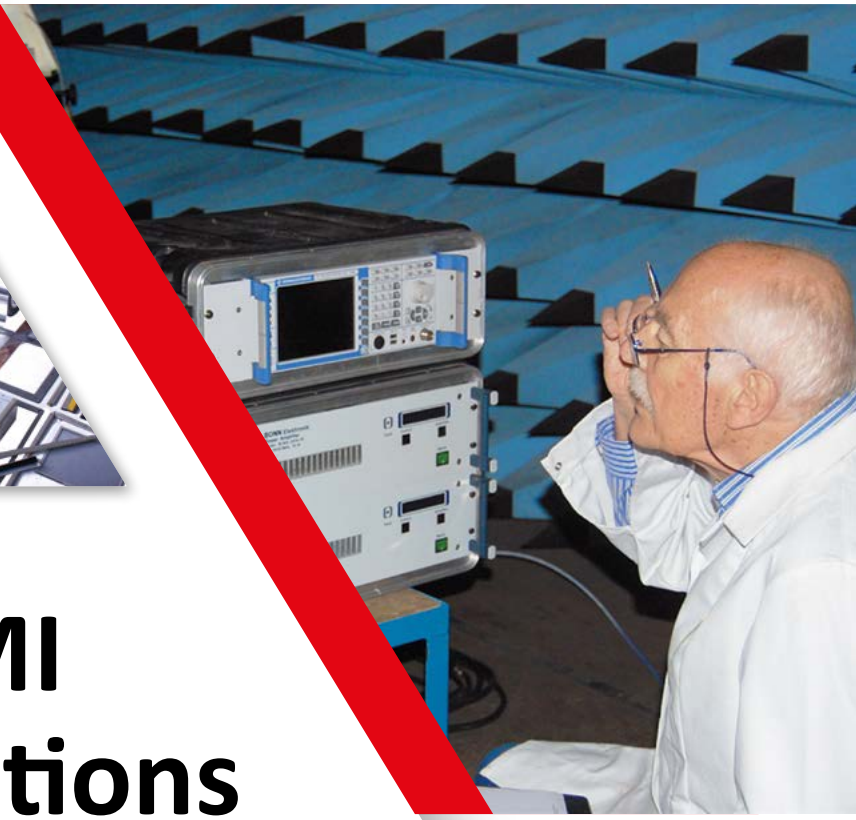
engineering shielding



innovative EMI shielding solutions

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- We work with precision, fast and at reasonable prices
- We always find a solution for our customers

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101 Shielding tips and tricks

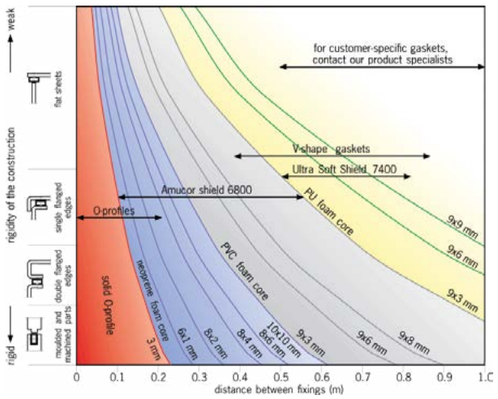
Shielding radiated emission and susceptibility of electronics components can be done in many ways. Sometimes it is possible to achieve the same goal in 10 different ways. But what is the most economical manner and which has the longest lifespan?

On this page and the following pages we have 101 shielding tips and tricks that can help you make the right choice.

If you have any questions, do not hesitate and contact one of our enthusiastic EMI problem solvers today.

Please note, red squares with numbers in the drawing refer to the corresponding tip or trick

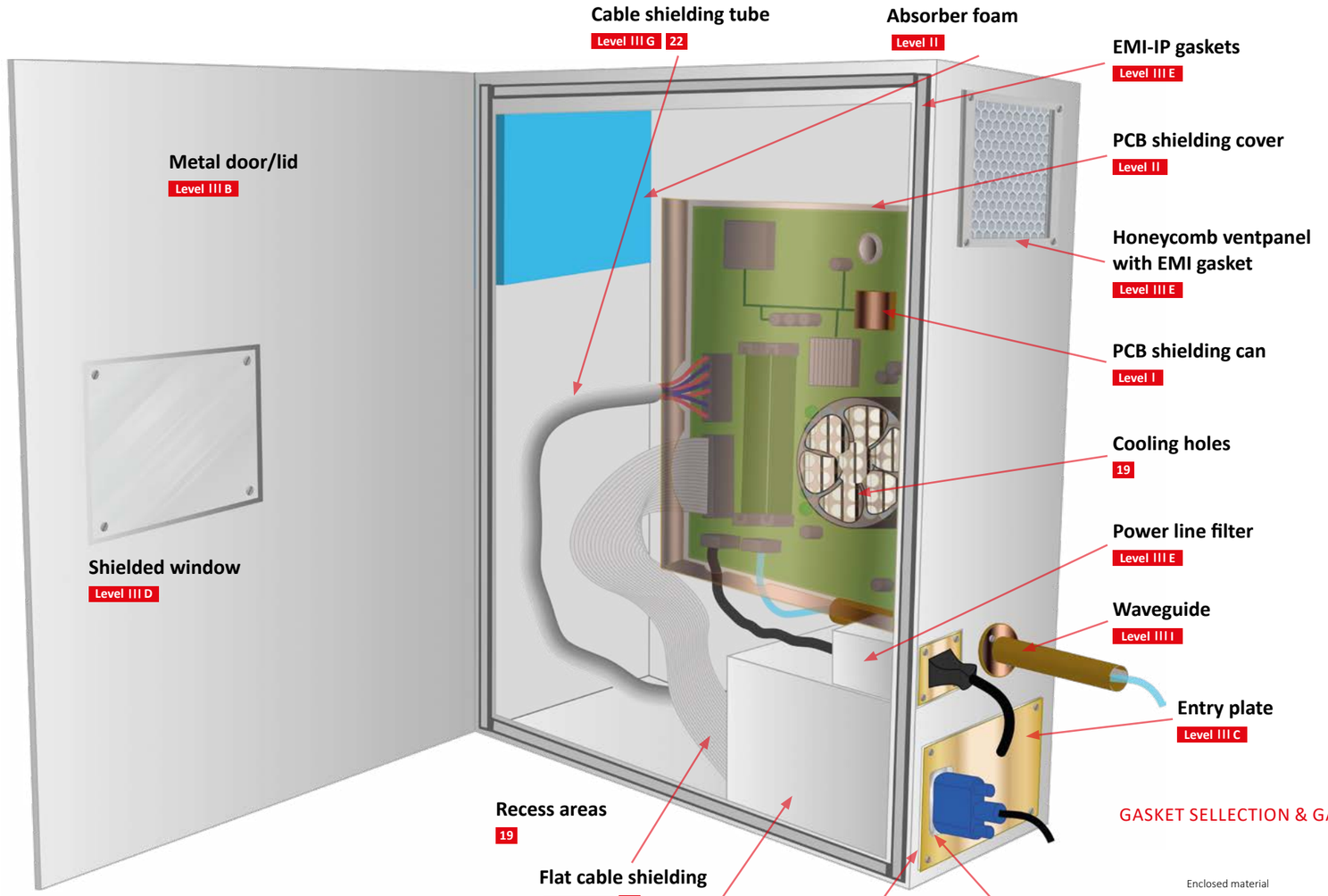
GASKET SELECTION & STIFFNESS OF ENCLOSURE



IP RATINGS

Shielding gaskets can be broken down into four classifications of environmental resistance. The following table explains the required installation environment for Holland Shielding Systems BV EMI-IP gaskets

Classification	IP Rating	Location	Description
Indoor	< 44	Indoor	Not intended for submersion in water. Installation in an indoor location required
Weather resistant	44- 65	Indoor / Outdoor under shelter	Not intended for submersion in water. Installation in a sheltered location required
Weatherproof	66- 67	Indoor / Outdoor	Not intended for submersion in water. Installation in a sheltered location recommended.
Submersible	68	Underwater	Full immersion.



GASKET SELLECTION & GALVANIC CORROSION

Enclosed material	Volts	Gasket material		
		Amucor shield	Ultra soft shield / Monel	Tinned copper
Zinc die-casting alloy	-1.10			
Zinc plating on steel, chromate passivated	-1.05			
Cadmium plating on steel	-0.80			
Aluminium, wrought, cast A1	-0.75			
Iron and steel: not corrosion resisting	-0.70			
Aluminium allow/Amucor	-0.65	*		
Duralumin	-0.60			
Tin plate (T.C.S.)	-0.50			*
Tin plating on steel	-0.45			
Chromium plating on nickel plated steel	-0.45			
Iron and steel: corrosion resisting, 12% Cr	-0.45			
Iron and steel: corrosion resisting, high Cr	-0.35			
Copper and its alloys, conductive fabric	-0.25		*	
Nickel-copper alloys, inc. Monel	-0.25			
Silver	0			
Carbon(colloidal graphite in acetone)	+0.10			
Gold	+0.15			
Platinum	+0.15			

PRINCIPLE OF SHIELDING

1 The principle of shielding is **creating a conductive layer completely surrounding the object** you want to shield. This was invented by Michael Faraday and this system is known as a Faraday cage.

2 **Ideally, the shielding layer will be made up of conductive sheets or layers of metal** that are connected by means of welding or soldering, without any interruptions. The shielding is perfect when there is no difference in conductivity between the used materials. When dealing with frequencies below 30 MHz, the metal thickness affects shielding effectiveness. We also offer a range of shielding methods for plastic enclosures. A complete absence of interruptions is not a realistic goal since the Faraday cage will have to be opened from time to time so electronics, equipment, or people can be moved in or out. Openings are also needed for displays, ventilation, cooling, power supply, signals, etc.

3 **Shielding works in both directions**: items inside the shielded room are shielded from outside influences. (Fig. 3)

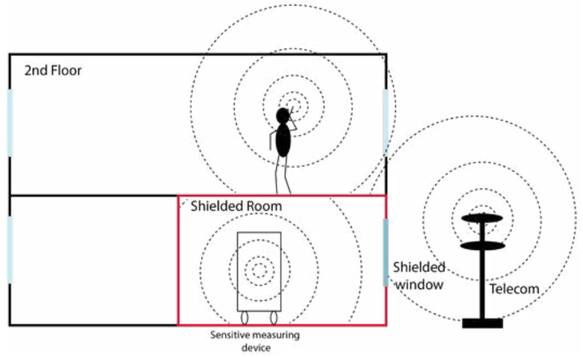


Figure 3: Shielding works in both directions

4 **The quality of the cage** is expressed as the ratio of the field strength in Volts/meter (V/m) inside the cage and outside the cage.

5 It is common practice to **present field strength Figures in a logarithmic scale (in dB)**.

6 **The reduction depends on the frequency** in Hz. Each frequency has a wavelength in meters.
For example 100 MHz = 100.000 kHz = 3 meter. For a better explanation, see the table on the right. (Fig. 6)

40 dB	100 times reduction of the field strength
60 dB	1.000 times
80 dB	10.000 times
100 dB	100.000 times
120 dB	1 million times
140 dB and up	Very difficult to measure, and only used in scientific applications

Figure 6: The reduction depends on the frequencyWaves

» 101 Shielding tips and tricks

WAVES

7 **A wave is a combination of electric field and magnetic fields**.
A electromagnetic wave is composed of a magnetic part depending on the electric current (ampere), and an electrical section, depending on the electrical voltage (volts). Near the source (near-field) the magnetic part is dominant.
At a greater distance, the electrical part and the magnetic part are present in a fixed ratio (far field). (Fig. 7)

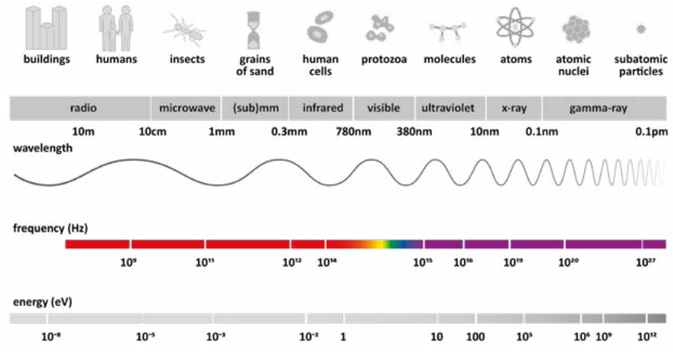


Figure 7: Wavelength vs. Frequency

8 **The material thickness determines which frequencies** are blocked from penetrating into or out of the cage. For low frequencies like 10 kHz (generally the near-field/magnetic fields), a mild steel layer of 6mm is needed to achieve a reduction of 80 dB, but a frequency of 30 MHz can be shielded by copper foil that is only 0.03mm thick. For higher frequencies in the GHz area the mechanical strength of the used shielding material will generally specify the thickness of the shield.

9 **For very low frequencies and DC** where the magnetic field is dominant, besides thick layers also special materials like Mu-metal and Mu-ferro alloys are needed. In addition, combinations of multiple layers are required to get sufficient shielding performance. Please consult our engineers.

10 **When a wire penetrates a shield** that is not completely connected to the shield, it will work as an antenna and this reduce the shielding performance of the cage. This is especially the case at higher frequencies. (Fig. 10)

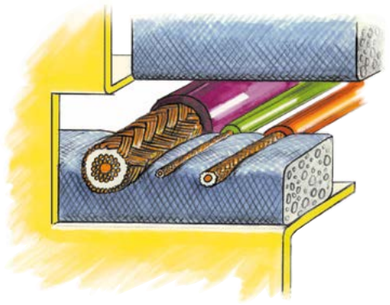


Figure 10: Wires penetrates a shieldv

WHY THE FARADAY CAGE PRINCIPLE FOR EMI SHIELDING?

11 Circumstances in which EMI shielding has to be implemented

- When a product has to meet government standards like CE or FCC which regulate immunity and compatibility of products.
- The regulations do not cover the requirements of daily practice (e.g. medical instruments are tested at 3 meters distance while they are used within 15 cm).
- Extra safety is desired for military use, e.g. for EMP (electromagnetic pulses).
- If someone wants to create increased levels of shielding for TEMPEST requirements, so that there is no risk of spying.
- Sensitive instruments or equipment are to be protected from interfering or harmful frequencies.
- Rules for sensitive measuring and weight equipment like balances and petrol-delivery materials have to be met.

12 Other aspects related to shielding

- Regulations regarding ESD (electrostatic discharge).
- Regulations regarding ATEX (explosion safety).
- Lightning protection / EMP/ HEMP / NEMP.
- Short circuit protection / prevention of sparks.

13 Identification systems like RFID (Radio Frequency Identification) prevent RFID from making contact with the stations. Several frequency ranges, lower the frequency are for longer distances.

- 125 kHz (Low Frequency)
- 13.56 MHz (High Frequency)
- 860 to 950 MHz (Ultra High Frequency)
- 2.45 GHz (Microwave)

14 Medical / personal protection: Shielding certain frequencies can prevent illness caused by radiation levels. Protective clothing can reduce field strength. Depending on the density. To this end, there is personal protection in the form of clothing, hats, gloves, stockings, sleeping bags, tents, and so on.

15 HOW TO CREATE OPTIMAL EMI SHIELDING

In general, a shield consisting of more layers or zones is cheaper to produce than a shield made out of 1 high performance layer. It is easy to create 3 zones.

Level I The component on the PCB is shielded by a can. Shielding at the source. (Fig. 15.1)
Level II The entire PCB is shielded by foil, wraps or a box or the PCB and all the cables are connected inside the shielded box. (Fig. 15.2)
Level III Or the outer housing is shielded as well. (Fig. 15.3)

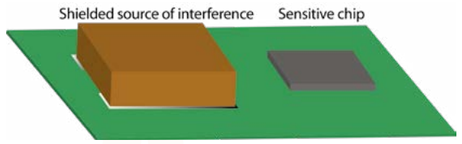


Figure 15.1: Shielding at the sourceFigure

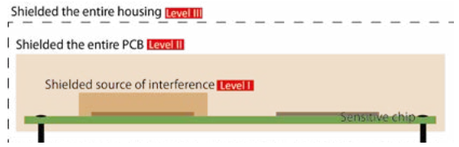
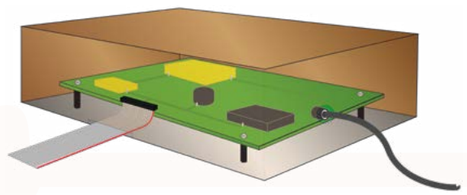


Figure 15.2: Shielding the entire PCB



15.3: Shielding in three levels, see tip 16- 24

Level I

16 SHIELDING AT THE SOURCE

Shielding at the source is usually the most cost-effective solution. Generally speaking, the source of unwanted radiation can be produced by voltage and current through one or more components or interconnections on the PCB.
The application of shielding can reduce it directly at the source.

17 Clip mounting

Shielding cans are mounted onto the PCB with SMD clips, which come in several sizes. After the re-flow, the can (a cover with walls attached) is placed into the clips and can subsequently be removed for adjustments.

18 Pin mounting

There are also systems with pins for though holes or covers with integrated pins that can be soldered directly onto the PCB. (Fig. 18)

19 Shield layout

Cooling holes can be made in the cover or steps to prevent short circuits with the tracks on the PCB. (Fig. 19.1)
Covers can also consist of a fixed part on the PCB (fence) and a separate cover that is clipped on to this fence. (Fig. 19.2 and Fig. 19.3) (Fig. 19.2)

Figure 18: Pin mounting used to mount PCB shielding cans

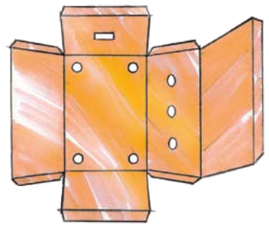


Figure 19.1: Example of a shield layout with holes and openings for cables

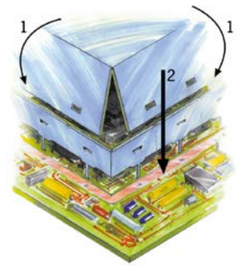


Figure 19.2: Fixed part on the PCB and a separate cover

Level II

20 Covering the entire PCB

Another option is covering the entire PCB in shielding material. This can be achieved either by means of small housing, custom-made to exactly the right shape, or by simply wrapping or sticking material around the PCB.
Foils, textiles, stretch material, and wrap shields, cut to the appropriate shape, are easy to apply. Since it is always important to prevent short circuits, all materials can be provided with insulation layers.

CABLE SHIELDING

21 Cables inside the housing

Once the PCB is covered, the attached cables can also be shielded. The longer a cable, the higher its potential for emitting lower frequencies. Shielding a wire inside the enclosure will also prevent cross-talk and will make the main enclosure act as a cavity, and thus amplify the radiation. To prevent this, the enclosure can be (partly) laminated with EM absorption material.

22 For round and flat cables we produce shields in the shape of sleeves, wraps, tubes, and textiles so that all types of cables can be shielded. Some cable shields need to be grounded at both ends, but it is usually best to ground at only one end to prevent common-mode currents

CABLE SHIELDING

23 **The housings themselves, i.e. the rack, the box, the enclosure, the metalized box, and the Faraday cage** they constitute the main cover of the entire system and also the connection to the outside world. Housings are equipped with displays, entries for power and signal lines, and cooling air-vents. For more information see the case at the beginning of this article.

24 **Elements that can reduce the effectiveness of a Faraday cage**

Level III A 26 32	Seams (Fig. 24.1)
Level III B 45	Doors
Level III C 10 63 69	Entries
Level III D 70 74	Transparent displays
Level III E 79	Ventilation panels
Level III F 64 69	Cables for power supply
Level III G 65	Cables for signals
Level III H 64 69	Pipes for fluids, air, heating (Fig. 24.2)
Level III I 64 69	Cables for optical connection

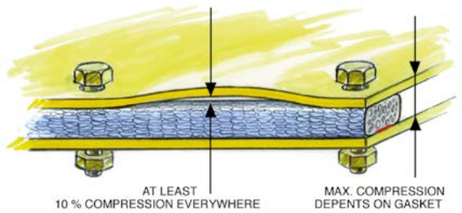


Figure 24.1: The pressing force on the panels of the housing is minimized.

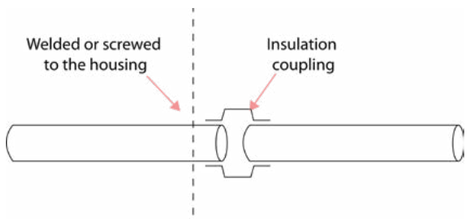


Figure 24.2: Pipes of conductive material need insulating couplings.

SEAMS

25 It is important for the conductivity of the seam to be more or less identical to that of the basic material that the cage is constructed out of. Welding or soldering tends to works best, but for places that have to be opened easily several mechanical connection methods are available: clamping, screwing, adhesive, sealing, sticking.

26 **Characteristics of an optimal seam**

- It is flat and smooth
- It has the right dimensions (Fig. 26.1)
- The construction is stiff enough (Fig. 26.1)
- It is and will remain free of corrosion (Fig. 26.2)
- If possible, it is in a single plane

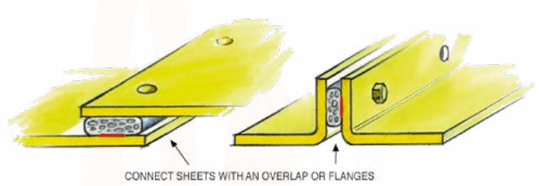


Figure 26.1: Examples of a stiff construction to prevent openings.

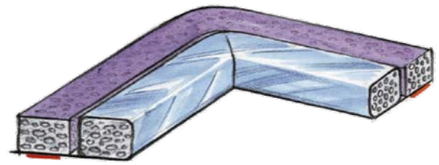


Figure 26.2: A EMI gasket combined with an environmental seal.

» 101 Shielding tips and tricks

27 **A superior flat surface** can be achieved by machining and finally grinding the top surface.
This is an expensive process and requires a stiff construction.

28 To reduce costs, **the connection can be improved by using a conductive gasket**, which will fill in any gaps. A gasket can also be used to seal against water or to meet other IP demands.

29 **The softer the gasket**, the more tolerance can be compensated, and the lighter the eventual construction will be.

30 **If more tolerance is allowed**, a less accurate production method can be used and production becomes more cost-effective.

31 **A lighter construction** can also be affected by having smaller distances between the fixings: this results in more hinges, more locks, and more bolts. All of these extra elements result in higher cost and longer mounting and demounting times.

32 **Right dimension** It is possible to integrate an IP sealing with the EMI gasket. The IP gasket on the “waterside “ protects the EMI gasket against corrosion.

PREVENTION OF CORROSION

33 **In the design stage, it is important to specify the environment**
It makes a difference whether the construction has to be able to withstand only humidity, or exposure to water (possibly even saltwater), fog, or condensation, e.g. during transport.

34 **If the metal of the housing is sensitive to corrosion**, a finishing of e.g. nickel and chrome can help the contact surface maintain the required conductivity. Materials like aluminium and zinc-plated steel develop an oxidation layer, which reduces the corrosion process but is less conductive.

35 **Gasket selection & galvanic corrosion**
Even when the materials of the housing withstand corrosion well, it is important that they work together not only with one another but also with the gasket (Fig. 35).

Enclosed material	Volts	Gasket material		
		Amucor shield	Ultra soft shield / Monel	Tinned copper
Zinc die-casting alloy	-1.10			
Zinc plating on steel, chromate passivated	-1.05			
Cadmium plating on steel	-0.80			
Aluminium, wrought, cast A1	-0.75			
Iron and steel: not corrosion resisting	-0.70			
Aluminium allow/Amucor	-0.65	*		
Duralumin	-0.60			
Tin plate (T.C.S.)	-0.50			*
Tin plating on steel	-0.45			
Chromium plating on nickel-plated steel	-0.45			
Iron and steel: corrosion-resisting, 12% Cr	-0.45			
Iron and steel: corrosion-resisting, high Cr	-0.35			
Copper and its alloys, conductive fabric	-0.25		*	
Nickel-copper alloys, inc. Monel	-0.25			
Silver	0			
Carbon (colloidal graphite in acetone)	+0.10			
Gold	+0.15			
Platinum	+0.15			

Figure 35: Galvanic corrosion table

36 **Sea/water environment:** In a situation where the galvanic values of the gasket and the housing material differ more than 0.3 volts in a salty environment, or 0.5 volts in an environment with just water, galvanic corrosion will occur. Even at a distance of 10 km from the sea, the atmosphere may be as salty as right on the coast. So the appropriate gasket material has to be chosen, see gasket selection graph.

37 **Around the bolt holes should be sufficient space for a water seal**.
Water should never reach the EMI gasket or the construction via the bolt holes. Alternatively extra water sealing can be applied around the bolts in the form of rings. (Fig. 37)

38 **For small parts**, where there is less space a gasket out of e.g. electrically conductive rubber can be used. These are available in profiles and plates, which can be cut accurately to the required dimensions.

39 **For bigger parts** it can be more efficient to use a combined gasket. An EMI gasket with a water seal made of neoprene, silicone or EPDM rubber. (Fig. 39)

40 **Neoprene has quite good flame retardant properties and can handle temperatures of -40 to +100 °C**.
EPDM rubber can withstand temperatures up to 120 degrees, making it suitable for the engine compartment of cars. Silicone rubber is used for temperatures up to 220 °C; it can be sterilized for medical applications and is soft. The rubbers can either be made in the shape of a foam or mousse or as a solid product.

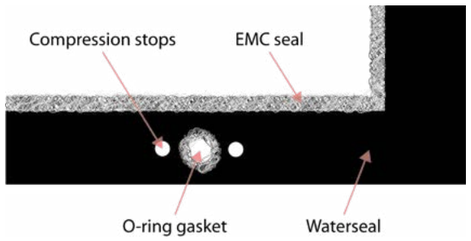


Figure 37: EMC / IP gasket example

Figure 39: Combined gasket (Waterseal combined with EMC seal)

RULES OF THUMB FOR GASKET CHOICE, DEPENDING ON THE TYPE OF ENCLOSURE

41 **Very small construction**: (smaller than 150 x 150) grooves, casted, molded or machined: conductive profiles, o-ring or cut gasket out of highly conductive rubber are suitable. (Fig. 41)

42 **Small construction**: (about 200 x 200mm) multi-shield gasket, consisting of metal wire from top to bottom though a soft silicone rubber with a thickness of 2-3mm are suitable. (Fig. 42)

43 **Medium size construction:** zinc-plated steel/metal: standard shield, neoprene foam with water seal, minimum width about 4mm and thickness 2-3mm. (Fig. 43)

44 **Full size rack with door:** Ultra-soft twin shield with separate water seal or knitted mesh over silicone tube with water seal, V-shape with additional water sealing, thickness 6-10mm are suitable. Other products like finger strips, textile-covered parts, clip-on gaskets or custom build hybrid gaskets are suitable. (Fig. 44)

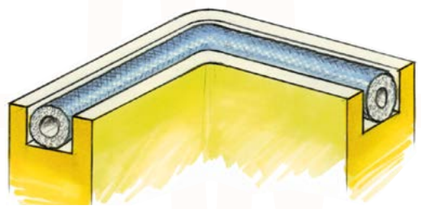


Figure 41: Groove construction with conductive o-ring gasket

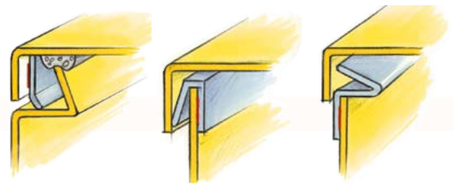


Figure 42: Solutions for medium size constructions

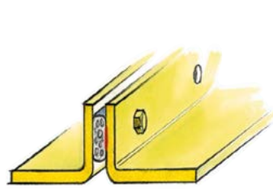


Figure 43: Solutions for small constructions

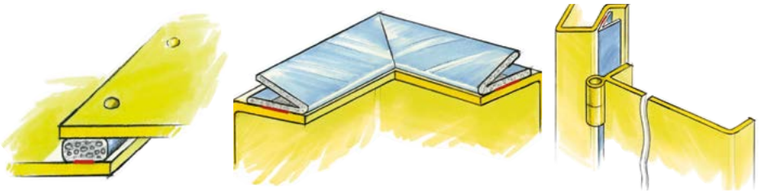


Figure 44: Solutions for larger constructions like server racks

SHIELDED DOORS

45 The closing force of a shielded door/Faraday cage door should be reduced as much as possible so that it can be opened by hands. For more information read 55.

46 **Gasket thickness:** Ultra-soft gaskets will help limit the closing force as well as bending of the door.

47 Just as indication, at a server cabinet of 600 x 2500mm, a gasket of 6mm thick may be used and an electronics housing 200x600mm a gasket of 6 x 4mm is an optimal size. All our gaskets can also be provided with water sealing.
In order for a gasket to have **sufficient stability**, its width should exceed its height.

48 In the case of **a screwed connection** at a housing, entry panels, windows, or vent panels, the closing force is less important. Depending on the plate thickness and bolt distance, 1-2mm is common and Amucor shield is a very good choice for the materials used most often.

49 When the housing has only **one edge flange** while a water and EMI seal are needed, this can be created by using clip-on gaskets. Of these gaskets more than 200 different shapes have been produced edged with mesh or highly conductive textiles. They are mounted by means of clamping. When we cut them into shape according to the customer's wishes, they can even make angles of 90 degrees.

50 For instruments and introducing **high currents** into a construction we make over 2400 different Be-Cu finger strips. These are not allowed in every country and are susceptible to being damaged when they are used in a construction that is not protected properly (knife-edge).

51 **Gaskets can be made in the shape of a frame**, complete with mounting holes and self-adhesive strip for mounting, if desired.

52 **In order to keep a gasket from becoming overly compressed**, it is possible to add compression stops next to the bolt holes. If there is enough space, plastic or metal rings (compression stops) with the final thickness can be integrated in the gasket.

53 For **easy mounting** there are gaskets in a P-shape or U-shape available. These gaskets can be easily mounted on a rim due to their shape. (Fig. 53)

54 **L-shaped gasket** can be used in constructions where EMI with water sealing is required and when there is just one flange. Maximum compression is 30%. (Fig. 54)

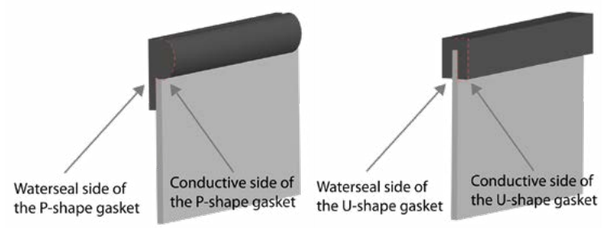


Figure 53: Example of a p-shape gasket and a u-shape gasket

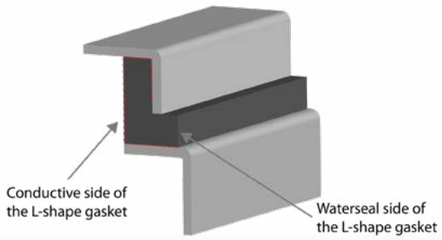


Figure 54: Example image of a L-shape gasket

55 **To prevent high closure force** V-shaped gaskets can be used which clamp the door not in the direction of the opening but in the direction of the door, so only the friction force is the closing force. (Fig. 55)

56 For **special constructions** our custom-built profiles can help to create an optimal seal.

57 **Watertight EMI gaskets in any shape** can be cut out of sheets of material like conductive rubber, or multi-shield with small conductive wires in the material. They have a compression of 10-15%. (Fig. 57)

58 **Conductive foam** is an open structure so it is not watertight, but it can be combined with a watertight neoprene gasket.

59 **Knitted mesh for military and low-frequency use** is available made out of full metal (10-15% compression) neoprene foam covered with knitted metal wires which has 30-40% compression. Silicone tube covered with knitting has up to 50% compression and low compression force.

60 The **knitted-mesh gasket** can be mounted into a groove or can be produced with a fin so that it can be screwed or clamped.

61 **When there is no groove in your construction** the knitted wire mesh gasket can be glued to self-adhesive rubber, to keep it in place.

62 For **high-performance gaskets** to seal gaps in for example Faraday cages for sensitive measurement the gaskets can be produced in a double implementation and bolted in the center.

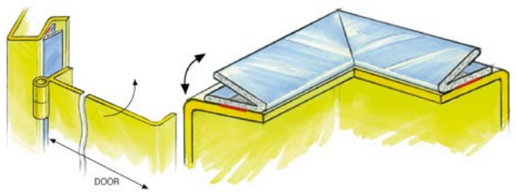


Figure 55: V-shape gasket to prevent high closure force

Figure 57: Conductive rubber gaskets can be cut in any shape according to customer drawing

CABLE SHIELDING

63 **Cables entering a Faraday cage can carry undesirable signals** into and out of the housing. When these cables are shielded, the cable shield should be 360 degrees around the cable, and be connected to the housing using a gland or cable entry plate. Entry shielding is also available in watertight and flame retardant versions. Power lines and signal lines should be filtered when it is not certain what frequencies are on the line. (Fig. 63)

64 **Filters for power, signals and data.** A power line coming from the grid function as an antenna of immense length and brings many unwanted frequencies with it. It has to be “cleaned” by a filter before entering the shielded room. The same goes for signal lines and pipes going into the housing. They will work as an antenna and interfere with the shielding. (Fig. 64)

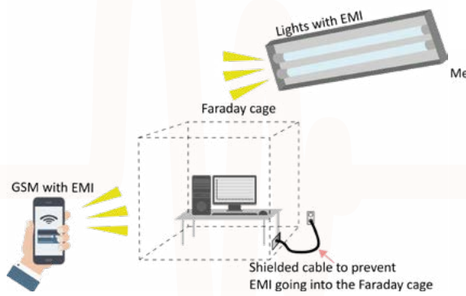


Figure 63: Cables entering a Faraday cage can carry undesirable signals

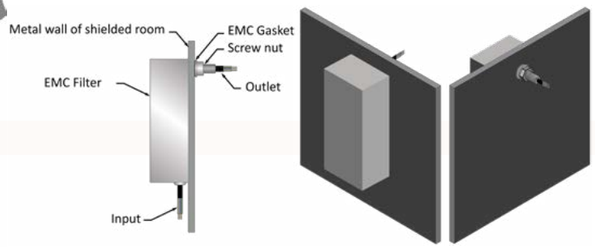


Figure 64: Example of a power line filter mounted on a Faraday cage wall

65 **Shielding for data lines** is done by converting the signal to light and bring the signal into the shielded room via a fiber optic cable through a waveguide. The fiber optic cable is non-conductive and will not bring in unwanted signals. (Fig. 65)

66 **A power- or signal line filter should be grounded** to the Faraday cage so that there is a connection with a low impedance to the body of the shield. This is needed for discharging unwanted signals.

67 **It is best to position all filters close together but to separate the signal line filters away from the power line filters** to prevent currents through the cage wall from the power line filters interfering with the signal line filters.

68 **The shielded housing creates a new “ground”** and should be connected to the common ground of the building, only for safety reasons. This is to prevent voltage on the cage in respect to the earth.

69 **When you want to enter a clean ground line inside the cage,** other than the earth line of the housing you also need a ground line filter for this extra clean ground line.

Figure 65: Example of a fiber optic converter combined with a waveguide solution

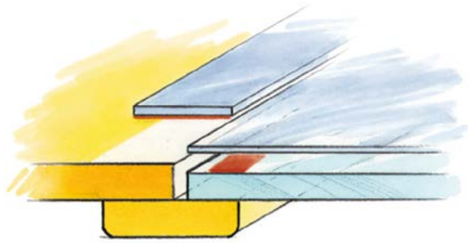


Figure 71: Example drawing of a clamp structure for mounting a transparent shielding

DISPLAYS

70 **Products for transparent shielding**

- Woven mesh 73
- Woven mesh between sheets of acrylic, polycarbonate or glass, connected at the edges (edge bonded) 73
- Woven mesh, fully laminated between plates of acrylic, polycarbonate or glass 73
- Woven mesh between foil with or without self-adhesive (mesh foil) 73
- Indium tin oxide (ITO) on foil or glass, 4 or 6mm (transparent foil)
- Copper grid on foil, high light transmission versus shielding performance 74
- High performance combinations of above materials, framed in metal with gaskets for easy mounting 75
- Transparent foil with anti-static layer (ESD foil)

71 **Mounting a transparent window.**
In order to ensure good shielding performance a transparent conductive shield can be provided with a silver contact busbar. Some shields can be made with flying mesh so that the flying mesh can be connected to the shielded housing. The shielded window should make full contact with the housing on all its sides by means of conductive adhesives, conductive seals, tape with conductive adhesive, or clamping with a gasket if desired. (Fig. 71)

72 **Conductive foils can be stuck to a standard screen or window with cleanly removable self-adhesive**.
More rigid transparent shields can be made with a frame or mounted with a bezel.

Warning
It is currently not possible to make transparent shields 100% optically correct because of the so called moiré effect, so minor disturbances have to be accepted.

CHOICE OF TRANSPARENT MATERIAL

73 **Mesh foil**
For shielding at low frequencies, mesh shielding types show the best performance. They have lower light transmission than for example ITO coated windows and foils but that is considered normal for a display rather than a problem. (Fig. 73)

When the foil is applied to a monitor and the lines of the mesh in the film do not correspond with the dots of the monitor a Newton's ring effect or a moiré pattern will arise. Orienting the mesh at a certain angle between 17 and 45 degrees will minimize this effect.
Please note: there is a physical rule: the finer the mesh, the darker the material, the better the shielding performance.

74 **ITO Coating**
Indium tin oxide coating does not produce a moiré effect and offers good shielding at higher frequencies.
The product is however sensitive to acid substances, such as for instance found in finger prints. Optionally a plastic film layer may be applied in order to protect the ITO layer. (Fig. 74)

75 **Framed windows**
We produce turnkey shielded windows with up-to and even over 100 dB attenuation that can be installed directly into an MRI room. These windows are framed and have several layers of shielding, all of which are connected to one another. (Fig. 75)

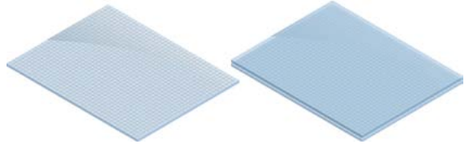


Figure 73: Example of a single layer mesh foil window (mesh bonded on the top of a window) and a double layer mesh foil window (mesh between two layers of glass or plastic).

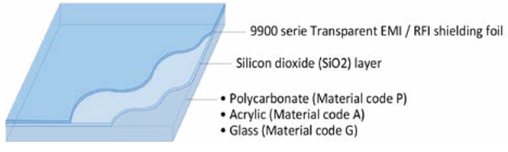


Figure 74: Possible structure of an ITO window

SHIELDING METHODS FOR PLASTIC HOUSING

76 It is possible to apply a **shielding foil** inside the housing, either completely or partially glued to the housing.
With the use of stiffer foils a shielded box can be created inside the plastic housing in cases where there is no need to have the housing fit a specific shape. Lips on the precut foil can be used for grounding and/or mounting.

77 **For housings with complex shapes**, a shielding paint or spray (in cans) can be used. The paint is filled with conductive metal particles like nickel, copper, silver or combinations.

78 **Metalization** under vacuum (sputtering) is another option; this can also be done partially.
Since a jig is needed for this process, it is not recommended for small production amounts. (Fig. 78)

79 Parts can be subjected to **galvanic treatment** when dealing with larger quantities.

Figure 75: Example of a framed ready to install high performance shielding window

Figure 78: Example of plastic housings with shielding paint.

VENTILATION PANELS

80 Within a few days we can produce **Honeycomb ventilation panels** according to the customer's drawing.
The honeycomb structure is like waveguides and lets air though while blocking electromagnetic waves from entering.

The cell size of the honeycombs is 3.2mm and combinations of sever layers is possible, even under cross constructions for higher performance. A cross cell honeycomb consists of minimal two layers of Honeycomb material stepped and rotated 90 degrees relative to each other. This results in a good shielding performance independent of the polarization of the waves. (Fig. 80)

81 **To prevent from dust**, a dust filter can be integrated in the ventilation panel. The dust filter can also be mounted to the outside of the enclosure. (Fig. 81)

82 The standard cost-effective honeycomb is made of aluminium but **for special applications like EMP** it can also be made out of mild steel, which is more expensive. (Fig. 82)

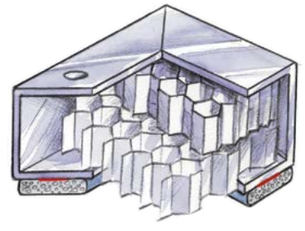


Figure 80: Example of a cross-cell Honeycomb ventilation panel

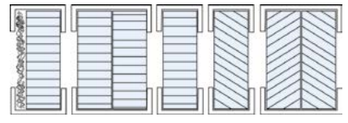


Figure 81: From left to right, Honeycomb with dust filter, cross cell, single cell straight, single cell slant 45 degrees, double slant to prevent eavesdropping

Figure 82: Picture of a EMP proof Honeycomb ventilation panel

83 **A honeycomb ventilation panel can be framed and pre-drilled on request for easy mounting** or can be produced frameless with optional a pressed flange for smaller constructions or when the honeycomb ventilation panel is mounted in a clamped construction.

84 **For outdoor use** the honeycomb can be treated with a nickel or other finish. This is to protect the honeycomb ventilation panel from environmental influences such as corrosion.

85 **To keep raindrops from falling into the enclosure** we can make the honeycomb also at a slant (45 degrees is standard)

86 **Two layers of slanted honeycomb** placed opposite to one another also make it impossible for metal rods to be entered into the cage, and thus prevent from electrocution.

87 **Mounting framed honeycombs** can be done via through holes or threaded holes which are flow drilled into the frame in order to achieve a good screw length. Flow drilling is better than using rivets which may become loosened.

88 **Honeycombs can also be used as flow straighteners** since the structure of the honeycomb material ensures that air is blown in a fixed direction.

89 **The honeycombs can optionally be provided with a flange** so that the honeycomb after mounting forms one whole shape with the shielded enclosure. (Fig 89.1 & 89.2)

Figure 89.1: Picture of a frameless Honeycomb.

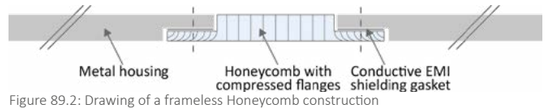


Figure 89.2: Drawing of a frameless Honeycomb construction

Index

CABLES

73 **Cables from and to a shielded enclosure** should also be shielded when no sufficient entry like power line filters are used.

Optimal cable shielding can be achieved with several materials like conductive flexible shielding tubes, wraps made of knitted metal, highly conductivity textiles or foils. All these materials can be supplied with- or without self-adhesive

The cable shield should be low impedance connected at the entrance of the screen, wall or body of the shielded enclosure. That way there is not only a galvanic connection but this also creates a high frequency coupling.
A full 360-degrees connection around the cable works best. For this purpose we produce cable entries. (Fig. 92)

74

Figure 92: Example of a full 360 degrees connection around the cable

75 **Inside the enclosure cables can emit radiation which can then be amplified by the cavity of the enclosure**, so it may be important to also shield the cables inside the enclosure. Tie-wraps and compressible cable-clamping strips can be helpful to make good connections with the conductive metal connector of the cable.

FINGERSTRIPS

To pass on higher currents for entry plates and so on, a very good product are beryllium copper fingerstrips.
Please note that not all countries accept these due to the percentage of beryllium which is toxic, therefore we have developed many other types of conductive gaskets. Which are more friendly for the environment and also less sensitive for damaging.
Also a good solution is to place knit mesh between the entry panel and the cage wall.

For screwed connections the 2400 series twisted fingerstrips are very popular. They can be compressed to the fingerstrips material thickness like 0.25mm. Most versions can be sticked with a self-adhesive strip to keep the strip in place.

For shielded doors and Faraday cage doors you need a bigger range of compression. You find these in the 2800 series fingers can be clamped, soldered or screwed.

76 **The 2100 series clip-on mounting Fingerstrips can be clamped** on regular metal plate thicknesses like 0.5, 0.8, 1 and 1.5mm. Some even have lances so that the strip will not slip loose quickly.

When there is a wide range of compression required, our 2200 series Snap-on Fingerstrips or our 2300 series
77 Stick-on fingerstrips may be suitable. These fingerstrips with self-adhesive can be integrated in the construction. Snap-on Fingerstrips can be firmly mounted in slots in your construction so that also a compression to nearly 0.25 can be realized. (Fig. 98)

78

For special constructions the 2500 series show fingers mounted under an 90 degree angle. (Fig. 99)

79 **For circular mounting** the fingers in the 2600 series have on top of the finger spherical tips so that there is under any angle a good point contact.

For sliding, rotating and moving applications, please contact our specialists.
To prevent wear down there is a conductive lubricant available.

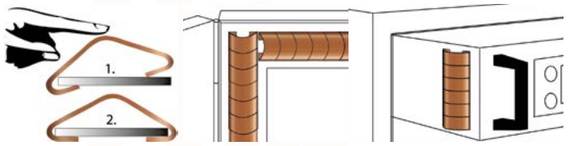


Figure 98: Snap-on fingerstrips for slot mounting and large compression

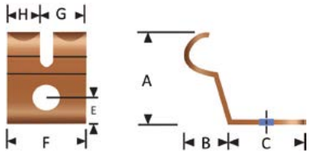
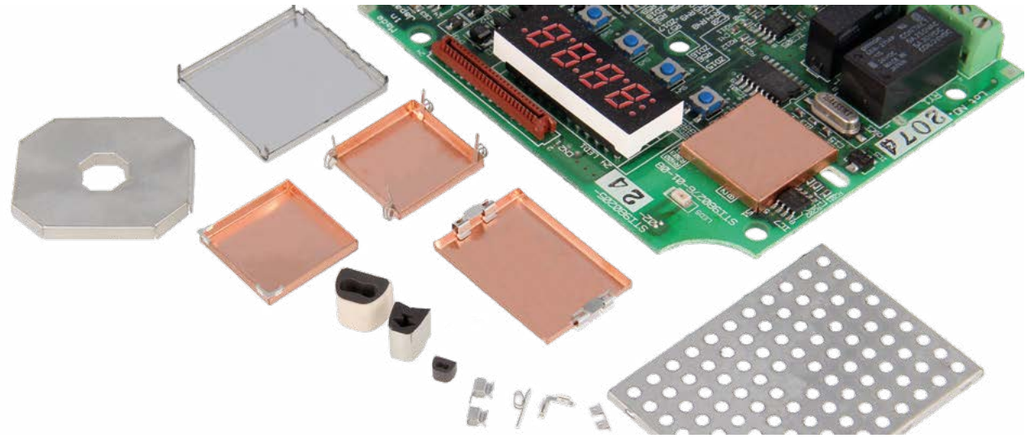


Figure 99: Example of finger under 90 degrees

Clip-on PCB shielding system 1500

EMI/RFI shielding and screening cans/covers for printed circuit boards



EMI screening covers (shielding cans) for PCB's were developed to shield only certain parts of electronic equipment from electromagnetic radiation at the source, rather than all of the components in the entire housing.

EMI shielding cans are available in standard sizes or can be produced customized within a few days.

Whether it is for a small number of prototypes or large production runs we can manufacture the precision components you require.

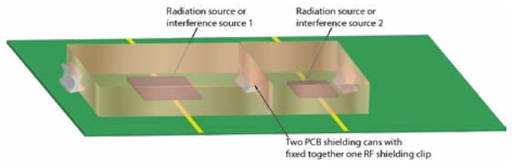
1500 Clip-on shielding system

This EMI/RFI shielding system for PCB's combines small pins or clips with a removable lid (PCB shielding can), which results in high-quality EMI/RFI shielding.

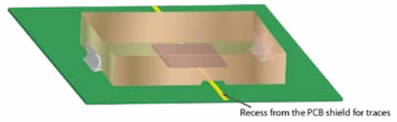
Advantages

- Less space taken up on the board
- Flexible clip positioning making the Clip-on system 1500 an excellent solution for series of 1 – 10.000 pieces
- For heavy-duty applications the lid can also be secured by soldering it to the clips and some of the pins
- Many different clips and pins are available for mounting the PCB shielding can to the PCB.

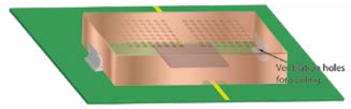
Design tips for PCB shielding cans



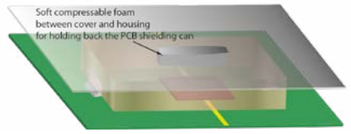
1. If you have two adjacent sources of interference you can place two PCB shielding cans right next to each other turning the shielding into one large can.



2. To prevent short-circuiting it is possible to make recessed areas in the PCB shielding can.



3. If the source of radiation or interference produces a lot of heat, it is advisable to make ventilation holes in the shielding can.



4. In order to prevent vibrations or movements from loosening the PCB shielding can from the RF shielding clips you can also place a piece of soft, compressible foam between the PCB and the housing of the device. For electric discharge, you can use an EMI gasket or an electrically conductive foam as well. For more design tips see our website.

Standard shielding cans Square PCB shielding cans (height 1 to 15mm)

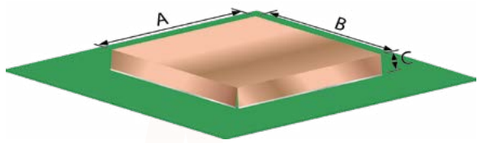
Length (mm)	Width (mm)	2	3	5	10	15
10	10	1500-10-10-2	1500-10-10-3	1500-10-10-5	1500-10-10-10	1500-10-10-15
15	15	1500-15-15-2	1500-15-15-3	1500-15-15-5	1500-15-15-10	1500-15-15-15
20	20	1500-20-20-2	1500-20-20-3	1500-20-20-5	1500-20-20-10	1500-20-20-15
25	25	1500-25-25-2	1500-25-25-3	1500-25-25-5	1500-25-25-10	1500-25-25-15
30	30	1500-30-30-2	1500-30-30-3	1500-30-30-5	1500-30-30-10	1500-30-30-15
35	35	1500-35-35-2	1500-35-35-3	1500-30-30-5	1500-30-30-10	1500-30-30-15
40	40	1500-40-40-2	1500-40-40-3	1500-40-40-5	1500-40-40-10	1500-40-40-15

Standard shielding cans Rectangular PCB shielding cans (1 to 15mm height)

Length A (mm)	Width B (mm)	2	3	5	10	15
10	15	1500-10-15-2	1500-10-15-3	1500-10-15-5	1500-10-15-10	1500-10-15-15
10	20	1500-10-20-2	1500-10-20-3	1500-10-20-5	1500-10-20-10	1500-10-20-15
10	25	1500-10-25-2	1500-10-25-3	1500-10-25-5	1500-10-25-10	1500-10-25-15
10	30	1500-10-30-2	1500-10-30-3	1500-10-30-5	1500-10-30-10	1500-10-30-15
10	35	1500-10-35-2	1500-10-35-3	1500-10-35-5	1500-10-35-10	1500-10-35-15
10	40	1500-10-40-2	1500-10-40-3	1500-10-40-5	1500-10-40-10	1500-10-40-15
10	45	1500-10-45-2	1500-10-45-3	1500-10-45-5	1500-10-45-10	1500-10-45-15
10	50	1500-10-50-2	1500-10-50-3	1500-10-50-5	1500-10-50-10	1500-10-50-15
15	20	1500-15-20-2	1500-15-20-3	1500-15-20-5	1500-15-20-10	1500-15-20-15
15	25	1500-15-25-2	1500-15-25-3	1500-15-25-5	1500-15-25-10	1500-15-25-15
15	30	1500-15-30-2	1500-15-30-3	1500-15-30-5	1500-15-30-10	1500-15-30-15
15	35	1500-15-35-2	1500-15-35-3	1500-15-35-5	1500-15-35-10	1500-15-35-15
15	40	1500-15-40-2	1500-15-40-3	1500-15-40-5	1500-15-40-10	1500-15-40-15
15	45	1500-15-45-2	1500-15-45-3	1500-15-45-5	1500-15-45-10	1500-15-45-15
15	50	1500-15-50-2	1500-15-50-3	1500-15-50-5	1500-15-50-10	1500-15-50-15

Please note: for more sizes see our website. Custom sizes and shapes can be produced on request and according to your drawing

PCB shielding cans order example



Please keep in mind: dimensions you specify are outside dimensions. Thickness of the material is standard 0.12 mm, optionally 0.18 mm or 0.20 mm. For example, when you order a 1500 series Clip-on shielding can of 10-20-5mm, the inside dimensions will be 9.76-19.76-4.88 mm.

Please note, no tooling cost if you use any of the above dimensions, with material thickness of 0.12 mm (standard). Standard tolerance for these products is +/- 0.1-0.2 mm.

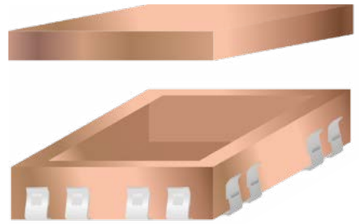
Material	Outer dimension (A)	Outer dimension (B)	Outer dimension (C)	Inner dimension (A)	Inner dimension (B)	Inner dimension (C)
Mu-copper 0.12mm	10mm	20mm	5mm	9.76mm	19.76mm	4.88mm
Mu-copper 0.18mm	10mm	20mm	5mm	9.64mm	19.64mm	4.82mm
Tinned steel 0.20mm	10mm	20mm	5mm	9.60mm	19.60mm	4.80mm

ORDER EXAMPLE

Series	Length (mm)	Width (mm)	Height (mm)	Material
1500	Length of the shielding cover in mm	Width of the shielding cover in mm	Height of the shielding cover in mm	**MU12 :** Mu-copper 0.12mm **MU18 :** Mu-copper 0.18mm **TMU12 :** Tinned Mu-copper 0.12 mm **TMU18 :** Tinned Mu-copper 0.18 mm **TS20 :** Tinned steel 0.20mm

Clip-on PCB shielding cans with cover 1505

A fence and a removable cover creating a very rigid shielding can for printed circuit boards. The fence need to be fixed to the PCB with SMD clips



EEMI screening covers (shielding cans) for PCB's were developed to shield only certain parts of electronic equipment from electromagnetic radiation at the source, rather than all of the components in the entire housing.

EMI shielding cans are available in standard sizes, or can be produced customized within a few days.

Whether it is for a small number of prototypes or large production runs, we can manufacture the precision components you require.

PCB shields consisting of partial two parts that together form a very solid and closed PCB shield but ease to open up.

The lid and the cover work together in one stroke, resulting in a very tight closure of the lid around the fence. Resulting in good quality EMI/RFI shielding.

Please keep in mind: dimensions you specify are outside dimensions. Thickness of the material is standard 0.12 mm, optionally 0.18 mm or 0.20 mm. For example, when you order a 1505 series of 10-20-5 mm, the inside dimensions will be 9.76-19.76-4.88 mm. Standard tolerance for these products is +/- 0.1-0.2 mm.

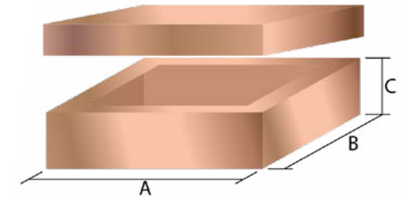
BENEFITS

- Easy cover removal for maintenance
- More robust design and therefore suitable for heavy applications
- Better corner closure, resulting in better shielding performance at today's higher frequencies

SMD mounting

The fence is mounted on the printed circuit board with tiny clips. Only the fence is attached to the PCB. The cover / lid can be slid over the fence and attaches very firmly.

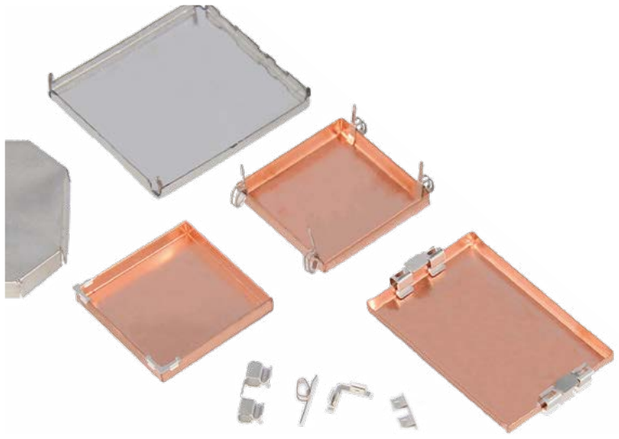
For applications where a lot of movement and / or vibrations can cause the cover / lid to release, a fence with pins that pass through the lid can be supplied. The pins can then be folded after placing the cover / lid so that it does not release from the fence.



ORDER EXAMPLE

Part number	Length A (mm)	Width B (mm)	Height C (mm)	Material
1505	Length of the shielding in mm	Width of the shielding in mm	Height of the shielding in mm Minimal 5 mm.	**MU12 :** Mu-copper 0.12mm **MU18 :** Mu-copper 0.18mm **TMU12 :** Tinned Mu-copper 0.12 mm **TMU18 :** Tinned Mu-copper 0.18 mm **TS20 :** Tinned steel 0.20mm

PCB clips



Introduction 1500 clips

The 1500 series PCB shielding clips are developed to fix a PCB shielding can onto the PCB. There are SMD and through hole mounting versions available. Easy to attach the PCB shielding into the clips and remove for maintenance.

Features

- Enhance your productivity by SMT process
- Seamless corners for ultra-high EMI shielding effect
- Reduce shield clip numbers to lower the costs

Advantages

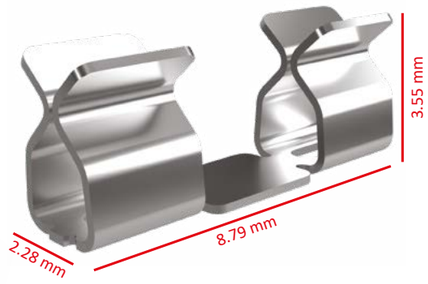
- Mass production
- Easy insertion and removal
- Convenient for re-work
- Also available in 90° version for seamless corners and high shielding effectiveness
- For mobile phones, MP3, PDA, navigation systems, internet repeaters, walkie talkies and much more...

ORDER EXAMPLE

Part number

LC : Large clip
MC : Medium clip
P : Small pin
TC : Tiny clip
TCC : Tiny corner clip
UTC : Ultra tiny clip
UUTC: Ultra tiny corner clip

Large clip (for 1500 series) LC



The large clip is a metal clip designed to attach PCB shielding cans/screening covers from our 1500 series.

This clip is to be mounted onto the surface of a PCB (SMT) and offers a fast solution for assembling RFI/EMI-shielding cans to PCB's. This clip eliminates the need for through holes and post re-flow operations on the PCB. For best performance, the shielding clip should be mounted on the PCB ground pattern. This can be done by hand or by vacuum pick-up nozzle (automated).

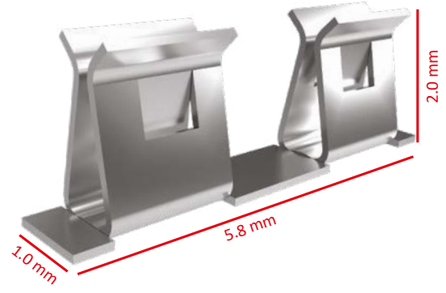
This clip offers a great opportunity for tuning and re-work after the assembly of the screening cover. The thickness of the screening cover can be from 0.18 up to 0.30 mm. The clip can be supplied on reels of 1.500 pieces.

Technical specifications

Material	Stainless steel SUS301-1/2H
Plating	Nickel (Ni) plated and afterwards matte tin (Sn) plated
Material thickness	0.2 ± 0.02
Insertion force	Max. 1.000gf
Withdrawal force	Min. 30gf
Durability	20 insertions Max.
Contact resistance	100mΩ Max.
Shield thickness	0.18 mm ~ 0.30mm
Operating temperature range	-40°C TO +150°C
Storage temperature range	-40°C TO +85°C
Quantity/reel	1.500
Packaging format	Reel and pieces
Weight per piece (gram)	0.083g

These values are measured under laboratory conditions.
In other situations results may differ. Please read our Guarantee.

Medium clip (for 1500 series) MC



This clip is to be mounted onto the surface of a PCB (SMT) and offers a fast solution for assembling RFI/EMI-shielding cans to PCB's. This clip eliminates the need for through holes and post re-flow operations on the PCB. For best performance, the shielding clip should be mounted on the PCB ground pattern. This can be done by hand or by vacuum pick-up nozzle (automated).

This clip offers a great opportunity for tuning and re-work after the assembly of the screening cover. The thickness of the screening cover can be in the range of 0.18 to 0.30 mm. The clip can be supplied on reels of 5.000 pieces.

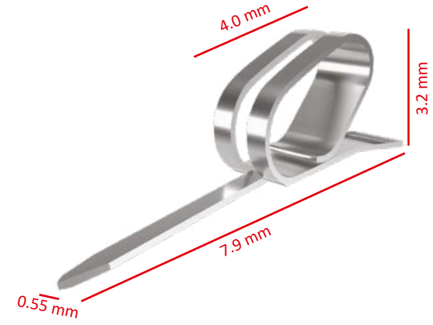
The Medium clip takes up 40% less space than the Large clip.

Technical specifications

Material	Stainless steel SUS301-1/2H
Plating	Nickel (Ni) plated and afterwards matte tin (Sn) plated
Material thickness	0.10 ± 0.01
Insertion force	0.1~2.0 kgf
Withdrawal force	0.1~2.0 kgf
Durability	10 Insertions Max.
Contact resistance	100mΩ Max.
Shield thickness	0.18 mm ~ 0.30mm
Operating temperature range	-40°C to +150°C
Storage temperature range	-40°C to +85°C
Quantity/reel	5.000
Packaging format	Reel and pieces
Weight per piece (gram)	0.0066g

These values are measured under laboratory conditions.
In other situations results may differ. Please read our Guarantee.

Small pin (for 1500 series) P



The Small pin is used to mount PCB screening cans and PCB shielding covers from our 1500 series PCB shielding cans onto your printed circuit board. This pin is designed to be placed through the surface of the PCB and offers a fast solution for assembling RFI/EMI shields to PCB's. The clip needs through holes and post re-flow operations on the PCB. This clip with a tinned pin can be soldered into the PCB at any available place around the screening cover.

Advantages

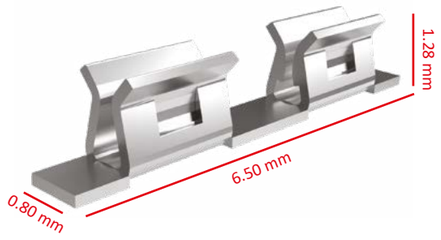
Thanks to the large clamping range, the pin does not have to be positioned with great precision. The recommended distance between the pins depends on the frequency that is to be shielded and the size of the PCB shielding can. For advice please consult our engineers.

Technical specifications

Material	Phosphor bronze
Finish	Nickel (Ni) plated and afterwards matte tin (Sn) plated
Material thickness	0.12 ± 0.01
Contact resistance	20mΩ max
Insulation resistance	5000MΩ min
Shield thickness	up to 0.18 mm
Operating temperature	-25°C up to +85°C
Storage temperature range	-40°C up to +85°C
Quantity packing	40
Packaging format	Tube packing
Weight per piece (gram)	0.019g

These values are measured under laboratory conditions.
In other situations results may differ. Please read our Guarantee.

Tiny clip (for 1500 series) TC



This clip is to be mounted onto the surface of a PCB (SMT) and offers a fast solution for assembling RFI/EMI-shielding cans to PCB's. This clip eliminates the need for through holes and post re-flow operations on the PCB.
For best performance, the shielding clip should be mounted on the PCB ground pattern. This can be done by hand or by vacuum pick-up nozzle (automated).

This clip offers a great opportunity for tuning and re-work after the assembly of the screening cover. The thickness of the screening cover can be in the range of 0.18 to 0.25 mm.
The clip can be supplied on reels of 15.000 pieces.

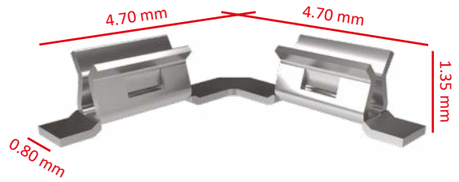
Please note: The tiny clip takes up 25% less space than the medium clip.

Technical specifications

Material	Stainless steel SUS301-1/2H
Plating	Nickel (Ni) plated and afterwards matte tin (Sn) plated
Material thickness	0.15 ± 0.01
Insertion force	0.1~2.0 kgf
Withdrawal force	0.1~2.0 kgf
Durability	10 Insertions Max.
Contact resistance	100mΩ Max.
Shield thickness	0.18 mm ~ 0.25 mm
Operating temperature range	-40°C TO +150°C
Storage temperature range	-40°C TO +85°C
Quantity/reel	15.000
Packaging format	Reel and pieces
Weight per piece (gram)	0.015

These values are measured under laboratory conditions.
In other situations results may differ. Please read our Guarantee.

Tiny corner clip (for 1500 series) TCC



This clip is to be mounted onto the surface of a PCB (SMT) and offers a fast solution for assembling RFI/EMI-shielding cans to PCB's. This clip eliminates the need for through holes and post re-flow operations on the PCB.
For best performance, the shielding clip should be mounted on the PCB ground pattern. This can be done by hand or by vacuum pick-up nozzle (automated).

This clip offers a great opportunity for tuning and re-work after the assembly of the screening cover. The thickness of the screening cover can be in the range of 0.18 to 0.25 mm.
The clip can be supplied on reels of 6.000 pieces.

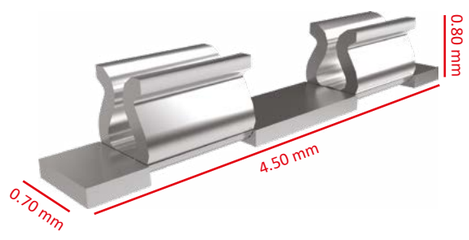
The outer wing of the Tiny corner clip is higher than the inner wing to facilitate insertion of the shielding can.

Technical specifications

Material	Stainless steel SUS301-1/2H
Plating	Nickel (Ni) plated and afterwards matte tin (Sn) plated
Material thickness	0.15 ± 0.01
Insertion force	0.1~2.0 kgf
Withdrawal force	0.1~2.0 kgf
Durability	10 Insertions Max.
Contact resistance	100mΩ Max.
Shield thickness	0.18 mm ~ 0.25 mm
Operating temperature range	-40°C TO +150°C
Storage temperature range	-40°C TO +85°C
Quantity/reel	6.000
Packaging format	Reel and pieces
Weight per piece (gram)	0.016g

These values are measured under laboratory conditions.
In other situations results may differ. Please read our Guarantee.

Ultra tiny clip (for 1500 series) UTC



This clip is to be mounted onto the surface of a PCB (SMT) and offers a fast solution for assembling RFI/EMI-shielding cans to PCB's. This clip eliminates the need for through holes and post re-flow operations on the PCB. For best performance, the shielding clip should be mounted on the PCB ground pattern. This can be done by hand or by vacuum pick-up nozzle (automated).

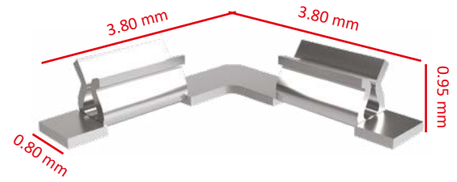
This clip offers a great opportunity for tuning and re-work after the assembly of the screening cover. Thickness of the screening cover can be from 0.12 up to 0.20 mm. The clip can be supplied on reels of 20.000 pieces. The Ultra tiny clip takes up 35% less space than the medium clip

Technical specifications

Material	Stainless steel SUS301-1/2H
Plating	Nickel (Ni) plated and afterwards matte tin (Sn) plated
Material thickness	0.15 ± 0.01
Insertion force	0.1~2.0 kgf
Withdrawal force	0.1~2.0 kgf
Durability	10 Insertions Max.
Contact resistance	100mΩ Max.
Shield thickness	0.12 mm ~ 0.20 mm
Operating temperature range	-40°C TO +150°C
Storage temperature range	-40°C TO +85°C
Quantity/reel	20.000
Packaging format	Reel and pieces
Weight per piece (gram)	0.0067g

These values are measured under laboratory conditions.
In other situations results may differ. Please read our Guarantee.

Ultra tiny corner clip (for 1500 series) UTCC



This clip is designed to be mounted onto the surface of a PCB (SMT) and offers a fast solution for assembling RFI/EMI-shielding cans to PCB's. This clip eliminates the need for through holes and post re-flow operations on the PCB.
For best performance, the shielding clip should be mounted on the PCB ground pattern. This can be done by hand or by vacuum pick-up nozzle (automated).

This clip offers a great opportunity for tuning and re-work after the assembly of the screening cover. Thickness of the screening cover can be from 0.12 up to 0.20 mm. The clip can be supplied on reels of 6.000 pieces.

Technical specifications

Material	Stainless steel SUS301-1/2H
Plating	Nickel (Ni) plated and afterwards matte tin (Sn) plated
Material thickness	0.15 ± 0.01
Insertion force	0.1~2.0 kgf
Withdrawal force	0.1~2.0 kgf
Durability	10 Insertions Max.
Contact resistance	100mΩ Max.
Shield thickness	0.12 mm ~ 0.20 mm
Operating temperature range	-40°C TO +150°C
Storage temperature range	-40°C TO +85°C
Quantity/reel	6.000
Packaging format	Reel and pieces
Weight per piece (gram)	0.011g

These values are measured under laboratory conditions.
In other situations results may differ. Please read our Guarantee.

Fixed PCB shielding cans 1510 - 1515

The same as the 1500 series Clip -on PCB shielding cans, but with teeth in order to glue the can onto the PCB. No clips are needed for mounting.

EMI screening covers (SMD shielding cans) for PCB's were developed to shield only certain parts of electronic equipment from electromagnetic radiation at the source, rather than all components in the entire housing.

EMI shielding cans are available in a wide range of sizes and types. Whether it is for a small number of prototypes or large quantities, we can manufacture the precision components that you require.

1510 series Fixed PCB shielding cans VS 1500 series clip-on PCB shielding cans

Our 1500 series Clip-on PCB shielding cans combines small pins or clips with a removable lid (PCB shielding can), resulting in good quality EMI/RFI shielding.

However, some customers would like a slightly more economic solution than the clip-on PCB shielding system and then move to PCB shielding covers without clip-on system. This system is called Fixed PCB shielding cans since the cans are fixed to the PCB with conductive glue or solder.

Furthermore customers choose this way of attachment because the can will be more firmly secured to the PCB than by using the 1510 series clip-on system. This is, for example, necessary when it comes to devices with very heavy vibrations and movements.

Mounting

Fixed PCB shielding cans, can be provided with teeth so that the can can be glued to the PCB (mounting method T) or with pins for mounting through the PCB (mounting method P).

If you require a relatively large PCB shielding can, we recommend to go for the 1500 series clip-on system since it is very difficult to glue relatively large PCB shielding cans on the PCB without deformation of the can and with a good seal (no openings along the edges).

1515 series (with removable lid)

The 1515 has the same properties as the 1510 series. The lid has a removable top cover. This makes it essayer to aces the parts on the PCB for service. The product is available in copper and tinned copper, with or without cooling holes.

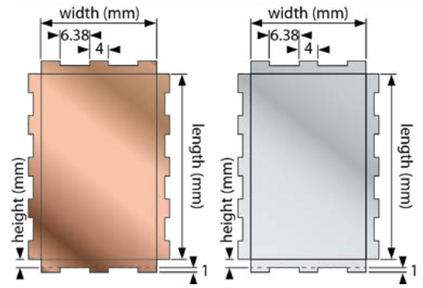
Copper or tinned copper version

Our 1510 and 1515 series fixed PCB shielding cans are available in both copper and tin-plated copper. The tinned copper version facilitates the soldering process.

Standard Fixed PCB shielding cans Part numbers

A technical drawing of the 1510 series Fixed PCB shielding cans. The distance between the teeth varies, and is dependent on the size of the side.

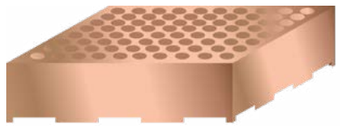
For example, a side of 40mm has 5 teeth and a side of 25mm has 3 teeth. The height of a teeth is 1mm.



Available material thicknesses

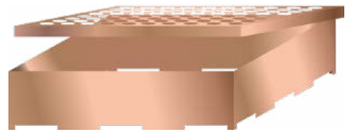
Material
Mu-copper 0.12mm
Mu-copper 0.18mm
Tinned steel 0.20mm

Examples



1510 copper with cooling holes

1515 tinned copper with removable lid



1515 with removable lid & cooling holes

Square Fixed PCB shielding cans (1 to 10mm height)

Length A (mm)	Width B (mm)	2	3	5	10
10	10	1510-10-10-2	1510-10-10-3	1510-10-10-5	1510-10-10-10
15	15	1510-15-15-2	1510-15-15-3	1510-15-15-5	1510-15-15-10
20	20	1510-20-20-2	1510-20-20-3	1510-20-20-5	1510-20-20-10
25	25	1510-25-25-2	1510-25-25-3	1510-25-25-5	1510-25-25-10
30	30	1510-30-30-2	1510-30-30-3	1510-30-30-5	1510-30-30-10
35	35	1510-35-35-2	1510-35-35-3	1510-30-30-5	1510-30-30-10
40	40	1510-40-40-2	1510-40-40-3	1510-40-40-5	1510-40-40-10

NOTE: Custom sizes and shapes can be produced on request and according to your drawing. Send your drawing to request a quote for a custom shape to info@hollandshielding.com.

Rectangular Fixed PCB shielding cans (1 to 10mm height)

Length A (mm)	Width B (mm)	Height C (mm)				
		1	2	3	5	10
10	15	1510-10-15-1	1510-10-15-2	1510-10-15-3	1510-10-15-5	1510-10-15-10
10	20	1510-10-20-1	1510-10-20-2	1510-10-20-3	1510-10-20-5	1510-10-20-10
10	25	1510-10-25-1	1510-10-25-2	1510-10-25-3	1510-10-25-5	1510-10-25-10
10	30	1510-10-30-1	1510-10-30-2	1510-10-30-3	1510-10-30-5	1510-10-30-10
10	35	1510-10-35-1	1510-10-35-2	1510-10-35-3	1510-10-35-5	1510-10-35-10
10	40	1510-10-40-1	1510-10-40-2	1510-10-40-3	1510-10-40-5	1510-10-40-10
10	45	1510-10-45-1	1510-10-45-2	1510-10-45-3	1510-10-45-5	1510-10-45-10
10	50	1510-10-50-1	1510-10-50-2	1510-10-50-3	1510-10-50-5	1510-10-50-10
15	20	1510-15-20-1	1510-15-20-2	1510-15-20-3	1510-15-20-5	1510-15-20-10
15	25	1510-15-25-1	1510-15-25-2	1510-15-25-3	1510-15-25-5	1510-15-25-10
15	30	1510-15-30-1	1510-15-30-2	1510-15-30-3	1510-15-30-5	1510-15-30-10

» Fixed PCB shielding cans 1510-1515

15	35	1510-15-35-1	1510-15-35-2	1510-15-35-3	1510-15-35-5	1510-15-35-10
15	40	1510-15-40-1	1510-15-40-2	1510-15-40-3	1510-15-40-5	1510-15-40-10
15	45	1510-15-45-1	1510-15-45-2	1510-15-45-3	1510-15-45-5	1510-15-45-10
15	50	1510-15-50-1	1510-15-50-2	1510-15-50-3	1510-15-50-5	1510-15-50-10
20	25	1510-20-25-1	1510-20-25-2	1510-20-25-3	1510-20-25-5	1510-20-25-10
20	30	1510-20-30-1	1510-20-30-2	1510-20-30-3	1510-20-30-5	1510-20-30-10
20	35	1510-20-35-1	1510-20-35-2	1510-20-35-3	1510-20-35-5	1510-20-35-10
20	40	1510-20-40-1	1510-20-40-2	1510-20-40-3	1510-20-40-5	1510-20-40-10
20	45	1510-20-45-1	1510-20-45-2	1510-20-45-3	1510-20-45-5	1510-20-45-10
20	50	1510-20-50-1	1510-20-50-2	1510-20-50-3	1510-20-50-5	1510-20-50-10
25	30	1510-25-30-1	1510-25-30-2	1510-25-30-3	1510-25-30-5	1510-25-30-10
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25	45	1510-25-45-1	1510-25-45-2	1510-25-45-3	1510-25-45-5	1510-25-45-10
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30	40	1510-30-40-1	1510-30-40-2	1510-30-40-3	1510-30-40-5	1510-30-40-10
30	45	1510-30-45-1	1510-30-45-2	1510-30-45-3	1510-30-45-5	1510-30-45-10
30	50	1510-30-50-1	1510-30-50-2	1510-30-50-3	1510-30-50-5	1510-30-50-10
35	40	1510-35-40-1	1510-35-40-2	1510-35-40-3	1510-35-40-5	1510-35-40-10
35	45	1510-35-45-1	1510-35-45-2	1510-35-45-3	1510-35-45-5	1510-35-45-10
35	50	1510-35-50-1	1510-35-50-2	1510-35-50-3	1510-35-50-5	1510-35-50-10

NOTE: Custom sizes and shapes can be produced on request and according to your drawing. Send your drawing to request a quote for a custom shape to info@hollandshielding.com.

dimensions you specify are outside dimensions. Thickness of the material is standard 0.12 mm, optionally 0.18 mm or 0.20 mm. For example, when you order a 1510- 1515 series in 0.12 mm Mu-copper of 10-20-5 mm, the inside dimensions will be 9.76-19.76-4.88 mm. The standard height of a teeth is 1 mm. Standard tolerance for these products is +/- 0.1-0.2 mm.

ORDER EXAMPLE

Series
1510 : Fixed PCB shielding can with fixed lid
1515 : Fixed PCB shielding can with removable lid

Length A (mm)
Specify the length in mm

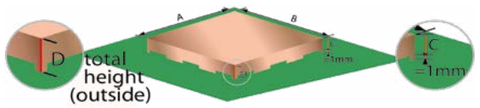
Width B (mm)
Specify the width in mm

Height C (mm)
Specify the height in mm. For the teeth, 1mm will be added in height.

Mounting
T : Teeth for mounting on the PCB
P : Pins for mounting through the PCB

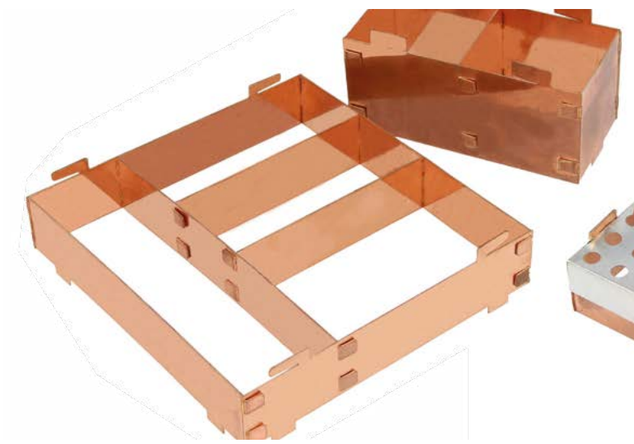
Cooling
NO : No cooling holes (standard)
CO : With cooling holes

Material
MU12 : Mu-copper 0.12mm
MU18 : Mu-copper 0.18mm
TMU12 : Tinned Mu-copper 0.12 mm
TMU18 : Tinned Mu-copper 0.18 mm
TS20 : Tinned steel 0.20mm



Fixed PCB shields 1600

Used to create EMI/RFI-shielded compartments on a PCB



The 1600 Fixed PCB shield series is used to make EMI/RFI-shielded compartments on a PCB to prevent electromagnetic interference between chips/processors/parts of the PCB.

A small shielding framework or shielding fence, can be manufactured by our CNC production system, including teeth or pins in any desired size for attachment to the printed circuit board.

Tooling costs are relatively low, making this system suitable for series of 100 to 100.000 pieces. The 1600 Fixed PCB shielding series is made according to your technical drawing

Advantages

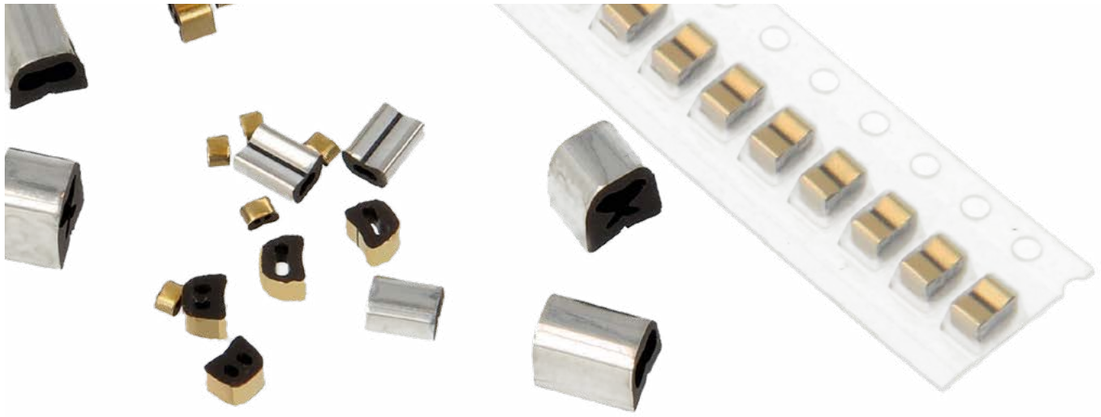
- Can be manufactured by our CNC production system
- Suitable for series of 100 -100.000 pieces
- Made according to customer's drawing
- A sample can be produced very quickly, in only 2 days
-

Options

- Several thicknesses depending on attenuation level
- With or without electrical insulation
- With or without conductive self-adhesive
- Available in a fire-retardant version
- Can be made with a lid for extra high shielding performance
- Can be made with openings for passage of cables or ventilation

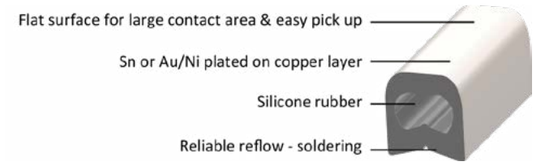
Conductive foil PCB shielding gaskets 1550

Good elastic recovery and electric property, for electrical connecting between electrical objects



1550 series has good elastic recovery and electric property, so it offers not only cushion property, but also electrical connecting between electrical objects including PCB. It is useful for EMI/ESD/RF countermeasure, electrical grounding and connecting as EMI Gasket and/or electric connector. It is consisted of conductive film, elastic adhesive and elasto-mer tube, so it is not broken and deformed like metal fingers. There are many sizes and options to meet various customers demands and needs.

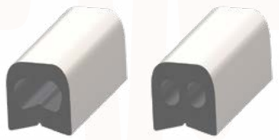
General structure



Metal clip VS 1550

Optional on request

The 1550 gasket is standard delivered with one hole. Optional is a version with two holes in the gasket. Keep in mind that because of the two holes the gasket can be stiff / harder and less easy to compress.



APPLICATION

- Smartphone
- Automotive
- TV
- Tablet
- PC
- LCD panel
- Navigation for electric connecting
- Grounding

Characteristics

- Surface mount technology (SMT) compatible
- Lowest electric resistance (typical 0.06Ω)
- Excellent elasticity & low compression force
- Not easily deformed & broken by external force
- Large contact area
- Solder protection line exist
- Sizes from small to big with various options
- Proper for mass production & re-work available
- Halogen-free, EU-RoHS compliant, non-flammable

Technical specifications

	Standard-Type (tin)	Gold-Type (Au/Ni)
Copper Layer (inside)	Standard performance	High performance
Plating (surface)	Sn (Tin)	Au/Ni
Plating on the copper edge	None	Yes Au/Ni
Reliability	Best	Proper
Example of P/N	1550-W-H-L-S	1550-W-H-L-G
Main applications	Economic price, home applications	Automotive, industrial & military
Re-flow soldering Temp.	Max 250°C	Max 270°C
Max. rework	1 time	3 times
Price	$	$$

These values are measured under laboratory conditions.
In other situations results may differ. Please read our Guarantee.

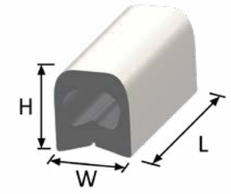
» Conductive Foil PCB shielding Gaskets 1550

Part numbers

Part number	W	H	L
1550-2.0-0.45-1.0	2.0	0.45	1.0
1550-2.0-0.45-1.5	2.0	0.45	1.5
1550-1.6-0.6-0.8	1.6	0.6	0.8
1550-2.0-0.6-1.0	2.0	0.6	1.0
1550-1.6-0.7-0.8	1.6	0.7	0.8
1550-2.0-0.7-1.0	2.0	0.7	1.0
1550-1.2-0.8-0.8	1.2	0.8	0.8
1550-1.6-0.8-0.8	1.6	0.8	0.8
1550-1.4-0.9-0.8	1.4	0.9	0.8
1550-1.6-0.9-0.8	1.6	0.9	0.8
1550-1.2-1.0-0.8	1.2	1.0	0.8
1550-1.6-1.0-0.8	1.6	1.0	0.8
1550-1.4-1.1-0.8	1.4	1.1	0.8
1550-1.6-1.1-0.8	1.6	1.1	0.8
1550-1.6-1.2-0.8	1.6	1.2	0.8
1550-1.6-1.5-0.8	1.6	1.5	0.8
1550-3.0-1.5-2.0	3.0	1.5	2.0
1550-3.0-1.5-4.0	3.0	1.5	4.0
1550-1.7-1.6-3.6	1.7	1.6	3.6
1550-1.6-1.8-0.8	1.6	1.8	0.8
1550-2.0-1.8-1.0	2.0	1.8	1.0
1550-2.0-1.8-1.25	2.0	1.8	1.25
1550-2.0-1.8-1.5	2.0	1.8	1.5
1550-2.5-2.0-2.0	2.5	2.0	2.0
1550-3.0-2.0-2.0	3.0	2.0	2.0
1550-3.0-2.0-4.0	3.0	2.0	4.0
1550-2.0-2.2-1.5	2.0	2.2	1.5
1550-2.5-2.3-1.5	2.5	2.3	1.5
1550-2.6-2.4-3.6	2.6	2.4	3.6
1550-2.6-2.4-8.0	2.6	2.4	8.0
1550-2.0-2.5-1.5	2.0	2.5	1.5
1550-2.5-2.5-2.0	2.5	2.5	2.0

Part number	W	H	L
1550-3.0-2.5-1.5	3.0	2.5	1.5
1550-3.0-2.5-2.0	3.0	2.5	2.0
1550-3.0-2.5-4.0	3.0	2.5	4.0
1550-4.0-2.5-3.0	4.0	2.5	3.0
1550-4.0-2.5-5.0	4.0	2.5	5.0
1550-5.0-2.5-3.0	5.0	2.5	3.0
1550-5.0-2.5-4.0	5.0	2.5	4.0
1550-2.0-2.8-1.8	2.0	2.8	1.8
1550-2.0-3.0-1.5	2.0	3.0	1.5
1550-2.0-3.0-1.8	2.0	3.0	1.8
1550-2.5-3.0-1.5	2.5	3.0	1.5
1550-2.5-3.0-2.0	2.5	3.0	2.0
1550-3.0-3.0-1.5	3.0	3.0	1.5
1550-3.0-3.0-2.0	3.0	3.0	2.0
1550-3.5-3.0-2.5	3.5	3.0	2.5
1550-4.0-3.0-3.0	4.0	3.0	3.0
1550-4.0-3.0-5.0	4.0	3.0	5.0
1550-4.0-3.0-8.0	4.0	3.0	8.0
1550-5.0-3.0-3.0	5.0	3.0	3.0
1550-5.0-3.0-4.0	5.0	3.0	4.0
1550-3.0-3.5-1.5	3.0	3.5	1.5
1550-3.0-3.5-2.0	3.0	3.5	2.0
1550-4.0-3.5-2.0	4.0	3.5	2.0
1550-4.0-3.5-3.0	4.0	3.5	3.0
1550-4.0-3.5-5.0	4.0	3.5	5.0
1550-4.0-4.0-2.5	4.0	4.0	2.5
1550-4.0-4.0-3.0	4.0	4.0	3.0
1550-4.0-4.0-5.0	4.0	4.0	5.0
1550-4.0-4.0-6.0	4.0	4.0	6.0
1550-5.0-4.0-3.0	5.0	4.0	3.0
1550-5.0-4.0-4.0	5.0	4.0	4.0

Part number	W	H	L
1550-8.0-4.0-4.0	8.0	4.0	4.0
1550-3.0-4.5-3.0	3.0	4.5	3.0
1550-4.5-4.5-6.0	4.5	4.5	6.0
1550-5.0-4.5-3.0	5.0	4.5	3.0
1550-5.0-4.5-6.0	5.0	4.5	6.0
1550-5.0-4.5-8.0	5.0	4.5	8.0
1550-6.0-4.5-4.0	6.0	4.5	4.0
1550-6.0-4.5-8.0	6.0	4.5	8.0
1550-3.5-5.0-2.5	3.5	5.0	2.5
1550-4.0-5.0-3.5	4.0	5.0	3.5
1550-4.0-5.0-5.0	4.0	5.0	5.0
1550-4.0-5.0-5.0	4.0	5.0	5.0
1550-4.5-5.0-2.5	4.5	5.0	2.5
1550-5.0-5.0-2.5	5.0	5.0	2.5
1550-5.0-5.0-3.0	5.0	5.0	3.0
1550-6.0-5.0-8.0	6.0	5.0	8.0
1550-8.0-5.0-4.0	8.0	5.0	4.0
1550-4.0-5.5-5.0	4.0	5.5	5.0
1550-5.0-5.5-3.0	5.0	5.5	3.0
1550-5.0-5.5-4.0	5.0	5.5	4.0
1550-6.0-5.5-4.0	6.0	5.5	4.0
1550-6.0-5.5-8.0	6.0	5.5	8.0
1550-4.0-6.0-3.0	4.0	6.0	3.0
1550-4.0-6.0-5.0	4.0	6.0	5.0
1550-4.5-6.0-2.5	4.5	6.0	2.5
1550-4.5-6.0-4.0	4.5	6.0	4.0
1550-4.5-6.0-6.0	4.5	6.0	6.0
1550-5.0-6.0-3.0	5.0	6.0	3.0
1550-5.0-6.0-4.0	5.0	6.0	4.0
1550-5.0-6.5-3.0	5.0	6.5	3.0
1550-5.0-6.5-8.0	5.0	6.5	8.0
1550-6.0-6.5-4.0	6.0	6.5	4.0



Part number	W	H	L
1550-6.0-6.5-8.0	6.0	6.5	8.0
1550-8.0-6.5-4.0	8.0	6.5	4.0
1550-5.0-7.0-3.0	5.0	7.0	3.0
1550-8.0-7.0-4.0	8.0	7.0	4.0
1550-5.0-7.5-3.0	5.0	7.5	3.0
1550-6.0-7.5-4.0	6.0	7.5	4.0
1550-6.0-7.5-8.0	6.0	7.5	8.0
1550-8.0-7.5-4.0	8.0	7.5	4.0
1550-8.0-8.0-4.0	8.0	8.0	4.0
1550-6.0-8.5-8.0	6.0	8.5	8.0
1550-8.0-8.5-4.0	8.0	8.5	4.0
1550-5.0-9.0-6.0	5.0	9.0	6.0
1550-6.0-9.0-8.0	6.0	9.0	8.0
1550-6.0-9.5-8.0	6.0	9.5	8.0
1550-6.0-10.0-8.0	6.0	10.0	8.0
1550-8.0-10.0-4.0	8.0	10.0	4.0
1550-6.0-10.5-5.0	6.0	10.5	5.0
1550-6.0-10.5-8.0	6.0	10.5	8.0
1550-6.0-11.5-8.0	6.0	11.5	8.0
1550-6.0-12.5-8.0	6.0	12.5	8.0
1550-6.0-13.0-8.0	6.0	13.0	8.0
1550-6.0-13.5-8.0	6.0	13.5	8.0
1550-6.0-14.5-8.0	6.0	14.5	8.0
1550-6.0-15.5-8.0	6.0	15.5	8.0

Holland shielding systems BV have got more than 100 kinds of 1550 series Film over Rubber PCB shielding gaskets for many applications and usages.
Please contact our engineer for your selection. S: Standard (tin), G = Gold (Au/Ni)

ORDER EXAMPLE

Series	Width (mm)	Height (mm)	Length (mm)	Cover
1550	Specify the width in mm	Specify the height in mm	Specify the length in mm	**S :** Standard (tin) **G :** Gold (Au/Ni)

***Notice**
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The product described in this data sheet shall be of standard quality, however the products are sold without warranty of fitness for a particular purpose, either expressed or implied, except to the extent expressly stated on HSS invoice, quotation or order acknowledgment. HSS does not warrant that products described in this data sheet will be free of conflict with existing or future patents of third parties. All risks of lack of fitness, patent infringement and the like are assumed by the user.

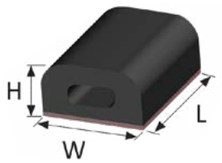
Index

Conductive rubber PCB shielding gaskets 1560

Surface Mountable Technology (SMT) compatible electric elastomer connector on PCB level

1560 series is Surface Mountable Technology (SMT) compatible electric elastomer connector. The shielding gasket has good elastic recovery and electric property, so it offers not only cushion, but also electrical connecting and grounding between electrical objects and PCB. The 1560 series consist of a conductive coating layer on an elastomer tube and a solder able metal foil under the tube. So it has good electrical conductivity and better soldering strength.

STANDARD PART NUMBERS



Part number	Dimension (mm)		
	W	H	L
1560-200810	2.0	0.8	1.0
1560-201110	2.0	1.1	1.0
1560-201310	2.0	1.3	1.0
1560-201410	2.0	1.4	1.0
1560-201615	2.0	1.6	1.5
1560-201815	2.0	1.8	1.5
1560-202015	2.0	2.0	1.5
1560-202518	2.0	2.5	1.8

* Other sizes are available on request. Any length is acceptable.

MAIN CHARACTERISTICS

- Low electric resistance
- Meet to most salt spray and environmental test
- Good resilient & recovery property.
  Easy to apply SMT and Repair.
- Strong soldering strength and not easy to detach on PCB

Applications

- Smart phone
- Mobile device
- Tablet
- PC
- LCD Panel,
- Navigation for Electric Connecting and Grounding.

Notice: 1560 series PCB shielding gaskets should be compressed (about 0.2~0.3mm) on the solder cream at the place-process of SMT.

Properties

Product type	1560 series		
Color of Conductive Coating Layer	Black, dark gray		
Width	2.0 mm ~		
Height	0.8 mm ~		
Compression ratio	Typical 10% ~ 40% compression of original height		
Operation temperature	-35 °C ~ 160 °C		
Resistance	Vertical	Typical 0.05Ω	
	Surface	Typical 0.05Ω/□	
Soldering strength	Length direction	Not easy to de-tach & removal due to flexibility & shove	Typical 150gf for 1560-2.0-1.1-1.0
	Width direction		Typical 200gf for 1560-2.0-1.1-1.0
Elastomer hardness	Shore A 50		
Recovery rate (30% × 10.000 times)	Typical 93%		
Abrasion test	No metal dust after rubbing with PP tape (2kg Roller / 10 cycles)		
Thermal Shock	Change ratio of resistance & elasticity is lower than 10% (-40 °C × 0.5hr ↔ 85 °C × 0.5hr × 100 cycles)		
High Temperature/ humidity	Change ratio of resistance & elasticity is lower than 10% (85 °C / 85% RH / 100hrs)		
Salt spray	No changing of color and electric resistance (KS D 9502, 5% NaCl, 35 °C / 48hrs)		
Flammability	Classified by UL to UL 94 V-1		
Environment	Halogen-free, EU-RoHS compliant, lead-free		
Recommend solder pattern		We recommend a non-separated solder pattern and the 100µm thickness of solder cream	

These values are measured under laboratory conditions.
In other situations results may differ. Please read our Guarantee.

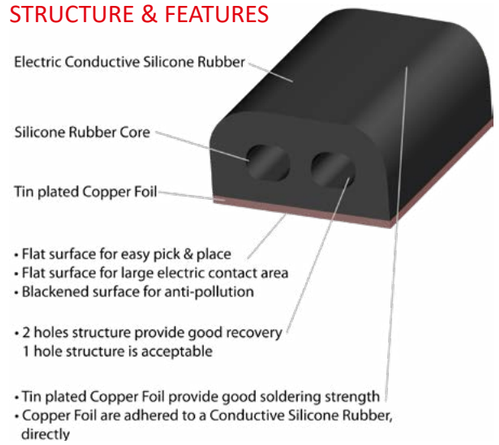
ORDER EXAMPLE

Series	Width (mm)	Height (mm)
1560	Width of the gasket (Standard 2mm)	Specify the height in mm

Length (mm)

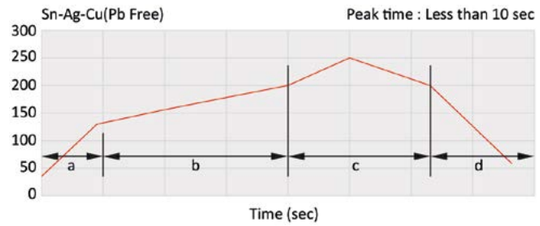
Specify the length in mm

STRUCTURE & FEATURES



Recommended re-flow soldering condition for sn plating

Condition of Ref-low soldering (Recommended)		
Zone	Temperature (°C)	Time (sec)
A	RT ~ 130	60
B	Max. 220	90 ~ 150
C	220 ~ 250 (max. 250)	90 ~ 150
D	220 ~ RT	Min. 60

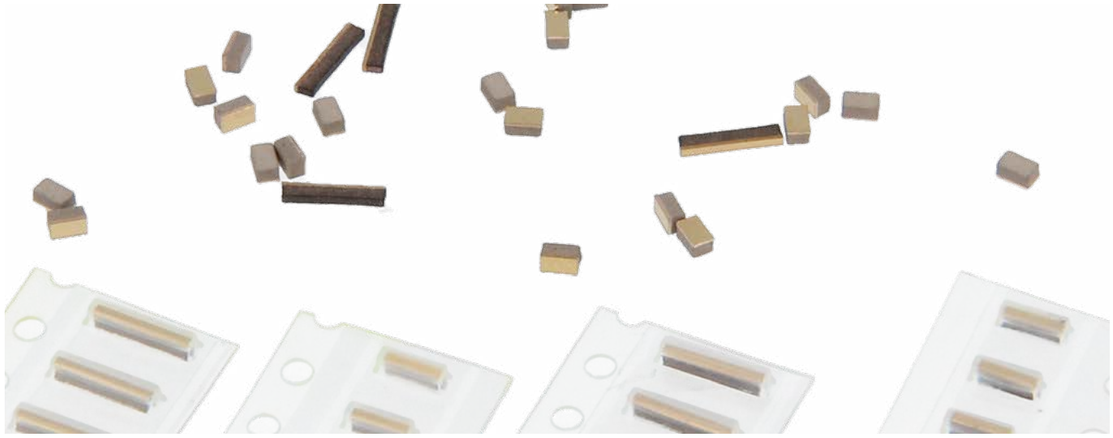


Alternatives

Alternatives for PCB shielding gaskets are PCB contact fingers 2900 series which can be found on page 101 PCB fingers are made of metal and therefore have better conductivity and are therefore suitable for applications where high currents flow. These PCB contact fingers come in many shapes and sizes.

Conductive silicone PCB shielding gasket 1570

The 1570 series PCB shielding gaskets are a Surface Mountable Technology (SMT) compatible electric elastomer connector which has good elastic recovery and electric property



The 1570 series PCB shielding gaskets are a Surface Mountable Technology (SMT) compatible electric elastomer connector. Our 1570 series has good elastic recovery and electric property, so it offers not only cushion, but also electrical connecting and grounding between electrical objects and PCB. The 1570 is a rectangle with narrow width and is mounted on PCB board. So this can replace Shield Can or EMI Dispensing Gasket or other electric contacts. Recommendation of compression is 10~30% of its height.

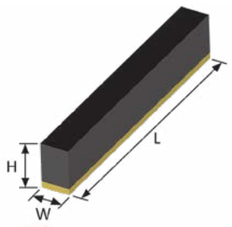
Main characteristics

- Suitable for EMI shielding and grounding
- Lower electric resistance
- Meet to most salt spray and environmental test.
- Good resilient & recovery property, easy to apply SMT
- Strong soldering strength and not easy to detach on PCB

Applications

- Smart phone
- Mobile device
- Tablet
- PC
- Digital camera
- Navigation for electricity connecting and grounding

STANDARD PART NUMBERS



Part number	Dimension (mm)		
	W	H	L
1570-200880	2	0.8	8
1570-12506580	1.25	0.65	8
1570-110580	1.1	0.5	8
1570-200855	2	0.8	5.5
1570-12506555	1.25	0.65	5.5
1570-1250555	1.25	0.5	5.5
1570-1007555	1	0.75	5.5
1570-1106532	1.1	0.65	3.2
1570-2008120	2	0.8	12

* Other sizes are available on request. Any length is acceptable.

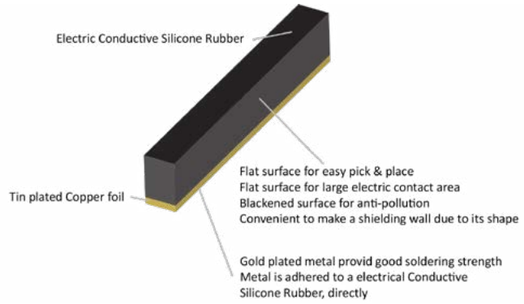
delivery on reel on request

Properties

Product type	1570 series		
Color of Conductive Coating Layer	Black, dark gray		
Width	0.6mm ~		
Height	0.4mm ~		
Compression ratio	Typical 10% ~ 30% compression of original height		
Operation temperature	-35 °C~ 160 °C		
Resistance	Vertical	Typical 0.05Ω	
	Surface	Typical 0.05Ω/□	
Soldering strength	Length direction	Not easy to detach & removal due to flexibility & shove	Typical 400gf for 1570-0.6-0.8-5.5
	Width direction		Typical 200gf for 1570-0.6-0.8-5.5
Elastomer hardness	Shore A 50		
Recovery rate (30%×10.000 times)	Typical 90%		
Abrasion test	No metal dust after rubbing with PP tape (2kg Roller / 10 cycles)		
Thermal shock	Change ratio of resistance & elasticity is lower than 10% (-40 °C × 0.5hr ↔ 85 °C × 0.5hr × 100 cycles)		
High temperature/ humidity	Change ratio of resistance & elasticity is lower than 10% (85 °C / 85% RH / 100hrs)		
Salt spray	No changing of color and electric resistance (KS D 9502, 5% NaCl, 35 °C /48hrs)		
Flammability	Classified by UL to UL 94 V-1		
Environment	Halogen-Free, EU-RoHS Compliant, Lead-free		
Recommend solder pattern		We recommend a non-separated solder pattern and the 100µm thickness of solder cream	

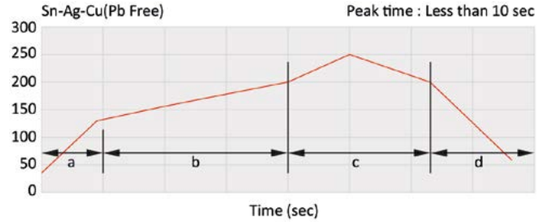
These values are measured under laboratory conditions.
In other situations results may differ. Please read our Guarantee.

Structure and features



Recommended re-flow soldering condition for sn plating

Condition of Ref-low soldering (Recommended)		
Zone	Temperature (°C)	Time (sec)
A	RT ~ 130	60
B	Max. 220	90 ~ 150
C	220 ~ 250 (max. 250)	90 ~ 150
D	220 ~ RT	Min. 60



ORDER EXAMPLE

Series		Width (mm)		Height (mm)		Length (mm)
1570	–		–		–	
		Specify the width in mm.		Specify the height in mm.		Specify the length in mm.

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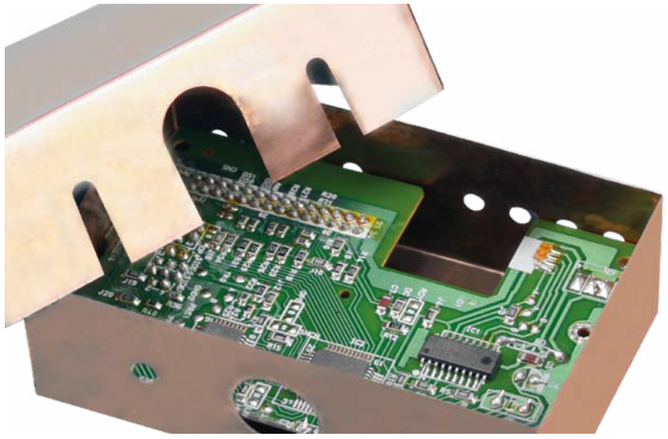
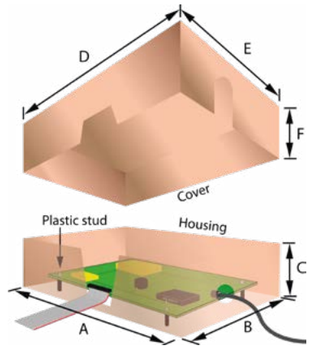
EMI-shielding housings/enclosures 1900

Mu-copper housings and enclosures for EMI shielding of PCB's





1900 series Mu-copper housings/enclosures consist of two parts cover and housing. The Mu-copper housings/enclosures provide excellent RFI/EMI shielding and protection. The EMI-shielded housing is designed to be installed in e.g. an existing plastic housing in order to protect the components against electromagnetic interference. The EMI-shielded housing can also be used to protect an entire printed circuit board in an enclosure against interference from other components in the enclosure.

Having a two-part body allows connectors, displays and switches fitted on the PCB to protrude through the cover and the housing sections. This would not be possible with single-part case bodies. Cutouts in the cover or housing sections or recesses create space for connectors, displays, and switches on the PCB.

PCB's can be mounted on plastic studs in order to insulate them from the EMI-shielded housing. The studs can be supplied threaded or with extremely strong adhesive, in any shape or size. For heavy-duty applications the cover can be soldered to the housing or attached with studs and screws.

Available in standard dimensions and in any desired shape and size, according to your drawing. You can also specify where the insulating studs should be placed. Available in Mu-copper or in a tinned Mu-copper version for easy soldering.

Advantages

- Lightweight solution
- Available in any dimension
- Shielding close to the source
- Mounting afterwards is possible
- No gaskets required
- Extra shielding layer in combination with other barriers

Typical applications

- Hand-held test and measurement devices
- Radio control equipment
- Wall-mounted monitoring systems
- Security devices
- Building control equipment

Options (on request)

- With insulation layer in the housing part for the PCB
- Vents in the cover part for heat dissipation or cooling
- For additional reduction of radiation, it is possible to add EM absorbers to the EMI housing

When ordering the housing we would like to point out that you have to order the outer bottom housing in terms of dimensions. As an example, in comparison with your chosen material thickness, we have put an example in a table below. For example, when you order 0.12 mm material thickness can with dimensions of 100-200-50 mm, the inside dimensions will be 99.76-119.76-49.88 mm.

ORDER EXAMPLE

Series	A Length (mm)	B Width (mm)	C Height (mm)	Material
1900	Please specify the length in mm.	Please specify the width in mm.	Please specify the height in mm.	**TS0.20** : Tinned steel 0.20 mm **TS0.30** : Tinned steel 0.30 mm **TS0.40** : Tinned steel 0.40 mm **TS0.50** : Tinned steel 0.50 mm **TS1.0** : Tinned steel 1.0 mm **MU0.12** : Mu-copper 0.12 mm **MU0.18** : Mu-copper 0.18 mm **MU0.30** : Mu-copper 0.30 mm **Mu0.50** : Mu-copper 0.50 mm **TMU0.12** : Tinned mu-copper 0.12 mm **TMU0.18** : Tinned mu-copper 0.18 mm

Metal knit gasket 1200

Universal EMC gasket to shield lower frequencies

The Metal knit EMI/RFI shielding gaskets of the 1200 series consist of a layer of knitted electrically conductive metal wires on attached to a low-closure force rubber or elastomer core. For heavy-duty applications like EMP or high temperatures, a fully metal version is available. Sometimes a Metal knit EMI/RFI gasket is combined with an environmental seal to provide IP rating, depending on the materials used.

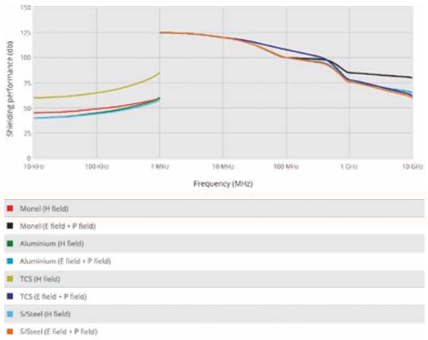
Knitted wire mesh gaskets provide a cost-effective solution to high shielding performance applications in the magnetic and electrical fields, including EMP. The gaskets can be made either completely from knitted metal mesh or from knitted metal mesh over an elastomer core which allows recovery after compression.

For high frequency shielding, foil-based gaskets like Amucor Shield 6800 series will perform better, because of their much larger contact surface.

Metal knit gasket vs. Amucor shield

Contact points of Amucor shield Contact points of metal knit gasket

Shielding performance*



Benefits

- High attenuation for lower frequencies (low-frequency magnetic shielding)
- Suitable for use under extreme conditions (military applications)
- Wear resistant
- Not susceptible to corrosion
- Various conductive materials against tension corrosion
- Roll lengths of 1 to 1000 meters (depending on width and height of the gasket)
- Tools required: pair of scissors

Options (on request)

- Custom made in the dimensions specified
- Available with flame-retardant core
- Available with conductive self-adhesive
- Available with chemical-resistant rubbers like EPDM
- Silicone sponge for high temperatures up to 220 °C
- Cut into accurate lengths
- As a ready made frame

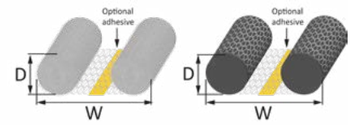
Technical specifications

Material	Applications
Monel Per QQ-N-281 BS 3075 N A 13 Class A diameter 0.11mm	The most commonly used material. Insensitive to corrosion and neutral on the galvanic scale.
Aluminium AMS 4187 BS 1475 5056A Alloy 5056 diameter 0.16mm	Used in some cases for aluminium enclosures.
T.C.S. Steel core (57%) Copper cladding (40%) Tin plating (3%) diameter 0.11mm	Excellent magnetic as well as electrical properties, because a Ferro alloy is covered with copper. The outside is tinned to prevent corrosion.
Stainless steel AISI 304 diameter 0.13mm	The strongest material with shielding performance comparable to aluminium. Highly wear-resistant.

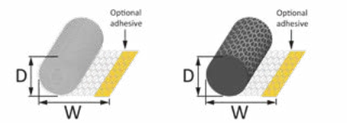
Stock dimensions

Below are all the standard sizes we keep in stock and so are available quickly. Almost any size and combination can be produced. If you need a size that is not listed below please contact for the options and delivery time.

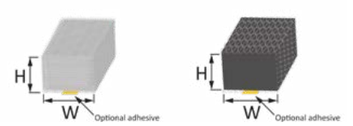
Round (R) D (mm)	
1.6	6.4
2.4	7.9
3.2	9.5
4.0	11.1
4.8	12.7



Double round (DR) d x w (mm)		
1.6 x 9.5	3.2 x 12.7	6.4 x 15.9
1.6 x 12.7	3.2 x 15.9	6.4 x 19.1
1.6 x 15.9	4.8 x 15.9	6.4 x 25.4
2.4 x 12.7	4.8 x 19.1	9.5 x 25.4
3.2 x 9.5	4.8 x 25.4	12.7 x 25.4



Round with tail (T) d x w (mm)		
1.6 x 9.5	4.0 x 12.7	7.9 x 15.9
1.6 x 12.7	4.0 x 19.1	7.9 x 19.1
1.6 x 15.9	4.8 x 12.7	7.9 x 25.4
1.6 x 19.1	4.8 x 15.9	9.5 x 15.9
2.4 x 12.7	4.8 x 19.1	9.5 x 19.1
2.4 x 15.9	4.8 x 25.4	9.5 x 25.4
2.4 x 19.1	6.4 x 12.7	11.1 x 19.1
3.2 x 12.7	6.4 x 15.9	11.1 x 25.4
3.2 x 15.9	6.4 x 19.1	12.7 x 19.1
3.2 x 19.1	6.4 x 25.4	12.7 x 25.4

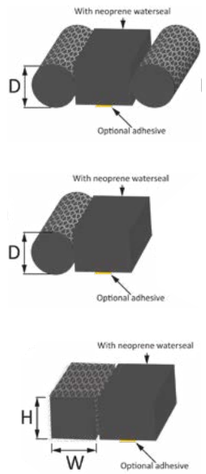


Rectangular (S) w x h (mm)		
3.2 x 1.6	9.5 x 3.2	19.1 x 12.7
3.2 x 2.4	9.5 x 4.8	20 x 6
3.2 x 3.2	9.5 x 6.4	20 x 8
4.0 x 3.2	12.7 x 6.4	20 x 10
4.8 x 2.4	12.7 x 9.5	20 x 12
4.8 x 3.2	12.7 x 12.7	20 x 20
4.8 x 4.8	15 x 6	25 x 6
6.4 x 1.6	15 x 8	25 x 8
6.4 x 2.4	15 x 10	25 x 10
6.4 x 3.2	15 x 12	25 x 12
6.4 x 4.8	15 x 15	25 x 18
6.4 x 6.4	15.9 x 9.5	25 x 20

With water seal/IP seal

All knitted mesh EMI/RFI gaskets can be produced with a water seal/IP seal.

The standard material for the fluid seal/water seal is Neoprene which can be adhesive-backed (indicated in red in the drawings) for easy installation. Alternatively, silicone sponge is also available.



ORDER EXAMPLE

Series	Core	Material	Outside shape	Dimensions	Waterseal (Optional)
1200	**N :** Not important **F :** Full metal **C :** Neoprene foam **S :** Silicone **SF :** Silicone foam **E :** EPDM foam	**N :** Not important **M :** Monel **T :** TCS **A :** Aluminium **S :** Stainless steel	**R :** Round **DR :** Double round **T :** Round with tail **S :** Rectangular	Find the sizes in the dimension table above for example 1.6 x 9.5	**N :** No waterseal Specify the width of the water seal in mm

Adhesive	Length (meters)
N : Not adhesive **A :** With adhesive placed in the middle **AS :** With adhesive placed asymmetrical	

Knitted wire mesh hollow silicone gaskets 1200H

Universal EMC gasket to shield lower frequencies

A knitted wire mesh gasket with a hollow silicone core delivers an excellent EMI/RFI shielding and reliable environmental sealing, thanks to its conductive metal mesh layer and compressible, durable silicone profile. This hybrid design ensures high electromagnetic interference attenuation, flexibility, and resistance to chemicals and high temperatures. The gasket's hollow silicone profile ensures maximum compression, resilience, and robust environmental sealing in demanding applications.

For high-frequency shielding, foil-based gaskets like Amucor shielding gasket will perform better, because of their much larger contact surface.

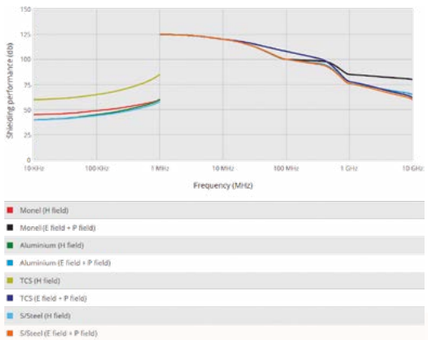
Benefits

- Combines flexible fit
- Long-term durability and wear-resistant
- High attenuation for lower frequencies (low-frequency magnetic shielding)
- Suitable for use under extreme conditions (military applications)
- Not susceptible to corrosion
- Various conductive materials against tension corrosion
- Roll lengths of 1 to 1000 meters (depending on width and height of the gasket)
- Tools required: pair of scissors

Metal knit gasket vs. Amucor shield

Contact points of Amucor shield — Contact points of metal knit gasket

Shielding performance*



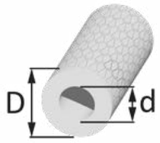
Technical specifications

Material	Applications
Monel Per QQ-N-281 BS 3075 N A 13 Class A diameter 0.11mm	The most commonly used material. Insensitive to corrosion and neutral on the galvanic scale.
Aluminium AMS 4187 BS 1475 5056A Alloy 5056 diameter 0.16mm	Used in some cases for aluminium enclosures.
T.C.S. Steel core (57%) Copper cladding (40%) Tin plating (3%) diameter 0.11mm	Excellent magnetic as well as electrical properties, because a Ferro alloy is covered with copper. The outside is tinned to prevent corrosion.
Stainless steel AISI 304 diameter 0.13mm	The strongest material with shielding performance comparable to aluminium. Highly wear-resistant.

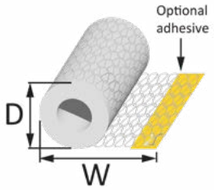
» *Knitted wire mesh hollow silicone gaskets 1200h*

Stock dimensions

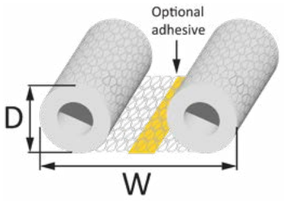
Below are all the standard sizes we keep in stock and so are available quickly. Almost any size and combination can be produced. If you need a size that is not listed below please contact for the options and delivery time.



Round (R) D (mm)	
3.2 x 1.6	9.5 x 6.4
4.8 x 3.2	11.1 x 8.0
6.4 x 3.2	12.7 x 9.5
8.0 x 4.8	14.9 x 11.1



Round with tail (T) d x w (mm)		
3.2 x 12.7	6.4 x 12.7	9.5 x 15.9
3.2 x 15.9	6.4 x 15.9	9.5 x 19.1
3.2 x 19.1	6.4 x 19.1	9.5 x 25.4
4.8 x 12.7	6.4 x 25.4	12.7 x 19.1
4.8 x 15.9	8.0 x 15.9	12.7 x 25.4
4.8 x 19.1	8.0 x 19.1	
4.8 x 25.4	8.0 x 25.4	

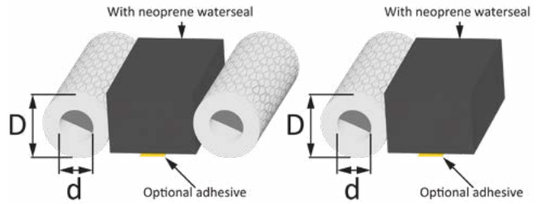


Double round (DR) d x w (mm)		
3.2 x 12.7	6.4 x 12.7	9.5 x 15.9
3.2 x 15.9	6.4 x 15.9	9.5 x 19.1
3.2 x 19.1	6.4 x 19.1	9.5 x 25.4
4.8 x 12.7	6.4 x 25.4	3.2 x 39.0
4.8 x 15.9	8.0 x 15.9	
4.8 x 19.1	8.0 x 19.1	
4.8 x 25.4	8.0 x 25.4	

With water seal/IP seal

All knitted mesh EMI/RFI gaskets can be produced with a water seal/IP seal.

The standard material for the fluid seal/water seal is Neoprene which can be adhesive-backed (indicated in red in the drawings) for easy installation. Alternatively, silicone sponge is also available.



ORDER EXAMPLE

Series	Material	Outside shape	Dimensions	Waterseal (Optional)	Adhesive
1200H	**N :** Not important **M :** Monel **T :** TCS **A :** Aluminium **S :** Stainless steel	**R :** Round **DR :** Double round **T :** Round with tail	Find the sizes in the dimension table	**N :** No waterseal Specify the width of the water seal in mm	**N :** Not adhesive **A :** With adhesive placed in the middle **AS :** With adhesive placed asymmetrical

Length (meters)

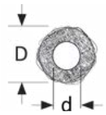
Knitted wire mesh washers & disks 1250

Universal EMC gasket to shield lower frequencies

The 1250 series are developed to seal the opening between the housing and the bolt holes. The washers and disks are made of tinned copper and they are often used in combination with an EMC gasket or are pre-assembled by us in gaskets such as the 1200 series knitted wire mesh gaskets. The material of the washers is T.C.S. (tinned copper steel) with a thickness of 2 mm. Other materials and thickness on request.

Applications

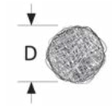
- Antenna seals
- Connector seals
- Cable glands



Standard size washers

Outside D Ø (mm)	Inside d Ø (mm)	Outside D Ø (mm)	Inside d Ø (mm)
Standard height 2mm		Standard height 2mm	
6.5	4.0	24.1	19.7
7.5	4.0	25.0	20.5
9.5	4.8	25.4	15.9
10.2	6.0	30.0	10.0
12.7	6.0	30.0	25.5
12.7	8.0	32.0	15.9
12.7	9.0	33.0	28.5
15.9	6.4	33.5	19.5
15.9	9.5	34.9	28.6
15.9	12.0	37.0	32.5
19.0	8.0	39.0	34.0
19.1	12.7	40.0	32.0
19.1	15.0	43.0	38.5
22.0	15.9	43.4	37.0
22.0	17.5	47.6	30.3

*Custom sizes on request



Standard size disk

Outside D Ø (mm)
12.5
22.0
30.5
32.0
50.0

*Custom sizes on request

ORDER EXAMPLE

Series	Outside Ø (mm)	Inside Ø (mm)
1250	Specify the outside diameter in mm	Specify the inside diameter in mm. When you want a disk, specify 0

every size can be made

Miniature shield foam 1400F

Very small EMI / RFI shielding gasket used for PCB's, smart phones and other applications where there is little space available

This EMI/RFI gasket can be made so narrow that the height exceeds the width. Nevertheless, it provides sufficient electromagnetic damping.

The gasket is made of a highly electrically conductive foam with or without an electrically conductive self-adhesive strip on one side. The electrically conductive foam can be compressed up to more than 50 % of its original height.

The smallest width is 1 mm and the maximum height is 5 mm. Roll lengths of 1 to 1000 meters, depending on width and height of the EMI gasket.

Applications

- Shielding on printed circuit board (PCB)
- EM, RF, LF, HF, EMI, RFI shielding
- Other products where there is very little space available and low compression force is required

Options

- Resistant to high temperatures
- With or without self-adhesive
- Made from electrically conductive foam
- Electrically conductive rubber version for chemical resistance

Standard dimensions

Height (mm) \ Width (mm)	1.0	1.5	2.0	2.5	3.0	3.5	4.0
0.5	1400-1.0-0.5	1400-1.5-0.5	1400-2.0-0.5	1400-2.5-0.5	1400-3.0-0.5	1400-3.5-0.5	1400-4.0-0.5
0.7	1400-1.0-0.7	1400-1.5-0.7	1400-2.0-0.7	1400-2.5-0.7	1400-3.0-0.7	1400-3.5-0.7	1400-4.0-0.7
1.0	1400-1.0-1.0	1400-1.5-1.0	1400-2.0-1.0	1400-2.5-1.0	1400-3.0-1.0	1400-3.5-1.0	1400-4.0-1.0
1.5	1400-1.0-1.5	1400-1.5-1.5	1400-2.0-1.5	1400-2.5-1.5	1400-3.0-1.5	1400-3.5-1.5	1400-4.0-1.5
2.0	1400-1.0-2.0	1400-1.5-2.0	1400-2.0-2.0	1400-2.5-2.0	1400-3.0-2.0	1400-3.5-2.0	1400-4.0-2.0
2.2	1400-1.0-2.2	1400-1.5-2.2	1400-2.0-2.2	1400-2.5-2.2	1400-3.0-2.2	1400-3.5-2.2	1400-4.0-2.2
3.5	1400-1.0-3.5	1400-1.5-3.5	1400-2.0-3.5	1400-2.5-3.5	1400-3.0-3.5	1400-3.5-3.5	1400-4.0-3.5
5.0	1400-1.0-5.0	1400-1.5-5.0	1400-2.0-5.0	1400-2.5-5.0	1400-3.0-5.0	1400-3.5-5.0	1400-4.0-5.0

ORDER EXAMPLE

Series	Width (mm)	Height (mm)	Adhesive	Length (m)
1400F				
	Specify the width in mm.	Specify the height in mm.	**NO :** No adhesive **PSA :** With conductive self-adhesive	

Miniature shield rubber 1400R

Very small EMI / RFI shielding gasket used for PCB's, smart phones and other applications where there is little space available

This EMI/RFI gasket can be made so narrow that the height exceeds the width. Nevertheless, it provides sufficient electromagnetic damping.

The gasket is made of a highly electrically conductive rubber with or without an electrically conductive self-adhesive strip on one side.

The smallest width is 1.5 mm and the maximum height is 3 mm. Roll lengths of 1 to 1000 meters, depending on width and height of the EMI gasket.

Applications

- Shielding on printed circuit board (PCB)
- EM, RF, LF, HF, EMI, RFI shielding
- Other products where there is very little space available and low compression force is required

Options

- EMI/RFI miniature gasket with water seal
- Resistant to high temperatures
- With or without self-adhesive
- Made from electrically conductive rubber
- Electrically conductive rubber version for chemical resistance

Standard dimensions

Height (mm) \ Width (mm)	1.5	2.0	2.5	3.0	3.5	4.0
1.0	1400R-1.5-1.0	1400R-2.0-1.0	1400R-2.5-1.0	1400R-3.0-1.0	1400R-3.5-1.0	1400R-4.0-1.0
1.5	1400R-1.5-1.5	1400R-2.0-1.5	1400R-2.5-1.5	1400R-3.0-1.5	1400R-3.5-1.5	1400R-4.0-1.5
2.0	1400R-1.5-2.0	1400R-2.0-2.0	1400R-2.5-2.0	1400R-3.0-2.0	1400R-3.5-2.0	1400R-4.0-2.0
2.5	1400R-1.5-2.5	1400R-2.0-2.5	1400R-2.5-2.5	1400R-3.0-2.5	1400R-3.5-2.5	1400R-4.0-2.5
3.0	1400R-1.5-3.0	1400R-2.0-3.0	1400R-2.5-3.0	1400R-3.0-3.0	1400R-3.5-3.0	1400R-4.0-3.0

ORDER EXAMPLE

Series	Width (mm)	Height (mm)	Adhesive	Length (mm)
1400R				650
	Specify the width in mm.	Specify the height in mm.	**NO :** No adhesive **PSA :** With conductive self-adhesive	**650 :** 650 mm

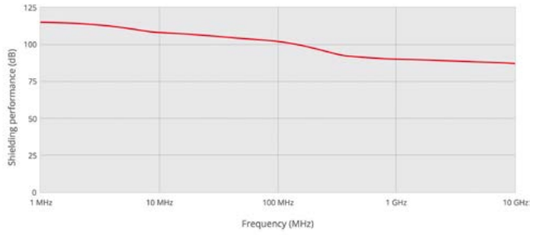
U-shape EMI gasket 7600

U-shaped gaskets for doors and other types of panels where a U-shape can be attached.

We have developed a U-shaped (U-channel) EMC gasket for doors and other types of panels where a U-shape can be attached. The U-channel (U-shape) permits opposing contact surfaces to enter the U-Channel opening while making three points of contact. For example for edge-mount applications.

The U-shaped gasket creates a positive seal between the bottom of a door or panel and its threshold to block out weather, light, sound, insects, and dust. At the same time it acts as an EMI gasket. It is easy to assemble by sticking it onto the edge of the door or panel with the self-adhesive strip.

Shielding performance*



Optional (on request)

The U-shape can be made in different widths and heights per side. It is also possible to place a half rounding layer on top

Standard part numbers

Part Number	A	B	C	D (material thickness)
7600-242	2	4	2	1
7600-464	4	6	4	1
7600-686	6	8	6	2
7600-8108	8	10	8	2
7600-9149	9	14	9	3
7600-111611	11	16	11	3
7600-131813	13	18	13	3
7600-152015	15	20	15	4
7600-162216	16	22	16	4
7600-182418	18	24	18	4

ORDER EXAMPLE

Series	Dimensions	Length (m)
7600	242 464 686 8108 9149 111611 131813 152015 162216 182418	

Amucor shield 6800

Amucor EMI shield is intended for panels and screwed applications

Amucor Shield 6800 is an affordable HF gasket which can be supplied in a wide range of dimensions. The gasket is very effective in combination with zinc-plated steel and aluminium constructions.

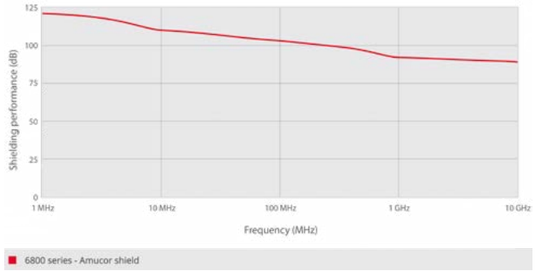
All EMI gaskets can be provided with a conductive or non-conductive self-adhesive strip.

The Amucor Shield 6800 series consists of a neoprene or PVC foam core covered with reinforced foil based on an Amucor alloy. This construction guarantees excellent shielding performance and is remarkably strong.

Special applications, different foam cores, conductive foils and fabrics are also available.

Shielding performance*

Shielding effectiveness depends on surface, shape of gaskets and materials used.



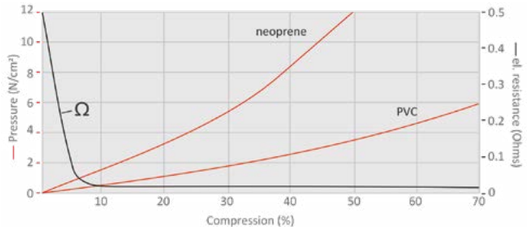
Benefits

- Self-adhesive EMC gasket
- Easy to fit, can be cut with scissors
- Good water resistance
- Gasket can be die-cut (screw holes)
- Roll lengths of 1 to 1000 meters (depending on the EMI gasket's width and height)
- High shielding performance
- Low closure force
- EXTREMELY STRONG
- Deflection 50%

Options

- Cut into accurate lengths
- Can be made die-cut or as a frame
- Combination with water seal
- UL94V-0 flame-retardant foam core
- Chemical resistant rubbers like EPDM
- Silicone sponge for high temperatures up to 220 °C
- Various conductive foils and fabrics
- With cutouts, so the gasket can be bent easily

Mechanical properties

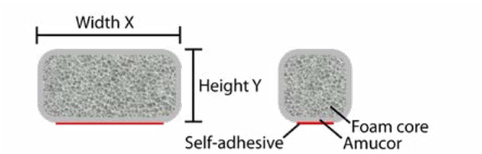


» *Amucor shield 6800*

Tape Specification
- **01** Standard self-adhesive placed in the middle
- **02** Without self-adhesive
- **03** With conductive self-adhesive (only recommended on small sizes)
- **06** Standard self-adhesive, asymmetrical
- **07** Standard self-adhesive placed on the side

Foam Specification
- **N** Standard Neoprene Foam
- **E** EPDM foam core
- **P** Low closure force PVC Foam, slow recovery
- **F** Flame retardant Foam (UL94V-0)
- **S** Silicone foam

Standard gasket dimensions



Height Y (mm)	Width X (mm)														
	2	3	4	5	6	7	8	10	12	15	18	20	25	32	50
1	2-1	3-1	4-1	5-1	6-1	7-1	8-1	10-1	12-1	15-1	18-1	20-1	25-1	32-1	50-1
2	2-2	3-2	4-2	5-2	6-2	7-2	8-2	10-2	12-2	15-2	18-2	20-2	25-2	32-2	50-2
3		3-3	4-3	5-3	6-3	7-3	8-3	10-3	12-3	15-3	18-3	20-3	25-3	32-3	50-3
4			4-4	5-4	6-4	7-4	8-4	10-4	12-4	15-4	18-4	20-4	25-4	32-4	50-4
5				5-5	6-5	7-5	8-5	10-5	12-5	15-5	18-5	20-5	25-5	32-5	50-5
6					6-6	7-6	8-6	10-6	12-6	15-6	18-6	20-6	25-6	32-6	50-6
8						7-8	8-8	10-8	12-8	15-8	18-8	20-8	25-8	32-8	50-8
10								10-10	12-10	15-10	18-10	20-10	25-10	32-10	50-10
12									12-12	15-12	18-12	20-12	25-12	32-12	50-12

ORDER EXAMPLE

Series	Width (mm)	Height (mm)	Tape code	Foam code	Length (m)
6800					

01 : standard self-adhesive placed in the middle
02 : without self-adhesive
03 : with conductive self-adhesive (only recommended on small sizes)
06 : standard self-adhesive, asymmetrical
07 : standard self-adhesive placed on the side

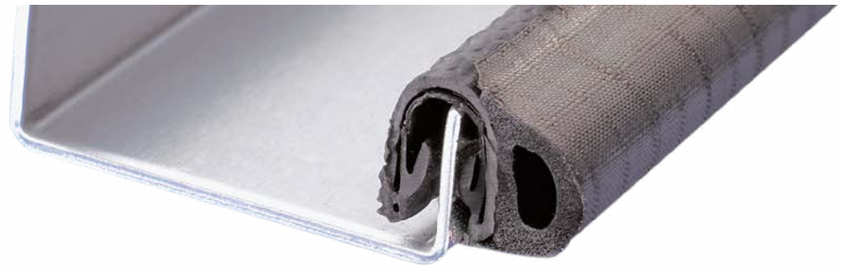
N : standard neoprene foam
E : EPDM foam core
P : PVC foam, slow recovery
F : flame retardant UL94V-0 foam
S : Silicone foam

***Notice**
Information supplied in these data sheets is based on independent and laboratory tests which Holland Shielding Systems BV, hereafter referred to as HSS believes to be reliable. HSS has no control over the design of customer's product which incorporates products, therefore it is the responsibility of the user to determine the suitability for his particular application and we recommend that the user make his own test to determine suitability.

The product described in this data sheet shall be of standard quality, however the products are sold without warranty of fitness for a particular purpose, either expressed or implied, except to the extent expressly stated on HSS invoice, quotation or order acknowledgment. HSS does not warrant that products described in this data sheet will be free of conflict with existing or future patents of third parties. All risks of lack of fitness, patent infringement and the like are assumed by the user.

Clip-on gasket 6500

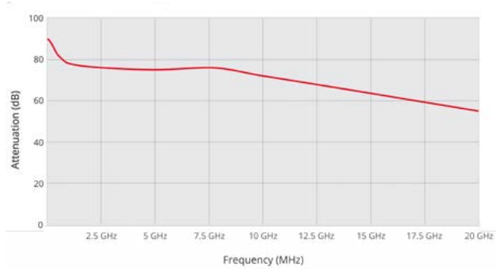
Clip-on EMI/RFI shielding gaskets with water seal. These gaskets are also know as trim gaskets or trim shield gaskets.



This easily mounted clip-on gasket is composed of two layers: a sponge rubber water seal, and an EMI-shielding side of highly conductive, wear-resistant metallized fabric. The gasket is very flexible due to the hollow rubber, ensuring a low closure force.

The gasket is assembled without tools, simply by manually pressing the section onto the metal flange of your enclosure. Different sizes are available on request. The gasket can be bent in either direction (it can not be bent into a right angle, but it can form a rounded corner with a very small radius). Temperature ranges from -40 to +110 °C.

Shielding performance*

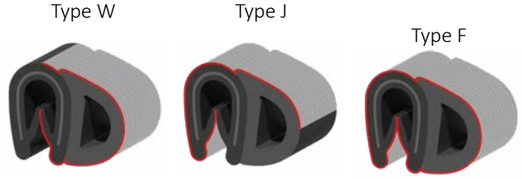


Shielding effectiveness depends on surface, shape of gasket and materials used.

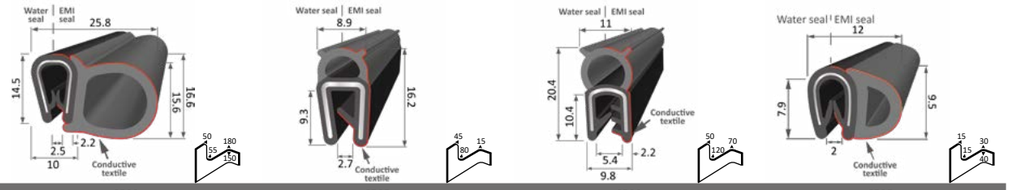
TEMPERATURE RESISTANCE
An EPDM core with an operating temperature up to 100 °C and good resistance to UV, water, and acids make the clip-on shielding gaskets the right choice for outdoor applications.

Applications
Special shapes and materials excel in dynamic or high cycling applications such as Faraday cage doors or access panels with low compression rates and very limited compression set.

Types



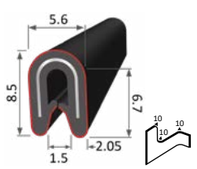
STANDARD SHAPES

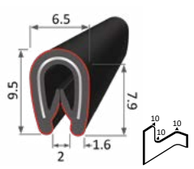


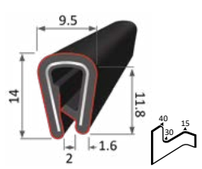
Partnumber	6580	6585	6590	6595
Available types	W, F	W, F	W, F	W, J, F
Clamping range	1-4 mm	0.5-2 mm	1-3 mm	1-2 mm
Profile material	PVC quality 911V5 ALD	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	PVC quality 911V5 ALD
Bulb material	EPDM quality EP 082	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347

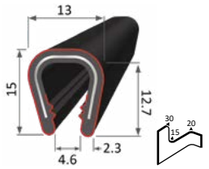
Conductive flexible edge protector

The gasket is designed to slide easily over metal flanges to help reduce installation costs and is a good choice for retrofit applications.

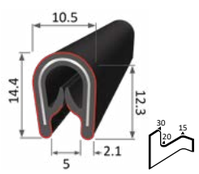


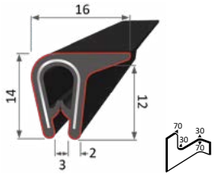


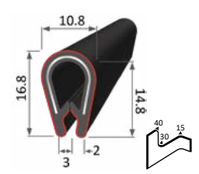


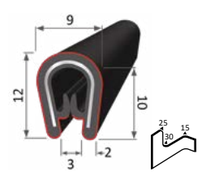


Partnumber	6501	6502	6503	6504
Available types	F	F	F	F
Clamping range	1 mm	1-2 mm	1-3 mm	6-8 mm
Profile material	PVC quality 911V5 ALD	PVC quality 911V5 ALD	PVC quality 911V5 ALD	PVC quality 911V5 ALD
Bulb material	-	-	-	-
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347

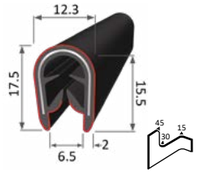


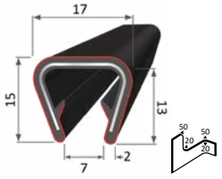


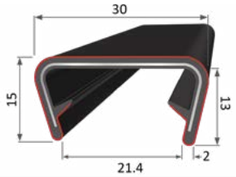


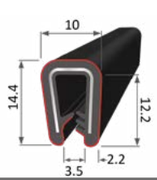


Partnumber	6505	6506	6507	6508
Available types	F	F	F	F
Clamping range	1-4 mm	1-3 mm	1-4 mm	1-3 mm
Profile material	PVC quality 911V5 ALD	PVC quality 911V5 ALD	PVC quality 911V5 ALD	PVC quality 911V5 ALD
Bulb material	-	EPDM quality EP 082	-	-
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347

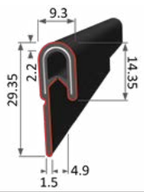








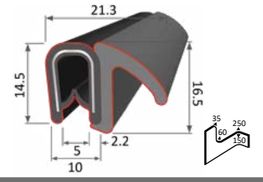
Partnumber	6509	6510	6512	6513
Available types	F	F	F	F
Clamping range	4-6 mm	9-12 mm	18-20 mm	1-2 mm
Profile material	PVC quality 911V5 ALD	PVC quality 911V5 ALD	PVC quality 911V5 ALD	PVC quality 911V5 ALD
Bulb material	-	-	-	-
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347

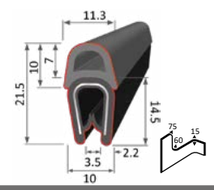


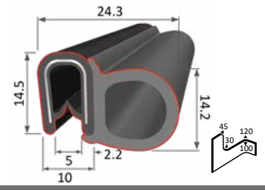
Partnumber	6514
Available types	F
Clamping range	2-3 mm
Profile material	PVC quality 911V5 ALD
Bulb material	-
Assembly insert	Steel 1.0347

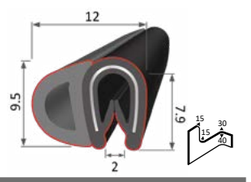
Sealing section

The gasket is designed to slide easily over metal flanges to help reduce installation costs and is a good choice for retrofit applications.

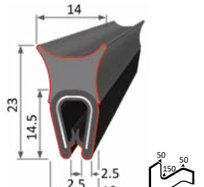


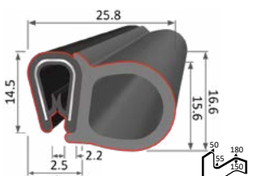


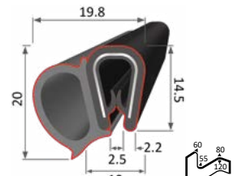


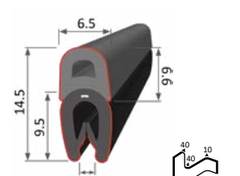


Partnumber	6521	6522	6523	6524
Available types	F	W, F	W, F	W, J, F
Clamping range	1-4 mm	1-4 mm	1-4 mm	1-2 mm
Profile material	PVC quality 911V5 ALD	PVC quality 911V5 ALD	PVC quality 911V5 ALD	PVC quality 911V5 ALD
Bulb material	EPDM quality EP 082	EPDM quality EP 082	EPDM quality EP 082	EPDM quality EP 082
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347

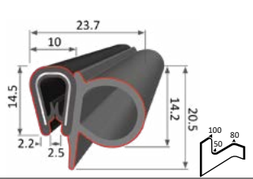


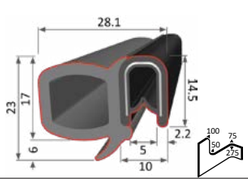


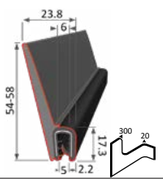


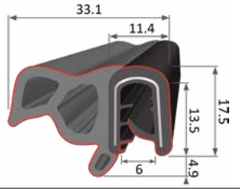


Partnumber	6525	6526	6527	6528
Available types	W, F	W, F	W, F	W, F
Clamping range	1-4 mm	1-4 mm	1-4 mm	1-2 mm
Profile material	PVC quality 911V5 ALD	PVC quality 911V5 ALD	PVC quality 911V5 ALD	PVC quality 911V5 ALD
Bulb material	EPDM quality EP 082	EPDM quality EP 082	EPDM quality EP 082	EPDM quality EP 082
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347

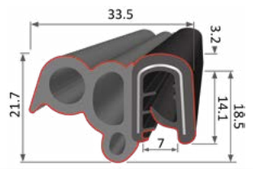


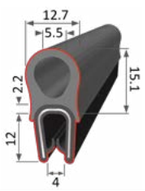


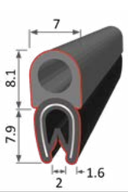


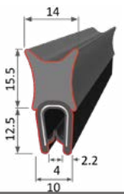


Partnumber	6529	6530	6532	6533 (on request)
Available types	W, F	W, F	W, F	W, F
Clamping range	1-4 mm	1-4 mm	2-4 mm	2-4 mm
Profile material	PVC quality 911V5 ALD	PVC quality 911V5 ALD	PVC quality 911V5 ALD	PVC quality 911V5 ALD
Bulb material	EPDM quality EP 082	EPDM quality EP 082	EPDM quality EP 082	EPDM quality EP 082
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347

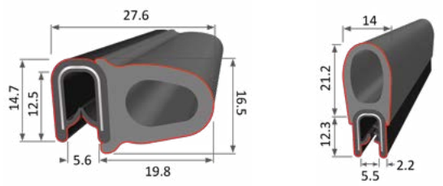








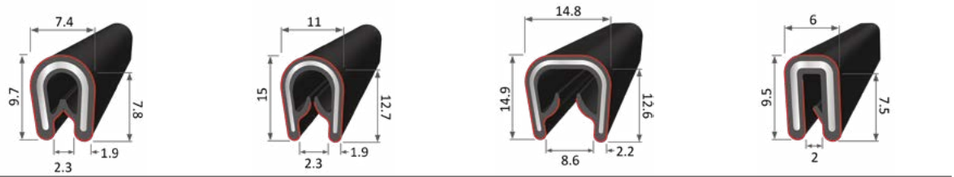
Partnumber	6534 (MOQ 50 meter)	6535 (MOQ 100 meter)	6536 (MOQ 100 meter)	6537
Available types	W, F	W, F	W, F	W, F
Clamping range	2-4 mm	2-4 mm	1-2 mm	0,5-2 mm
Profile material	PVC quality 911V5 ALD	PVC quality 911V5 ALD	PVC quality 911V5 ALD	PVC quality 911V5 ALD
Bulb material	EPDM quality EP 082	EPDM quality EP 082	EPDM quality EP 082	EPDM quality EP 082
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347



Partnumber	6538	6539
Available types	W, F	W, F
Clamping range	1-4 mm	1-4 mm
Profile material	PVC quality 911V5 ALD	PVC quality 911V5 ALD
Bulb material	EPDM quality EP 082	EPDM quality EP 082
Assembly insert	Steel 1.0347	Steel 1.0347

Conductive edge protector

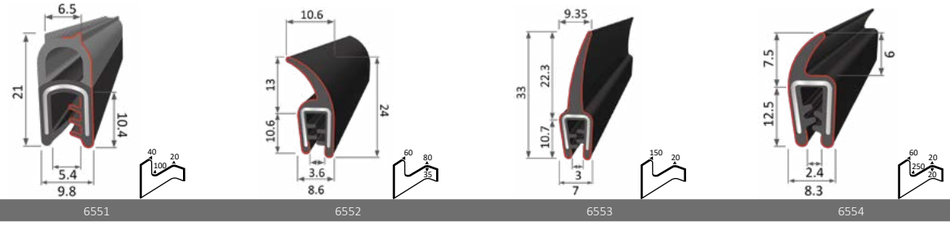
This is a very rigid profile, used to protect sharp edges from damaging and still preserve the electrical conductance.
This type is also suitable for connecting two steel plates or for static discharge.



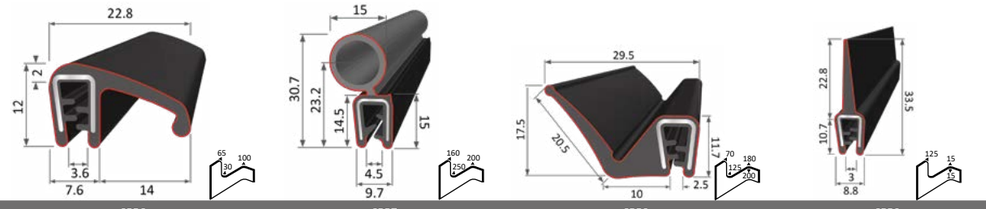
Partnumber	6540	6541	6542	6543
Available types	F	F	F	F
Clamping range	0.5-2 mm	2-5 mm	5-8 mm	1.2-1.8 mm
Profile material	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore
Bulb material	-	-	-	-
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347

Dynamic section

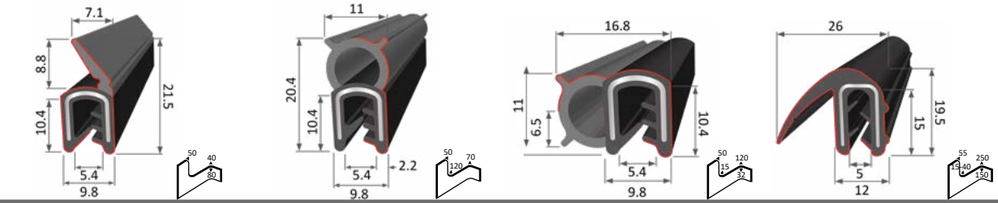
Simple clip-on installation for door jambs and similar needs, edge mounts, low and high deflection.
For applications where a small dynamic range is required and a clip-on mounting is preferred. Mounts simply by pressing into position. The gasket comes with retaining lances lo lock into the desired position.



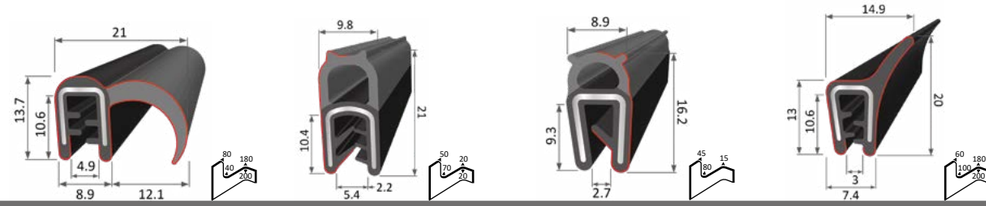
Partnumber	6551	6552	6553	6554
Available types	W, F	F	F	F
Clamping range	0.8-3 mm	1-3 mm	1-2 mm	1-2 mm
Profile material	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore
Bulb material	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347



Partnumber	6556	6557	6558	6559
Available types	F	F	F	F
Clamping range	1-3 mm	1-3 mm	1-3 mm	1-3 mm
Profile material	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore
Bulb material	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347

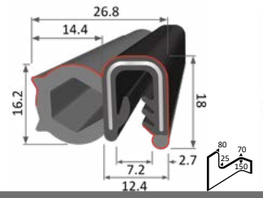


Partnumber	6560 (on request)	6561	6562	6563
Available types	F	W, F	W, F	F
Clamping range	1-3 mm	1-3 mm	1-3 mm	1-4 mm
Profile material	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore
Bulb material	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347

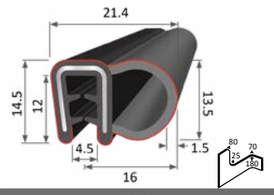


Partnumber	6564 (MOQ 50 meter)	6565	6566	6567
Available types	F	W, F	W, F	F
Clamping range	1-3 mm	1-3mm	0.5-2 mm	1-3 mm
Profile material	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore A
Bulb material	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347

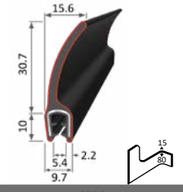
» CLIP-ON GASKET 6500



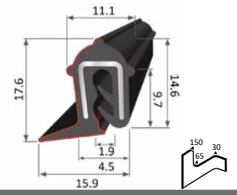
Partnumber	6568	6569 (on request)	6570	6571
Available types	W, F	W, F	W, F	F
Clamping range	3-5 mm	1-3 mm	6-8 mm	2.5-3.5 mm
Profile material	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore A
Bulb material	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347



Partnumber	6572	6573 (on request)	6574	6575
Available types	F	F	W, F	F
Clamping range	1.5-3 mm	2-3 mm	1-3 mm	2-4 mm
Profile material	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore
Bulb material	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347

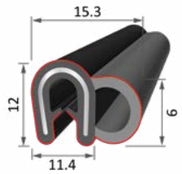


Partnumber	6576	6577	6578	6579
Available types	F	F	F	W, F
Clamping range	2-4 mm	2-4 mm	2-4 mm	1-3 mm
Profile material	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60
Bulb material	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347



Partnumber	6581 (MOQ 1000 meter)	6582	6583	6586 (on request)
Available types	W, F	F	F	W, F, H
Clamping range	1-2.5 mm	1-2 mm	1.5-3 mm	1,5-3,5 mm
Profile material	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore
Bulb material	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347

» CLIP-ON GASKET 6500



Partnumber	6591 (on request)
Available types	F
Clamping range	0.5-2 mm
Profile material	EPDM quality ES 60, 60 ± 5 shore
Bulb material	EPDM quality ES 06
Assembly insert	Steel 1.0347

Silicone clamp section

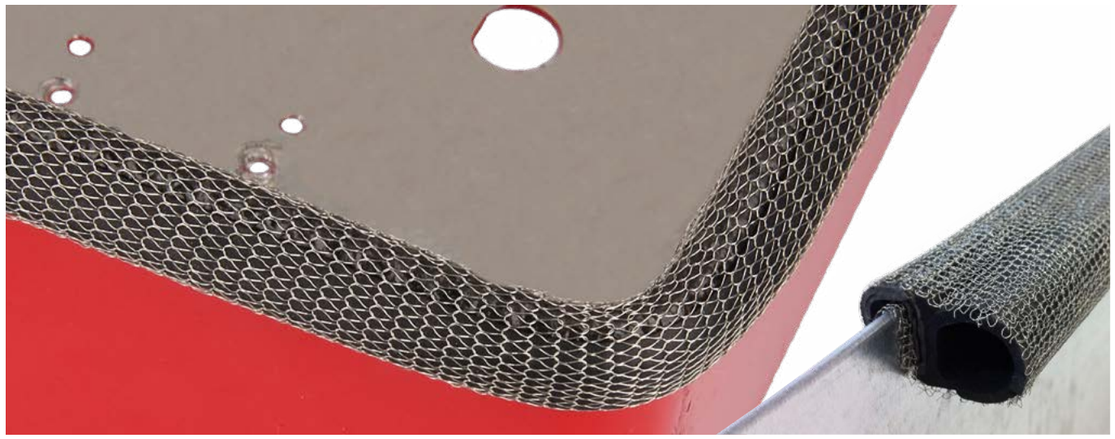
Partnumber	6592	6593
Available types	F	F
Clamping range	1.5- 2 mm	2- 4 mm
Material	Silicone, 55 ± 5 shore	Silicone, 60 ± 5 shore

ORDER EXAMPLE

Part number		Type		Length (m)
	–		–	
Please specify the part number from the tables.		**W :** Type W **J :** Type J **F :** Type F		Specify the length in meters

Clip-on gasket full metal 6600

Clip-on EMI heavy duty gaskets, specifically designed for heavy-duty applications



Clip-on EMI gaskets heavy-duty

The clip-on gasket heavy-duty is a flexible rubber tube with all-metal cladding. The large range of the clip makes it extremely easy to mount and it guarantees solid mechanical attachment of the EMI-shielding gasket without the use of adhesives.

The metal cladding is corrosion resistant and offers both excellent EMI shielding and electrical conductivity. The hollow rubber provides low closure force and good spring properties, making it ideal to use for EMI shielding, grounding and static discharge (ESD) or as an alternative for finger strips.

The clip-on gasket can bend up to 90 degrees and can be clipped on to plate material of between 0.5 and 3mm thick. It can be delivered in continuous lengths or short, pre-cut sections.

All shapes of our 6500 serie can be delivered with metal cladding.

Applications

- EMI / EMC shielding
- Static discharge (ESD) / grounding
- Electrical connections
- Doors / lids
- Medical / military
- General electronics

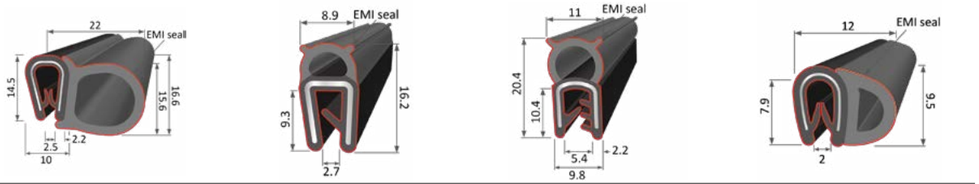
Advantages

- Non toxic
- High spring / compression range
- Extremely high shielding performance
- Superb electrical conductivity
- Easy to mount

Technical data

- Shielding effectiveness >100 dB (10 kHz- 22 GHz)
- Electrical resistance 0.004 Ohms / square cm
- Temp. range -40 to +100 °C

STANDARD SHAPES



Partnumber	6680	6685	6690	6695
Clamping range	1-4 mm	0.5-2 mm	1-3 mm	1-2 mm
Profile material	PVC quality 911V5 ALD	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore	EPDM quality ES 60, 60 ± 5 shore
Bulb material	EPDM quality EP 082	EPDM quality ES 06	EPDM quality ES 06	EPDM quality ES 06
Assembly insert	Steel 1.0347	Steel 1.0347	Steel 1.0347	Steel 1.0347

ORDER EXAMPLE

Part number	Cladding	Length (m)
	4730 : Monel **4740 :** Tinned copper steel (standard) **4750 :** Stainless steel **4760 :** Aluminium	Specify the length in meters

P-shaped EMI shielding profile 7200

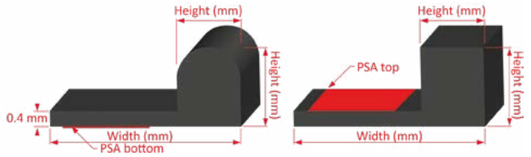
Conductive fabrics with Ni/Cu-layer over P-shaped sponge core (elastomer core)

7200 series P-shape EMI shielding gaskets consists of a P-shaped closed cell foam core which is covered with a conductive fabric with a copper-nickel metal coating (material code T) or highly conductive Amucor foil (material code A).

P-shape EMI shielding gasket comes with a self-adhesive strip for easy mounting.

The version with highly conductive Amucor foil (material code A) is designed especially to be combined with aluminium and zinc-plated steel.

Our 7200 series P-shape EMI shielding gaskets continuous strip gaskets have excellent shielding effectiveness (SE), high durability, low compression set and low resistance.



There is a square and a round shape available. The width of the bulb is the same as the p-shape height.

Applications

- Displays
- Metal housings
- Switching cabinets
- Depending on the application an IP54 protection class could be reached, that means by the use of the shielding gasket a protection against dust (index 5) and protection against splashed water (index 4) could be offered

Characteristics

Conductive fabrics with Ni/Cu-layer. A PU sponge core (elastomer) covered with electro conductive fabric

- Shielding effectiveness: > 85dB attenuation from 20 MHz to 10 GHz
- Electrical Resistance: < 0.1 Ohms/Sq
- Compression Deflection: < 1 lb/in
- Compression Set: 15-19%
  - 15% at 21 °C (70 °F)
  - 19% at 70 °C (158 °F)
- Service Temperature -40 °C (-40 °F) to 70 °C (158 °F)

ORDER EXAMPLE

Series	Width (mm)	Heigth (mm)	Tape code	Adhesive side	Foam code
7200	**8 :** 8 mm **10 :** 10 mm **12 :** 12 mm **14 :** 14 mm **16 :** 16 mm	**3 :** 3 mm **4 :** 4 mm **6 :** 6 mm **8 :** 8 mm	**01 :** Standard self-adhesive placed in the middle **03 :** With conductive self-adhesive (only recommended on small sizes) **06 :** Standard self-adhesive, asymmetrical	**T :** Adhesive on top side **B :** Adhesive on bottom side	**N :** Standard neoprene foam **E :** EPDM foam core **P :** Low closure force PVC foam, slow recovery **F :** Flame retardant UL94V-0 foam

Cover material	Shape	Water seal width (mm) Optional	Length (mm)
T : Conductive textile **A :** Amucor	**R :** Round shaped **S :** Square shaped	If you want the gasket with a water seal, then specify the width of the water seal in mm.	Specify the length (mm) Max. length 2500 mm. Others on request. Keep small for economic transport.

Standard shield 7000

Soft EMI/RFI shielding gasket for panels, doors and lids. Economical High frequency shielding gasket (HF shielding gasket) solution.

Standard shield 7000 series is an economical HF (High Frequency) EMI shielding gasket which can be supplied in a wide range of dimensions. It is very effective in combination with stainless steel, copper and chrome-plated constructions.

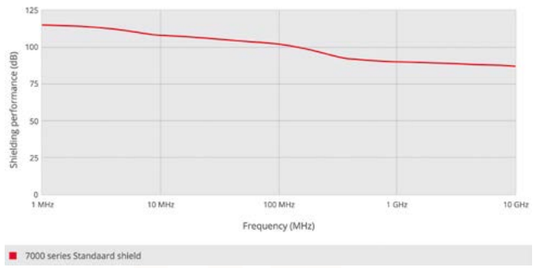
Our 7000 series standard shield EMI gaskets can be provided with a conductive or a non-conductive self-adhesive strip on the back for easy assembly.

Standard shield consists of a foam core covered with highly electrically conductive textile.

For smaller widths than 3mm we suggest to use the conductive adhesive (**code 03**). This guarantees excellent EMI / RFI shielding performance.

Please note: For special applications, different foam cores, conductive foils and fabrics are available on request.

Shielding performance*



Benefits

- Self-adhesive EMC gasket
- Easy to fit, can be cut with scissors
- Gasket can be die-cut (screw-holes, bites for easy bending etc...)
- Roll length of 1 until 1000 meters (Depending on width and height of the EMI gasket)
- High EMI/RFI shielding performance
- Low closure force
- EXTREMELY STRONG
- Deflection 50%

Options

- CNC cut into specific lengths
- Can be made into any shape or as a frame (according CAD drawing)
- Combination with water seal
- UL94V-0 flame retardant foam core (**foam code F**)
- Chemical resistant rubbers like EPDM
- Silicone sponge for high temperatures up to 220 °C
- Different conductive foils and fabrics
- With cut-outs so that the gasket can be easily bend

Tape Specification

- **01** Standard self-adhesive placed in the middle
- **02** Without self-adhesive
- **03** With conductive self-adhesive (only recommended on small sizes)
- **06** Standard self-adhesive, asymmetrical
- **07** Standard self-adhesive placed on the side

Foam Specification

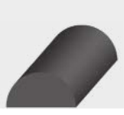
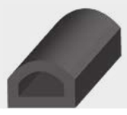
- **N** Standard Neoprene Foam
- **E** EPDM foam core
- **P** Low closure force PVC Foam, slow recovery
- **F** Flame retardant Foam (UL94V-0)
- **S** Silicone foam

Available Sizes

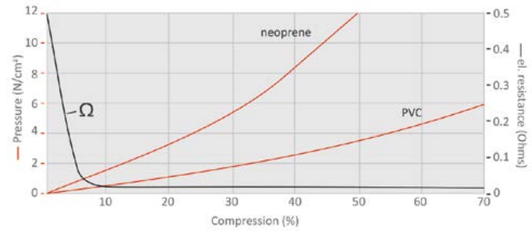
Height Y (mm) \ Width X (mm)	2	3	4	5	6	7	8	9	10	12	15	18	20	25	32	50
1	2-1	3-1	4-1	5-1	6-1	7-1	8-1	9-1	10-1	12-1	15-1	18-1	20-1	25-1	32-1	50-1
2	2-2	3-2	4-2	5-2	6-2	7-2	8-2	9-2	10-2	12-2	15-2	18-2	20-2	25-2	32-2	50-2
3		3-3	4-3	5-3	6-3	7-3	8-3	9-3	10-3	12-3	15-3	18-3	20-3	25-3	32-3	50-3
4			4-4	5-4	6-4	7-4	8-4	9-4	10-4	12-4	15-4	18-4	20-4	25-4	32-4	50-4
5				5-5	6-5	7-5	8-5	9-5	10-5	12-5	15-5	18-5	20-5	25-5	32-5	50-5
6					6-6	7-6	8-6	9-6	10-6	12-6	15-6	18-6	20-6	25-6	32-6	50-6
8						7-8	8-8	9-8	10-8	12-8	15-8	18-8	20-8	25-8	32-8	50-8
9								9-9	10-9	12-9	15-9	18-9	20-9	25-9	32-9	50-9
10									10-10	12-10	15-10	18-10	20-10	25-10	32-10	50-10
12										12-12	15-12	18-12	20-12	25-12	32-12	50-12

Other dimensions on request.

Special profile shapes

EPDM rubber	70D-72	70D-68	70D-58	70D-62	70D-64	70D-76	70D-51
							
Y x Xmm	4 x 2mm	6 x 3 mm	8 x 4 mm	8 x 6 mm	12 x 8 mm	12 x 10 mm	21 x 17 mm

Mechanical properties



ORDER EXAMPLE

Series	Width (mm)	Heigth (mm)	Tape code	Foam code	Length (meters)
7000					

Tape code

- **01 :** Standard self-adhesive placed in the middle
- **02 :** Without self-adhesive
- **03 :** With conductive self-adhesive (only recommended on small sizes)
- **06 :** Standard self-adhesive, asymmetrical
- **07 :** Standard self-adhesive placed on the side

Foam code

- **N :** Standard neoprene foam
- **E :** EPDM foam core
- **P :** Low closure force PVC foam, slow recovery
- **F :** Flame retardant UL94V-0 foam
- **S :** Silicone foam

Ultra soft shield 7400

**Ultra-soft EMI shielding gasket for doors, panels and lids.
Very low closure force to prevent deflection.**

Ultra soft shield 7400 series is an HF-shielding gasket with high shielding performance and extremely low closure force. This prevents deflection of doors/parts, which improves shielding effectiveness. The product works very well in combination with stainless steel and other metals.

The core consists of high-grade polyurethane foam with a maximum compression of 80%, which distinguishes Ultra soft shield 7400 from other commonly used shielding materials.

Ultra soft shield 7400 is covered with a highly conductive, wear & tear resistant, metallized fabric.

Different foam cores and conductive foils/fabrics are available for special applications.

Options (on request)

- Aspire cut into accurate lengths
- Ultra soft shield 7400 series combined with a water seal (see our Ultra soft twin shield 7800 series)
- With UL94V-0 flame-retardant textile cover
- With chemical-resistant rubbers like EPDM
- With silicone-sponge core for high temperatures up to 220 °C
- Different conductive foils and fabrics
- Bites or shapes cut out for easy application or bends, possible according to customer drawing

Benefits

- Gasket can be compressed up to 80%
- Very low closure force
- Very high electrical conductivity
- High shielding performance
- Roll lengths of 1 to 1000 meters, depending on width and height of the EMI gasket
- Easy to fit with self-adhesive
- High abrasion resistance
- Can be cut with a pair of scissors
- Because the Ultra soft shield 7400 series is so soft, it is easy to bend it around corners

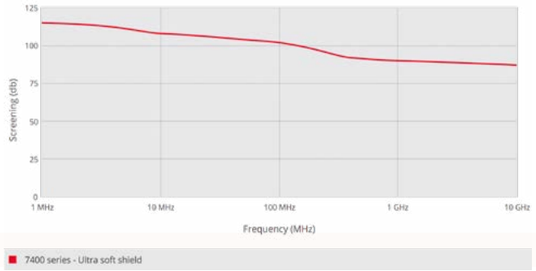
Tape specification

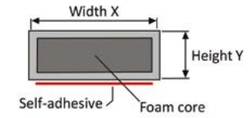
- **01** Standard self-adhesive placed in the middle
- **02** Without self-adhesive
- **03** With conductive self-adhesive
- **06** Standard self-adhesive, asymmetrical

Foam specification

- **P** Standard polyurethane foam
- **F** Flame retardant UL94V-0 foam

Shielding performance*





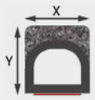
Standard dimensions

Height Y (mm) \ Width X (mm)	3	4	5	6	9	10	12	15	18	20	25
3	3-3	4-3	5-3	6-3	9-3	10-3	12-3	15-3	18-3	20-3	25-3
4		4-4	5-4	6-4	9-4	10-4	12-4	15-4	18-4	20-4	25-3
6				6-6	9-6	10-6	12-6	15-6	18-6	20-6	25-6
8					9-8	10-8	12-8	15-8	18-8	20-8	25-8
9					9-9	10-9	12-9	15-9	18-9	20-9	25-9
10						10-10	12-10	15-10	18-10	20-10	25-10
12							12-12	15-12	18-12	20-12	25-12
15								15-15	18-15	20-15	25-15
18									18-18	20-18	25-18
20										20-20	25-20
25											25-25

* Other dimensions on request. Base material thickness can vary. Tolerance 12,5% +-2.5% depending on the size of the gasket. Because this item easily compresses up to 80%, it is recommended to order a larger size.

Ultra soft high deflection D-shape gasket (74D)

We have developed a combination gasket for an extremely high spring range. These gaskets are developed for applications where a high deflection and a high spring range is required. To give you an example. A 26 mm high deflection gasket can be compressed up to 7 mm without overly exerting excessive force. That is 70% compression at low force.

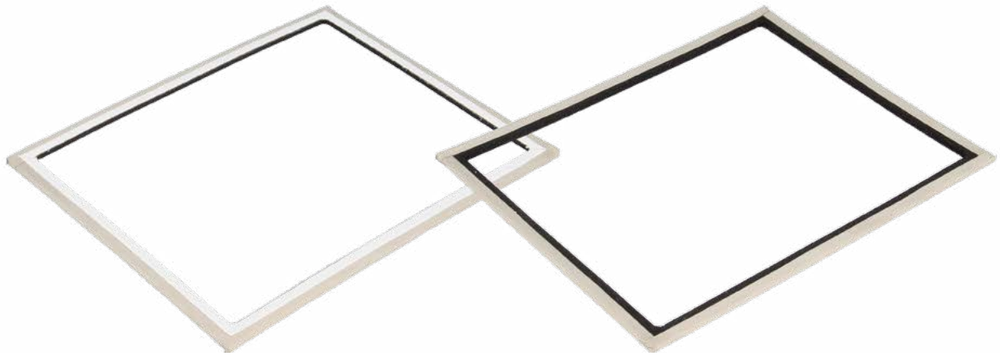
Part number	74D-763	74D-766	74D-769	74D-7612
				
Y x Xmm	15 x 12mm	18 x 12mm	21 x 12mm	24 x 12mm

ORDER EXAMPLE

Series	Width (mm)	Height (mm)	Tape code	Foam code	Length (meters)
7400	Specify the width of the gasket in mm	Specify the heigth of the gasket in mm	**01** : standard self-adhesive placed in the middle **02** : without self-adhesive **03** : with conductive self-adhesive (only recommended on small sizes) **06** : standard self-adhesive, asymmetrical	**P :** Standard polyurethane foam **F :** Flame retardant UL94V-0 foam	

Endless gasket (EMC/IP) 8000

Combined EMI-shielding and water-seal gasket for grooves and door/lid constructions



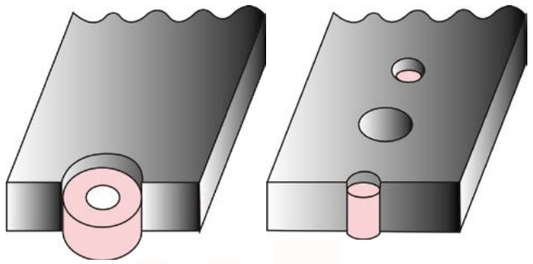
The 8000 series Endless gaskets are ready-made gaskets according to customer specifications. They are suitable for many applications in which both an EMI-shielding gasket and a water seal are required.

The 8000 series Endless gasket consists of a rectangular EMI gasket like Amucor shield 6800 series, Standard shield 7000 series or Ultra soft shield 7400 series, combined with a closed-cell water seal.

All gaskets can be provided with a self-adhesive strip for easy mounting. Gasket materials for the 8000 series Endless gaskets are watertight at 30% compression, depending on the construction.

Compression stops (optional)

Disc or washer-type compression stops can be included to prevent over-compression.



Washer type
Used at bolt holes

Disk type
Used next to bolt holes

IP seal position

The gasket can be supplied with the water sealing/IP seal on the outside of the gasket (IP seal position O), or with the water seal at the inner side of the gasket (IP seal position I).

Options

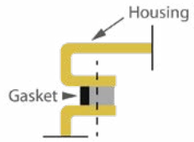
- UL94V-0 flame-retardant foam core
- Chemical-resistant rubbers like EPDM
- Silicone sponge for high temperatures up to 220 °C
- Available in conductive textile, Amucor or Knitted wire mesh versions

Benefits

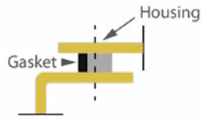
- Easy mounting
- High shielding performance
- No tools required
- Dimensions up to 2 x 2 m

Various uses

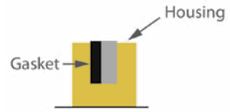
Examples of different uses for the Endless gasket
(The solid Gray part is the water seal)



1. Endless gasket used in a flat lid on a curved housing construction

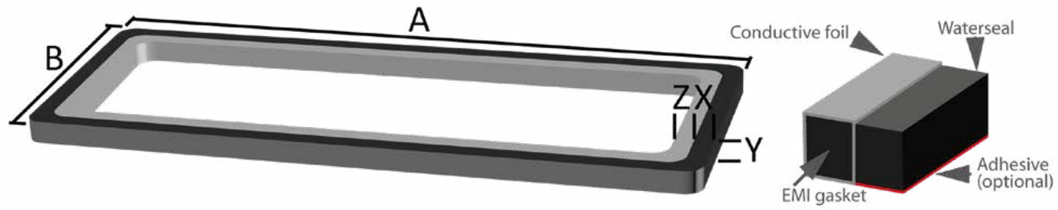


2. Endless gasket used in a curved lid on a curved housing construction



3. Endless gasket used in a groove

Technical drawing standards



If you send us a drawing, please include the dimensions shown above.

ORDER EXAMPLE

Part number	Gasket width (mm) A	Gasket length (mm) B	Material (EMI gasket core)	Material (waterseal)	Adhesive
8000 : Endless gasket Amucor version **8001 :** Endless gasket Conductive textile version **8002 :** Endless gasket Knitted wire mesh version	Specify the width of the gasket in mm	Specify the length of the gasket in mm	**N :** Neoprene **P :** Low closure force PVC foam **E :** EPDM **F :** Flame retardant UL94V-0 foam **S :** Silicone foam **L :** Polyurethane foam (ultra soft)	**N :** Neoprene **S :** Silicone	**02 :** Without self-adhesive **01 :** Standard self-adhesive **03 :** With conductive self-adhesive

IP seal position	Width of waterseal (mm) Z	Width of EMI gasket (mm) X	Frame thick-ness(mm) Y
I : Inside gasket **O :** Outside gasket	Specify the width of the waterseal in mm	Specify the width of the EMI gasket in mm	Specify the thickness of the frame in mm

Frame gasket (EMC/IP) 8100

For EMI shielding of panels and screwed applications like displays, windows, and honeycomb vents

The 8100 Frame gaskets series are ready-made gaskets according to customer specifications. They have reinforced corner pieces to guarantee optimum shielding performance and easy mounting characteristics.

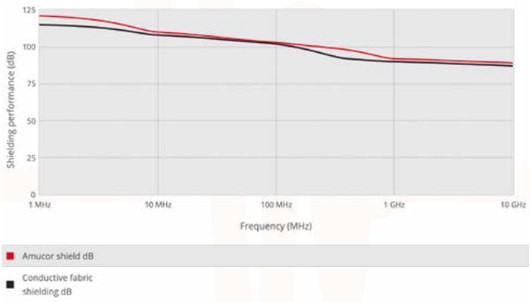
The base material is Amucor-shield series,Standard shield 7000 series or Ultra soft shield 7400 series.

The gasket can be produced with or without self-adhesive. When the gasket has little contact surface we recommend providing the gasket with an electrically conductive self-adhesive.

Neoprene core specifications

Volume weight	140 / 180 kg / m³
Hardness shore 00	38-55 Sh 00
Resistance when compressed	25% 350-630 g / cm²
Temperature °C	-40° + 100°
Water absorption	< 5%
Linear shrinkage (22hr 70°C)	< 5%
Max. deformation when compressed	25%, 22 hrs at 70°C 12%
Recommend max. compression	25%

Shielding performance*

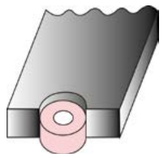


Benefits

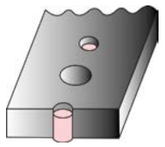
- Easy mounting
- High shielding performance
- No tools required
- Dimensions up to 2 x 2 m
- Low closure force
- EXTREMELY STRONG
- Can be supplied with self-adhesive

Compression stops (optional)

Disc or washer-type compression stops can be included to prevent over compression.



Washer type
Used at bolt holes



Disk type
Used next to bolt holes

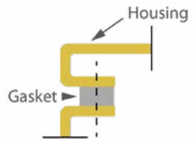
Shielding performance

The product's shielding performance depends on the chosen outer material (i.e. the conductive material). The 8100 series Frame gasket can be made with Amucor (Aluminium alloy) or conductive textile (very effective in combination with stainless steel, copper and chrome-plated constructions).

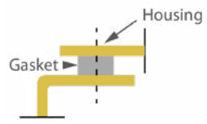
8100 Frame gasket; Amucor version with neoprene core.

Various uses

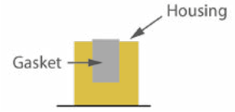
Examples of different uses for the frame gasket
(The solid Gray part is the water seal)



1. Frame gasket used in a flat lid on a curved housing construction

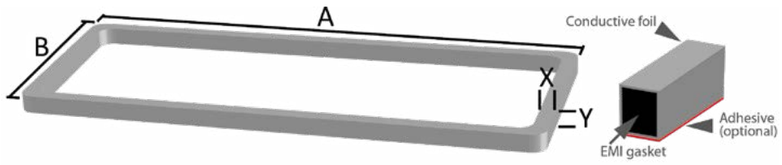


2. Frame gasket used in a curved lid on a curved housing construction



3. Frame gasket used in a groove

Technical drawing standards



If you send us a drawing, please include the dimensions shown above.

ORDER EXAMPLE

Part number	Gasket width (mm) A	Gasket length (mm) B	Frame width (mm) X	Frame thickness (mm) Y	Core material
8100 : Frame gasket Amucor version **8101 :** Frame gasket Conductive textile version	Specify the width of the gasket in mm	Specify the length of the gasket in mm	Specify the width of the frame in mm	Specify the frame thickness in mm	**N :** Neoprene **P :** Low closure force PVC foam **E :** EPDM **F :** Flame retardant UL94V-0 foam **S :** Silicone foam **L :** Polyurethane foam (ultra soft)

Adhesive
01 : Standard self-adhesive **02 :** Without self-adhesive **03 :** With conductive self-adhesive

V-shape gasket 8700

V-shape EMI/RFI shielding gaskets for applications between lids, hinges and locks, and between door and door frame

V-shape EMI/RFI shielding gaskets for applications between lids, hinges and locks, and between door and door frame.

The V-shape gaskets 8700 series are characterized by a very large compression range and low closure force. They come with a self-adhesive strip for easy mounting. The most common version is with conductive nickel over copper textile (**Material code T**).

The version with highly conductive Amucor foil (**Material code A**) is designed especially to be combined with aluminium and zinc-plated steel. To prevent loss of material and for easy shipping we cut the material to exact lengths. The longest length available is 2.5 meters.

V-shape gaskets are also available with a resilient foam rubber insert for more compression just at the moment of closing.

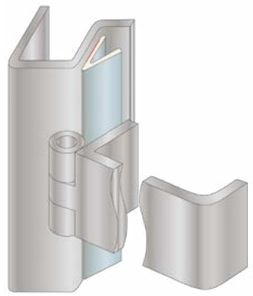
The V-shape gasket 8700 series is flame retardant and can be supplied in a UL94V-0 compliant version. Excellent shielding can be achieved without any permanent closure force. This construction prevents bending of doors, so the enclosure can be less rigid. It is also suitable for hinges and locks.

Benefits

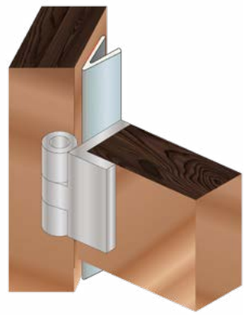
- Easy to fit with self-adhesive
- Allows for large tolerances
- High EMI/RFI shielding performance
- Very high deflection
- Very low closure force
- Lengths of 5mm up to 2500mm
- Only scissors required for installation

Options (on request)

- Cut into accurate lengths
- Different conductive foils and fabrics

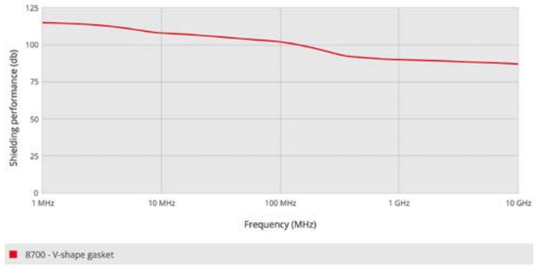


Metal door

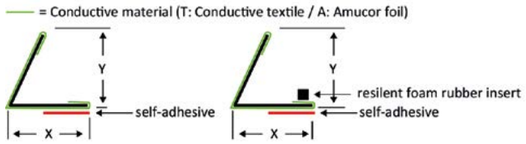


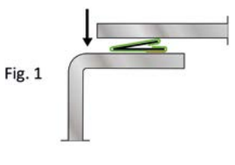
Wooden door

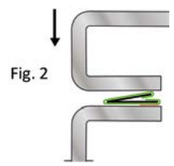
Shielding performance*

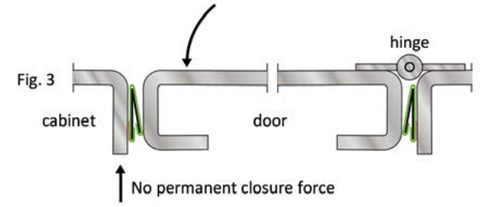


Standard dimensions

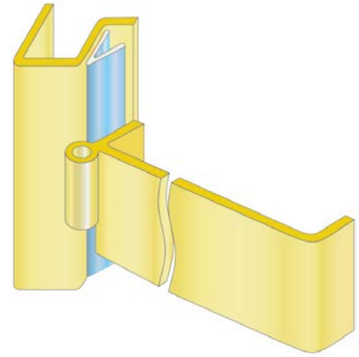








Part number	8700-3	8700-4	8700-5	8700-6	8700-7	8700-8	8700-10	8700-12	8700-18	8700-20
Width X (mm)	3	4	5	6	7	8	10	12	18	20
Range Y (mm)	0.3-1.5	0.3-2.0	0.3-2.5	0.6-3.0	0.6-4.0	0.6-4.0	0.6-5.0	0.6-6.0	1.0-9.0	1.0-10.0



To place the v-shape in a curve, we recommend that the surface is clean, smooth and dust free.

Examples of applications

The V-shape gasket is intended for applications between lids, hinges and locks as well as between a door and the door frame. Of course many other applications can be imagined.

ORDER EXAMPLE

Series	Width X (mm)	Material	Insert	Length (mm)
8700				
	Specify the width of the gasket in mm	**T :** Conductive textile **A :** Amucor foil (standard)	**I** : With a resilent foam rubber **N** : No insert	Specify the length (mm) Max. length 2500 mm. Others on request. Keep small for economic transport

EMC/EMI gaskets 8800

Standard-shaped EMC/EMI gaskets manufactured to application-specific geometries.

A CNC extrusion system has been developed to manufacture EMI shielding gaskets in a wide range of shapes and dimensions. Thanks to this system there are no additional tooling costs, which makes it interesting for smaller quantities or special constructions. The metal-cladded, flame-retardant gasket can be manufactured in several rigidities and is very compatible with aluminium, zinc-plated steel, AluZinc, stainless steel, copper, etc.

Enclosures can be constructed more cost-effective and compact due to the (electrically conductive) self-adhesive strips that eliminate the need for mounting equipment. The material is non-toxic and is an excellent replacement for the environmentally polluting beryllium gaskets.

Available in dimensions from 1.7- 30 mm with or without separate water seal. The gaskets can be supplied in various lengths, according to customer specifications.

Standard shapes are available for 19” racks, watertight enclosures and PCB shielding.

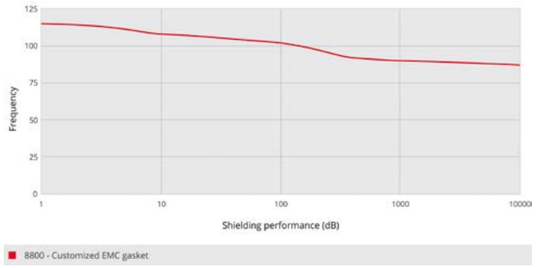
Benefits

- No tooling costs
- A wide range of shapes
- Self-adhesive gasket
- Easy to fit
- Small dimensions
- Very high deflection
- Low closure force

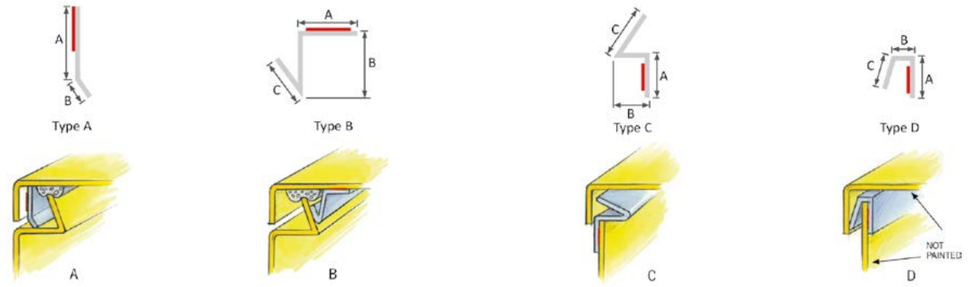
Options

- Cut into accurate lengths
- Combination with water seal
- UL94V-0 compliant, flame retardant
- Chemical resistant versions
- Resistant to high temperatures
- Various conductive foils and fabrics

Shielding performance*



Standard part numbers



Type A			Type B			
Part number	A	B	Part number	A	B	C
8800-A-4-2	4	2	8800-B-4-4-2	4	4	2
8800-A-6-3	6	3	8800-B-6-6-3	6	6	3
8800-A-8-4	8	4	8800-B-8-8-5	8	8	5
8800-A-10-7	10	7	8800-B-10-10-7	10	10	7
8800-A-12-6	12	6	8800-B-12-12-9	12	12	9
8800-A-14-7	14	7	8800-B-14-14-11	14	14	11
8800-A-16-8	16	8	8800-B-16-16-13	16	16	13
8800-A-18-9	18	9	8800-B-18-18-15	18	18	15
8800-A-20-10	20	10	8800-B-20-20-17	20	20	17
8800-A-22-11	22	11	8800-B-22-22-19	22	22	19
8800-A-24-12	24	12	8800-B-24-24-21	24	24	21
8800-A-26-13	26	13	8800-B-26-26-23	26	26	23
8800-A-28-14	28	14	8800-B-28-28-25	28	28	25
8800-A-30-15	30	15	8800-B-30-30-27	30	30	27
Other dimensions on request						

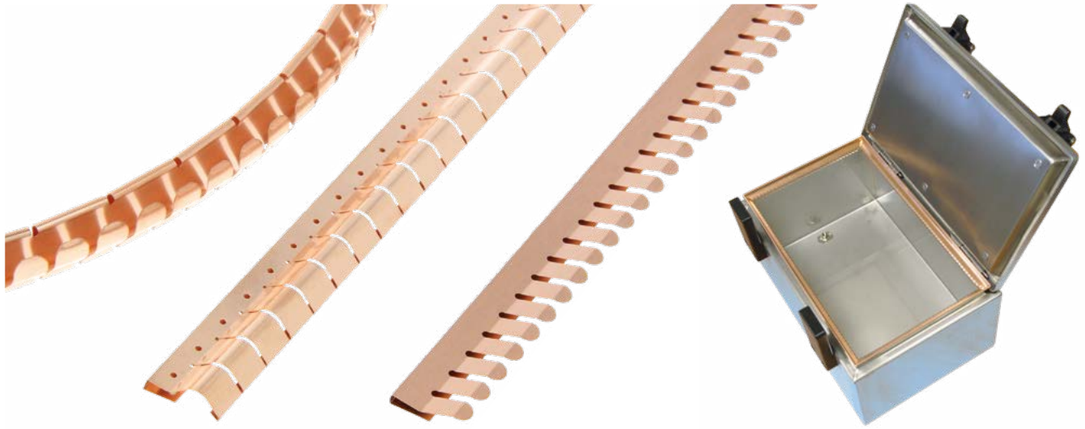
Type C				Type D			
Part number	A	B	C	Part number	A	B	C
8800-C-4-2-4	4	2	4	8800-D-4-2-2	4	2	2
8800-C-6-4-6	6	4	6	8800-D-6-3-4	6	3	4
8800-C-8-6-8	8	6	8	8800-D-8-4-6	8	4	6
8800-C-10-8-10	10	8	10	8800-D-10-5-8	10	5	8
8800-C-12-10-12	12	10	12	8800-D-12-6-10	12	6	10
8800-C-14-12-14	14	12	14	8800-D-14-7-12	14	7	12
8800-C-16-14-16	16	14	16	8800-D-16-8-14	16	8	14
8800-C-18-16-18	18	16	18	8800-D-18-9-16	18	9	16
8800-C-20-18-20	20	18	20	8800-D-20-10-18	20	10	18
8800-C-22-20-22	22	20	22	8800-D-22-11-20	22	11	20
8800-C-24-22-24	24	22	24	8800-D-24-12-22	24	12	22
8800-C-26-24-26	26	24	26	8800-D-26-13-24	26	13	24
8800-C-28-26-28	28	26	28	8800-D-28-14-26	28	14	26
8800-C-30-28-30	30	28	30	8800-D-30-15-28	30	15	28
Other dimensions on request							

ORDER EXAMPLE

Series	Type	Dimension A (mm)	Dimension B (mm)	Dimension C (mm)	Material	Length (mm)
8800	**A :** Type A **B :** Type B **C :** Type C **D :** Type D	See technical drawing above for more information	See technical drawing above for more information	See technical drawing above for more information	**A :** Amucor foil **T :** Conductive textile	Specify the length (mm) Max. length 2500 mm. Others on request.

Clip-on mounting fingerstrips 2100

This simple clamping system is suitable for sealing gaps between an EMI/RFI-shielded door and its door frame and similar applications

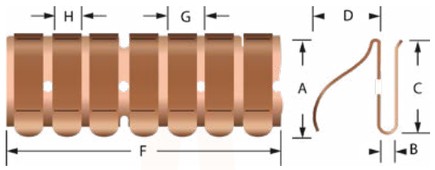


This series made from beryllium copper are designed for use where high temperature or other design considerations preclude the use of adhesive-mounted gasketing.

These Fingerstrips provide the same shielding characteristics and effectiveness as the 2300 series Stick-on mounting Fingerstrips.

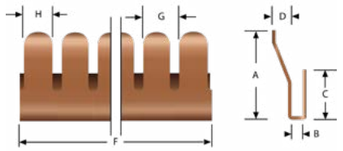
2100 series Clip-on mounting fingerstrips offer shielding effectiveness >100dB for 100 MHz plane wave. The contact edge of this Fingerstrip series expands. The Fingerstrip has a low to high deflection (see technical drawings). For applications where a small dynamic range is required and a spring clip mounting is preferred. Fingerstrips from this series are easy to mount by simply Clip-on or clip over the edge where it is to be attached through pressing / sliding.

Clip-on 2101



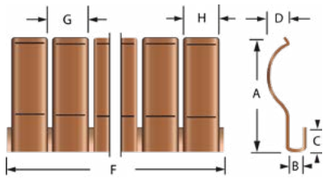
Part nr.	A	B	D	F	G	H	Material thickness
2101-01	9.5	1.5	5.2	406	6.4	5.3	0.13mm
2101-02	9.5	1.5	6.9	406	6.4	5.3	0.13mm
2101-03	9.5	1.5	5.1	610	6.4	5.3	0.13mm
2101-04	9.5	1.5	7.9	406	6.4	5.3	0.13mm
2101-05	9.5	1.5	6.9	610	6.4	5.3	0.13mm
2101-05R	9.5	1.5	6.9	7600	6.4	5.3	0.13mm

Clip-on 2102



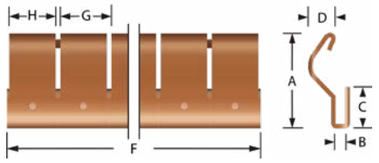
Part nr.	A	B	C	D	F	G	H	Material thickness
2102-01	11.4	1.0	6.9	2.5	407	4.8	3.6	0.1mm
2102-02	11.4	1.5	6.4	2.5	460	4.8	3.6	0.1mm
2102-03	11.4	2.0	5.8	2.5	407	4.8	3.6	0.1mm

Clip-on 2103



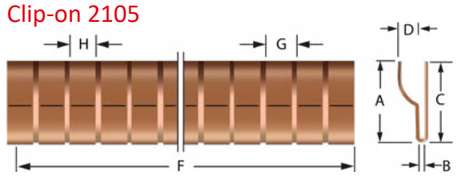
Part nr.	A	B	C	D	F	G	H	Material thickness	Compression force N
2103-01	27.0	2.0	7.8	6.9	494	9.5	8.5	0.13mm	
2103-02	27.7	2.3	6.6	6.6	457	9.5	8.7	0.13mm	25% 240 N/m 50% 630 N/m
2103-03	27.7	3.2	6.6	6.6	457	9.5	8.7	0.13mm	25% 240 N/m 50% 630 N/m

Clip-on 2104

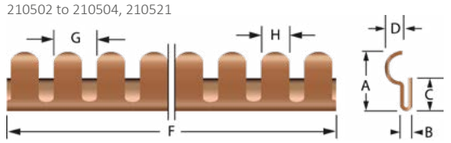


Part nr.	A	B	C	D	F	G	H	Material thickness
2104-01	11.7	1.0	6.1	3.0	457	6.4	5.9	0.08mm
2104-02	11.7	1.5	5.6	3.0	457	6.4	5.9	0.08mm
2104-03	11.7	2.0	5.1	3.0	457	6.4	5.9	0.08mm
2104-04	19.3	1.0	7.4	6.4	456	9.5	9.0	0.08mm
2104-05	19.3	1.5	6.9	6.4	456	9.5	9.0	0.08mm
2104-06	19.3	2.0	6.4	6.4	456	9.5	9.0	0.08mm
2104-07	19.3	3.0	5.3	6.3	456	9.5	9.0	0.08mm
2104-09	10.7	1.0	6.6	3.1	406	6.4	5.7	0.08mm
2104-10	10.7	1.5	6.6	3.1	406	6.4	5.7	0.08mm
2104-11	16.3	1.5	4.5	5.6	457	9.5	8.7	0.08mm

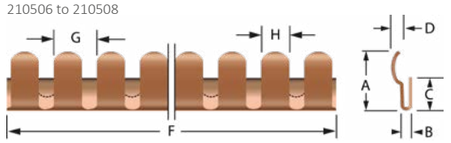
Clip-on 2105



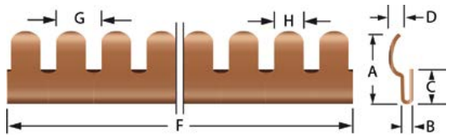
210502 to 210504, 210521



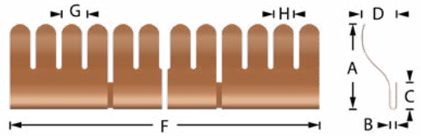
210506 to 210508



210509 to 210510



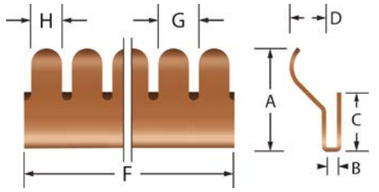
210511 to 210514, 210520, 210524 to 210528



210516 to 210517

Part nr.	A	B	C	D	F	G	H	Material thickness
2105-02	6.8	1.0	7.1	2.5	409	6.4	5.6	0.15mm
2105-03	6.7	1.0	7.0	2.3	406	6.4	5.6	0.15mm
2105-04	6.6	1.0	7.1	1.6	409	6.4	5.6	0.15mm
2105-06	7.9	0.8	4.8	2.9	407	4.8	3.6	0.13mm
2105-07	7.9	1.0	7.8	2.9	407	4.8	3.6	0.13mm
2105-08	7.9	1.5	4.8	4.0	406	4.6	3.4	0.13mm
2105-09	7.9	1.3	4.8	1.3	406	4.6	3.4	0.13mm
2105-10	7.9	1.5	4.8	2.9	407	4.8	3.6	0.13mm
2105-11	10.8	0.8	4.9	3.5	407	4.8	3.6	0.13mm
2105-12	10.5	1.5	4.4	3.5	407	4.8	3.6	0.13mm
2105-13	10.7	1.0	4.8	2.3	406	4.8	3.6	0.13mm
2105-14	10.7	1.3	4.8	2.3	406	4.8	3.6	0.13mm
2105-16	15.2	1.0	4.8	6.2	406	4.6	3.6	0.13mm
2105-17	15.2	1.5	4.8	6.7	406	4.6	3.6	0.13mm
2105-20	15.6	1.5	7.5	5.8	406	4.8	3.6	0.10mm
2105-21	6.2	1.5	7.1	1.6	407	4.8	3.6	0.15mm
2105-24	10.7	1.8	4.8	5.8	406	4.8	3.6	0.13mm
2105-25	10.7	1.0	4.8	3.1	406	4.8	3.6	0.13mm
2105-26	10.7	1.5	4.8	3.1	406	4.8	3.6	0.13mm
2105-27	10.7	2.4	4.8	3.1	406	4.8	3.6	0.13mm
2105-28	10.7	1.3	4.8	3.6	406	4.8	3.6	0.13mm

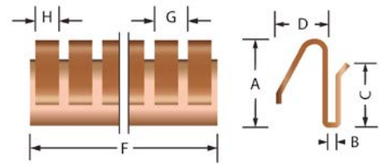
Clip-on 2106



Part nr.	A	B	C	D	F	G	H	Material thickness
2106-01	15.4	1.0	7.4	5.3	406	4.8	3.6	0.1 mm
2106-02	15.4	1.5	6.9	5.3	406	4.8	3.6	0.1 mm
2106-03	15.4	2.0	7.1	5.3	406	4.8	3.6	0.1 mm
2106-04*	8.6	1.0	6.3	2.5	402	4.8	3.6	0.1 mm
2106-05*	8.6	1.5	5.8	2.5	402	4.8	3.6	0.1 mm
2106-06*	8.6	2.0	5.4	2.5	402	4.8	3.6	0.1 mm

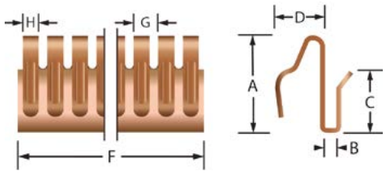
* with Tlance

Clip-on 2107



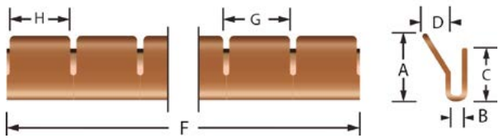
Part nr.	A	B	C	D	F	G	H	Material thickness
2107-01	4.6	1.0	3.8	2.3	307	3.2	2.8	0.08mm
2107-02	4.6	1.5	3.4	2.3	307	3.2	2.8	0.08mm
2107-03	12.3	1.0	8.3	7.2	406	4.8	3.2	0.15mm
2107-05	12.3	2.0	7.6	7.2	407	4.8	3.2	0.15mm
2107-06	12.3	3.0	6.3	7.2	407	4.8	3.2	0.15mm

Clip-on 2108



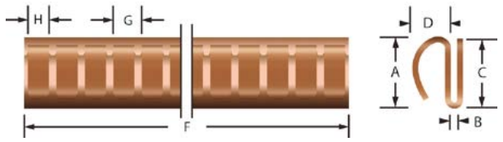
Part nr.	A	B	C	D	F	G	H	Material thickness
2108-01	6.1	1.0	5.3	2.8	406	1.5	1.0	0.08mm
2108-02	6.1	1.5	4.8	2.8	406	1.5	1.0	0.08mm
2108-06	9.4	1.0	6.9	5.1	408	2.4	1.6	0.15mm
2108-09	9.4	3.0	4.6	5.1	408	2.0	1.5	0.15mm

Clip-on 2109



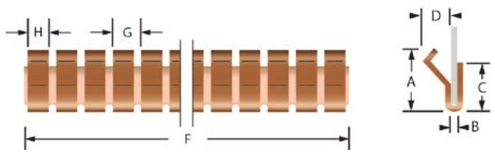
Part nr.	A	B	C	D	F	G	H	Material thickness
2109-02	4.8	1.0	2.8	1.3	306	4.2	3.8	0.08mm
2109-03	4.8	1.5	2.3	1.3	306	4.2	3.8	0.08mm

Clip-on 2110



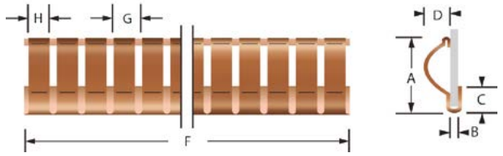
Part nr.	A	B	C	D	F	G	H	Material thickness
2110-01	10.5	1.55	8.2	6.5	402	4.75	3.2	0.13 mm
2110-02	10.5	1.55	8.1	6.5	405	9.5	7.95	0.13 mm
2110-03	10.5	1.55	7.4	6.5	405	4.75	3.2	0.13 mm

Clip-on 2111



Part nr.	A	B	C	D	F	G	H	Material thickness
2111-01	8.4	0.8	6.5	4.2	407	4.6	3.6	0.13mm
2111-02	8.1	1.0	6.5	4.2	407	4.6	3.6	0.13mm
2111-03	8.2	1.5	6.5	4.2	407	4.6	3.6	0.13mm

CLIP-ON 2112



Part nr.	A	B	C	D	F	G	H	Material thickness
2112-01	10.5	0.8	5.7	3.0	409	6.3	5.7	0.06mm
2112-02	10.5	1.0	5.5	3.0	409	6.3	5.7	0.06mm
2112-03	10.5	1.5	5.3	3.0	409	6.3	5.7	0.06mm
2112-04	10.0	2.0	5.2	3.0	409	6.3	5.7	0.06mm
2112-05	16.3	1.5	5.6	5.4	455	9.5	8.5	0.10mm

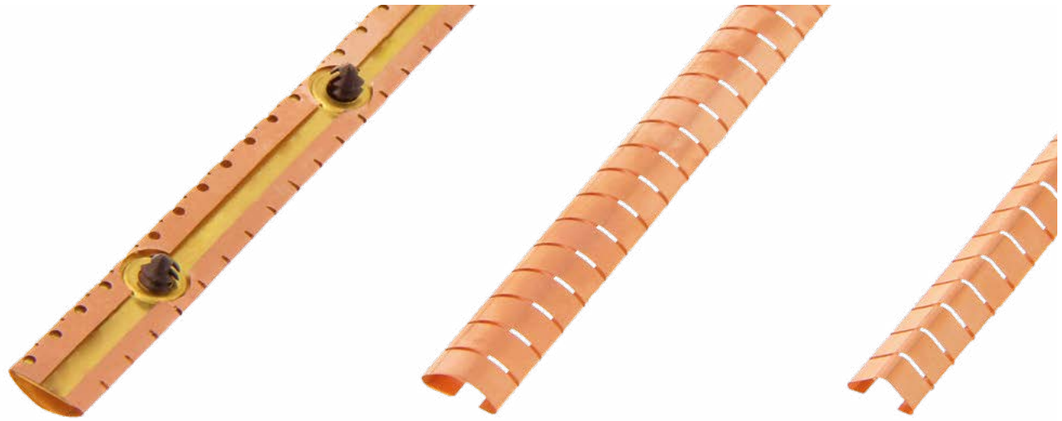
ORDER EXAMPLE

Part number

Specify the part number that you need from the table

Snap-on mounting fingerstrip 2200

Snap-on fingerstrip gaskets can be attached on t or rails, or through holes or slots in your construction

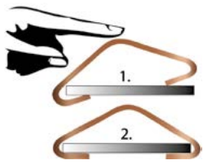


These Snap-on fingerstrips have very low compression force and almost no friction when compressed. They are excellent for “sliding” applications. The symmetrical design allows two-way contact. Very convenient for ESD grounding and RFI/EMI shielding of:

- Front panel handles
- in shielded housings
- Panels in shielded enclosures
- Covers of shielded enclosures
- Sliding trays
- Assembly of plug-in units
- Back planes
- And other electronic enclosure applications

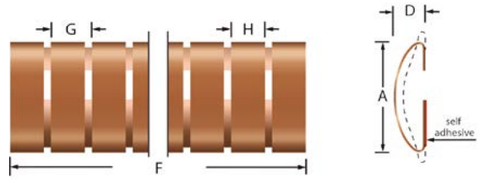
Installation is simple

- Press and hold the edge of the fingerstrip gasket in one of the grooves
- Push in the direction of the second groove until the fingerstrip snaps into the second groove

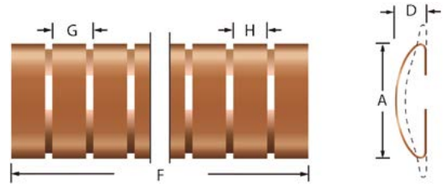


NOTE: For some fingerstrips. Special Snap-on fingerstrips tracks are available for mounting.

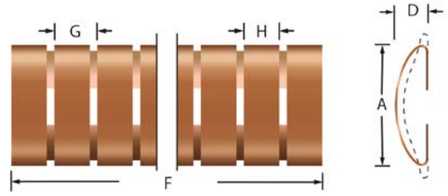
SNAP-ON 2202



2202-01, 2202-03 and 2202-05



2202-02

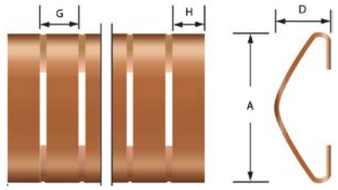


2202-04 and 2202-06

Part nr.	A	D	F	G	H	Material thickness	Available mounting track
2202-01*	9.1	2.8	403	4.8	4.3	0.08mm	
2202-02	9.1	2.8	403	4.8	4.3	0.08mm	TR220202
2202-04	11.4	3.6	383	6.4	5.8	0.08mm	TR220204
2202-05*	15.8	5.6	379	9.6	8.8	0.10mm	
2202-07*	8.9	2.8	508	4.8	4.3	0.08mm	
2202-08	8.9	2.8	508	4.8	4.3	0.08mm	

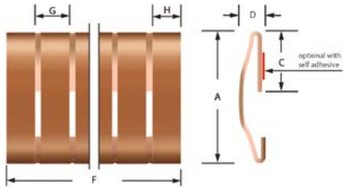
* With adhesive strip Material: Berylliumcopper

SNAP-on 2203



Part nr.	A	D	F	G	H	Material thickness	Available mounting track
2203-01	7.6	3.3	406	4.8	4.3	0.05mm	TR220303
2203-02	8.1	2.5	406	4.8	4.2	0.05mm	TR220303
2203-03	8.1	2.9	400	4.8	4.3	0.05mm	TR220303
2203-04	8.1	2.8	406	4.8	4.3	0.05mm	TR220303
2203-05	9.1	3.0	381	4.8	4.3	0.05 mm	
2203-06	9.4	3.3	400	6.3	5.7	0.05mm	TR220306
2203-08	15.2	5.8	457	7.2	6.4	0.08mm	TR220307
2203-09	15.2	5.6	400	9.5	8.7	0.05mm	TR220307
2203-10	19.5	8.1	400	9.5	8.7	0.08mm	TR220310
2203-11	20.3	8.1	400	9.5	8.7	0.10mm	TR220311

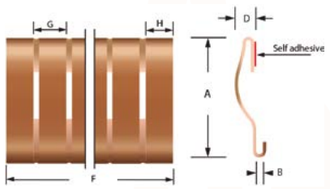
SNAP-on 2204



2204-01 and 2204-02

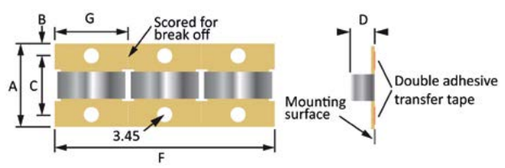
Part nr.	A	C	D	F	G	H	Material thickness
2204-01	11.4	6.0	2.0	406	3.1	2.5	0.05mm
2204-03	15.2	8.2	3.0	406	3.1	2.5	0.05mm

SNAP-on 2205



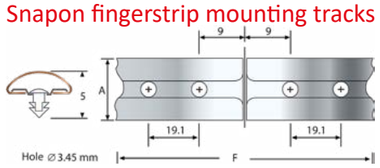
Part nr.	A	B	D	F	G	H	Material thickness
2205-02	15.2	Max 2	2.3	406	3.2	2.5	0.09mm
2205-03	14.0	Max 1.5	2.0	406	3.2	2.5	0.09mm
2205-04	19.1	Max 1.5	3.0	406	3.2	2.5	0.09mm

SNAP-on 2206

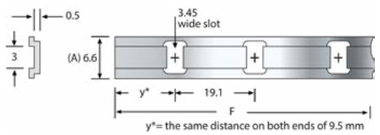


Part nr.	A	B	C	D	F	G	Material thickness
2206-01	19.0	2.8	13.5	5.6	406	16.8	0.09mm

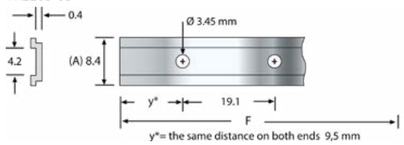
Snapon fingerstrip mounting tracks



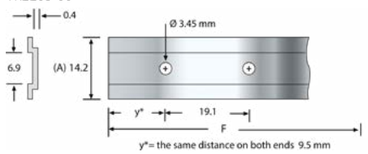
TR2202-02, TR2202-04, TR2202-06



TR2203-03



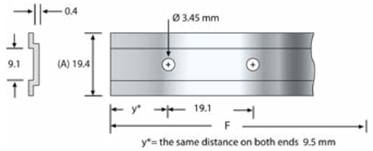
TR2203-06



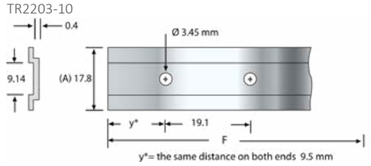
TR2203-07

» Snap-on mounting Fingerstrip 2200

SNAP-ON FINGERSTRIP MOUNTING TRACKS



TR2203-10

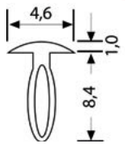


TR2203-11

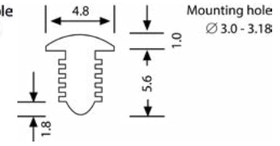
The installation of the 2200 Series can be directly in your housing using slots or alternatively using a Snap-on fingerstrips track (mounting rail).

Part nr.	A	F
TR2202-02	8.6	383
TR2202-04	11.4	383
TR2202-06	15.2	381
TR2203-03	6.6	406
TR2203-06	8.4	401
TR2203-07	14.2	457
TR2203-10	19.4	400
TR2203-11	17.8	400

Snapon fingerstrips rivet



R-01

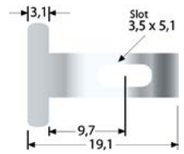


R-02

Part nr.	
R-01	For plate thickness of 0.5 to 1.5mm
R-02	For plate thickness of 0.5 to 1.5mm

Snap-on Fingerstrips TEnd Piece

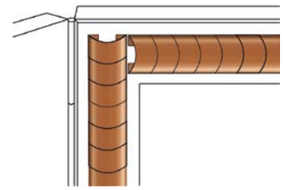
Snapon track Tend piece for end of Snapon track



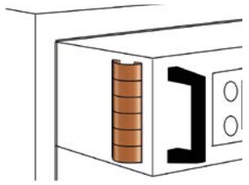
TE-01, TE-02, TE-03

Part nr.	Available for track
TE-01	TR2203-03
TE-02	TR2203-06
TE-03	TR2203-07
TE-04	TR2203-11

Mounting examples



Ideally suited for applications where lids or doors (think of doors for a Faraday cage or EMI shielded enclosure) are repeatedly opened and closed.



This type fingerstrip is also widely used in 19” racks, communication cabinets, communication cabinets, EMI/ RFI shielded enclosures. The 2200 Snap-on Fingerstrips mounting series profiles can be used for earthing or electric connection.

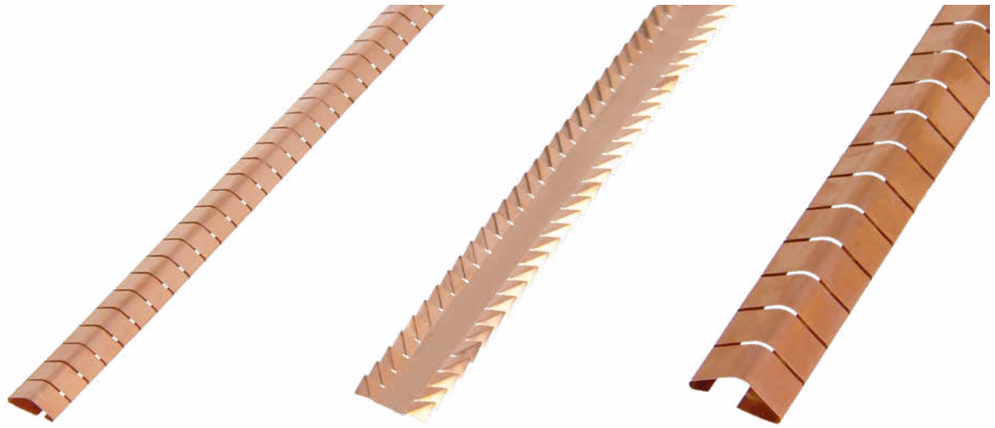
ORDER EXAMPLE

Part number

Specify the part number that you need from the table

Stick-on mounting fingerstrip 2300

Stick-on mounting finger stock gaskets with pressure sensitive adhesive (PSA) are suitable for low-profile, bi-directional applications and gaps from 0 to 3 mm

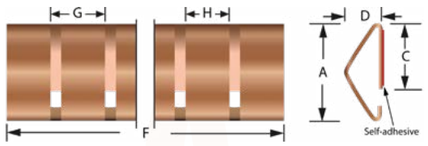


Stick-on mounting finger stock gaskets with pressure-sensitive adhesive (PSA) are suitable for low-profile, bi-directional applications like rack mounting of line-cards in telecommunications equipment.

A red line indicates the self-adhesive strip.

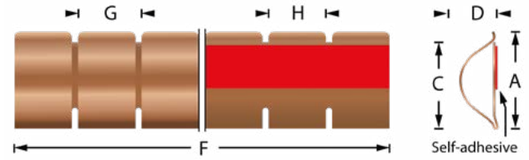
These gaskets offer high EMI-shielding performance in applications where space may be limited. Stick-on mounting fingerstrips are low-compression, adhesive-mounted beryllium-copper shielding strips. The self-adhesive tape makes mounting easy and secure.

STICK-ON 2301

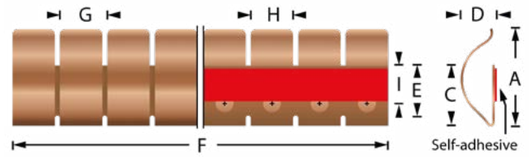


Part nr.	A	C	D	F	G	H	Material thickness
2301-01	7.1	4.6	2.8	610	4.8	4.3	0.05mm
2301-07	15.2	7.1	5.6	610	9.5	8.7	0.09mm
2301-08	19.8	11.2	8.1	457	8.8	8.7	0.10mm
2301-10	5.3	3.3	2.0	406	4.8	4.3	0.05mm
2301-11	15.2	7.2	5.7	455	9.5	8.7	0.10mm

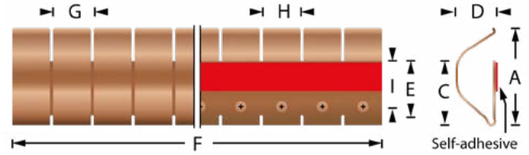
Stick-on 2302



2302-01, 2302-03, 2302-04



2302-05

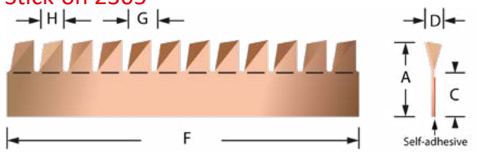


2302-06

Part nr.	A	C	D	E	F	G	H	I	Ø	Material thickness
2302-01	6.7	5.5	3.1	-	405.84	4.78	4.32	-	-	0.07mm
2302-03	9.0	7.5	4.0	-	406,48	6.36	5.8	-	-	0.08mm
2302-04	14.5	12.6	5.6	-	608.47	9.52	8.71	-	-	0.09mm
2302-04R	14.5	12.6	5.6	-	7620 (on rol)	9.52	8.71	-	-	0.09mm
2302-05	19.4	12.0	6.4	10	609.6	9.53	8.51	7.6	3.6	0.10mm
2302-06	29.0	19.90	12.0	17	303.78	12.7	11.68	14.3	3.6	0.18mm

» STICK-on mounting Fingerstrip 2300

Stick-on 2305



Part nr.	A	C	D	F	G	H	Material thickness	Compression force N
2305-01	5.8	3.1	0.8	610	2.4	2.0	0.08mm	
2305-02	8.6	4.6	1.8	610	4.2	3.8	0.08mm	25%: 130 N/m 50%: 330 N/m
2305-03	12.7	6.4	3.0	610	6.4	6.0	0.08mm	25%: 70 N/m 50%: 150 N/m
2305-04	8.6	4.6	1.8	7600 (on roll)	4.2	3.8	0.08mm	25%: 130 N/m 50%: 330 N/m

ORDER EXAMPLE

Part number

Specify the part number that you need from the table

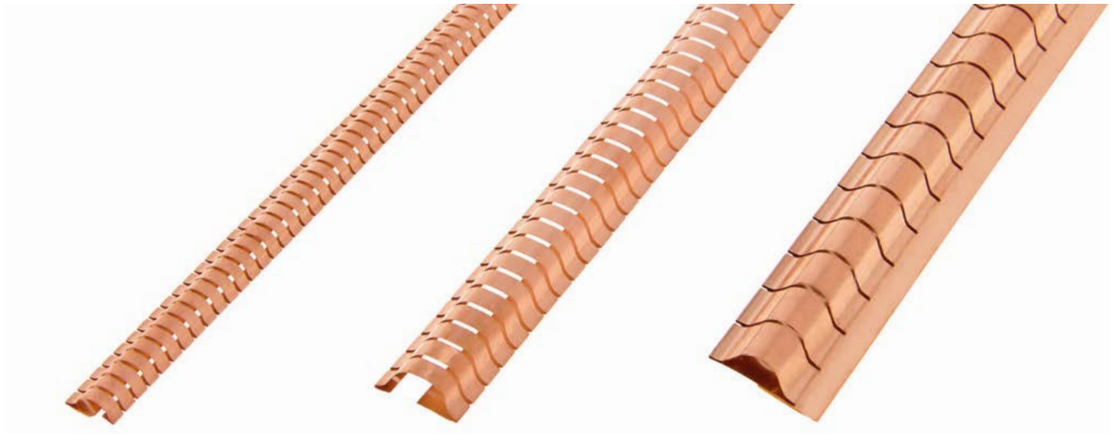
***Notice**

Information supplied in these data sheets is based on independent and laboratory tests which Holland Shielding Systems BV, hereafter referred to as HSS believes to be reliable. HSS has no control over the design of customer's product which incorporates products, therefore it is the responsibility of the user to determine the suitability for his particular application and we recommend that the user make his own test to determine suitability.

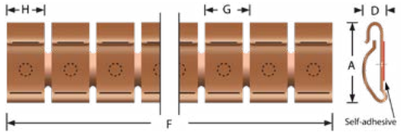
The product described in this data sheet shall be of standard quality, however the products are sold without warranty of fitness for a particular purpose, either expressed or implied, except to the extent expressly stated on HSS invoice, quotation or order acknowledgment. HSS does not warrant that products described in this data sheet will be free of conflict with existing or future patents of third parties. All risks of lack of fitness, patent infringement and the like are assumed by the user.

Stick-on mounting fingerstrip 2330

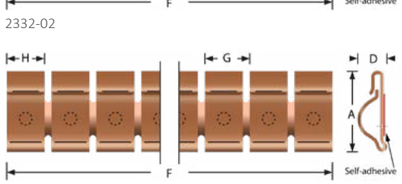
Stick-on mounting finger stock gaskets with pressure sensitive adhesive (PSA) are suitable for low-profile, bi-directional applications and gaps from 3 to 6 mm



Stick-on 2332



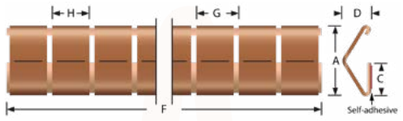
2332-02



2332-05

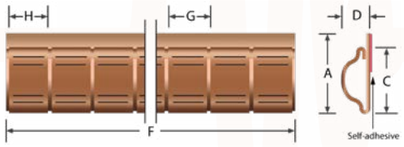
Part nr.	A	D	F	G	H	Material thickness
2332-02	9.7	3.2	406	4.8	4.3	0.07mm
2332-05	19.3	5.8	609	9.5	8.8	0.10mm

Stick-on 2334

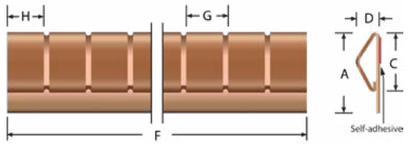


Part nr.	A	C	D	F	G	H	Material thickness
2334-01	8.1	5.3	2.8	408	4.8	4.3	0.05mm
2334-04	9.4	5.3	3.3	406	6.4	5.7	0.05mm

Stick-on 2335



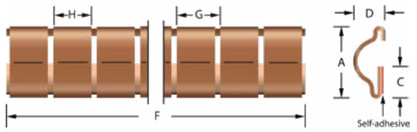
2335-01



2335-02

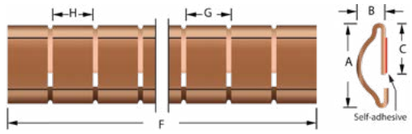
Part nr.	A	C	D	F	G	H	Material thickness
2335-01	19.8	15.2	5.6	456	9.5	8.7	0.09mm
2335-02	12.7	9.4	3.3	406	6.35	5.72	0.05mm

Stick-on 2336



Part nr.	A	C	D	F	G	H	Material thickness
2336-04	15.2	7.4	5.6	457	9.5	8.7	0.09mm

Stick-on 2338

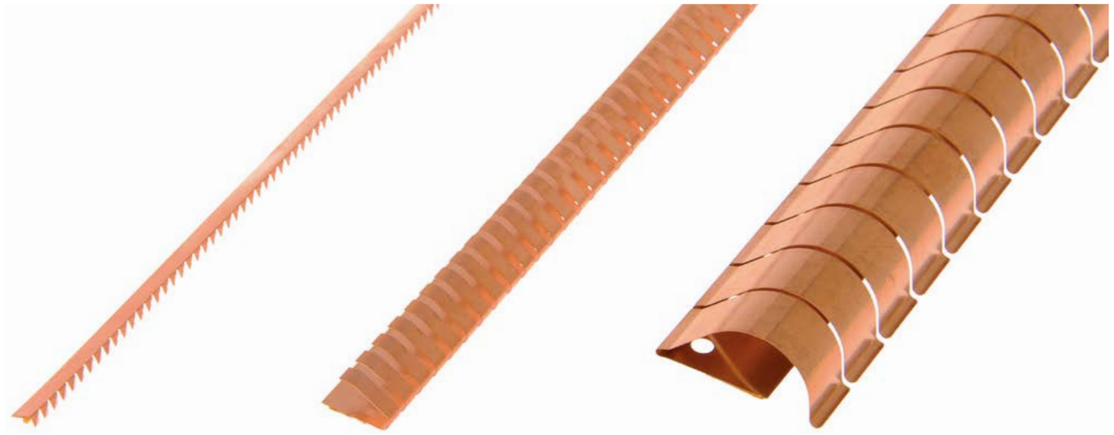


Part nr.	A	C	D	F	G	H	Material thickness
2338-01	8.1	4.8	2.5	406	4.0	3.5	0.10mm
2338-02	8.1	4.8	2.5	406	4.8	3.5	0.10mm
2338-03	9.4	4.8	3.3	406	6.4	5.7	0.10mm
2338-04	9.4	4.8	3.3	406	3.2	2.8	0.10mm
2338-05	15.3	4.8	5.6	457	9.5	8.7	0.10mm
2338-06	15.3	4.8	5.6	457	4.8	4.2	0.10mm

Material: Beryllium copper

Stick-on mounting fingerstrip 2360

Stick-on fingerstrips for openings and gaps from 6 to 11 mm

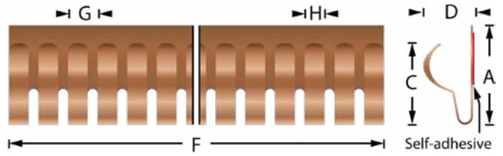


Stick-on mounting finger stock gaskets with pressure-sensitive adhesive (PSA) are suitable for low-profile, bi-directional applications like rack mounting of line-cards in telecommunications equipment.

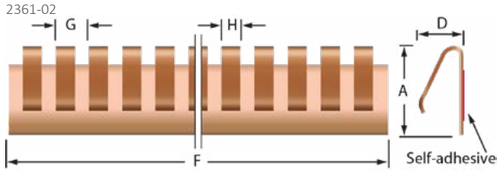
A red line indicates the self-adhesive strip.

These gaskets offer high EMI-shielding performance in applications where space may be limited. Stick-on mounting fingerstrips are low-compression, adhesive-mounted beryllium-copper shielding strips. The self-adhesive tape makes mounting easy and secure.

Stick-on 2361



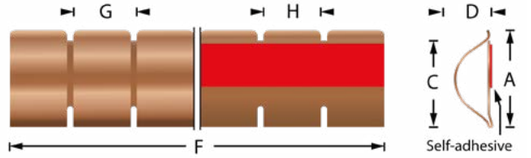
2361-02



2361-04

Part nr.	A	C	D	F	G	H	Material thickness	Compression force N
2361-02	5.0	4.0	2.4	499	1.5	1.0	0.10mm	25% 100 N/m 50% 150 N/m
2361-04	12.1	-	7.2	406	4.8	3.2	0.25mm	25% 30 kg/m 50% 90 kg/m

Stick-on 2362

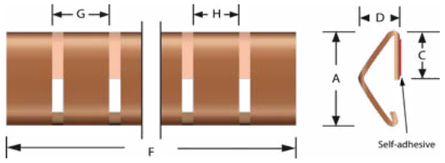


2362-01, 2362-01R, 2362-03, 2362-03R

Part nr.	A	C	D	F	G	H	Material thickness
2362-01	6.7	5.5	3.10	405.84	4.78	4.32	0.07mm
2362-01R	6.7	5.5	3.10	7620 (on roll)	4.78	4.32	0.07mm
2362-03	9.0	7.5	4.0	406,48	6.36	5.8	0.08mm
2362-03R	9.0	7.5	4.0	7620 (on roll)	6.36	5.8	0.08mm
2362-04	14.5	12.6	5.6	608.47	9.52	8.71	0.09mm
2362-04R	14.5	12.6	5.6	7620 (on rol)	9.52	8.71	0.09mm

» STICK-ON MOUNTING FINGERSTRIP 2360

Stick-on 2364



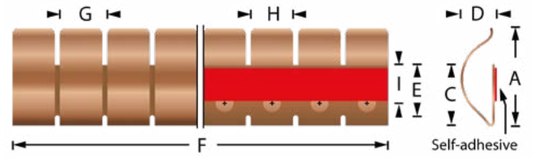
Part nr.	A	C	D	F	G	H	Material thickness	Compression force N
2364-01	15.2	7.2	5.7	608	9.5	8.7	0.09mm	25% 150 N/m 50% 300 N/m
2364-03	19.8	11.2	8.1	457	9.7	8.7	0.10mm	25% 150 N/m 50% 250 N/m
2364-04	27.9	19.8	10.4	456	12.7	11.7	0.10mm	25% 170 N/m 50% 350 N/m

ORDER EXAMPLE

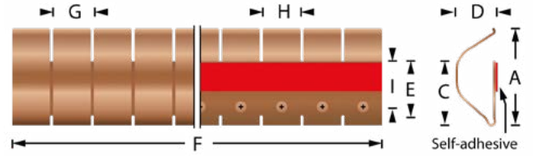
Part number

Specify the part number that you need from the table

Stick-on 2365



2365-01



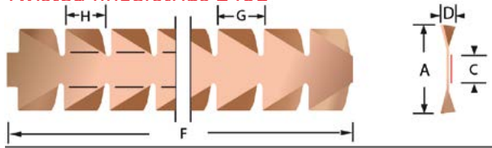
2365-03

Part nr.	A	C	D	E	F	G	H	I	Ø	Material thickness
2365-01	19.4	12.0	6.4	10	609.6	9.53	8.51	7.6	3.6	0.10 mm
2365-03	29.0	19.90	12.0	17	303.78	12.7	11.68	14.3	3.6	0.18 mm

Twisted fingerstrips 2400

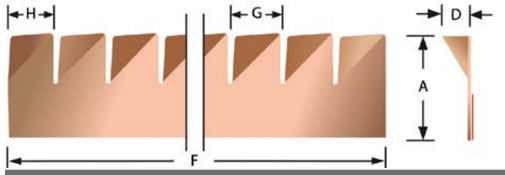
These fingerstrips are electronic gaskets for general EMI-shielding applications where there is a narrow opening or gap

Twisted fingerstrips 2401



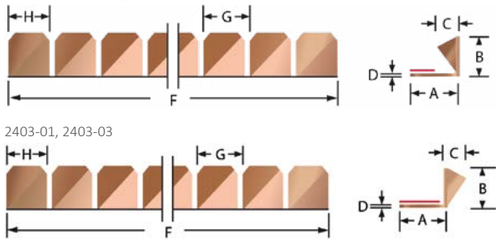
Part nr.	A	C	D	F	G	H	Material thickness
2401-01	12.3	4.8	1.78	610	4.2	3.8	0.08 mm
2401-01R	12.3	4.8	1.78	7600 (roll)	4.2	3.8	0.08 mm
2401-02	12.7	4.83	1.8	499	4.2	3.8	0.08 mm

Twisted fingerstrips 2402



Part number	A	D	F	G	H	Material thickness
2402-01	5.8	0.8	610	2.4	2.0	0.08 mm
2402-02	8.5	1.8	610	4.2	3.8	0.08 mm

Twisted fingerstrips 2403

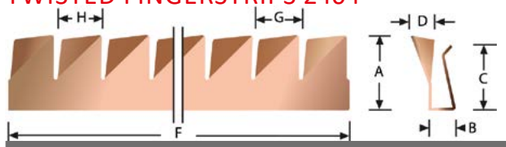


2403-01, 2403-03

2403-02, 2403-04

Part nr.	A	B	C	D	F	G	H	Material thickness
2403-01	3.85	2.2	0.8	0.08	609	2.4	2.0	0.08 mm
2403-02	3.85	2.2	0.8	0.08	609	2.4	2.0	0.08 mm
2403-03	5.0	3.8	1.8	0.08	499	4.2	3.8	0.08 mm
2403-04	5.0	3.8	1.8	0.08	499	4.2	3.8	0.08 mm

TWISTED FINGERSTRIPS 2404



Part nr.	A	B	C	D	F	G	H	Material thickness	Compression force N
2404-04	4.3	1.5	4.4	0.8	405	2.4	2.0	0.08 mm	
2404-09	5.9	1.5	4.3	0.8	405	2.4	2.0	0.08 mm	
2404-13	4.0	1.5	4.0	0.8	610	2.4	2.0	0.08 mm	25% 480 N/m 50% 710 N/m
2404-14	4.0	1.5	5.8	0.8	610	2.4	2.0	0.08 mm	25% 480 N/m 50% 710 N/m
2404-16	9.7	1.5	5.6	1.8	610	4.2	3.8	0.08 mm	25% 150 N/m 50% 330 N/m

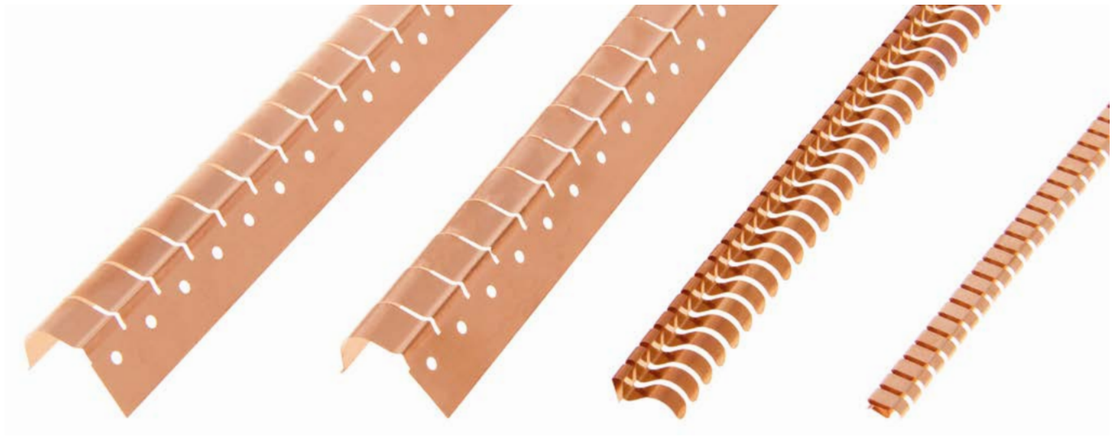
ORDER EXAMPLE

Part number

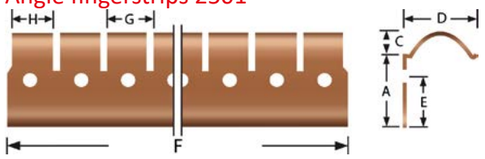
Specify the part number that you need from the table

Angle fingerstrips 2500

Ideal for 90° applications, where the gasket has to be mounted onto a surface perpendicular to the finger compression area

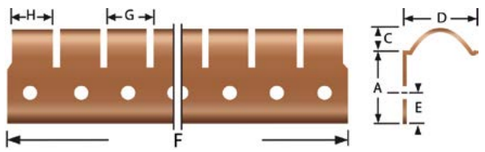


Angle fingerstrips 2501



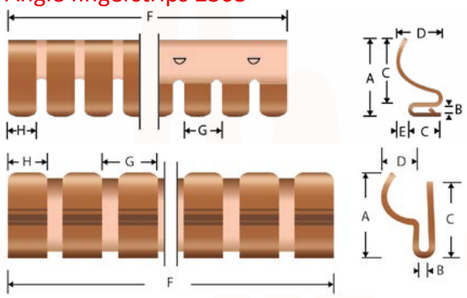
Part nr.	A	C	D	Ø	E	F	G	H	Material thickness
2501-01	12.2	6.3	21.1	3.6	9.5	304	9.5	8.5	0.1mm
2501-02	19.5	10.6	31.9	3.6	14.3	304	12.7	11.7	0.2mm

Angle fingerstrips 2502

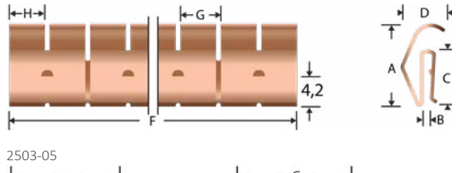


Part nr.	A	C	D	Ø	E	F	G	H	Material thickness
2502-01	6.1	2.8	7.1	1.5	2.0	406	4.8	4.3	0.08mm
2502-02	7.3	4.1	9.3	1.6	2.4	406	6.2	5.8	0.08mm
2502-04	12.7	5.6	14.5	2.0	7.9	609	9.5	8.7	0.09mm

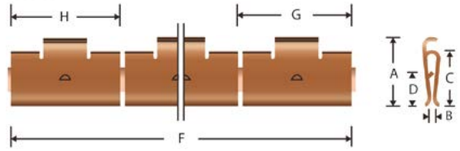
Angle fingerstrips 2503



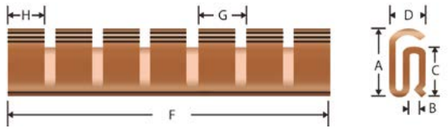
2503-03



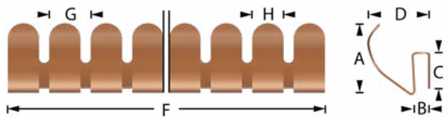
2503-05



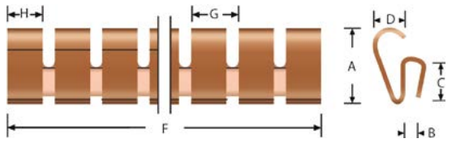
2503-06



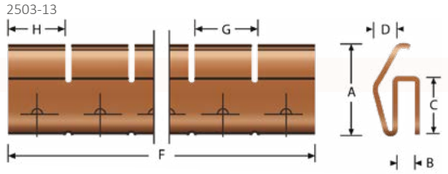
2503-07, 2503-08



2503-11

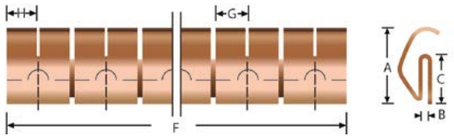


2503-13



2503-16

» ANGLE FINGERSTRIPS 2500



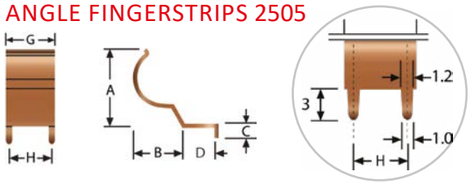
2503-17

Part nr.	A	B	C	D	E	F	G	H	Material thickness
2503-02	9.5	1.5	5.0	6.5	2.0	402	4.8	3.6	0.13mm
2503-03	7.2	1.5	6.0	3.3		425	4.8	3.6	0.13mm
2503-05	13.0	1.5	8.3	3.3		402	6.4	5.6	0.13mm
2503-06	7.8	1	6.6	3.3		300	13.8	12.7	0.07mm
2503-07	6.0	1.5	3.85	2.8		407	4.0	3.0	0.09mm
2503-08	5.8	2.0	4.1	2.9		406	4.0	3.0	0.09mm
2503-11	8.0	1.5	4.1	5.0		407	4.8	3.6	0.13mm
2503-13	7.6	1.5	3.8	3.0		406	4.8	3.6	0.08mm
2503-16	14.0	2.0	8.5	3.5		303	9.9	9.0	0.08mm
2503-17	14.0	1.5	7.9			406	6.4	5.6	0.13mm

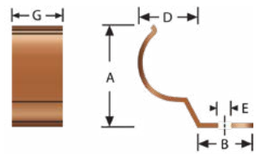
Angle fingerstrips 2504

Part nr.	A	B	C	Ø	E	F	G	H	Material thickness
2504-07	9.5	4.0	7.0	2.6	3.5	8.4	4.8	3.6	0.13mm

ANGLE FINGERSTRIPS 2505



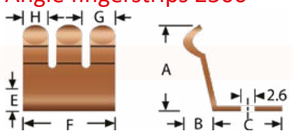
2505-01



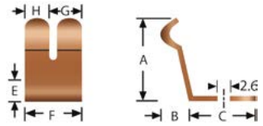
2505-02

Part nr.	A	B	C	D	Ø	E	G	H	Material thickness
2505-01	18.7	9.0	3.0	9	No hole		8.5	5	0.13 mm
2505-02	18.7	9.0		9	3.6	4.0	8.5		0.13 mm

Angle fingerstrips 2506



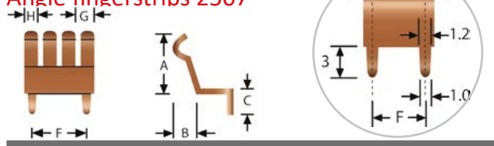
2506-01



2506-02

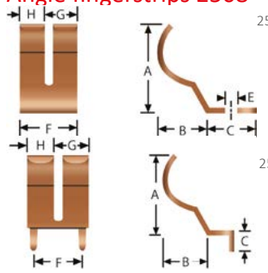
Part nr.	A	B	C	E	F	G	H	Material thickness
2506-01	10.3	3.5	8.0	4.0	11.0	4.0	3.0	0.20mm
250602	10.3	3.5	8.0	4.0	7.0	4.0	3.0	0.20mm

Angle fingerstrips 2507

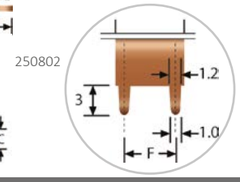


Part nr.	A	B	C	F	G	H	Material thickness
2507-04	8.0	2.5	3.0	5.0	2.0	1.5	0.15mm

Angle fingerstrips 2508



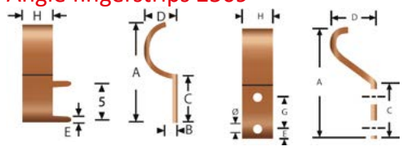
250801



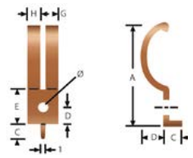
250802

Part nr.	A	B	C	E	F	G	H	Ø	Material thickness
2508-01	13.3	7.5	7.0	3.5	8.5	4.8	3.6	2.6	0.13mm
2508-02	13.3	7.5	3.0		5.0	4.8	3.6	No hole	0.13mm

Angle fingerstrips 2509



2509-01



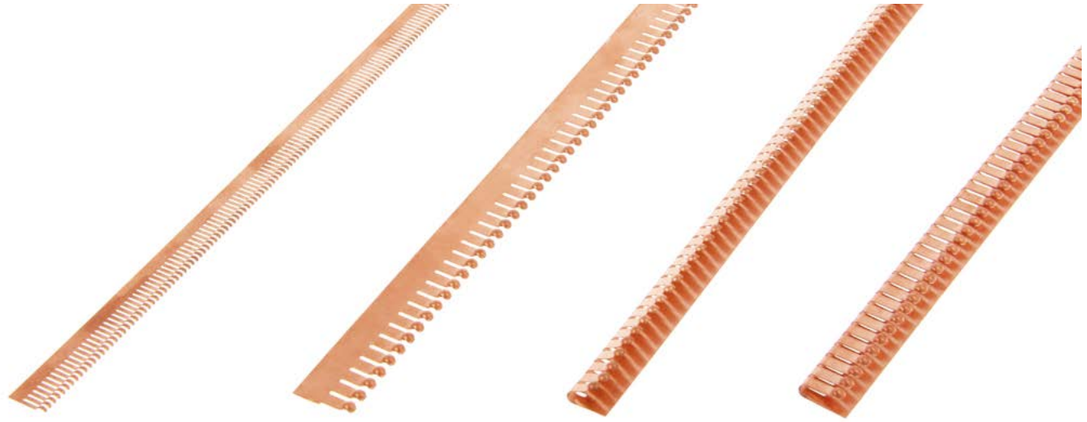
2509-03

2509-04

Part nr.	A	B	C	D	E	G	H	Ø	Material thick-ness
2509-01	17.2	1.9	8.4	4.3	1.3		4.0	No hole	0.15mm
2509-03	19.5	1.7	10.0	7.7	3	4.7	5.0	1.7	0.15mm
2509-04	20.5	4	3.0	4.5	7.0	3.1	2.5	2.0	0.15mm

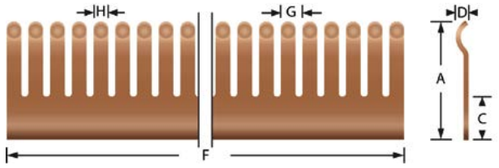
Circular fingers 2600

Used for grounding and EMI shielding
in high-frequency equipment

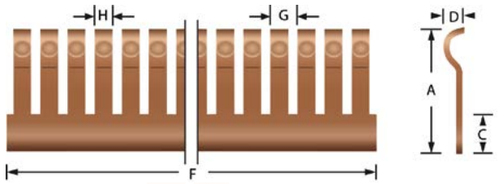


Circular fingerstrips are used for grounding and EMI shielding in highfrequency equipment and for forming large diameter round contacts rings. Circular fingerstrips are used to solve grounding en EMI shielding problems were round contacts and a dynamic range is required.

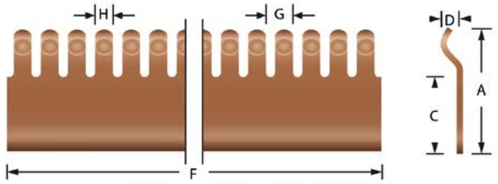
Circular fingers 2601



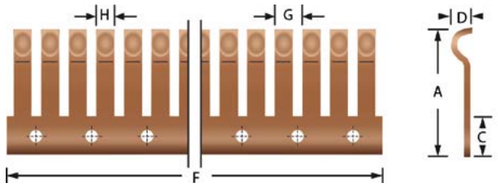
2601-01, 2601-03, 2601-05, 2601-07, 2601-08



2601-02, 2601-06



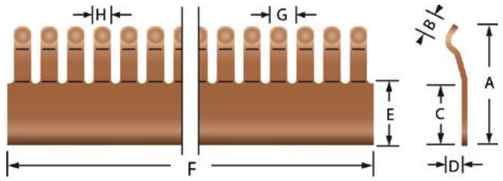
2601-09



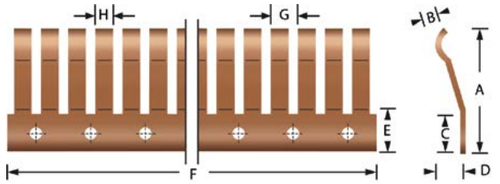
2601-10 hole diameter Ø 3.5

Part nr.	A	C	D	F	G	H	Material thickness	Compression force N
2601-01	8.6	3.2	1.0	406	1.5	1.0	0.10mm	
2601-02	9.5	3.2	1.2	499	1.5	1.0	0.10mm	
2601-03	9.7	1.6	1.3	406	1.9	1.3	0.16mm	
2601-05	14.0	6.5	1.5	499	4.0	3.0	0.20mm	
2601-06	14.2	5.5	1.05	500	2.0	1.5	0.15mm	
2601-07	18.5	6.5	1.5	499	4.0	3.0	0.20mm	
2601-08	19.1	12.7	3.1	406	4.8	3.6	0.13mm	
2601-09	22.6	14.9	3.0	406	4.8	3.6	0.13mm	25% 120 N/m 50% 550 N/m
2601-10	30.0	9.0	3.2	503	4.0	3.0	0.5mm	

Circular fingers 2602



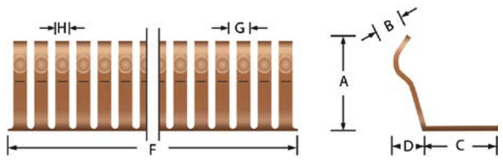
2602-01 tot 2602-03



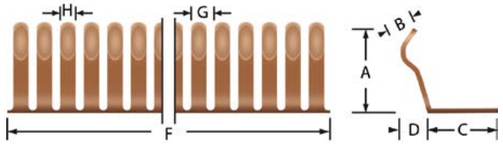
2602-05 hole diameter Ø 3.5

Part nr.	A	B	C	D	E	F	G	H	Material thickness
2602-01	9.2	1.2	3.2	2.5	3.6	500	1.5	1.0	0.10mm
2602-02	13.8	1.3	6.5	2.7	8.0	499	4.0	3.0	0.20mm
2602-03	13.9	0.8	6.0	3.0	6.0	500	2.0	1.5	0.15mm
2602-05	26.7	3.2	8.0	9.0	10.0	503	4.0	3.0	0.5mm

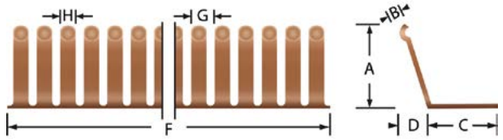
Circular fingers 2603



2603-01



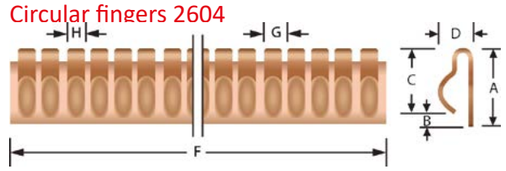
2603-02



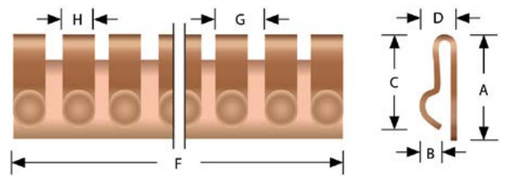
2603-03 and 2603-04

Part nr.	A	B	C	D	F	G	H	Material thickness
2603-01	5.5	1.2	3.9	2.1	500	2.0	1.5	0.10mm
2603-02	8.0	0.9	6.0	2.5	500	1.5	1.0	0.15mm
2603-03	11.0	1.3	8.0	3.8	499	4.0	3.0	0.20mm
2603-04	15.0	1.3	8.0	4.6	499	4.0	3.0	0.20mm

Circular fingers 2604



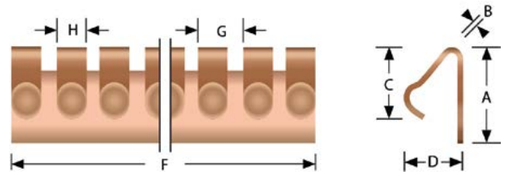
2604-01



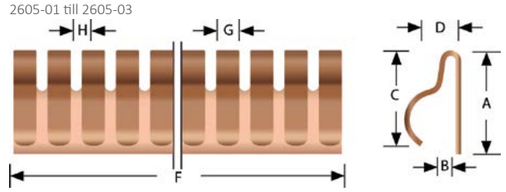
2604-02 till 2604-05

Part nr.	A	B	C	D	F	G	H	Material thickness	Compression force N
2604-01	4.8	0.8	4.1	2.3	406	1.5	1.0	0.13mm	25% 100 N/m 50% 150 N/m
2604-02	6.6		5.8	2.8	406	1.9	1.3	0.15mm	25% 130 N/m 50% 250 N/m
2604-03	6.8	0.9	6.5	2.8	499.5	2.0	1.5	0.15mm	
2604-04	9.2	1.3	7.7	4.5	499	4.0	3.0	0.20mm	
2604-05	11.2		8.1	4.1	406	2.4	1.6	0.25mm	25% 220 N/m 50% 700 N/m
2604-06	11.6	1.3	9.8	4.7	499	4.0	3.0	0.20mm	

Circular fingers 2605



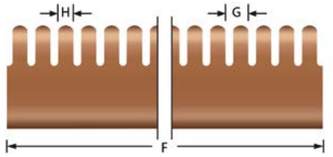
2605-01 till 2605-03



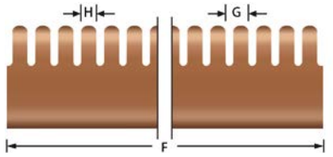
2605-04

Part nr.	A	B	C	D	F	G	H	Material thickness
2605-01	7.0	0.8	5.5	4.9	500	2.0	1.5	0.15mm
2605-02	9.5	1.1	6.4	7.0	500	4.0	3.0	0.20mm
2605-03	12.0	1.1	8.4	8.0	500	4.0	3.0	0.20mm
2605-04	4.1	1.2	4.6	2.4	500	1.5	1.0	0.10mm

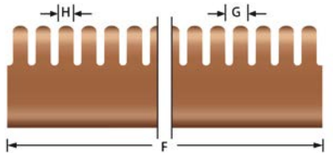
Circular fingers 2606



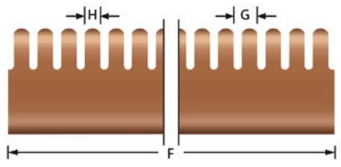
2606-01



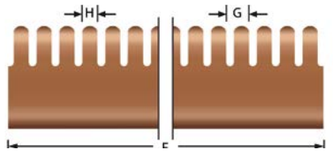
2606-02



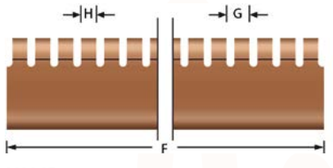
2606-03



2606-04



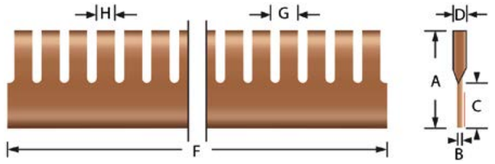
2606-05



2606-07

Part nr.	A	C	D	F	G	H	Material thickness
2606-01	19.6	16.0	5.8	406	4.8	3.6	0.13mm
2606-02	22.6	16.0	2.3	406	4.8	3.6	
2606-03	22.6	16.0	3.3	406	4.8	3.6	
2606-04	23.4	16.0	2.3	406	4.8	3.6	
2606-05	23.4	16.0	2.3	406	4.8	3.6	
2606-07	19.0	15.8	3.1	406	4.8	3.6	

CIRCULAR FINGERS 2607



Part nr.	A	B	C	D	F	G	H	Material thickness	Compression force N
2607-01	9.1	0.13	4.1	0.75	610	2.4	1.6	0.13mm	25% 220 N/m 50% 1030 N/m

The Fingers of part number 2607-01 and 2607-02 are approximately 30° turned outwards.

Part number 2607-01 and 2607-02 are supplied with an adhesive strip for easy mounting (red mark in drawing 2607-01 & 260702)

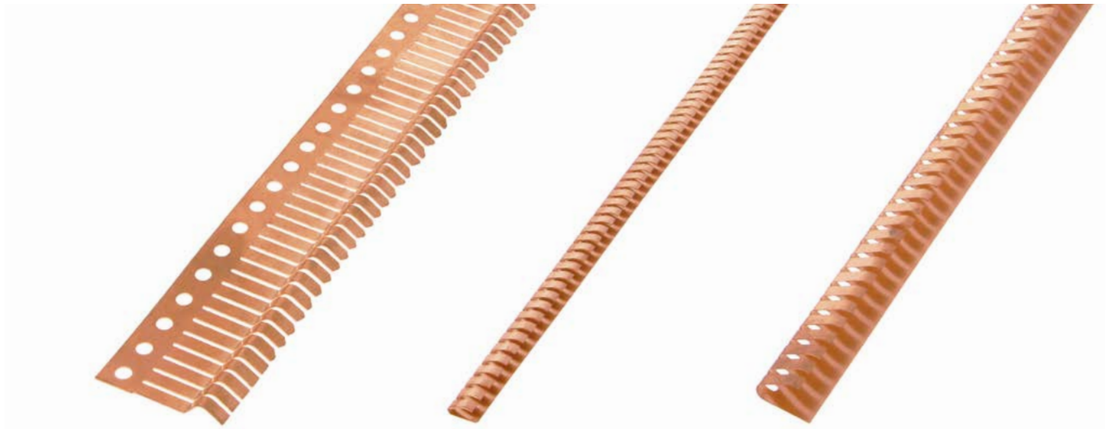
ORDER EXAMPLE

Part number

Specify the part number that you need from the table

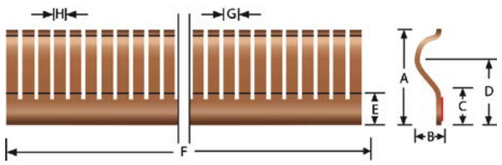
Contact fingers 2700

Contact fingers for Faraday cage doors and lids for shielded enclosures

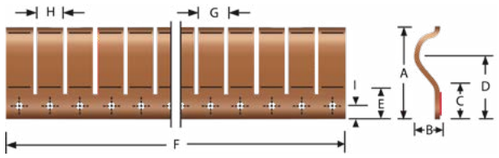


The Fingerstrips are very easy to bend and are therefore suitable for round and very dynamic contacts. These contact strips have a very dynamic spring range.

Contact fingers 2701



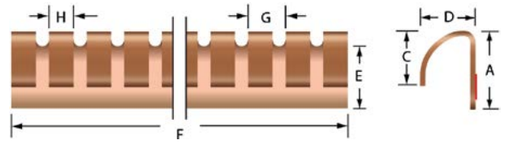
2701-01



2701-02 till 2701-04

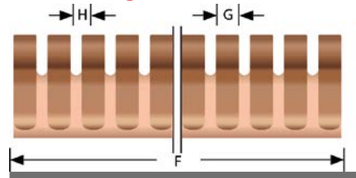
Part nr.	A	B	C	D	E	F	G	H	I	Ø	Material thickness
2701-01	24.0	7.0	7.0	15.5	6.5	499	4.0	3.0			0.20mm
2701-02	27.7	6.6	6.4	17.0	6.4	504	9.5	8.7	4	3.6	0.13mm
2701-02R	27.7	6.6	6.4	17.0	6.4	7600	9.5	8.7	4	3.6	0.13mm
2701-03	40.2	10.9	6.7	27.0	7.9	508	12.7	11.7	4.8	3.6	0.18mm
2701-04	42.4	10.9	7.9	27.0	7.9	504	12.7	11.7	4.8	3.6	0.18mm
2701-04R	42.4	10.9	7.9	27.0	7.9	7620	12.7	11.7	4.8	3.6	0.18mm

Contact fingers 2702



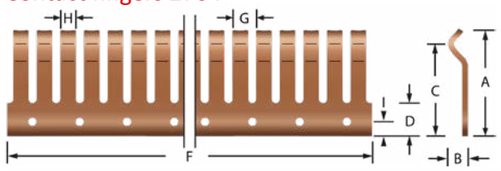
Part nr.	A	C	D	E	F	G	H	Material thickness	Compression force N
2702-01	3.3	2.5	1.8	2.1	304	1.5	1.0	0.10mm	25% 260 N/m 50% 610 N/m
2702-02	3.3	2.5	2.3	2.2	406	3.2	2.0	0.12mm	25% 260 N/m 50% 720 N/m
2702-03	7.1	6.4	3.3	5.7	406	3.4	2.3	0.25mm	25% 60 N/m 50% 1430 N/m
2702-05	7.1	4.8	5.1	5.9	406	3.4	2.3	0.25mm	25% 260 N/m 50% 2300 N/m
2702-08	16.0	10.4	11.2	12.7	406	3.4	2.2	0.25mm	25% 240 N/m 50% 680 N/m

Contact fingers 2703



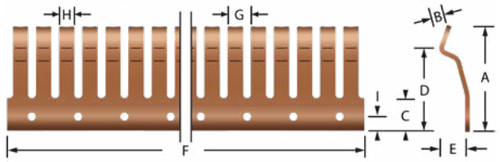
Part nr.	A	B	C	F	G	H	Material thickness
2703-01	4.2	2.6	4	406	1.5	1	0.10mm

Contact fingers 2704

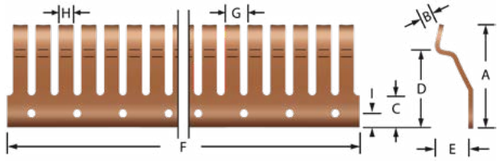


Part nr.	A	B	C	D	F	G	H	I	Ø	Material thickness
2704-01	30.0	3.2	25.0	9.0	503	4.0	3.0	4.5	3.5	0.40mm

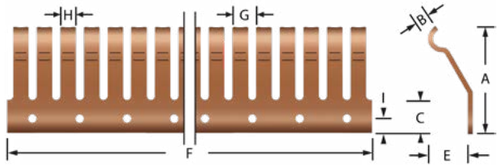
Contact fingers 2705



2705-01



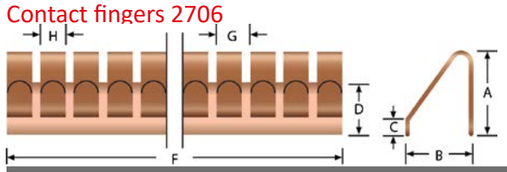
2705-02



2705-03

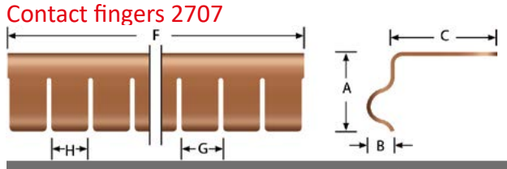
Part nr.	A	B	C	D	E	F	G	H	I	Ø	Material thickness
2705-01	29.1	3.2	9.0	23.5	7.0	503	4.0	3.0	4.5	3.5	0.40mm
2705-02	27.8	3.2	9.0	22.5	9.0	503	4.0	3.0	4.5	3.5	0.40mm
2705-03	26.7	3.2	9.0		11.0	503	4.0	3.0	4.5	3.5	0.40mm

Contact fingers 2706



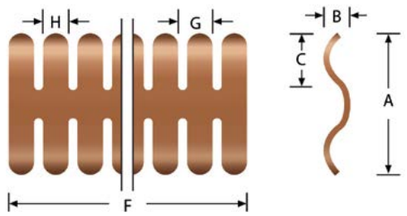
Part nr.	A	B	C	D	F	G	H	Material thickness
2706-01	12.5	9.9	2.0	5.5	500	2.0	1.5	0.15mm

Contact fingers 2707



Part nr.	A	B	C	F	G	H	Material thickness	Compression force N
27070-1	18.3	5.6	23.9	406	9.5	8.7	0.10mm	25% 250 N/m 50% 700 N/m

Contact fingers 2708



Part nr.	A	B	C	F	G	H	Material thickness	Compression force N
2708-01	19.8	3.0	7.6	406	4.8	3.6	0.13mm	25% 240 N/m 50% 1080 N/m

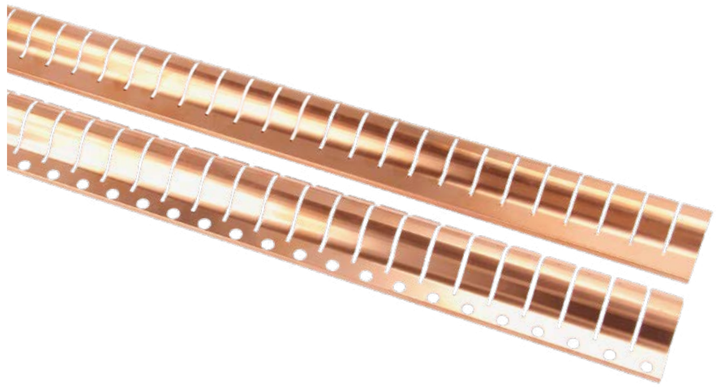
ORDER EXAMPLE

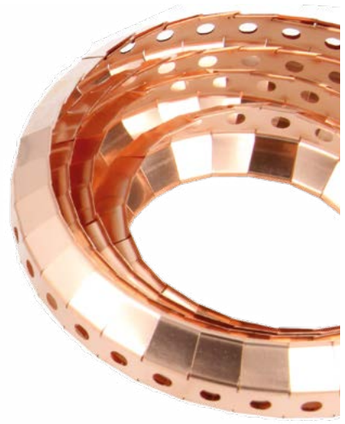
Part number

Specify the part number that you need from the table

Door fingers 2800

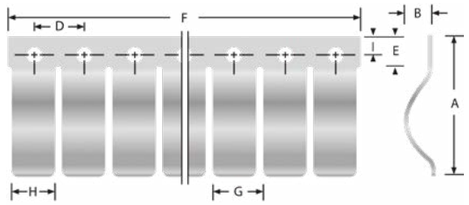
Contact fingers for Faraday cage doors and lids for shielded enclosures





EMI Finger stock, fingerstrips & spring contacts for shielded Faraday cage doors, electrical conductive doors and lids.

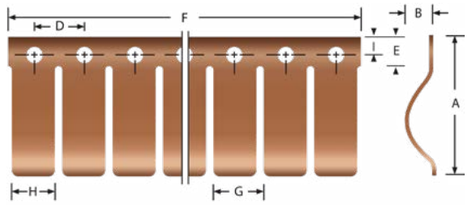
Contact fingers 2801 Rol TIN



Part nr.	A	B	D	E	F	G	H	I	Ø	Material thickness
2801-01RTIN	27.7	6.6	9.53	6.35	10600	9.53	8.71	3.96	3.56	0.18mm

Material beryllium copper with tin finish

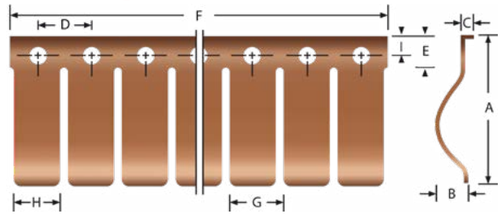
Contact fingers 2801



Part nr.	A	B	D	E	F	G	H	I	Ø
2801-01	27.7	6.9	9.53	6.35	504	9.53	8.71	3.96	3.56
2801-01R	27.7	6.9	9.53	6.35	10600	9.53	8.71	3.96	3.56
2801-02	40.2	10.9	12.7	8.0	507	12.7	11.7	4.8	3.6
2801-03	42.42	10.41	12.7	7.87	504	12.7	11.68	4.83	3.56
2801-03R	42.42	10.41	12.7	7.87	7620	12.7	11.68	4.83	3.56

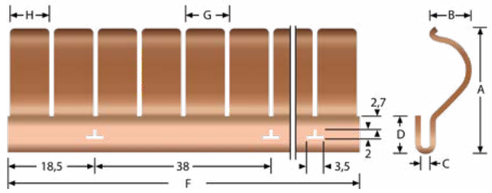
Material thickness 0.18mm,

Contact fingers 2802



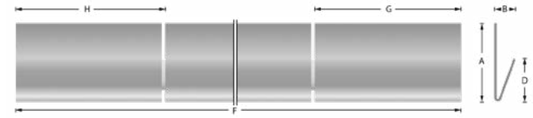
Part nr.	A	B	C	D	E	F	G	H	I	Ø	Material thickness
2802-01	26	6.9	2.0	9.5	4.9	503	9.5	8.5	2.3	3.6	0.13mm

Contact fingers 2803



Part nr.	A	B	C	D	F	G	H	Material thickness
2803-01	26.8	6.9	2.0	7.8	494	9.5	8.5	0.13mm

Contact fingers 2805



Part nr.	A	B	D	F	G	H	Material thickness
2805-01T	26.3	6.5	14	506	50.7	49.5	0.20 mm

Material: Tinned spring steel

PCB contact fingers 2900

Surface mount spring contacts are now available in different sizes, ranging from 1.7mm to 7.25mm

The contact fingers are applicable to make vertical or horizontal contact. You can order the fingers in different sizes and are designed for whipping and sliding applications. The use of the contact fingers are as example for shielding, grounding and general electrical connections applications and ideal to use for surface mount PCB's. The fingers are also known as Grounding / EMI/ RFI contacts, spring or Shield Finger.

The PCB contacts are ideal for automatic placement and can be delivered on Tape and Reel packing. When the contacts are mounted in a row they can provide excellent RFI shielding connection for metal doors or other cabinet enclosures. However, we can better advise our beryllium copper fingerstrips.

2901-01

Contact Gender	Male/Plug
Connector Orientation	Vertical
Current Rating	4A
Operating Temperature	-40 °C to +105 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	Gold
Finish/Plating on Contact Surface	Gold
Weight	0.008g
Body Length	2.7mm
Height of Connector above PCB	1.7mm
Reel quantity	5000 pieces

2901-02

Contact Gender	Male/Plug
Connector Orientation	Vertical
Current Rating	6A
Operating Temperature	-40 °C to +105 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	100% Tin over Nickel
Finish/Plating on Contact Surface	100% Tin over Nickel
Weight	-
Body Length	5.4mm
Height of Connector above PCB	2.5mm
Reel quantity	2500 pieces

2901-03

Contact Gender	Male/Plug
Connector Orientation	Vertical
Current Rating	5A
Operating Temperature	-40 °C to +105 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	100% Tin over Nickel
Finish/Plating on Contact Surface	Nickel
Weight	0.015g
Body Length	3.5mm
Height of Connector above PCB	2.5mm
Reel quantity	6000 pieces

2901-04

Contact Gender	Male/Plug
Connector Orientation	Vertical
Current Rating	6A
Operating Temperature	-40 °C to +105 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	100% Tin over Nickel
Finish/Plating on Contact Surface	Gold
Weight	0.019g
Body Length	4mm
Height of Connector above PCB	2.7mm
Reel quantity	2500 pieces

2901-05

Contact Gender	Male/Plug
Connector Orientation	Vertical
Current Rating	4A
Operating Temperature	-40 °C to +105 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	100% Tin over Nickel
Finish/Plating on Contact Surface	Gold
Weight	0.036g
Body Length	6.25mm
Height of Connector above PCB	2.75mm
Reel quantity	2500 pieces

2901-06

Contact Gender	Male/Plug
Connector Orientation	Vertical
Current Rating	4A
Operating Temperature	-40 °C to +105 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	100% Tin over Nickel
Finish/Plating on Contact Surface	Gold
Weight	
Body Length	4.5mm
Height of Connector above PCB	3.5mm
Reel quantity	2000 pieces

2901-07

Contact Gender	Male/Plug
Connector Orientation	Vertical
Current Rating	4A
Operating Temperature	-40 °C to +105 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	100% Tin over Nickel
Finish/Plating on Contact Surface	100% Tin over Nickel
Weight	
Body Length	4.5mm
Height of Connector above PCB	3.5mm
Reel quantity	2000 pieces

2901-08

Contact Gender	Male/Plug
Connector Orientation	Vertical
Current Rating	3A
Operating Temperature	-40 °C to +105 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	100% Tin over Nickel
Finish/Plating on Contact Surface	Gold
Weight	0.02g
Body Length	4.05mm
Height of Connector above PCB	3.5mm
Reel quantity	2500 pieces

2901-09

Contact Gender	Male/Plug
Connector Orientation	Vertical
Current Rating	3A
Operating Temperature	-40 °C to +105 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	Gold
Finish/Plating on Contact Surface	Gold
Weight	0.015g
Body Length	7mm
Height of Connector above PCB	4mm
Reel quantity	2000 pieces

2901-10

Contact Gender	Male/Plug
Connector Orientation	Vertical
Current Rating	5A
Operating Temperature	-40 °C to +105 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	100% Tin over Nickel
Finish/Plating on Contact Surface	Gold
Weight	0.023g
Body Length	4mm
Height of Connector above PCB	4mm
Reel quantity	2000 pieces

2901-11

Contact Gender	Male/Plug
Connector Orientation	Vertical
Current Rating	6A
Operating Temperature	-40 °C to +105 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	100% Tin over Nickel
Finish/Plating on Contact Surface	Gold
Weight	0.036g
Body Length	6.25mm
Height of Connector above PCB	2.75mm
Reel quantity	1800 pieces

2901-12

Contact Gender	Male/Plug
Connector Orientation	Vertical
Current Rating	4A
Operating Temperature	-40 °C to +105 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	100% Tin over Nickel
Finish/Plating on Contact Surface	Gold
Weight	0.048g
Body Length	7mm
Height of Connector above PCB	5.5mm
Reel quantity	1500 pieces

2901-13

Contact Gender	Male/Plug
Connector Orientation	Vertical
Current Rating	4A
Operating Temperature	-40 °C to +105 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	100% Tin over Nickel
Finish/Plating on Contact Surface	Gold
Weight	0.029g
Body Length	4mm
Height of Connector above PCB:	6mm
Reel quantity	1400 pieces

2901-16

Contact Gender	Male/Plug
Connector Orientation	Vertical and Horizontal
Current Rating	9A
Operating Temperature	-55 °C to +125 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	100% Tin over Nickel
Finish/Plating on Contact Surface	100% Tin over Nickel
Weight	0.023g
Body Length	9.6mm
Height of Connector above PCB:	7.25mm
Reel quantity	350 pieces

2901-17

Contact Gender	Male/Plug
Connector Orientation	Vertical and Horizontal
Current Rating	7A
Operating Temperature	-55 °C to +125 °C
Maximum Soldering Temperature	260 °C for 10 seconds
Finish/Plating on Termination	100% Tin over Nickel
Finish/Plating on Contact Surface	100% Tin over Nickel
Weight	0.036g
Body Length	9.6mm
Height of Connector above PCB	7.25mm
Reel quantity	350 pieces

ORDER EXAMPLE

Part number	Type
2901	–
	Specify the type from the tables, for example 1

***Notice**
Information supplied in these data sheets is based on independent and laboratory tests which Holland Shielding Systems BV, hereafter referred to as HSS believes to be reliable. HSS has no control over the design of customer's product which incorporates products, therefore it is the responsibility of the user to determine the suitability for his particular application and we recommend that the user make his own test to determine suitability.

The product described in this data sheet shall be of standard quality, however the products are sold without warranty of fitness for a particular purpose, either expressed or implied, except to the extent expressly stated on HSS invoice, quotation or order acknowledgment. HSS does not warrant that products described in this data sheet will be free of conflict with existing or future patents of third parties. All risks of lack of fitness, patent infringement and the like are assumed by the user.

Conductive rubber profiles

Electrically conductive rubber profiles in general are known for its excellent weather, oxidation and ozone resistance

Silver plated aluminium conductive rubber profiles 5750P

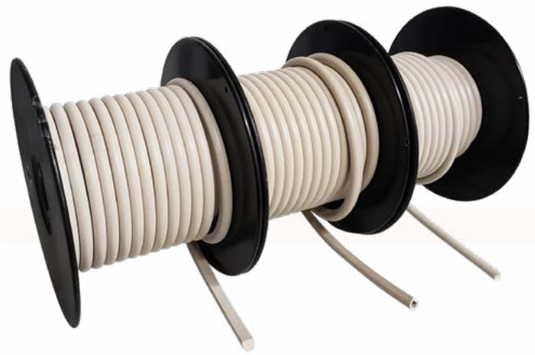
Conductive carbon filled rubber profiles 5755P

Nickel/graphite filled conductive rubber profiles 5760P

The rubber in these profiles is made conductive by means of small conductive metal particles, distributed throughout the rubber. It can provide an EMI-proof and a pressure watertight seal in narrow constructions.

Electrically conductive rubbers are typically used for EMI applications. Also used for EMP protection, wave-guide applications and against static electricity. The rubber can be filled with silver, nickel, silvered glass, silvered aluminium or graphite (only for ESD). Commercial EMI applications often call for **Nickel/graphite filled conductive rubber profiles (5760P)** or **Conductive carbon filled rubber profiles (5755P)** due to costs, whereas military and aerospace applications often call for **Silver plated aluminium conductive rubber profiles (5750P)** to meet Mil-G-83528C specifications. In military or aerospace, fluorosilicone versions may also be used for its chemical and fuel resistance.

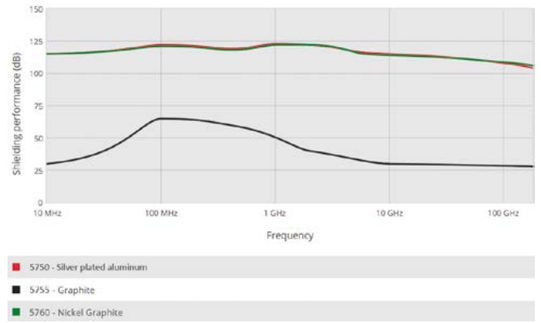
As the material shields high frequencies, electrically conductive rubber shows a shielding effect of 60 dB at 30MHz ~ 10GHz. Due to its excellent conductivity, grounding and EMI shielding effect, it is well suited for military communication equipment. The rubber can be manufactured in various shapes such as sheets, molded parts, die-cut, strips, o-rings, etc.



Benefits

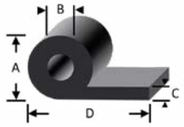
- Excellent conductivity throughout the surface
- Excellent electromagnetic shielding effect
- Easy die-cutting, kiss-cutting and slitting
- Temperature range -60 to +185°C (under certain circumstances, tolerance can be up to 220°C)

Shielding performance*



Technical details and specifications

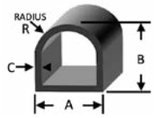
Conductive material	5750P Silver plated aluminium	5755P Graphite	5760P Nickel Graphite
Filler	Ag/Al	Graphite	Ni-graphite
Base polymer	Silicone	Silicone	Silicone
Elongation, %, min.	90	50	50
Volume resistance, Ohm-cm (expression of conductivity)	0.008	1.8	0.05
Operating Temp	+125	+160	+160
Range (C)	-55	-50	-55
Color	Dark Tan	Black	Dark Gray
Shore Hardness (A +/-5) ASTM D2240	65	60	60
Volume Resistivity (ohms) ASTM D991	0.005	2.2	0.04
Specific Gravity (+/- 0.25)	3.5	2.0	2.0



P profile (P)

Available for 5750P + 5755P + 5760P

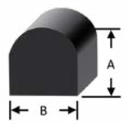
Size	A (mm)	B (mm)	C (mm)	D (mm)
5.0X2.0X1.6X12.7	5.0	2.0	1.6	12.7
5.0X2.0X1.6X21.6	5.0	2.0	1.6	21.6
6.4X3.2X1.6X12.7	6.4	3.2	1.6	12.7
6.4X3.2X1.6X15.9	6.4	3.2	1.6	15.9
6.4X3.2X1.6X22.2	6.4	3.2	1.6	22.2
7.9X4.8X1.6X22.2	7.9	4.8	1.6	22.2
9.1X6.5X1.8X19.8	9.1	6.5	1.8	19.8



hollow D profile (D)

Available for 5750P + 5755P + 5760P

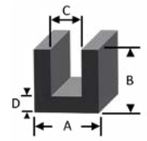
Size	A (mm)	B (mm)	C (mm)	R (mm)
4.0X4.0X1.1X2.0	4.0	4.0	1.1	2.0
4.8X4.7X1.3X2.4	4.8	4.7	1.3	2.4
6.4X6.4X1.7X3.2	6.4	6.4	1.7	3.2
7.9X7.9X1.3X4.0	7.9	7.9	1.3	4.0
12.4X8.2X2.0X6.2	12.4	8.2	2.0	6.2



Solid D (SD)

Available for 5750P + 5755P + 5760P

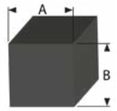
Size	A (mm)	B (mm)
1.6X1.4	1.6	1.4
1.7X1.6	1.7	1.6
2.0X2.4	2.0	2.4
2.3X2.0	2.3	2.0
2.5X1.6	2.5	1.6
2.8X3.2	2.8	3.2
3.4X3.1	3.4	3.1
4.0X3.0	4.0	3.0
4.0X4.0	4.0	4.0
4.5X4.5	4.5	4.5
4.8X4.8	4.8	4.8



U channel profile (u)

Available for 5750P + 5755P + 5760P

Size	A (mm)	B (mm)	C (mm)	D (mm)
2.4X2.5X0.9X0.8	2.4	2.5	0.9	0.8
3.2X2.8X0.7X1.3	3.2	2.8	0.7	1.3
3.2X5.7X0.5X2.0	3.2	5.7	0.5	2.0
4.0X4.0X1.6X1.2	4.0	4.0	1.6	1.2
4.5X4.0X1.2X1.9	4.5	4.0	1.2	1.9
8.3X6.0X1.6X2.9	8.3	6.0	1.6	2.9



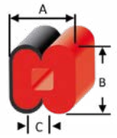
Rectangular profile (R)

Available for 5750P + 5760P

Size	A (mm)	B (mm) Thickness of
...X...	Your required width in mm	1.0, 1.2, 1.5, 1.7, 2.0, 2.5, 3.0

Available for 5755P

Size	A (mm)	B (mm) Thickness of
...X...	Your required width in mm	1, 2, 3, 4, 5, 10



DD profile (DD)

Available for 5750P + 5760P

Size	A (mm)	B (mm)	C (mm)
4.57X4.75X1.65	4.57	4.75	1.65

Order example

Series	Profile	Size number	Tape code	Length (meters)
5750P: Silver plated aluminium profile **5755P:** Carbon filled conductive rubber profiles **5760P:** Nickel/graphite filled conductive rubber profiles	**P :** P Profile **D :** Hollow D profile **SD :** Solid D profile **U :** U channel profile **DD :** DD profile with water seal **R :** Rectangular profile	Specify the type from the tables, for example 5.0X2.0X1.6X12.7	**02 :** Without self-adhesive **03 :** With conductive self-adhesive	

Extreme ultra-soft EMI-IP gaskets 7450

Gasket covered with conductive textile and closed-cell neoprene

The extreme ultra-soft gasket is a high-performance shielding gasket made of neoprene and covered with conductive textiles. The outer closed-cell neoprene material creates a water seal and due to the inner PU foam core of the gasket, it creates an extremely low closure force and has and has a compression rate of 90%.

This prevents the deflection of doors/parts, which improves shielding effectiveness. The product works very well in combination with stainless steel and other metals.

The gasket can be ordered in different sizes and shapes (on request) and can be ordered on rolls up to 1000 meters.

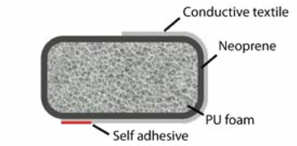
Available dimensions

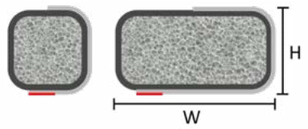
Part number	Width	Height
7450-12-12	12	12
7450-24-12	24	12
7450-15-15	15	15
7450-30-15	30	15
7450-20-20	20	20
7450-40-20	40	20
7450-25-25	25	25
7450-30-25	50	25
7450-30-30	30	30
7450-60-30	60	30
7450-35-35	35	35
7450-70-35	70	35
7450-40-40	40	40
7450-80-40	80	40
7450-50-50	50	50
7450-60-60	60	60
7450-70-70	70	70
7450-80-80	80	80

Benefits

- The gasket can be compressed up to 90%
- Very low closure force
- Very high electrical conductivity
- High shielding performance
- Roll lengths of 1 to 1000 meters, depending on the width and height of the EMI gasket
- Easy to fit with self-adhesive
- High abrasion resistance
- Can be cut with a pair of scissors
- It is easy to bend it around corners

Profile structure





Order example

Part number	Width	Heigth
7450	Specify the width of the gasket in mm	Specify the height of the gasket in mm

Length
Specify the length of the gasket in mm

EMC-IP gasket with controlled compression stops 1230

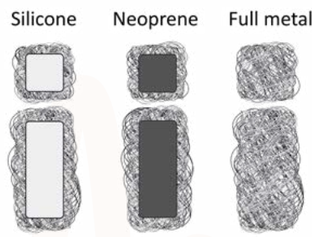
EMC-IP gasket with controlled compression stops
for EMI and EMP protection

This gasket is used for screwed connections for EMI and EMP protection. The water seal is made out of flame retardant neoprene foam. In the water seal are not only holes for bolts but also holes to make the foam more easy to compress. This makes it so that it can be used to screw thinner plates together without bending.

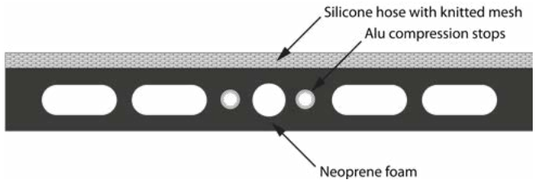
Around the bolt holes are compression stops to prevent the gasket overstretches. This makes it possible so that with a torque control the gasket is under exactly the right stress for water and EMI sealing during mounting. The bolt holes can be made at any distance. The compression stops can be out of metal or plastic. The thickness and width can change as well as the reduction of the compression force, without influence on the shielding capacities.

Knitted mesh core

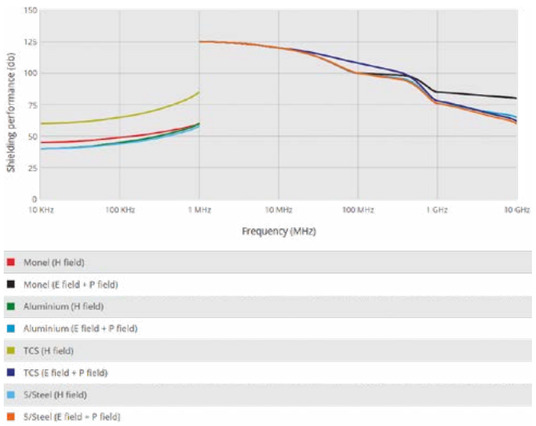
The core of the knitted mesh material can be made in:



Technical drawing

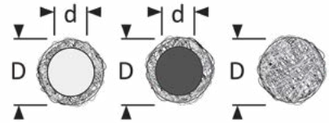


Knitted mesh Shielding performance

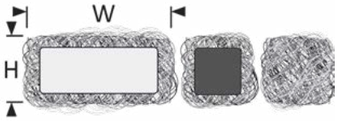


» 1230 - EMC-IP gasket with controlled compression stops

Knitted mesh shape



Round core



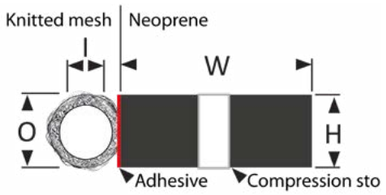
Rectangular & square

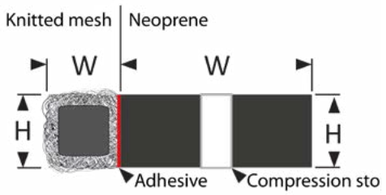
D (mm) or D x d (mm)		
1.6	4.8 x 3.2	9.5 x 6.4
2.4	6.4	11.1
3.2	6.4 x 3.2	11.1 x 8.0
3.2 x 1.6	7.9	12.7
4.0	8.0 x 4.8	12.7 x 9.5
4.8	9.5	14.9 x 11.1

w x h (mm)		
3.2 x 1.6	9.5 x 3.2	19.1 x 12.7
3.2 x 2.4	9.5 x 4.8	20 x 6
3.2 x 3.2	9.5 x 6.4	20 x 8
4.0 x 3.2	12.7 x 6.4	20 x 10
4.8 x 2.4	12.7 x 9.5	20 x 12
4.8 x 3.2	12.7 x 12.7	20 x 20
4.8 x 4.8	15 x 6	25 x 6
6.4 x 1.6	15 x 8	25 x 8
6.4 x 2.4	15 x 10	25 x 10
6.4 x 3.2	15 x 12	25 x 12
6.4 x 4.8	15 x 15	25 x 18
6.4 x 6.4	15.9 x 9.5	25 x 20

Neoprene foam (base material)

The base material of the gasket is made of neoprene that can be ordered in different widths and lengths. The thicknes of the foam can be ordered in: 1, 2, 3, 4, 5, 6, 7, 8, 10 and 12 mm.





If you send us a drawing, please include the dimensions shown above. For a inquiry send a email to info@holland-shielding.com

High temperature resistant EMI gasket 7100

Same as the 7100 series Standard Shield gaskets but then resistant up to peak temperatures of 135 °C

This series is a HF shielding gasket with high shielding performance and extremely low closure force. This prevents deflection of doors/parts, which improves shielding effectiveness. It is very effective in combination with stainless steel and metals.

The core consists of a high-grade FUBA foam which is an EPDM foam covered with high conductive wear & tear resistant metallized fabric. This EMI gasket is used in large scale in automotive production up to 135 °C.

FUBA foam general description

FUBA foam is a semi-closed cell EPDM foam with excellent sealing properties. The semi-closed cell structure combines the flexibility of open cell types with the excellent sealing capabilities of closed cell types (after compression). This unique foam can be laminated with advanced adhesive technology to seal (complex) gaps against water, wind, dust, noise and heat.

FUBA foam characteristics

Good resistance to UV, humidity, high and low temperatures and chemicals (such as acids and alkalis). The flexibility of the foam makes sure that the optimal sealing performance is obtained, even with expansion or contraction of the structure caused by temperature changes. Thanks to the low compression load the foam will never deform the structure after application.

Combined with advanced adhesive technology, the foam can be applied on greasy, rough, smooth, and low energy surfaces. No heavy metals (such as cadmium) or regulated substances (such as CFC's and halogen gases) are used during the manufacturing process nor in the product itself. FUBA foam can be disposed of by incineration.

Features

- Semi-closed cell structure
- Good UV resistance
- Good weather-ability
- Low compression load
- Very high electrical conductivity
- High shielding performance
- Roll length of 1 until 1000 meters. (Depending on width and height of the EMI gasket)
- Easy to fit with self-adhesive
- High abrasion resistance
- Can be cut wit a pair of scissors
- Because the FUBA foam series is so soft, it is easy to bend around corners

TAPE SPECIFICATION

- With standard self-adhesive placed in the middle
- Without self-adhesive
- With conductive self-adhesive
- Standard self-adhesive, asymmetrical
- Standard self-adhesive placed on the side

Application

FUBA foam gaskets are especially designed to seal (complex) gaps against electrical noise and heat. Depending on the applications, the EMI gasket needs to be compressed between 50-80% to activate its sealing properties. Automotive- sealing of HVAC unit, dashboard, air duct, glass run, fire wall. Building and construction- sealing of exterior panel joints, solar panels. Industrial- sealing of air-conditioners, mobile phones, refrigerators.

» 7100 High temperature resistant EMI gasket

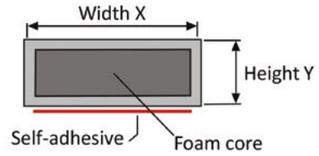
STANDARD DIMENSIONS

Height Y (mm) \ Width X (mm)	4	5	6	9	10	12	15	18	20	25
3	7143	7153	7163	7193	71103	71123	71153	71183	71203	71253
4	7144	7154	7164	7194	71104	71124	71154	71184	71204	71254
6			7166	7196	71106	71126	71156	71186	71206	71256
8				7198	71108	71128	71158	71188	71208	71258
9				7199	71109	71129	71159	71189	71209	71259
10					711010	711210	711510	711810	712010	712510
12						711212	711512	711812	712012	712512
15							711515	711815	712015	712515
18								711818	712018	712518
20									712020	712520
25										712525

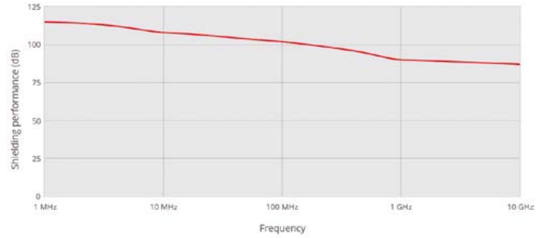
FUBA FOAM CORE SPECIFICATIONS

Properties	Value	Standard
Density	95 kg/m³	ISO 845
Thickness	3-30mm	
Temperature- service (continuous)	-40 to 135 °C	
Temperature max	180 °C	
Compression load (50%)	5 kPa	ISO 844
Elongation	430 %	ISO 1798
Elongation- acid (1% H2SO4)	430 %	Immersion at 20 °C for 7 days
Elongation- alkaline (1% NaOH)	390 %	Immersion at 20 °C for 7 days
Elongation- initial	430 %	Immersion at 20 °C for 7 days
Tensile strength- acid (1% H2SO4)	81 kPa	Immersion at 20 °C for 7 days
Tensile strength	90 kPa	ISO 1798
Tensile strength- alkaline (1% NaOH)	77 kPa	Immersion at 20 °C for 7 days
Tensile strength- initial	90 kPa	Immersion at 20 °C for 7 days
Water absorption	ISO 2896	
Flammability	Pass	FMVSS 302
Weather ability	Excellent	
High deflection	Up to 65 %	

TECHNICAL DRAWING



SHIELDING PERFORMANCE*



ORDER EXAMPLE

Series	Width X (mm)	Height Y (mm)	Adhesive	Length (meters)
7100				
	Specify the width of the gasket in mm	Specify the height of the gasket in mm	**01 :** Standard self-adhesive placed in the middle **02 :** Without self-adhesive **03 :** With conductive self-adhesive (only recommended on less than 3mm sizes) **06 :** Standard self-adhesive, asymmetrical **07 :** Standard self-adhesive placed on the side	

Power supply gasket 7150

Gasket with a copper strip on the inside to guide higher currents. Can be used for example, heated window

Standard EMC gaskets are not made for conducting higher currents but for EMC applications and static discharge. For higher currents through an EMC gasket we have developed the 7150 series Power supply gasket.

An extra mu-copper strip is used in this adapted standard shielding, which ensures that a higher conductivity of current is possible.

The gasket is provided with an mu-copper contact strip in order to make contact with the power supply. Optionally, the gasket can be supplied with soldered wire for easy connection.

The Power supply gasket is delivered in your specified length.

Applications

- Heated mirrors, glass or other heated parts
- LED panels
- Resilient gaskets for higher currents9

Standard sizes

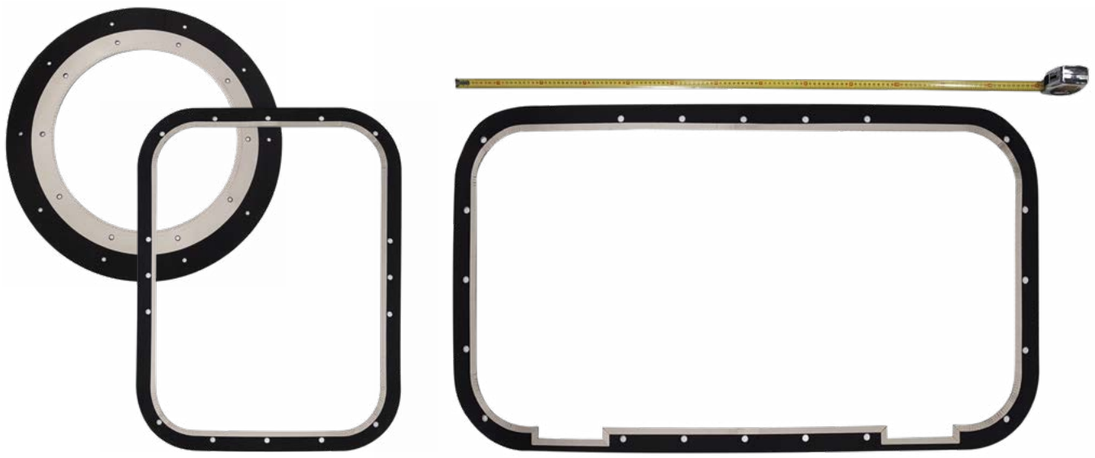
Height Y (mm)	3	4	5	6	7	8	9	10	12	15	18	20	25	32	50
1	7150-3-1	7150-4-1	7150-5-1	7150-6-1	7150-7-1	7150-8-1	7150-9-1	7150-10-1	7150-12-1	7150-15-1	7150-18-1	7150-20-1	7150-25-1	7150-32-1	7150-50-1
2	7150-3-2	7150-42-	7150-5-2	7150-6-2	7150-7-2	7150-8-2	7150-9-2	7150-10-2	7150-12-2	7150-15-2	7150-18-2	7150-20-2	7150-25-2	7150-32-2	7150-50-2
3	7150-3-3	7150-4-3	7150-5-3	7150-6-3	7150-7-3	7150-8-3	7150-9-3	7150-10-3	7150-12-3	7150-15-3	7150-18-3	7150-20-3	7150-25-3	7150-32-3	7150-50-3
4		7150-4-4	7150-5-4	7150-6-4	7150-7-4	7150-8-4	7150-9-4	7150-10-4	7150-12-4	7150-15-4	7150-18-4	7150-20-4	7150-25-4	7150-32-4	7150-50-4
5			7150-5-5	7150-6-5	7150-7-5	7150-8-5	7150-9-5	7150-10-5	7150-12-5	7150-15-5	7150-18-5	7150-20-5	7150-25-5	7150-32-5	7150-50-5
6				7150-6-6	7150-7-6	7150-8-6	7150-9-6	7150-10-6	7150-12-6	7150-15-6	7150-18-6	7150-20-6	7150-25-6	7150-32-6	7150-50-6
8					7150-7-8	7150-8-8	7150-9-8	7150-10-8	7150-12-8	7150-15-8	7150-18-8	7150-20-8	7150-25-8	7150-32-8	7150-50-8
9							7150-9-9	7150-10-9	7150-12-9	7150-15-9	7150-18-9	7150-20-9	7150-25-9	7150-32-9	7150-50-9
10								7150-10-10	7150-12-10	7150-15-10	7150-18-10	7150-20-10	7150-25-10	7150-32-10	7150-50-10
12									7150-12-12	7150-15-12	7150-18-12	7150-20-12	7150-25-12	7150-32-12	7150-50-12

ORDER EXAMPLE

Series	Width X (mm)	Height Y (mm)	Wire
7150			
	Specify the width of the gasket in mm	Specify the height of the gasket in mm	**Y :** With wire for easy connection **N :** No wire

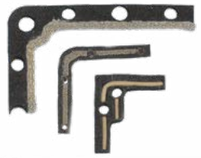
Die-cut gasket 8300

Gasket die-cut according to the client out of various materials, for example: silicone gasket, monel gasket, conductive rubber, conductive foam, neoprene



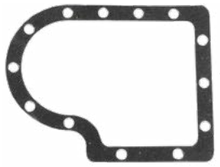
Combiner IP-EMC seal

Gaskets made out of conductive rubber are quite expensive and are also usually less soft than needed for the application. Due to excessive stiffness, the door or lid of the electronics housing will become warped or bent, which then causes electromagnetic leakage. Therefore we have developed gaskets which provide the same functionality while being significantly softer.
Gasket size can be up to 2 x 3 meter and even bigger on request. Some examples are listed below.



- Self-adhesive neoprene gasket with knitted mesh inside
- Very small gasket with inserts of conductive foam
- Small gasket with insert of conductive, hollow, round rubber profile

- Flash-cut gasket with knitted mesh



- Flash-cut gasket

- Neoprene edge around a core of conductive foam

- Die-cut gasket from profile (embossed Amucor foil)

- Round closed-cell neoprene gasket with soft conductive foam inside

- Neoprene gasket with conductive-rubber hollow O-ring profile

- Silicone foam gasket with mesh foil inside

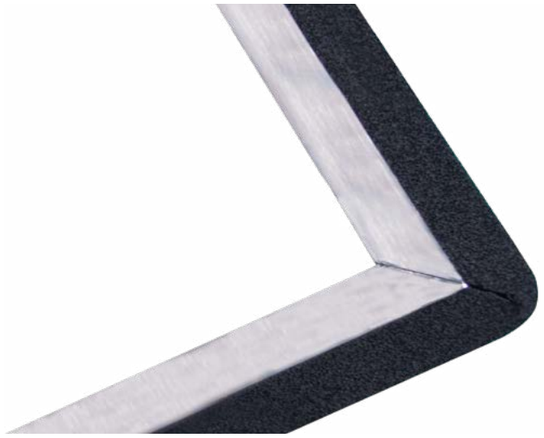
- Fabric over foam-gasket profile with asymmetric tape

- EMC/IP gaskets 7300 series (Amucor version) with cutouts for easy bending
- EMC/IP gaskets 7300 series with holes cut according to customer's drawing and with uninterrupted water seal

- Standard shield 7000 series with cut-outs for easy bending

EMC-IP gasket 7300

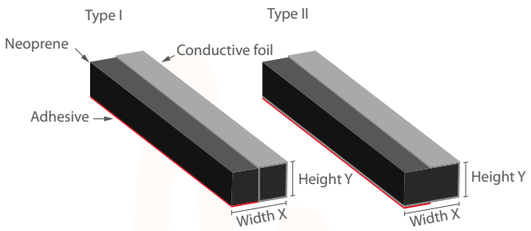
Water sealing EMI gaskets for screwed applications like panels, displays, and windows



The 7300 series EMC / IP gaskets are cost-effective combinations of an EMI shielding gasket and a water seal. This type of gasket comes with a self-adhesive strip.

The gasket consists of two neoprene foam cores, one of which is covered with reinforced foil, based on the high performance Amucor alloy. Amucor is highly compatible with aluminium and zinc-plated steel. If the gasket is intended to be in contact with alochrom or stainless steel, we recommend using highly conductive textile in stead of Amucor. The two parts can be bent independently from one another to guarantee optimal shielding and sealing performance. Sharp inner corners can be made easily, without interrupting the water seal. For special applications we can offer different foam cores, conductive foils and fabrics.

Construction



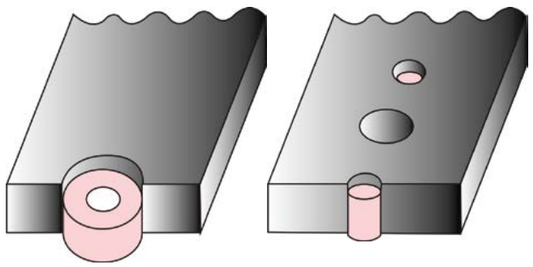
Benefits

- Bends easily around sharp corners without interrupting the water seal
- Excellent water sealing up to IP65 (depending on construction)

The 7300 EMC / IP gasket can also be produced in a circle shape. The water-seal can be either on the outside or the inside of the gasket

Compression stops (optional)

Disc or washer-type compression stops can be included to prevent over compression.

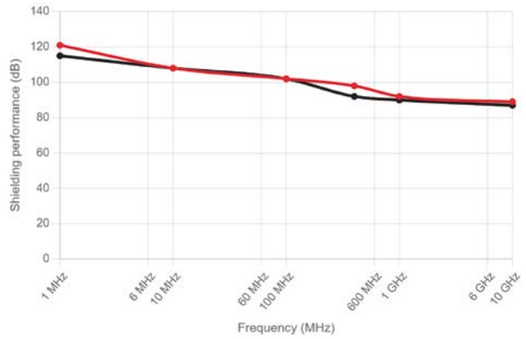


Washer type
Used at bolt holes

Disk type
Used next to bolt holes

Shielding performance*

Shielding effectiveness depends on surface, shape of the gasket and materials used.



Part numbers

Height Y (mm)	Width X (mm) 4	6	8	9	10	12	15	18	20	25
1	7300-4-1	7300-6-1	7300-8-1	7300-9-1	7300-10-1	7300-12-1	7300-15-1	7300-18-1	7300-20-1	7300-25-1
2	7300-4-2	7300-6-2	7300-8-2	7300-9-2	7300-10-2	7300-12-2	7300-15-2	7300-18-2	7300-20-2	7300-25-2
3	7300-4-3	7300-6-3	7300-8-3	7300-9-3	7300-10-3	7300-12-3	7300-15-3	7300-18-3	7300-20-3	7300-25-3
4	7300-4-4	7300-6-4	7300-8-4	7300-9-4	7300-10-4	7300-12-4	7300-15-4	7300-18-4	7300-20-4	7300-25-4
5	7300-4-5	7300-6-5	7300-8-5	7300-9-5	7300-10-5	7300-12-5	7300-15-5	7300-18-5	7300-20-5	7300-25-5
6	7300-4-6	7300-6-6	7300-8-6	7300-9-6	7300-10-6	7300-12-6	7300-15-6	7300-18-6	7300-20-6	7300-25-6
8	7300-4-8	7300-6-8	7300-8-8	7300-9-8	7300-10-8	7300-12-8	7300-15-8	7300-18-8	7300-20-8	7300-25-8
10		7300-6-10	7300-8-10	7300-9-10	7300-10-10	7300-12-10	7300-15-10	7300-18-10	7300-20-10	7300-25-10
12		7300-6-12	7300-8-12	7300-9-12	7300-10-12	7300-12-12	7300-15-12	7300-18-12	7300-20-12	7300-25-12
15			7300-8-15	7300-9-15	7300-10-15	7300-12-15	7300-15-15	7300-18-15	7300-20-15	7300-25-15
18				7300-9-18	7300-10-18	7300-12-18	7300-15-18	7300-18-18	7300-20-18	7300-25-18
20					7300-10-20	7300-12-20	7300-15-20	7300-18-20	7300-20-20	7300-25-20
25						7300-12-25	7300-15-25	7300-18-25	7300-20-25	7300-25-25

ORDER EXAMPLE

Series	Width X (mm)	Height Y (mm)	Foil code	Type
7300				
	Specify the width of the gasket in mm	Specify the height of the gasket in mm	**A :** Amucor **T :** Textile	**Type I :** Two pieces **Type II :** One piece

***Notice**

Information supplied in these data sheets is based on independent and laboratory tests which Holland Shielding Systems BV, hereafter referred to as HSS believes to be reliable. HSS has no control over the design of customer's product which incorporates products, therefore it is the responsibility of the user to determine the suitability for his particular application and we recommend that the user make his own test to determine suitability.

L-shape gaskets 7500

L-shaped EMI/RFI-shielding gasket with water seal (IP seal) for thin doors and lids

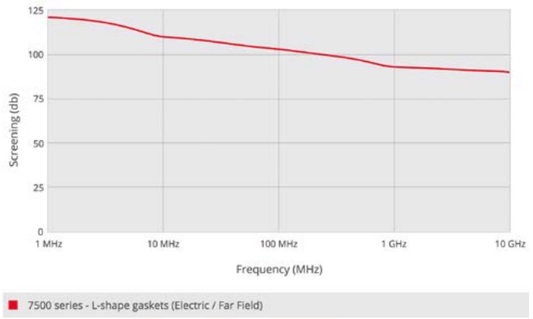
The L-shaped gasket as an efficient combined seal for doors and lids. The gasket is used to achieve two goals at the same time: a water seal and an EMI seal.

This L-shaped gasket is made from a solid piece of neoprene foam. One side has been laminated with conductive textile (the conductive side) and the other side is uncovered neoprene which provides a water seal.

The flange of the door will compress the water-seal side of the gasket with very little force to assure a watertight seal.

The electrically conductive part on the other side of the gasket establishes an electrical connection between the lid and housing

Shielding performance*



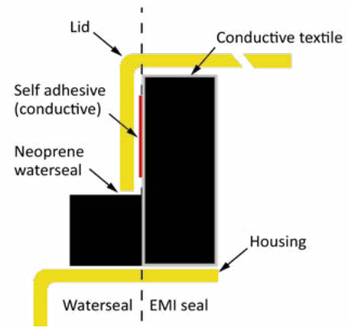
Benefits

- Bends easily around sharp corners without interrupting the water seal
- Excellent water sealing up to IP65 (depending on construction)
- Easily mounted with a self-adhesive strip
- Easy to use for small doors and lids
- Low closure force to prevent bending of doors and lids
- Tools required: a pair of scissors

Options (on request)

- Custom made in the dimensions you need
- Available in flame-retardant version
- Available with conductive self-adhesive
- Available with chemical-resistant rubbers like EPDM
- Cut into accurate lengths
- In the shape of a ready-made frame

TECHNICAL DRAWING

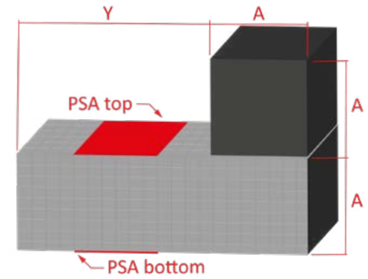


» L-shape gasket 7500

Standard dimensions

Part number	A	Y
7500-2-4-X	2	4
7500-2-6-X	2	6
7500-2-8-X	2	8
7500-3-6-X	3	6
7500-3-8-X	3	8
7500-3-10-X	3	10
7500-4-8-X	4	8
7500-4-10-X	4	10
7500-4-12-X	4	12
7500-5-8-X	5	8
7500-5-10-X	5	10
7500-5-12-X	5	12
7500-6-8-X	6	8
7500-6-10-X	6	10
7500-6-12-X	6	12
7500-7-10-X	7	10
7500-7-12-X	7	12
7500-7-14-X	7	14
7500-8-14-X	8	14
7500-8-16-X	8	16
7500-8-18-X	8	18

X = conductive cover.
Other sizes on request



ORDER EXAMPLE

Series		A (mm)		Y (mm)		Tape code		Adhesive side		Core material		Cover
7500	-	Specify size A in mm.	-	Specify size Y in mm.	-	**01:** Standard self-adhesive placed in the middle **03:** With conductive self-adhesive (only recommended on small sizes) **06:** Standard self-adhesive, asymmetrical	-	**T:** Adhesive on top side **B:** Adhesive on bottom side	-	**N:** Neoprene **E:** EPDM **F:** Flame retardant UL94V-0 foam	-	**T :** Conductive textile **A :** Amucor foil

***Notice**

Information supplied in these data sheets is based on independent and laboratory tests which Holland Shielding Systems BV, hereafter referred to as HSS believes to be reliable. HSS has no control over the design of customer's product which incorporates products, therefore it is the responsibility of the user to determine the suitability for his particular application and we recommend that the user make his own test to determine suitability.

The product described in this data sheet shall be of standard quality, however the products are sold without warranty of fitness for a particular purpose, either expressed or implied, except to the extent expressly stated on HSS invoice, quotation or order acknowledgment. HSS does not warrant that products described in this data sheet will be free of conflict with existing or future patents of third parties. All risks of lack of fitness, patent infringement and the like are assumed by the user.

Ultra soft twin shield 7800

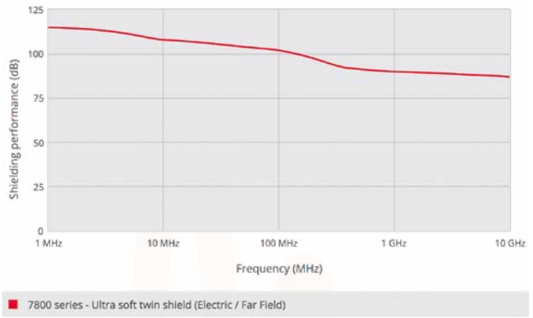
EMI/RFI shielding gasket with low closure force to prevent bending of doors, lids and panels combined with a environmental seal (dust/waterseal)

Ultra soft twin shield 7800 series is a range of HF gaskets similar to our Ultra soft shield 7400, which have been combined with an environmental seal (also known as water seal) made of closed-cell foam rubber. The product requires very low closure force. All gaskets are provided with a self-adhesive strip on the side of the water seal.

The standard material for the water seal is neoprene foam. Alternatively a slowly recovering PVC foam is available, which is fully watertight at 30% compression.

The ultra soft twin shield is easy to bend so that the water seal is not interrupted.

Shielding performance*



Benefits

- Deflection up to 80%
- Very low closure force
- Very high electrical conductivity
- High shielding performance
- Roll lengths of 1 to 1000 meters, depending on width and height of the gasket
- Easy to fit, self-adhesive
- High abrasion resistance
- Tools required: a pair of scissors

Options

- Cut into accurate lengths
- UL94V-0 flame-retardant foam core
- Chemical-resistant rubbers like EPDM
- Silicone sponge for high temperatures up to 220 °C
- Different conductive foils and fabrics

STANDARD DIMENSIONS

Part number	Z (mm)	X (mm)	Y (mm)
7800-3-5-4	3	5	4
7800-3-6-6	3	6	6
7800-3-9-6	3	9	6
7800-4-9-8	4	9	8
7800-4-12-8	4	12	8
7800-4-12-10	4	12	10
7800-5-14-10	5	14	10
7800-5-14-12	5	14	12
7800-5-16-12	5	16	12
7800-6-16-14	6	16	14
7800-6-18-14	6	18	14
7800-6-18-16	6	18	16
7800-10-20-16	10	20	16
7800-10-20-18	10	20	18
7800-10-22-18	10	22	18
7800-14-22-20	14	22	20
7800-14-24-20	14	24	20
7800-14-24-24	14	24	24
7800-18-26-24	18	26	24
7800-18-26-28	18	26	28
7800-18-28-28	18	28	28
7800-22-28-32	22	28	32
7800-22-30-32	22	30	32
Other dimensions on request			

Tape specification

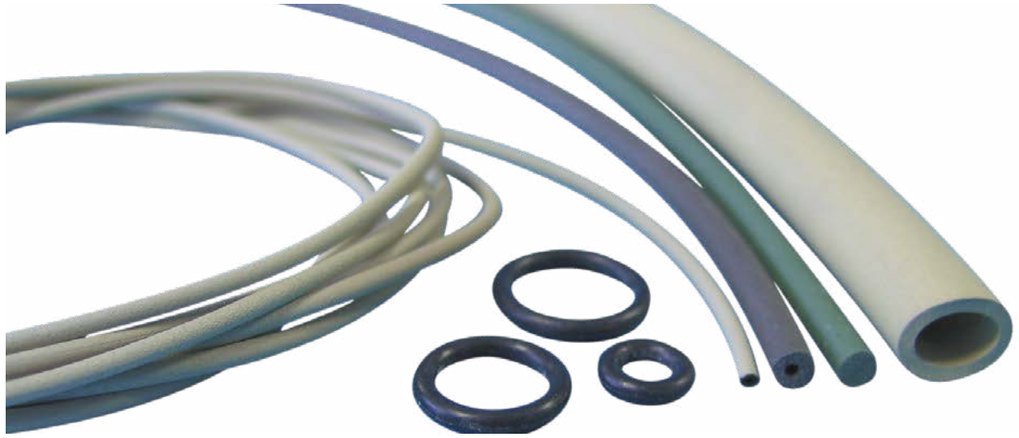
- **01** standard self-adhesive, asymmetrical
- **02** without self-adhesive
- **03** conductive self-adhesive

ORDER EXAMPLE

Series	Width Z (mm)	Width X (mm)	Height Y (mm)	Adhesive	Length (m)
7800					
	Specify width Z in mm. Other sizes on request	Specify width X in mm. Other sizes on request	Specify height Y in mm. Other sizes on request	**01 :** Standard self-adhesive, asymmetrical **02 :** Without self-adhesive	

O-profiles 7900

For EMI shielding applications in grooves

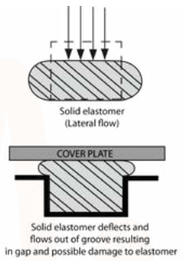


Several types of O-profiles have been developed for different applications, each with its own advantages. O-profiles were originally designed for high-performance shielding, mainly for military applications. They are used when environmental sealing and EMI screening are required, and where there is not much space.

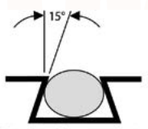
Three kinds of extrusion types are available: **1: hollow**, **2: solid**, **3: Cell Rubber**. These extrusion cores can be covered with metallized fabric foil or they can be made out of conductive rubber. For optimal shielding performance a compression of 5-10% is recommended for solid elastomer's and 10-50% for hollow extrusions and sponge rubbers.

Compression

Solid elastomer's cannot be compressed much. They are easily deformed but the volume does not change as would be the case with sponge elastomer (EPDM, Neoprene) so that allowance for material flow must be considered in the groove design.



The figure below shows a groove design. This is a mechanically retain circular cross-section gaskets by side friction.



Typical circular groove design

Benefits

- Easy to fit into grooves
- Deflection up to 50%
- Low closure force

Options (on request)

- Cut into accurate lengths or endless O-rings
- Drop-out prevention fixtures
- UL94V-0 flame-retardant version
- High temperature-resistant Silicone core (up to 220 °C)
- Fluorosilicone (silver aluminium, silver copper, nickel, nickel graphite) for applications with chemicals

Extrusion types

Special materials (on request)

- Silicone Carbon
- Fluorosilicone Nickel Graphite
- Silicone Nickel Graphite Flame Retardant
- Silicone Silver Aluminium
- Fluorosilicone Silver Aluminium
- Fluorosilicone Nickel
- Silver Plated Nickel
- Silver Glass

technical details

Conductive material	Conductive fabric	Amucor	Graphite	Nickel graphite	Silver aluminium
Operating Temp	-	-	+160	+160	+160
Range (˚C)	-	-	-50	-55	-55
Color	Gray	Silver	Black	Dark Gray	Beige
Shore Hardness (A +/-5)	-	-	60	60	65
Volume Resistivity (ohms)	-	-	2.2	0.04	0.008
Specific Gravity (+/- 0.25)	-	-	2.0	2.0	2.0

» O-profile 7900

Shielding performance

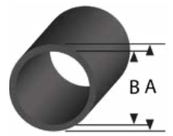
Conductive material	Conductive fabric	Amucor	Graphite	Nickel graphite	Silver aluminium
10 MHz	N/A	N/A	30	115	111
100 MHz	60	65	65	121	120
400 MHz	98	110	60	119	120
1 GHz	94	108	N/A	122	121
2 GHz	91	105	40	122	119
6 GHz	90	102	N/A	115	115
10 GHz	90	100	30	114	112
18 GHz	N/A	N/A	N/A	106	105

Material options

Series	Material	Extrusion types	Cover options	Code (old)
7900NEO	Neoprene	2: Solid 3: Sponge rubber	T: Conductive textile	79-2-1-2 79-3-1-2
7900SIL	Silicone	1: Hollow 2: Solid 3: Sponge rubber	T: Conductive textile	79-1-2-1 79-2-2-1 79-3-2-1
7900EPDM	EPDM	2: Solid 3: Sponge rubber	T: Conductive textile	79-2-4-2 79-3-4-2
7900SPA	Silver plated aluminium rubber	1: Hollow 2: Solid	-	79-1-5-3 79-2-5-3
7900NIG	Nickel/graphite filled rubber	1: Hollow 2: Solid	-	79-1-5-4 79-2-5-4
7900GRA	Graphite filled rubber	1: Hollow 2: Solid	-	79-1-5-5 79-2-5-5

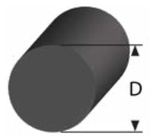
Standard extrusions

Type 1: Hollow



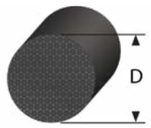
Hollow		
Size	Outside A (mm)	Inside B (mm)
0.9 X 0.3	0.9	0.3
1.2 X 0.5	1.2	0.5
1.6 X 0.5	1.6	0.5
1.8 X 0.5	1.8	0.5
1.9 X 0.7	1.9	0.7
2.0 X 0.5	2.0	0.5
2.0 X 0.8	2.0	0.8
2.4 X 0.8	2.4	0.8
2.4 X 1.0	2.4	1.0
2.6 X 1.5	2.6	1.5
3.0 X 0.5	3.0	0.5
3.0 X 0.8	3.0	0.8
3.0 X 1.0	3.0	1.0
3.0 X 1.6	3.0	1.6
3.2 X 0.8	3.2	0.8
3.2 X 1.1	3.2	1.1
3.2 X 1.5	3.2	1.5
3.5 X 0.8	3.5	0.8
3.5 X 1.6	3.5	1.6
3.6 X 1.5	3.6	1.5
4.0 X 1.1	4.0	1.1
4.0 X 1.3	4.0	1.3
4.0 X 1.6	4.0	1.6
4.0 X 2.0	4.0	2.0
4.1 X 2.0	4.1	2.0
4.5 X 1.6	4.5	1.6
4.8 X 2.4	4.8	2.4
5.0 X 1.6	5.0	1.6
5.0 X 3.0	5.0	3.0
5.5 X 1.6	5.5	1.6
5.5 X 3.2	5.5	3.2
6.0 X 1.6	6.0	1.6
6.0 X 3.2	6.0	3.2
6.0 X 4.0	6.0	4.0
6.4 X 1.6	6.4	1.6
6.4 X 3.2	6.4	3.2
8.0 X 5.0	8.0	5.0
8.0 X 6.0	8.0	6.0
9.0 X 6.4	9.0	6.4
9.5 X 6.4	9.5	6.4
10.0 X 7.0	10.0	7.0
10.0 X 8.0	10.0	8.0
12.0 X 8.0	12.0	8.0
15.0 X 12.0	15.0	12.0
16.0 X 12.0	16.0	12.0
20.0 X 16.0	20.0	16.0

Type 2: Solid



Solid	
Size	Diameter (mm)
1.0	1.0
1.2	1.2
1.4	1.4
1.6	1.6
1.8	1.8
2.0	2.0
2.4	2.4
2.6	2.6
2.8	2.8
3.0	3.0
3.2	3.2
3.5	3.5
4.0	4.0
4.5	4.5
4.8	4.8
5.0	5.0
5.4	5.4
5.5	5.5
6.0	6.0
6.4	6.4
7.0	7.0
7.5	7.5
8.0	8.0
8.5	8.5
9.0	9.0
9.5	9.5
10.0	10.0
11.0	11.0
12.0	12.0
15.0	15.0
18.0	18.0
20.0	20.0

Type 3: Cell rubber



Cell Rubber	
Size	Diameter (mm)
2.1	2.1
3.0	3.0
3.5	3.5
4.0	4.0
4.5	4.5
5.0	5.0
5.5	5.5
6.0	6.0
6.5	6.5
7.0	7.0
7.5	7.5
8.0	8.0
9.0	9.0
9.5	9.5
10.0	10.0
11.0	11.0
12.0	12.0
15.0	15.0
18.0	18.0
20.0	20.0
22.0	22.0
25.0	25.0

Conductive O-rings 7910

For EMI shielding applications in grooves. Also suitable where IP seal is required.

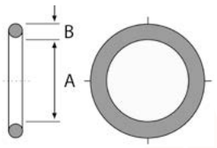
The 7910 series Jointed O-ring are practically the same as the 7900 series O-Profiles, however, this is a turnkey closed O-ring. They are used where environmental and EMI screening is required but were little space is available.

These cores can be covered with metallized fabric foils or made out of conductive rubber. For optimal shielding performance a compression of 5-10% is recommended for solid elastomers and 10-50% for hollow extrusions and cell rubbers.

Material options

Type	Code	Core	Cover
7910-X-X-11	11	Neoprene	Amucor foil
7910-X-X-12	12	Neoprene	Conductive fabric
7910-X-X-21	21	Silicone	Amucor foil
7910-X-X-22	22	Silicone	Conductive fabric
7910-X-X-41	41	EPDM	Amucor foil
7910-X-X-42	42	EPDM	Conductive fabric
7910-X-X-53	53	Silvered particles filled silicone rubber	No cover possible
7910-X-X-54	54	Nickel filled silicone rubber	No cover possible
7910-X-X-55	55	Graphite filled silicone	No cover possible

Standard dimensions



Part number	A(mm)	B(mm)
7910-6.6-1.8	6.6	1.8
7910-7.5-1.2	7.5	1.2
7910-9.2-1.8	9.2	1.8
7910-10.5-1.4	10.5	1.4
7910-11.3-1.3	11.3	1.3
7910-12.4-1.8	12.5	1.8
7910-12.7-2.5	12.7	2.5
7910-14.0-1.8	14.0	1.8
7910-16.1-1.6	16.1	1.6
7910-17.2-1.8	17.2	1.8
7910-18.8-1.8	18.8	1.8
7910-19.2-2.5	19.2	2.5

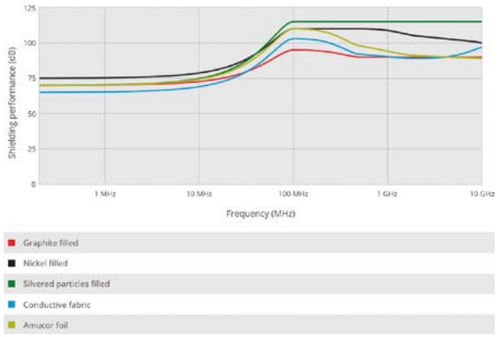
Part number	A (mm)	B (mm)
7910-20.3-1.8	20.3	1.8
7910-21.9-1.8	21.9	1.8
7910-23.4-3.5	23.4	3.5
7910-25.1-1.8	25.1	1.8
7910-25.4-6.4	25.4	6.4
7910-28.3-1.8	28.3	1.8
7910-31.5-1.8	31.5	1.8
7910-34.6-2.6	34.6	2.6
7910-34.7-1.8	34.7	1.8
7910-37.8-2.6	37.8	2.6
7910-40.9-2.6	40.9	2.6
7910-44.1-2.6	44.1	2.6

Technical details

Conductive material	Conductive fabric	Amucor	Graphite	Nickel graphite	Silver aluminium
Operating Temp	-	-	+160	+160	+160
Range (˚C)	-	-	-50	-55	-55
Color	Gray	Silver	Black	Dark Gray	Beige
Shore Hardness (A +/-5) ASTM D2240	-	-	60	60	65
Volume Resistivity (ohms) ASTM D991	-	-	2.2	0.04	0.008
Specific Gravity (+/- 0.25)	-	-	2.0	2.0	2.0

These values are measured under laboratory conditions. In other situations, results may differ. Please read our Guarantee.

Shielding performance*



ORDER EXAMPLE

Series	Dimension A (mm)	Dimension B (mm)
7910	Specify the dimensions from the table.	Specify diameter in mm

Core + cover

- **11 :** Neoprene + Amucor foil
- **12 :** Neoprene + Conductive fabric
- **21 :** Silicone + Amucor foil
- **22 :** Silicone + Conductive fabric
- **41 :** EPDM + Amucor foil
- **42 :** EPDM + Conductive fabric
- **53 :** Silvered particles filled silicone rubber (no cover)
- **54 :** Nickel filled silicone rubber (no cover)
- **55 :** Graphite filled silicone (no cover)

Ultra soft conductive rubber 5200

Very soft conductive Rubber for medical, military and automotive industries, where less closure force is required

Standard electrically conductive rubbers are generally not soft enough. As a result, a lot of tension is placed on the seal when tightening the housing or the lid.

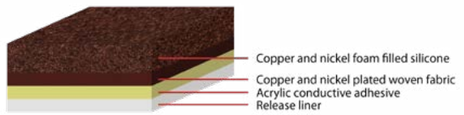
For applications where no extreme force is allowed, we have developed ultra-soft conductive rubber.

The material is used in medical, military and automotive industries and even in commercial products requiring EMI suppression, grounding, or static discharge. It is very suitable for applications where an environmental or watertight seal is required and less closure force is required.

The 5200 ultra soft conductive rubber can be ordered in different thicknesses. We apply several layers of the rubber to get the right thickness.

Standard thickness of the 5200 are **1.0**, **1.5**, **2.0**, **2.2**, **3.0**, **3.5** and **5.0**mm.

Product build-up



ORDER EXAMPLE

Series	Thickness (mm)	Width (mm)	Length (mm)	Adhesive
5200	**1 :** 1mm thick **1.5 :** 1.5mm thick **2 :** 2mm thick **2.2 :** 2.2mm thick **3.0 :** 3.0mm thick **3.5 :** 3.5mm thick **5 :** 5mm thick	Specify the width in mm. Max. 970 mm	Specify the length in mm. Max. 1800 mm. Other length on request	**S :** Standard conductive adhesive **N :** No adhesive adhesive

Specifications

- Shore: A 20
- Color: dark red
- Surface resistance: 3.7 Ω/sq
- Temperatures up to 220 °C
- High shielding performance
- Water sealing up to 10 meters
- Pressure resistant
- Salt spray/chemical resistant
- Supplied as sheets, strips or die-cuts
- Max compression rate 20%

Applications

- Conductive seal for medical or military devices
- Pressure sensitive sensors
- Watertight seal between housing and lid with less closure force
-

Custom shape/size

Ultra soft conductive rubber can be cut very precise according your CAD drawing. To make an quotation, we ask you to send a drawing with the desired specifications to info@hollandshielding.com or use the form below to submit your drawing.

Conductive washer & cylinder 5500

Electrically conductive washers & cylinders made from conductive foam and conductive rubber materials to seal the opening between the housing and the bolt holes.

Our Conductive Washers & Disks are precision-cut components designed to provide reliable EMI/RFI shielding and electrical grounding around screws, bolts, connectors, and enclosure interfaces.

Manufactured from electrically conductive materials, these washers and disks ensure optimal electrical contact while maintaining excellent mechanical sealing performance. They are widely used in electronics, telecommunications, medical devices, industrial equipment, and defense applications.

Available material & thickness

We manufacture conductive washers and disks from the following materials:

- **Electrically Conductive Foam** (is especially recommended when lightweight solutions and easy installation are required.)
- **Silver-Plated Aluminium Conductive Rubber** (This material is ideal when long-term stability and reliable grounding performance are required.)
- **Carbon-Filled Conductive Rubber** (is widely used in industrial electronics and general shielding applications.)
- **Nickel / Graphite Filled Conductive Rubber** (This material is commonly used in high-reliability electronic and military applications.)

Available material & thickness

Material	Thickness (mm)
Conductive foam (FOAM)	0.3, 0.5, 0.7, 1.0, 1.5, 2.0, 2.2, 3.0, 3.5, 5.0 (Tolerance of ± 0.1 mm)
Silver plated aluminium conductive rubber (SPA)	0.3, 0.5, 1.0, 1.2, 1.5, 1.7, 2.0, 2.5, 3.0 (Tolerance Up to 3.0 mm +/- 0.15 mm)
Carbon filled conductive rubber (GRA)	1.0, 2.0, 3.0, 4.0, 5.0, 10.0
Nickel/graphite filled conductive rubber (NIG)	0.3, 0.5, 1.0, 1.2, 1.5, 1.7, 2.0, 2.5 (Tolerance Up to 3.0 mm +/- 0.15 mm)

Benefits

- High EMI/EMP shielding effectiveness
- Any size in a few days
- Custom parts
- High temperature up to 220 °C
- Easy to mount
- Water tight constructions

Options

- Custom outer and inner diameters
- Various thicknesses available
- Die-cut according to drawing
- Self-adhesive backing optional
- Supplied as washers, solid disks, strips, or custom shapes

Applications

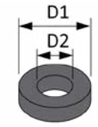
- EMI/RFI shielding of screw connections
- Grounding of panels and enclosures
- Shielding around connectors and cable entries
- PCB grounding points
- Static discharge control
- Industrial, telecom, aerospace, and defense systems

» Conductive Washer & cylinder 5500

5500-C Cylinder

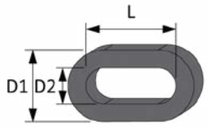
D1 (mm)	
2	16
3	18
4	20
5	22
6	24
8	26
10	28
12	30
14	32
Other dimensions on request. MOQ 10 pieces	

5500-R Washer/Ring



D1 x D2	
5 x 2	32 x 16
7 x 3	36 x 18
9 x 4	40 x 20
10 x 5	44 x 22
12 x 6	48 x 24
16 x 8	52 x 26
20 x 10	56 x 28
24 x 12	60 x 30
28 x 14	64 x 32
Other dimensions on request. MOQ 10 pieces	

5500-OR Oval-ring



D1	D2	L
5	2	10-15-20-25-30-35
7	3	15-20-25-30-35-40
9	4	20-25-30-35-40-45
Other dimensions on request. Packed in bags of 10 pieces		

ORDER EXAMPLE

Series: 5500

Shape:
- **C :** Cilinder
- **R :** Washer/Ring
- **OR :** oval-ring

Material:
- **FOAM :** Conductive foam
- **SPA :** Silver plated aluminium conductive rubber
- **GRA :** Carbon filled conductive rubber
- **NIG :** Nickel graphite filled silicone conductive rubber

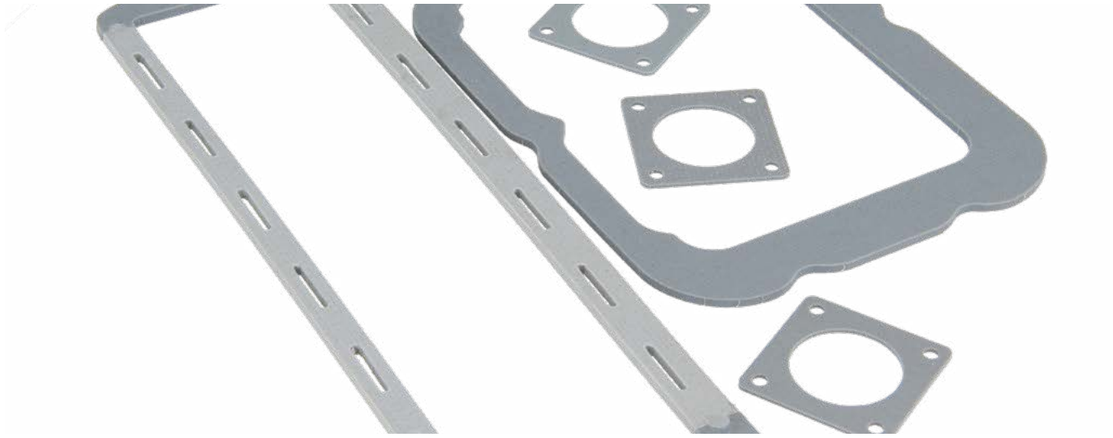
D1 – **D2** – **L**

Thickness (mm): Please choose a thickness from the table

Adhesive:
- **01 :** Standard self-adhesive
- **02 :** Without self-adhesive
- **03 :** With conductive adhesive

Oriented wire shield 5711 - 5722

Silicone sheet material with oriented wires for EMI shielding and IP sealing. Can be cut into complicated shapes by CNC knife cutting, laser cutting and/or water jet cutting, or die-cut



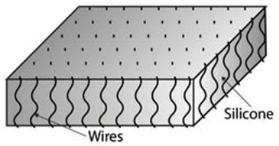
Oriented wire shield 5711- 5722 is a composite gasket material consisting of a large number of small wires embedded and bonded in solid or sponge silicone, or fluorosilicone elastomer for oil resistance.

The wires provide excellent conductivity to establish EMI / RFI shielding.

The material is used in military, industrial and commercial products requiring EMI suppression, grounding, or static discharge. It is very suitable for applications where an environmental or pressure seal is required.

The sponge version is used in cases where the severe joint is uneven, or if lower closure forces or greater compressibility are required.

Technical drawing



Part numbers

Material	Part number
Solid silicone with monel wire	5711
Solid silicone with aluminium wire	5712
Solid fluorosilicone with monel wire	5713
Sponge silicone with monel wire	5721
Sponge silicone with aluminium wire	5722

Dimensions

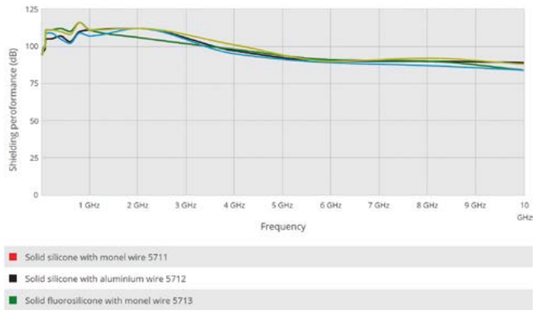
We produce sheets of max. 228 x 900 mm, from which we can then cut gaskets without interruptions. Bigger gaskets can be welded/joined together in order to prevent waste of material.

Custom compositions are available on request, simply by sending a drawing with the desired dimensions to our email address info@hollandshielding.com.

Benefits

- Temperatures up to 220 °C
- High shielding performance
- Water sealing up to 10 meters
- Pressure resistant
- Salt spray / chemical resistant
- Fluorosilicone rubber for fuel/oil resistance
- Supplied as sheets, strips or die-cuts

Shielding performance* (dB)



Technical specifications

Material	Solid silicone with monel wire	Solid silicone with aluminium	Solid fluorosilicone with monel wire	Sponge silicone with monel wire	Sponge silicone with aluminium wire
Part number	5711	5712	5713	5721	5722
Color	Gray	Gray	Blue	Gray	Gray
Wire count/ sq. inch	900 +/- 15%	900 +/- 15%	900 +/- 15%	600 +/- 15%	600 +/- 15%
Elastomer Type	Silicone	Silicone	Fluorosilicone	Silicone Sponge	Silicone Sponge
Wire Type	Monel	Aluminium	Monel	Monel	Aluminium
Elastomer Specification	ZZ-R-765 2b	ZZ-R-765 2b	Mil-R-25988 G 50	AMS 3195	AMS 3195
Closing force (psi)	25-100	25-100	25-100	15-75	15-75
Fuel/solvent resistant	No	No	Yes	No	No
Temperature (°C)	-65°C to 200°C	-65°C to 200°C	-65°C to 200°C	-65°C to 200°C	-65°C to 200°C
Wire Diameter	0.114mm Ø	0.127mm Ø	0.114mm Ø	0.114mm Ø	0.127mm Ø
Specification	BS 3075 NA13 QQ-N-281-B	BS EN 537 pt3 Alloy 5056	BS 3075 NA13 QQ-N-281-B	BS 3075 NA13 QQ-N-281-B	BS EN 537 pt3 Alloy 5056

Technical specifications

Elastomer	Silicone or fluorosilicone
Conductive filler	Monel wire, aluminium wire
ROHS compliance	Yes
Corrosion resistance	Yes
UV resistance	Yes
Oil resistance	Fluorosilicone type only
Fuel resistance	Fluorosilicone type only
IP rating	Yes
Shore A	35-40

Conductive adhesive (conductive PSA)

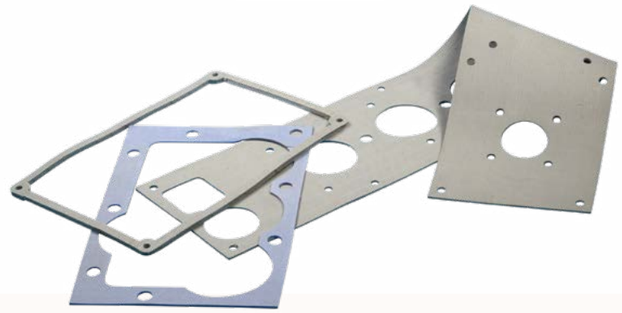
Property	Unit	Outcome	Test method
Surface resistance	Ω/sq	<0.10	MIL-DTL-83528C
Adhesive strength	G/25mm	850	ASTM D 3330
Conductive PSA	-	Acrylic + Ni	-
Liner	-	Paper, film	

Available thicknesses

0.81, 1.13, 1.38, 1.57, **2.40**, **3.18**, 3.96, 4.78, 6.35mm. Other thicknesses on request. Tolerance +- 0.25 mm.

ORDER EXAMPLE

Part number		Width (mm)		Length (mm)		Thickness
	-		-		-	
5711 : Solid silicone with Monel wires **5712 :** Solid silicone with aluminium wires **5713 :** Solid fluoro-silicone with Monel wires **5721 :** Sponge silicone with Monel wires **5722 :** Sponge silicone with aluminium wires		Specify the desired width in mm		Specify the desired length in mm		**0.81 :** 0.81mm thick **1.13 :** 1.13mm thick **1.38 :** 1.38mm thick **1.57 :** 1.57mm thick **2.40 :** 2.40mm thick **3.18 :** 3.18mm thick **3.96 :** 3.96mm thick **4.78 :** 4.78mm thick **6.35 :** 6.35mm thick



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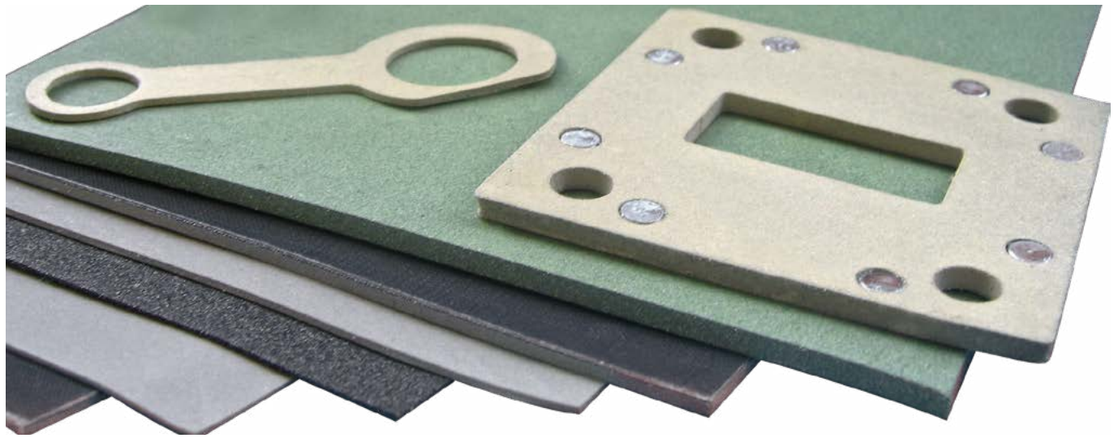
Conductive rubber sheets

In EMI shielding, this rubber in particular is used as a medium to provide electrical conductivity across a gasket-flange interface



The rubber is made conductive by incorporating small conductive metal particles throughout the material. It can provide an EMI-proof and watertight seal in narrow constructions.

Electrically conductive rubbers are typically used for EMI applications. But they are also useful for EMP protection, wave-guide applications and against static electricity. The rubber can be filled with silver, nickel, silvered glass, silvered aluminium, or graphite (only for ESD). Commercial EMI applications often choose **Nickel-graphite conductive rubber (Part number 5760)** or **Graphite conductive rubber (Part number 5755)** from a costs point of view, while military and aerospace applications often call for **Silver Aluminium Silicone Conductive Rubber (Part number 5750)** to meet Mil-G-83528C specifications. In military or aerospace, fluorosilicone versions may also be used due to their chemical and fuel resistance.

As the material shields high frequencies, electrically conductive rubber shows a shielding effect of 60 dB at 30MHz ~ 10GHz. Due to its excellent conductivity, grounding, and EMI shielding effect, it is well suited for military communications equipment. The rubber can be manufactured in various shapes such as sheets, molded parts, die-cut, strips, o-rings, etc.

Conductive adhesive information (Conductive PSA)

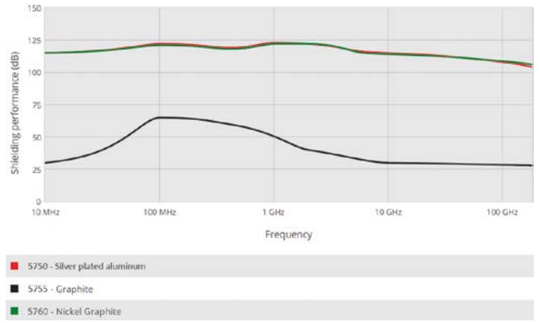
Property	Unit	Outcome	Test method
Surface resistance	Ω/sq	<0.10	MIL-DTL-83528C
Adhesive strength	G/25mm	850	ASTM D 3330
Conductive PSA	-	Acrylic + Ni	-
Liner	-	Paper, Film	-

* Please note: Conductive adhesive is **optional**. By default, these Conductive rubber gaskets are supplied without adhesive.

Benefits

- Excellent conductivity on the entire surface
- Excellent electromagnetic shielding effect
- Easy die-cutting, kiss-cutting and slitting
- Temperature ranges of-60 to +185°C (under certain circumstances, tolerance can be up to 220°C)

Shielding performance*



Technical details

Part number	5750S Silver plated aluminium	5755S Graphite	5760S Nickel Graphite
Filler	Ag/Al	Graphite	Ni-graphite
Base polymer	Silicone	Silicone	Silicone
Width (mm)	610 x 660	**430 x 430**	610 x 660
Elongation, %, min.	90	50	50
Volume resistance, Ohm-cm (expression of conductivity)	0.008	1.8	0.05
Operating temp.	+125	+160	+160
Range (°C)	-55	-50	-55
Color	Dark tan	Black	Dark gray
Volume Resistivity (ohms) ASTM D991	0.005	2.2	0.04
Specific Gravity (+/- 0.25)	3.5	2.0	2.0

Available sheet thicknesses

Ag/Al Silicone conductive rubber (silver plated aluminium) 5750S	
Thickness (mm)	0.3, 0.5, 1.0, 1.2, 1.5, 1.7, 2.0, 2.5, 3.0

Graphite conductive rubber (black) 5755S	
Thickness (mm)	1, 2, 3, 4, 5, 10 mm

Ni-Graphite conductive rubber (dark gray) 5760S	
Thickness (mm)	0.3, 0.5, 1.0, 1.2, 1.5, 1.7, 2.0, 2.5, 3.0

What questions need to be answered to select the right material?

- What is the approximate shielding effectiveness you need to achieve for your application?
- What environment will this material be exposed to? Does the rubber need to be solvent or fuel resistant (fluorosilicone)?
- Are you looking for a semi-conductive/static dissipating material or is this a true EMI/RFI shielding application?

How does the conductive filler material in the rubber compare to costs and performance?

Part number	Conductive filler	Cost	Conductivity	Typical shielding effectiveness*
5750S	Silver plated aluminium	$$$	Extremely conductive	120 dB
5760S	Ni-graphite	$$	Super conductive	100 dB
5755S	Graphite	$	Very conductive	70 dB

Special materials (on request)

These Conductive Rubber Sheets are also available in special materials for special applications for example applications with chemicals. Below is a list of special materials. For availability and delivery please contact us.

- Silicone Carbon
- Fluorosilicone Nickel Graphite
- Silicone Nickel Graphite Flame Retardant
- Silicone Silver Aluminium
- Fluorosilicone Silver Aluminium
- Fluorosilicone Nickel
- Silver Plated Nickel
- Silvered Glass
- EPDM (thickness 1 mm)
- Silver copper silicone conductive rubber
- Compatible with MIL-DTL-83528-B

Electrically conductive rubber is available as

- Sheets
- Molded parts
- Die-cut or flash cut
- Strip/Profile

ORDER EXAMPLE

Part number		Thickness		Width (mm)		Length (mm)		Tape code
5750S : Silver plated aluminium **5755S :** Graphite **5760S :** Ni-graphite	-	Check "Available sheet thicknesses" table above for more information	-	Specify the width of the Conductive rubber sheet in mm	-	Specify the length of the Conductive rubber sheet in mm	-	**02 :** Without self-adhesive **03 :** with conductive self-adhesive

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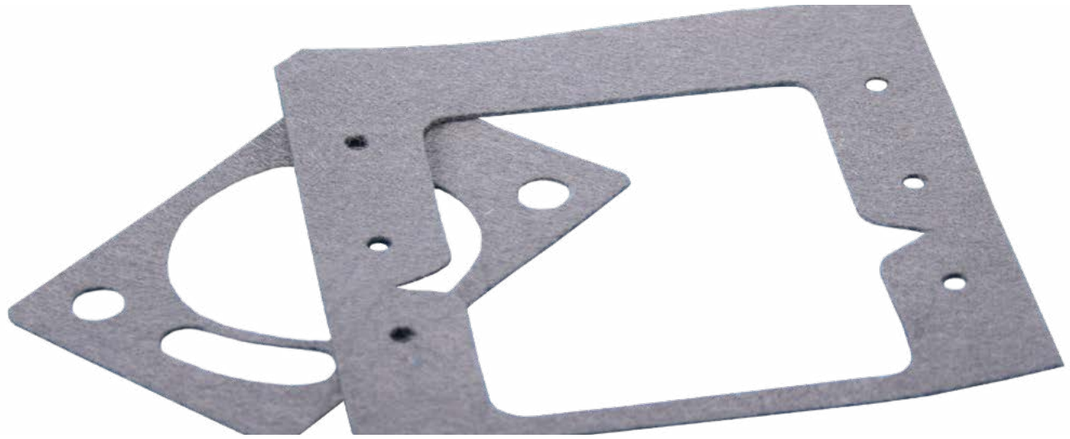
Electrically conductive felt 5730

Felt, metalized with pure nickel



We would like to present our 5730 conductive felt for EMI shielding. A special electrically conductive coating is applied to our felt products to make them conductive. This material is widely used in various industries for EMI shielding applications. Conductive felt is a non-woven polyester fabric with an electrically conductive nickel coating. The thickness is 1.5mm.

Features

- Maximum width 450mm
- Nickel coating: 35 - 40 g/m^2

Options

- With or without conductive adhesive
- CNC cut according to your drawing

Specifications

Part number	5730
Tensile strength (Length of roll)	>=230 N/5cm
Tensile strength (across)	>=340 N/5cm
Fabric weight	150 g/m2
Thickness	1.5mm
Max. elongation	>=55%
Flame resistance	UL 94 HB

Shielding performance*

Magnetic field H 3 MHz - 30 MHz		Electric field E 1 MHz - 30 MHz		Electric field E 100 MHz - 700 MHz		Plane wave 0.8 GHz - 18 GHz	
3 MHZ	15 dB	1 MHZ	100 dB	100 MHZ	52 dB	0.8 GHz	67 dB
10'MHZ	25 dB	5 MHZ	75 dB	150 MHZ	50 dB	0.9 GHz	70 dB
15 MHZ	28 dB	10 MHZ	62 dB	400 MHZ	62 dB	1.0 GHz	70 dB
20 MHZ	32 dB	20 MHZ	60 dB	500 MHZ	65 dB	10.0 GHz	90 dB
30 MHZ	35 dB	30 MHZ	56 dB	700 MHZ	70 dB	18.0 GHz	70 dB

These values are measured under laboratory conditions. In other situations, results may differ; please read our Guarantee.

ORDER EXAMPLE

Series	Width (mm)	Length (mm)
5730		
	Specify the width in mm. Maximum width of 450mm	Specify the length in mm.

Conductive elastomer 5751

A 65 durometer (Shore A), electrically-conductive fluorosilicone

Conductive fluorosilicone elastomer is a 65 durometer (Shore A), electrically-conductive fluorosilicone compound that is filled with silver-plated aluminium particles and comparable for conductive elastomer gaskets.

MIL-DTL-83528 Type D

Conductive fluorosilicone elastomer is designed to meet the requirements of MIL-DTL-83528 Type D for a silver-plated, aluminium filled fluorosilicone capable of 90 dB of plane wave shielding effectiveness at 10 GHz, with a continuous use temperature range of-55 °C to +160 °C, and resistant to solvents and jet fuels.

Technical specifications

The data below was generated using ASTM test method and procedures. 5751- Conductive fluorosilicone elastomer was designed to meet the requirements outlined in the MIL-G-83528C specifications.

Shore A	65
Tensile psi (150 minimum)	185 psi
Elongation % (300 minimum)	350%
Compression Set % (30 max.)	21% (70 hours at 100 °C)
Tear "B" ppi (report)	
Specific Gravity (1.75 – 2.25)	2.08
Volume Resistivity ohm / cm (0.004 max.)	.002 ohm /cm
Color	Tan
Thermal Stability Range	-60 °C- 220 °C
Thermal Conductivity	-

ORDER EXAMPLE

Part number	Width (mm)	Length (mm)
5751		
5751 : Conductive fluorosilicone elastomer	Specify the width of the sheet in mm	Specify the width of the sheet in mm

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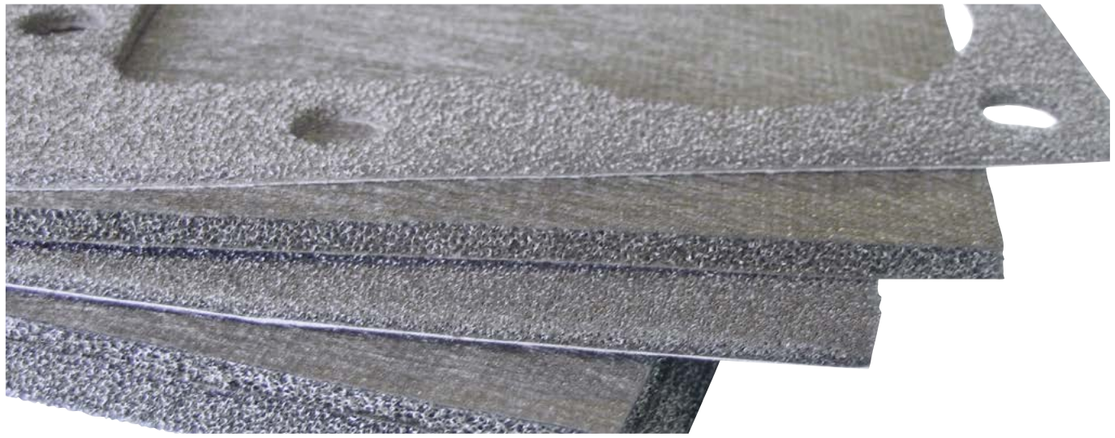
Electrically conductive foam 5770

Foam structure with foam as its central layer, suitable for EMI shielding and absorbing gaskets



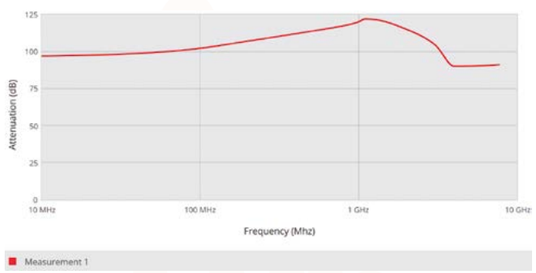
Conductive foam offers an innovative approach to traditional shielding and grounding by providing X, Y, and Z-axis conductivity, which enhances the shielding effectiveness required to meet the increasing microprocessor speeds of today's computer, telecommunications, and aerospace equipment.

This conductive foam is made of polyurethane foam plated with copper and nickel. Compression is 25% to 75%. The temperature range is between-10 and 85 °C

The material will return close to normal height when released. The foam is coated with conductive polyurethane to protect it from environmental influences and to prevent burrs when cutting.

Conductive Foam is designed for low-cycling applications such as input/output (I/O) shielding and other non-shear standard connectors. Rectangular strips are available for perimeter gasketing applications.

Shielding performance*



Characteristics

- Thicknesses of 0.5, 0.7, 1.0, 1.5, 2.0, 2.2, 3.0, 3.5 and 5.0 mm in 950 mm roll width
- Thicknesses of 0.3 mm in 300 mm roll width
- Several layers can be joined together for thickness, on request
- Excellent electric conductivity throughout the material
- Excellent electromagnetic shielding effect
- High workability due to adhesion
- Easy die cutting, kiss cutting and slitting

Applications

- Mobile phone
- Noise filter core
- Cable tray
- Shielded rooms

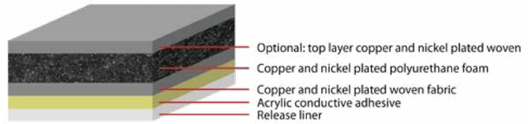
Material specifications

- Mesh: woven polyester, copper and nickel coated
- Conductive foam: polyurethane foam (copper and nickel coated)
- PSA: acrylic ester polyol copolymer + nickel powder
- PU coating: polymer resin (polyurethane)
- Release liner: CP paper avg 150 µm

Benefits and options

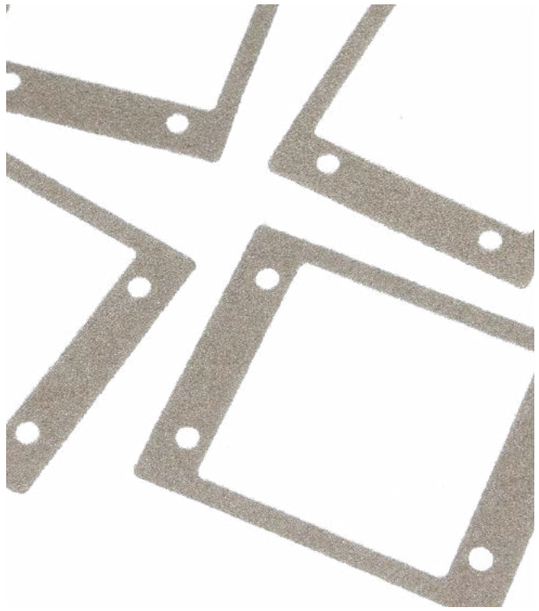
- Supplied as sheets, strips or die-cuts
- Reinforced with woven fabric on 1 or 2 sides
- Nickel/copper metalization
- X-Y-Z axis conductivity
- Tolerance of ± 0.1 mm
- I/O static applications/gasket replacement

Product build-up



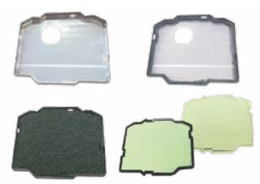
Technical data

Item	Data
Thickness (mm) (other sizes on request)	0.3 mm in 300 mm roll width 0.5, 0.7, 1.0, 1.5, 2.0, 2.2, 3.0, 3.5 and 5.0 mm in 950 mm roll width
Color	Gray
Width	Max. 950 mm
Length	Depending on thickness material 50 meters max.
Adhesive strength (gf/25mm)	1.000
Surface resistance (Ω/sq)	0.2
Top-bottom resistance (Ω/in²)	0.2
RoHS	Compliant
Temperature range °C	-10 to 85
Shelf life	6 months

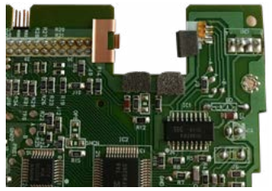


ORDER EXAMPLE

Series	Width (mm)	Length (mm)	Thickness (mm)	Adhesive	Top layer
5770	Specify the width of the sheet in mm	Specify the width of the sheet in mm	0.3 (300 max.) 0.5, 0.7, 1.0, 1.5, 2.0, 2.2, 3.0, 3.5 and 5.0 (950 max.)	**01:** Standard adhesive (non-conductive) **02 :** Without self-adhesive **03 :** With conductive self-adhesive	**S :** Standard PU-foam top layer **T :** Top layer Copper and nickel plated woven



Product example of 5770 Conductive foam in use



Product example of 5770 Conductive foam in use

Conductive foam kiss cut according to customer's requirements

We can cut several layers of conductive foam to create cavities

Stretch conductive fabric 4900

Stretch conductive fabric is coated with a medical-grade silver coating and can be stretched in both directions

This conductive fabric is coated with a medical-grade silver coating and has a broad range of applications, since it can be stretched in both directions - lengthwise even up to 100% of its original dimension! The fabric can be used as an anti-bacterial wound or burn dressing (note: the material is not supplied sterile) but it is also a great material for electrode contacts, clothing, or other shielded garments. Not only is the material highly conductive, but the conductivity increases up to 25% as it stretches, which is convenient for smart textile applications. The silver coating is 99,9% pure.

Advantages

- The width of the fabric affects the percentage of conductivity
- The material is very consistent in quality
- When the material is stretched lengthwise, its conductivity increases; when you stretch it crosswise, conductivity decreases
- Crosswise the fabric can be stretched by around 60%, and lengthwise by almost 100%

Applications

- “Intelligent” or shielding garments
- Cable shielding wrap
- Technology where a change in conductivity with stretch is important

Specifications

Property	Test value
Thickness	0.40mm
Standard width	135 cm (52 inch)
Temperature range	-30 to 90°C
Lengthwise stretch	~100% x length
Crosswise stretch	~60% x width
Surface resistivity	< 0.5 Ohm/sq. (unstretched)
Weight	4.3 oz/yd²

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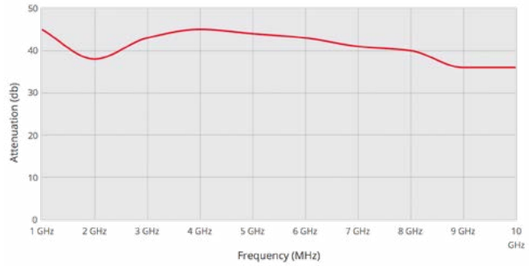
Attenuation



ORDER EXAMPLE

Series	Width (mm)	Length (mm)
4900	Specify the width in mm	Specify the length in mm

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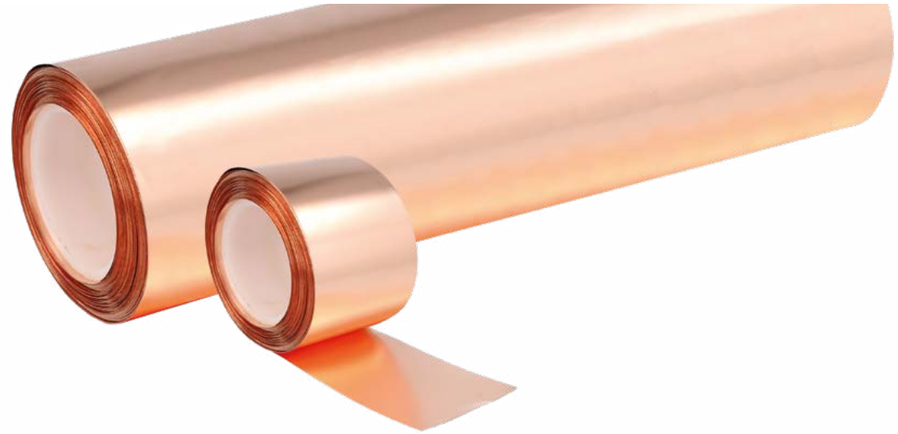
Mu-copper tape 3200

A large series of electrically conductive tapes for EMI/RFI shielding, ideal for grounding, conductance and EMI/RFI shielding of housings/Faraday cages



Many EMI problems can be solved easily with Mu-copper foil or tape. Mu-copper tape is available with or without (conductive) self-adhesive and an optional insulation layer. Mu-copper tape can be cut to any width starting at 3mm and can be delivered from stock. The most commonly used width is 25mm; standard roll length is 16.5 meters.

When large surfaces are to be shielded, it is recommended to cover most of the surface with Mu-copper foil, possibly in combination with tape with a conductive self-adhesive. This solution is much cheaper than covering the entire surface with tape strips.

Mu-copper tape can also be delivered as die-cut, according to your drawing, on strips or in pieces (as stickers), with optional self-adhesive. Almost every shape and size is possible.

Applications

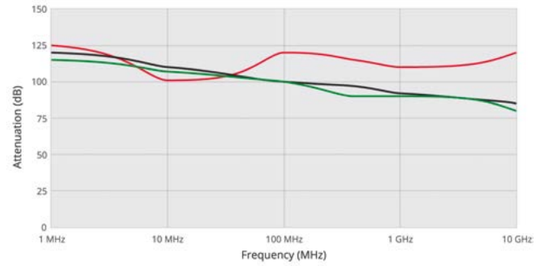
- EMI shielding of plastic enclosure parts
- EMI shielding tape/gasket
- Shielding of all non-conductive materials
- Ground plane
- Anti-static floors (ESD floors)
- Electrical connection between surfaces
- Shielding in housings and Faraday cages
- Temporary shielding during tests
- Mounting transparent foils and windows for EMI/RFI shielding
- Cable shielding (tape wrapped around cable)
- Temporary shielding during emissions and immunity tests

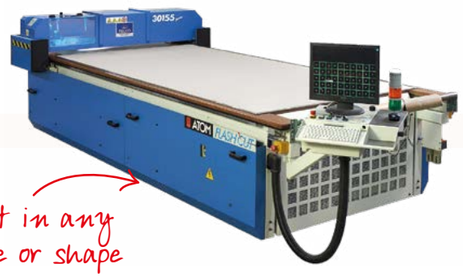
Shielding effectiveness

There are many factors that influence the actual effectiveness of an EMI/RFI shielding tape after it has been applied, such as the type and thickness of foil, type of adhesive, closeness of contact, smoothness of application surface, strength and frequency of the EMI/RFI signal, etc. Still, attenuation values can be determined using standard tests and fixtures.

For EMI/RFI shielding tape, typical shielding effectiveness (far field) is in the range of 60dB to 80dB (10 kHz to 20 GHz). For more specifications see table and graph below.

3200 - Mu-copper tape vs other tapes





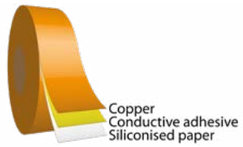
» Mu-copper tape 3200

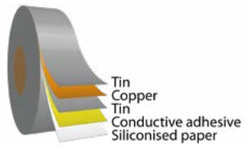
Technical specification and Part numbers

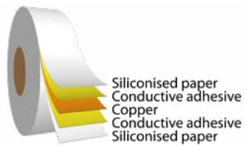
Part number (with conductive adhesive)	3201 (0.035 mm thick), 3212 (0.12 mm thick), 3218 (0.18 mm thick)	3202	3206	3207
Part number (with standard adhesive)	3301	3302	-	-
Foil material	Soft copper	Soft copper	Soft copper	soft copper with paper
Surface	Shiny	Tinned	-	Bright
Foil thickness	0.035 mm	0.035 mm	0.035 mm	0.035 mm
Total thickness	0.060 mm	0.060 mm	0.085 mm	0.060 mm
Adhesive	Synthetic conductive resin	Synthetic conductive resin	Synthetic conductive resin	Synthetic conductive resin
Adhesive performance	4.5 N/cm	4.5 N/cm	4.5 N/cm	4.5 N/cm
Tensile strength	55 N/cm	40 N/cm	55 N/cm	55 N/cm
Temperature resistance	155 °C	155 °C	155 °C	-
El. resistance through adhesive	0.003 Ohms	0.003 Ohms	0.003 Ohms	0.003 Ohms
Roll length	Min. 16.5m (standard)			
Standard roll width (mm)	10, 25, 50, 100			

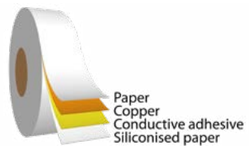
These values are measured under laboratory conditions. Results may differ in other situations. Please read our Guarantee. Other roll length & widths on request

Mu-copper tape with conductive adhesive



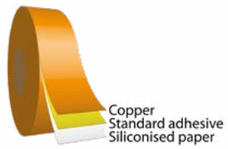


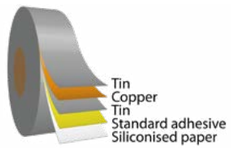




3201 (0.035 mm thick), 3212 (0.12 mm thick), 3218 (0.18 mm thick)	3202	3206	3207
A flexible metal foil with a highly conductive self-adhesive on one side, with a release liner	Similar to Tape 3201, but with a layer of tin added for protection against corrosion and better solderability. with a highly conductive self-adhesive on one side, with a release liner	A flexible metal foil, laminated on 2 sides with a conductive self-adhesive; available in sheets and rolls.	Similar to Tape 3201, but with a paper layer added to insulate the top layer of copper.

Mu-copper tape with standard adhesive





3301	3302	-	-
A flexible metal foil with a highly standard self-adhesive on one side, with a release liner	Similar to Tape 3301, but with a layer of tin added for protection against corrosion and better solderability. With a standard self-adhesive on one side, with a release liner		

ORDER EXAMPLE

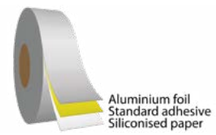
Part number		Width (mm)		Length (meters)
Please choose a part number out of the table	–	Specify the width in mm. Standard roll widths 25, 50, 100. Other width on request	–	Specify the length in meters. Standard roll length 16.5 meter.

Conductive Aluminium tape 3203

Conductive alluminum tape was developed especially for EMI/RFI shielding/screening in aluminium housings and frames to prevent galvanic corrosion.

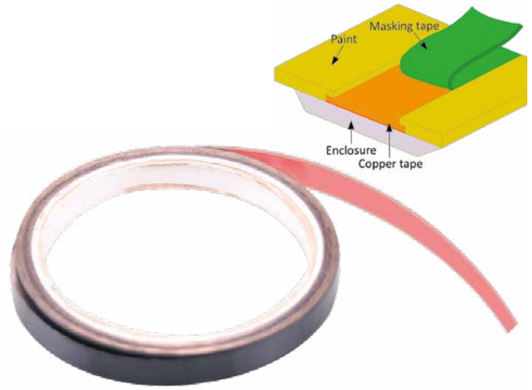
We not only produce our aluminium tape on rolls, but also die-cut according to the customer's drawing on strips or in pieces (as stickers), both with or without self-adhesive.

TECHNICAL SPECIFICATION AND PART NUMBERS

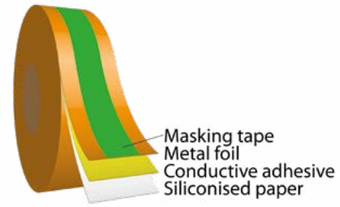
Part number (with conductive adhesive)	
	3203
Part number (with standard adhesive)	
	3303
Foil material	Aluminium
Surface	Shiny
Foil thickness	0.040mm
Total thickness	0.065mm
Adhesive	Synthetic conductive resin
Adhesive performance	4.5 N/cm
Tensile strength	25 N/cm
Temperature resistance	155 °C
El. resistance through adhesive	0.003 Ohm
Standard roll widths(mm)	10, 25, 50, 100 Other width on request
Roll length	Min. 16.5m (standard) Other roll length on request

These values are measured under laboratory conditions.
In other situations results may differ. Please read our Guarantee.

Contact-surface tape 3204



This contact-surface tape is used to improve the corrosion resistance of construction metals (like untreated steel plates), or to improve galvanic compatibility when 2 metal parts are connected with a gasket. After the parts have been coated, the paint overlaps the metal tape to increase the bonding.



TECHNICAL SPECIFICATION AND PART NUMBERS

Part number (with conductive adhesive)	3204
Foil material	Soft copper
Surface	Shiny
Foil thickness	0.035mm
Total thickness	0.060mm
Adhesive	Synthetic conductive resin
Adhesive performance	4.5 N/cm
Tensile strength	55 N/cm
Temperature resistance	155 °C
El. resistance through adhesive	0.003 Ohm
Standard roll width (mm)	10, 25, 50, 100 Other width on request
Roll length	Min. 16.5m (standard) Other roll length on request

These values are measured under laboratory conditions.
In other situations results may differ. Please read our Guarantee.

Mounting tape 3205

A double-sided self-adhesive transfer tape for mounting purposes. This tape can be applied much more quickly than a conductive glue and it is easy to position it very accurately. No time is required for curing (for the pressure-sensitive version). For lower resistance and/or to fill in gaps on a rough surface, we recommend Shieldokit electrically conductive two-component adhesive

TECHNICAL SPECIFICATION

Part number (with conductive adhesive)	3205
Color	Transparent
Base material	Silicone release paper
Total thickness	0.050 mm
Adhesive	Electrically conductive acrylic
Adhesive performance	5.5 N/cm
Temperature resistance	Standard-20°C up to +130°C Short term up to 180°C
Electrical resistance	0.01Ω/□
Shelf life	6 months from date of delivery
Storage	Cool and dry in original packaging at 23°C +/- 2°C and 50% Relative Humidity +/- 2% RH
Standard roll widths (mm)	10, 25, 50, 100 Other width on request
Roll lengths	Min. 16.5m (standard) Other roll length on request
These values are measured under laboratory conditions. In other situations results may differ. Please read our Guarantee.	

Semi-conductive non-woven 4771

Semi-Conducting non woven tapes primary function is to equalize the field current around the conductor or core and to ensure electrical contact with the earthing system. This reduces the electrical stress on the insulation material and enhances performance. They can also be used to prevent electrolytic corrosion of metallic armour layers.

Benefits
- Good bedding performance
- Good conductive properties
- Strong material

Applications
- ESD lining
- EMI shielding of cables
- Shielding and electric field control

Structure

TECHNICAL SPECIFICATION AND PART NUMBERS

Properties	4771-0.15	4771-0.18	4771-0.30	4771-0.50	Test method
Thickness (mm)	0.15	0.18	0.30	0.50	ISO 9073-2
Mass per unit area (g/m2)	100	65	60	95	ISO 9073-1
Tensile strength (N/cm)	60	35	35	60	ISO 9073-3
Elongation (%)	13	13	13	14	ISO 9073-3
Specific length resistivity (Ωcm)	5	800	800	600	DIN 54345 Part 5
Volume resistivity (kΩcm)	10	25	10	10	DIN 54345 Part 1
Service temperature (°C)	< 140				IEC 60216 (TIS 045)
Processing temperature (°C)	< 225				(TIS 045)
Max. width	960 mm				
These values are measured under laboratory conditions. In other situations results may differ. Please read our Guarantee.					

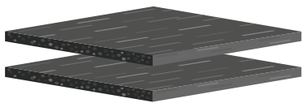
Semi-conductive conductor separation tape 4772

Semi-Conducting non woven tapes primary function is to equalize the field current around the conductor or core and to ensure electrical contact with the earthing system. This reduces the electrical stress on the insulation material and enhances performance. They can also be used to prevent electrolytic corrosion of metallic armour layers.

Benefits
- Good bedding performance
- Good conductive properties
- Thin and strong material

Applications
- ESD lining
- EMI shielding of cables
- Shielding and electric field control

Structure



Technical specification

Properties	Part number 4772-0.20	Test method
Thickness (mm)	0.20	ISO 9073-2
Mass per unit area (g/m²)	147	ISO 9073-1
Tensile strength (N/cm)	100	ISO 9073-3
Elongation (%)	15	ISO 9073-3
Specific length resistivity (Ωcm)	10	DIN 54345 Part 5
Volume resistivity (kΩcm)	100	DIN 54345 Part 1
Service temperature (°C)	< 140	IEC 60216 (TIS 045)
Processing temperature (°C)	< 225	(TIS 045)
Max. width	960 mm	-

Electrically conductive foam tape 5776

Conductive Foam tape conducts electricity both horizontally and vertically. Conductive Foam tape is better than plated sponge and comes with less powder detachment when cutting, friction and repeating compression.

Conductive foam tape is easy to attach to objects due to electrically conductive adhesive tape on the bottom and easy for converting due to roll supply. Thickness of the conductive foam tape is 0.3, 0.4 and 0.5 mm.

Properties
- Highly compressible with minimal force, good resilience, fast recovery
- Pass salt water and corrosion resistance test
- Halogen Free, EU-RoHS, thermal resistance
- Easy to die cut and convert due to roll type product
- Minimal dust and metal powder detachment for external friction, repeating compression, handling and production
- Good electric conduction horizontally and vertically

Technical details

Color		Grey
Temperature	°C	-10 ~ 80 °C (Depend on adhesive tape type)
Thickness	mm	0.3, 0.4 and 0.5 mm (Thickness including adhesive tape types)
Max. width	mm	100
Max. length	m	10
Resistance (Top to bottom)	Ω	Typical. 0,1 Ω
Surface Resistance	Ω/□	Typical. 0.1 Ω/□
Recommended Compression	%	Max. 50% of original height
Compression Force	kgf/cm²	Max. 1.0 (compress 40% of original height)

Mu-ferro tape 3208

Mu-ferro foil and tape have been developed for low-frequency (LF) magnetic field shielding

Mu-ferro foil/tape is a thin foil. Its thickness is only 0.023mm. It combines excellent soft magnetic properties with unusual mechanical hardness and flexibility. This means that tight bends can be realized with only very slight impairment of permeability. The fine strip thickness and comparatively low electrical conductivity permit effective shielding even of higher-frequency fields.

Applications

The primary applications of Mu-ferro foil/tape are flexible shielded cables with small diameters and rapid, flexible solutions to problems at low field strengths.

Other applications

- Magnet heads
- Magnetic field sensors
- Chokes
- Transformers
- Electronic article-surveillance tags

Advantages

- Very high permeability
- Low losses

Characteristics

Mu-ferro foil works well for shielding low-frequency magnetic fields. Due to the low electrical resistance it shields both low-frequency electric fields (LF) and high-frequency fields (HF). Comparable with Mu-Metal specifications.

Properties

- Easy to bend
- Easy to fold
- Can be cut with scissors
- Good corrosion resistance in a normal environment
- Bending, folding, cutting does not cause major loss of attenuation

Grounding

Due to the highly conductive surface this material can be grounded easily to shield low-frequency (LF) electric fields. For professional grounding please contact us.

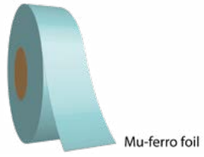
Width	Any width up to 50mm
Length	By the meter; rolls of up to 100m
Attenuation LF magnetic field	14 dB = 80 % (for more shielding, use multiple layers)
Permeability	μ_4
Saturation induction Bs	0.58 T
Density	7.7 g/cm³
Curie temperature °C	200
Crystallization temperature Tx °C	530
Specific electrical resistance	1.4 µΩm

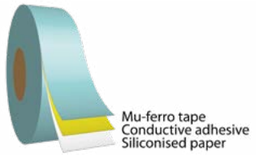
These values are measured under laboratory conditions.
In other situations results may differ. Please read our Guarantee.

Part numbers

Specification	Part number				
	3284	3208	3305	3408	3468
Product description	Mu-ferro foil	Mu-ferro tape with conductive adhesive	Mu-ferro tape with standard adhesive	Mu-ferro foil with 0.15mm thick, white insulation layer	Mu-ferro foil with 0.22mm thick, black insulation layer
Foil material	Mu-ferro	Mu-ferro	Mu-ferro	Mu-ferro	Mu-ferro
Surface	Silver color	Silver color	Silver color	Silver color	Silver color
Foil thickness	0.023mm	0.023mm	0.023mm	0.023mm	0.023mm
Total thickness	0.023mm	0.048mm	0.048mm	0.175mm	0.243mm
Adhesive	No adhesive	Synthetic conductive resin	Synthetic conductive resin	No adhesive	No adhesive
Standard roll widths (mm)	max. 50mm Other width on request				
Roll lengths	max. 100 m Other roll length on request				

These values are measured under laboratory conditions. In other situations results may differ. Please read our Guarantee.

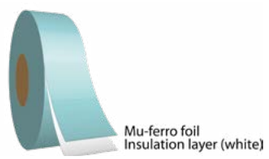


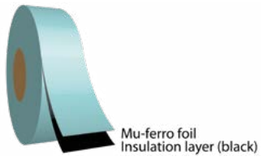


3284 — Max. width 50 mm

3208 — Max. width 50 mm

3305 — Max. width 50 mm





3408 — Max. width 50 mm

3468 — Max. width 50 mm

ORDER EXAMPLE

Part number		Width (mm)		Length (meters)
	–		–	
Please choose a part number out of the table		Specify the width of the tape in mm		Specify the length of the tape in meters

***Notice**

Information supplied in these data sheets is based on independent and laboratory tests which Holland Shielding Systems BV, hereafter referred to as HSS believes to be reliable. HSS has no control over the design of customer's product which incorporates products, therefore it is the responsibility of the user to determine the suitability for his particular application and we recommend that the user make his own test to determine suitability.

The product described in this data sheet shall be of standard quality, however the products are sold without warranty of fitness for a particular purpose, either expressed or implied, except to the extent expressly stated on HSS invoice, quotation or order acknowledgment. HSS does not warrant that products described in this data sheet will be free of conflict with existing or future patents of third parties. All risks of lack of fitness, patent infringement and the like are assumed by the user.

Amucor tape series 4700

Amucor foil and tape for EMI shielding. Amucor foil or tape can be used to shield plastic housings and enclosures

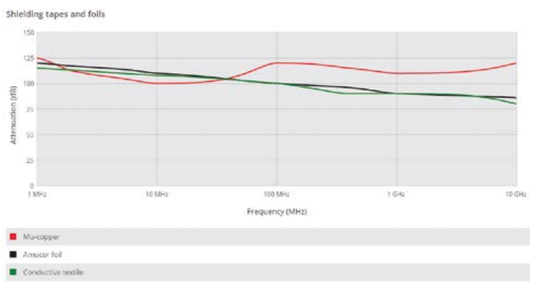
Many EMI problems can be solved easily by the use of Amucor foil or tape, a commonly used material. Amucor foil and tape can be produced with or without (conductive) self-adhesive and an optional insulation layer.

Amucor tape can be cut to any width starting at 3mm and can be delivered from stock. The most commonly used width is 25mm. The standard roll length is 16.5 meters.

If coverage of large surfaces is needed, it is usually best to use tape with a conductive self-adhesive in combination with foil. This solution is much cheaper than only using tape.

Amucor foil can also be delivered as die-cut, according to the customer's drawing, on a strip or in pieces (stickers), with optional self-adhesive.

Mu-copper tape vs Amucor foil vs Conductive textile - shielding performance



Applications

- EMI shielding of plastic enclosure parts (EMI/RFI-shielding tape/gasket)
- Shielding all non-conductive materials
- Ground plane
- Anti static floor (ESD floor)
- Electrical connection between surfaces (sheets/foils)
- Die-cuts
- Shielding in housings and Faraday cages
- Temporary shielding during tests
- Mounting transparent foils, windows for EMI/RFI shielding
- Cable shielding (wrapped around the cable)
- Temporary shielding during emission and immunity test

OPTIONS

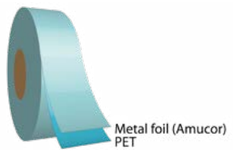
- Fire-retardant version
- With (conductive) self-adhesive backing
- With insulation layer
- Die-cutting to any shape according to CAD drawing

Technical specifications

Foil material	Amucor +PET	Amucor + PET + Amucor	Amucor with a reinforcement net
Surface	Bright	Bright	Bright
Foil thickness	0.012mm	0.35mm	-
Total thickness	0.038mm	0.3725mm	-
For tape, standard roll widths (mm) *	10, 25, 50, 100	10, 25, 50, 100	10, 25, 50, 100
Roll lengths	Min. 16.5m (standard) Other roll lengths on request		

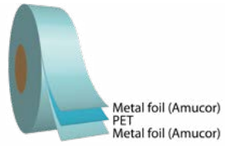
Technical specification and part numbers

AMUCOR FOIL (WITHOUT ADHESIVE)



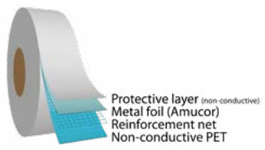
4701

Max. width 1100 mm



4716

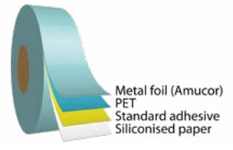
Max. width 1100 mm



4706

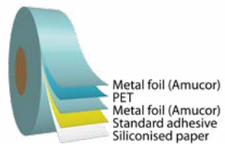
Max. width 3100 mm

AMUCOR TAPE WITH STANDARD ADHESIVE



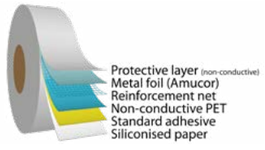
4702

Max. width 1100 mm



4717

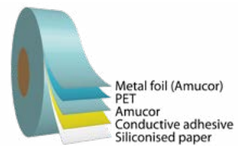
Max. width 1100 mm



4707

Max. width 1100 mm

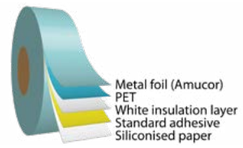
AMUCOR TAPE WITH A CONDUCTIVE ADHESIVE



4718

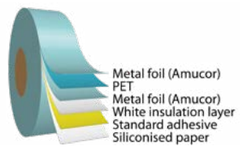
Max. width 1100 mm

AMUCOR FOIL WITH STANDARD SELF ADHESIVE AND INSULATION LAYER (UL94V-0) 0.15 MM (WHITE)



4704

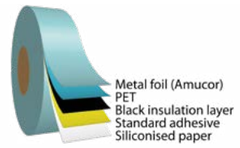
Max. width 900 mm



4719

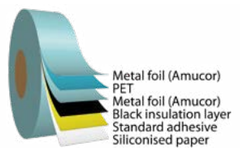
Max. width 900 mm

AMUCOR FOIL WITH STANDARD SELF ADHESIVE AND INSULATION LAYER (UL94V-0) 0.22 MM (BLACK)



4705

Max. width 1100 mm



4720

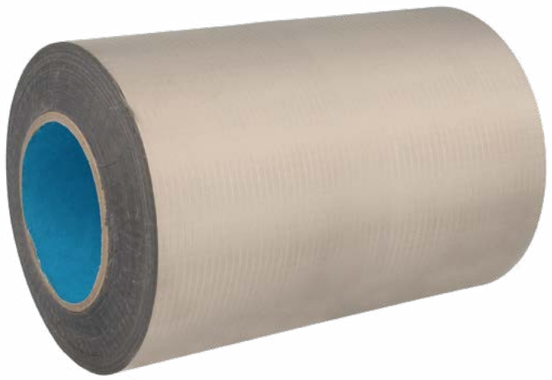
Max. width 1100 mm

ORDER EXAMPLE

Part number		Width (mm)		Length (meters)
	–		–	
Please choose a part number out of the table		Specify the width of the tape in mm		Specify the length of the tape in meters

Conductive textile 4711

Very easy to apply to plastic housings
to create an EMI-shielded housing

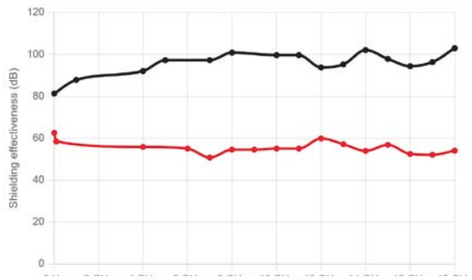


Conductive textile is made of a polyester, metallized with Cu/Ni, extremely strong and flexible. It has conductivity in all directions, i.e. along the axes X, Y and Z. Conductive textile can be supplied as a cloth or as pressure-sensitive adhesive (PAS) tape which is easy to apply to plastic housings in order to cover complex forms and shapes. Conductive textile has low contact resistance and the tape version has superior adhesive force. The product shields electromagnetic interference (EMI) effectively.

Laminates of metal foils with flame-retardant Nomex or Valox are also available. See our Mu-copper tapes or Amucor tapes.

Our engineers can help you develop the right design to create overlaps, holes or connectors, cables and spuds

4711 - Conductive textile single layer and double layer - shielding performance



Advantages

- Easily follows the contours of your housing
- Flame retardant
- Extremely strong
- Can be applied as die cut parts, as a sheet or in roll form

Applications

- Shielding plastic enclosure parts
- Shielding all non-conductive materials
- Ground plane
- Anti static floor
- Electrical connection between surfaces (sheets/foils)
- Die-cuts
- Shielding in housings
- Shielding cables
- Temporary shielding during tests

Options

- Flame-retardant version
- With (conductive) self-adhesive backing
- With insulation layer
- Die-cutting to any shape

Technical specifications

Surface resistivity Ω/sq	<0.05
Coating component	Cu+Ni
Basic material	Polyester
Storage	-20°C- +40°C, Relative humidity < 65%
Notice	Some people develop a skin allergy after prolonged contact
Standard roll width (mm)	10, 25, 50, 100 *Any roll width available on request
Roll length	Min. 16.5m (standard) *other roll length on request

part numbers

Specification	4711	4712	4713	4714	4715	4721
Type	Conductive textile cloth	Conductive textile tape with standard adhesive	Conductive textile tape with conductive adhesive	4714 Conductive textile tape with standard adhesive and 0.15 mm white insulation layer	4715 Conductive textile tape with standard adhesive and 0.22 mm black insulation layer	Conductive textile with hot-melt adhesive (Flame retardant level: UL94V0)
Max. width mm	1400 mm	1000 mm	1000 mm	1000 mm	1000 mm	700 mm
Thickness mm	0.08 ±0.02	0.10 ±0.02	0.11 ±0.02	0.23 ±0.02	0.30 ±0.02	0.16 ±0.02
Weight gr/m2	70 ±10	70 ±10	120 ±10	135 ±10	135 ±10	240 ± 10
Fabric density	260	260	260	260	260	260
Textile	Plain wave					Ripstop
Flame-retardant level	-	-	-	-	-	UL94V0
Processing temperature	-	-	-	-	-	150°C

4711- Conductive textile cloth

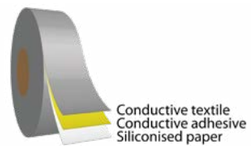
Max. width 1400 mm

Conductive textile cloth can be delivered on rolls or as a sheet. The cloth can also be cut into any desired shape according to a customer's CAD drawing.

4712 - Conductive textile tape with standard adhesive

Max. width 1000 mm

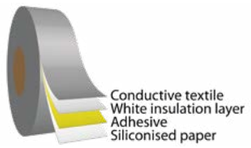
Conductive textile tape with standard non-conductive adhesive on the back can be supplied on rolls. The tape is easy to use, e.g. for shielding cables. After application of the tape, the cables remain flexible.



4713- Conductive textile tape with conductive adhesive

Max. width 1000 mm

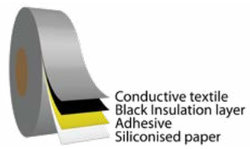
Conductive textile tape with conductive adhesive on the back can be supplied on rolls. The tape is easy to use, e.g. for shielding cables. After application of the tape, the cables remain flexible.



4714- Conductive textile tape with insulation layer

Max. width 1000 mm

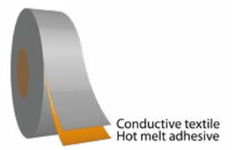
Conductive textile tape with adhesive on the back can be supplied with a 0.15 mm thick white insulation layer and can be delivered on rolls.



4715- Conductive textile tape with insulation layer

Max. width 1000 mm

Conductive textile tape with adhesive on the back can be supplied with a 0.22 mm thick black one, and can be delivered on rolls.



4721- Conductive textile with hot-melt adhesive

Max. width 700 mm

Conductive textile with hot-melt adhesive has a flame retardant level UL94V0 with a Processing temperature up to 150°C.

ORDER EXAMPLE

Part number		Width (mm)		Length (mm)
	-		-	
4711 : Conductive textile fabric **4712 :** Conductive textile tape (with standard adhesive) **4713 :** Conductive textile tape (with conductive self-adhesive) **4714 :** Conductive textile tape (with insulation layer 0.15mm white) **4715 :** Conductive textile tape (with insulation layer 0.22mm black) **4721 :** Conductive textile with hot melt adhesive (Flame retardant level:UL94V0)		Specify the desired width in mm. When you order Conductive textile tape (part number 4713) this generally is 25mm		Specify the desired length in mm. When you order Conductive textile tape (part number 4713) this generally is 16.5 meters (16500mm)

Conductive non-woven fabric 4770

Copper/Nickel conductive non-woven fabric for EMI shielding applications.

Our Copper/Nickel conductive non-woven fabric combines highly conductive metals with lightweight fabric to meet a diverse range of EMI/RFI shielding requirements. Manufactured with our patented technology, this metallized fabric is available in various woven and non-woven substrate configurations.

We use a patented technology for applying thin metal coatings of copper and/or nickel to woven and non-woven fabrics. As a result these metallized materials have the flexibility conformability and breathability of a fabric with the electrical properties of a metal. This means low surface and through resistivity and excellent shielding effectiveness.

The Conductive non-woven fabric can be can be cut into any desired shape, on the basis of your supplied drawing. This material can also be provided with a conductive or non-conductive adhesive.

Applications

- Protects against EMI/RFI and ESD where weatherability is not a concern;
- Architectural EMI/RFI shielding gaskets
- Conductive tape for example for cable shielding
- EMI shielding laminates for example for grounding

Product specifications

Item	Unit	Specifications (0.19 mm thick version)	Specifications (0.30 mm thick version) (Standard)	Test standard
Max. width	mm	1000		GB/T4667-1995
Thickness	mm	0.19 ± 0.03	0.30 ± 0.05	FZ/T01003-1991
Weight	gr/m2	85 ± 10	165 ± 20	GB/T4669-1995
Surface resistivity	Ω / sq	< 0.03		ASTM F390
Basis material		polyest		-
Polyest content	%	60 ± 5		-
Copper content	%	21 ± 3		-
Nickel content	%	19 ± 3		-
Storage conditions		-20 °C- 40 °C, relative humidity < 65%		-
Fire point	°C	250 °C, never self-ignite		-
Fire extinguisher		fire extinguisher, water, carbon		-
Waste handling		Non-toxic, tasteless, does not decompose		-

Notice: Some people develop skin allergy after long contact

Please note: 0.30 mm thick version is the standard stock version

ORDER EXAMPLE

Part number	Width (mm)	Length (mm)	Thickness (mm)	Adhesive
4770	Specify the desired width in mm.	Specify the desired length in mm.		**01:** Standard self-adhesive **02:** Without self-adhesive **03:** With conductive self adhesive

Flexible cable shield 4700R

Flexible cable shield for EMI shielding of flexible cables. Branches are easy to realize

Flexible cable shield is suitable for EMI-shielding applications where flexibility is required, for example when cables have small diameters. The material guarantees superb EMI shielding performance. The product is supplied on rolls and can be wrapped around the cables. Flexible cable shield is available in **Amucor** or in **conductive fabric**, with or without (conductive) self-adhesive.

Part numbers

- 4701R : Amucor foil
- 4702R : Amucor foil with self-adhesive
- 4711R : Conductive fabric
- 4712R : Conductive fabric with self-adhesive
- 4713R : Conductive fabric with conductive self-adhesive

Advantages

- Highly flexible
- High EMI-shielding performance
- Wide range of applications
- Easy to cut
- Useful in a broad range of temperatures and environments

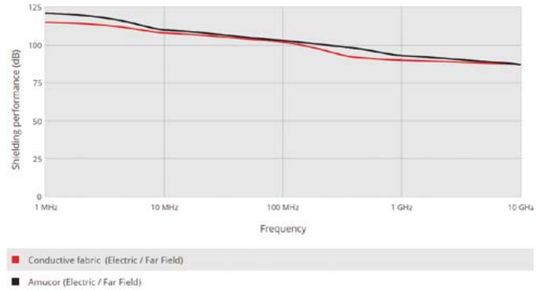
Standard widths

8, 10, 12, 14, 16, 26, 32, 50, or 100mm.

Standard roll lengths

10, 25, 50 meters
(On request: roll lengths of 1 to 1000 meters.)

Shielding performance*



ORDER EXAMPLE

Part number	Width (mm)	Roll length (m)
4701R : Amucor foil **4702R :** Amucor foil + self-adhesive **4711R :** Conductive fabric **4712R :** Conductive fabric + self-adhesive **4713R :** Conductive fabric + conductive self-adhesive	Standard width: 50mm, Other on request	Standard roll lengths: 10, 25, 50 meters

***Notice**
Information supplied in these data sheets is based on independent and laboratory tests which Holland Shielding Systems BV, hereafter referred to as HSS believes to be reliable. HSS has no control over the design of customer's product which incorporates products, therefore it is the responsibility of the user to determine the suitability for his particular application and we recommend that the user make his own test to determine suitability.

The product described in this data sheet shall be of standard quality, however the products are sold without warranty of fitness for a particular purpose, either expressed or implied, except to the extent expressly stated on HSS invoice, quotation or order acknowledgment. HSS does not warrant that products described in this data sheet will be free of conflict with existing or future patents of third parties. All risks of lack of fitness, patent infringement and the like are assumed by the user.

Ready-made sleeve 4700S

We have developed cost-effective EMI protection for flat cables. This is an easy way to protect sensitive sources from interference

The ready-made sleeve (EMI-screening sleeve) for flat cables allows easy cable routing during assembly. The material is a highly conductive Amucor film offering full 360° protection against electromagnetic radiation. Shielding performance can even be improved using optional grounding connections.

For placing or curving flat cables there is an ultra flexible solution with conductive textile with a self-adhesive, combining suburb mechanical and EMI-screening properties. The sleeve is also available for round cables with a diameter up to 45mm.
The product can be supplied in rolls of up to 100 meters.

Ready-made sleeves can be supplied in **Amucor** or in **Conductive textile (fabric)**. The material provides high shielding performance. The ready-made sleeve is used for cables with large diameters and flat cables and can be produced with a self-adhesive backing so that the EMI shielding remains securely in place.

Standard widths

Width range (mm)	Part number
3-5	4701S-2-5
5-8	4701S-2-8
8-12	4701S-2-12
12-15	4701S-2-15
15-18	4701S-2-18
18-22	4701S-2-22
22-25	4701S-2-25
25-30	4701S-2-30
30- 35	4701S-3-35
35-40	4701S-3-40
40-45	4701S-3-45
45-50	4701S-3-50
50-60	4701S-3-60
60-70	4701S-3-70
70-80	4701S-3-80
80-90	4701S-3-90
90-100	4701S-3-100

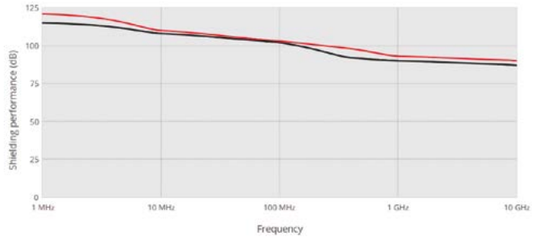
Part numbers

- **4701S** : Amucor foil
- **4711S** : Conductive fabric

Grounding connection (optional)

On request, we can make the cable shield completely customized, for example, a connection to earth but also other special shapes and sizes are available on request.

Shielding performance* (dB)



ORDER EXAMPLE

Part number		Height (mm)		Width (mm)
4701S : Amucor foil **4711S** : Conductive fabric	–	Specify the height of the cable in mm	–	Specify the width of the cable in mm

Length (mm)		Insulation
Specify the length per sleeve	–	**I** : Inside **O** : Outside **X** : No insulation (for 4711S)

Wrapshield 4730

Wrapshield is a knitted wire mesh for EMI cable shielding

Cable wrapping is used to shield, ground and statically discharge cables, or to harness entire bundles of cables. Wrapshield is a double-layer knitted wire mesh supplied on rolls, which is used to wrap cables. For the best shielding performance it is important to assure there is a 50% overlap.

Benefits

- Highly flexible
- High shielding performance
- Wide range of applications
- Shielding performance can be increased by more overlap
- One size for all diameters
- Branches can be wrapped

Wrapshield materials

Wrapshield is available in four different wire materials:

- 4730 Wrapshield monel
- 4740 Wrapshield tinned copper/steel (TCS)
- 4745 Wrapshield tinned copper
- 4750 Wrapshield stainless steel
- 4760 Wrapshield aluminium

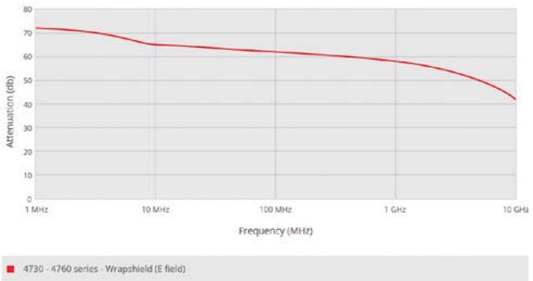
Standard widths

12, 25, 50, 100, or 150 mm.
Other widths on request.

Options

- With self-adhesive backing
- Customer-specific widths

Shielding performance* (dB)



ORDER EXAMPLE

Part number		Width (mm)		Length (m)
4730 : Wrapshield monel **4740 :** Wrapshield tinned copper/steel (TCS) **4745 :** Wrapshield tinned copper (TC) **4750 :** Wrapshield stainless steel **4760 :** Wrapshield aluminium	–	**12 :** 12mm width **25 :** 25mm width **50 :** 50mm width (standard) **100 :** 100mm width **150 :** 150mm width	–	Standard roll lengths: 10, 25, 50 meter

Full metal cable shield 4800

Mu-copper cable shielding, flexible shielding tube for high shielding performance. A wide range of cable diameters can be shielded with a single tube..

Full metal flexible cable shielding is a ready-to-use Mu-copper wire or tinned Mu-copper wire braided tube through which a cable or bundle of cables can be pulled. When the braided full metal flexible cable shielding is compressed lengthwise, the diameter expands to simplify the assembly. Therefore a wide range of cable diameters can be shielded with a single flexible shielding tube.

Please note that the Full metal flexible cable shielding has to be expanded for larger diameters and that a larger nominal length will then be required- up to twice the length of the cable.

Typical EMI/RFI problem areas behind connectors and back-shells can easily be shielded with the 4800 series Full metal flexible cable shielding (a.k.a. tubular braids). Multiple sizes are available to shield problem areas at the ends of cables or harnesses where additional EMI/RFI shielding is necessary to meet demanding specifications

Part numbers

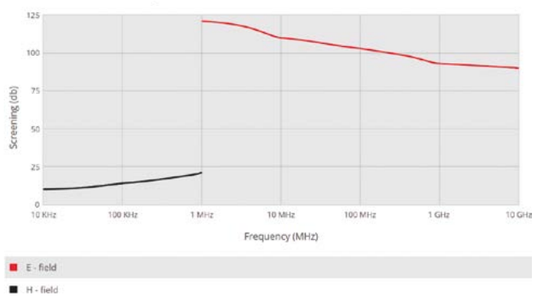
Diameter(mm)	Diameter(inch)	Part number	mm²
0-3	0- 0.12	4803	0.50
3- 6	0.12- 0.24	4806	1.32
5- 15	0.2- 0.59	4815	7.9
12- 24	0.47- 0.95	4824	12.4
20- 36	0.79- 1.42	4836	19.4
32- 48	1.26- 1.89	4848	21.6
42- 60	1.65- 2.36	4860	23.8
60- 80	2.36- 3.15	4880	60.3
80- 100	3.15- 3.93	48100	78.4

For larger diameters, please consider our 4730-4760-Wrapshield

Advantages of Flexible EMI-shielding tube

- Highly flexible
- High EMI/RFI-shielding performance
- Wide range of applications
- Easy to cut
- Useful in a broad range of temperatures and environments

Shielding performance*



Mounting options

- **01** Tie wrap
- **02** Tape
- **03** Cable entry

ORDER EXAMPLE

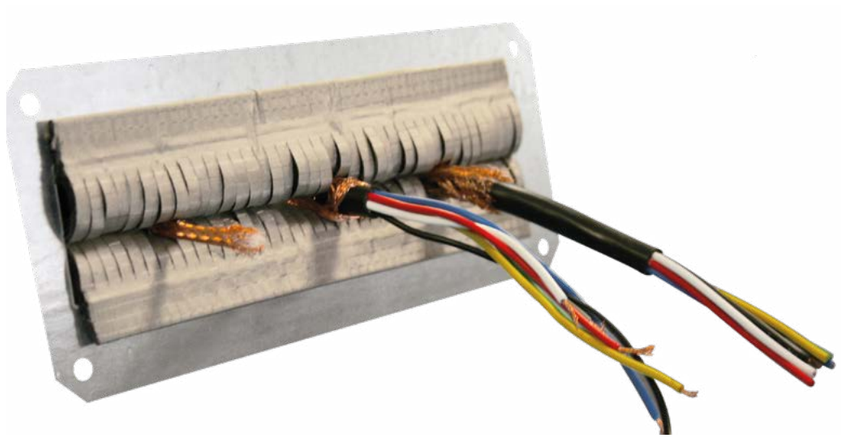
Part number		Length (m)
	-	

4803 : 0 - 3 mm
4806 : 3- 6mm
4815 : 5- 15mm
4824 : 12- 24mm
4836 : 20- 26mm
4848 : 32- 48mm
4860 : 42- 60mm
4880 : 60- 80mm
48100 : 80- 100mm

Standard roll lengths : 10, 25, 50 meters

Cable entry shield 4910

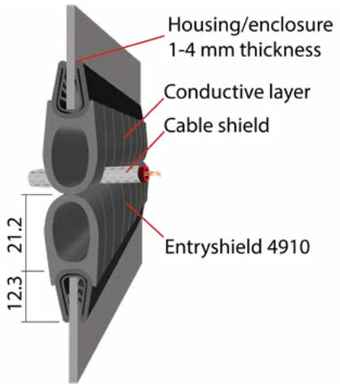
EMI/RFI-shielded cable entry-system to mount, ground and shield several cables or bundles of cables simultaneously



A shielded cable-entry system to mount, ground and shield several cables or bundles of cables simultaneously. The highly conductive, flexible EMC gasket between which the cables are entered into the enclosure guarantees excellent shielding performance between 1 MHz and 10 Ghz. Standard material for the plate is galvanized steel.

Advantages

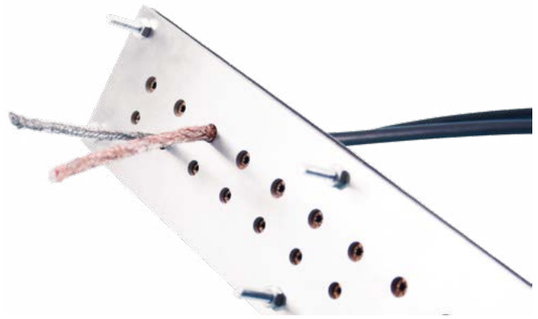
- High shielding performance over a wide frequency range
- Mounting within a few minutes
- Very easy to add more cables later
- Requires only 1 rectangular recess in your enclosure
- Standard or according to customer specifications



4915 - Entryshield instant version options (on request)

- With Amucor EMI gasket
- Made according to your drawing
- Custom drill pattern

* Larger versions or a version according to your drawing are available on request.



High-performance shielding cable entry system 4930

For a higher shielding application you can use the High-performance shielding cable entry system 4930. For throughput of larger numbers of cables in a situation where space is limited, it makes sense to use an EMI/RFI-shielded cable entry system. Power and signal cables, as well as water supply lines and waveguides can be accommodated in the cable entry system. The electrically conductive beryllium-copper contact plate with small pointed fingers ensures good contact with the cable shield, which guarantees good shielding performance.

Available versions

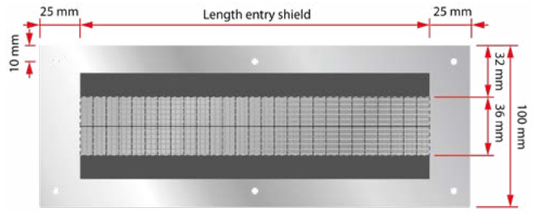
4910 - Entryshield (Profile)

4915 - Entryshield (Instant version)

INTEGRATION OF A CABLE-ENTRY SHIELD

You can integrate Entryshield 4910 easily into any enclosure. You should make a slot in your housing that is 36 mm in height. The length of the slot depends on how many cables you want to carry in. Entryshield is a clip-on profile that can be attached easily by pressing it into position.

We can deliver cable-entry shield as a turnkey implementation- we call this the Entryshield instant version 4915. This instant version is a Mu-ferro plate of 2 mm thick with the entry shield already mounted in this plate. The instant version is like a letterbox flap, only for entering EMI/RFI-shielded cables. This version is easy to fit into a EMI/RFI-shielded box, EMI/RFI-shielded room or Faraday cage.



ORDER EXAMPLE

Part number		Length (mm)
	–	
4910 : Entryshield (Profile) **4915** : Entryshield (Instant version)		Specify the length in mm

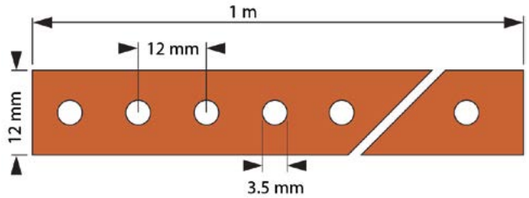
Cable grounding clamps 4920

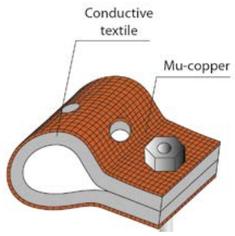
Cable grounding clamps EMI/RFI shielding and ESD suppression. These clamps can be used as an end piece for cable shields.

Cable grounding clamps are perfect for attaching and grounding EMI/RFI-shielded power and signal cables in various applications where an electrical connection is required between the cable and the grounding/EMI/RFI-shield circuit for EMI/RFI shielding or ESD suppression.

The product is supplied in strips of 1 meter, on rolls, or precut to the desired length. The holes in the strip can be placed at any desired interval. In our standard strips the distance between the holes is 12mm.

Technical drawing





Features

- Provides simultaneous attachment and grounding for coaxial and braid-shielded cables.
- Resin base plated with copper foil.
- Due to the high-quality materials used, the clamp will not damage the cable shielding or the insulation sleeve.
- Excellent flexibility ensures constant contact pressure and stable contact resistance under heat variation and heavy vibration conditions.
- The contact resistance of the highly conductive copper layer is lower than the nickel or chromium plating on the standard metallic clamps.
- Low-weight, space-saving solution for dedicated cable grounding.

Specifications

Material:

- Conductive textile inside
- Mu-copper foil outside

Best mounting method:

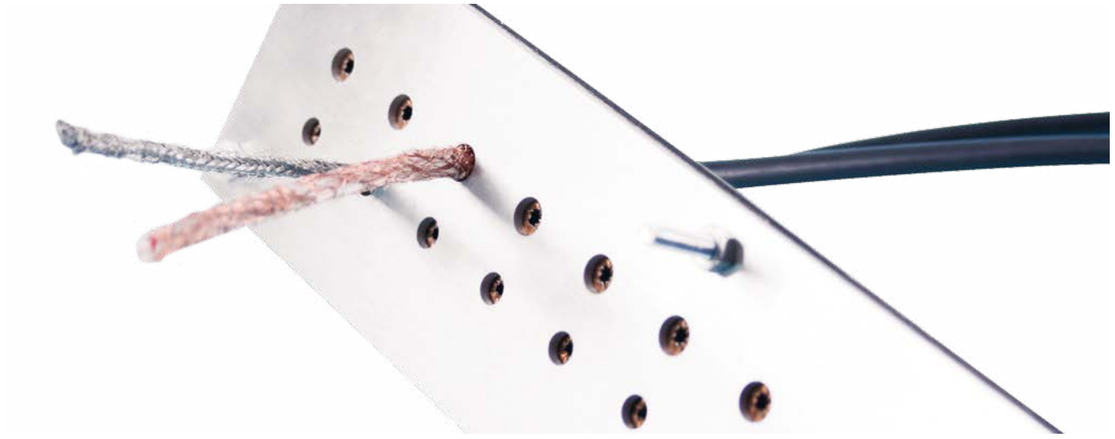
- M3 (Size 4) screw

ORDER EXAMPLE

Series		Strips/Pieces		Length (mm)
4920	–		–	
		Specify if you want to order as strip of 1 meter (**S**) or as pieces (**P**) cut in length		When you order in pieces then specify the length per piece in mm

High performance cable entry shield 4930

Shielding, grounding and attaching of cables to and from the equipment in your shielded enclosure



A shielded cable going into or out of the EMI/RFI-shielded housing has to make 360° contact, i.e. around the jacket of the shielded cable, with the EMI/RFI-shielded housing. For cables without a shielding jacket, Power or signal line filters should always be installed. Otherwise the cable will act as an antenna.

Penetration/throughput

For throughput of larger numbers of cables in a situation where space is limited, it makes sense to use an EMI/RFI-shielded cable entry system. Power and signal cables, as well as water supply lines and waveguides can be accommodated in the cable entry system. The electrically conductive beryllium-copper contact plate with small pointed fingers ensures good contact with the cable shield, which guarantees good shielding performance.

Options

- Also available in fireproof, gas tight or watertight versions
- The shielding cable entry system can be provided with additional dummy holes on the inside plate and the beryllium-copper contact plate. The outer plate remains closed to keep shielding performance high. You can add more cables later by drilling a hole in the outside plate. We will mark the position of the dummy holes on the outer plate in advance.

Advantages

- This system facilitates letting many cables enter into a small area without the individual use of (expensive) cable glands.
- Cable diameters can be between 3- 28mm. Other diameters on request.

Ordering/quotation

To get a quick quote please send us a list of cable diameters and we will submit a proposal. You can describe your specifications or the size of the entry plate.

This High-performance shielding cable entry system can also be made according to the customer's drawing.

If you want a quote for a High-performance cable shielding system, please send an email to info@hollandshielding.com.

ORDER EXAMPLE

Series	Height (mm)	Width (mm)
4930		
	Height of the Cable entry shield high performance in mm	Width of the Cable entry shield high performance in mm

Number of cables	Diameter of the cables (mm)
Specify the number of cables to be passed through the cable entry shield high performance	Specify the diameter of the cables in mm

Cable shield tie-wraps 4950

A convenient tie-wrap for cable shielding, EMI cable-shielding tie-wrap is used for fast, reliable, and cost-effective RFI/EMI/EMP shield terminations

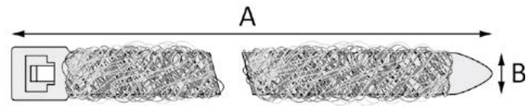
The area where the cable shield is connected to the cabinet earth is a critical point. It is very important that the connection has a low resistance

We provide a tie-wrap solution that is very easy to install, since no tools are required. The tie-wrap is made of plastic, and the electrically conducting layer is made of a springy metal wire mesh which is pulled together easily by tightening the tie-wrap.

4950 series EMI cable-shielding tie-wrap provides a highly effective shield termination for any size and type of backs hell design. EMI cable-shielding tie-wrap has successfully passed rigorous testing with respect to shocks, vibrations, and thermal cycles, unlike other shield-termination systems. There is no device on the market that realizes shield termination more quickly.

Used for critical applications in aircraft, military vehicles, and other sensitive electronic equipment.

Standard sizes



Part number	Width B (mm)	Length A (mm)
4950-2.5-100	2.5	150
4950-2.5-150	2.5	350
4950-3.6-145	3.6	150
4950-3.6-190	3.6	350
4950-4.8-190	4.8	150
4950-4.8-190	4.8	350
4950-7.6-190	7.6	150
4950-7.6-190	7.6	350
Notice: tie-wrap dimensions are without mesh material		

Benefits

To protect sensitive equipment, 4950 series EMI cable shielding tie-wrap is designed to provide the following advantages:

- Virtually eliminates RFI/EMI/EMP leakage paths
- Maintains constant tension under extreme environmental conditions
- Clasps small diameters just as easily, quickly and reliably as large diameters
- Simple and tool-free assembly
- Space saving by an optimized arrangement
- Permanent and continuous pressure on the cable shield, adjustment of spring load not necessary
- Vibration proof, maintenance free

Specifications

Material	Applications
Monel Per QQ-N-281 BS 3075 N A 13 Class A	The most commonly used material.

ORDER EXAMPLE

Series	Width (mm)	Length (mm)
4950		
	Specify the width of the EMI cable-shielding tie-wrap in mm	Specify the length of the EMI cable-shielding tie-wrap in mm

Cable connector shields 4955

Easy connector shielding without replacing the whole connector

These sleeves can create a more continue connection where cable shields are interrupted.

They can be mounted afterward and are very flexible not only in lengths and the bending but also in diameter. For extra strengths these can be clamped with cable clamps, tie-wraps.

When you want the connection water tight you can cover these with shrinking sleeves.

Benefits

- In any size, diameter or length
- The conical version available to create also bigger steps in diameter
- Eventual with inside high flexible copper strips for higher currents

4956 - Conical cable connector shields series

The Conical sleeves is for connecting the braiding of the shield to bigger diameters, like connectors, receptacles, tubes or housings. This shield taper to create an optimal shield between 2 different diameters.

Diameter range	Part number	Begin diameter	End diameter	Part number
2-4 mm	4955-2	2-4 mm	8-12 mm	4956-2-8
4-8 mm	4955-4	4-8 mm	12-16 mm	4956-4-12
8-12 mm	4955-8	8-12 mm	16-20 mm	4956-8-16
12-16 mm	4955-12	12-16 mm	22-26 mm	4956-12-22
16-20 mm	4955-16	16-20 mm	25-29 mm	4956-16-25
20-25 mm	4955-20	20-25 mm	30-35 mm	4956-20-30
25-30 mm	4955-24	25-30 mm	35-40 mm	4956-24-35
30-35 mm	4955-30	30-35 mm	50-55 mm	4956-30-50
40-45 mm	4955-40	40-45 mm	70-75 mm	4956-40-70

Larger diameters on request

Length

These cable connector shields can be made in any desired length. You can specify the length at the end of the part number. For example, to have a quotation for Cable connector shields with a diameter of 8mm and a length of 50mm you can specify the part number as follows: **4955-8-50**

Technical details

Material	Silver plated 76% Nylon 24% elastic fiber fabric
Stretch	All directions
Silver coating	99.9% pure
Surface resistivity	<0.5 Ohm/sq. (unstretched)
Shielding Effect	30- 60 dB in range 30 Mhz- 20 Ghz
Resistance	<0.15 ohm /sq. (unstretched) between the shields based on optimal compression
Temperature range	-30 to 90 °C
Material thickness	0.40mm
Stretch	~100%

From diameters 16mm the sleeves can be reinforced with 0.12mm copper strips. These strips are sticked on the inside of the sleeve, but at special order other connection parts available.

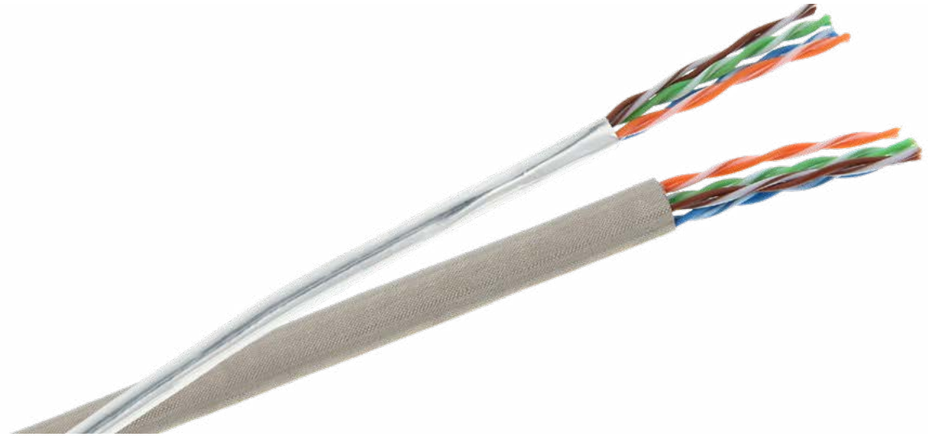
The elasticity of the diameter is about 1 : 2, please take care that the strips need some initial contact force. The best is to send the cable assembly to us so that we can check the right fitting or contact our technical staff.

ORDER EXAMPLE

Part number		Length (mm)
	-	
4955 : Cable connector shield **4956** : Conical Cable connector shield		Specify the length of the shield in mm

Ready-made round cable shielding sleeve 4700T

Ready-made round sleeve (EMI-screening sleeve) easy cable routing with high shielding performance



The ready-made round sleeve (EMI-screening sleeve) for round cables allows easy cable routing during assembly. The material is a highly conductive Amucor film offering full 360° protection against electromagnetic radiation. Shielding performance can even be improved using optional grouding connections.

For placing or curving round cables there is an ultra flexible solution with conductive textile with a self-adhesive, combining suberb mechanical and EMI-screening properties.

Ready-made round sleeves can be supplied in Amucor or in Conductive textile (fabric). The material provides high shielding performance. The ready-made round sleeve can be used for cables with large diameters.

Standard diameters

Diameter (mm)	Partnumber
2	47xx-2
4	47xx-4
6	47xx-6
8	47xx-8
10	47xx-10
12	47xx-12
15	47xx-15
18	47xx-18
20	47xx-20
22	47xx-22
24	47xx-24
26	47xx-26
28	47xx-28
30	47xx-30

*Any other diameter available upon request, without tooling costs
X=material options: Reinforced Amucor foil or Conductive fabric

Material options

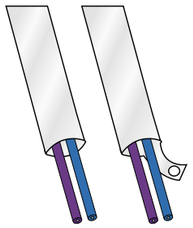
- 4701T : Amucor foil
- 4711T : Conductive fabric

Round cable connector shield

When your cable has a connector, it may be of importance for achieving the desired shielding effect to also shield the connector.

With earthing connection (on request)

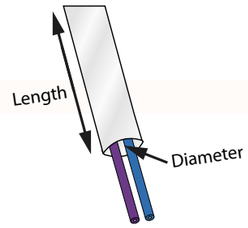
The ready-made round sleeve can also be delivered with an earthing connection in any length and according to your drawing



ORDER EXAMPLE

Part number		Diameter (mm)		Length (mm)
	-		-	
4701T : Amucor foil **4711T** : Conductive fabric		Specify the diameter of the cable in mm.		Specify the length per sleeve.

Insulation
I : Inside **O** : Outside **X** : No insulation (for 4711S)



HDMI cable connector shield 4975

Easy to be stuck to any HDMI connector to create a high shielding performance HDMI cables

A HDMI cable in or outside electronics housing often leads to interference.

Now we have developed a HDMI cable connector shield that is very easy to be stuck to any connector of a HDMI cable. With this shield the cable including the connector can be fully shielded to get the best shielding performance.

Most sizes are available from stock but the shield can be produced in any dimension. The shields can also be manufactured according to your drawing.

Shielding performance can even be improved using optional grounding connections or by using multiple layers, or multiple HDMI connector shields stuck over each other.

Benefits

- Very high shielding performance
- Available for any connector
- Easy to mount
- Good connection to the shield of the cable

Options (on request)

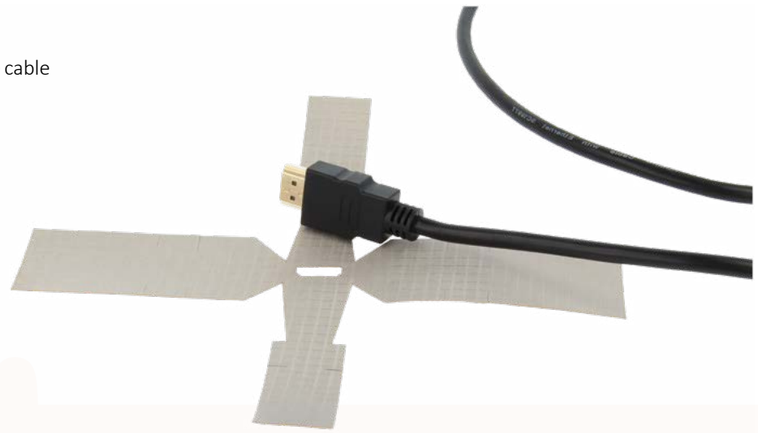
- Can be equipped with grounding strip for better performance
- Performed in an Amucor execution

Standard part numbers

The HDMI connector shield is so developed that it has a fairly large overlap. This makes the shield almost suitable for any HDMI connector. The standard part number for an HDMI cable connector shield is 8215. Any custom sizes/part numbers on request.

ORDER EXAMPLE

Series
4975



EMI heat shrinking tubes (conductive textile based)

For a tight seal with high shielding performance for cables and connectors

Our EMI heat shrinking tubes are made of polyolefin material with conductive textile on the inside to shield electromagnetic interference (EMI) effectively. The tubes are having excellent physical and electrical performance. The tubes can resist temperatures up to 135°C.

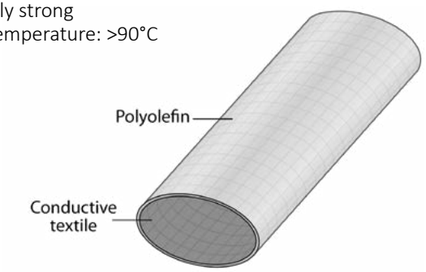
Emi heat shrinking tubes are available in a wide range of diameters and can be made in different lengths, max length 1000 mm.

Partnumbers

Part number	Before shrinkage inner diameter mm	After shrinkage inner diameter mm (max.)	After shrinkage wall thickness mm (min.)
4995-3	3	1	0.45
4995-6	6	2	0.7
4995-9	9	3	0.7
4995-12	12	4	0.7
4995-18	18	6	0.8
4995-24	24	8	1.0
4995-39	39	13	1.15

Advantages

- Very flexible
- Shrink ratio: 3:1
- Continuous operating temperature of outer jacket:-55°C to 135°C
- High shielding performance
- Extremely strong
- Shrink temperature: >90°C



The heat shrinking tubes are also available as a knitted mesh sleeve. This version can be made up to a length of 15 meter.

ORDER EXAMPLE

Series		Tube inner diameter (mm)		Length (mm)
4995	–		–	
		3 : 3 mm **6 :** 6 mm **9 :** 9 mm **12 :** 12 mm **18:** 18 mm **24 :** 24 mm **39 :** 39 mm	Please specify the length in mm (Max length 1000 mm)

EMI heat shrinking tubes knitted mesh 4996

For a tight seal with high shielding performance for cables and connectors

Our EMI heat shrinking tubes are made of polyolefin material with conductive textile on the inside to shield electromagnetic interference (EMI) effectively. The tubes are having excellent physical and electrical performance. The tubes can resist temperatures up to 135°C.

A robe is the standard inside of the sleeve to easily bring in the cable or bundle. When you want to add more cables afterwards, please take care that you add a spare rope.

Emi heat shrinking tubes are available in a wide range of diameters and can be made in different lengths with a maximum length of 15 meters.

Partnumbers

Part number	Before shrinkage inner diameter mm	After shrinkage inner diameter mm (max.)	After shrinkage wall thickness mm (min.)
4996-6	6	2.0	0.7
4996-9	9	3.0	0.7
4996-12	12	4.0	0.7
4996-18	18	6.0	0.8
4996-24	24	8.0	1.0
4996-39	39	13.0	1.15

Advantages

- Very flexible
- Maximal length of 15 meters
- Shrink ratio: 3:1
- Continuous operating temperature of outer jacket:-55°C to 135°C
- High shielding performance
- Extremely strong
- Shrink temperature: >90°C

ORDER EXAMPLE

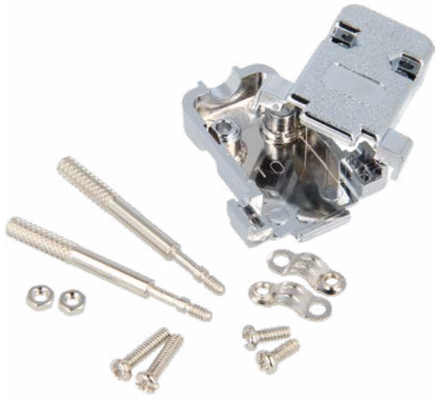
Series		Tube inner diameter (mm)		Length (mm)
4996	–		–	

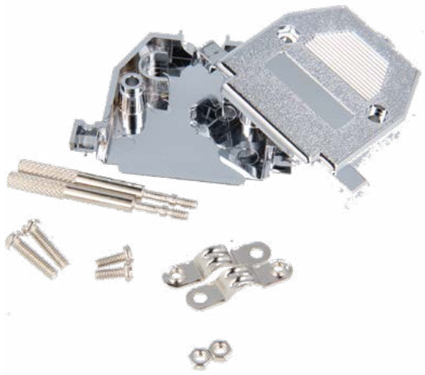
6 : 6 mm
9 : 9 mm
12 : 12 mm
18: 18 mm
24 : 24 mm
39 : 39 mm

Please specify the length in mm (Max length 15000 mm)

Shielded connector hoods 8250

These shielded connector hoods are ideal for indoor signal or power applications requiring robustness and/or high EMI/RFI performance





The shielded connector hoods are ideal for indoor signal or power applications requiring robustness and/or high EMI/RFI performance in the industrial and telecommunications markets.

This D-Sub shielded hood is designed with an optimum number of pieces:

- Two half-metal covers in zamak (zinc alloy),
- Two jack screws, and a steel fiber-reinforced plastic strain relief for EMI/RFI screening and mechanical cable retention. The strain relief works with cable diameters from 4.00mm to 13.00mm. With just two screws to fasten, assembly is fast and easy, allowing for reduced labor costs.

Applications

- Industrial Applications
- Telecommunications Applications
- Indoor Signal
- Power Applications

Technical details

Gender	All
Number of contacts	See part numbers in table below
Color	Chrome
Material insulator	Thermoplast UL94-HB

Features & Benefits

- Metallized plastic back-shell for covering male/female D-sub connectors
- The 8250 series D-Sub shielded hoods are available in 9-, 15-, 25- and 37-position versions
- Internal cable strain relief for improved durability
- Metallized chrome plating provides effective shielding.
- Two piece cover design enables quick and easy assembly.
- Standard assembly and mating hardware included.

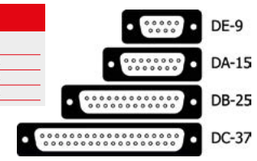
Standard part numbers

Part number	Number of contacts
8250-9	9 contacts
8250-15	15 contacts
8250-25	25 contacts
8250-37	37 contacts

ORDER EXAMPLE

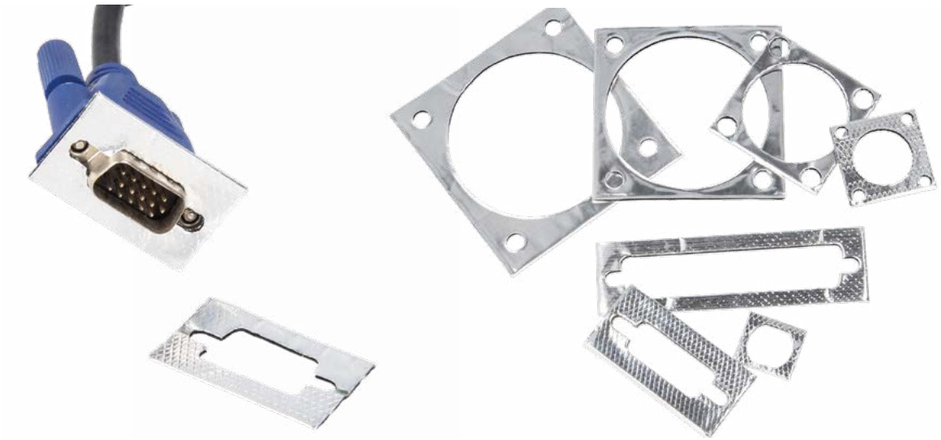
Series		Number of contacts
8250	–	

9 : 9 contacts
15 : 15 contacts
25 : 25 contacts
37 : 37 contacts



Connector gasket 8200

EMI flange seals for electrical connectors

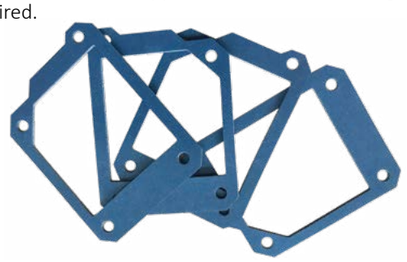


The 8200 series Connector gaskets are die-cut gaskets for EMI shielding and for grounding of a wide range of connectors. These connector gaskets are more effective in closing gaps caused by fabrication tolerances and misaligned or irregular surfaces than could be achieved with a solid flange design.

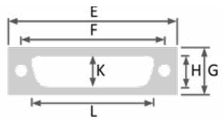
The 8200 series Connector gasket is made of die-cut 6800 Amucor shield or conductive textile, is 1 or 2mm thick, and can be provided with self-adhesive. Please note that Connector gaskets can also be produced in any desired size or shape and according to your CAD drawing.

Conductive rubber (On request)

The 8200 connector gasket is on request also available in conductive rubber. For applications where a watertight seal is required.

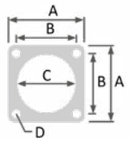


D-SUB connector gaskets



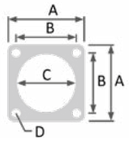
Part number	Shell size	Dimensions in mm							
						Front mounting		Rear mounting	
		E	F	G	H	L	K	L	K
8209DSUB	9	33.35	25.00	19.05	3.56	19.86	11.43	16.89	9.40
8215DSUB	15	41.68	33.33	19.05	3.56	28.20	11.43	25.22	9.40
8225DSUB	25	55.58	47.04	19.05	3.56	41.91	11.43	38.94	9.40
8237DSUB	37	71.86	63.50	19.05	3.56	58.37	11.43	55.40	9.40
8250DSUB	50	69.60	61.11	21.85	3.56	55.88	16.82	53.01	12.19

JT, PT, PC, MIL-C-26482, MS-3110, MS-3112, MS-3119, MS-3120 connector gaskets



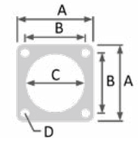
Part number	Dimensions in mm			
	A	B	C	D
8206	17.48	11.91	9.53	3.30
8208	20.62	15.09	12.70	3.30
8210	23.83	18.26	15.88	3.30
8212	26.19	20.65	19.05	3.30
8214	28.56	23.01	22.23	3.30
8216	30.96	24.61	25.40	3.30
8218	33.32	27.00	28.56	3.30
8220	36.53	29.36	31.75	3.30
8222	39.70	31.75	34.93	3.30
8224	42.88	34.93	38.10	3.96

AN, HT, QWL, MIL-C-5015, MS3100, MS3102 connector gaskets A series



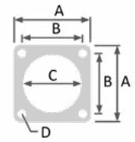
Part number	Dimensions in mm			
	A	B	C	D
8208A	22.23	15.09	12.70	4.37
8210A	25.40	18.28	15.88	4.37
8212A	29.79	20.65	19.05	4.37
8214A	30.16	23.01	22.23	4.37
8216A	32.54	24.61	25.40	4.37
8218A	34.93	27.00	28.56	5.15
8220A	38.10	29.36	31.75	5.15
8222A	41.28	31.75	34.93	5.15
8224A	44.45	34.93	38.10	5.15
8228A	50.80	39.70	44.45	5.15
8232A	57.15	44.45	50.80	5.56
8236A	63.50	49.23	55.58	5.56
8240A	69.85	55.58	61.93	5.56
8244A	76.20	60.33	70.64	5.56
8248A	82.55	66.68	76.99	5.56

Bendix-SP connector gaskets B series



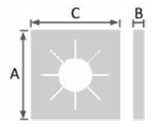
Part number	Dimensions in mm			
	A	B	C	D
8206B	24.21	16.28	9.53	4.06
8208B	26.59	18.64	12.70	4.06
8210B	28.56	20.62	15.88	4.06
8212B	31.75	23.83	19.05	4.06
8214B	34.93	26.19	22.23	4.06
8216B	36.50	28.56	25.40	4.06
8218B	38.51	30.56	28.56	4.06
8220B	42.47	32.94	31.75	4.06
8222B	44.45	34.93	34.93	4.06

RF connector gasket



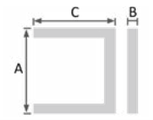
Part number	Connector type	Dimensions in mm			
		A	B	C	D
8200RFBN	BN	17.45	12.70	11.10	2.77
8200RFBNC	BNC	17.45	12.70	11.10	2.77
8200RFC	C	25.40	18.26	15.88	4.37
8200RFHN	HN	30.18	23.01	19.05	3.56
8200RFLC	LC	50.80	36.50	31.75	6.53
8200RFN	N	25.40	18.26	15.88	4.37
8200RFUHF	UHF	32.54	24.61	25.40	4.37

C series



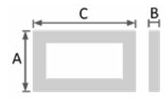
Part number	Dimensions in mm		
	A	B	C
8200C	14	2	14

D series



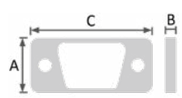
Part number	Dimensions in mm		
	A	B	C
8200D	18.9	1.5	18.1

E series



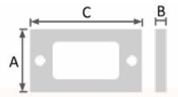
Part number	Dimensions in mm		
	A	B	C
8200E	16	3	26

F series



Part number	Dimensions in mm		
	A	B	C
8200F	12.5	1	31

G series

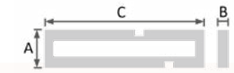


Part number	Dimensions in mm		
	A	B	C
8200G	19	2	33.4

H series

Part number	Dimensions in mm		
	A	B	C
8200H	14	1	49

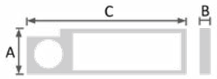
I series



Part number	Dimensions in mm		
	A	B	C
8200I	17.8	1.52	52.3

» Connector gasket 8200

J series

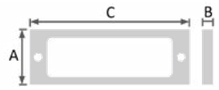


Part number	Dimensions in mm		
	A	B	C
8200J	12.5	1	53

K series

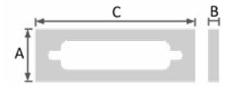
Part number	Dimensions in mm		
	A	B	C
8200K	19	2	55.6

L series



Part number	Dimensions in mm		
	A	B	C
8200L	17.8	2.5	57.9

M series



Part number	Dimensions in mm		
	A	B	C
8200M	15	3	72

Conductive rubber connector gaskets (alternative)

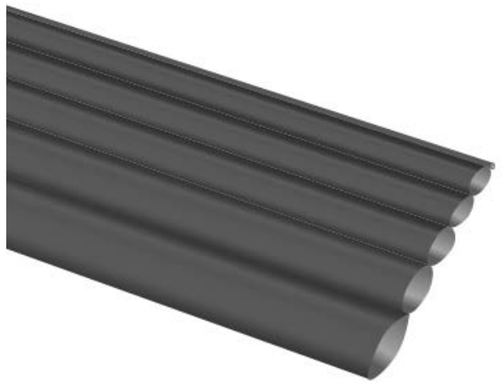
For very high performance applications where an IP-tight (waterproof) connection is required, we can make connector gaskets out of electrically conductive rubber or wire-filled silicone. For more information see 5750 series Electrically conductive rubber or 5711- 5722 series Oriented wire shield.

ORDER EXAMPLE

Part number	Covering	Thickness (mm)	Adhesive	Mounting
Select the part number from the connector gasket part number tables above	**A :** Amucor foil (standard) **T :** Conductive textile	**1 :** 1mm thickness (standard) **2 :** 2mm thickness **3 :** 3mm thickness	**01 :** With self-adhesive **02 :** Without self-adhesive (standard) **03 :** Conductive self-adhesive	**Front :** Front mounting **Rear :** Rear mounting

CONDUCTIVE SHRINKING SLEEVES 4980

Used for cables and connectors & easy to use



The Conductive shrinking sleeves are used for cable and connector terminals to provide efficient EMI shielding. The sleeve is a combination of heat shrink polyolefin tube and a flexible conductive layer that can shrink. When the sleeves are heated the conductive layer will shrink at the same time.

The 4980 sleeves are easy to instal and are lighter than traditional metal braid shielding sleeves. The shielding performance can be 35 dB up to 50 dB in 14 kHz up to 10 GHz in frequency.

Features & benefits

- High shielding effectiveness, quite wide shielding frequency, can work in 14 kHz- 10 GHz and meet the stringent requirement. The shielding effectiveness can be up to 50 dB, which is higher than the general shielding cable.
- Light weight compared with the general anti-wave sleeve. Using the 4980 sleeves can make the weight decrease by more than 35%, especially when using the small diameter size, the weight will reduce more than 60%.
- Good flexibility, the shielding layer is high polymer material and can be bended at random, won't affect the shielding layer.
- Easy to use, it's quite convenient and quick to heat-shrink by using a heat gun.
- Length of the sleeve 150 mm.

Technical performance

Shielding effectiveness (dB)	50+-
Shrink ration (%)	50~85
Shrink temperature (°C)	120~190
Working temperature (°C)	-55~130

Standard dimensions

Partnumber	Diameter Ø (mm)
4980-3.2	3.2
4980-6.4	6.4
4980-9.5	9.5
4980-12.7	12.7
4980-19	19
4980-25.4	25.4
4980-32	32
4980-38	38
Other dimensions on request	

ORDER EXAMPLE

Part number	Diameter Ø (mm)	Length (mm)
4980	**3,2 :** 3,2 mm **6,4 :** 6,4 mm **9,5 :** 9,5 mm **12,7 :** 12,7 mm **19 :** 19 mm **36,4 :** 36,4 mm **32 :** 32 mm **38 :** 38 mm	Specify the desired length in mm. Maximal length is 910 mm

Thermal grease 1100

Ceramic-filled single-component silicone with high thermal conductivity

Thermal grease is a ceramic-filled single-component silicone with high thermal conductivity. The non-cross linked thermal compounds will not dry out and the silicone components do not leak out of the compound. The paste is particularly suitable for silicone-sensitive applications. The long-term stability of our 1100 series guarantees full functionality during the entire lifetime of the product. Under normal application conditions Thermal grease will not cure, dry our, or melt.

Storage

Special storage is not required for our Thermal grease, so it can be stored under normal climate conditions for up to 12 months. If any separation of the filler materials is noted, the 1100 series must be mixed thoroughly before use.

Properties per part number

Properties	Unit	1100-98
Colour		Gray
Compound		Soft / pasty
Thermal properties		
Thermal resistance Rth	K/W	0.0100
Thermal impedance Rti	°Cmm²/W KIN²/W	4.1 0.0064
Thermal conductivity	W/mK	6.0
Electrical properties		
Electrical conductivity (according to DIN 51412-1)	pS/m	0
Mechanical properties		
Measured thickness (+/- 10%)	Mm	0.025
Physical properties		
Application temperature	°C	-60 to +200
Density	G/cm³	2.2
Viscosity*	Pas	110- 150
Total mass loss (TML)	Ma.-%	< 1.5
Possible thickness	Mm	Variable

ORDER EXAMPLE

Series	Type	Content
1100	98	

7 : 7 grams (standard)
15 : 15 grams

Thermal pads 1150

Thermal interface materials (TIMs) are designed to fill in air gaps and microscopic irregularities

Thermal interface material is used to fill the gaps between thermal transfer surfaces such as between microprocessors and heat sinks, in order to increase the efficiency of thermal transfer. There is usually air in these gaps, and air is a notoriously poor conductor. The interface material is easy to handle and is not messy. It is available in solid and liquid form and comes in various thicknesses.

Thermal conductivity

The thermal conductivity of the interface material determines its thermal performance to a large extent. The high thermal conductivity of this product guarantees sufficient heat transfer, resulting in a better cooling solution and the desired heat dissipation.

This film, wih its excellent thermal and electrical properties, is especially suitable for high-power applications. The material performs so well that it can be used reliably in densely packed electronic applications.

Properties

- Good insulation properties
- Heat conducting
- Good compressibility
- Flexible
- Environmentally friendly

Applications

- RD-RAM memory chips
- Heat pipe thermal solutions
- automotive engines
- control units
- plasma supply panels

Benefits

- Temperatures up to 200 °C
- High insulation properties
- Supplied as sheets, strips or die-cuts
- Thicknesses of 0.5 to 5 mm (see table below)

Part number	Color	Thermal resistance	Thermal impedance	Thermal conductivity	Breakdown voltage	Dielectric breakdown Ed; ac	Volume resistivity	Dielectric loss factor tan δ	Dielectric constant εr	Hardness	Young´s modulus	Application temperature	Density	Available thickness
		K/W	°Cmm²/W Kin²/W	W/mK	KV	KV/mm	Ωm			Shore 00	N/cm²	°C		mm
1150-125	Dark orange	0.8	322 0.5	1.5	6.0	12.0	6.1 x 1010	1.5 x 10-1	4.3	10- 25	24	-40 to +180	2.0	0.5, 1.0, 1.5, 2.0, 3.0, 4.0, 5.0
1150-128	Pink / dark orange	0.8	322 0.5	1.5	6.0	12.0	1.8 x 1012	1.0 x 10-3	2.3	10- 25	67	-40 to +180	1.9	0.5, 2.5, 4.5
1150-200	Pink/yellow	1.2	480 0.75	1.0	8.0	16.0	1.0 x 1011	1.5 x 10-3	3.9	10- 20	22	-60 to +200	1.61	0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0
1150-225	Orange	0.6	240 0.37	2.0	6.0	12.0	2.2 x 1011	1.0 x 10-3	3.6	30- 45	58	-40 to +180	1.65	0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0
1150-228	Pink / orange	0.6	240 0.37	2.0	6.0	12.0	2.8 x 1011	1.0 x 10-3	2.5	30- 45	160	-40 to +180	1.95	0.5, 1.0
1150-235	Yellow	0.6	240 0.37	2.0	6.0	12.0	1.7 x 1011	2.0 x 10-2	3.7	25- 40	32	-40 to +200	1.65	0.5, 1.0, 1.5, 2.0, 2.5, 4.0, 5.0
1150-238	Pink / yellow	0.6	240 0.37	2.0	6.0	12.0	4.7 x 1011	1.0 x 10-3	1.9	25- 40	122	-40 to +200	1.65	0.5, 1.0, 2.0, 3.0, 4.5
1150-320	Yellow	0.5	147 0.23	2.5	5.0	10.0	6.8 x 1011	2.9 x 10-2	3.4	25- 38	32	-40 to +180	1.69	1.0, 1.5, 2.0, 3.0, 4.0, 4.5
1150-450	Brown	0.27	108 0.18	4.5	5.0	10.0	3.6 x 1012	3.0 x 10-3	2.5	65- 75	95	-40 to +180	1.32	0.5, 1.0
1150-500	Brown	0.25	100 0.15	5.0	1.0	2.0	1.0 x 1011	1.5 x 10-3	3.9	65- 75	70	-60 to +200	1.33	0.5, 1.0, 1.5, 2.0
1150-525	Violet	0.22	89 0.14	5.5	1.25	2.5	1.6 x 1013	1.0 x 10-3	2.7	50- 65	99	-40 to +180	1.18	0.5, 1.0, 1.5, 2.0, 2.5, 3.0
1150-550	Light grey	-	0.22	6.0	>5.0	15.5	6.0x1013	-	-	55-65	-	-58 to +200	-	0.5, 1.0, 1.5, 2.0, 2.5
1150-600	Grey	0.2	80 0.12	6.0	1.5	3.0	1.7 x 1010	2.0 x 10-3	2.5	60- 75	77	-60 to +180	1.28	0.5, 1, 1.5
1150-U110 (silicon free)	Brown	1.2	-	2.0	-	8.0	-	-	-	60-75	-	-40 to +110	1.87	0.5, 2.0

Silver-filled conductive silicone grease 1110

An electrically conductive silicone grease for improving electrical connections between sliding surfaces and part

Silver Conductive Grease provides maximum electrical and thermal conductivity, proven lubrication properties, and protection from moisture, oxidation, and other environmental hazards. This system utilizes an advanced silicone lubricant that is compatible with metal, rubber, and plastic.

As with any compound, compatibility with substrate should be determined on a non-critical area prior to use.

Typical applications

Our Silver Conductive Grease may be used for high and low power applications including:

- Lubrication of Substation Switches or Circuit Breakers
- Heat Dissipation from Transformers
- Low or Medium Speed Sliding Contacts
- Static Grounding on Seals or O-Rings
- Extending the Life of Rotating Switches

Benefits

- High electrical conductivity
- Excellent thermal conductivity
- Provides protection against wear
- Improves electrical connections between irregular surfaces
- Remains stable in a wide temperature range;-70 to 485°F (-57 to 252 °C)
- Protects against moisture and corrosion
- Extends the life of contacts
- Very low viscosity vs. temperature change
- Safe on plastics
- Ensures electrical contact between loose or vibrating parts and small gaps

ORDER EXAMPLE

Series
1110
Silver-Filled Conductive Silicone Grease

Technical details

Data	Specification
Material	100% Silver Filled Silicone Grease
Color	Silver/Gray
Consistency	Smooth Paste
Specific Gravity	2.7 –3.2
Volume Resistivity	<0.01 ohm-cm
Surface Resistivity	0.5 – 1.0
Color	Gray
Evaporation	< 1%
Bleed	< 1%
Electrically Conductive	Yes
Thermally Conductive	Yes
Thermal Conductivity (BTU-in/hr-ft2-°F)	38.8
(CAL-cm/sec-cm2- °C) 1.3 x 10-2	1.3 x 10-2
(W/m°K)	5.6
Consistency	Paste
Operating temperature range	-70 to 485°F (-57 to 252 °C)
Unworked Penetration (ASTM D-1403) 77°F	210
Worked Penetration (ASTM D-1403, 60 Strokes)	250
Dropping Point (ASTM D-2266)	491°F (255 °C)
Steel on Steel Wear (ASTM D-2266)	1.5mm
Corrosion on Copper	None
Moisture Resistance	Excellent
Chemical Resistance	Excellent
Electrical Conductivity	Excellent
Thermal Conductivity	Excellent
Lubrication Properties	Excellent
Protection from Oxidation	Excellent
Power Rating	High/Low
Standard package	7 grams

Conductive nickel coating 3800N

For EMI/RFI shielding of plastic housings and plastic components

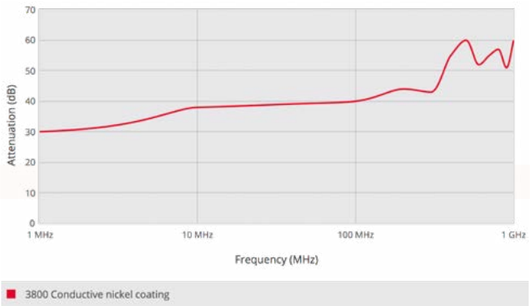
Applying electrically-conductive nickel coating 3800 series is a fast and easy method for EMI/RFI shielding/screening of plastic enclosures/housings. Your electrostatically sensitive applications can be shielded by using an electrically conductive paint containing nickel, copper or silver.

The paint comes in aerosols (Part number 3801) for easy use, but can also be supplied in tins of 5 liters, 7 kg (Part number 3805) and tins of 20 liters, 28 kg (Part number 3820) if you need larger quantities. Materials such as iron-chromium-aluminium and molybdenum disilicide are used for higher temperature applications.

Some oxide ceramics are used as conductors and semi-conductors for specialized applications. To fulfill the requirements concerning the limits of immunity and emission to interference, plastic housings and components need to be coated either fully or selectively with an electrically conductive coating. The nickel-conductive coating is contained in an air-drying acrylic resin.

It is recommended that an grounding connection is made to achieve maximum shielding performance. A suitable material for this is Part number 3201 Copper shielding tape which can simply be stuck onto the coated surface or over-sprayed with the electrically-conductive nickel coating. The coating, once it has been applied, has a mat gray textured finish.

Shielding effectiveness



Benefits

- Available in aerosol for prototype and small runs (Part number 3801)
- Low surface resistivity of 0.9Ω/sq yielding high attenuation
- Enables speed and easy coverage of complex shapes
- Delivery from stock
- Cost-effective solution
- Compatible with most plastics and metal substrates, the paint meets the requirements of BS IEC 61340-5-1:2001 and suitable for use in Atex hazardous environments.

PHYSICAL PROPERTIES

Color	Gray
Flash point (Abel closed cup- method IP 33/59)	25 °C
Recommended dry film thickness (ASTM D 4138-82)	50 microns (2 thou)
Specific gravity	1.5 g/cc
Coverage per liter at 50 microns	7-10 square meters
Drying time: touch	15 minutes
Drying time: full	12 hours
Adhesion (BS 3900 E6)	Excellent
Pencil hardness (ASTM D3363-74)	H
Shelf life	12 months
Surface resistivity at 50 microns (2 thou) ASTM D257	0.5 Ohms/square or less
Viscosity when tinned 1:1 with 3800N thinner	0.6p on a cone & plate, 27-32secs on a B4 flow cup
SE(dB)	50-55
UV-resistant	Yes

How to order

Part number
3801N: Aerosol 400 ml **3805N:** Tin 5 liters (7 kg) **3820N:** Tin 20 liters (28 kg)

conductive silver plated copper coating 3800C

EMI/RFI shielding application for prototype and touch up work of plastic enclosures/housings

Conductive silver plated copper coating Is supplied ready for use, it is designed to give low resistance in thin film thickness, and exhibits superb EMI shielding and grounding properties displaying excellent adhesion to most plastics and is specially suitable for electronic equipment housing. It exhibits superb long term shielding and grounding properties while providing an esthetically pleasant appearance.

The resin becomes touch dry in approx. 5 minutes after application, to handle in 10 minutes and achieves maximum conductivity within 4 to 16 hours when air dried. It is intended to prevent electrical interference which penetrates enclosures made from thermoplastics and other insulating materials. The coating also prevents static build up.

It is recommended that an grounding connection is made to achieve maximum shielding performance. A suitable material for this is Part number 3201, Copper shielding tape which can simply be stuck onto the coated surface or over-sprayed with the electrically-conductive copper coating. The coating, once it has been applied, has a copper colored finish.

PHYSICAL PROPERTIES

Surface resistance at 25 micron (thou) ASTM D257	0.5 ohm/square or less
Conductive additive	Silver plated copper
Viscosity	16- 18 sec. (zahn cup 2)
Flash Point	-5°C
Specific Gravity	1050 kg/m3
Typical coverage	5 m2/kg at 25 microns (dependent on substrate)
Drying time: touch	5 minutes
Drying time: full	4 up to 16 hours (air dry)
Shelf life	12 months

Typical properties

Sheet resistance	<0.50 /square at 25 m
Attenuation	75 dB at 50 µm
Maximum service temperature	95 °C

METHOD OF USE

Mixing and dilution

Conductive silver plated copper coating is easily mixed by stirring and care must be taken to ensure all solids are evenly dispersed. Dilution is not usually necessary. Product can be thinned with Xylene based thinners if necessary. ECP JSF024 thinners may be used.

Application method

Conventional propeller agitated pressure pot systems can be used for production. Small sample runs can be sprayed using suction cup spray equipment providing product has been well mixed and is not given time to settle in use. Highest efficiency has been achieved using high volume, low pressure (HVLP) spray guns.

A nominal 25-50 *m coating thickness is recommended for good shielding properties. A thinner coat can be used depending upon the shielding requirements of the device being protected. Avoid dry spray for maximum adhesion and conductivity.

Part number

3801C: Aerosol 400 ml
3805C: Tin 5 liters (7 kg)
3820C: Tin 20 liters (28 kg)

Conductive translucent paint 3821

Aerosol Permanently Conductive Graphene Hybrid Transparent Acrylic Paint

3821 Conductive translucent paint is a single component permanently conductive graphene hybrid clear acrylic coating which provides effective static elimination for electronics safe handling area and explosive atmosphere applications. Fully compliant with BS EN 61340-5-1:2007 and ATEX. Contains carbon nanotubes and graphene derivative.

Applications in lighting, windows, clear covers and lids, displays etc. Supplied as an aerosol for ease of application.

Physical properties

Surface Resistivity at 50 micron (ASTM D257)	<10^7 ohm/sq
Recommended Dry Film Thickness	20 micron
Density	1.1g/cm³
Drying Time- Touch	20 Minutes
	Full 12 Hours
Static Decay (IEC TC15)	< 2 Seconds
Light transparency	87%
Coverage	6-8 m²/liter

How to order

Series

3821

Method of use

Surface Preparation

All contaminants must be removed from the surface. Mark areas that do not require coating. A suitable primer may be necessary on certain substrates such as Polyethylene and Polypropylene. Please contact us for a suitable primer.

Application

One or two passes are normally required to give optimum thickness and surface resistivity values depending on the degree of transparency required.

Supplied as a 400 ml aerosol

Precautions

Highly flammable- Keep away from sources of ignition. No smoking. Keep away from heat, sparks and open flames. Keep all containers closed when not in use.

Use under well ventilated conditions, personal respiratory protection should be worn during spraying conditions. Such devices must be used in accordance with the manufacturers instructions.

Avoid contact with skin, wear protective gloves and clothing. Wash thoroughly with soap and water after use.
If accidentally swallowed, seek medical advice.

Transparent coating with flexibility 3822

High conductivity for flexible surfaces

Transparent coating with flexibility is a polyurethane graphene hybrid paint. The article is delivered in a can of 1L and it is suitable for applications where a highly conductive surface is required on a flexible surface.

The following articles can be used as an example:

- PVC
- P.U. elastomer
- Fabrics
- Rubber variants
- Leather
- Etc.

Technical data

Surface Resistivity		<107 ohms/Sq
Color		Transparent
Flash Point		4 °C
Overcoating		Possible at any stage of dry
Film Thickness	Wet	50 micron
	Dry	10- 15 micron
Elongation		Approximately 500%
Finish		Low gloss
Coverage		Approx. 10 sq.m/liter. (dependent on substrate)
Storage		12 months in original sealed containers
Maximum VOC Content		0.8 kgs/ltr
Packaging		1L can

Applications

Typical applications include the removal of static electricity from electronic components in sensitive areas, such as touch screen monitors and flexible control panels in hospitals, as well as ATEX processing environments such as oil rigs etc.

The 3822 transparant coating is generally applied directly to a clean and grease free substrate.

Thinners may attack some plastics, try before applying. The paint is thinned with approximately 15-30 % thinner for spraying or 10% thinner for brushing.

The 3822 is an air drying coating that is touch dry in approximately 5 minutes at 20 °C, hard dry in 20 minutes, with full properties in around 1 hour.

How to order

Part number	
3822	Transparent coating with flexibility 1L can

2 component coating for floors 3823

A water based epoxy with hardener for floors

2 component coating for floors is a permanently conductive, clear, two pack water-based epoxy graphene paint. High quality, water borne two pack epoxy system. It is very environmentally friendly, easy to clean with equipment using water and it provides the benefit of a low odour.

You can find the 3823 in different applications such as floor coatings (particularly where the previous coating is unknown as solvent will attack many coatings causing them to lift).

Technical data

Solids	approximately 36-38 %
Flash point	N/A
Specific gravity	1.35 g/cm3
Viscosity	2.3 poise ICI cone and plate
Storage	6 months in original sealed containers
Pot life	1 hour at 20 °C
Ph	8.0
Firm dry	16 hours
Hard dry	3 days
2 pack mixing ratio	4:1 (4 parts water base epoxy to 1 part hardener)
Cleaning	Use warm soapy water before curing is complete
Thinning	If required thin with approx. 10-20 % water (thin after mixing the 2 parts)
Color	Light grey
Surface resistance	< 106 Ω per square at 2 coats

Typical installations including:

- Electrical industry
- Petrol/ Chemical industries
- Water treatment plants
- Hospitals
- ATEX Environments e.g oil rigs, sewers, mines
- And many other industrial uses

The 3823- 2 component coating is showing excellent mechanical properties that can withstand wear and impact, and is also resistant to a wide range of chemicals, including:

- Fats
- Oils
- Acids
- Solvents
- Alkalis

The electrical properties of the paint are permanent and independent of humidity, additionally a conductive underlay is not required for grounding the system. The 3823 provides the option of directly grounding racking/shelving used for storing ESD'S (electrostatic sensitive devices) to the floor.

For grounding applications for personnel the product is best used in conjunction with suitable electrostatic dissipative footwear.

How to order

Part number	
3823	2 component coating for floors 1L can

Wallshield coating 3824

Shielded carbon paint for use in- and outside

The 3824 wallshield coating is based on a high quality pure acylate binder. The paint is odorless, low-emmision,solvent free, breathable and frost resistant for shipping in winter.

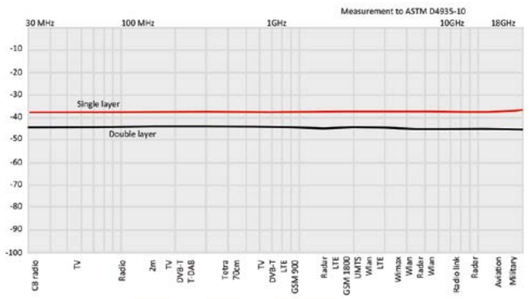
With this paint you can easily shield your walls against the high frequency fields of transmitter masts and / or the DECT telephone and wireless internet of your neighbors.

3824 can usually be painted over within 24 hours. The paint must be applied undiluted with a brush or roller (thin coat).

Surface

Interior and extrior has a excellent adhesion on almost all surfaces such as old layers of paint, plasterboard, wallpaper, stucco, concrete, foam, wood, glass, plastic surfaces etc.

Shielding performance



Benefits

- HF-Shielding paint with high attenuation value
- For on walls, ceiling, floor
- Very thin and easy to apply
- Consumption:
  - Indoor up to 7.5 m2 per liter on a non-absorbent surface
  - Outside: up to 5m2
- Paintable or wallpaperable
- For indoor and outdoor use
- Contains no metals, solvents or preservatives
- Can be applied in any direction
- Can also be used for low-frequency fields through good grounding

Application

- Wall exterior
- Ceiling
- Wall interior

Properties

Based on a new multi-phase pure acrylate binder. Breathable, free of solvents, plasticizers and emissions. For shielding high frequency electromagnetic fields and low frequency electric alternating fields.

- As a 0-VOC paint emission-free and almost odorless
- Moisture resistance
- Adhesive strength / impact resistance
- Extremely versatile for indoor and outdoor use
- Without metals, herefore corrosion resistant
- High decline with single-layer processing

Technical details

Screening one-layer	37 dB (99.980 %)
Screening two-layer	44 dB (99.996 %)
Ecology	Normal
VOC content	0.2 g/l
PAH content	0.002 mg/kg
Binding agent	Pure acrylate
Solvent	Water
Screening basis	Carbon
Application area	Interior, exterior
Coverage one-layer	5- 7.5 m²/l
Moisture resistance	High
Substrates	Almost all
Applicable with	Paint roller, airless (nozzle>525)
Spatter behavior	Very low
Adhesive tensile strength	2.3 N/mm²
Viscosity (Brookfield)	2000 mPas
Rheology	Newtonian
Film character	Elastic soft
Color	Black
Temperature max.	100 °C
Sd-value	0.1 m
pH-value	8
Pigmentation size max.	100 µm
Density	1.25 kg / l
Solids content	56 %
MFFT	5 °C
Frost resistance***	5 frost-/thaw cycles
Delivery size	1 L
Shelf life	12 months after delivery

* Volatile organic compounds. The EU limit value for cat. A/a is 30 g/l (by 2010).
** Polycyclic aromatic hydrocarbons. The nonbinding EU limit value for children toys is 0.2 mg/kg.
*** The given frost resistance is valid liquid in the container, of course on the wall its permanent frost-resistant.

Coating

Preferably covered with plastic bonded, water-based emulsion paints, dispersion silicate paints, facade paints or silicon resin paints. Not applicable are pure mineral paints (clay, loam, chalk, silicate). Due to the high adhesive tensile strenght (to ETAG 004 for EIFS-systems, minimum 0.08 N/mm²), applicable directly under pure organic plaster, no mineral pasters!

Ingredients

Pure acylic dispersion, graphite, water, carbon black, additives, preservative (MIT, BIT)

How to order

Part number	
3824	Transparent coating with flexibility 1L can

Conductive Silver coating 3830

Silver-pigmented conductive coating

Silver coating 3830 is the latest in a series of coatings which provide electromagnetic compatibility (EMC). This product has been specifically designed to offer more coverage while maintaining very high conductivity.

This is a very economic means of achieving excellent shielding against emitted electromagnetic interference (EMI).

The coating retains its low resistance even after exposure to heat, cold, humidity, and salt spray. The product is simply sprayed or brushed on and then left to air-dry, and does not require either a primer or a top coat.

It is easily applied by spray or brush and is compatible with the types of plastic that are commonly used in enclosures for electronic equipment.

Available in cans of 30 grams.

Typical properties

Color	Silver
Technology	Thermoplastic
Operating Temperature-(Maximum)	105°C
Solids Content, %	47
Viscosity @ 20 °C, mPa·s (cP): Speed 20 rpm	900
Density, kg/cm³	1,340
Theoretical coverage, m²/kg: @ 10 µm coating thickness	10
Shelf Life @ 5 to 30°C, year	1
Flash Point , °C	14

Typical properties of cured material

On Lexan panels, dried 30 minutes @ 70 °C

Physical Properties	
Attenuation @ 15 µm coating thickness, dB	70 to 80
Electrical Properties	
Sheet Resistivity , ohms/sq: @ 25 µm coating thickness	<0.015

Benefits

- Excellent conductivity
- Very smooth, bright coating
- Meets UL specification 746-C
- Overspray easily removable with MEK
- Excellent adhesion to substrates such as polycarbonate, ABS, polystyrene and PC/ABS blends

Typical applications

- Plastic enclosures of mobile telephones; laptop and
- Notebook personal computers; industrial, military, scientific and medical equipment.

Surface preparation

Make sure substrate is clean (free from dirt and grease) and dry.

Mixing and Dilution

Thoroughly mix Silver Coating 3830 before use.
Check to make sure there are no unmixed solids at the bottom of the container.

By brush:
Use Silver Coating 3830 neat for brush application.

By spray:
Use Methylethylketone (MEK)
By Volume: 2 part(s) product to 1 part(s) solvent
By Weight: 1 part(s) product to 1 part(s) solvent
If the evaporation speed of this mixture is too high, replace 10 to 15% of the Methylethylketone (MEK) by Diaceton Alcohol (DAA).

ORDER EXAMPLE

Series
3830
Conductive Silver Coating 30Gr package

Conductive metalization 3838

For higher EMI/RFI shielding demands and larger quantities we can sputter a fully metal, electrically conductive coating onto 90% of all commonly used plastics

Sputtering is a technique used to create a thin layer of metal on a part made out of synthetic material. This technique is used for protective coatings that meet extremely high standards.

The process takes place in a high-vacuum chamber, in which argon is brought to a pressure of about 5E-3 mBar. On one wall is sputtered material that should be, this is the so-called target. Opposite the substrate. This is the material the sputtered material to be made. On the target is an applied voltage of around-500V. With these pressures in an argon-plasma of such positive ions, these ions move visibility into the negatively charged target, the collision with the target material are released and move to the other side fails. After a certain time has a thin layer. Sputtering is faster when the target behind a magnet. The magnetic field creates an electronic track with a round (or oval) forms in the target erosion pattern. Not even metals can be sputtered instead of a DC voltage is an RF voltage is used (usually 13.65 MHz). Sometimes it can / should be a gas (along with argon) to create the desired layer. This is called reactive sputtering.

By this metal ion bombardment melting the metal particle as it were, into the plastic without being affected. And a high degree of adhesion is the result.

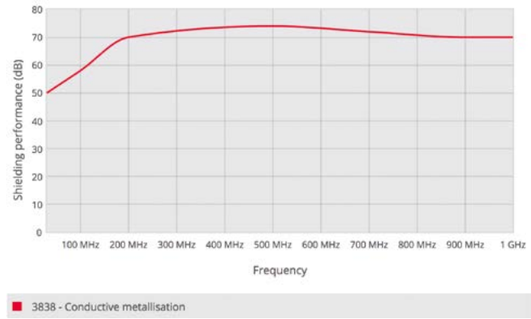
First a thin layer of stainless steel, to prevent the softeners in the plastic affecting the shielding. Secondly a thin layer of copper for superb shielding performance. And thirdly another layer of stainless steel to avoid corrosion.

It is also possible to only metalize a part of your plastic housing. That we call selective metalization.

Conductive metalization applications

- Shielding/Screening (EMI, RFI)
- To meet EMC standards

Shielding performance*



Quotation

To make a quotation we ask you to upload a drawing or photograph of the relevant object that should be metallized together whit the quantities.

High temperature conductive coating 3840

Elemental static silicone/acrylic coating which offers great electrostatic resistance in addition to its anti-corrosion properties. Continuous heat resistance is provided up to 350 °C.

An elemental static silicone/acrylic coating that offers great electrostatic resistance in addition to its anti-corrosion properties. Continuous heat resistance is provided up to 350 °C. Typical applications would include oven interiors, flow solder machines, etc. The 3840 high-temperature conductive coating is standard packed in a 1 L can but on request available in cans of 5 L and cans of 20 L.

Mixture

Phenylmethyl polysiloxane resin, acrylic resin, conductive mineral additive, titanium dioxide.

Application

Surface preparation	All contaminants including mould release, grease, and dirt must be removed. A suitable primer may be necessary on certain substrates.
Mixing	Some settling may occur in the can, so care must be taken to mix in all solids. Should any dilution be necessary, thinners should be used.
Application	The 3840 can be used by a conventional spray gun (40 – 50 psi pressure), or by brush coating.
Stoving	Allow parts to air dry for a minimum of 24 hours then oven cured at a temperature of 100 °C for approx. 10 minutes.

Technical specifications

Properties	
Surface resistivity	108Ω/sq. (ASTM D257)
Color	Light grey
Specific gravity	1.3g/cc
Coverage	Approx. 4 – 6 sq mtr/ltr.
Drying time (air)	1 hour – touch dry
Stoving at 220 °C	10 – 15 minutes
Shelf life	6 months

Precautions

This product is highly flammable. Keep away from heat, sparks, and open flames. Keep all containers closed when not in use. Use under well-ventilated conditions. Personal respiratory protection should be worn under spraying conditions. Such devices must be used in accordance with the manufacturer's instructions. Avoid contact with skin. Wear protective gloves and clothing. Wash thoroughly with soap and water after use. If accidentally swallowed, seek medical advice.

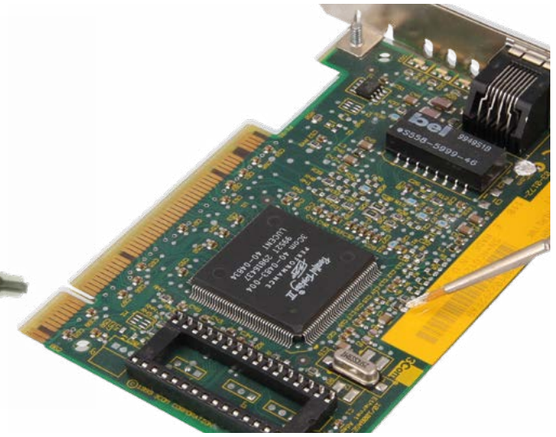
ORDER EXAMPLE

Part number		Content (L)
3840	–	

1 : 1 liter
5 : 5 liter
20 : 20 liter

Electrically conductive glue (shieldokit) 3980

Electrically conductive glue / Electrically conductive adhesive



Shieldokit creates an electrically and thermally conductive connection between components (electrically conductive adhesive). One of the applications is EMI shielding.
The conductive glue cures at room temperature and has excellent filling properties. The viscosity of conductive glue is comparable to peanut butter, so it can be used to fill in uneven surfaces.

The product consists of a two-component epoxy-based glue containing 65% silver. It is a paste which can be applied to metals (copper, aluminium, stainless steel, brass, etc.), ceramics and most plastics.

Technical Application

Shieldokit is designed to connect components at temperatures between 20 and 80°C.

Structure

Shieldokit is a solvent-free, silver pigmented two components conductive adhesive, based on epoxy resin.

Special Characteristics

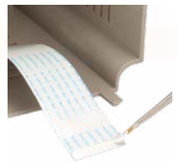
Shildokit shapes a strong connection with excellent conductivity. The two components base offers a hardening at room temperature and the adhesive is thereby suitable to connect temperature-sensitive components.

Application

Shieldokit can be applied with a dispenser or by screen printing. It is absolutely necessary to clean all used tools immediately.

Standard package

Shieldokit is typically supplied in PE-cans of 14 gram.



Cured properties

Resistivity	7.0 x 10-3 Ω·cm
Hardness	73 D
Tensile Strength	13 N/mm2
Compressive Strength	39 N/mm2
Lap Shear (stainless steel) (aluminium)	3.8 N/mm2 5.5 N/mm2
Water Absorption	0.04 %
Outgassing @ 125 ˚C for 24 h	6.3 %
Glass Transition Temperature (Tg)	50 ˚C
CTE Prior Tg	54 ppm/˚C
CTE After Tg	169 ppm/˚C
Thermal Conductivity @ 25 ˚C	1.4 W/(m·K)
Service Temperature Range	-55–150 ˚C

Usage Parameters

Working Time	10 min
Service Cure	5 h @ 22 ˚C
Mix Ratio by Volume	1:1
Mix Ratio by Weight	1.04:1

Uncured Properties

Mixed Density	2.29 g/mL
Shelf Life	2 years after production date
Viscosity @ 25 ˚C	(A) 1.000 Pa·s (B) 15.000 Pa·s

Cure instructions

The product will cure at room temperature for 24 hours, or cure the adhesive in a oven at one of these time/temperature options: 15 min @ 65 ˚C, 7 min @ 125 ˚C

ORDER EXAMPLE

Series
3980

Electrically conductive glue needle 3981

The Glue Needle is ideal for applying small amounts of glue. The content consists of electrically conductive silver glue.

The Glue Needle is ideal for applying small amounts of glue. The content consists of electrically conductive silver glue.

For example, these can be used for electrical connections and EMI shielding which are included in computers and telephones, for example.

The adhesive has a very low resistance by adding 80% pure silver. When using this glue you do not need a soldering iron. It is therefore ideal to draw a thin electrically conducting track. The glue can be used on glass, metal, rubber and bakelite.

It is not suitable for conductive connections where mechanical stress occurs. The silver glue that consists of pure silver for 80%, which ensures perfect conductivity of current with a resistance lower than 0.1%. With this glue, you can renew old tracks on printed circuit boards. This glue is also suitable for jumpers on the motherboards of different electronics.

Pay attention!

This glue does not have any pulling force as you are used to with a glue.

Curing

The drying time is 2-4 hours. This drying time can be accelerated by heating (for example, with a hair dryer). The drying time will then be 5-10 minutes. The content is sufficient for about 20 to 30 cm conductive connection. The silver glue can be stored for 12 months after opening. This must happen at room temperature in a dark room.

By default there is 0.3 ml glue in the glue needle. The total content is 1 ml.

Shieldoseal 3991

Creates a electrically and thermally conductive connection between components. Used for ESD and EMI shielding applications.

Shieldoseal is a 65-durometer adhesive sealant that is made of a one-part, electrically conductive silicone-based adhesive with micron-sized nickel-coated graphite particles with excellent filling properties. Shieldoseal cures quickly at room temperature (RTV) in the presence of atmospheric moisture. It can cure on metals (copper, aluminium, stainless steel, brass, etc.), ceramics, and most plastics and can be used in environments from -55 up to + 150 °C without the loss of physical or electrical properties. The material remains as elastic as rubber and is homogeneously conductive.

Shieldoseal can be used to attach shielding windows to edge frames, bond conductive elastomer gaskets, and for EMI and environmental protection as a sealant. Sieldoseal is a high-performance non-corrosive silicone material that meets the requirements of MIL-A-46146 and will form a cured skin within 60 minutes without the formation of corrosive byproducts of exposure to atmospheric moisture. Shieldoseal is a thixotropic paste that can be published on vertical surfaces without prolapsing.

Specifications

Elastomer adhesive	Silicone
Filler material	Nickel coated graphite
Density	2 gcm
Hardness	60 Shore
Volume resistivity	<0.01 ohm/cm
Adhesion	>100Ncm
Attenuation 100 MHz to 10 GHz	80- 115 dB
Elongation	100%
Operating temperature	-55 to 150 °C
Metal with metal	Good
Metal with RFI gasket	Good
RFI gasket with RFI gasket	Good
Shelf life	Stored in a cool dark, dry place. Refrigerator or freezer recommended

applications

- Vibrations and/or shock resistant sealant/adhesive for electronic assemblies
- Environmental sealing
- ESD control/grounding
- Electrical connection/bonding of materials with dissimilar thermal expansion coefficients i.e. mounting shielding windows EMI shielding with environmental sealing

Curing

Specification	Unit	3991
Curring at room temperature	21 °C	Yes
Tack free	Min.	60
Light handling	Hrs.	12 - 24
Full cure	Hrs.	96 - 144
Odorless		No

CAN BE ORDERED SEPARATELY:

3991-M : Shieldoseal manual gun

3991-P : Shieldoseal pneumatic gun

ORDER EXAMPLE

Part number

3991 : Shieldoseal 130 g plastic cartridge
3991-M : Shieldoseal manual gun
3991-P : Shieldoseal pneumatic gun

Conductive mesh 8900

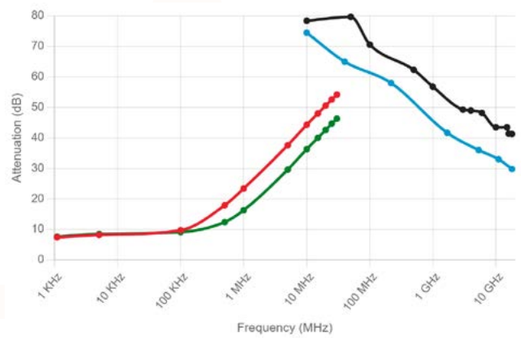
Conductive mesh is made of polyester coated with nickel and copper. It offers excellent surface conductivity, shielding effectiveness, and corrosion resistance for a variety of applications.

Conductive mesh is made of polyester coated with nickel and copper. The base layer is copper, which is highly conductive, and the outer layer is nickel for corrosion resistance. Nickel/copper coated polyester fabric offers excellent surface conductivity, shielding effectiveness, and corrosion resistance for a variety of applications. Conductive mesh is recommended to obtain high EMI shielding at a frequency range of 500 kHz to 10 GHz.

Characteristics

Item	Unit	Spec.	Reference
Roll width	mm	1000	
Roll length		30 meters	
Mesh/OPI		80 - 130	
Mesh total thickness (mm)	mm	0.085 ± 0.01	
Surface resistivity	Ω/square	< 0.13	MIL-G-83528
Mesh count	Inch	130	130

Shielding effectiveness (dB)



Features

- Extremely delicate, lightweight and flexible
- Used for EMI/RFI-shielded windows
- Used to make windows in a Faraday tent
- DFAR compliant
- 80 to 130 OPI
- Used in outer-space probes and leading physics laboratories

Applications

- Electric-magnetic field shielding

Technical details

Material	8901	8902	8903
wires/inch (OPI)	130	130	100
Mesh total thickness (mm)	0.085 ±0.01	0.085 ±0.01	0.050 ±0.01
Nominal Aaperture (mm)	0.110	0.110	0.204
Light Transmission %	64.5	64.5	64.5

ORDER EXAMPLE

Part number	Width (mm)	Length (mm)
8901 : Conductive mesh with flash nickel (black) **8902 :** Conductive mesh with flash nickel **8903 :** Conductive mesh stainless steel	Specify the width of the sheet in mm	Specify the length of the sheet in mm

Mesh foil 9000 - 9300

Using Mesh foil is the easiest way to create transparent EMI/RFI-shielded windows.

Mesh foil is a very fine electrically conductive wire mesh laminated between two layers of scratch-resistant transparent foil. The wires are so fine that they can hardly be seen with the naked eye. The product is very strong but it still bends easily. It is easy to apply Mesh foil onto glass, acrylic and polycarbonate either by hand or with a laminator. It can be supplied with or without self-adhesive. The foil is available in 3 different sheet styles. The maximum sheet/roll in width is approx 1035 mm.

- **1STD** Mesh foil laminated between two layers of plastic
- **4BTB** Mesh foil with 3-4 mm silver busbar at the top and bottom, laminated between two layers of plastic
- **5BAR** Mesh foil with a 3-4 mm silver busbar all around, laminated between two layers of plastic

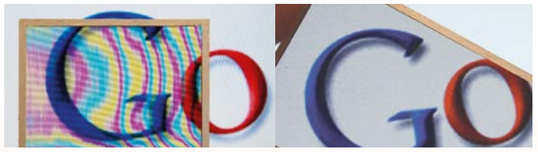
Turnkey windows

If you are interested in ready-made mesh-foil windows, please take a look at our 9700 series EMI/RFI shielded mesh-foil windows. Here the mesh foil is bonded between two layers of glass or plastic, or a single layer of mesh foil is fixed onto one side of a single glass or plastic window.

Technical details

Type (wires/inch)	130
Mesh total thickness (mm)	0.086
Nominal aperture (mm)	0.110
Light transmission %	63

Wire-mesh angle



Mesh foil with moiré effect and without moiré effect

- The wire mesh can be placed at a custom angle to prevent the moiré effect on your display (standard is 0 degrees).
- A custom wire-mesh angle is only available with sheet styles 1 and 5

Mesh foil applications

Shielding displays, windows, touch screens, monitors, LCD screens, TEMPEST.

Options (on request)

- Stainless steel wire mesh
- Blackened copper wire mesh
- Phosphorus bronze wire mesh

Mesh foil options

High performance foil for windows & displays:

- No adhesive 9000 serie
- Transparent adhesive 9100 serie
- Scratch resistance 9200 serie
- Scratch resistance adhesive 9300
- Micro suction silicone adhesive 91SUC

Micro Suction Silicone adhesive

For easy manual application of the foil we have developed a new Micro Suction Silicone adhesive. This adhesive has a number of advantages that make the film easy to position. Our advise is to use standard adhesive only for laminating machines or very very experienced people. For all else use this Micro Suction Silicone Adhesive

Benefits

- Reusable / Repositionable
- Never attach permanently
- Easy to apply by hand, less bubbly

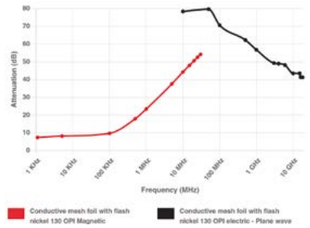
Please note : Mesh foil with Micro Suction Silicone adhesive has a thickness of 450 micron / 0.45 mm.

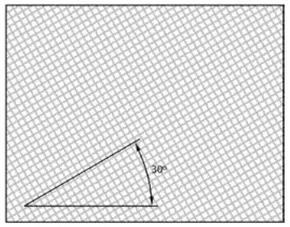
Please note: the top layer can be affected by acids, for example from human skin. To protect the conductive layer, you can apply a transparent film or you can have the adhesive side facing out. Max. working temperature 60 ºC.

Looking for the highest optical quality in transparent EMI shielding? Discover our 9400 Transparent EMI shielding copper grid PET film

Shielding performance*

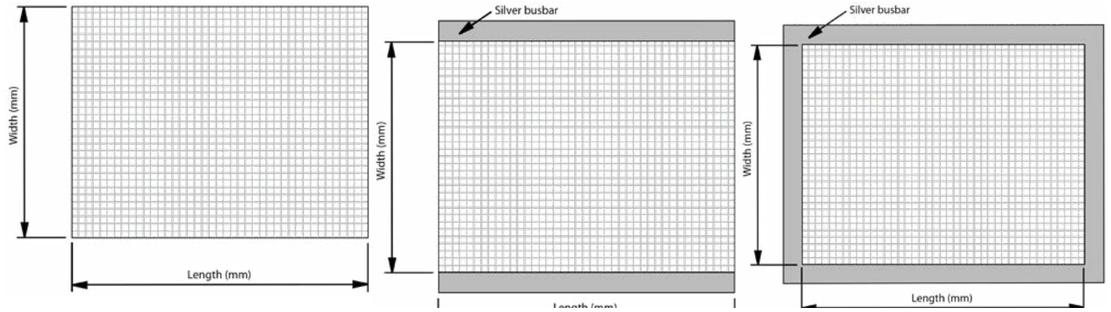
9000 series - Standard mesh foil





NOTE: For LCD displays, 17°, 35° or 45° are used typically. We recommend that you request a sample of the product to determine the proper angle of the wire mesh for your application.

Mesh foil sheet styles

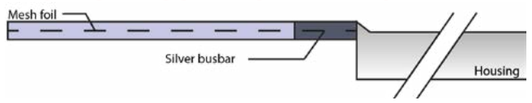


1STD : Standard mesh foil
Mesh foil laminated between two layers of plastic. Available with or without a transparent self-adhesive layer.

4BTB : With silver bar at top and bottom
Mesh foil with 3-4mm silver busbar, laminated between two layers of plastic. At the top and the bottom of the mesh foil there is a silver strip (busbar) to make a perfect electrical connection with your enclosure.

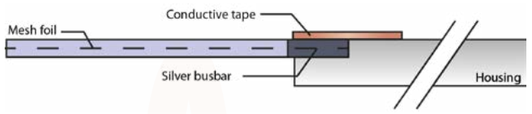
5BAR : With silver bar on all sides
Mesh foil with a 3-4mm silver busbar, laminated between two layers of plastic. On all sides of the mesh foil there is a silver strip (busbar) to make a perfect electrical connection with your enclosure.

MESH FOIL MOUNTING EXAMPLES



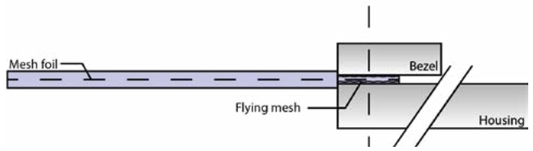
Mounting example 1

Mesh foil mounted with Conductive glue 3980 series



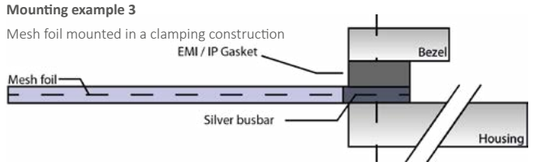
Mounting example 2

Mesh foil mounted with Conductive tape 3201



Mounting example 3

Mesh foil mounted in a clamping construction



Mounting example 4

Standard Mesh foil mounted in a clamping construction with an EMI gasket.

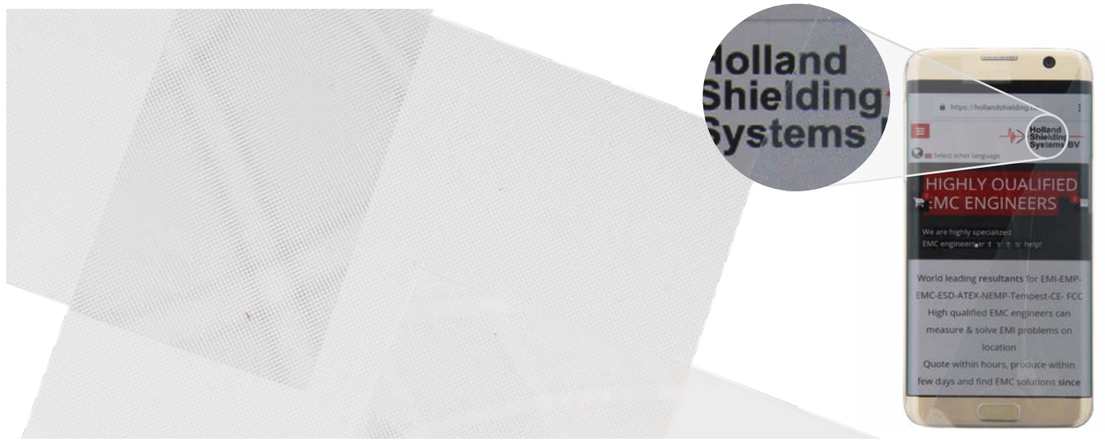
A water seal is possible here.

ORDER EXAMPLE

Series	Width (mm)	Length (mm)	Wire angle	Sheet style	Width (mm) Contact edge
90 : Standard mesh foil **91 :** Standard mesh foil + Self-adhesive **92 :** Standard mesh foil + Scratch resistant layer **93 :** Standard mesh foil + Scratch resistant layer + Self-adhesive **91SUC :** Standard mesh foil + Micro suction silicone adhesive	Width of the visible area in mm	Length of the visible area in mm	Angle of the wire mesh in degrees. Standard is 0 degrees.	**1STD :** Standard mesh foil **2FTB :** With flying mesh at top and bottom **5BAR :** With silver bar on all sides	Specify the width of the contact edge in mm.

Copper grid PET film 9400

PET film deposited with copper grid and protected with a nickel layer

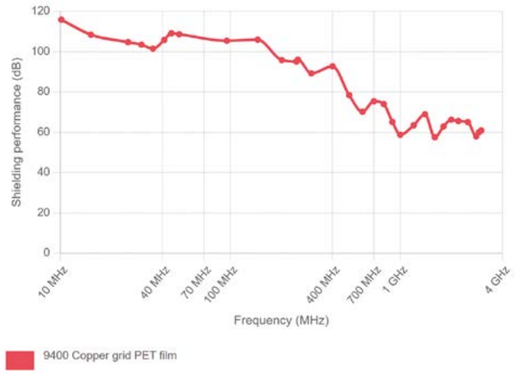


This transparent conductive Metal Mesh PET film is optical PET film deposited with copper grid and protected with a nickel layer. This film conducts better than our best 9900 series Transparent shielding foil and is only a fraction less transparent. This film has a conductive layer with a very fine etched mesh that is one with the transparent carrier.

Transparent conductive Metal Mesh PET film remains very high transparency, this film is extreme low resistance for high frequency EMI shielding application and is easy to apply. The copper mesh is almost invisible.

- Film thickness : 150um
- Transparency : >76%

SHIELDING PERFORMANCE*



Please note : top layer can be affected by acid for example from the skin. To protect the conductive layer, you can apply a transparent film or use the adhesive side on top.

FEATURES

- Conductive layer flexible and durable, surface resistance and basic PET thickness customized available, conductive side hard coating available
- RoHS certificate

APPLICATION

- Confidential meeting room
- Computer room
- Hospital
- Display & windows EMI shielding

STANDARD SIZE

- On roll: roll width 1450 mm
- When you want to order 9400 series Transparent EMI shielding copper grid PET film in specific sizes, please send your CAD drawing.

STRUCTURE

EMI shielding layer + optical adhesive (option A) + release layer. Due to the random structure none or almost no moiré effect is visible when applied to an display.

» Copper grid pet film 9400

Transparent EMI shielding copper grid PET film technical data

Item		Unit	Performance index 150 Mesh/OPI	Detection method	Remark
EMI Shielding Layer		μm	100±5	ASTM D374	Material: PET
Adhesive		μm	20±5		Optical acrylic adhesive gum
Release layer		μm	50±5		Material: PET
Mesh shape			36°		
Mesh width		μm	17		
Mesh spacing		μm	143		
Visible light transmittance		%	≥75	GB/T 2410-2008	
Adhesive force (conductive side)			At least two-stage	GB/T 9286-1998	
Gum peel strength		G/25mm	≥100	GB/T 2792-1998	For glass panel
Wet-hot resisting performance	Resistance variation	%	≤30	65 °C, 90%, 100hours	$\Delta R/R_0$
	Light transmittance change	%	≤5		$\Delta T/T_0$

ORDER EXAMPLE

Series	Width (mm)	Length (mm)	Adhesive
9400	–	–	–
Transparent EMI shielding copper grid PET film	Width in mm (max 1450 mm	Length in mm	**A :** With adhesive **N :** No adhesive (foil only) **SUC :** Suction Silicone adhesive

***Notice**

Information supplied in these data sheets is based on independent and laboratory tests which Holland Shielding Systems BV, hereafter referred to as HSS believes to be reliable. HSS has no control over the design of customer's product which incorporates products, therefore it is the responsibility of the user to determine the suitability for his particular application and we recommend that the user make his own test to determine suitability.

The product described in this data sheet shall be of standard quality, however the products are sold without warranty of fitness for a particular purpose, either expressed or implied, except to the extent expressly stated on HSS invoice, quotation or order acknowledgment. HSS does not warrant that products described in this data sheet will be free of conflict with existing or future patents of third parties. All risks of lack of fitness, patent infringement and the like are assumed by the user.

Shielded EMI glass 9600

A new series of EMI/RFI-shielded glass has been developed. Our EMI/RFI-shielded glass 9600 series is a float glass with a conductive coating on one side to prevent EMI/RFI.

The combination of high light transmission, near-neutral color and low electrical resistance makes this glass an ideal EMI/RFI shield for electronic displays requiring moderate shielding effectiveness and high-quality optical properties.

EMI/RFI-shielded glass is suited for outdoor use and provides excellent shielding performance from 10 kHz up to 40 GHz. In the electrin and electromagnetic fields. In addition the coating has good scratch-resistant properties. Typical applications are medical and military LED/LCD monitors, shielded cameras, sensors and displays.

Our EMI/RFI-shielded glass provides a good balance between shielding on the one hand and optical clarity on the other.

On request EMI/RFI-shielded glass with 20 Ohms/sq is available. The disadvantage of this glass is that it has reduced light transmission and increased light reflection.

TECHNICAL DETAILS

Light transmission	84%
Electrical resistance	10-12 Omhs/sq
Temperatures	-60 / +110 °C
Available thicknesses	3, 4, and 6mm

EMI glass can be produced up to 3 x 1.5m

Advantages

- Excellent EMI/RFI shielding
- High transparency
- Scratch resistant
- Suited for outdoor use
- Any shape or size available
- Can be produced or cut according to CAD drawing

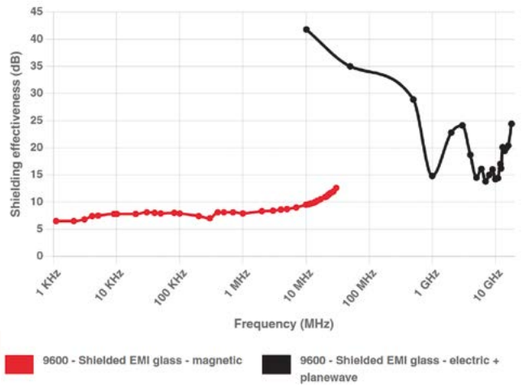
Options (on request)

- Laminated with highly transparent mesh foil for very high shielding performance

Applications

- Shielded sensors
- Shielded displays, glass, or windows
- Shielded cameras
- RF shielding
- EMI shielding

Shielding performance

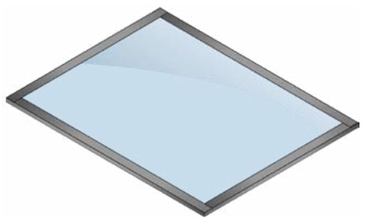


Contact edges

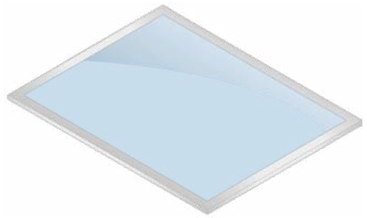
EMI/RFI-shielded glass 9600 series is conductive on one side. If you want to establish a connection with the other side of the glass which is not conductive, a contact edge is needed.

The glass is also available finished with an aluminium frame for easy mounting in Faraday cages and MRI rooms. We can supply EMI-shielded glass with the following edges:

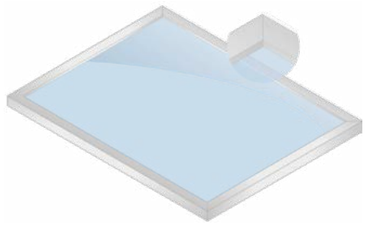
(C) With copper edges for grounding



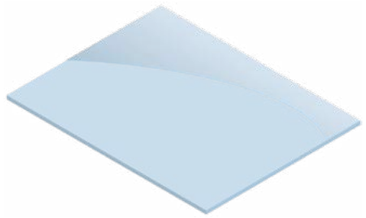
(TC) With tinned copper edges for easy soldering and grounding



(S) With a silver busbar



(F) With an aluminium frame for shielded enclosures, Faraday cages and MRI rooms



(N) Without a special contact edge; there still is electrical conduction at the coated side of the glass.

Please note: the top layer can be affected by acids, for example from the skin. To protect the conductive layer, you can apply a transparent film.

Looking for the highest optical quality in transparent EMI shielding? Discover our 9400 Transparent EMI shielding copper grid PET film

ORDER EXAMPLE

Series	Width (mm)	Length (mm)	Thickness (mm)	Contact edge	Contact edge width (mm)
9600	Width of the visible area in mm	Length of the visible area in mm	**3 :** 3mm thick **4 :** 4mm thick **6 :** 6mm thick	**N :** No contact edge **S :** Silver busbar **C :** Copper **TC :** Tinned copper **F :** With aluminium frame	**NO :** No contact edge **3 :** 3 mm **4 :** 4 mm **5 :** 5 mm **6 :** 6 mm **7 :** 7 mm **8 :** 8 mm **9 :** 9 mm **10 :** 10 mm

High performance glass 9650

Ideal EMI/RFI shield for electronic displays requiring moderate shielding effectiveness and high-quality optical properties.

The combination of high light transmission, near-neutral colour and low electrical resistance makes this glass an ideal EMI/RFI shield for electronic displays requiring moderate shielding effectiveness and high-quality optical properties.

EMI/RFI-shielded glass is suited for outdoor use and provides excellent shielding performance from 10 kHz up to 40 GHz. In addition the coating has good scratch-resistant properties. Typical applications are medical and military LED/LCD monitors, shielded cameras, sensors and displays.

Our EMI/RFI-shielded glass provides a good balance between shielding on one hand and optical clarity on the other.

On request EMI/RFI-shielded glass with 20 Ohms/sq is available. The disadvantage of this glass is that it has reduced light transmission and increased light reflection.

Technical details

Light transmission:	84%
Electrical resistance:	10-12 Omhs/sq
Temperatures:	-60 / +110 °C
Available thicknesses:	3, 4, and 6 mm

Options (on request)

- Tempered to increase impact resistance
- Anti-glare
- Laminated with highly transparent mesh foil for very high shielding performance

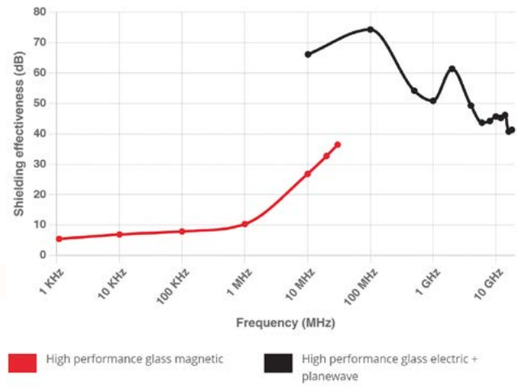
Applications

- Shielded sensors
- Shielded displays, glass, or windows
- Shielded cameras
- RF shielding
- EMI shielding

Advantages

- Excellent EMI/RFI shielding
- High transparency
- Scratch resistant
- Suited for outdoor use
- Any shape or size available
- Can be produced or cut according to CAD drawing

shielding performance

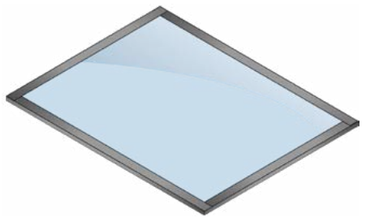


Contact edges

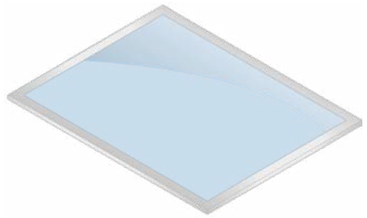
EMI/RFI-shielded glass 9650 series is conductive on one side. If you want to establish a connection with the other side of the glass which is not conductive, a contact edge is needed.

The glass is also available finished with an aluminium frame for easy mounting in Faraday cages and MRI rooms. We can supply EMI-shielded glass with the following edges:

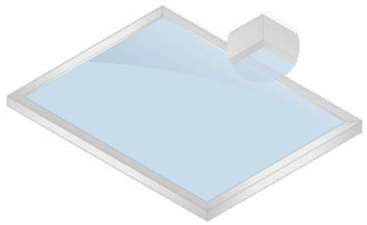
(C) With copper edges for grounding



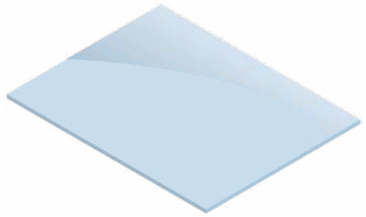
(TC) With tinned copper edges for easy soldering and grounding



(S) With a silver busbar



(F) With an aluminium frame for shielded enclosures, Faraday cages and MRI rooms



(N) Without a special contact edge; there still is electrical conduction at the coated side of the glass.

Please note: the top layer can be affected by acids, for example from the skin. To protect the conductive layer, you can apply a transparent film.

Looking for the highest optical quality in transparent EMI shielding? Discover our 9400 Transparent EMI shielding copper grid PET film

ORDER EXAMPLE

Series	Width (mm)	Length (mm)	Thickness (mm)	Contact edge	Contact edge width (mm)
9650	Width of the visible area in mm	Length of the visible area in mm	**3 :** 3mm thick **4 :** 4mm thick **6 :** 6mm thick	**N :** No contact edge **S :** Silver busbar **C :** Copper **TC :** Tinned copper **F :** With aluminium frame	**NO :** No contact edge **3 :** 3 mm **4 :** 4 mm **5 :** 5 mm **6 :** 6 mm **7 :** 7 mm **8 :** 8 mm **9 :** 9 mm **10 :** 10 mm

Faraday cage windows

EMI/RFI-shielded Faraday cage windows

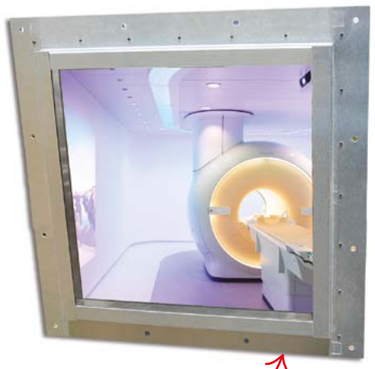
We manufacture Faraday cage windows ready for installation. These windows guarantee very high EMI/RFI/EMC-shielding performance. Faraday cage windows can be manufactured in any dimension and according to the customer's drawing.

A Faraday cage window is made up of several EMI/RFI-shielding products.

We put two layers of 9600 series EMI/RFI-shielded glass on either side of 9000 series Mesh foil to ensure very high shielding performance in a wide frequency range.

These three layers are held together by an aluminium frame for easy installation. The aluminium frame is provided with an electrically conductive 6800 series Amucor gasket to ensure good electrical contact with the Faraday cage.

Our engineers can give you the best advice for your application. Please send your drawing to info@hollandshielding.com fore more information.



ORDER EXAMPLE

Product	Width (mm)	Length (mm)
Faraday cage windows	Specify the width in mm including the frame. Max 3 meter.	Specify the length in mm including the frame. Max 6 meter.

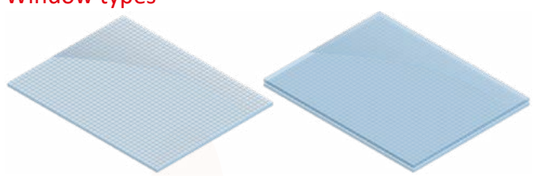
Mesh foil windows 9700

Ready to use EMI/RFI shielded mesh foil windows

For the highest possible EMI / RFI shielding performance, a woven electrically conductive microstructure of mesh is bonded between two layers of glass or plastic (**stepped double layered window**). The EVA combined with the mesh will work as reinforcement for the glass. Alternatively, a single layer of Mesh foil 9000 series is fixed onto one side of a single glass or plastic window with self-adhesive (**single layered window**).

This can be done by laminating or edge bonding. The EMI-shielded mesh-foil windows can be provided with a silver bus bar, an electrically conductive gasket or can be supplied with a frame for easy mounting. Windows can optionally be provided with a water seal.

Window types



Single layer: Wire mesh fixed onto one side of a glass or plastic window

Double layer: Wire mesh bonded between two glass or plastic windows

Note that it is also possible to laminate the wire mesh under a custom angle to prevent moiré effect on for example monitors or LCD displays.

mesh foil windows can be produced up to 3 x 1.5m

Light transmission

Opacity of mesh windows is 64.5%. A lack of available light should not be a concern, since an average pair of sunglasses allows less than 9% light to come through.

Applications

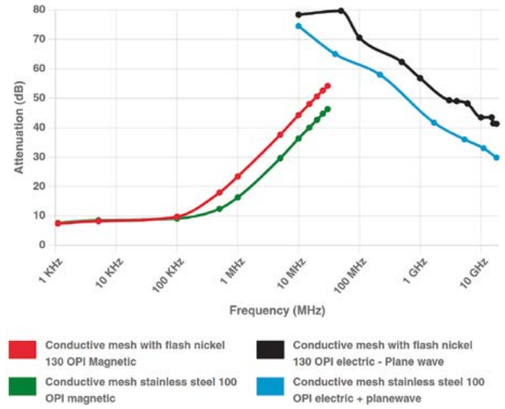
- LCD displays;
- Membrane switches,
- Touch screens
- Defense / Avionics etc.
- Devices for medical technology
- For test and measuring instruments

Window materials

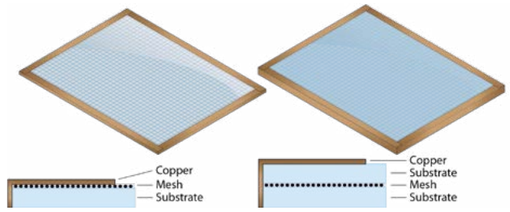
EMI/RFI shielded mesh foil windows can be made from your existing windows or can be supplied as a new window made of:

- Polycarbonate (**material code P**)
- Acrylic (**material code A**)
- Glass (**material code G**)
- Polycarbonate scratch resistant (**material code PS**)

Shielding performance*

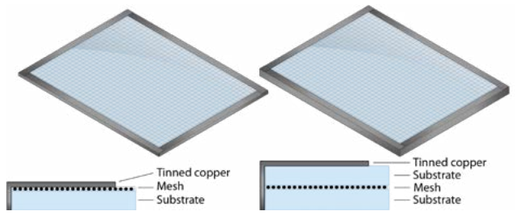


Contact edges



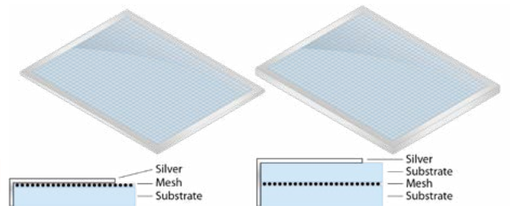
CO : Copper busbar (Single layer)
Wire mesh fixed onto one side of glass or plastic substrate.

CO : Copper busbar (Double layer)
Wire mesh fixed between two layers of glass or plastic substrate.



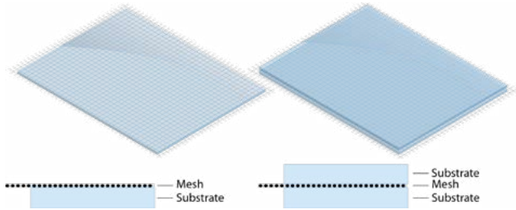
TC : Tinned copper busbar (Single layer)
Wire mesh fixed onto one side of a glass or plastic substrate. With tinned copper edges for easy soldering and grounding.

TC : Tinned copper busbar (Double layer) Wire mesh fixed between two glass or plastic substrate. With tinned copper edges for easy soldering and grounding.



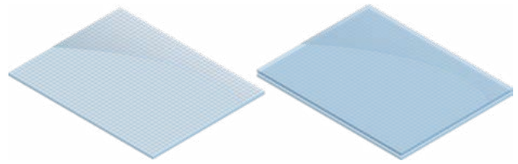
SB : Silver busbar (Single layer)
Wire mesh fixed onto one side of glass or plastic substrate.

SB : Silver busbar (Double layer)
Wire mesh fixed between two layers of glass or plastic substrate.



FM : Flying mesh (Single layer)
Wire mesh fixed onto one side of glass or plastic substrate.

FM : Flying mesh (Double layer)
Wire mesh fixed between two layers of glass or plastic substrate.



NO : No contact edge (Single layer)
Wire mesh fixed onto one side of glass or plastic substrate.

NO : No contact edge (Double layer)
Wire mesh fixed between two layers of glass or plastic substrate.

Please note
Top layer can be affected by acid for example from the skin. To protect the conductive layer, you can apply a transparent film or use the adhesive side on top.

Looking for the highest optical quality in transparent EMI shielding? Discover our 9400 Transparent EMI shielding copper grid PET film

» Mesh foil windows 9700

Technical details and shielding performance

Material	Conductive mesh flash nickel (black) (standard)	Conductive mesh flash nickel	Conductive mesh stain-less steel
		Standard	
Wires/inch (OPI)	130	130	100
Mesh total thickness (mm)	0.086	0.086	0.030
Nominal Aperture (mm)	0.110	0.110	0.224
Light Transmission	64.5	64.5	64.5

ORDER EXAMPLE

Series
9700

Width (mm)
Width of the visible area in mm

Length (mm)
Length of the visible area in mm

Window material
P : Polycarbonate (standard)
A : Acrylate
G : Glass
PS : Polycarbonate (scratch Resistance)

Window type
1 : Single layer
2 : Double layer

Thickness
For single layer, **1**, **2**, **3** or **4**mm thickness is standard.
For double layer **2**, **3**, **4, 6**, or **8**mm is standard.
Other thickness on request.

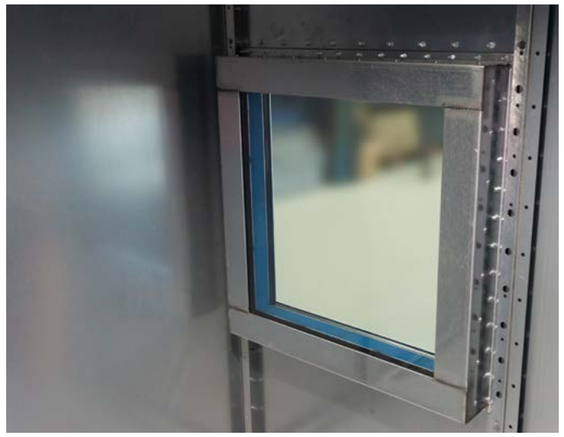
Contact edge
NO : No contact edge
SB : Silver busbar
CO : Copper
TC : Tinned copper
FM : Flying mesh

Width (mm) Contact edge
NO: No contact edge
3: 3 mm
4: 4 mm
5: 5 mm
6: 6 mm
7: 7 mm
8: 8 mm
9: 9 mm
10: 10 mm

Mesh angle
0°: 0 (standard)
17°: 17
35°: 35
45°: 45

Multi layered performance shielded window 9750

Shielded window designed for the high EMI/RFI and low frequency shielding

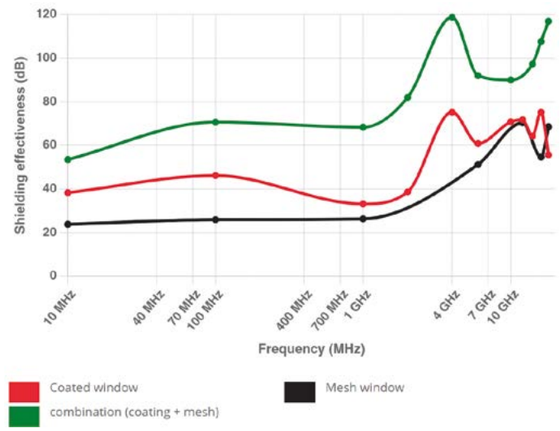


These faraday cage windows can be used where excellent visibility is needed without largely compromising the shielding capabilities of your secure environment. These windows can be used in control room of MRI room applications. These windows can be made to customer specifications to ensure all your needs are covered.

Features

- High Shielding performance
- Excellent Visibility
- Sturdy Exterior
- Can be made to customer specifications

Shielding performance



ORDER EXAMPLE

Series
9750

Width (mm)
Specify the width in mm including the frame. Max 2000 mm.

Height (mm)
Specify the height in mm including the frame. Max 1200 mm.

ESD film 9800

Electrostatic-dissipative polyester film with adhesive backing.
ANTI-static & ATEWX film

9800 ESD film is a transparent, static dissipative, self-adhesive polyester film. It includes a special coating on one side and a release film on the other side. The film can be applied to flat, insulating surfaces.

Electrical properties

Property	Test standard	Typical value	Requirements
Surface resistance RS	EN 61340-2-3	10^6 –10^8 Ω	1 x 10^4 RP 1 x 10^{10} Ω EN 61340-5-1
Point to point resistance RP			

Chemical resistance

Samples were immersed in the specified chemicals for 24 hours at room temperature and then examined visually.

Chemical	Surface damage	Visual evaluation
Deionized water	None	Clear
30% Sulphuric acid	None	Clear
30% Nitric acid	None	Clear
30% HCL	None	Clear
Methanol	None	Clear
Ethanol	None	Clear
Isopropyl alcohol	None	Clear
Acetone	None	Slight change
Methylene chloride	None	Clear

Advantages

- High tear strength, clear, adhesive-backed polyester film
- Permanently electrostatic-dissipative coating
- Complies with EN 61340-5-1
- Humidity independent
- Very low tribocharge generation and excellent electro-static decay performance
- High clarity, good chemical and abrasion resistance
- Ideal for PCB manufacturing and testing
- Suitable for clean manufacturing applications (retrofitting clean room windows, etc.)
- Can be used as transparency for copies
- Thickness: 0.1mm
- Maximum sheet/roll width: 1220mm

Typical physical properties

Property	Test method	Unit	(100 microns)
Tensile strength			
MD	ASTM D-882A	PSI	25.000
TD	ASTM D-882A	PSI	35.000
Yield strength			
MD	ASTM D-882A	PSI	14.000
TD			14.000
Elongation at break			
MD	ASTM D-882A	%	200
TD			120
Pencil hardness			
Hardness	ASTM D-3363	Hardness scale	3H
Optical			
Transmittance – total visible	ASTM D-1003	%	85
Transmittance – total UV			10
Haze			7.3
MD = Machine Direction | TD- Transversal Direction			

Applying the film - step by step

Step 1

- Measure the usable area
- Cut the foil to size, adding 2 cm on each side (the extra will be cut off afterwards)

Step 2

- Moisten the surface to which the foil will be applied with water from a spray bottle. The surface should be wet during the entire application process.

Step 3

- Stick a piece of adhesive tape on one edge of the foil to easily pull off the transparent protection film.
- Moisten the adhesive on the foil with the spray bottle.

Step 4

- Carefully apply the wet, sticky side of the foil to the wet surface. It is important that both sides are moist.
- Smooth the film carefully to avoid creases or bubbles.

Please note: in exceptional cases, the top layer can be affected by acids, for example from the skin. To protect the conductive layer, you can apply a transparent film or use the adhesive side on top.

Small optical defects are allowed in this product. If you require a product that is absolutely free from optical defects, please contact us for the "superior selected quality". Due to the extreme caution needed to produce these products, they can be several times more expensive.

ORDER EXAMPLE

Series	Width (mm)	Length (mm)
9800		
	Width of the visible area in mm. Max. width 1220mm	Length of the visible area in mm

Transparent shielding foil 9900

Transparent EMI/RFI-shielding foil

Transparent shielding foil with specialty of one side conductive meanwhile optical transmittance, is widely used for applications of EL panel, LCD EMI shielding, touch screen, flexible solar cell etc.

Transparent EMI/RFI-shielding foil 9900 series is a polyester film with a transparent conductive coating. The foil provides excellent electric and electromagnetic shielding of 40-70 dB at 10 kHz to 300 Mhz and 25-40 dB from 300 MHz to 22 Ghz.

In addition to EMI/RFI/EMC shielding it is also used for grounding and static discharge applications. Typical applications are transparent shielding panels for visual displays in instrumentation equipment, control panels and computers. The light transmission is 65-95%, depending on the electrical conductivity (20-5 Ohm/sq).

Due to its transparency, Transparent EMI/RFI-shielding foil 9900 series is the optimal choice for optical clarity.

For TEMPEST sites or radar/telecom protection, large dimensions are available.

Contact us if you have a drawing of a specific shape you require.

Product properties

Part number	9900 5 Ohm	9900 50 Ohm
Total thickness (micron)	125	125
Maximal roll width (mm)	1220	1220
Electrical resistance (ohms/sq.)	5	50
Heat stabilized PET residual shrinkage value (% TD and % MD)	< 0.2	< 0.2
Visible light transmission (% Tvis)	85	87.5
Haze (%)	< 2.0%	< 2.0%
Coating adhesion (R/Ro)	1.0	1.0

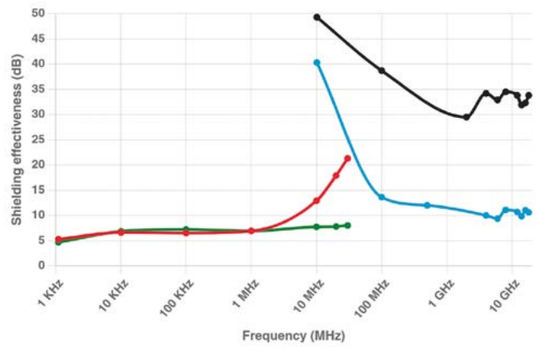
Applications

- Transparent shielding foil for LED glass
- Transparent conductive layer for transmitting electron
- Transparent shielding foil for capacity touch key
- ITO Film with high light transmittance is used as the transparent conductive layer for transmitting electron

Options

- Standard transparent EMI-shielding foil
- Transparent EMI-shielding foil with silver busbar
- Transparent EMI-shielding foil with copper edges for grounding

Shielding performance*



9900 - Transparent EMI/RFI-shielding foil 5 ohms magnetic

9900 - Transparent EMI/RFI-shielding foil 5 ohms electric+planewave

9900 - Transparent EMI/RFI-shielding foil 50 ohms magnetic

9900 - Transparent EMI/RFI-shielding foil 50 ohms electric+planewave

Please note : These values are measured under laboratory conditions. Results may vary in other situations; please read our Guarantee.

Micro Suction Silicone Adhesive

For easy manual application of the foil, we have developed a Micro Suction Silicone adhesive. This adhesive has a number of advantages that make the film easy to position. Our advise is to use standard adhesive only for laminating machines or very very experienced people. For all else use this Micro Suction Silicone Adhesive.

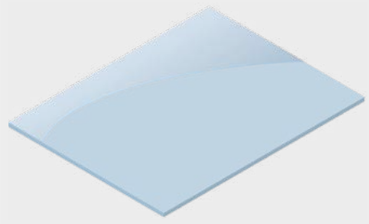
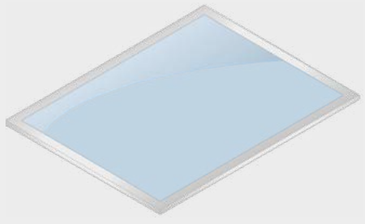
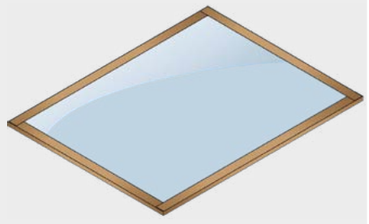
Benefits

- Reusable / Repositionable
- Never attach permanently
- Easily applied by hand, less bubbling

Mounting

A connection can be made between the conductive side of the Transparent EMI/RFI-shielding foil 9900 series and a conductive mounting surface of the construction with Shielded tape 3201 or it can be clamp mounted with Ultra soft shield 7400.

Sheet styles

Sheet style #1STD Standard transparent EMI-shielding foil. No extra contact edge. There is electrical conduction on the top side of the foil.	Sheet style #2BAR Transparent EMI-shielding foil with silver busbar.	Sheet style #3CAR Transparent EMI-shielding foil with copper edges for grounding.
		

Please note: The top layer can be affected by acid, for example from the human skin. To protect the conductive layer, you can apply a transparent film or use the non-conductive side on top. Transparent protective foil containing Micro Absorbent Silicone adhesive has a thickness of 370 microns / 0.37 mm.

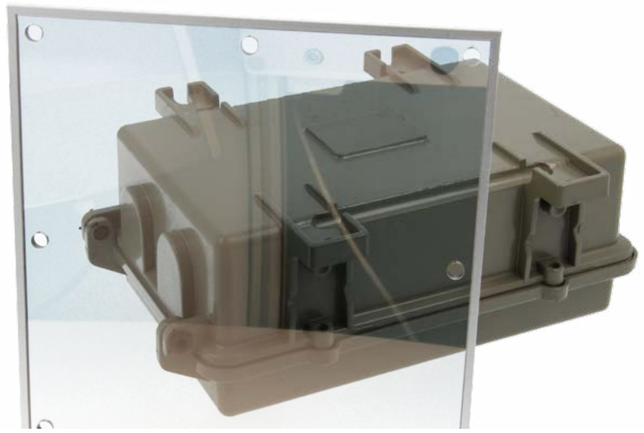
Looking for the highest optical quality in transparent EMI shielding? Discover our 9400 Transparent EMI shielding copper grid PET film

ORDER EXAMPLE

Series	Width (mm)	Length (mm)	Adhesive	Sheet style
9900	Width of the visible area in mm	Length of the visible area in mm	**01 :** Self-adhesive **02 :** Without self-adhesive	**#1STD :** Standard transparent foil **#2BAR :** Finished with silver busbar **#3CAR :** With copper grounding contact

Transparent shielding foil windows 9910

Ready-made transparent EMI-shielding foil windows for moderate EMI shielding, with good light transmittance and transparency.

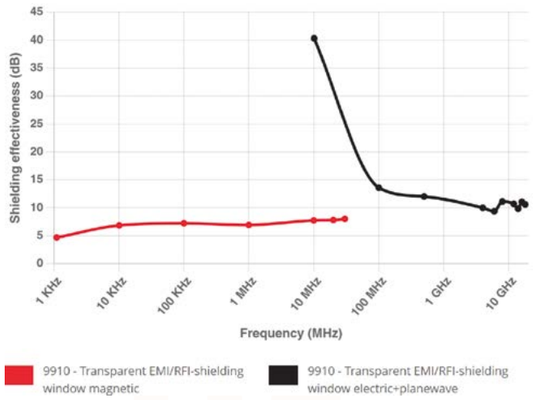


Transparent EMI/RFI-shielding foil windows 9910 series consist of a strong polyester film with a layer of transparent conductive coating from our 9900 series Transparent shielding foil laminated on one side of a single glass or plastic window.

Transparent EMI/RFI-shielding foil 9910 series can also be laminated onto an existing window, if the window is brought to us, or onto any new window made of:

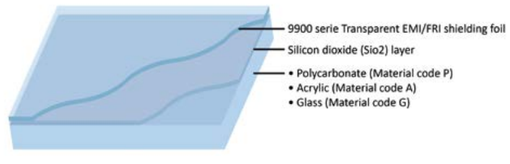
- Polycarbonate **(material code P)**
- Acrylic **(material code A)**
- Glass **(material code G)**

Shielding performance*



These values are measured under laboratory conditions.
In other situations results may differ. Please read our Guarantee.

Technical drawing



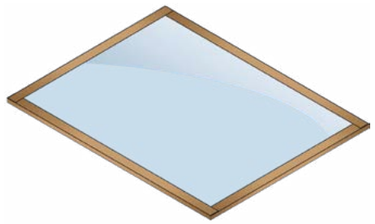
Contact edges

Transparent EMI/RFI-shielding foil window 9910 series is only conductive on one side. If you want to make a connection with the other side of the window which is not conductive, we can add a contact edge for you.

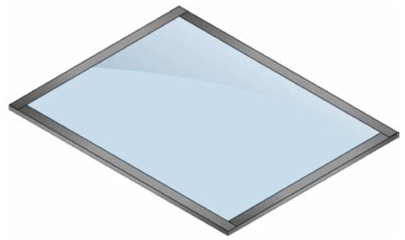
We can also supply the windows complete with an aluminium frame for easy mounting in Faraday cages and MRI rooms.

» Transparent shielding foil windows 9910

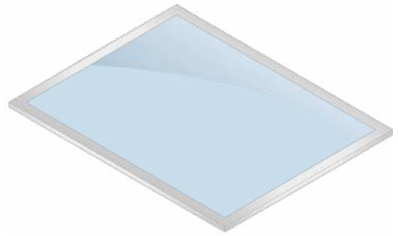
CONTACT EDGES



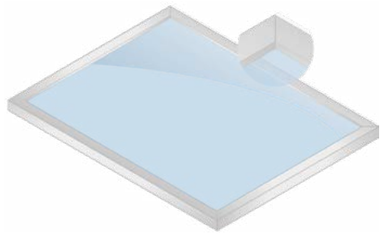
(C) With copper edges for grounding



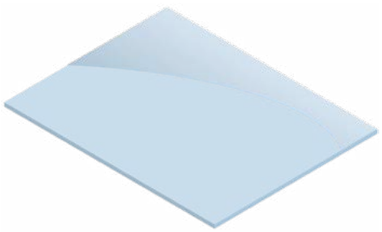
(TC) With tinned copper edges for easy soldering and grounding



(S) With a silver busbar



(F) With an aluminium frame for shielded enclosures, Faraday cages and MRI rooms



(N) Without a special contact edge; there still is electrical conduction at the coated side of the glass.

Mounting

Connection from the conductive side of the Transparent EMI/RFI-shielding foil window 9910 series to a conductive mounting surface of the construction can be provided by Shielded tape 3201 series or by clamp-mounted Ultra soft shield 7400 series.

Please note: the top layer can be affected by acid, for example from the skin. To protect the conductive layer, you can apply a transparent film or use the non-conductive side on top.

Looking for the highest optical quality in transparent EMI shielding? Discover our Transparent EMI shielding copper grid PET film

ORDER EXAMPLE

Series		Width (mm)		Length (mm)
9910	–		–	
		Width of the visible area in mm. So without a possible contact edge.		Length of the visible area in mm. So without a possible contact edge.

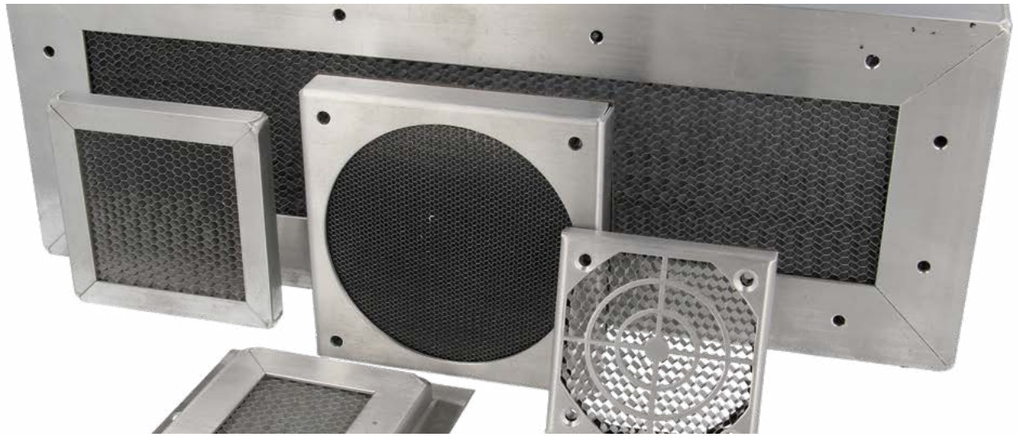
Window material		Thickness (mm)		Contact edge
	–		–	
P : Polycarbonate **A :** Acrylic **G :** Glass		Specify the thickness of the window in mm		**C :** Copper **TC :** Tinned copper **F :** With frame **S :** Silver busbar **N :** No contact edge

***Notice**
Information supplied in these data sheets is based on independent and laboratory tests which Holland Shielding Systems BV, hereafter referred to as HSS believes to be reliable. HSS has no control over the design of customer's product which incorporates products, therefore it is the responsibility of the user to determine the suitability for his particular application and we recommend that the user make his own test to determine suitability.

The product described in this data sheet shall be of standard quality, however the products are sold without warranty of fitness for a particular purpose, either expressed or implied, except to the extent expressly stated on HSS invoice, quotation or order acknowledgment. HSS does not warrant that products described in this data sheet will be free of conflict with existing or future patents of third parties. All risks of lack of fitness, patent infringement and the like are assumed by the user.

Honeycomb vents 9500

EMI shielded ventilation panels for ventilation and heating



Honeycomb vents are used to shield openings for ventilation or acoustic/visual contact. We can make these vents according to your drawing within a few days, or you can use our standard range from stock.

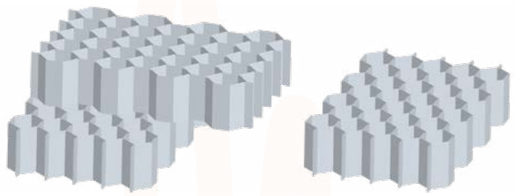
We can supply Honeycomb vents with frames, pre-drilled with fasteners, or with flow-drilled thread holes. The standard material is aluminium which can be given a nickel finish (or any other finish you choose).

If high shielding levels are required, the use of cross-cell honeycombs is recommended. These are constructed from multiple sections of 6.35 mm or 12.7 mm or 26 mm thick honeycombs within a single frame. The shielding performance will improve as airflow is decreased, but not eliminated.

For military applications we make a heavy hot-dip galvanized mild-steel version. Please contact us for more information.

Honeycombs are also frequently used as flow straighteners to create a laminar flow.

Standard and cross-cell versions



Standard honeycomb & Cross-cell honeycomb
(for higher shielding performance)

Benefits

- Light-weight
- High shielding performance
- Low air-flow resistance
- Reduction of turbulence

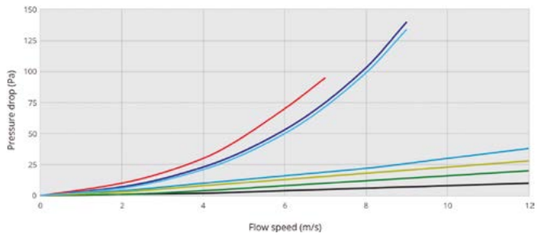
Options

- Cross-cell honeycomb for extra high shielding performance
- Slant honeycomb 30°, 45°, 60° for outdoor rainproof applications
- 45° degrees is the most common implementation
  Please note, slant honeycombs are available on request
- Polyurethane filter for dust protection
- Kick plate for mechanical protection
- Stainless steel, mild steel or brass versions
- Cell sizes 1.6 mm, 3.2 mm, 6.4 mm, 9.5 mm, 12.7 mm, or 19 mm (standard 3.2 mm)
- Gaskets for firm connections

Approximately 95% of the honeycomb vents we produce are made to customer specifications.

Shielding effectiveness

9500 series - Honeycomb ventilation panels



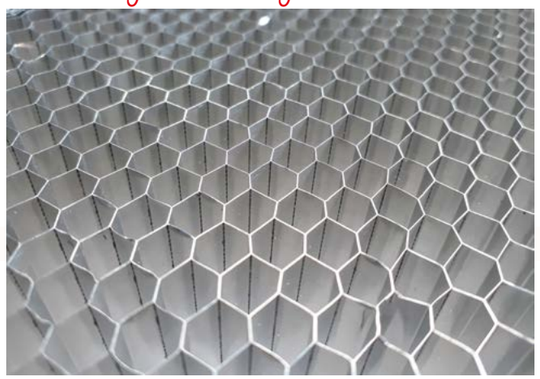
Shielding performance* (dB)

Frequency	Field	Single-layer 6.35mm thick honeycomb material Frames B, C, D, G, L	Cross-cell 6.35mm thick honeycomb material Frame H	Single-layer 12.7mm thick honeycomb material Frames E, F	Cross-cell 54mm thick honeycomb material Frame K
200 kHz	H	39	71	78	85
100 MHz	E	80	105	100	110
500 MHz	P	55	93	55	95
2 GHz	P	52	94	96	98
10 GHz	P	61	82	80	90

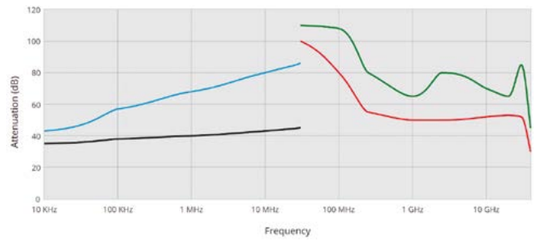
These values were measured under laboratory conditions and with proper gasket material used. In other situations, results may differ. Please read our Guarantee.

Please note these dimensions are only indicative, hole spacing also depends on the frame type, and exact layout is up to our discretion. When needed, we can send an approval drawing before we start production.

any size, any shape
according to drawing

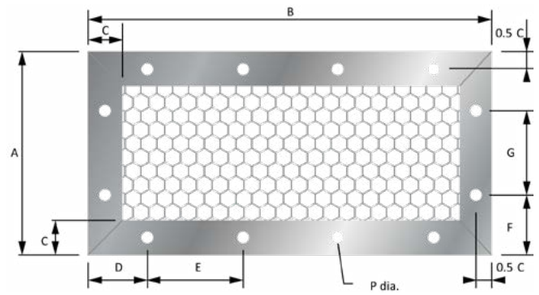


Airflow characteristics



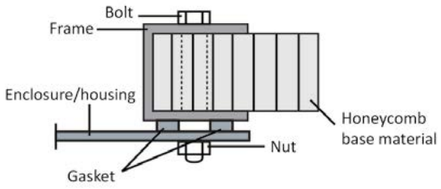
Standard dimensions

Our Honeycomb ventilation panels are usually custom made for our client. However, some common dimensions are in stock. In the standard dimensions table below some common types of Honeycomb ventilation panels are specified to illustrate the required information. Hole diameter P is standard 3.5mm, with other dimensions possible on request. Also available with screw apertures or inserts.

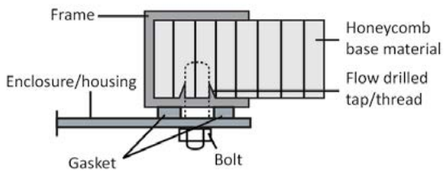


Outer dimensions		Mounting holes horizontal			Mounting holes vertical		
A	B	No	D	E	No	F	G
75	150	2	40	70	1	37.5	-
100	100	1	50	-	1	50	-
100	200	3	20	80	1	50	-
125	125	2	20	85	1	62.5	-
125	250	3	30	95	1	62.5	-
150	150	2	25	100	2	25	100
150	300	4	30	80	2	25	100
175	175	2	40	95	2	40	95
175	350	4	40	90	2	40	95
200	200	3	20	80	3	20	80
200	400	5	30	85	3	20	80
250	250	3	30	95	3	30	95
300	300	4	30	80	4	30	80
300	600	7	30	90	4	30	80

MOUNTING OPTIONS



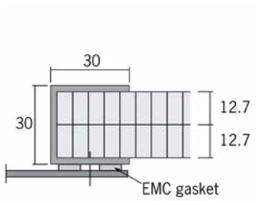
Option 1 : Through hole/bolt



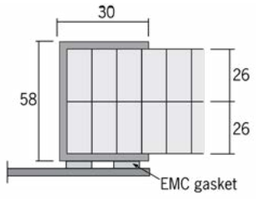
Option 2 : Flow-drilled tap/thread

Frame options

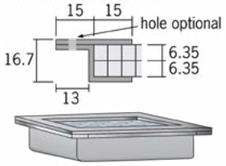
Cross-cell honeycombs



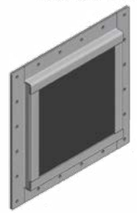
Frame A
(Cross cell honeycomb)



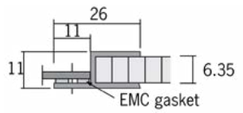
Frame K
(Cross cell honeycomb)



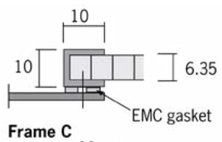
Frame H
(Cross cell honeycomb)



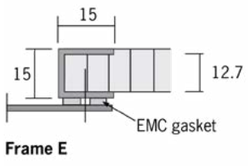
Single-layer honeycombs



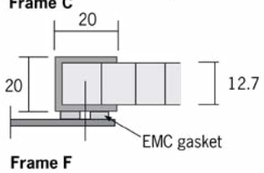
Frame B



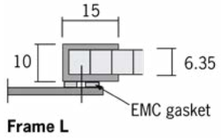
Frame C



Frame E



Frame F



Frame L

GASKET MATERIAL

Our 9500 series framed Honeycomb ventilation panels are generally supplied with a 6800 series Amucor gasket.

This is a EMC gasket with an aluminium alloy. Suitable for most applications. However, due to galvanic corrosion for some applications, the Honeycombs can also be supplied with a 1200 series Metal knit gasket.

ORDER EXAMPLE

Series	Height (mm)	Width (mm)	Frame	Drill pattern	Gasket material
9500	Specify the height dimension in mm	Specify the width dimension in mm	**A :** Frame A **B :** Frame B **C :** Frame C **D :** Frame D **E :** Frame E **F :** Frame F **G :** Frame G **H :** Frame H **K :** Frame K **L :** Frame L	**DS :** Standard drill pattern **DC :** Custom drill pattern **N :** No holes	**A :** Amucor (standard) **K :** Knitted wire mesh **N :** No gasket

Frameless honeycomb vents 9505

EMI shielded ventilation panels for ventilation and heating

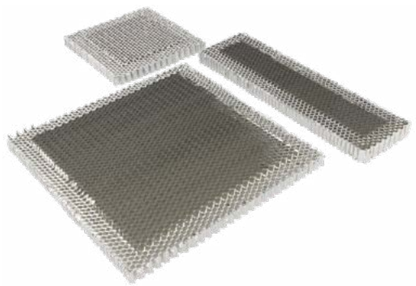
Honeycomb vents are used to EMI shield openings for ventilation or acoustic/visual contact. We can make these vents according to your drawing within a few days, or you can use our standard range from stock. Honeycombs are also frequently used as flow straighteners to create a laminar flow.

Honeycomb material thicknesses

We manufacture Honeycomb material in thicknesses of 6.35, 12.7 and 25.4 mm.

Compressed sides

The 9505 series Frameless Honeycomb ventilation panels can be made with compressed sides. This has the advantage that the ventilation panel easily remains in place in the opening of your electronics housing. This also provides better shielding performance.



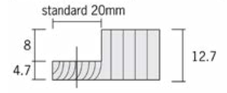
Benefits

- Light weight
- High shielding performance
- Low air-flow resistance
- Reduction of turbulence
- Can be made round or rectangular shaped

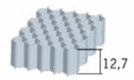
Types

Frameless M
(With compressed sides)

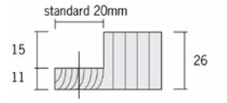
Frameless N
(Honeycomb core material)



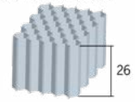
Frameless O
(With compressed sides)



Frameless P
(Honeycomb core material)



Frameless Q
(With compressed sides)



Frameless R
(Honeycomb core material)

Dimensions

Frameless honeycomb vent panels can be produced very accurately in any desired size. Specify in the quotation the dimensions you want.

ORDER EXAMPLE

Series	Shape	Width (mm)	Length (mm)	Type
9505	**RO :** Round **RE :** Rectangular	Please note: Specify the outer dimension in mm.	Please note: Specify the outer dimension in mm.	**M :** 6.35 mm thick with compressed sides **O :** 12.7 mm thick with compressed sides **Q :** 26 mm thick with compressed sides **N :** 6.35 mm thick **P :** 12.7 mm thick **R :** 26 mm thick

EMC dust filter ventilation panels 9510

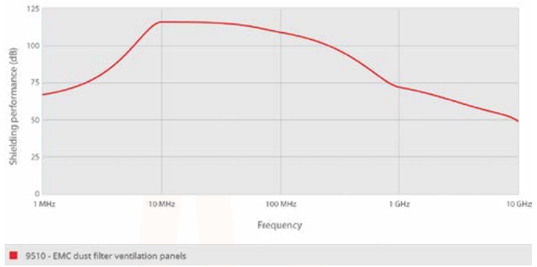
EMC Dust filter ventilation panels are used to shield openings for heating and ventilation against undesirable electromagnetic waves

EMC dust filter ventilation panels consist of several layers of aluminium foil mesh encased in a rigid aluminium frame, pre-drilled, or with fasteners made to the customer's specifications, or with flow-drilled thread holes.

Approximately 95% of the 9510 series EMC Dust filter ventilation panels are made to customer specifications complying with an order. These panels can be treated with a variety of finishes to provide corrosion protection. Air filter oil can be applied to the aluminium filter to assist in dirt and dust retention.

By default, frames can be provided with an additional 6800 series Amucor or 7000 series Standard shield EMI gasket.

Attenuation levels (dB)



Applications

- Electronics enclosures
- Air conditioning units
- Fan housings
- EMC racks

Advantages

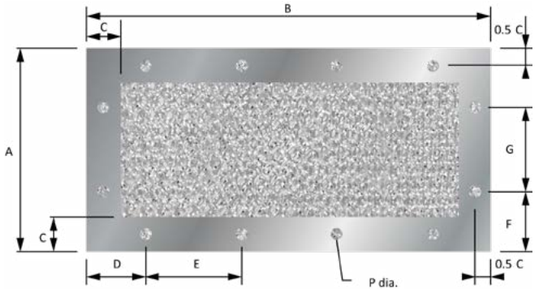
- Light weight
- High shielding performance
- Very low air-flow resistance
- Reduction of turbulence

Standard delivery time

Most standard-sized EMC dust filters are available from stock. When they are not in stock or when you need a custom-made filter, delivery is within two weeks.

Standard dimensions

Our EMC dust filter ventilation panels are usually custom made for each client. However, some common dimensions are in stock. In the table of standard dimensions below some common types of EMC dust filter ventilation panels are specified to illustrate the required information. Hole diameter P is 3.5mm by default, with other dimensions possible on request. Also available with screw apertures or inserts.

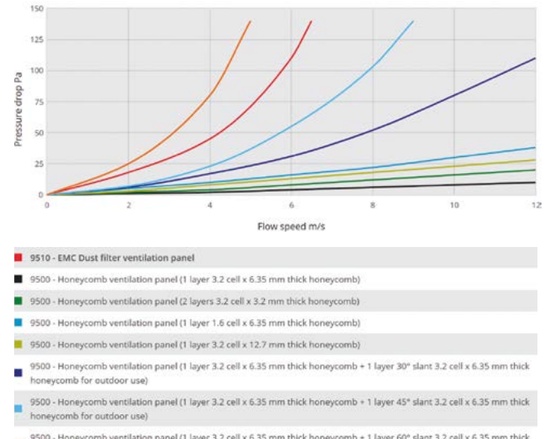


Please note these dimensions are only indicative, hole spacing also depends on the frame type, and exact layout is up to our discretion. When needed, we can send an approval drawing before we start production.

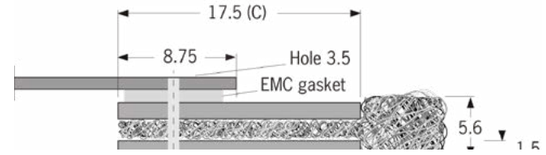
Outer dimensions		Mounting holes horizontal			Mounting holes vertical		
A	B	No	D	E	No	F	G
150	75	2	40	70	1	37.5	-
100	100	1	50	-	1	50	-
200	100	3	20	80	1	50	-
125	125	2	20	85	1	62.5	-
250	125	3	30	95	1	62.5	-
150	150	2	25	100	2	25	100
300	150	4	30	80	2	25	100
175	175	2	40	95	2	40	95
350	175	4	40	90	2	40	95
200	200	3	20	80	3	20	80
400	200	5	30	85	3	20	80
250	250	3	30	95	3	30	95
300	300	4	30	80	4	30	80
600	300	7	30	90	4	30	80

Air-flow pressure reduction

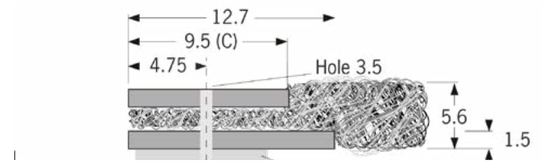
9510 series - Air flow pressure drop graph



Frame options



Frame A



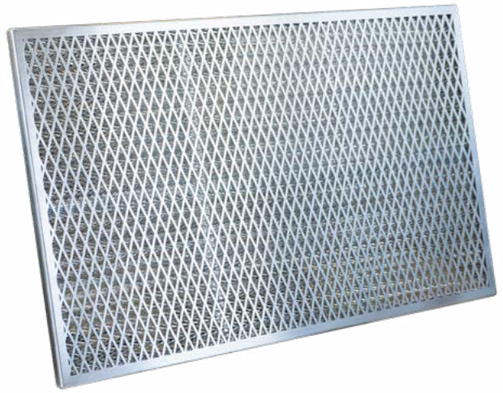
Frame B

ORDER EXAMPLE

Series	Width (mm)	Height (mm)	Frame	Drill pattern	Gasket material
9510	Specify the width in mm	Specify the height in mm	**A :** Frame A **B :** Frame B	**DS :** Standard drill pattern **DC :** Custom drill pattern **N :** No holes	**A :** Amucor (standard) **K :** Knitted wire mesh **N :** No gasket

EMC woven mesh ventilation panel 9520

EMC Woven mesh ventilation panel used for heating, air flow for cooling and ventilation in electronic enclosures



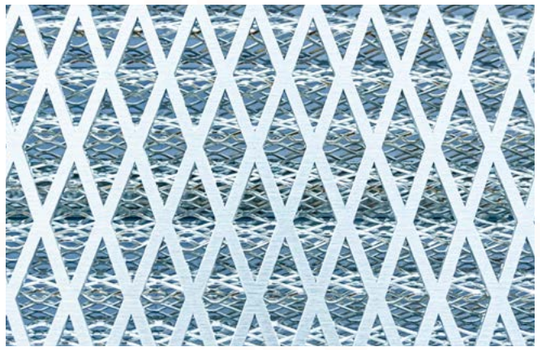
EMC Woven mesh ventilation panels are used for heating, air flow for cooling and ventilation in electronic enclosures without compromising the shielding integrity of an enclosure.

Aluminium EMC Woven mesh ventilation panels consist of 3 layers of pleated aluminium woven mesh, trapped between aluminium kick-plates, in a rigid aluminium frame, pre-drilled or with fasteners made to your specifications or flow drilled thread holes.

The 3 layers of pleated wire mesh are separated by the pleats being of different height enabling the vent to have a high dust holding capacity.

Approximately 95% of the 9520 series EMC Woven mesh ventilation panels are made to customer specifications, and are all made to comply an order.

These panels can be treated with a variety of finishes to provide corrosion protection or improve conductivity. Air filter oil can be applied to the aluminium filter media to assist in dirt and dust retention. Panels with a gasket groove have a knitted monel wire mesh gasket as standard. Other frames can be provided with an additional EMI Gasket.



Options (on request)

- EMI gasketing
- Environmental sealing
- Kempass (RoHS) aluminium passivation finish
- With kickplate

Benefits

- Light weight
- High shielding performance
- Very low air-flow resistance
- Reduction of turbulence

EMC gasket options

- 1200 series Metal knit gasket (Only frames with a gasket groove)
- 5711-5722 series Orientated wire shield gasket
- 1200 series Metal knit gasket with a Neoprene sponge carrier 2.4mm thick
- 2000 series Beryllium Copper finger strip

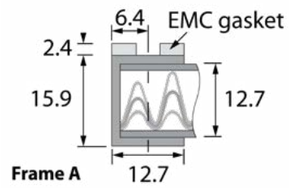
* Other gasket options on request

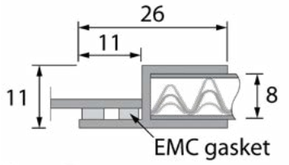
Design and constructional tips

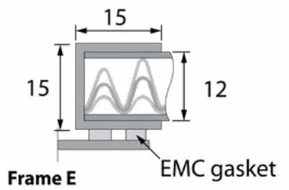
In your design, you can take into consideration moisture and dust protection through:

- Color coated frame (leave a part free of coating for contact)
- External overhang for rain protection
- Holes for drainage
- Aerodynamic drag
- Additional EMC gasketing
- Try to avoid round vents because its complexity and therefore expensive production
- Prevent holes in corners of the frame because of the rigidity of the frame when compressing the gasket
- If specifying captive inserts in both sides of the frame off-set the position by 10mm minimum

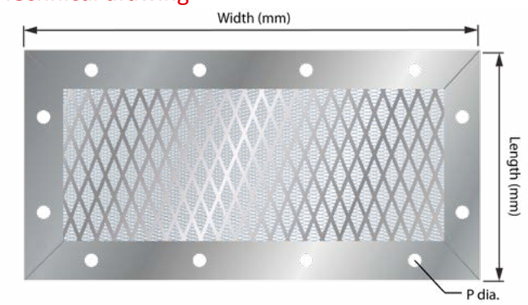
Frame options





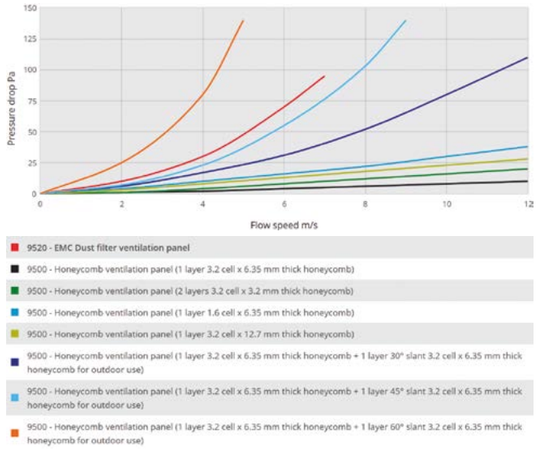


Technical drawing

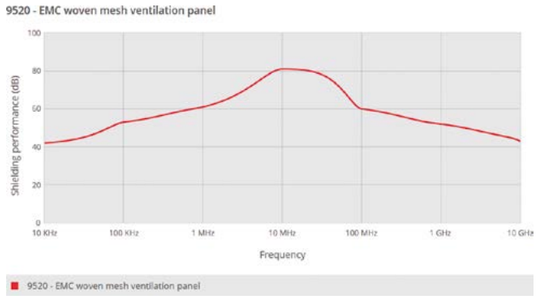


Air flow pressure drop graph

9520 series - Air flow pressure drop graph



Attenuation levels (dB)



Finishes (on request)

- Painted (frame only for dust panels)
- Electro less plated Tin or Nickel
- Kempass (RoHS) Aluminium Passivation process
- Trivalent chromium (RoHS compliant)

ORDER EXAMPLE

Series	Height (mm)	Length (mm)	Frame	Drill pattern	Gasket material
9520	The width in mm of the honeycomb, including the frame.	The length in mm of the honeycomb, including the frame	**A :** Frame A **B :** Frame B **E :** Frame E	**DS :** Standard drill pattern (We make mounting holes at our discretion) **DC :** Custom drill pattern **N :** No holes	**A :** Amucor (standard) **K :** Knitted wire mesh **N :** No gasket

Honeycomb fan shield 9530

A range of low-cost EMC vents for use with standard fan size fans. The Honeycomb fan shield 9530 series are designed to provide EMI shielding and maximum airflow without degrading the fan output.

These vents provide a low-cost option to perforated metal when airflow rates are critical. A high-gloss acrylic frame is fitted with one layer of 6.35 or 12.7 thick honeycomb material and an optional conductive foam gasket (5770-3-02-S) to connect the honeycomb to the metalwork.

When mounting the conductive foam gasket, the foam side must be against the honeycomb and the mesh against the metalwork side. Honeycomb Fan Shield in almost all sizes corresponding to industry-standard fans with standard 4-hole mounting.

Honeycomb ventilation grids specifically designed for standard sized fans in e.g. computer cases

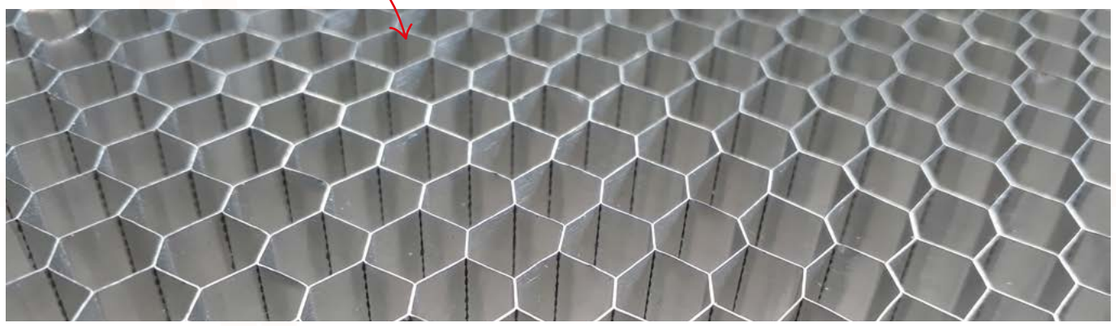
Shielding performance*

Shielding performance is achieved from 1/8 cell aluminium honeycomb panels with compressed mounted in a square shaped flat Mu-ferro plate with a circular cut-out on the inside. The contact with the housing is made with an amucor shielding gasket cut into the correct shape of the Honeycomb fan shield.

Performance below have been measured with honeycomb specifications 1/8 Cell size, 1/4 Thick.

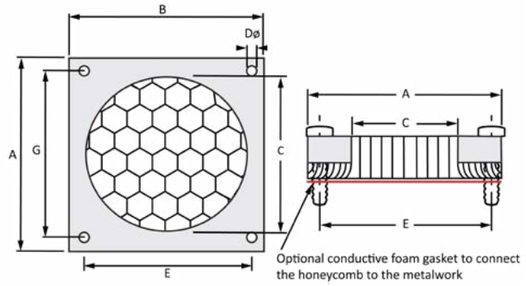
Frequency	Field	Typical (db)
200 kHz	H	53
100 MHz	E	102
500 MHz	P	85
2 GHz	P	74
10 GHz	P	58

any size, any shape according to drawing

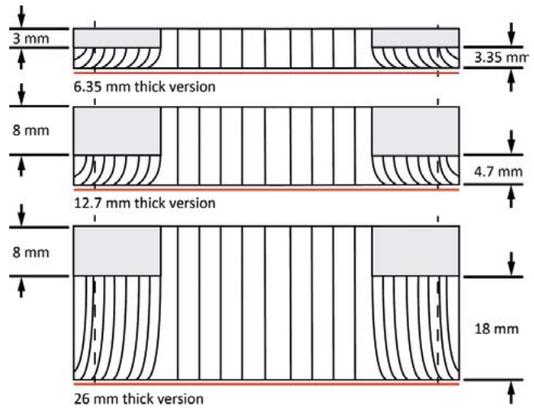


Standard dimensions

In the table below some common types are specified to illustrate the required information. The hole diameter is standard 3.5mm but it can also be delivered in any other size.



Honeycomb fan shield available thicknesses



Part number	Outer dimension				Mounting holes horizontal		Mounting holes vertical	
	A	B	C	D	No	E	No	G
9530-40-40	40	40	31.5	3.5 mm	2	32	2	32
9530-50-40	50	50	41.2	3.5 mm	2	40	2	40
9530-60-60	60	60	53	3.5 mm	2	50	2	50
9530-70-70	70	70	60	3.5 mm	2	60	2	60
9530-80-80	80	80	70	3.5 mm	2	71.5	2	71.5
9530-90-90	90	90	80	3.5 mm	2	82.5	2	82.5
9530-120-120	120	120	105	3.5 mm	2	105	2	105
9530-140-140	140	140	125	3.5 mm	2	124.5	2	124.5
9530-200-200	200	200	185	3.5 mm	2	154	2	154
9530-220-220	220	220	205	3.5 mm	2	170	2	170
(Optional) other sizes on request								

ORDER EXAMPLE

Series	Width (mm)	Length (mm)	Thickness (mm)	EMC gasket
9530	Specify the outer dimension in mm	Specify the outer dimension in mm	**6.35 :** 6.35mm thick honeycomb material **12.7 :** 12.7mm thick honeycomb material **26 :** 26 mm thick honeycomb material	**N :** No gasket **F :** Conductive foam gasket

Aluminium honeycomb fan shield 9535

Honeycomb ventilation grids specifically designed for standard sized fans in e.g. computer cases

A range of low-cost EMC vents for use with standard fan size fans. The Honeycomb fan shield 9530 series are designed to provide EMI shielding and maximum airflow without degrading the fan output.

These vents provide a low-cost option to perforated metal when airflow rates are critical. A aluminium frame is fitted with one layer of 6.35 or 12.7 thick honeycomb material and an optional conductive foam gasket (5770-3-02-S) to connect the honeycomb to the metalwork.

When mounting the conductive foam gasket, the foam side must be against the honeycomb and the mesh against the metalwork side. Honeycomb Fan Shield in almost all sizes corresponding to industry-standard fans with standard 4-hole mounting.

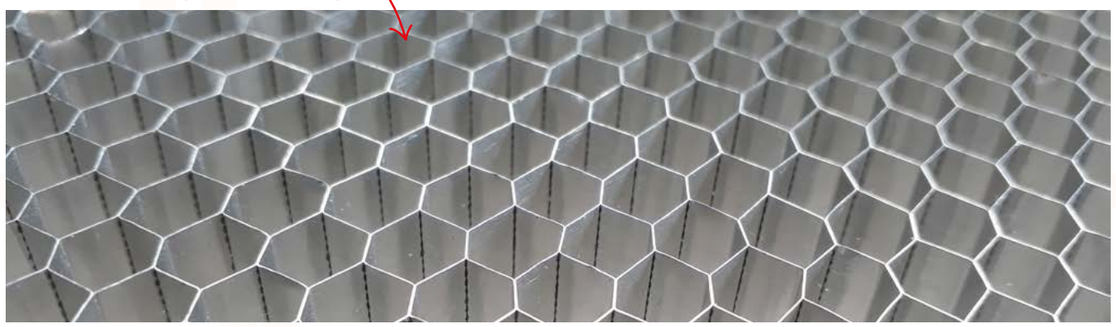
Shielding performance*

Shielding performance is achieved from 1/8 cell aluminium honeycomb panels with compressed mounted in a square shaped flat Mu-ferro plate with a circular cut-out on the inside. The contact with the housing is made with an amucor shielding gasket cut into the correct shape of the Honeycomb fan shield.

Performance below have been measured with honeycomb specifications 1/8 Cell size, 1/4 Thick.

Frequency	Field	Typical (db)
100 MHz	E	102
500 MHz	P	85
2 GHz	P	74
10 GHz	P	58

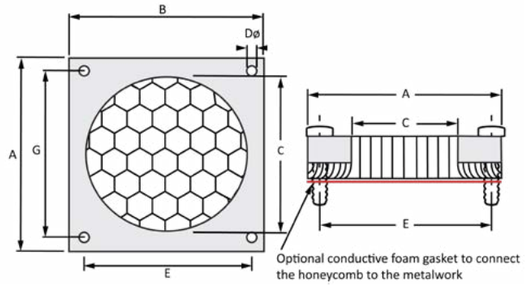
any size, any shape according to drawing



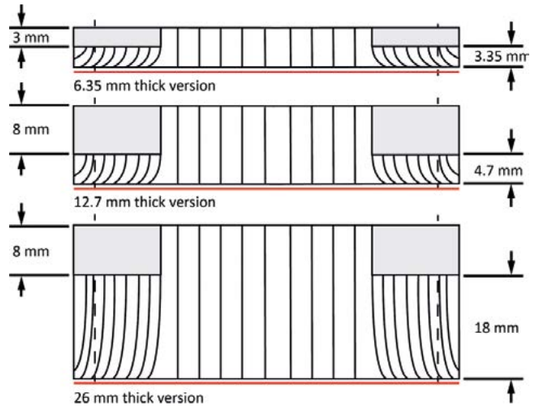
» *Aluminium honeycomb fan shield 9535*

Standard dimensions

In the table below some common types are specified to illustrate the required information. The hole diameter is standard 3.5mm but it can also be delivered in any other size.



Honeycomb fan shield available thicknesses



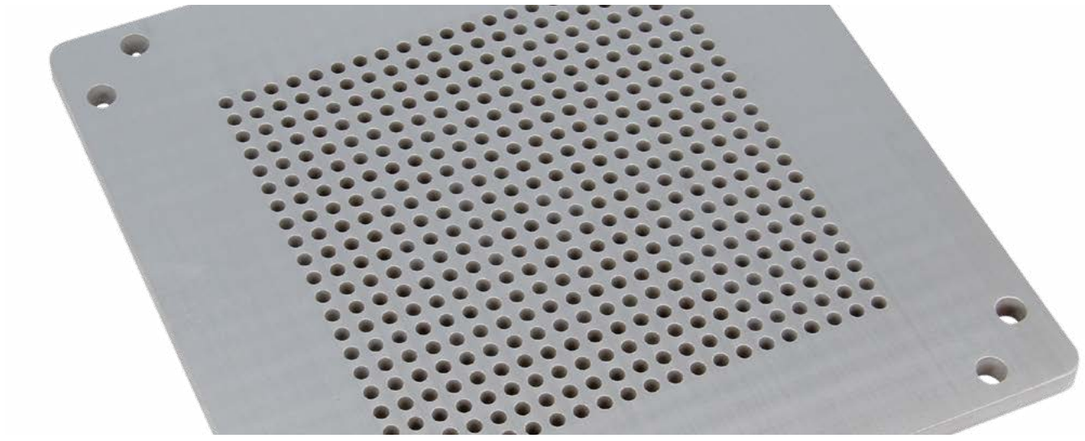
Part number	Outer dimension				Mounting holes horizontal		Mounting holes vertical	
	A	B	C	D	No	E	No	G
9535-40-40	40	40	31.5	M3	2	32	2	32
9535-50-40	50	50	41.2	M3	2	40	2	40
9535-60-60	60	60	53	M3	2	50	2	50
9535-70-70	70	70	60	M3	2	60	2	60
9535-80-80	80	80	70	M3	2	71.5	2	71.5
9535-90-90	90	90	80	M3	2	82.5	2	82.5
9535-120-120	120	120	105	M3	2	105	2	105
9535-140-140	140	140	125	M3	2	124.5	2	124.5
9535-200-200	200	200	185	M3	2	154	2	154
9535-220-220	220	220	205	M3	2	170	2	170
(Optional) other sizes on request								

ORDER EXAMPLE

Series	Width (mm)	Length (mm)	Thickness (mm)	EMC gasket
9535				
	Specify the outer dimension in mm	Specify the outer dimension in mm	**6.35 :** 6.35mm thick honeycomb material **12.7 :** 12.7mm thick honeycomb material **26 :** 26 mm thick honeycomb material	**N :** No gasket **F :** Conductive foam gasket

EMP ventilation panels 9540

Solid and rigid drilled ventilation panels for EMP applications



These drilled ventilation panels are designed for high performance applications, where high attenuation is required particularly in the H (magnetic) field.

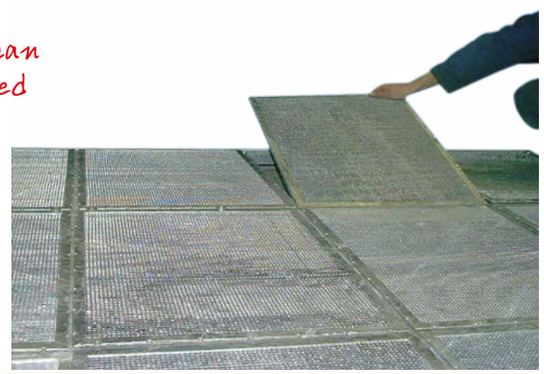
In contrast to our competitors where EMP ventilation panels are made from a composition of materials, this is a solid healed ventilation panel. This ensures that no transitions between materials are made and that the shielding performance is many times higher.

Applications

Ventilation panels are designed for use in electronic enclosures where good air flow is required for cooling and ventilation but where EMC compliance must be ensured.
Typical applications are:

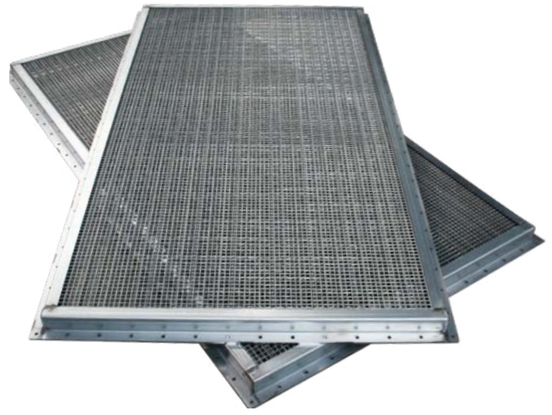
- EMI screened rooms
- Military air conditioning units
- High performance communication shelters
- EMP instillations/bunkers
- Availability

All EMP ventilation panels are individually built to your specification, size, configuration, style, fixing method and finish. These ventilation panels can be supplied with fixing holes to aid mounting.



EMP vents for Faraday cages 9545

Heavy duty EMP vents for Faraday Cages and EMP bunkers



Heavy duty EMP vents for Faraday Cages and EMP bunkers are designed for high performance applications, where high attenuation is required particularly in the H (magnetic) field.

In contrast to our competitors where EMP ventilation panels are made from a composition of materials, this is a solid healed ventilation panel. This ensures that no transitions between materials are made and that the shielding performance is many times higher.

Applications

These heavy duty EMP proof ventilation panels are designed for use in Faraday cages of big size electronic enclosures where good air flow is required for cooling and ventilation but where EMC and EMP compliance must be ensured.

Typical applications

- EMI screened rooms
- Faraday cages
- Military air conditioning units
- High performance communication shelters
- EMP installation's/bunkers
- EMP proof data-centers

Availability

All EMP ventilation panels are individually built to your specification, size, configuration, style, fixing method and finish. These EMP ventilation panels can be supplied with fixing holes to aid mounting
Request for quotation

Because these EMP ventilation panels are always made according to the requested specifications of the customer, we need your application with sizes and quantities to make a quotation. In order to make a quotation in a concrete way, a drawing would be desirable.

ORDER EXAMPLE

Part number		Width (mm)		Height (mm)
4945	–		–	
		The width in mm of the EMP vent, including the frame		The height in mm of the EMP vent, including the frame

Brass honeycomb ventilation panels 9550

A honeycomb made of brass material for ventilation or acoustic/visual contact

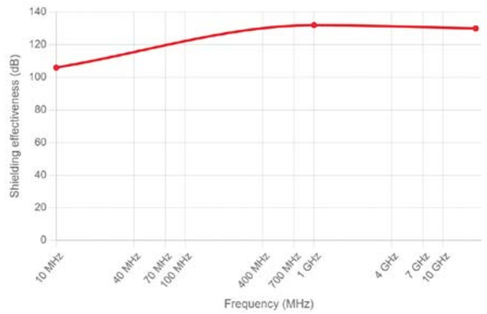
The brass honeycombs are used to shield ventilation openings in your Faraday cage. Their unique honeycomb structure ensures optimal airflow while effectively blocking electromagnetic radiation. Ventilation can be based on natural air circulation or connected to your building's ventilation system.

Each honeycomb panel is made of brass and finished with a tin layer, providing excellent corrosion resistance and high electrical conductivity. This ensures long-lasting performance and reliability in both industrial and laboratory environments.

Specifications and performance

With a thickness of 25 mm and a cell size of 4 mm, the brass honeycombs are designed to achieve attenuation above 120 dB up to 30 GHz and beyond. The honeycomb geometry and depth minimize air turbulence while maintaining maximum airflow, ensuring efficient cooling and consistent shielding performance.

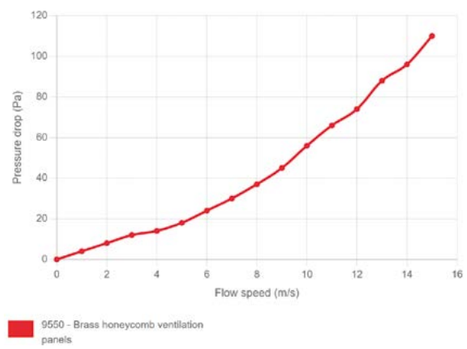
Shielding effectiveness



Benefits

- High shielding effectiveness up to and above 30 GHz
- Excellent corrosion resistance due to tin coating
- Suitable for both natural and forced ventilation
- Reduced air turbulence for optimized airflow
- Available in multiple standard sizes and custom dimensions

Airflow characteristics



ORDER EXAMPLE

Part number	Size	Gasket
9550		
	100X100 : 180 x 180 mm with a flow area of 100 x 100 mm **150X150 :** 230 X 230 mm with a flow area of 150 x 150 mm **300X300 :** 400 x 400 mm with a flow area of 300 x 300 mm	**N :** No gasket **A :** Gasket side A **B :** Gasket side B

Microwave absorber foam 3500

Used at higher frequencies than traditional shielding and can also be used with other EMI/RFI shields to extend frequency range

These absorbers can be used at higher frequencies than traditional shielding and can also be used with other EMI/RFI shields to extend frequency range.

The microwave absorbers can be installed easily with pressure-sensitive adhesive (PSA), often directly onto high-frequency board-level components, to absorb unwanted radiated and surface-wave EMI/RFI and to meet FCC requirements without shielding.

Our Microwave absorber foam is RoHS compliant. It is a coated, open-cell foam and is used as a microwave absorbing material, especially for applications with frequencies of 1 to 17 GHz. The product acts like a free-space resistor to incoming electromagnetic energy.

The Microwave absorber foam is available in a soft and a hard variant. The type you choose depends on the force you want the foam to be able to withstand, if necessary.

Microwave absorber products can solve EMI/RFI problems without additional shielding and enable advanced technologies including automotive radar, military, and commercial wireless applications.

Standard sheet

Temperature specification:- 40°C to +100°C
Die-cut: Material can be cut into any shape according to your drawing. please contact us with your drawing with the desired quantities for a quote.

Soft version:
Max. sheet size 1000 x 1000 mm
Hardness shore: 40 +/- 20

Hard version:
Max. sheet size 555 x 355 mm

Typical applications

- Antenna hats
- Test boxes
- PCB shielding/housings
- Military applications
- EMI reduction
- Antenna pattern shaping
- Radar cross reduction

Versions

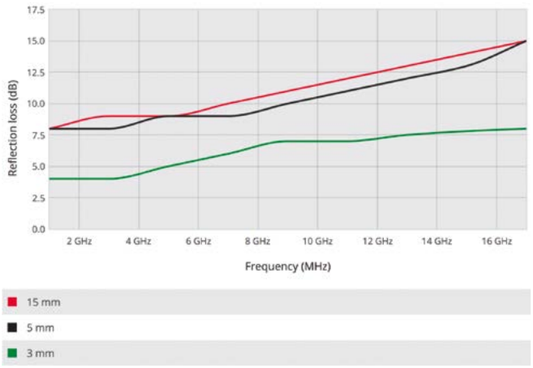
- A **soft version** which can be easily compressed to 75% is available as die cut or in the form of sheets.
  The soft microwave absorber sheets are available with thicknesses of 3, 6, and 15 mm and with or without PSA. (Pressure-sensitive adhesive).
- A **hard version** which can carry more weight and keeps its shape and position more easily is available with a thickness of 6 mm and 12 mm. Other thicknesses are available on request.

Product specifications

Property	ISO	Unit	IP 45
Density	845	Kg/m³	42- 48
Tensile strength	1798	kPa	298-337
Elongation strength	1798	%	30- 41
Compression deflection strength	844	kPa	
25%	844	kPa	55- 75
50%	844	kPa	123- 145
24h	1856	%	6.0
Working temperature range	-	Celsius	-60/+80
Thermal conductivity at 0 °C	8301	W/mK	0.04
Water absorption 7 days	-	Vol. %	<1
Flammability	FMVSS302	-	Pass
Surface resistivity	IEC-61340	Ohm	10^7

» *Microwave absorber foam 3500*

REFLECTION LOSS (SOFT VERSION)



ORDER EXAMPLE

Series	Thickness	Width (mm)	Length (mm)	Adhesive
3500 : Microwave absorber foam	**3SOFT :** 3 mm thick (soft) **6SOFT :** 6 mm thick (soft) **15SOFT :** 15 mm thick (soft) **6HARD :** 6 mm thick (hard) **12HARD :** 12 mm thick (hard)	Specify the length in mm. Soft version: max. 1000 mm Hard version: max. 555 mm	Specify the length in mm. Soft version: max. 1000 mm Hard version: max. 355 mm	**PSA :** With pressure sensitive adhesive **NA :** No adhesive

VHF ferrite absorber tiles 3600

Ferrite absorber tile is the industry standard solution and exhibits excellent overall performance versus cost

Our 3600 series Ferrite absorber tile is the standard solution for industry applications. It is an attractive solution for new anechoic chambers or for upgrading existing rooms for radiated-emission and immunity tests. These tiles are used when relatively high absorption and a compact solution are required (-15 to-25dB <100MHz). It is an excellent, reliable and compact solution for attenuating reflections in shielded enclosures.

3600 VHF ferrite absorber tile

The VHF ferrite absorber tile is made of sintered ferrite and shaped like a square tile. The dimensions are 100 x 100mm with a thickness of **6.7mm**.

The tiles are subject to precise mechanical tolerances on all sides, minimizing gaps between adjacent tiles to ensure maximum performance.

The tiles provide excellent electromagnetic absorption performance in the VHF band for EMC anechoic chambers.

Material Characteristics

Characteristics	Symbols	units	3600 series
Initial permeability	μiac		1000 ±20%
Relative loss factor	tanδ/μiac	$x10^{-6}$	25 (0.1MHz)
Saturation flux density	Bs	mT	360 (1194A/m)
Remanence	Br	mT	100
Coercivity	Hc	A/m	12
Relative temp. factor (20°C ~60°C)	αμr	$x\ 10^{-6}$/°C	3 ~ 5
Curie temperature	Tc	°C	>100
Density	δ	kg/m²	$5.0x\ 10^{3}$
Resistivity	ρ	MΩ*m	>1.0

Characteristics

- No risk of explosion, flammability, reactivity or health hazard

Features

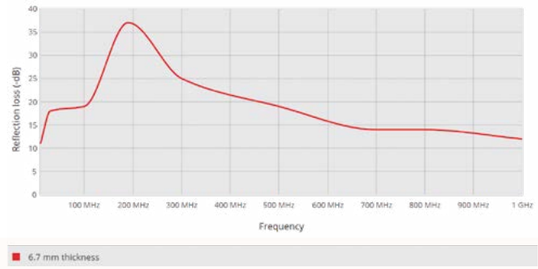
- Absorption of lower electromagnetic waves
- Wide frequency and fire resistant
- An electromagnetic absorbing material
- Easy and quick to assemble
- Precision-machined tiles for seamless installation
- No physical degradation over time
- Ultra thin, so takes up little space
- Highly weather resistant

Applications

- EMC electromagnetic-wave anechoic chamber
- Electromagnetic-wave reflection of buildings
- Electromagnetic-wave absorption
- Electromagnetic reflection problems
- ANSIC63.4, CISPR16-1-4, IEC61000-4-3
- Prevents TV ghost

Performance characteristics (3600-M)

(Normal incidence reflection loss)
Reflective attenuation vs. frequency

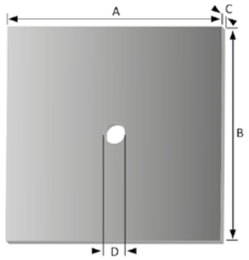


Please note: These values are measured under laboratory conditions. Results may vary in other situations. Please read our Guarantee.

Part numbers and product specification

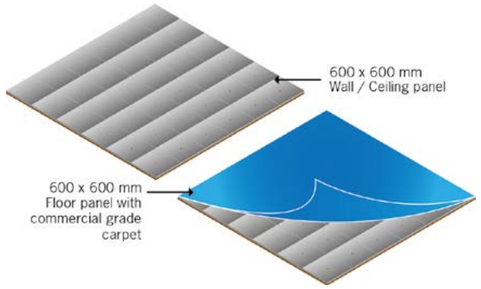
EMC-chamber dedicated, ferrite tile is produced with a traditional ceramic manufacture process.

Please note: These ferrite tiles are very thin, which can save more space for chamber installation. The tiles are non-flammable and they can be fully suitable for high-power test chambers. Ferrite tiles can be screwed directly on to the shielded housing; installation is very easy. Even after many years the effect of the ferrite tiles still will not be degraded



Supplied as 600 x 600 mm panels (optionally available)

Both the 3600 VHF ferrite absorber tile and the 3610 UHF ferrite absorber tile are optionally available in the panel format of 36 Ferrite absorber tiles.



Part number	Dimensions A (mm)	B (mm)	C (mm)	D (mm)	Weight Kg/sq m	Typical Reflection Loss (dB) 30MHz	100MHz	200MHz	300MHz	500MHz	700MHz	1GHz
3600	100 (±0.5)	100 (±0.5)	6.75 (±0.2)	10 (±0.2)	33	-18	-27	-36	-25	-20	-15	-12

ORDER EXAMPLE

Part number	Type	Size
3600	M	100

100 : 100 x 100 mm
600 : 600 x 600 mm

UHF ferrite absorber tiles 3610

Ferrite absorber tile is the industry standard solution and exhibits excellent overall performance versus cost

Our 3610 series Ferrite absorber tile is the industry standard solution and exhibits excellent overall performance versus cost. It is an attractive alternative to traditional, large, foam-type absorber materials for new anechoic chambers or for upgrading existing rooms for radiated emission and immunity measurements.

These tiles are a quite recent development. They are used when relatively high absorption is required together with a compact solution (up to-37 dB @ 800 ~ 900MHz). They also provide a reliable and compact solution for attenuating plane-wave reflections in shielded enclosures.

For the best economical choice, see our most common 3600 series VHF ferrite absorbers. These are the most frequently used choice for Anechoic chambers.

3610 UHF ferrite absorber tile

UHF ferrite absorber tile is made of a sintered ferrite in the shape of a square tile. The dimensions are 100 x 100 mm with a thickness of 4.0mm.

The tiles can easily be screwed on to a wall individually, inserting screws through the 10mm hole, or mounted by means of adhesive. The tiles are optionally available in panel format. The tiles are surface-ground on all sides to precise mechanical tolerances, minimizing gaps between adjacent tiles to ensure maximum low-frequency performance.

The tiles provide excellent electromagnetic absorption in the UHF band. The product works well in a Dark box for mobile phone inspection and EMC anechoic chambers, and it is also suitable for high buildings to prevent TV ghost or for the absorption of RFID.

Features

- Absorption of lower electromagnetic waves in the range of 30MHz ~ 1GHz
- Wide frequency and fire resistant
- An electromagnetic absorbing material
- Easy and quick to assemble
- No physical degradation over time
- Ultra thin, so takes up little space

Applications

- Dark box for mobile phone inspection
- Prevention of radio communications disturbance
- Prevention of TV ghost
- Prevention of UHF RFID-readers interference

Characteristics

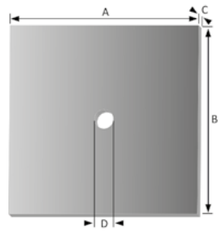
- Standard wieght : 214 gr.
- Standard dimensions : 100 x 100 x 4.0 mm
- Main hazards : No risk of explosion, flammability, reactivity or health hazard

Material characteristics

Characteristics	Symbols	Units	3610 series
Initial permeability	µiac		100 ±20%
Relative loss factor	tanδ/µiac	$x10^{-6}$	52 (1.0MHz)
Saturation flux density (1194A/m)	Bs	mT	380
Remanence	Br	mT	300
Corrective	Hc	A/m	120
Relative temp. factor (20 °C~60 °C)	αµr	$x10^{-6}$/°C	5~10
Curie temperature	Tc	°C	> 300
Density	δ	Kg/m^3	5.0×10^3
Resistivity	ρ	MΩ*m	> 5.0
Frequency coverage of Reflection loss (under-20dB)	-	MHz	630~1040
Optimized thickness of tiles	-	Mm	4.0

» UHF Ferrite absorber tiles 3610

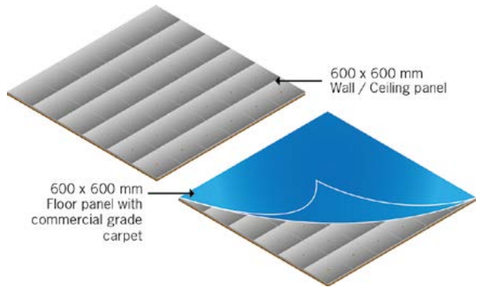
Part numbers and dimensions

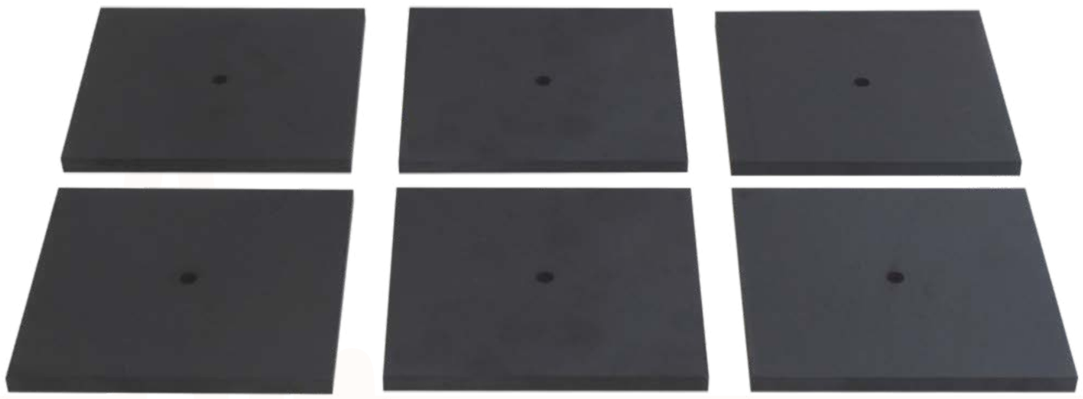


Part number	A (mm)	B (mm)	C (mm)	D (mm)	Weight (Gr)
3610-100-40	100 (±0.5)	100 (±0.5)	4.00 (±0.2)	10 (±0.2)	214

Supplied as 600 x 600mm panels (optionally available)

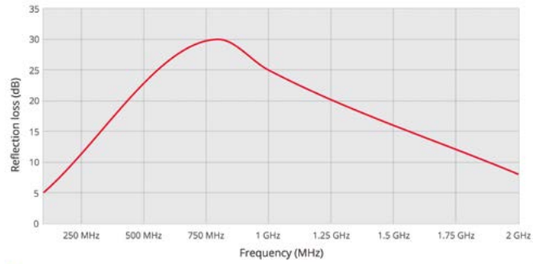
Both the 3600 VHF ferrite absorber tile and the 3610 UHF ferrite absorber tile are optionally available in the panel format of 36 Ferrite absorber tiles.





Performance characteristics

(Normal incidence reflection loss)
Reflective attenuation vs. frequency



Please note : These values are measured under laboratory conditions. Results may vary in other situations. Please read our Guarantee.

ORDER EXAMPLE

Series		Size
3610	–	100

100 : 100 x 100 mm
600 : 600 x 600 mm

Double layer ferrite absorber tiles 3620

Ferrite absorber tile is the industry standard solution and exhibits excellent overall performance versus cost

Our 3600 series Ferrite absorber tile is the industry standard solution and exhibits excellent overall performance versus cost.
It is an attractive alternative to traditional, large, foam-type absorber materials for new anechoic chambers or for upgrading existing rooms for radiated emission and immunity measurements. These tiles are a quite new development. They are used when relatively high absorption is required together with a compact solution (-15 to-25 dB @ <100MHz)- approximately 4 to 6mm vs 2400mm for foam absorbers. They also provide a reliable and compact solution for attenuating plane-wave reflections in shielded enclosures.

3620 Double-layer ferrite absorber tile

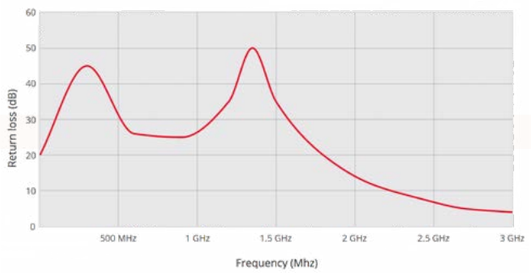
3620 Double-layer ferrite absorber tile is especially designed for small EMC anechoic chambers, to get excellent electromagnetic absorption performance in 30MHz to 2GHz.

The 3620 Double-layer ferrite absorber tile contains a 21mm gap between two pieces of 100 x 100 x 3mm sintered ferrite tile and has a total thickness of 27mm. It can be glued on to a wall easily.

Due to the special double-layer design, these tiles provide a wider frequency range than single-piece ferrite tiles, even in a small anechoic chamber or a dark box for mobile phone inspection.

Performance characteristics

(Normal incidence reflection loss)
Reflective attenuation vs. frequency



Features

- Absorption of lower electromagnetic waves
- An electromagnetic absorbing material
- Suitable for 30 MHz to 2 GHz (see attenuation graph)
- Easy and quick to assemble
- No physical degradation over time
- Good performance for a small-sized chamber
- Good performance at low frequencies

Applications

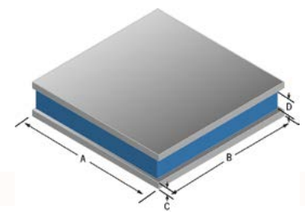
- Dark box for mobile phone inspection
- Prevention of radio communications disturbance
- Prevention of TV ghosting
- Prevention of UHF RFID-readers interference
- EMC anechoic chambers

Characteristics

- Standard weight : 410 Gr.
- Standard dimensions : 100 x 100 x 27mm
- Optimum working temperature range:-30 ~ 70°C
- Main hazards: No risk of explosion, reactivity or health hazard

Part numbers and dimensions

Part number	A (mm)	B (mm)	C (mm)	D (mm)
3620-270	100 (±0.15)	100 (±0.15)	3.0 (±0.15)	21 (±0.2)



ORDER EXAMPLE

Series		Type
3620	–	270

Wide band hybrid pyramid EM absorbers 3630

For the construction of a small anechoic chamber to get a larger space than one could build with pyramid-shaped absorbers

The 3630 series Wide-band hybrid pyramid EM absorber is an 80 mm high absorber that measures 200 mm x 200 mm. It shows good absorption performance in the wide band between 30 MHz and 18 GHz when combined with 6.3 mm thick Ferrite absorber tiles (Part nr. 3600-63). The hybrid pyramid absorber is made out of ferrite and carbon powder and is tuned for perfect performance over Ferrite absorber tiles.

Due to this special characteristic, the product is suitable for building a small anechoic chamber to get a bigger space than build with form pyramidal absorber. Also, it can increase the frequency from 1GHz to 18GHz as compared to a standard anechoic chamber that only has Ferrite absorber tiles.

structure & specifications

Color	Dark gray
Shape	Pyramid
Main material	Ferrite powder
Power Handling Capacity	1.8 kW/m²
Max service temperature (°C)	150
Fire retardance	Non-flammable

Part numbers and dimensions

Part number	Pyramid quantity per unit	Unit size A * C * B (mm xmm xmm*)	Standard weight per unit	Type
3630-200-80	16	200 x 200 x 80	2.11 kg	Single unit
3630-200-250	4	200 x 200 x 250	3.24 kg	

ORDER EXAMPLE

Series	Width (mm)	Height (mm)
3630	200	

80 : 80 mm
250 : 250 mm

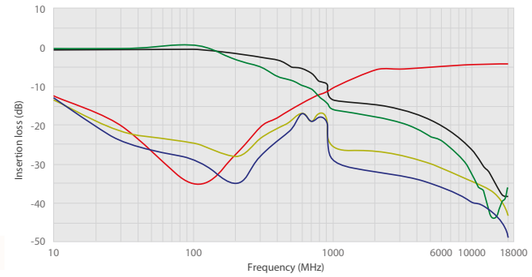
Features

- Performs very well in wide band (30MHz to 18GHz)
- Small size (200 x 200 x 80mm)
- Long service life
- Only 8 cm high, so room space can be used efficiently
- So strong that an adult can stand on it
- Does not deteriorate even if it gets wet
- 10 times more durable than conventional products
- By slant molding, stable quality is assured
- Easy to install on wall surfaces without adhesives being required

Applications

- Electromagnetic-wave anechoic chambers
- Compact EM-wave anechoic chambers
- Floor-type electromagnetic-wave absorbers
- Installation on shielded doors
- Suitable for EMS high-power irradiation test
- Suitable for small anechoic chamber (approximately 3 meters)
- Anechoic chambers for antenna
- For actual use in various GHz bandwidth

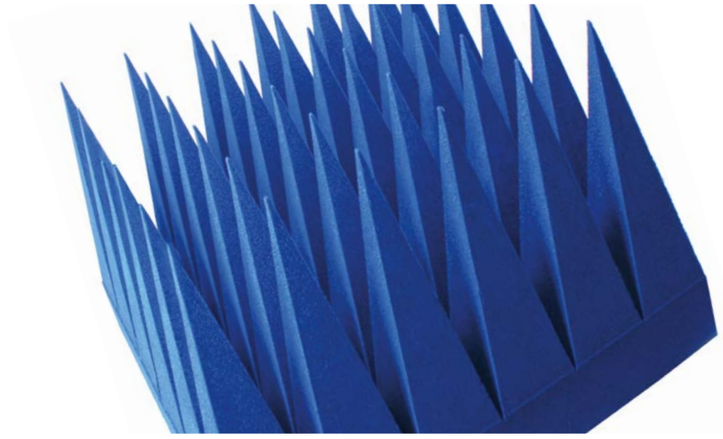
Shielding performance

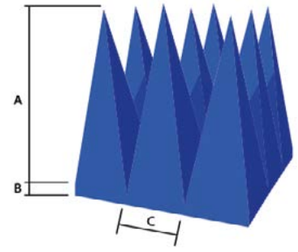


- 3600 - ferrite tile
- 3630-80 - hybrid pyramid absorber
- 3630-250 - hybrid pyramid absorber
- 3600 - ferrite tile + 3630-80 - hybrid pyramid absorber
- 3600 - ferrite tile + 3630-250 - hybrid pyramid absorber

PU foam based pyramid absorbers 3640

These PU foam bases pyramid absorbers are the most popular solution for 3m, 5m and 10m EMC chambers in the market





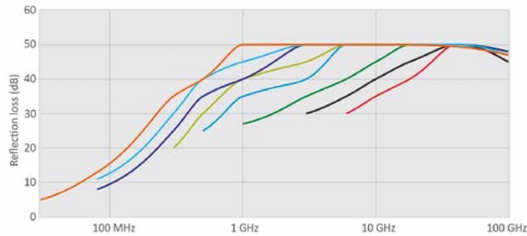
Solution for 3m, 5m and 10m EMC chambers in the market

These absorbers are the most popular solution for 3m, 5m and 10m EMC chambers in the market. They are composed of pyramidal, full tip SAM or truncated SMT pulsing the matching layer to separate the pyramidal part from the ferrite part. Through optimization, this product has a superb performance across 30MHz to 18GHz. The ferrite performs from 30MHz to 1GHz and the foam performs above 1GHz.

Prototypes are made and the design is tested. Results become part of a valuable feedback loop for refining our design further. Broadband Pyramidal Absorber is a low density polyurethane foam, filled with high loss dielectric material in open cell structure and finished with blue paint.

The general base size is 60 cm x 60 cm with 50 mm to 1200 mm height pyramidal. It's flexible and light weight, can be attached on the wall easily. It is a high performance broadband RF absorber and widely used for Anechoic Chambers.

Reflection loss under vertical incidence (-dB @ GHz)



3640-50 3640-96 3640-190 3640-300
3640-495 3640-700 3640-1000 3640-1200

Characteristics

- Such absorbers have a pyramid-shaped appearance, with blue color (it can be selected as request)
- Pliable and flexible, the pyramids won't bend in long-term use, and its absorbing properties won't be changed within 10 years.
- Oxygen index ≥ 29% (GB/T2406-93), which belongs to flame retardant B2 level (GB8624-1997)
- Power handling capacity up to 1.5 kW/m²
- Good environmental performance, all raw materials can meet the environmental requirements, no volatile, no smell and non-toxic.
  - Working conditions: general indoor application
  - Long-time working temperature: -50°C ~ 90°C
  - Short-time working temperature: -100°C ~ 120°C
  - Relative humidity: 55% ± 15%
  - Frequency range: 30MHz ~ 110GHz

Product specification and part numbers

Part number	Base size (mm x mm)	Pyramid quantity per unit	Unit size A * C * B (mm xmm xmm*)	Standard weight (kg/m²)
3640-50	600 x 600	576	50 x 18.5 x 15	1.5
3640-96		225	96 x 36 x 20	2.2
3640-190		81	190 x 65 x 50	4
3640-300		36	300 x 100 x 60	7
3640-495		16	495 x 145 x 65	11
3640-700		9	700 x 195 x 130	16
3640-1000	300 x 300	1	1000 x 300 x 150	22
3640-1200	400 x 400	1	1200 x 400 x 200	25

Please note : For the data below 500MHz, it is obtained by low-frequency coaxial test method (GJB5239-2004); while for the data above 1GHz, it is obtained by far-field RCS test method (GJB2038A-2011) The performance data listed in the above table is the guaranteed data, and the measured data would be equal to or better than the guaranteed data. Certification: CE ROHS

ORDER EXAMPLE

Series	Height
3640	

PU foam based pyramid absorbers with a height of 300 mm can be delivered from stock

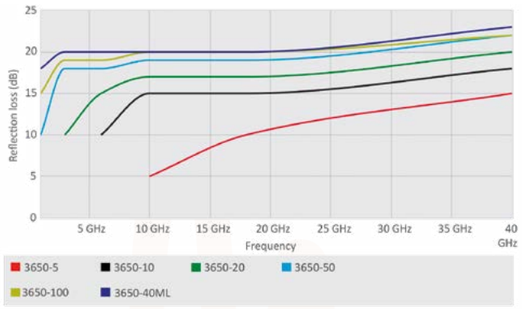
PU foam based flat absorbers 3650

These absorbers can be used at higher frequencies than traditional shielding and can also be used with other EMI/RFI shields to extend frequency range

These absorbers can be used at higher frequencies than traditional shielding and can also be used with other EMI/RFI shields to extend frequency range. The microwave absorbers can be installed easily with (PSA) pressure sensitive adhesive, often directly onto high-frequency board-level components to absorb unwanted radiated and surface wave EMI/RFI and meet FCC requirements without shielding.

PU foam based flat absorbers has the advantages of light quality and good performance, which can be applied for the site near the antenna, and it can be used to reduce the side-lobe, improve the front-to-back ratio, absorb the clutter, eliminate the interference, as well provide the camouflage and concealment of the military facilities.

Reflection loss under vertical incidence (-dB @ GHz)



Please note: Other sizes and thicknesses on request. For the data above 1GHz, it is obtained by far-field RCS test method (GJB2038A-2011). The performance data listed in the above table is the guaranteed data, and the measured data would be equal to or better than the guaranteed data. Certification: CE ROHS

Characteristics

- Such absorbers have a flat appearance, with black color (it can be selected as request), it is clean and soft.
- Oxygen index ≥29% (GB/T2406-93), which belongs to flame retardant B2 level (GB8624-1997)
- Good environmental performance, all raw materials can meet the environmental requirements, no volatile, no smell and non-toxic.
- Power handling capacity up to 1.5 kW/m²
- Working temperature:-60℃~90℃ relative humidity: 55%±15% Frequency range: 1GHz~18GHz

Product specification and part numbers

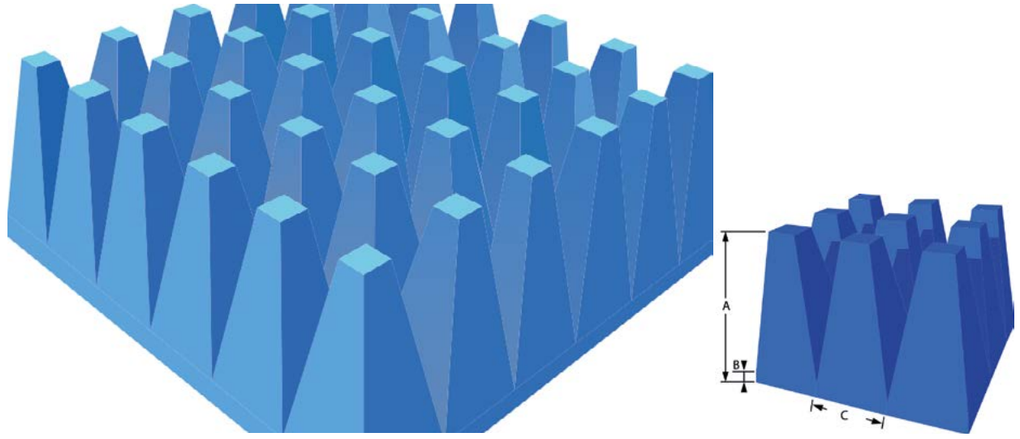
Part number *	Unit dimension B x B x H (mm xmm xmm)	Standard weight (Kg/m²)
3650-5	600 x 600 x 5	0.3
3650-10	600 x 600 x 10	0.5
3650-20	600 x 600 x 20	0.6
3650-50	600 x 600 x 50	1.5
3650-100	600 x 600 x 100	3
3650-40-ML	600 x 600 x 40	1.5

ORDER EXAMPLE

Series
3650

PU foam based hybrid absorbers 3660

Almost has the same performance in low frequency as the pyramid absorbers (with tips); but its performance in high frequency might be slightly declined



The 3660 series PU foam based Hybrid absorbers product is similar to our standard pyramid absorbers, but having the tips of the pyramids truncated. This saves space in small chambers and provides a more rugged product, eliminating the possibility of tip breakage.

PU foam based Hybrid absorber in an appropriate combination in a EMC anechoic chamber and is an ideal absorber treatment for Immunity Test Chambers (EN 1000-4-3 and equivalent specifications).

Removing 20% from the tips of pyramid absorbers (low carbon), it is the Truncated absorbers (without tips), which almost has the same performance in low frequency as the pyramid absorbers (with tips); but its performance in high frequency might be slightly declined. The advantage of such absorbers is bringing a larger net space, eliminating the tips droop, and it has a stronger resistance capability against mechanical damage.

Product specification and part numbers

Part number	Base size (mm xmm)	Pyramid quantity per unit	Unit size A x C x B (mm xmm xmm)	Standard weight (kg/m²)
3660-P200	600 x 600	81	190 x 65 x 50	4
3660-P300	600 x 600	36	300 x 100 x 60	7
3660-P500	600 x 600	16	495 x 145 x 65	11
3660-P700	600 x 600	9	700 × 195 × 130	16
3660-T300	600 x 600	16	305 × 145 × 72	9
3660-T500	600 x 600	9	495 × 195 × 110	10
3660-T700	600 x 600	4	710 × 295 × 100	14
3660-P1000	300 x 300	1	1000 × 300 × 150	22
3660-T1000	600 x 600	1	1000 × 300 × 185	28

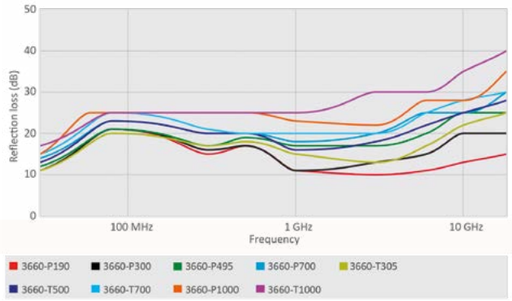
Characteristics

- It used to have a truncated appearance (some customers might want to keep the tips)
- It has blue color (more color for optional), it is pliable and flexible
- It must be matched with ferrite tiles, to get a better broadband performance during 30MHz- 18GHz
- There shall be matching design between ferrite tiles layer and absorbers layer, to further develop the bandwidth.
- Oxygen index ≥29% (GB/T2406-93), which belongs to flame retardant B2 level (GB8624-1997)
- Good environmental performance, all raw materials can meet the environmental requirements, no volatile, no smell and non-toxic
- Installation method: it generally uses fasteners installation or Velcro installation, which would facilitate the replacement of absorbers and the relocation of chambers. For small anechoic chambers, absorbers can be directly pasted by an environmental protective adhesive.

Working condition:

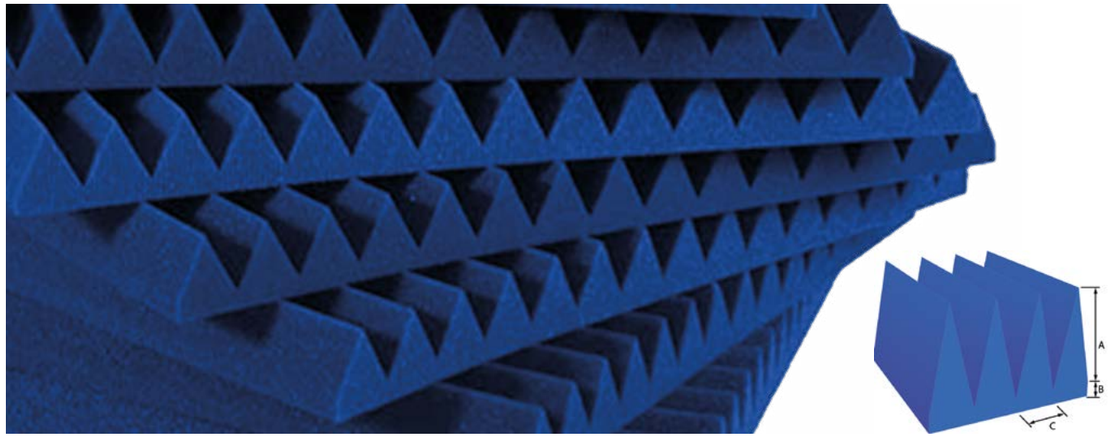
- Long-time working temperature:-50°C ~ 80°C
- Relative humidity: 55% ± 15%

Reflection loss under vertical incidence



PU foam based wedge absorbers 3670

The main advantage is to reduce the back scattering of pyramid absorbers and obtain higher quietness of quiet zone



PU foam based wedge absorbers has the properties similar to the pyramid absorbers with same height, it also has excellent performance in 100MHz-110GHz. It is mainly applied in large compact anechoic chamber and tapered anechoic chambers, the main advantage is to reduce the back scattering of pyramid absorbers and obtain higher quietness of quiet zone.

Characteristics

- Such absorbers have a wedge-shaped appearance, with blue color (it can be selected as request)
- Pliable and flexible, the pyramids won't bend in long-term use, and its absorbing properties won't be changed within 10 years.
- Oxygen index ≥29% (GB/T2406-93), which belongs to flame retardant B2 level (GB8624-1997)
- Good environmental performance, all raw materials can meet the environmental requirements, no volatile, no smell and non-toxic.

Working conditions

- Long-time working temperature:-50 °C ~ 90 °C
  Short-time working temperature:-100 °C ~ 120 °C
- Relative humidity: 55% ± 15%

Installation method

it generally use an environmental protective adhesive to paste the absorbers on the shield body; when the absorbers height is below 500mm, Velcro installation can be applied; furthermore, we can also adopt the fasteners to install the absorbers, which would facilitate the replacement of absorbers and the relocation of chambers.

Reflection loss under vertical incidence (-dB @ GHz)

Please note: For the data below 500MHz, it is obtained by low-frequency coaxial test method (GJB5239-2004); while for the data above 1GHz, it is obtained by far-field RCS test method (GJB2038A-2011) The performance data listed in the above table is the guaranteed data, and the measured data would be equal to or better than the guaranteed data. Certification: CE ROHS

Product specification and part numbers

Part number	Base size (mm xmm)	Pyramid quantity per unit	Unit size A x C x B (mm xmm xmm)	Standard weight (Kg/m²)
3670-200		6	200 × 10 × 5	8
3670-300	600 x 600	6	300 × 10 × 7	10
3670-495		3	495 × 20 × 7.5	15
3670-700	600 x 400	2	700 × 20 × 10	24

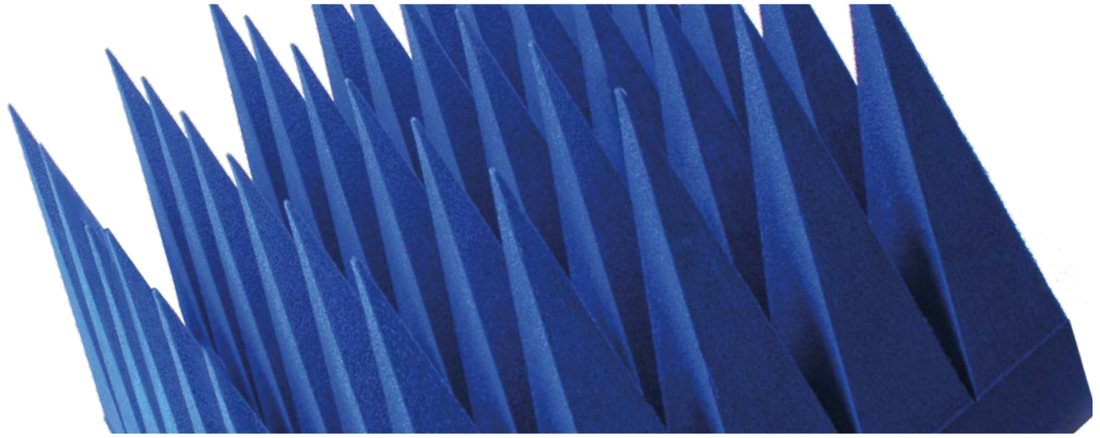
ORDER EXAMPLE

Series		Height (mm)
3670	–	

Specify the height of the desired absorber in mm

Nonflammable high power handling absorbers 3680

Nonflammable high power handling EM absorbers for anechoic chambers



Non-flammable high power handling absorber, is a non-woven fabrics based hollow broadband microwave absorbers with fire retardant and microwave absorption impregnated.

It is mainly used in microwave anechoic chambers, and it can be used to shield the test equipments inside the chamber; under vertical incidence and oblique incidence conditions, it has better broadband performance; meanwhile, it has a good scattering attenuation and isolation performance, and it can be applied for all parts of the anechoic chambers.

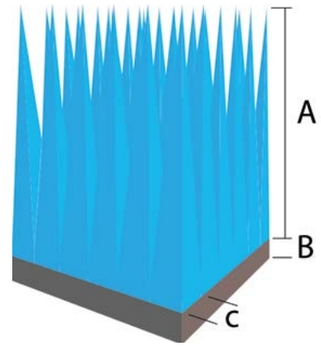
It is a hollow broadband microwave absorber which is made of a heat resistance non-woven fabric which is dipped with flame retardants and microwave absorbing agents, and it is mainly used in microwave anechoic chamber and covers the test equipments. Under the condition of normal incidence and oblique incidence, it has better broadband performance as well as scattering and isolation attenuation performance. It can be used in any part of the chamber.

Product specification and part numbers

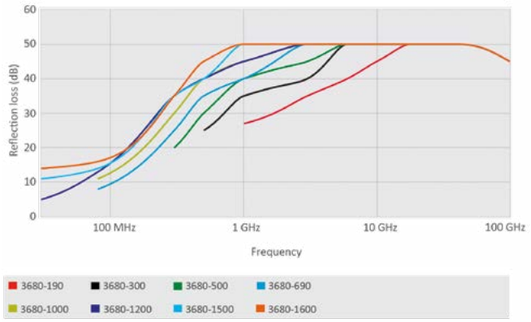
Part number	Base size (mm xmm)	Pyramid quantity per unit	Unit size A x C x B (mm xmm xmm)	Standard weight (Kg/m²)
3680-190	500×500	81	190×65×50	10
3680-300		64	300×60×50	13
3680-500		64	500×60×76	19
3680-690		36	690×80×90	20
3680-1000		16	1000×123×160	26
3680-1200		9	1200×163×180	28
3680-1500		9	1500×163×205	29
3680-1600		9	1600×163×220	29

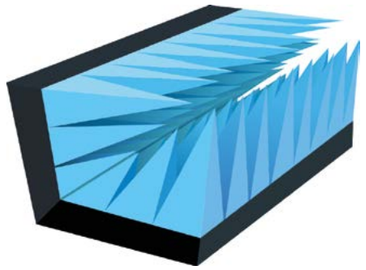
Characteristics

- Flame retardant according to DIN4102 level B1.
- Excellent high power handling capacity, it can withstand the power irradiation (continuous wave) ≥6kW/m²
- It adopts keel mounting method, without any adhesive.
- The absorbing performance of such absorbers is equal to or better than the PU foam absorber with same height.
- It adopts inorganic flame retardants and microwave absorption, no volatile, no smell and non-toxic;
  it is stable in long-term use.
- Working conditions:
  - Long-time working temperature:-50 °C ~ 120 °C
  - Short-time working temperature:-100 °C ~ 150 °C
  - Relative humidity: 55% ± 15%



REFLECTION LOSS UNDER VERTICAL INCIDENCE (-DB @ GHZ)





Please note:

- For the data below 500MHz, it is obtained by low-frequency coaxial test method (GJB5239-2004); while for the data above 1GHz, it is obtained by far-field RCS test method (GJB2038A-2011) The performance data listed in the above table is the guaranteed data, and the measured data would be equal to or better than the guaranteed data.
- 3680-1600 can also be used in EMC chambers such as 10 meters and 3 meters.
- Certification: CE ROHS

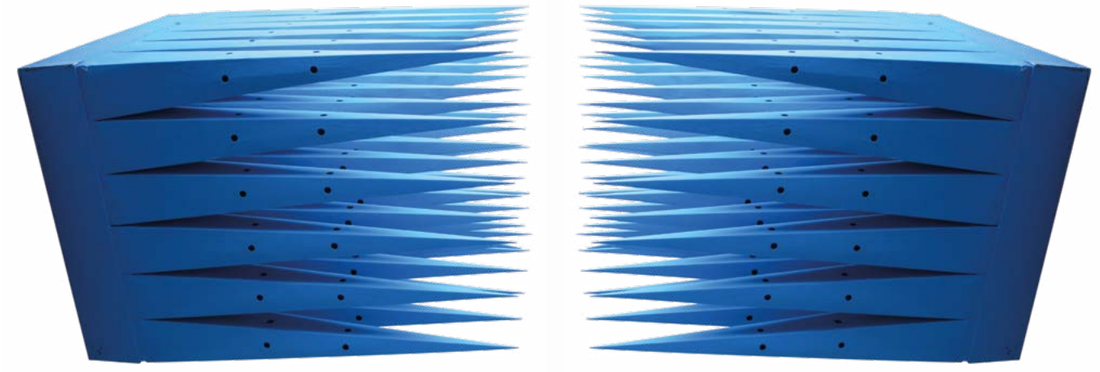
ORDER EXAMPLE

Series	Height (mm)
3680	–

Specify the height of the desired absorber in mm

High power handling pyramid absorbers 3690

Microporous pyramid absorbers can support inside and outside ventilation circulation

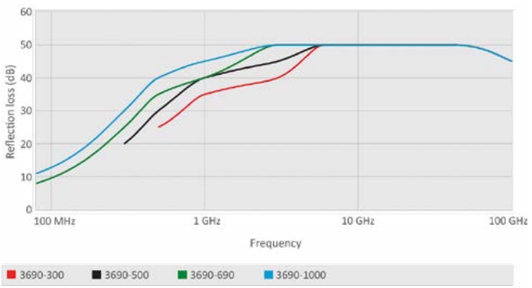


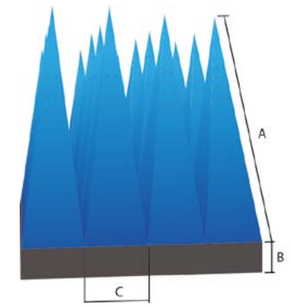
Reflection loss under vertical incidence (-dB @ GHz)

High power handling microporous pyramid absorbers can support inside and outside ventilation circulation, which would further improve the power handling capacity of such absorbers; it is mainly applied in high power shield cabinet, ventilation vents of anechoic chambers, and etc.

Characteristics

- Good flame retardant characteristics, it won't burn when it encounter the fire, it has oxygen index ≥60% and flame retardant B1 level
- Excellent high power handling capacity, it can withstand the power irradiation (continuous wave) 8-10kW/m²
- It adopts keel mounting method, without any adhesive





Product specification and part numbers

Part number	Base size (mm xmm)	Pyramid quantity per unit	Unit size A x C x B (mm xmm xmm)	Standard weight (Kg/m²)
3690-300	500 × 500	64	300 × 60 × 50	13
3690-500		64	500 × 60 × 76	19
3690-690		36	690 × 80 × 90	20
3690-1000		16	1000 × 123 × 160	26

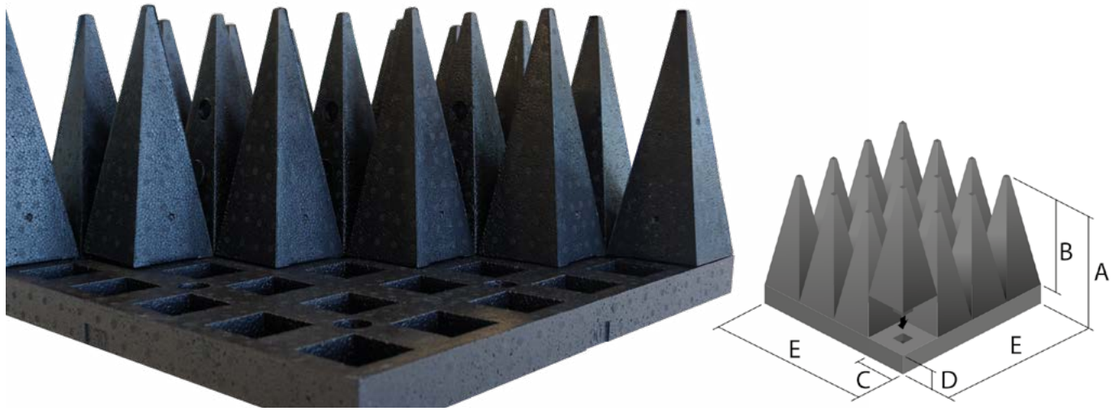
ORDER EXAMPLE

Part number	Height (mm)
3690	–

Specify the height of the desired absorber in mm

Polypropylene (pp) based hybrid pyramid absorber 3700

Absober optimalized for in EMC chambers



Polypropylene (pp) based hybrid pyramid absorber is a product that is optimalized to be used in a EMC chamber and is available in a different range of sizes. Each size has its own reducing factor of electromagnetic waves and can reach when using the 3600 ferrite tiles a broadband operating frequency range starting from 30 MHz and up to 40 GHz.

Due to the carbon powder synthesis technique the pyramids are having a a high high uniformity of carbon powder density throughout the absorber. The product has almost no carbon dust, so applicable for clean test sites and it has low maintenance cost.

Features

- Polypropylene based hybrid absorber
- Unique carbon powder synthesis technology
- High uniformity of carbon powder density
- Provides repeatable and accurate test results
- Extremely low carbon dust emission
- Outstanding impedance matching with ferrite tiles
- Foam expansion molding manufacture system
- Eco friendly
- Water resistant
- Fire resistant
- light weight material
- Easy installation

Material Characteristics

Color	Black
Material	Polypropylene (pp)
Shape	Pyramid
Power Handling Capacity	1.5 kW/ m2 or 752 V/m
Max service temperature	100°C
Cleanroom equipment suitability	ISO 14644 Class 4
Fire etardancyr	UL94 HBF / DIN 4102 Class B2

Typical Reflectivity

Part number	30 MHz	50 MHz	100 MHz	500 MHz	1 GHz	3 GHz	5 GHz	10 GHz	18 GHz	28 GHz	40 GHz
3700-300	-18	-26	-23	-17	-15	-18	-23	-27	-32	-40	-45
3700-500	-19	-26	-23	-19	-20	-25	-28	-36	-43	-45	-50
3700-750	-21	-25	-23	-21	-24	-29	-33	-40	-47	-50	-50

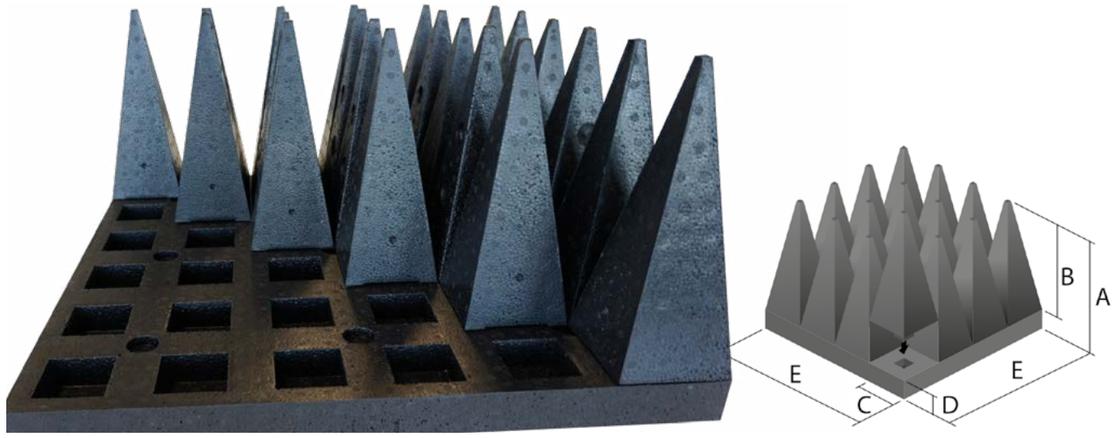
Physical Properties

Partnumber	Weight (kg)	No. of Tips	Type	Absorber Dimensions (mm) A	B	C	D	E
3700-100	0.68 0.17)	144 36)	Single unit	100	70	50	30	600 (300)
3700-200	1.10 0.27)	64 16)	Single unit	200	170	75	30	600 (300)
3700-300	1.60	36	Plug & Pull	300	260	100	40	600
3700-500	2.60	16	Plug & Pull	500	440	150	60	600
3700-750	3.80	9	Plug & Pull	750	670	200	80	600

Due to the characteristics of polypropylene material, the dimensional tolerances of 5mm may be occurred during transportation.

Polypropylene (pp) based microwave absorber 3710

Antenna measurement in anechoic rooms on high frequency range



The Polypropylene (pp) based microwave(electromagnetic wave) absorber is looking the same as our Polypropylene (pp) based hybrid pyramid absorber 3700 but this absorber is used on the high frequeny range. The absorber is designed for antenna measurement in anechoic rooms and solution for Antenna Pattern Measurement (APM), Antenna Test Range (ATR), Radar Cross Section (RCS) and Electronic Warfare Test (EWT) chambers.

Depending on the different range of sizes, each size has its own reducing factor of electromagnetic waves. It can be used to cover up the low frequency band without the use of ferrite tiles.

Features

- Polypropylene based microwave broadband absorber
- Specifically designed for high frequency range
- Suitable for antenna pattern measurement chamber
- High uniformity of carbon powder density
- Provides repeatable and accurate test results
- Extremely low carbon dust emission
- Foam expansion molding manufacture system
- Eco friendly
- Water resistant
- Fire resistant
- Light weight material
- Easy installation

Material Characteristics

Color	Black
Material	Polypropylene (pp)
Shape	Pyramid
Power handling capacity	1.5 kW/ m2 or 752 V/m
Max service temperature	100°C
Cleanroom equipment suitability	ISO 14644 Class 4
Fire retardancy	UL94 HBF / DIN 4102 Class B2

Typical Reflectivity

Part number	30 MHz	50 MHz	100 MHz	500 MHz	1 GHz	3 GHz	5 GHz	10 GHz	18 GHz	28 GHz	40 GHz
3710-100					-28	-32	-33	-33	-33	-33	-33
3710-200					-30	-40	-40	-50	-50	-50	-50
3710-300	-1	-3	-24	-28	-35	-48	-48	-50	-50	-50	-50
3710-500	-4	-11	-29	-34	-45	-50	-50	-50	-50	-50	-50
3710-750	-9	-20	-32	-37	-46	-50	-50	-50	-50	-50	-50

Physical Properties

Partnumber	Weight (kg)	No. of Tips	Type	Absorber Dimensions (mm) A	B	C	D	E
3710-100	0.86 (0.21)	144 (36)	Single unit	100	70	50	30	600 (300)
3710-200	1.39 (0.35)	64 (16)	Single unit	200	170	75	30	600 (300)
3710-300	1.89	36	Plug & Pull	300	260	100	40	600
3710-500	3.00	16	Plug & Pull	500	440	150	60	600
3710-750	4.38	9	Plug & Pull	750	670	200	80	600

Due to the characteristics of polypropylene material, the dimensional tolerances of 5mm may be occurred during transportation.

EPP outdoor absorbers 3655

The EPP outdoor absorbers are a solid, expanded polypropylene absorbent material, under normal conditions and oblique incident electromagnetic area, it has excellent broadband wave absorption, and of the EPP material, it is also weather-resistant and suitable for outdoor use.

The base material of the flat foam absorbers is polypropylene mixed with carbon material and other additives.

Compared to traditional polyurethane absorbent materials, the EPP rigid foam absorbent materials we produce are weather resistant and have the advantages of higher energy consumption, stronger usage intensity, improving the clean and hygienic environment of the whole chamber. The life of the EPP foam absorber can be up to 20 years.

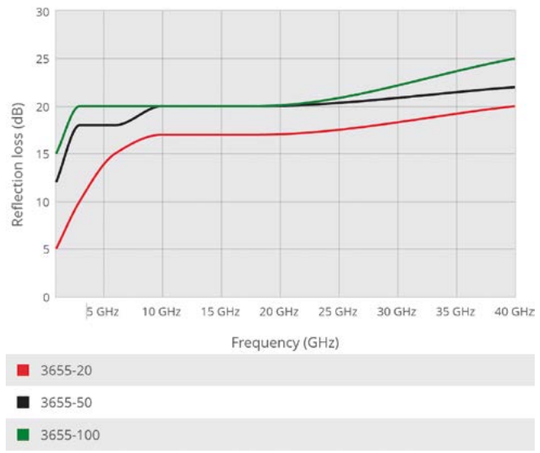
Partnumber and dimensions

Partnumber	Base size (mm x mm)	Heigth (mm)
3655-20	600 x 500	20
3655-50		50
3655-100		100

Features

- No dust shedding
- No moisture
- No discoloration
- Weatherproof (for outdoor applications)
- Can be used in various EMC and microwave chambers

Reflection loss under vertical incidence (-dB @ GHz)



EMI absorber sheets 5780

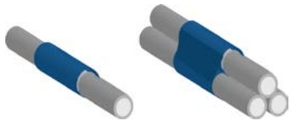
The EMI flexible absorber sheets, developed for electro-magnetic-wave absorption and noise suppression, can eliminate noise effectively

The EMI flexible absorber sheets, developed for electromagnetic-wave absorption and noise suppression, can eliminate noise effectively. EMC/EMI problems are solved by attaching noise-suppression sheets simply on the parts that are sources of noise.

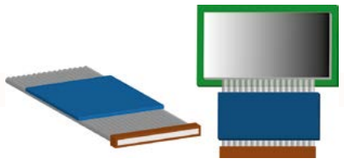
Features and advantages

- Very flexible and easy to handle
- Can be delivered in any shape, size and/or thickness
- Optionally available as a custom-made tube
- Can be cut according to the customer's drawings
- Provides effective EMI suppression in a wide frequency range (1MHz to 18GHz)
- Changes the magnetic flux path to avoid interference with other components or surrounding cables
- Reduces the eddy current when the magnetic flux is close to metal
- Non-conductive adhesive backing (UL recognized) available
- Effective in preventing resonance and suppressing coupling
- High surface resistance (>10^6 Ω)
- Easy and fast to process due to self-adhesive

Usage examples



Example 1: Wrapped around a cable

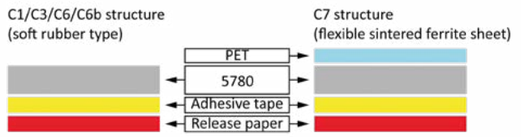


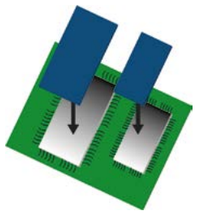
Example 2: Applied to a flat cable

Applications

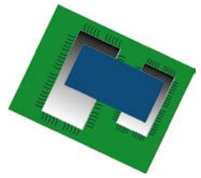
- RFID (Radio Frequency Identification) systems
- NFC (Near-field communication)
- Wireless power chargers (WPC / Qi)
- Computers (NB / desktop / tablet) and peripherals
- Digital Products
- Mobile phones / smartphones / phablet
- Wireless equipment
- EMI-shielding box / black box
- Between printed circuit boards
- On IC's, processors, and controllers
- On cables that need high flexibility

MATERIAL STRUCTURE

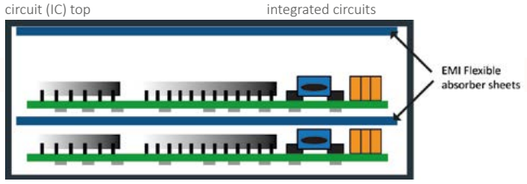




Example 3: Applied to an integrated circuit (IC) top

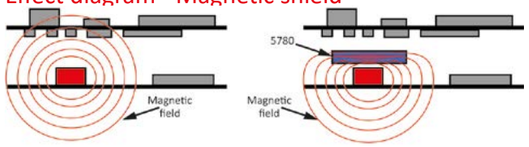


Example 4: Applied between integrated circuits



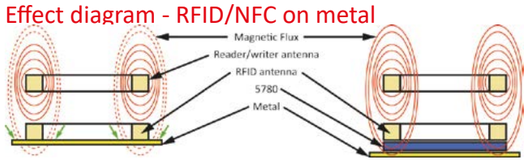
Example 5: Applied to case and between boards

Effect diagram - Magnetic shield



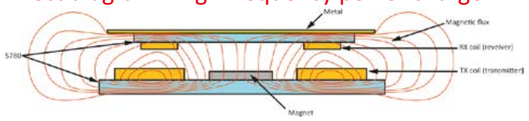
5780 EMI flexible absorber sheets can change the magnetic flux path to keep the magnetic flux from affecting other components.

Effect diagram - RFID/NFC on metal



5780 EMI Flexible absorber sheets can be used for a wireless power charger to avoid eddy current when the RX coil is attached to metal; this changes the magnetic flux path between TX coil, RX coil, and magnet.

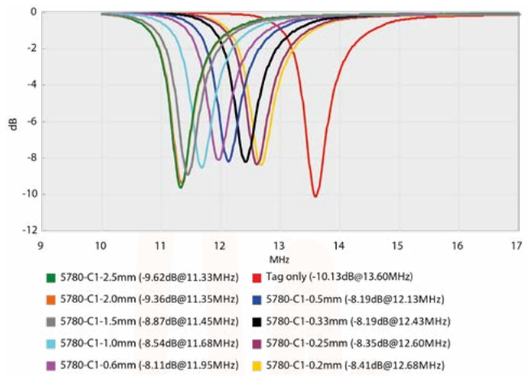
Effect diagram - high frequency power charger



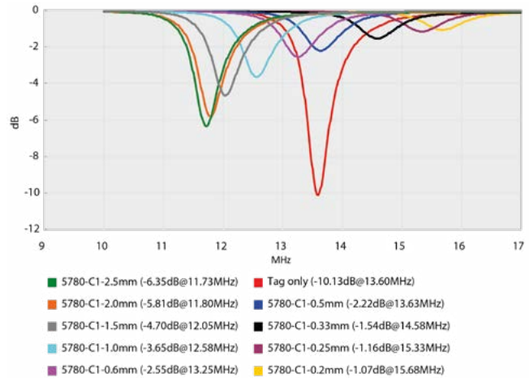
5780 EMI Flexible absorber sheets can be used for a wireless power charger to avoid eddy current when the RX coil is attached to metal. This changes the magnetic flux path between TX coil, RX coil, and magnet.

The variation of response frequency when RFID tag + 5780 + metal (Reference)

The response frequency is become lower when 5780 thickness become thick but the signal strength with little difference.

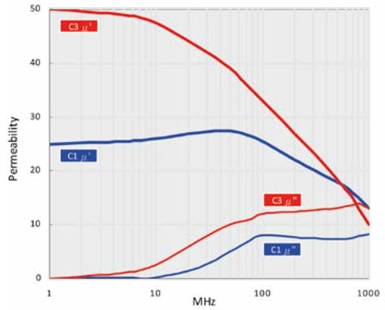


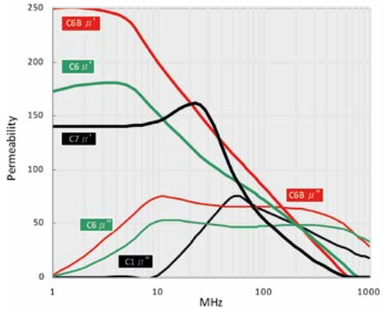
The response frequency is increase when metal attached, but the signal strength is smaller if the 5780 thickness is thinner. It means the metal affect more when the 5780 is thinner.



- The dimensions of the 5780 and metal are 85.6x54mm.
- The RFID tag is standard ISO card size (85.6x54mm) with HF TI 2048 chip.

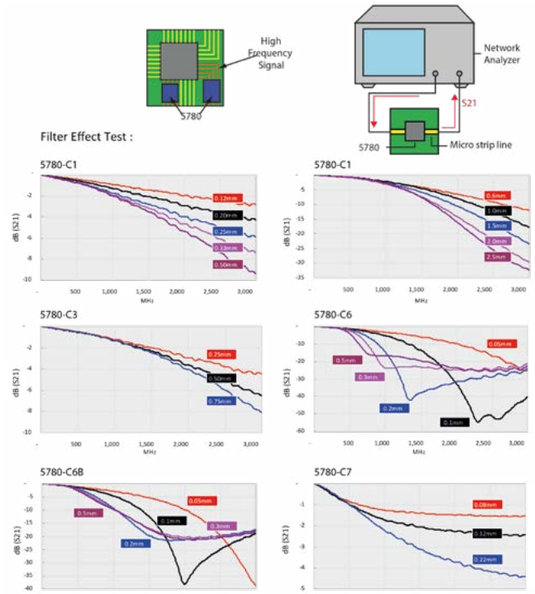
Permeability (μ = μ’ – j μ’’) :



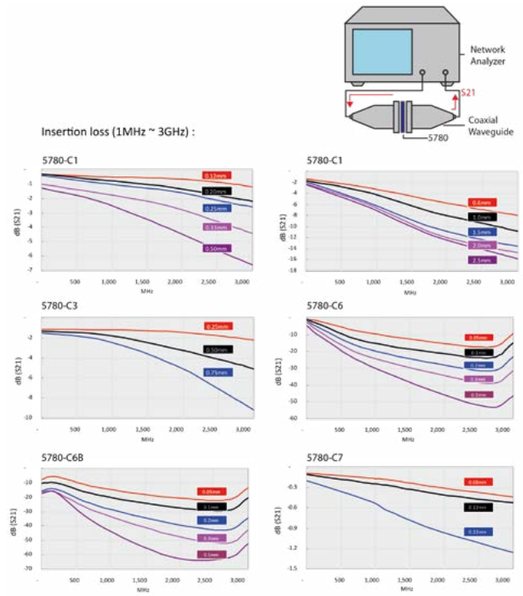


» EMI absorber sheets 5780

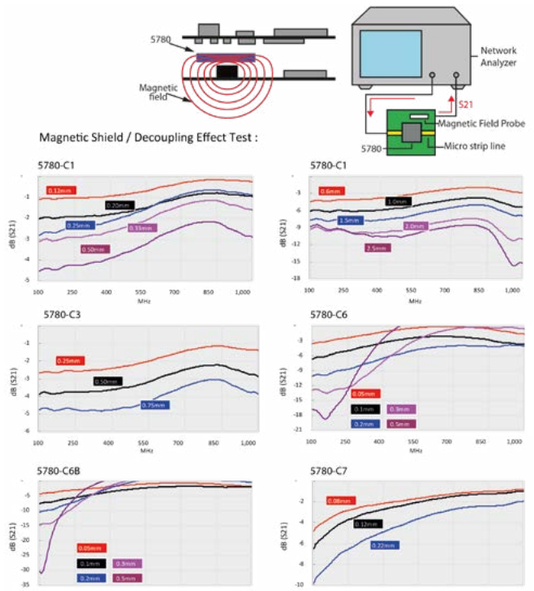
Filter Effect Test



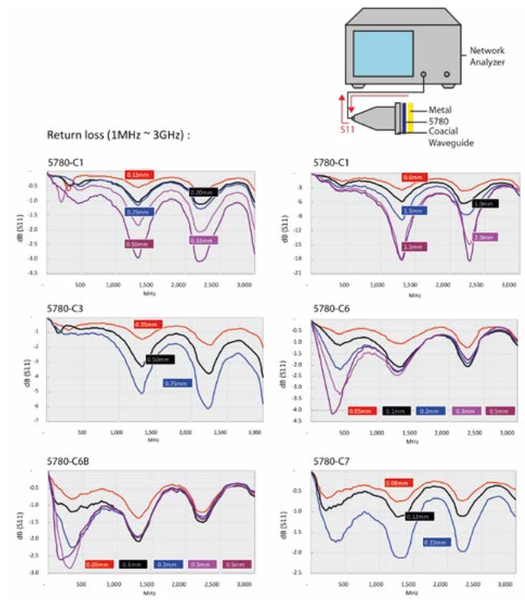
Insertion loss (1MHz ~ 3GHz)



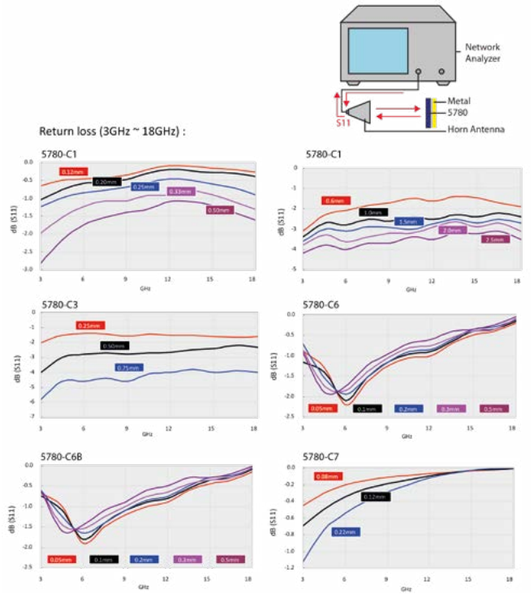
Magnetic Shield / Decoupling Effect Test



Return loss (1MHz ~ 3GHz)



Return loss (3GHz ~ 18GHz)



Choosing the right EMI flexible absorber sheet

Item	C1	C3	C6	C6B	C7
Best Application	RFID, NFC	EMI, RFID, NFC	EMI, RFID, NFC, wireless charger (no magnet type)	EMI, RFID, NFC, wireless charger (no magnet type)	EMI, RFID, NFC, wireless charger (no magnet type)
Material	Magnetic powder + rubber	Magnetic powder + rubber	Magnetic powder + rubber	Magnetic powder + rubber	Sintered ferrite sheet
Acceptable frequency range	1MHz- 18GHz	1MHz- 18GHz	1MHz- 9GHz	1MHz- 9GHz	1MHz- 3GHz
Operation temperature	-40 ~ +85 C°	-40 ~ +85 C°	-40 ~ +85 C°	-40 ~ +85 C°	-30 ~ +120 C°
Permability (μ'@1MHz	25	50	170	250	140
Density (g/cm3)	3.6	4.8	3.8	3.8	3.8
Surface Resistance	10^6	10^6	10^6	10^6	10^9
RoHS 2.0 Compliance	2011/65/EU	2011/65/EU	2011/65/EU	2011/65/EU	2011/65/EU
Halogen-Free	No	No	Yes	Yes	Yes
Thickness (mm)	0.12/0.20/0.25/0.33/0.50/ 0.6/1.0/1.5/2.0/2.5	0.25/0.50/0.75	0.05/0.1/0.2/0.3/0.5	0.05/0.1	0.008/0.12/0.22
Max. Dimension	600 x 400 mm	600 x 400 mm	210 x 297 mm (A4)	210 x 297 mm (A4)	130 x 130 mm

ORDER EXAMPLE

Series	Type	Width (mm)	Length (mm)	Thickness (mm)
5780	**C1 :** Magnetic powder + rubber **C3 :** Magnetic powder + rubber **C6 :** Magnetic powder + rubber **C6b :** Magnetic powder + rubber **C7 :** Sintered ferrite	Specify the width in mm	Specify the length in mm	Specify the desired thickness. The options can be found in the table above.

High performance EMI absorber sheets 5790

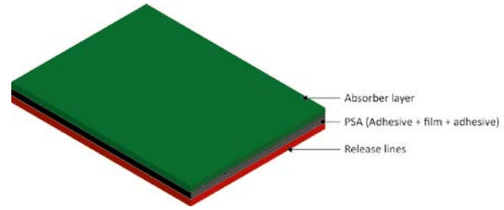
EMC/EMI problems can be solved by attaching EM absorber and noise suppression sheets simply next to noise sources

The high-performance EMI (electromagnetic interference) absorber and noise suppression series can eliminate noise effectively. This product is made with magnetic metal powder. Through the distributed and mixed process, there is a Microwave absorbing sheet made of rubber sheets.

As increasing use of wide frequency band, this products absorb and control unnecessary electronic microwaves (noise). You can solve EMC/EMI problems by attaching EM absorber and noise suppression sheets simply on the part of noise sources.

The high performance EMI absorber sheet series is designed for applications where high noise suppression is needed in a broad frequency range. Examples are applications in the construction of medical and military devices.

Construction



Advantages

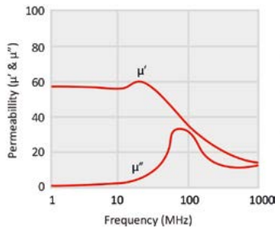
- Perfect suppression of radiation noise
- High electrical resistance (1x109Ω)
- Flexible and easy to handle/apply with single-side adhesive, even on a rounded side
- Can be manufactured in many shapes, sizes and thickness according to CAD drawing

Technical specifications

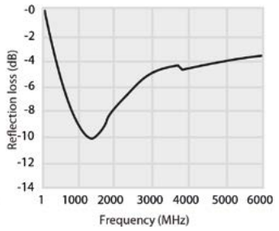
Part number	Unit	5790-ES11	5790-ES12	5790-ES31	5790-ES45	5790-ES46	5790-ES47	5790-ES48
Feature		Wide band	Wide band	Wide band, High permeability	Standard	Wide band	Wide band	Wide band, High permeability
Structure		Single layer						
Frequency range		10MHz to 6GHz						
Permeability		55 ± 5 (@13.56MHz)	60 ± 5 (@13.56MHz)	130 ± 5 (@3MHz)	25 ± 5 (@3MHz)	70 ± 5 (@3MHz)	80 ± 5 (@3MHz)	100 ± 5 (@3MHz)
Operating temp.	C°	-30 till +80						
Density	G/cm^3	3.9 ± 0.3	2.8 ± 0.3	3.7 ± 0.3	3.6 ± 0.3	3.6 ± 0.3	3.7 ± 0.3	3.7 ± 0.3
Surface resistance	Ω/sq	>1 x 10^6						
Standard thickness	Mm	0.1mm (others on request)						
Standard dimensions	Mm	200x300 (others on request)						
Adhesion	Gf/25mm	Min 1.000						
Environmental issues		RoHS compliant						

» High performance EMI absorber sheets 5790

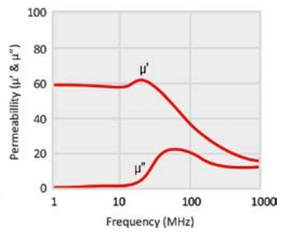
Permeability & Reflection loss



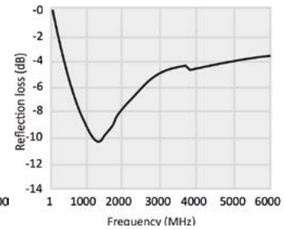
5790-ES11 Permeability



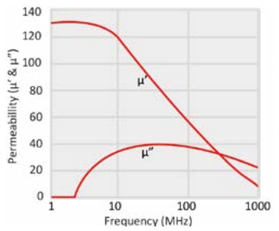
5790-ES11 Return loss



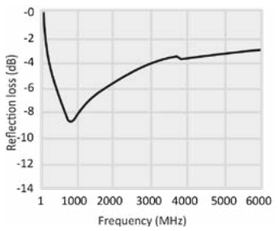
5790-ES12 Permeability



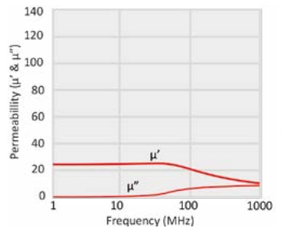
5790-ES12 Return loss



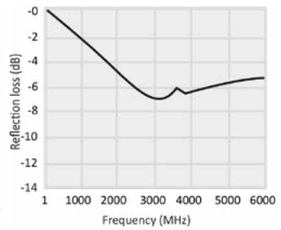
5790-ES31 Permeability



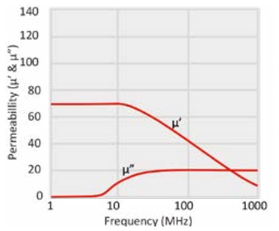
5790-ES31 Return loss



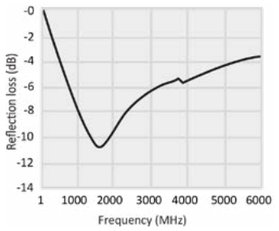
5790-ES45 Permeability



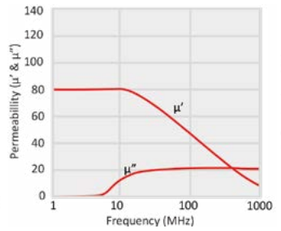
5790-ES45 Return loss



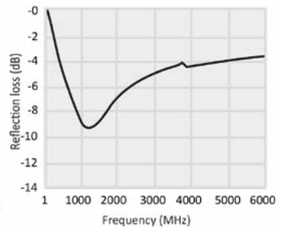
5790-ES46 Permeability



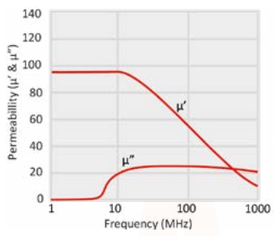
5790-ES46 Return loss



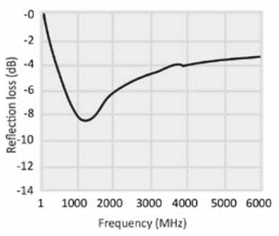
5790-ES47 Permeability



5790-ES47 Return loss



5790-ES48 Permeability



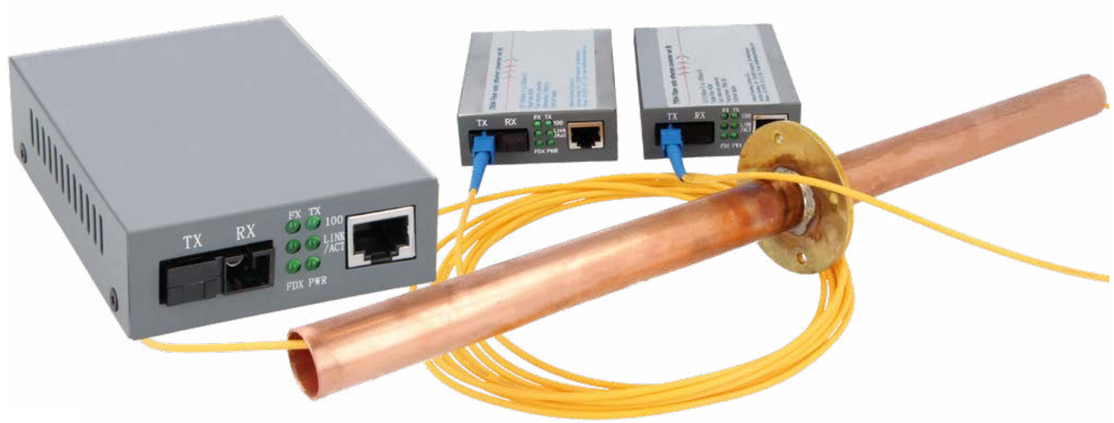
5790-ES48 Return loss

ORDER EXAMPLE

Series	Type	Width (mm)	Length (mm)	Thickness (mm)
5790	**ES11 :** Wide band 55 ± 5 (@13.56MHz) **ES12 :** Wide band 60 ± 5 (@13.56MHz) **ES31 :** Wide band, High permeability 130 ± 5 (@5MHz) **ES32 :** Wide band, High permeability 110 ± 5 (@5MHz) **ES45 :** Standard 25 ± 5 (@5MHz) **ES46 :** Wide band 70 ± 5 (@3MHz) **ES47 :** Wide band 80 ± 5 (@3MHz) **ES48 :** Wide band, High permeability 95 ± 5 (@3MHz)	Specify the width of the absorber sheet in mm	Specify the length of the absorber sheet in mm	Specify the desired thickness. The options (0.05, 0.1, 0.2, 0.5) can be found in the table above.

Fiber optic ethernet converter set 7894

EMI Shielded room and Faraday cage feedthrough for high speed Ethernet / UTP communication links



Our 7894- Fiber-optic ethernet converter set offers a shielded-room feedthrough for high-speed Ethernet/UTP communication links. The fiber-optic ethernet converter set is used to convert a 10/100/1000 Base-T signal to a 10/100/1000 optical signal, so you can use your internet connection or for example your videocamera connection inside or outside the Faraday cage while maintaining over 140 dB of room attenuation.

The set consists of two shielded fiber-optic converters, a waveguide passage (copper waveguide part number 7850-22) and a fiber-optic cable.

An optical fiber guiding light (high frequency) does not guide magnetic and electric waves. So signals from within the cage are not transported to the outside of the cage, or vice versa, because the optical fiber does not function as an antenna.

Features

- The transmission of optical signals can be done through a single fiber since this allows for twice as much data transmission compared with a twin fiber type
- Auto negotiation function allows UTP ports to auto select 10/100/1000M and Full Duplex or Half Duplex.
- UTP port supports MDI / MDI-X auto crossover.
- Supporting the max 1536 byte Ethernet packet
- Supporting flow control
- Adopting internal power supply

Specifications

Operating standards	IEEE802.3z/AB 1000Base-T, 1000Base-SX/LX
MAC address table	4K
Data Buffer	256K
Connector	UTP: RJ-45, 10/100/1000Mbps
	Fiber: SC,1000Mbps
Cable	UTP: Cat 5e or Cat 6 (the max distance up to 100m)
	Fiber (singlemode): 8.3/125, 8.7/125, 9/125μm (the max distance up to 100km)
Flow Control	Full Duplex: IEEE802.3x flow control
	Half Duplex: back pressure flow control
Power	AC110-240V to DC5V
Ambient temperature	0 - 50 °C
Storage temperature	-40 - 70°C
Humidity	5% - 90%
Dimensions	140 x 110 x 40 mm

ORDER EXAMPLE

Series	
7894	Fiber optic ethernet converter set + waveguide

Fiber optic ethernet converter set with casing 7891

High-speed network feedthrough for shielded rooms, maintaining full EMI/RFI protection while enabling reliable 10/100/1000 Mbit Ethernet connectivity.

This fiber optic Ethernet converter set with casing is specially designed as a secure, high performance network feedthrough for EMI/RFI shielded environments. By converting copper Ethernet signals to fiber optics, it provides a fully galvanically isolated connection between your external network and the equipment inside a shielded enclosure. The set set is used to convert a 10/100/1000 Base-T signal to a 10/100/1000 optical signal. If mounted on the outside the Faraday cage it maintain over 140 dB of room attenuation.

In this setup, the Local extender is mounted outside the cage, while the Remote extender is installed inside it, with only a fiber optic cable passing through the wall or feedthrough. This design ensures that no conductive copper lines penetrate the shielding barrier, drastically reducing the risk of electromagnetic interference, ground loops, and unintended signal leakage.

The converter set with casing is ideal for use in EMI/RFI shielded rooms, TEMPEST and SCIF environments, secure communication spaces, and research laboratories where data integrity and electromagnetic compatibility are critical.

Typical applications

- Shielded test rooms, TEMPEST and SCIF facilities requiring secure, dependable Ethernet connectivity without compromising shielding performance.
- Forensic labs, high-security areas and development departments where interference-free measurements and secure network access inside a shielded room are essential.

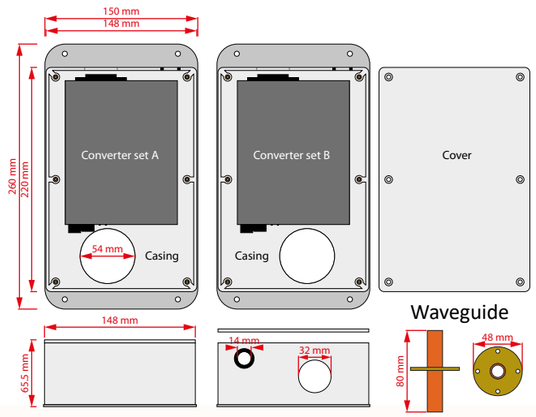
Features

- Auto negotiation function allows UTP ports to auto select 10/100/1000M and Full Duplex or Half Duplex.
- UTP port supports MDI / MDI-X auto crossover.
- Supporting the max 1536 byte Ethernet packet
- Supporting flow control
- Adopting internal power supply

Specifications

Operating standards	IEEE802.3z/AB 1000Base-T, 1000Base-SX/LX
MAC address table	4K
Data Buffer	256K
Connector	UTP: RJ-45, 10/100/1000Mbps
	Fiber: SC,1000Mbps
Cable	UTP: Cat 5e or Cat 6
	Fiber (singlemode): 8.3/125, 8.7/125, 9/125µm
Flow Control	Full Duplex: IEEE802.3x flow control
	Half Duplex: back pressure flow control
Power	AC110-240V to DC5V
Ambient temperature	0 - 50 °C
Storage temperature	-40 - 70°C
Humidity	5% - 90%
Dimensions	Mounting plate: 260 x 150 x 2 mm Case: 220 x 148 x 65,5 mm

Technical drawing



ORDER EXAMPLE

Series
7891

Audio, DVI & USB data line filter 7895

Shielded room feedthrough for high speed DVI and USB 2.0 communication links

A shielded-room feedthrough for high speed DVI and USB 2.0 communication links, the DVI USB 2.0 data line filter is used to convert a DVI and USB 2.0 signal to a optical signal, which subsequently goes into the Faraday cage via a waveguide. The DVI USB 2.0 data line filter is optimized for state of the art signals such as DVI and USB. The transmission distance of is completely lossless.

With the DVI USB 2.0 data line filter 7895 in place, you can use DVI or USB 2.0 communication links for example for interface supports, keyboard, mouse, tablets, touch screens, sound modules, printer, smartcard readers, serial adapters and a video-camera connection inside or outside the Faraday cage while maintaining over 140 dB of room attenuation.

The set consists of two shielded fiber-optic converters, a waveguide passage (copper waveguide part number 7850-22) and a fiber-optic cable.

Advantages

- Max. 500m distance
- 1920 x 1200 resolution
- Without loss of quality or room attenuation
- Transparent USB 2.0
- Full HD video performance
- DVI extension
- Transparent USB 2.0
- Plug and Play installation
- Single-fibre duplex cable required
- Small, so can be used between a big Faraday cage and small mobile shielded boxes

Features

- Automatic Plug and Play installation
- USB keyboard / mouse / touch screen
- Supports DDC / EDID monitor information
- Local and remote monitor
- Transparent USB 2.0 extension
- Full HD 1080p 1920x1080 @ 60 Hz
- Built-in ESD protection system
- Ultra compact: up to 4 channels in a 19" 1U

ORDER EXAMPLE

Series	
7895	Audio, DVI & USB data line filter set including waveguide

USB 3.0 converter set 7896

USB 3.0 converter set converts usb 3.0 signal to a light signal and passes the signal through a waveguide into the shielded room

The 7896 USB 3.0 converter set converts USB 3.0 signal to a light signal and passes the signal through a waveguide into the shielded room.

The 7896 USB 3.0 converter set provides true USB 3.0 extension at up to 5Gbps over 300 m of OM3-300 multi-mode fiber optics, without the need of additional software drivers. A true plug-and-play solution, the 7896 USB 3.0 converter set is compatible with all leading operation systems. Note: backward compatibility with USB 2.0/1.1.

The set consists of two converter sets, a waveguide passage (copper waveguide part number 7850-22) and a fiber-optic cable.

Features

- Extends USB 3.0 supper-speed, backward compatibility with USB 2.0/1.1. X Operates with USB 3.0 hosts
- Supports all USB devices up to 5Gbps
- Distance of up to 300 m
- Number of devices can be increased using additional USB hubs
- True plug and play
- Software drivers required
- Works with operating systems: Windows 7, Windows 8, Windows 10
- Low RFI / EMI profile for sensitive applications
- Power adapter at host is not required
- Surface-mountable

Performance		
Local unit	Upstream port	usb3.0 Type B Male
	Downstream port	USB3.0 SFS*1
Remote unit	Upstream port	USB3.0 SFS*1
	Downstream port	4-port
Operation mode	Support USB3.0 5GBps, backwards compatibility with usb 2.0/1.1	
Connections		
USB 3.0 input (local unit)	USB3.0 Type-B Female	
USB 3.0 Output (remote unit)	USB3.0 Type-A Female	
Optical	1x USB3.0 SFS+ port	

Applications

- Digital Sign-age
- Industrial Control
- KVM Extension
- Conference Room Video Equipment
- Home Network Integration
- Medical Device Connectivity
- Security: web camera, access control
- USB Device Sharing: print, scan, storage

Technical specifications

Cable		
Fiber cable type	Multi-mode fiber:OM3-300*2	
Max. Length	<300 m	
Mechanical		
Construction	High-impact alufer enclosure	
Dimensions (L x W x H) (Unit:mm)	Local extender	104 x 114 x 28
	Remote extender	104 x 114 x 28
Net weight	Local extender	200 g
	Remote extender	350 g
Environmental		
Operating temperature	32 °F till + 122 °F (0 °C till + 50 °C)	
Storage temperature	-40 °F till + 185 °F (-40 °C till + 85 °C)	
Operating humidity	5% till 80% (non-condensing)	
Storage humidity	5% till 95% (non-condensing)	
Power Requirements		
External AC power adapter	Local unit: Power adapter at host is not required Remote unit Input: 100-240VAC/50-60Hz 0.2A Output: 5VDC, 2.0A 5/2.5mm jack	
Power consumption	Local unit: 2 Watts	Remote unit: 3.5 watts

ORDER EXAMPLE

Series
7896

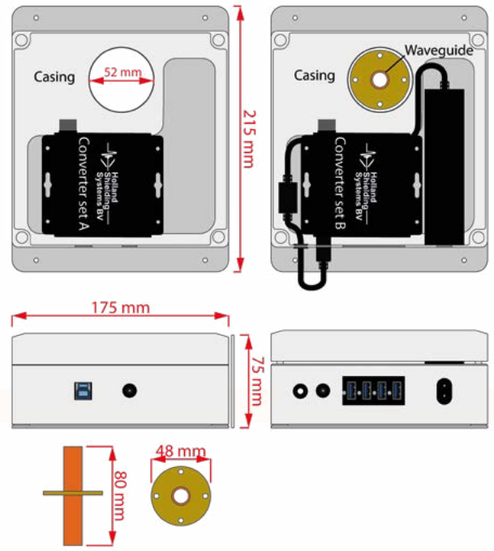
USB 3.0 converter set with casing 78961

USB 3.0 converter set with casing for mounting on a EMI-shielded test chambers, R&D Faraday cages, and shielded cabinet.

The USB 3.0 converter can easily be mounted on EMI-shielded test chambers, R&D Faraday cages, and shielded cabinets with the included waveguide. Place a connector casing on the wall of your enclosure and your data will be routed by the 1 USB 3.0 port to the in or outside of the second converter casing. It can be connected to 4 USB 3.0 through 2 twin fiber cables. The connected devices can be increased by a additional USB hub.

This construction minimizes unwanted electromagnetic leakage while still allowing convenient connection of USB 3.0 cabling. A drill plate is delivered with the set for easy installation on the shielded room. A true plug-and-play solution, the set is compatible with all leading operation systems. Note: backward compatibility with USB 2.0/1.1.

Technical drawing



Features

- True plug and play
- Easy installation on a on EMI shielded test chambers, R&D Faraday cages, and shielded cabinets
- Extends USB 3.0 supper-speed, backward compatibility with USB 2.0/1.1. X Operates with USB 3.0 hosts
- Number of devices can be increased using additional USB hubs
- Software drivers required
- Works with operating systems: Windows 7, Windows 8 and Windows 10
- Low RFI / EMI profile for sensitive applications
- Power adapter at host is not required
- Connector: SC OS2 Simplex

Applications

- Digital Sign-age
- Industrial Control
- KVM Extension
- Conference Room Video Equipment
- Home Network Integration
- Medical Device Connectivity
- Security: web camera, access control
- USB Device Sharing: print, scan and storage

The set consists of

1x Casing with converter set remote extender
1x Casing with converter set lokal extender with power adapter and power cable
1x copper waveguide part number 7850-22
1x fiber-optic cable

ORDER EXAMPLE

Series
78961

» USB 3.0 converter set with casing 78961

Technical specifications

	Performance	
Local unit	Upstream port	usb3.0 Type B Male
	Downstream port	USB3.0 SFS*1
Remote unit	Upstream port	USB3.0 SFS*1
	Downstream port	4-port
Operation mode	Support USB3.0 5GBps, backwards compatibility with usb 2.0/1.1	
	Connections	
USB 3.0 input (local unit)	USB3.0 Type-B Female	
USB 3.0 Output (remote unit)	USB3.0 Type-A Female	
Optical	1x USB3.0 SFS+ port	

	Cable	
Fiber cable type	Multi-mode fiber:OM3-300*2	
Max. Length	<300 m	
	Mechanical	
Construction	High-impact alufer enclosure	
Dimensions (L x W x H) (Unit:mm)	Local extender	104 x 114 x 28
	Remote extender	104 x 114 x 28
Net weight	Local extender	200 g
	Remote extender	350 g
	Environmental	
Operating temperature	32 °F till + 122 °F (0 °C till + 50 °C)	
Storage temperature	-40 °F till + 185 °F (-40 °C till + 85 °C)	
Operating humidity	5% till 80% (non-condensing)	
Storage humidity	5% till 95% (non-condensing)	
	Power Requirements	
External AC power adapter	Local unit: Power adapter at host is not required	
	Remote unit Input: 100-240VAC/50-60Hz 0.2A Output: 5VDC, 2.0A 5/2.5mm jack	
Power consumption	Local unit: 2 Watts	Remote unit: 3.5 watts

ORDER EXAMPLE

Series

78961

HDMI 4K 60Hz over fiber extender - 7898

Submit a HDMI to HDMI signal (with a fiber optic cable) through a waveguide into the shielded room

HDMI 4K 60Hz Over Fiber Extender, consists of a Transmitter and a Receiver unit that allows you to extend HDMI 2.0 and USB HID signals up to 300 meters over LC OM4 MM Fiber Optic Cabling. The HDMI KVM extender delivers up to 4K 60Hz UHD picture quality to your remote display with support for 4:4:4 chroma sampling.

The Transmitter uses a distribution chip to make one HDMI input become two outputs, one output uses Wavelength-division multiplexing technology to convert four high-speed differential signals into optical fiber output through the photoelectric conversion engine, and the other output is local output. The Receiver restores the signal input from the optical fiber to HDMI output.

The set consists of two shielded fiber-optic converters, a waveguide passage (copper waveguide part number 7850-22) and a fiber-optic cable.

Features

- Transmits 4K HDMI 2.0 video signals up to 300 meters over OM4 MMF
- Support keyboard and mouse signal transmission
- Uncompressed HDMI 2.0 video transmission up to 4K @60Hz 4:4:4
- Transmitter support local loop output
- Local module connectors: HDMI input, USB input (type B-female) for keyboard / mouse, fiber optic connector (LC-female), and 5 VDC power connector (DC-jack-female)
- Remote module connectors: HDMI output for remote display, 2 USB outputs (keyboard / mouse), fiber optic connector (LC-female), and 5 VDC power connector (DC-jack-female)
- Simple to install, plug and play

Technical specifications

	Video
Standards	HDMI 2.0 and HDCP 2.2
Maximum pixel clock	600 MHz
Data speed	18 Gbps (6 Gbps/CH)
Resolution range	4K@60Hz/4K@30Hz/1080p/720p
Connector Impedance	Female HDMI type A 100Ω
	K/M
Interface	PC: MINI-USB Keyboard And Mouse: USB-A
	Optical fiber
Interface	LC connector
Fiber type	OM4 Multimode
Wave length	850 nm
Interface bandwidth	18 Gbps
Transmission distance	OM4 Multimode fiber: 300M
	Other
Power supply	Power adapter: DC 5V
Power dissipation	TX:<1.5W; RX:<1W
Temperature	0°C ~ +55°C
Humidity	5% ~ 90%
Dimension (LxWxH)	93 x 70 x 28 mm
Gross weight	0.25KG

Note: This product supports EDID transparent transmission

ORDER EXAMPLE

Series

7898

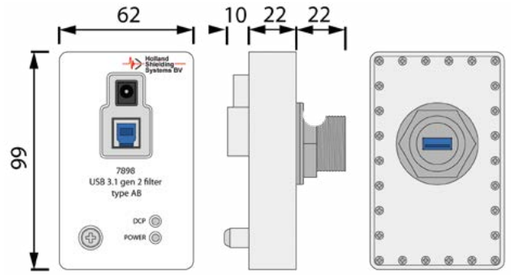
USB 3.1 gen 2 filter type AB 78901

The shielding performance of the filter is greater than 100 dB from 200 MHz through 8 GHz on all signal and power lines while transferring your data. Compatible with USB 2.0, 3.0, 3.1 and Supports SS+ (10 Gbps), SS (5 Gbps), HS (480 Mbps), FS (12 Mbps) and LS (1.5 Mbps). The filter powered by USB power and supports USB v1.2 enhanced battery charging. The unit is compatible with Type A and Type B USB 2.0 cables as well as Type A and Type B USB 3.0/3.1 cables. Two status LEDs indicate power supply health and downstream charging port status.

specifications

Data Line Balanced Impedance	90 Ω Typ.
USB 2 Data Pair Support	SS+ (10 Gbps), SS (5 Gbps)
BC v1.2 Mode	Up to 1.5A at 5V (Always Available- Both with and without a Host Connected)
Proprietary mode	Up to ².²A at ⁵V Available When No Host is Connected (Dedicated Charge Mode)
Power Pair Rejection	200 MHz ~ 8 GHz >100 dB 8 GHz ~ 40 GHz >100 dB
All Pairs Rejection	10 ~ 15 VDC, 2 A
Power In	200 MHz ~ 8 GHz >100 dB 8 GHz ~ 40 GHz >100 dB
LED Indicators	Power OK (Red)
	Dedicated Charge Mode Available [No Host Detected] Dedicated Charge Mode Available [No Host Detected]
Connector	USB 3.1 Type A Female (Pipe) USB 3.1 Type B (Non-Pipe)
Power Connector	2.0 or 2.1 x 5.5mm Barrel Jack Connector 12 VDC Nominal Input, 12 W Max
Dimensions	65.5 x 100.6 x 53.6 mm

Technical drawing



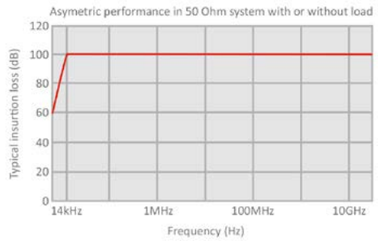
ORDER EXAMPLE

Series

78901

Ultra high-performance filter 8010

For the anechoic chamber, shielded room, cabinet, and shelter, where the effective suppression of radiated and conducted emission is required



The Ultra high-performance filter is a superior filter housed in a three-compartment casing with bolted covers and accessible terminals that achieves 100 dB insertion transmission loss at 14 kHz and above.

This series is offered as a two-line filter (single-phase and neutral) or as a four-line filter (three phases and neutral). The two-line filter can withstand up to 230 Volt, 1-150 amp and 46 kW. If you are looking for a filter that can withstand more power we have the four-line filter. This filter delivers up to 400 Volt, 1-150 amp and 138 kW. The neutral line is always attenuated and all conductors are decoupled from each other. This allows the conductors to operate independently without attenuation loss.

The filter is made to withstand the harshest environment and is very economical. Because of the custom design for your filter, the assembly is very simple and always with very low leakage. This filter is also a stock item and therefore always available quickly.

The circuit is designed as a symmetrical double- circuit with high-quality rod cores providing inductance. These cores do not saturate due to their large air gap and they are insensitive to asymmetrical load.

Foil capacitors ensure a long operating life by their self-healing features even after voltage transients. A seamless fixing of the filter casing to the shielded room is very important to ensure the correct operation. The filter is housed in a casing that has a base flange which provides stable mounting and excellent earthing when bolted to the shielded room via the mounting bolts.

Please note: EMP protection is available on request.

Mounting

These protections are designed for mounting on the penetration panel or directly on the non-painted wall of the Faraday cage. Mounting terminals dependent on the amount of power. Please see connection in the product range table.

Please note: all 8010 filters can NOT be protected by a standard 30mA residual circuit breaker (RCCB).However, a RCCB protection device can be placed down line / load side of filter.

General characteristics

For a clean main supply into a shielded room, high-performance filters are indispensable. Usually, these filters are directly mounted on the shielding wall. It is recommended to route filtered lines into the shielded room (Faraday cage) through the wall with an optional flexible metal conduit.

- Mains filter for single and three phase systems
- Insertion transmission loss 100 dB @ 14 kHz
- Double- ∏ circuit
- Rod cores allow asymmetrical load
- Self-healing effect of foil capacitors

Applications

- EMC test laboratories
- Anechoic chambers
- Tempest rooms
- MRI screened facilities

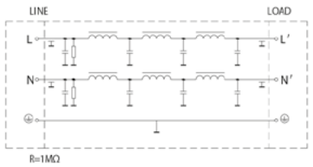
Rated current available from 6 amps to 3000 amps in both single and three phase versions. Filters are ideally suitable for applications where the very highest performance is demanded.

Technical Data

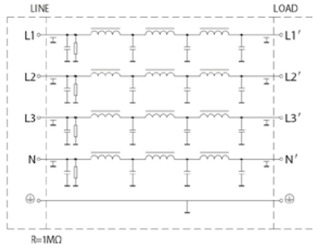
Rate voltage VR for two-line filters	277 VAC / 500 VDC	Line-line or line-case
Rate voltage VR for four-line filters	up to 480 VAC	Line-line
	up to 277 VAC	Line-case
Rated Frequency fR	DC-60 Hz	
Rate Current IR	See characteristics	Referred to +40°C ambient temperature
Number of lines	2 or 4	
Insertion Loss, Per MIL-STD-220C	>100dB	14 kHz – 40 GHz
DC Resistance	See characteristics	Each Line
Power Dissipation	See characteristics	At Rated Current
Test Voltage	1200Vdc/2s	Line-line or line-case
Voltage Drop /Phase ΔV	<1%	Of VR at 50Hz and IR
Leakage Current ILeakage	See characteristics	at 250 VAC and 50 Hz
Reactive Current IReactive	See characteristics	at 250 VAC and 50 Hz
Discharge Time to Below 34V	30s	
Climatic category	25/085/21	

» Ultra high-performance filter 8010

Circuit diagrams



2 line filters



4 line filters

Available dimensions

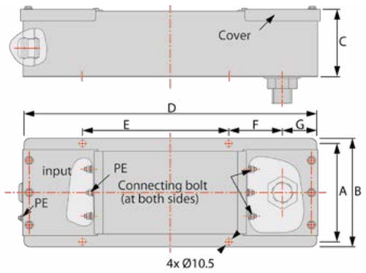


Diagram 2

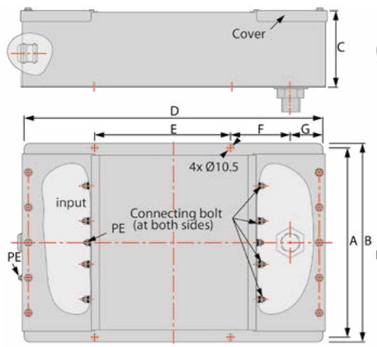


Diagram 2

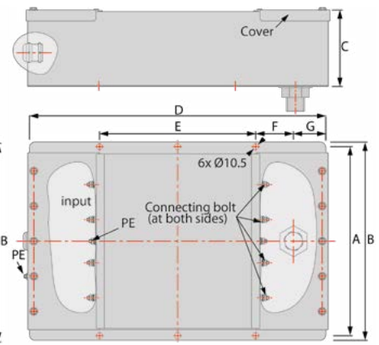


Diagram 3

Single phase and neutral filter types: 230 Volt | 1-150 amp | 34 kVA

Part number	A	B	C	D	E	F	G	Installation instructions	Outline drawing	IR (A)	I Leakage (A)*	I Reactive (A)	DC Resistance (Ω)	Power dissipation (w)	Connection
8010-2-16	188	205	120	750	450	110	80	M24 conduit screw	1	16	3.5	3.5	<70	<40	M6 Screw
8010-2-32	188	205	120	750	450	110	80	M24 conduit screw	1	32	5	5	<20	<40	M6 Screw
8010-2-63	188	205	140	920	620	110	80	M33 conduit screw	1	63	5	5	<15	<90	M6 Screw
8010-2-100	288	305	180	1180	800	110	80	M60 conduit screw	1	100	9	9	<5	<120	M12 Screw
8010-2-150	288	305	180	1180	800	110	80	M60 conduit screw	1	150	9	9	<3	<140	M12 Screw

Three phases and neutral filter types: 400 Volt | 1-150 amp | 103 kVA

Part number	A	B	C	D	E	F	G	Installation instructions	Outline drawing	IR (A)	I Leakage (A)*	I Reactive (A)	DC Resistance (Ω)	Power dissipation (w)	Connection
8010-4-16	288	305	120	750	450	110	80	M33 conduit screw	2	16	0.7	3.5	<70	<70	M6 Screw
8010-4-32	288	305	120	750	450	110	80	M33 conduit screw	2	32	0.9	5	<20	v80	M6 Screw
8010-4-63	348	365	140	920	620	110	80	M33 conduit screw	2	63	0.9	5	<15	<170	M6 Screw
8010-4-100	348	365	180	1480	1000	160	80	M60 conduit screw	3	100	1.7	9	<5	<220	M12 Screw
8010-4-150	348	365	180	1480	1000	160	80	M60 conduit screw	3	150	1.7	9	<3	<270	M12 Screw

* If voltage between neutral and earth is 0V Actual size may differ from the above. Please contact us for the correct size

High performance power line filters 8020

For shielded rooms where the effective suppression of radiation emission is required 100 dB @ 14 kHz-40 GHz (MIL-STD-285)

The Compact high-performance power line filters are capable of providing a radiated transmission loss of 100 dB at 14 kHz up to 40 GHz. The leakage current is in milliampere level and the voltage drop is less than 1 V.

The filter is made to withstand the harshest environment and is very economical. Because of the custom design for your own filter, the assembly is very simple and always with very low leakage. This filter is also a stock item and therefore always available quickly.

This series is offered as a two-line filter (single-phase and neutral) or as a four-line filter (three phases and neutral). The single-phase filter can withstand up to 277 Volt, 1-1000 amp. If you are looking for a filter that can withstand more power we have the three-phase filter, this filter delivers up to 480 Volt, 1-1600 amp. The neutral line is always attenuated and all conductors are decoupled from each other. This allows the conductors to operate independently without attenuation loss.

The circuit is designed as a symmetrical double-circuit with high-quality rod cores providing inductance. These cores do not saturate due to their large air gap and they are insensitive to asymmetrical load.

Foil capacitors ensure a long operating life by their self-healing features even after voltage transients. A seamless fixing of the filter casing to the shielded room is very important to ensure the correct operation. The filter is housed in a casing that has a base flange which provides stable mounting and excellent earthing when bolted to the shielded room via the mounting bolts.

Please note: EMP protection is available on request.

Also, check our Ultra high-performance filters

Advantages

- Applicable in very low frequency (VLF) applications
- Can be delivered EMP-proof
- Suitable for use under extreme conditions (military applications)
- Wear-resistant
- Insensitive to corrosion
- Shielding performance: 100 dB @ 14 kHz-40 GHz (MIL-STD-285)

Applications

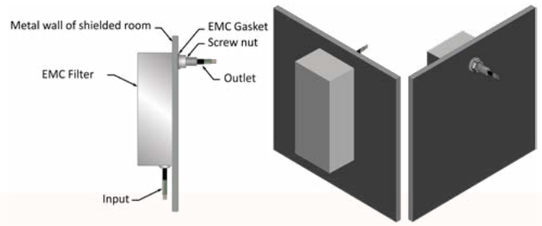
- Shielded rooms
- Shielded chambers
- Anechoic chambers
- Military applications
- Medical applications

Mounting

These protections are designed for mounting on the penetration panel or directly on the non-painted wall of the Faraday cage. Mounting terminals are dependent on the amount of power. Please see Connection in the Product range table.

Installation diagram

The technical drawing below shows how a power line filter is mounted on the wall a your Faraday cage.



Please note:

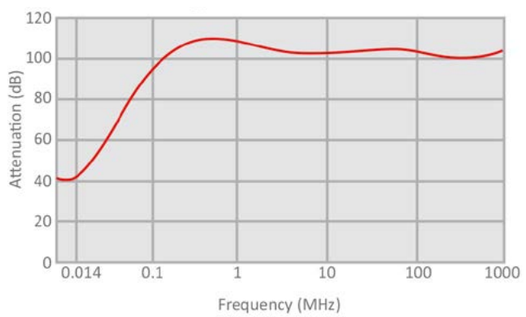
all 8020 filters can NOT be protected by a standard 30mA residual circuit breaker (RCCB).

However, a RCCB protection device can be placed down line / load side of filter.

Technical Data

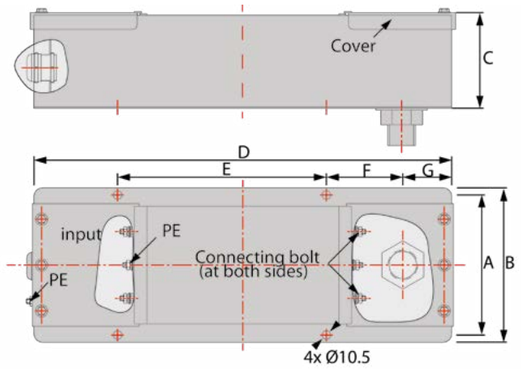
Rated voltage VR for two-line filters	277 VAC/500 VDC	Line-line or line-case
Rated voltage VR for four-line filters	480 VAC/277 VAC	Line-line
		Line-case
Rated Frequency fR	DC-60 Hz	
Rated Current IR	See characteristics	Referred to +40 °C ambient temperature
Number of lines	2/4	
Test voltage	1200 VDC / 2 s	Line-line or line-case
Voltage drop/phase ΔV	<1%	of VR at 50 Hz and IR
Leakage current I Leakage	See characteristics	at 250 VAC and 50 Hz
Reactive current I Reactive	See characteristics	at 250 VAC and 50 Hz
Discharge Time to Below 34 V	30 s	
Climatic category	25/085/21	
Shielding performance	100 dB @	14 kHz ~ 40 GHz

Insertion loss

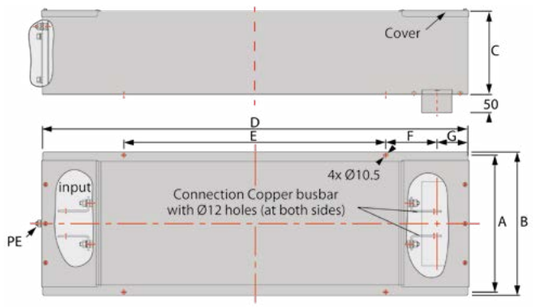


Available dimensions

Single phase and neutral filter types:
277 VAC/500 VDC, 1-1000 amp



Outline drawing 1



Outline drawing 2

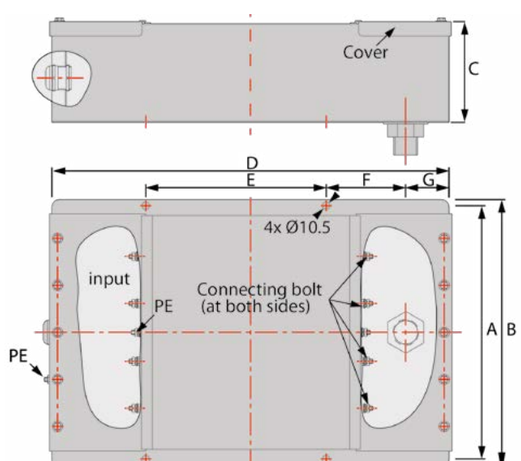
Part number	A	B	C	D	E	F	G	Installation instructions	Outline drawing	IR (A)	I Leakage (A)*	I Reactive (A)	Terminal connection In	Terminal connection In	Shielding effectiveness
8020-2-16	188	205	120	750	450	110	80	M24 conduit screw	1	2×16	0.1	1.7	M6 Screw	M6 Screw	100 dB, 14 kHz ~ 40 GHz
8020-2-32	188	205	120	750	450	110	80	M24 conduit screw	1	2×32	0.1	1.7	M6 Screw	M6 Screw	
8020-2-63	188	205	140	920	620	110	80	M33 conduit screw	1	2×63	0.1	1.7	M6 Screw	M6 Screw	
8020-2-100	228	245	155	960	450	205	80	M60 conduit screw	1	2×100	0.15	7.0	M12 Screw	M12 Screw	
8020-2-200	228	245	155	960	450	205	80	M60 conduit screw	1	2×200	0.15	7.0	M12 Screw	M12 Screw	
8020-2-250	228	245	155	960	450	205	80	M60 conduit screw	1	2×250	0.15	7.0	M12 Screw	M12 Screw	
8020-2-400	320	340	205	1330	850	140	120	Flange	2	2×400	0.30	7.0	Bus bar	Bus bar	
8020-2-630	370	390	225	1300	800	170	105	Flange	2	2×630	0.45	7.0	Bus bar	Bus bar	
8020-2-800	485	505	255	1450	900	185	115	Flange	2	2×800	0.58	7.0	Bus bar	Bus bar	
8020-2-1000	510	530	255	1450	900	185	115	Flange	2	2×1000	0.58	7.0	Bus bar	Bus bar	

* If voltage between neutral and earth is 0V.

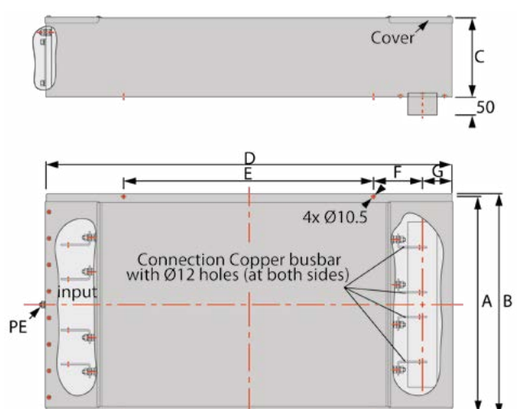
» High performance power line filters 8020

Available dimensions

Three phases and neutral filter types:
480 VAC/277 VAC, 1-1600 amp



Outline drawing 3



Outline drawing 4

Part number	A	B	C	D	E	F	G	Installation instructions	Outline drawing	IR (A)	I Leakage (A)*	I Reactive (A)	Terminal connection In	Terminal connection In	Transmission loss
8020-4-16	288	305	120	750	450	110	80	M33 conduit screw	3	4×16	0.1	1.7	M6 Screw		100 dB, 14 kHz 40 GHz
8020-4-32	288	305	120	750	450	110	80	M33 conduit screw		4×32	0.1	1.7	M6 Screw	M6 Screw	
8020-4-63	348	365	140	920	620	110	80	M33 conduit screw	3	4×63	0.1	1.7	M6 Screw	M6 Screw	
8020-4-100	348	365	155	960	450	205	80	M60 conduit screw	3	4×100	0.1	7.0	M12 Screw	M12 Screw	
8020-4-200	348	365	155	960	450	205	80	M60 conduit screw		4×200	0.1	7.0	M12 Screw	M12 Screw	
8020-4-250	536	556	205	1360	850	170	120	Flange	4	4×250	0.1	7.0	Bus bar	Bus bar	
8020-4-400	670	690	225	1300	800	170	105	Flange	4	4×400	0.10	7.0	Bus bar	Bus bar	
8020-4-630	900	920	255	1450	900	185	115	Flange	4	4×630	0.10	7.0	Bus bar	Bus bar	
8020-4-800	945	965	255	1450	900	185	115	Flange	4	4×800	0.12	7.0	Bus bar	Bus bar	
8020-4-1000	910	930	275	1790	1150	270	125	Flange	4	4×1000	0.12	7.0	Bus bar	Bus bar	
8020-4-1200	910	930	275	1790	1200	280	110	Flange	4	4×1200	0.18	7.0	Bus bar	Bus bar	

* If voltage between neutral and earth is 0.

Power line filters for ground wire 8040

If you are concerned about noise in your environment, ground filter is a good way to mitigate the problem. Shielding performance: 100dB @ 14 kHz - 40 GHz (MIL-STD-285)

Just like power lines, ground wires connect the entire facility together. All human-reachable surfaces of electrical equipment must be at ground potential for safety reason. While safety practices are always a good idea, a side effect of such connection is that if one piece of equipment injects noise into ground for whatever reason (mis-wiring, improper design, poor maintenance, etc.). This noise propagates throughout the facility and enters other equipment. Ground filters are capable of reducing this noise while maintaining all safety practices.

If you are concerned about noise in your environment, ground filter is a good way to mitigate the problem.

Dimensional Diagrams

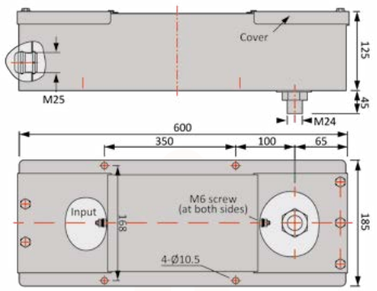


Diagram 1

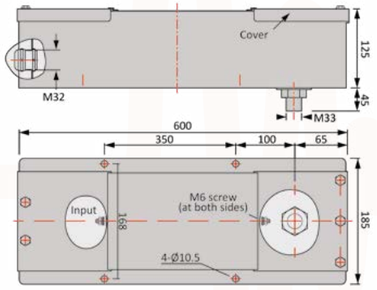


Diagram 2

Advantages

- Suitable for use under extreme conditions (military applications)
- Wear resistant
- Insensitive for corrosion

Applications

- S3 rooms
- Shielded room
- Shielded cabinet
- Anechoic chamber

Features

- Rated Voltage: 250VAC, 500VDC
- Operating Frequency: 0-60Hz
- Voltage drop: Less than 1V @ unity power factor

Product range

Type	IR (A)	Outline drawing	Shielding Effectiveness (dB)
8040-16	16	1	100dB, 14k-40GHz
8040-32	32		
8040-63	63		
8040-100	100	2	
8040-150	150		
8040-200	200		
8040-250	250		

ORDER EXAMPLE

Series		Rated current (A)
8040	-	

16 : 16 ampere
32 : 32 ampere
63 : 63 ampere
100 : 100 ampere
150 : 150 ampere
200 : 200 ampere
250 : 250 ampere

HEMP/NEMP powerline filter 8080

Withstand an unlimited amount of EMP hits and comply with the highest standards and to meet the MIL-STD-188-125 in shielding effectiveness and the E1 and E2 pulse compliance.

The 8080 HEMP/NEMP powerline filters of Holland Shielding Systems are designed to withstand the PCI test known as E1 and E2 while largely exceeding the shielding effectiveness as stated in MIL-STD-188-125.

Our R&D specialist has designed the filters so they meet the highest shielding demands with an insertion loss of 100 dB @ 9 kHz and 120 dB @ 20 kHz.

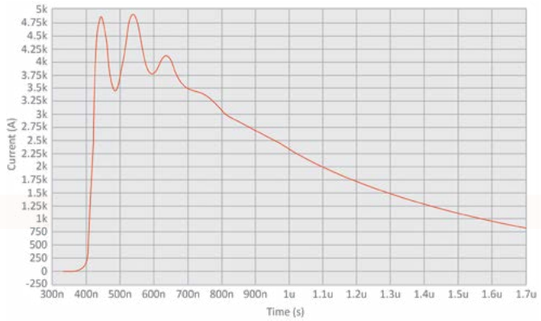
All our filters are tested with our in-house E1/E2 testing facility to confirm that they meet our high quality demands.

As the only powerline filter supplier in the world that has an E1 and E2 pulse tester in-house, we have the possibility to test and supply the filters with a short delivery time.

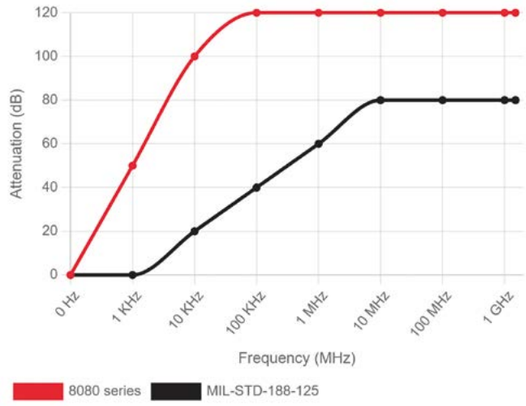
Features

- 230 V / 440 VAC with 16 A – 200 A current ratings (others on request)
- Single or three phase applications
- Up to 100 dB @ 9 kHz
- Very low residual pulse current
- Quick development and delivery possible with our in-house testing facility

Test pulse (5 kA)

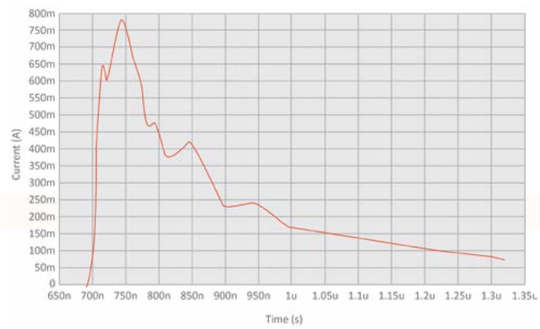


8080 - Shielding performance

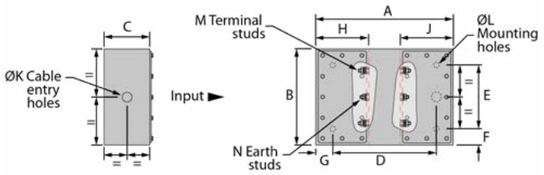


Please note:
all 8080 filters can NOT be protected by a standard 30mA residual circuit breaker (RCCB). However, a RCCB protection device can be placed down line / load side of filter.

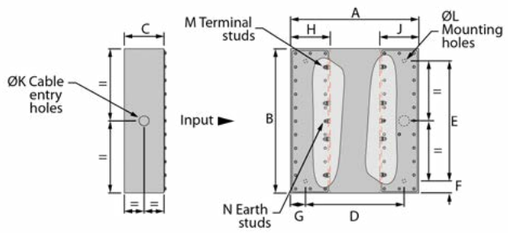
Residual pulse (800 mA)



2 Line Power Filter



4 Line Power Filter

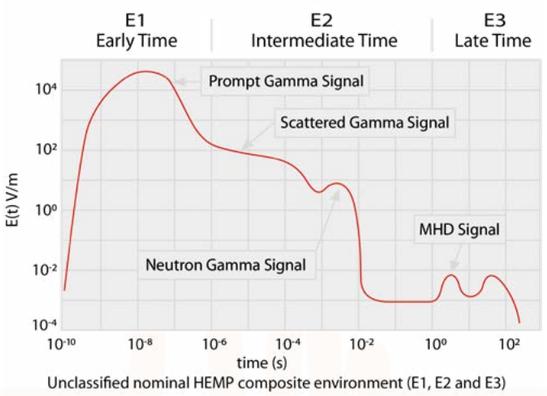


Dimensions (mm)

partnumber	A	B	C	D	E	F	G	H	J	K	L	M	N	Mass Approx.
8080-2-16	393	240	138.5	323	150	45	35	120.75	120.75	21	11	M6	M6	10 kg
8080-4-16	539	400	120	320	390	45	35	120	120	21	11	M8	M8	20 kg
8080-2-32	393	240	138.5	323	150	45	35	120.75	120.75	21	11	M6	M6	10 kg
8080-4-32	633	560	138.5	533	520	20	50	150.75	150.75	33	11	M6	M6	20 kg
8080-4-63	633	560	138.5	533	520	20	50	150.75	150.75	33	11	M6	M6	55 kg
8080-4-125	450	480	120	400	440	20	25	150	150	52	11	M12	M12	65 kg
8080-4-200	700	620	175	640	560	30	30	200	200	52	17	M12	M12	80 kg
8080-4-400	1000	770	250	860	630	70	70	300	300	64	17	M20	M20	100 kg

Insertion loss and E1 and E2 pulse testing facility

As the only filter producer that can perform individual pulse testing, we are able to guarantee that your filter will protect your facility and not just on paper. Our filters are tested with our in-house test facility with which we are capable to perform PCI as per E1 (20 / 500 ns 2.5 kA peak) and E2 (1.5 / 4000 µs 250 A peak) test pulses. With our testing facilities we make sure that our filters comply with the highest demands and that the residual currents are within limits of the applicable standards and norms.



Unclassified nominal HEMP composite environment (E1, E2 and E3)

The intense electromagnetic pulse (EMP) is generated by the phenomenon called “Compton effect” or “Compton scattering”. The nuclear explosion that generates this transient electromagnetic disturbance is also known as NEMP (Nuclear Electromagnetic Pulse) or HEMP (High altitude Electromagnetic Pulse). The HEMP is typically defined as a combination of three consecutive pulses called early time (E1), intermediate time (E2) and late time (E3). This is shown in the graph on the side.

Power line filters for shielded cabinet 8050

Designed for well grounded shielded cabinet with rated voltage of 250VAC/60Hz 500V DC. Shielding performance: 100dB @ 14 kHz - 40 GHz (MIL-STD-285)

The 8050 series Power line filters for shielded cabinets is a superior filter housed in a two-compartment casing that achieves 100 dB shielding performance at 14 kHz till 40 GHz. The circuit is designed as a double-circuit with high-quality rod cores providing inductance.

This series of power line filters is specially designed for well grounded shielded cabinet with rated voltage of 250VAC/60Hz 500V DC. It is compact and in compliance with Class B and C standards for shielded cabinet.

This series is only offered as a two line filter (phase and neutral).

Advantages

- High attenuation level for lower frequencies
- Suitable for use under extreme conditions (military applications)
- Wear resistant
- Corrosion resistant

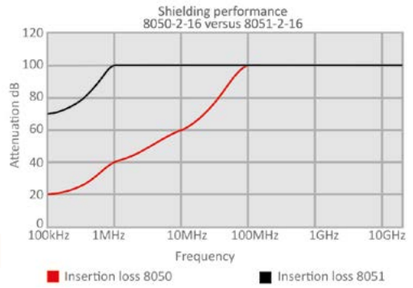
Applications

- Shielded rooms
- Shielded chambers
- Anechoic chambers
- Military application
- MRI rooms

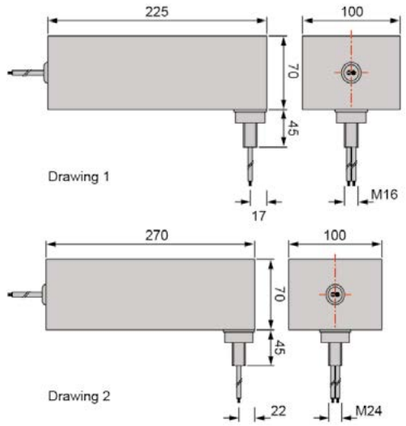
Available dimensions

Type	IR (A)	I Leakage (mA) *	Outline drawing	Shielding Effectiveness (dB)
8050-2-16	16	<3	1	100 dB, 14 kHz- 40 GHz
8050-2-32	32	<5	2	
8051-2-16	16	<3	1	

Shielding performance



Dimensional Diagrams



ORDER EXAMPLE

Series
8050
8050-2-16
8050-2-32
8051-2-16

Feedthrough filters 8060

Used for EMI suppression of all electrical installations and equipment

Used for EMI suppression of all electrical installations and equipment. Shielding performance: 100dB @ 1M-40GHz (MIL-STD-285)

Technology

- Self-healing plastic film non inductive capacitor
- Tinned metal case
- Feed through mounting
- Flame retardant V0

Mounting

These filters are designed to be mounted directly in the entry panel of a Faraday cage or in an shielded filter housing. Please contact us for options.

Product part numbers

Part number	IR (A)	Screw	Insertion loss (dB)	Rated voltage
8060-32	32	M6		
8060-63	63	M6	100dB, 1M-40GHz	250VAC/600VDC
8060-100	100	M8		

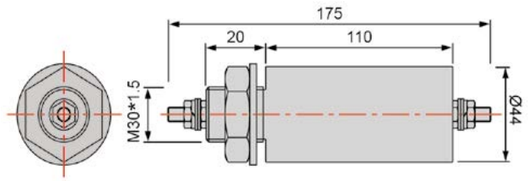
Torque value max.

- Ø M 27 : 40 Nm
- Ø M 32 : 40 Nm

Connection

Treaded terminals with nut:

- Ø M 4 : 1.2 Nm
- Ø M 6 : 2.45 Nm
- Ø M 8 : 10 Nm
- Ø M 10 : 15 Nm
- Ø M 12 : 20 Nm



250VAC/60VDC ORDER EXAMPLE

Series		Rated current (A)
8060	–	

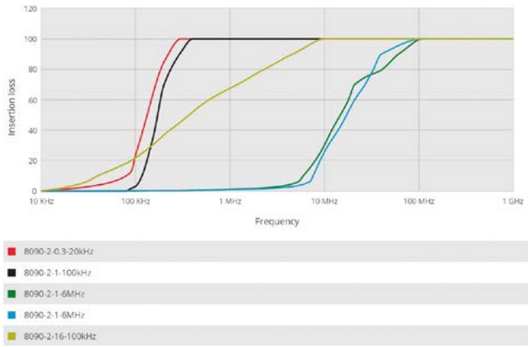
32 : 32 ampere
63 : 63 ampere
100 : 100 ampere

Signal line filters 8090

This series of signal filters are used for telephone, data communication, control, and fire alarm

These signal line filters are specially designed to use for telephone, fax, fire detection, video signal, and AC/DC switch signal with a rated current between 0.3 A and 1 A. The filter complies with standards specified by national military class C and D shielded room and anechoic chamber.

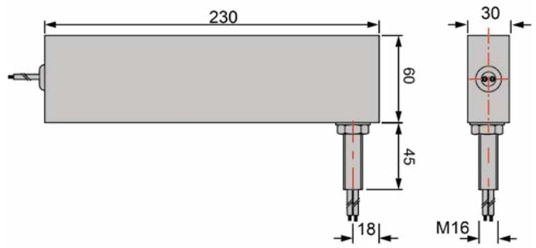
Shielding performance



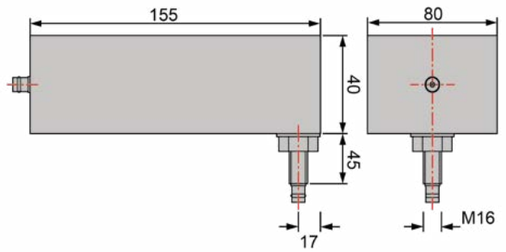
APPLICATIONS

- Telephone
- Fax
- AC/DC
- Switch signal
- Fire detection
- Door opening buttons
- All other application using the band pass specified in the

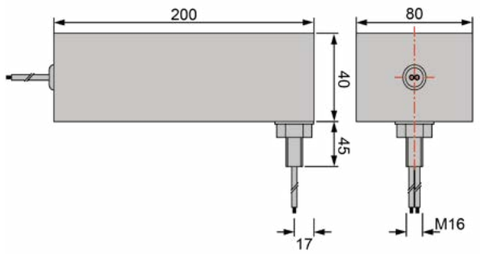
Dimensional diagrams



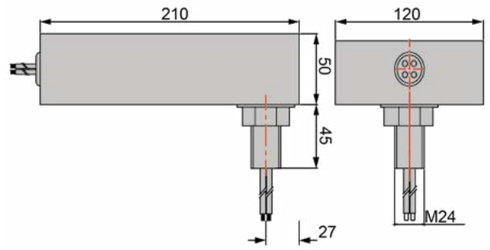
Outline drawing 1



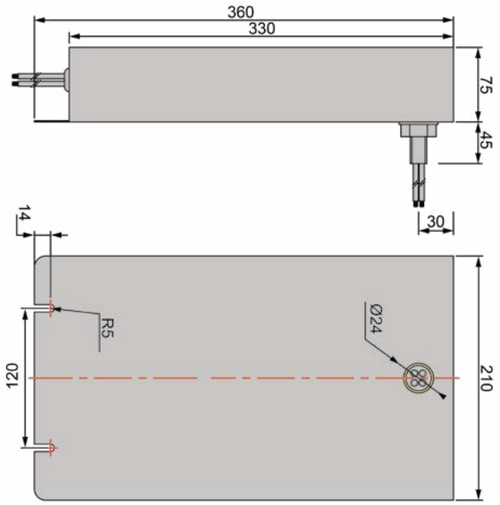
Outline drawing 2



Outline drawing 3



Outline drawing 4



Outline drawing 6

PRODUCT RANGE

Type	Rated voltage	Rated current	Outline drawing	Conduit size	Band pass	Typical applications
8090-2X0.3X20	250 VDC	2 x 0.3 A	1	M16	0-20 kHz	Telephone, fax
8090-2X1X100	250 VAC	2 x 1 A	1	M16	0-100 kHz	Control, voice
8090-2X1X6	100 VDC	2 x 1 A	1	M16	0-6 MHz	Special fire alarm
8090-1X1X6	100 VDC	1 x 1 A	2	M16	0-6 MHz	Video signal
8090-2X16X100	250 VAC	2 x 16 A	3	M16	0-100 kHz	Air conditioning unit
8090-10X1X6	250VDC	10 x 1 A	4	M24	0-6 MHz	Special fire alarm
8090-10X1X20	250 VAC/250VDC	10 x 1 A	6	M24	0-20 kHz	Telephone, fax
8090-10X1X100	250 VAC	10 x 1 A	6	M24	0-100 kHz	Control, voice
Note: Specify number of control line and current volume if control lines are more than 2 or current is bigger than 1A.						

ORDER EXAMPLE

Type

8090

8090-2X0.3X20
8090-2X1X100
8090-2X1X6
8090-1X1X6
8090-2X16X100
8090-10X1X6
8090-10X1X20
8090-10X1X100

EMI signal line USB 3.0 filter 80901USB

EMI signal line USB 3.0 filter for transferring data inside of your shielded cabinet / faraday cage. The filter can easy be installed and is compact in size. To have the best transfer speed, the appropriate integrated cable length should be selected and to minimize the number of interfaces between the USB3.0 filter and the USB device.

SPECIFICATIONS

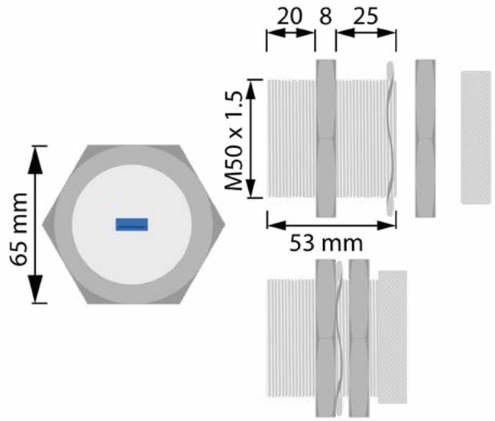
Signal type	USB 3.0
Instalation method	USB 3.0-A, female
Dimensions	65 x 53 mm

ORDER EXAMPLE

Series

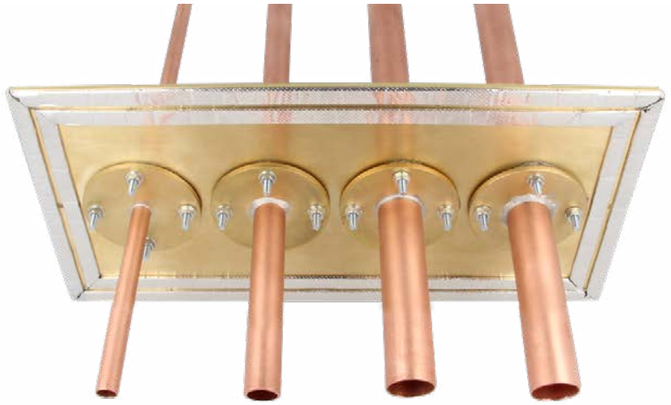
80901USB

Technical drawing



Copper Waveguides 7850

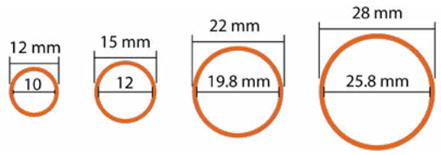
Copper tubes designed to block electromagnetic waves for non metallic materials



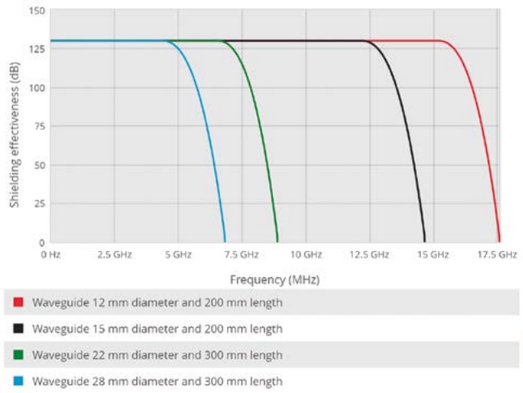
Waveguides are specially designed metal tubes in order to block electromagnetic waves. They are available in almost any size depending on frequency. Attenuation curve is in relationship with diameter. Any non metallic material can be fed through the waveguide such as optical fiber, water, gas or air.

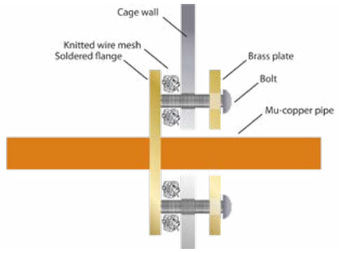
There are two versions available of the waveguide. Mu-copper version and a brass version with thread (7855).

The Mu-copper version (7850) is available in 12 mm, 15 mm, 22 mm and 28 mm.

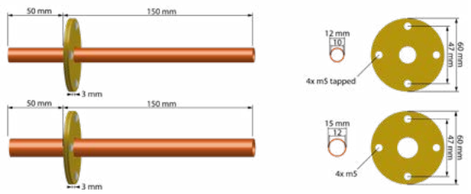


ATTENUATION WAVEGUIDE

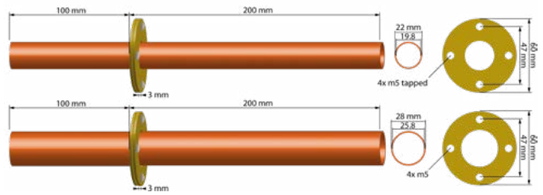




COPPER WAVEGUIDES 12 & 15 MM



COPPER WAVEGUIDES 22 & 28 MM



ORDER EXAMPLE

Part number		Outer diameter (mm)
7850 : Mu-copper waveguides	–	**12 :** 12 mm (200 mm length) **15 :** 15 mm (200 mm length) **22 :** 22 mm (300 mm length) **28 :** 28 mm (300 mm length)

Brass waveguides 7855

Brass tubes designed to block electromagnetic waves for non metallic materials

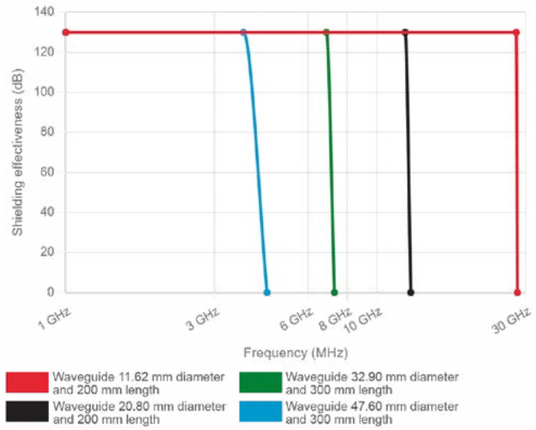
Brass waveguides are high-quality metal tubes designed to block electromagnetic waves while allowing the passage of non-metallic materials such as optical fiber, water, gas, or air.

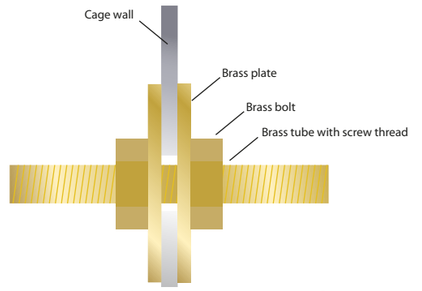
Made from durable, corrosion-resistant brass, the 7855 version features a threaded design for easy installation and reliable shielding performance. Available in various diameters to suit different frequency ranges, brass waveguides deliver excellent durability, precision, and a professional finish — perfect for EMC chambers and shielded installations.

Also available are the copper waveguides type Waveguides

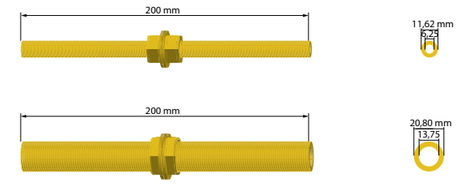
The brass version (7855) with thread is available in 11.6 mm, 20.80 mm, 32.90 mm and 47.60 mm. Other sizes on request

ATTENUATION WAVEGUIDE

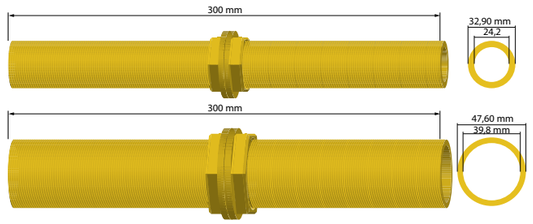




Waveguide brass 7855-11,62 & 7855-20,80



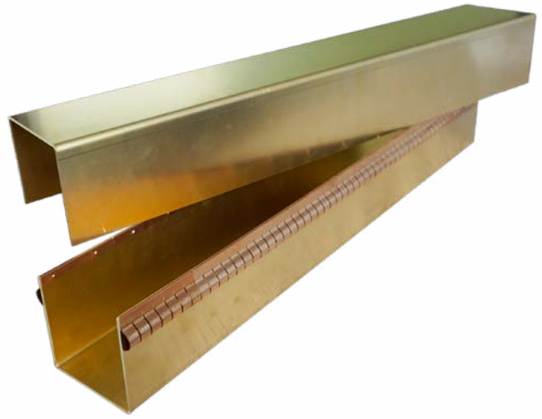
Waveguide brass 7855-32,90 & 7855-47,60



ORDER EXAMPLE

Part number		Outer diameter (mm)
7855 : Messing waveguides with thread	–	**11,6 : 11,6** mm (200 mm) **20,80 : 20,80** mm (200 mm) **32,90 : 32,90** mm (300 mm) **47,60 : 47,60** mm (300 mm)

Two-part square waveguides 7865

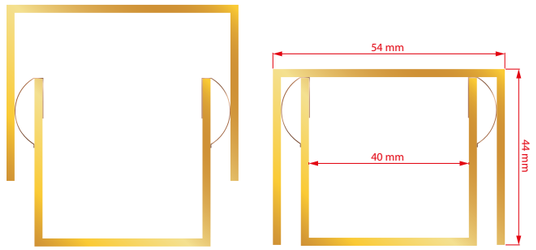


The brass square waveguides are specially designed metal tubes in order to block electromagnetic waves. This two part waveguide is design to easily embed existing cabling, but also can be opened and closed again for adding new materials inside or for maintenance. Any non metallic material can be fed through the waveguide such as optical fiber, water, gas or air. On the inside there is a finger strip that ensures a good closure. Available in a variety of sizes to accommodate different frequencies. Attenuation curve is related to the size of the waveguide.

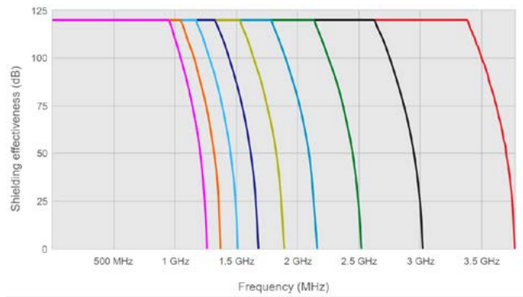
Available sizes

Part number	Size (W x H x L)
7865-4040400	40 x 40 x 400 mm
7865-5050450	50 x 50 x 450 mm
7865-6060500	60 x 60 x 500 mm
7865-7070550	70 x 70 x 550 mm
7865-8080600	80 x 80 x 600 mm
7865-9090650	90 x 90 x 650 mm
7865-100100700	100 x 100 x 700 mm
7865-110110750	110 x 110 x 750 mm
7865-120120800	120 x 120 x 800 mm

Technical drawing



Attenuation waveguide



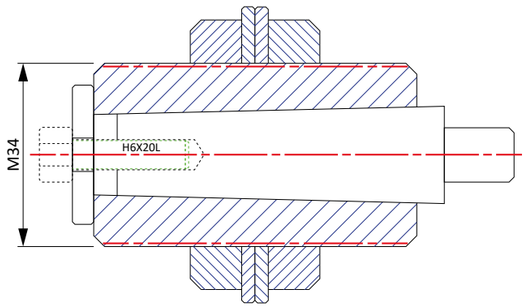
- 40x40x400
- 50x50x450
- 60x60x500
- 70x70x550
- 80x80x600
- 90x90x650
- 100x100x700
- 110x110x750
- 120x120x800

High performance fiber optic waveguide 7860

Fiber optic waveguides with a average shielding value between 100dB @ up to 18GHz and 80dB @ up to 40GHz.

Compared to the normal waveguides such as the 7850 & 7855, the fiber optic waveguides has been specially developed for the high frequency value measured with an average shielding value between 100dB @ up to 18GHz and 80dB @ up to 40GHz. This makes it very suitable for the use of either MRI or Faraday cages.

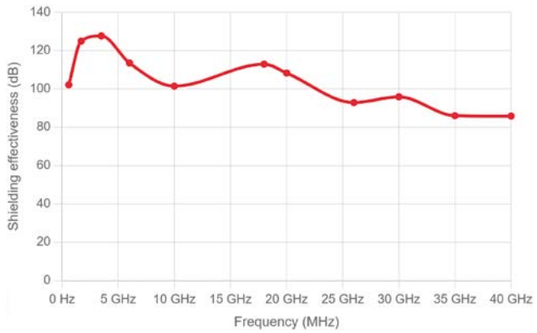
These waveguides are made for use with fiber optic cables which are available in 2 versions of 6 or 8 fiber optic cables. The 6 cable version (7860-6) has a maximum fiber optic cable thickness of 6 mm. The 8 cable version (7860-8) has a maximum fiber optic cable thickness of 4 mm. The filter has a removable center core and, depending on the version, can easily place 6 or 8 fiber optic cables with attached connectors.



Applications

- MRI / medical room
- faraday cage
- RF shielded room
- Anechoic chamber

Shielding performance



Part number & specifiation

Part number	fiber optic cables	Max fiber diameter (mm)	Thread size	Effective length (mm)	Overall length (mm)
7860-6	6	6	M34	60	95
7860-8	8	4	M34	60	95

RFID card shielding

Card details theft is rampant. This simple yet effective shielded RFID card jacket blocks the transmission of high frequency waves (13.56 MHz or UHF 860-960 MHz) used to read “smart” (contact-less) RFID cards. Prevents unauthorized access to your RFID card information.

RFID card shielding

RFID have serious disadvantages such as risks to privacy and undetected fraud. All this can be done while you think you have stored your RFID card 'safe'. Theoretically, it is even possible from 3 to 4 meters to read a chip and / or edit it.

Card details theft is rampant. This simple yet effective shielded RFID card jacket blocks the transmission of high frequency waves (13.56 MHz or UHF 860-960 MHz) used to read “smart” (contact-less) RFID cards. Prevents unauthorized access to your RFID card information.
How it works

Hackers can now walk past you and steal your credit/debit card numbers without ever touching you or your wallet using inexpensive RFID scanners or a cell phone. This new crime is called "Crowd Hacking" and the RFID card shielding is a easy to use, high-tech defense against this crime.

The RFID card shielding uses our E-Field shielding technology to make your information invisible to hackers without batteries or charging.

RFID have serious disadvantages such as risks to privacy and undetected fraud. All this can be done while you think you have stored your RFID card 'safe'.

Advantages

- RFID card shielding sleeves prevent electronic pick-pocketing
- Protects your ID & credit card info
- Protect your credit card number, expiration dates,
- Birth dates, names, addresses, photos and much more
- Sleeves block high-tech hijacking scanning equipment waves

ORDER EXAMPLE

Product		Amount of card
RFIDCS	-	
RFIDCS stands for **RFID card shield**		**1 :** For 1 card **2 :** For 2 cards

RFID card shielding clip

Blocks RFID reading of a single iClass, TWIC, LincPass, PIV, CAC, or other identification card. The RFID card shield clip meets the FIPS-201 shielding requirements. The RFID card protector puts the user in control of where and when their id card is read.

These RFID card shield clips are listed on the United States Government Services Administration (GSA) FIPS 201 approved products list as meeting the requirements of preventing the reading of contact-less RFID chips.

The RFID card shield clip is designed to hold and shield one card. Our Squeeze to read technology allows the card to be read by simply squeezing the tabs at the top. Release the tabs and the card is shielded again. Perfect when your hands are full, or when you are wearing gloves!

Product specifications

- Holds 1 ISO7810 ID-1 form factor (standard credit card size) contact-less smart card
- Blocks RFID chips in cards from being read without permission
- Ergonomic design allows user to present card to reader with one hand without removing the card
- User can easily insert and remove card from holder with one hand
- Holds one ISO7810 ID-1 form factor contact-less smart card
- Shields ISO 14443/15693 and EPC Gen 1/Gen 2 contact-less smart cards and RFID tags
- Physically protects card, weather- and water-resistant
- Dimensions: 4-1/2" x 2-3/4

ORDER EXAMPLE

Product
RFIDCSC
RFIDCSC stand for **RFID card shield clip**

Passport shield

Identity theft is rampant. This simple yet effective shielded passport jacket blocks the transmission of high frequency waves (13.56 MHz or UHF 860-960 MHz) used to read “smart” (contact-less) passports. Prevents unauthorized access to your passport information.

Dimensions

Passport Jacket Dimensions:

- 3-3/4 x 5-1/8 inches, fits most passports.
- 9.5 x 13.0 cm, fits most passports

Each jacket holds a single passport. Undetectable RFID barrier is embedded in the jackets, and adds almost no weight or bulk. Keeps your passport clean, safe, and secure.
Passport slips in and out easily when it’s time to present it to authorities. Get one for each traveler.

ORDER EXAMPLE

Product
PS
PS stands for **Passport shield**

Shielding pouch standard

Lightweight, Flexible and High Performing RF / EMI Shielding Pouches

3 different phone pouch

Leather tablet and wallet pouch

Laptop, medium leather & tablet army pouch

The shielded pouches protect portable transceivers from RF & microwave interference and/or emissions. The shielding pouch can also be used to shield a full wallet with content.

The RFID cards in your wallet can no longer remotely be read with the pouch closed around it. Our pouches are light-weight and flexible. They are made to attenuate and prevent signals from entering or leaving the pouch.

These shielding pouches are suitable for everyday use, for example for people with electro allergy and for storing RFID cards to prevent abuse. All types having a rollover closure with a shielded compartment and a non shielded compart-ment.

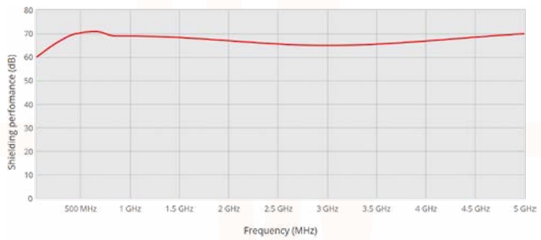
The shielding pouches are made with a highly conductive silver/copper/nickel RoHS compliant fabric on the inside.

Shielding effectiveness

Prevents cell phones, PDA's, smartphones, laptops and GPS units from logging onto an active network.

Field tests have shown an average of 99.99% signal attenuation. In practice, our shielding pouches proved to have a better design and better materials than pouches made by the competition. These pouches are built to last and can be reused over and over again with minimal shielding degradation.

SHIELDING PERFORMANCE



Industries

- Commercial wireless
- Industrial wireless
- Aerospace and defense
- Cellular forensics
- Computer forensics
- Homeland security
- Law enforcement
- Military
- Personal protection (electro smog / electro allergy)

Applications

- Mobile device forensics
- Cyber forensics
- Secure facilities
- Government facilities
- Crime scene investigations
- Industrial and corporate espionage
- Fieldwork

STANDARD SIZES

	Version	Outer size (width x height)	Inner size (width x height)	Material	Description
1	Pouch S - Phone 1	110 x 150	90 x 130	Imitation leather	Rollover closure, shielded compartment and a non shielded compartment
2	Pouch S- Phone 2	125 x 175	110 x 150	Imitation leather	
3	Pouch S- Phone 3	120 x 160	85 x 130	Army fabric	
4	Pouch S - Wallet	195 x 100	160 x 70	Black fabric	
5	Pouch S - Tablet 1	210 x 320	180 x 280	Imitation leather	
6	Pouch S- Tablet 2	225 x 285	190 x 255	Army fabric	
7	Pouch S - Medium	230 x 175	195 x 145	Imitation leather	
8	Pouch S - laptop	390 x 400	345 x 380	Imitation leather	

The shielded compartment allows you to safely store your RFID cards, and the non shielded compartment allows you to still be accessible on your mobile.

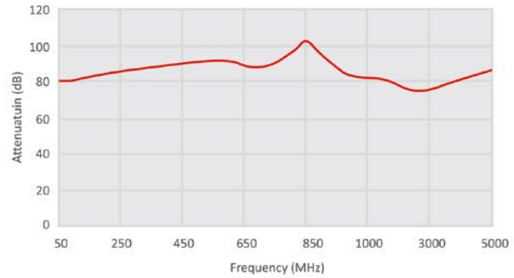
Shielding pouch textile version

Lightweight, flexible and high shielding performing pouches for electronic car keys, RFID devices, credit cards and so much more...

The pouches protect portable transceivers from RF & micro-wave interference and/or emissions. The shielding pouch can also be used to shield a full wallet with contents in the wallet.

The are RFID cards inside that are no longer remotely can be read with the pouch. Our pouches are lightweight and flexible. They are made to attenuate and prevent signals from enter-ing or leaving the pouch. It is generally used for professional purposes, i.e. for RF research, optionally in combination with a window for usage and vision of the device inside. The shield-ing pouches are made with a double layer conductive silver/copper/nickel RoHS compliant fabric (textile version).

Shielding effectiveness



Base material has an average shielding effectiveness of-85dB in the range of 30 MHz to 1 GHz and an average-80dB in the range of 1 GHz to 11 GHz.

ORDER EXAMPLE

Product	Width (mm)	Height (mm)	Window
Pouch T	Specify the width in mm	Specify the height in mm	**W :** With Window **NW :** No window

Options

- Hanging loop
- RF shielding window for ventilation and/or visibility
- Custom I/O connector plates.
- Pad Printing / Screen Printing / Custom Embroidery

Applications

- Mobile device forensics
- Cyber forensics
- Secure facilities
- Government facilities
- Crime scene investigations
- Industrial and corporate espionage
- Fieldwork

Standard sizes

Part number	Interior dimensions (mm)		Application
	Width	Length	
Pouch T-100-100-w	100	100	Electronic Car Keys, RFID Devices, Credit Cards (with window)
Pouch T-100-170-w	100	170	Portable devices – cell phones, pagers, iPhones, Blackberry (with window)
Pouch T-170-200-w	170	200	Multiple cell phones, PDAs, Passports, GPS Naviga-tion Units (with window)
Pouch T-240-320-w	240	320	Mobile tablet devices, iPads, RFID tagged docu-ments (with window)
Pouch T-400-320-n	400	320	Laptops, Computers, Multiple cell phones, PDAs, Blackberrys, or iPhones (with window)
Pouch T-400-370-n	400	370	Notebook Computers, Multiple cell phones, PDAs, Blackberrys, iPhones, Ultramobile PCs (with window)

Please note: Custom sizes from 40mm x 80mm (Length x Width) up to larger sizes of 1200 x 1200mm can be designed to fit your specifications

Shielding for cars

To protect the people inside the car from electromagnetic fields and radio frequencies

Shielding for signal-jammer cars

A signal-jammer car have to be shielded to protect the people inside it from the powerful electromagnetic fields and radio frequencies that are emitted by the jammers on the car's roof.

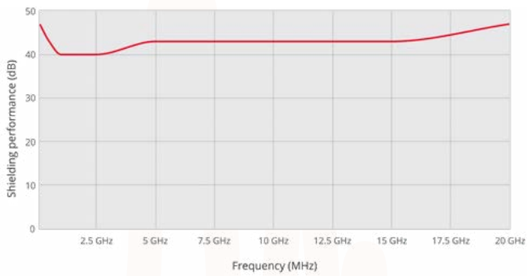
We are specialized in electromagnetic shielding of signal jammer cars. These shields are available for any model and type of car and can be custom made according to your wishes.

Such shields are also used by people who are allergic to electromagnetic radiation or to prevent the computer and telecommunications can be intercepted.

Applications

- Computer and cell-phone forensics
- Military field or embassy use
- Radar-jammer protection
- Electromagnetic allergy / electro-smog

Shielding performance* (dB)



Easy to fit transparent shield

Especially for military and embassy applications we have developed a easy to fit transparent window.

This window which is equipped with a very fine electrically conductive mesh protects the driver of the vehicle from the many different fields and frequencies spread from the antennas on the roof of the car.

Mounting the shield for signal-jammer cars is achieved easily, by means of suction cups to the windows. The shield we supply will be customized for your make and model car.

Light transmission

Opacity of mesh windows is 64.5%. A lack of available light should not be a concern, since an average pair of sunglasses allows less than 9% light to come through.

Request a quote

If you would like to request a quote for a car shielding, please send us the model and type of the car and the amount of cars concerned.

Stretch sensor 4940

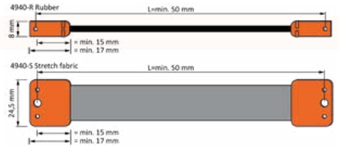
For measurement of small movements

Stretch materials up to 30% without permanently deforming. On both sides copper clips for mounting the sensor on the product with little resistance loss. Precise movement measuring by changing resistance in the material. Two types of material; conductive fabric and conductive rubber. Length of the sensor can be specified on request. The sensor doesn't have any sharp edges so it can be used on skin.

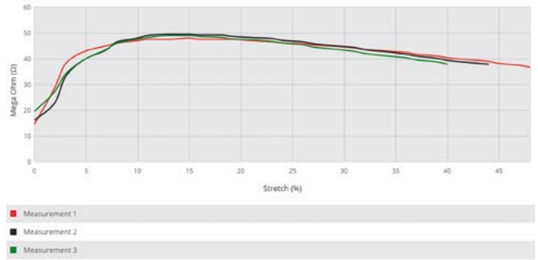
Specifications material

Conductive rubber	
Elongation, %, min	50
Flame resistance, UL94 (horizontal)	HB
Flame resistance, UL94 (vertical)	V-0
Volume resistance, ohms/cm (expression of conductivity)	1.8
Operating Temp	+160
range (°C)	-50
Colour	Black
Shore Hardness (A +/-5) ASTM D2240	60
Volume Resistivity (ohms) ASTM D991	2.2
Specific Gravity (+/- 0.25)	2.0
Conductive fabric	
Surface resistivity	<0.5 Ohm-sq. (unstretched)
Shielding Effect	35+ dB: 1-10 GHz
Temperature range	-30 °C to 90 °C
Thickness	0,40mm
Weight	4.3 oz/yd² 145 Gr./0.84m²
Stretch	~100% x length; ~65% x width direction
Permanent deformation	After ± 30% stretch
Standard length	135 cm (52 inch) wide

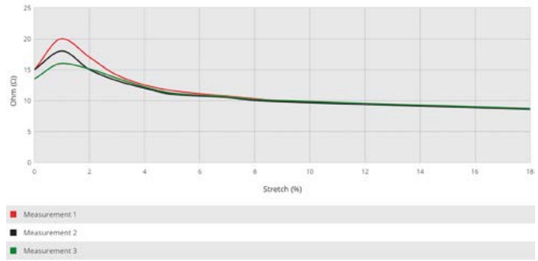
Options and dimensions



Stretching sensor - rubber length



Stretch sensor - fabric width



How to order

Part number	Options	Length (mm)
4940	**R :** Rubber **S :** Stretch fabric	Please specify the length in mm (min 50 mm)

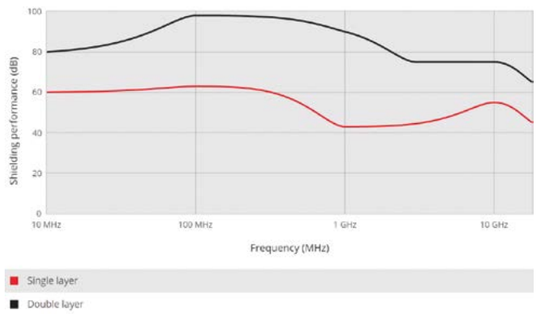
Shielded Faraday tents

Cost-effective instant Faraday tent

The EMI/RFI-shielded Faraday tents are made of highly conductive, lightweight, and ultra-strong textile. By default the Faraday tents are delivered with multiple ropes so they can be easily attached to a ceiling, or they can come with a self-standing frame.

Typical applications are EMC experiments, RF measurements, mobile military or forensic activities, and personal protection in the field. Faraday tents offer a mobile solution for only a fraction of the cost compared to a conventional Faraday cage.

Shielding performance* (dB)



Applications

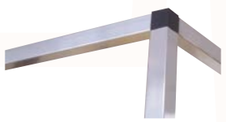
- Computer and cell-phone forensics
- Military field or embassy use
- Secure or TEMPEST communication
- Radar-jammer protection
- Electromagnetic allergy / electro-smog
- Pre-compliance testing
- Temporary EMI shielding
- Reverberation chamber (RVC)
- Mode-stirred chamber (MSC)

Advantages

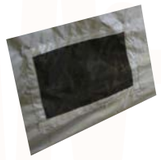
- Easy to mount and move, mobile laboratory
- Any size possible
- Optionally supplied with a rigid reinforced floor
- Single-layer Faraday tent: 40-60 dB up to 22.5 GHz
- Double-layer Faraday tent: 70-90 dB up to 22.5 GHz

Options

- Aluminium or reinforced mounting frame
- Shielded ventilation
- Waveguide for data transfer
- Cable sleeve for entry of filter cables
- Woven mesh ventilation panels
- Lighting for inside the tent
- Shielded signal- and power line filters
- Optionally supplied with a rigid reinforced floor and door for heavy load
- Many other options on request



Mounting frame



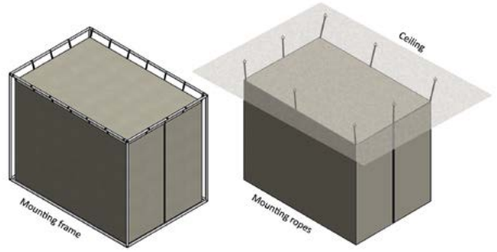
Shielded ventilation

Wave guide & power line filter

Shielded window

Power connection inside

Mounting options

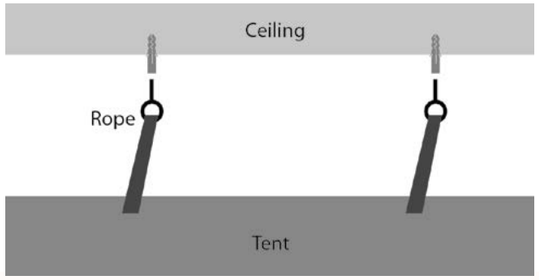


Our Faraday tents can optionally be supplied with a mounting frame so they can easily be set up as a stand-alone structure almost anywhere, but they are usually supplied with mounting ropes to attach to a ceiling. Mounting ropes are generally used when the Faraday tent is installed inside a building in a permanent location.

Access to the tent

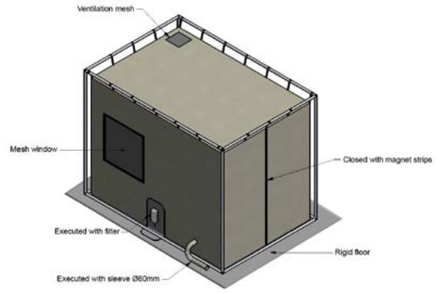
The typical entrance of a tent is a split door with a magnetic closing system. The closure with magnetic strips ensures superb electrical contact. For large tents, it is possible to turn a whole side into a door. If necessary, the entrance can also be equipped with conductive Velcro strips.

Adjustable rope to frame



Adjustable rope to ceiling

Additions (on request)



As illustrated in the technical drawing above, our Faraday tents can be supplied with the following options:

- Rigid floor for heavy load (metal floor)
- Solid floor for medium load (wood)
- Shielded ventilation mesh / AC
- Cable sleeve for entry of filtered cables, Ø 80mm
- Shielded mesh window for visual contact
- Standard closure with magnet strips
- Power-line or signal-line filter according to your specifications
- Led light inside (battery powered)
- Led light inside (with power line filter on the net)
- Data transmission filter (optical conversion, including wave guide)
- Packing/transport bag
- Many other options on request

Please note: when you want to enter the tent with heavy equipment like vehicles, planes, tanks you need a rigid floor and a tent with magnetic strips to the bottom so that the entrance to the tent can be fully opened.

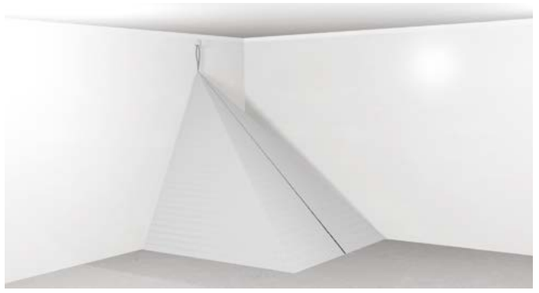
» Shielded Faraday tents

Standard sizes / shapes

We have a number of Faraday tents in standard sizes and shapes in stock. In addition, almost any size and shape can be made on request. Feel free to send us a technical drawing of the desired Faraday tent.

Please note : All measurements given in the tables below are outer dimensions. In a dual-layer tent, approximately 10 cm is lost on the inside of the tent. So when you order for example a 2 meters wide double layer shielded tent, the inside wide will be 1.90 meters

Single-point wall version (SPW)



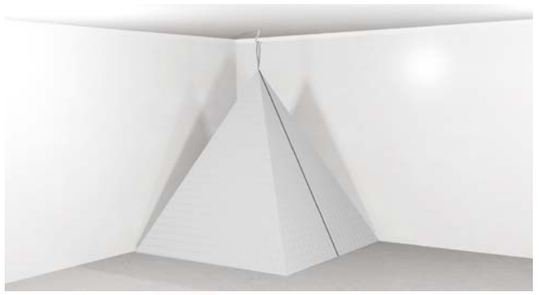
Type	Size	Ordering code
Small	1 x 1 x 2.3 meters	P-1x1x2.3
Medium	2.5 x 2.5 x 2.3 meters	P-2.5x2.5x2.3
Large	3 x 3 x 2.3 meters	P-3x3x2.3

Rectangular (R)

Type	Size	Ordering code
Large	2.5 x 3 x 2.3 meters	R-2.5x3x2.3
Extra large	3 x 2 x 2.3 meters	R-3x2x2.3
Jumbo	5 x 3 x 4 meters	R-5x3x4

Please note : any other size on request

Pyramid (P)



Type	Size LxWxH	Ordering code
Small	1 x 1 x 2.3 meters	P-1x1x2.3
Medium	2.5 x 2.5 x 2.3 meters	P-2.5x2.5x2.3
Large	3 x 3 x 2.3 meters	P-3x3x2.3

ORDER EXAMPLE

Product	Shape	Width (m)	Depth (m)	Height (m)	Layers
Shielded tent	**SPW :** Single-point wall **P :** Pyramid **R :** Rectangular	The width of the tent in meters	The depth of the tent in meters	The height of the tent in meters	**1 :** Single layer **2 :** Double layer

Prefabricated Faraday cages

Our prefabricated self-standing modular Faraday cages offer superior screening of RF/LF/HF signals, e.g. for R&D, TEMPEST and Testing purposes

A freestanding (independent of the host building) prefabricated modular Faraday cage provides a superior screening of RF-signals and is applicable in a wide range of situations for a wide range of purposes.

The modular Faraday cage is designed to meet or even exceed the vast majority of shielding requirements requested in todays society.

Applications

- LF/RF/HF tests
- EMC test labs
- Wireless product testing
- EMI/RFI shielded server rooms
- Protection of sensitive information (NATO TEMPEST standards)
- HEMP & EMP protection
- Neuroscience laboratories
- Cellular communication devices
- Immunity & emission test chambers
- Anechoic chambers
- MRI rooms
- Neurology labs

Advantages

- Freestanding construction
- High shielding performance without deterioration
- Easy to modify, enlarge or reinstall with conventional hand power tools
- Optionally supplied as a kit for assembly by the user
- Easy to mount by skilled local workers
- Many sizes directly available from stock, custom designs available within a few weeks
- Standard 10 years warranty, moving parts and electronics excluded

Options

Examples of several options are listed below:

- (Customized) shielded honeycomb ventilation panels
- Shielded doors
  - Automatic sliding doors
  - Double leaf door
  - Double door as in sluice-gate construction
- Bolts on the in-or outside for construction convenience
- Shielded piping for water or gas flow
- Acoustic panels on the inside
- Entry panel fitted with:
  - Power filters, single- or three phase +N (specify amperage, voltage and frequency)
  - Feed through signal filters
  - Wave guides for passage of fiber-optic cables
  - Feed through penetration (e.g. SMA- or BNC connector)
  - Grounding bolt

Standard cage dimensions

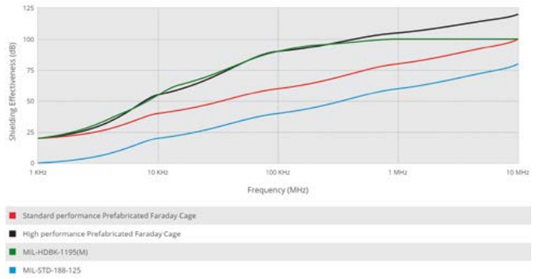
Our prefabricated Faraday cages can be made in almost any size. By default, the following prefabricated Faraday cage panels are in stock and can be delivered quickly. A Faraday cage can also be produced according to the customers specifications. Any time you can enlarge it, make it smaller and create different shapes.

Length (mm)	Width (mm)	Height (mm)
1090	1170	2315 / 2840 / 3405
1090	2260	2315 / 2840 / 3405
2180	2260	2315 / 2840 / 3405
3270	2260	2315 / 2840 / 3405
3270	3350	2315 / 2840 / 3405
4360	2260	2315 / 2840 / 3405
4360	4440	2315 / 2840 / 3405
5450	5530	2315 / 2840 / 3405
Custom		

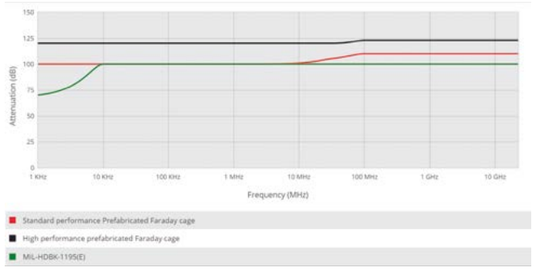
Shielding performance*

Shielding performance graph of a standard prefabricated cage vs a high performance Faraday cage.

Prefabricated Faraday cage [Magnetic]



Prefabricated Faraday cage [Electric]



Additional product information and material use

The prefabricated Faraday cage consists of galvanized (2 mm thick) Mu-Ferro steel shielding panels. The galvanization ensures excellent resistance to corrosion.

Gaskets are applied between all panels of the Faraday cage to ensure a good electrical conductivity and a good seal between the panels. The gaskets are produced in our gasket production facility.

To ensure a high shielding performance over time, the bare modular prefabricated Faraday cage construction does not contain any wooden parts that could be affected by variations in temperature or moisture.

In short, the corrosion resistant panels guarantee excellent electrical conductivity and provide a high shielding effectiveness.

IN HOUSE PRODUCTION FACILITY

We produce Faraday cages daily and are therefore able to quickly deliver standard sizes from our large stock. The panels we keep in stock can also be adjusted quickly according to your needs, for example for the input of power line filters, waveguides, honeycomb ventilation panels, etc. These custom sizes can be produced in several weeks from order date. When desired, the Faraday cage can also be adjusted on location.
We can deliver a cage in any requested size with any requested attenuation. If a straightforward cage with low attenuation requirements is desired, we can deliver the cage standard from stock for an attractive price.

The modular panels can be shipped and assembled by the customer or under supervision of our engineers, anywhere in the world.

Fully finished interior

We can also provide a fully finished interior. The walls and ceiling of the cage are then completely decorated with wood, and the floor with carpeting so that the shielding panels of the cage are no longer visible.

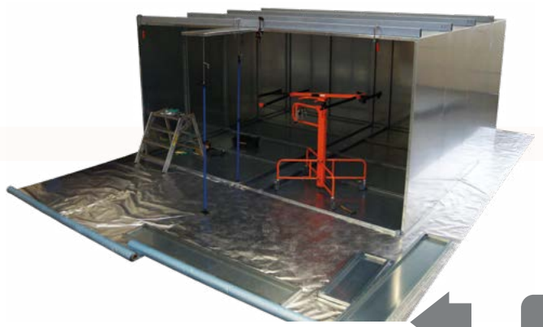
Below is an example of a prefabricated Faraday cage before and after its interior finish.

Air conditioning, lighting, wall outlets cable ducts, work tables and many more features can be taken into account in this complete interior finish.

How to order

For a quotation of a prefabricated Faraday cage please send an email with drawings of the room that requires shielding.

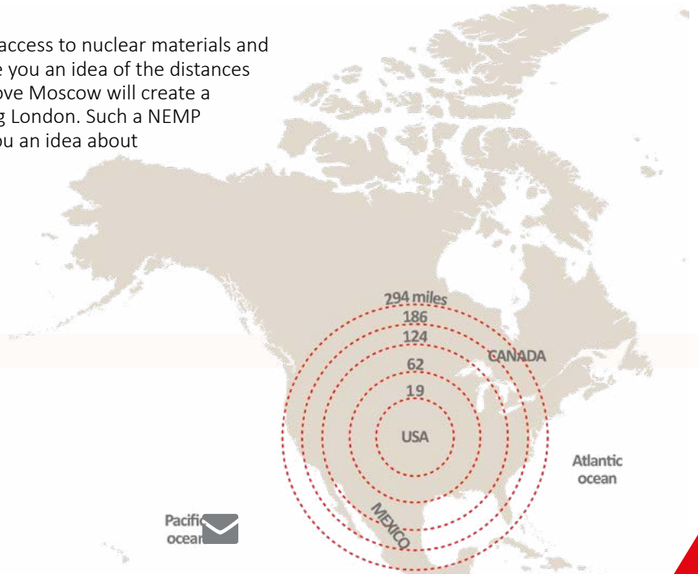
In case no drawings of the room are available, we must know the amount of square meters that require shielding.
Also indicate the application of the shielded room. This enables us to think about the right solution from scratch.



Electromagnetic Pulse protection

The threat of an EMP attack is today more real than ever. Countries like North Korea and Iran already have the technology available to launch an EMP attack and the consequences will be devastating. EMP is like super-energetic lightning. Instead of striking a point it can cover an entire nation, like the continental United States, with an EMP field. A nuclear EMP attack (NEMP) would destroy electronics everywhere, cause planes to crash, stop cars and rail traffic, blackout electric grids and other critical infrastructures that make modern civilization, and life itself, possible. Eventually, millions would die from starvation, disease, and societal collapse. EMP missiles are not the only threat to the technology driven modern world as we know today. Other realistic threats are Solar storms, terrorism or even on smaller scale DIY EMP guns. On Youtube you can find the instructions to build an EMP gun within minutes. The size of these guns vary from hand-held to JOLT generators (A Highly Directive, Very Intensive, Impulse-Like Radiator) which fits onto a small truck, which they can park next to your data center.

More and more nations and organizations have access to nuclear materials and this presents a risk of nuclear explosions. To give you an idea of the distances involved: a nuclear burst in the stratosphere above Moscow will create a NEMP field over all of Western Europe, including London. Such a NEMP field can destroy all unprotected data. To give you an idea about the impact on the USA alone.

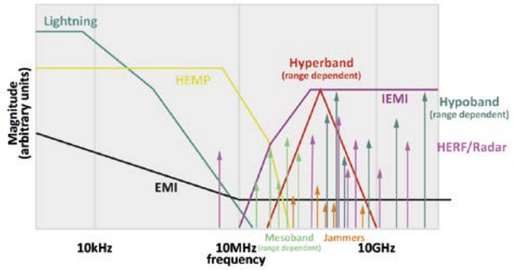


IEMI Threat

There are several electromagnetic (EM) threats. Intentional electromagnetic interference (IEMI) is another growing risk around the world. With all the electric devices and automatically controlled processes our vulnerability is growing. Also the complexity of all the radiation is rising. More possibilities and problems require all sorts of different solutions. Think about Smart Electrical Grids, Virtual Reality, Driver less Cars, Eye Tracking Technology, High Efficiency Photo-voltaic Cells, Green Energy Electrical Power Converter, Wireless Wearable Tech, Graphene, Ion-thruster Energy, etc.

The difference between EMI and IEMI is that IEMI is intentional electromagnetic interference. With the increasing risk of terrorist attacks, electronic warfare, smart burglars and hackers more and more interference is caused on purpose.

IEMI usually occurs in a small frequency band. An EMP or HEMP (high altitude EMP) usually occurs in a broadband nature. EMP threats are one of the largest electromagnetic threats of this time. The amount of impact is tremendous. The range of such an attack is outstanding. A HEMP is a high amplitude short duration, broadband pulse of electromagnetic energy. This can have a highly destructive effect on the world which does not function without electronics.



EMP is a threat for

- National security
- Data centers
- Telecommunications
- Heating companies
- Transportation sector
- Banks and other financial services
- Security systems
- The electricity distribution infrastructure
- Hospitals and public health facilities
- Oil/gas industry
- Water treatment facilities
- All other not mentioned technology driven instances.

Active systems like EMP burst devices

A portable, battery-powered EMP burst device can generate extremely powerful fields in almost no time.
One such burst can be enough to damage all servers and other (safety) electronics in your location.

On the internet you can easily find instructions for making an EMP burst device. A handyman can construct one in a few hours with commonly available components. For people who have difficulty reading the texts, there is even an instruction video on YouTube.

And a lazy or less technically skilled criminal can rent a portable device, a fully anonymously, for less than US $1.000, from several sources all over the world. It is a real industry, an entirely new type of crime.

Through the air these NEMP waves will propagate for hundreds of meters, and concrete walls are no obstacle. The waves can also travel through existing cables, through the metallic protection around cables or even common pipelines for gas and water, bringing the data-killing power burst to its intended target:
YOUR DATA CENTER.

EMP protection solutions and engineering

We are worldleading in engineering and prodution of EMP protections. Think about EMP protected Faraday cages, EMP data and power line filters, EMP Ethernet converter units, etc.

Our engineers are specialized in the protection against EMP attacks. We have a specialized product range for the protection against EMP threats.

The shielding effectiveness exceeds the minimum HEMP requirements as specified in the MIL-STD-188-125 (HEMP protection for ground-based C4I facilities performing critical, time urgent missions).

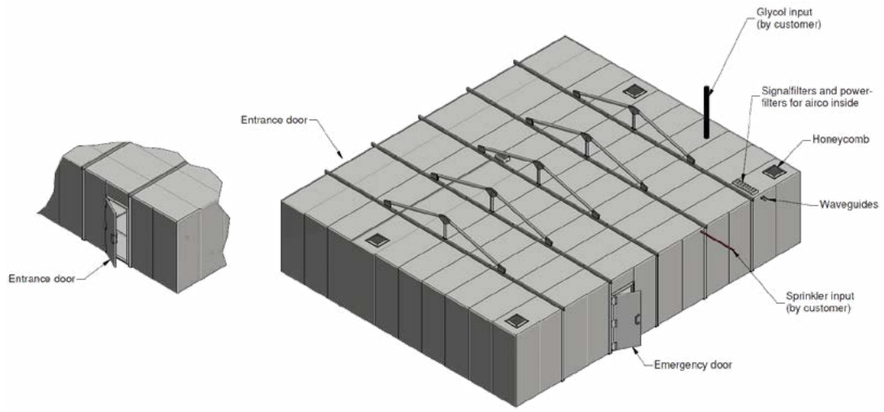
Our filters are tested with our in-house test facility with which we are capable to perform PCI as per E1 (20/500ns 5kA peak) and E2 (1.5/4000µs 250A peak) test pulses. With our testing facilities we make sure that our filters comply with the highest demands and that the residual currents
are within limits of the applicable standards and norms.

E1/E2 power line filter test by our specialists

» *Electromagnetic Pulse protection*

Below you find a selection of products which will help you to protect your facility from EMP attacks. A complete Faraday cages is depicted including all the components we manufacture with an electromagnetic pulse protection. In our development laboratory we can develop any EMP protected product according to your wishes. Our testing facility can also provide you with a broad EMP measurement analysis.

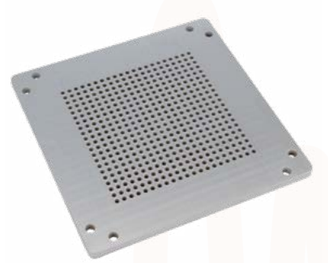
Contact info@hollandshielding.com for a quote on testing your product/device/etc.
We have broad experience in EMP protection internationally.



Faraday cages and components

EMP - EMI racks

EMP shielded windows



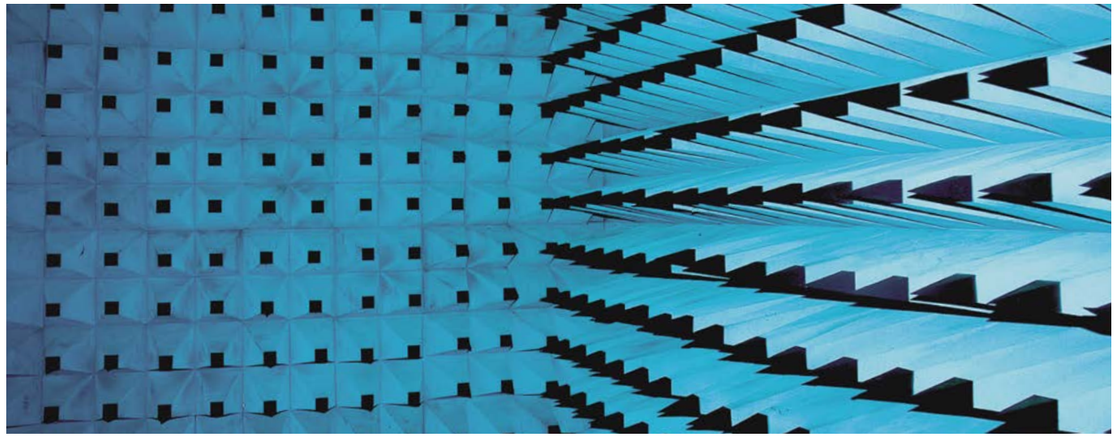
9540 - EMP ventilation panels

power, signal & data line filters

IP enclosures & PCB housings

Anechoic chamber

The Anechoic Chambers show superb shielding performance and are mainly applied in EM emission testing according to commercial and military standards



Our anechoic chambers are constructed as shielded rooms whose walls and ceiling are completely covered with absorbing materials and/or ferrite tiles. The anechoic chambers offer superb shielding performance and are mainly applied in EM-emission testing according to commercial and military standards.

The anechoic chambers are used to perform compliant radiated immunity tests in accordance to EMC standards such as IEC / EN 61000-4-3.

They provide a full compliance immunity test site for the frequency range of 26Mhz to 18GHz and are also suitable for the free-space emission test suggested in PREN 50147-3.

We can also construct open-area test sites.

If you wish to receive a quote for an anechoic chamber send a drawing of the room in question. Do you have any drawing please contact us via email (info@hollandshielding.com) or our contact form on our website to pass on all the specifications of the room.

It is important to indicate the purpose of the room or possibly the desired frequency range in which the room should work. Also indicate the size of the door to the room and the amount of power and ventilation needed in room.

Emission performance – 26MHz-18GHz
Immunity 26 MHz-18GHz

Key features

- Fully compliant design to meet UKAS and FCC requirements
- Any dimensions are possible
- Emission performance of +/-4 dB or better in the 30 MHz - 40 GHz frequency range
- Fully compliant for immunity in accordance with EN61000.4.3
- Ferrite and hybrid lining from 30 MHz- 40 GHz measurements
- Very cost-effective solution
- Flexible modular design enables you to make easy site changes or upgrades

TURNKEY SYSTEMS

A complete system approach is available to fully facilitate your laboratory and includes:

- Electrical distribution
- Turntables/dynamometers
- Masts
- CCTV
- Air conditioning
- Fire detection and suppression
- Emission & immunity measurement systems

Mu-copper cages

Mu-copper foil is used to create a Faraday cage in an existing room or building

Mu-copper wall covering system

Mu-Copper foil has high attenuation properties in the electrical field (up to 120 dB) as well as in the magnetic field.

It is easy to apply, like wallpaper, thanks to its special adhesive for walls, ceilings and floors. The interior finish can be plaster board, foam tiles or plywood.

The 0.12mm thick Mu-Copper is used to transform a regular room into a shielded room; the product has excellent shielding performance even at low frequencies. The system is easy to mount on shielded doors with clamping devices. The standard width of Mu-Copper is 1000mm. The foil can be delivered on rolls or as ready-made sheets.

Overlap options

For the joints you can use a 50mm overlap. For extra high performance you can fully solder the joints or use a seaming /copper tape with a conductive self-adhesive to apply over the joints.

Ventilation

For ventilation we have developed honeycomb ventilation panels. Especially for the Mu-copper Faraday cages we can deliver honeycomb vent panels with a Mu-copper flap around the edges. It is easy to solder these into the Mu-copper Faraday cage.

Advantages over mesh

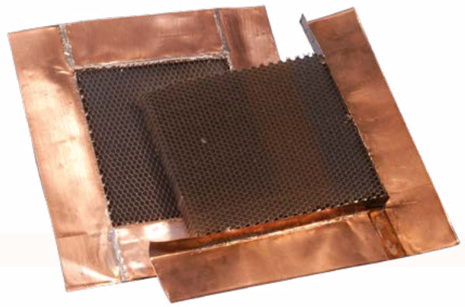
Mesh does not protect against high frequencies and it is difficult to connect all wires or the mesh in big constructions. With foil you can use the whole surface to create coupling.

Advantages

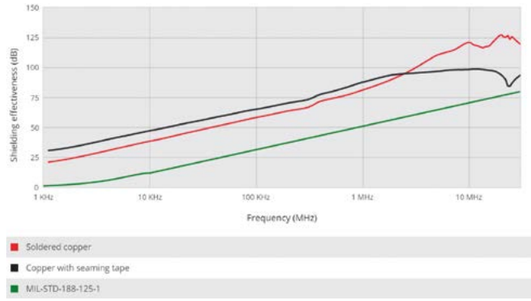
- Cost-effective / takes up little space
- Light weight / high floor load
- Can be constructed with local labour
- Standard interior finish possible like plasterboard
- Can be delivered with 10 year guarantee
- Maintenance free
- Delivery with turnkey measurement report

Applications

- EMI shielded server room
- EMI shielded MRI room
- Server rooms
- EMC test rooms
- Computer rooms
- Medical examination rooms
- MRI, EEG, EMG & EVP
- Rooms for physiotherapy
- Radar protection/Airport
- TEMPEST Sites
- Military EMC protection
- Board room shielding
- Industrial espionage/ Secure room
- Buildings for intelligence agencies



Shielding performance*



Options

The Mu-copper Faraday cage can be equipped with the following options:

- Wave guides for data communication
- Shielded windows
- Shielded ventilation panels
- Power line filters
- Signal line filters
- Shielding solutions for water pipes and (medical) gases
- Standard interior finish is possible (like glued plasterboard, foam tiles or plywood)

Ceiling

The system can be used with a detachable or fixed ceiling to separate existing ducts and cables from the shielded room.

Modified RF shielded door

When a lower performance of e.g. 40-60 dB is acceptable, we can retrofit your existing door. The door is then equipped with gaskets at the top and sides, and with a conductive copper brush and doorstep at the bottom. Both swinging and sliding doors are suitable for being shielded this way.

For heavy duty applications we can supply Faraday cage doors that offer up to 140 dB reduction.

Components

In addition to EM shielded doors and windows, the screened rooms can be equipped with the following components:

- Shielded doors
- Shielded windows
- Shielded ventilation panels
- Power and signal filters

We also offer shielding solutions for water pipes, medical gases, and ventilation when needed.

You can create a Faraday cage with high shielding performance yourself in an economic way, using local labour. This is possible in existing buildings as well as in new ones, without loss of space. Depending on the quality of the doors, vent panels, filters and/or windows used, attenuation levels up to 80-100 dB in the E-field can be realized. When more layers are applied, it is possible to achieve over 120 dB.

ORDER EXAMPLE

You can indicate below how many square meters Mu-copper foil you need for covering your room. You can also specify if you want an offer for adhesives for pasting the Mu-copper on the walls and solder for closing the seams.

In order to make a more specific offer for a Mu-copper cage please send your drawing to info@hollandshielding.com

Mu-copper (M²)		Adhesive		Solder
	–		–	
Indicate how many square meters Mu-copper foil you need		**WA :** With adhesive **NA :** No adhesive		**WS :** With solder **NS :** No solder

Amucor Faraday cage

Amucor foil can be used to create a Faraday cage in an existing room or building

Amucor foil 4701 (4702 with self-adhesive) has high attenuation properties in the electrical field (up to 110 dB) as well as in the magnetic field (see shielding performance table).

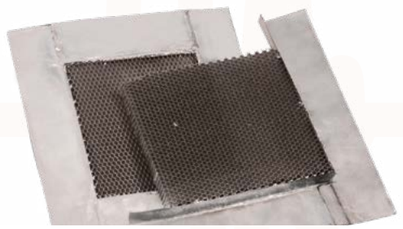
It is easy to apply because the foil is provided with a very strong self-adhesive. For an extra good result, we recommend applying plasterboard before applying the film. After the application of the Amucor foil the interior can be finished with an extra finishing layer of plaster board, foam tiles or plywood.

The 48 µm thick Amucor is used to transform a regular room into a shielded room; the product has excellent shielding performance even at low frequencies. The system is easy to mount on shielded doors with clamping devices. The standard width of Amucor is 1000 mm. The foil can be delivered on rolls or as ready-made sheets.

Overlap options

Depending on the overlap you can meet a certain shielding performance. Holland Shielding Systems can advise in how to install the Amucor for your application. The standard for Amucor is an overlap of 200mm. It's even possible to meet the MIL-STD-188-125 with the dual layer Amucor system.

You can create a Faraday cage with high shielding performance yourself in an economic way, using local labour. This is possible in existing buildings as well as in new ones, without loss of space. Depending on the quality of the doors, vent panels, filters and/or windows used, attenuation levels up to 80-100 dB in the E-field can be realized.



Advantages

- Cost-effective / takes up little space
- Can be delivered with a self-adhesive allowing very easy appliance of the film
- Light weight / high floor load
- Can be constructed by local contractor under supervision of Holland Shielding Systems
- Standard interior finish possible like plasterboard
- Can be delivered with 10 year guarantee
- Maintenance free
- Delivery with turnkey measurement report

Applications

Amucor film is suitable for a large scale of applications where a medium performance reduction is required. Below we have made a small list of some commonly used applications.

Data security for

- Computer rooms
- Industrial espionage/ Secure room / SCIF rooms
- Intelligence agencies
- Board room shielding
- RF Noiseless

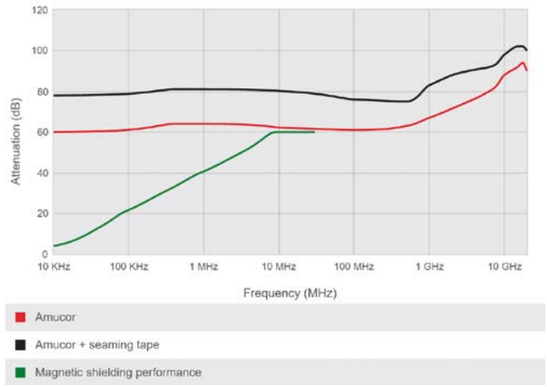
RF Noiseless

- TEMPEST sites
- MIL-STD-188-125
- Computer rooms
- Industrial espionage/ Secure room
- Intelligence agencies
- Board room shielding
- Free from Radar interference on Airports

Ventilation

For ventilation we have developed honeycomb ventilation panels. Especially for the Amucor Faraday cages we can deliver optimized honeycomb vent panels for this type of cage. For other honeycomb ventilation panels, like rigid aluminium Framed Honeycombs, see our Honeycomb ventilation

SHIELDING PERFORMANCE



MODIFIED RF SHIELDED DOOR

When a lower performance of e.g. 40-60 dB is acceptable, we can retrofit your existing door.
The door is then equipped with gaskets at the top and sides, and with a conductive copper brush and doorstep at the bottom.

For heavy duty applications we can supply Faraday cage doors that will match the max specification of the cage.
For more information see our Faraday cage doors webpage.

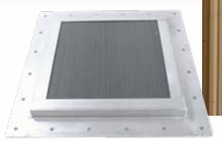
Medical door

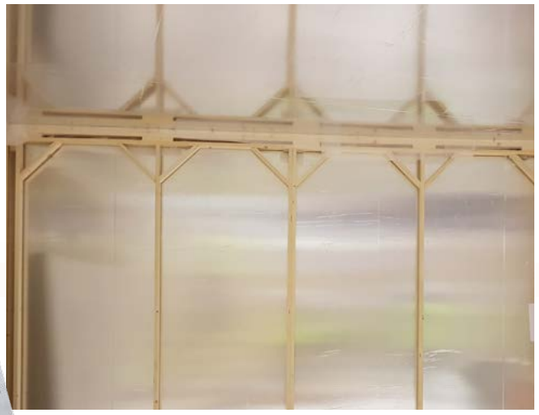
EMI/RFI-shielded doors

COMPONENTS

In addition to EM shielded doors and windows, the screened rooms can be equipped with the foil.

- Shielded doors
- Shielded windows
- Shielded ventilation panels
- Power and signal line filters
- We also offer shielding solutions for water pipes, medical gases, and ventilation when needed.





Faraday cage doors

EMI/RFI/EMP-shielded doors for use in Faraday cages and EMI/RFI shielded rooms

Designing and manufacturing standard and custom EMI/RFI-shielded doors for EMI/RFI-shielded rooms and Faraday cages. High performance single and double knife finger-strip doors in sliding, swinging and even double swinging implementations are some of the many possibilities. Our engineers will be happy to help you find the best solution possible.

We also produce sets to shield doors with gaskets at the top and sides, while the bottom can be provided with a electrically conductive copper brush and doorstep.

Virtually every type of door can be provided in a swinging or sliding implementation.

Options

- Fireproof
- Automatic closing
- Gas tight
- (Automatic) locking system
- Soundproof
- Clean room specifications

Types

- HDFD : Heavy duty fingerstrip door
- FDWSF : Fingerstrip door with soldered fingers
- FDWCF : Fingerstrip door with clamped fingers
- SPD : Standard performance door
- SMD : Standard modified door

EMI/RFI-SHIELDED SLIDING DOORS

The fully automatic EMI/EMP/RFI-shielded sliding doors are designed for RF and EMP-tight enclosures. They can be integrated in EMI/RFI-shielded rooms and are also suitable for other types of shielding.

There are two steps involved in opening the sliding door: Unlatching of the contact-spring system and outward movement; Sideways movement of the door leaf. The movements of the door and ramp is fully automated; they are operated electrically and pneumatically. Each opening and closing of the door has a self-cleaning effect on the contact surfaces (fingerstrips and knife of the door).

Types

- Single fingerstrip door (fingerstrip door with soldered or clamped fingers)
- Double fingerstrip door (heavy-duty fingerstrip door)
- Standard modified door with gaskets (copper-plated wooden door, with copper brush and copper doorstep)

Swinging doors

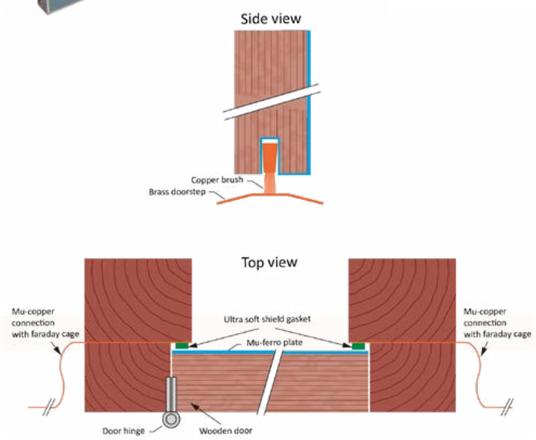
The fingerstrip swinging doors are well known for their high shielding performance and are used in prefab cages as well as in our Mu-Copper systems.

We manufacture single fingerstrip doors for medium shielding performance and double fingerstrip doors for high shielding performance (reductions up to 140 dB). Delivery from stock is possible in various dimensions. In EMC applications, ferrite tiles can be affixed to the standard door leaf.

To achieve the various attenuation levels required, we have several types of swinging door in our assortment.

Types

- Single fingerstrip door (fingerstrip door with soldered or clamped fingers)
- Standard performance door for hospital use
- Standard modified door (copper-plated wooden door, with copper brush and copper doorstep)

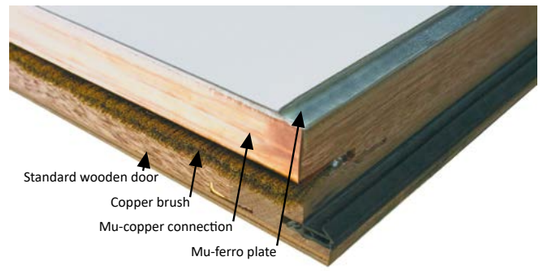


Wooden modified doors for EMI/RFI-shielded rooms and chambers

For applications with a performance up to 40-60 dB we can upgrade a wooden door to a shielded door. The modified wooden door can be supplied in a sliding or a swinging implementation. The wooden modified door is used in hospitals, e.g. in EEG, EMG, and measurement rooms.

Standard sizes

Standard shielded leaf doors in steel/wooden or steel frames
Width: single 800 / 1200mm, double 1500 / 2000mm
Height: 2000 / 2100 / 2500mm.



ORDER EXAMPLE

Door		Width (mm)		Height (mm)
	-		-	
HDFD : Heavy duty fingerstrip door **FDWSF :** Fingerstrip door with soldered fingers **FDWCF :** Fingerstrip door with clamped fingers **SPD :** Standard performance door **SMD :** Standard modified door		Width of the door in mm (millimeters)		Height of the door in mm (millimeters)

Implementation

Swing : Swing door
Sliding : Sliding door

Mu-ferro HD MFHD

magnetic shielding for sensors and electronic devices

Electromagnetic fields can affect electrical equipment, magnetic systems and also living organisms. For magnetic shielding of electronic devices and PCs we have developed the Mu-ferro HD.

Mu-ferro HD can be used to prevent low frequency magnetic radiation (0Hz- 100 kHz) from leaving a device, or it can be applied around a sensitive device or sensor, to prevent external electromagnetic interference from disrupting normal operations.

Mu-ferro HD offers important magnetic-field shielding characteristics, due to its high magnetic permeability and its ability to absorb magnetic energy. This allows for the highest possible attenuation, making this shielding alloy the material of choice for reducing low-frequency electromagnetic interference.

For magnetic shielding of electronic devices our Mu-ferro HD plate material are 650 x 1350 mm (other on request) and available in 0.5 and 1 mm thick. In addition we will gladly produce custom shapes which will deliver the best shielding effect possible in your situation.

Mu-ferro HD is also available as a foil or tape, delivered on rolls (0.024 mm thick) with or without regular or conductive self-adhesive for high-frequency shielding and easy mounting. For more information, part number 3208.

ORDER EXAMPLE

If you need a rectangular piece of Mu-ferro HD then you can specify the part number as in the blocks below. When you need a cut to shape or form made piece of Mu-ferro metal then send us a drawing of the relevant form.

Series	Width (mm)		Length (mm)	
MFHD	–	Specify the width in mm.	–	Specify the length in mm.

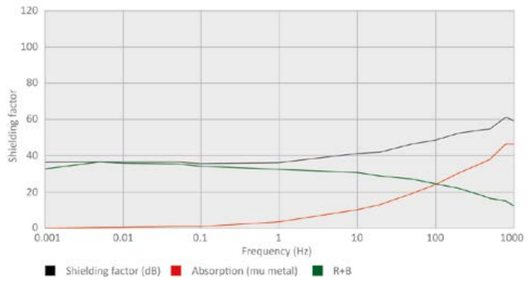
Thickness (mm)

0.5 : 0.5mm thick
1.0 : 1.0mm thick

Applications

- Aviation and aerospace industries
- Sensitive sensors
- Medical equipment
- Physics research
- Telecommunication
- Automotive
- Military

Shielding effectiveness*



Properties

Item	Data
Carbon	0.02%
Manganese	0.50%
Silicium	0.35%
Nickel	80.00%
Molybdenum	4.20%
Iron	Balance
Density kg/m³	8747
Thermal conductivity W/m K	34.6
Electrical conductivity micro-ohms	580

Mu-ferro shielding foil MFSD

Magnetic shielding sheets that are thin and flexible with a high permeability

The Mu-ferro shielding foil is a magnetic shielding sheet and made of a high permeability material laminated on a PET film. The sheets are easy to handle and because of the thinness of 0.12 mm the material is very flexible.

The mu-ferro shielding foil is lightweight and has a superior magnetic shielding effect. The best shielding frequency can be made when the frequency gets below several 100 kHz. When one layer of Mu-ferro foil is used it can shield 100 µT.

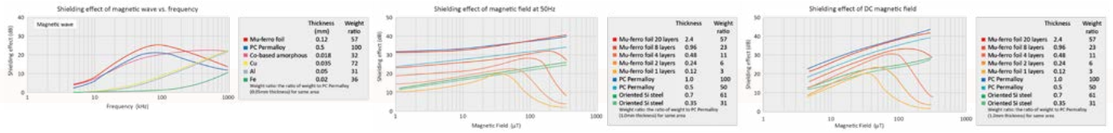
When multiple layers of the material are used it can shield a strong magnetic field. Having small deterioration in shielding effect by bending, cutting and punching, Mu-ferro foil can be applied on curved surface and cut or punched in various shapes. The foil is also available in a long sheet and is suitable for large-scale magnetic shielding for example a shielded room.

Specifications

Type		roll
Dimensions	Length	100 m
	Width	470 mm
Thickness		0.12 mm
Magnetic flux density, B800 (DC H=800A/m)		1.23 T
Maximum permeability, µmax (DC)		70.000
Operating temperature range		-40°C +80°C

Double-sided adhesive tape is available for 610 mm × 460 mm sheet.

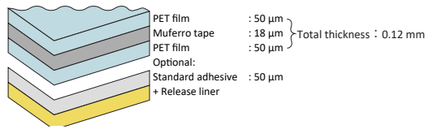
Shielding effect



Applications

- For suppression of magnetic noise generated from inductors in electronic devices, such as personal computer, mobile phone, DVC, DSC, etc.
- For magnetic shielding of buildings or houses close to power lines or power distribution installation.
- For magnetic shielding of equipments that are easily affected by geomagnetic field or fluctuating magnetic field.

Structure



How to order

Series	Width (mm)		Length (mm)	
MFSD	–	Specify the width in mm.	–	Specify the length in mm.

Adhesive

A : With adhesive
N : No adhesive

Low-frequency magnetic shielding Mu-Ferro

Material for shielding/screening low-frequency magnetic fields.

Indoor transformer rooms

The frequency of these magnetic fields is typically 50/60 Hz. The Mu-ferro material is suitable for magnetic shielding in frequency ranges from 10 Hz to 100 kHz. Mu-ferro has a plate size of 2000 x 1000 x 0,66 mm.

Customer benefits

- Cost-effective solution
- Up to 95% field-strength reduction or more
- Flexible design
- Measurement report
- 10-year guarantee

Mu-ferro combines permeable and satiety characteristics which makes it extremely suitable for screening low-frequency magnetic fields.

Applications

- Transformer rooms (indoors or outdoors)
- Power plants
- Aluminium melting/production
- High-voltage labs
- Anything that creates strong magnetic fields (high currents)

Example of a project

Due to space restrictions, one of our clients was forced to turn a room which had formerly been used for storage into an office space; this room was located on the floor above power transformers. However, powerful magnetic fields were noticed in that room which made the computer displays flicker, so we were asked to carry out a magnetic field measurement. It was found that the magnetic field strength was far above the standard referred to above- it was 750 nTesla. This magnetic field was reduced by the installation of an umbrella construction of Mu-ferro. Since completion of this project, the magnetic field has been reduced to only 80 nTesla.

Why use magnetic shielding/screening?

Magnetic fields pose a serious threat to human health and wellbeing. For instance, research has shown that exposure to magnetic fields of > 300 nT or 0.003 Gauss significantly increases a person's chances of developing leukemia. And there are numerous other physical symptoms associated with exposure to magnetic fields, e.g. headaches, depression, and insomnia. For this reason the Health and Safety Codes in many countries recommend that for working spaces exposure should be < 0.5 µT=500 nT and for public spaces it should be < 0.1 µT=100nT.

Apart from their negative impact on health, strong magnetic fields can cause interference or damage to electronics in the direct vicinity of where the field is generated. Magnetic fields also interfere with sensitive measurements in hospitals and laboratories.

Measurement

Before the screening/shielding is ordered and installed, we can conduct a site survey (magnetic field strength measurement) for you. We not only measure the magnetic field strength but also locate its probable source. The measurement results are then presented in a report.

We can implement magnetic shielding even after the transformer has been put into place. For screening entire buildings, or rooms, the shielding material is applied to walls, ceilings and/or floors. This protects both people and electronics.

Shielded racks SR

EMI shielding metal racks and enclosures

Metal cabinets, (19") Racks and shielded enclosures

As the threat of IEMI or EMP attacks become more real and the awareness of the risks rises, the necessity of shielded racks and/or data-centers increases. Holland Shielding offers shielded racks which can fully customized to your requirements.

Applications

- IEMI (intentional Electromagnetic interference)
- Tempest
- Eavesdropping
- Solarstorms
- EMP attacks
- MIL-STD-188-125
- Radiated attacks
- Lightning
- NSA 94-106

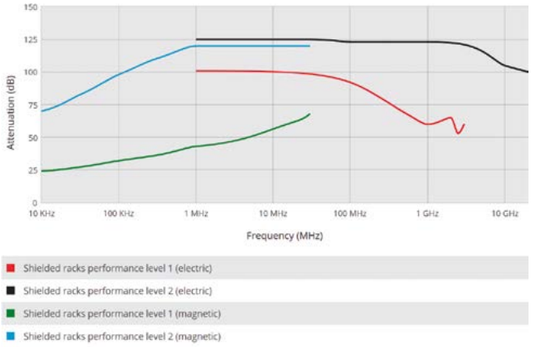
For more information refer to our Data center security

Attenuation levels

We have 2 standard performance levels for our shielded racks, so you can pick the type of rack that will suit your application.

Level 1: This type of rack is based on the well-known racks in the market and optimized for the shielding of your equipment with our in house produced shielding materials. This rack will give you the basic protection and will reduce the incoming attack up to 10.000 times.

Level 2: The ultimate shielding will come from our racks which are a spin-off from our prefab Faraday cages. These racks are exceeding the most shielding effectiveness standards and offer a performance over 120dB.



OPTIONS

All our racks can be fully customized to your requirements. Just note that every opening or cable is going to be a leakage in the RF shielding of the rack. For this purpose we have power and signal line filters.

Most integrated options are:

- Power-line filters
- Signal-line filters
- Ventilation honeycombs
- Waveguide
- I/O panel (BNC-,SMA-,N-Connector)
- 7894 UDP data-line filter
- 7896 USB 3.0 optical converter
- Fixed/sliding shelves
- Etc..

More information

Do you have questions or would you like to receive more information about the shielded racks? Our engineers can give you the right advise for your specific application or answers. Please contact us www.hollandshielding.com

ORDER EXAMPLE

Part number	Outside width (mm)		Outside depth (mm)		Outside height (mm)		Performance level
SR	–	Specify the outside width of the shielded rack in mm.	–	Specify the outside width of the shielded rack in mm.	–	Specify the outside height of the shielded rack in mm.	– **1** : Level 1 **2** : Level 2

Low frequency magnetic shielded box LFSB

Shielded box made from our patented Mu-ferro HD material specially developed for shielding low frequency fields

For shielding of low frequency magnetic fields, we produce shielded boxes made from our patented Mu-ferro HD material.

Mu-ferro HD is a material that is often used to prevent low frequency magnetic radiation (0 Hz – 300 kHz) from leaving a device, or it can be applied around a sensitive device or sensor, to prevent external electromagnetic interference from disrupting normal operations.

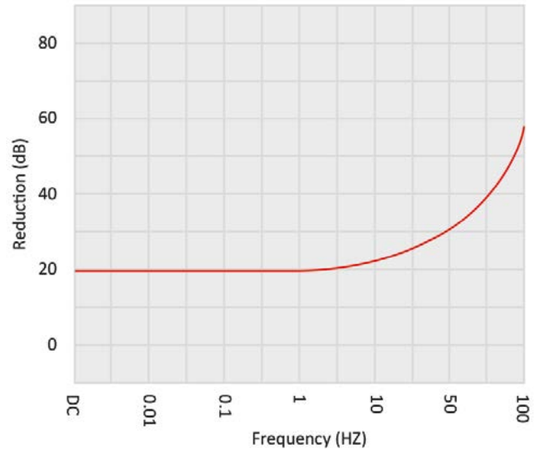
These boxes for shielding low frequency magnetic fields can be made in any desired shape and according to your supplied CAD drawings.

They can also be equipped with date-, signal- or power line filters to supply equipment within the box or to have data communication with the device in the box.

ORDER EXAMPLE

When you want to order Low frequency shielded boxes specify the part number as follow or send your drawing to info@hollandshielding.com.

Shielding performance* of 2mm thick Mu-ferro-HD box



Shielded briefcase SSBC

Safe data transport with the shielded briefcase

Shielded safe and secure transport of sensitive and important data. These briefcases block wireless communication such as communication with a mobile phone in the case. The briefcases are also very good in preventing eavesdropping.

Optionally this briefcase can also be delivered with an acoustic enhancement upgrade. This means that it is also not possible to make sound recordings with any sound recording device inside the case.

Standard types

These EMI shielded briefcases can be made in any custom size. However, we have two standard sizes in stock.

Part number	Outer size	Inner size
SSBC-Compact	296 x 212 x 96 mm	268 x 153 x 80 mm
SSBC-Medium	470 x 357 x 176 mm	425 x 284 x 155 mm
SSBC-Laptop	549 x 438 x 124 mm	479 x 333 x 97 mm
SSBC-Large	733 x 426 x 232 mm	660 x 356 x 213 mm
SSBC-Trolley	802 x 520 x 316 mm	725 x 445 x 270 mm

ORDER EXAMPLE

Series		Size
SSBC	-	
SSBC stand for Shielded and sound proof briefcase		**Compact :** 296 x 212 x 96 mm **Medium :** 470 x 357 x 176 mm **Laptop :** 549 x 438 x 124 mm **Large :** 733 x 426 x 232 mm **Trolley :** 802 x 520 x 316 mm

Benefits

- Blocking wireless communications as WIFI, bluethooth, GPS, phone signals
- RFID protection
- Transport of your crypto valuta
- No eavesdropping
- No data leakage
- Shock proof

Applications

- Put all the equipment of staff in the briefcases at secret meetings / Important decisions that can not be brought out.
- Put all your mobile equipment in the case when you do not want to be found/traced. To stay off the radar.
- Secret service, government, military applications.

***Notice**
Information supplied in these data sheets is based on independent and laboratory tests which Holland Shielding Systems BV, hereafter referred to as HSS believes to be reliable. HSS has no control over the design of customer's product which incorporates products, therefore it is the responsibility of the user to determine the suitability for his particular application and we recommend that the user make his own test to determine suitability.

The product described in this data sheet shall be of standard quality, however the products are sold without warranty of fitness for a particular purpose, either expressed or implied, except to the extent expressly stated on HSS invoice, quotation or order acknowledgment. HSS does not warrant that products described in this data sheet will be free of conflict with existing or future patents of third parties. All risks of lack of fitness, patent infringement and the like are assumed by the user.

Compact shielded experiment box

Compact shielded box to block wireless communication during testing and measurements
working size 210(W)*354(D)*120(H)

Compact shielded test box (210 x 354 x 120mm)
By default, this box comes with 6 shielded SMA penetrations. Many other shielded conduits are available on request. They may optionally also be added later.

Technical specifications

Data interface	See our filter modules
Radio frequency interface	SMA*6
Numbers of filters	3 pcs
Work size(mm)	200(W)*334(D)*115(H)
Outer dimensions (mm)	210(W)*354(D)*120(H)
Box body material	Alu-alloy
Weight (kg)	4 kg
Working temperature(°C)	0-50
Frequency(GHz)	0.8~6GHZ
Isolation	≥80 dB @2.4GHz) & (≥70 dB @5.8GHz)
Appearance color	Beige
* Notice: dimensions are indicative	

Attenuation

The RF shielded box is the most economical solution for example, blocking GSM, WiFi, Bluetooth and other wireless communication standards. The average attenuation over a wide frequency range is 80 dB.

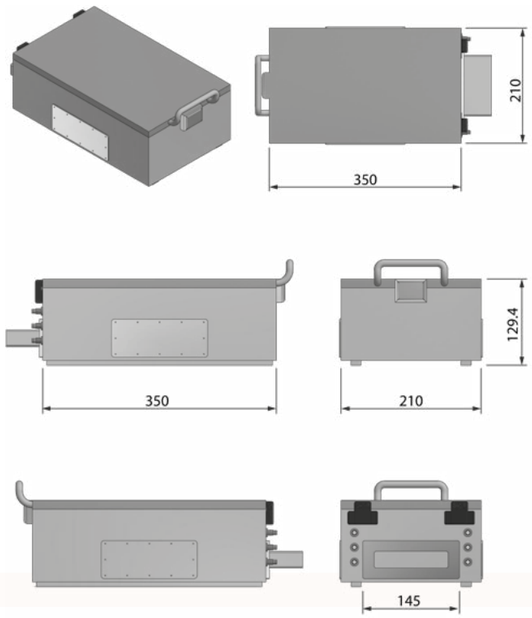
Frequency (Mhz)	Attenuation (dB)
2400	Front 84, rear 79
5800	Front 83, rear 76

ORDER EXAMPLE

Series
MPSB213512

Features

- Wireless communication test system
- For 3G, wifi, Bluetooth wireless test
- High levels of shielding attenuation, greater than 75dB
- Easy & Flexible operation in Lab and production line
- R&D, custom design
- Box can be equipped with shielded power filters for power connection in the box while still blocking all wireless signals
- Easy to transport



Medium shielded experiment box

Medium shielded box to block wireless communication during testing and measurements

Medium shielded test box (230 x 320 x 160mm)

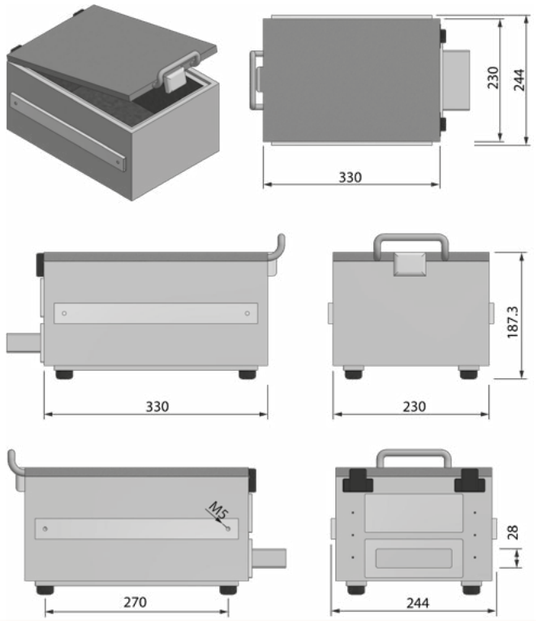
- Audio frequency interface: N-SMA*6
- Box body material: Aluminium alloy with painted surface
- Application: for Bluetooth, WiFi, 3G, wireless test, RFID
- Frequency: 0~6000MHz.

Features

- High levels of shielding attenuation, greater than 70 dB
- Box can be equipped with shielded power filters
- Connection in the box while still blocking all wireless signals
- Easy & Flexible operation in Lab and production line.
- R&D, custom design
- Easy to transport

Technical specifications

Shielding effect	≥70 dB @2.4GHz
	≥65 dB @5.8GHz
Interface type	See our filter modules
Numbers of filters	2pcs
Working temperature (°C)	(0-70)
Working dimensions (mm)	224.6(W)*320(D)*162.3(H)
Outer dimensions (mm)	240(W)*389.86(D)*217(H)
Box body material	Aluminium alloy, the surface paint
Weight(kg)	8 kg
* Notice: dimensions are indicative	



ORDER EXAMPLE

Series

MPSB233216

Compact desktop measurement box

Compact size desktop type shielded box for testing

Compact desktop measurement box (350 x 400 x 300mm)

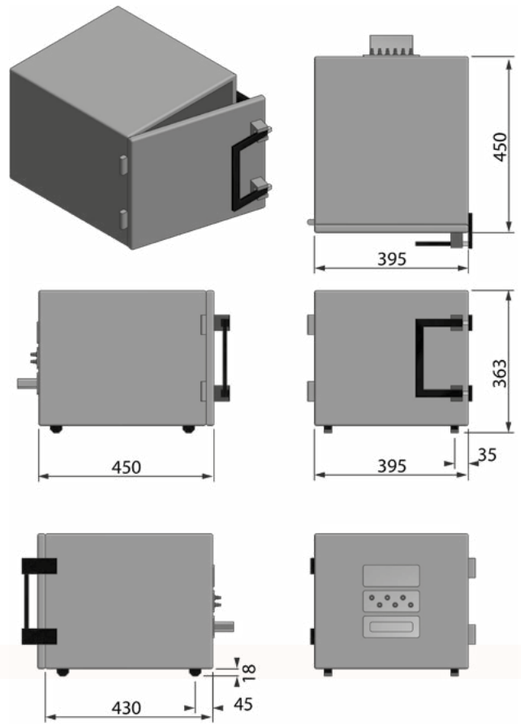
- Makes an ideal solutions for Bluetooth, WiFi, 3G/4G phones test
- High isolation
- Easy & Flexible operation

Features

- High levels of shielding attenuation, greater than 75 dB
- Box can be equipped with shielded power filters for power connection in the box while still blocking all wireless signals.
- Easy & Flexible operation in Lab and production line
- R&D, custom design

Technical specifications

Shielding effect	More than 70dB
Interface type	See our filter modules
Numbers of filters	3 pcs
Working temperature (°C)	Operating at room temperature
Working dimensions (mm)	350(W)*400(D)*300(H)
Outer dimensions (mm)	430(W)*538(D)*366(H)
Weight (kg)	20 kg
Appearance of color	Beige
* Notice: dimensions are indicative	



ORDER EXAMPLE

Series

MPSB354030

Desktop measurement box with ventilation

Desktop type shielded box with ventilation for testing working size 480 (W) * 490 (D) * 480 (H)

Desktop measurement box with ventilation (515 x 550 x 515mm)

The box comes with two shielded fans and place for optional 6 filter modules.

- Wireless communication test system
- For Bluetooth, WiFi, 3G, wireless test, RFID
- Easy & Flexible operation in Lab and production line

Features

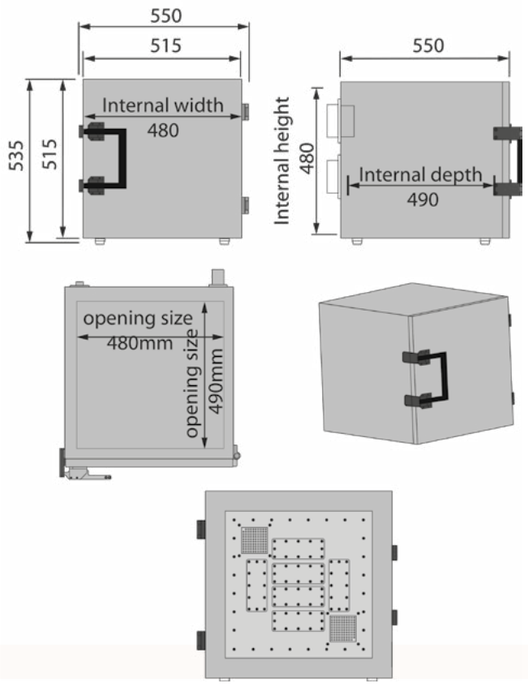
- High levels of shielding attenuation, greater than 65 dB
- R&D, custom design
- Box can be equipped with shielded power filters for power connection in the box while still blocking all wireless signals.

Technical specifications

Optional data interface	See our filter modules
Radio frequency interface	SMA*6
Numbers of possible filters	6 pcs
Work size (mm)	480 (W) * 490 (D) * 480 (H)
Appearance size (mm)	550 (W) * 650 (D) * 535 (H)
Weight (kg)	Ca. 40
Working temperature (°C)	0-50
Shielding effect	≥70 dB @ 2.4 GHz/5.8 GHz)
Appearance color	Beige

* Notice: dimensions are indicative

Technical drawing



ORDER EXAMPLE

Series

MPSB515551

Automatic test box

Test box with automatic open & closure system working size 433(W)*440(D)*313(H)

Automatic test box (433 x 440 x 313mm)

- Make a ideal solutions for bluetooth, wifi, 3G, 4G testing
- High isolation
- Easy & Flexible operation

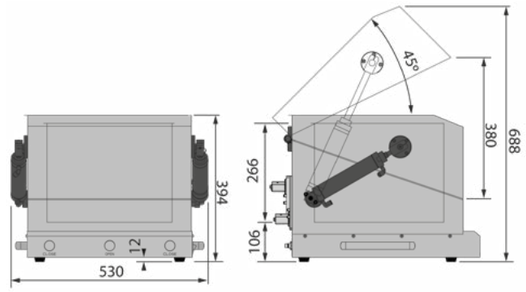
Features

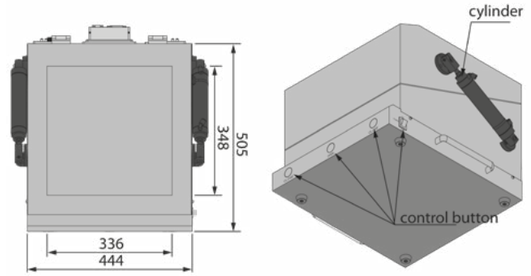
- High levels of shielding attenuation, greater than 75 dB
- Box can be equipped with shielded power filters for power
- Connection in the box while still blocking all wireless signals.
- Easy & Flexible operation in Lab and production line
- R&D, custom design

Technical specifications

Frequency (GHz)	0.8~6GHZ
Shielding effect	≥75 Db @2.4GHz
	≥70 Db @5.8GHz
Radio frequency interface	SMA*4
Data interface	See our filter modules
AC power requirements	AC 110V-220V/50-60HZ
Work size(mm)	433(W)*440(D)*313(H)
Outer dimensions (mm)	530(W)*562(D)*395(H)
Box body material	Coll plated, the surface paint
Weight (kg)	30
Working temperature (°C)	0-50
Appearance color	Beige

* Notice: dimensions are indicative





ORDER EXAMPLE

Series

MPSB434431C

Big mobile measurement box

Big size shielded box for laboratory purposes working size 698(W)*686(D)*696(H)

Big mobile meaurement box (698 x 686 x 696mm)

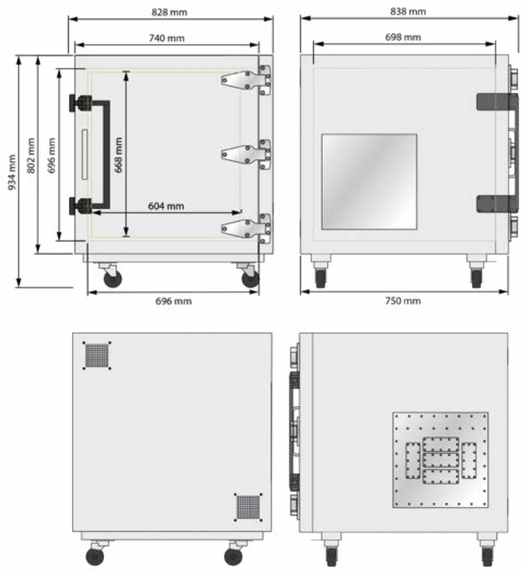
- Radio frequency interface: N-SMA*2
- Box body material: Aluminium alloy with painted surface
- Application: for Bluetooth, WiFi, 3G, wireless test, RFID
- Frequency: 0~6000MHz

Features

- High levels of shielding attenuation, greater than 80 dB
- Box can be equipped with shielded power filters
- Connection in the box while still blocking all wireless signals
- Easy & Flexible operation in Lab and production line
- R&D, custom design

Technical specifications

Shielding effect	≥75@2.4GHz/5.8GHz
Interface type	See our filter modules
Numbers of filters	5 pcs
Working temperature (°C)	(0-50)
Working dimensions (mm)	696(W)*696(D)*696(H)
Outer dimensions (mm)	828(W)*934(D)*838(H)
Weight (kg)	90 kg
* Notice: dimensions are indicative	



ORDER EXAMPLE

Series

MPSB707070

Investigation box (with gloves & window)

Investigation box with build in led light and shielded gloves working size 500(W)*400(D)*406(H)

Investigation box (with gloves & window) (500 x 400 x 406mm)

Investigation shielding box is designed for medium shielding performance of around 80 dB and keeping contact with the device under investigation.

The box is also equipped with shielded gloves so you can use and operate the appliances inside the box, without having to open the box and thus retains the shield.

By using the built-in LED lighting, it is possible to have a good view on the device and your hands inside the box.

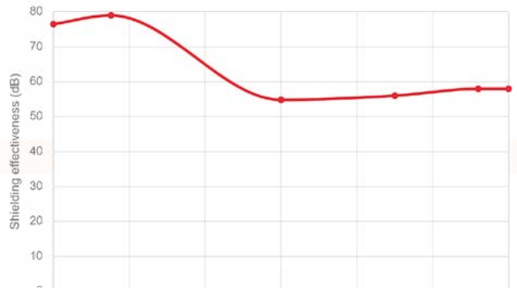
Features

- High levels of shielding attenuation, greater than 80 dB
- Box can be equipped with shielded power filters
- Connection in the box while still blocking all wireless signals
- Easy & Flexible operation in Lab and production line
- R&D, custom design

Technical specifications

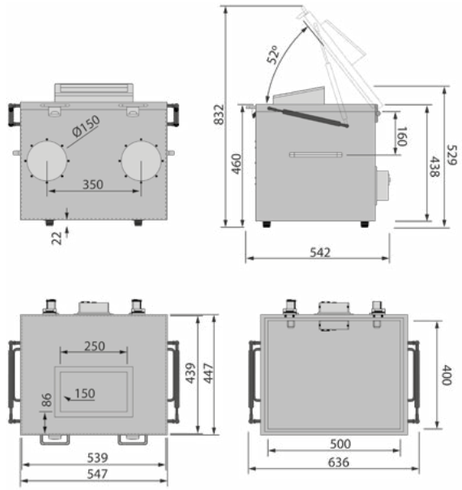
Shielding effect	≥65 Db
Interface type	See our filter modules
Number of filters	4
Working temperature(°C)	Normal work
Working Dimensions(mm)	500(W)*400(D)*406(H)
Outer Dimensions(mm)	547(W)*447(D)*438(H)
Weight (kg)	36
Appearance of color	Beige
* Notice: dimensions are indicative	

Shielding performance* (dB)



Gas springs

The shielded box is equipped with gas springs that makes opening and closing the box easy.



ORDER EXAMPLE

Series

MPSB504040

***Notice**

Information supplied in these data sheets is based on independent and laboratory tests which Holland Shielding Systems BV, hereafter referred to as HSS believes to be reliable. HSS has no control over the design of customer's product which incorporates products, therefore it is the responsibility of the user to determine the suitability for his particular application and we recommend that the user make his own test to determine suitability.

Filters & feed-through for shielded box

Shielded boxes can be extended with different types of filters

We produce filter units that are suitable for use directly in our medium performance shielded boxes. These filters can also be used for other medium performance shielded enclosures such as Faraday tents. Please note: custom filters can be made on request.

Standard types

Type 1
2x RJ45 + 2x USB + 2x DC

Type 2
1x DC + 1x RJ45 + 2x USB + 1x DB9

Type 3
USB 2.0

Type 4
6x SMA

Type 5
AC- Power line filters + 2x DC

Type 6
1x DB25 + 1x DB9

Type 7
2x RJ45 + 2 x USB + VGA

Type 8
2x HDMI

Type 9
2x RJ45 + 4x USB 2.0 + USB 3.0

» Filters & feed-through for shielded box

Type 10
DB25 + VGA

Type 11
2x USB 2.0 + 4x RJ45

Type 12
5x RJ45

Type 13
2x USB 3.0 + 3x RJ45

Type 14
2x RJ45 + 2x USB + DB9

Type 15
10x terminal, max 50 VDC 3A

Type 18
2 x antenna bnc connector (more on request)

Type 19
2 x antenna N-connector (more on request)

Type 20
14mm Waveguidea

Type 21
2x USB-C ports + 3x RJ45

Type 22
4x USB + 3x RJ45

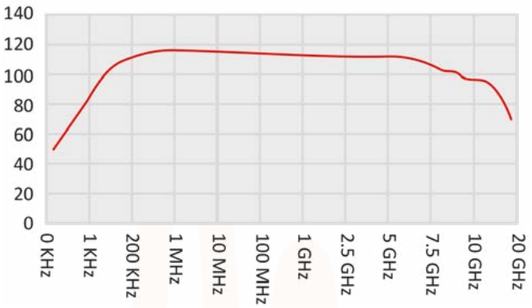
High performance shielded box

This EMI/RFI-shielded box has up to 120dB reduction of RF signals up to 5 GHz. This makes the shielded box ideal for testing cellular handsets, RFID, Bluetooth, Zigbee, WiMax, WLAN or similar wireless devices. The box can be constructed in any size required.

Thanks to its mobility, the box is well suited for forensics in cases where the current state of an electronic device needs to be frozen by blocking all wireless contact with the outside world.

By default this box comes with 10 shielded SMA penetrations. Many other shielded conduits are available on request, or they may optionally be added later to the filter plate at the rear of the box.

Shielding performance* (dB)



Shielded box for wireless testing and forensics with very high performance

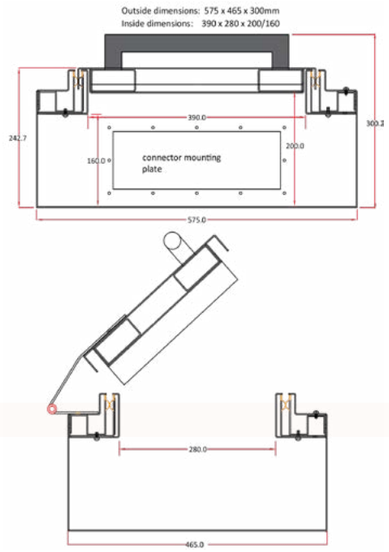
Applications

- Digital forensics
- Wireless testing
- R&D
- EMC Testing

Options (on request)

The box can be equipped with shielded power filters for a power connection to the box while all wireless signals remain blocked. In addition the box can be equipped with any or all of the following options:

- Shielded ventilation panels for heat transfer
- Shielded window to maintain visual contact with the devices inside
- Coaxial feed-through / signal filters
- Ethernet connection



Measurements on location

Measurements can be carried out in the low-frequency spectrum (0 Hz DC - 30 MHz) and in the high-frequency spectrum (9 kHz - 22 GHz) at any location specified by the client

EMF MEASUREMENTS/EM MEASUREMENTS/ELECTROMAGNETIC RADIATION

Electromagnetic fields cause interference in electronic devices and may affect the health of people close to where the fields are generated. It is important to recognize this at an early stage in a construction process, for instance at a future construction location or while construction is already underway, so that budgets are not exceeded.

By means of field-strength measurements one can chart the existing electromagnetic fields and radiation emitted by GSM, UMTS antennas and transformer spaces, to mention a few examples.

These measurements can help determine the best location in the new building for rooms where sensitive measurements are to take place, e.g. in hospitals or nano laboratories. And last but not least, field-strength measurements can detect sources of interference and can be part of a scheduled check of existing screened spaces and Faraday cages.

MAGNETIC FIELD-STRENGTH ELF MEASUREMENTS

Measurements can be carried out in the low-frequency spectrum (0 Hz DC- 30 MHz) for magnetic fields around installations through which high currents flow.

In most cases the frequency will be 50/60 Hz, for example in transformer rooms, overhead lines, busbar systems and switchboard cabinets, and in the vicinity of high-voltage cables and railway lines, both above and below the ground.

ELECTRIC FIELD-STRENGTH EMF MEASUREMENTS

Measurements can also be performed in the high-frequency spectrum (9 kHz-22 GHz), to measure electric fields generated by transmission equipment or installations including C2000, GSM and UMTS towers, radar systems, wireless devices, etc.

Tests may be performed to meet ICNIRP standards, 2013/35/EU guidelines or alternative health recommendations such as SBM-2008.

APPLICATIONS

- Baseline
- Electromagnetic fields (V/m or W/m2)
- EMF measurement
- ELF measurement of transformer room (nano Tesla)
- Detection of sources of interference
- Established standards for health, environment, licenses, OSH regulations
- Determining location for rooms to conduct sensitive measurements
- Checking shielded areas
- Counter-check (second opinion)

ADVANTAGES

- Measurement on location
- Cost-effective
- Clear reporting
- Expertise in all screening/ shielding disciplines
- Recommendations regarding reduction of the fields
- Certification

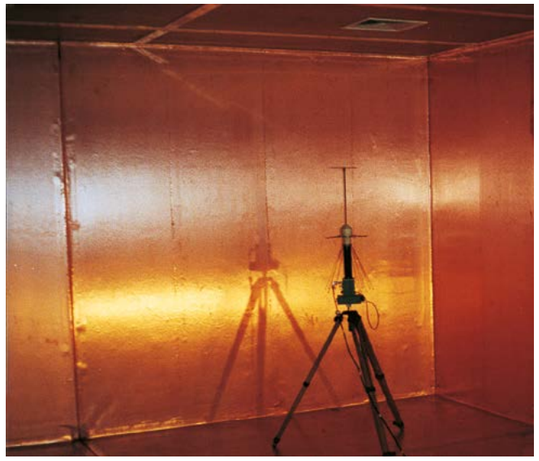
» Measurements on location

WHY PERFORM MEASUREMENTS?
It is extremely complicated to assess electromagnetic radiation from a theoretical point of view. It can even be said to be impossible, due to the many variables in the environment. That is why measuring at the location itself is often indispensable to chart the prevailing electromagnetic fields and to locate possible sources of interference.

PREVAILING FIELDS AND RECOMMENDED STANDARDS
There are recommended standards for both magnetic and electric fields, set by the Health Council as limits in the Telecommunications Act. Especially magnetic fields are considered a serious threat to health.

For instance, there is widespread concern regarding a causal connection between exposure to magnetic fields and leukemia in children. Besides that, there are numerous health complaints suspected of being associated with (or linked to) exposure to magnetic fields, for example headaches, depression and insomnia.

INSPECTION MEASUREMENTS OF FARADAY CAGES
Every Faraday cage needs regular maintenance check-ups. This does not only apply to the workmanship of the door. Because there can be many invisible reasons why a cage can become 'leaky' so it no longer works according to the specifications. Therefore we carry out control measurements on location. After the measurement, a certificate is provided. Periodic measurements are important for hospitals and companies with ISO (9000) certification.

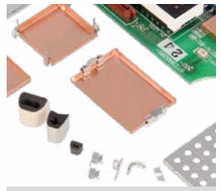


HEALTH AND SAFETY MEASUREMENTS
For the safety and health of your personnel it's important to know if there are no dangerous fields near their working environments. Holland Shielding Systems can perform a measurement on location to determine the current field strengths.

These measurements are performed according to the 2013/35/EU guideline. A detailed report will give a detailed overview of the field strengths and a recommendations on how to shield you employers if too high fields strengths are being measured.

DETERMINING THE POSITION OF SENSITIVE MEASUREMENT ROOMS
When a map is made of the existing prevailing electromagnetic fields either during construction, in an existing building, or during remodeling, recommendations can be made for the optimal position for a sensitive measurement room.


Shielding gasket

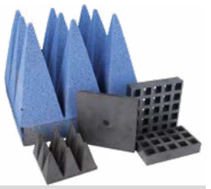

PCB cans & clips


Foam & rubber sheets


EMI measurements


Faraday cages


Cable shielding & entries


Absorbers & ferrites


EMP- EMI racks


Windows & transparent foil


Tapes & textile


EMI- EMP ventilation


Painting & glue


Personal protection


EMP- EMI- IP enclosures


Power & signal filter


Magnetic shielding

Request a EMI shielding product sample

For more information about our company or about our products visit www.hollandshielding.com