TBA

Protective Solutions

EMI SHIELDING

EMI SHIELDING SOLUTIONS

Specialist materials for EMI Shielding and static control

TBA -PS's product range is primarily aimed at supplying both materials and finshed products for electrostatic protection and EMI/RFI shielding within the electronics industry. Our product range falls largely into four family groups: static control, EMI/RFI gaskets and seals, conductive polymers, and conductive coatings and metallising.
With a constant programme of research, development, product improvement, and due to our continuing expansion programme, we are very happy to discuss other product requirements and applications.

TBA Protective Solutions
Unit 3, Transpennine Trading Estate, Gorrells Way, Rochdale OL11 2PX. Tel: 01706 647718, Fax: 01706 646170

Certificate No: FM 21940

TBA0109

TBA PROTECTIVE SOLUTIONS
EMI SHIELDING PRODUCTS
TABLE OF CONTENTS

Page 4-7	ECP 600K series	Knitted wire mesh gaskets
Page 8	ECP 700 series	Woven wire sheet
Page 9-10	ECP 730 series	Metal foil tapes
Page 11-12	ECP 800 series	Oriented wire in silicone rubber
Page 13-19	ECP 870 series	Moulded and extruded conducting elastomers
Page 20-23	ECP 880 series	Printed EMI shielding elastomers
Page 24-26	ECP 900 series	EMI shielding windows
Page 27-28	ECP 920 series	ITO coated windows
Page 29-30	ECP 8000 series	Honeycomb vents
Page 31	ECP 8200 series	Shielded fan vents
Page 32	ECP 8300 series	Quiet vents
Page 33	ECP 8500 & 8900 series	Shielded Air Filters

ECP 600K SERIES
KNITTED EMI SHIELDING GASKETS

TBA Protective Solutions
EMI SHIELDING

A range of knitted gaskets with excellent electromagnetic and radio frequency interference (EMI/RFI) shielding characteristics.
Knitted gaskets reduce the leakage of unwanted fields through a joint between two parts of a metal enclosure (or metal coated plastics) by providing a continuous low resistance path between the parts (ie. a box and a lid). they are also resilient enough to conform to a large joint unevenness and the wiping action of the wires can improve surface contact.
The main applications are in sealing doors and panels in enclosures and cabinets, mounting conductive windows into housings, mounting vents cabinets.
Available in many configurations, the mesh comes with or without an elastomer core, depending on the degree of resilience required. It can also be supplied bonded to an elastomer seal for improved environmental protection. A choice of metal wire allows good electrochemical compatibility.

SPECIFICATION

WIRE MATERIALS

The majority of shielding requirements can be satisfied by using the material below. Other speciality metals can be used. Most applications require 2 layers of wire to achieve optimum shielding effectiveness.

WIRE SPECIFICATION	DIAMETER mm	REF
MONEL (BS3075-NA13)	0.11	MO
STAINLESS STEEL (BS970 part 1 1983)	0.11	SS
TIN PLATED COPPER CLAD STEEL (ASTM B227 + ASTM B33)	0.11	TCS
ALUMINIUM (BS 14755056A)	0.13	AL

ELASTOMER SPECIFICATION	TEMPERATURE RANGE	SERVICE LIFE
SOLID SILICONE RUBBER (G.P. GRADE)	-40° C TO + 180° C	15 YEARS
SPONGE SILICONE RUBBER (AMS3195)	-40° C TO + 150° C	15 YEARS
SPONGE NEOPRENE RUBBER (MIL-R-6130 TYPE II GRADE A CONDITION MEDIUM)	-15° C TO + 80° C	–

GASKET COMPRESSIBILITY AND SHIELDING PERFORMANCE

Optimum Shielding and Sealing performance is obtained within the compressibility range quoted below.

TYPE	COMPRESSION %
ALL METAL MESH	5-30
MESH OVER SPONGE	5-40
MESH OVER TUBING	10-40
GASKETS WITH ENVIRONMENTAL SEAL	10-40

*** NB**

1. Because of the possible variation in the manufacture of the material (within allowable tolerances) the data in this table should be used only as a guide.
2. To ensure a satisfactory conductive path between mating surfaces, it is important to consider the following criteria.
   i) The distance between fixings should be such that maximum deflection between the centres is 50% less than the desired compression of the gasket.
   ii) That the flatness tolerance shall be such, that the combined extreme tolerances maximum material condition (MMC) of both surfaces, is less than 50% of the desired compression.

H - FIELD (dB)					E - FIELD (dB)						
	Frequency MHz				Frequency MHz						
	0.01	0.1	1.0	1.0	0.1	1.0	10	100	400	1000	10,000
Monel	28	45	64	>104	>118	>136	123	99	96	84	46
Aluminium	36	47	64	>104	>118	>136	>120	91	76	72	34
TCS	47	67	88	>104	>118	>136	>126	109	98	77	43

ECP 600K SERIES
KNITTED EMI SHIELDING GASKETS

TBA Protective Solutions
EMI SHIELDING

ALL METAL TYPES

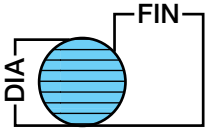
ECP 600K

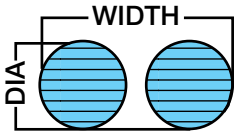
All metal mesh, circular section
Size range: 2.0mm to 13.0mm diameter.

ECP 610K

All Metal mesh, square/rectangular section
Size range: Width: 2.0mm to 32.0mm
Thickness: 2.0mm to 10mm

ECP 606K





All Metal mesh, circular section + fin (P-section)
Size range: 3.0mm to 10mm diameter
and 13.0mm to 25mm overall width

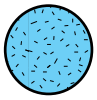
This number also cover a range of double circular sections joined by a fin.
Size range: 3.0mm to 10mm diameter
and 10mm to 32mm overall width

ECP 624K

All metal flat bandage, about 0.5mm thick.
Size range: 6.0mm to 330mm.

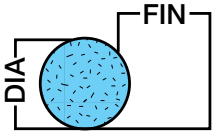
Metal Mesh on elastomer sponge

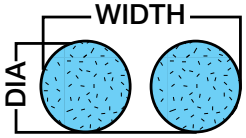
ECP 602K



Metal mesh on sponge core, circular section
Size range: 2mm to 19 mm diameter

ECP 608K
plus

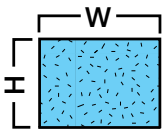




Metal mesh on sponge core, circular section mesh fin (P-section).
Size range: 3.0mm dia + 13mm overall width
and 13.0mm dia + 25mm overall width

This number also covers a range of double circular cores jointed by a fin.
Size range: 3mm to 10mm diameter core
and 13mm to 32mm overall width

ECP 612K



Metal mesh on sponge core, square/ rectangular section.
Size range : Width 3.0mm to 19mm
Height 3.0mm to 13mm

ECP 600K SERIES
KNITTED EMI SHIELDING GASKETS

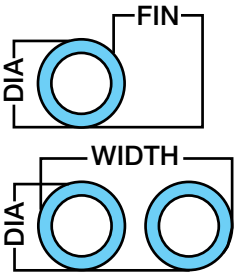
TBA Protective Solutions
EMI SHIELDING

METAL MESH ON ELASTOMER TUBING

ECP 604K

Metal mesh on elastomer tubing, circular section.
Size range: 3.0mm to 13.0mm diameter.

ECP 609K



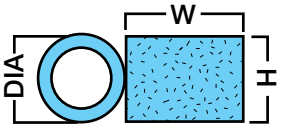
Metal mesh on elastomer tubing, circular section plus mesh fin.
Size range: 3.0mm to 10mm
and: 7.5mm to 28mm overall width

This number also cover a range of double cores joined by a mesh fin.
Size range: 3.0mm to 10mm diameter
and 13mm to 32mm overall width

CONSTRUCTION WITH ADDED NEOPRENE OR SILICONE SPONGE FLUID SEALS

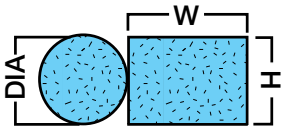
CAN BE SUPPLIED WITH SELF-ADHESIVE BACKED TAPE.

ECP 614K



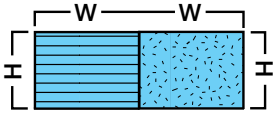
Metal mesh on silicone tube bonded to a rectangular silicone or neoprene sponge seal.
Size range: 3.0mm to 13.0mm tubing
and 3.0 x 3.0mm to 9.0 x 19.0mm seal

ECP 616K



Metal mesh on silicone sponge core bonded to a silicone or neoprene sponge seal.
Size range: 3.0mm to 19.0mm
and: 3.0 x 3.0mm to 9.0 x 19.0mm seal

ECP 618K



A square / rectangle metal mesh bonded to a silicone or neoprene sponge seal.
Size range: 2.0 x 3.0 mesh + 2.0 x 6.0 seal
up to: 9.0 x 6.0 mesh + 9.0 x 19.0 seal.

ECP 600K SERIES
KNITTED EMI SHIELDING GASKETS

TBA Protective Solutions
EMI SHIELDING

ELECTROCHEMICAL COMPATIBILITY

To avoid galvanic action between contacting metals refer to the following chart. Materials in adjacent groups may be safely used together. Choosing materials from within a single group in the table will provide the least corrosion due to galvanic action, when the materials are in contact for an extended period of time with appropriate protective finish.

GROUP 1	GROUP 2	GROUP 3	GROUP 4
Magnesium	Aluminium	Cadmium Plating	Brass
Magnesium Alloys	Aluminium Alloys	Carbon Steel	Stainless Steel
Aluminium	Beryllium	Iron	Copper & Copper Alloys
Aluminium Alloys	Zinc & Zinc Plating	Nickel & Nickel Plating	Nickel / Copper Alloys
Beryllium	Chromium Plating	Tin & Tin Plating	Monel
Zinc & Zinc Plating	Cadmium Plating	Tin / Lead Solder	Silver
Chromium Plating	Carbon Steel	Brass	
	Iron	Stainless Steel	
	Nickel & Nickel Plating	Copper & Copper Alloys	
	Tin & Tin Plating	Monel	
	Tin / Lead Solder		

HOW TO ORDER

600K Series - Knitted Gaskets

A "line call-out" is used when ordering gaskets. Dimensions are given as a four figure number, e.g. 5.0mm is expressed as -0050,. Metal wire references used :-Monel - MO, Stainless Steel - SS, Copper - C, Tinned Copper - TC, Tin Plated Copper Clad Steel - TCS, Aluminium - AL, Silver Plated Copper - SC. Elastomer Core/Fluid Seal reference:- Neoprene - NEO, Silicone - SIL.

EXAMPLES

- Circular, All Monel wire, 5.0mm diameter — ECP 600K-0050-MO
- Twin Neoprene sponge cores, 6.0mm diameter, stainless steel wire mesh, 19.0mm overall width. — ECP 608K-0060 x 2 - 0190-SS-NEO
- Silicone Tube, 5.0mm dia.,aluminium wire+neoprene sponge fluid seal, 3.0x12.0mm self adhesive back — ECP 614K-0050SIL-0030-0120-AL-NEO/SAB

Gaskets can be supplied in continuous lengths except for ECP614K, 616K and 618K which are in lengths up to 10 metres long or as finished gaskets to customers specifications. The sponge can be accurately die cut to size and compression stops/collars fitted to eliminate the risk of overtightening the gaskets.

TOLERANCES ON DIMENSIONS

Long length gaskets : body size ± 0.8mm , fin. size ± 1.6mm.
ECP614k, 616K and 618K - gaskets with fluid seals. Mesh size ± 0.8mm fluid seal size ± 0.8mm
Finished gaskets: ± 0.8mm up to 300mm. Hole centres ± 0.4mm

ECP 700 SERIES
WOVEN WIRE SHEET

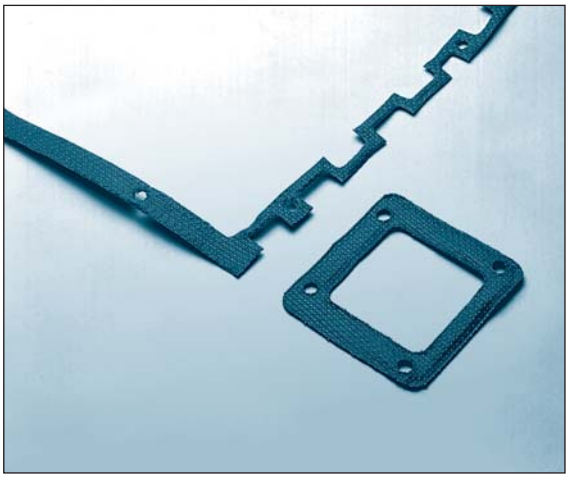
TBA Protective Solutions
EMI SHIELDING

A woven wire sheet impregnated with an elastomer to yield a highly conductive, yet resilient gasketing material. This material is used for EMI/RFI Shielding and also provides a fluid tight seal. The materials also exhibit EMP survivability. This material can be fabricated in virtually any shape, by die stamping, or by hand, using shears. It is particularly useful where a gasket of minimum thickness and/or complex shape is required. It is generally used for shielding enclosures and gaskets for circular multipin + D sub connectors in both commercial and military applications. Designed for those specific applications where joint unevenness does not exceed 0.1mm and/or where space restrictions occur. Conductivity is achieved on contact due to exposed metal contact points.

SPECIFICATION

SHIELDING PERFORMANCE (BASED ON MIL STD 285)

FREQUENCY	FIELD	ATTENUATION dB
1GHz	P	55
100MHz	E	80
10MHz	E	100
1MHz	E	100
100KHz	H	44
15KHz	H	34



MATERIALS	
MESH	Aluminium AMS 4182A
ELASTOMERS	Silicone ZZR-765 Class Z <50 durometer -40°C to + 150°C

WIDTHS	203,254,305mm
THICKNESS	0.5mm
CUSTOM PARTS	To Customer Specifications
LENGTH OF ROLL	15 metres
TOLERANCES	Thickness ± 0.13mm, Linear ± 0.8mm Hole Centre ± 0.4mm

DESIGN CONSIDERATIONS

Where holes are required, a minimum of 2.30mm should be left between the gasket edge and the hole. If this is not possible, then u-shaped slots should be used. The recommended closing pressure is between 345 and 690KPa (50 to 100PSI). Compression set at 50psi = 1%.

HOW TO ORDER

ECP 705 - XXXX SIZE OR DESCRIPTION

ECP 730 SERIES
METAL FOIL TAPES

TBA Protective Solutions
EMI SHIELDING

Metal foil tapes for static drain and EMI/RFI shielding applications. Plain (smooth) copper or aluminium tapes are available with adhesive backing. Tapes with conductive adhesive provide the most effective shielding properties as the layer ensures good electrical contact with the component surface.

ECP732 HTM is a copper tape laminated with a high temperature masking tape and can be used as a EMI Shielding tape to provide corrosion resistance on cabinets. The masking tape allows the cabinet to be overpainted for environmental protection, stripping the tape then gives a conductive contact surface for EMI Shielding gaskets.

SPECIFICATION

SHIELDING EFFECTIVENESS

Copper and aluminium foil tapes are used to shield across the range of frequencies covered by EMC regulations. They reflect and absorb within the range of frequencies from 200 KHz to over 1GHz. They are not effective below 200 KHz (magnetic field).

COPPER TAPE

PRODUCT NO.	FOIL THICKNESS	TOTAL TAPE THICKNESS	ADHESIVE THICKNESS	ADHESIVE	PEEL ADHESION	STANDARD LENGTH
ECP 731	0.038mm	0.060mm	0.025mm	Acrylic	17.3N/2.5cm	33 Metres
A plain soft Copper Foil Polyacrylate coated with a thermosetting Polyacrylate Adhesive, which has unusually good ageing properties and resistance to attack by moisture under high humidity conditions. It is solderable. UL Recognised Meets Flame Retardancy Requirements of UL510						
ECP 732	0.035mm	0.060mm	0.025mm	Conductive Acrylic	10.2N/2.5cm	33 Metres
As ECP 731 but with conductive adhesive backing						

ALUMINIUM TAPE

PRODUCT NO.	FOIL THICKNESS	TOTAL TAPE THICKNESS	PEEL ADHESION
ECP 734	0.050mm	0.070mm	10.2N/2.5cm
With conductive adhesive backing			

ECP 730 SERIES
METAL FOIL TAPES

TBA Protective Solutions
EMI SHIELDING

HTM MASKING TAPE

PRODUCT NO.	FOIL THICKNESS	TOTAL TAPE THICKNESS	MATERIAL OF TAPE	PEEL ADHESION	TENSILE STRENGTH
ECP 732 HTM	0.035mm	0.060mm	Acrylic Conductive adhesive	10.2N/2.5cm	163N/2.5cm
Very high temperature masking tape with a continuous temperature resistance of 155°C , 2595 consists of a lightly creped, buff coloured paper coated with a thermostable, silicone based adhesive, laminated to ECP 732 foil.					

DESIGN CONSIDERATIONS

METAL FOIL TAPE

A foil with a non-conductive adhesive is not so effective as one coated with a conductive adhesive. Where greater electrical contact is required to provide shielding (important in the MHz range), the conductive adhesive type should be used.

HTM MASKING TAPE

A masking tape type 2595 is specifically designed for use in paint stoving cycles incorporating temperature in excess of 140°C. It has worked satisfactorily on a number of metals including polished and anodised aluminium, chemically etched steel, passivated cadmium, magnesium, various types of copper containing alloys and brass. It has been found that removal is most easily and clearly accomplished when the tape and its substrate have cooled to 40°C - 60°C. As a guide objects at 60°C are just too hot to handle comfortably. ECP732HTM is a copper tape laminated with a high temparature masking tape and can be used as a EMI Shielding tape to provide corrosion resistance on cabinets. The masking tape allows the cabinet to be overpainted for environmental protection, stripping the tape then gives a conductive contact surface for EMI Shielding gaskets.

HOW TO ORDER

ECP 730 SERIES	ECP 732 HTM
ECP 731,732,734.	Standard Tape 20.0mm Wide Roll length 33 metres
Standard Widths 6,9,12,15,19,25,30,38,50,60,75,100mm	Laminated with 15.0mm Masking Tape
Roll lengths 50 or 33 metres	Other widths and lengths available on request

ECP 800 SERIES
ORIENTED WIRE IN SILICONE ELASTOMERS

TBA Protective Solutions
EMI SHIELDING

ECP 800 series is a range of solid or sponge silicone gasket materials perpendicularly impregnated with conductive metal wire. The standard wire density is 140 strands per square cm. (900 strands per square inch) . The impregnated wires are chemically bonded to the elastomer and are convoluted to minimise compression set. Compression stops can be fitted to help maintain the correct degree of constant pressure. For normal applications Silicone is used. A low compression version 802C is available.

SPECIFICATION

SOLID ELASTOMERS

ECP NO.	TYPE OF WIRE/ ELASTOMER	MAX WIDTH (mm)	MAX LENGTH (mm)	BASE ELASTOMER HARDNESS SHORE A	WIRE DENSITY PINS/CM^2
800A	Monel/Silicone	225	900	35	140
800B	Aluminium/Silicone	225	900	35	140

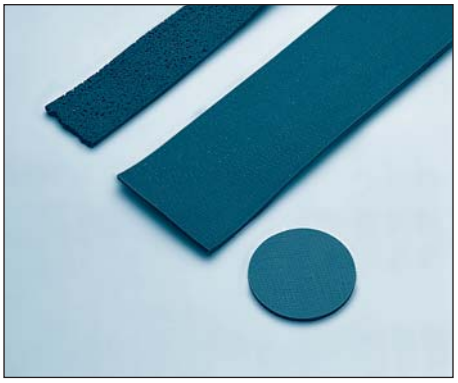
Hardness of rubber without embedded wires - material will seem harder with wires incorporated.
Wider material can be supplied by edge adhesive bonding.

SILICONE SPONGE

ECP NO.	TYPE OF WIRE / ELASTOMER	MAX WIDTH (mm)	MAX LENGTH (mm)	HARDNESS SHORE A	WIRE DENSITY PINS/CM^2
802A	Monel/Silicone	38	900	20	140
802B	Aluminium/Silicone	38	900	20	140
802C	Monel/Silicone	38	900	20	80

MATERIALS

Monel Wire	USA Federal Spec QQ-NZ81-B
Aluminium Wire	USA Federal Spec AMS-4182A
Solid Silicone Elastomer	USA Federal Spec ZZ-R-765 Class 2
Sponge Silicone Elastomer	USA Federal Spec AMS 3195



Temperature range is -40°C to + 150°C

TOLERANCES	ECP 800	ECP 802
Thickness	± 0.13mm	± 0.13mm
Linear	± 0.80mm	± 0.80mm
Hole Centres	± 0.40mm	± 0.40mm

SHIELDING PERFORMANCE (Based on MIL STD 285)

ECP 800A

H Field

Frequency MHz	0.01	0.1	1.0	10.0
Attenuation (db)	64	85	>110	>104

E Field

Frequency MHz	0.1	1.0	10.0	100
Attenuation (db)	>118	>136	>126	>133

P Field

Frequency MHz	400	1000	1000
Attenuation (db)	>120	>116	>106

ECP 800 SERIES
ORIENTED WIRE IN SILICONE ELASTOMERS

TBA Protective Solutions
EMI SHIELDING

HOW TO ORDER

800 SERIES - ORIENTED WIRES/ IN SILICONE ELASTOMER

Each gasket has a distinctive and unique line call out description.
example :- ECP 800-0254-0032 is a rectangular gasket of dimension
25.4mm wide x 3.2mm high
Dimensions are given as a four figure number e.g. 0064=6.4mm 0032=3.2mm

ECP 8XX - X - XXXX - XXXX - SAB

- Elastomer Type : 00 Solid Silicone
  02 Silicone Sponge
- Type of wire
  eg:- A = Monel : B = Aluminium
  C = Low density monel pins
- Width (mm)
  eg:- 0254 = 25.4mm
- Height
  e.g.0060 = 6.0mm
- If Self Adhesive Backing required

Material can be edge bonded to produce larger widths or lengths, or slit to reduce size
Can be supplied with a self-adhesive backing protected by a peel off paper layer.
Complex gaskets can be made by fabrication technique and may incorporate compression stops.

ECP 870 SERIES
MOULDED + EXTRUDED CONDUCTIVE ELASTOMERS

TBA Protective Solutions
EMI SHIELDING

A range of conductive elastomeric gaskets. These give high level EMI shielding with effective environmental sealing. The gaskets are based on silicone or fluorosilicone elastomer loaded with a choice of conductive fillers to ensure good galvanic compatibility within the joint.

A wide range of standard extruded profiles and moulding are available for most common sealing applications. Custom made gaskets can be made.

SPECIFICATION

ECP NO	DESCRIPTION
870 Carbon	Low cost semi-conductive compound for low level shielding/environmental seals. Used in commercial applications - gaskets for electronic/static control devices and flexible electrical contacts.
871 Nickel Graphite	Lowest cost metal filled compound - exhibits good electrical and thermal conductivity. It also has very good broadband shielding effectiveness, particularly at low frequencies, and has good EMP resistance. Another major use of this grade is in aggressive salt spray environments where corrosion of aluminium flanges is a problem.
873 Silver Copper	Offers excellent thermal and electrical conductivity. It exhibits very good broadband shielding effectiveness.
874 Silver Glass	Offers excellent high temperature stability and electrical conductivity.
876 Silver Aluminum	Low density, high electrical and thermal conductivites used where weight is a prime consideration.
879 Silver Nickel	Offers very good electrical conductivity and thermal stability in arduous environments.

PHYSICAL & ELECTRICAL PROPERTIES

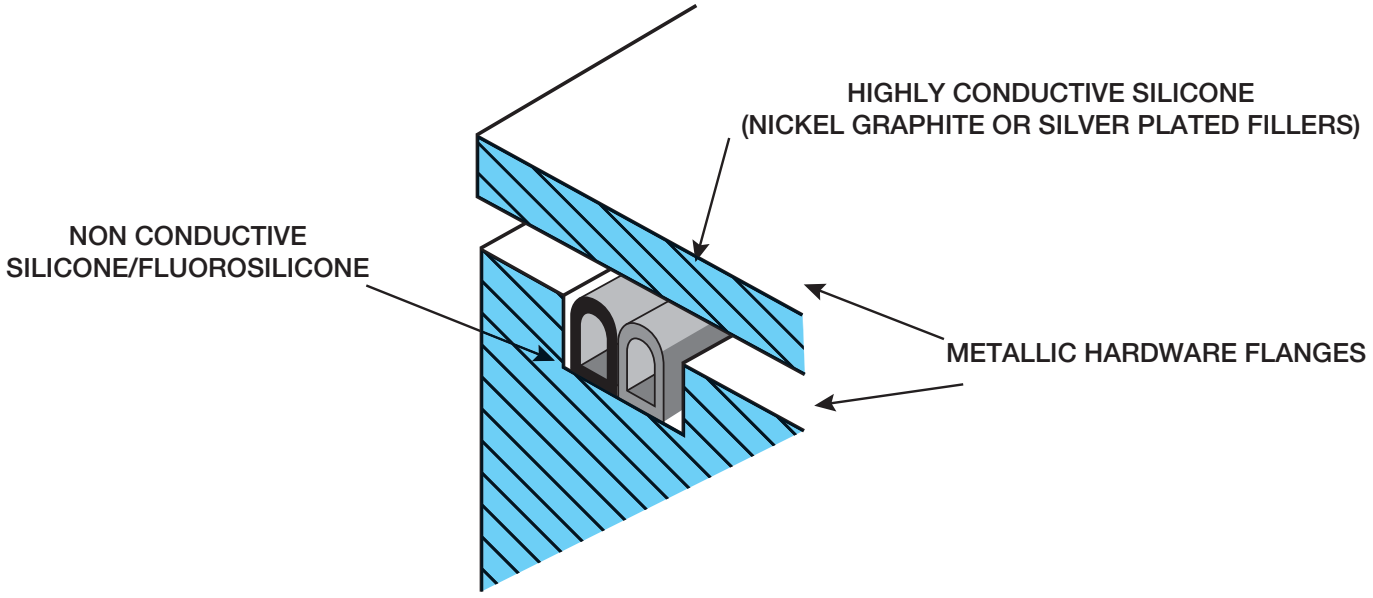
MOULDABLE / EXTRUDABLE GRADES

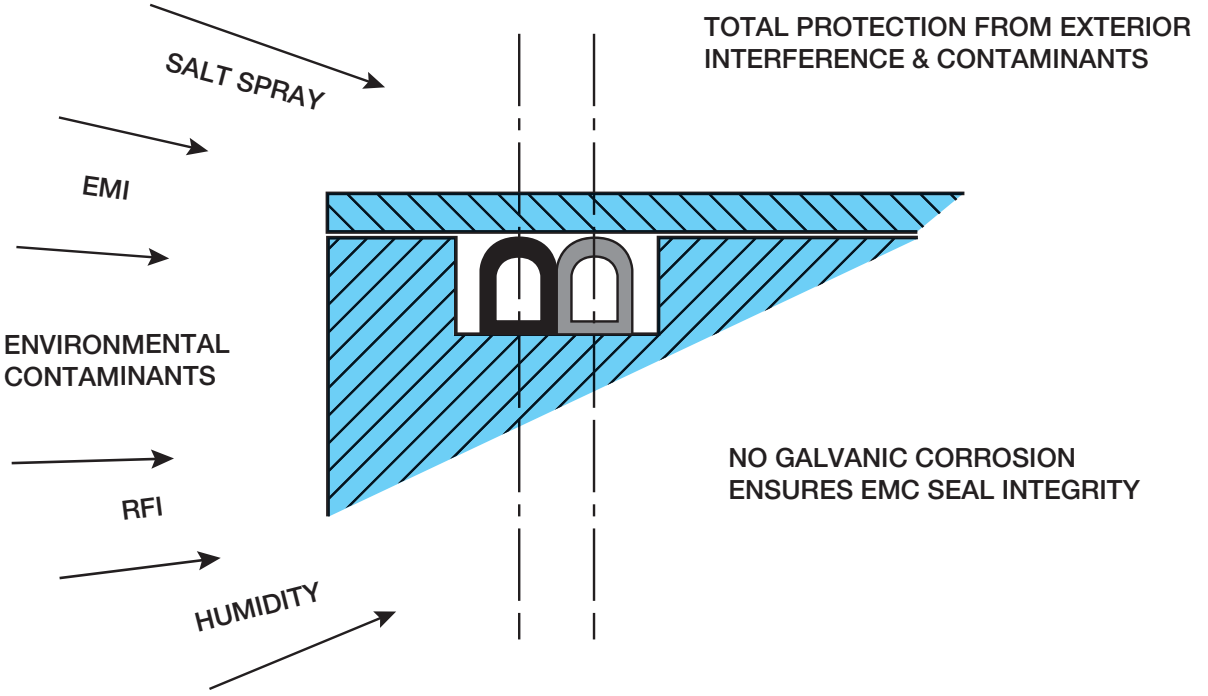
SILICONE / ELASTOMERS

ECP NO	FILLER TYPE	TEMP RANGE °C	SPECIFIC GRAVITY (g/cc) ±5%	HARDNESS (IRHD) ±5	TENSILE (MPa min)	ELONGATION (% min)	COMPRESSION SET 72hrs/100°C (% max)	VOL RESISTIVITY ohm.cm Spec (max)	VOL RESISTIVITY Aged 168 hrs @ 100°C
870	Carbon	-50/+160	1.19	70	5.00	150	20	6.000	3.900
871	Nickel/Graphite	-50/+160	2.55	90	1.25	100	30	0.050	0.080
873	Silver/Copper	-50/+125	4.32	75	1.25	100	30	0.005	0.005
874	Silver/Glass	-50/+160	2.00	75	1.25	100	30	0.005	0.005
876	Silver/Aluminium	-50/+160	2.19	70	1.25	100	30	0.005	0.005
879	Silver/Nickel	-50/+160	3.71	70	1.25	100	20	0.005	0.005

ECP 871 SERIES
DOUBLE SEAL

TBA Protective Solutions
EMI SHIELDING

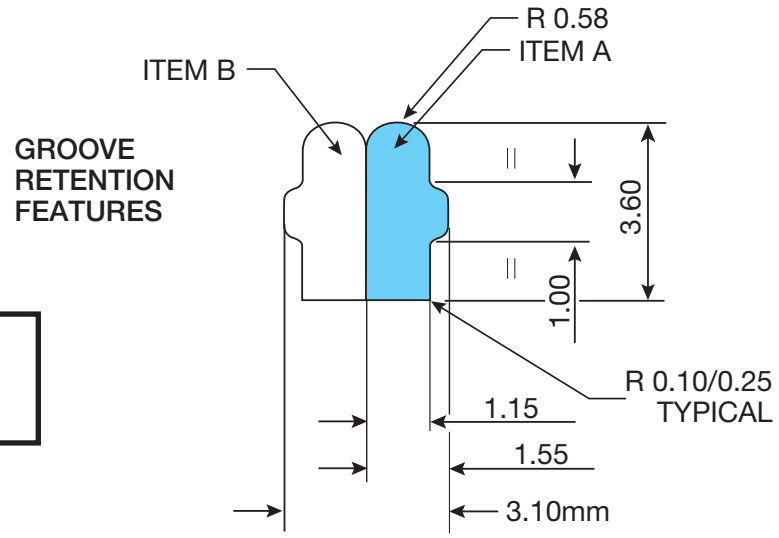




ECP 871 SERIES
TYPICAL DOUBLE SEAL AND GROOVE DETAILS

TBA Protective Solutions
EMI SHIELDING

DOUBLE SEAL PART NUMBER
ECP 871-ES-XX-176

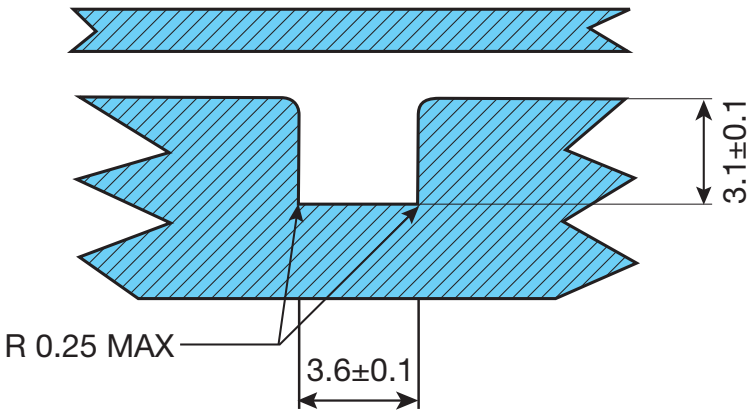


ITEM A : CONDUCTIVE R/F SEAL
ITEM B : NON-CONDUCTIVE SEAL

NOTES:

MAXIMUM SECTIONAL AREA = 5.13mm PER SECTION
ITEMS A AND B ARE CO-VULCANISED

RECOMENDED GROOVE DETAIL

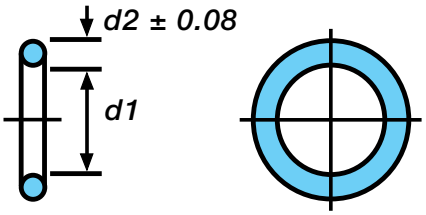


MAX COMPRESSION: 20%
MIN COMPRESSION: 7.2%
GROOVE TOLERANCE: ± 0.10mm
DUO SEAL TOLERANCE: ± 0.15mm
MAX SEAL SECTIONAL AREA: 10.26mm^2
SEAL MAX/MIN HEIGHT: 3.75mm/3.45mm
GROOVE MAX/MIN HEIGHT: 3.2mm/3.0mm
MIN GROOVE SECTIONAL AREA: 10.50mm^2

ECP 870 SERIES
MOULDED + EXTRUDED CONDUCTIVE ELASTOMERS

TBA Protective Solutions
EMI SHIELDING

Rear mounting jam Nut Receptacle 'O' Rings



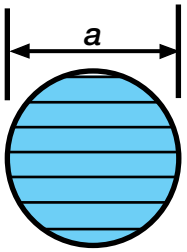
MOULDING

MIL C 38999 MIL C 26482	SHELL SIZE	MIL C 81511	d1	TOLERANCE ON d1±	d2
ECP Ref		ECP Ref	mm	mm	mm
M001	6	-	14.00	0.13	1.78
M002	8	-	17.16	0.13	1.78
-	8	M003	18.77	0.13	1.78
M004	9	-	20.35	0.15	1.78
-	10	M005	21.95	0.15	1.78
M006	11+12	-	25.12	0.15	1.78
M007	13+14	M007	28.30	0.15	1.78
M008	15+16	M008	31.47	0.15	1.78
M009	17+18	M009	34.65	0.15	1.78
M010	19+20	-	37.77	0.15	2.62
M011	21+22	-	40.95	0.25	2.62
M012	23+24	-	44.12	0.25	2.62

EXTRUDED PROFILES

O SECTION

ECP REF	Dia.a mm	ECP REF	Dia.a mm
E010	1.02	E019	3.18
E011	1.35	E020	3.30
E012	1.57	E021	3.53
E013	1.78	E022	3.81
E014	2.03	E23	4.06
E015	2.36	E024	4.78
E016	2.62	E025	5.49
E017	2.84	E026	6.35
E018	3.02		

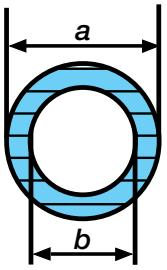


ECP 870 SERIES
MOULDED + EXTRUDED CONDUCTIVE ELASTOMERS

TBA Protective Solutions
EMI SHIELDING

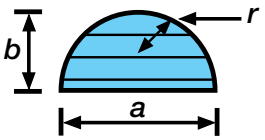
HOLLOW O SECTION

ECP REF	Dia.a mm	Dia.b mm
E027	2.40	0.80
E028	3.18	1.14
E029	3.96	1.27
E030	6.35	3.18
E031	7.92	4.88
E032	9.53	6.35



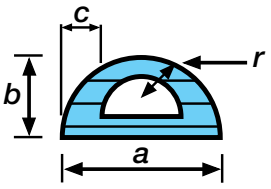
D SECTION

ECP REF	Dim.a	Dim.b	Rad.r
E033	1.40	1.63	0.70
E034	1.57	1.73	0.79
E035	2.39	1.98	1.19
E036	1.96	2.26	0.99
E037	1.57	2.54	0.79
E038	3.81	2.79	1.91
E039	3.00	3.96	1.50
E040	4.52	4.45	2.26
E041	3.96	3.96	1.98



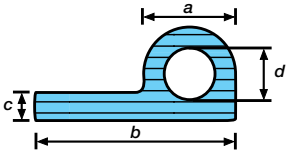
HOLLOW D SECTION

ECP REF	Dim.a	Dim.b	Dim.c	Rad.r
E042	3.96	3.96	1.14	1.98
E043	4.75	4.72	1.27	2.36
E044	7.92	7.92	1.27	3.96
E045	7.92	7.92	1.57	3.96
E046	12.37	8.23	2.03	6.20
E047	6.35	6.35	1.65	3.18



HOLLOW P SECTION

ECP REF	Dim.a	Dim.b	Dim.c	Dim.d
E060	5.08	12.70	1.57	2.03
E061	5.08	21.59	1.57	2.03
E062	6.35	12.70	1.57	3.18
E063	6.35	15.88	1.57	3.18
E064	6.35	22.22	1.57	3.18
E065	7.92	22.22	1.57	4.75
E066	9.14	19.81	1.79	6.48

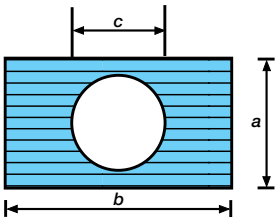


ECP 870 SERIES
MOULDED + EXTRUDED CONDUCTIVE ELASTOMERS

TBA Protective Solutions
EMI SHIELDING

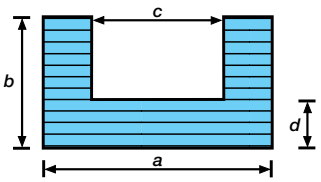
HOLLOW RECTANGULAR SECTION

ECP REF	Dim.a	Dim.b	Dim.c
E073	7.75	8.38	3.18
E074	9.53	9.53	4.78



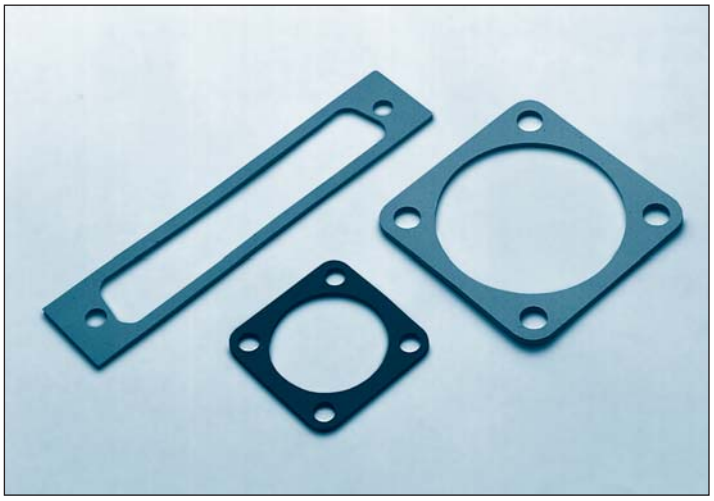
CHANNEL SECTION

ECP REF	Dim.a	Dim.b	Dim.c	Dim.d
E054	2.54	2.54	0.86	0.84
E055	3.20	2.79	0.66	1.27
E056	3.20	5.72	0.51	1.91
E057	3.96	3.94	1.57	1.19
E058	4.45	3.96	1.19	1.91
E059	8.31	5.94	1.57	2.92



FLAT STRIP SECTION

ECP REF	Dim.a	Dim.b
E048	1.60	1.07
E049	2.41	1.57
E050	3.05	1.91
E051	3.18	1.57
E052	3.96	1.57
E053	6.35	1.57
E067	12.70	1.91
E068	12.70	3.18
E069	12.70	4.78
E070	19.05	1.57
E071	22.35	1.57
E072	25.40	6.35



ECP 870 SERIES
MOULDED + EXTRUDED CONDUCTIVE ELASTOMERS

TBA Protective Solutions
EMI SHIELDING

DESIGN CONSIDERATIONS

Optimum shielding effectiveness is obtained by ensuring good intimate contact between the seal and the joint surfaces.
As a general rule 10% compression is the normal minimum.
Maximum compression is between 25-30% for solid sections and 50-60% for hollow extruded sections.
Over compression can be controlled by the use of compression stops.
It is not advisable to stretch these gaskets beyond 5% as the filler matrix will be disrupted and performance affected.
Gasket interfaces should be clean, flat and free from any insulating layers.

HOW TO ORDER

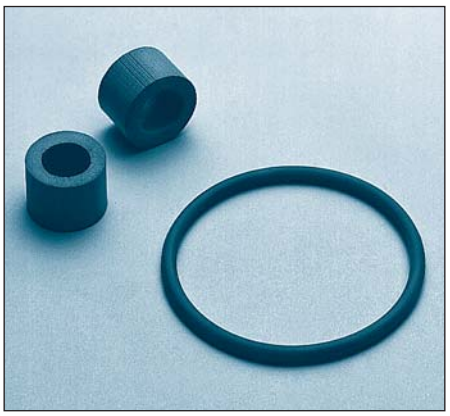
870 SERIES CONDUCTIVE ELASTOMER / MOULDING EXTRUSIONS

Each gasket has a distinctive and unique line call out description

ECP XXX - X - XXX

- XXX: Part No As Per Table
- X: E or M (Extruded or Moulding)
- ECP XXX: Specification Material

e.g. ECP 874-E010 is silver plated glass in silicone extruded 1.0mm O section



ECP 880 SERIES
PRINTED EMI SHIELDING ELASTOMER

TBA Protective Solutions
EMI SHIELDING

A range of elastomeric gaskets produced by a cost-effective printing technique, this technique can be used to produce standard connector gaskets and is ideal for custom made special designs. Various silver plated metal fillers loaded into silicone rubber gives the user a choice of properties and good galvanic compatibility between the gasket and the joint. A printed raised sealing bead improves electrical contact in the joint. The gasket can be printed onto a substrate to ease assembly and location or directly printed onto the component to be shielded.

SPECIFICATION

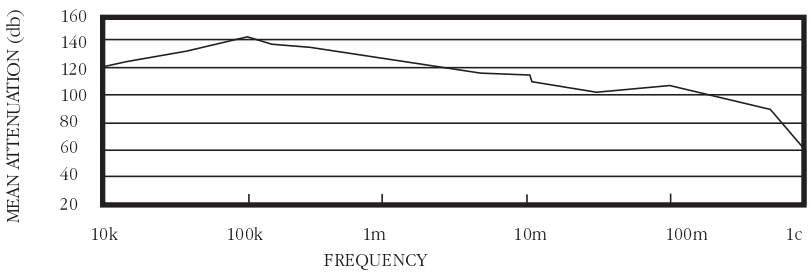
Material

ECP NO.	FILLER TYPE	DESCRIPTION
880	Nickel/Graphite	Lowest cost metal filled compound - exhibits good electrical and thermal conductivity. It also has very good broadband shielding effectiveness, particularly at low frequencies, and has good EMP resistance. Another major use of this grade is in aggressive salt spray environments where corrosion of aluminium flanges is a problem.
881	Silver/Nickel	Offers very good electrical conductivity and thermal stability in arduous environments. It is especially suited to microwave applications.
882	Aluminium Compatible Silicone	Offers exceptional corrosion resistance in salt and sulphur dioxide laden salt spray atmospheres
884	Silver/Copper	Offers excellent thermal and electrical conductivity. It exhibits very good broadband shielding effectiveness.
885	Silver/Aluminium	Low density, high electrical and thermal conductivity used where weight is a prime consideration.
886	Silver/Glass	Offers excellent high temperature stability and electrical conductivity.

PHYSICAL & ELECTRICAL PROPERTIES PRINTABLE GRADES
SILICONE ELASTOMERS

ECP NO	FILLER TYPE	TEMP RANGE	SPECIFIC GRAVITY (g/cc) ±5%	HARDNESS (IRHD) ±5%	TENSILE (MPa min)	ELONGATION (% min)	COMPRESSION SET 72hrs/100°C (% max)	VOL RESISTIVITY ohm.cm Spec (max)	Aged 168 hrs @ 100°C
880	Nickel/Graphite	-50/+160	2.25	90	3.00	10	30	0.050	0.080
881	Silver/Nickel	-50/+160	3.00	80	3.00	30	30	0.005	0.005
882	Alum/Compatible Silicone	-50/+160	1.95	80	2.50	10	30	12	30
884	Silver/Copper	-50/+125	2.75	80	1.50	35	30	0.005	0.005
885	Silver/Aluminium	-50/+160	1.75	70	1.35	30	30	0.008	0.008
886	Silver/Glass	-50/+160	1.65	80	4.00	20	30	0.050	0.050

EMI SHIELDING PERFORMANCE
Mean attenuation to SAE-ARP-1705 for Nickel/Graphite loaded silicone



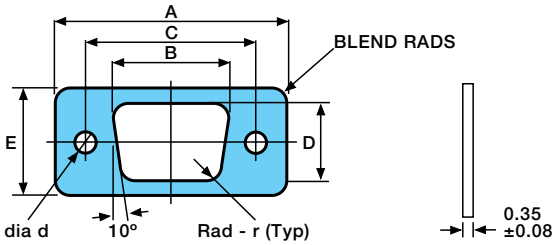
Note: Reduction in attenuation occuring towards 1GHz frequency is not material performance related but is due to resonances within ARP-1705 fixture arrangement.

ECP 880 SERIES
PRINTED EMI SHIELDING ELASTOMER

TBA Protective Solutions
EMI SHIELDING

PRINTING

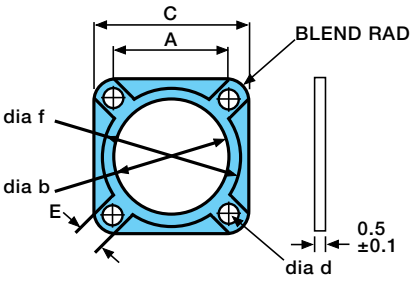
Miniature Sub 'D' Connector Gaskets
(Flange Mounting)
(PB type)



ECP REF	SHELL SIZE	No. of Contacts	A ±0.38mm	B ±0.08mm	C ±0.08mm	D ±0.18mm	E ±0.38mm	Dia d ±0.12mm	Rad r
PB001	1	9	30.81	20.45	25.00	11.34	14.91	3.12	3.56
PB002	2	15	39.14	28.57	33.30	11.34	14.91	3.12	3.56
PB003	3	25	53.03	42.29	47.05	11.34	14.91	3.12	3.56
PB004	4	37	69.32	58.80	63.48	11.34	14.91	3.12	3.56
PB005	5	50	66.93	56.64	61.14	14.23	17.83	3.12	3.56

Mil Spec Back Shell Connector Gaskets

Mil-C-38999 Connector Gaskets
(Flange Mounting)
(PD type)



ECP REF	SHELL SIZE	A mm±0.20	Dia b mm±0.20	C mm±0.25	Dia d mm±0.15	E mm±0.20	Dia f mm±0.20
PD001	8	15.09	16.25	21.34	3.43	7.00	20.75
PD002	9+10	18.26	19.30	24.51	3.43	7.00	23.80
PD003	11+12	20.62	22.48	26.92	3.58	7.50	26.98
PD004	13+14	23.01	25.78	29.29	3.43	7.00	30.28
PD005	15+16	24.61	29.05	31.95	3.96	7.50	33.55
PD006	18	26.97	32.25	34.32	3.96	7.50	36.75
PD007	19+20	29.36	35.18	38.10	3.58	7.50	39.68
PD008	21+22	31.75	38.35	41.28	3.58	7.50	42.85
PD009	23+24	34.93	41.53	44.45	4.37	8.00	46.03
PD010	25	38.10	44.70	47.63	4.37	8.00	49.20

ECP 880 SERIES
PRINTED EMI SHIELDING ELASTOMER

TBA Protective Solutions
EMI SHIELDING

Mil-C-5015/26482

ECP REF	SHELL SIZE	A mm±0.20	Dia b mm±0.20	C mm±0.25	Dia d mm±0.15	E mm±0.20	Dia f mm±0.20
PD011	8	15.09	12.95	22.23	3.96	7.50	17.45
PD012	10	18.26	16.08	25.40	3.96	7.50	20.58
PD013	12	20.65	19.30	27.79	3.58	7.00	23.80
PD014	14	23.01	22.48	30.18	3.96	7.50	26.98
PD015	16	24.61	25.65	32.54	3.96	7.50	30.15
PD016	18	26.97	29.08	34.93	3.96	7.50	33.58
PD017	20	29.36	32.00	38.10	4.37	8.00	36.50
PD018	22	31.75	35.18	41.28	4.37	8.00	39.68
PD019	24	34.93	38.35	44.45	5.16	9.00	42.85

Mil-C-5015 Only

ECP REF	SHELL SIZE	A mm±0.20	Dia b mm±0.20	C mm±0.25	Dia d mm±0.15	E mm±0.20	Dia f mm±0.20
PD020	28	39.67	44.70	50.80	5.16	9.00	49.20
PD021	32	44.45	51.05	57.15	5.56	9.50	55.55
PD022	36	49.23	57.40	63.50	5.56	9.50	61.90
PD023	40	55.58	63.75	69.85	5.56	9.50	68.25
PD024	44	60.33	70.89	76.20	5.56	9.50	75.39
PD025	48	66.68	77.24	82.55	5.56	9.50	81.74

Mil-C-81511

ECP REF	SHELL SIZE	A mm±0.20	Dia b mm±0.20	C mm±0.25	Dia d mm±0.15	E mm±0.20	Dia f mm±0.20
PD026	8	15.09	14.68	20.62	3.18	7.00	19.18
PD027	10	18.26	17.52	23.80	3.18	7.00	22.02
PD028	14	23.01	24.08	28.58	3.18	7.00	28.58
PD029	16	24.61	27.25	31.75	3.18	7.00	31.75
PD030	18	26.97	30.45	34.11	3.18	7.00	34.95
PD031	20	29.36	33.57	37.26	3.18	7.00	38.07
PD032	22	31.75	36.75	39.67	3.18	7.00	41.25
PD033	24	34.93	39.95	43.26	3.86	7.00	44.45

Non-Mil-Standard Connector Gaskets

ECP REF	SHELL SIZE	A mm±0.20	Dia b mm±0.20	C mm±0.25	Dia d mm±0.15	E mm±0.20	Dia f mm±0.20
PD034	17	26.97	29.00	34.93	3.58	7.50	33.50

ECP 880 SERIES
PRINTED EMI SHIELDING ELASTOMER

TBA Protective Solutions
EMI SHIELDING

DESIGN CONSIDERATIONS

The nature of the printing process ensures that minimum wastage of material occurs. The typical thickness of the pure print is 0.50mm and the bead width should be between 1.5 and 5.0mm.

Adjacent beads should be separated by at least 1.0mm and when printing onto hardware or surfaces a minimum clearance of 5.0mm should be applied to the edge of the component.

Additional environmental sealing using conventional elastomer to protect the EMC bead can be incorporated into the design.

Simple pure prints or complex gaskets can be made by printing onto a plastic carrier substrate.

Printing directly onto component hardware is limited to components size of 600mm x 800mm x 25mm deep.

The gaskets are quite delicate and care should be taken to avoid over-stretching the gasket which could disrupt the filler matrix and deteriorate the shielding performance.

HOW TO ORDER

880 SERIES PRINTED EMI SHIELDING ELASTOMER

Each gasket has a distinctive and unique line call out description

ECP XXX - XX - XXX

- XXX: Part No As Per Table reference (eg PD024)
- XX: PB or PD (Sub D or Shell Connector Gaskets)
- XXX: Specification Material

Customised parts to be defined by additional description or drawings

ECP 900 SERIES
EMI SHIELDING WINDOWS

TBA Protective Solutions
EMI SHIELDING

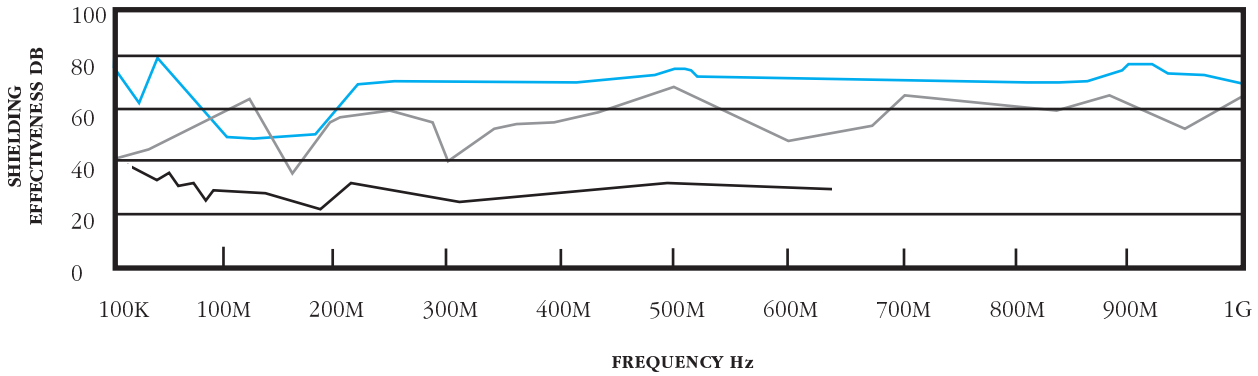
A series of shielded windows consisting of laminated glass or various plastics. The windows incorporate highly conductive microfine wire meshes or a metal oxide film to attenuate the interference. The wire mesh and the metal oxide films can be varied to achieve different performance. The windows may also be supplied with antiglare and scratch resistance finishes.

SPECIFICATION

SHIELDING EFFECTIVENESS

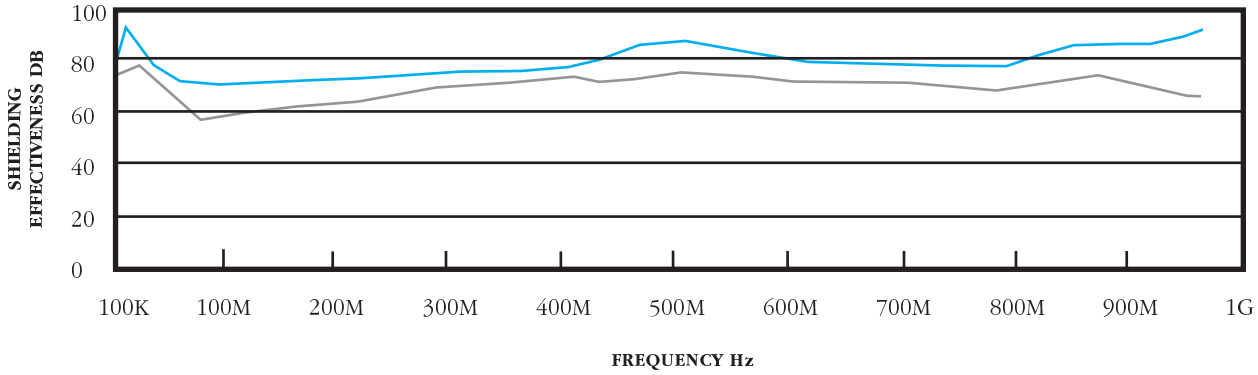
Attenuation of 80 db between 100KHz and 1GHz are obtained using laminated mesh windows and 20 to 40db using metal oxide films.

Figure 1



Blackened Phosphor Bronze Mesh
Blackened Copper Mesh
Metal Oxide Coating

Figure 2



Blackened Silver Plated Stainless Steel Mesh
Blackened Stainless Steel Mesh

ECP 900 SERIES
EMI SHIELDING WINDOWS

TBA Protective Solutions
EMI SHIELDING

MATERIALS

WIRE MESH OPTIONS

Blackened copper mesh

Blackened stainless steel mesh

Blackened silver plated stainless steel mesh

Weave density:-50 to 250 opening per inch can be supplied. Standard density 100 opi.

WINDOW OPTIONS

Product No.	Feature	Availability
ECP 905 Glass Laminated Wire Mesh	High abrasion, heat and chemical resistance, low impact resistance, excellent optical properties.	Curved or Flat windows up to 1000mm ±0.20mm up to 600mm, ±0.5mm over 600mm Thickness 3mm upwards.
ECP 910 NR 200 Cast Resin Wire Mesh	Optical properties comparable to optical glass, superior to acrylic + Polycarbonate. Abrasion resistance 30 x acrylic. Low distortion even at 130°C. Good solvent ageing and stress resistance.	Sheet size up to 450mm x 600mm. Tolerance on cut sizes ± 0.25mm. Thickness 1.5-6mm
ECP 915 Polycarbonate Laminated Wire Mesh	Better impact resistance than glass NR 200 or acrylic but poor U.V. light resistance.	Flat only, size and tolerances. As per glass Thickness 2.5mm upwards.

TECHNICAL DATA ECP 910 CAST RESIN

MECHANICAL PROPERTIES	TEST	UNITS	VALUE
Abrasion Resistance	D1044	(x Acrylic)	20
Hardness	D785	Rockwell	M95-M100
Tensile Strength	D638	MPa	34-41
Compressive Strength	D695	MPa	155
Flexural Yield Strength	D790	MPa	52-59
Flexural Modulus	D790	GPa	17-23
THERMAL PROPERTIES	**TEST**	**UNITS**	**VALUE**
Mx Recommended Operating Temp (no load)			100°C
Intermittant (1 Hr)			150°C
Specific Heat	C351	KJ/Kg/K	2.3
Coeff. of Linear Thermal Expansion	D696	Linear Coeff/ 0C	8-14x105
Thermal Conductivity	C177	J/S/M/K	0.2
Burning Rate	D635	mm/min	<25
Combustion (Self Ignition)	D1829	°C	382

ECP 900 SERIES
EMI SHIELDING WINDOWS

TBA Protective Solutions
EMI SHIELDING

DESIGN CONSIDERATIONS

MESH LAMINATED WINDOWS

Mesh is normally at 90° orientation but can be varied according to the optical requirements of the application.
Windows can be supplied with free mesh to allow termination to ground plane.
Free mesh can be wrapped over an environmental sponge seal gasket.
Add 0.75mm to the window thickness for the mesh.

CAST WINDOWS

Edge of the window can be machined with a step or butt edge.
Electrical termination to the mesh can be made with a silver paint busbar or using copper foil ECP732.

ITO COATED WINDOWS

Electrical termination to the conductive layer is normally made with silver painted busbar which may be accurately screen printed.
Alternatively a copper foil tape (ECP732) may be used.

HOW TO ORDER

Quote ECP No. supplemented by dimensional drawing and detail description.

ECP 920 SERIES
ITO COATED WINDOWS

TBA Protective Solutions
EMI SHIELDING

Conductive Coatings have been developed to provide EMI/RFI Shielding and ESD protection of display windows and other transparent or translucent areas. Based on Indium Tin Oxide (ITO), these coatings can be applied to either glass or plastic substrates. The coatings exhibit a high level of electrical conductivity and visible transparency.

The process can be applied to substrates measuring up to 350 x 320mm. A variety of plastics including polycarbonate and acrylic as well as glass can be coated. Special jigging allows complex shapes to be coated. Applications include display apertures in electronic equipment, protection of LCDs, touchscreens and membranes. The coatings can be applied to free-issue parts or we can provide fully machined and finished windows or display covers in Polycarbonate, acrylic or glass. Windows can be screen printed in standard or conductive inks and can also incorporate hard anti-glare, scratch-resistant and anti-fog features. Busbars can be applied using silver paint or conductive copper foil ECP 732.

SPECIFICATION

OPTICAL/ELECTRICAL

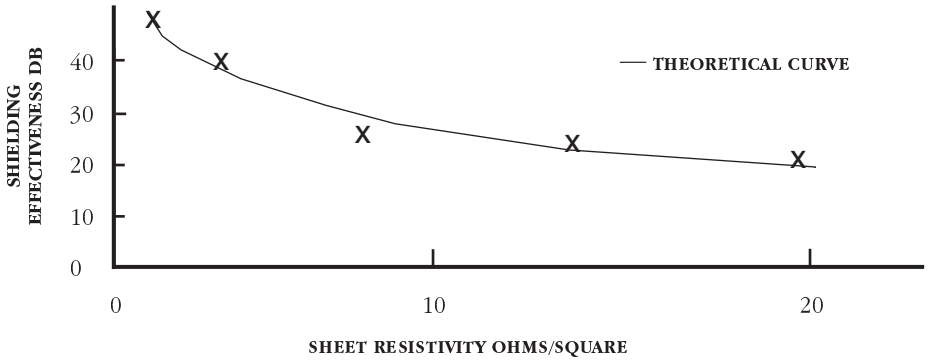
DESIGNATION	SHEET RESISTIVITY ohms/square	VISIBLE TRANSMITTANCE + % CIE C	APPLICATIONS
ECP 920/5000	5000	90.5	Static Dissipation
ECP 920/500	500	89	Static Dissipation
ECP 920/40	40	88	Shielding
ECP 920/20*	20	85	General Purpose Shielding
ECP 920/10	10	83	General Purpose Shielding

+ Measured on glass substrate (uncoated glass has transmittance 91%)
* Preferred shielding grade

SHIELDING EFFECTIVENESS

Figure 1 illustrates the variation of shielding effectiveness with sheet resistivity of the coatings deposited onto Polycarbonate substrates. Measurements were carried out using the insertion loss method at frequencies from 10MHz to 10GHz under far field plane wave conditions.

Figure 1



ECP 920 SERIES
ITO COATED WINDOWS

TBA Protective Solutions
EMI SHIELDING

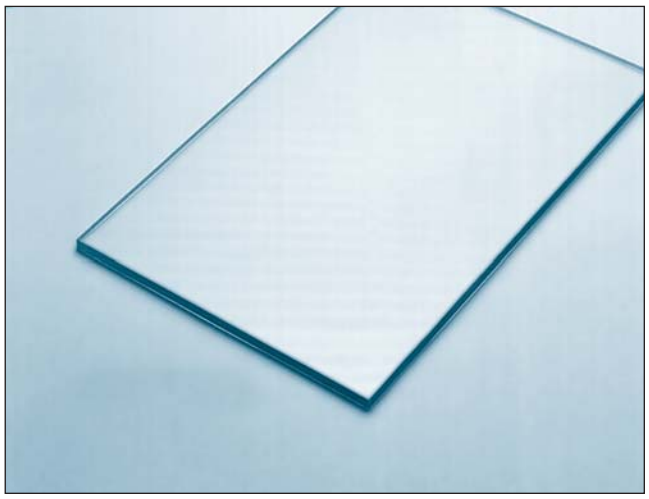
ENVIRONMENTAL STABILITY

ECP 920/20 deposited on Polycarbonate Sheet has been subjected to the accelerated tests given below without significant degradation. Coating adhesion was tested to ASTM D 3359-83 method B.

TEST	RESULTS
Thermal Cycling to MIL STD C 48497, 4.5.4.1. 5h at - 60°C followed by 5h at +70°C	a) No optical degradation. b) No Increase in sheet resistivity. c) 100% coating adhesion.
Salt Solution to MIL STD C48497, 4.5.5.2. 24h immersion in 5% NaCI solution	a) No optical degradation - salt residues wiped off with Isopropyl Alcohol. b) No change in sheet resistivity. c) 100% coating adhesion.
Humidity Cycling to MIL STD C48497, 4.5.3.2. 24h 50°C 95% humidity	a) No optical degradation. b) No change in sheet resistivity. c) 100% coating adhesion.

HOW TO ORDER

Quote ECP No. supplemented by dimensional drawing and detail description.



ECP 8000 SERIES
VENT & FILTER SPECIFICATIONS

TBA Protective Solutions
EMI SHIELDING

MATERIAL SPECIFICATIONS

Extrusion	Aluminium Alloy 6063-T1 QQ-A-200/9
Filter Media	Aluminium Alloy 5056, per RR-W-365
Honeycomb	Aluminium Alloy MIL-C-7438
Grilles	Aluminium Alloy 3003-H-14 per QQ-A-359
Finish	Iridite to MIL-C-5541
RFI Gasket	Mesh (Monel, T.C.S., or Al), BeCu, Metalized Fabric
Twinseal	Neoprene sponge .093" Thick to ASTM D6576, Type II, Grade A (Formerly MIL-R-6130)

8200 Series
EMI Shielding Performance

1/8 Cell Size, 1/4 Thick

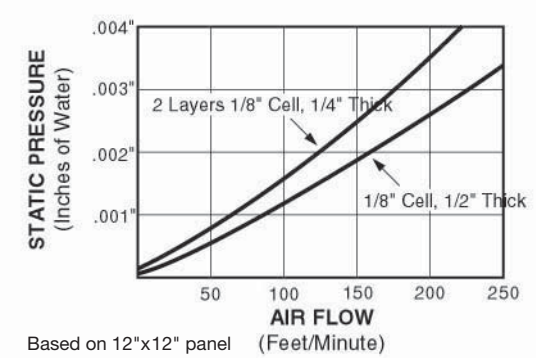
Honeycomb Finish	E-Field 10MHz	Plane Wave 1GHz	Plane Wave 10GHz
Iridite	70 dB	50 dB	30 dB

8000 and 8300 Series
EMI Shielding Performance

1/8 Cell Size, 1/2 Thick

Standard Honeycomb Finish	H-Field 100kHz	E-Field 10MHz	Plane Wave 1GHz	Plane Wave 10GHz
Iridite	40 dB	75 dB	60 dB	40 dB
Tin	70 dB	125 dB	100 dB	80 dB
Nickel	75 dB	130 dB	115 dB	95 dB
Cross-Cell Honeycomb Finish	**H-Field 100kHz**	**E-Field 10MHz**	**Plane Wave 1GHz**	**Plane Wave 10GHz**
Iridite	60 dB	105 dB	90 dB	80 dB

Airflow Characteristics

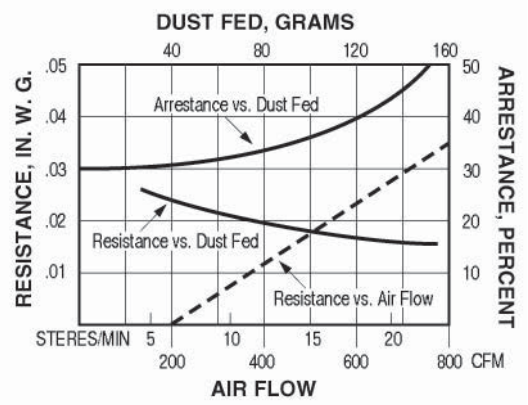


Based on 12"x12" panel

8500 Series
EMI Shielding Performance

Finish	H-Field 100kHz	E-Field 10MHz	Plane Wave 1GHz	Plane Wave 10GHz
Iridite	50 dB	80 dB	55 dB	40 dB

Airflow Characteristics

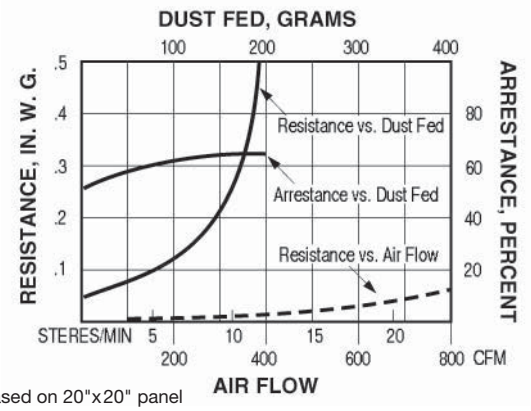


Based on 20"x20" panel (Dry)

8900 Series
EMI Shielding Performance

Finish	H-Field 100kHz	E-Field 10MHz	Plane Wave 1GHz	Plane Wave 10GHz
Iridite	45 dB	85 dB	55 dB	40 dB

Airflow Characteristics



Based on 20"x20" panel

ECP 8000 SERIES
EMI SHIELDING
HONEYCOMB VENTS

TBA Protective Solutions
EMI SHIELDING

The 8000 Series Vents are manufactured in both custom and standard configurations. EMI shielding performance is achieved from 1/8 cell aluminium honeycomb panels mounted in high strength extruded aluminum frames available in 8 styles as shown. Frame to enclosure shielding options include Twinseal, Mesh gaskets, Beryllium copper shielding strips or Metalized Fabric Gaskets. Shielding effectiveness and environmental protection can be improved by plating with tin or nickel. The highest level of shielding is achieved with a cross cell configuration where two 1/4 thick honeycomb panels are assembled with the foil seams oriented 90 degrees from each other. Standard vents are available in style 1 frames with 8-32 threaded blind fasteners for mounting. See chart below for sizes. For custom requirements, frame style, frame to enclosure shielding, finish and dimensional specifications are required. See Fig. 1

Honeycomb Vent Aluminium Frame Styles

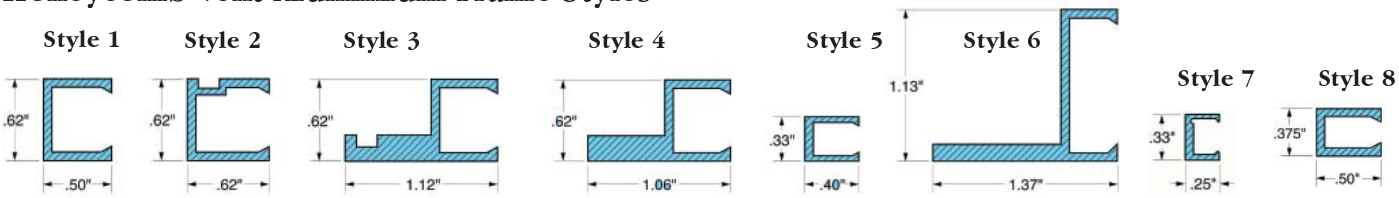
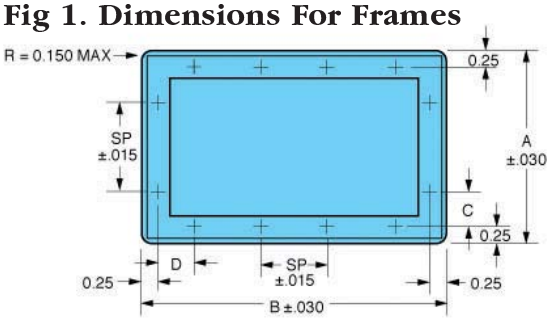
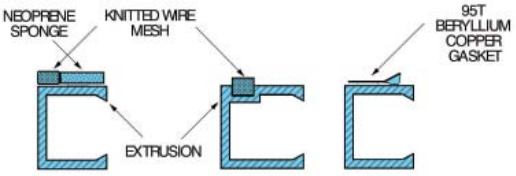


Fig 1. Dimensions For Frames



Supply dimensions A, B, C, & D for non-standard frames.
Note: Try to avoid placing holes or fasteners at the corners of the frame.

Frame Shielding



Standard Frame Sizes: Style 1

Outer Dimensions A x B	Sequential Part Number	Fasteners Vertical NO.	C	SP	Fasteners Horizontal No.	D	SP
4" x 4"	0001	1	1.75"	-	1	1.75"	-
4" x 8"	0002	1	1.75"	-	3	0.75"	3.00
5" x 5"	0003	1	2.25"	-	2	0.75"	3.00
5" x 10"	0004	1	2.25"	-	3	1.25"	3.50
6" x 6"	0005	2	1.00"	3.50	2	1.00"	3.50
6" x 12"	0006	2	1.00"	3.50	4	1.25"	3.00
7" x 7"	0007	2	1.50"	3.50	2	1.50"	3.50
7" x 14"	0008	2	1.50"	3.50	4	1.50"	3.50
8" x 8"	0009	2	2.00"	3.50	3	0.75"	3.00
8" x 16"	0010	3	0.75"	3.00	5	1.25"	3.25
10" x 10"	0011	3	1.25"	3.50	3	1.25"	3.50
12" x 12"	0012	4	1.25"	3.00	4	1.25"	3.00

FOR SIZES NOT SHOWN, PLEASE ASK!

HOW TO ORDER

8000 Series
Shielded Vent Panels - Honeycomb

Example: Part number 8001-3202-0009 is a shielded aluminium slant honeycomb vent with a Style 1 frame 8" x 8" and Twinseal with monel mesh gasket. **Unless standard, the sequential number is assigned by the factory.**

8 0 X X - Y Y Z Z - X X X X

8000 SERIES

FRAME (XX)
00 Custom
01 Style 1
02 Style 2
03 Style 3
04 Style 4
05 Style 5
06 Style 6
31 Style 7
32 Style 8

GASKET (YY)
00 None
10 Mesh (T.C.S.)
20 Mesh (Monel)
31 Twinseal With T.C.S. Mesh
32 Twinseal With Monel Mesh
33 Twinseal With Aluminium Mesh
40 Mesh (Aluminium)
50 BeCu 95T
60 Metalized Fabric Over Foam
90 Custom

HONEYCOMB MATERIAL (Z)
0 Aluminium 1/8 Cell

SHIELD MEDIUM (Z)
1 Honeycomb straight
2 Honeycomb slant
3 Honeycomb cross-cell
4 Honeycomb cross-cell slant

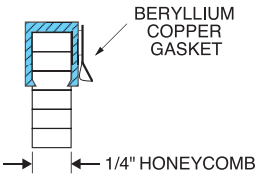
SEQUENTIAL (XXXX)

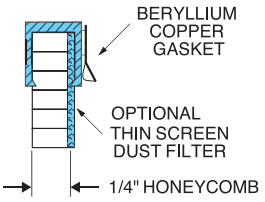
TBA Protective Solutions

ECP 8200 SERIES
SHIELDED FAN VENTS

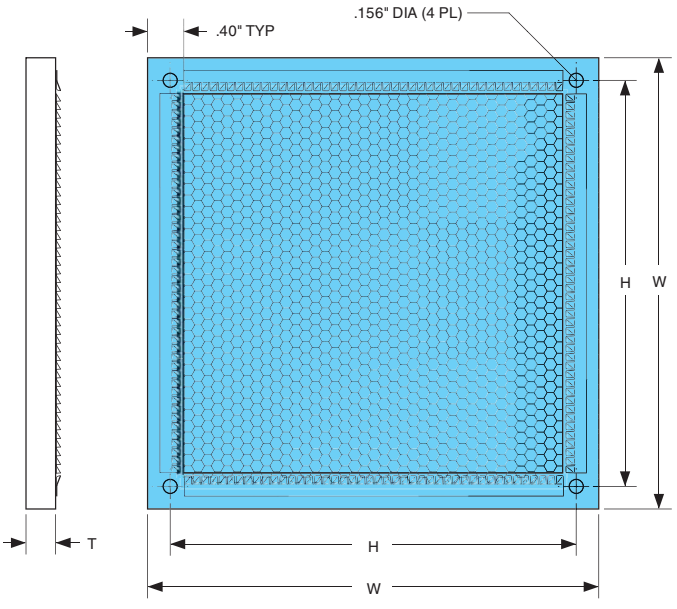
TBA Protective Solutions
EMI SHIELDING

The 8200 Series of Shielded Fan Vents with optional dust screens are designed to provide EMI shielding and maximum air flow without degrading the fan output. These vents provide a low cost option to perforated metal when airflow rates are critical. TBA ECP stocks fan vents in 5 sizes corresponding to industry standard fans with standard 4-hole mounting. Shielding performance is achieved from 1/8 cell aluminium honeycomb panels mounted in high strength extruded aluminium frames with beryllium copper shielding strips for shielding the frame to the enclosure. Dust screens consisting of multilayer expanded aluminium can be added, but airflow will be restricted.





Sequential Number For Frame Size				
Size	Dimensions W	H	T	Size Code XXXX
1	2.36"	1.97"	.33"	0197
2	3.14"	2.81"	.33"	0281
3	4.69"	4.13"	.33"	0413
4	5.00"	4.45"	.33"	0445
5	3.62"	3.25"	.33"	0325



HOW TO ORDER

8200 Series
Shielded Fan Vents - Honeycomb

Example: Part number 8205-5005-0445 is a shielded 1/8 cell honeycomb fan vent 5.00" wide by 5.00" high by .33" thick with an aluminium dust screen. **The sequential number determines the size of the frame.**

8 2 0 5 – 5 0 Z Z – X X X X

8200 SERIES

FRAME (05)
05 Style 5

GASKET (50)
50 BeCu 95T

HONEYCOMB MATERIAL (Z)
0 Aluminium 1/8 Cell

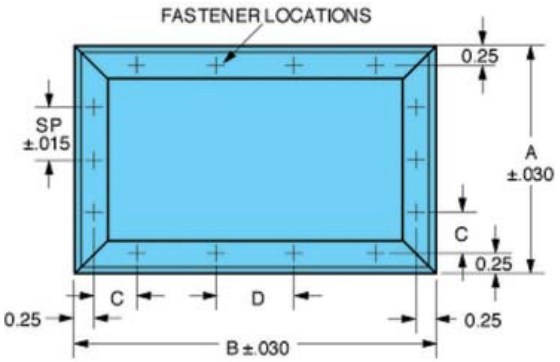
DUST SCREEN (Z)
1 No dust screen
5 With dust screen

SEQUENTIAL
0197 Frame Size 1
0281 Frame Size 2
0413 Frame Size 3
0445 Frame Size 4
0325 Frame Size 5

ECP 8300 SERIES
QUIET VENTS

TBA Protective Solutions
EMI SHIELDING

The 8300 Series Quiet Vents are designed to provide high EMI shielding performance of up to 90 dB attenuation with very low costs. These honeycomb vents are offered as an alternative to perforated metal or slots to reduce turbulence and noise by providing an unrestricted and quiet airflow. Shielding performance is achieved from two 1/4 inch thick honeycomb panels assembled in a cross cell configuration. The panels are mounted in high strength extruded aluminium frames with optional captive fasteners or thru holes as detailed below. Frame to enclosure shielding comes from Twinseal.



Sequential Numbers for Standard Frame Sizes

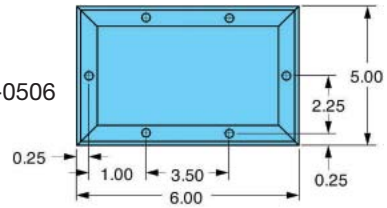
Vertical Size (A) of Frame	Horizontal Size (B) of Frame 3"	4"	5"	6"	7"	8"	9"	10"	12"	14"	16"
3"	0303	0304	0305	0306	0307	0308	0309	0310	0312	0314	0316
4"	0403	0404	0405	0406	0407	0408	0409	0410	0412	0414	0416
5"	0503	0504	0505	0506	0507	0508	0509	0510	0512	0514	0516
6"	0603	0604	0605	0606	0607	0608	0609	0610	0612	0614	0616
7"	0703	0704	0705	0706	0707	0708	0709	0710	0712	0714	0716
8"	0803	0804	0805	0806	0807	0808	0809	0810	0812	0814	0816
9"	0903	0904	0905	0906	0907	0908	0909	0910	0912	0914	0916
10"	1003	1004	1005	1006	1007	1008	1009	1010	1012	1014	1016
12"	1203	1204	1205	1206	1207	1208	1209	1210	1212	1214	1216
14"	1403	1404	1405	1406	1407	1408	1409	1410	1412	1414	1416
16"	1603	1604	1605	1606	1607	1608	1609	1610	1612	1614	1616

Fastener/Hole Locations

For the height (A) and the width (B) use the chart to determine number and location of the captive fasteners or through holes per side.

Standard Length	Number of Fasteners	C	D
3" (A or B)	1	1.25"	NA
4" (A or B)	1	1.75"	NA
5" (A Only)	1	2.25"	NA
5" (B Only)	2	.75"	3.00"
6" (A or B)	2	1.00"	3.50"
7" (A or B)	2	1.50"	3.50"
8" (A Only)	2	2.00"	3.50"
8" (B Only)	3	.75"	3.00"
9" (A or B)	3	.75"	3.50"
10" (A or B)	3	1.25"	3.50"
12" (A or B)	4	1.25"	3.00"
14" (A or B)	4	1.50"	3.50"
16" (A or B)	5	1.25"	3.25"

Example
8301-3200-0506



HOW TO ORDER

8300 Series
High Airflow Shielded Vents - Honeycomb

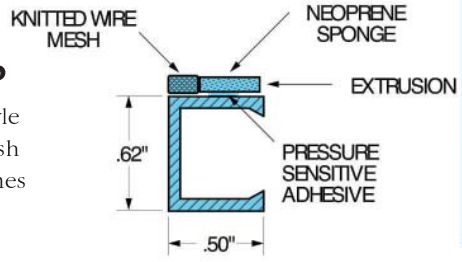
Example: Part number 8301-3200-0506 is an aluminium honeycomb 5" x 6" vent in a Style 1a frame with captive fasteners shielded with Twinseal. The sequential number specifies the height (A) and width (B) of the frame.

8 3 0 X – Z Z 0 0 – A A B B

- 8300 SERIES
- FRAME (0X)
  - 01 Style 1a (Captive Fasteners 8-32)
  - 02 Style 1b (Through Holes .204 DIA)
- GASKET (ZZ)
  - 00 No Gasket
  - 31 Twinseal Neoprene Elastomer and T.C.S. Mesh
  - 32 Twinseal Neoprene Elastomer and Monel Mesh
  - 33 Twinseal Neoprene Elastomer and Aluminium Mesh
- HONEYCOMB MATERIAL (00)
  - 00 Aluminium 1/8 Cell
- SEQUENTIAL (AABB)
  - AA Vertical Height
  - BB Horizontal Width

Frame Style 1a and 1b

Style 1a has captive fasteners. Style 1b has through holes. Frame finish is MIL-C-5541 Iridite. Other finishes can be supplied if required.



ECP 8500 & 8900 SERIES
SHIELDED AIR FILTERS

TBA Protective Solutions
EMI SHIELDING

Aluminium Mesh Shielded Air Filters

Shielded filter and dust shields perform three functions: they attenuate EMI, they provide for a passage of cooling air, and they filter dust from the air flow. Designed for use in industrial environments at low to medium air flow rates, they can be cleaned either by immersion and agitation in a suitable solvent or by air blasting. The filter is comprised of three layers of corrugated aluminium mesh aligned to provide maximum dust trapping effectiveness and minimum resistance to airflow. The filter material is contained in a rigid "C" channel aluminium frame of all welded construction and protected on each side with an expanded metal grid.

Electronic filters and dust shields are manufactured to meet the needs of individual applications. For custom requirements, please supply a detailed drawing with the following information:

- Location and size or type of fixing holes or fasteners (6/32 or 8/32 UNC, preferred). Use table and fig. 1 on page 30 as a guide for hole/insert spacings.
- Outer dimensions of filter.
- Type of gasket required.

HOW TO ORDER

8500 Series
Shielded Air Filters - Aluminum Mesh

Example: Part number 8502-1060-0250 is a shielded air filter with Style 2 frame, T.C.S. wire mesh and 3-layer aluminium screen. **Unless standard, the sequential number is assigned by the factory.**

8 5 X X – Y Y 6 0 – X X X X

8500 SERIES

FRAME (XX)
00 Custom
01 Style 1
02 Style 2
03 Style 3
04 Style 4

GASKET (YY)
00 None
10 Mesh (T.C.S.)
20 Mesh (Monel)
31 Twinseal With T.C.S. Mesh
32 Twinseal With Monel Mesh
33 Twinseal With Aluminium Mesh
40 Mesh (Aluminium)
90 Custom

FILTER MEDIUM (60)
60 Aluminium 3-Layer Screen

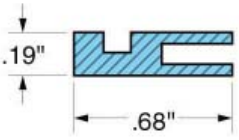
SEQUENTIAL (XXXX)

Thin Screen Shielded Air Filters

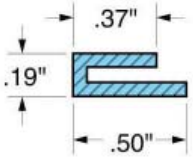
Composed of expanded multi-layer aluminium, Thin Screen Shields combine the functions of EMI shielding with efficient dust filtering and ventilation. Thinner than electronic filter dust shields, they provide better dust extraction, but with greater restriction of air flow. They cost less than electronic dust shields and honeycomb.

Thin screen "C" channel frame styles

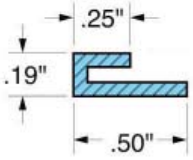
Style A



Style B



Style C



Special Notes

Avoid locating holes or fasteners in corners of frame.

HOW TO ORDER

8900 Series
Shielded Air Filters - Thin Screen Shields

Example: Part number 8920-2070-0100 is Thin Shield Screen with Style A frame and mesh gasketing. **Sequential number is assigned by the factory. Note: When ordering, furnish a detailed drawing specifying size, hole locations and frame design.**

8 9 X X – Y Y 7 0 – X X X X

8900 SERIES

FRAME (XX)
20 Style A
30 Style B
40 Style C

GASKET (YY)
00 None
20 Mesh (Monel)

FILTER MEDIUM (70)
70 Thin Screen

SEQUENTIAL (XXXX)

TBA
Protective Solutions

Unit 3, Transpennine Trading Estate,
Gorrells Way, Rochdale OL11 2PX

Tel. +44 (0)1706 647718
Fax. +44 (0)1706 646170

email. info@tbaps.com
www.tbaps.com