

INSULATING SILICONES



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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 $200 \cdot 10^{-4}$

- dielectric strength 10 to 30 kV/mm

Fire resistance

Silicones have better natural fire resistance than polyolefins. Silicones also have 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.

Technical sealing expertise



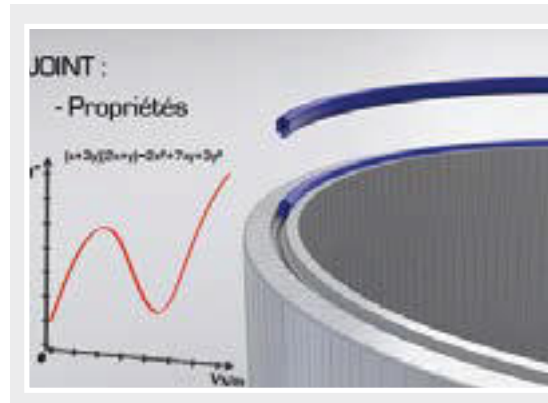
1 - Requirements analysis

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

non-fluorinated silicone

Silicone products type VMQ (ASTM D 1418)

Working temperature: -73°C to +232°C

These elastomers are used for the manufacture of molded items, extruded seals, cut flat seals and seals vulcanized 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 | Fluorinated silicone | Silicone | Fluorinated silicone |
| Shore A hardness (±5) | ASTM D 792 | 25 | 30 | 30 | 40 | 40 |
| Specific mass at 25°C (g/cm ³) | 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 22h at 177°C (%) | ASTM D 395 Method B | 20 | 20 | 20 | 30 | 20 |
| Color | | Red | White | Blue | Orange | Blue |

■ Molded
 ■ Extrud-
 ■ Cut
 ■ Secured by vulcanization
 ■ Sheet
 ■ Secured

TOLERANCES OF OUR INSULATING SHEETS

| 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 |
| Greater than 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 |
| Greater than 2 | ± 13% |

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

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

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

We can also provide cut sections to suit the most appropriate procedure for your requirements: tool cut, laser cut, water jet cut, flash cut.

These cut sections are delivered within two weeks after receiving your order and designs.

Fluorinated silicone

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 molded items, extruded seals, cut flat seals and seals vulcanized 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 | Fluorinated silicone | Silicone | Fluorinated silicone | Silicone | Fluorinated silicone | 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 COMPRESSION FORCE TO THE-CRUSHING OF MOLDED 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 molded sheet material. Measurements taken on cut out sections.



Cellular silicone elastomers

Our range of cellular silicone elastomers allows the making of seals with low hardness and shock-absorbing stops. All these products are available with or without adhesive on request.

CHARACTERISTICS

| Reference | GT 11 | GT 21 | GT 31 | GT 27 EX |
|---|--|-------------------|-------------------|-------------------------------|
| Type | Closed cell cellular material | | | |
| Material | Expanded silicone | Expanded silicone | Expanded silicone | Expanded fluorinated silicone |
| Shore A hardness (± 5) | 12 | 20 | 30 | 20 |
| Density g/cm ³ (± 0.1) | 0.40 | 0.60 | 0.80 | 0.55 |
| UL 94 rating | RF version (UL94 V1) feasibility | | | |
| Color | Off-white (coloring possible on request) | | | Blue |
| Working temperature | -55°C to +200°C (up to 250°C) | | | -60°C to +230°C |

| Compression Force | | | | | | |
|-------------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|
| Sample Thickness | GT 11 | | GT 21 | | GT 31 | |
| | 4mm | | 3.5mm | | 4 mm | |
| | Force kg*/cm ² | Crushing % | Force kg*/cm ² | Crushing % | Force kg*/cm ² | Crushing % |
| | 0.26 | 7 | 0.4 | 17 | 0.65 | 5 |
| | 0.45 | 18.6 | 0.7 | 25 | 1.3 | 10 |
| | 0.76 | 30.2 | 1.1 | 35 | 2.34 | 15 |
| | 1.16 | 41.9 | 1.5 | 42 | 3.25 | 20 |
| | 1.84 | 53.5 | 2.1 | 48 | - | - |

■ Molded ■ Cut ■ Sheet

TOLERANCES OF OUR INSULATING SHEETS

| 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 due to the risk of breaking the cell walls and inducing significant residual deformation. Recommended compression is in the 20 to 30% range.



MANAGEMENT SYSTEM CERTIFICATE

Certificate No.
59406-2009-AQ-FRA-SINCERT

First Issue Date
2011-05-20

Certificate Issue Date
2017-05-20

Certificate Reissue Date
2017-05-19

Certification Expiry Date
2020-05-19[†]

This certifies that the quality management system of

GETELEC

375 rue Morane Saulnier, Buc 78530, France

Conforms to the quality management system standard

ISO 9001:2008

and

EN 9100:2009

(TECHNICALLY EQUIVALENT TO AS9100C AND JISQ 9100:2009)

Assessment has been performed in accordance with EN9104-001:2013 standard requirements

Certification Structure: SINGLE SITE

This certificate is valid for the following products or services:

(Further clarifications regarding the scope and the applicability of the requirements of the standard(s) may be obtained by consulting the certified organization)

Design, manufacturing and sale of electromagnetic shielding gasket realized by molding, extrusion, bonding and die-cutting.

Sector EA: 19

**) This certificate will not be valid after 15 September 2018*

Place and date:
Vimercate (MB), 2017-05-19



Eric Maugard



SGQ N° 003 A EMAS N° 009 F
SGA N° 003 D PRD N° 003 B
SGE N° 007 M RRS N° 004 C
SOR N° 004 P SSI N° 002 G

Membro di NEA EA per gli schemi di accreditamento
SGQ, SGA, PRD, RRS, DSP, OHS, LAB e LAT, di PRA IAF
per gli schemi di accreditamento SGQ, SGA, SSI, FSH
e PRD e di PRA ILAC per gli schemi di accreditamento
LAB, MED, LAT e ISO

For the Accredited Unit:
DNV GL Business Assurance Italia S.r.l.

Nicola Privato
Management Representative

Aerospace quality silicone

Mixture of silicone elastomer hardness 70 shore A developed

for applications requiring excellent resistance to fire.

The parts that comply with the 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 management of braking controls



CHARACTERISTICS

| Characteristics | Standards | GT 70 E RF-2 | GT 70 M RF-2 | GT 70 E RF-4 |
|--|-------------|--------------------------------|--------------------------------|--------------------------------|
| Density (g/cm ³) | ASTM D 792 | 1.35 ± 0.05 | 1.35 ± 0.05 | 1.39 |
| Shore A hardness | ASTM D 2240 | 70 ± 5 | 70 ± 5 | 71 |
| Break resistance MPa | ASTM D 412 | > 6 | > 6 | 82 |
| Tear strength kN/m | ASTM D 624 | > 10 | > 10 | 341 |
| % Elongation at break | ASTM D 412 | > 180 | > 180 | 376 |
| % residual deformation after 70 hours compression at 150°C | ASTM D 395 | < 50 | < 50 | < 50 |
| Continuous working temperature °C | | -60°C to +200°C (up to +230°C) | -60°C to +200°C (up to +230°C) | -60°C to +200°C (up to +230°C) |
| Color | | On demand | On demand | On demand |
| Format options | | ■ | ■ ■ ■ ■ | ■ ■ ■ ■ ■ |

■ Molded ■ Extruded ■ Cut ■ Secured by vulcanization ■ Sheet

Qualified according to standard:

FAR 25.853

Norm AIRBUS ABD0031

Aeronautic quality formulations

3

| 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% CVCVM <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 |

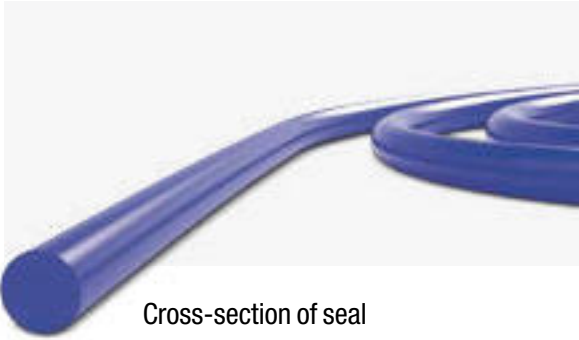
TOLERANCES FOR EXTRUDED SECTIONS

| 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% |

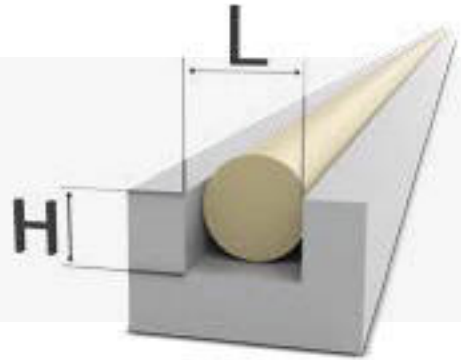
| TOLERANCES ON HOLLOW CROSS SECTION FOR EXTRUDED PROFIL | |
|--|------------|
| DIMENSIONS (mm) | TOLERANCES |
| From 0.5 to 1.0 | ± 15% |
| > 1.0 | ± 10% |

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

Solid round profile



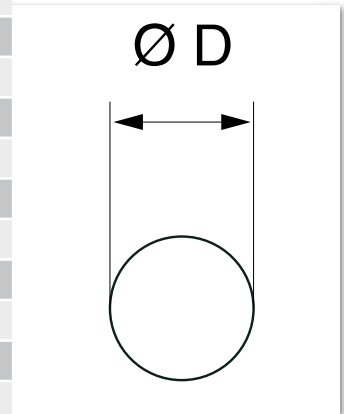
Cross-section of seal



Recommended groove dimensions
Machining tolerance: ± 0.05

3

| 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 |
| 0610 | 0.60 | 0.45 | 0.80 | 3024 | 3,00 | 2.4 | 3.3 |
| 0710 | 0,71 | 0.55 | 0.8 | 3172 | 3,17 | 2.5 | 3.5 |
| 0810 | 0,80 | 0.6 | 0.9 | 3200 | 3,20 | 2.50 | 3.50 |
| 0910 | 0.9 | 0.7 | 1.1 | 3326 | 3,30 | 2.6 | 3.6 |
| 1020 | 1,00 | 0.8 | 1.1 | 3400 | 3,40 | 2.70 | 3.70 |
| 1100 | 1.10 | 0.90 | 1.30 | 3529 | 3,50 | 2.8 | 3.8 |
| 1211 | 1,20 | 1.0 | 1.3 | 3600 | 3,60 | 2.9 | 3.9 |
| 1251 | 1,25 | 1.0 | 1.4 | 3700 | 3,70 | 3.0 | 4.0 |
| 1300 | 1.30 | 1.00 | 1.50 | 3831 | 3,80 | 3.0 | 4.1 |
| 1351 | 1,35 | 1.1 | 1.5 | 3900 | 3,90 | 3.10 | 4.20 |
| 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 | 4200 | 4,20 | 3.4 | 4.5 |
| 1735 | 1,70 | 1.4 | 1.9 | 4300 | 4,30 | 3.5 | 4.6 |
| 1815 | 1,80 | 1.4 | 2.0 | 4400 | 4,40 | 3.60 | 4.70 |
| 1900 | 1,90 | 1.5 | 2.1 | 4500 | 4,50 | 3.6 | 4.9 |
| 2017 | 2,00 | 1.6 | 2.2 | 5045 | 5,00 | 4.0 | 5.5 |
| 2100 | 2.10 | 1.70 | 2.30 | 5342 | 5,33 | 4.3 | 5.8 |
| 2218 | 2,20 | 1.8 | 2.4 | 5400 | 5,40 | 4.3 | 5.9 |
| 2300 | 2.30 | 1.8 | 2.5 | 5545 | 5,50 | 4.4 | 6.0 |
| 2419 | 2,40 | 1.9 | 2.6 | 6050 | 6,00 | 4.8 | 6.5 |
| 2502 | 2,50 | 2.0 | 2.7 | 6452 | 6,40 | 5.1 | 7.0 |
| 2621 | 2,60 | 2.1 | 2.8 | 7056 | 7,00 | 5.6 | 7.6 |
| 2725 | 2,70 | 2.2 | 2.9 | 7040 | 7,40 | 5.9 | 8.1 |
| 2842 | 2,84 | 2.3 | 3.1 | 8064 | 8,00 | 6.4 | 8.7 |
| | | | | 1012 | 10,00 | 8.0 | 10.9 |



Contact us for alternative sizes.

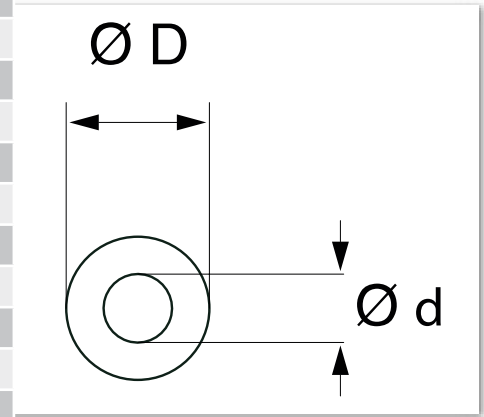
0538 GT60: profile reference + 60 shore insulating silicone

Recommended groove dimensions calculation is based on the following data:

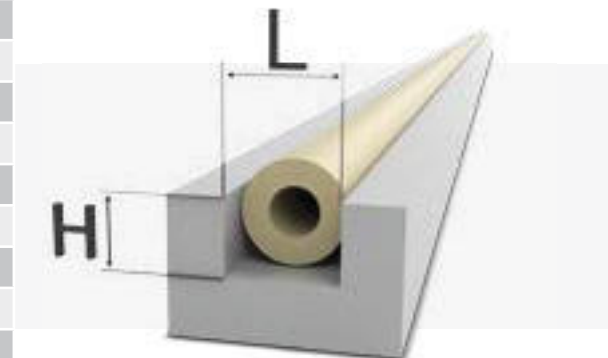
Average seal compression 20%
Groove fill rate 90%

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 | 1.10 | 0.8 | 3214 | 3.18 | 1.40 | 3.30 | 2.40 |
| 1305 | 1.30 | 0.55 | 1.40 | 1.0 | 3211 | 3.20 | 1.10 | 3.60 | 2.40 |
| 1406 | 1.45 | 0.65 | 1.55 | 1.10 | 3215 | 3.20 | 1.50 | 3.40 | 2.40 |
| 1607 | 1.50 | 0.70 | 1.60 | 1.10 | 3217 | 3.20 | 1.70 | 3.40 | 2.20 |
| 1605 | 1.60 | 0.50 | 1.80 | 1.20 | 32016 | 3.20 | 1.60 | 3.40 | 2.30 |
| 1608 | 1.60 | 0.80 | 1.70 | 1.20 | 3202 | 3.20 | 2.00 | 3.40 | 2.10 |
| 1808 | 1.80 | 0.80 | 1.90 | 1.40 | 3412 | 3.40 | 1.20 | 3.60 | 2.60 |
| 1812 | 1.80 | 1.10 | 1.90 | 1.40 | 3420 | 3.40 | 2.00 | 3.50 | 2.50 |
| 2011 | 2.00 | 1.10 | 2.10 | 1.50 | 3519 | 3.50 | 1.90 | 3.70 | 2.60 |
| 2050 | 2.00 | 0.50 | 2.20 | 1.50 | 4013 | 4.00 | 1.30 | 4.20 | 2.80 |
| 2080 | 2.00 | 0.80 | 2.10 | 1.50 | 4020 | 4.00 | 2.00 | 4.20 | 2.80 |
| 2108 | 2.10 | 0.80 | 2.20 | 1.60 | 4520 | 4.50 | 2.00 | 4.70 | 3.40 |
| 2112 | 2.10 | 1.27 | 2.20 | 1.60 | 4525 | 4.50 | 2.50 | 4.60 | 3.30 |
| 2206 | 2.25 | 0.60 | 2.40 | 1.70 | 5023 | 5.00 | 2.30 | 5.20 | 3.80 |
| 2309 | 2.30 | 0.89 | 2.50 | 1.70 | 5323 | 5.30 | 2.30 | 5.50 | 4.00 |
| 2310 | 2.30 | 1.00 | 2.40 | 1.70 | 5535 | 5.50 | 3.50 | 5.70 | 4.10 |
| 2313 | 2.30 | 1.30 | 2.40 | 1.70 | 6030 | 6.00 | 3.00 | 6.20 | 4.50 |
| 2305 | 2.50 | 0.50 | 2.70 | 1.90 | 6004 | 6.00 | 4.00 | 6.10 | 4.40 |
| 2510 | 2.50 | 1.00 | 2.70 | 1.90 | 6432 | 6.40 | 3.20 | 6.60 | 4.80 |
| 2511 | 2.50 | 1.10 | 2.60 | 1.90 | 7034 | 7.00 | 3.40 | 7.20 | 5.30 |
| 2608 | 2.60 | 0.80 | 2.80 | 2.00 | 7037 | 7.00 | 3.75 | 7.20 | 5.00 |
| 2610 | 2.60 | 1.00 | 2.70 | 2.00 | 7837 | 7.85 | 3.75 | 8.00 | 5.90 |
| 2612 | 2.60 | 1.20 | 2.80 | 1.90 | 7949 | 7.95 | 4.88 | 8.20 | 6.00 |
| 2611 | 2.68 | 1.08 | 2.90 | 2.00 | 8061 | 8.00 | 6.00 | 8.20 | 5.60 |
| 2717 | 2.75 | 1.70 | 2.90 | 2.10 | 9060 | 9.00 | 6.00 | 9.20 | 6.80 |
| 2808 | 2.80 | 0.80 | 3.10 | 2.10 | 9563 | 9.50 | 6.40 | 9.70 | 7.10 |
| 2815 | 2.80 | 1.50 | 3.00 | 2.10 | 1106 | 11.00 | 6.50 | 11.20 | 8.30 |
| 30010 | 3.00 | 1.00 | 3.30 | 2.30 | 1206 | 12.00 | 6.00 | 12.20 | 9.00 |
| 3011 | 3.00 | 1.10 | 3.20 | 2.30 | 1208 | 12.00 | 8.00 | 12.10 | 8.50 |
| 3012 | 3.00 | 1.20 | 3.10 | 2.30 | 1209 | 12.00 | 9.00 | 12.00 | 8.40 |
| 3014 | 3.00 | 1.40 | 3.20 | 2.20 | 1601 | 16.00 | 15.00 | 16.00 | 10.00 |
| 3016 | 3.00 | 1.60 | 3.20 | 2.10 | 2813 | 28.00 | 12.50 | 28.00 | 20.00 |
| 3212 | 3.18 | 1.14 | 3.40 | 2.40 | 3002 | 30.00 | 20.00 | 30.00 | 22.00 |



Cross-section of seal



Recommended groove dimensions
Machining tolerance: ± 0.05

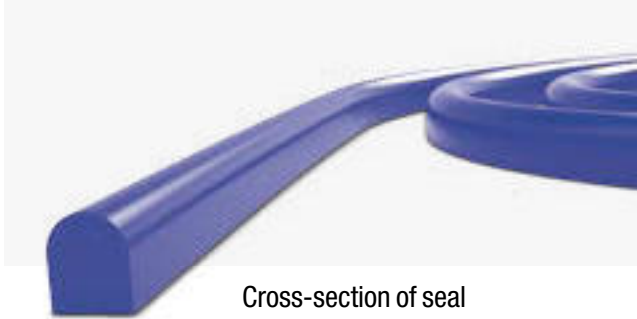
Contact us for alternative sizes.

1005 GT40: profile reference + 40 shore insulating silicone

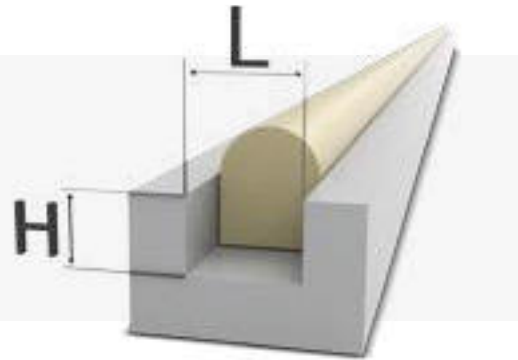
Recommended groove dimensions calculation is based on the following data:

Average seal compression 25%
Groove fill rate 95%

Solid D profile

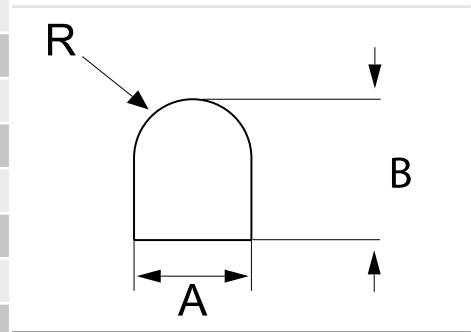


Cross-section of seal



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%

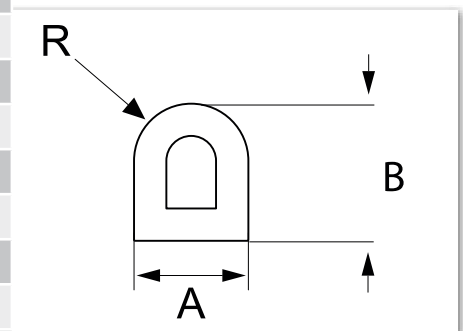
Hollow D profile



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 |

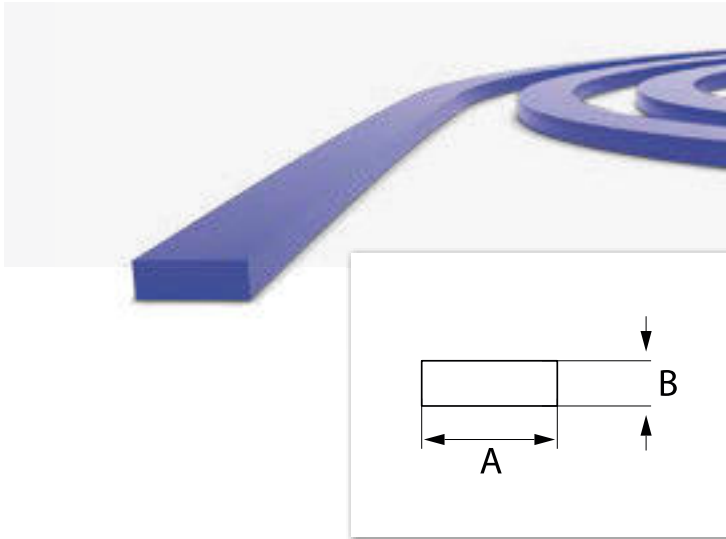


Contact us for alternative sizes.

3931 GT67: profile reference + 60 shore insulating fluorosilicone

Other profiles

SOLID RECTANGULAR PROFILE

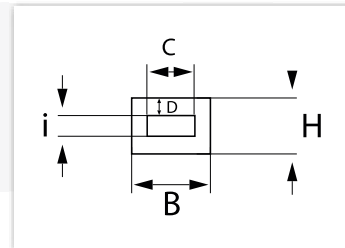


| Ref. | A (mm) | B (mm) | Ref. | A (mm) | B (mm) |
|------|--------|--------|------|--------|--------|
| 1025 | 1.00 | 2.50 | 2503 | 5.00 | 3.00 |
| 1610 | 1.60 | 1.07 | 6010 | 6.00 | 1.00 |
| 1805 | 1.80 | 0.50 | 6020 | 6.00 | 2.00 |
| 2010 | 2.00 | 1.00 | 6080 | 6.00 | 8.00 |
| 2415 | 2.41 | 1.57 | 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 |



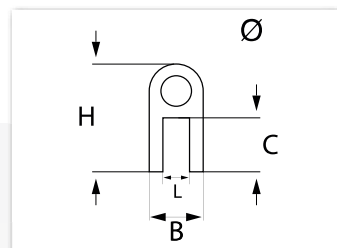
HOLLOW SQUARE PROFILE



| 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 |

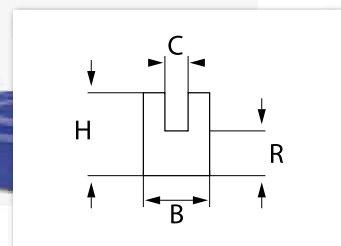
| Ref. | B (mm) | H (mm) | L (mm) | C (mm) | Ø (mm) |
|------|--------|--------|--------|--------|--------|
| 1531 | 1.57 | 3.18 | 0.81 | 1.60 | 0.50 |
| 1836 | 1.80 | 3.60 | 0.40 | 1.80 | 0.50 |
| 2357 | 2.00 | 5.50 | 0.80 | 3.50 | 1.00 |
| 2055 | 2.30 | 5.70 | 0.80 | 3.40 | 0.90 |
| 2560 | 2.50 | 6.00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

"A" PROFILE



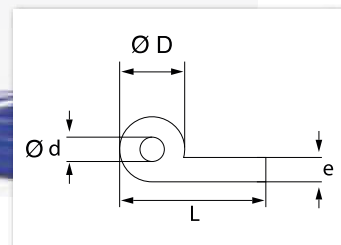
| Ref. | B (mm) | H (mm) | C (mm) | R (mm) |
|-------|--------|--------|--------|--------|
| 2525 | 2.54 | 2.54 | 0.86 | 0.84 |
| 3228 | 3.20 | 2.80 | 0.66 | 1.27 |
| 3939 | 3.96 | 3.96 | 1.57 | 1.19 |
| 39039 | 3.96 | 3.96 | 1.57 | 2.80 |
| 4050 | 4.00 | 5.00 | 1.40 | 2.70 |
| 4056 | 4.50 | 5.50 | 2.10 | 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 |

"U" 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 |

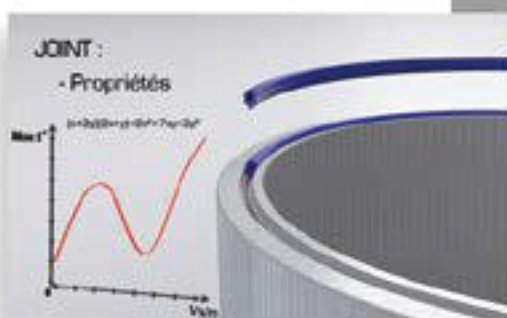
"P" PROFILE



JOINTS sur-Mesure



1. Prise en compte des contraintes



2. R&D: formulation et mise en forme



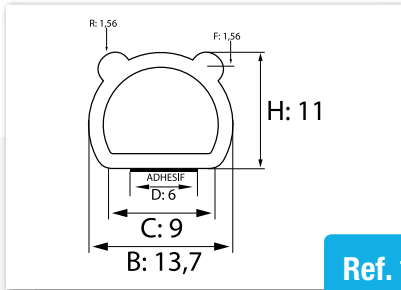
3. Fabrication des outillages



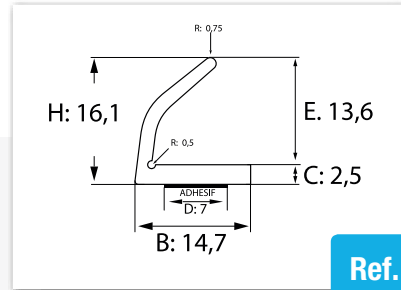
4. Extrusion sur-mesure



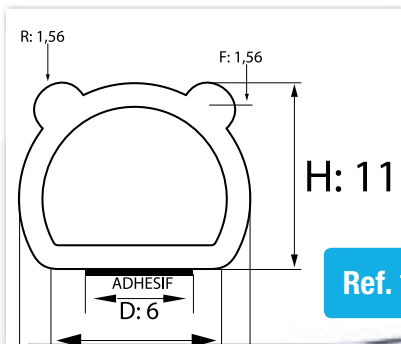
Telecoms cabinets and bays specific profile



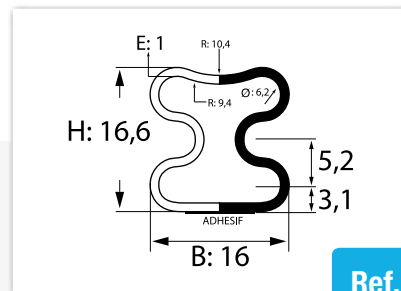
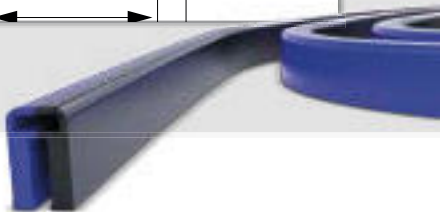
Ref. 1371



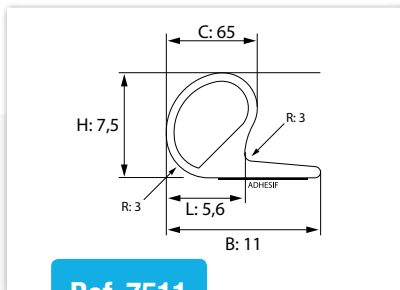
Ref. 1517



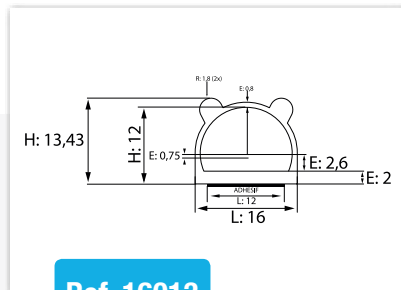
Ref. 1539



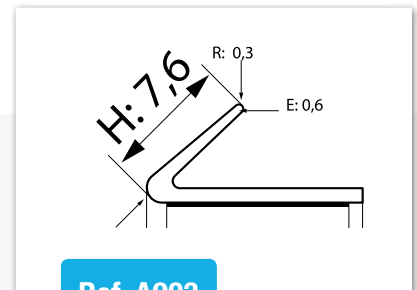
Ref. 1616



Ref. 7511



Ref. 16013



Ref. A903



Flat connector gaskets

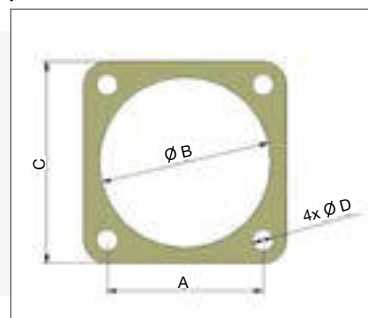
| Housing | Getelec reference | A ± 0.25mm | B ± 0.51mm | C ± 0.38mm | D ± 0.25mm | Standard thickness (mm) |
|---------|-------------------|---------------|---------------|---------------|---------------|-------------------------|
| 6 | D 110 | 11.90 | 9.53 | 18.75 | 3.60 | 0.50 or 0.80 |
| 6 | D 111 | 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

D Sub connector seals

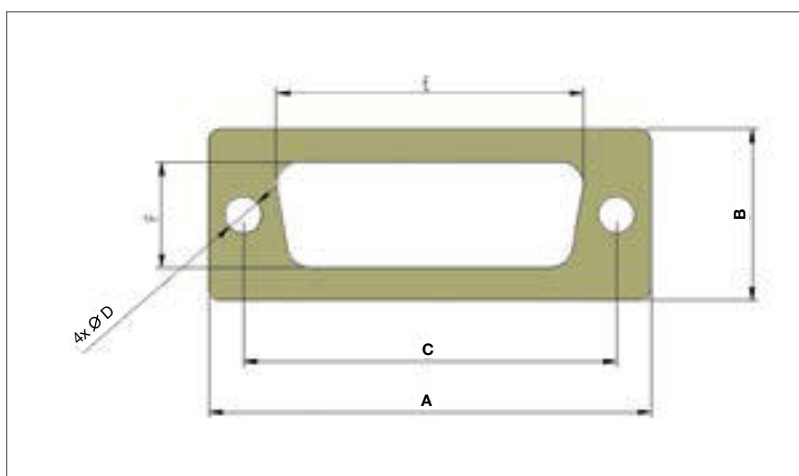
D SUB connector seals are used for connecting drawer bays and miniature chassis cables.

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° |

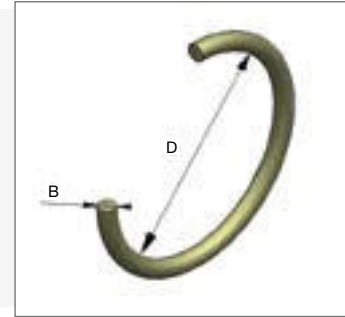
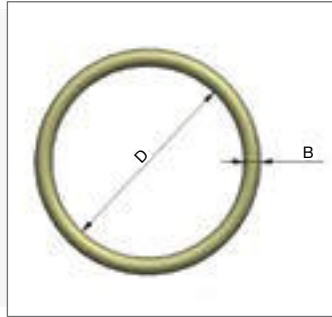
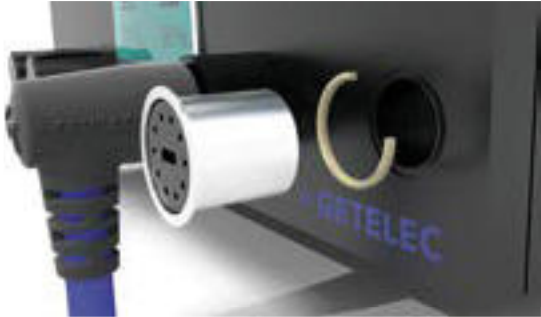
All dimensions in millimetres

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

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 | |

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