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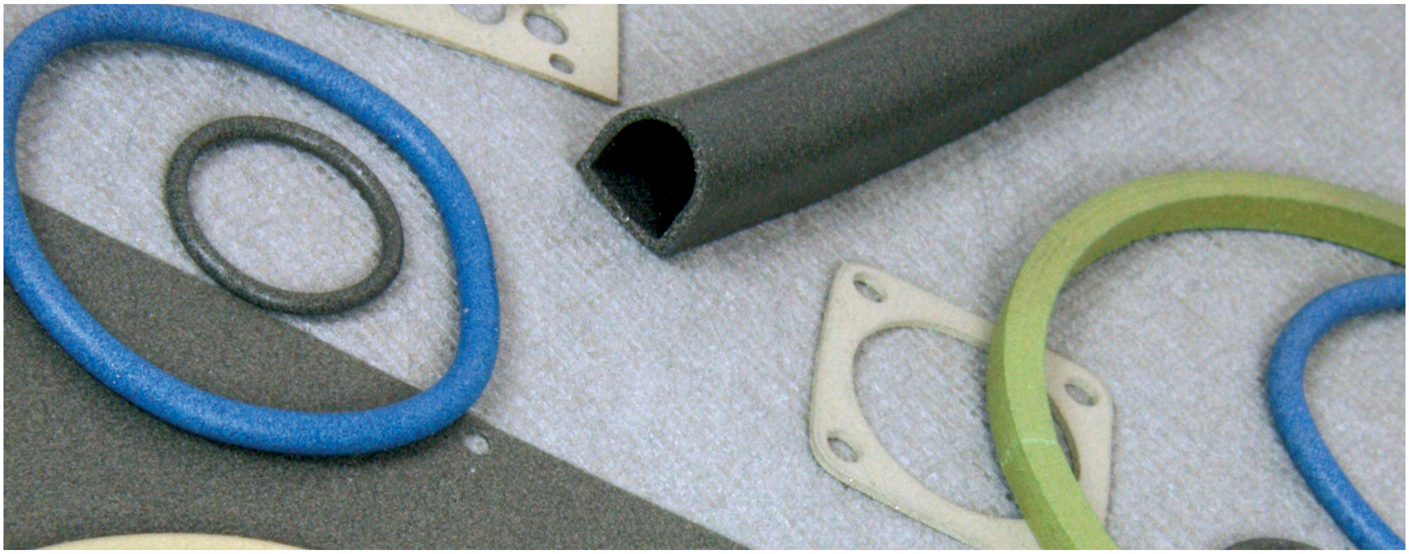
CONDUCTIVE ELASTOMERS

CONDUCTIVE ELASTOMERS: MATERIALS DATA



Product Overview

Conductive elastomers are fully cured silicones or fluorosilicone loaded with a variety of highly conductive particles providing superior EMI/RFI shielding performance combined with excellent environmental sealing. The various conductive fillers are designed to ensure galvanic compatibility whilst providing low contact resistance between mating surfaces. Kemtron Ltd.'s many years of manufacturing experience combined with quality control and compliance testing ensures our conductive elastomers are suitable for the most demanding situations, offering consistency time after time.

Application

- Industrial controls
- Instruments
- Military equipment
- Avionics
- Medical electronics
- Electronic equipment enclosures

Availability

- Highly conductive EMI/RFI gasket and environmental seal
- Extrusions
- Flat gaskets
- O-Rings
- Sheet
- Thickness from 0.5mm
- Wide temperature range -55˚C +200˚C
- Fluorosilicone for harsh environments: Fuel oils and solvents
- Choice of materials for galvanic compatibility
- Flame retardant to UL94 V-0
- Conductive self adhesive backing on sheets

Material Selection

Kemtron Ltd. manufactures conductive elastomers using four standard highly conductive fillers in both silicone and fluorosilicone variants, all have slightly different attributes:

Conductive fillers available for silicone and fluorosilicone

- **Nickel Plated Graphite:** A high quality cost effective commercial material with increased use in the military markets. Easily extruded or moulded. SNG FR grade to UL94 V-0
- **Silver Plated Aluminium:** An excellent grade high performance material widely used for higher frequency applications in the commercial and military markets. Lighter in weight than some other materials

Vinyl Methyl Silicone (VMQ)

Silicone rubber is used because the end use requires a material that retains its elastomeric properties over a very wide range of temperatures and does not degrade due to the presence of oxygen and ozone.

Silicone elastomers do have weaknesses in their properties and behaviour. In comparison with other elastomers their tensile, tear and abrasion properties are significantly poorer, however, they do not decay as the temperature is increased and above 150˚C they become on the whole better.
The swelling and chemical resistance of silicones is comparable to those of Chlorophrene rubber, they are not affected by aliphatic oils however they swell in napthenic and are attacked by hot aromatic oils.

Silicones main weakness is to hydrolytic attack and decomposition especially to steam between 120˚C and 140°C, they are also susceptible to attack by acids and alkalis.

Fluorosilicone (FVMQ)

Fluorosilicone is used because it overcomes the formers chemical resistance and swelling weaknesses whilst retaining on the whole the excellent high temperature properties. FVMQ however still suffers from attack by high temperature steam and hydrolysis by both acids and alkalis.

Production Capabilities

Kemtron Ltd.'s extensive manufacturing facilities combined with our development team, Quality control and experienced manufacturing personnel enable us to be one of Europe's leading manufacturers of electrically conductive elastomers.

Here at Kemtron Ltd., we develop, test, compound, mould, extrude and vulcanize conductive elastomers. This enables us to be flexible in our approach towards customer satisfaction.

In addition to our standard range, we can develop and compound new grades of materials at our facility in the UK to meet customer specific requirements, subject to economic minimum quantities.

Materials

Material	Material Code
Silicone Nickel Graphite	SNG
Fluorosilicone Nickel Graphite	FNG
Silicone Nickel Graphite Flame Retardant UL94 VO	SNG-FR
Silicone Silver Aluminium 65 Shore A	SSA
Fluorosilicone Silver Plated Aluminium 70 Shore A	FSA(70)

Fire retardant materials

Silicone nickel graphite flame retardant material SNG-FR is tested and approved by Underwriters Laboratories to UL94 V-0 file number E344902.

Test Results

Listed below are the test results of Kemtron Ltd.'s electrically conductive silicone elastomer materials. Some tests are performed in house and others by external laboratories all using calibrated equipment, testing to the standard specified in MIL-DTL-83528. Kemtron Ltd. offers the performance data and methods of testing to MIL-DTL-83528 for comparison only. All of Kemtron Ltd.'s test certificates and reports are available upon request. The results were obtained in laboratory conditions and should be used as a guide only. Customer hardware and many other factors are beyond our control. Therefore customers should perform their own tests to ensure suitability of the product for the desired performance.

Kemtron Ltd. recognises the importance of quality and consistency in conductive elastomer seal manufacture, with this in mind;

- We specify, batch control and trace all raw materials
- Control compounding with robust procedures and batch test every mix with calibrated test equipment to ensure batch to batch consistency and conformance to our published data sheets
- Use certified and approved outside test laboratories
- Batch control and trace all manufacturing including materials, tools, equipment and operators

The controls are embedded into our accredited management system that we have held since 1988.

All the above is overseen by our quality assurance department and our in-house qualified polymer engineering/chemist ensuring proven consistency and traceable results.

Test Description	Material Performance				
Elastomer Binder	SNG VMQ	SNG-FR VMQ	SSA VMQ	FNG FVMQ	FSA70 FVMQ
Conductive Filler	Ni/C	Ni/C	Ag/Al	Ni/C	Ag/Al
Colour	Dark Grey	Light Grey	Tan	Dark Green	Light Green
Volume Resistivity MIL-DTL 83528 (ohm-cm, max.) As supplied (without pressure sensitive adhesive)	0.05	0.05	0.008	0.05	0.012
Hardness (ShoreA±7) ASTM D2240	60	65	65	65	70
Specific Gravity (±13%) ASTM D792	2.0	2.0	2.0	2.2	2.0
Tensile Strength (lb./in. min) ASTM D412	200	250	200	200	180
Elongation % min ASTM D412	150	100	100	150	60
Tear Strength (lb./in. min) ASTM D624	50	35	30	40	35
Compression Set ASTM D395 – Method B – 70 hrs @ 100°C (%,) min	25	30	32	30	30
Compression / Deflection ASTM D575 – Method B 100 psi on 1.58mm% max	3.5	3.5	3.5	3.5	3.5
Operating Temperatures Max °C Min °C	160 -55	160 -55	160/200 -55	160 -55	160/200 -55
Shielding Effectiveness MIL-DTL 83528 (dB)					
20 MHz	106	106	108	106	106
40 MHz	105	105	106	105	105
60 MHz	106	105	109	105	107
80 MHz	114	111	118	110	111
100 MHz	111	108	109	108	106
200 MHz	116	114	117	114	106
400 MHz	119	112	123	116	117
600 MHz	112	105	114	106	106
800 MHz	114	109	120	116	120
1 GHz	118	108	114	108	112
2 GHz	111	102	101	100	106
4 GHz	100	106	107	104	112
6 GHz	104	103	105	104	97
8 GHz	110	115	105	106	114
10 GHz	110	109	102	105	112
Electrical Stability After Break (Ohm-cm, max)	0.1	0.1	0.015	0.15	0.015
Heat Ageing MIL-DTL 83528 – 48 hrs at 1.25 X Max – Operating Temperature – Ohcm-cm, max	0.1	0.1	0.01	0.2	0.015

FSA and SSA materials have a maximum intermittent operating temperature range of 200ºC for periods of up to 48 hrs.

Properties of elastomers that can be measured and how they impact on selection of the appropriate material for gasket/sealing purposes

Hardness

Hardness is a measure of the degree of indentation when an indenter of known geometry is placed on the elastomeric surface under a known constant force for a fixed time. The different scales used Shore A and IRHD are defined by the form of the indenter, applied load and time of reading after indenter application. In a standard elastomer there is reasonable agreement between observed hardness and Young's Modulus (E). In the case of conductive elastomers this relationship is not so clear cut since the elastomer acts more as a binder for the filler and the hardness appears to have a rule of mixtures response.

Tensile strength and elongation at break

Tensile strength and elongation at break are obtained from the same standard dumbbell shaped test-piece punched from a moulded sheet of rubber of known thickness. By use of tensile test equipment fitted with an extensometer a stress strain response curve can be obtained and a judgement of the stresses and strains that can be made on the material during service made.

Tear

The tearing properties of a material are obtained using tensile test equipment and a standard test piece of known dimensions. Tests are carried out in tension and the results reported in terms of load required per distance moved by the tear tip.

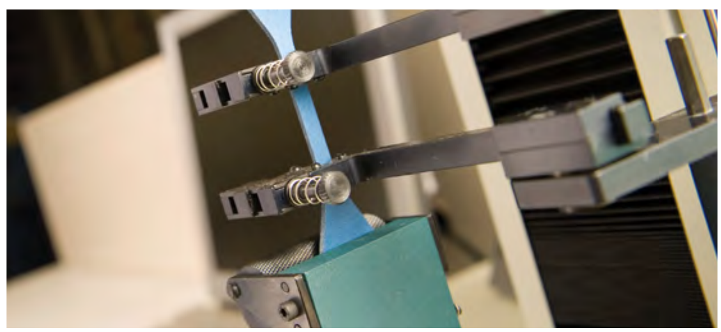
Compression set

Compression set (or more correctly permanent set after compression to a fixed strain) should not be confused with either creep or stress relaxation. The test was originally conceived as a measure of state of cure. The test basically involves compressing a cylinder of material to a fixed strain and leaving it for a known temperature for a fixed time. The compression is removed, the cylinder allowed to recover over a fixed time and the height re-measured. The value recorded being the percentage difference according to the equation below;

$$\text{Compression set at Constant Strain} = \frac{to - tr}{to - ts} \times 100$$

Where	
to	is the original thickness
tr	is the thickness after recovery
ts	is the deflection applied (thickness of shim)

Hence, the test as originally conceived would be carried out on test pieces cured for varying times at a fixed temperature and the correct cure determined from where the compression set value was found to be a minimum. Although the original purpose of the test has been superseded by modern rheometers the test continues to be used. The reason for this being the belief that the test gives an indication of creep which can be seen below is not strictly true. Since the test is an amalgamation of that used to assess creep and stress relaxation.



Creep also known as cold flow

Creep is defined as the change in strain with time whilst the elastomer is held under a constant stress. This stress can take the form of compression, tension and/or shear.

In terms of how creep applies to a seal or gasket, this is dependent on whether it is constrained or non-constrained. In the non-constrained environment the strain within the elastomer will increase with time until in theory the stress within the elastomer reaches a minimum. The elastomer seal/gasket will compress and spread out. In the constrained environment the seal/gasket will conform to the groove allowed and the creep arrested.

Stress relaxation

Stress relaxation is defined as the change in stress with time whilst the elastomer is held under a constant strain. Consider that you have a seal that during installation is compressed by 10% of its original thickness. To obtain this 10% compression requires 100 MPa, and you can consider that the elastomer is exerting 100 MPa in return and the seal would be able to retain internal and external forces of 100 MPa. However, with time and ageing the stress exerted by the elastomeric seal can decay i.e. it may only exert 90 MPa yet still be compressed by 10%.

The paragraph above describes the reality of Stress Relaxation in compression, the other two modes of tension or shear can also be measured.

Certain schools of thought recommend that stress relaxation issues can be overcome by increasing the initial compression the seal/gasket is taken to by 25% in the expectation that stress relaxation will occur and the operational force will be that required. This approach obviously assumes that the seal/gasket will be able to withstand the extra strain and the seal/gasket behaviour to the extra stress remains the same. Consideration must also be given to whether it is retained in a groove or free to take up a natural form on deflection.

Compression deflection

This test is carried out using a disc of the gasket/seal material of a known thickness and diameter to which is applied a load equivalent to 100 psi and the deflection measured.

Accelerated ageing tests

In general any of the above tests can be carried out on test samples either aged or cut from test sheets which have been exposed to air ageing at an elevated temperature. Such tests may give an indication of how the material will perform in the long term in the service environment.

Standard Tests Specific to Conductive Elastomers

Volume resistivity

In this test a sample of the conductive elastomer whose dimensions are known is put under compression to a known strain. The difference between the known applied current is compared to that flowing through the elastomer and the resistivity of the elastomer.

Volume resistivity after extension/break

This test is the same as that for volume resistivity except that the sample is punched from the central strip of a dumbbell that has been stretched to break and then allowed to recover for thirty minutes.

This test gives an indication of the behaviour of the material if it is stretched during installation or is re-used during servicing.

Dynamic volume resistivity

In this test the variation in the volume resistivity is measured whilst a sample of known dimensions is put under a fixed load. The load is then oscillated around this fixed point by a known amount over a range of frequencies and the volume resistivity recorded.

The purpose of this test is to give an indication as to how the seal/gasket will perform in service when the vibrations from equipment operations are imposed upon it.

Conductive Silicone & Fluorosilicone Elastomers – Product Handling & Storage

Conductive elastomer products are expected to provide a service life of many years. However, if the product is to be stored, certain factors may have a detrimental effect. Kemtron recommends that the following precautions are carefully observed to ensure product longevity:

Handling

These materials should not be subjected to stretching in either storage or installation otherwise the conductive particles may disperse in the rubber, resulting in degradation of the shielding performance. In addition materials should be handled using cotton gloves to prevent surface contamination. Extra care must be used when fitting gaskets into channels, especially O-Rings. The product should be eased into the final groove shape from each end or opposite diagonals, working slowly inwards or round the outside. It must not be placed in at one end and simply pushed in along the length, this will stretch the gasket and leave excess material. If in doubt please contact us for our recommendations.

Storage temperature

It is recommended that the product be stored at normal ambient temperatures.

Exposure to light & UV

Exposure to any UV source (i.e artificial or natural light) should be avoided if possible. It should be kept stored in light proof, sulphur free packaging.

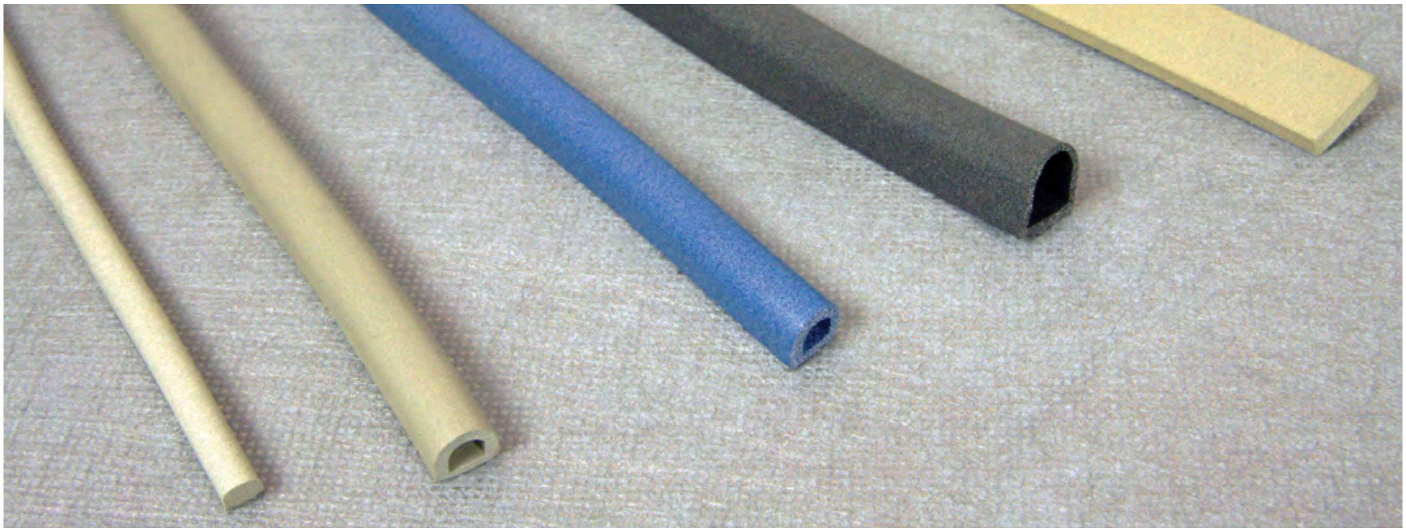
Method of storage

The material must be stored without any stretching or crushing. It is best kept in light proof, sulphur free polythene bags or light proof, sulphur free boxes.

Contact with other materials

The product should not be allowed to come into contact with solvents, oils & greases, PVC, any material containing sulphur, dissimilar rubbers or metal containers.

CONDUCTIVE ELASTOMERS: EXTRUSIONS



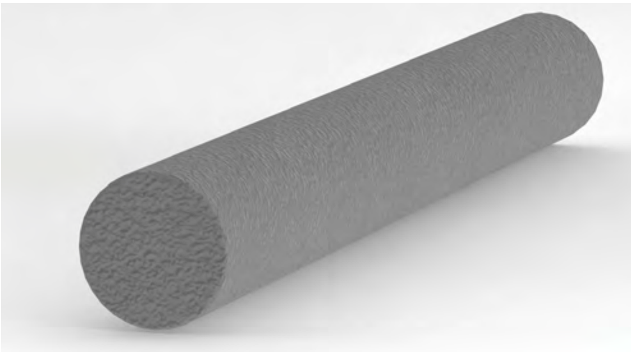
Product Overview

Kemtron manufactures a wide variety of profiles from our standard tooling. We are also able to produce to your exact requirement with minimal tooling cost. Extruded profiles are available in continuous, cut lengths or fabricated to your requirements, such as rectangles by vulcanizing the joints. This process uses the same conductive polymer compound. Ensuring complete electrical conductivity is maintained across the joints. Please see o-ring section.

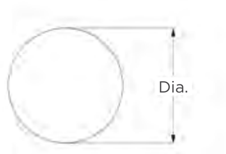
Design Considerations

- When selecting a profile it is important to give attention to the mechanical design of your product. Round and D section seals should ideally be mounted in a suitably sized channel or groove.
- If the gasket is to fit in a groove. It is important that the gasket size chosen does not overfill the groove, when using solid sections you should ensure that the groove cross sectional area is a minimum of 5% greater than the proposed gasket cross section.
  See grove design data.
- Attention must also be paid to the closing force required to compress the gasket to the working height required.
- Self-adhesive backing can be supplied on some flat profiles and usually only partially covers an area of the extrusion. Available as conductive (CSAB) or non conductive (SAB). This adhesive is an assembly aid only.

Technical Specifications: Round



Profile: 1201

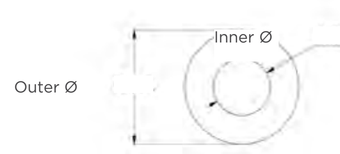


Part Number	Description
2418192-1	Ni/C Silicone Cord 1.0mm
2418091-1	Ni/C Silicone Cord 1.6mm
2418092-1	Ni/C Silicone Cord 1.8mm
2418093-1	Ni/C Silicone Cord 2.0mm
2418094-1	Ag/Al Silicone Cord 1.0mm
2418095-1	Ag/Al Silicone Cord 1.6mm
2418096-1	Ag/Al Silicone Cord 1.8mm
2418193-1	Ag/Al Silicone Cord 2.0mm

Part Number	Description
2418116-1	Ni/C Fsilicone Cord 1.0mm
2418210-1	Ni/C Fsilicone Cord 1.6mm
2418211-1	Ni/C Fsilicone Cord 1.8mm
2418212-1	Ni/C Fsilicone Cord 2.0mm
2418121-1	Ag/Al Fsilicone Cord 1.0mm
2418213-1	Ag/Al Fsilicone Cord 1.6mm
2418214-1	Ag/Al Fsilicone Cord 1.8mm
2418215-1	Ag/Al Fsilicone Cord 2.0mm

Technical Specifications: Tubular

Profile: 1202



Part Number	Description
2418098-1	Ni/C Silicone Tube 1.6mm OD x 0.5mm ID
2418194-1	Ni/C Silicone Tube 2.6mm OD x 1.1mm ID
2418195-1	Ni/C Silicone Tube 3.2mm OD x 1.1mm ID
2418196-1	Ag/Al Silicone Tube 1.6mm OD x 0.5mm ID
2418197-1	Ag/Al Silicone Tube 2.6mm OD x 1.1mm ID
2418198-1	Ag/Al Silicone Tube 3.2mm OD x 1.1mm ID

Part Number	Description
2418216-1	Ni/C Fsilicone Tube 1.6mm OD x 0.5mm ID
2418217-1	Ni/C Fsilicone Tube 2.6mm OD x 1.1mm ID
2418218-1	Ni/C Fsilicone Tube 3.2mm OD x 1.1mm ID
2418219-1	Ag/Al Fsilicone Tube 1.6mm OD x 0.5mm ID
2418220-1	Ag/Al Fsilicone Tube 2.6mm OD x 1.1mm ID
2418221-1	Ag/Al Fsilicone Tube 3.2mm OD x 1.1mm ID

Gasket Groove Sizes

Cord Diametermm	15% Compression		20% Compression	
	Depth	Width	Depth	Width
1.00mm	0.85mm	1.10mm	0.80mm	1.15mm
1.10mm	0.94mm	1.21mm	0.88mm	1.27mm
1.20mm	1.02mm	1.32mm	0.96mm	1.38mm
1.30mm	1.11mm	1.43mm	1.04mm	1.50mm
1.40mm	1.19mm	1.54mm	1.12mm	1.61mm
1.50mm	1.28mm	1.65mm	1.20mm	1.73mm
1.60mm	1.36mm	1.76mm	1.28mm	1.84mm
1.80mm	1.53mm	1.98mm	1.44mm	2.07mm
2.00mm	1.70mm	2.20mm	1.60mm	2.30mm
2.20mm	1.87mm	2.42mm	1.76mm	2.53mm
2.40mm	2.04mm	2.64mm	1.92mm	2.76mm
2.50mm	2.13mm	2.75mm	2.00mm	2.88mm
2.60mm	2.21mm	2.86mm	2.08mm	2.99mm
2.80mm	2.38mm	3.08mm	2.24mm	3.22mm
3.00mm	2.55mm	3.30mm	2.40mm	3.45mm
3.20mm	2.72mm	3.52mm	2.56mm	3.68mm
3.50mm	2.98mm	3.85mm	2.80mm	4.03mm
3.80mm	3.23mm	4.18mm	3.04mm	4.37mm
4.00mm	3.40mm	4.40mm	3.20mm	4.60mm
4.30mm	3.66mm	4.73mm	3.44mm	4.95mm
4.50mm	3.83mm	4.95mm	3.60mm	5.18mm
4.80mm	4.08mm	5.28mm	3.84mm	5.52mm
5.00mm	4.25mm	5.50mm	4.00mm	5.75mm
5.30mm	4.51mm	5.83mm	4.24mm	6.10mm
5.50mm	4.68mm	6.05mm	4.40mm	6.33mm
5.80mm	4.93mm	6.38mm	4.64mm	6.67mm
6.00mm	5.10mm	6.60mm	4.80mm	6.90mm
6.30mm	5.36mm	6.93mm	5.04mm	7.25mm
6.50mm	5.53mm	7.15mm	5.20mm	7.48mm

The above cross sectional area groove sizes allow for the free movement of the gasket when being compressed. This method of calculation ensures that the volume of the gasket does not exceed that of the groove when fully compressed, resulting in groove overfill. This also minimises the amount of compression force required to achieve a good RFI/EMI seal.

It is important to note that when designing in an EMC gasket, that the principles of o-ring design for pressure sealing do not apply. The groove depth dimension is the most important, as it is this that limits the gasket compression. The groove width has no maximum dimension and is only there for gasket location purposes. Tighter groove dimensions using volume calculations may be employed to enhance environmental sealing. However this will increase the compression forces required.

The above calculations are based on reducing the depth of the groove by a given compression % and increasing the width by the same amount less 5% e.g. 20% reduction in depth 15% increase in width.

When choosing a tube section as a gasket it is recommended that consideration be given to the lower compression forces, making sure that there is enough resilience in the gasket to ensure a good RFI/EMI seal. In these cases it is sometimes better to use the volume groove size calculation, with the groove side walls offering support for the tube.

Because there are so many variables with tube cross sections it is difficult to give precise information on this subject. Kemtron Ltd. is able to supply samples for evaluation purposes.

Compression %	10	15	20	25
Cord Diameter (mm)	Force per 100mm			
1.0	17N	24N	35N	47N
2.0	26N	43N	68N	94N
3.0	37N	66N	110N	154N
4.0	66N	105N	146N	196N

Tolerances

- Up to 2mm ± 0.1mm
- 2mm to 5mm ± 0.15mm
- 5mm to 9mm ± 0.2mm

It is also important to consider the tolerances of the gasket and the groove.

Compressed Gasket

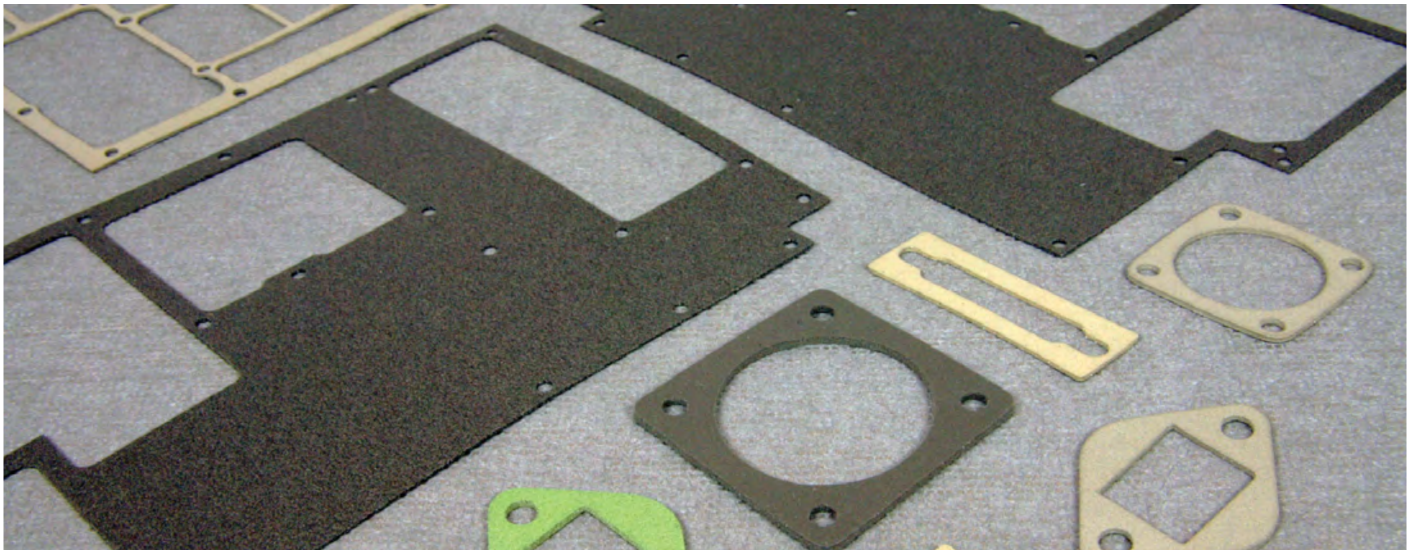
Internal Bend Radius: Casting with Solid Cord Gasket

The minimum internal bend radius of a solid cord gasket is 1.5 x cross section of cord.

Internal Bend Radius: Casting with Tube Gasket

Minimum internal bend radius of a tube gasket where the id of the tube is no greater than 30% of the cross section is 2.5 x cross section of tube.

CONDUCTIVE ELASTOMERS: SHEET & FLAT GASKETS



Product Overview

Flat gaskets are produced from moulded sheet using economic rule dies. Larger gaskets can be cut from moulded or fabricated picture frames. This option has the advantage of saving material and allows larger gaskets to be produced economically. Fabricated frames use either extruded or moulded flat section that is joined by vulcanizing the polymer. The same conductive polymer compound is used to vulcanize the joints ensuring complete electrical conductivity is maintained across the joint .

This process has allowed Kemtron Ltd. to produce gaskets up to 2 meters' long, with the same mechanical and electrical integrity as is found in a single part gasket cut from sheet. This method of manufacture often offers cost savings over cutting from sheet with subsequent loss of waste material.

Our in-house production facilities are suitable for prototype, short and medium production runs, up to commercial quantities.

Design Considerations

- It is important that this material is not over-compressed. If the design of the equipment does not allow for any mechanical method of preventing over-compression, the gasket should be fitted with built-in compression limiters, either metal stops fitted to the gasket, or metal collars fitted into each fixing hole.
- The material is not suitable in sliding applications.
- Recommended compression: 10% to 20%.
- Self-adhesive backing (conductive or non-conductive) is offered as an assembly aid only.
- Fluorosilicone: self-adhesive backing is not recommended for use with this type of elastomer.
- Minimum material width should not be less than 2mm or at least the material thickness in any part of the gasket If this cannot be achieved around fixing holes consider using a slot. Particular attention is required if specifying compression collars in holes.
- Consideration must be given to compression forces, hole centres, size and number of fixings and rigidity of mating flanges.
- Integral compression stops or collars should be considered to limit over compression if external controls cannot be applied. Recommended minimum sheet thickness for integral limits is 1.5mm.

Materials

Material	Material Code
Silicone Nickel Graphite	SNG
Fluorosilicone Nickel Graphite	FNG
Silicone Nickel Graphite Flame Retardant UL94 VO	SNG-FR
Silicone Silver Aluminium 65 Shore A	SSA
Fluorosilicone Silver Plated Aluminium 70 Shore A	FSA(70)
Silicone Silver Aluminium 65 Shore A Blue	SSA(65B)
Silicone Silver Copper	SSC
Fluorosilicone Silver Copper	FSC
Silicone Nickel	SN
Fluorosilicone Nickel	FN

Standard Sheet Sizes

- 150mm x 150mm (code 1210)
- 300mm x 300mm (code 1212)

Standard Thickness

- 0.8mm
- 1.2mm
- 1.6mm

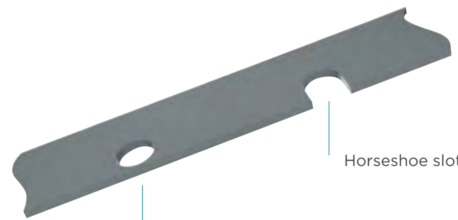
Other thicknesses and sheet sizes are available subject to minimum quantities.

Dimensional Tolerances

- Thickness:
  ± 0.15mm up to 2mm
  ± 0.25mm above 2mm
- Linear ± 0.8mm
- Hole Centre's ± 0.4mm

Minimum Land

Horseshoe



Part Number	Description
2418199-1	Ni/C Silicone Sheet 150mm sq x 0.8mm
2418105-1	Ni/C Silicone Sheet 150mm sq x 0.8mm
2418200-1	Ni/C Silicone Sheet 150mm sq x 1.6mm
2418201-1	Ag/Al Silicone Sheet 150mm sq x 0.8mm
2418202-1	Ag/Al Silicone Sheet 150mm sq x 1.2mm
2418203-1	Ag/Al Silicone Sheet 150mm sq x 1.6mm
2418204-1	Ni/C Silicone Sheet 300mm sq x 0.8mm
2418205-1	Ni/C Silicone Sheet 300mm sq x 1.2mm
2418206-1	Ni/C Silicone Sheet 300mm sq x 1.6mm
2418207-1	Ag/Al Silicone Sheet 300mm sq x 0.8mm
2418208-1	Ag/Al Silicone Sheet 300mm sq x 1.2mm
2418209-1	Ag/Al Silicone Sheet 300mm sq x 1.6m

Part Number	Description
2418222-1	Ni/C Fsilicone Sheet 150mm sq x 0.8mm
2418223-1	Ni/C Fsilicone Sheet 150mm sq x 1.2mm
2418224-1	Ni/C Fsilicone Sheet 150mm sq x 1.6mm
2418225-1	Ag/Al Fsilicone Sheet 150mm sq x 0.8mm
2418226-1	Ag/Al Fsilicone Sheet 150mm sq x 1.2mm
2418136-1	Ag/Al Fsilicone Sheet 150mm sq x 1.6mm
2418137-1	Ni/C Fsilicone Sheet 300mm sq x 0.8mm
2418138-1	Ni/C Fsilicone Sheet 300mm sq x 1.2mm
2418227-1	Ni/C Fsilicone Sheet 300mm sq x 1.6mm
2418228-1	Ag/Al Fsilicone Sheet 300mm sq x 0.8mm
2418142-1	Ag/Al Fsilicone Sheet 300mm sq x 1.2mm
2418143-1	Ag/Al Fsilicone Sheet 300mm sq x 1.6mm

Surface Mounted Gaskets

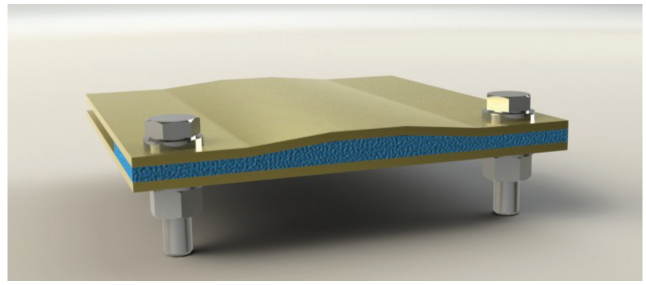
With surface mounted elastomeric gaskets, the aim should be to limit the compression of the gasket to between 10% and 20%. 10% being the minimum with a solid silicone style of gasket. (Some form of compression stop or limit is essential with surface mounted gaskets to prevent over compression).

Compression stops can be built into many styles of gasket, or made as an integral part of the flange. Their height should equal that of the maximum compressed height of the gasket. Compression stops fitted into gaskets can be in the form of collars or washers so that fixing bolts can pass through them or as solid studs located either side of a fixing bolt.

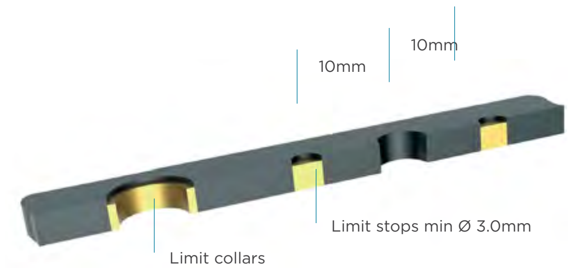
The thickness of the gasket for a known application can be calculated as follows e.g. Consider a gasket which can be compressed between 10% and 25% to be used on flanges which are not perfectly flat, i.e. the flanges without gaskets touch at some points and leave gaps in others. Since the gasket will compress between 10% and 25% we will require 25% compression at the high points and 10% at the low points (the “gaps”). The greatest gap is therefore 15% of the gasket thickness. If that gap is 0.45mm, then a gasket of 3.0mm thickness is required.

This is fine in theory provided that the flanges do not “bow” when placed under load. To overcome flange distortion, fixings may need to be added, the number of which will be determined by the flange stiffness/rigidity.

Compression



Compression Limit Applications



Notice

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