



Choosing the Right EMI Shielding Gasket

In choosing the most effective EMI Shielding gasket for products such as telecommunications equipment, computers, Tempest equipment, automotive, medical and Military electronics. Very often you can narrow the selection into four options: Conductive fabric over foam, knitted wiremesh gaskets, conductive elastomers or Beryllium Copper BeCu fingerstock strips. Depending on products needs, these solutions provide varying EMI protection, intricacy of forms and environmental protection.

Several factors must be considered when designing into products.

- Form, referring to the complexity of the form or pattern in which the gasket fits.
- Mechanical durability.
- Attenuation level. Most commercial applications typically require 60 to 100 dB but can go high as 120 dB.
- Compression. Most commercial applications require low closure force. Compression force has the greatest effect on conductive elastomer shielding characteristics. Since they can be loaded with relatively low- to high conductivity filler materials, conductive elastomers supply the widest range of shielding effectiveness. BeCu strips and conductive fabric over foam gaskets are not affected as much by compression forces. As a result, they offer a narrow range of shielding capabilities.
- Galvanic compatibility. In all cases you have to be aware of galvanic corrosion between the gasketing material and the Sub-strate material/ metal. This avoids creating a galvanic cell, which can lead to corrosion.
- Environmental sealing from water, dust and similar external substances. Other selection considerations include cost, service life (cycles, actuations) tolerances and mounting methods such as fastener types and possible adhesives.

Conductive fabric over foam makes sense where no environmental seal, complex profile or demanding mechanical durability is required. **Soft-Shield 3500** (Figure 1.0) material is a Nickel Plated Copper taffetta fabric this is a low cost closure force competitive solution for EMI shielding and electrical grounding. Softshield 3500 typically requires less than 1Lb/In (0.175 /mm) closure force, making it effective for low closure force applications. Softshield 3500 is an excellent alternative shielding solution to traditional Beryllium Copper.



figure 1: Fabric over foam

Knitted **wiremesh gaskets**, (Figure 2.0) are available in a wide variety of metals, Monel, Ferrex® (Tin plated copper steel) and Aluminium are standard alloy choices, with custom available on request. All these gaskets are available with or without environmental seal. The environmental seals are very often a Neoprene rubber and for a more durable application very often a Silicone material the right choice. All these gaskets are available in a wide selection of profiles, round, square, flat and rectangular shapes. All gaskets can be very often bond onto the application with a psa (pressure sensitive adhesive) or be bond with a industrial adhesive.



Figure 2: knitted wiremesh gasket

Beryllium Copper **fingerstock BeCu** (Figure 3.0) is a high performance metal which can be fabricated in a wide variety of standard and custom build components. Its mechanical and electrical properties make it the perfect material to EMI shielding products. The benefits of Beryllium Copper are High electrical and RF conductivity, excellent plating compatibility, maximum spring performance. The Beryllium Copper parts are available in a wide variety of plating finishes.



Figure 3: Beryllium Copper

Elastomers, (Figure 4.0) each conductive elastomer consists of silicone, fluorosilicone or EPDM binder with a filler of pure silver, silver plated Copper, silver plated nickel, silver plated aluminium, silver plated glass or a nickel plated graphite. A very popular and very often used material is the **Cho-Seal 1285** (silver plated aluminium) material of choice in high end military corrosion environments where corrosion and shielding of 95-100 dB is required. The nickel plated graphite **Cho-Seal S6300** series are the best choice for commercial applications requiring good performance in moderately corrosive environments. Material of choice for large finishes due to the hardness of the particles to penetrate trough finishes to achieve good electrical contact



Figure 4: Conductive Elastomer

For all of your technical questions please call our helpdesk +31 75 628 3717 or send your e-mail to info@hftechnology.nl we are more than happy to help you with any of your emc problems.



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