and Dimension Tabulation

Base Part No.	Opening		Frame Dimensions										
	Width	Length	AA	BB	A	B	C	D	E	F	G	H	J
XXXX-0303-ZZ	3.00 (76,2)	3.00 (76,2)	5.25 (133,4)	5.25 (133,4)	4.50 (114,3)	4.50 (114,3)	2.25 (57,2)	2.25 (57,2)	-	-	-	-	4
XXXX-0305-ZZ	3.00 (76,2)	5.00 (127,0)	7.25 (184,2)	5.25 (133,4)	6.50 (165,2)	4.50 (114,3)	1.75 (44,5)	2.25 (57,2)	1	3.50 (88,9)	-	-	6
XXXX-0311-ZZ	3.00 (76,2)	11.00 (279,4)	13.25 (336,6)	5.25 (133,4)	12.50 (317,5)	4.50 (114,3)	1.75 (44,5)	2.25 (57,2)	3	3.00 (76,2)	-	-	10
XXXX-0404-ZZ	4.00 (101,6)	4.00 (101,6)	6.25 (158,8)	6.25 (158,8)	5.50 (139,7)	5.50 (139,7)	1.00 (25,4)	1.00 (25,4)	1	3.50 (88,9)	1	3.50 (88,9)	8
XXXX-0409-ZZ	4.00 (101,6)	9.00 (228,6)	11.25 (285,8)	6.25 (158,8)	10.50 (266,7)	5.50 (139,7)	0.75 (19,1)	1.00 (25,4)	3	3.00 (76,2)	1	3.50 (88,9)	12
XXXX-0505-ZZ	5.00 (127,0)	5.00 (127,0)	7.25 (184,2)	7.25 (184,2)	6.50 (165,1)	6.50 (165,1)	0.50 (12,7)	1.50 (38,1)	2	2.75 (69,9)	1	3.50 (88,9)	10
XXXX-0511-ZZ	5.00 (127,0)	11.00 (279,4)	13.25 (336,6)	7.25 (184,2)	12.50 (317,5)	6.50 (165,1)	1.00 (25,4)	1.50 (38,1)	3	3.50 (88,9)	1	3.50 (88,9)	12
XXXX-0606-ZZ	6.00 (152,4)	6.00 (152,4)	8.25 (209,6)	8.25 (209,6)	7.50 (190,5)	7.50 (190,5)	0.75 (19,1)	0.75 (19,1)	2	3.00 (76,2)	2	3.00 (76,2)	12
XXXX-0609-ZZ	6.00 (152,4)	9.00 (228,6)	11.25 (285,8)	8.25 (209,6)	10.50 (266,7)	7.50 (190,5)	0.75 (19,1)	0.75 (19,1)	3	3.00 (76,2)	2	3.00 (76,2)	14
XXXX-0714-ZZ	7.00 (177,8)	14.00 (355,6)	16.25 (412,8)	9.25 (235,0)	15.50 (393,7)	8.50 (215,9)	0.75 (19,1)	0.75 (19,1)	4	3.25 (82,6)	2	3.00 (76,2)	16
XXXX-0909-ZZ	9.00 (228,6)	9.00 (228,6)	11.25 (285,8)	11.25 (285,8)	10.50 (266,7)	10.50 (266,7)	0.75 (19,1)	0.75 (19,1)	3	3.00 (76,2)	3	3.00 (76,2)	16
XXXX-1111-ZZ	11.00 (279,4)	11.00 (279,4)	13.25 (336,6)	13.25 (336,6)	12.50 (317,5)	12.50 (317,5)	1.00 (25,4)	1.00 (25,4)	3	3.50 (88,9)	3	3.50 (88,9)	16
XXXX-1414-ZZ	14.00 (355,6)	14.00 (355,6)	16.25 (412,8)	16.25 (412,8)	15.50 (393,7)	15.50 (393,7)	0.75 (19,1)	0.75 (19,1)	4	3.50 (88,9)	4	3.50 (88,9)	20
XXXX-1818-ZZ	18.00 (457,2)	18.00 (457,2)	20.25 (514,4)	20.25 (514,4)	19.50 (495,3)	19.50 (495,3)	0.75 (19,1)	0.75 (19,1)	6	3.00 (76,2)	6	3.00 (76,2)	28

Sizes and configurations not shown are available upon request.

\*Not available in Material Code 72.

## How to Order ElectroVent Panels:

When vent size has been determined, select mounting frame configuration from the types shown in Figures 3, 4, and 5 on pages 11-12. Insert the type designation into the space occupied by the letters XXXX. Insert material/plating code from Table 1 on page 9 in place of the letters ZZ.

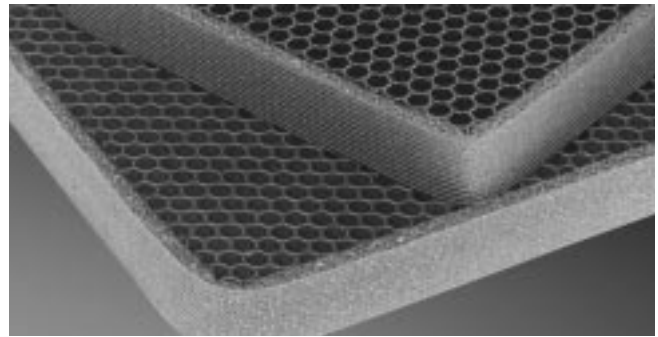
## Example:

1. From Table 3 on page 10 for panel opening size of 3.0 x 3.0, Base Part No. is XXXX-0303-ZZ.
2. Type mounting chosen from Section X-X is 8620.
3. From Table 1 on page 9, materials/plating code is 70.
4. Ordering part number is 8620-0303-70.

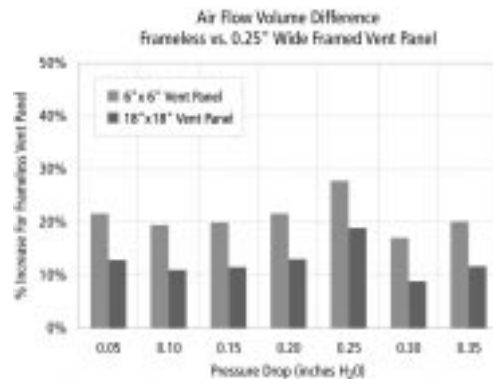
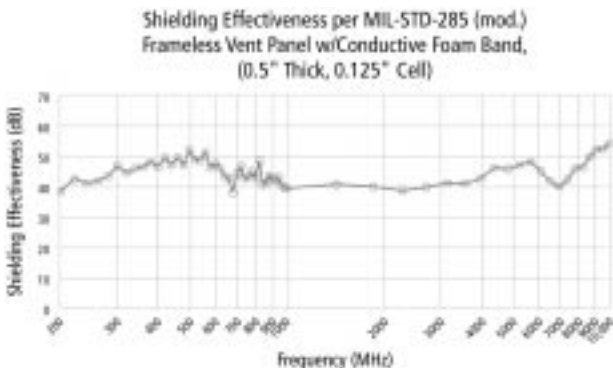


Laird Technologies introduces our MaxAir™ vent panel product line, an innovative cost effective approach to provide increased airflow along with EMI protection. This nickel copper plated polymeric honeycomb material provides a rigid medium which eliminates the need for costly frame designs. This patent-pending frameless design allows greater airflow through the entire area of the honeycomb surface.

- Metallized polymeric honeycomb provides excellent product rigidity and dent resistance
- Eliminates frames, rivets and costly labor to install
- UL 94 VO rated or intumescent coated versions available for flame resistance
- Increases usable air flow area compared to framed vent panels by 10% to 20%
- Special features can be machined into honeycomb, such as recesses and rabbet cuts to customize panel
- Honeycomb available in 1/4" (6,35 mm), 1/8" (3,18 mm) and 3/32"(2,38 mm)

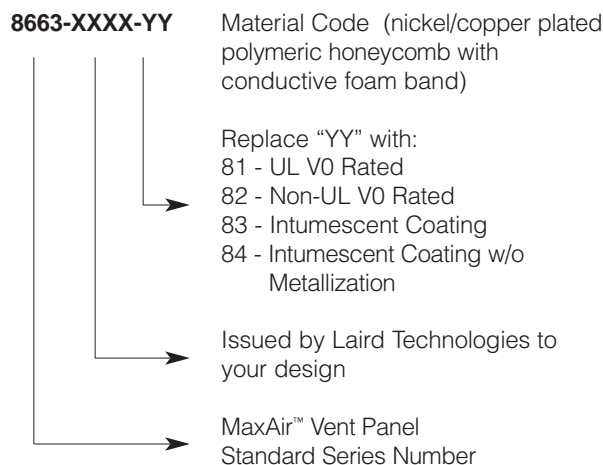


- Lightweight-half the weight of traditional honeycomb vent panels
- Standard honeycomb thicknesses of 1/4" (6,35) and 1/2" (12,7); other thicknesses available upon request
- Compressible conductive foam band provides extensive tolerance to accommodate variations in shelf widths or vent panel opening dimensions
- Can be inserted with slide-in motion or by compression fit utilizing compression stops and minimal hardware



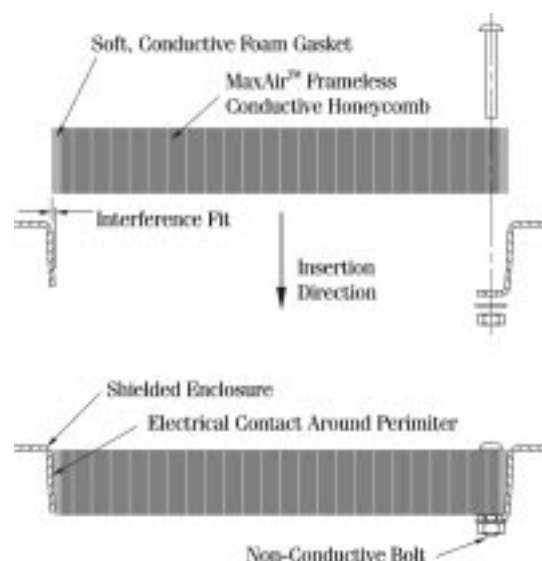
## Part Number Designation

The ten digit part number will be determined by the method below.



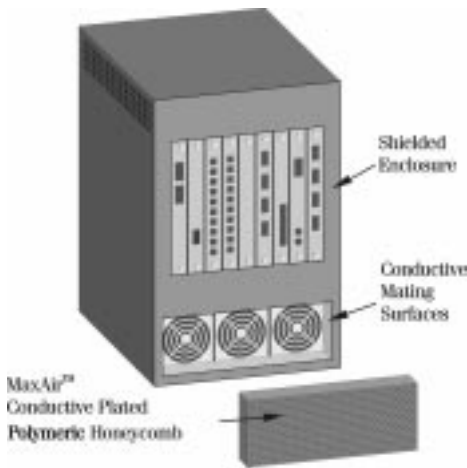
All dimensions shown are in inches (millimeters) unless otherwise specified.

## Detail of Interference Fit With Added Hardware

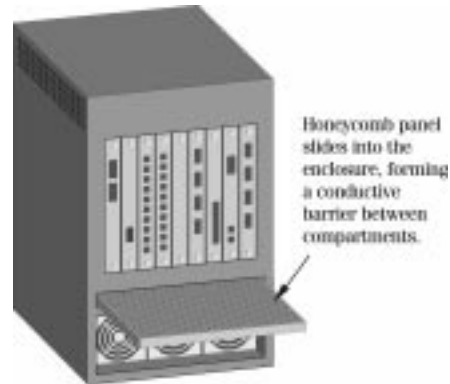
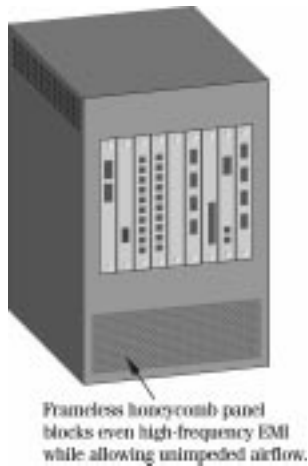
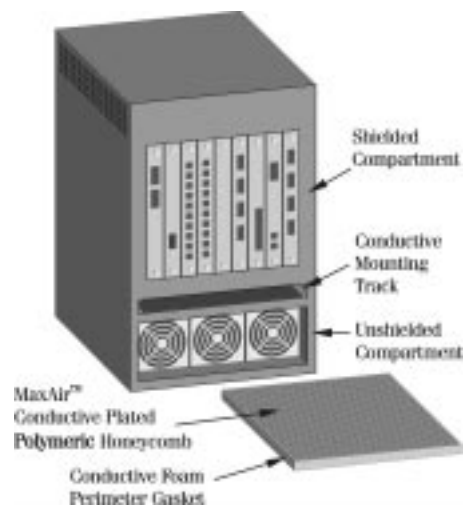




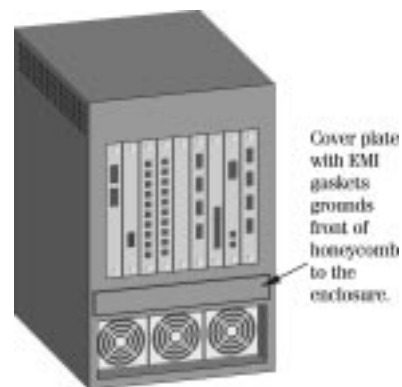
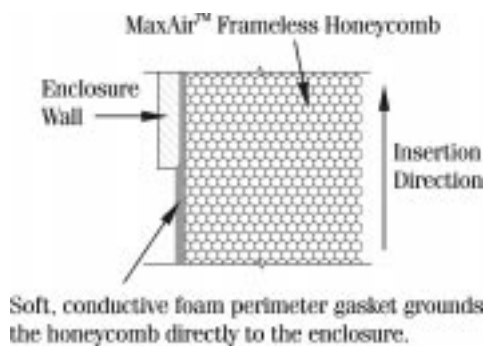
## Insertion in the Air-Flow Direction



## Insertion in the Cross-Flow Direction



## Detail of Conductive Foam Perimeter Gasket Around Honeycomb



- Notice:** The data set forth in all text, tables, charts, graphs and figures herein are based on samples tested and are not guaranteed for all samples or applications. Such data are intended as guides and do not reflect product specification for any specific part.



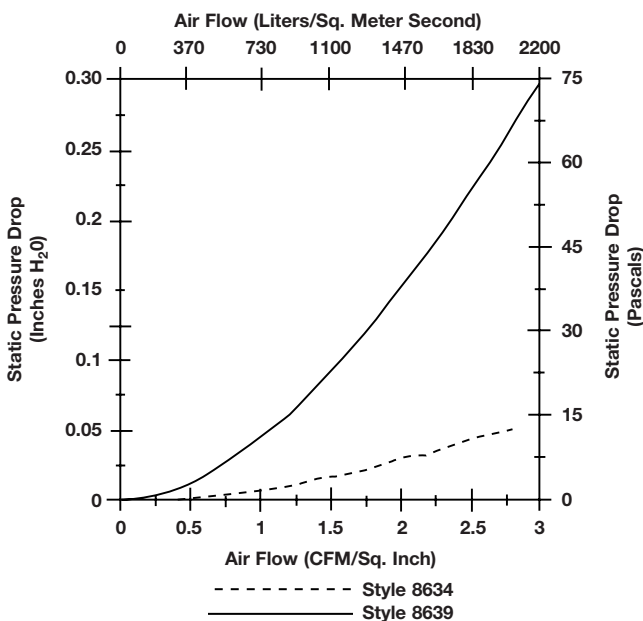
## Maximum Protection/ Minimum Impedance

Laird Technologies has a proven solution to air filtration and EMI shielding in electronic enclosures. The Electro-Air EMI/Dust Filtration Panel, consisting of layered, woven, and crimped wire mesh plus filtering media (as needed), captures microscopic airborne contaminants while providing minimal air flow impedance. Better yet, the panel's specially designed EMI gasket prevents signal migration to the enclosed sensitive electronic equipment. In fact, when measured according to MIL-STD-285, the panel provides shielding effectiveness in excess of 60 dB for a range of 18 MHz to 1 GHz plane wave.

## Advantages:

- **Universal applications**—ideal for small enclosures, large housings, high traffic areas, even room size facilities
- **Extensive service life**—built to outlast the equipment it protects
- **Variety of design specifications**—modular construction is available in assorted standard sizes (from 3 to 18 sq. in.) (19,35 to 116,13 sq. cm)
- **Easy installation**—pre-drilled through holes or captive fasteners allow for quick mounting and removal
- **Simple maintenance**—washing with mild soap solution, rinsing, and drying as often as necessary will not degrade performance
- **Design assistance**—Laird Technologies' engineering and EMC lab offers technical assistance and testing data to help solve the toughest application challenges

Figure 1. Air Flow vs. Resistance



All dimensions shown are in inches (millimeters) unless otherwise specified.

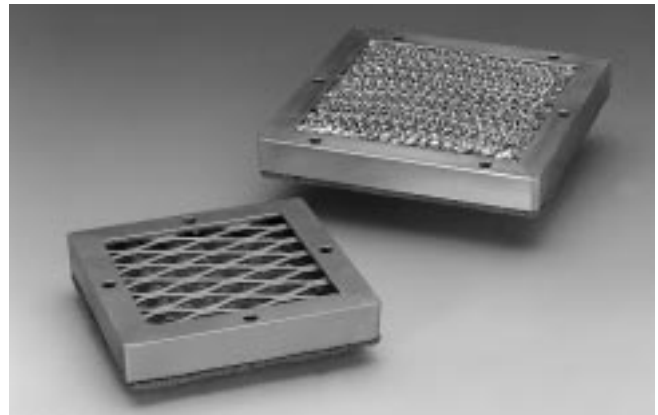
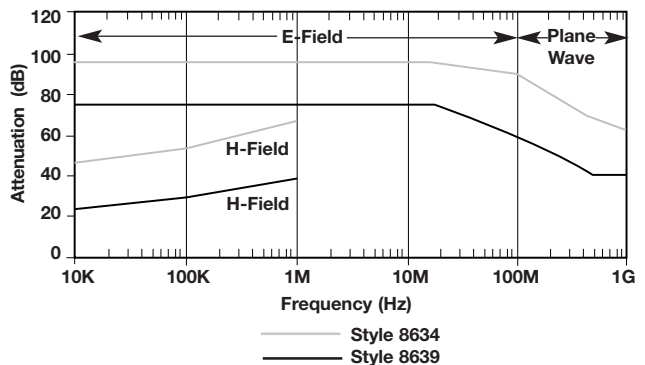


Table 1. Material and Plating Codes

Code No.	Frame Material	Filter Media	EMI Gasket	Plating Finish
73	Aluminum Alloy 6063-T4	<b>Grill:</b> Aluminum Alloy 6063-T1  <b>Media:</b> Wire Fabric Aluminum RR-W-385 Type VII 18x14	<b>Ground:</b> Knit Monel Wire Per QQ-N-281 Class A  <b>Elastomer:</b> Neoprene Sponge Per MIL-R-6130 Type II Medium	Chromate Coating Per MIL-C-5541 Class 3
74	Aluminum Alloy 6063-T4	Aluminum Alloy 1100-0 Per QQ-A-250/1, with Polyethylene Interlayer	Knit Monel Wire Per QQ-N-281 Class A	Chromate Coating Per MIL-C-5541 Class 3

If required, the panels can be supplied painted to match enclosure color.

Figure 2. Shielding Effectiveness



## Filtration Panel Size Determination Style 8639

1. Customer determines fan size and velocity based on their calculated cooling requirements.  
Example: Fan @ 240 CFM velocity with static pressure of 0.035 inches H<sub>2</sub>O.
2. Determine panel opening size so as not to impede airflow
  - A. From Figure 1 graph intersect 0.035 inches on Y axis
  - B. Draw line to curve—this intersects at 2.3 CFM/in<sup>2</sup>
  - C. Required vent opening = (240 ÷ 2.3) = 104 in<sup>2</sup> opening
  - D. Choose vent size with 104 in<sup>2</sup> opening or larger





Figure 3. Channel Mount EMI Filtration Panel

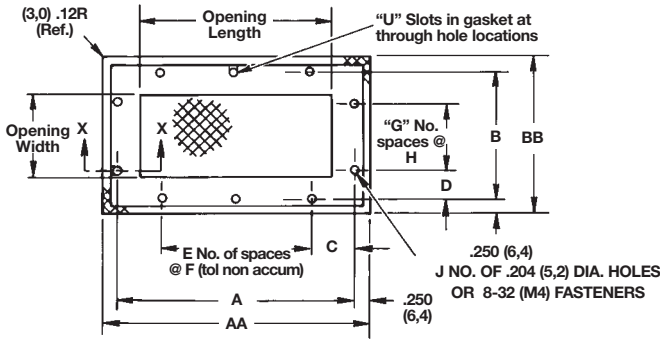
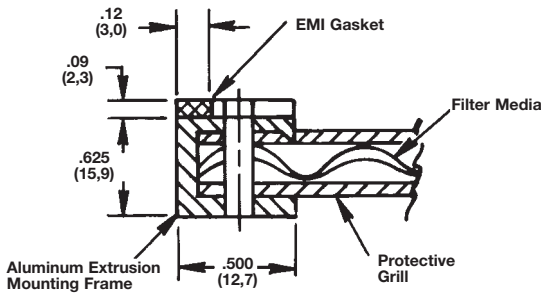


Table 2a. Tolerances

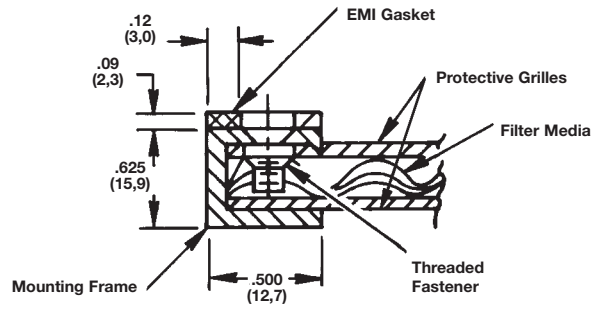
Dimensional Location	Size Range with Tolerance		
	0-4 (0-101,6)	4.1-12.0 (104,1-304,8)	12.1 to 24.0 (307,3-609,6)
Length and Width	±.020 (±,51)	±.031 (±,79)	±.040 (±1,02)
Hole Location	±.010 (±,25)	±.015 (±,38)	±.020 (±,51)
Square	±.007 (±,178)	±.015 (±,38)	±.040 (±1,02)

Section X-X



Type 8634

Section X-X



Type 8635

Table 2. Part No. and Dimension Tabulation

Base Part No.	Opening		Frame Dimensions										
	Width	Length	AA	BB	A	B	C	D	E	F	G	H	J
XXXX-0303-73	3.00 (76,2)	3.00 (76,2)	4.00 (101,6)	4.00 (101,6)	3.50 (88,9)	3.50 (88,9)	1.75 (44,5)	1.75 (44,5)	-	-	-	-	4
XXXX-0305-73	3.00 (76,2)	5.00 (127,0)	6.00 (152,4)	4.00 (101,6)	5.50 (139,7)	3.50 (88,9)	1.00 (25,4)	1.75 (44,5)	1	3.50 (88,9)	-	-	6
XXXX-0311-73	3.00 (76,2)	11.00 (279,4)	12.00 (304,8)	4.00 (101,6)	11.50 (292,1)	3.50 (88,9)	1.25 (31,8)	1.75 (44,5)	3	3.00 (76,2)	-	-	10
XXXX-0404-73	4.00 (101,6)	4.00 (101,6)	5.00 (127,0)	5.00 (127,0)	4.50 (114,3)	4.50 (114,3)	0.75 (19,1)	2.25 (57,2)	1	3.00 (76,2)	-	-	6
XXXX-0409-73	4.00 (101,6)	9.00 (228,6)	10.00 (254,0)	5.00 (127,0)	9.50 (241,3)	4.50 (114,3)	1.25 (31,8)	2.25 (57,2)	2	3.50 (88,9)	-	-	8
XXXX-0505-73	5.00 (127,0)	5.00 (127,0)	6.00 (152,4)	6.00 (152,4)	5.50 (139,7)	5.50 (139,7)	1.00 (25,4)	1.00 (25,4)	1	3.50 (88,9)	1	3.50 (88,9)	8
XXXX-0511-73	5.00 (127,0)	11.00 (279,4)	12.00 (304,8)	6.00 (152,4)	11.50 (292,1)	5.50 (139,7)	1.25 (31,8)	1.00 (25,4)	3	3.00 (76,2)	1	3.50 (88,9)	12
XXXX-0606-73	6.00 (152,4)	6.00 (152,4)	7.00 (177,8)	7.00 (177,8)	6.50 (165,1)	6.50 (165,1)	1.50 (38,1)	1.50 (38,1)	1	3.50 (88,9)	1	3.50 (88,9)	8
XXXX-0609-73	6.00 (152,4)	9.00 (228,6)	10.00 (254,0)	7.00 (177,8)	9.50 (241,3)	6.50 (165,1)	1.25 (31,8)	1.50 (38,1)	2	3.50 (88,9)	1	3.50 (88,9)	10
XXXX-0714-73	7.00 (177,8)	14.00 (355,6)	15.00 (381,0)	8.00 (203,2)	14.50 (368,3)	7.50 (190,5)	0.75 (19,1)	.75 (19,1)	4	3.25 (82,6)	2	3.00 (76,2)	16
XXXX-0909-73	9.00 (228,6)	9.00 (228,6)	10.00 (254,0)	10.00 (254,0)	9.50 (241,3)	9.50 (241,3)	1.25 (31,8)	1.25 (31,8)	2	3.50 (88,9)	2	3.50 (88,9)	12
XXXX-1111-73	11.00 (279,4)	11.00 (279,4)	12.00 (304,8)	12.00 (304,8)	11.50 (292,1)	11.50 (292,1)	1.25 (31,8)	1.25 (31,8)	3	3.00 (76,2)	3	3.00 (76,2)	16
XXXX-1414-73	14.00 (355,6)	14.00 (355,6)	15.00 (381,0)	15.00 (381,0)	14.50 (368,3)	14.50 (368,3)	1.25 (31,8)	1.25 (31,8)	4	3.00 (76,2)	4	3.00 (76,2)	20
XXXX-1818-73	18.00 (457,2)	18.00 (457,2)	19.00 (482,6)	19.00 (482,6)	18.50 (469,9)	18.50 (469,9)	1.75 (44,5)	1.75 (44,5)	5	3.00 (76,2)	5	3.00 (76,2)	24

Sizes and configurations not shown are available upon request.

All dimensions shown are in inches (millimeters) unless otherwise specified.





Figure 4. Groove Gasket Channel Mount

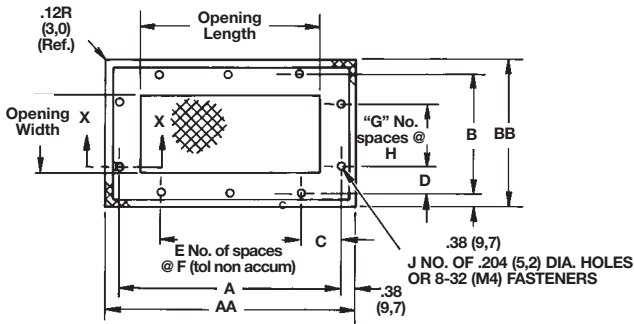
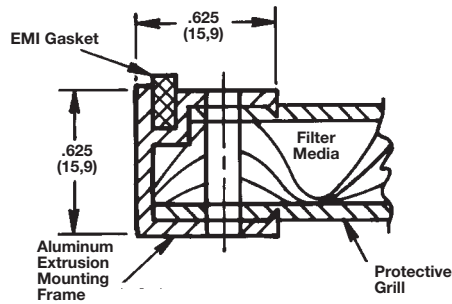


Table 3a. Tolerances

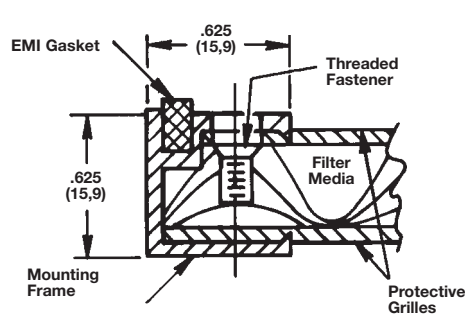
Dimensional Location	Size Range with Tolerance		
	0-4 (0-101,6)	4.1-12.0 (104,1-304,8)	12.1 to 24.0 (307,3-609,6)
Length and Width	±.020 (±,51)	±.031 (±,79)	±.040 (±1,02)
Hole Location	±.010 (±,25)	±.015 (±,38)	±.020 (±,51)
Square	±.007 (±,178)	±.015 (±,38)	±.040 (±1,02)

Section X-X



Type 8636

Section X-X



Type 8637

Table 3. Part No. and Dimension Tabulation

Base Part No.	Opening		Frame Dimensions										
	Width	Length	AA	BB	A	B	C	D	E	F	G	H	J
XXXX-0303-73	3.00 (76,2)	3.00 (76,2)	4.25 (108,0)	4.25 (108,0)	3.50 (88,9)	3.50 (88,9)	1.75 (44,5)	1.75 (44,5)	-	-	-	-	4
XXXX-0305-73	3.00 (76,2)	5.00 (127,0)	6.25 (158,8)	4.25 (108,0)	5.50 (139,7)	3.50 (88,9)	1.00 (25,4)	1.75 (44,5)	1	3.50 (88,9)	-	-	6
XXXX-0311-73	3.00 (76,2)	11.00 (279,4)	12.25 (311,2)	4.25 (108,0)	11.50 (292,1)	3.50 (88,9)	1.25 (31,8)	1.75 (44,5)	3	3.00 (76,2)	-	-	10
XXXX-0404-73	4.00 (101,6)	4.00 (101,6)	5.25 (133,4)	5.25 (133,4)	4.50 (114,3)	4.50 (114,3)	0.75 (19,1)	2.25 (57,2)	1	3.00 (76,2)	-	-	6
XXXX-0409-73	4.00 (101,6)	9.00 (228,6)	10.25 (260,4)	5.25 (133,4)	9.50 (241,3)	4.50 (114,3)	1.25 (31,8)	2.25 (57,2)	2	3.50 (88,9)	-	-	8
XXXX-0505-73	5.00 (127,0)	5.00 (127,0)	6.25 (158,6)	6.25 (158,6)	5.50 (139,7)	5.50 (139,7)	1.00 (25,4)	1.00 (25,4)	1	3.50 (88,9)	1	3.50 (88,9)	8
XXXX-0511-73	5.00 (127,0)	11.00 (279,4)	12.25 (311,2)	6.25 (158,6)	11.50 (292,1)	5.50 (139,7)	1.25 (31,8)	1.00 (25,4)	3	3.00 (76,2)	1	3.50 (88,9)	12
XXXX-0606-73	6.00 (152,4)	6.00 (152,4)	7.25 (184,2)	7.25 (184,2)	6.50 (165,1)	6.50 (165,1)	1.50 (38,1)	1.50 (38,1)	1	3.50 (88,9)	1	3.50 (88,9)	8
XXXX-0609-73	6.00 (152,4)	9.00 (228,6)	10.25 (260,4)	7.25 (184,2)	9.50 (241,3)	6.50 (165,1)	1.25 (31,8)	1.50 (38,1)	2	3.50 (88,9)	1	3.50 (88,9)	10
XXXX-0714-73	7.00 (177,8)	14.00 (355,6)	15.25 (387,4)	8.25 (209,6)	14.50 (368,3)	7.50 (190,5)	0.75 (19,1)	.75 (19,1)	4	3.25 (82,6)	2	3.00 (76,2)	16
XXXX-0909-73	9.00 (228,6)	9.00 (228,6)	10.25 (260,4)	10.25 (260,4)	9.50 (241,3)	9.50 (241,3)	1.25 (31,8)	1.25 (31,8)	2	3.50 (88,9)	2	3.50 (88,9)	12
XXXX-1111-73	11.00 (279,4)	11.00 (279,4)	12.25 (311,2)	12.25 (311,2)	11.50 (292,1)	11.50 (292,1)	1.25 (31,8)	1.25 (31,8)	3	3.00 (76,2)	3	3.00 (76,2)	16
XXXX-1414-73	14.00 (355,6)	14.00 (355,6)	15.25 (387,4)	15.25 (387,4)	14.50 (368,3)	14.50 (368,3)	1.25 (31,8)	1.25 (31,8)	4	3.00 (76,2)	4	3.00 (76,2)	20
XXXX-1818-73	18.00 (457,2)	18.00 (457,2)	19.25 (489,0)	19.25 (489,0)	18.50 (469,9)	18.50 (469,9)	1.75 (44,5)	1.75 (44,5)	5	3.00 (76,2)	5	3.00 (76,2)	24

Sizes and configurations not shown are available upon request.

All dimensions shown are in inches (millimeters) unless otherwise specified.





Figure 5. Recess Mount EMI Filtration Panel

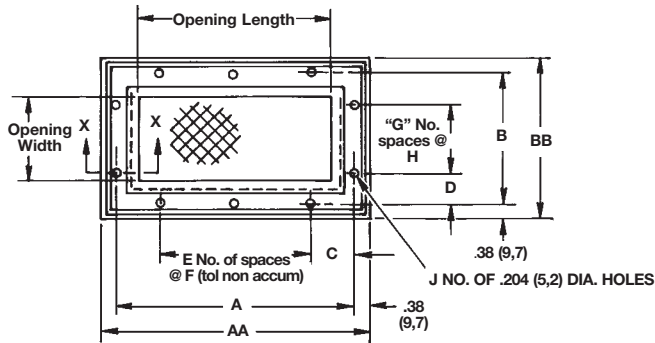
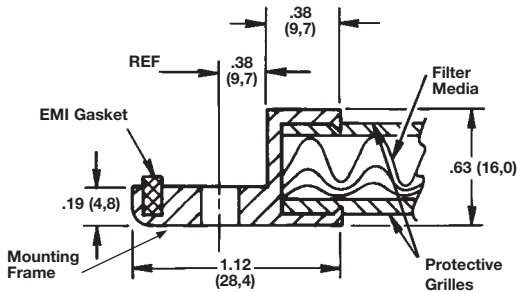


Table 4a. Tolerances

Dimensional Location	Size Range with Tolerance		
	0-4 (0-101,6)	4.1-12.0 (104,1-304,8)	12.1 to 24.0 (307,3-609,6)
Length and Width	±.020 (±,51)	±.031 (±,79)	±.040 (±1,02)
Hole Location	±.010 (±,25)	±.015 (±,38)	±.020 (±,51)
Square	±.007 (±,178)	±.015 (±,38)	±.040 (±1,02)

## Section X-X



Type 8638

Table 4. Part No. and Dimension Tabulation

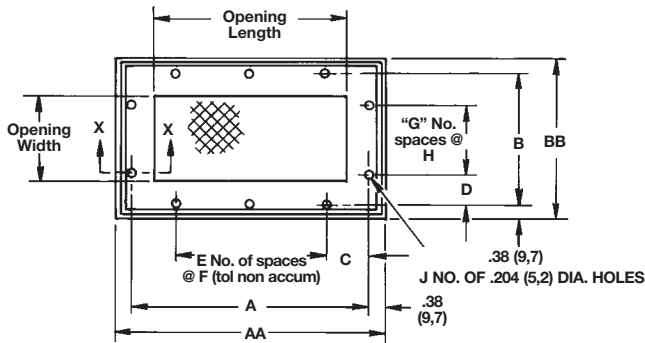
Base Part No.	Opening		Frame Dimensions										
	Width	Length	AA	BB	A	B	C	D	E	F	G	H	J
8638-0303-73	3.00 (76,2)	3.00 (76,2)	5.25 (133,4)	5.25 (133,4)	4.50 (114,3)	4.50 (114,3)	2.25 (57,2)	2.25 (57,2)	-	-	-	-	4
8638-0305-73	3.00 (76,2)	5.00 (127,0)	7.25 (184,2)	5.25 (133,4)	6.50 (165,2)	4.50 (114,3)	1.50 (38,1)	2.25 (57,2)	1	3.50 (88,9)	-	-	6
8638-0311-73	3.00 (76,2)	11.00 (279,4)	13.25 (336,6)	5.25 (133,4)	12.50 (317,5)	4.50 (114,3)	1.75 (44,5)	2.25 (57,2)	3	3.00 (76,2)	-	-	10
8638-0404-73	4.00 (101,6)	4.00 (101,6)	6.25 (158,8)	6.25 (158,8)	5.50 (139,7)	5.50 (139,7)	1.00 (25,4)	1.00 (25,4)	1	3.50 (88,9)	1	3.50 (88,9)	8
8638-0409-73	4.00 (101,6)	9.00 (228,6)	11.25 (336,6)	6.25 (158,8)	10.50 (266,7)	5.50 (139,7)	0.75 (19,1)	1.00 (25,4)	3	3.00 (76,2)	1	3.50 (88,9)	12
8638-0505-73	5.00 (127,0)	5.00 (127,0)	7.25 (184,2)	7.25 (184,2)	6.50 (165,2)	6.50 (165,2)	0.50 (12,7)	1.50 (38,1)	2	2.75 (69,9)	1	3.50 (88,9)	10
8638-0511-73	5.00 (127,0)	11.00 (279,4)	13.25 (336,6)	7.25 (184,2)	12.50 (317,2)	6.50 (165,2)	1.00 (25,4)	1.50 (38,1)	3	3.50 (88,9)	1	3.50 (88,9)	12
8638-0606-73	6.00 (152,4)	6.00 (152,4)	8.25 (209,6)	8.25 (209,6)	7.50 (190,5)	7.50 (190,5)	0.75 (19,1)	0.75 (19,1)	2	3.00 (76,2)	2	3.00 (76,2)	12
8638-0609-73	6.00 (152,4)	9.00 (228,6)	11.25 (285,7)	8.25 (209,6)	10.50 (266,7)	7.50 (190,5)	0.75 (19,1)	0.75 (19,1)	2	3.00 (76,2)	2	3.00 (76,2)	14
8638-0714-73	7.00 (177,8)	14.00 (355,6)	16.25 (412,8)	9.25 (234,9)	15.50 (393,7)	8.50 (215,9)	0.75 (19,1)	0.75 (19,1)	4	3.50 (88,9)	2	3.50 (88,9)	16
8638-0909-73	9.00 (228,6)	9.00 (228,6)	11.25 (285,7)	11.25 (285,7)	10.50 (266,7)	10.50 (266,7)	0.75 (19,1)	0.75 (19,1)	3	3.00 (76,2)	3	3.00 (76,2)	16
8638-1111-73	11.00 (279,4)	11.00 (279,4)	13.25 (336,6)	13.25 (336,6)	12.50 (317,5)	12.50 (317,5)	1.00 (25,4)	1.00 (25,4)	3	3.50 (88,9)	3	3.50 (88,9)	16
8638-1414-73	14.00 (355,6)	14.00 (355,6)	16.25 (412,8)	16.25 (412,8)	15.50 (393,7)	15.50 (393,7)	0.75 (19,1)	0.75 (19,1)	4	3.50 (88,9)	4	3.50 (88,9)	20
8638-1818-73	18.00 (457,2)	18.00 (457,2)	20.25 (514,4)	20.25 (514,4)	19.50 (495,3)	19.50 (495,3)	0.75 (19,1)	0.75 (19,1)	6	3.00 (76,2)	6	3.00 (76,2)	28

Sizes and configurations not shown are available upon request.

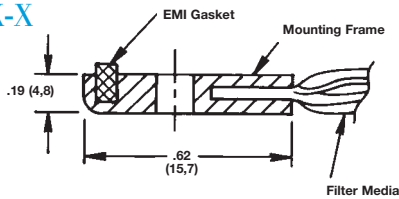
All dimensions shown are in inches (millimeters) unless otherwise specified.



Figure 6. Thin Line EMI Filtration Panel



### Section X-X



Type 8639

Table 5a. Tolerances

Dimensional Location	Size Range with Tolerance		
	0-4 (0-101,6)	4.1-12.0 (104,1-304,8)	12.1 to 24.0 (307,3-609,6)
Length and Width	±.020 (±.51)	±.031 (±.79)	±.040 (±1.02)
Hole Location	±.010 (±.25)	±.015 (±.38)	±.020 (±.51)
Square	±.007 (±.178)	±.015 (±.38)	±.040 (±1.02)

Depending upon the manufacturing process, some parts will be supplied with holes for cleaning and plating purposes. These holes will not affect the overall performance of the product.

Table 5. Part No. and Dimension Tabulation

Base Part No.	Opening		Frame Dimensions										
	Width	Length	AA	BB	A	B	C	D	E	F	G	H	J
8639-0303-74	3.00 (76,2)	3.00 (76,2)	4.25 (108,0)	4.25 (108,0)	3.50 (88,9)	3.50 (88,9)	1.75 (44,5)	1.75 (44,5)	-	-	-	-	4
8639-0305-74	3.00 (76,2)	5.00 (127,0)	6.25 (158,8)	4.25 (108,0)	5.50 (139,7)	3.50 (88,9)	1.00 (25,4)	1.75 (44,5)	1	3.50 (88,9)	-	-	6
8639-0311-74	3.00 (76,2)	11.00 (279,4)	12.25 (311,2)	4.25 (108,0)	11.50 (292,1)	3.50 (88,9)	1.25 (31,8)	1.75 (44,5)	3	3.00 (76,2)	-	-	10
8639-0404-74	4.00 (101,6)	4.00 (101,6)	5.25 (133,4)	5.25 (133,4)	4.50 (114,3)	4.50 (114,3)	0.75 (19,1)	2.25 (57,2)	1	3.00 (76,2)	-	-	6
8639-0409-74	4.00 (101,6)	9.00 (228,6)	10.25 (260,4)	5.25 (133,4)	9.50 (241,3)	4.50 (114,3)	1.25 (31,8)	2.25 (57,2)	2	3.50 (88,9)	-	-	8
8639-0505-74	5.00 (127,0)	5.00 (127,0)	6.25 (158,6)	6.25 (158,6)	5.50 (139,7)	5.50 (139,7)	1.00 (25,4)	1.00 (25,4)	1	3.50 (88,9)	1	3.50 (88,9)	8
8639-0511-74	5.00 (127,0)	11.00 (279,4)	12.25 (311,2)	6.25 (158,6)	11.50 (292,1)	5.50 (139,7)	1.25 (31,8)	1.00 (25,4)	3	3.00 (76,2)	1	3.50 (88,9)	12
8639-0606-74	6.00 (152,4)	6.00 (152,4)	7.25 (184,2)	7.25 (184,2)	6.50 (165,1)	6.50 (165,1)	1.50 (38,1)	1.50 (38,1)	1	3.50 (88,9)	1	3.50 (88,9)	8
8639-0609-74	6.00 (152,4)	9.00 (228,6)	10.25 (260,4)	7.25 (184,2)	9.50 (241,3)	6.50 (165,1)	1.25 (31,8)	1.50 (38,1)	2	3.50 (88,9)	1	3.50 (88,9)	10
8639-0714-74	7.00 (177,8)	14.00 (355,6)	15.25 (387,4)	8.25 (209,6)	14.50 (368,3)	7.50 (190,5)	0.75 (19,1)	0.75 (19,1)	4	3.25 (82,7)	2	3.00 (76,2)	16
8639-0909-74	9.00 (228,6)	9.00 (228,6)	10.25 (260,4)	10.25 (260,4)	9.50 (241,3)	9.50 (241,3)	1.25 (31,8)	1.25 (31,8)	4	3.50 (88,9)	2	3.50 (88,9)	12
8639-1111-74	11.00 (279,4)	11.00 (279,4)	12.25 (311,2)	12.25 (311,2)	11.50 (292,1)	11.50 (292,1)	1.25 (31,8)	1.25 (31,8)	4	3.00 (76,2)	2	3.00 (76,2)	16
8639-1414-74	14.00 (355,6)	14.00 (355,6)	15.25 (387,4)	15.25 (387,4)	14.50 (368,3)	14.50 (368,3)	1.25 (31,8)	1.25 (31,8)	4	3.00 (76,2)	2	3.00 (76,2)	20
8639-1818-74	18.00 (457,2)	18.00 (457,2)	19.25 (489,0)	19.25 (489,0)	18.50 (469,9)	18.50 (469,9)	1.75 (44,5)	1.75 (44,5)	4	3.00 (76,2)	2	3.00 (76,2)	24

Sizes and configurations not shown are available upon request.

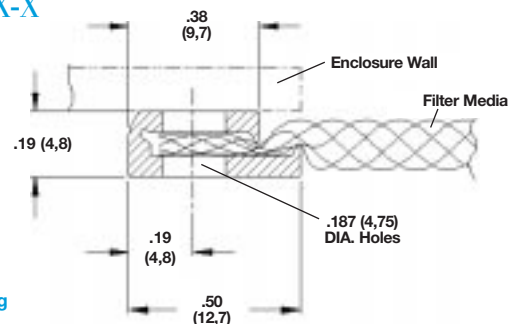
### How to Specify:

Determine the mounting configuration that meets enclosure space and accessibility requirements from Figures 3, 4, 5, or 6. From the air flow data shown in Figure 1 on page 15, determine the panel opening size that best suits the system's air flow characteristics with a normal pressure drop. Insert the mounting type code in place of the XXXX (where applicable) in the Part No. code.

### Example:

- From Table 2 on page 16 for a panel opening size of 5.0 x 5.0, Base Part No. is XXXX-0505-73.
- Mounting type 8635 is chosen from Section X-X (page 16).
- Ordering part number is 8635-0505-73.

### Section X-X



Type 8643 Self-Gasketing

### Note:

To order filter panel Type 8643 supply drawing to inside sales for custom part number.

All dimensions shown are in inches (millimeters) unless otherwise specified.

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