Since 1968, our expertise and innovation and our customers' satisfaction have been at the heart of Getelec's business.

Your satisfaction has been our raison d'être for nearly 45 years.

Unwaveringly focused on finding exclusive solutions, our R&D teams' expertise and know-how are dedicated to defining and implementing bespoke high technology solutions for microwave shielding products, technical sealing solutions and heat dissipation.

Designing, developing and implementing highly reliable and effective systems are our qualitative imperatives, going hand in hand with our customer relationships management, from the initial project definition stages through to design and implementation of your bespoke solutions.

Getelec is a key player in today's European EMC shielding market. This success is due to the involvement of all our operational services in a rigorous quality setting.

Thanks to these actions, GETELEC has an organised Quality and Environment structure, sufficient to earn the full confidence of our current and future customers. This Quality and Environmental framework is a powerful development marker in international markets.

Our constant focus on developing and improving our quality assurance policies have meant that Getelec has secured the award of ISO 9001 and EN 9100 certification, warranting our commitment towards putting our expertise into practice.

This new version of our products and solutions catalogue fully subscribes to this global quality commitment and, more than ever, we are by your side to innovate, turning our actions into the drivers for your next technological success.

Most sincerely

François Dusailly
CEO

Briefing Papers

- Introduction to EMC
- The 24 criteria defining sealing and electromagnetic shielding functionality
- Galvanic couples table
- Telecoms applications
- Military applications

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2 Corrosion-resistant silicone gaskets

3 Insulating silicones

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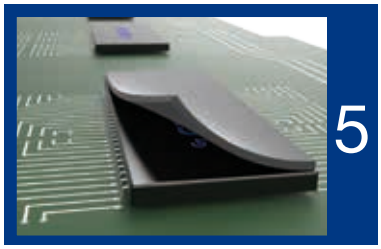

4 Shielding metal gasketing

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6 Microwave absorbent materials

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Introduction to EMC

Electromagnetic compatibility (EMC) means the ability of a device, electric or electronic system,to function satisfactorily in its electromagnetic environment, without introducing intolerable electromagnetic disturbances to anything in that environment.

Electromagnetic compatibility describes a state of "being a good electromagnetic neighbour":

- limiting undesired emissions from the device in order to not disturb radio reception or other devices;
- being sufficiently immune to disturbances from other devices, or the environment more generally.

1 January 1996: European Directive 89/336/CEE on EMC

15 December 2004: European Directive 2004/108/CE

Fields

An electromagnetic wave is characterised by the oscillation of an **electrical field** E (generated by the potential difference between two conductors subject to an electrical current) and a **magnetic field** H (generated by an electrical current flowing thought a conductor).

The wave is characterised by its frequency F or its wavelength l.

l=c/F where c = the speed of light = 300,000 km/s.

The higher the frequency (the smaller the wavelength), the more easily conductors become transmission antennas. So, the nearer a conductor gets to the ideal dimensions to be an antenna (a whole fraction or multiple of the wavelength), the more it radiates energy in the form of electromagnetic waves.

Units used:

- intensity of electrical field E in V/m,
- intensity of magnetic field H in A/m.

Frequency bands
The principles of shielding:

Frequency	300 Hz	3 kHz	30 kHz	300 kHz	3 MHz	30 MHz	300 MHz	3 GHz	30 GHz	300 GHz
Wavelength	1000 km	100 km	10 km	1 km	100 m	10 m	1 m	10 cm	10 mm	1 mm

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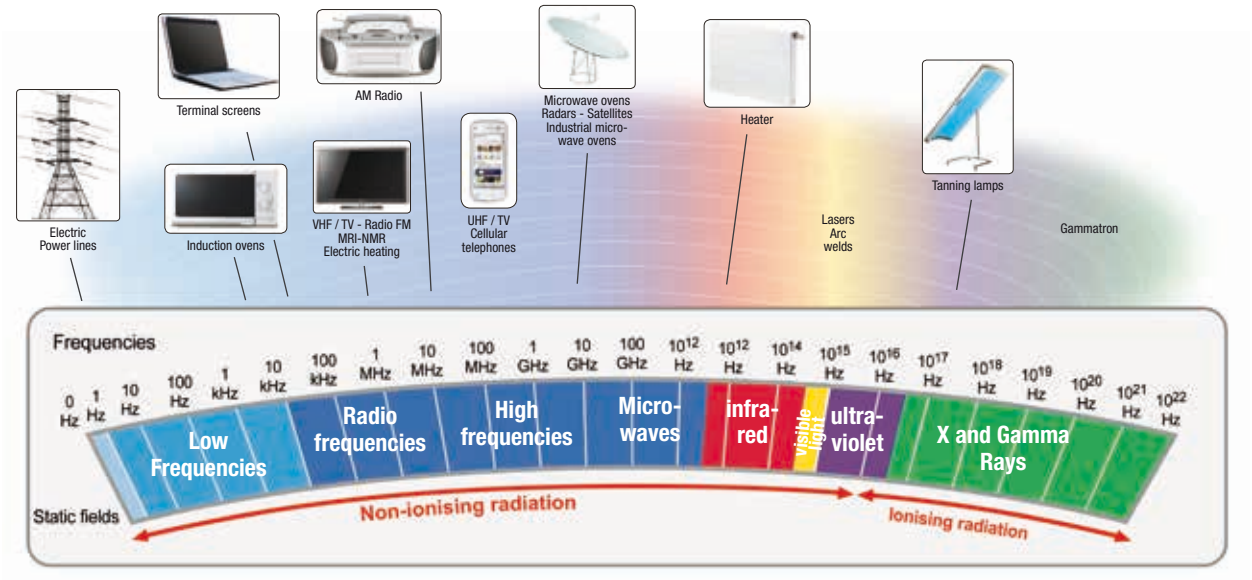

- to attenuate the electromagnetic field emitted by a device in order to make it compliant with radiated emissions
- to attenuate the electromagnetic fields received by the internal electronics of the equipment to make it compliant with electromagnetic immunity standards.

Shielding is:

- Making a screen (shielding) around a cable
- Sealing the openings in a housing by building in a conductive gasket
- Improving the electrical continuity (high frequency) between the cable shielding and the device's chassis.
- Improving the electrical continuity (high frequency) and equipotential bonding of a system's earths without necessarily aiming for sealing.
- Using the housing as a Faraday cage
- Improving the shielding's low frequency (magnetic) and high frequency absorption.

The functions of a conductive silicone gasket

1- Electrical continuity

The function of a conductive gasket is to preserve electrical conductivity in the shielding. The load used for our silicone gaskets depends on the electromagnetic performance desired and the equipment's working environment.

The conductive particles (10 to 40 micron) forming the load (between 60% and 80% of the load) of our conductive formulations can be varied to meet your equipment's galvanic couple.

2- Sealing

Using a conductive silicone gasket fulfils two objectives in just one seal, electrical continuity and physical sealing. And indeed, silicone's properties ensure perfect sealing for the great majority of fluids. In this way, your equipment's operability is guaranteed even in extreme salt fog type conditions.

The 24 criteria defining sealing and electromagnetic shielding functionality

A ELECTROMAGNETIC CRITERIA

1 Frequency band used by system.

2 System's power output.

3 Level of attenuation needed from the shielding system.

4 Emission shielding protection or susceptibility.

5 Compliance with MIL G 83528, STD 285, 89/336/CEE shielding standards.

B EXTERNAL ENVIRONMENT AGGRESSIVITY REQUIREMENTS

6 Working temperature (continuous and peak) and system storage temperature.

7 Working and storage relative humidity.

8 Contact with aggressive substances: hydrocarbons, acids, solvents, NBC, gases, etc.

9 Salt fog resistance (number of hours' exposure).

10 Product inflammability- Compliance with flame resistance standards UL 94 - V0 - V1...

C PHYSICAL REQUIREMENTS

11 Mechanism precision, type of mechanism, means of achieving.
- Sheet metal • Casting • Machining
- Moulding • Plastic

12 Space available flat seal or fitted in a groove.

13 Gasket crush specification
- Crush limits
- Number of screws and spacing between fixings • Tightening torque

14 Sealing system specification.

15 Vibration and shock resistance.

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D USAGE REQUIREMENTS

16 I.P. sealing
- Dripping
- Projection
- Immersion
- Dust

17 Is the system pressurised? To what pressure? With what gas?

18 Nature of mounting and surface protection.

19 Galvanic compatibility.

20 Positioning of product.
- Time planned for positioning product
- Accessibility of mounting
- Manual placement
- Automatic placement
- Adhesiveness of product

21 Frequency of opening and closing the equipment.
- Is the sealing system changed every time it is opened?

E FINANCIAL CONSTRAINTS

22 Planned budget for sealing and shielding.

23 Number of systems to be built? At what rate?

24 Impact of these requirements on the system's functionality.

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Galvanic couples table

1/ Galvanic compatibility

Definition: the power of two different metals to form a stable system
A galvanic effect occurs in the presence of 3 elements: 2 metals and an electrolyte
If two electrodes made of different metals are immersed in an electrolyte, an electrolytic exchange occurs which generates an electrical current.
The electrode supplying electrons will then erode.
Depending on the type of metals used and the presence of damp and salt fog (or any other acid or base), there is a paramount necessity to reduce the galvanic couples of the metals in contact.
If the contact surface is small, the current density will be strong, and so will the corrosion. Conversely, if the contact surface is large, the current density will be small, and there will be less corrosion.

2- Measuring the corrosion potential

In order to arrive at the resulting galvanic couple, the voltage developed between the two electrodes made of different materials is deduced from the voltage difference between them.
The different electrodes are immersed in an electrolyte (3% NaCl) and connected to a reference electrode.

TYPE OF MATERIAL	Potential Difference (PD) in Volts	Chrome-plated steel, Brass (BR)	Galvanised steel	Stainless	Iron-nickel-chrome alloy	Aluminium (Al)	Silver (Ag)	Passivated Stainless Steel	Tin (Sn)	Iron (Fe)
Potential Difference (PD) in Volts		**-0.35**	**-1.05**	**-0.55**	**-0.2**	**-0.75**	**0**	**-0.45**	**-0.5**	**-0.7**
Chrome-plated steel, Brass (BR)	- 0.35	0	0.7	0.2	0.15	0.4	0.35	0.1	0.15	0.35
Galvanised steel	- 1.05	0.7	0	0.55	0.85	0.3	1.05	0.6	0.55	0.35
Stainless	- 0.55	0.2	0.55	0	0.35	0.25	0.55	0.1	0.05	0.2
Iron-nickel-chrome alloy	- 0.2	0.15	0.85	0.35	0	0.55	0.2	0.25	0.3	0.5
Aluminium (Al)	- 0.75	0.4	0.3	0.25	0.55	0	0.75	0.3	0.25	0.05
Silver (Ag)	0	0.35	1.05	0.55	0.2	0.75	0	0.45	0.5	0.7
Passivated Stainless Steel	- 0.45	0.1	0.6	0.1	0.25	0.3	0.45	0	0.05	0.25
Tin (Sn)	- 0.5	0.15	0.55	0.05	0.3	0.25	0.5	0.05	0	0.2
Iron (Fe)	- 0.7	0.35	0.35	0.2	0.5	0.05	0.7	0.25	0.2	0
Monel, Nickel (Ni), Copper (Cu)	- 0.3	0.05	0.75	0.25	0.1	0.45	0.3	0.15	0.2	0.4
Platinum (Pt), Gold (Au), Graphite (C)	0.25	0.6	1.3	0.8	0.45	1	0.25	0.7	0.75	0.95
Titanium	- 0.15	0.2	0.9	0.4	0.05	0.6	0.15	0.3	0.35	0.55
Zinc	- 1.1	0.75	0.05	0.6	0.75	0.35	1.1	0.65	0.6	0.4
Magnesium alloys	- 1.6	1.25	0.55	1.1	1.4	0.85	1.6	1.15	1.1	0.9
Alodine 1200 treated aluminium alloy	- 0.78	0.43	0.27	0.23	0.58	0.03	0.78	0.33	0.28	0.08
GETELEC PRODUCTS										
GT 1000 (Cu / Ag)	- 0.15	0.20	0.90	0.40	0.05	0.60	0.15	0.30	0.35	0.55
GT 5000 (Al / Ag)	- 0.6	0.25	0.45	0.05	0.4	0.15	0.6	0.15	0.1	0.1
GT 2000 (Ag)	- 0.05	0.3	1	0.5	0.15	0.7	0.05	0.4	0.45	0.65
BL 10000 (Carbon)	- 0.2	0.15	0.85	0.35	0	0.55	0.2	0.25	0.3	0.5
GT 3100 (Ni / C)	- 0.09	0.26	0.96	0.46	0.11	0.66	0.09	0.36	0.41	0.61

These values are indicative only and are to be weighted depending on the degree of salt fog exposure.

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The potential difference (pd) at the two electrodes' terminals is then noted.

For items subjected to:

Salt fog, the metal load must be chosen to ensure the potential difference between the conductive content of the gasket and the metal housing is less than 0.25V

High humidity (in a non-saline environment), the potential difference must not exceed 0.45V

3 - Examples

Aluminium and silver
0.75 – 0.00 = 0.75 (inadmissible couple)

Zinc and passivated stainless steel
1.10 – 0.45 = 0.65 (inadmissible couple)

Aluminium and GT5000
0.75 – 0.60 = 0.15 (acceptable couple)

Monel, Nickel (Ni), Copper (Cu)	Platinum (Pt), Gold (Au) Graphite (C)	Titanium (Ti)	Zinc (Zn)	Magnesium alloys	Alodine 1200 treated aluminium alloy		GT 1000 (Cu / Ag)	GT 5000 (Al / Ag)	GT 2000 (Ag)	BL 10000 (Carbon)	
-0.3	0.25	-0.15	-1.1	-1.6	-0.78		-0.15	-0.6	-0.05	-0.2	-0.09
0.05	0.6	0.2	0.75	1.25	0.43		0.20		0.3	0.15	0.26
0.75	1.3	0.9	0.05	0.55	0.27		0.90	0.45	1	0.85	0.96
0.25	0.8	0.4	0.6	1.1	0.23		0.40	0.05	0.5	0.35	0.46
0.1	0.45	0.05	0.9	1.4	0.58		0.05	0.4	0.15	0	0.11
0.45	1	0.6	0.35	0.85	0.03		0.60	0.15	0.7	0.55	0.66
0.3	0.25	0.15	1.1	1.6	0.78		0.15	0.6	0.05	0.2	0.09
0.15	0.7	0.3	0.65	1.15	0.33		0.30	0.15	0.4	0.25	0.36
0.2	0.75	0.35	0.6	1.1	0.28		0.35	0.1	0.45	0.3	0.41
0.4	0.95	0.55	0.4	0.9	0.08		0.55	0.1	0.65	0.5	0.61
0	0.55	0.15	0.8	1.3	0.48		0.15	0.3	0.25	0.1	0.21
0.55	0	0.4	1.35	1.85	0.53		0.10	0.35	0.2	0.05	0.16
0.15	0.4	0	0.95	1.45	0.63		0	0.45	0.1	0.05	0.06
0.8	1.35	0.95	0	0.5	0.32		0.95	0.5	1.05	0.9	1.01
1.3	1.85	1.45	0.5	0	0.82		1.45	1	1.55	1.4	1.51
0.48	0.53	0.63	0.32	0.82	0		0.63	0.18	0.73	0.58	0.69
0.15	0.10	0	0.95	1.45	0.63		0	0.4	0.95	0.8	0.91
0.3	0.35	0.45	0.5	1	0.18		0.4	0	0.55	0.4	0.51
0.25	0.2	0.1	1.05	1.55	0.73		0.95	0.55	0	0.15	0.04
0.1	0.05	0.05	0.9	1.4	0.58		0.8	0.4	0.15	0	0.11
0.21	0.16	0.06	1.01	1.51	0.69		0.91	0.51	0.04	0.11	0

GETELEC PRODUCTS

CATHODE

Direction of corrosion

ANODE

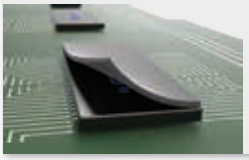
Telecoms applications

GETELEC has had the expertise, through its experience, to develop shielding products suitable for the telecoms market. Particularly in terms of the conductor - carbon filled silicone conductor mix routinely used for sealing cabinet doors and telecoms bays. The extruded profiles are developed to suit your equipment design and are delivered direct as adhesive products.

Conductive door gasket, pg.29

Carbon loaded conductive gasket for shielding telecoms bays and cabinets. Supplied with adhesive strip for easy application to your doors.

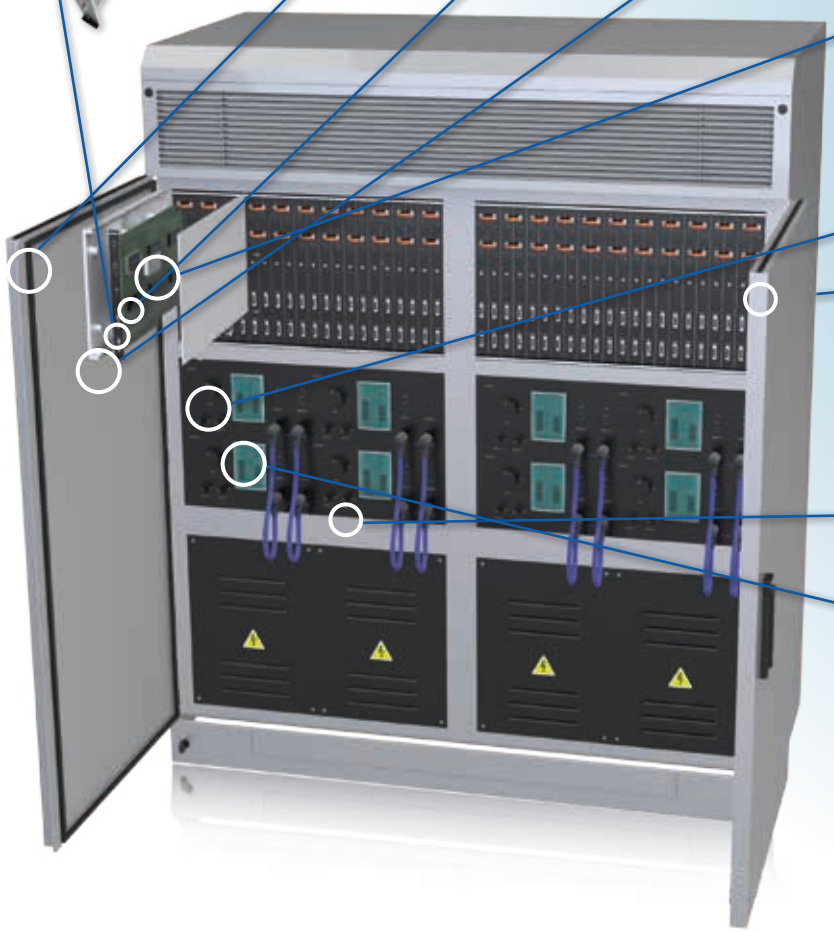
Thermally conductive gap fillers, pg.107



To reduce a component's thermal resistance, it is useful to dissipate the heat emitted by its power. These products are available as custom-cut seals in different thicknesses.

Bronze beryllium spring fingers

Bronze beryllium spring fingers for electromagnetic shielding of racks.



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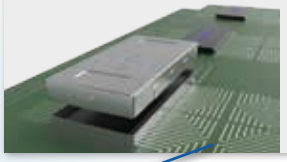
Extruded conductive silicone gasket, pg.23

Extruded conductive silicone profile providing EMI sealing between 2 devices. Wide choice of standard profiles to suit your grooves, with a custom-made option available. Material chosen to suit the application and required technical properties.

Tinned steel shielding covers



These covers enable the rapid shielding of part of a circuit, either radiating or susceptible to EMI/RFI interference on a printed circuit board.

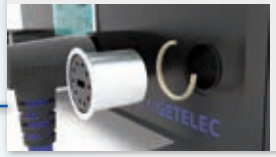
Pre-cut conductive silicone gaskets, pg.32

Pre-cut conductive gaskets ensure sealing and electromagnetic shielding. Gaskets are cut from sheets made in a range of conductive materials and thicknesses from 0.5mm to 10mm.

Sealing gasket, pg.63

"T" seal, also called "scraper seal" designed to drive water away from the door opening in telecoms bays and cabinets, thus maintaining perfect sealing in the equipment bay.

Moulded conductive silicone gaskets, pg.34



Conductive moulded gaskets ensure sealing and electromagnetic shielding. Getelec is able to offer both standard and custom shapes.

Connector overmolding, pg.132

Using high pressure overmolding technology, Getelec is able to carry out conductive and non-conductive thermoplastic overmolding guaranteeing your connectors are sealed and avoiding time-consuming and costly heat shrinking procedures.

Military applications

GETELEC has been developing its own MIL G 83528-compliant conductive formulations for more than 40 years. Our expertise in sealing materials has brought us to work in close collaboration with the major military sector procurement agencies to meet their contractual demands.

Tinned steel shielding covers

These covers enable the rapid shielding of part of a circuit, either radiating or susceptible to EMI/RFI interference on a printed circuit board.

Pre-cut conductive silicone gaskets, pg.32

Pre-cut conductive gaskets ensure sealing and electromagnetic shielding. Gaskets are cut from sheets made in a range of conductive materials and thicknesses from 0.5 mm to 10 mm.

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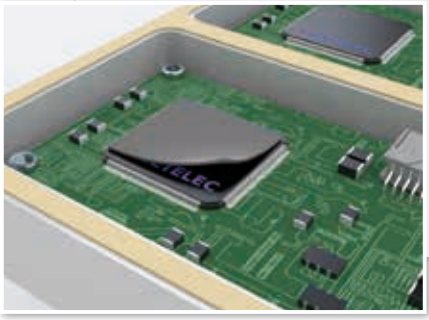
Corrosion-resistant silicone gaskets, pg.50

The bi-material seal is made of a conductive silicone and an insulating silicone bonded together by co-extrusion into one seal. This separates the shielding and sealing functions and the seal is, therefore, much more resistant to salt fog type extreme environments.

Thermally conductive gap fillers, pg.107



To reduce the thermal resistance which could damage a component, it is useful to dissipate the heat emitted by its power. These products are available as custom-cut seals in different thicknesses.

Electromagnetic shielding windows, pg.102

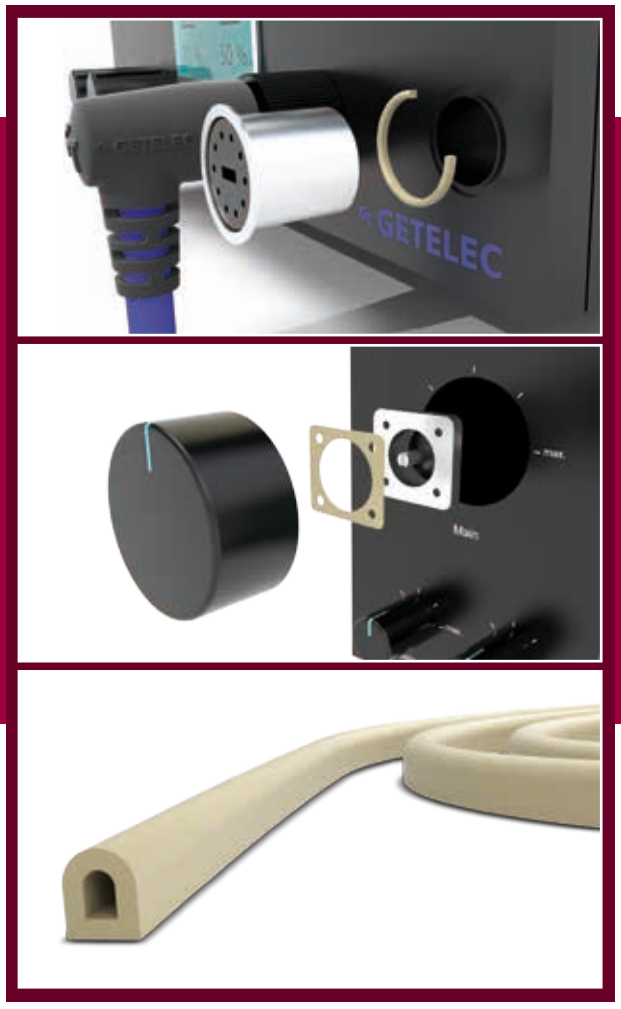
Shielded windows provide electromagnetic protection to the front face of display screens. Available in polycarbonate or glass, their light transmission can be as much as 82%.

Moulded conductive silicone gaskets, pg.34

Conductive moulded gaskets ensure sealing and electromagnetic shielding. Getelec is able to offer both standard and custom shapes.

GETELEC

CONDUCTIVE SILICONE GASKETS



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CONTENTS

Introduction

GETELEC formulates its own conductive materials and uses its expertise to transform them, thus enabling us to provide our clients with bespoke solutions.

We use specific silicone grades as the basis of our formulations to which we add conductive loads so that they have electromagnetic shielding properties.

The load used depends on the electromagnetic performance desired and the environment your equipment is working in.

The conductive particles (10 to 40 micron) forming the load (between 60% and 80% of the load) of our conductive formulations can be varied in order to achieve the right formulation for each application and environment.

In this way, electromagnetic performance and attenuation levels vary depending on the conductive material load, permitting us to adjust material costs to suit your application.

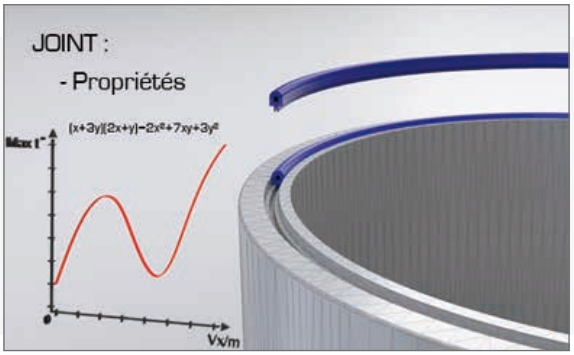
All our formulations meet MIL G 83528 standard and guarantee to comply with your customer specifications.

The 3 main objectives of our formulations:

- electrical continuity performance
- mechanical performance (residual deformation, elongation at break etc.)
- Resistance to extreme temperatures

Our laboratory and research centre support clients from selection of material through to the choice of transformation procedure.

Our in-house control of the different processes means we are able to create a bespoke solution for your environment.



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Guide to conductive materials by industry sector

GETELEC has been developing its own MIL G 83528-compliant conductive formulations for more than 40 years. Over this period our engineers have developed a broad range of conductive silicones with various loads (Cu/Ag, Al/Ag, Ag, Ni/C, Carbon etc.) In this way we have electrically conductive materials to meet every client's different requirements.

MILITARY AND AERONAUTIC APPLICATIONS PRODUCTS

Reference	Load	Attenuation 200MHz – 10GHz	Temperature (°C)	Comments	Transformation possibilities
GT 1000 GT 1007	Silver-plated copper Fluorosilicone version	120 to 140 dB	-55 to +125	Good EMP shielding Low degassing rate Electrical and thermal conductor all in one. Very stable over time. High mechanical strength	
GT 5000 GT 5007	Silver plated aluminium Fluorosilicone version	104 to 137 dB	-55 to +160	Compatible with most alloys. Low density Resistant to high temperatures (200°C peak)	
GT 5080 GT 5087	Treated silver plated aluminium Fluorosilicone version	80 dB	-55 to +160	Good resistance to extreme corrosion	
GT 2020 GT 2024 GT 2027	Silver Fluorosilicone version	60 dB	-55 to +160	High electromagnetic performance product - highly conductive - very low volume resistivity - excellent attenuation performance Resistant to high temperatures (200°C peak)	

CIVILIAN ELECTRONIC APPLICATIONS PRODUCTS

Reference	Load	Attenuation	Temperature (°C)	Comments	Transformation possibilities
GT 1015	Silver-plated copper	120 to 140 dB	-55 to +125	Good EMP shielding Low degassing rate Electrical and thermal conductor all in one. Very stable over time. High mechanical strength	
GT 5080 GT 5087	Treated silver plated aluminium Fluorosilicone version	80 dB	-55 to +160	Good salt fog resistance	
GT 2660 GT 2667	Silver Fluorosilicone version	110 dB	-55 to +160	Conductive outer skin around non-loaded silicone Low cost solution	

TELECOMS APPLICATIONS PRODUCTS

Reference	Load	Attenua-tion	Temperature (°C)	Comments	Transformation possibilities
GT 3100 GT 3107	Nickel Graphite Fluorosilicone version	100 dB	-55 to +150	Good low frequency performance Stable electrical properties UL 94V0 compliant grade	
BL 10000 BL 10007	Carbon Fluorosilicone version	105 dB	-55 to +125	Conductive and leaktight product very often used for sealing telecoms cabinet doors. Good mechanical properties (RDC, elongation at break) Very good salt fog resistance UL 157 compliant	

Moulded Extruded Cut Secured by vulcanisation Sheet

Conductive silicones

We use specific silicone grades as the basis of our formulations to which we add conductive loads so that they have electromagnetic shielding properties.

The load used depends on the electromagnetic performance desired and the environment your equipment is working in.

The conductive particles (10 to 40 micron) forming the load (between 60% and 80% of the load) of our conductive formulations can be varied in order to achieve the right formulation for each application and environment.
All our formulations meet MIL G 83528 standard and guarantee to comply with your customer specifications.

The 3 main objectives of our formulations:

- electrical continuity performance
- mechanical performance (Residual deformation, elongation at break etc.)
- Resistance to extreme temperatures

	Standards	GT 1000	GT 1007	GT 1015	GT 2020	GT 2024	GT 2027	GT 3000	GT 3007	
Type MIL G 83528		K	C	A	-	E	F	L		
Elastomer		Silicone	Fluorosilicone	Silicone	Silicone	Silicone	Fluorosilicone	Silicone	Fluorosilicone	
Fillers		Silver-plated copper	Silver-plated copper	Silver-plated copper	Pure silver	Pure silver	Pure silver	Silver plated nickel	Silver plated nickel	
Volume resistivity Ω.cm	MIL G 83528	< 0.005	< 0.006	< 0.004	< 0.006	< 0.0016	< 0.006	< 0,005	< 0.006	
Shore hardness A ±7	ASTM D 2240	82	73	69	75	69	75	75	60	
Density g/cm³	ASTM D 792 Method A	3.40	3.90	3.64	3.90	3.80	4.30	3.70	3.50	
Break resistance kg/cm	ASTM D 412 Method A C	2.20	1.79	1.78	4.61	2.64	-	3,00	2.4	
% elongation at break	ASTM D 412 Method A C	341	250	283	355	380	-	290	250	
Tear strength kg/cm	ASTM D 624 C	13.44	8.92	13.83	13.73	16.28	-	9,50	7.50	
% residual deformation after 70 hours' compression at 100°C	ASTM D 395 Method B	17.50	25.30	14.30	-	15.10	19	< 32	< 35	
Working temperature °C		-55 to +125	-55 to +125	-55 to +125	-55 to +160	-55 to +160	-55 to +160	-55 to + 125	-55 to + 125	
Colour		Grey	Grey	Grey	Light beige	Light beige	Beige	Grey	Grey	
Shielding performance: 20 MHz 100 MHz 500 MHz 2GHz 10GHz		130 dB 140 dB 120 dB 120 dB 120 dB	113 dB 144 dB 119 dB 128 dB 114 dB	113 dB 139 dB 120 dB 128 dB 114 dB	110 dB 110 dB 110 dB 110 dB 110 dB	113 dB 147 dB 118 dB 128 dB 110 dB	125 dB 110 dB 110 dB 110 dB 110 dB	120 dB 126 dB 137 dB 132 dB 112 dB	120 dB 126 dB 137 dB 132 dB 112 dB	

Moulded Extruded Cut Secured by vulcanisation Sheet

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SHEET SIZE 300mm x 300mm	
Thickness (mm)	TOLERANCES
0.20	± 0.07
From 0.30 to 0.40	± 0.1
0.50	± 0.15
0.60	± 0.15
0.70	± 0.15
0.80	± 0.18
0.90	± 0.18
From 1.0 to 2.0	± 0.20
Up to 2	± 13%

SHEET SIZE 150mm x 150mm	
Thickness (mm)	TOLERANCES
0.20	+0.05 / -0
From 0.30 to 0.40	± 0.05
0.50	± 0.07
0.60	± 0.10
0.70	± 0.10
0.80	± 0.15
0.90	± 0.15
From 1.0 to 2.0	± 0.15
Up to 2	± 13%

The tolerances for control are those shown on this page except when a FAI, a DVI or specific control document is request to GETELEC.

	GT 3100	GT 3107	GT 4000	GT 5000	GT 5007	GT 5080	GT 5087	GT 6000	BL 10000	BL 10007	GT 13100
	-	-	M	B	D	-	-				
	Silicone	Fluorosilicone	Silicone	Silicone	Fluorosilicone	Silicone	Fluorosilicone	EPDM	Silicone	Fluorosilicone	Thermoplastic elastomer
	Nickel Graphite	Nickel Graphite	Silver plated glass	Silver plated aluminium	Silver plated aluminium	Treated aluminium	Treated aluminium	Silver plated aluminium	Carbon	Carbon	Nickel Graphite
	< 0.10	< 0.10	< 0.015	< 0.0054	< 0.0029	2.5	2.5	< 0.015	2.7	2.7	0.03
	65	65	67	65	71	70	80	70	70	70	55
	2	2.3	2	1.90	2	2.5	2.5	2	1.22	1.28	2.34
	1.37	1.30	2.47	1.89	1.85	1.38	1.38	1.70	4.41	4.41	0.50
	150	200	180	286	262	100 / 300	100 / 300	470	200	200	200
	8.73	6.08	8.06	8.43	7.36	4.37	4.37	12.00	11.77	0.00	4.10
	40	25	25	17.30	21	30	30	40	18	18	40
	-55 to +150	-55 to +150	-55 to +160	-55 to +160	-55 to +160	-55 to +160	-55 to +160	-45 to +160	-55 to +125	-55 to +125	-35 to +90
	Dark grey	Dark grey	Grey	Grey	Light blue	Black	Black	Grey	Black	Black	Grey
	100 dB 100 dB 100 dB 100 dB 100 dB	100 dB 100 dB 100 dB 100 dB 100 dB	118 dB 131 dB 138 dB 132 dB 112 dB	128 dB 137 dB 133 dB 122 dB 104 dB	105 dB 108 dB 110 dB 115 dB 91 dB	80 dB 80 dB 80 dB 80 dB 80 dB	80 dB 80 dB 80 dB 80 dB 80 dB	128 dB 137 dB 133 dB 122 dB 104 dB	60 dB 105 dB 105 dB 105 dB 105 dB	60 dB 60 dB 60 dB 60 dB 60 dB	90 dB 90 dB 90 dB 90 dB 90 dB
											Injection

All these material may be available in UL version on demand.

Extruded Conductive Silicone

Most of GT conductive materials can be extruded in various sections.
Spliced to form O ring gaskets, they allow production of customized gaskets without tooling charge, and within very short deadline.
Large range of standard sections available. Special section can be supplied upon request.

SPECIFICATIONS

SILICONE ELASTOMER			
MATERIAL	TYPE	FILLER	RESISTIVITY (mΩ/cm) MIL G 83528
GT 1000	K	Silver plated Copper	15
GT 2020	E	Silver	6
GT 3100		Nickel/Graphite	100
GT 5000	B	Silver plated Aluminium	8
BL 10000		Carbon	< 6 Ω-cm

FLUOROSILICONE ELASTOMER			
MATERIAL	TYPE	FILLER	RESISTIVITY (mΩ/cm) MIL G 83528
GT 1007	C	Silver plated Copper	15
GT 2027	F	Silver	10
GT 5007	D	Silver plated Aluminium	12
GT 3107		Nickel/Graphite	100

TOLERANCES ON CROSS SECTION FOR EXTRUDED PROFIL	
DIMENSIONS (mm)	TOLERANCES
From 0.5 to 1.8	± 0.07
From 1.8 to 2.5	± 0.10
From 2.5 to 5.0	± 0.15
From 5.0 to 9.0	± 0.25
> 9.0	± 3%

TOLERANCES ON HOLLOW CROSS SECTION FOR EXTRUDED PROFIL	
DIMENSIONS (mm)	TOLERANCES
From 0.5 to 1.0	± 15%
> 1.0	± 10%

The tolerances for control are those shown on this page except when a FAI, a DVI or specific control document is request to GETELEC.

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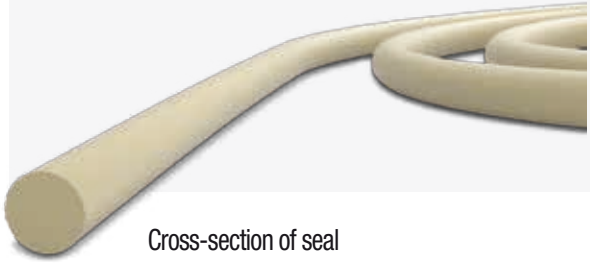
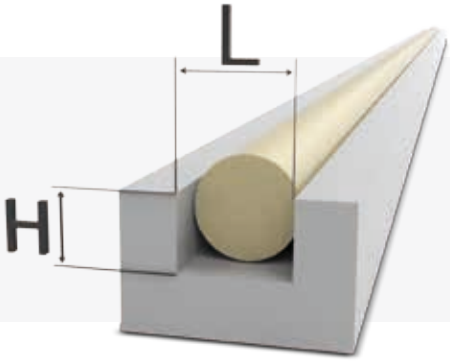
Solid round profile

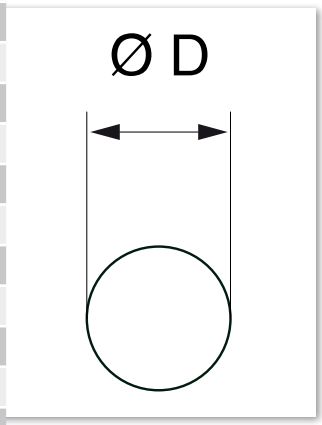


Cross-section of seal



Recommended groove dimensions
Machining tolerance: ± 0.05

Ref.	D (mm)	H (mm)	L (mm)	Ref.	D (mm)	H (mm)	L (mm)
0538	0.50	0.4	0.6	2922	2.90	2.3	3.2
0710	0.71	0.6	0.8	3024	3.00	2.4	3.3
0810	0.80	0.6	0.9	3172	3.17	2.5	3.5
1020	1.00	0.8	1.1	3326	3.30	2.6	3.6
1211	1.20	1.0	1.3	3529	3.50	2.8	3.8
1251	1.25	1.0	1.4	3600	3.60	2.9	3.9
1351	1.35	1.1	1.5	3831	3.80	3.0	4.1
1400	1.40	1.1	1.5	4033	4.00	3.2	4.4
1550	1.50	1.2	1.6	4150	4.15	3.3	4.5
1613	1.60	1.3	1.7	4500	4.50	3.6	4.9
1735	1.70	1.4	1.9	5045	5.00	4.0	5.5
1815	1.80	1.4	2.0	5342	5.33	4.3	5.8
1900	1.90	1.5	2.1	5400	5.40	4.3	5.9
2017	2.00	1.6	2.2	5545	5.50	4.4	6.0
2218	2.20	1.8	2.4	6050	6.00	4.8	6.5
2419	2.40	1.9	2.6	6452	6.40	5.1	7.0
2502	2.50	2.0	2.7	7056	7.00	5.6	7.6
2621	2.60	2.1	2.8	7040	7.40	5.9	8.1
2725	2.70	2.2	2.9	8064	8.00	6.4	8.7
2842	2.84	2.3	3.1	1012	10.00	8.0	10.9



Contact us for alternative sizes.

Example:

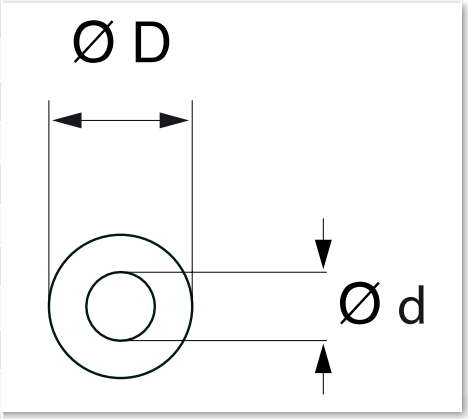
1613 GT1000 = profile reference + Silicone silver plated conductor

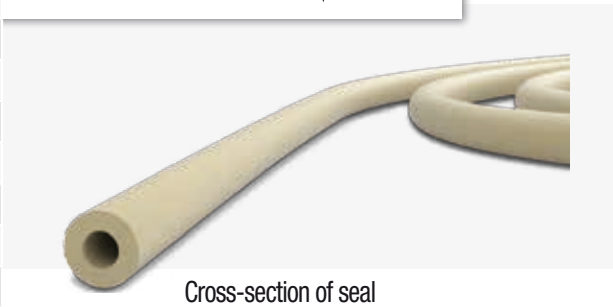
Recommended groove dimensions calculation is based on the following data:

Average seal compression 20%
Groove fill rate 90%

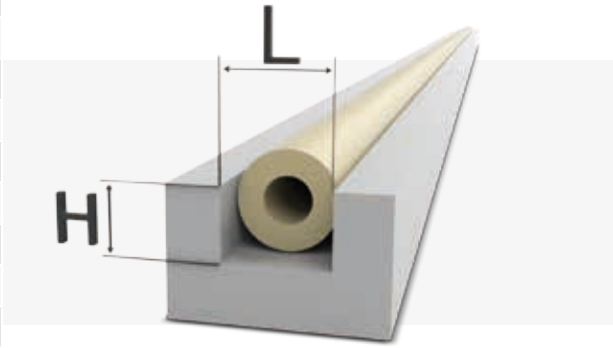
Hollow round profile

Ref.	D (mm)	d (mm)	L (mm)	H (mm)	Ref.	D (mm)	d (mm)	L (mm)	H (mm)
1005	1.00	0.50	0.8	0.8	3214	3.18	1.40	2.8	2.4
1305	1.30	0.55	1.2	1.0	3211	3.20	1.10	3.1	2.4
1406	1.45	0.65	1.3	1.1	3215	3.20	1.50	2.8	2.4
1607	1.50	0.70	1.3	1.1	3217	3.20	1.70	2.5	2.4
1605	1.60	0.50	1.6	1.2	32016	3.20	1.60	2.6	2.4
1608	1.60	0.80	1.3	1.2	3202	3.20	2.00	2.1	2.4
1808	1.80	0.80	1.6	1.4	3412	3.40	1.20	3.3	2.6
1812	1.80	1.10	1.2	1.4	3420	3.40	2.00	2.4	2.6
2011	2.00	1.10	1.5	1.5	3519	3.50	1.90	2.7	2.6
2050	2.00	0.50	2.1	1.5	4013	4.00	1.30	3.9	3.0
2080	2.00	0.80	1.9	1.5	4020	4.00	2.00	3.3	3.0
2108	2.10	0.80	2.0	1.6	4520	4.50	2.00	4.0	3.4
2112	2.10	1.27	1.5	1.6	4525	4.50	2.50	3.4	3.4
2206	2.25	0.60	2.3	1.7	5023	5.00	2.30	4.3	3.8
2309	2.30	0.89	2.2	1.7	5323	5.30	2.30	4.7	4.0
2310	2.30	1.00	2.1	1.7	5535	5.50	3.50	3.6	4.1
2313	2.30	1.30	1.7	1.7	6030	6.00	3.00	5.0	4.5
2505	2.50	0.50	2.6	1.9	6004	6.00	4.00	3.7	4.5
2510	2.50	1.00	2.3	1.9	6432	6.40	3.20	5.3	4.8
2511	2.50	1.10	2.2	1.9	7034	7.00	3.40	5.9	5.3
2608	2.60	0.80	2.6	2.0	7037	7.00	3.75	5.5	5.3
2610	2.60	1.00	2.4	2.0	7837	7.85	3.75	6.7	5.9
2612	2.60	1.20	2.3	2.0	7949	7.95	4.88	5.5	6.0
2611	2.68	1.08	2.5	2.0	8061	8.00	6.00	3.9	6.0
2717	2.75	1.70	1.9	2.1	9060	9.00	6.00	5.5	6.8
2808	2.80	0.80	2.8	2.1	9563	9.50	6.40	5.7	7.1
2815	2.80	1.50	2.2	2.1	1106	11.00	6.50	7.9	8.3
30010	3.00	1.00	2.9	2.3	1206	12.00	6.00	9.9	9.0
3011	3.00	1.10	2.9	2.3	1208	12.00	8.00	7.3	9.0
3012	3.00	1.20	2.8	2.3	1209	12.00	9.00	5.8	9.0
3014	3.00	1.40	2.6	2.3	1601	16.00	15.00	2.1	12.0
3016	3.00	1.60	2.4	2.3	2813	28.00	12.50	24.7	21.0
3212	3.18	1.14	3.1	2.4	3002	30.00	20.00	18.4	22.5





Cross-section of seal



Recommended groove dimensions
Machining tolerance: ± 0.05

Contact us for alternative sizes.

Example:

1613 GT1000 = profile reference + Silicone silver plated conductor

Recommended groove dimensions calculation is based on the following data:

Average seal compression 25%
Groove fill rate 95%

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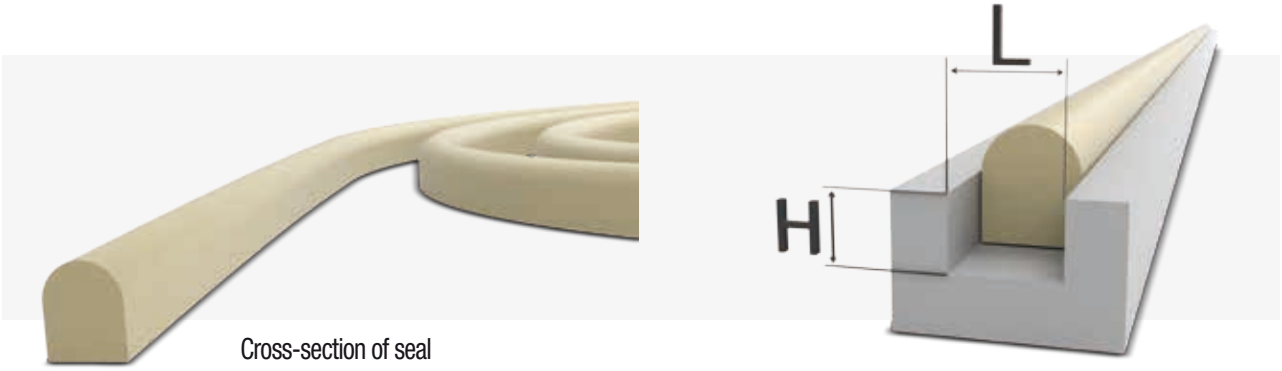
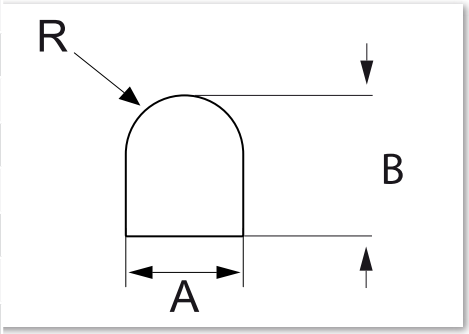
Solid "D" profile



Cross-section of seal

Recommended groove dimensions
Machining tolerance: ± 0.05

Ref.	A (mm)	B (mm)	R (mm)	L (mm)	H (mm)
1617	1.60	1.70	0.80	1.8	1.4
2022	2.00	2.20	1.00	2.3	1.9
2024	2.00	2.40	1.00	2.3	2.0
2217	2.20	1.750	1.10	2.4	1.5
2420	2.40	2.00	1.20	2.7	1.7
2713	1.30	2.70	0.65	1.6	2.3
3035	3.00	3.50	1.50	3.5	3.0
3045	3.00	4.50	1.50	3.6	3.8
3046	3.00	4.60	1.50	3.6	3.9
3060	3.00	6.00	1.50	3.6	5.1
3997	3.96	3.96	1.98	4.5	3.4
4030	3.96	3.00	1.50	4.3	2.6
4544	4.50	4.40	2.25	5.1	3.7
5040	4.00	5.00	2.00	4.7	4.3
50045	5.00	4.50	2.50	5.6	3.8
60031	6.00	3.00	3.00	6.0	2.6



Contact us for alternative sizes.

Example:

1613 GT1000 = profile reference + Silicone silver plated conductor

Recommended groove dimensions calculation is based on the following data:

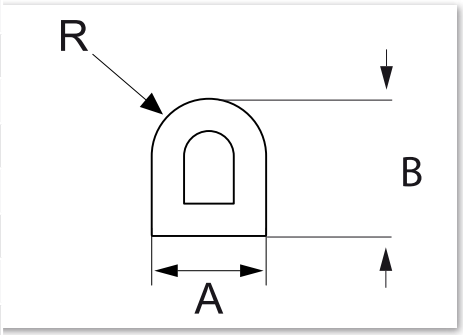
Average seal compression 15%
Groove fill rate 92%

Hollow "D" profile

Cross-section of seal

Recommended groove dimensions
Machining tolerance: ± 0.05

Ref.	A (mm)	B (mm)	R (mm)	Wall thickness (mm)
3931	3.92	3.00	1.96	0.80
3996	3.96	3.96	1.98	1.14
4031	3.96	3.00	2.00	0.80
4747	4.70	4.70	2.35	1.27
47047	4.75	4.75		
4948	4.80	4.80	2.40	1.30
6031	6.00	3.00		
6331	6.35	6.35	3.18	1.61
70009	7.00	9.00	3.50	1.60
70011	7.00	10.00		
70080	7.00	8.00		
7638	7.60	3.00		
7639	7.60	3.98	3.80	1.00
7979	7.90	7.90	3.95	1.57
1003	10.00	10.00		1.57
1030	10.00	3.00		
1111	11.99	10.99	6.00	2.00
1510	15.00	10.00	7.50	1.50



Contact us for alternative sizes.

Example:

3931 GT1000 = Silicone loaded with silver plated copper

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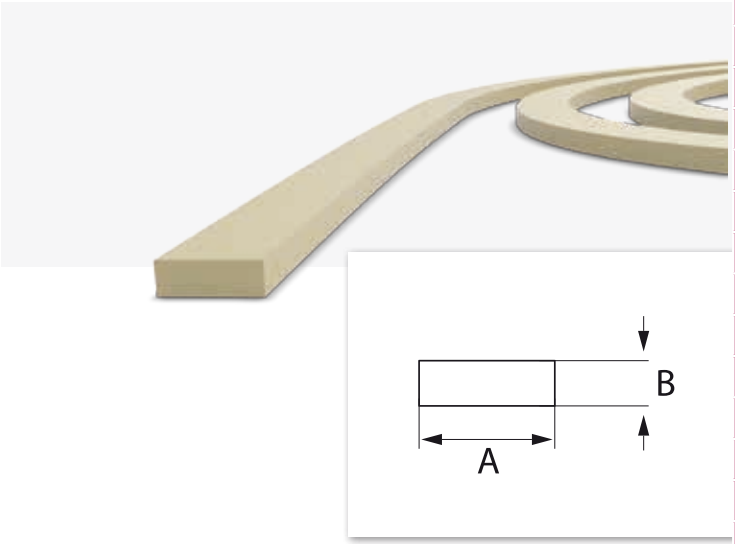
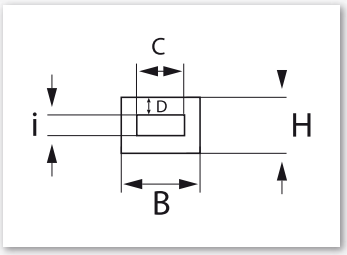
Other extruded conductive profiles

SOLID RECTANGULAR PROFILE



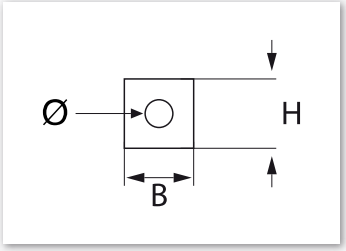
Ref.	A (mm)	B (mm)	Ref.	A (mm)	B (mm)
1025	1.00	2.50	2503	5.00	3.00
1610	1.60	1.07	6010	6.00	1.00
1805	1.80	0.50	6020	6.00	2.00
2010	2.00	1.00	6080	6.00	8.00
2415	2.41	1.57	6416	6.40	1.60
2501	2.50	1.00	6580	6.50	8.00
2515	2.50	1.50	7512	7.50	1.25
3032	3.00	3.20	8060	8.00	6.00
3040	3.00	4.00	1016	10.00	1.60
3115	3.00	1.50	1203	12.00	3.00
3010	3.00	1.00	1240	12.00	4.00
3019	3.05	1.91	1248	12.70	4.78
3216	3.20	1.60	1273	12.70	3.18
3232	3.20	1.00	1503	15.00	3.00
3248	3.20	4.80	2542	25.40	2.00
3610	3.60	1.10	3510	35.00	1.00
4016	4.00	1.60	3710	37.00	10.00

HOLLOW RECTANGULAR PROFILE



Ref.	B (mm)	H (mm)	C (mm)	D (mm)	I (mm)
2738	3.80	2.70	2.30	0.80	1.00
1268	12.00	6.00	8.00	0.80	4.40

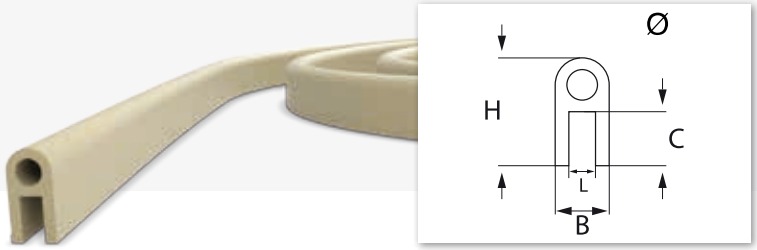
HOLLOW SQUARE PROFILE



Ref.	B (mm)	H (mm)	Ø (mm)
2828	2.80	2.80	1.20
3031	3.00	3.00	1.00
30315	3.00	3.00	1.50
3535	3.50	3.50	1.40
6062	6.00	6.00	2.50

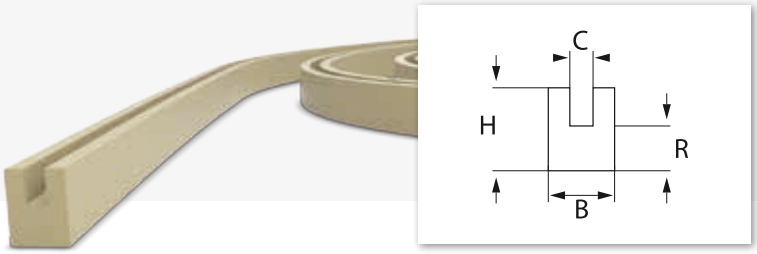
"A" PROFILE

Ref.	B (mm)	H (mm)	L (mm)	C (mm)	Ø (mm)
1531	1.57	3.18	0.81	1.60	0.50
1836	1.80	3.60	0.40	1.80	0.50
2357	2.30	5.70	0.80	3.40	0.90
2055	2.00	5.50	0.80	3.50	1.00
2560	2.50	6.00	-	-	1.00
3163	3.18	6.35	1.57	3.18	1.80
3523	3.50	4.50	1.60	1.70	2.30



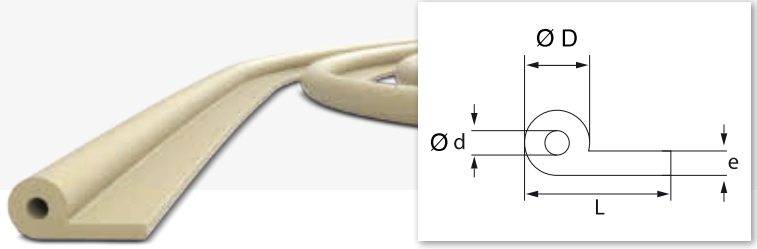
"U" PROFILE

Ref.	B (mm)	H (mm)	C (mm)	R (mm)
2525	2.54	2.54	0.86	0.84
3228	3.20	2.80	0.66	1.27
3939	3.96	3.96	1.57	1.19
39039	3.96	3.96	1.57	2.80
4050	4.00	5.00	1.40	2.70
4056	4.50	5.50	2.10	3.00
4439	4.45	4.00	1.19	1.91
8080	8.00	8.00	5.00	1.50
9162	9.15	6.20	3.00	4.40



"P" PROFILE

Ref.	Ø D (mm)	Ø d (mm)	L (mm)	e (mm)
5712	3.50	2.55	5.70	1.20
4084	4.00	2.00	8.40	2.00
4090	4.00	1.50	9.00	1.50
5011	5.00	1.80	11.00	1.70
8014	7.92	4.70	14.30	1.60
8114	7.92	3.42	14.30	1.60
3015	3.00	1.50	15.00	2.00
6401	6.40	3.20	16.00	1.60
1165	11.00	6.50	17.50	1.60
9019	9.00	6.48	19.00	1.60
7018	6.40	4.80	19.10	1.60
1021	10.00	6.00	21.00	2.00



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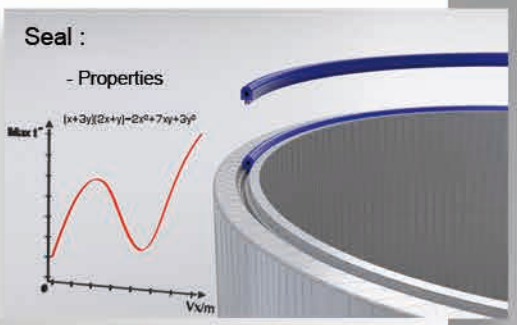
Custom seals

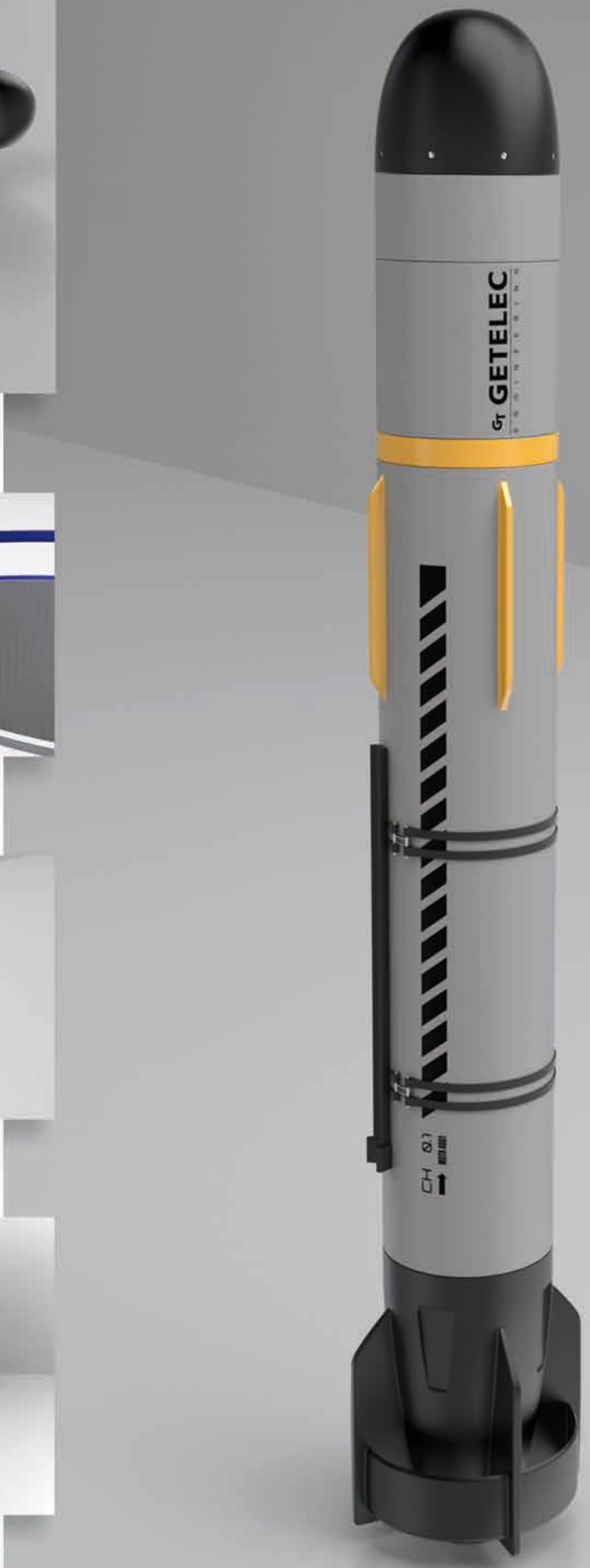
1. Responsiveness to requirements



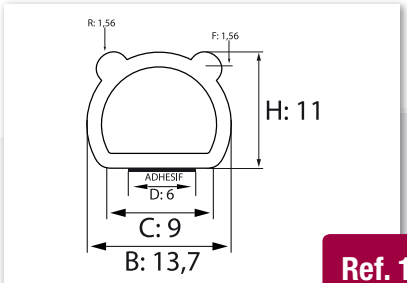
2. R&D

3. Tooling manufacture

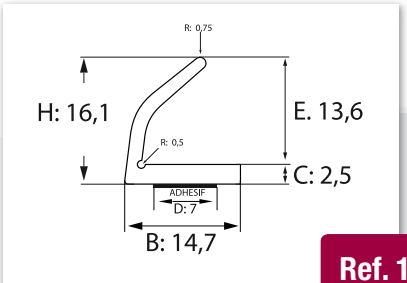
4. Custom extrusion



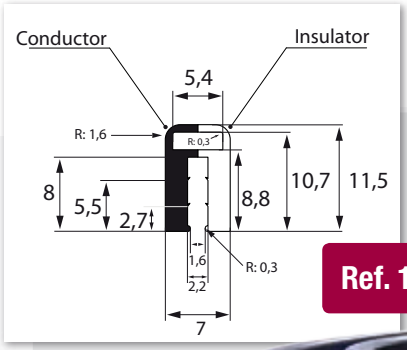
Telecoms cabinets and bays specific profile



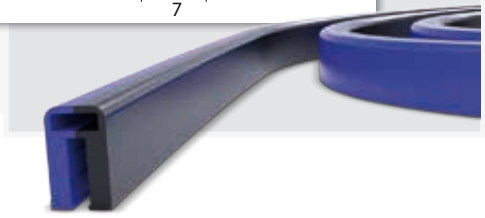
Ref. 1371

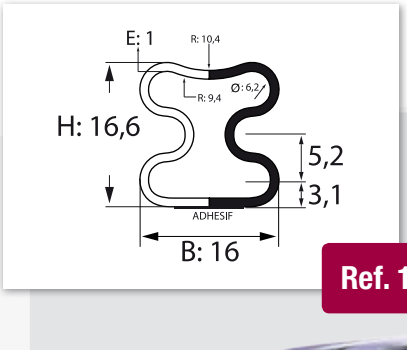


Ref. 1517

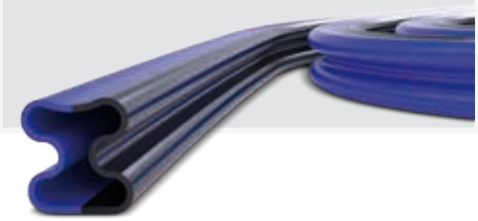


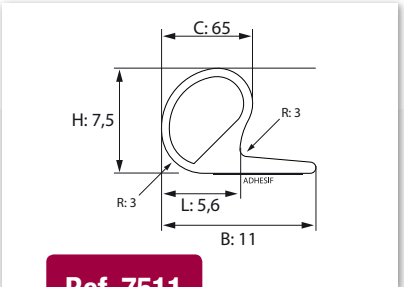
Ref. 1539



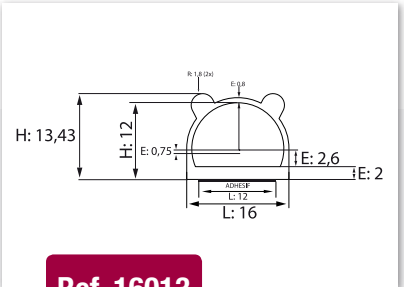


Ref. 1616

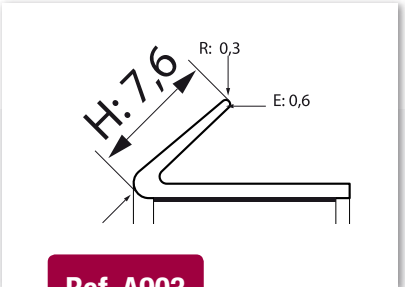




Ref. 7511



Ref. 16013



Ref. A903

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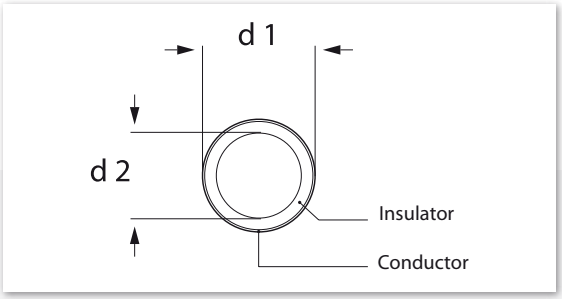
Profile with conductive coating

MCC gaskets are made up of a conductive outer skin applied to an insulating core. These products are made by double layer co-extrusion This continuous transformation method makes it possible to guarantee excellent cohesion between the insulating and the conducting materials. The seal is available in solid and hollow round profile in continuous length, cut to length or glued into O rings.

The conductive outer skin comprises an elastomer loaded with silver, silver plated copper etc. The binder is a silicone or fluorosilicone in the case of usage in an aggressive environment (hydrocarbons, solvents, etc.).

The average thickness of this conductive coat is 0.2mm.

Ref.	(D)mm	d (mm)
1812	1.80	1.10
2108	2.10	0.80
2505	2.50	0.50
2511	2.50	1.10
2608	2.60	0.80
3211	3.20	1.10
3202	3.20	2.00
6432	6.40	3.20



	Standards	GT 2640	GT 2647	GT 2660	GT 2667
Type MIL G 83528		K	K	K	K
Elastomer		Silicone	Fluorosilicone	Silicone	Fluorosilicone
Load		silver	silver	silver	silver
Volume resistivity Ω-cm	MIL G 83528	< 0.005	< 0.005	< 0.005	< 0.005
Shore hardness A ±7	ASTM D 2240	40	40	60	60
Working temperature °C		-55 to +125	-55 to +125	-55 to +125	-55 to +125
Colour		Beige	Beige	Beige	Beige
Shielding performance: 20 MHz 100 MHz 500 MHz 2GHz 10GHz		> 60 dB	> 60 dB	> 60 dB	> 60 dB

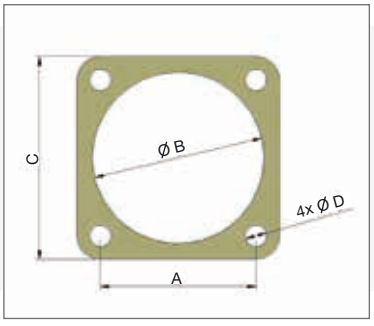
Flat connector gaskets

Housing	Getelec reference	A ± 0.25mm	B ± 0.51mm	C ± 0.38mm	D ± 0.25mm	Standard thickness (mm)
6	D 110	11.90	9.53	18.75	3.60	0.50 or 0.80
6	D 111	12.70	11.00	17.50	3.00	0.50 or 0.80
8	D 112	15.10	16.00	21.34	3.43	0.50 or 0.80
8	D 113	15.10	14.40	20.60	3.00	0.50 or 0.80
8	D 114	15.10	12.70	22.23	3.96	0.50 or 0.80
9	D 115	18.20	19.00	24.50	3.60	0.50 or 0.80
10	D 116	18.20	15.88	25.40	3.96	0.50 or 0.80
11	D 117	20.60	22.23	26.93	3.60	0.50 or 0.80
12	D 118	20.60	19.05	27.80	3.60	0.50 or 0.80
13	D 119	23.00	25.53	29.30	3.43	0.50 or 0.80
14	D 120	23.00	22.23	30.18	3.96	0.50 or 0.80
16	D 121	24.60	25.40	32.54	3.96	0.50 or 0.80
15/16	D 122	24.60	28.83	31.95	3.96	0.50 or 0.80
18	D 123	27.00	28.83	35.00	3.96	0.50 or 0.80
17/18	D 124	27.00	32.00	34.32	3.96	0.50 or 0.80
19/20	D 125	29.36	34.93	38.10	3.60	0.50 or 0.80
20	D 126	29.36	33.30	37.26	3.20	0.50 or 0.80
21/22	D 127	31.75	38.10	41.30	3.60	0.50 or 0.80
22	D 128	31.75	34.93	41.30	4.37	0.50 or 0.80
23/24	D 129	34.93	41.30	44.45	4.37	0.50 or 0.80
24	D 130	34.93	38.10	44.45	5.16	0.50 or 0.80
25	D 131	38.10	44.45	47.63	4.37	0.50 or 0.80
28	D 132	39.70	44.45	50.80	5.20	0.50 or 0.80
32	D 133	44.45	50.80	57.15	5.60	0.50 or 0.80
36	D 134	49.23	57.15	63.50	5.60	0.50 or 0.80
40	D 135	55.58	63.50	69.85	5.60	0.50 or 0.80
44	D 136	60.33	70.64	76.20	5.60	0.50 or 0.80
48	D 137	66.70	77.00	82.55	5.60	0.50 or 0.80

Contact us for alternative thicknesses.

Gaskets made from:

GT1000, GT1015, GT2020, GT3100, GT5000, BL10000, MS composite seals
These seals can be made in insulating fluorosilicone or not or in corrosion-resistant bi-material.



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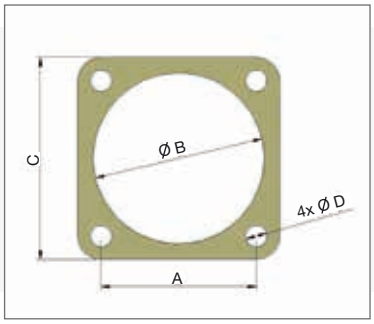
GETELEC reference	A ± 0.25mm	B ± 0.51mm	C ± 0.38mm	D ± 0.25mm	Standard thickness (mm)
G 21	8.60	7.70	12.90	2.40	0.50 ou 0.80
J 61	12.70	11.00	17.50	3.00	0.50 ou 0.80
S 122	12.70	11.20	18.00	3.20	0.50 ou 0.80
A 57	15.10	14.40	20.60	3.00	0.50 ou 0.80
B 76	15.10	14.40	20.60	3.00	0.50 ou 0.80
H 13	15.10	14.30	21.00	3.30	0.50 ou 0.80
K 177	18.00	14.80	24.00	3.50	0.50 ou 0.80
H 194	18.00	11.30	24.00	3.50	0.50 ou 0.80
F 86	18.20	17.50	24.00	3.50	0.50 ou 0.80
Z 30	18.20	15.50	24.00	3.20	0.50 ou 0.80
K 34	18.25	19.00	24.50	3.50	0.50 ou 0.80
H 15	18.30	18.40	24.40	3.30	0.50 ou 0.80
A 256	20.60	18.00	28.00	3.20	0.50 ou 0.80
C 86	20.60	19.05	26.20	3.10	0.50 ou 0.80
H 64	20.60	22.20	26.90	3.50	0.50 ou 0.80
H 14	20.60	23.20	27.00	3.30	0.50 ou 0.80
R 3	20.60	23.50	30.00	3.50	0.50 ou 0.80
Z 31	20.60	19.50	26.50	3.20	0.50 ou 0.80
J 151	21.00	19.50	27.00	3.50	0.50 ou 0.80
C 84	23.00	23.00	28.60	3.00	0.50 ou 0.80
B 6	24.60	24.00	33.00	3.20	0.50 ou 0.80
J 193	24.60	28.60	32.00	3.60	0.50 ou 0.80
Z 32	24.60	26.00	32.00	3.20	0.50 ou 0.80
K 178	25.00	31.00	25.40	3.50	0.50 ou 0.80
D 30	26.20	25.10	35.00	3.50	0.50 ou 0.80
E 104	27.00	32.00	34.30	4.00	0.50 ou 0.80
F 99	27.00	30.90	33.50	3.30	0.50 ou 0.80
N 32	27.00	30.00	33.00	3.20	0.50 ou 0.80
S 123	28.20	31.75	36.50	3.00	0.50 ou 0.80
W 195	31.00	30.50	40.00	4.50	0.50 ou 0.80
S 124	30.50	35.00	39.70	3.00	0.50 ou 0.80
N 33	31.70	36.00	40.00	3.20	0.50 ou 0.80
B 187	31.75	32.10	41.30	3.60	0.50 ou 0.80
K 179	33.00	30.50	42.00	5.50	0.50 ou 0.80
S 125	34.90	38.00	42.90	3.00	0.50 ou 0.80
N 34	35.00	39.20	43.00	3.20	0.50 ou 0.80
J 142	42.00	36.00	49.00	4.00	0.50 ou 0.80

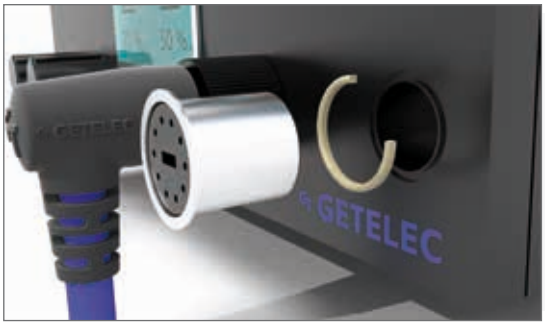


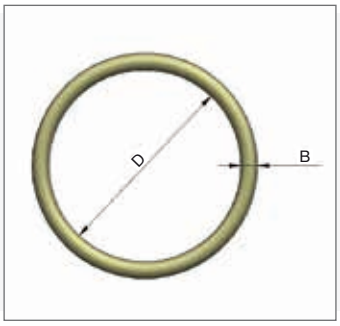
Contact us for alternative thicknesses.

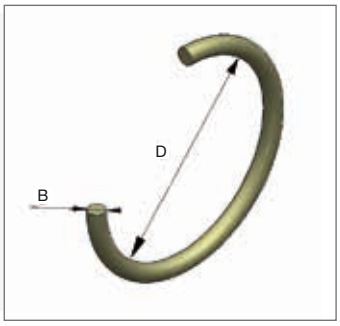
Gaskets made from:

GT1000, GT1015, GT2020, GT3100, GT5000, BL10000, MS composite seals
These seals can also be made in insulating fluorosilicone
or not or in corrosion-resistant bi-material.

Round connector seals







HOUSING	REF.	CROSS-SECTION	INTERIOR Ø
-	LR 16	1.50	7.60
-	LR 34	1.50	10.50
-	LR 31	1.70	7.50
-	LR 32	1.80	12.50
-	LR 71	1.80	14.00
-	LR 72	1.80	17.17
09-10	LR 17	1.80	20.30
-	LR 14	1.80	20.50
09-10	LR 67	1.80	21.90
-	LR 68	1.80	23.50
11-12	LR 18	1.80	25.10
-	LR 15	1.80	25.30

INTERIOR Ø	TOLERANCES
01 to 38 mm.	± 0.25 mm
38 to 65 mm.	± 0.40 mm

HOUSING	REF.	CROSS-SECTION	INTERIOR Ø
13-14	LR 12	1.80	28.30
15-16	LR 13	1.80	31.50
-	LR 10	1.80	33.00
17-18	LR 19	1.80	34.60
-	LR 11	2.60	32.00
19-20	LR 20	2.60	37.80
-	LR 54	2.60	40.00
-	LR 55	2.60	57.00
21-22	LR 84	2.60	40.90
23-24	LR 124	2.60	44.10
-	LR 125	2.60	47.40
-	LR 134	2.60	60.00

CROSS-SECTIONS	TOLERANCES
1.5 to 1.8 mm.	± 0.08 mm
1.8 to 2.6 mm.	± 0.15 mm

Fast delivery on other dimensions on request.

Gaskets made from:

GT1000, GT1015, GT2020, GT3100, GT5000, BL10000,
These seals can also be made in insulating fluorosilicone or not or in corrosion-resistant bi-material

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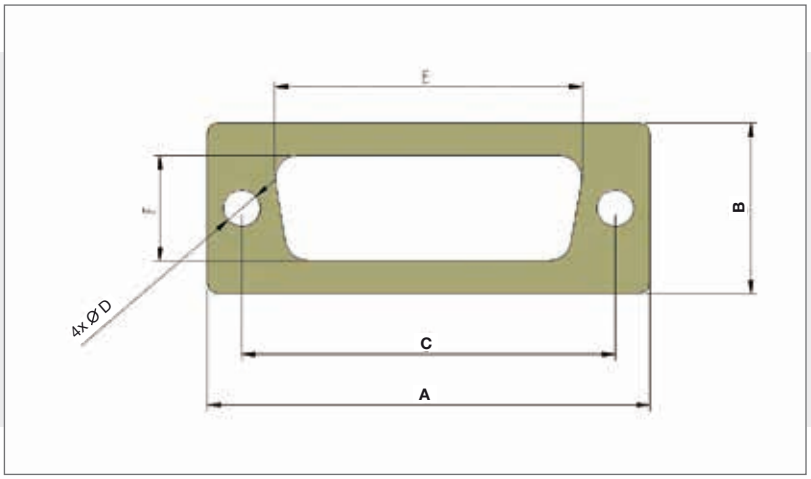
D Sub connector seals

D SUB connector seals are used for connecting drawer bays and miniature chassis cables.

This type of seal is widely used in the following areas:

telecoms, medical, information technology, military and aerospace.

GETELEC supplies these seals in standard sizes from 9 to 50 pins.
These seals can also be made to measure to suit your individual needs.



Housing sizes	Getelec reference	A (mm)± 0.38	B (mm)± 0.38	C (mm)± 0.25	D (mm)± 0.25	E (mm)± 0.38	F (mm)± 0.25	Cutting angle
9 contacts	H 127	30.81	15.09	25.00	3.05	17.70	9.14	10°
15 contacts	H 128	39.52	15.24	33.32	3.30	27.43	9.40	10°
25 contacts	H 129	53.01	15.09	47.04	3.05	40.21	9.60	10°
37 contacts	D 165	69.32	15.09	63.50	3.05	56.67	9.60	10°
50 contacts	D 166	66.93	15.37	61.11	3.05	53.57	11.84	10°

All dimensions in millimetres

Gaskets made from:

GT1000, GT1015, GT2020, GT3100, GT5000, BL10000, MS composite seals, thicknesses 0.4 to 0.8 mm
These seals can be made in insulating fluorosilicone or not or in corrosion-resistant bi-material.

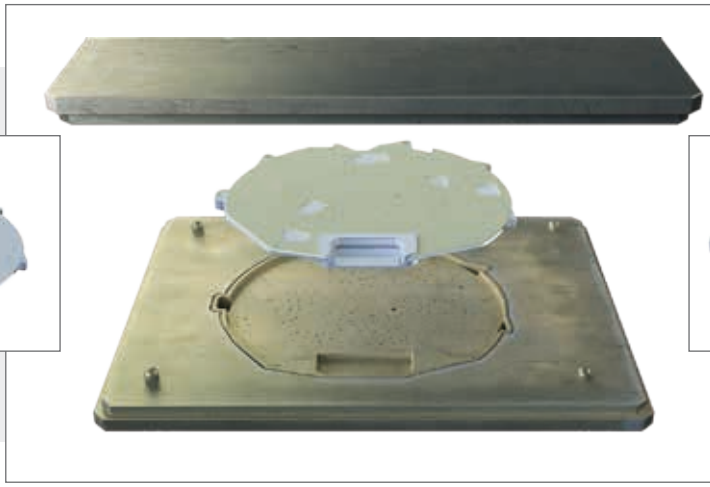
Seals overmolded in place

The procedure used in our production facility enables seals to be vulcanised, by moulding onto the covers of electronic assemblies, in the various GT and BL materials, bringing the following advantages:

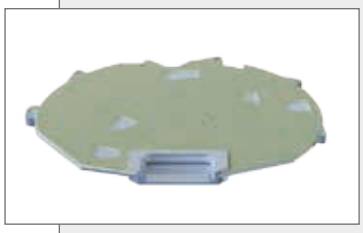
- No need to glue seals
- Improved mechanical performance
- Elimination of cumulative tolerances in the cover/adhesive/seal assembly
- Eliminates the need to machine grooves for positioning flat or rounded seals
- Optimised seal cost
- Enables provision of externally fitted insulating component, enabling corrosion-resistant assemblies
- Choice of materials
- Fast delivery

The assembly's electrical and mechanical characteristics are similar to those quoted on the datasheets of the material used.

1/ Customer's component



2/ Compression moulding direct to the component



3/ Seal secured by overmolding

We can provide a complete solution with mechanical part + gasket

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Form-in-place seal

Automatic placement technology is a completely automated electro-magnetic shielding solution for your equipment allowing you to meet the most demanding electromagnetic compatibility requirements.

Seals are placed in position with exceptional precision, adhering perfectly to the application surface.

Advantages:

- Reduced costs
- No gluing process
- No manual seal placement
- Prototyping in under 48 hours
- Bi-material joint availability (one part insulating/one part conductive) and insulator

Specifications

	GT/D 1010		GT/D 5010	
	Test standard	Value	Test standard	Value
Material:	-	Silicone	-	Silicone
Load	-	Cu/Ag	-	Al/Ag
Shielding performance 200 MHz to 10 GHz	MIL-G-83528	80-100 dB	MIL-G-83528	80-100 dB
Volume resistivity Ohm-cm	MIL-G-83528	0.05	MIL-G-83528	0.01
Tensile strength (min)	ASTM D 412	0.60 MPa	ASTM D 412	> 0.55 MPa
Elongation (min.)	ASTM D 412	60%	ASTM D 412	> 50 %
Hardness (Shore A) ±10	ASTM D2240	45	ASTM D2240	60
RDC (22 hrs at 70°C), % Max.	ASTM D395 Method B	35%	ASTM D395 Method B	25%
Density (g/cm3)	ASTM D792	2.6	ASTM D792	1.90
Maximum working temperature	-	125°C	-	160°C

GT 1006 Die-cut waveguide flange seals

Conductive GT1006 is a silicone elastomer, loaded with passivated silver-plated copper, with expanded copper reinforcement. This product is particularly recommended for waveguide flanges, as the reinforcement prevents creep inside the guide when the joint is tightened.

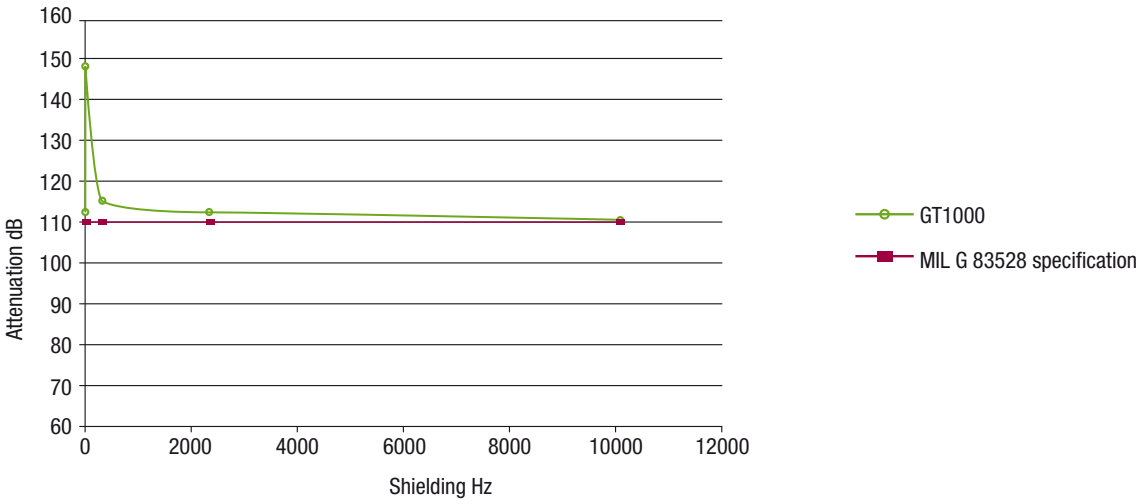
For applications needing pressurisation, it is possible to have a raised lip around the opening to ensure sealing.

Joints made are re-usable after dis-assembly.

CHARACTERISTICS

PRODUCT	GT 1006		MIL G 83528 specification
Load	Cu-Ag		-
MIL G 83528 standard	Type G		-
Volume resistivity Ω-cm	< 0.002		0.007
Density	490		475
Hardness shore A	86		80
Break resistance kg/cm²	-		-
Tear strength kg/cm	-		-
% elongation at break	10.5		20
% residual deformation after 70 hours' compression at 100°C	-		-
Continuous working temperature °C	-55°C to +125°C		-55°C to +125°C
Colour	Brick red		-
Resistance after ageing Ω-cm	0.105		0.01
Resistance under vibration Ω-cm	For	0.06	0.01
	After	0.009	0.007

MICROWAVE SHIELDING



Format options:

Moulded Cut Sheet

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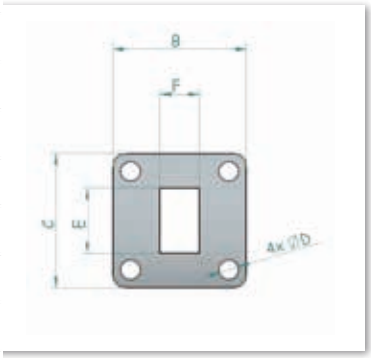
GT 1006 Die-cut waveguide flange seals

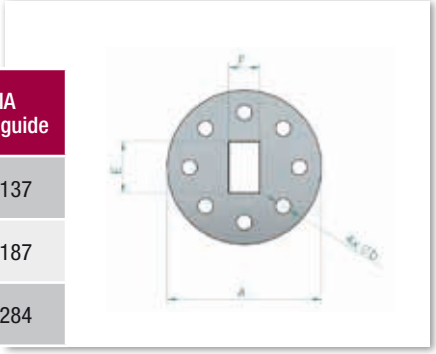
Frequency range (Ghz)	Band	Size of waveguide	JAN Designation	Flange type			Getelec article Reference	MIL 83528 013 Reference [ ]-( )	Getelec tool Reference
				UG	CPR	CMR			
26.50 - 40.00	Ka	WR28	RG-96/U (silver)	UG-599/U	-	-	PF8561	[G]-(001)	
18.00 – 26.50	K	WR42	RG-53/U (brass)	UG-595/U UG-597/U	-	-	PF060010068	[G]-(003)	D 72
12.40 – 18.00	Ku	WR62	RG-91/U (brass)	UG-419/U	-	-	PF8562	[G]-(005)	D 83
10.00 – 15.00	-	WR75	-	-	-	-	PF060010018	[G]-(007)	R 31/B
8.20 – 12.40	X	WR90	RG-52/U (brass)	UG-39/U UG-135/U	-	-	PF060010001	[G]-(009)	D 82 (1)
				UG-1736/U UG-1737/U	CPR-90F	-	PF8563	[G]-(010)	C 92
7.05 – 10.00	X1	WR112	RG-51/U (brass)	UG-51/U UG-138/U	-	-	PF060010002	[G]-(015)	D 87 (1)
				UG-1734/U UG-1735/U	CPR-112F	-	PF060010128	[G]-(016)	D 92
5.85 – 8.20	Xb	WR137	RG-50/U (brass)	UG-344/U UG-441/U	-	-	PF060010074	[G]-(019)	D 88 (1)
				UG-1732/U UG-1733/U	CPR-137F	-	PF060010042	[G]-(020)	D 54
				-	-	CMR-137	PF060010075	[G]-(021)	D 99
4.90 – 7.05	-	WR159	-	UG-1730/U UG-1731/U	CPR-159F	-	PF060010107	[G]-(024)	D 84
				-	-	CMR-159	PF8564	[G]-(025)	
3.95 – 5.85	C	WR187	RG-49/U (brass)	UG-149A/U UG-407/U	-	-	PF060010049	[G]-(026)	D 89 (1)
				UG-1728/U UG-1729/U	CPR-187F	-	PF8565	[G]-(027)	D 32
				-	-	CMR-187	PF8566	[G]-(028)	
3.30 – 4.90	-	WR229		UG-1726/U UG-1727/U	CPR-229F	-	PF060010105	[G]-(031)	D 94
				-	-	CMR-229	PF8567	[G]-(032)	
2.60 – 3.95	S	WR284	RG-48/U (brass)	UG-53/U UG-584/U	-	-	PF060010061	[G]-(033)	D 90 (1)
				UG-1724/U UG-1725/U	CPR-284F	-	PF8568	[G]-(034)	
				-	-	CMR-284	PF8569	[G]-(035)	
2.20 – 3.30	-	WR340	RG-112/U (brass)	UG-533/U UG-554/U	CPR-340F	-	PF8570	[G]-(038)	D 91
1.70 – 2.60	W	WR430	RG-104/U (brass)	UG-435A/U UG-437A/U	-	-	PF8571	[G]-(040)	D 85
				-	CPR-430F	-	PF8572	[G]-(041)	
1.12 – 1.70	L	WR650	RG-69/U (brass)	UG-417A/U UG-418A/U	-	-	PF060010009	[G]-(042)	D 86

GT 1006 Die-cut waveguide flange seals

Reference Getelec Article	Reference Tools Reference	B (mm)	C (mm)	E (mm)	F (mm)	D (mm)	Thickness (mm)	EIA waveguide
PF8561		19.05	19.05	3.68	7.24	2.95	0.70	WR28
PF060010068	D 72	22.23	22.23	4.45	10.80	2.95	0.70	WR42
PF8562	D 83	33.35	33.35	16.00	8.13	3.56	0.70	WR62
PF060010018	R 31/B	38.00	38.00	19.30	9.78	3.94	0.70	WR75
PF060010001	D 82/1	41.28	41.28	22.99	10.29	4.29	0.70	WR90
PF8563	C 92	53.19	40.49	10.29	22.99	4.29	0.70	WR90
PF060010002	D 87/1	47.63	47.63	28.70	12.83	4.57	0.70	WR112
PF060010128	D 92	63.50	44.45	12.83	28.70	4.34	0.70	WR112
PF060010042	D 54	68.25	49.20	16.08	35.05	5.23	0.70	WR137
PF060010075	D 99	57.94	38.89	16.05	35.10	3.81	0.70	WR137
PF060010107	D 84	80.98	61.93	20.45	40.64	6.53	0.70	WR159
PF8564		63.50	44.45	20.32	40.64	4.06 / 3.81	0.70	WR159
PF8565	D 32	63.50	88.90	47.75	22.35	6.76	0.70	WR187
PF8566		70.64	45.31	22.40	47.80	3.96 / 3.58	0.70	WR187
PF060010105	D 94	98.43	69.85	29.34	58.42	6.86	0.70	WR229
PF8567		80.16	50.80	29.34	58.42	3.81	0.70	WR229
PF8568		76.20	114.30	72.39	34.29	6.76	0.70	WR284
PF8569		59.54	37.64	72.39	34.29	4.37 / 4.78	0.70	WR284
PF8570	D 91	138.18	95.25	43.43	86.61	6.71 / 6.35	0.70	WR340
PF8571	D 85	161.14	106.38	54.86	109.47	6.76	0.70	WR430
PF060010009	D 86	220.68	138.13	82.80	165.35	6.35 / 8.33	0.70	WR650



Getelec Article Reference	Reference Getelec Tools	A (mm)	E (mm)	F (mm)	D (mm)	Thickness	EIA waveguide
PF060010074	D 88/1	79.38	35.10	16.05	5.94	0.70	WR137
PF060010049	D 89/1	92.08	47.80	22.40	5.94	0.70	WR187
PF060010061	D 90/1	134.93	72.39	34.29	7.37	0.70	WR284



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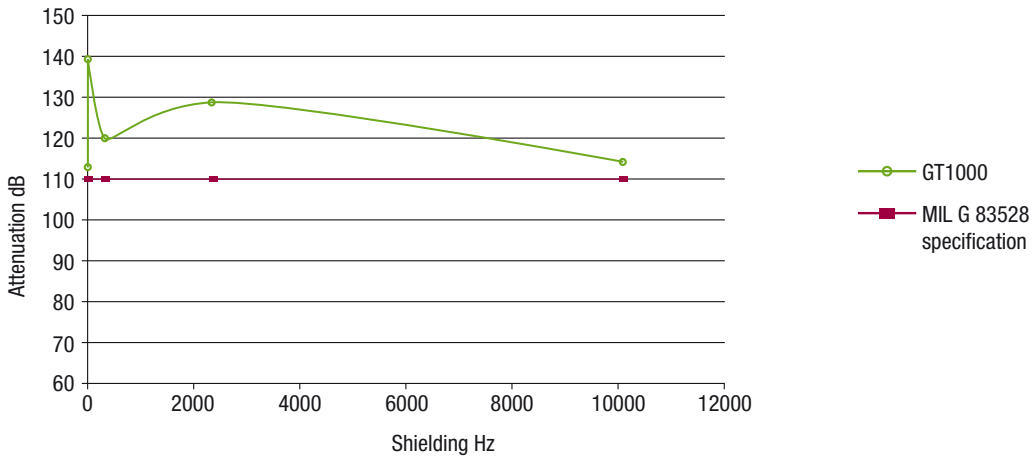
Moulded waveguide flange seals

Frequency range (Ghz)	Band	Size of aveguide	JAN Designation	Flange type			Getelec Article Reference	MIK 83528 Reference 013 [ ]-( )	Reference tool Reference
				UG	CPR	CMR			
26.50 - 40.00	Ka	WR28	RG-96/U (silver)	UG-600A/U	-	-	PF3457	[K]-(002)	LR 121
18.00 – 26.50	K	WR42	RG-53/U (brass)	UG-596A/U UG-598A/U	-	-	PF8572	[K]-(004)	LR 120
12.40 – 18.00	Ku	WR62	RG-91/U (brass)	UG-541A/U	-	-	PF030040098	[K]-(006)	LR 42
				-	-	-	PF8573	-	LR 41
10.00 – 15.00	-	WR75	-	-	-	-	PF030040100	[K]-(008)	LR 35
8.20 – 12.40	X	WR90	RG-52/U (brass)	UG-136A/U UG-40A/U	-	-	PF030040097	[K]-(011)	LR 62
				UG-136B/U UG-40B/U	-	-	PF030040096	[K]-(012)	LR 61
				UG-1360/U UG-1361/U	CPR-90G	-	PF8574	[K]-(013)	LR 116
7.05 – 10.00	X1	WR112	RG-51/U (brass)	UG-52B/U UG-137B/U	-	-	PF030040072	[K]-(017)	LR 63
				UG-1358/U UG-1359/U	CPR-112G	-	PF040040013	[K]-(018)	LR 117
5.85 – 8.20	Xb	WR137	RG-50/U (brass)	UG-1356/U UG-1357/U	CPR-137G	-	PF040040026	[K]-(023)	LR 118
3.95 – 5.85	C	WR187	RG-49/U (brass)	UG-148C/U UG-406B/U	-	-	PF030040016	[K]-(029)	LR 65
				UG-1352/U UG-1353/U	CPR-187G	-	PF040040016	[K]-(030)	LR 119
2.60 – 3.95	S	WR284	RG-48/U (brass)	UG-54B/U UG-585A/U	-	-	PF030040017	[K]-(036)	LR 66
				UG-1348/U UG-1349/U	CPR-284G	-	PF040040010	[K]-(037)	LR 51

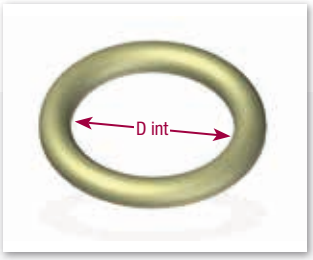
Material: Conductive silicone loaded with silver plated copper: **Ref. GT 1000 (cf. chapter 1)**

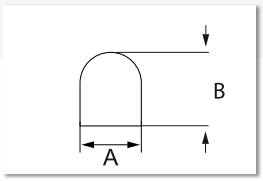


Moulded waveguide flange seals

"D" SECTION O-RING SEAL

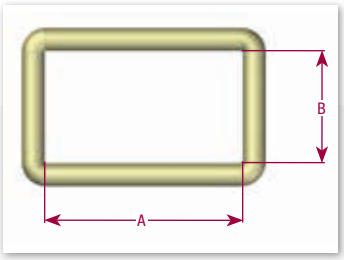
Getelec Article Reference	Reference Getelec Tools	D (mm)	A (mm)	B (mm)	EIA waveguide
PF3457	LR 121	10.4	2	1.4	WR 28
PF8572	LR 120	14.9	2	1.2	WR 42
PF030040098	LR 42	22.5	3.9	3.1	WR 62
PF030040100	LR 35	28.5	2.5	1.6	WR 75
PF030040096	LR 61	33.3	2.9	1.9	WR 90
PF030040097	LR 62	34	2.4	2.2	WR 90
PF030040072	LR 63	39.4	2.6	2	WR 112
PF030040016	LR 65	68.1	2.9		WR 187
PF030040017	LR 66	99.3	6.1	4.8	WR 284

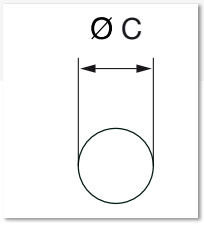




"O" SECTION RECTANGULAR SEAL

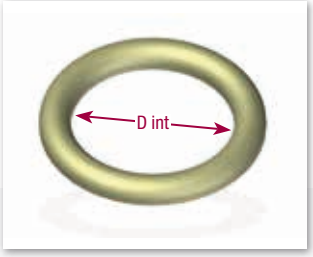
Getelec Article Reference	Reference Getelec Tools	A (mm)	B (mm)	C (mm)	EIA waveguide
PF8573	LR 41	18.4	10.4	2.1	WR 62
PF8574	LR 116	29.5	16.8	2.6	WR 90
PF040040013	LR 117	35.8	19.93	2.6	WR 112
PF040040026	LR 118	42.2	23.1	2.6	WR 137
PF040040016	LR 119	55.2	29.8	3.5	WR 187
PF040040010	LR 51	80.6	42.5	3.5	WR 284

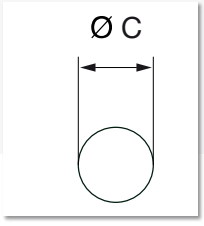




"O" SECTION O-RING SEAL

Getelec Article Reference	Reference Getelec Tools	C (mm)	D (mm)	EIA waveguide
PF030040016	LR 65	2.9	68.1	WR 187





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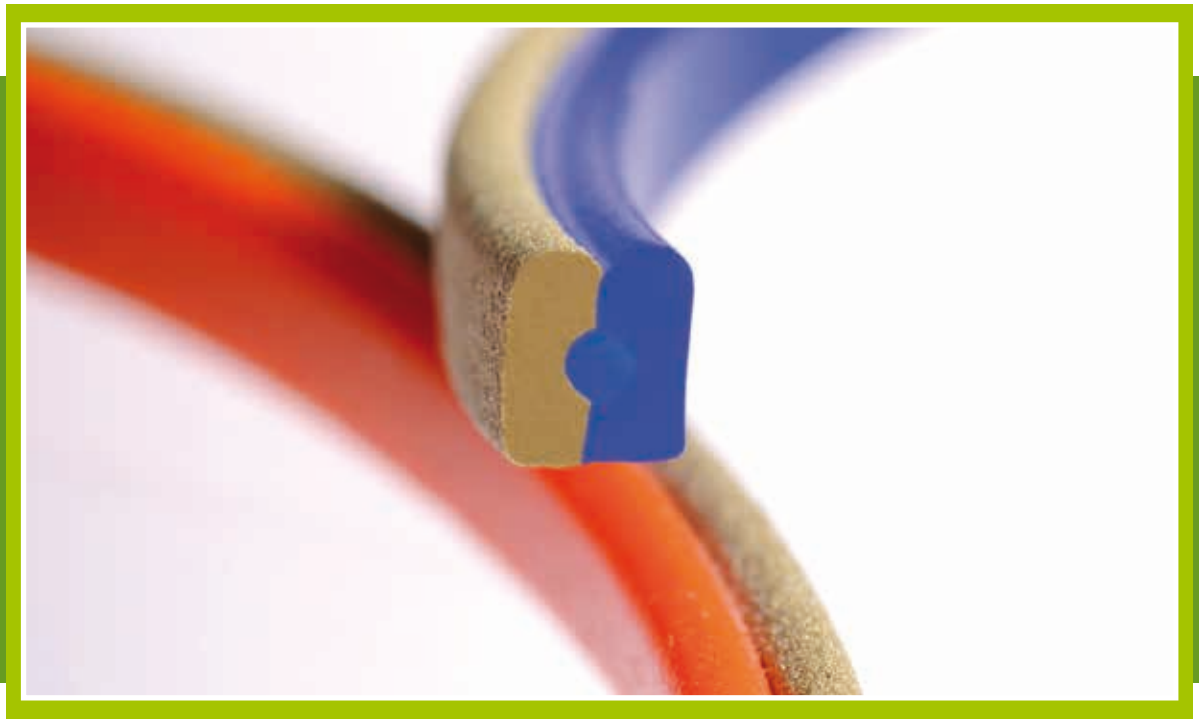
CORROSION-RESISTANT SILICONE GASKETS



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Introduction

GETELEC offers and effective solution to the problems of corrosion encountered with the use of conductive seals, when they are in contact with different electrolytes such as salt fog or acid. These gaskets are water and pressure resistant.

Seals for these applications are bi-material, as they are made of a conductive silicone and an insulating silicone bonded together by co-extrusion into one seal.

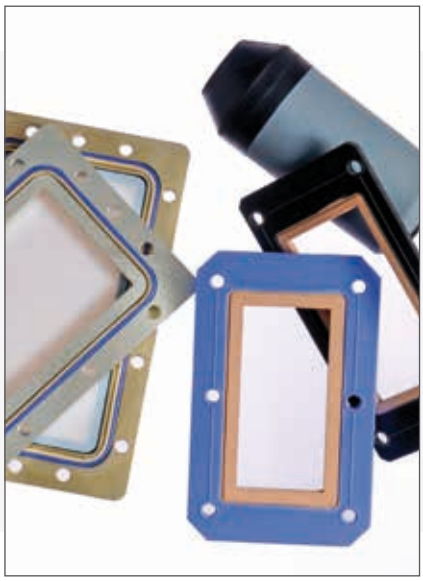
And in fact, by separating the microwave shielding and environmental sealing functions, the seal gains considerably in resistance to extreme environments, in which single component conductive seals would have much shorter lifespans.

In this way, bi-material gaskets provide you with microwave shielding and environmental sealing in just one groove, or in other words, gains as regards congestion in your equipment and also regarding the machining of your part.

Our control of silicone mixes enables us to offer our customers a wide choice in terms of electromagnetic performance, hardness and hydrocarbon resistance etc.

These materials are available as extruded seals, moulded seals or cut lengths.

This method is also available as equipment housing covers by direct vulcanisation in our workshops.



Guide to corrosion-resistant conductive materials by industry sector

GETELEC has been developing its own MIL G 83528-compliant conductive formulations for more than 40 years. Over this period our engineers have developed a broad range of corrosion-resistant conductive silicones with various loads (Cu/Ag, Al/Ag, Ag, Ni/C, Carbon etc.). In this way we have electrically conductive materials to meet every client's different requirements.

MILITARY AND AERONAUTIC APPLICATIONS PRODUCTS					
Reference	Load	Attenuation	Temperature (°C)	Comments	Transformation possibilities
GT 1040 GT 1047 GT 1060 GT 1067	Silver-plated copper Fluorosilicone version Silver-plated copper Fluorosilicone version	120 to 140 dB	-55 to +125	Very good shielding performance	
GT 1060 GT 1047 GT5060 GT5067	Silver plated aluminium Fluorosilicone version Silver plated aluminium Fluorosilicone version	104 to 137 dB	-55 to +160	Compatible with aluminium alloys Low density Low degassing rate Resistant to high temperatures (200°C peak)	
GT 2040 GT 2047 GT 2060 GT 2067	Silver Fluorosilicone version Silver Fluorosilicone version	110 dB	-55 to +160	High electromagnetic performance product - highly conductive - very low volume resistivity - excellent attenuation performance Resistant to high temperatures (200°C peak)	

CIVILIAN ELECTRONIC APPLICATIONS PRODUCTS					
Reference	Load	Attenuation	Temperature (°C)	Comments	Transformation possibilities
GT 1040 GT 1047 GT 1060 GT 1047	Silver-plated copper Fluorosilicone version Fluorosilicone version	120 to 140 dB	-55 to +125	Good EMP resistance on account of the particle geometry and thus optimised surface contact between particles Low degassing rate Electrical and thermal conductor all in one. Very stable over time.	
GT 3140 GT 3147 GT 3160 GT 3167	Nickel Graphite Fluorosilicone version Nickel graphite Fluorosilicone version	100 dB	-55 to +150	Good low frequency performance Low resistivity. UL94 V1 certified	

TELECOMS APPLICATIONS PRODUCTS					
Reference	Load	Attenuation	Temperature (°C)	Comments	Transformation possibilities
BL 10000 BL 10007	Carbon Fluorosilicone version	105 dB	-55 to +125	Good mechanical properties (RDC, elongation at break)	

Moulded Extruded Cut Secured by vulcanisation Sheet

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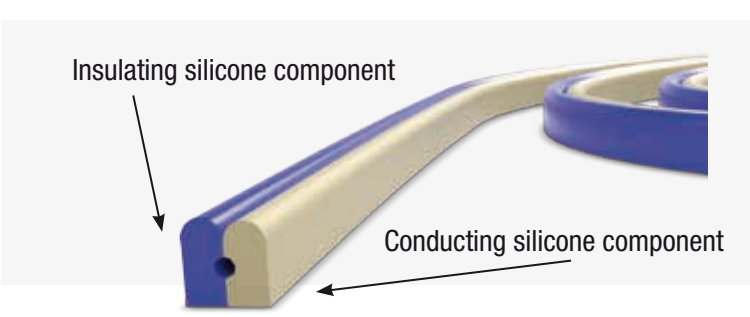
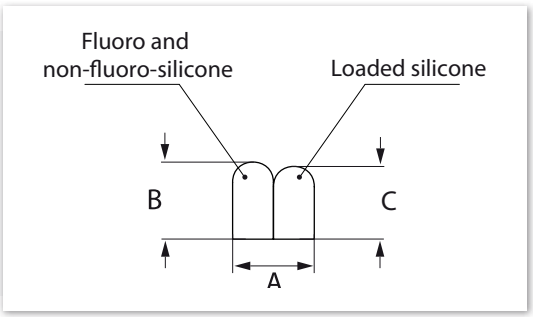
Corrosion-resistant conductive silicones

	Standards	GT 1040	GT 1047	GT 1060	GT 1067	GT 2040	GT 2047	GT 2060
Elastomer		Silicone	Fluorosili-cone	Silicone	Fluorosili-cone	Silicone	Fluorosili-cone	Silicone
Load		Silver-plated copper				Pure silver		
Volume resistivity Ω-cm	MIL G 83528	< 0.005				< 0.006		
Shore hardness A ±7	ASTM D 2240	82				75		
Density g/cm3	ASTM D 792 Method A	3.40				3.90		
Break resistance kg/cm²	ASTM D 412 Method AC	22.40				47		
% elongation at break	ASTM D 412 Method AC	341				355		
Tear strength kg/cm	ASTM D 624 Method C	13.70				14		
% residual deformation after 70 hours' compression at 100°C	ASTM D 395 Method B	17.50				-		
Shielding performance: 20 MHz 100 MHz 500 MHz 2GHz 10GHz		130 dB 140 dB 120 dB 120 dB 120 dB				110 dB 110 dB 110 dB 110 dB 110 dB		
Working temperature °C		-55 to +125				-55 to +160		
Colour		Beige				Light beige		
Insulating silicone component								
Density at 25°C	ASTM D 792	1.10	1.43	1.27	1.46	1.10	1.43	1.27
Shore hardness A ±5	ASTM D 2240	40	40	60	60	40	40	60
Tensile strength Psi Mpa	ASTM D 412	1000 6.80	1250 8.60	950 6.55	1200 8.30	1000 6.80	1250 8.60	950 6.55
% Elongation	ASTM D 412	500	400	300	300	500	400	300
% residual deformation after 22 hours' compression at 177°C	ASTM D 395 Method B	30	20	33	25	30	20	33
Colour		Orange	Orange	Blue	Light blue	Orange	Orange	Blue

Moulded Extruded Cut Secured by vulcanisation Sheet

	GT 2067	GT 3140	GT 3147	GT 3160	GT 3167	GT 5040	GT 5047	GT 5060	GT 5067	BL 10060	BL 10067
Elastomer	Fluo-rosili-cone	Sili-cone	Fluoro-silicone	Silicone	Fluoro-silicone	Silicone	Fluoro-silicone	Silicone	Fluoro-silicone	Silicone	Fluoro-silicone
Load		Nickel Graphite				Silver plated aluminium				Carbon	
Volume resistivity Ω-cm		< 0.10				< 00054				6	
Shore hardness A ±7		65				65				70	
Density g/cm3		2				1.90				1.22	
Break resistance kg/cm²		14				19.30				45	
% elongation at break		150				286				150	
Tear strength kg/cm		8.9				8.60				-	
% residual deformation after 70 hours' compression at 100°C		40				17.30				40	
Shielding performance: 20 MHz 100 MHz 500 MHz 2GHz 10GHz		100 dB 100 dB 100 dB 100 dB 100 dB				128 dB 137 dB 133 dB 122 dB 104 dB				60 dB 105 dB 105 dB 105 dB 105 dB	
Working temperature °C		-55 to +150				-55 to +160				-55 to +125	
Colour		Grey				Beige				Black	
Insulating silicone component											
Density at 25°C	1.46	1.10	1.43	1.27	1.46	1.10	1.43	1.27	1.46	1.27	1.46
Shore hardness A ±5	60	40	40	60	60	40	40	60	60	60	60
Tensile strength Psi Mpa	1200 8.30	1000 6.80	1250 8.60	950 6.55	1200 8.30	1000 6.80	1250 8.60	950 6.55	1200 8.30	950 6.55	1200 8.30
% Elongation	300	500	400	300	300	500	400	300	300	300	300
% residual deformation after 22 hours' compression at 177°C	25	30	20	33	25	30	20	33	25	33	25
Colour	Light blue	Orange	Orange	Blue	Light blue	Orange	Orange	Blue	Light blue	Blue	Light blue





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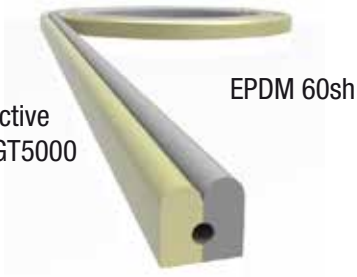
2 Conductive filled silicone + EPDM

Conductive silicone + EPDM P/N – **GT5060 EP**

Advantages

- Low permeability to water vapor and other gases.
- Resistance to hydraulic fluids. like phosphoric ester (Skydrol)
- Good resistance to abrasion.
- Reach and Rohs Compliant.

To meet specific applications, we have developed a bi-material materials by combining a silver plated Aluminium filled silicone(GT5000) with an EPDM 60 shore P/N 41B8.
Like all of our bi-material gaskets, this mixture is intended to meet the constraints of a corrosive environment by separating the shielding function and the sealing function.
The use of EPDM instead of a silicone allowing to meet the permeability problematic to water vapor and gas.



PROPERTIES

Properties	Standards	GT 5000	Spec MIL G 83528
Type	-	B	-
Elastomer	-	Silicone	-
Fillers	-	Al/Ag	-
Volume resistivity Ω.cm	MIL G 83528	< 0.0054	0.012
Hardness shore A	ASTM D 2240	65	70
Specific gravity g/cm3	ASTM D 762 Méthode A	1.90	2.00
Break resistance Mpa	ASTM D 412 Méthode A C	1.89	-
Elongation at break %	ASTM D 412 Méthode A C	286	60 - 260
Tear strength N/mm	ASTM D 624 C	8.43	-
Compression set after 70h at 100°C %	ASTM D 395 Méthode B	17.30	30
Working temperature		-55°C to +160°C	-55°C to +160°C
Color		Grey	-

Properties	Standards	EPDM 60sh 41B8
Specific gravity g/cm3	ASTM D 792	1.13
Hardness shore A	ASTM D 2240	60
Break resistance Mpa	ASTM D 412	11
Elongation at break %	ASTM D 412	400
Temperature withdrawal TR10	NF ISO 2921	- 42.5°C
Color		Black

FORMING OPTIONS

Moulded Cut

Secured by vulcanisation

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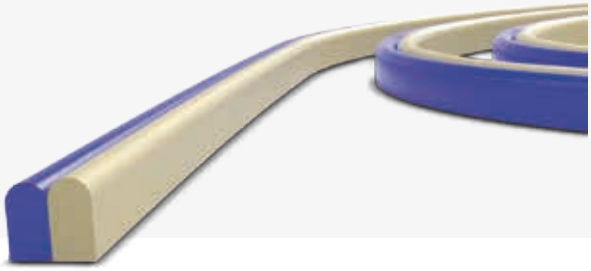
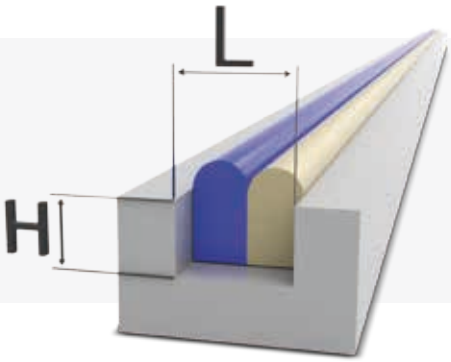
Solid double D profile

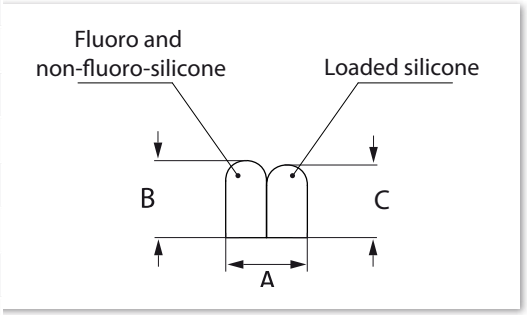


Cross-section of seal



Recommended groove dimensions
Machining tolerance: ± 0.05

Ref.	A (mm)	B (mm)	C (mm)	L (mm)	H (mm)
1414	1.4	1.45	1.35	1.6	1.15
15017	1.5	1.7	1.55	1.7	1.35
16017	1.6	1.7	1.6	1.85	1.35
2015	2	1.55	1.45	2.2	1.2
2020	2	2.1	1.9	2.2	1.6
22180	2.2	1.8	1.7	2.5	1.3
2435	2.4	3.5	3.3	2.6	2.8
2520	2.5	2	1.9	2.7	1.6
2522	2.6	2.2	2.1	2.8	1.7
2634	2.6	3.3	3.2	2.9	2.7
2824	2.8	2.8	2.4	3	2
2825	2.8	2.5	2.4	3.1	2.1
3028	3	2.9	2.8	3.3	2.4
3034	3	3.3	3.2	3.3	2.9
3227	3.2	2.7	2.6	3.6	2.2
3736	3.7	3.6	3.5	4	3
4040	4	4.1	3.9	4.3	3.4
4746	4.6	4.7	4.5	4.9	4.1
4844	4.6	4.3	4.1	4.9	3.8



Contact us for alternative sizes.

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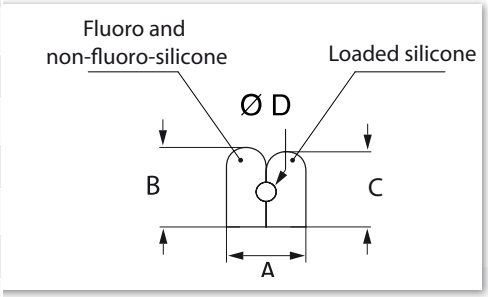
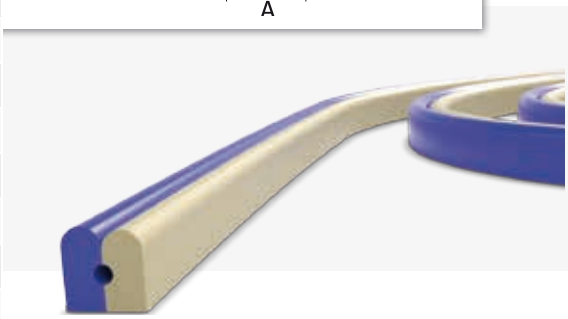
Hollow double D profile

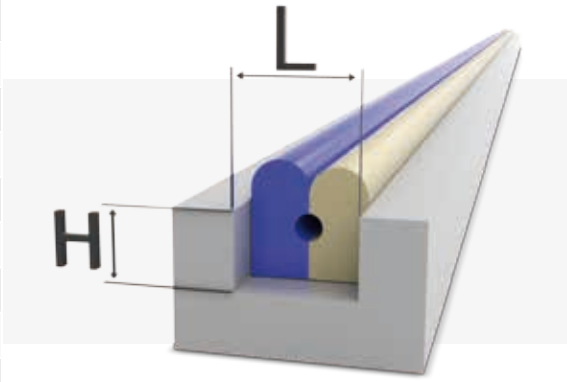
Ref.	A (mm)	B (mm)	C (mm)	D (mm)	L (mm)	H (mm)
14014	1.40	1.45	1.35	0.50	1.60	1.05
16185	1.60	1.85	1.70	0.50	1.85	1.35
1823	1.80	2.30	1.90	0.50	2.00	1.70
2021	2.00	2.10	1.90	0.50	2.20	1.60
20021	2.00	2.10	1.90	0.90	2.20	1.60
2123	2.10	2.30	1.90	0.50	2.40	1.60
2220	2.20	2.00	1.90	0.50	2.40	1.60
2528	2.50	2.00	1.90	0.80	2.70	1.40
2622	2.60	2.20	2.10	0.80	2.80	1.70
2623	2.60	2.35	2.20	1.10	2.90	1.80
2832	2.80	3.30	3.20	1.10	3.20	2.50
2936	2.95	3.65	3.30	1.30	3.20	2.55
3029	3.00	3.20	2.80	1.10	3.25	2.25
3030	3.00	3.00	2.80	0.80	3.30	2.40
3036	3.00	3.50	3.40	1.10	3.20	2.80
3037	3.00	3.75	3.40	1.30	3.25	2.80
30039	3.00	3.95	3.40	1.50	3.30	2.80
3134	3.00	3.40	2.80	0.80	3.25	2.50
3136	3.00	3.50	3.40	1.30	3.25	2.60
3236	3.00	3.50	3.40	2.00	3.25	2.45
3330	3.30	3.00	2.60	0.90	3.60	2.30
3331	3.30	3.00	2.60	1.00	3.50	2.20
3429	3.40	2.90	2.80	0.80	3.60	2.20
4041	4.00	4.10	3.90	1.10	4.30	3.40
4044	4.00	4.40	3.90	1.10	4.30	3.30
4047	4.00	4.70	3.90	1.10	4.30	3.55
4240	4.00	4.20	4.00	1.20	4.30	3.40
4647	4.60	4.70	4.50	1.10	4.90	4.10
4648	4.60	4.70	4.50	2.00	4.90	3.50
4834	4.80	3.40	3.20	1.00	5.20	2.70
6061	6.00	6.20	6.10	3.00	6.50	4.80
6063	6.00	6.20	6.10	3.50	6.50	4.65
6069	6.00	6.90	6.70	3.00	6.50	5.60
7066	7.00	6.60	5.60	2.50	7.50	4.90

Contact us for alternative sizes.





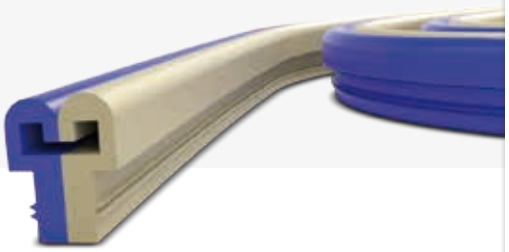
Recommended groove dimensions
Machining tolerance: ± 0.05

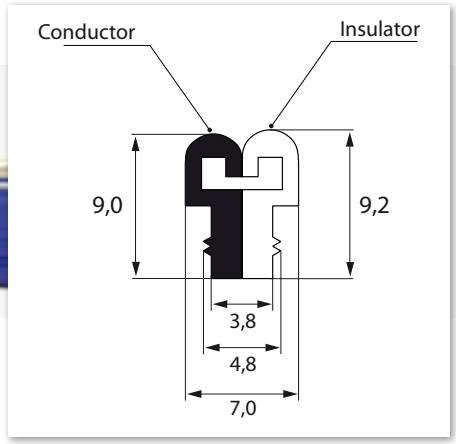


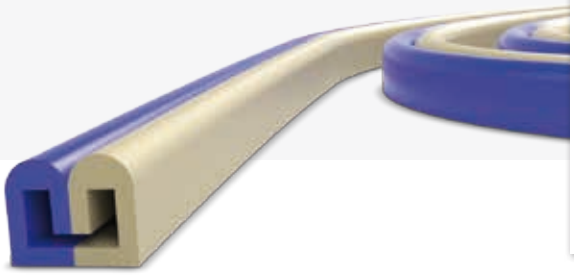
Cross-section of seal

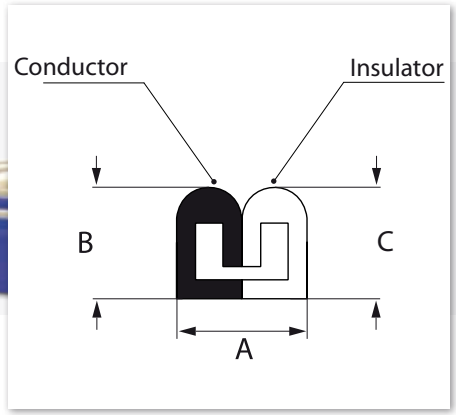
Other corrosion-resistant extruded profiles

Ref. 7092









Reference	A (mm)	B (mm)	C (mm)	Reference	A (mm)	B (mm)	C (mm)
6959	6.90	5.60	5.80	7858	7.80	5.70	5.90
7082	7.00	8.00	8.20	9539	9.50	3.90	4.10

Contact us for alternative sizes.

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NBC (Nuclear, Bacteriological, Chemical) resistant moulded seals

Our bi-material moulded seals for NBC applications comprise a conductive layer secured to a fluorocarbon insulating layer.

The conductive layer is a silicone loaded with metal particles (silver plated aluminium, silver plated copper, or silver) ensuring excellent electrical continuity. Materials used meet the requirements of MIL G 83528 standard.

The fluorocarbon insulating layer has the following properties:

- Very good mechanical properties. Tear resistance, compression set, hardness range to suit that of the conductive products.
- Excellent resistance to chemicals (acids, solvents, hydrocarbons, oils etc.)
- Very low gas permeability. Very good hydrolytic stability.
- Excellent resistance to climate-related attack (oxidation, ozone, sunlight-related weathering).
- Excellent bacteriological resistance.
- Excellent flame-resistance.
- Very wide working temperature range (-25°C to +200°C). Very low working temperature (down to -40°C) for certain grades.

INSULATING SILICONES

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CONTENTS

Introduction

GETELEC formulates its own silicone mixtures and transforms them itself, thus ensuring we can provide made-to-measure solutions for our customers.
We use specific grades of silicone as the basis of our formulations.

THE ADVANTAGES OF SILICONE

Resistance to heat

Silicones' thermo-oxidative stability is considerably superior to that of classical organic molecules.
For example, continuous temperature resistance, in the absence of other constraints, can be estimated as follows:

- EVC silicone elastomers..... 180 – 250°C

Resistance to light and ozone-induced natural ageing

The light-resistance of EVCs in the absence of other constraints can be estimated as shown on a scale of 1 (weak resistance) to 5 (good resistance):

- EVC silicone elastomers..... 4.5

Resistance to chemicals

In the absence of acidic or basic catalysts, silicones have very good hydrolytic stability.
This explains their use in medical and paramedical applications and physiological settings as well as their employment for the manufacture of packaging for certain food and cosmetics products.

Low temperature-induced loss of properties

Their viscosity, dielectric properties, thermal capacity etc. change less with temperature than many other polymers.

Permeability and gas absorption

Elastomers' gas permeability and silicone fluids' gas absorption are relatively high.

Dielectric properties

Silicones are naturally good insulators, even though it is possible to make them conductive by incorporating conductive loads.
Their electrical properties fall on average within the following ranges:

- volume resistivity..... 10^{12} to 10^{16} Ohms/cm
- dielectric constant ..... 1 to 4
- loss factor..... 2 to 200.10^{-4}
- dielectric strength..... 10 to 30 kV/mm

Fire resistance

Silicones have better natural fire resistance than polyolefins. Silicones also have the the advantage of forming a silicic skeleton which may work as the final barrier to the propagation of fires and maintain electrical insulation, for cable sheaths, for example.

Physiological safety

The carefully chosen grades of silicone comply with all necessary European and American standards for medical, pharmaceutical, paramedical and food applications.

Our laboratory and research centre support clients from selection of material through to the choice of transformation procedure. Having in-house control of the various processes (extrusion, cutting, moulding, injection, automatic placement, vulcanisation onto the cover etc.) ensures we are able to provide a made-to-measure solution for your environment.

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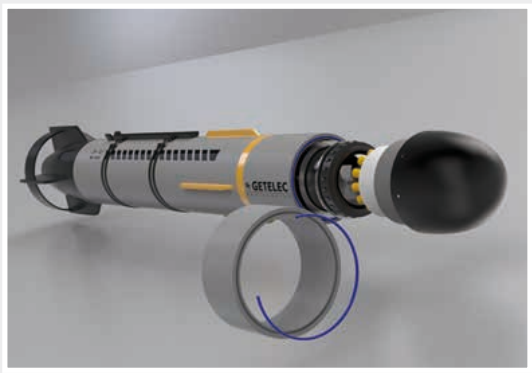
Technical sealing expertise



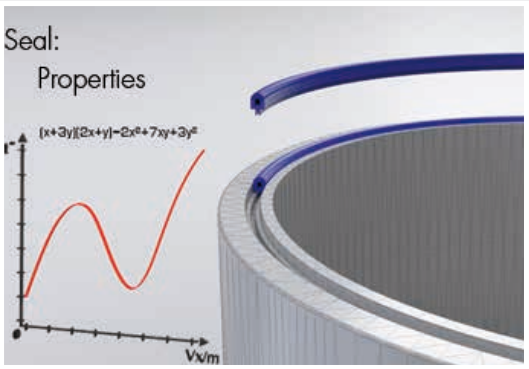
1 - Requirements analysis

A team of engineers works with you supportively to specify the product and diagnose, based on your requirements. Whether it is an extruded seal or a technical moulded item, our experts will use their know-how to guide you through design and production.

2 - R&D: Formulation and formatting

Our in-house control of silicone formulations enables us to provide our clients with bespoke solutions, maintaining great responsiveness to customer requirements.

Thanks to our team of chemical engineers and extensive range of machinery, we are very flexible, able to find the right choice of materials and process to meet your technical requirements.



3 - Tooling design

Our research centre takes full internal control of tool design, ensuring responsiveness and quality.

Insulating silicones

Unfluorinated silicone

VMQ (ASTM D 1418) type silicones.
Working temperature: -73°C to +232°C

These elastomers are used for the manufacture of moulded items, extruded seals, cut flat seals and seals vulcanised in place. They maintain their mechanical characteristics over a broad temperature range.

	Standards	GT 20	GT 30	GT 37	GT 40	GT 47
Elastomer		Silicone	Silicone	Fluorosilicone	Silicone	Fluorosilicone
Shore hardness A (±5)	ASTM D 792	25	30	30	40	40
Density at 25°C (g/cm³)	ASTM D 2240	1.10	1.11	1.36	1.10	1.43
Tensile strength Psi Mpa	ASTM D 412	 870 6	 980 6.75	 1000 6.90	 1000 6.80	 1250 8.60
% Elongation	ASTM D 412	950	850	480	500	400
Residual deformation 22hr at 177°C (%)	ASTM D 395 Method B	20	20	20	30	20
Colour		Red	White	Blue	Orange	Blue

Moulded Extruded Cut Secured by vulcanisation Sheet

INSULATING SHEETS TOLERANCES

SHEET SIZE 300mm x 300mm	
Thickness (mm)	TOLERANCES
0.20	± 0.07
From 0.30 to 0.40	± 0.1
0.50	± 0.15
0.60	± 0.15
0.70	± 0.15
0.80	± 0.18
0.90	± 0.18
From 1.0 to 2.0	± 0.20
Up to 2	± 13%

SHEET SIZE 150mm x 150mm	
Thickness (mm)	TOLERANCES
0.20	+0.05 / -0
From 0.30 to 0.40	± 0.05
0.50	± 0.07
0.60	± 0.10
0.70	± 0.10
0.80	± 0.15
0.90	± 0.15
From 1.0 to 2.0	± 0.15
Up to 2	± 13%

The tolerances for control are those shown on this page except when a FAI, a DVI or specific control document is request to GETELEC.

For other thicknesses, do contact us: up to 10mm available

All our sheets are individually checked and given certificates of conformity. Each type of sheet can be made in a fire-resistant (to UL 94) version to order.

We can also provide cut sections to suit the most appropriate procedure for your requirements: tool cut, laser cut, water jet cut, flashcut. These cut sections are delivered within two weeks of receipt of your order and designs.

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Fluorosilicone

Fluorosilicone products type FVMQ (ASTM D 1418)
Working temperature: -60°C to +230°C

These products have good resistance to solvents, fuels, and organic and silicone oils

These elastomers are used for the manufacture of moulded items, extruded seals, cut flat seals and seals vulcanised in place. They maintain their mechanical characteristics over a broad temperature range.

GT 50	GT 57	GT 60	GT 67	GT 70	GT 77	GT 80
Silicone	Fluorosilicone	Silicone	Fluorosilicone	Silicone	Fluorosilicone	Silicone
50	50	60	60	70	70	80
1.19	1.44	1.27	1.46	1.35	1.48	1.43
980 6.75	1200 8.45	950 6.55	1200 8.30	1000 6.89	1250 8.60	965 6.65
380	350	300	300	180	300	165
32	25	33	25	34	25	35
Red	Blue	Blue	Blue	Red	Blue	Red

RELATIONSHIP OF COMPRESSIVE FORCE TO THE CRUSHING OF MOULDED GT37

Samples		1	2	3
Section diameter (mm)		9.19	9.20	9.24
Nominal thickness (mm)		1.36	1.33	1.38
Thickness under pressure (kg)	4	1.10	1.10	1.10
	5	1.02	1.05	1.06
	6	0.95	1.02	1.05
	7	0.90	0.95	1.00

Measurements made on moulded sheet material Measurements taken on cut out sections

Aerospace quality silicone 70 shore GT70 E RF-2 and GT70 M RF-2

Mixture of silicone elastomer hardness 70 shore A developed for applications requiring excellent resistance to fire.

The parts complied with requirements of aerospace standards:
- ✔ Low flame spread
- ✔ Low smoke emission
- ✔ Low emission of toxic gases

Applications :
- ✔ Finishing business class airplane seats
- ✔ Rugged computer
- ✔ Embedded electronics systems
- ✔ Electronic system order management braking

PROPERTIES

Properties	Standard	GT 70 E RF-2	GT 70 M RF-2
Specific gravity g/cm³	ASTM D 792	1.35 ± 0.05	1.35 ± 0.05
Hardness shore A	ASTM D 2240	70 ± 5	70 ± 5
Break resistance MPa	ASTM D 412	> 6	> 6
Tear strength kN/m	ASTM D 624	> 10	> 10
Elongation at break %	ASTM D 412	> 180	> 180
Compression set 70h at 100°C	ASTM D 395	< 50	< 50
Working temperature		-60°C to +200°C (peak at 230°C)	-60°C to +200°C (peak at 230°C))
Color		On demand	On demand
Shaping possibility		■	■ ■ ■ ■

■ Moulded ■ Extruded ■ Die-cut ■ Vulcanisation ■ Sheet

Qualified according to standard:
FAR 25.853
Norm AIRBUS ABD0031

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Aeronautic quality formulations

ACRYLONITRILE-BUTADIENE (NBR – Perbunan – Krynac - Hycar)			
Product reference	Standards	Hardness (shore A)	Extreme working temperatures
20 A5	NFL17-120	50	-30°C to +140°C
20A6		60	
20A7		70	
20A8		80	
20 B5	NFL17-120	50	-50°C to +120°C
20 B6		60	
20 B7		70	
20 B8		80	
21 A6	NFL17-121	60	-20°C to +140°C
21 A7		70	
21 A8		80	
21 B4	NFL17-121	40	-40°C to +120°C
21 B6		60	
21 B8		80	
23 B7	NFL17-123	70	-50°C to +120°C
24 B7	NFL17-124	70	-50°C to +120°C
FLUOROCARBONS (Viton, Fluorel, Technoflon)			
60 C7	NFL17-160	75	-20°C to +260°C
60 C9		90	-15°C to +260°C
64 C6	NFL17-164	60	-20°C to +260°C
64 C8		80	
FLUOROSILICONE (FMVQ), Silastic)			
61 D6	NFL17-161	60	-50°C to +200°C
61 D8		80	
SILICONE (VMP – PVMQ – Silastic – Rhodorsil)			
50 D5	NFL17-150	50	-55°C to +260°C
50 D6		60	
50 D7		70	
53 D5	NFL17-153	50	-70°C to +225°C
ETHYLENE – PROPYLENE - EPDM			
41 B8	NFL17-141	80	-55°C to +140°C
POLYCHLOROPRENE - NEOPRENE			
31 B3	NFL17-131	30	-40°C to +120°C
31 B4		40	
31 B5		50	
31 B6		60	
31 B7		70	
31 B8		80	

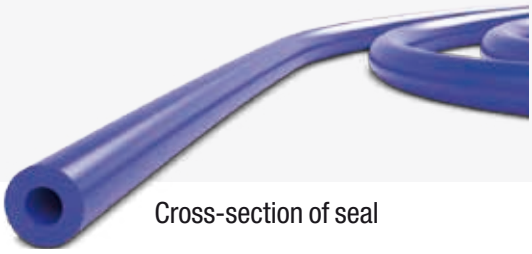
Moulded Extruded Cut Sheet

Extruded insulating silicone

We have a wide range of standard solid and hollow profiles corresponding to a maximum configuration of customers. The realization of an extrusion die is at very competitive rates, so we are able to offer tailor-made forms to our customers when the profile is non-existent catalog in a reduced time.

In addition to our standard silicone materials (VMQ / FMVQ) we also mastered:

- ✔ Silicone flame retardant UL 94 HB, V0
- ✔ Silicone quality rail according NFF16-101 and 102, and EN 45545-2
- ✔ Silicone aircraft grade required fire / smoke / toxicity according to FAR 25.853 (AIRBUS ABD0031 standard)
- ✔ Silicone spatial quality (low outgassing) according to standard ASTM E 595 (TML <1% CVCM <0.1%)
- ✔ Material aircraft grade
- ✔ liquid silicone (LSR)
- ✔ Food Grade Silicone (FDA)
- ✔ medical grade material
- ✔ Silicone phenylated (PVMQ)



Cross-section of seal

CHEMICAL RESISTANCE SILICONES

	Silicone (VMQ)
Air	Excellent
Alcohol	Good
Hydrocarbon	Very low (projection)
Grease (not silicone)	Good
Vegetable oils	Good
Silicone oils	Poor
Weak acids	Good
Strong acids	Do not resist
Steam	Poor at high temperature (ok up to 100°C)

	Fluorosilicone (FMVQ)
Air	Excellent
Alcohol	Good
Hydrocarbon	Excellent
Grease (not silicone)	Very good
Mineral oils	Very good
Weak acids	Good
Strong acids	Very low

TOLERANCES FOR EXTRUDED SECTIONS

TOLERANCES ON CROSS SECTION FOR EXTRUDED PROFIL	
DIMENSIONS (mm)	TOLERANCES
From 0.5 to 1.8	± 0.07
From 1.8 to 2.5	± 0.10
From 2.5 to 5.0	± 0.15
From 5.0 to 9.0	± 0.25
> 9.0	± 3%

TOLERANCES ON HOLLOW CROSS SECTION FOR EXTRUDED PROFIL	
DIMENSIONS (mm)	
From 0.5 to 1.0	± 15%
> 1.0	± 10%

The tolerances for control are those shown on this page except when a FAI, a DVI or specific control document is request to GETELEC.

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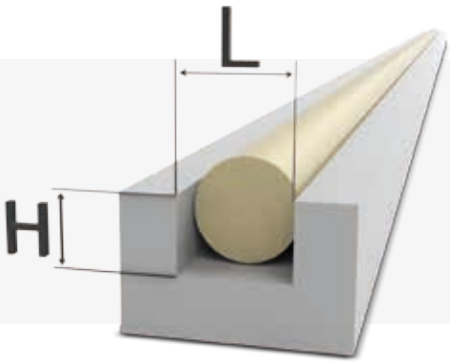
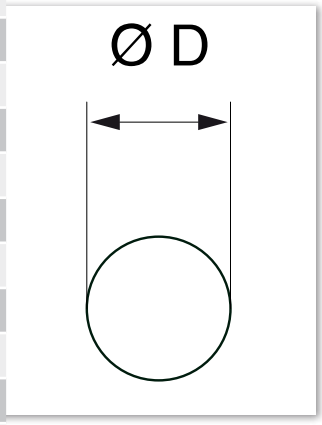
Solid round profile

Cross-section of seal



Recommended groove dimensions
Machining tolerance: ± 0.05

Ref.	D (mm)	H (mm)	L (mm)	Ref.	D (mm)	H (mm)	L (mm)
0538	0.50	0.4	0.6	2922	2.90	2.3	3.2
0710	0.71	0.6	0.8	3024	3.00	2.4	3.3
0810	0.80	0.6	0.9	3172	3.17	2.5	3.5
1020	1.00	0.8	1.1	3326	3.30	2.6	3.6
1211	1.20	1.0	1.3	3529	3.50	2.8	3.8
1251	1.25	1.0	1.4	3600	3.60	2.9	3.9
1351	1.35	1.1	1.5	3831	3.80	3.0	4.1
1400	1.40	1.1	1.5	4033	4.00	3.2	4.4
1550	1.50	1.2	1.6	4150	4.15	3.3	4.5
1613	1.60	1.3	1.7	4500	4.50	3.6	4.9
1735	1.70	1.4	1.9	5045	5.00	4.0	5.5
1815	1.80	1.4	2.0	5342	5.33	4.3	5.8
1900	1.90	1.5	2.1	5400	5.40	4.3	5.9
2017	2.00	1.6	2.2	5545	5.50	4.4	6.0
2218	2.20	1.8	2.4	6050	6.00	4.8	6.5
2419	2.40	1.9	2.6	6452	6.40	5.1	7.0
2502	2.50	2.0	2.7	7056	7.00	5.6	7.6
2621	2.60	2.1	2.8	7040	7.40	5.9	8.1
2725	2.70	2.2	2.9	8064	8.00	6.4	8.7
2842	2.84	2.3	3.1	1012	10.00	8.0	10.9



Contact us for alternative sizes.

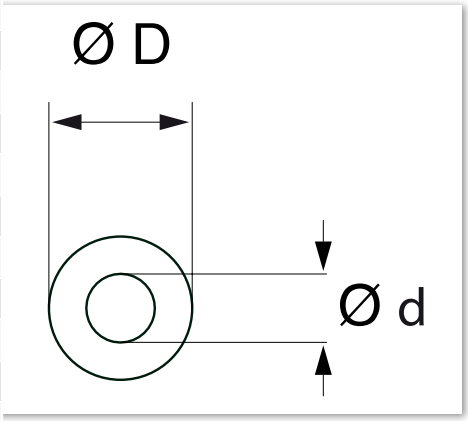
0538 GT60: profile reference + 60 shore insulating silicone

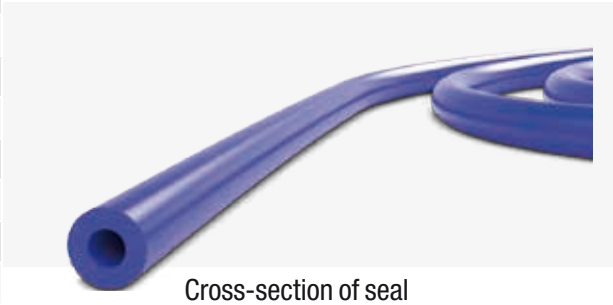
Recommended groove dimensions calculation is based on the following data:

Average seal compression 20%
Groove fill rate 90%

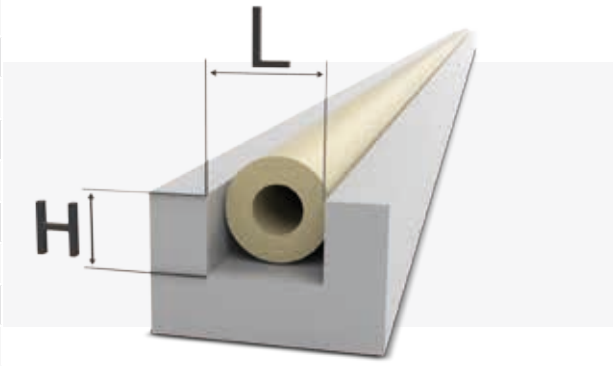
Hollow round profile

Ref.	D (mm)	d (mm)	L (mm)	H (mm)	Ref.	D (mm)	d (mm)	L (mm)	H (mm)
1005	1.00	0.50	0.8	0.8	3214	3.18	1.40	2.8	2.4
1305	1.30	0.55	1.2	1.0	3211	3.20	1.10	3.1	2.4
1406	1.45	0.65	1.3	1.1	3215	3.20	1.50	2.8	2.4
1607	1.50	0.70	1.3	1.1	3217	3.20	1.70	2.5	2.4
1605	1.60	0.50	1.6	1.2	32016	3.20	1.60	2.6	2.4
1608	1.60	0.80	1.3	1.2	3202	3.20	2.00	2.1	2.4
1808	1.80	0.80	1.6	1.4	3412	3.40	1.20	3.3	2.6
1812	1.80	1.10	1.2	1.4	3420	3.40	2.00	2.4	2.6
2011	2.00	1.10	1.5	1.5	3519	3.50	1.90	2.7	2.6
2050	2.00	0.50	2.1	1.5	4013	4.00	1.30	3.9	3.0
2080	2.00	0.80	1.9	1.5	4020	4.00	2.00	3.3	3.0
2108	2.10	0.80	2.0	1.6	4520	4.50	2.00	4.0	3.4
2112	2.10	1.27	1.5	1.6	4525	4.50	2.50	3.4	3.4
2206	2.25	0.60	2.3	1.7	5023	5.00	2.30	4.3	3.8
2309	2.30	0.89	2.2	1.7	5323	5.30	2.30	4.7	4.0
2310	2.30	1.00	2.1	1.7	5535	5.50	3.50	3.6	4.1
2313	2.30	1.30	1.7	1.7	6030	6.00	3.00	5.0	4.5
2505	2.50	0.50	2.6	1.9	6004	6.00	4.00	3.7	4.5
2510	2.50	1.00	2.3	1.9	6432	6.40	3.20	5.3	4.8
2511	2.50	1.10	2.2	1.9	7034	7.00	3.40	5.9	5.3
2608	2.60	0.80	2.6	2.0	7037	7.00	3.75	5.5	5.3
2610	2.60	1.00	2.4	2.0	7837	7.85	3.75	6.7	5.9
2612	2.60	1.20	2.3	2.0	7949	7.95	4.88	5.5	6.0
2611	2.68	1.08	2.5	2.0	8061	8.00	6.00	3.9	6.0
2717	2.75	1.70	1.9	2.1	9060	9.00	6.00	5.5	6.8
2808	2.80	0.80	2.8	2.1	9563	9.50	6.40	5.7	7.1
2815	2.80	1.50	2.2	2.1	1106	11.00	6.50	7.9	8.3
30010	3.00	1.00	2.9	2.3	1206	12.00	6.00	9.9	9.0
3011	3.00	1.10	2.9	2.3	1208	12.00	8.00	7.3	9.0
3012	3.00	1.20	2.8	2.3	1209	12.00	9.00	5.8	9.0
3014	3.00	1.40	2.6	2.3	1601	16.00	15.00	2.1	12.0
3016	3.00	1.60	2.4	2.3	2813	28.00	12.50	24.7	21.0
3212	3.18	1.14	3.1	2.4	3002	30.00	20.00	18.4	22.5





Cross-section of seal



Recommended groove dimensions
Machining tolerance: ± 0.05

Contact us for alternative sizes.

1005 GT40: profile reference + 40 shore insulating silicone

Recommended groove dimensions calculation is based on the following data:

Average seal compression 25%
Groove fill rate 95%

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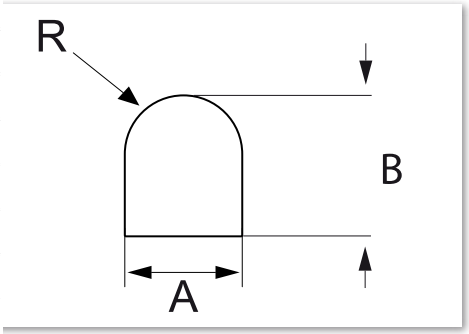
Solid D profile

Cross-section of seal

Recommended groove dimensions
Machining tolerance: ± 0.05

Ref.	A (mm)	B (mm)	R (mm)	L (mm)	H (mm)
1617	1.60	1.70	0.80	1.8	1.4
2022	2.00	2.20	1.00	2.3	1.9
2024	2.00	2.40	1.00	2.3	2.0
2217	2.20	1.750	1.10	2.4	1.5
2420	2.40	2.00	1.20	2.7	1.7
2713	1.30	2.70	0.65	1.6	2.3
3035	3.00	3.50	1.50	3.5	3.0
3045	3.00	4.50	1.50	3.6	3.8
3046	3.00	4.60	1.50	3.6	3.9
3060	3.00	6.00	1.50	3.6	5.1
3997	3.96	3.96	1.98	4.5	3.4
4030	3.96	3.00	1.50	4.3	2.6
4544	4.50	4.40	2.25	5.1	3.7
5040	4.00	5.00	2.00	4.7	4.3
50045	5.00	4.50	2.50	5.6	3.8
60031	6.00	3.00	3.00	6.0	2.6



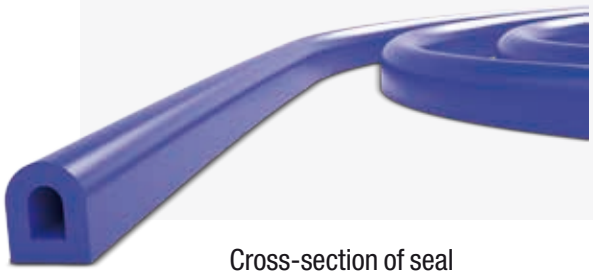
Contact us for alternative sizes.

1617 GT60 : profile reference + 60 shore insulating silicone

Recommended groove dimensions calculation is based on the following data:

Average seal compression 15%
Groove fill rate 92%

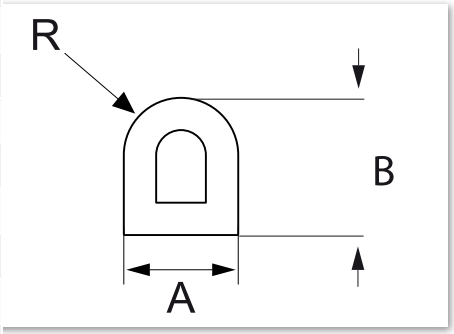
Hollow D profile



Cross-section of seal

Recommended groove dimensions
Machining tolerance: ± 0.05

Ref.	A (mm)	B (mm)	R (mm)	Wall thickness (mm)
3931	3.92	3.00	1.96	0.80
3996	3.96	3.96	1.98	1.14
4031	3.96	3.00	2.00	0.80
4747	4.70	4.70	2.35	1.27
47047	4.75	4.75		
4948	4.80	4.80	2.40	1.30
6031	6.00	3.00		
6331	6.35	6.35	3.18	1.61
70009	7.00	9.00	3.50	1.60
70011	7.00	10.00		
70080	7.00	8.00		
7638	7.60	3.00		
7639	7.60	3.98	3.80	1.00
7979	7.90	7.90	3.95	1.57
1003	10.00	10.00		1.57
1030	10.00	3.00		
1111	11.99	10.99	6.00	2.00
1510	15.00	10.00	7.50	1.50



Contact us for alternative sizes.
3931 GT67: profile reference + 60 shore insulating fluorosilicone

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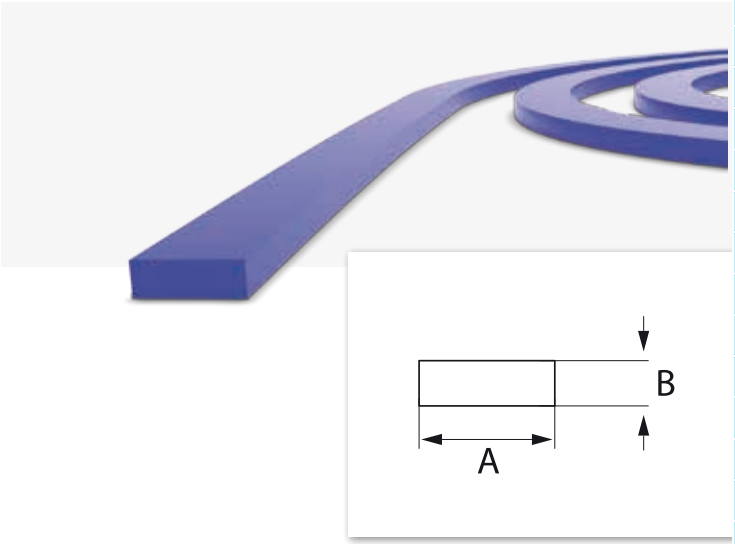
Other profiles

SOLID RECTANGULAR PROFILE



Ref.	A (mm)	B (mm)	Ref.	A (mm)	B (mm)
1025	1.00	2.50	2503	5.00	3.00
1610	1.60	1.07	6010	6.00	1.00
1805	1.80	0.50	6020	6.00	2.00
2010	2.00	1.00	6080	6.00	8.00
2415	2.41	1.57	6416	6.40	1.60
2501	2.50	1.00	6580	6.50	8.00
2515	2.50	1.50	7512	7.50	1.25
3032	3.00	3.20	8060	8.00	6.00
3040	3.00	4.00	1016	10.00	1.60
3115	3.00	1.50	1203	12.00	3.00
3010	3.00	1.00	1240	12.00	4.00
3019	3.05	1.91	1248	12.70	4.78
3216	3.20	1.60	1273	12.70	3.18
3232	3.20	1.00	1503	15.00	3.00
3248	3.20	4.80	2542	25.40	2.00
3610	3.60	1.10	3510	35.00	1.00
4016	4.00	1.60	3710	37.00	10.00

HOLLOW RECTANGULAR PROFILE

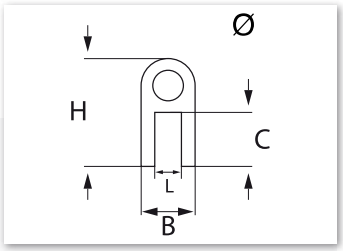
Ref.	B (mm)	H (mm)	C (mm)	D (mm)	I (mm)
2738	3.80	2.70	2.30	0.80	1.00
1268	12.00	6.00	8.00	0.80	4.40

HOLLOW SQUARE PROFILE

Ref.	B (mm)	H (mm)	Ø (mm)
2828	2.80	2.80	1.20
3031	3.00	3.00	1.00
30315	3.00	3.00	1.50
3535	3.50	3.50	1.40
6062	6.00	6.00	2.50

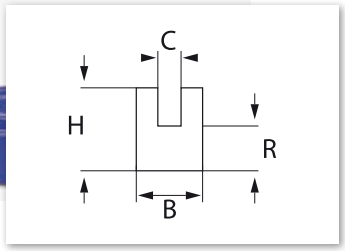
"A" PROFILE

Ref.	B (mm)	H (mm)	L (mm)	C (mm)	Ø (mm)
1531	1.57	3.18	0.81	1.60	0.50
1836	1.80	3.60	0.40	1.80	0.50
2357	2.00	5.50	0.80	3.50	1.00
2055	2.30	5.70	0.80	3.40	0.90
2560	2.50	6.00	-	-	1.00
3163	3.18	6.35	1.57	3.18	1.80
3523	3.50	4.50	1.60	1.70	2.30



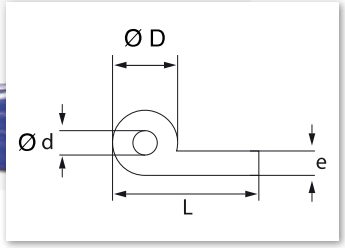
"U" PROFILE

Ref.	B (mm)	H (mm)	C (mm)	R (mm)
2525	2.54	2.54	0.86	0.84
3228	3.20	2.80	0.66	1.27
3939	3.96	3.96	1.57	1.19
39039	3.96	3.96	1.57	2.80
4050	4.00	5.00	1.40	2.70
4056	4.50	5.50	2.10	3.00
4439	4.45	4.00	1.19	1.91
8080	8.00	8.00	5.00	1.50
9162	9.15	6.20	3.00	4.40



"P" PROFILE

Ref.	Ø D (mm)	Ø d (mm)	L (mm)	e (mm)
5712	3.50	2.55	5.70	1.20
4084	4.00	2.00	8.40	2.00
4090	4.00	1.50	9.00	1.50
5011	5.00	1.80	11.00	1.70
8014	7.92	4.70	14.30	1.60
8114	7.92	3.42	14.30	1.60
3015	3.00	1.50	15.00	2.00
6401	6.40	3.20	16.00	1.60
1165	11.00	6.50	17.50	1.60
9019	9.00	6.48	19.00	1.60
7018	6.40	4.80	19.10	1.60
1021	10.00	6.00	21.00	2.00



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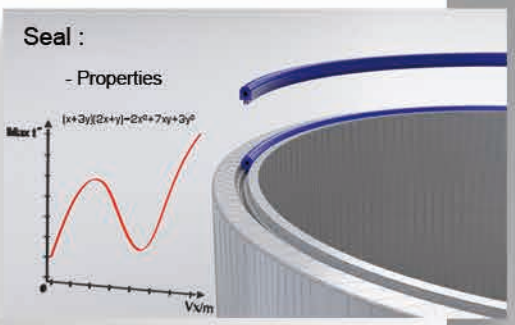
Custom seals

1. Responsiveness to requirements

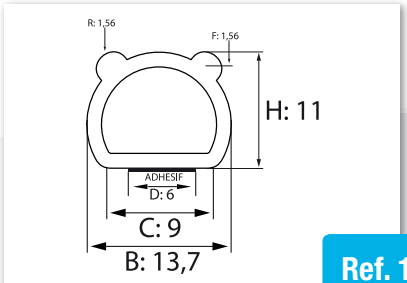


2. R&D

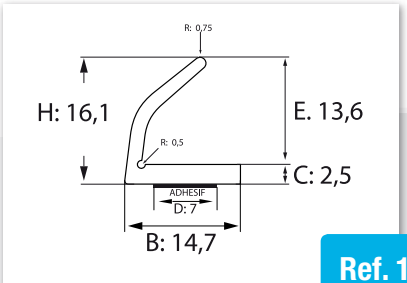
3. Tooling manufacture

4. Custom extrusion

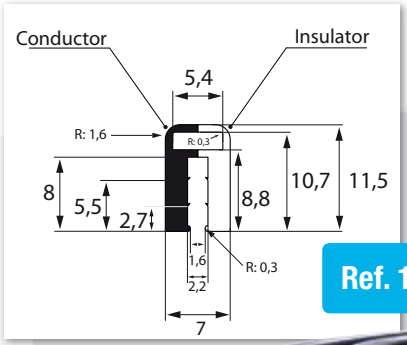
Telecoms cabinets and bays specific profile



Ref. 1371



Ref. 1517



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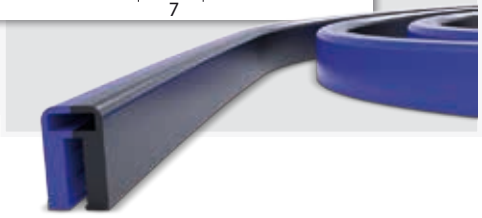

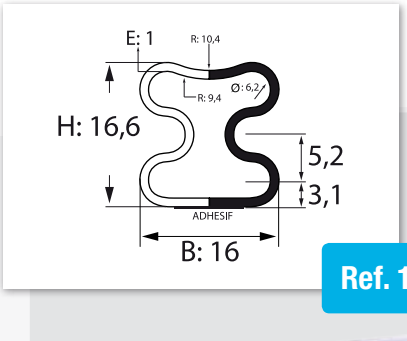

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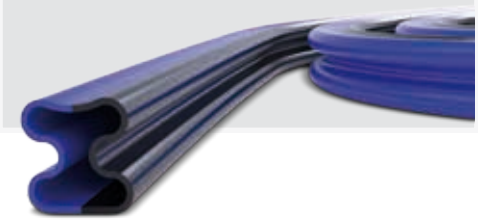
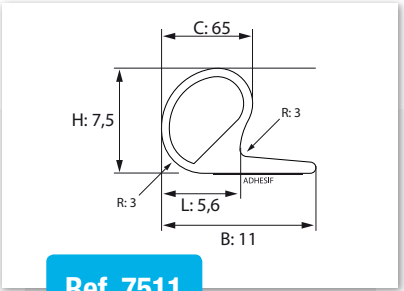
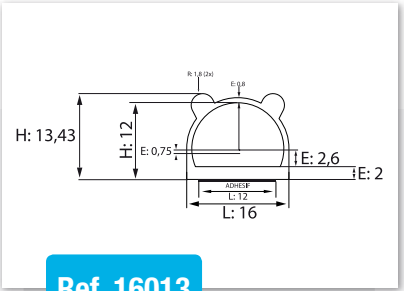
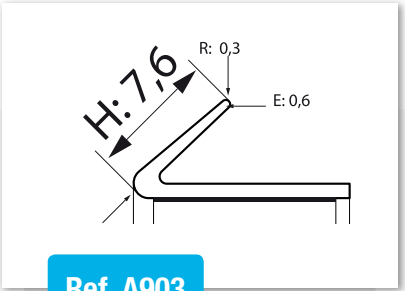




Ref. 7511



Ref. 16013



Ref. A903

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Flat connector gaskets

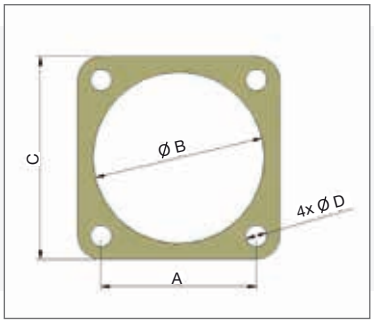
Housing	Getelec reference	A ± 0.25mm	B ± 0.51mm	C ± 0.38mm	D ± 0.25mm	Standard thickness (mm)
6	D 110	11.90	9.53	18.75	3.60	0.50 or 0.80
6	D 111	12.70	11.00	17.50	3.00	0.50 or 0.80
8	D 112	15.10	16.00	21.34	3.43	0.50 or 0.80
8	D 113	15.10	14.40	20.60	3.00	0.50 or 0.80
8	D 114	15.10	12.70	22.23	3.96	0.50 or 0.80
9	D 115	18.20	19.00	24.50	3.60	0.50 or 0.80
10	D 116	18.20	15.88	25.40	3.96	0.50 or 0.80
11	D 117	20.60	22.23	26.93	3.60	0.50 or 0.80
12	D 118	20.60	19.05	27.80	3.60	0.50 or 0.80
13	D 119	23.00	25.53	29.30	3.43	0.50 or 0.80
14	D 120	23.00	22.23	30.18	3.96	0.50 or 0.80
16	D 121	24.60	25.40	32.54	3.96	0.50 or 0.80
15/16	D 122	24.60	28.83	31.95	3.96	0.50 or 0.80
18	D 123	27.00	28.83	35.00	3.96	0.50 or 0.80
17/18	D 124	27.00	32.00	34.32	3.96	0.50 or 0.80
19/20	D 125	29.36	34.93	38.10	3.60	0.50 or 0.80
20	D 126	29.36	33.30	37.26	3.20	0.50 or 0.80
21/22	D 127	31.75	38.10	41.30	3.60	0.50 or 0.80
22	D 128	31.75	34.93	41.30	4.37	0.50 or 0.80
23/24	D 129	34.93	41.30	44.45	4.37	0.50 or 0.80
24	D 130	34.93	38.10	44.45	5.16	0.50 or 0.80
25	D 131	38.10	44.45	47.63	4.37	0.50 or 0.80
28	D 132	39.70	44.45	50.80	5.20	0.50 or 0.80
32	D 133	44.45	50.80	57.15	5.60	0.50 or 0.80
36	D 134	49.23	57.15	63.50	5.60	0.50 or 0.80
40	D 135	55.58	63.50	69.85	5.60	0.50 or 0.80
44	D 136	60.33	70.64	76.20	5.60	0.50 or 0.80
48	D 137	66.70	77.00	82.55	5.60	0.50 or 0.80

Contact us for alternative thicknesses.

Seals can be made in insulating fluorosilicone or not or in corrosion-resistant bi-material.

These seals can also be made in conductive fluorosilicone

GT1000, GT1015, GT2020, GT3100, GT5000, BL10000, MS composite seals



Getelec reference	A ± 0.25mm	B ± 0.51mm	C ± 0.38mm	D ± 0.25mm	Standard thickness (mm)
G 21	8.60	8.60	7.70	2.40	0.50 or 0.80
J 61	12.70	12.70	11.00	3.00	0.50 or 0.80
S 122	12.70	12.70	11.20	3.20	0.50 or 0.80
A 57	15.10	15.10	14.40	3.00	0.50 or 0.80
B 76	15.1	15.10	14.40	3.00	0.50 or 0.80
H 13	15.10	15.10	14.30	3.30	0.50 or 0.80
K 177	18.00	18.00	14.80	3.50	0.50 or 0.80
H 194	18.00	18.00	11.30	3.50	0.50 or 0.80
F 86	18.20	18.20	17.50	3.50	0.50 or 0.80
Z 30	18.20	18.20	15.50	3.20	0.50 or 0.80
K 34	18.25	18.25	19.00	3.50	0.50 or 0.80
H 15	18.30	18.30	18.40	3.30	0.50 or 0.80
A 256	20.60	20.60	18.00	3.20	0.50 or 0.80
C 86	20.60	20.60	19.05	3.10	0.50 or 0.80
H 64	20.60	20.60	22.20	3.50	0.50 or 0.80
H 14	20.60	20.60	23.20	3.30	0.50 or 0.80
R 3	20.60	20.60	23.50	3.50	0.50 or 0.80
Z 31	20.60	20.60	19.50	3.20	0.50 or 0.80
J 151	21.00	21.00	19.50	3.50	0.50 or 0.80
C 84	23.00	23.00	23.00	3.00	0.50 or 0.80
B 6	24.60	24.60	24.00	3.20	0.50 or 0.80
J 193	24.60	24.60	28.60	3.60	0.50 or 0.80
Z 32	24.60	24.60	26.00	3.20	0.50 or 0.80
K 178	25.00	25.00	31.00	3.50	0.50 or 0.80
D 30	26.20	26.20	25.10	3.50	0.50 or 0.80
E 104	27.00	27.00	32.00	4.00	0.50 or 0.80
F 99	27.00	27.00	30.90	3.30	0.50 or 0.80
N 32	27.00	27.00	30.00	3.20	0.50 or 0.80
S 123	28.20	28.20	31.75	3.00	0.50 or 0.80
W 195	31.00	31.00	30.50	4.50	0.50 or 0.80
S 124	30.50	30.50	35.00	3.00	0.50 or 0.80
N 33	31.70	31.70	36.00	3.20	0.50 or 0.80
B 187	31.75	31.75	32.10	3.60	0.50 or 0.80
K 179	33.00	33.00	30.50	5.50	0.50 or 0.80
S 125	34.90	34.90	38.00	3.00	0.50 or 0.80
N 34	35.00	35.00	39.20	3.20	0.50 or 0.80
J 142	42.00	42.00	36.00	4.00	0.50 or 0.80

Contact us for alternative thicknesses.

Seals can be made in insulating fluorosilicone or not or in corrosion-resistant bi-material.

These seals can also be made in conductive fluorosilicone
GT1000, GT1015, GT2020, GT3100, GT5000, BL10000, MS composite seals

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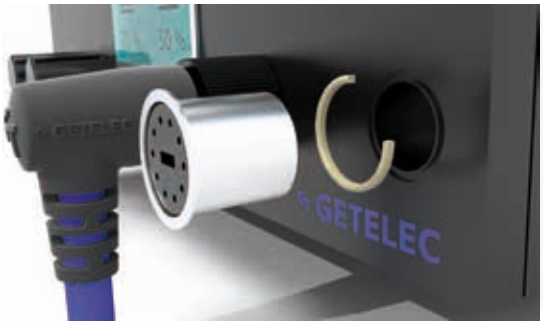
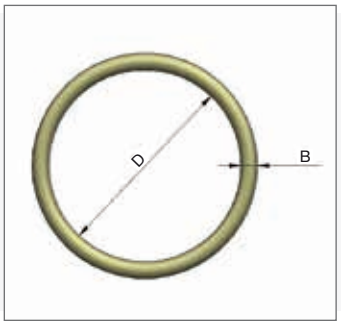
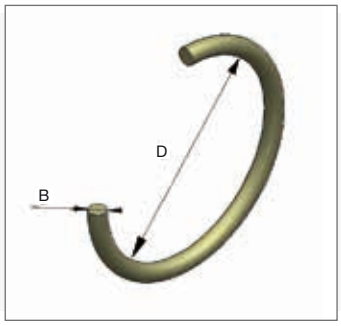
Round connector seals







HOUSING	REF.	CROSS-SECTION	INTERIOR Ø
-	LR 16	1.50	7.60
-	LR 34	1.50	10.50
-	LR 31	1.70	7.50
-	LR 32	1.80	12.50
-	LR 71	1.80	14.00
-	LR 72	1.80	17.17
09-10	LR 17	1.80	20.30
-	LR 14	1.80	20.50
09-10	LR 67	1.80	21.90
-	LR 68	1.80	23.50
11-12	LR 18	1.80	25.10
-	LR 15	1.80	25.30

INTERIOR Ø	TOLERANCES
01 to 38 mm.	± 0.25 mm
38 to 65 mm.	± 0.40 mm

HOUSING	REF.	CROSS-SECTION	INTERIOR Ø
13-14	LR 12	1.80	28.30
15-16	LR 13	1.80	31.50
-	LR 10	1.80	33.00
17-18	LR 19	1.80	34.60
-	LR 11	2.60	32.00
19-20	LR 20	2.60	37.80
-	LR 54	2.60	40.00
-	LR 55	2.60	57.00
21-22	LR 84	2.60	40.90
23-24	LR 124	2.60	44.10
-	LR 125	2.60	47.40
-	LR 134	2.60	60.00

CROSS-SECTIONS	TOLERANCES
1.5 to 1.8 mm.	± 0.08 mm
1.8 to 2.6 mm.	± 0.15 mm

Fast delivery on other dimensions on request.

Getelec offers a range of over 8000 types of O-ring seal. Do contact us for rapid delivery.

Seals can be made in insulating fluorosilicone or not or in corrosion-resistant bi-material.

These seals can also be made in conductive fluorosilicone

GT1000, GT1015, GT2020, GT3100, GT5000, BL10000, MS composite seals

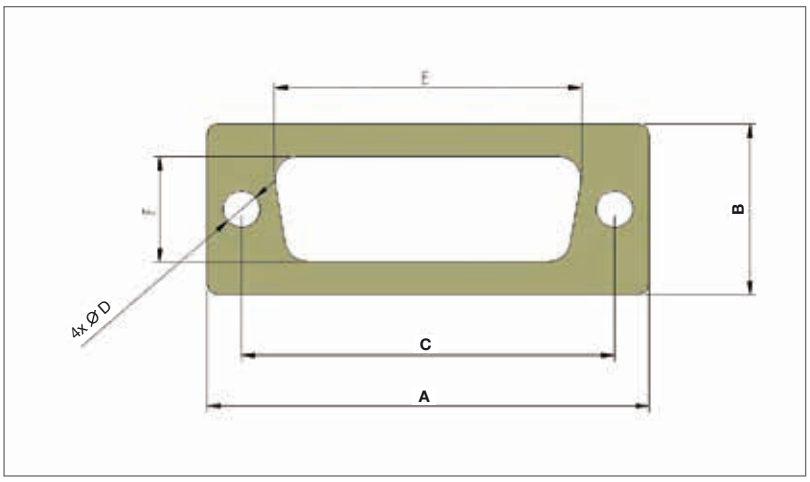
D Sub connector seals

D SUB connector seals are used for connecting drawer bays and miniature chassis cables.

This type of seal is widely used in the following areas:

telecoms, medical, information technology, military and aerospace.

GETELEC supplies these seals in standard sizes from 9 to 50 pins.
These seals can also be made to measure to suit your individual needs.



Housing sizes	Getelec reference	A (mm)± 0.38	B (mm)± 0.38	C (mm)± 0.25	D (mm)± 0.25	E (mm)± 0.38	F (mm)± 0.25	Cutting angle
9 contacts	H 127	30.81	15.09	25.00	3.05	17.70	9.14	10°
15 contacts	H 128	39.52	15.24	33.32	3.30	27.43	9.40	10°
25 contacts	H 129	53.01	15.09	47.04	3.05	40.21	9.60	10°
37 contacts	D 165	69.32	15.09	63.50	3.05	56.67	9.60	10°
50 contacts	D 166	66.93	15.37	61.11	3.05	53.57	11.84	10°

All dimensions in millimetres

Seals can be made in insulating fluorosilicone or not or in corrosion-resistant bi-material.

These seals can also be made in conductive fluorosilicone
GT1000, GT1015, GT2020, GT3100, GT5000, BL10000, MS composite seals

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Cellular silicone elastomers

GT21 and GT31 are cellular silicone elastomers used to make seals with low hardness and shock-absorbing stops.

CHARACTERISTICS

Reference	GT 11	GT 21	GT 21 F	GT 21 BD	GT 31
Type	Closed cell cellular material				
Material	Foamed Silicone	Foamed Silicone	Foamed Flurosilicone	Foamed Silicone low density	Foamed Silicone
Hardness shore A (+/- 5)	12	20	20	12 (45 sh00)	30
Density g/cm3 (+/-0.1)	0.40	0.60	0.61	0.40	0.80
Flammability classification UL94	Possibility made with UL94 V1 rating				
Color	Off-white (other color available on demand)				
Working temperature	-55°C to +200°C (peak up to 250°C)				

Moulded Cut Sheet

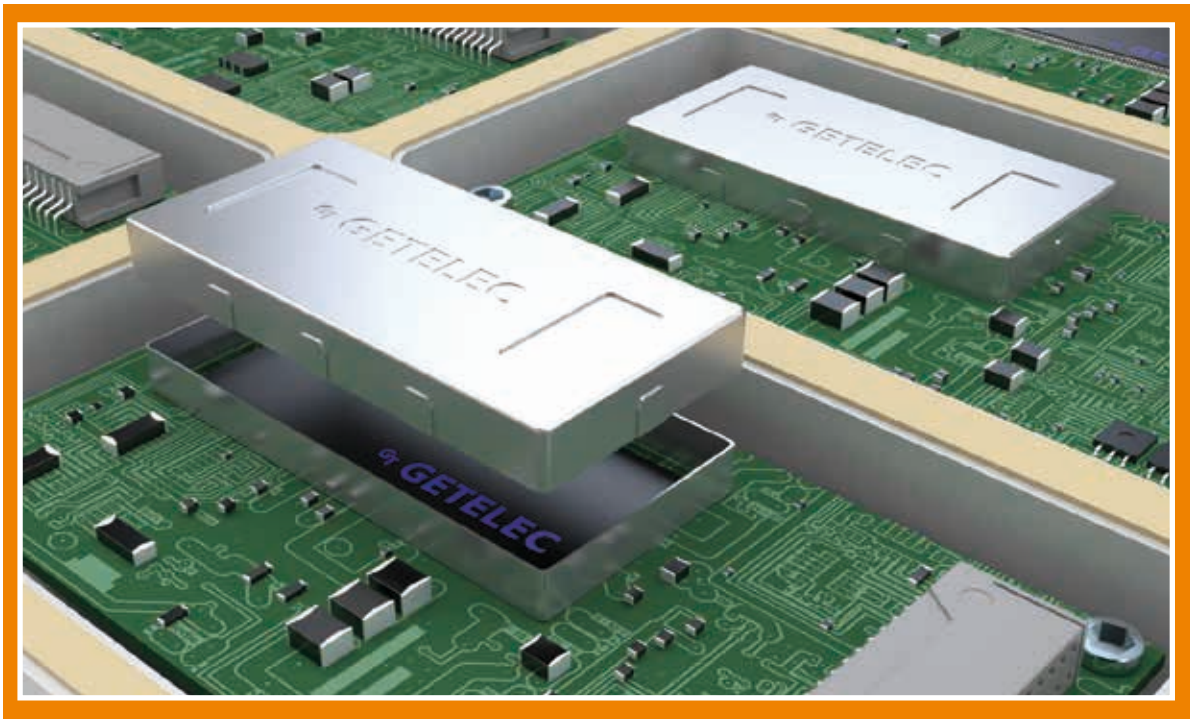
INSULATING SHEETS TOLERANCES

External dimensions (mm)	Thickness (mm)	Thickness tolerances +/-
300 x 300	1.00 ≤ Th. < 2.00	+/- 0.20
300 x 300	2.00 ≤ Th. < 4.00	+/- 0.30
300 x 300	4.00 ≤ Th. < 8.00	+/- 0.50

Note

The use of expanded material beyond 50% compression is not recommended (risks of cell wall rupture and significant residual deformation).
Recommended compression is in the 20 to 30% range.

SHIELDING METAL GASKETING



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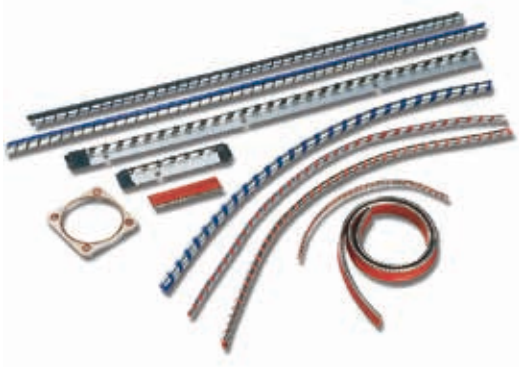
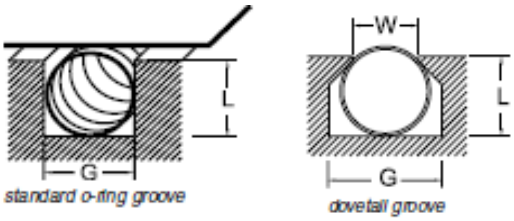
CONTENTS

GTS Spira shield

The Spira-Shield patented spiral is the basis for all of our unique high shielding EMI gasketing solutions. The spiral is wound out of spring temper beryllium copper for excellent spring memory and compression set resistance. The spiral is tin plated for superior conductivity and shielding properties. The edge plated version exhibits excellent corrosion resistance against aluminum when exposed to humid or salt-fog environments.





Spira-Shield Part Numbers (RoHS Tin Plated Beryllium Copper)				Recommended Groove Dimensions		
Diameter (mm)	Standard Force*	Moderate Force	Low Force	Depth (L) +0.05 /-0 (mm)	Width (G) +0.18 / -0.13 (mm)	Width (W) +0 / -0.05 (mm)
0.86 ± 0.05	GTS-IWSS-86	GTS-IWMS-86 NC**	-	0.58	1.17	0.84
1.19 ± .0.05	GTS-IWSS-119	GTS-IWMS-119 NC**	-	0.89	1.60	1.14
1.60 ± 0.08	GTS-IWSS-160	GTS-IWMS-160	GTS-IWLS-160	1.17	2.39	1.52
1.78 ± 0.08	GTS-IWSS-178	GTS-IWMS-178	GTS-IWLS-178	1.35	2.39	1.70
1.98 ± 0.08	GTS-IWSS-198	GTS-IWMS-198	GTS-IWLS-198	1.50	2.77	1.91
2.39 ± 0.10	GTS-IWSS-239	GTS-IWMS-239	GTS-IWLS-239	1.78	3.18	2.29
2.62 ± 0.10	GTS-IWSS-262	GTS-IWMS-262	GTS-IWLS-262	1.96	3.58	2.51
2.77 ± .0.10	GTS-IWSS-277	GTS-IWMS-277	GTS-IWLS-277	2.08	3.96	2.67
3.18 ± 0.10	GTS-IWSS-318	GTS-IWMS-318	GTS-IWLS-318	2.39	4.34	3.07
3.53 ± 0.13	GTS-IWSS-353	GTS-IWMS-353	GTS-IWLS-353	2.64	4.75	3.40
3.58 ± 0.13	GTS-IWSS-358	GTS-IWMS-358	GTS-IWLS-358	2.67	4.75	3.45
4.37 ± 0.13	GTS-IWSS-437	GTS-IWMS-437	GTS-IWLS-437	3.25	5.94	4.19
4.75 ± 0.15	GTS-IWSS-475	GTS-IWMS-475	GTS-IWLS-475	3.56	6.35	4.60
6.35 ± 0.18	GTS-IWSS-635	GTS-IWMS-635	GTS-IWLS-635	4.70	8.71	6.10
7.92 ± 0.23	GTS-IWSS-792	GTS-IWMS-792	GTS-IWLS-792	5.94	10.72	7.62
9.53 ± 0.28	GTS-IWSS-953	GTS-IWMS-953	GTS-IWLS-953	7.11	12.70	9.25
12.70 ± 0.38	-	GTS-IWMS-1270	GTS-IWLS-1270	9.53	16.66	12.32

Moderate and low force gaskets come with a cord unless specified otherwise. (See Options).
* All standard force gaskets come without a cord.
** These sizes cannot be ordered with a cord.

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Application information

MATERIAL

Spiral: Tin plated beryllium copper. (RoHS compliance).
Cord: 80 durometer PVC (hard plastic).

SHIELDING QUALITY

This gasket offers shielding quality up to 165 dB. The shielding quality may vary depending on your specific application.

COMPRESSION FORCE

Spira-Shield gaskets come in three different resiliencies (as shown below). Optimal compression of the gasket is 25% of the diameter of the spiral. Since the force to compress the gasket is a function of the cube of the thickness of the beryllium copper ribbon, the compression forces shown are approximate.
Standard Force: 5.5 kg/cm.
Moderate Force: 1.8 kg/cm.
Low Force: 0.3 kg/cm.

Available options

CUSTOM SIZES

We can manufacture Spira-Shield gaskets in any size diameter, from 0.86mm up to approximately 38.10mm. The functional length of the part may be small at very large diameters. Please contact us with your requirements.

PLATING

Plating options can be specified by adding a prefix before the part number:
EIW: RoHS compliant edge tin plating for high humidity or salt-fog.

Material	Force	RoHS Edge Tin
Beryllium Copper	Standard	EIWSS
	Moderate	EIWMS
	Low	EIWLS

Specify plating by choosing the desired prefix from the table.

Example: **GTS-EIWLS-475**
RoHS edge tin plated
Low Force

Additional plating options are available by special request including: Reflow edge tin plating (R), Gold (G) and Sulfamate Nickel (N).

CORD INSERT

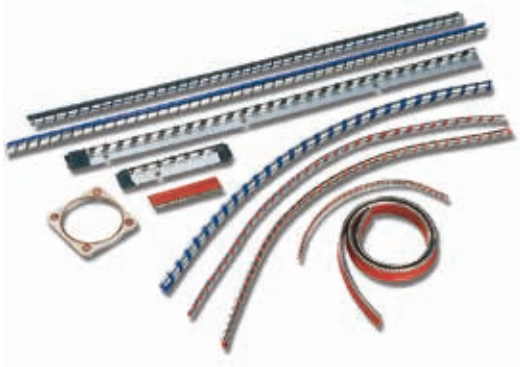
Moderate and low force gaskets come standard with PVC cord. The cord acts as a mechanical stop to protect the spiral from over-compression during use and handling. Specify “no cord” in the moderate and low force gaskets as follows:
NC: No Cord (Example: **GTS-IWMS-318 NC**).
All Standard Force gaskets come without cord (no NC required).

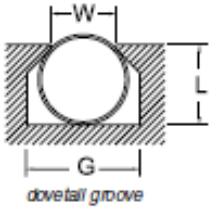
SPECIAL CORD

Special cords can be specified as follows (may not be available in all sizes and may include extra charges):
-F: Solid Fluorosilicone Cord (Example: **GTS-IWMS-318-F**)
-O: Space Qualified Silicone (non-outgassing)
-S: Solid Silicone Cord
-T: Thermal Plastic Rubber Cord

GTS Quick-Shield

This patented spiral is the best low cost EMI gasket solution. The spiral is wound out of spring temper stainless steel for excellent spring memory and compression set resistance. The stainless steel spiral exhibits moderate to high shielding properties at a very low cost.





Quick-Shield Part Numbers (Stainless Steel)				Recommended Groove Dimensions		
Diameter (mm)	Standard Force*	Moderate Force	Low Force	Depth (L) +0.05 /-0 (mm)	Width (G) +0.18 / -0.13 (mm)	Width (W) +0 / -0.05 (mm)
0.86 ± 0.05	GTS-NI-86	-	-	0.58	1.17	0.84
1.19 ± .0.05	GTS-NI-119	GTS-NM-119 NC**	-	0.89	1.60	1.14
1.60 ± 0.08	GTS-NI-160	GTS-NM-160 NC	GTS-NL-160 NC	1.17	2.39	1.52
1.78 ± 0.08	GTS-NI-178	GTS-NM-178 NC	GTS-NL-178 NC	1.35	2.39	1.70
1.98 ± 0.08	GTS-NI-198	GTS-NM-198 NC	GTS-NL-198 NC	1.50	2.77	1.91
2.39 ± 0.10	GTS-NI-239	GTS-NM-239 NC	GTS-NL-239 NC	1.78	3.18	2.29
2.62 ± 0.10	GTS-NI-262	GTS-NM-262 NC	GTS-NL-262 NC	1.96	3.58	2.51
2.77 ± .0.10	GTS-NI-277	GTS-NM-277 NC	GTS-NL-277 NC	2.08	3.96	2.67
3.18 ± 0.10	GTS-NI-318	GTS-NM-318 NC	GTS-NL-318 NC	2.39	4.34	3.07
3.53 ± 0.13	GTS-NI-353	GTS-NM-353 NC	GTS-NL-353 NC	2.64	4.75	3.40
3.58 ± 0.13	GTS-NI-358	GTS-NM-358 NC	GTS-NL-358 NC	2.67	4.75	3.45
4.37 ± 0.13	GTS-NI-437	GTS-NM-437 NC	GTS-NL-437 NC	3.25	5.94	4.19
4.75 ± 0.15	GTS-NI-475	GTS-NM-475 NC	GTS-NL-475 NC	3.56	6.35	4.60
6.35 ± 0.18	GTS-NI-635	GTS-NM-635 NC	GTS-NL-635 NC	4.70	8.71	6.10
7.92 ± 0.23	GTS-NI-792	GTS-NM-792 NC	GTS-NL-792 NC	5.94	10.72	7.62

Moderate and low force gaskets come with a cord unless specified otherwise. (See Options).
* All standard force gaskets come without a cord.
** These sizes cannot be ordered with a cord.

COMPRESSION FORCE

Quick-Shield gaskets come in three different resiliencies (as shown below). Optimal compression of the gasket is 25% of the diameter of the spiral. Since the force to compress the gasket is a function of the cube of the thickness of the stainless steel ribbon, the compression forces shown are approximate.

Standard Force: 5.5 kg/cm
Moderate Force: 1.8 kg/cm
Low Force: 0.3 kg/cm

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Application information

The low cost and moderate shielding of this gasket offer an excellent solution for meeting FCC and European Community EMI requirements. Combining it with a die-cast or molded “pinch boss” groove gives you the optimal price/performance combination.

MATERIAL

Spiral: Stainless steel.
Cord: “No cord” is the default to keep costs low. See Options if cord is desired.

SHIELDING QUALITY

This gasket offers shielding quality in excess of 95 dB at 1 GHz. The shielding quality may vary depending on the specific application.

Available options

CUSTOM SIZES

We can manufacture Quick-Shield gaskets in any size diameter, from 0.86mm up to approximately 38.10mm. The functional length of the part may be short at very large diameters. Please contact us with your requirements.

PLATING

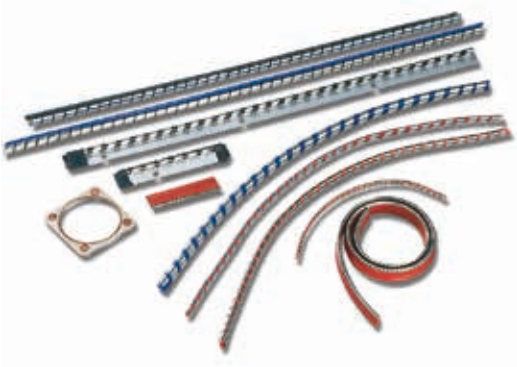
For plating options see page 83.

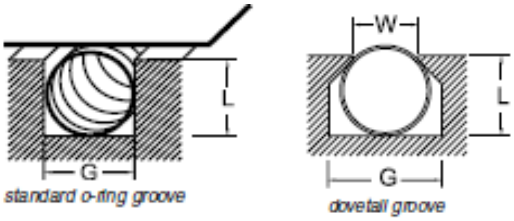
CORD INSERT

If over-compression of the gasket is a concern or problem, remove the “NC” from the part number on the moderate and low force series gaskets to request cord.
Example: **GTS-NM-239 NC** will come without a cord. **GTS-NM-239** will include cord.
All Standard Force gaskets come without cord (no NC required).

GTS Ultra Quick-Shield

Ultra Quick-Shield offers excellent shielding at an affordable price. The spiral is wound out of low cost spring temper stainless steel for excellent spring memory and compression set resistance. The spiral is tin plated for superior conductivity and shielding properties.





standard o-ring groove

dovetail groove

Ultra Quick-Shield Part Numbers (RoHS Tin Plated Stainless Steel)				Recommended Groove Dimensions		
Diameter (mm)	Standard Force*	Moderate Force	Low Force	Depth (L) +0.05 /-0 (mm)	Width (G) +0.18 / -0.13 (mm)	Width (W) +0 / -0.05 (mm)
0.86 ± 0.05	GTS-IWNI-86	GTS-IWNM-86 NC**/***	-	0.58	1.17	0.84
1.19 ± .0.05	GTS-IWNI-119	GTS-IWNM-119 NC**/***	-	0.89	1.60	1.14
1.60 ± 0.08	GTS-IWNI-160	GTS-IWNM-160 NC	GTS-IWNL-160 NC***	1.17	2.39	1.52
1.78 ± 0.08	GTS-IWNI-178	GTS-IWNM-178 NC	GTS-IWNL-178 NC	1.35	2.39	1.70
1.98 ± 0.08	GTS-IWNI-198	GTS-IWNM-198 NC	GTS-IWNL-198 NC***	1.50	2.77	1.91
2.39 ± 0.10	GTS-IWNI-239	GTS-IWNM-239 NC	GTS-IWNL-239 NC***	1.78	3.18	2.29
2.62 ± 0.10	GTS-IWNI-262)	GTS-IWNM-262 NC	GTS-IWNL-262 NC***	1.96	3.58	2.51
2.77 ± .0.10	GTS-IWNI-277***	GTS-IWNM-277 NC	GTS-IWNL-277 NC	2.08	3.96	2.67
3.18 ± 0.10	GTS-IWNI-318***	GTS-IWNM-318 NC	GTS-IWNL-318 NC	2.39	4.34	3.07
3.53 ± 0.13	GTS-IWNI-353	GTS-IWNM-353 NC	GTS-IWNL-353 NC	2.64	4.75	3.40
3.58 ± 0.13	GTS-IWNI-358	GTS-IWNM-358 NC	GTS-IWNL-358 NC	2.67	4.75	3.45
4.37 ± 0.13	GTS-IWNI-437	GTS-IWNM-437 NC	GTS-IWNL-437 NC	3.25	5.94	4.19
4.75 ± 0.15	GTS-IWNI-475***	GTS-IWNM-475 NC***	GTS-IWNL-475 NC	3.56	6.35	4.60
6.35 ± 0.18	GTS-IWNI-635***	GTS-IWNM-635 NC	GTS-IWNL-635 NC	4.70	8.71	6.10
7.92 ± 0.23	GTS-IWNI-792***	GTS-IWNM-792 NC***	GTS-IWNL-792 NC	5.94	10.72	7.62

Moderate and low force gaskets come with a cord unless specified otherwise. (See Options).
* All standard force gaskets come without a cord.
** These sizes cannot be ordered with a cord.
*** These sizes are non-stock items and may include additional plating fees.

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Application information

The affordable cost and superior shielding of this gasket makes it an excellent choice for high end commercial applications. Combining it with a die-cast or molded “pinch boss” groove gives you the optimal price/performance combination.

MATERIAL

Spiral: Tin plated stainless steel. (RoHS compliance).

SHIELDING QUALITY

These gaskets can offer shielding quality in excess of 150 dB at frequencies between 100 kHz and 1 GHz. The shielding quality may vary depending on the specific application.

COMPRESSION FORCE

Ultra Quick-Shield gaskets come in three different resiliencies (as shown below). Optimal compression of the gasket is 25% of the diameter of the spiral. Since the force to compress the gasket is a function of the cube of the thickness of the stainless steel ribbon, the compression forces shown are approximate.
Standard Force: 5.5 kg/cm.
Moderate Force: 1.8 kg/cm.
Low Force: 0.3 kg/cm.

Available options

CUSTOM SIZES

We can manufacture Ultra Quick-Shield gaskets in any size diameter, from 0.86mm up to approximately 38.10mm. The functional length of the part may be short at very large diameters. Please contact us with your requirements.

PLATING

IW: RoHS compliant tin plating (Example: **GTS-IWNL-239 NC**).

Material	Force	No Plating	RoHS Tin Plating	RoHS Edge Tin Plating
Stainless Steel	Standard	See Quick-Shield	IWNI	See Spira-Shield
	Moderate		IWNM	
	Low		IWNL	

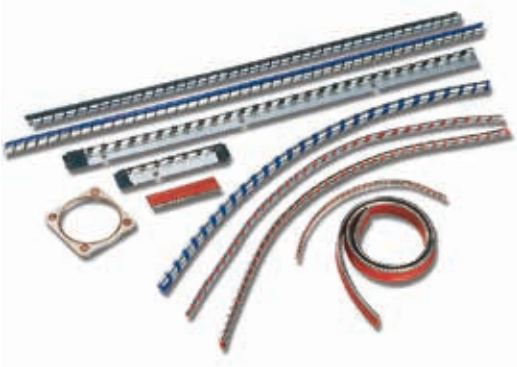
This gasket is not recommended for high humidity or salt-fog applications because the edges of the gasket are not plated. If high humidity or salt-fog environments are to be encountered, the edge plated version of our Spira-Shield gasket is recommended.

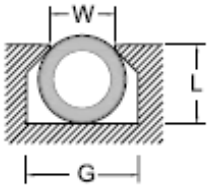
CORD INSERT

To keep costs low, we recommend you omit the cord usually used in the spiral. However, if over-compression of the gasket is a concern or problem, remove the “NC” from the part number on the moderate and low force series gaskets.
Example: **GTS-IWNL-239 NC** will come without a cord. **GTS-IWNL-239** will include cord.
All Standard Force gaskets come without cord (no NC required).

GTS Flexi-Shield

Spira's Flexi-Shield gasket offers the best of both worlds! This gasket combines the EMI shielding performance of our other spiral gaskets with the rain/wind/dust sealing of an elastomer! A special process wraps our highly conductive spiral around a soft silicone tube. This results in gaskets that are very easy to handle, are rugged enough to be used in demanding sliding applications, provide as little as two pounds of closure force per inch, and offer moderate to high shielding, depending on the materials chosen. The low force series is especially well-suited to shielding the front/rear panels of VME/VXI and similar enclosures.





Flexi-Shield mounted in dovetail groove.

Flexi-Shield mounted in standard o-ring groove.

Flexi-Shield Part Numbers (Stainless Steel)				Recommended Groove Dimensions*		
Diameter (mm)	Standard Force*	Moderate Force	Low Force	Depth (L) +0.05 /-0 (mm)	Width (G) +0.18 / -0.13 (mm)	Width (W) +0 / -0.05 (mm)
1.60 ± 0.08	GTS-SQ-160	GTS-MQ-160	GTS-LQ-160	1.17	2.39	1.52
1.78 ± 0.08	GTS-SQ-178	GTS-MQ-178	GTS-LQ-178	1.35	2.39	1.70
2.39 ± 0.10	GTS-SQ-239	GTS-MQ-239	GTS-LQ-239	1.78	3.18	2.29
2.62 ± 0.10	GTS-SQ-262	GTS-MQ-262	GTS-LQ-262	1.96	3.58	2.51
2.69 ± 0.10	GTS-SQ-269	GTS-MQ-269	GTS-LQ-269	2.03	3.58	2.59
3.18 ± 0.10	GTS-SQ-318	GTS-MQ-318	GTS-LQ-318	2.39	4.34	3.07
3.53 ± 0.13	GTS-SQ-353	GTS-MQ-353	GTS-LQ-353	2.64	4.75	3.40
3.58 ± 0.13	GTS-SQ-358	GTS-MQ-358	GTS-LQ-358	2.67	4.75	3.45
4.75 ± 0.20	GTS-SQ-475	GTS-MQ-475	GTS-LQ-475	3.56	6.35	4.60
6.35 ± 0.25	GTS-SQ-635	GTS-MQ-635	GTS-LQ-635	4.70	8.71	6.10

COMPRESSION FORCE

Flexi-Shield gaskets come in three different resiliencies (as shown below). Optimal compression of the gasket is 25% of the diameter of the spiral. Since the force to compress the gasket is a function of the cube of the thickness of the stainless steel ribbon, the compression forces shown are approximate.

Standard Force: 5.5 kg/cm
Moderate Force: 1.8 kg/cm
Low Force: 0.4 kg/cm

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Application information

Whether you need moderate to high shielding levels, rain/wind/dust sealing, or simply want the ease of handling that the inner tube provides, Spira's Flexi-Shield comes through for you. All the benefits for one low cost!

MATERIAL

Spiral: Stainless steel (tin plating optional).
Inner Tubing: 40 ± 5 durometer silicone.

SHIELDING QUALITY

We offer stainless steel for moderate shielding quality, and optional tin plating for higher shielding levels. All shielding quality results are based on tests against tin plated joint surfaces. The shielding quality may vary depending on your specific application.
Stainless Steel (All Forces): 100 dB at 1 GHz
Low Force Tin Plated Gaskets: 120 dB at 1 GHz
Moderate and Standard Force Tin Plated Gaskets: 130 dB at 1 GHz

LOW CLOSURE FORCE

The low force series is ideal for applications with very little closure force (approximately 0.4 kg/cm compression). The gasket resists compression set, is very easy to handle and will provide a rain/wind/dust seal.

Available options

PLATING

Specify material by choosing the desired prefix from the table.

Plating for stainless steel Flexi-Shield can be specified using the following prefix:
IW: RoHS compliant tin plating (Example: **GTS-IWSQ-160**).

Tin plated beryllium copper material may be substituted if desired. An edge plated version is also available for high humidity/salt-fog environments as shown below.

Material	Force	No Plating	RoHS Tin	RoHS Edge Tin
Stainless steel	Standard Moderate Low	SQ (default) MQ LQ	IWSQ IWMQ IWLQ	-
Beryllium Copper	Standard Moderate Low	-	IWST IWMT IWLT	EIWST EIWMT EIWLT

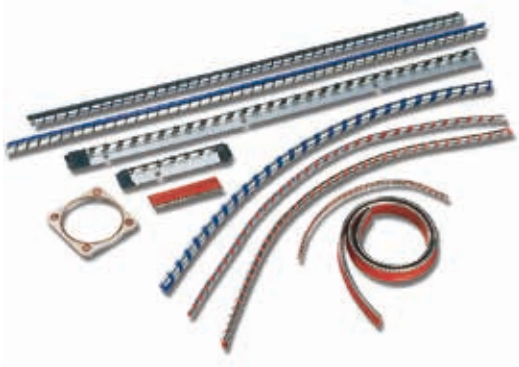
Example:
EIWMT-08
RoHS edge tin plated beryllium copper
Moderate Force

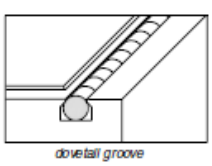
SPECIAL TUBING

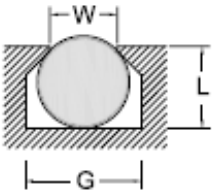
Fluorosilicone tubing can be specified as follows (may include extra charges):
-F: Fluorosilicone tubing (Example: **GTS-SQ-160-F**)

GTS Endur-o-Shield

This gasket uses our high shielding tin plated beryllium copper Spira-Shield as its base. We inject a liquid silicone adhesive into the center of the spiral, which hardens and bonds completely to the metal, making this gasket extremely durable when properly used.







RoHSTin Plated Beryllium Copper				Recommended Groove Dimensions*		
Diameter (mm)	Standard Force	Moderate Force	Low Force	Depth (L) +0.05 /-0 (mm)	Width (G) +0.18 / -0.13 (mm)	Width (W) +0 / -0.05 (mm)
0.86 ± 0.05	GTS-IWSISS-86	GTS-IWSIMS-86	--	0.58	1.17	0.84
1.19 ± 0.05	GTS-IWSISS-119	GTS-IWSIMS-119	--	0.89	1.60	1.14
1.60 ± 0.08	GTS-IWSISS-160	GTS-IWSIMS-160	GTS-IWSILS-160	1.17	2.39	1.52
1.78 ± 0.08	GTS-IWSISS-178	GTS-IWSIMS-178	GTS-IWSILS-178	1.35	2.39	1.70
1.98 ± 0.08	GTS-IWSISS-198	GTS-IWSIMS-198	GTS-IWSILS-198	1.50	2.77	1.91
2.39 ± 0.10	GTS-IWSISS-239	GTS-IWSIMS-239	GTS-IWSILS-239	1.78	3.18	2.29
2.62 ± 0.10	GTS-IWSISS-262	GTS-IWSIMS-262	GTS-IWSILS-262	1.96	3.58	2.51
2.77 ± 0.10	GTS-IWSISS-277	GTS-IWSIMS-277	GTS-IWSILS-277	2.08	3.96	2.67
3.18 ± 0.10	GTS-IWSISS-318	GTS-IWSIMS-318	GTS-IWSILS-318	2.39	4.34	3.07
3.53 ± 0.13	GTS-IWSISS-353	GTS-IWSIMS-353	GTS-IWSILS-353	2.64	4.75	3.40
3.58 ± 0.13	GTS-IWSISS-358	GTS-IWSIMS-358	GTS-IWSILS-358	2.67	4.75	3.40

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Application information

Because of its durability, Enduro-Shield is ideal for groove-mounted sliding applications, such as in connectors.

MATERIAL

Spiral: Tin plated beryllium copper (RoHS compliance).
Inner Core: Cured silicone adhesive.

SHIELDING QUALITY

This gasket offers shielding quality from 117 dB to 152 dB. The shielding quality may vary depending on your specific application.

COMPRESSION FORCE

Enduro-Shield gaskets come in three different resiliencies (as shown below). Optimal compression of the gasket is 25% of the diameter of the spiral. Since the force to compress the gasket is a function of the cube of the thickness of the beryllium copper ribbon, the compression forces shown are approximate. Some sizes are also available in low force.
Standard Force: 5.5 kg/cm
Moderate Force: 1.8 kg/cm
Low Force: 0.3 kg/cm

Available options

CUSTOM SIZES

We can manufacture Enduro-Shield gaskets in any size diameter, from 0.86mm up to approximately 38.10mm. The functional length of the part may be short at very large diameters. Please contact us with your requirements.

PLATING

Plating options can be specified by adding a prefix before the part number:
IW: RoHS compliant tin plating (Example: GTS-IWSIMS-318)
EIW: RoHS compliant edge tin plating for high humidity or salt-fog

Stainless steel material may also be substituted if desired. Please see the following chart for part number options.

Specify material by choosing the desired prefix from the table.

Example:
GTS-IWSINI-358
Tin Plated St. Steel
Standard Force

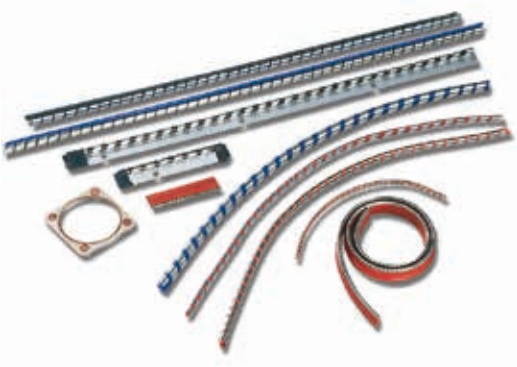
Material	Force	No plating	RoHS Tin	RoHS Edge Tin
Beryllium Copper	Standard Moderate Low	-	IWSISS IWSIMS IWSILS	EIWSISS EIWSIMS EIWSILS
Stainless Steel	Standard Moderate Low	SINI SINM SINL	IWSINI IWSINM IWSINL	-

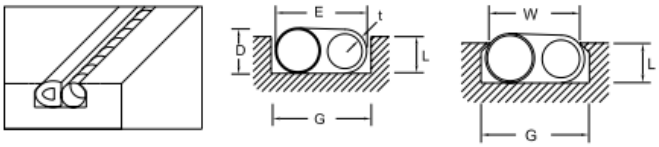
SPECIAL CORE

A special core can be specified by using the following option:
-F: Fluorosilicone (Example: **GTS-SIMS-318-F**)
-O: Silicone that meets outgassing requirements
-Z: Silicone which is a non-acetic acid adhesive (per MIL-A-46146)

GTS “D” multi-seal

“D” Multi-Seal is a groove-mounted gasket with a bulbous silicone elastomer for an excellent environmental seal. It comes standard with the Spira-Shield for superior shielding quality or can be ordered with any other spiral material.





Gasket Dimensions			“D” Multi-Seal Part Numbers (Spira-Shield Gasket)			Recommended Mounting Dimensions		
Width of Gasket (E) mm	Spiral Diameter (D) mm	Thickness of Wall (t) mm	Standard Force*	Moderate Force	Low Force	Depth (L) +0.05 /-0 (mm)	Width (G) +0.18 / -0.13 (mm)	Width (W) +0 / -0.05 (mm)
3.58	1.60 ± 0.08	N/A**	GTS-DIWSS-358	GTS-DIWMS-358 NC	-	1.17	4.75	3.51
4.75	2.39 ± 0.10	N/A**	GTS-DIWSS-475	GTS-DIWMS-475 NC	-	1.78	6.35	4.57
6.35	3.18 ± 1.02	0.79	GTS-DIWSS-635	GTS-DIWMS-635 NC	-	2.39	7.95	6.10
9.53	4.75 ± 0.15	1.19	GTS-DIWSS-953	GTS-DIWMS-953 NC	-	3.56	12.70	9.32
12.70	6.35 ± 0.18	1.19	GTS-DIWSS-1270	GTS-DIWMS-1270 NC	-	4.78	15.88	12.32

Moderate and low force gaskets come with a cord unless specified otherwise. (See Options).
* All standard force gaskets come without a cord.
** These sizes cannot be ordered with a cord.

Application information

This combination EMI and environmental gasket is ideal for applications that need excellent sealing and have somewhat limited space or want to utilize a groove-mount solution.

MATIERE

Spiral: Spira-Shield, Tin (RoHS compliance) plated beryllium copper.
Elastomer option: Solid silicone rubber, 40 durometer on 3.58mm and 4.75mm; 60 durometer all other sizes. (See Options for RoHS compliance or other material choices).

SHIELDING QUALITY

This gasket offers shielding quality from 86 dB to 165 dB. The shielding quality may vary depending on your specific application.

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COMPRESSION FORCE

"D" Multi-Seal gaskets come in two different resiliencies (as shown below). Optimal compression of the gasket is 25% of the diameter of the spiral. Since the force to compress the gasket is a function of the cube of the thickness of the beryllium copper ribbon, the compression forces shown are approximate.
Standard Force: 5.9 kg/cm
Moderate Force: 2.3 kg/cmm

SPECIAL ELASTOMER

The standard elastomer is solid silicone. A special elastomer can be specified as shown below (available in certain sizes only). Note that these elastomers (as with most special options) are non-stock items and will include additional charges.
/E: EPDM (Example: GTS-DMS-953 /E)
/F: Fluorosilicone
/O: Space Qualified Silicone (non-outgassing)

Available options

SPIRAL MATERIAL

"D" Multi-Seal comes standard with a tin plated Spira-Shield gasket. Other spiral materials or plating may be specified by choosing a different prefix from the following table.

1. Choose the desired gasket from the table on page 13 based on size and force.
Example: GTS-DMS-953, moderate force, E=9.53 mm, D=4.75 mm
2. Substitute the prefix from the table below based on spiral material and plating.
Example: GTS-DEMT-953, moderate force Flexi-Shield, edge tin/lead plated BC.

	Spira-Shield	Quick & Ultra Quick-Shield	Enduro-Shield		Flexi-Shield	
Spiral	Tin Plated BC	St. Steel	Tin Plated BC	St. Steel	Tin Plated BC	St. Steel
Standard: Tin/Lead or No Plating	DSS (default) DMS	DNI DNM	DSISS DSIMS	DSINI DSINM	DST DMT	DSQ DMQ
RoHS Tin Plating Option (IW)	DIWSS DIWMS	DIWNI DIWNM	DIWSISS DIWSIMS	DIWSINI DIWSINM	DIWST DIWMT	DIWSQ DIWMQ
RoHS Edge Tin Plating Option (EIW)	DEIWSS DEIWMS	-	DEIWSISS DEIWSIMS	-	DEIWST DEIWMT	-

Example: **GTS-DEIWSS-953** "D" Multi-Seal RoHS edge plated Spira-Shield gasket Standard force (No cord by default).
Specify material by choosing the desired prefix from the table.

CORD INSERT

Standard Force gaskets come without a cord. We also recommend you omit the cord in moderate force gaskets specified by "NC" (no cord) in the part number. If over-compression of the gasket is a concern or problem, remove the "NC" from the part number on moderate force gaskets and PVC cord will be included.

SPECIAL CORD

Special cords including solid fluorosilicone, solid silicone and thermal plastic rubber are available in some sizes.

Ventilation panels

Often used for electromagnetically screening ventilation openings, ventilation panels allow the free movement of air while ensuring a high level of EMF/RFI protection.

GETELEC ventilation panels comprise a honeycomb filter element and a frame giving the structure its rigidity.

These filters can be made in Surtec treated aluminium for applications where field H performance is not too high or in tinned steel when good field H and field E attenuation is required.

Electrical continuity between the ventilation panel and the housing is ensured by means of a conductive elastomer seal or metal braiding. These filters are made to customer plans and specifications with fast delivery.

Aluminium honeycomb attenuation

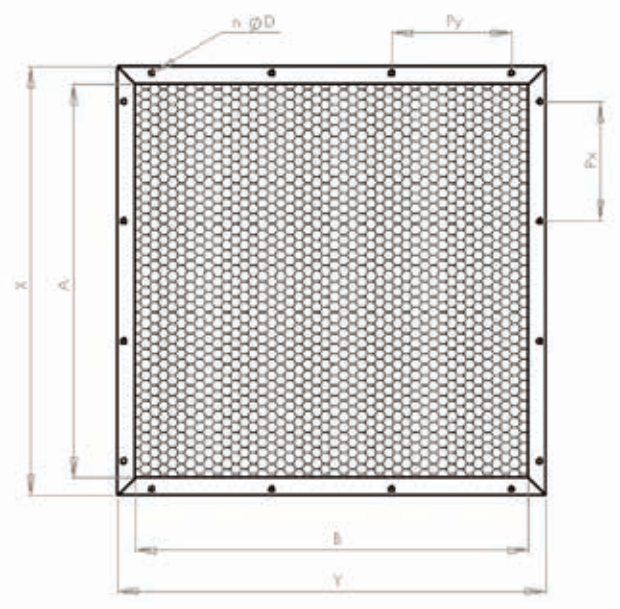
Fields	Frequencies	Attenuation (dB)
Field H	100 KHz	20 dB
Field E	1 MHz	35 dB
	100 MHz	90 dB
Plane wave	1 GHz	55 dB

Tinned steel honeycomb attenuation

Fields	Frequencies	Attenuation (dB)
Field H	100 KHz	85 dB
Field E	1 MHz	120 dB
	100 MHz	130 dB
Plane wave	1 GHz	120 dB

Getelec ventilation panels standard dimensions

Airflow	Cell diameter	Honeycomb depth	Frame depth
83%	3.2 mm	6.35 mm	9.50 mm
83%	3.2 mm	12.70 mm	15.90 mm



Tolerances:
Linear: ± 0.8mm
Between centres: ± 0.4mm
Drillings: ± 0.15mm
Frame: ± 0.10mm

Useful dimensions to give us for quoting

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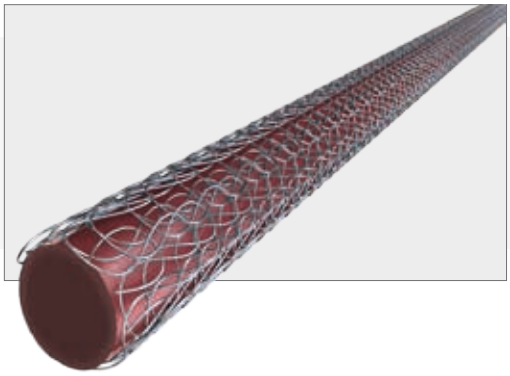
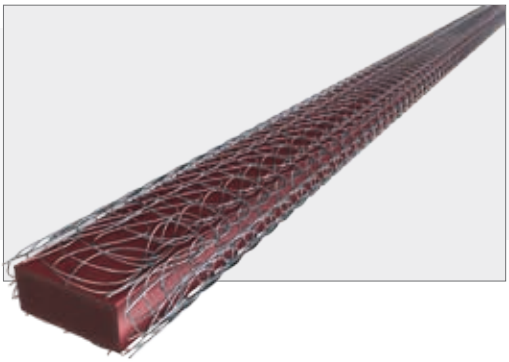
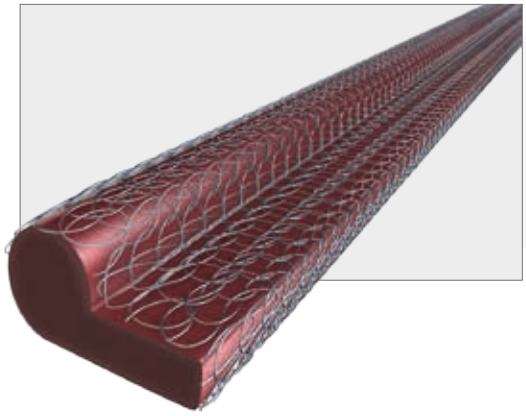
Wire Mesh and Elastomer core

DIAMETER mm	REFERENCES	CORE + METAL OUTER
1.6	RA-0016	SE - Silicone Sponge ST - Silicone Tube NE - Neoprene Sponge EA - EPDM Sponge Rubber MO - Monel TCS - Tinned Copper Steel AL - Aluminium AI - Stainless Steel CE - Tinned Copper Order example: RA-0016-NE-MO
1.8	RA-0018	
2.0	RA-0020	
2.4	RA-0024	
2.6	RA-0026	
3.0	RA-0030	
3.2	RA-0032	
4.0	RA-0040	
4.8	RA-0048	
6.4	RA-0064	
7.0	RA-0070	
8.0	RA-0080	
9.0	RA-0090	
9.5	RA-0095	
12.7	RA-0127	
14.3	RA-0143	
15.9	RA-0159	
19.1	RA-0191	
25.4	RA-0254	



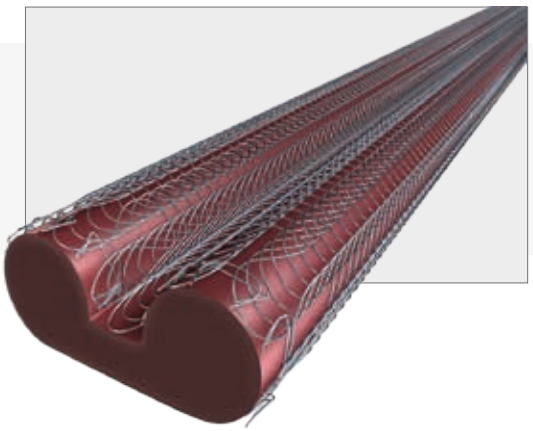
HEIGHT mm	WIDTH mm	REFERENCES	CORE + METAL OUTER
2.0	2.0	RTA-0020-0020	SE - Silicone Sponge ST - Silicone Tube NE - Neoprene Sponge NT - Neoprene Tube EA - EPDM Sponge Rubber MO - Monel
2.4	2.4	RTA-0024-0024	
3.2	3.2	RTA-0032-0032	
4.8	4.8	RTA-0048-0048	
6.4	6.4	RTA-0064-0064	
7.0	7.0	RTA-0070-0070	
8.0	8.0	RTA-0080-0080	
9.0	9.0	RTA-0090-0090	
9.5	9.5	RTA-0095-0095	
12.7	12.7	RTA-0127-0127	TCS - Tinned Copper Steel AL - Aluminium AI - Stainless Steel CE - Tinned Copper
14.3	14.3	RTA-0143-0143	
19.1	19.1	RTA-0191-0191	
19.1	12.7	RTA-0191-0127	
3.2	2.4	RTA-0032-0024	
3.2	4.8	RTA-0032-0048	
3.2	6.4	RTA-0032-0064	
3.2	9.5	RTA-0032-0095	
3.2	12.7	RTA-0032-0127	
4.8	2.4	RTA-0048-0024	
4.8	6.4	RTA-0048-0064	
4.8	9.5	RTA-0048-0095	
4.8	12.7	RTA-0048-0127	
4.8	14.3	RTA-0048-0143	Order example RTA - 0020-0020-NE-MO
4.8	15.9	RTA-0048-0159	
4.8	19.1	RTA-0048-0191	
6.4	2.4	RTA-0064-0024	
6.4	3.2	RTA-0064-0032	
6.4	9.5	RTA-0064-0095	
6.4	12.7	RTA-0064-0127	





DIAMETER mm	WIDTH mm	REFERENCES	CORE + METAL OUTER
2.4	9.5	PA-0024-0095	SE - Silicone Sponge ST - Silicone Tube NE - Neoprene Sponge NT - Neoprene Tube EA - EPDM Sponge Rubber
2.4	12.7	PA-0024-0127	
3.2	9.5	PA-0032-0095	
3.2	12.7	PA-0032-0127	
3.2	15.9	PA-0032-0159	
3.2	19.1	PA-0032-0191	MO - Monel TCS - Tinned Copper Steel AL - Aluminium AI - Stainless Steel CE - Tinned Copper
4.8	12.7	PA-0048-0127	
4.8	15.9	PA-0048-0159	
4.8	19.1	PA-0048-0191	
6.4	12.7	PA-0064-0127	
6.4	15.9	PA-0064-0159	Order example PA-0024-0095-NE-MO
6.4	19.1	PA-0064-0191	
8.0	15.9	PA-0080-0159	
8.0	19.1	PA-0080-0191	
9.0	15.9	PA-0090-0159	
9.0	19.1	PA-0090-0191	

DIAMETER mm	WIDTH mm	REFERENCES	CORE + METAL OUTER
2.4	9.5	DPA-0024-0095	SE - Silicone Sponge ST - Silicone Tube NE - Neoprene Sponge NT - Neoprene Tube EA - EPDM Sponge Rubber
2.4	12.7	DPA-0024-0127	
3.2	9.5	DPA-0032-0095	
3.2	12.7	DPA-0032-0127	
3.2	15.9	DPA-0032-0159	
4.8	15.9	DPA-0048-0159	MO - Monel TCS - Tinned Copper Steel AL - Aluminium AI - Stainless Steel CE - Tinned Copper
4.8	19.1	DPA-0048-0191	
6.4	15.9	DPA-0064-0159	
6.4	19.1	DPA-0064-0191	
6.4	25.4	DPA-0064-0254	
8.0	19.1	DPA-0080-0191	Order example DPA-0024-0095-NE-MO
8.0	25.4	DPA-0080-0254	
9.0	32.0	DPA-0090-0320	



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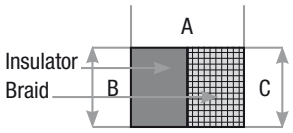
MCT Braid composite materials

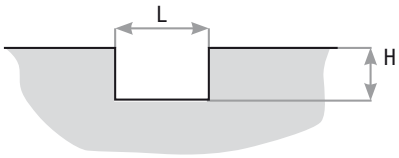
GETELEC MCT comprises two co-extruded parts. Sealing is ensured by type solid or hollow GT45 or GT60 silicone or by GT47 or GT67 fluorosilicone.

Conduction is via a metal braid of tinned copper steel, or braided aluminium or Monel, or over a solid or hollow silicone core, thus ensuring electrical continuity and electromagnetic shielding between two parts.

A profile cross-section



Cross-section of seal

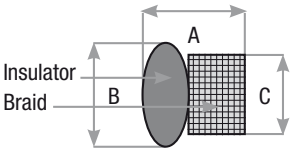


Recommended groove dimensions

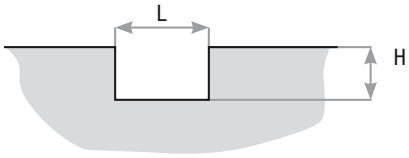
Reference	A	A Braid	B	C	L	H
100024	2.40	1.20	3.20	3.20	2.64	2.60
100040	4.00	2.00	4.00	4.00	4.40	3.20
100048	4.80	2.40	4.80	4.80	5.28	3.80
100064	6.40	3.20	4.80	4.80	7.04	3.80
100070	7.00	3.20	6.40	6.40	7.70	5.10
100092	9.20	3.20	3.20	3.20	10.10	2.60

(All dimensions in millimetres)

B profile cross-section



Cross-section of seal



Recommended groove dimensions

Reference	A	A Braid	B	C	L	H
150066	6.60	3.20	7.00	6.80	7.26	5.44
150024	2.40	1.20	3.40	3.20	2.64	2.56

(All dimensions in millimetres)

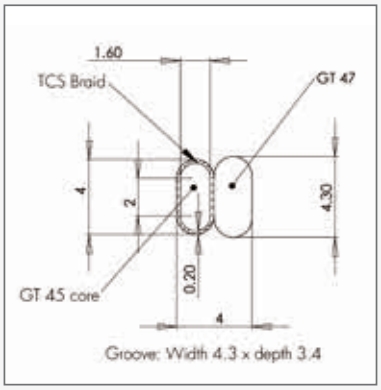
TOLERANCES ON CROSS SECTION FOR CO-EXTRUDED MESH PROFIL (WITH SILICONE CORE)	
DIMENSIONS (mm)	TOLERANCES
From 1.8 to 5.0	+0.15 / -0.2
From 5.0 to 12	± 0.30

TOLERANCES POUR SECTIONS TRESSES CO-EXTRUDEES (SANS AME SILICONE)	
DIMENSIONS (mm)	TOLERANCES
De 1.8 à 5.0	+ 0.3 / -0.2
De 5.0 à 12	± 0.50

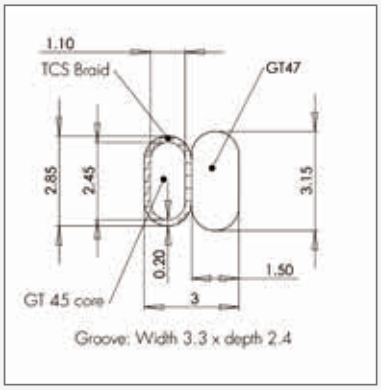
The tolerances for control are those shown on this page except when a FAI, a DVI or specific control document is request to GETELEc.

Other available profiles

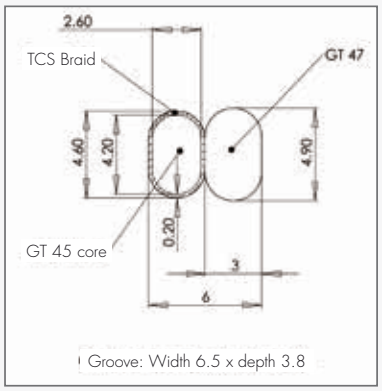
REF. 150040



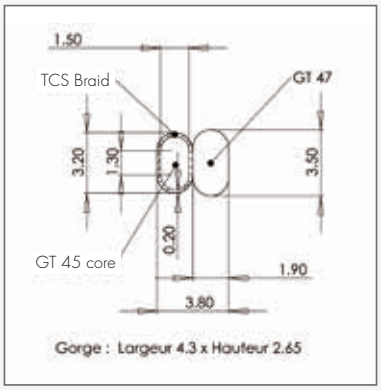
REF. 150030



REF. 150060

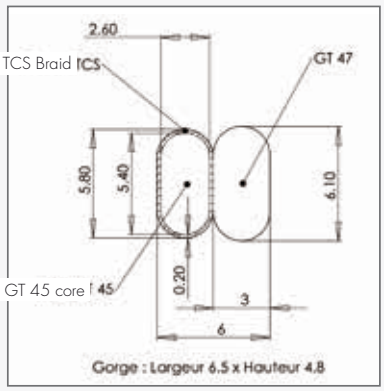


REF. 150038



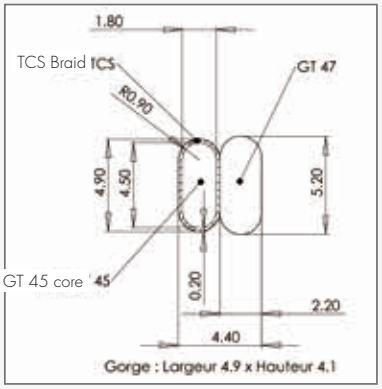
Groove: Width 4.3 x depth 2.65

REF. 150033



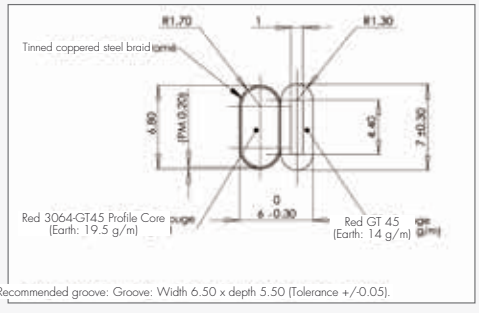
Groove: Width 6.5 x depth 4.8

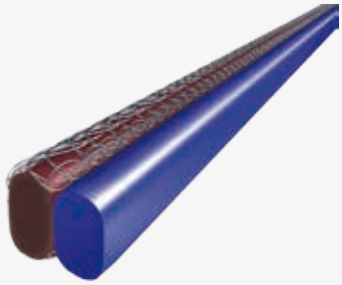
REF. 150044



Groove: Width 4.9 x depth 4.1

REF. 150075





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Conductive metallised fabrics

Conductive metallised fabrics are structures made from synthetic polyamide fibres coated in metal conductive materials (copper, nickel, silver). These metallised fabrics secured to silicone bases or various foams make it possible to make shielding seals for such applications as information technology, mobile radio, cellular telephony and other electronic instruments.

Applications

- Telecommunications
- Information technology
- Automobile
- Medical equipment
- Military

Formats

- Cut seals to customer drawing
- Roll

	GT 6500 NA	GT 6500 NE	GT 6500 NI
Metallisation	Nickel/Copper/Silver	Nickel/Copper	Nickel / Copper / Nickel
Thickness	0.15 mm	0.28 mm	0.10 mm
Working temperature	-30°C to +90°C	-30°C to +90°C	-30°C to +90°C
Volume resistivity	< 0.02 Ω/□	< 0.09 Ω/□	0.01 Ω/□
Shielding performance: Electrical field MIL-STD-285 magnetic field	> 80Db from 30 MHz to 10GHz	> 90Db from 30 MHz to 10GHz	> 70dB from 30MHz to 10GHz
Weight g/m²	60 ± 5%	75 ± 5%	82 ± 5%
Roll width	130 cm	100 cm	107 cm
Shape	PW (woven) or RS (Rip stop)	NW (non-woven)	Rip Stop

Silicone foam + GTMC 21 conductive fabric

Composition/Description

GT21 silicone foam vulcanised onto CMF: Conductive Metallised Fabric.

Use

The thickness of the foam coupled with the softness of the fabric considerably improve contact between the fabric and the printed circuit shielding screens. The foam is slightly compressed between the top and the upper edge of the screens, thus increasing the pressure of the fabric on the various parts in contact. This ensures improved electrical continuity.

Formats

- Sheets 280mm x 280mm
- Thickness 1mm to 2mm
- Tolerances: ± 0.3mm
- Contact us for pre-cut parts

Comments

It is recommended not to use expanded material beyond 50% compression due to the risk of breaking the cell walls and inducing significant residual deformation.
Recommended compression is in the 20 to 30% range.

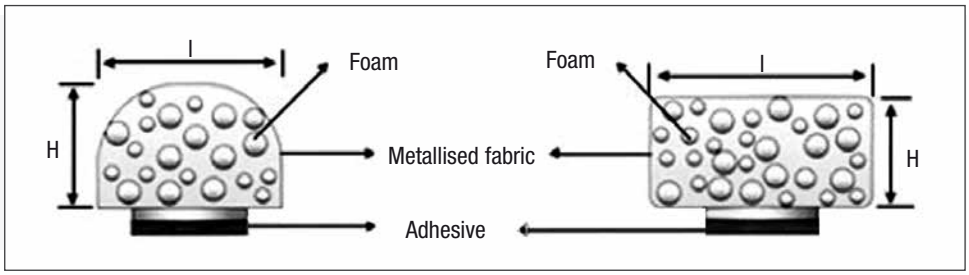
The fabric

See technical specifications p. 38.

Reference expanded silicone	GT 21
Type	Closed cell cellular material
Shore hardness A ±5	20
Density g/cm3	0.60
Colour	Off white (colours possible)
Working temperature	-30°C to +90°C

EMI seals based on closed cell foam + conductive metallised fabric coating

GT 60000



MATERIAL	
Base material	Polyurethane foam
Conductive coating	Conductive metallised fabric loaded with Nickel/Copper
Adhesive	Conductive or non-conductive

STANDARD DIMENSIONS	
Width	2mm to 60mm
Height	0.5mm to 30mm
Appearance	Foam covered in metallised fabric

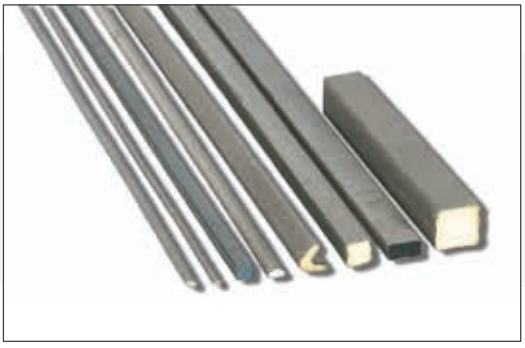
GENERAL PROPERTIES	
Shielding performance:	80dB – 90dB (ASTM D 4935-89)
Surface resistivity	< 0.08 Ω/□
Flame retardance	UL 94 V-0
Working temperature	-25°C to +80°C
Working temperature	-25°C to +80°C

TOLERANCES Width and height (mm)

Width-Height (mm)	Tolerance (mm)
0.5-6.3	+/- 0.5
6.3-10.0	+/- 0.7
10.0-16.0	+/- 0.8
16.0-25.0	+/- 1.0
25.0-40.0	+/- 1.3
40.0-63.0	+/- 1.6

TOLERANCES Length

Length (mm)	Tolerances (mm)
5.0-150.0	+/- 0.8
151.0-300.0	+/- 1.3
301.0-1200.0	+/- 2.5
1201.0-1750.0	+/- 4.7
1751.0-2300.0	+/- 6.4
40.0-63.0	+/- 1.6



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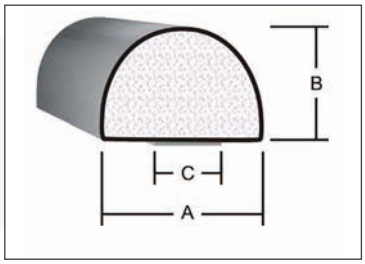
"D" profile cellular foam with conductive metallised fabric coating



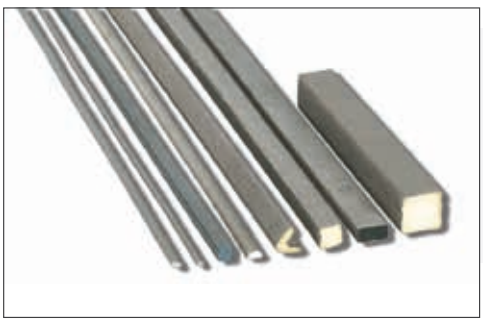
Manufacturing options

- Length: 1 metre standard. Contact us for bespoke lengths
- Load: Cu/Ni as standard, Ag or aluminium strip options available
- Available with conductive or non-conductive custom
- Contact us for non-listed sizes

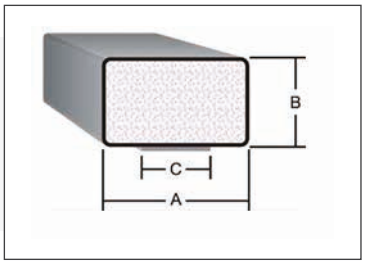
Reference	Width mm (A)	Height mm (B)	Width of adhesive mm (C)
D 2 x 1.5 GT60000	2.0	1.5	1.5
D 2 x 2 GT60000	2.0	2.0	1.5
D 2.3 x 2.3 GT60000	2.3	2.3	2.0
D 3.8 x 1.5 GT60000	3.8	1.5	2.0
D 3.8 x 2.3 GT60000	3.8	2.3	2.0
D 4 x 3 GT60000	4.0	3.0	2.0
D 6 x 2 GT60000	6.0	2.0	2.5
D 6 x 4 GT60000	6.0	4.0	2.5
D 6 x 5 GT60000	6.0	5.0	2.5
D 6.4 x 3.2 GT60000	6.4	3.2	2.5
D 6.4 x 3.2 GT60000	6.4	3.6	2.5
D 7 x 2.5 GT60000	7.0	2.5	3.0
D 7.6 x 1.6 GT60000	7.6	1.6	3.0
D 7.6 x 4.8 GT60000	7.6	4.8	3.0
D 8 x 4 GT60000	8.0	4.0	3.0
D 8 x 6 GT60000	8.0	6.0	3.0
D 9 x 3 GT60000	9.0	3.0	4.0
D 9.5 x 6.4 GT60000	9.5	6.4	4.0
D 10 x 4 GT60000	10.0	4.0	4.0
D 10 x 7 GT60000	10.0	7.0	4.0
D 10 x 8 GT60000	10.0	8.0	4.0
D 10 x 10 GT60000	10.0	10.0	4.0
D 12 x 10 GT60000	12.0	10.0	5.0
D 12.7 x 12.7 GT60000	12.7	12.7	5.0

RoHS

UL94 V0



Rectangular profile cellular foam with conductive metallised fabric coating, height < 3mm



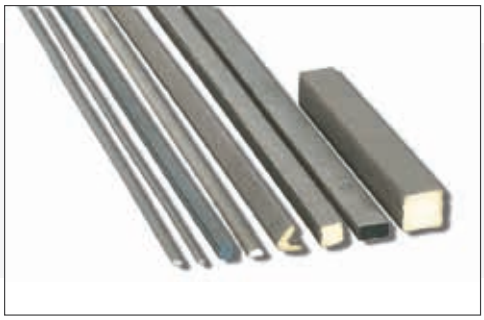
Manufacturing options

- Length : 1 metre standard. Contact us for custom lengths
- Load: Cu/Ni as standard, Ag or aluminium strip options available.
- Available with conductive or non-conductive adhesive
- Contact us for non-listed sizes

Reference	(A)	(B)	C adhesive (mm)
RT 2 x 2 GT60000	2.0	2.0	1.5
RT 3 X 1 GT60000	3.0	1.0	1.5
RT 3 X 1.2 GT60000	3.0	1.2	1.5
RT 3 x 2 GT60000	3.0	2.0	1.5
RT 4 x 1.2 GT60000	4.0	1.2	2.0
RT 4 x 2 GT60000	4.0	2.0	2.0
RT 5 x 0.5 GT60000	5.0	0.5	2.0
RT 5 x 1 GT60000	5.0	1.0	2.0
RT 5 x 1.2 GT60000	5.0	1.2	2.0
RT 5 x 1.5 GT60000	5.0	1.5	2.0
RT 5 x 2 GT60000	5.0	2.0	2.0
RT 6 x 1.2 GT60000	6.0	1.2	2.5
RT 6 x 2 GT60000	6.0	2.0	2.5
RT 7 x 1 GT60000	7.0	1.0	3.0
RT 7 x 1.2 GT60000	7.0	1.2	3.0
RT 7 x 2 GT60000	7.0	2.0	3.0
RT 7.6 x 1.6 GT60000	7.6	1.6	3.0
RT 8 x 1.5 GT60000	8.0	1.5	3.0
RT 8 x 2 GT60000	8.0	2.0	3.0
RT 9.7 x 1.5 GT60000	9.7	1.5	3.5
RT 10 x 0.5 GT60000	10.0	0.5	4.0
RT 10 x 1 GT60000	10.0	1.0	4.0
RT 10 x 1.2 GT60000	10.0	1.2	4.0
RT 10 x 2 GT60000	10.0	2.0	4.0
RT 13 x 2 GT60000	13.0	2.0	5.0
RT 22 x 2 GT60000	22.0	2.0	13.0
RT 25 x 1.2 GT60000	25.0	1.2	12.0
RT 25 x 1.5 GT60000	25.0	1.5	12.0
RT 41 x 2 GT60000	41.0	2.0	15.0
RT 45 x 2 GT60000	45.0	2.0	15.0
RT 56 x 2 GT60000	56.0	2.0	20.0

RoHS

UL94 V0



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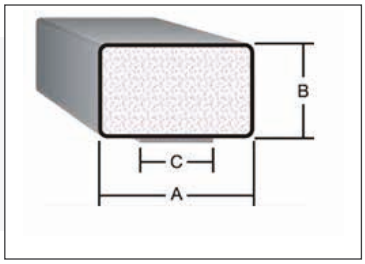
Rectangular profile cellular foam with conductive metallised fabric coating, height: 3mm – 7.5mm



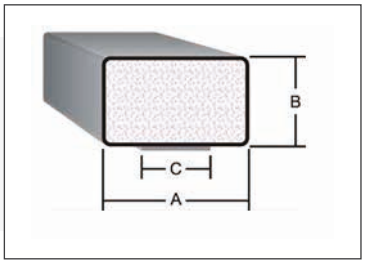
Manufacturing options

- Length : 1 metre standard. Contact us for custom lengths
- Load: Cu/Ni as standard, Ag or aluminium strip options available.
- Available with conductive or non-conductive adhesive
- Contact us for non-listed sizes

Reference	Width mm (A)	Height mm (B)	Width of adhesive mm (C)
RT 3 x 3 GT60000	3.0	3.0	1.5
RT 4 x 3 GT60000	4.0	3.0	2.0
RT 4.8 x 3.3 GT60000	4.8	3.3	2.0
RT 5 x 3 GT60000	5.0	3.0	2.0
RT 5 x 4 GT60000	5.0	4.0	2.0
RT 5 x 5 GT60000	5.0	5.0	2.0
RT 6 x 3 GT60000	6.0	3.0	2.5
RT 6 x 4 GT60000	6.0	4.0	2.5
RT 6 x 5 GT60000	6.0	5.0	2.5
RT 6 x 6 GT60000	6.0	6.0	2.5
RT 6 x 7 GT60000	6.0	7.0	2.5
RT 6.4 x 3.2 GT60000	6.4	3.2	2.5
RT 6.4 x 6.4 GT60000	6.4	6.4	2.5
RT 7 x 3.2 GT60000	7.0	3.2	3.0
RT 7 x 4 GT60000	7.0	4.0	3.0
RT 8 x 3 GT60000	8.0	3.0	3.0
RT 8 x 4 GT60000	8.0	4.0	3.0
RT 8 x 5 GT60000	8.0	5.0	3.0
RT 9 x 3 GT60000	9.0	3.0	4.0
RT 9 x 6 GT60000	9.0	6.0	4.0
RT 9 x 7 GT60000	9.0	7.0	4.0
RT 9.5 x 3.2 GT60000	9.5	3.2	4.0
RT 9.5 x 6.4 GT60000	9.5	6.4	4.0
RT 10 x 3 GT60000	10.0	3.0	4.0
RT 10 x 4 GT60000	10.0	4.0	4.0
RT 10 x 5 GT60000	10.0	5.0	4.0
RT 10 x 5.5 GT60000	10.0	5.5	4.0
RT 10 x 7 GT60000	10.0	7.0	4.0
RT 12.7 x 3.2 GT60000	12.7	3.2	5.0
RT 12.7 x 6.4 GT60000	12.7	6.4	5.0
RT 13 x 6 GT60000	13.0	6.0	5.0
RT 13 x 7 GT60000	13.0	7.0	5.0
RT 15 x 4 GT60000	15.0	4.0	6.0
RT 15 x 7.5 GT60000	15.0	7.5	6.0
RT 21 x 4 GT60000	21.0	4.0	8.0

RoHS UL94 V0

Rectangular profile cellular foam with conductive metallised fabric coating, height > 7.5mm



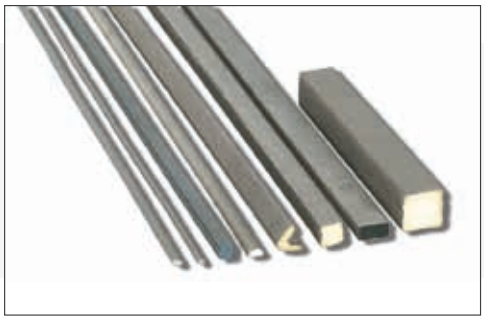
Manufacturing options

- Length : 1 metre standard. Contact us for custom lengths
- Load: Cu/Ni as standard, Ag or aluminium strip options available.
- Available with conductive or non-conductive adhesive
- Contact us for non-listed sizes

Reference	Width mm (A)	Height mm (B)	Width of adhesive mm (C)
RT 6 x 8 GT60000	6.0	8.0	2.5
RT 7 x 10 GT60000	7.0	10.0	3.0
RT 8 x 8 GT60000	8.0	8.0	3.0
RT 8 x 12 GT60000	8.0	12.0	3.0
RT 9 x 9 GT60000	9.0	9.0	4.0
RT 9.5 x 9.5 GT60000	9.5	9.5	4.0
RT 10 x 8 GT60000	10.0	8.0	4.0
RT 10 x 10 GT60000	10.0	10.0	4.0
RT 10 x 12 GT60000	10.0	12.0	4.0
RT 10 x 15 GT60000	10.0	15.0	4.0
RT 10.5 x 11.5 GT60000	10.5	11.5	4.0
RT 11.5 x 10.5 GT60000	11.5	10.5	5.0
RT 12 x 10 GT60000	12.0	10.0	5.0
RT 12.7 x 9.5 GT60000	12.7	9.5	5.0
RT 12.7 x 12.7 GT60000	12.7	12.7	5.0
RT 13 x 10 GT60000	13.0	10.0	5.0
RT 13 x 10.5 GT60000	13.0	10.5	5.0
RT 14 x 12 GT60000	14.0	12.0	6.0
RT 14 x 14 GT60000	14.0	14.0	6.0
RT 15 x 8 GT60000	15.0	8.0	6.0
RT 15 x 10 GT60000	15.0	10.0	6.0
RT 17 x 17 GT60000	17.0	17.0	7.0

RoHS

UL94 V0



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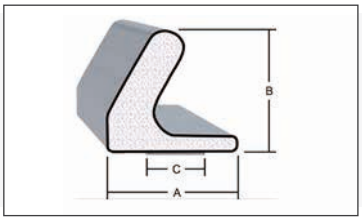
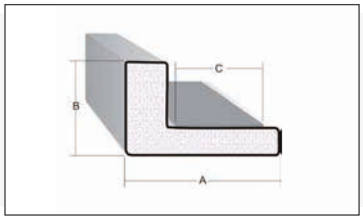
C, L, K, M, P profile cellular foam with conductive metallised fabric coating

Manufacturing options

- Length : 1 metre standard. Contact us for custom lengths
- Load: Cu/Ni as standard, Ag or aluminium strip options available
- Available with conductive or non-conductive adhesive
- Contact us for non-listed sizes

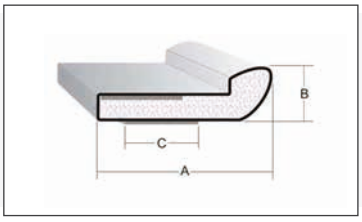
Reference	A (mm)	B (mm)	C adhesive (mm)
C 6 x 3.5 GT60000	6.0	3.5	2.5
C 6 x 6 GT60000	6.0	6.0	2.5
C 10.7 x 9.8 GT60000	10.7	9.8	5.0
C 11 x 11 GT60000	11.0	11.0	5.0
C 14.7 x 17.1 GT60000	14.7	17.1	6.0
C 14.7 x 17.9 GT60000	14.7	17.9	6.0

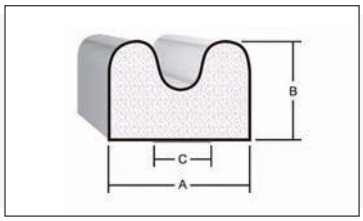




Reference	A (mm)	B (mm)	C adhesive (mm)
L 5.6 x 3 GT60000	5.6	3.0	3.0
L 15 x 19 GT60000	15.0	19.0	6.0

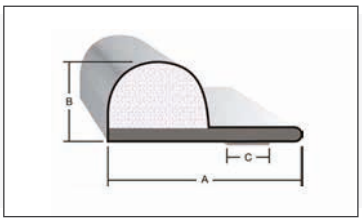
Reference	A (mm)	B (mm)	C adhesive (mm)
K 11.3 x 2.3 GT60000	11.3	2.3	6.0
K 11.3 x 2.7 GT60000	11.3	2.7	6.0





Reference	A (mm)	B (mm)	C adhesive (mm)
M 12.7 x 9.5 GT60000	12.7	9.5	5.0

Reference	A (mm)	B (mm)	C adhesive (mm)
P 8 x 3 GT60000	8.0	3.0	3.0
P 17 x 10 GT60000	17.0	10.0	4.0
P 18 x 4.5 GT60000	18.0	4.5	5.0
P 29 x 4.8 GT60000	29.0	4.8	5.0



RoHS

UL94 V0

Screened viewing windows

Electromagnetic interference (EMI) can be described as any electrical disturbance, whether a signal or noise, which interferes with electrical equipment's ability to operate correctly.

OPTIC screened windows provide electromagnetic protection to the front of control screens, measurement indicators and displays while still providing good display visibility.

Examples of use:

- Military telecommunications radio
- Telecoms bay and cabinet display
- Hardened computer screen

Screened windows can be made from glass or polycarbonate to suit the operating conditions and desired performance.

Shielding is by means of of a fine mesh metal screen placed between the two sheets of glass or polycarbonate. The metal screen is treated to darken it for optimal visual performance.

Earthing is via a conductive silver busbar located around the periphery of the filter.

It can be moved to order, to the filter's front or rear surface. Continuity is then ensured by means of a conductive elastomer seal. Other means of ensuring continuity are also possible.

Fine-mesh screen	O.P.I (Opening)	Number of cells per cm^2	Mesh Diameter (mm)	Field E attenuation (dB)			Plane wave attenuation (dB)			Transmission (%)
				1 MHz	10 MHz	100 MHz	400 MHz	16 Hz	10 GHz	
Copper	70	27	0.08	110	111	98	68	64	38	62
	100	39	0.03	> 120	> 120	100	67	54	50	81
	100	39	0.05	107	111	85	70	58	-	64
	145	57	0.05	128	112	106	84	82	64	51
Stainless	+50	+19	0.03	100	100	75	60	50	37	90
	50	19	0.05	94	90	82	58	55	28	81
	+80	+31	0.05	106	88	82	64	60	34	71
	+80x60	+31 x 23	0.03	102	105	103	75	60	43	84
	+100	+39	0.03	128	112	92	80	86	74	81
	+165	+64	0.05	137	124	106	100	81	61	45
	+200	+78	0.04	128	108	98	88	86	68	46
	+230	+90	0.03	140	120	95	94	80	60	46

+ means silver plating before darkening.
The values below are indicative only. Testing was on a sample of fine-mesh screens measuring 300 mm x 300 mm as per MIL-STD-285 standard. Transmission values are theoretical only, measured at the fine-mesh screen only.

Dimensions and thicknesses

OPTIC screened windows are made to customer specifications. Standard thicknesses are 2.5mm; 3.0mm; 4mm and 6mm. Other thicknesses are available on request.

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FMT 10 Transparent metallised film

Transparent metallised film (FMT) is a low thickness, transparent medium one of whose surfaces is made to be conductive by the application of a metal deposit.

The medium can be polyester or polycarbonate with different surface resistances, which have an impact on the product's transparency.

An anti-reflective coating can be applied to the non-conductive face.

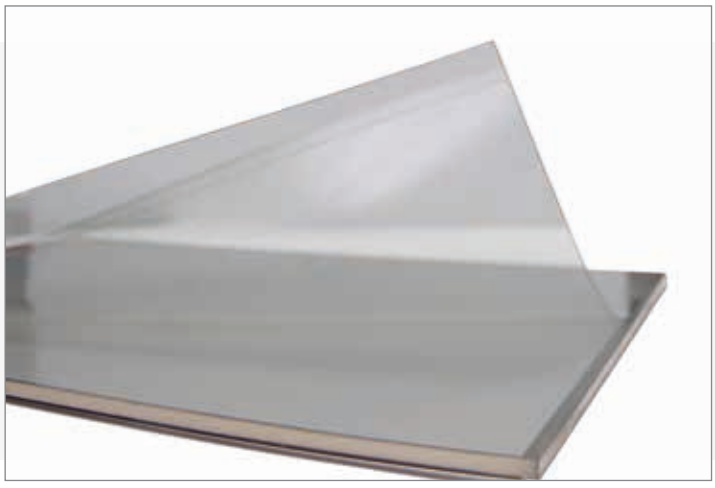
Reference	Surface resistivity Ω/□ *	Light transmission% **
FMT 10	10	82 ±4%

* Surface resistivity ± 10%
** Values based on a 50 micron polyester sheet

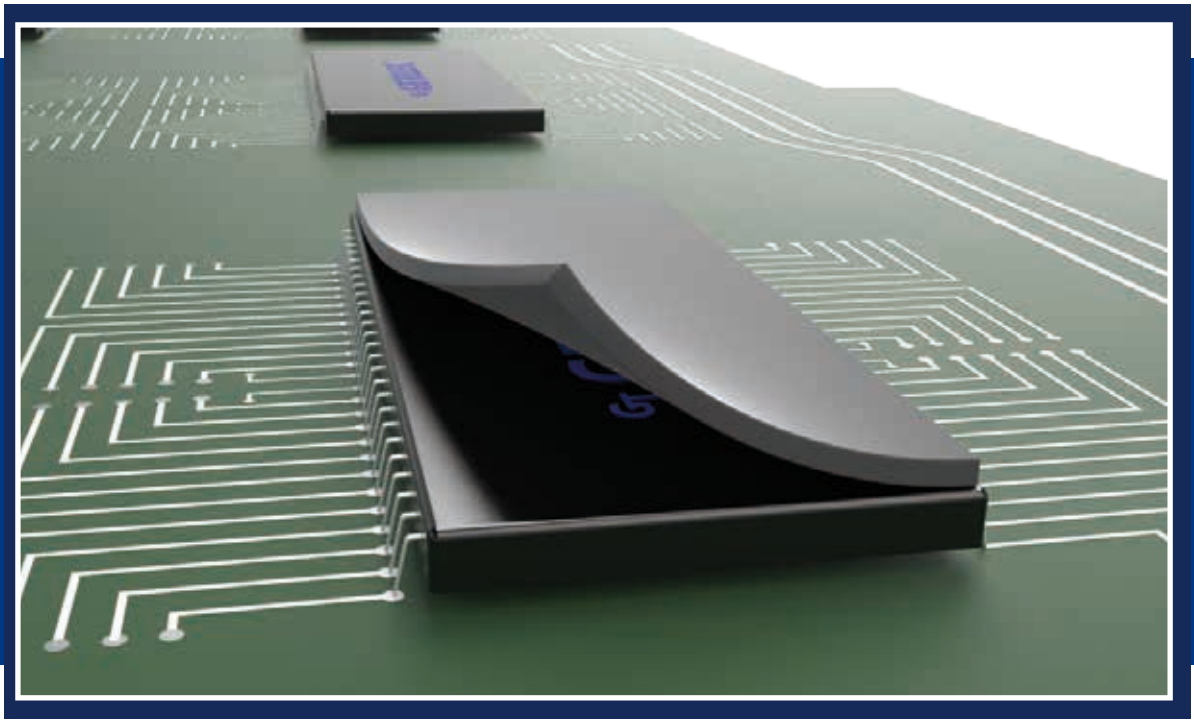
Transmission tolerance ± 4%

Attenuations in dB					
References	10 KHz	1 MHz	10 MHz	100 MHz	1 GHz
FMT 10	90	84	82	65	37

- Anti-reflective coating
- 175 micron ITO polycarbonate



THERMAL MANAGEMENT



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Formats

1. DESCRIPTION

GTG is a highly thermally conductive foam. Ideal for applications requiring excellent thermal conductivity. Its specific formulation and load endow this silicone elastomer with exceptional thermal conductivity. Thanks to its great softness and flexibility, it absorbs any surface irregularities between the power component and the cooler, thus reducing your equipment's thermal resistance. Vibration absorbing, this electrical insulator is easy to fit and effective for extended periods of time.

2. TESTS: DETERMINATION OF THERMAL CONDUCTIVITY

In steady state, the thermal gradient is uniform across the sample. The heat flux is given by:

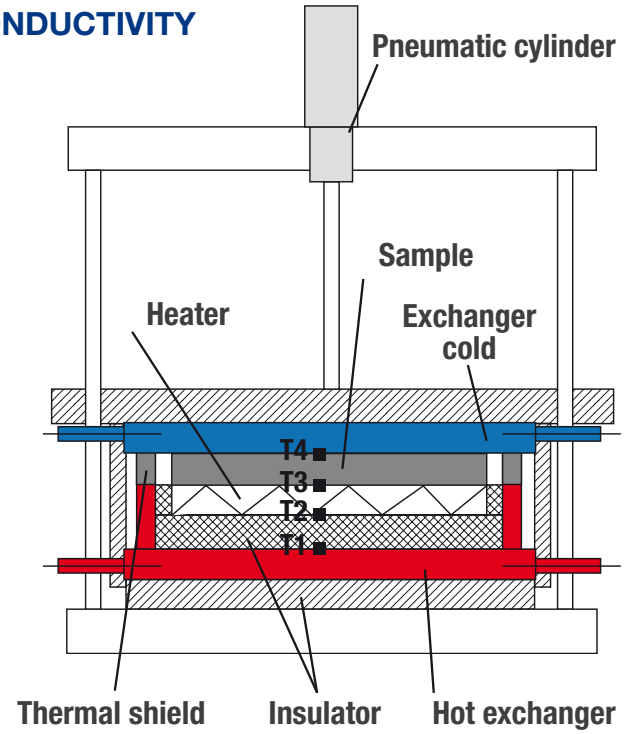
$$\frac{ø}{S} = \frac{UI}{L^2} = \lambda \frac{T_4 - T_3}{L_{4-3}}$$

where:

- ø is the heat flow in W
- S is the sample surface area in m²

where:

- **T1 :** hot exchanger
- **T2 :** heaters (lower surfaces)
- **T3 :** heaters (upper surfaces)
- **T4 :** cold exchanger
- **U:** voltage across the heater terminals (V)



3. DATA COMPARISON

Our first action was to measure the uncompressed thickness of each product and then to carry out the tests while compressing the samples 25%.

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CONTENTS

THERMALLY CONDUCTIVE GAP FILLERS

	PROPERTY	UNIT	GTG 9005	GTG 7014	GTG 9010	GTG 9015	GTG 7030	GTG 7035	GTG 7055	GTG 7066	GTG 7011
PRODUCT	Colour		Grey	White pink	Blue	Blue	Beige Pink	Grey	Grey	Grey	Light grey
	Hardness	Shore 00	45	5	50	75	30	15	37	65	64
	Flame retardance	UL 94	V0	V0	V0	V0	V0	V0	V0	V0	V0
	RoHS	2002/95/EC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
THERMAL	Thermal resistance @ 10 PSI	°C-cm²/W	N.C	0.77 to 3.0	-	-	0.3 to 0.6	0.4 to 1.87	0.48 to 1.80	0.85 to 2.60	0.97 to 0.70
	Thermal conductivity	W/m.K	1.3*	1.3	2.2*	2.69*	3	3	5.5	7	11
	Working temperature	°C	-60 to +200	-40 to +180	-45 to +200	-45 to +200	-40 to +200	-40 to +200	-60 to +180	-40 to +200	-50 to +180
ELECTRICAL	Dielectric strength	kV/mm	5	6	18	-	>10	>10	10	>10	>10
	Volume resistivity	Ohm - cm	3×10^{15}	6.2×10^{15}	3.9×10^{12}	-	1.0×10^{10}	1.0×10^{10}	1.0×10^{13}	1.0×10^{12}	7.0×10^{11}
	Dielectric constant	@ 1 MHz	6.2	N.C	0.005	N.C	N.C	N.C	N.C	N.C	N.C

* Measuring thermal conductivity according to method LFA

Product	Thickness mm	Sheet sizes mm	Fitment	Product	Thickness mm	Sheet sizes mm	Fitment
GTG 9005	0.8 to 20	300 x 300 or 500 x 500	Molded Die-cut Adhesive or not	GTG 7035	0.5 to 4.5	210 x 420 (0.5mm to 2mm) 200 x 200 (3mm) 150 x 200 (3.5mm to 4.5mm)	Molded Die-cut
GTG 9010	0.8 to 20	300 x 300 or 500 x 500	Molded Die-cut Adhesive or not	GTG 7055	0.5 to 2	460 x 100	Molded Die-cut
GTG 9015	0.8 to 20	300 x 300 or 500 x 500	Molded Die-cut Adhesive or not	GTG 7066	0.5 to 3	200 x 200	Molded Die-cut
GTG 7014	0.5 to 5	305 x 305 (0.5mm to 3mm) 245 x 245 (>4mm)	Molded Die-cut	GTG 7011	1 to 2	200 x 300	Molded Die-cut
GTG 7030	0.5 to 3	210 x 420 (0.5mm to 2.5mm) 200 x 400 (3mm)	Molded Die-cut				

GT901 Thermally and electrically conductive silicone

GT901 is a silicone elastomer loaded with silver plated copper particles, particularly recommended for thermal exchanges, between radiators and circuit boards with heat-emitting components.

It is available in sheets of various thicknesses ready for cutting to customer requirements in our workshops

Vulcanising the product direct to the radiator ensures the best possible thermal exchange.

SPECIFICATIONS

	GT 901/60	GT 901/45
Thermal conductivity W/m.K	1.20	1.20
Electrical resistivity Ω/cm/cm²	< 0.015	<0.015
Shore hardness A ±5	60	45
Density g/cm³	3.50	3.00
Working temperature	-50°C to +125°C	-50°C to +125°C

Moulded Cut Secured by vulcanisation Sheet

Formats

300mm x 300mm sheets
Standard thickness: 0.5mm to 10mm

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GT906 Thermally conductive silicone

General characteristics

GT906 is an RTV polyaddition silicone elastomer, fluid and curing at room temperature with no solvent requirement. The vulcanised product benefits from high hardness and excellent thermal conductivity.

Applications

This product is recommended for encapsulating and coating electrical and components. It can be used and an electrically insulating thermal drain.
This product's continuous working temperature is from -50°C to +220°C.

PROPERTIES

	Standards	Values		
Mechanical properties				
Colour		Brown-red		
Density (g/cm^3)	DIN 53479 A	2.35		
Hardness (shore A)	DIN 53505	80		
Break resistance (N/mm^2)	DIN 53504 S 1	2		
% Elongation	DIN 53504 S 1	50		
Tear strength (N/mm)	ASTM D 624 B	8		
Thermal properties				
Linear expansion coeff. 0-150°C (m/m.K)		$1.6\ 10^4$		
Thermal conductivity (W/m.K)	DIN 52612	1.2		
Electrical properties				
Dielectric strength (th. 1mm) (kV/mm)	DIN 53482	23		
Volume resistivity (Ω-cm)	DIN 53481	21,015		
		50 Hz	5 KHz	5 MHz
Dielectric constant	DIN 534843	6.1	5.7	5.3
Dissipation factor (tan)	DIN 53483	$210\ 10^{-4}$	$140\ 10^{-4}$	$85\ 10^{-4}$
Breakdown voltage kV	DIN 57303 / ASTM 2302-73	3.5		

Moulded Cut Secured by vulcanisation Sheet

Formats

300mm x 300mm sheets
Standard thickness: 0.5mm to 10mm

GT907 Thermally conductive silicone

General characteristics

GT907 is an RTV polyaddition silicone elastomer, fluid and curing at room temperature with no solvent requirement. When vulcanised it has good thermal conductivity and flame-resistance (UL94-V0).

Applications

This product is recommended for encapsulating and coating electrical and components.
It can be used and an electrically insulating thermal drain.
This product's continuous working temperature is from -50°C to +220°C.

	Standards	Values
Colour	-	Brown-red
Density at 23°C (g/cm³)	ISO 2781	1.43
Hardness (shore A)	ISO 868	55
Break resistance (N/mm)	ISO 37	3.5
% Elongation	ISO 37	10
Tear strength (N/mm)	ASTM D 624 B	4
Resilience (%)	ISO 4462	45
Thermal expansion coeff. 0-150°C (m/m.K)		1.5 10-4
Thermal conductivity (W/m.K)	20-150°C	0.55
Dielectric strength (th. 1mm) (kV/mm)	-	23
Volume resistivity (Ω.cm) measured dry at 23°C	-	1015
Volume resistivity (Ω.cm) measured damp at 60°C	-	1014
Surface resistivity (Ω)	-	1013
Dielectric constant (Σr)	50 Hz	3.7
Dissipation factor (tan)	50 Hz	370 10-4
Tensile strength	-	CTI>600
Flame propagation (Law %)	-	28 – UL94 V0

Moulded Cut Secured by vulcanisation Sheet

Formats

300mm x 300mm sheets
Standard thickness: 0.5mm to 10mm

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Thermally conductive electrical insulators (Contents)

Thermally conductive electrical insulators are used at the component/radiator interface.

They have numerous advantages over conventional grease-based products.
They eliminate the problems associated with silicone greases. These elastomers are glass-fibre reinforced, they are supple and they compensate for surface imperfections in the component and radiator.

PROPERTIES

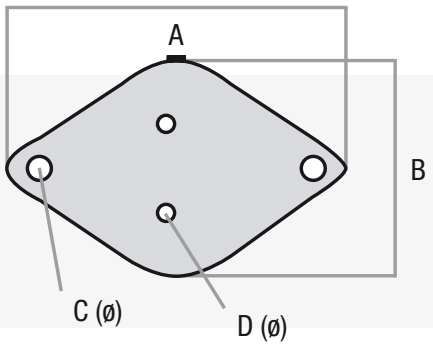
	MILITARY APPLICATIONS					INDUSTRIAL APPLICATIONS			
	1671	ST 81	ST 80	ST 83	ST 85	ST 79	ST 70	1674	ST 100
Replaces	Be 0 grease	Be 0 grease	Alumin. Oxide Anodised Alumin. grease	Be 0 grease	Alumin. Oxide Anodised Alumin. grease	MICA GREASE			
Tensile Strength kg/cm²	28	100	30	-	30	105	250	105	130
Tear strength kg/cm²	17.8	50	12	-	12	17.8	70	17.8	70
Elongation %	2	2	2	2	2	2	2	2	2
Hardness shore A	90	85	90	90	90	90	72	90	-
Min. breakdown voltage V	4000	9000	12000/mn	4000/mn	12000/mn	1500	10000	1500	12000
Working temperature °C	200	200	200	200	200	200	200	200	
Density g/cm3	1.55	1.5	1.5	-	1.5	2.2	2.18	2.2	-
Thickness in millimetres	0.38	0.4	0.3	0.4	0.45	0.25	0.3	0.25	0.8
Colour	White	White	White	White	White	Blue	Dark blue	Blue	White
Resistivity Ω.cm	$10x10^{14}$	$10x10^{14}$	$1.5x10^{14}$	$10x10^{13}$	$1.5x10^{14}$	$2x10^{14}$	$5x10^{13}$	$2x10^{14}$	$1.1x10^{15}$
Thermal conductivity W/m.K	2.6	5.0	5.0	-	-	1.3	1.2	1.0	5.0
Dielectric constant 10^6 Hz	4	2.6	4	4	4	4	4.2	4	-
Thermal resistance C/W	0.22	0.30	0.30	0.2	0.38	0.5	0.8	0.5	0.40

Cut Sheet

SHEETS	
Ref.	Dimension in mm (±0.3mm)
1671	203 x 203 / 254 x 254 / 420 x 570 / 300 x 300
ST 81	270 x 210 /
ST 80	210 x 210 / 400 x 200 / 510 x 440
ST 83	
ST 85	210 x 210 / 400 x 200 / 420 x 420 / 510 x 440
ST 79	203 x 203 / 406 x 406
ST 70	
1674	203 x 203 / 406 x 406
ST 100	

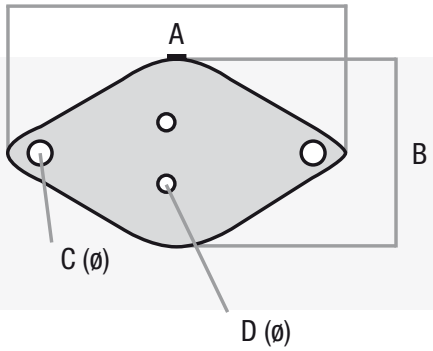
Thermally conductive electrical insulators (Standard die-cut)

TO-3



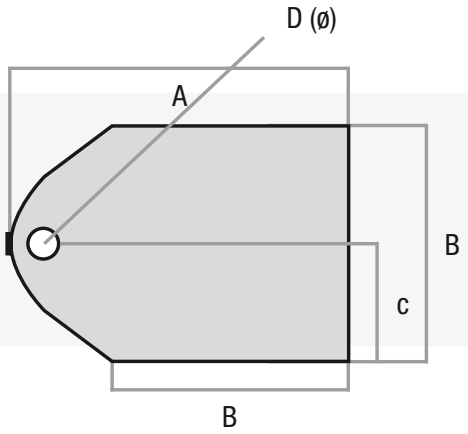
Ref.	A (mm)	B (mm)	C (mm)	D (mm)
D 51	40.50	28.00	4.00	1.80
C 463	43.00	30.00	3.50	2.00
H 21	43.20	30.00	4.00	1.60
D 53	44.00	31.80	3.60	1.60
E 72	48.10	34.70	2.90	1.30
C 4	49.40	36.50	3.60	1.60
S 15	52.00	35.00	5.50	4.50

TO-66



Ref.	A (mm)	B (mm)	C (mm)	D (mm)
F 66	31.80	17.80	3.50	1.60
C 461	34.00	20.00	3.50	1.20
F 67	34.90	21.00	3.60	1.60
D 45	36.80	22.80	3.60	1.20

TO-36



Ref.	A (mm)	B (mm)	C (mm)	D (mm)
E 26	22.00	16.50	8.30	3.60

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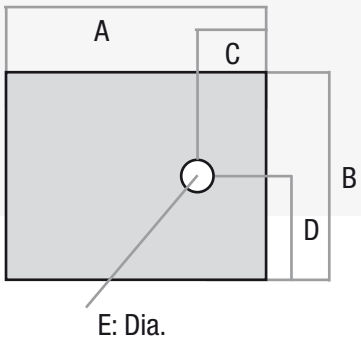
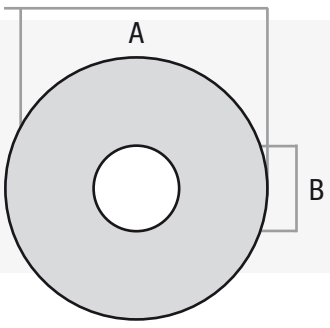
Ref.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
W 184	15.00	8.80	4.40	4.40	2.50
C 63	16.00	11.00	4.00	-	3.20
H 7	16.00	11.00	3.00	-	3.00
S 73	17.00	12.00	4.00	6.00	2.60
F 68	17.40	14.30	5.50	7.10	3.20
V 57	17.70	11.60	3.60	-	2.70
C 41	18.00	12.00	4.00	-	2.20
C 75	18.00	12.00	4.00	-	2.60
W 23	18.00	13.00	4.00	-	3.50
F 69	20.00	12.00	5.00	-	3.20
P 76	20.00	14.00	5.50	7.00	4.00
V 102	20.80	15.00	4.80	7.50	4.30
V 200	21.50	17.00	6.30	8.50	3.30
C 80	22.00	11.00	3.50	-	2.30
S 92	22.00	16.00	-	8.00	3.10
V 50	22.00	16.50	5.50	-	3.50
J 180	22.00	17.00	5.00	-	4.20
U 59	23.00	19.00	7.00	9.50	3.40
V 51	24.00	19.00	7.00	-	3.30
K 02	24.00	20.00	6.50	10.00	3.00
K 194	25.00	20.00	9.00	10.00	3.60
P 65	25.00	34.00	8.00	-	3.00
P 67	28.00	16.00	8.00	8.00	3.70
C 48	28.00	23.00	8.00	-	4.00
J 100	30.50	19.00	5.50	-	3.50
M 117	34.00	24.00	10.00	12.00	3.60
V 189	40.00	26.00	10.00	13.00	3.20

TIP-32 or TO-220



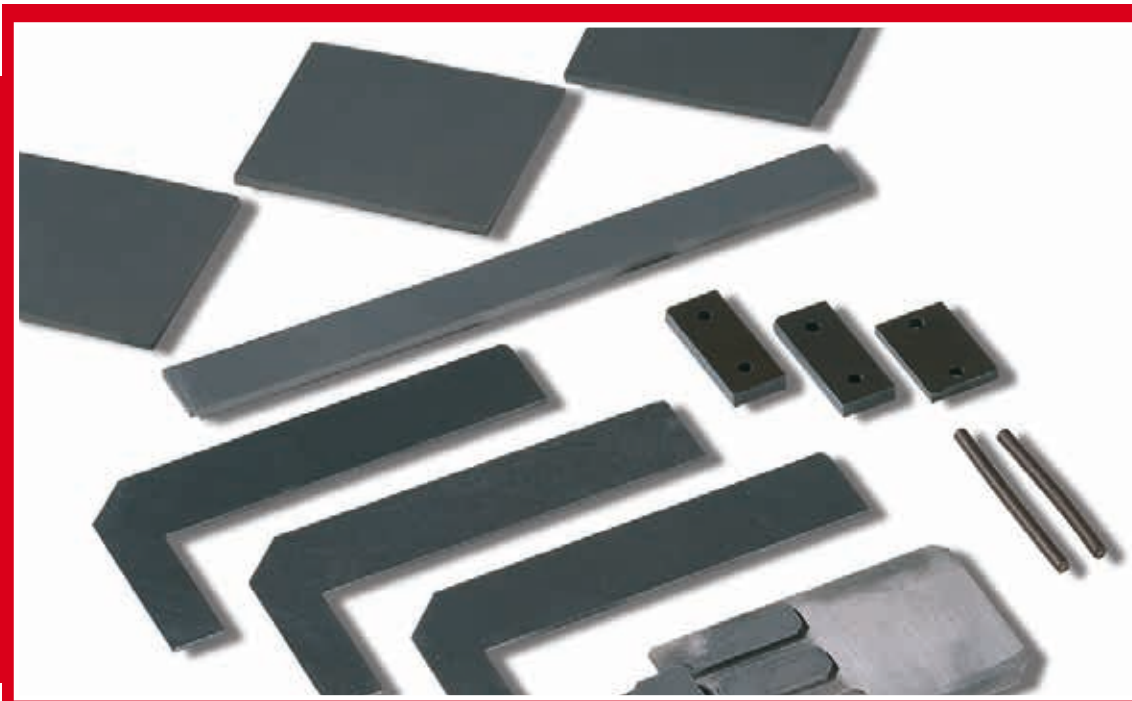
Ref.	A (mm)	B (mm)	Ref.	A (mm)	B (mm)
BR 7828	7.50	4.00	D 37	20.00	3.50
A 1064	8.50	4.20	Y 27 – C 382	20.00	6.50
P 101	10.00	2.50	D 11	21.50	6.50
R 109	10.00	5.00	U 11-2	21.60	6.80
E 45	12.00	6.00	X 14	23.10	4.20
U 11-1	13.00	5.00	K 81	24.00	12.00
C 462	15.00	5.10	D 55	25.40	6.50
D 20	16.00	5.00	C 381	25.40	8.00
U 131	16.00	12.00	Y 28	30.00	13.00
A 499	19.30	6.00			

DO



GETELEC

MICROWAVE ABSORBENT MATERIALS



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CONTENTS

GT501 Epoxy microwave absorbent materials

GT501 is a ***microwave***-absorbent product developed by our laboratories.

GT501 is available in sheets that we can then cut to shape in different thicknesses. It is made of small diameter (5µ approx.) carbonyl iron spheres, dispersed in an appropriate resin. The mixture's homogeneity is ensured by a complex mixing system, perfected by Getelec.

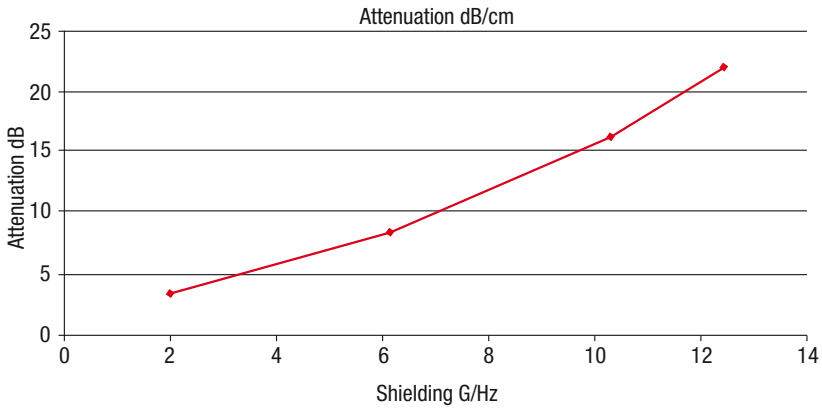
Flowing and moulding are carried out under vacuum to reduce any porosity. Reproducibility is ensured through rigorous monitoring of constituents, particularly those of the resin formulation.

SPECIFICATIONS

PRODUCT	GT 501
Working temperature	100°C maximum
Humidity absorption %	0.20
Hardness shore A	90
Density (g/cm3)	3.60

MICROWAVE SHIELDING

	2 GHz	6 GHz	10 GHz	12 GHz
Magnetic permeability (H . m-1)	1.85	1.55	1.35	1.30
Dielectric constant (pF. m-1)	9.50	9.20	9.00	8.90



Format options:

Moulded Cut Secured by vulcanisation Sheet

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GT602 Epoxy microwave absorbent materials

GT602 is a ***microwave***-absorbent product developed by our laboratories.

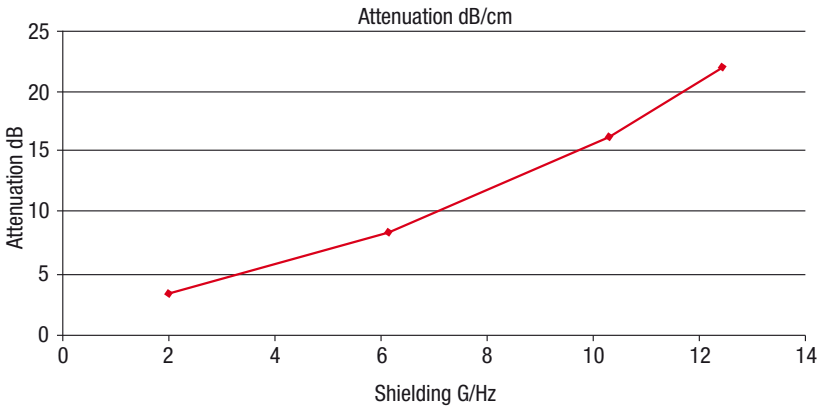
GT602 is available in sheets that we can then cut to shape in different thicknesses. It is made of small diameter (5µ approx.) carbonyl iron spheres, dispersed in an appropriate resin. The mixture's homogeneity is ensured by a complex mixing system, perfected by Getelec.

SPECIFICATIONS

PRODUCT	GT 602
Working temperature	200°C maximum
Hardness shore A	62
Density (g/cm3)	3.50
Compression resistance	6.70
Tensile Mpa	3.50
Residual deformation %	9.20
Tearing daN/cm	24.15

MICROWAVE SHIELDING

	2 GHz	6 GHz	10 GHz	12 GHz
Magnetic permeability (H . m-1)	1.85	1.55	1.35	1.30
Dielectric constant (pF. m-1)	9.50	9.20	9.00	8.90



Format options:

Moulded Cut Secured by vulcanisation Sheet

GT602 R85 silicone microwave absorbent materials

GT602 R85 is a supple ***microwave***-absorbent product developed by our laboratories.

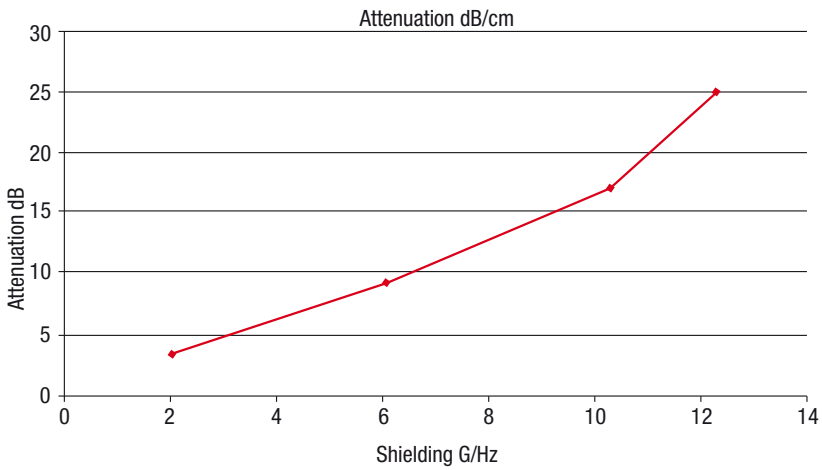
GT602 R85 is available in sheets that we can then cut to shape in different thicknesses. It is made of small diameter (5µ approx.) carbonyl iron spheres, dispersed in an appropriate resin. The mixture's homogeneity is ensured by a complex mixing system, perfected by Getelec.

SPECIFICATIONS

PRODUCT	GT 602 R85
Working temperature	-55°C to +200°C
Hardness shore A	70
Density (g/cm3)	3.96
Tensile strength Mpa	2.70
% elongation at break	232
Tear strength kN/m	16.60
Residual deformation %	13.60

MICROWAVE SHIELDING

	2 GHz	6 GHz	10 GHz	12 GHz
Magnetic permeability (H . m-1)	1.90	1.65	1.47	1.46
Dielectric constant (pF. m-1)	9.80	9.75	9.81	9.95



Format options:

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GT602 R87 silicone microwave absorbent materials

GT602 R87 is a supple ***microwave***-absorbent product developed by our laboratories.

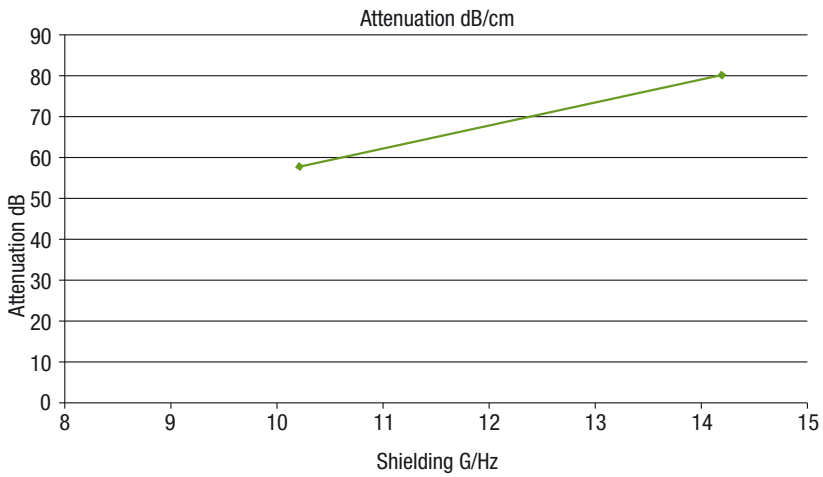
GT602 R87 is available in sheets that we can then cut to shape in different thicknesses. It is made of small diameter (5µ approx.) carbonyl iron spheres, dispersed in an appropriate resin. The mixture's homogeneity is ensured by a complex mixing system, perfected by Getelec.

SPECIFICATIONS

PRODUCT	GT 602 R87
Working temperature	-55°C to +200°C
Hardness shore A	70
Density (g/cm3)	4.70
Tensile strength at 20°C daN/mm²	0.19
% elongation at break	-
Tear strength kN/m	-
Thermal conductivity in W/m.K	1.01

MICROWAVE SHIELDING

	2 GHz	6 GHz	10 GHz	12 GHz
Magnetic permeability (H . m-1)	1.90	1.65	1.47	1.46
Dielectric constant (pF. m-1)	9.80	9.75	9.81	9.95



Format options:

Moulded Cut Secured by vulcanisation Sheet

OTHER SHIELDING PRODUCTS

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CONTENTS

12097 Epoxy silver conductive glues

Use: GT 12097 is a two-component silver-loaded epoxy, specially designed as a chip adhesive for when low temperature polymerisation is required. GT 12097 is also recommended for applications needing high temperature polymerisation: at 105°C, GT 12097 polymerises in 5 minutes, unlike the 30 minutes needed by many single component products. This low viscosity resin contains no solvents.

Life span: Before mixing, the resin has a life span of 2 years in ambient conditions; mixed product remains usable for 4 days, also at ambient. Due to its long mixed lifespan and the absence of solvents, GT 12097 is ideal for use on automated production lines. The combination of a long lifespan when mixed and rapid polymerisation mean that GT 12097 is an ideal production optimisation tool.

Temperature: Experience demonstrates that, polymerised above 120°C, GT 12097 withstands soldering temperatures of 300°C to 400°C.

POLYMERISATION		VOLUME RESISTIVITY	SHEARING RESISTANCE
Temp. °C	Minutes	Ω cm	Bar
80	90	0.0009	56
100	40	0.0005	70
120	15	0.0002	77
150	5	0.00008	91
180	1	0.00005	91

Coefficient of expansion: Before Tg = 3.2 x 10-5 – After Tg = 5.4 x 10-5. Density: 2.60
Important: Before mixing, ensure that both A and B are **well stirred**. Part A: 2/5 by weight - Part B: 3/5 by weight.

Formats
28 gram jar

584-29 Epoxy silver conductive glues

Use: 584-29 is an epoxy-type resin, loaded with powdered silver and with an average usable lifespan after mixing. An excellent conductive resin for the manufacture of adhesive film.

Temperature: This cold soldering product withstands average temperatures of the order of 130°C. The most commonly used hardener is hardener 29.

Applications: Shielding, electrostatic screen, adhesive film, cold soldering, base for electrolytic deposit, various adhesions to numerous media.

SHELF LIFE	TEMPERATURE
36 months	- 18°C
18 months	+ 5°C
9 months	+ 25°C

Its mechanical performance on copper is equivalent to that of aluminium. It also has excellent resistance to impact, tensile forces and low temperatures.

Formats
Pre-weighed 2.5 gram kits
100 gram and 453 gram jars

POLYMERISATION

Hardener	Polymerisation cycle	Volume resistivity Ω-cm	Tensile strength and resistance to shearing Kg/cm (1)	Mixing proportions by weight (2)	Usable life after mixing (23°C)	Density	Coefficient of thermal expansion (in/in/°C)	Thermal conductivity (W/m°C)
29	24 hours at 25°C	0.05	45.7	6.3	30 mins	2.5	49 x 10-6	0.40
	2 hours at 66°C	0.009	63.3					
	45 mins at 100°C	0.003	91.4					
	15 mins at 112°C	0.002	98					

(1) Tensile strength was obtained on an assembly, with the INSTRON machine at a speed of 2.45 mm/min.

(2) Parts hardener for 100 parts resin by weight.

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GT 4120 Nickel loaded Epoxy conductive glues

GT 4120 is a 100% solid two-component nickel loaded conductive epoxy.

Designed for supplementary use, it is never intended to replace silver loaded epoxy, which offers optimal conductivity and performance.

This nickel epoxy is recommended for the repair of circuits or sheathing applications, in which electrical conductivity is not critical.

GT 4120 comes as an easy-handling smooth paste; it can be applied by screen printing, standard application system or by syringe. It has good powers of adhesion on a range of substrates including most metals and plastics, ceramics and glass.

GT 4120 epoxy resin is easy to mix (1 to 1 by weight) with a long usable life after mixing. It polymerises quickly at relatively low temperatures.

This epoxy can be used for other applications where its non-reflective properties could be significant. And there is no need to add any solvent to this 100% solid system. It does not dry out during its mixed usable life of 3-4 days.

It withstands intermittent temperatures of 300-400°C, with no detectable degradation below 430°C.

PHYSICAL PROPERTIES

Colour	Black
Consistency	Slightly thixotropic smooth paste
Density g/cm3	3.5
Volume resistivity Ω-cm	0.35
Mixture viscosity at 25°C	30000 cps
Tg at 150°C for one hour	95°C
Hardness shore D	73
Tensile strength and tear resistance	147.7 kg/cm
Coefficient of thermal expansion (150°C for 1 hour)	
Before Tg	89 x 10-6 mm/mm/°C
After Tg	139 x 10-6 mm/mm/°C
Continuous working temperature	150°C
Intermittent working temperature	300-400°C
Degradation temperature	430°C
Usable life after mixing (25°C)	3-4 days
Storage life before mixing (at 25°C)	1 year

POLYMERISATION

Temperature	Minimum setting time
150°C	5 minutes
120°C	15 minutes
80°C	90 minutes

Mixing ratios

Part A (epoxy resin and nickel powder) 1
Part B (hardener and nickel powder) 1

Note

Mix Parts A and B separately, ensuring good mixing of the individual components, before mixing them together.

RTV 1030 silicone/metal glue

Resin 1030 is a single-component RTV silicone filled with silver plated copper particles. This product solves the problems of glueing conductors, eliminating HG, VHF and UHF interference.
This conductive silicone uses natural humidity in the air to cure. It contains no acetic acid.

- **Before polymerisation,** 1030 is a paste that can be easily spread onto the surfaces to be assembled.
- **After polymerisation,** 1030 makes a secure, flexible joint.

User instructions: Clean and dry the mating surfaces; apply a film of primer (1086) to the metal face and leave 1 hour to dry. Apply a thin film (2/10mm) of 1030. The width of applied adhesive must not exceed 1cm to ensure total polymerisation at the centre of the glued area. Apply pressure at ambient temperature during curing. Complete polymerisation is achieved within 48 hours with 50% relative humidity.

CHARACTERISTICS

Hardness shore A	70
Density g/cm3	3.60
Maximum volume resistivity Ω-cm	0.10
Continuous working temperature	-55°C to +200°C
Storage life	6 months at +25°C,

Formats
113 gram tube
453 gram cartridge for compressed air guns

RTV 1029 two-component silicone/metal glue

Use: 1029 glue is a conductive silicone adhesive filled of silver plated copper particles, specially formulated for glueing conductive silicone seals to metal media. This glue ensures high thermal and electrical conductivity.

Formats : 1029 glue is an easily-spreadable cream. It is a two-component system plus a primer (1085), polymerisable at temperature, providing permanent and flexible adhesion. Each component is differently coloured, giving a uniform colour when properly mixed.

Storage temperature: Primer and adhesive must be stored at +5°C.

User instructions: To ensure best adhesion, the metal medium must be cleaned and degreased using toluene or trichloroethylene. Chemical surface preparation improves these properties but is not essential. The solvent must be allowed to evaporate when the primer is applied. The metal media must be coated in the correct primer before application of the adhesive. The primer must be applied in **as thin a coat as possible,** as this is an insulator (there is no need to apply primer to the silicone gasket). **Wait 15 minutes before applying glue.** Clean the seal with denatured alcohol, prepare the adhesive (1 part 1029 A to 2.5 parts 1029 B, by weight, until the paste is evenly coloured), then apply a very thin coat, 0.1 mm, of 2019 using the spatula. Apply pressure to the seal to ensure perfect contact and polymerise as per the table below.

CHARACTERISTICS

Density g/cm3	2.90
Electrical resistivity Ω/cm/cm²	0.60
Unmixed storage life	2 years at -18°C 1 year at +5°C 6 months at +25°C
Usable life after mixing (25°C)	2 hours
Polymerisation cycle	30 mins at +120°C 45 mins at +90°C 1 hr at 65°C 1 week at +25°C
Working temperature	-55°C to +125°C

Formats
100 gram kit
453 gram kit

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RTV 1038 silicone /metal glue

Use

1038 is a conductive silicone glue filled of silver plated copper particles and used to secure EMI/RFI seals, and as an EMI protection mastic.

Before polymerisation

Before polymerisation, 1038 is a non-flowing smooth paste spreadable by spatula or directly applied to vertical surfaces.

1038 polymerises in ambient conditions using natural air humidity. It contains no acetic acid or corrosives.

After polymerisation

Once cured, 1038 remains flexible and conductive at temperatures from -55°C to +125°C.

Drying times

Two minutes after start of exposure to ambient humidity, 1038 forms a skin. It can, nonetheless, still be manipulated during this time.

Polymerisation is complete after 48 hours' exposure to ambient humidity, at 50% relative humidity.

Usage instructions

Clean and dry the mating surfaces (isopropyl alcohol, acetone etc.)

Apply 1038 directly. If used as glue, it should be spread over the entire mating surfaces. It is important to apply pressure to 1038 while polymerisation is taking place. 1038 can also be used to make shaped joints.

If assembling to a metal surface, apply a primary film of 1086 and leave one hour to dry.

CHARACTERISTICS

Hardness shore A	83
Density g/cm3	3.55 ±0.35
Volume resistivity Ω-cm	0.01
Working temperature	-55°C to +125°C

Formats
113 gram tube

GT 4015 nickel paint

4014 paint is a single component nickel acrylic coating. It is designed to screen plastic cases housing electronic circuits, such as computers, terminals etc. against electromagnetic interference (EMI/RFI).
This paint dries in ambient air and has excellent adhesion to most plastics (polycarbonates, polystyrene etc.)

Usage instructions: The surface must be completely degreased and clean, with no trace of mould release agents.

Clean it with isopropyl alcohol (IPA) or methyl ethyl ketone (MEK). 4015 paint can be sprayed.

4015 paint is touch dry in 5 minutes in low humidity ambient air at 25°C, and withstands handling after 40 mins, depending on ambient conditions.

CHARACTERISTICS

Direct current resistance at 25 °C 0.05 mm	0.30 Ω/sq
Attenuation 30 – 1000 MHz	Up to 60dB
Maximum working temperature	120°C
Effect of damp on surface resistivity	negligible
Viscosity, 25°C	8000 cps
Theoretical coverage at 0.026 mm thickness	≈ 3.4 m²/kg
Storage life at ambient	1 year
Colour	Black

Formats
1 kg tub
5 kg tub

GT 4091 silver paint

4090 paint is a single component acrylic resin binder silver paint.

Use:

- Metallisation of plastic, wood, paper etc. materials
- Module shielding
- Static charge removal
- Conductive electrodes on insulating substrate, epoxy glass, Mylar etc.

User instructions : Applicable by brush, spray gun, dipping, etc. Apply as thin a coat as possible. If applying a second or third coat, allow to dry between coats.

D**rying time:** 30 mins approx. at 20°C – 10 mins approx at 160°C. Resistivity is improved when polymerised at temperature (maximum 250°C) with prolonged drying.

CHARACTERISTICS

Working temperature	-55°C to +100°C
Resistivity	0.05 Ω/sq
Density	1.80
Minimum coat thickness	10 µ
Coverage (for one 100g jar), depending on application	0.50 m² to 1.70 m²

Formats
250 gram bottle

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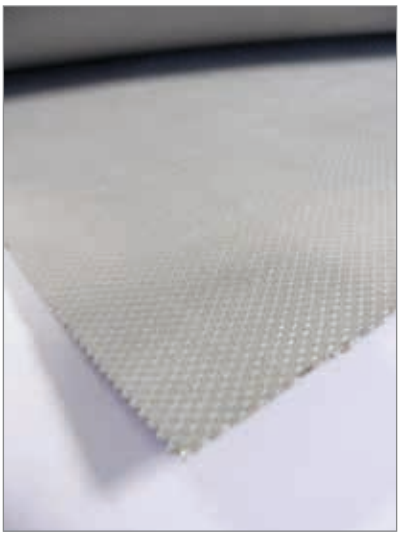
MS composite seals



MS composite seals are an EMI/RFI product made of an aluminium wire mesh impregnated with 50 shore hardness silicone or neoprene elastomer.

Use

- Seals made with these materials ensure an electrical connection and sealing, while maintaining good salt fog resistance.
- These materials are available as sheets or cut gaskets in different elastomers and thicknesses. (see table below)

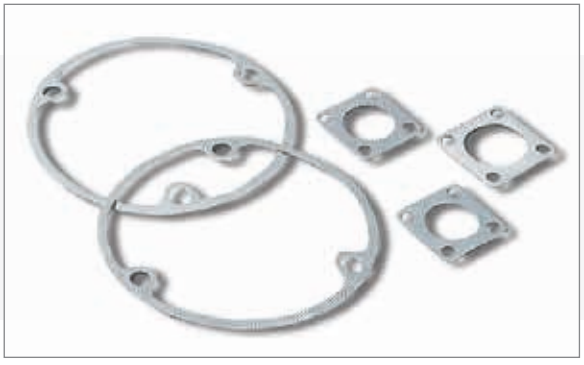
Getelec reference	Thicknesses	Elastomers	Aluminium mesh
MS 16	0.4 mm	Neoprene	30
MS 20	0.5 mm	Neoprene	24
MS 516	0.4 mm	Silicone	30
MS 520	0.5 mm	Silicone	24

ATTENUATIONS		
Field H	100 KHz	40 - 50 dB
Field E	10 MHz	100 dB
Plane wave	1 GHz	50 - 60 dB

WORKING TEMPERATURES		
Silicone Elastomer	-60°C to +250°C	40 - 50 dB
Neoprene Elastomer	-40°C to +100°C	100 dB

Formats

Contact us for standard shapes and pre-cut gaskets



Monel or aluminium wire embedded in silicone: PICSEAL

PICSEAL is a composite material comprising a silicone elastomer or a fluorosilicone for applications requiring resistance to hydraulic fluids. PICSEAL contains oriented metal wires ensuring electrical continuity between the two mating surfaces.

This product is available in sheet form, or as cut connector seals or to plan, square or rectangular section seals, in different hardnesses and with different wire types.

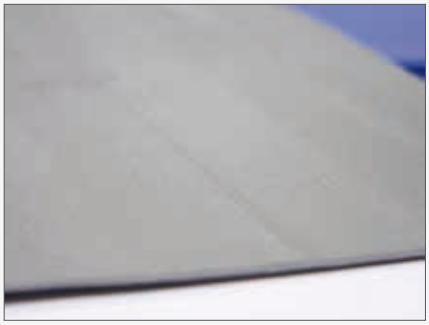
They can be pre-applied with adhesive to order.

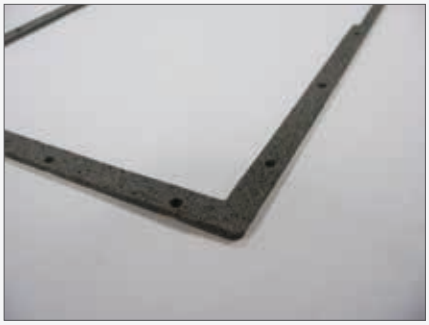
Joints made using these materials, whether die cut or glued to plan, ensure electrical continuity while at the same time providing sealing and good salt fog resistance.

CHARACTERISTICS	
Number of wires/cm²	100 to 150
Working temperature	-65°C to +200°C
Silicone or closed cell foam hardness	25 or 40 or 60 shore A
Metal wires	Monel / TCS / Aluminium
Compression	Minimum 10% - maximum 30%
Attenuation	100dB at 10MHz

Formats

Sheets available in thicknesses 0.8mm; 1.1mm; 1.6mm; 2.4mm; 3.2mm; 4.8mm.
Contact us for pre-cut gaskets.





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Monel or aluminium wire embedded in silicone: PICSEAL

PRODUCT

Reference	Description	Hardness shore A
PS 35 – MO	Monel in silicone	40
PS 35 – AL	Aluminium in silicone	40
PS 25 – MO	Monel in sponge silicone	25
PS 25 – AL	Aluminium in sponge silicone	25
PS 35 F – MO	Monel in fluorosilicone	60
PS 35 F – AL	Aluminium in fluorosilicone	60

DIMENSIONS

Thicknesses	Widths			
	3.2 mm	4.8 mm	6.4 mm	9.5 mm
1.6 mm	Ref. 16-032	Ref. 16-048	Ref. 16-064	Ref. 16-095
3.2 mm	Ref. 32-032	Ref. 32-048	Ref. 32-064	Ref. 32-095
4.8 mm	Ref. 48-032	Ref. 48-048	Ref. 48-064	Ref. 48-095
6.4 mm	Ref. 64-032	Ref. 64-048	Ref. 64-064	Ref. 64-095
8.0 mm	Ref. 80-032	Ref. 80-048	Ref. 80-064	Ref. 80-095

Other sizes are available on request. Contact us for further information.

To order, please use the following example:
Monel in a silicone sponge of thickness 1.6mm x 3.2 mm

The reference is PS25-16-032-MO
Add the suffix A if an adhesive is required on the back:
PS25-16-032-MO-A

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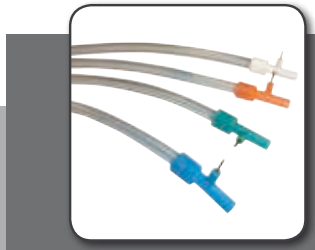
THERMOPLASTIC OVERMOLDING



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CONTENTS

Introduction

Getelec has taken over KAP Press design and manufacture with an extended development programme of interest to all in the plastics fabrication sector.

Presses in our current PRECINJECT range are specifically designed for high volume overmolding and micromolding applications.

Our technical approach to our clients and partners is holistic; our machines, made in the town of Buc, just outside Paris, France are very often supplied complete with the pre- or mass-production moulds which we also design.

The Getelec/KAP team is at your disposal for any information you may require about overmolding and precision micromolding, using our knowledge gained over 20 years' experience in the field

Why overmolding?

Definition

Overmolding, also known as insert moulding, is very close to the injection moulding process, since it builds on classic moulding techniques.
This technology is used for both simple and complex parts and it is employed in a great number of industries and areas of application, including automobile, datacomms, electronics, telephony, household goods, aeronautics, cosmetics, designer, and many more.

The basic principle of overmolding is simple. It consists of positioning one part, part A (the insert) in an injection mould and then injecting a substance, material B. It is by filling the mould that the insert is overmolded with material B.

There are various types of insert:

- metal insert
- plastic insert
- composite insert
- treated and non-treated inserts

With this method it is possible to make, in just one process, parts with inserts which, very often, could not be made using traditional methods.
Finally, with overmolding supplementary steps such as assembly or finishing are no longer needed, thus reducing costs.

Why overmolding is so useful

- **Manufacture of sealed parts**
  Overmolding guarantees a direct seal, with no need for external gaskets or adhesives, fitting the shape and overmolded material.
- **Complex part fabrication**
  In classic technologies such as adding (often by use of force) inserts to moulded parts, problems often crop up such as surface damage or the impossibility of added complex parts or parts with bends.By overmolding directly onto the insert, however, complex parts can be made without having to resort to joining two plastic halves or snapping parts together over the insert. This process eliminates problems of supplementary stages (such as supplementary moulded parts, mould design, assembly machines, etc.) and surface issues (such as joint splits).
- **Appearance and design**
  With overmolding excellent finishes are possible, using coloured materials and different textures while at the same time dispensing with assembly phases and surface finish problems, without forgetting reproducibility. The product's functionality can also be guaranteed by the use of overmolding (e.g. curvature radius of a connector, smooth appearance, identification marks, etc.)
- **Manufacture of parts with metal inserts**
  Widely used in the datacomms, electronics and automobile sectors, metallic inserts are placed in the mould and are completely embedded in it or emerge from it depending on the required application. They are mostly used for carrying electrical currents (e.g. connectors, sensors, temperature probes, etc.)
- **Elimination of assembly phases**
  Assembly is an automatic part of overmolding, and there is no need to design or have a final assembly machine. This cuts down both total fabrication time and costs, while ensuring your product has even better quality.

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The Kap PRECINJECT overmolding machine

TECHNOLOGICAL ADVANTAGES

The new PRECINJECT model range:

- Less electro-pneumatic energy for comfortable use
- Efficiency gained through a double-actionwork station which simultaneously carries out the injection cycle and loads the next cycle

KAP injection moulding machines, having proved their practicality and durability for 25 years, have now benefited from the added advantage of the GETELEC process. Continuous trials in GETELEC's plastic-forming workshops ensure productivity gains and improve dreproducibility from day one.

GUARANTEED PRODUCTIVITY GAINS

PRECINJECT has been designed for technical parts (thin walls, complex curves, technical sealing, various assemblies, etc.) and its productivity ensures the quickest possible return on investment.

This press works at 300 units per hour, thanks to 2 principles working cumulatively:

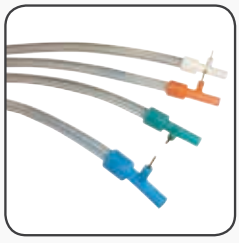
- Double action, or in other words, the tool is loaded during the injection cycle.
- Multi-position moulding capability.

Not to mention that the design of the work station reduces losses of both time and materials.

Tooling changes between production runs is the work of just a few minutes and the product is loaded instantaneously thanks to a patented system.

All with low maintenance costs.

MAIN APPLICATIONS



High precision overmolding requires technical know-how and technological solutions.

Examples of overmolding:

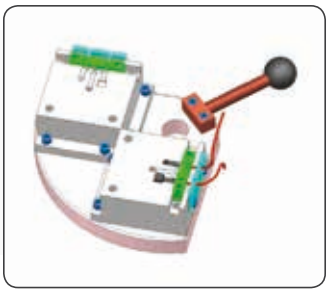
- Overmolded cables and connectors
- Overmolded catheters
- Overmolded electronic components
- Overmolded metal inserts

TECHNICAL DETAILS

Three PID thermo-regulation zones: 0/400°C
- Injection speed: 0.4 seconds
- Injection pressure adjustment precision: 10 mbar
- Cycle repetition precision: 0.2%

Screw - multi-material profile		
Screw diameter	Injectable volume	Injection pressure
16 mm	10 cm3	1200 bar
20 mm	16 cm3	-

STANDARDISED CLAMPING UNIT



- Oleo-pneumatic system
- Vertical clamp force 130 Kn
- Vertical injection
- Opening travel: 50 mm

Central ejection: 4 mm
- Kap mould dimensions: 80 x 80 x 60 mm

THE ADVANTAGES OF HIGH PRECISION OVERMOLDING

Overmolding requires flexibility in the process and allows the plastics manufacturer to carry out a technical, and thus hard-to-relocate, specialisation.

Areas of application:

Sealed parts, complex parts, designer parts etc.
Elimination of assembly stages.

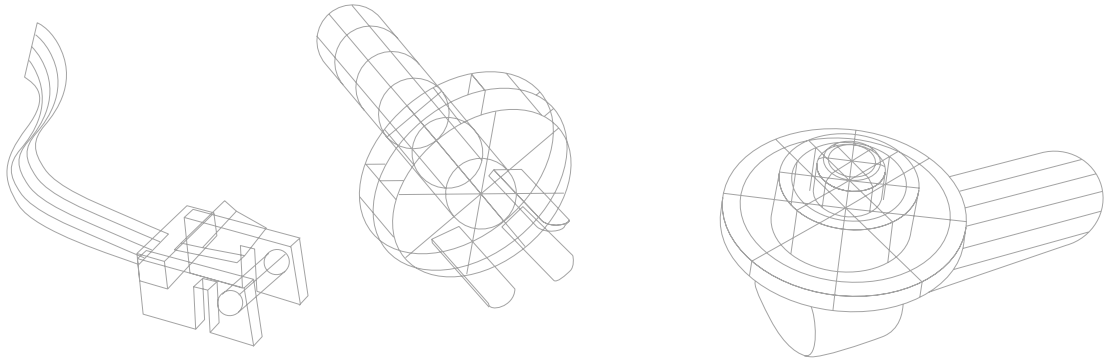
INDUSTRY SECTORS

Aeronautics
Armaments
Automobile
Medical
Telecommunications
Datacomms
Cables and wiring

REFERENCES

Thalès Alenia Space
Dassault Aviation
EADS
Matra Aérospatial
DCAN

KAP, the team that is at your service to advise you, help you define your needs, provide all the assistance you need...and give top-performing After Sales Service.



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