

# *The Suitability of EMI Gaskets for EMP Applications.*



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## **Introduction to EMP**

An Electromagnetic Pulse (EMP) results from a thermonuclear explosion. This type of explosion can cause electrical current to flow through the skin of an aircraft or the superstructure and hull of a ship in the order of 10kA (10,000 Amps).

## **EMI Gaskets for EMP applications**

There is basically no difference between a gasket that is used for commercial EMI shielding and military EMP applications. The only difference is the amount of electrical current that flows through the gasket from seam to seam. Therefore a gasket that is used for EMP applications must be able to carry large amounts of electrical current without the volume resistivity increasing. This means that gaskets with a high metal content such as the knitted wire mesh variants are ideally suited.

For EMI gaskets that are based on conductive elastomers, such as the Tecknit Consil range, the denser materials such as the silver plated copper (Consil C), silver plated aluminium (Consil A) and the pure silver (Consil R) types must be chosen.

## **EMI Gaskets types that are not recommended for EMP applications**

If an EMI gasket is chosen that cannot carry a large amount of electrical current, then the electrical resistance (or volume resistivity) will increase during the EMP. The actual heat generated when current is flowing is proportional to the internal resistance of the gasket. It is therefore possible that the gasket could get so hot during the EMP that the conductive material becomes damaged and ceases to conduct at all. In this situation the gasket is no longer an EMI shield.

A typical example of an unsuitable EMI gasket for EMP applications would be the conductive elastomers that are based on Silver glass particles, such as the Tecknit Consil E and Consil II products.

## **General**

An EMP gasket is generally mounted into a groove or cavity so that when the gasket is in its final position there is additional metal around it to help carry the electrical load. The EMP survivability of an EMI gasket is confirmed using the standard MIL-G-83528 section 4.6.16 and the result is expressed in Kilo amperes (kA) per inch perimeter.