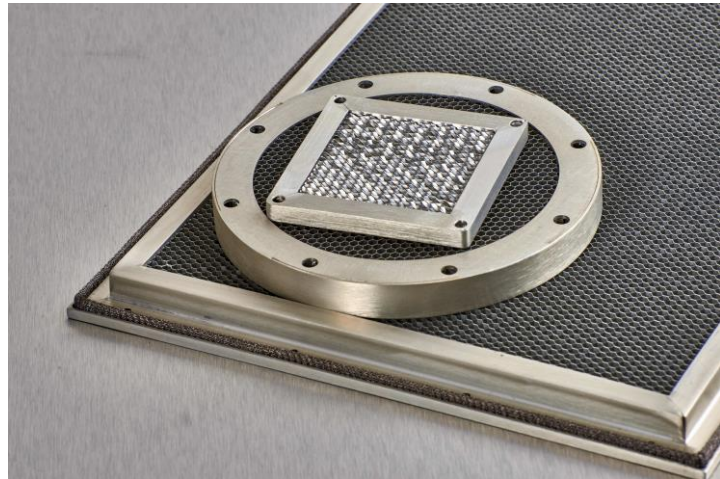


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# Aluminium Honeycomb Vents, Windows and Tapes



## Fothershield

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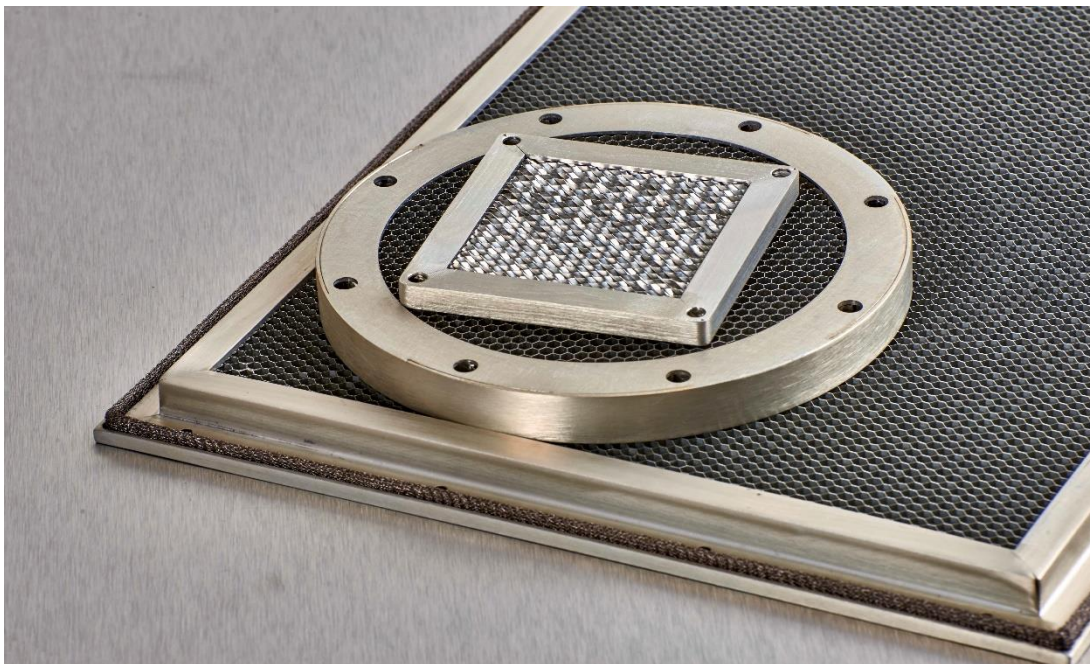
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# ALUMINIUM HONEYCOMB VENTS, WINDOWS AND TAPES

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## ALUMINIUM HONEYCOMB VENTS



Fothershield's lightweight aluminium honeycomb electromagnetic (EMI) shielding vent panels can be mounted onto most EMI shielding enclosures to provide airflow over cooling fans or convection. The panels are designed to provide minimum pressure drop of airflow through the assembly whilst still giving good radio frequency (RF) attenuation.

The aluminium honeycomb material is formed by expanding bonded aluminium foil into a honeycomb structure producing a material which is polarised and is conductive either horizontally or vertically. To avoid polarisation two layers of honeycomb are mounted at 90° to each other. Straight through panels can be supplied with plating to overcome the polarisation problem. The vents can be fitted with a conductive gasket to improve shielding effectiveness and can be mounted almost anywhere on the enclosure. Dust filters may also be mounted to either side of the vent, and to prevent accidental damage protective kick plates can be fitted.

Mounting can be by bolting through drilled holes in the frame, or by the use of threaded captive inserts.

Vents are finished in Alocrom 1200 for protection against oxidation. Other finishes are available, refer to the finish chart in the how to order section.

## ROUND VENTS

Fothershield's round honeycomb vents exhibit the same performance and characteristics as the square and rectangle vents and can be supplied in either aluminium/steel or plastic material. Minimum overall diameter is 50mm with a thickness range from 6.35mm to 50mm thick. Electromagnetic compatibility (EMC) or environmental gaskets may be attached.

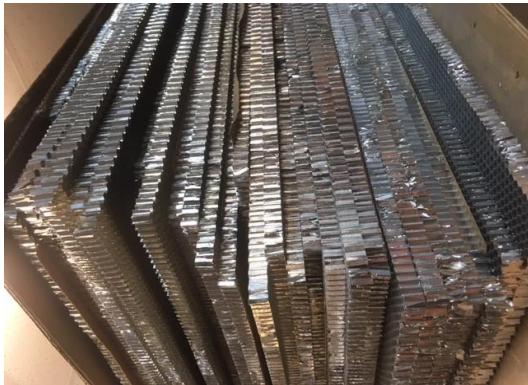
### Specification

Material Property	Value
Aluminium Frame	6063-T6
Aluminium Honeycomb	5052 Grade
Monel Wire	BS3075 NA13
Neoprene Sponge	MIL-R-6130 Type 11 Grade A Condition Soft
Beryllium Copper	Alloy 25 (CA172)
Silicone Rubber	ZZ-R-765 Class 2 Grade 40
Aluminium Wire	5056

### Shielding Effectiveness (dB)

Frequency	Field	Attenuation
10KHz	H	45
100KHz	H	49
1MHz	H	51
1MHz	E	>100
10MHz	E	>100
100MHz	E	>100
1GHz	P	98
10GHz	P	95

Aluminium honeycomb may also be purchased separately. Please contact us with your requirements.

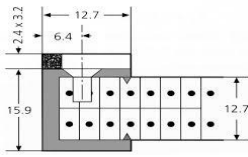


### How to Order

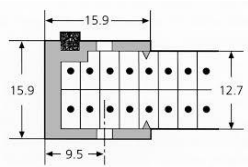
Vent Style	Honeycomb Style	Overall Size	Fixings (No)	Fixing Type	Finish	Gasket
FS-AHV1	01 – Cross Pole	XXXX-XXXX	XX	01 – Captive Insert	01 – Alocrom 1200	01 – Knitted Wire Mesh and Neoprene Sponge
FS-AHV2	02 – Single Layer			02 – Through Hole	02 – Surtec 650	02 – Be/Cu Gasket
FS-AHV3	03 – Slant 30 degree				03 – Nickel Plated	
FS-AHV4	04 – Slant 45 degree				04 – Tin Plated	
FS-AHV5	05 – Slant 60 degree				05 - Painted	
FS-AHV6						
FS-AHV7						
FS-AHV8						
FS-AHV9						
FS-AHV10R						

For example: FFS-AHV1-03-2500x2500-15-02-01-01 = FS-AVH1 (Vent Style 1) 03 (one layer honeycomb straight through, second layer 30 degree angle) 2500-2500 (250mm x 250mm square) 15 (15 holes) 02 (through holes) 01 (Alocrom finish) 01 (knitted wire mesh and neoprene gasket attached). Wherever possible please provide a detailed technical drawing.

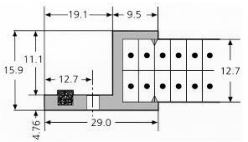
### FS-AHV 1



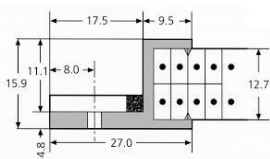
### FS-AHV 2



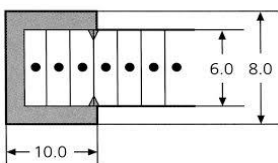
### FS-AHV 3



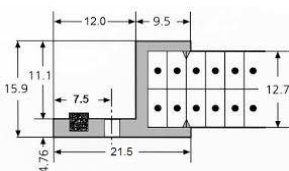
### FS-AHV 4



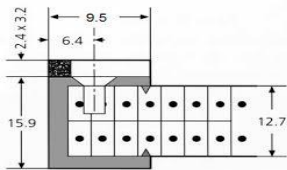
### FS-AHV 5



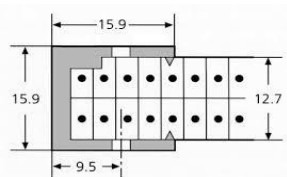
### FS-AHV 6



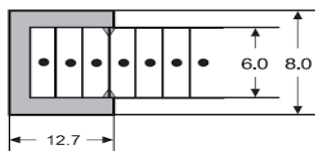
### FS-AHV 7



### FS-AHV 8



### FS-AHV 9



### FS-AHV 10R Round



For aluminium vent panel types and styles which are not shown please contact us with your detailed technical drawing for consideration.

Tolerances: Overall dimensions  $\pm 0.8\text{mm}$ , Fixing holes/fasteners  $\pm 0.5\text{mm}$  (with jigs  $\pm 0.2\text{mm}$ ).

## EMI SHIELDED WINDOWS

Fothershield's shielded windows are produced in either glass or polycarbonate and can be treated with anti-reflective and scratch resistant properties.

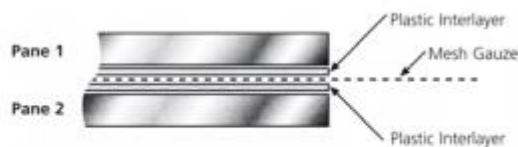
When specifying a type of window, temperature cycling, contamination and possible accidental damage should be taken into consideration. Glass, although the most abrasion resistant, is not best for impact resistance, but is better for anti-contamination than plastic. Fully laminated windows are less cost effective than edge-laminated windows and provide an excellent solution for most applications.

Screened windows are usually mounted within a frame or bonded onto door panels using conductive adhesive or caulking. Fully laminated step windows may have a front panel protruding through a facia, with the rear panel bonded inside the enclosure.

Termination depends on the type of window used and gasket material is often used where environmental protection is required.

Bezel mounts fabricated from aluminium, steel or other suitable metals can be made to suit most windows and can be hinged or fitted with quick action fasteners if required.

### Fully Laminated Windows



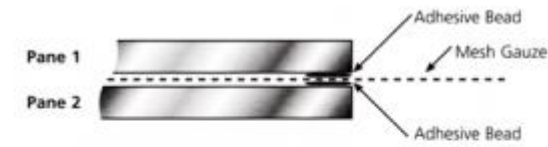
BASIC CONSTRUCTION: FULL LAMINATION - With Plastic Interlayers

Fully laminated windows are available with or without a step and with or without a silver painted busbar. Anti-scratch and anti-reflective treatments are available. For termination flying mesh, foil, silver painted busbars or gasket materials are used.

Care should be taken with stepped windows, particularly glass ones, as the pressure exerted by the gasket under compression can overstress the window. Fortershield suggest that stepped windows should be plastic, or a composite where the glass is not under pressure when mounted.



## Edge Bonded Windows



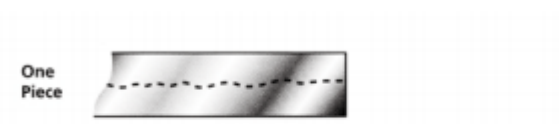
BASIC CONSTRUCTION: EDGE BONDED - Square Edge



BASIC CONSTRUCTION: EDGE BONDED - Stepped Edge

Using the same substrates and mesh as fully laminated windows, edge bonded gaskets are only laminated around the edges and outside the viewing area. Standard edge bonded windows are a cost effective solution for most applications.

## Cast Plastic Windows

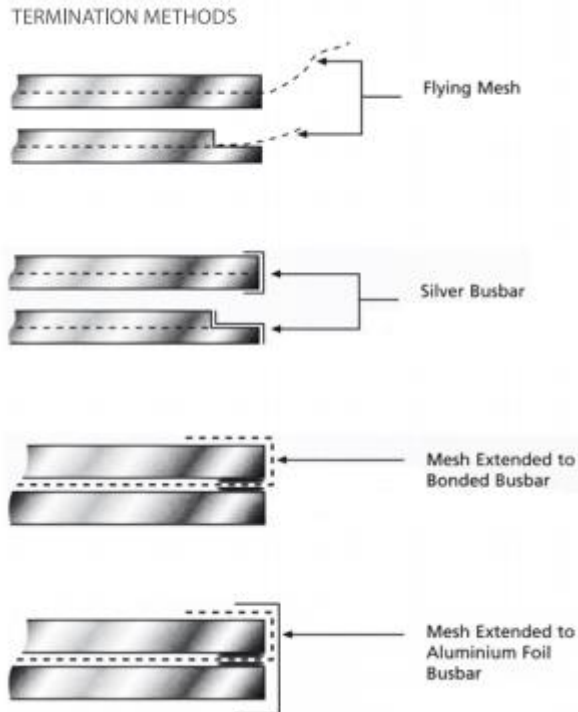


BASIC CONSTRUCTION: CAST WINDOWS - Integral Mesh

Cast windows are formed by encapsulating the mesh within a thermosetting plastic or resin substrate. Cast windows offer surface finishes, tints, minimum thickness and strength. The cast process necessitates a silver busbar termination, although a stepped construction is possible during the machining of the cast blank. Cast windows are more expensive than an edge laminated solution, but are more robust for specialist applications.



## Gasket Options



1. Flying mesh windows generally bond both the window and the flying mesh to a convenient point on the equipment, however the window and/or the mesh can be fitted with most types of gasket. The mesh can also be wrapped around a sponge material and clipped into position.
2. Silver busbar windows can be supplied with gaskets made from oriented wires in silicone, knitted mesh or metal loaded silicone.
3. Extended mesh options (with or without foil busbar) are mesh fitted with various forms of gaskets such as knitted mesh, conductive fabric or oriented wires in silicone.

## Glazing Media

- Glass, including clear, diffused and toughened.
- Polycarbonate, including clear, hard-faced, anti-reflective, tinted, polarised and filtered.

## Mesh Media

- Woven copper (may be anti-reflective treated) or stainless steel mesh, typically 100 openings per inch (OPI).

### Tolerances

<b>Glass Thickness</b>	± 0.5mm
Overall Dimensions	± 1.0mm to 300mm ± 1.5mm to 600mm
<b>Plastic Thickness</b>	± 0.5mm per piece
Overall Dimensions	± 0.5mm to 300mm ± 1.0mm to 600mm

### Shielding Effectiveness

Shielding effectiveness in dB, typical values tested in accordance with MIL-STD-285 with test samples of woven copper mesh 300mm x 300mm. A smaller test sample would return a far higher attenuation and all manufacturers data should be compared on this basis to avoid misinterpretation.

Frequency	Field	100 OPI	50 OPI
10KHz	H	20	15
100KHz	H	40	35
1MHz	H	50	45
1MHz	E	>100	>100
10MHz	E	>100	>100
100MHz	E	80	75
1GHz	P	60	55
10GHz	P	30	20

### How to Order

Generally by description stating size, wire type and finish.

## WINDOW MESHES

Fothershield also supply woven copper and stainless steel meshes. Untreated (non-blackened) mesh material is available pre-cut, although it is advisable to order this by the linear metre to avoid handling and fraying problems. Blackened copper mesh can be pre-cut and packed in bulk or in single sheets.

Material width is normally 1200mm and standard OPI is 100. 50, 70 and 145 OPI are available as a special order (minimum order quantities apply). Wire diameter is 0.51mm and 0.25mm

### How to Order

Order by description, mesh type, finish, size and tolerance if cut to size.

## COPPER AND ALUMINIUM FOIL TAPES



Fothershield's foil tapes provide an economical solution for EMI shielding in a variety of uses. The conductive adhesive ensures good electrical contact with the surface. Copper and aluminium tapes reflect and absorb within the frequency range from 200KHz to over 1GHz, but are not effective below 200KHz (magnetic field).

### Specification

- Total thickness 0.06mm
- Standard length 33m roll
- Volume Resistivity 0.004 ohms/sq.
- Temperature resistance -20°C to +155°C
- RoHS compliant
- Underwriters Laboratories UL510 flame retardancy
- Solderable

### Typical Uses

- Providing electrical conductivity in the seams of EMI shielded rooms and enclosures
- EMI shielding for cables by wrapping the tape around the cable (overlap recommended)
- Corrosion resistant ground contact points
- Elimination of electrical noise and heat
- Electrostatic discharge (ESD) shielding
- Slug and snail barrier applications



### How to Order

Width Size Code	Material Code
01 – 9mm	01 – Copper (Copper Colour)
02 – 13mm	02 – Aluminium (Silver Colour)
03 – 25mm	
04 – 50mm	
05 – 100mm	

For example: FS-CAFT-03-01 = FS-CAFT (Copper/Aluminium Foil Tapes) 03 (25mm width) 01 (Copper Tape)

*All technical data herein is accurate to the best of our knowledge based on our most up to date testing information and material specifications. This information is not presented as a warranty or guarantee and is not intended to be all inclusive as to conditions of use. The data herein represents typical properties and is not to be used as a basis for a specification.*