



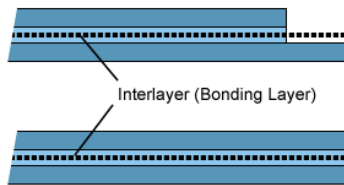
Shielded Window Solutions

Product Overview

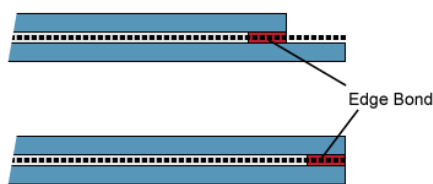
UVOX Ltd offers fully laminated RFI/EMC Shielded Windows that are bonded over the full size (screen) area. This is achieved by laying out the screen assembly in the correct required configuration interleaved with an adhesive interlayer material. When subjected to heat and pressure under carefully controlled conditions the result is in a fully bonded and sealed window. This strong construction has excellent physical properties and is very resistant to impact, shock and vibration. Fully laminated polycarbonate windows are exceptionally tough and suitable for the most demanding of applications. Glass, acrylic or polycarbonate may also be laminated using this method, which enhances the original material properties. It is also possible to laminate in special purpose contrast filters or tinted/coloured windows with materials.



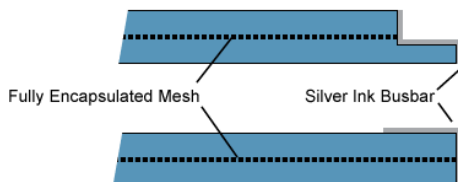
Window Construction Methods



Fully Laminated Construction

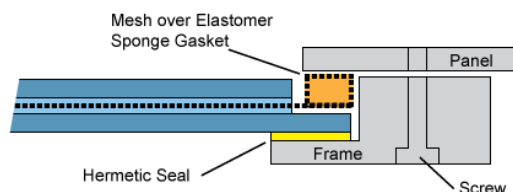
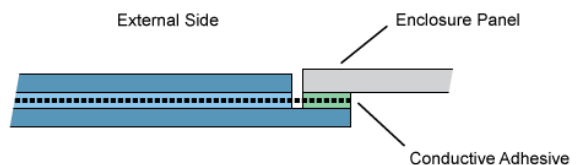
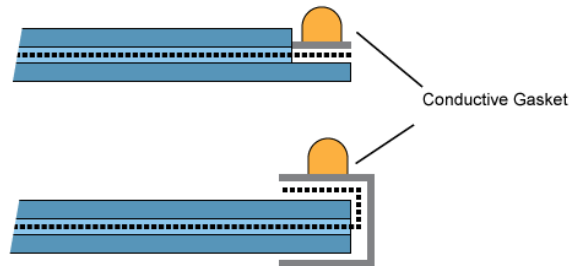
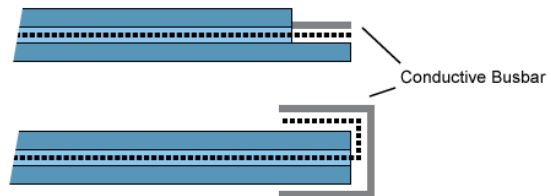


Edge Bonded Construction



Cast Construction

Window Termination/Mounting Methods



UVOX provide shielded windows based on glass, polycarbonate or acrylic or polyester coated with vacuum deposited thin films of Indium Tin Oxide (ITO) or Silver selected metals to your specifications. The films applied in this way are very thin and can have light transmissions of up to 80 – 90% mid-spectrum.

Transparent conductive film coated substrates can then be laminated with other materials to improve the ruggedness and optical properties as required. The main advantage of these window types is that they allow the display to be viewed clearly without the minor distortion or ‘moiré fringing’ that can occur sometimes with mesh windows on certain display types. Mesh windows offer higher levels shielding performance and therefore ITO and AgHT 4 & 8 metal film windows are not suitable for all applications.

Low impedance termination to a mating enclosure or panel is critical to the performance of a window. UVOX has a number of options depending on the end specification for the equipment. Electrically conductive adhesives can be used to directly bond a shielded window in place. Connections to the window are normally is made via a silver paint bus-bar around the perimeter of the window which makes contact with wire mesh or conductive film.

Higher levels of mechanical and shielding performance can be achieved when the screen itself is bonded using a structural adhesive and then wire mesh is terminated directly to the mating enclosure or panel using various mechanical solutions or using a conductive adhesive. All shielded windows can be supplied set into a frame complete with gaskets, drilled holes or fasteners ready to install. Such assemblies can be designed for internal or external mounting.

Performance Characteristics

| Property | Optical Clarity | Impact Resist | Scratch Resist | Solvents | Non-Flammable | Coated Finishes |
|------------------|-----------------|---------------|----------------|----------|---------------|-----------------|
| Glass | Good | Good | Good | Good | Good | Yes |
| Polycarbonate | Good | V. Good | V. Good | Coated | V. Good | Yes |
| Acrylic | V. Good | Coated | Coated | | | Yes |
| Polyester (CR39) | V. Good | V. Good | V. Good | V. Good | Good | Yes |

Glass

- Usual construction method – fully laminated, sometimes edge bonded
- Surface finishes – etched anti-reflective, magnesium fluoride or multilayer anti-reflective

Polycarbonate

- Usual construction method – fully laminated, edge bonded
- Surface finishes – scratch/mar, solvent and chemical resistant hard surface coating, this coating can be applied as an option

Acrylic

- Usual construction method – fully laminated, can be cast or edge bonded
- Surface finishes – scratch/marking resistant hard surface coating, and anti-reflective coating

Cast Polyester (CR39)

- Usual construction method – cast or cast/laminated assembly
- Surface finishes – ‘cast in’ anti-reflective finish
- Special purpose display or contrast enhancement filters can be built in to our windows. Cast windows allow filters to be cast in at the time of manufacture.

Many alternatives are available for producing RFI/EMC shielded windows - each one having its unique strong advantages. These are all dependent on the specific design priorities for each application, where a fine balance between optical / clarity properties and shielding effectiveness is required.

Cast windows are produced by loading a sheet of wire mesh in a thermoset Polyester (CR39) or acrylic resin cast prior to moulding. The resin can be tinted a wide range of colours to suit the display requirements or have optical filters cast in. Polyester (or CR39) cast windows have exceptionally stability operating at high temperature and good scratch resistance.

Types of Shielding Material Options

RFI / EMC Wire Meshes

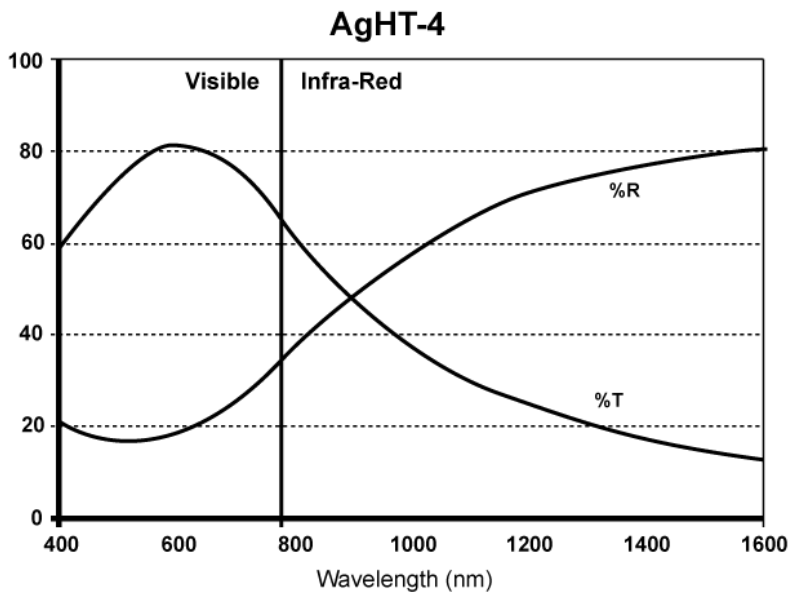
UVOX is able to offer a range of woven metal meshes for RFI/EMC shielding. These include stainless steel, blackened stainless steel and blackened copper. These are available in mesh sizes from 50 OPI X 0.025mm wire diameter to 100 OPI X 0.05mm wire diameter. Mesh sizes available up to 500 x 750mm.

The mesh can be supplied separately or incorporated into a cast window using clear CR39 or Acrylic material for a tailor made RFI/EMC solution.

Conductive Silver Coated Films AgHT

AgHT's unique combination of high visible light transmission, nearly neutral colour and low electrical resistance makes it ideal as an EMI shield for electronic displays and membrane switches. AgHT film products are outstanding in their ability to transmit visible light while reflection infra-red heat (see graph).

Standard products are AgHT-4 and AgHT-8, the number designation indicating the surface resistance in ohms per square. Both are available on rolls of optical grade polyester film.



Properties of Standard AgHT Products

| Property | AgHT-4 | AgHT-8 |
|-----------------------------------|------------|------------|
| Visible Light Transmission | Min. 75% | Min. 82% |
| Infrared Reflection (2.5 – 25 µm) | Min. 80% | Min. 75% |
| Surface Resistance (Ω/sq.) | 4.5 ± 1.0 | 8.0 ± 2.0 |
| Shielding Effectiveness | 24 – 44 dB | 20 – 40 dB |

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