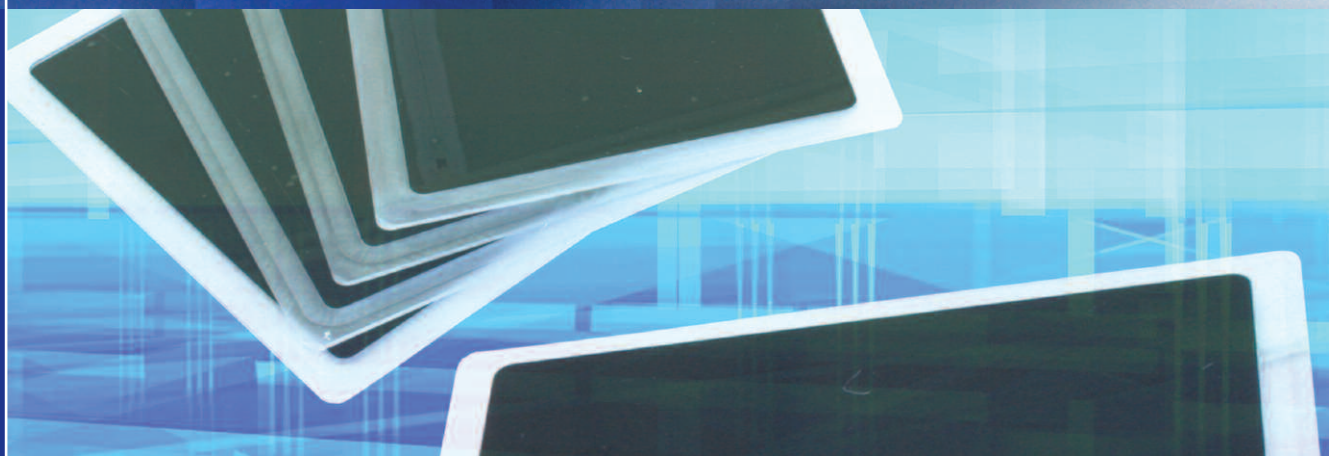
arka technologies

1100 RANGE

SHIELDED WINDOWS

EMI



DESCRIPTION:

A shielded or EMI window allows the transmission of light whilst preventing the transmission of electromagnetic interference or EMI. Most windows of this type consist of a fine woven copper or silver plated stainless steel mesh sandwiched or encapsulated within a polymer or glass panel. In each case the mesh surface has a anti-reflective finish to improve the viewing characteristics of the window. Alternatively, a shielded window can comprise of a clear glass or plastic substrate coated with a practically transparent, very thin layer of metal, usually silver or ITO (indium doped tin oxide). In either case the conductive medium or layer is terminated at the edge where the window can be terminated to the enclosure either by some form of gasket or an electrically conductive adhesive. There are a vast array of shielded window constructions and materials. If required Arka Technologies would be more than pleased to assist you in the design or specification of a shielded window for your application. As part of this process Arka Technologies will take into account operating environment and performance levels required. In order to illustrate the very wide range of possible window designs, an overview of the basic methods of construction and material types is given below.

ASSEMBLY SERVICE:

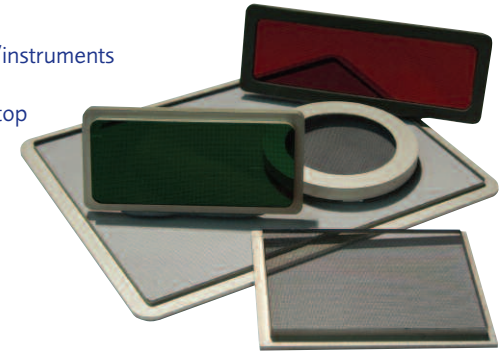
Arka Technologies have extensive experience of bonding windows into customer's free issue enclosures or panels. Conductive adhesives can be precisely applied using precision CNC equipment ensuring consistent results. This can extend to building up complete sub-assemblies that incorporates various components, such as gaskets, thermal control materials, switchgear etc. In this way Arka Technologies can ensure that parts are properly prepared and fitted.

SPECIAL PURPOSE WINDOWS:

Arka Technologies can also provide shielded windows for extreme environments such as high pressure windows for diving applications or ruggadised windows that are resistant to deliberate attempts at damage.

APPLICATIONS:

- Portable or handheld meters/instruments
- Industrial controls
- Special purpose laptop/palmtop computers
- Panel mounted displays
- Telecoms enclosures



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SALES OFFICE: 235 HUNTS POND ROAD, FAREHAM, HANTS, PO14 4PJ TEL: 01264 356004 FAX: 01489 570863
TECHNICAL OFFICE: 235 HUNTS POND ROAD, FAREHAM, HANTS, PO14 4PJ TEL: 01489 579050 FAX: 01489 570863
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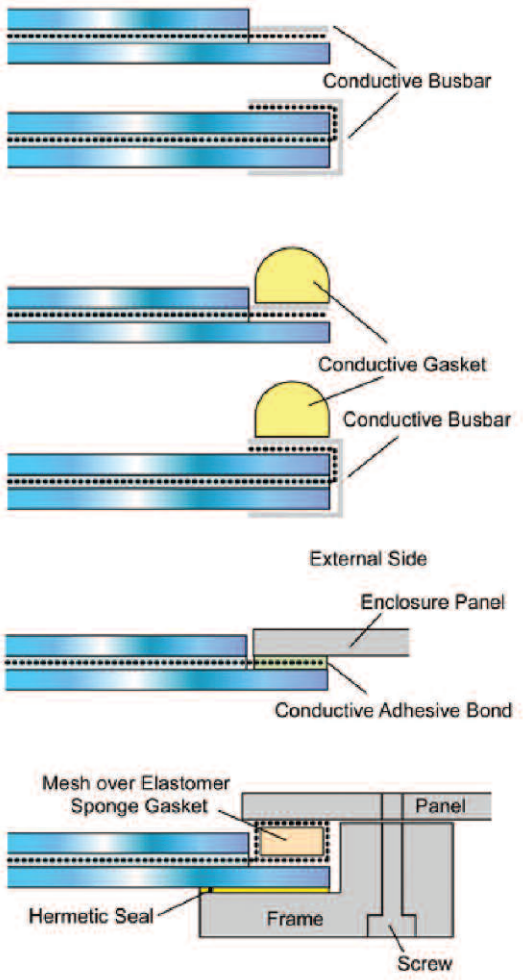
WINDOW TERMINATION MOUNTING METHODS



EDGE BONDED WINDOW

A basic method of construction where two or more layers are made up into a window by applying a bead of adhesive or strip of adhesive tape around the window perimeter. The window may be as simple as a layer of mesh bonded to a glass or acrylic blank for example, but would more usually be a layer of mesh held between two window panels. This method allows special purpose filters such as a circular polarizer to be easily incorporated. This method of window construction is low cost but not recommended for uses where it may be subject to vibration or shock.

FULLY LAMINATED WINDOW

As the name suggests fully laminated windows are bonded over their full (screen) area. This is achieved by laying up the screen assembly in the required configuration but interleaving with an adhesive interlayer material. The assembly is then subject to heat and pressure under carefully controlled conditions that results in a fully bonded and sealed window. This window construction has excellent physical properties and in particular is very resistant to impact, shock and vibration. Fully laminated polycarbonate windows are exceptionally tough and suitable for some of the most demanding applications. Glass, acrylic or polycarbonate may be laminated using this technique and in each case enhancing the properties of the original material. It is possible to laminate in special purpose filters or contrast windows with tinted/coloured materials.

CAST WINDOW

Cast windows are produced by casting a sheet of mesh directly in a thermoset polyester (CR39) or acrylic resin. The resin may be tinted a wide range of colours to suit the display it is intended for or have filters such as polarizers cast in. In particular polyester or CR39 cast windows have exceptional high temperature stability and very good scratch resistance.

ITO COATED / METAL FILM WINDOWS

Arka Technologies are also able to supply shielded windows based on a variety of substrates including glass, polycarbonate or acrylic or polyester coated with vacuum deposited thin films of ITO or selected metals. The films applied in this way are very thin and can have light transmissions of around 80 – 90% mid-spectrum. These transparent conductive film coated substrates may then be laminated with other materials to improve ruggedness and/or 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 'fringing' that can occur sometimes with mesh windows. However mesh windows offer higher levels shielding performance and therefore ITO and metal film windows are not suitable for some applications.

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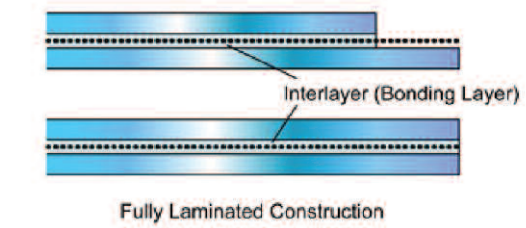
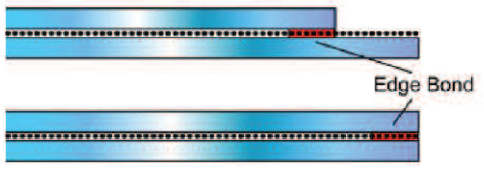
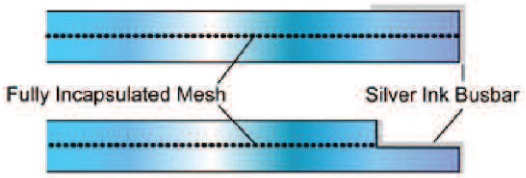
WINDOW CONSTRUCTION METHODS



Fully Laminated Construction



Edge Bonded Construction



Cast Construction

GLASS
Advantages: scratch resistance, resistance to solvents/chemicals, non-flammable

Usual construction method: fully laminated, sometimes edge bonded

Types: low coefficient of expansion borosilicate glass, toughened

Surface finishes: etched anti reflective, magnesium fluoride or multilayer antireflective

POLYCARBONATE
Advantages: impact resistance/toughness, low density, low or non-flammable

Usual construction method: fully laminated, edge bonded

Types: UL94-V0 flammability or low smoke emission grades, range of tints

Surface finishes: scratch/mar, solvent and chemical resistant hard surface coating, this coating can be applied as

ACRYLIC
Advantages: clarity, low density

Usual construction method: fully laminated, cast or edge bonded

Types: wide range of tints

Surface finishes: scratch/mar resistant hard surface coating, antireflective coating

CAST POLYESTER (CR39)
Advantages: clarity, low density, scratch resistance, high temperature stability, resistance to solvents/chemicals

Usual construction method: cast or cast/laminated assembly

Types: wide range of tints

Surface finishes: 'cast in' anti-reflective finish
Special purpose polarising or contrast enhancement filters may be incorporated within windows. In particular cast windows lend themselves to this as the filter may be cast in at the time of manufacture.

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OPTICAL FILTERING DEVICES

Part No.	
111XX-XXXX Conductive Films	Optical grade metalized polyester films, with 10-20 ohms/square coating
112XX-XXXX Acrylic	Acrylic with wire as the conductive media, embedded into the body of the acrylic sheet. Meets UL94-HB requirements
113XX-XXXX Edge Bonded	Either acrylic, poly-carbonate or a combination as the optical media with an interlayer of wire as the conductive media structurally bonded along the perimeter
114XX-XXXX Laminations	Fully laminated glass, polycarbonate, glass/poly combinations and acrylic are available with PVB interlayer. By properly terminating with "Flying-Lead" or Silver Bus Bar, achieving the highest level of Optical Shielding Performance available

Part No.	Wire	Count	% Open Area	Diameter
11X1a	Monel	10-15	92	.0022
11X2a	Monel	10-15	92	.0045
11X3a	SnCuFe	10-15	92	.0045
11X4a	Blk Cu	50	82	.0022
11X4b	Blk Cu	70	75	.0022
11C4c	Blk Cu	100	64	.0022
11X5a	Ag/Cu Blk	100	64	.0022
11X5b	Ag/Cu Blk	145	52	.0022
11X6a	Ag/SS Blk	50	88	.0015
11X6b	Ag/SS Blk	80	82	.0015
11X6c	Ag/SS Blk	100	77	.0015
11X6d	Ag/SS Blk	200	46	.0015
11X6e	Ag/SS Blk	230	47	.0015
11X6f	Ag/SS Blk	100	65	.0022
11X6g	Ag/SS Blk	165	46	.0022
11X7a	SS	50	88	.0015
11X7b	SS	80	77	.0022
11X7c	SS	100	64	.0022
11X7d	SS	230	47	.0015
11X8	Conductive Film	-	-	-

Part No.	Surface Finish
XXXX-XX1X	Smooth both sides
XXXX-XX2X	Anti glare 1 side Coarse (limited availability)
XXXX-XX3X	Clear hard coat finish
XXXX-XX4X	Anti reflection hard coat finish (<6% reflection)
XXXX-XX5X	Anti glare 2 sides Coarse (limited availability)
XXXX-XX6X	Anti glare 1 side Fine
XXXX-XX7X	Anti glare 2 sides Fine

Part No.	Colour	Roman Has#	% Light Transmission
XXXX-1XXX	Clear	-	-
XXXX-2XXX	Gray	2064	28%
XXXX-3XXX	Bronze	2370	10%
XXXX-4XXX	Red	2423	7%
XXXX-5XXX	Amber	2451	53%
XXXX-6XXX	Blue	2152	25%
XXXX-7XXX	Red	2444	8%
XXXX-8XXX	Gray	2074	12%

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PERFORMANCE CHARACTERISTICS

Part No.	Shielding Media	Openings/in.	% Open Area	1 MHZ	10 MHz	100 MHz	400 MHz	1 GHz	10 GHz
11X1a	Monel	10-15	92	35	70	90	90	25	-
11X2a	Monel	10-15	92	40	100	105	95	40	-
11X3a	SnCuFe	10-15	92	40	105	110	98	40	-
11X4a	Blk Cu	50	82	95	105	86	60	48	30
11X4b	Blk Cu	70	75	107	112	100	65	60	35
11C4c	Blk Cu	100	64	108	110	89	70	60	40
11X5a	Ag/Cu Blk	100	64	108	110	88	75	65	42
11X5b	Ag/Cu Blk	145	52	120	112	105	85	80	62
11X6a	Ag/SS Blk	50	88	95	90	85	60	55	25
11X6b	Ag/SS Blk	80	82	105	90	85	65	60	35
11X6c	Ag/SS Blk	100	77	120	112	93	80	87	75
11X6d	Ag/SS Blk	200	46	120	110	98	85	86	65
11X6e	Ag/SS Blk	230	47	120	120	95	95	80	60
11X6f	Ag/SS Blk	100	65	120	115	112	95	90	70
11X6g	Ag/SS Blk	165	46	120	120	106	100	81	60
11X7a	SS	50	88	93	90	80	60	55	25
11X7b	SS	80	77	106	88	80	65	60	32
11X7c	SS	100	64	120	105	88	76	62	40
11X7d	SS	230	47	120	120	95	95	80	60
11X8	Conductive Film	N/A	N/A	120	120	106	100	81	61

Material	Thickness (mm)	Weight of Free Falling Object	Energy to Break (FT-IB)
Acrylic Sheet	2.5	.25	3.0
Acrylic Sheet	3.0	2.0	4.7
Acrylic Sheet	4.5	2.0	11.1
Acrylic Sheet	6.0	5.0	18.1
Single Strength Window Glass	-	.25	0.8
Double Strength Window Glass	-	.25	1.8
Plate Glass	-	.25	2.0
Plate Glass	-	.25	1.0
Laminated Safety Glass	-	.25	1.1

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