

## 1. INTRODUCTION

This specification covers the requirements for application of RFI/EMI Jam nut seals which are designed to provide Radio Frequency Interference / Electro-Magnetic Interference (RFI/EMI) shielding / sealing solutions.

The Jam nut seals referred to in this specification are manufactured to a specified shape and size and therefore considerations of application must be made to ensure that the appropriate product is selected and utilized correctly, so that the performance of the Connector Gasket in service is optimized.

This specification will provide technical advice on article selection & design considerations when implementing RFI/EMI Jam nut seals.



## 2. REFERENCE MATERIAL

### 2.1. Engineering Drawings

TE Connectivity Customer Drawings for specific products are available from the service network. The information contained in Customer Drawings takes priority if there is a conflict with this specification or with any other technical documentation supplied by TE Connectivity/Kemtron Ltd.

The appropriate Customer drawings for the product referenced herein are detailed as follows:

Customer Drawing	Standard size
C-98-SERIES - JAM NUT SEALS	MIL-DTL-38999 / MIL-DTL-26482
C-99-SERIES - JAM NUT SEALS	MIL-DTL-81511

### 2.2. Specifications

Product specification 108-120068 provides material specific product performance and test specification details.

### 2.3. Instructional Material

The TE Connectivity/Kemtron Ltd catalogue provides extensive instruction on the range of product alternative shapes and sizes that are on offer. If an alternative dimension or shape of product is required that is not covered by the scope of this specification, please consult the catalogue and seek technical sales advice from your customer service representative.

### 3. REQUIREMENTS

#### 3.1. Safety

Please use sulfur-free protective gloves when handling RFI/EMI Conductive Elastomer products. This will provide protection for the product from contamination, as well as protection for the product handler.

Some products contain sensitive metals which can tarnish or degrade when exposed to contamination, whilst others may cause skin sensitization / allergic reactions when the product is handled.

#### 3.2. Storage

##### A. Ultraviolet Light

The products should be stored in their original packaging & isolated from direct sunlight to prevent premature degradation of the product.

##### B. Chemical Exposure

Do not store product near any of the chemicals listed below as they may cause corrosion or other degradation of the material.

Acids      Alkalines      Sulfur Compounds      Ammonia      Amines

Acyl Halides      Dissimilar rubbers or plastics (excluding original product packaging)

##### C. Shelf-Life

When stored according to the conditions above at ambient temperature and humidity, conductive elastomers have a shelf-life of 20 years.

### 4. JAM NUT SEALS

TE Connectivity/Kemtron Ltd manufacture a range of Jam nut seals to suit many standard size connectors which require an EMI shield with optional environmental seal.

The choice of Jam nut seals materials includes:

- Silicone Nickel Graphite (SNG)
- Fluorosilicone Nickel Graphite (FNG)
- Silicone Silver Aluminium (SSA)
- Fluorosilicone Silver Aluminium (FSA)

Jam nut seals to meet standard sizes,

- MIL-DTL-38999
- MIL-DTL-26482
- MIL-DTL-81511

Jam nut seals are normally made by compression molding or joining extruded strip. The compound used at joints is electrically conductive ensuring good shielding integrity. Tube section O-rings must be extruded and joined.

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Jam nut seals are reusable as long as the seal is not compressed over the recommended limits of the material (20% maximum compression rate).

## 5. TOLERANCES:

Inside diameter (ID)

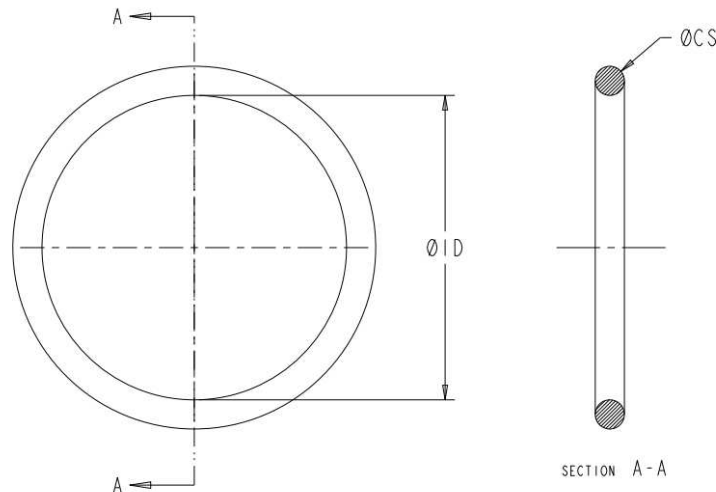
Up to 40 mm =  $\pm 0.25$ mm

>40 mm =  $\pm 0.38$ mm

Cross section (CS)

Up to 2 mm =  $\pm 0.1$ mm

>2 mm =  $\pm 0.13$ mm



## 6. MATING SURFACE GALVANIC COMPATIBILITY

When operating in service, the galvanic compatibility of the conductive elastomer materials must be considered.

Galvanic corrosion is a process where dis-similar metals undergo electro-chemical reactions in the presence of an electrolyte.

“In-service” conditions such as exposure to saline environments or washdown fluids may cause galvanic corrosion between the conductive elastomer gasket and the mating surface of the electronic enclosure.

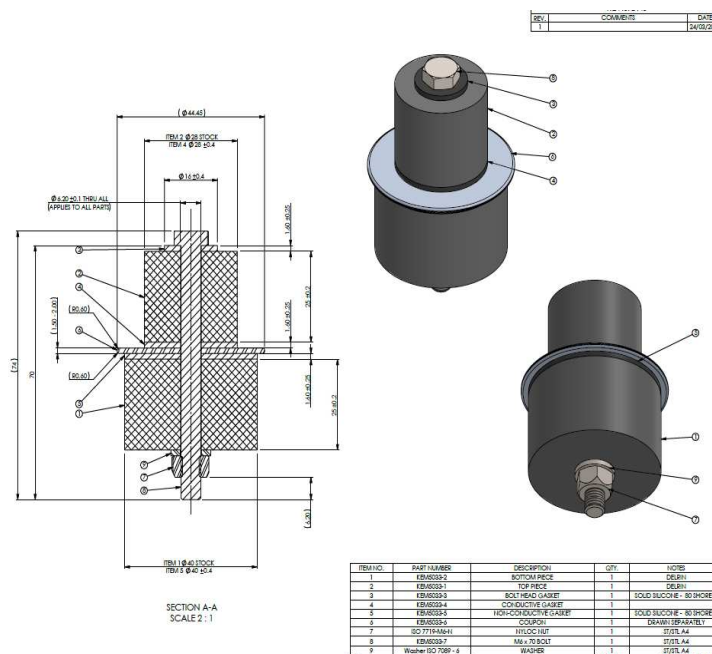
If galvanic corrosion does occur this may impact upon the performance of the gasket.

The galvanic compatibility of materials can be investigated through experimentation in a salt fog chamber. Gasket samples are compressed against a defined mating surface. The assemblies are then subjected to 504 hours of salt fog exposure according to ASTM B117.

The mass loss of the sample of the mating surface provides quantifiable data on the performance of the gasket / surface combination.

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For testing and reporting purposes the standard mating surface was passivated Aluminium 6061 – T6. Please note, a higher mass-loss in milligrams represents a more corroded sample and therefore poorer galvanic compatibility.



**A schematic of the assembly used to hold a gasket under compression against a defined mating surface for salt-fog testing.**

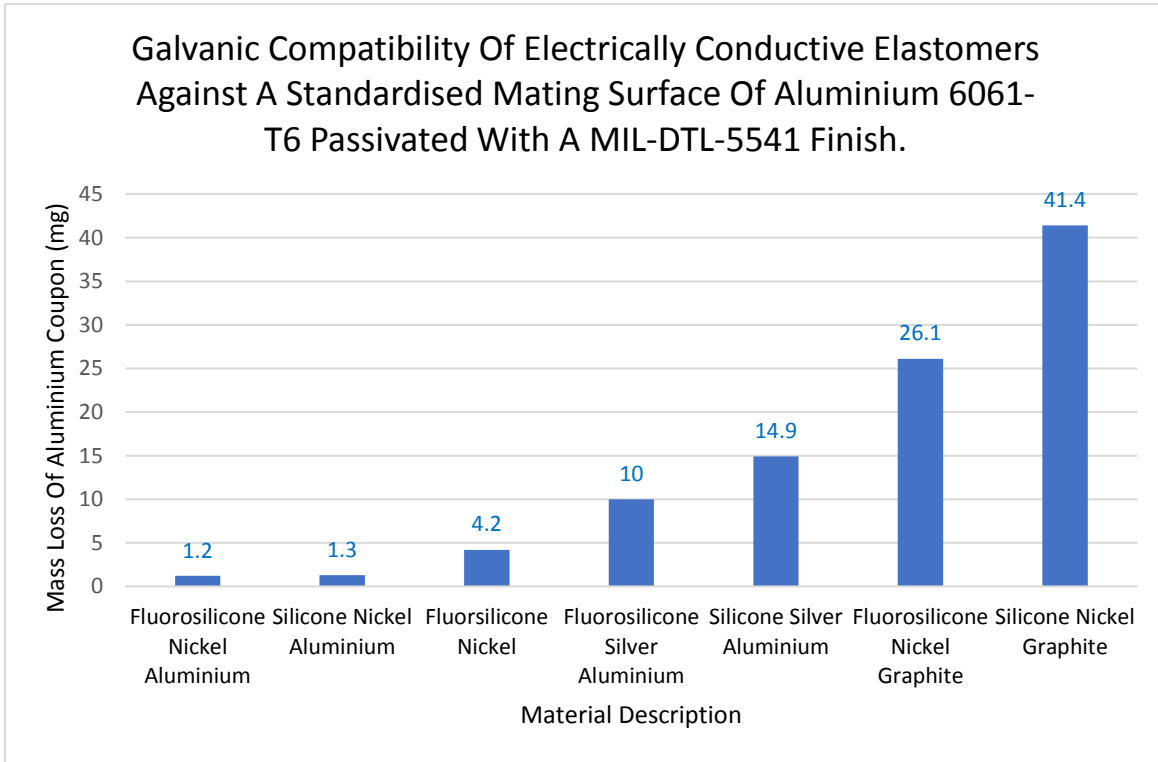
The effects of galvanic corrosions can be mitigated using the following methods:

- Selecting a compatible gasket material that suits the enclosure mating surface
- Selecting a compatible surface finish or passivation coating of the mating surface to suit the selected gasket
- Incorporation of an environmental seal to protect the EMI seal from exposure to the conditions of galvanic corrosion.

The data below is only to provide a reasonable comparison between materials and does not represent all design scenarios.

It is advised that application testing is performed to justify the choice of gasket / mating surface combination, as well as testing within expected “in-service” environmental conditions.

If unsure on the requirements for a particular application, the advice of a customer service representative should be sought.



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Aluminium 6061-T6 coupons and their associated Silicone Nickel Graphite gaskets after 504 hours of salt-fog exposure.



Aluminium 6061-T6 coupons and their associated Silicone Silver Aluminium gaskets after 504 hours of salt-fog exposure.

**7. REVISION HISTORY**

Revision number	Change request	Date	Incorporated By
A	-	12-Oct-2022	Dominic Hemmings