



**EMI/RFI
SHIELDING**

**Lightning and
Surge PROTECTION**

**Power and signal
INTEGRITY**

**TOTAL
PROTECTION**



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EMI/RFI SHIELDING GASKETS

EMI/EMC FULL METAL GASKETS



Conductive gaskets made with different concentric metallic wire meshes.

They may have different sections: round, rectangular, round with tail or double round. Standard materials used are: Monel, Copperweld, Tinned-Copper, Stainless Steel and Aluminium. The wire suitable for your needs must be evaluated based upon the shielding and environmental specifications requested.

Applications

Full metal gaskets are used for shielding lockers and containers where there is no need for elastic recovery after crushing. These are ideal for EMI/EMP shielding. These are not suitable for applications also requiring a seal from atmospheric conditions or elements, like water.

The Copperweld wire offers excellent shielding both in magnetic and electrical field frequencies.

WIRE MESH OVER ELASTOMER GASKETS



Metal elastomer gaskets obtained with the cladding of layers in concentric metallic mesh around an elastomer material that accomplishes the function of elastic recovery after compression. Various sections are available and dimensions upon client request. This type is not suitable for water tight sealing; for this specific application refer to the Twinshield type of gasket. The possibility of combining elastomer and metallic mesh and overlapping layers is very broad and left to the needs of the client.

Applications:

Gasket for the shielding of electric and magnetic fields where there is no requirement for water tight sealing as well. Elastic recovery is obtained with expanded materials of various types such as Silicone, Neoprene and EPDM. These are recommended for panel systems, electrical control panels, doors, etc., which must be disassembled or opened with a certain frequency, therefore the need for the elastic recovery of the gasket.

TWINSHIELD GASKETS (EMI SHIELDING+IP65)



The Twinshield type conductive gaskets are made up of one conductive part that provides the electromagnetic shielding function, and one part in elastomer for a seal against the elements.

Applications:

Gasket for the shielding of electric and magnetic fields where there is also a requirement for watertight sealing. Elastic recovery is obtained with expanded materials of various types such as Silicone, Neoprene and EPDM, bonded in between the IP sealing sections and the electrically conductive section. Utilised for containers, electrical boxes, electronics cabinets, etc., with the IP64 and the IP65 environmental sealing requirement.

EMI GASKETS WITH CONDUCTIVE FABRIC OVER FOAM CORE



EMI gaskets, noted for their high level of compressibility, obtained by combining expanded materials with different elastic recoveries and different conductive fabric cladding. The fabric-reinforced gaskets originate from the combination of an electrically conductive fabric that wraps a core in expanded polyurethane, neoprene or silicone. These gaskets are furnished with double-sided adhesive mounting tape. The standard geometries are those represented in the figure.

Applications:

Shielding of electric and telecommunications lockers, and containers, etc., above all if there is a low compression resistance needed.

EMKA GASKETS CLAD IN CONDUCTIVE FABRIC



Metal elastomer gaskets obtained with the cladding of layers in concentric metallic mesh around an elastomer material that accomplishes the function of elastic recovery after compression. Various sections are available and dimensions upon client request. This type is not suitable for water tight sealing; for this specific application refer to the Twinshield type of gasket. The possibility of combining elastomer and metallic mesh and overlapping layers is very broad and left to the needs of the client.

Applications:

Gasket for the shielding of electric and magnetic fields where there is no requirement for water tight sealing as well. Elastic recovery is obtained with expanded materials of various types such as Silicone, Neoprene and EPDM. These are recommended for panel systems, electrical control panels, doors, etc., which must be disassembled or opened with a certain frequency, therefore the need for the elastic recovery of the gasket.

ENVIROMENTAL IP 65 EMC/EMI GASKETS



Market requirements permit us to offer different gaskets that cover the double function of watertight seals and electromagnetic interference shielding. An initial demand was for a gasket that was of a self-blocking type to be installed directly on plate moulding. Gaskets with codes A3208, A3213 e A3213-L, are those we offer for this type of application.

Applications:

Utilised for electric and telecommunications, etc. locker shielding, where there is a watertight seal required as well.

EMI/RFI SHIELDING GASKETS IP65 / EMI EMC IP 65 SEALED GASKETS



The IP environmental seal is always a further qualifying element for gaskets that are attached to electrical control panels. Thermal welding is carried out utilising the same elastomer material of which the gasket is made. With this type of technology the gaskets do not lose their elasticity and assure a watertight seal. The firm Soliani EMC makes thermally welded gasket frames for standard profile sections (see EMKA gaskets and ENVIROMENTAL IP 65 EMI-EMC gaskets) but also carries out thermal welding of gaskets for sections upon client request.

Applications:

Gaskets for electronic devices where the assurance of an IP65 seal or higher is necessary.

EPDM CONDUCTIVE GASKET EMC/NBC



Seals EPDM elastomer loaded with conductive filler graphite nickel.

The material is black and is made specifically to give excellent stability and high electromagnetic shielding IP.

The range of effective temperature of the material is -45 to +150 ° C.

This material offers resistance to nuclear, biological and chemical warfare (NBC).

Usually these products are a problem consider yourself strictly military. However, many times these Seals can be used in the food and pharmaceutical chemistry as well as in others. The machines in these areas must withstand harsh wash-downs, and the materials of which they are manufactured gaskets, must remain functional and can not promote growth or maintenance of chemical or biological agents.

Tests have shown that the mechanical and electrical properties of electrically conductive elastomer gaskets remain well within the 20% of their values operating performance after exposure to chemical agents and decontamination solutions. The only che-

EMI/EMC FINGERS STRIP



Fingers are used to guarantee excellent electrical contact. They are made of Copper-Beryllium with different surface treatments such as nickelling, silvering or zincing, etc., or in stainless steel in different sections and dimensions.

Applications:

Fingers may be used for electromagnetic shielding where atmospheric agent sealing is not required. Telecommunications, Military, Aerospace, EMC Shielded Doors and Tech Panels are the fields of their application.

Standard sections are suitable for diverse attachment systems, interlocked, with double sided adhesives and special installation slots.

ELECTRICALLY CONDUCTIVE SILICONE GASKET CONDUCTIVE SILICONE EXTRUDED GASKET



Electrically conductive silicone gaskets are manufactured in different standard profiles and upon client request, in silicone and fluorosilicone, loaded with Nickel Graphite, Silver Aluminium, Silver Copper, etc., fillers. The material is identified among those listed above based upon the resistance to corrosion characteristics and the shielding level required.

Applications:

Conductive silicone gaskets are utilised so as to obtain the combination of electromagnetic shielding and IP environmental sealing, also in critical situations.

The blends according to MIL-G-83528 are utilised for EMP and Tempest requests.

CONDUCTIVE SILICONE MOLDED GASKETS

IP 65/66/67 environmental sealing conductive silicone gaskets for electromagnetic shielding

This category of items is in continuous evolution, the raw material from which it is made is the first component that must be analysed in function of its application characteristics in that it must fulfil the compromise between its response to the electromagnetic shielding and the mechanically operational purposes required.

The characteristics that define the choice of materials are:

- IP 65/67 sealing grade;
- minimum and maximum temperature;
- type of assembly foreseen; the compressibility of the material and its elastic recovery;
- the number of pieces to be produced;
- the consequent choice of tools and equipment;
- the need for a sample for shielding trials;
- UL 94 fire resistance.

They may be manufactured in polymer base silicone and fluorosilicone for resistance to oils, gasoline, etc.

Materials according to MIL-G-83528 for use in the military field and industrial use Standards.

Applications:

Conductive silicone gaskets are utilised so as to obtain the combination of electromagnetic shielding and IP environmental sealing, also in critical situations.

The blends according to MIL-G-83528 are utilised for EMP and Tempest



SILICONE GASKETS WITH METAL WIRE ORIENTED FILLER



This material represents the passed history of a solution adopted so as to realise electrical continuity between surfaces by way of metallic fillers interposed according to a certain defined diameter and density. Monel or Aluminium wires and solid or expanded silicone may be ordered.

Applications:

Where watertight sealing and EMI shielding are required. In that the product is still utilised, it is irrefutable that today, because of its negative aspects, it is substituted in nearly every case with silicones loaded with conductive fillers. To list some of the negative aspects, infiltration of humidity or water along the metal wires covered by the silicone material, which come into contact with the surface and at points, may cause corrosion on aluminium or other metals. Then there is the risk of the breakage upon compression of the metal wires during crushing.

THERMALLY CONDUCTIVE SILICONE



This is a product realised with the insertion of the filler matrix that has the prerogative of dissipating heat without being electrically conductive but insulating. The product's filler is made up of parts of boron and alumina and still others. Thermal conduction dissipation is measured in W/m-K.

The Regulation that governs these materials is the MIL I 49456. The product may have a Shore hardness of A, different so as to guarantee the perfect planarity between surfaces. In this way the best dissipation of heat is obtained.

Applications:

Wherever heat dissipation is required it will be in consideration of the heat generated by the equipment inside of the containers. The dissipation to be made use of is for products with varying thicknesses, and parameters from 0.9 to 3.5 W/m-K and for configurations that may have adhesives structured according to their placement.

AUTOMATIC DEPOSITION OF CONDUCTIVE SILICONE



Form-in-Place Gasket:

This solution offered has become a part of our operational possibilities when there are requirements made to realise D section gaskets on top of parts so as to recreate electrical continuity and both watertight sealing and electromagnetic interference shielding without the necessity of waiting for the times necessary for the vulcanisation of the silicone.

Applications:

This layering of silicone, defined by its viscosity and its electrical conductivity, has represented and continues to offer a valid solution for prototype pieces before making moulds. It also has the possibility of offering a solution to shielding strings of conductive silicone directly attached adhesively without any type of gluing onto the surface of the piece whether this latter is metal or plastic. In the case of plastic parts, these have to have been appropriately made electrically conductive through paint coating treatment.

CONDUCTIVE ADHESIVES AND SEALANTS



These offer, besides adhesion, electrical continuity and are available in different types with fillers that can assure uniformity with the type of electrically conductive application that needs to be made as well. These are available with silicone, fluorosilicone and epoxide polymers.

Applications:

Gluing and sealing where there is assured electrical conductivity required.

EMC ELECTRICALLY CONDUCTIVE PAINTS



Paints for the electromagnetic shielding of electronic equipment that satisfy international regulations that impose the respect of any electronic device for its requisite electromagnetic emissions and immunity.

The range of solvent or water based conductive paints are of principally three types: Silver, Copper and Nickel. There are also flexible versions

APPLICATIONS:

Shielding of electronic and electro-medical apparatus realized with materials transparent to electromagnetic waves.

ELECTRICALLY CONDUCTIVE SPRAY PAINT - 400 ML



To better give the possibility of evaluating the shielding properties on plastic containers it was decided to place a small amount of paint inside of spray cans that with a simple press of the button allows the deposition of the paint.

This deposition is possible with copper base and nickel based paint.

With two different articles one may make an evaluation of the electrical resistance and the electromagnetic shielding. Conductivity and thickness are the two parameters for the identification of the attenuation action on the frequencies. One spray can is very easy to use and does not create any waste of time and may be applied in any environment.

APPLICATIONS:

Shielding of electronic and electro-medical apparatus realized with materials transparent to electromagnetic waves.

CONDUCTIVE NON-WOVEN



Non-woven is a product in rapid evolution, which has already transformed its utilisation, undermining the fabric structure in just a few years. The advantage is clearly its low price, which has allowed the production of disposable products, considering that the fibre and the types of production give an advantage to future applications assuring, besides mechanical resistance, good permeability as well. Currently we can treat non-fabrics like polyamide, polyester and other products classified with different production processes such as spunbond, spunlaced electroless and needle felted.

Materials:

To give a brief orientation we furnish polyamide with Copper, code PBII-Cu; Copper and Nickel, code PBII-CuNk; and Copper and Tin, code PBII - CuTin; Polyester with nickel only, code N.W.15.NK. We have currently metallised non-woven articles of different base material gram weights, transferring onto them quantities of metal nearly equal to the weight of the original non-fabric.

EMI/EMC CONDUCTIVE FOAM PET-PU



The product consists of a substrate, constructed of Polyester knit fabric and urethane foam, and Copper/Nickel plated on the substrate, so designed and manufactured as to provide excellent electric conductivity and electromagnetic interference (EMI) shielding performance.

CONDUCTIVE MASK TAPE EMI/EMC



The use of electrically conductive fabric with an electrochemical treatment of pure nickel on all of the fibres is an optimum characteristic for recreating an electrical surface for an electrical control panel that must be protected with paint that is not electrically conductive. This treatment would create an insulated contact surface for the shielded gasket, which must have electrical continuity. Therefore, the recommended action is to proceed as follows.

Applications:

Define within the electrical control panel in steel or aluminium the parts on the surface where the conductive gaskets are to be installed and their areas of contact. Remove the film from the conductive tape and apply it to the surface that requires shielding. The locker may in this way be painted. The impenetrable mask protects the conductive self adhesive tape. The conductive tape will stand up to a temperature of 200° C for about 5 minutes. After painting and cooling of the locker, the mask may be removed and the conductive tape will remain fixed in its place.

EMI/EMC SCHIELED WINDOWS

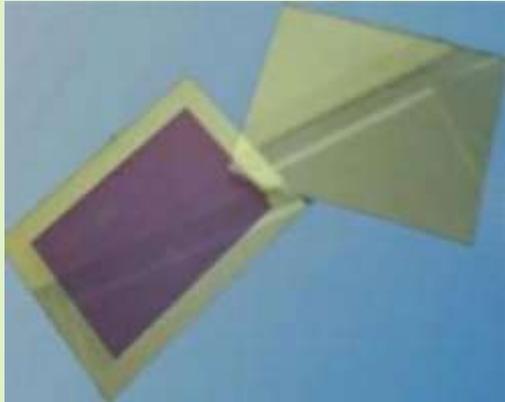


Glassed areas make up a serious negative point for the guarantee of a shielding value of a room or of any electrical apparatus. So as to be able to close and define the concept of the Faraday Cage with a good compromise between visibility and the shielding value required, shielding windows, which may be of different thicknesses, are made, with standard, tempered glass, in transparent or coloured thermo-plastic material. Enclosed inside of this material there is, with the work of an autoclave, a mesh with an opening grade desired from 80 to 130 mesh, which may be In metallic wire, polyester or polyamide treated with copper or nickel, so as to obtain shielding efficiency.

Applications:

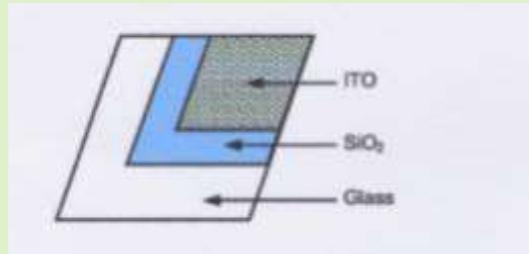
from small screens for electronic apparatus and large windows in buildings, mobile vehicles with plane or curved geometries.

EMI/EMC ITO LAYER SHIELDED WINDOWS

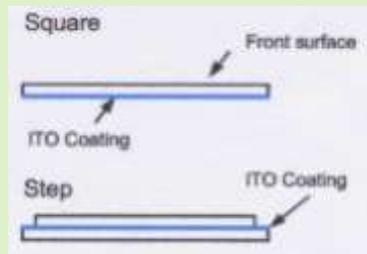


The ITO LAYER treatment offers a range of conductive cladding that renders glass or other antistatic or conductive thermoplastic materials suitable for EMC shielding. Our claddings may be applied to polycarbonate, acrylic, glass or to a series of transparent films. The cladding may vary as to electrical resistance between 10 ohms and 1000 ohms per sq cm as required.

Type of treatment:



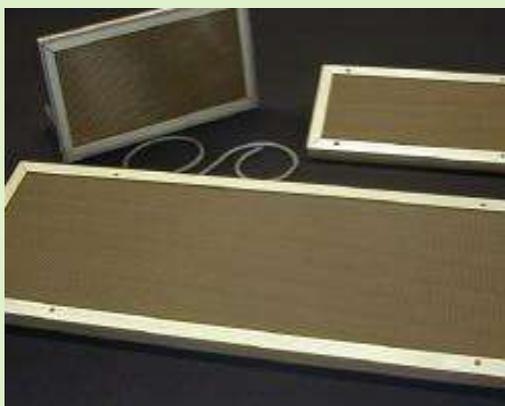
ITO LAYER with laminated protective glass:



Applications:

Glassed surfaces of diverse types as they range from small screens for electronic apparatus to large windows in buildings, mobile vehicles with plane or curved geometries.

SHIELDED HONEYCOMB AIR VENT



Honeycomb filters are utilised to obtain effective electromagnetic shielding while assuring, at the same time, excellent airflow. The filters may be provided in various materials, with or without EMI/EMC frame and gaskets (and environmental sealing), ready for installation.

MATERIALS:

Honeycomb filters may be realised in different materials according to the utilisation requested.

Brass: Utilised both in the industrial and military sectors: excellent resistance to corrosion and reasonable costs. Shielding Effectiveness from 1 KHz to 40 GHz.

Steel: This is the type most utilised, both in civil and military applications, for the correct compromise between costs, performance and corrosion resistance. This resistance may be improved with painted coatings (both conductive and/or protective from the aggression of external elements). Shielding Effectiveness from 1 KHz to 40 GHz.

Stainless steel: Utilisation both in civil and military sectors, excellent for all environments. Shielding Effectiveness from 1 KHz to 40 GHz.

Applications:

They are used in all apparatus where electromagnetic shielding and airflow are required, such as for example, military, shelter, electrical control panel, etc., air conditioning systems.

RF-SHIELDED DOORS



The demand for the improvement of access modes to shielded locales has evidenced how the doorway assumes a relevant significance and has contributed to the creation of types responding to different attenuation, of frequency requirements and values, both for magnetic and electromagnetic fields and plane waves.

We can provide lightweight doors in aluminium, steel and iron, as a function of the shielding values. Beginning from this differentiation we can guarantee the following attenuation values:

between 60 – 70 dB in electromagnetic field in a frequency range from 30 MHz to 5 GHz;

80 dB both in magnetic field and in electric field in a frequency range from 10 MHz to 18 GHz;

for higher specifications 98 dB from 10 KHz to 10 GHz.

These doors are distinguished by the following points:

- type of opening;
- type of gaskets and fingers installed;
- by construction;
- by installation, if they need to be installed on walls in masonry or in metallic panels and shelter structures. These doors have been installed and qualified with electromagnetic tests. The most current doors with shielding values of 60 – 70 dB may even have very simple floor ingresses.

Applications:

Shielded spaces, military shelters, ships and mobile vehicles.

RF-SHIELDED TENTS EMC /RFI / TEMPEST

SOLEMI[®] tend



RF-SHIELDED TENTS EMC /RFI / TEMPEST

SOLEMI tend®

Shielded tents, light and quickly installed so as to be able to be also transported, realised in special metallised fabric, offer environments protected from electromagnetic fields. The supporting structure of the tent is realised in aluminium tubing and may be personalised in its dimensions and accessories. The fabric section is made of pure Nickel conductive fabric and is covered in a Flame Retardant protection. Access areas are realised with a conductive Velcro closure or with magnets and zippers to assure maximum shielding effectiveness in the areas with openings as well.



Quality testing and shielding performance:

-MIL STD 202-204 vibration resistance testing and MIL STD 202-205B Shock resistance

-Saline Fog MIL 202-101B-Test MIL STD 285 standard IEEE, in the frequency range from 30MHz to 3 GHz

The average of the shielded value is about 48 dB attenuation, with peaks of 65 dB a 200 MHz and 400 MHz.

Shielding values depend on dimensions and on the type of opening closure requested by the Client.

Specifications:

Designed and manufactured entirely in Italy.

Completely corrosion resistant.

Optimised for EMI and EMC

Possibility of the definition of the shielding effectiveness with the client: from 45 dB to 70 dB according to the frequency.

Dimensions: At Client request

Options:

Shielded windows;

Technical panels for mesh filters and accessory connections;

Honeycomb filters for airflow;

Illumination.

LIGHT SECURITY TENT



The ultra-mobile shielded tent is a device able to offer a protection from the electromagnetic interference to protect the communication's security (COMSEC) and the automatic processing of classified data (EAD).

The product is made with an electrically conductive shielding fabric called "Static Clean" starting by the polyester yarn's weave in the wool and the cloth, applied by long time on bigger tents.

The tent is made in different dimensions (the example in the picture misures 3 m² and it is equipped with:

- a preassembled structure "2 seconds" easily to fall back in a backpack.

- the tent with the shielding fabric

- antistatic tiles easily and fast to fall back

- 1 line of LED lights

Those characteristics guarantee to the shielded tent shorts time to open and close it, without tools and extremely fast "ready to use" (5 minutes max).

To guarantee the usury's resistance of the floor, we can supply a modular paving made by antistatic tiles with excellent property of abrasion resistance (7mm).

Tiles are made with the same electrical conductive fabric of the other sides of the tent so, it adheres perfectly to the floor.

REVERBERATION TENT



Shielded tents manufactured in conductive fabric, mechanically flexible in vibration able to reflect the electromagnetic field internally creating a reverberation effect. The reverberating tent is made up of a curtain in shielding fabric within which a distribution of an electromagnetic field is realised that is statistically isotropic in time and space. The walls are built in conductive flexible metallic fabric mechanically set to vibrate at from 5 to 20 Hz capable of reflecting the electromagnetic field inwards so creating a reverberation effect. The reverberation tent chamber (RTCH) is used for emission and immunity tests and shielding efficiency tests, within the frequency interval from just a few Hz to microwaves.

Reverberation chambers are becoming widespread as an alternative to methods such as the "Open Area Test Sites" (OATS), (semi) anechoic chambers or TEM cells in response to an ever-increasing demand for easily realisable, repeatable and economic test procedures. The IEC 61000-4-21:2003 standard recognises the importance of reverberation chambers as an alternative means with the expectation of results of measurements that are more accurate and rigorous than those of traditional methods. The reverberation curtain chamber offers the advantage of being able to realise high ranges with the utilisation of remarkably inferior signals compared to other methods. Modular construction allows the realisation of custom structures according to the demands of the spaces available and/or including the device being tested. The RTCH is provided completely with technical panel and optional filters.

EMI/EMC SHIELDED ROOMS



These rooms may be realised in different dimensions with very high attenuation values, up to 100 dB in a frequency range from 10 KHz to 18 GHz.

They have very particular specifications and are normally used to certify or qualify electronic products. They are realised in metal panels with interposed shielded gaskets.

Doors projected are also realised with very precise locking mechanisms and the inclusion of metallic fingers and gaskets.

Interconnections are filtered both for the electrical mains lines and for the interconnected parts with equipment, while shielding filters suitable for the required type of signal are used.

Modular structure allows for a remarkable flexibility of construction, permitting the realisation of any technical requirement.

Applications:

Universities and research institutes, in the field of telecommunications (for research and testing on potentially harmful radiation), hospitals (for laboratories furnished with electronic equipment sensitive to interference), industry (for the calibration of antennae and electronic apparatus, for electronic equipment, high tension cable and transformer testing), in the field of security for protection of data and information as well as many other fields.

EMI/EMC ROOMS SHIELDED WITH CONDUCTIVE FABRIC



This type of shielding is offered as a solution for more modest requirements yet is still valid as a response to market demands. In a frequency range from 30 MHz to 5 GHz this solution assures an attenuation of 60 dB with a modest cost for the possibility of utilising the structures of existent walls and to therefore clad them with shielding fabric. All solutions are possible even with complex curved surfaces.

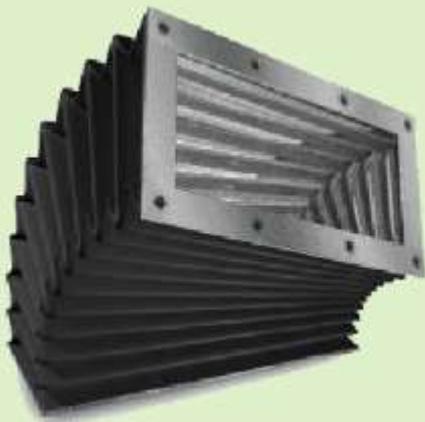
Usually critical points are identified during the room inspection: Windows, air conditioning system ducts, electrical outlets.

Beginning from these references an economic evaluation is initiated that will quantify the sq metres of fabric required, the stratification necessary to create the shielding effect required within the frequency field considered. The door has simpler characteristics that do not foresee contact fingers, but easily compressible conductive gaskets without the need for enormous forces to open and close the entrances. Eventually the windows, will require frames in electrically conductive materials and screens that are relative to the shielding value needed. Ultimately the honeycomb intakes are fundamental for the passage of air giving the space the properties of a Faraday Cage. A final point is the connections between the electrical power lines and for telephones and data lines.

Applications:

Rooms for compatibility pre-qualification, applications for data security and prevention environments in the medical field.

EMI/EMC SHIELDED BELLOWS



The need to shield flexible bellows on their interiors was an applicative consequence for parts that require a flexible sleeve with two metallic flanges on its ends for a conductive connection. Actually the attachment areas are in metal (normally in steel or aluminium) and dimensions are those requested by the client; while the internal flexible and gusseted element is made of electrically conductive fabric that we manufacture, METALCOTEX, which assures, compared to the diverse competition, the following advantages:

- Resistance of adhesion of the metal to the single fibres;
- Presence of only pure Nickel and absence of Copper guarantees stability from galvanic corrosion;
- Remarkable shielding capacity due to the presence of intrinsically clad multi-filaments.

Applications:

We currently provide from small dimensioned bellows for passage of cables up to large opening sections, where even a person may pass: beginning from the dimensions provided by the Client, the useable interior dimensions, the opening that requires the boot and the type of attachment.

SHIELDING CABLE

EMI FERRITES



This product is made up of a plastic shell and two ferrite cores. It may be easily installed, directly on the cable, without any need to cut the latter. The shielding may be removed just as easily as it was installed. Thanks to this characteristic this product may be installed on already assembled systems, with great time savings.

Applications:

- High frequency disturbance suppression on cables.
- Suitable for cables of varying powers / signals: the cables may be internal or external in relationship to the equipment.
- Used widely for electrical equipment such as NBS, PCs, monitors, printers, digital cameras, DVD players, Fax machines, medical equipment, etc.

METALLIC MESH TAPE



This solution brings with it a valid advantage for cable shielding due to its double action: the first gives curvature flexibility to the surface of the cable and the second for the type of metal wire and for any eventual stratification. It offers optimisation of the shielding parameter value both in frequency and in dB.

Applications:

We have developed different claddings even for already shielded cables so as to give them increased value when curved; also so as to have operational flexibility or for improving their performance with regard to magnetic fields, or else for cladding simple command cables.

The most noticeable feature is lightness compared with traditional solutions adopted for cable shielding as well as their ease of connection in the terminals with metal connectors.

Besides cladding inserting the cable inside of the tube in formation, it is also possible to uniformly wrap, or tape the exterior of the cable with an end overlapped so as to assure continuity from one end to the other.

FLAT CABLE SHIELDING



Flat cables are shielded by cladding them with conductive fabric. Based upon which type of fabric and how many layers, different shielding results may be obtained.

Applications:

Flat cable shielding for electronic, electro-medical, telecommunications and military equipment.

EMI/EMP SHIELDING SLEEVES



To better offer practical solutions for cable shielding, a simple method allowing the grouping of several cables in a single shielding sleeve is offered, so assuring mechanical and electrical advantages as well. The sleeves, of various diameters have Velcro closures, which, for its mechanical holding properties, offers an simple and fast method for removing or adding cables with great facility.

Applications:

Currently cables are demonstrating their vulnerability for interconnected electrical systems: acting as antennae they emit signals not desirable within the equipment.

For this reason it is important to always close them completely at the two connector points, (on both sides) creating the shielding connection and making everything into a single unit.

ELECTROMAGNETIC SHIELDING TEST

To better offer practical solutions for cable shielding, a simple method allowing the grouping of several cables in a single shielding sleeve is offered, so assuring mechanical and electrical advantages as well.

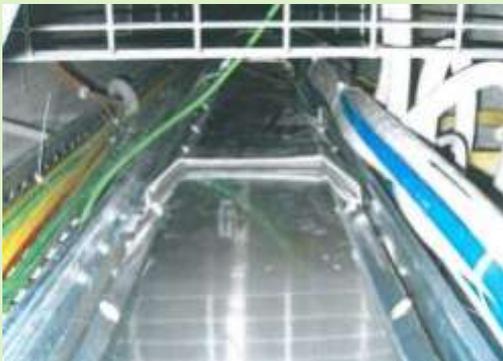
The sleeves, of various diameters have Velcro closures, which, for its mechanical holding properties, offers an simple and fast method for removing or adding cables with great facility.

Applications:

Currently cables are demonstrating their vulnerability for interconnected electrical systems: acting as antennae they emit signals not desirable within the equipment.

For this reason it is important to always close them completely at the two connector points, (on both sides) creating the

CABLE CONDUIT SHIELDING



APPLICATIONS:

With the utilisation of overlapped panels set side by side along a cable line or set around a transformer, these panels adequately provide the shielding necessary to bring the emission parameters in line with the limits set by law.

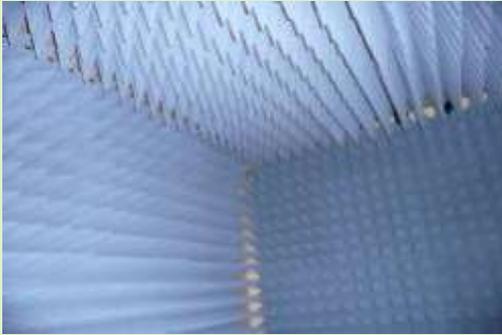


Generation of magnetic fields requires attention and special materials to be able to provide valid, economical solutions in relation to the alternative, Mu-metal, which is very costly for certain applications. MT/BT transformation electrical lockers that power entire plants generate magnetic fields higher than 10 micro Tesla. One concept is to utilise metallic plate stratification so as to saturate and attenuate their propagation into surrounding areas. Generally aluminium panels are used with overlapping of layers of other highly permeable material. It is just this stratification and combination of thin sheets with high magnetic permeability sustained by others in steel or other alloys that can attenuate these propagations. The attached photographs give an overview of various realisations that have brought the values below levels set by the EN 500082-1 regulations in force, which establish that the magnetic field must be below 3 ampere metres, that is, 3.75 micro – Tesla and the law that disciplines exposition is the DPCM, which fixes the exposition limit at 50 Hz. Cables, Busbars, MT/BT transformers, high tension lines are all generators that today are always encountered more often in an environment where small electronics detect the presence of the magnetic field's strength.

WELDER SHIELDING

Shielding of magnetic fields caused by welding plants or other machinery

RADAR ABSORBENT MATERIALS



Absorbers are made of low-density polyurethane foam, with material that absorbs electromagnetic fields contained inside of it. They are then coated with azure blue paint. Standard dimensions are 60 x 60 cm. They are flexible and light. They may be attached, very simply, to the walls of anechoic chambers with glue, Velcro or other attachment systems and in some realisations of high performance shielded rooms, before the anechoic material tiles in ferrite are installed, which improves performance.

Applications:

Semi-anechoic, anechoic and RF test zone chambers.

PYRAMIDAL RF MICROWAVE ABSORBERS



FU-SE absorber product line is a complete range of high performance pyramidal microwave absorbers.

Available in wide range of thickness and absorbencies.

Variety of thickness gives the chamber designer the opportunity to choose grades appropriate for specific frequencies and incidence angles.

Constructed using low density, flexible foam, impregnated with a carbon black ferrite formulation to achieve the desired electrical performance

The pyramidal structure gives it the geometrical matching and the carbon dispersed gives the attenuation required at near normal incidences

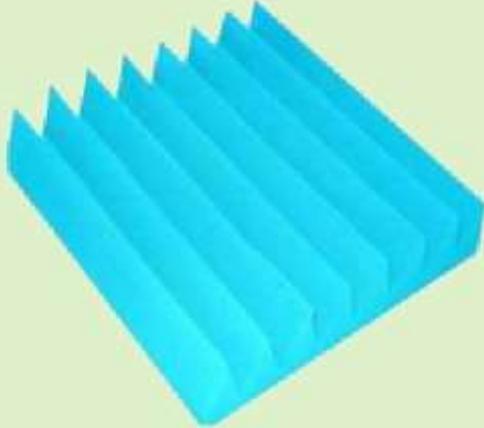
Provide engineers with the building blocks needed in the design and construction of RF absorbing surface used in anechoic chambers, antenna assemblies and microwave measuring facilities.

MATERIAL PROPERTIES: - Color: As Desired, generally available in blue color. - Dimensions: 60 cm X 60 cm - Chemical Composition: Carbon ferrite impregnated polyurethane foam - Maximum service temperature: 90 degree Centigrade - Power handling capacity: 0.5 Watt/Cm² - Fire Retardancy: Passes NRL-8093, USA test 1, 2 & 3 With Zero Halogen Means. - Our foam absorbers are fire retardant with zero halogen means thereby avoid formation of toxic gases like HCl / HBr and poisonous gases like phosgene.

AREAS OF APPLICATION: - Broadband absorbers suitable for in-door measurements. - Used in making microwave anechoic chambers for performing measurements like RCS, Antenna Measurements etc. - Used in making Moving screens for hiding the areas of maximum reflections - Used for obtaining Quiet Zones in very wide frequency range.

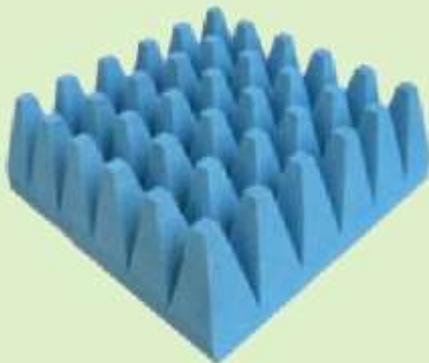
Absorber Type	Thickness (Inches)	Reflectivity (dB) for near normal incidence relative to metal surface of same size at different frequency.						
		80 MHz	250 MHz	500 MHz	1.0 GHz	3.0 GHz	10.0 GHz	18 GHz-40GHz
FU-SE 70/45/36	70/45/36	TO BE DESIGNED FOR THE GIVEN FERRITE TO MAKE HYBRID ABSORBERS AT LOW FREQUENCIES						
FU-SE-24	24	-6	-20	-35	-40	-50	-50	-50
FU-SE-18	18			-30	-40	-45	-50	-50
FU-SE-12	12				-25	-40	-50	-50
FU-SE-8	8					-25	-50	-50
FU-SE-4	4						-40	-50
FU-P-SE-24	24			-30	-40	-40	-45	-40
FU-P-SE-12	12				-25	-40	-45	-40

WEDGE MICROWAVE ABSORBERS



Reflection Loss (dB) of wedge type (FW-SE) at normal incidence is 3 dB to 5 dB down in comparison of our pyramidal microwave absorber.

PYRAMIDAL HYBRID MICROWAVE ABSORBERS



TOTAL PYRAMID: FHY type absorber are pyramidal shaped flexible polyurethane foam based carbon / ferrite powder loaded hybrid absorber which are made for use in EMC test chambers. These FHY absorbers are to be combined with ferrite tiles to perform at lower frequencies and a low density matching dielectric layer to make hybrid absorber suitable at higher frequencies as well. FHY Absorber is available in three thicknesses viz 30.0cm, 45cm and 60cm thick and termed as FHY-12, FHY-18 and FHY-24 respectively. **TRUNCATED:** FHY Absorbers are available in truncated version where tips of the pyramidal are removed for saving space in chambers and tip breakage thus making a more rugged product. This is done at the expense of their performance at higher frequencies. Truncated absorbers are available in 30 cm and 45 m thickness and are termed as FHY-12-T and FHY-18-T, respectively.

Absorber Type	Reflectivity (dB) with respect to Metal at frequency (MHz)								
	30	50	80	250	1000	10000	20000	30000	40000
FHY-12	-13	-15	-18	-15	-16	-18	-30	-40	-40
FHY-18	-14	-15	-18	-15	-16	-20	-35	-40	-40
FHY-24	-14	-15	-18	-15	-20	-25	-40	-40	-40
FHY-12-T	-14	-15	-18	-15	-16	-15	-15	NR	NR
FHY-18-T	-14	-15	-18	-15	-16	-15	-15	NR	NR



Lightweight, flexible, broadband, Multilayer PU foam based microwave absorber.

- Fabricated using six layers of carbon impregnated foam.
- FU-ML is an electrically graded flat PU foam based microwave absorber. - Carbon loaded laminate polyurethane sheets.
- Can be readily cut on a band saw, with scissors, or a sharp knife.
- Available in various thicknesses from 18 mm to 120 mm and beyond.
- FU-ML is not waterproof and will not operate correctly when wet, since there is not washout
- FU-ML will function as expected after being allowed to dry

FLAT ANTENNA MICROWAVE ABSORBERS



AREAS OF APPLICATION

Used for isolation of adjacent antennas such as parabolic dish and horn antennas and array elements.

Mainly used to line the interior walls of shrouds on antenna dishes in order to suppress side/back lobes in shadow region.

Various camouflaging and interference suppression applications.

Used for Low performance Anechoic Chambers in non critical areas.

Specially formulated coatings for better ageing characteristics. Light weight, flexible and easy to cut.

Polyurethane foam sheet dipped in absorbing slurry providing desired electrical grading.

Standard size is 600 mm X 600 mm. Custom tailored sizes can also be supplied.

Thicknesses are 45mm, 35mm, 30mm, 25mm, 15mm, 12.5mm and 10 mm (FAS-45, FAS-35, FAS-30, FAS-25, FAS-15, FAS-12.5 and FAS-10). Larger thickness can be produced to suit low frequency applications.

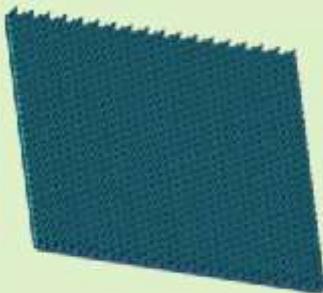
Colored surface should face the incident radiation.

The back surface (black) should be close to the metallic surface to achieve best performance.

Provides better wider angle performance than multilayer flat absorber.

Frequency Range (GHz)	Maximum Reflection Loss (dB)						
	At near normal incidence wrt metal plate of same size						
	FAS-45	FAS-35	FAS-30	FAS-25	FAS-15	FAS-12.5	FAS-10
4.5-5.5	-15.0	-----	-----	-----	-----	-----	-----
7.0-8.0	-16.0	-16.0	-15.0	-15.0	-----	-----	-----
8.0-10.0	-16.0	-16.0	-15.0	-15.0	-----	-----	-----
10.0-12.0	-20.0	-20.0	-20.0	-20.0	-15.0	-13.0	-----
12.0-15.0	-20.0	-20.0	-20.0	-20.0	-15.0	-15.0	-13.0
15.0-40.0	-20.0	-20.0	-20.0	-20.0	-15.0	-15.0	-15.0

CONICAL RUBBER BASED RADAR ABSORBENT MATERIAL



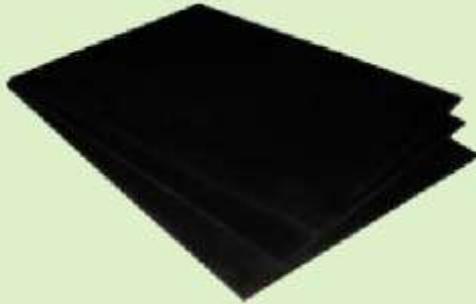
Conical Rubber Based Radar Absorbent Material (RAM)

- At Normal Incidence & Upto 45o from Normal: Min. reflection loss (angle of incidence equals angle of reflection) w.r.t metal plate of same size shall be -15dB at 5.0 GHz, rising to min. -17 dB at 8.0 GHz and min. -20 dB at 10.0 GHz and higher frequencies in both polarizations.

- At 60o From Normal: The reflection loss is down by less than 5 dB w.r.t normal and upto 45o performance at all frequencies and in both polarizations.

- Under Wet Condition: Performance under wet condition remains practically unchanged w.r.t dry condition performance at all angles/polarizations/frequencies.

THIN FLEXIBLE NARROW BAND RESONATING RADAR ABSORBENT



RA is a Thin, Flexible, weatherproof, Personating Rubber based Microwave Asorment

SHIELDING RFID CARDS

Radio Frequency Identification (RFID) is a technology that allows you to identify the credit card, passport or driver's license in front of a reader scanner, instead of having to detect the code of the magnetic stripe. It 'a simple concept: the scanner sends an electronic signal that is received by an antenna connected to the RF chip card. The microprocessor is activated and the reader recognize the card. This technology is also used in the systems of access control and time and attendance through electronic badges with an integrated RFID microchip (also called transponders or tags).



The advantages of using RFID cards are convenience, speed, and the elimination of contact with the card, but there is also a negative side. The chips based on radio frequency can be, easily, reading, copying and even manipulated by unauthorized persons.

It should be noted, in fact, that the microchip present in electronic badges and other media, with very few exceptions, respond passively to external RFID readers, also in cases of unauthorized data collection. With the stolen data can be produced so-called clones that - provided that the electronic badge is not effectively protected - can be used inappropriately. For pocket devices with integrated antenna, the reading distance is approximately 120 mm. With a greater technical effort this distance can be further extended.

To protect the devices can be used with a fabrics treatment shielding of our development. apparently normal fabrics, made with a special coating on the individual fibers, which hinder the effect of electromagnetic emissions, preventing unauthorized persons can acquire data and then use them improperly. Bags of various sizes, achievable with different materials, depending on the degree of shielding required that cover a wide frequency spectrum.

Our company has made specific qualifications at the laboratory of the European Community Join Research Centre Institute for the Protection and Security of the Citizen according to EMC Shielding Sleeves ISO 7810ID-1 and ID-3 with the method defined in section 3 using credit cards and the range of international passports as operational test, passing the test.



Protect

Power and signal reliability play a role in every critical electrical and communication asset. Using advanced surge suppression and EMI/EMP technologies; PolyPhaser and Transtector Systems engineer solutions for global RF, AC, DC, and Data applications, thus providing dependable network protection against lightning and power anomalies.

AC Surge Protection

Silicon diode, MOV and hybrid options available in AC panel, self-contained enclosures, modular DIN rail and rack mount configurations.

DC Surge Protection

Wall and DIN rail mounted designs with fast acting, superior performance, and high reliability surge suppression

Data Line Surge Protection

SASD, gas tube and hybrid designs; RJ-45, RS-422 and RD-485 connections, line and load bidirectional protection. , modular DIN rail and rack mount configurations.

EMP/EMI Mitigation

High performance filter technologies to protect communication and electrical power systems from all major power quality threats.

RF Surge Protection

Utilizing multiple circuit topologies, DC block, high pass filter and hybrid designs are optimized for superior insertion and return loss.

Grounding & Bonding

Single point grounding is the most important part of any lightning protection systems.



AC Surge Protection

Transtector Systems offers AC surge protection products engineered to meet IEC, IEEE, ANSI and NEC standards. These products come in 120 Vac single phase, 240 Vac single phase, 120/240 split phase, 240/415 Vac 3-phase wye, 220/380 Vac 3-phase wye, 277/480 Vac 3-phase wye and 480 3-phase delta. Our ac surge protection products are available in wall mount, rack mount, panel mount and DIN rail mount ac surge protection product designs incorporate proprietary non-degrading, fast acting, high performance silicon avalanche suppressor diodes (SASD) and robust MOV technology for high current surge protection.



Panel Protectors

When surge protection is critical for service entrance and branch panel applications, Transtector, DOWIN and LEA International offer a wide range of electrical configurations and voltages to meet today's AC panel protector requirements.

- Indoor | Outdoor
- Parallel | Series
- SASD | MOV | Hybrid Technologies



Rack Mount

For ease of installation Transtector AC surge protection products offer rack mount installation options (19" and 23") to meet the needs of our customers.

- Silicon diode technology for superior protection
- 120/230 Vac with 15 A and 20 A capabilities
- Also available with switches, individual suppression or fuses



Plug-In

Plug-in TVSS surge protection devices are available in 120 Vac to 240 Vac configurations and used for installations between the outlet and the sensitive electronic equipment to be protected.

- 120 Vac to 240 Vac configurations
- NEMA 5-15, 5-20 or IEC style plug types
- NEMA 5-20 and 6-30 locking plugs available
- Many receptacle configurations



DIN Rail

From 120 Vac to 480 Vac, Transtector and DOWIN offer TVSS in a DIN rail package designed to assist in reducing maintenance costs and installation time. Silicon, hybrid or MOV technologies ensure that the control panels' mission critical equipment is protected.

- Modular 120 Vac and 240 Vac
- Single phase, 3-phase delta or wye
- Dry contacts



Hardwire

Transtector and LEA International deliver a full range of compact hardwired TVSS surge protection systems for all-mode protection.

- 120 Vac to 480 Vac configurations
- Single phase, split phase and 3-phase wye capabilities



DC Surge Protection

For equipment operating on direct current, Transtector offers superior surge protection solutions for a variety of application situation ranging from solar, rail and communications to marine and industrial controls. Due to the approaching proliferation of low voltage direct current in place of alternating current, applications such as data centers, electric vehicle charging stations, heating and air conditioning system as well as many residential systems will soon also rely on DC power and will need to be appropriately protected.



DIN Rail

Transtector and DOWIN offer DIN rail TVSS mounted solutions designed to assist network operators reduce maintenance costs and installation time.

- Silicon avalanche diode suppression technology
- MOV
- Operating voltages: 12 Vdc to 48 Vdc
- Plugable modules



Hardwire

PolyPhaser and Transtector deliver a full line of compact hardwired DC surge protectors that exhibit superior energy absorption, low voltage let-through and near instantaneous response time.

- Industrial strength hardwire, multi-conductor DC surge protection
- Panel or wall mount
- Operating voltages: 12 Vdc to 120 Vdc



High Voltage DC Protection

High voltage surge protection devices engineered by PolyPhaser and Transtector use fast acting superior performance and high reliability suppression technology.

- Silicon avalanche diode suppression technology
- DIN rail or panel mount
- Operating voltages: up to 1000 Vdc



Low Voltage DC Protection

Engineered by PolyPhaser and Transtector and designed to IEC, IEEE, UL, ANSI and NEC standards, our low voltage DC surge protective devices shield a constantly broadening field of applications, including solar, rail, communications, marine, industrial controls, data centers, residential systems and many more.

- DIN rail or panel mount
- Operating voltages: 7 Vdc to 70 Vdc



Enclosure Solutions

Our engineers' experience in designing surge protection for various industry systems covers more than 40 years and millions of applications worldwide. If you need custom OEM circuit packaging, our Protection Technology Group experts work closely with you to design protection solutions that meet your budget and performance needs.

- Indoor, • Outdoor, • Parallel, • Series



Data Line Surge Protection

Our full range of data line surge protectors are engineered and manufactured by Transtector. This mission critical protection product offering includes units optimized for PoE, Gigabit Ethernet, Gigabit PoE, Ethernet, RS-232/RS-422/RS-485, CCTV, DeviceNet and other low voltage signals.



Multi-Protocols

- Configurable to handle multiple protocols in one package
- Modules available for T1/E1, Ethernet, and Gigabit Ethernet



PoE, Gigabit PoE, GbE, T1/E1

PolyPhaser and Transtector engineered Ethernet and T1/E1 surge protection devices provide non-degrading, fast-acting, high performance surge protection for continuous operation of your network equipment.

The following configurations are available:

- Modular rack mount
- Modular surface mount
- DIN rail mount
- In-line indoor enclosures
- Surface and pole mount outdoor enclosures, plastic or metal
- Connector styles include RJ-11, RJ-45, BNC, punch down block and terminal screw block connectors

Our PoE and T1/E1 protection configurations include:

- Fused,
- Non fused,
- UL 497,
- UL 497A,
- UL 497B



RS-232 | RS-422 | RS-485

Engineered in compliance with the RS-232 | RS-422 | RS-485 standards respectively, our data line protectors feature:

- (RS-232) tolerance in line with ± 3 to ± 15 V
- (RS-422 | RS-485) tolerance in line with -7 to +12 V
- All common signal levels including ± 5 V, ± 10 V, ± 12 V and ± 15 V



Rack Mount

Transtector's carrier grade rack mount surge protectors are optimized for signal throughput with industry leading capacitance levels, available for 10/100BT, T1/E1, PoE, Ethernet, GbE and xDSL.

- Silicon avalanche diode technology
- Line and load bidirectional protection
- Modular chassis, multi-protocol
- Fused and non-fused options



Data Line Surge Protection

PolyPhaser's Data Line products are fully weatherized, modular high speed digital data / DC line protectors designed for RS232, RS422, RS485, T1/E1, and Telco Trunk Line applications. DC voltages include 12, 24, 48, 56, and 72 volts that meet the needs of Audio, GPS and Wi-Fi applications.

CCTV		PoE	
DS3		POTS	
Ethernet		RS-232	
GbE		Submersible Protector	
GbE PoE		T1/E1	
GbE PoE+		Telco Trunk	
GbE PoE++		Two Pair Signal	



EMP | EMI Protection

E3 Mitigation Expertise and Innovation

Transtector provides a complete systems approach for the protection of communications systems and critical electronics from lightning and power anomalies. Our unique expertise in filter technologies enables us to provide a comprehensive portfolio of electromagnetic environmental effect (E3) hardening solutions including custom designs to fit your specific EMP - EMI protection needs.

Lightning strikes, solar storms, electromagnetic pulse and high power microwave weapons are serious threats to electronic equipment. Transtector's high performance filter technologies protect communications, satellite and electrical power systems from all major power quality threats including:

- EMI (electromagnetic interference)
- EMP (electromagnetic pulse)
- HEMP (high altitude electromagnetic pulse)
- SREMP (surface radiated electromagnetic pulse)
- NEMP (nuclear electromagnetic pulse)
- SGEMP (system generated electromagnetic pulse)
- HRM (high-powered microwave)
- Geomagnetic storms
- Tempests
- Internally generated transients
- Power grid anomalies
- Lightning induced transients



Transtector's proven technology is engineered to withstand the most extreme physical environments and EMP - EMI conditions, as well as meet industry and military standards wherever applicable. For over 10 years, top defense contractors have relied on our knowledge and design experience to meet the requirements set by military standards. Our team of experienced professionals design and manufacture custom as well as COTS products for carriers, defense contractors, municipalities and the government. Our systems approach saves valuable time during the design, development and procurement phase.

Military Standards

Transtector Systems is ISO 9001:2008, 14001:2004, OHSAS 18001:2008 and AS 9100C certified as well as highly experienced with the following military and commercial standards:

- MIL-STD 188-125-1 HEMP Hardening (Fixed Facilities)
- MIL-STD 188-125-2 HEMP Hardening (Transportable Systems)
- MIL-STD 202 Environmental Requirements Component Level
- MIL-STD 810 Environmental Requirements Box Level
- MIL-STD 461 EMI Requirements (Subsystems)
- MIL-STD 464 EMI Requirements (Systems)
- RTCA DO-160F Aircraft Protection
- UL1449 Safety Standards for Low Voltage Surge Protective Devices (Steering Committee)
- IEEE/ANSI C62.41 Product Application Location, Test Methods, Guide to using the standard (A representative of Transtector Systems sits on this commission)
- IEC Standards International Electrical Committee (Representatives of Transtector Systems sit on Working Groups 5 and SC77c)



RF Surge Protection

PolyPhaser's superior RF patented designs and platform includes board-level protection, DC Pass, DC Block, Bias-T and Ultra-Low PIM.

	<p>Ultra-Low PIM Protectors</p> <p>Passive Intermodulation produces signals at unwanted frequencies that can interfere with RF signal reception. PolyPhaser's ultra-low PIM surge protectors are specifically designed to minimize such interferences.</p> <ul style="list-style-type: none">• Significantly lower PIM: -155 dBC• Frequency range of 698 MHz to 2.7 GHz• -26 dB return loss• DC pass and DC block options• Bi-directional capabilities• Coverage of LTE frequency band
	<p>DC Block Filters and Arrestors</p> <p>PolyPhaser's DC blocked products are designed to pass RF frequencies and effectively block all DC, while providing the industry's best RF performance. DC block protectors find their ideal use in applications where DC is not required on the coaxial cable such as SCADA, two-way radio, cellular, GSM, CDMA and UMTS.</p> <ul style="list-style-type: none">• Frequencies from 300 MHz to 10 GHz• Low voltage let-through• Low throughput energy• < 0.1 dB insertion loss• Maximum 1.1:1 VSWR
	<p>DC Pass Arrestors</p> <p>Engineered for low voltage let-through and superior RF performance, PolyPhaser's patented DC pass lightning protection devices offer superior performance to protect sensitive Tower Top Amplifiers (TTA) or active antenna systems where DC voltage is required such as GPS, 3G, WIMAX and RET.</p> <ul style="list-style-type: none">• High surge handling capacity• Low voltage let-through• No ongoing maintenance requirements
	<p>Protected Bias-T</p> <p>Whenever DC power needs to be inserted into an AC signal to power remote antenna amplifiers or other devices, a Bias-T connector is required. PolyPhaser's GXTM Series Bias-T products are RF path protectors with an integrated, protected DC Bias-T function.</p> <ul style="list-style-type: none">• Available in up to 4 RF bands• Frequency range of 400 – 3700 MHz• DC pass voltages from 6 to 60 Vdc• Maximum 1.1:1 VSWR• 0.1 dB insertion loss• Variety of user voltages



Grounding and Bonding

The complete and proper installation of a single point grounding installation is imperative for human safety and system integrity. In addition to our lightning and surge protection devices, PolyPhaser offers the accessories required to complete your grounding installation. Our product offering includes shield grounding kits, copper cleaning kits, clamps, copper straps and more. We also offer site configuration consulting, kitting as well as grounding and bonding education.

Grounding Solutions

The complete and proper installation of a single point grounding installation is imperative for human safety and system integrity. PolyPhaser's Earthed Entry Panels are an all-copper coaxial solution for your grounding needs.

- Earthed entry panels
- Shield grounding kits
- Copper cleaning kits
- Clamps
- Copper straps





TRANSTECTOR

PRODUCT SELECTION

- RF Surge Protection
- Grounding and Bonding
- Cable Management Kit
- Data Line Surge Protection

Protected Side Connector

Bi-Directional D
 Bi-Directional N
 Bi-Directional SMA
 BNC Female
 DIN Female
 DIN Male
 F Female
 N Female
 N Male
 RTNC Male
 SMA Female
 TNC Female
 UHF Female
 UHF Male

Surge Side Connector

Bi-Directional D
 Bi-Directional N
 BNC Female
 DIN Female
 DIN Male
 F Female
 N Female
 N Male
 RTNC Remale
 TNC Female
 TNC Male
 UHF Female
 UHF Male

PIM RATING

No
 Yes

Data DC RF Line Voltage

+15 Vdc
 +24 Vdc
 +33 Vdc
 +36 Vdc
 +48 Vdc
 ±18 Vdc
 ±6 Vdc
 ±60 Vdc
 -60 Vdc
 50 Vdc

Frequency

dc to 2.4 GHz
 dc to 2.7 GHz
 dc to 3 GHz
 dc to 50 MHz
 dc to 7 GHz
 217MHz - 223MHz
 500 KHz to 1.0 GHz
 698MHz to 1GHz
 698MHz TO 2.7GHz RF dc
 TO 2.5MHz Telemetry
 (ASIG)
 1.5 MHz to 400 MHz
 1.5 MHz to 700 MHz
 1.75 MHz to 400 MHz
 4 MHz to 900 MHz
 5 MHz, 10MHz, 50 MHz to
 400 MHz
 50 MHz to 700 MHz
 100 MHz to 512 MHz
 125 MHz to 1.0 GHz
 160 MHz - 163 MHz
 300 MHz to 1.2 GHz
 300 MHz to 2.5 GHz
 400 MHz to 1.2 GHz
 400 MHz to 2.5 GHz
 450 MHz - 460 MHz
 680 MHz to 2.7 GHz
 689 MHz to 1 Ghz
 698 MHz to 2.5 GHz
 698 MHz to 2.7 GHz
 700 MHz to 2.5 GHz
 700 MHz to 2.7 GHz
 800 MHz to 2.3 GHz
 800 MHz to 2.5 GHz
 1.8 GHz to 3.8 GHz
 1.8 GHz to 3.8 GHz and 4.2
 GHz to 6.0 GHz
 2.0 GHz to 6.0 GHz
 2.0 GHz to 6.0GHz
 6.0 GHz to 10.0 GHz

PRODUCT SELECTION

- AC Surge Protection
- DC Surge Protection
- Data Line Surge Protection
- EMP | EMI Protection

VOLTAGE

120 Vac
 120/208 Vac
 120/240 Vac
 127/220 Vac
 240 Vac
 240/415 Vac
 277 Vac
 277/480 Vac
 480 Vac

PHASE

single phase
 split phase
 3-phase delta
 3-phase wye

MOUNT TYPE

DIN rail
 Fixed
 Hardwire
 Panel Mount
 Plug In
 Rack Mount

Indoor

Outdoor:

COMPLIANCE

CE Compliance
 Hazardous Location
 IEC Compliance
 IEEE Compliance
 NEMA Compliance
 R56 Compliance
 UL Compliance

SOLUTIONS

Data Center



Energy



Industrial



Land Mobile Radio



Medical



Military



Rail



Security



Telecommunications

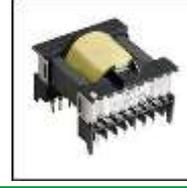


KOMPONENT FİRMALARIMIZ

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BOBİNLER



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DİYOTLAR**



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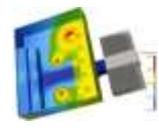
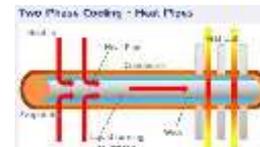
**RF
Konnektörler,
Anahtar,**

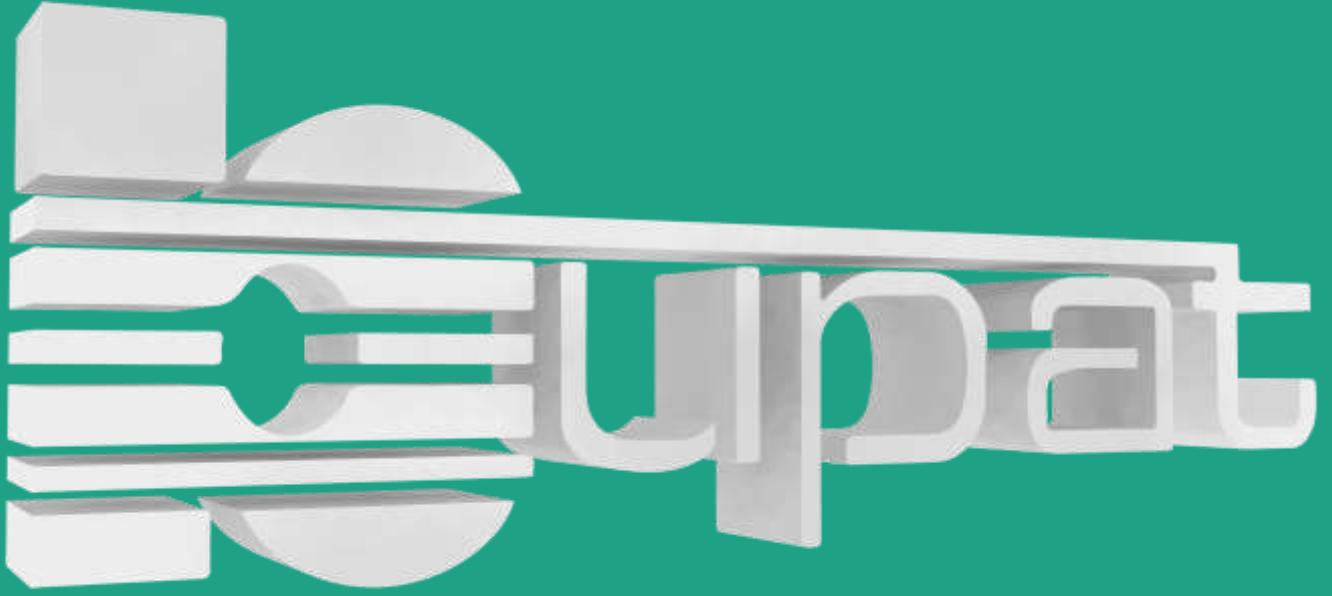


THERMACORE
Thermal Management Solutions

www.thermacore.com

**ISI ÇÖZÜMLERİ
(HEAT PIPE)**





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