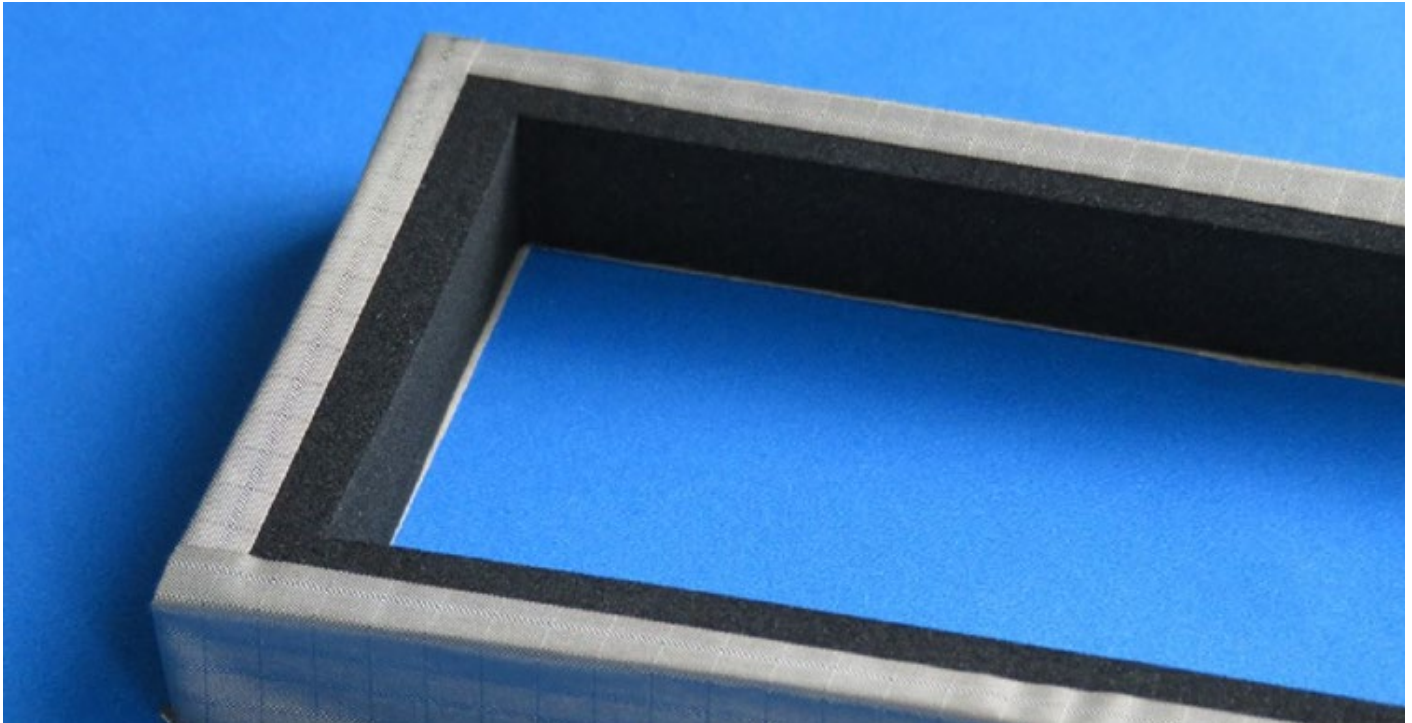




EMC SHIELDING IS THE MECHANICAL FIX FOR AN ELECTRICAL PROBLEM



EMC is the acronym for electromagnetic compatibility which means the ability of equipment to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to other equipment in that environment.

Electronics engineers are very familiar with this and will consider in their design good board layout, filtering, grounding, signal integrity etc. to try resolving electromagnetic interference (EMI) at its source. However, shielding of the enclosure is just as important and solves the problem of radiated emissions and susceptibility. Shielding is a mechanical fix for an electrical problem and the enclosure design engineer should be aware of the types of gaskets available and their different attributes and ensure there is enough land area on the enclosure seams, doors etc. to fit the gasket.

There are 4 main gasket types available:

- Knitted wire mesh
- Electrically conductive elastomers
- Conductive fabric over foam
- Metal: Beryllium copper/stainless steel

Knitted wire mesh can be fitted in grooves or surface mounted when bonded to a carrier. There are four wire options available to address shielding and corrosion issues. When bonded to a carrier it offers good dust and moisture seal, often preferred for rugged military applications as it provides good electromagnetic pulse (EMP) protection as the gasket can carry high currents.

Conductive elastomers are conductive particles loaded into silicone or fluorosilicone. Many different particles are available from carbon up to pure silver, the most popular are nickel coated graphite and silver-plated aluminum. All, apart from carbon, offer good all-round shielding and high performance at all frequencies. Nickel coated graphite is very cost effective

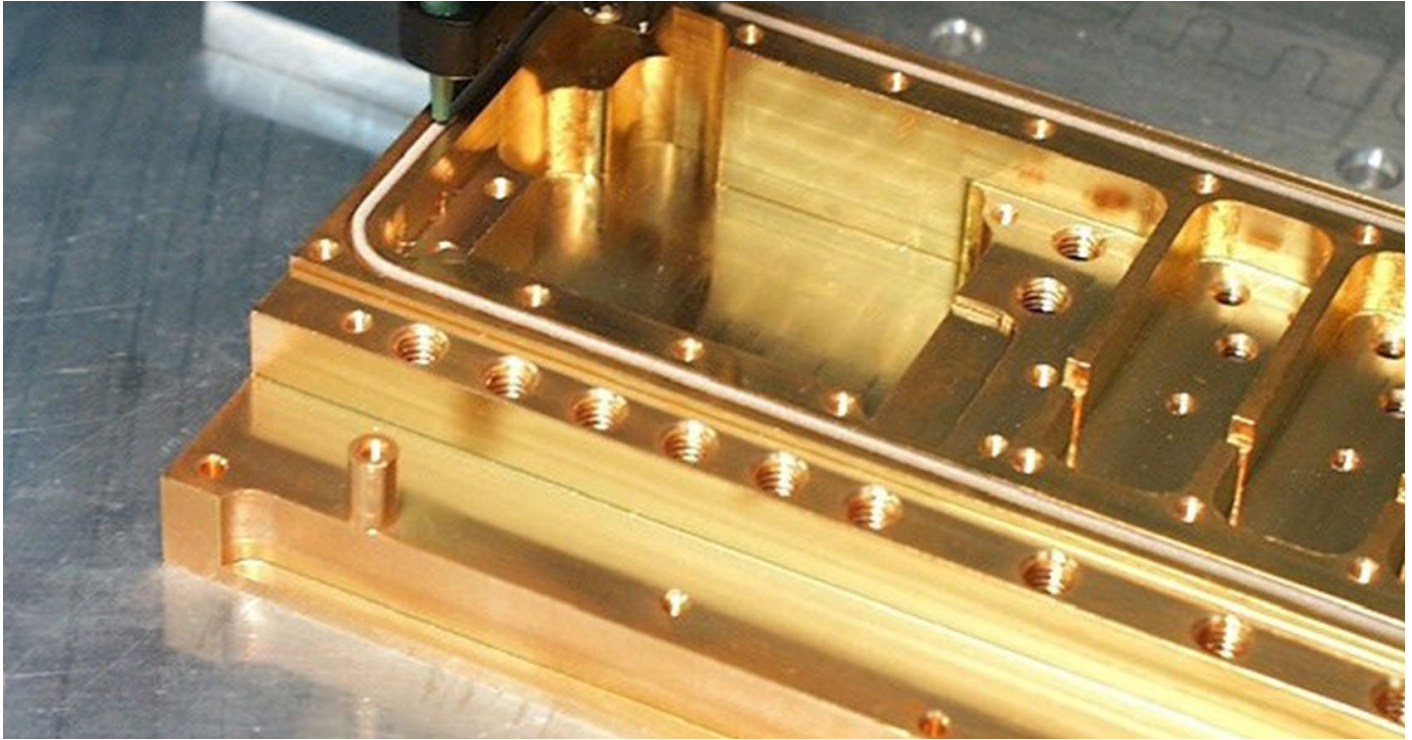
being a factor of 3-5 times less expensive than silver plated aluminum and yet still offers shielding effectiveness similar to that of silver-based products. The conductive elastomer compound can be extruded in continuous lengths in many different profiles and can be molded as sheet and die cut or molded as a component. Conductive elastomer "O" rings make for a very cost-effective EMI seal and are popular in defense and aerospace applications due to their small profile size, low weight and high performance.

Form in place is a conductive elastomer, being conductive silicone in liquid form for depositing direct to enclosure hardware. Particularly suited for use on small enclosures due to the narrow land widths, different fillers are available similar to that of conductive elastomers. This type of gasket offers a dust & moisture seal. It is not suitable for opening and closing of the enclosure.

Oriented wire in silicone are Monel or aluminum wires vertically oriented in solid or sponge silicone. Available as flat sheet material for surface mounting, the gasket can be die cut to shape or fabricated from strips to make a picture frame gasket and provides a good EMI and environmental seal. This type of gasket is very popular in defense applications as it offers very low contact resistance as the wires penetrate the mating surface.

Conductive fabric over foam gaskets are good for commercial applications, most are stick on surface mount and are soft and compliant making good cabinet door seals. Very popular in laptop computers, gaming machines etc. for grounding.

Beryllium copper fingers are good in shear/wiping applications and will be seen on doors for shielded rooms, they offer good all-round high performance and are available in many plated finishes to enhance shielding and address galvanic concerns.



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