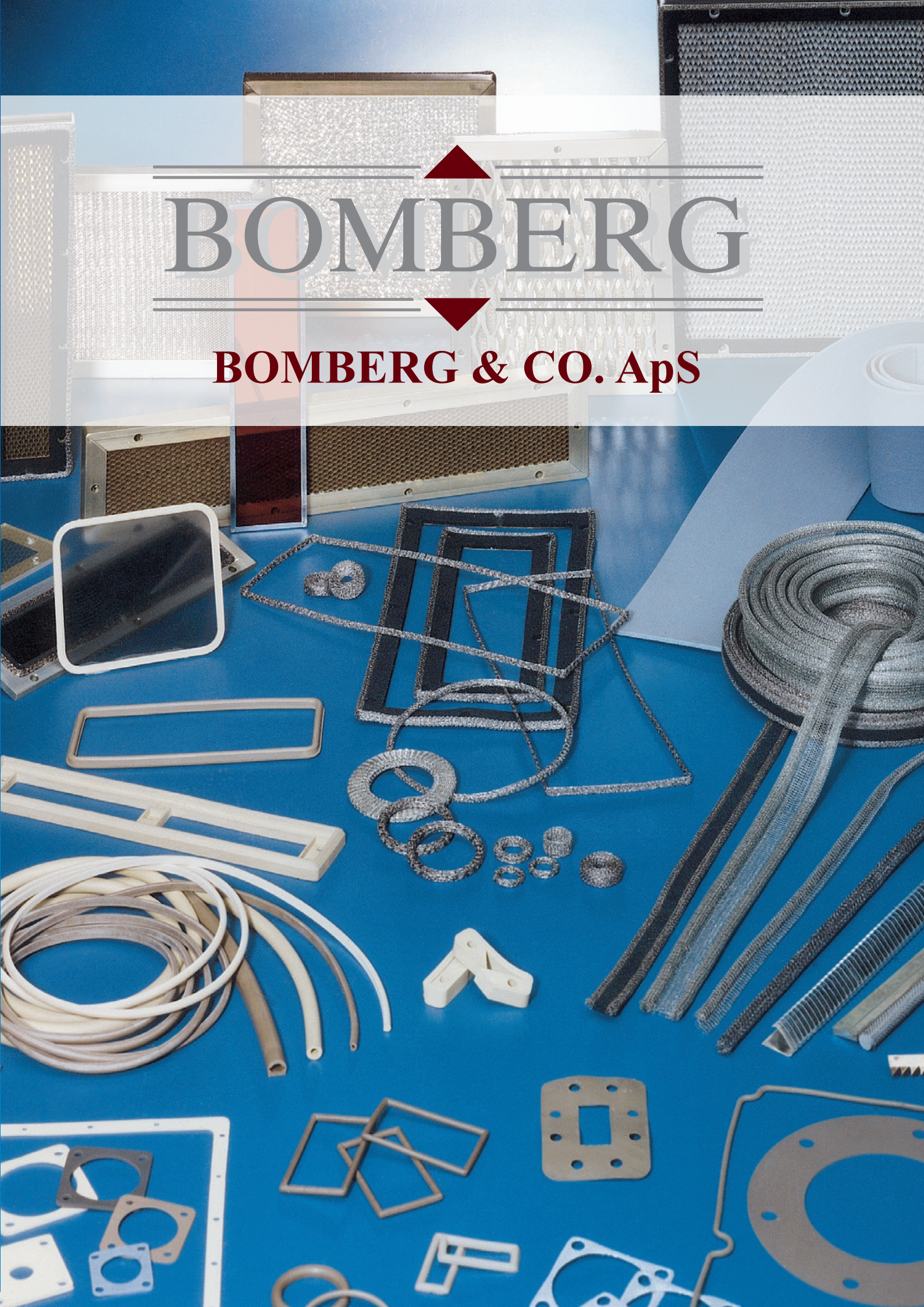
BOMBERG

BOMBERG & CO. ApS



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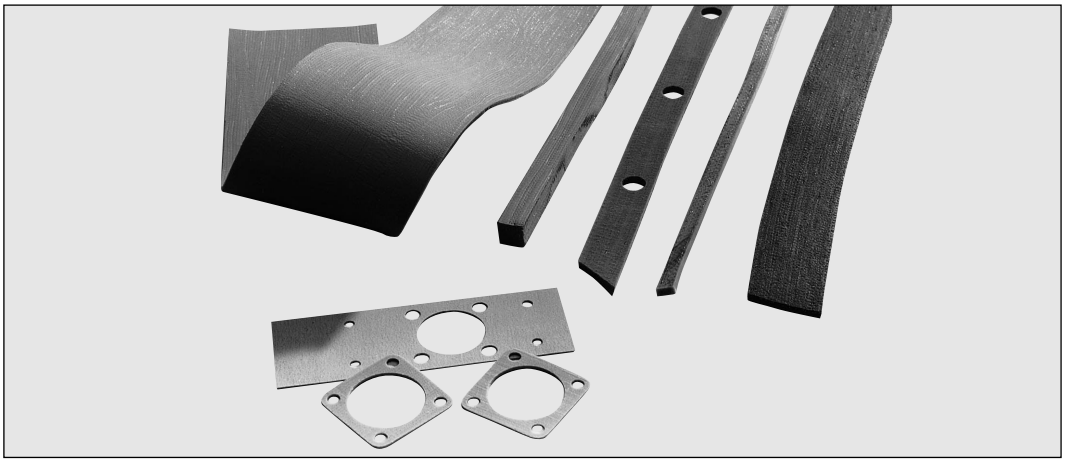
NOTES

- All specifications herein mentioned are obtained according to standard MIL and DIN test methods, however, this does only apply partially in some cases.
- Bomberg can give only recommendations to the best of our knowledge based on the information given. The customer is responsible for choosing the right material and for correct installation.
- Due to various application possibilities and conditions which are beyond our control, customers should carry out their own tests to determine the suitability for individual applications.
- All dimensions stated in this catalogs are given in millimeters.
- All information printed herein is to the best of our knowledge true and correct.
- We reserve the right to change technical specifications without notice and take no responsibility for errors and misprints.



General Description

- BOM 1 consists of fine monel or aluminium wires which are vulcanized into solid or sponge silicone. In order to add elasticity to the gasket and to optimize the mechanical performance the wires will be crimped. More than 140 wires/ cm2 - vertically oriented - provide the electrical contact. The gasket can be used to compensate large surface tolerances on flat surfaces or in grooves. To hold the material in place a simple silicone adhesive (e.g. RTV 732) can be used which provides at the same time a mounting provision. However, it should be used spotwise only for contact reasons.
- BOM 1 is not only a highly flexible EMI/RFI shielding product, but also offers an excellent dust, moisture and spraywater protection. If solid silicone is used with the right mounting pressure, the gasket meets the environmental sealing per IP65. For harsh environments, e.g. with aggressive liquids like hydraulic oil, fuels, kerosene etc., fluorosilicone will be a suitable material.
- In case BOM 1 is used in a groove, it is important to remember that the elastomer does not compress but deforms. This must be considered in the calculation of the groove`s cross section.
- BOM 1 is optionally available with stainless steel, SCF and phosphorus bronze. Since this is a special product, a minimum order value applies. Specifications are available on request.

Availability

Sheets

- The BOM 1 sheet materials made from solid or sponge silicone are listed in table 1, for dimensions please refer to table 2. The sheets are supplied in a standard length of 914 mm. Other dimensions per customer requests are available at no extra charge, but a minimum order value may apply.
- Sheets of solid or sponge silicone can optionally be supplied with pressure sensitive adhesive tape (PSA) as mounting provision.

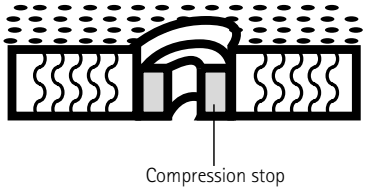
Strips

- The BOM 1 strip materials made from solid or sponge silicone are shown in table 1, for dimensions please refer to table 3. The strips are supplied in a standard length of 5486 mm. Strips can be bonded together with a simple silicone compound (e.g. RT732) in order to extend the length. Special dimensions per customer requests are possible, but a minimum order value may apply. Optionally a PSA can be applied to solid or sponge strips, but this is limited to strips with a certain width.

Die-cut parts

► To form a uniform gasket, BOM 1 material can be die-cut to customer specifications. When selecting material and thickness, the following should be considered:

- Diameter on bolt holes should not be less than the thickness of the material.
- Minimum hole distance from the edge of gasket should not be less than the material thickness. If this is not possible, a U-slot can be used instead.
- Compression stops used in the bolt holes prevent the material from being damaged, as the recommended compression of the material is thus limited.

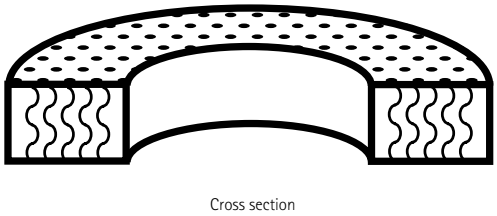


Connector gaskets

► Connector gaskets will be die-cut from material as listed in the tables on page 39 to 43.

O-rings

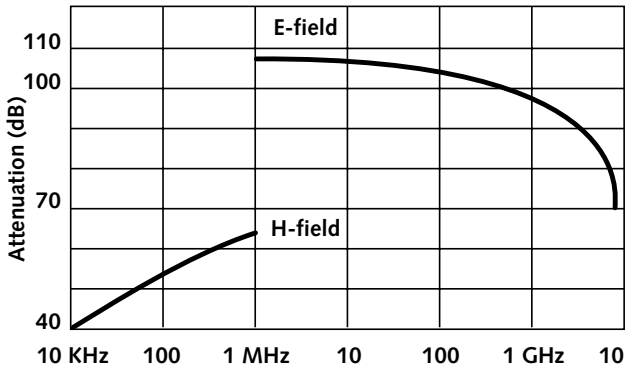
► Uniform O-rings in different sizes will be die-cut from sheet material as listed in table 1. Please note that the cross section is rectangular. Customer specified parts are welcome.



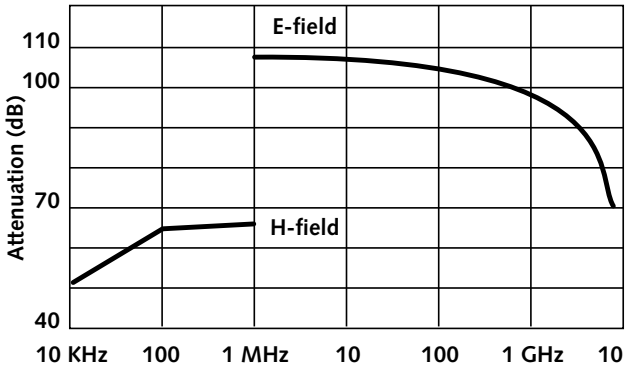
► O-rings with a large diameter can be made by bonding strip material together with a silicone compound (e.g. RTV 732), however, please be aware of the wire orientation when using this method.

Shielding Performance

► BOM 1 Sheet gasket



► BOM 1 Strips and rings



Compression Force

- To reach the above stated shielding effectiveness, it is recommended to compress the gasket by 10-25 % . With this mechanical compression, the material is used within its elastic limits. To avoid a damage of the material by overpressure, compression stops can be inserted.

Applications

- All industrial equipment, avionics and aerospace, radioelectronics, radar, communications, computer, instruments, display systems, digital equipment and military.

Specifications

Monel:
- Ø 0,11 ± 0,01 mm
- QQ-N-281-B

Aluminium:
- Ø 0,13 ± 0,01 mm
- AMS-4182, alloy 5056

Solid silicone:
- ZZ-R-765
- 30 shore
- Temperature range -57° to + 260°C

Sponge silicone:
- AMS-3195
- Temperature range -62° to + 204°C

Colour:
- Grey for silicone
- Blue for fluorosilicone

Mechanical Tolerances

Sheets solid and sponge:
- Height 0,80-6,35 mm: ± 0,25 mm
- Width 19,05-228,60 mm: ± 5,00 mm

Strips solid:
- Height 1,57-6,35 mm: ± 0,25 mm
- Width 1,57-6,35 mm: ± 0,38 mm
- Height 6,50-12,70 mm: ± 0,38 mm
- Width 6,50-12,70 mm: ± 0,51 mm

Strips sponge:
- Height 2,36-6,35 mm: ± 0,38 mm
- Width 2,36-6,35 mm: ± 0,51 mm
- Height 6,50-12,70 mm: ± 0,51 mm
- Width 6,50-12,70 mm: ± 0,76 mm

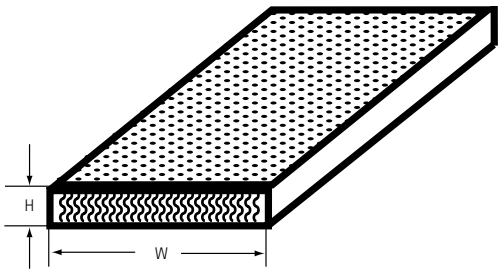
Material Code

Table 1: Material

	Composition	
	Sheets	**Strips**
Solid silicone with monel wire	1213-xxx	1212-xxx
Sponge silicone with monel wire	1313-xxx	1312-xxx
Solid fluorosilicone with monel wire	1413-xxx	1412-xxx
Solid silicone with alu-wire	1223-xxx	1222-xxx
Sponge silicone with alu-wire	1323-xxx	1322-xxx

Ordering Code

Table 2: Standard sheets from solid and sponge silicone

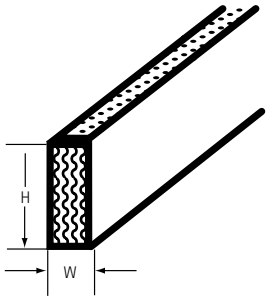


Dimensions in mm (Standard length is 914 mm)

Height	Width W						
H	19,05	25,4	50,8	76,2	114,3	152,4	228,6
0,81	-0307*	-0310*	-0320*	-0330*	-0345*	-0360*	-0390*
1,13	-0407*	-0410*	-0420*	-0430*	-0445*	-0460*	-0490*
1,38	-0507*	-0510*	-0520*	-0530*	-0545*	-0560*	-0590*
1,57	-0607*	-0610*	-0620*	-0630*	-0645*	-0660*	-0690*
2,40	-0907	-0910	-0920	-0930	-0945	-0960	-0990
3,18	-1207	-1210	-1220	-1230	-1245	-1260	-1290
3,96	-1507	-1510	-1520	-1530	-1545	-1560	-1590
4,78	-1807	-1810	-1820	-1830	-1845	-1860	-1890
6,35	-2507	-2510	-2520	-2530	-2545	-2560	-2590

* not available as sponge silicone

Table 3: Standard strips from solid and sponge silicone



Dimensions in mm (Standard length is 5486 mm)

Height	Width W							
H	2,36	3,18	3,96	4,78	6,35	7,92	9,53	12,7
1,57	-0609*	-0612*	-0615*	-0618*	-0625*	-0631*	-0637*	-0650*
2,36	-0909	-0912	-0915	-0918	-0925	-0931	-0937	-0950
3,18	-1209	-1212	-1215	-1218	-1225	-1231	-1237	-1250
3,96	-1509	-1512	-1515	-1518	-1525	-1531	-1537	-1550
4,78	-1809	-1812	-1815	-1818	-1825	-1831	-1837	-1850
6,35	-2509	-2512	-2515	-2518	-2525	-2531	-2537	-2550
7,92	-3109	-3112	-3115	-3118	-3125	-3131	-3137	-3150

* not available as sponge silicone

General Description

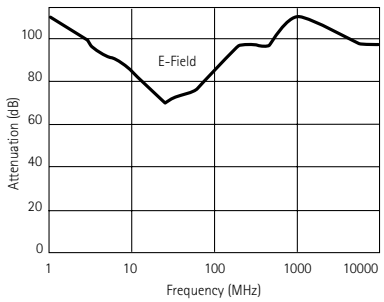
- Polyester non-woven fabrics are mainly used for room shielding. It is a low-cost alternative for shielded cabinets; fast to obtain and easy to apply. The carrier material is polyester non-woven which is supplied with a conductive layer. Two different conductive surfaces are available. The polyester non-woven is a very thin fabric thus providing excellent flexibility and breathability.
- A commercial paste adhesive will be perfectly suitable for applying the fabric in rooms. We recommend to glue the single bands in a way that they overlap each other by 10 cm (serves as RF-trap). The fabric should not be used outside as it is not wheather-proof. The actual (i.e. useable) width of the band is 1,34 m, and it can be supplied in lengths up to 34 m.

Ordering Code

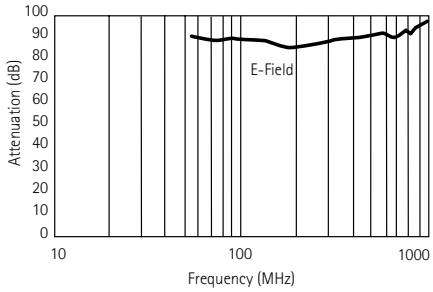
Polyester non-woven with Cu	BOM-2226-106T
Polyester non-woven with Ni-plated Cu	BOM-2227-217T

Shielding Performance

- BOM-2226-106T



- BOM-2227-217T



Specifications

Physical properties	**BOM-2226-106T**	**BOM-2227-217T**
Carrier material	Polyester non-woven	Polyester non-woven
Metals	Cu	Cu, Ni-plated
Weight	57 - 65 g/m^2	82 - 111 g/m^2
Thickness	280 - 318 µ	340 - 450 µ
Amount of metal	12 - 19 g/m^2	30 - 65 g/m^2
Max. short duration temperature	185°C	185°C

Mechanical properties	**BOM-2226-106T**	**BOM-2227-217T**
Tensile strength warp/machine direction	2 - 2,3 kg/cm	3 - 4 kg/cm
Elongation warp/machine direction	6 - 7 %	3 - 5 %

Electrical properties	**BOM-2226-106T**	**BOM-2227-217T**
Surface resistivity	< 0,1 Ω/square	< 0,05 Ω/square
Shielding performance at 1GHz	> 85 dB	> 90 dB

General Description

- BOM 6 gaskets even meet highest performance demands. They consist of a homogeneous mix with conductive particles in silicone. BOM 6 is available in sheet form, as moulded part or extruded profile.
- Depending on environment and required shielding performance Bomberg offers following particles mixed in silicone:
  - Carbon (CP): Mainly for anti-static protection with highest temperature range (225°C) and for low-cost solutions.
  - Nickel (NP): Can be used for salt spray conditions. Has a good resistance against oxidation and corrosion. Offers moderate shielding performance at low cost.
  - Nickel and Graphite (NPGR): Offers better volume resistivity and shielding effectiveness than NP.Good for salt spray conditions
  - Silver Plated Glass (SPG): Very reasonable silver plated version with good shielding performance.
  - Silver Plated Copper (SPC): High performance shielding. EMP resistant.
  - Silver Plated Nickel (SPN): High performance shielding. Improved temperature range and corrosion resistance compared to SPC.
  - Pure Silver (SP): Excellent shielding performance for high-end-solutions.
  - Silver Plated Aluminium (SPA): Good shielding performance and very good corrosion resistance.
- When exposed to aggressive fluids, such as hydraulic oil, kerosene, jet fuel, etc. we recommend to use our fluorosilicone version.
- Connector gaskets are listed on page xx to xx.
- Die-cut or moulded parts are made per customer specifications. Please contact Bomberg sales office for assistance and choice of material.
- BOM 6 gaskets can be used to combine application as environmental seal as well as shielding gasket.

Recommended Compression Force

Sheet material:
- 6 - 10 % of material thickness

Extruded profiles:
- 10 - 25 % of diameter / material thickness

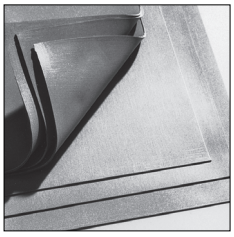
- For BOM 6 material with conductive surface only, see UVS-series.

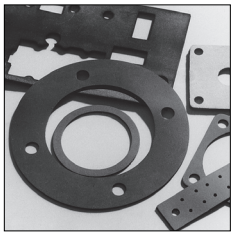
- Following pages show different standard profiles. However, our assortment is far from being restricted to those listed. Custom-made profiles are welcome.

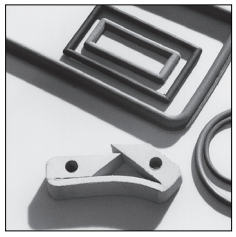
Specifications

Material	Conductive particle	Elastomer	Ordering code	Durometer Shore	max. Volume resistivity* (Ohm - cm)	Shielding effectiveness (dB) min.			Temperature max. (°C)	Tensile strength (psi)	Elongation (%)	Gravity	Tear strength (lb/in)
						10 KHz	1 MHz	10 GHz					
BOM 6-CP	Carbon	Silicone	665X-	65	2	0	30	20	225	650	120	1,35	90
BOM 6-NP	Nickel	Silicone	668X-	40	.2	40	75	45	200	400	400	3,50	50
				60	.2	40	75	45	200	450	480	3,55	55
		Fluoro-Silicone	648X-	60	.4	40	75	45	165	310	210	3,70	65
BOM 6-NPGR	Nickel-graphite	Silicone	623X-	60	.05	80**	90**	90**	200	250	200	2,80	35
BOM 6-SPG	Silver plated glass	Silicone	626X-	40	.009	60	100	70	180	150	200	1,65	35
				60	.008	60	110	72	180	200	280	1,75	44
				80	.008	60	110	72	180	200	400	1,85	53
		Fluoro-Silicone	646X-	60	.010	60	110	72	180	180	200	1,85	30
BOM 6-SPA	Silver plated alu-minium	Silicone	624X-	40	.008	60	110	80	180	150	200	1,70	30
				60	.008	60	115	100	180	200	280	1,75	42
				80	.008	60	115	100	180	200	400	1,85	51
		Fluoro-Silicone	644X-	60	.009	60	115	90	180	180	200	1,85	30
BOM 6-SPC	Silver plated copper	Silicone	627X-	40	.009	70	110	110	135	100	200	3,45	22
				60	.004	70	120	120	135	200	400	3,55	55
				80	.004	70	120	120	135	200	375	3,65	73
		Fluoro-Silicone	647X-	60	.009	70	120	110	135	250	175	3,65	60
		Reinforced Silicone	657X-	80	.007	70	120	100	135	800	50	4,85	92
BOM 6-SPN	Silver plated nickel	Silicone	622X-	40	.008	70	120	120	200	100	200	3,45	22
				60	.003	72	130	130	200	200	500	3,55	55
				80	.003	72	130	130	200	250	375	3,65	73
		Fluoro-Silicone	642X-	60	.009	70	130	120	200	250	175	3,65	60
BOM 6-SP	Pure silver	Silicone	629X-	60	.004	70	120	120	200	200	250	3,50	30
				80	.004	70	120	120	200	200	400	3,60	45
		Fluoro-Silicone	649X-	60	.010	70	120	110	200	180	150	3,60	60
Test-Methode				ASTM D-2240 DIN 53505	MIL-G-83528	MIL-STD 285 **SAE-ARP-1705				ASTM D-412	ASTM D-412	ASTM D-297	

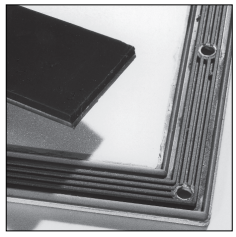
*The volume resistivity is measured on sheet material with special probe per MIL - G-83528


Sheet


Die-cut parts


Moulded parts


Extruded


Vulcanized

Material Table

Material	Specific Gravity (approx)	Composition Sheet	Die-cut part	Moulded part	Extruded	Vulcanized
Carbon in silicone	1,35	6653-	6654-	6655-	6656-	6657-
Nickel in silicone	3,05	6683-	6684-	6685-	6686-	6687-
Nickel in fluoro silicone	3,15	6483-	6484-	6485-	6486-	6487-
Silver plated glass in silicone	1,75	6263-	6264-	6265-	6266-	6267-
Silver plated glass in fluoro silicone	1,85	6463-	6464-	6465-	6466-	6467-
Silver plated copper in silicone	3,55	6273-	6274-	6275-	6276-	6277-
Silver plated copper in fluoro silicone	3,65	6473-	6474-	6475-	6476-	6477-
Silver plated copper in reinforced silicone	–	6573-	6574-	–	–	–
Silver plated nickel in silicone	3,66	6223-	6224-	6225-	6226-	6227-
Silver plated nickel in fluoro silicone	3,65	6423-	6424-	6425-	6426-	6427-
Pure silver in silicone	4,00	6293-	6294-	6295-	6296-	6297-
Pure silver in fluoro silicone	4,10	6493-	6494-	6495-	6496-	6497-
Silver plated aluminium in silicone	1,75	6243-	6244-	6245-	6246-	6247-
Silver plated aluminium in fluoro silicone	1,85	6443-	6444-	6445-	6446-	6447-
Nickel-graphite in silicone	2,80	6233-	6234-	6235-	6236-	6237-

Ordering Example

► Extruded solid O-strip, ø 3,18 mm in silver plated copper with durometer shore 50.
6276-1210-50
- 50 — Durometer (shore)
- 10 — Profile/dimension
- 6276 — Material

Ordering Information for Sheet Material

► The ordering code consists of a 10-digit number.
1) The first 4 digits decide the material, particles and composition according to the material table.
2) The digits 5 to 8 decide sheet size according to table 1.
3) The 9. and 10. digit decide the durometer as per specification.

Tolerances

Extruded parts

- up to 5 mm ± 0,13 mm
  > 5 to 9 mm ± 0,20 mm
  > 9mm ± 0,25 mm

Sheet material

- **Thickness:**
  up to 0,51 mm ± 0,10 mm
  up to 0,81 mm ± 0,13 mm
  up to 1,57 mm ± 0,18 mm
  up to 3,18 mm ± 0,25 mm
- **Outside dimensions:** ± 5,00 mm

Composition and Ordering Code

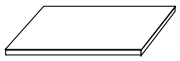
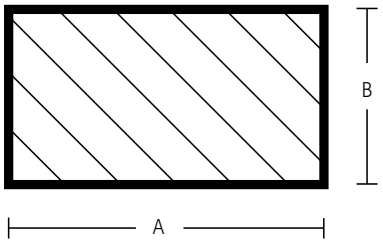


Table 1: Sheet material

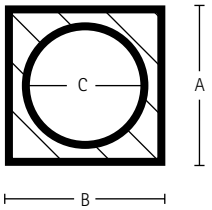
Thickness	Sheet size (mm)					
(mm)	180 x 180	250 x 250	300 x 300	400 x 400	250 x 500	460 x 500
0,51	-0206-	-0211-	-0212-	-	-	-
0,81	-0306-	-0311-	-0312-	-0314-	-0316-	-
1,13	-0406-	-0411-	-0412-	-0414-	-0416-	-0421-
1,57	-0606-	-0611-	-0612-	-0614-	-0616-	-0621-
2,36	-0906-	-0911-	-0912-	-0914-	-0916-	-0921-
3,18	-1206-	-1211-	-1212-	-1214-	-1216-	-1221-

Table 2: Extruded profiles



a) Solid rectangular profile

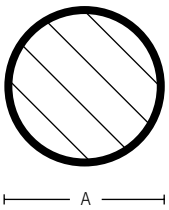
Dimensions		
A	B	Order code
1,60	1,07	-0681-
2,41	1,57	-0982-
3,05	1,91	-1283-
3,18	1,57	-1282-
3,96	1,57	-1582-
6,35	1,57	-2582-
12,70	1,91	-5084-
12,70	3,18	-5085-
12,70	4,78	-5086-
19,05	1,57	-7582-
22,35	1,57	-8882-
25,40	6,35	-A187-
29,97	1,57	-A282-



b) Hollow rectangular profile

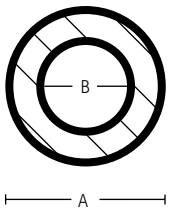
Dimensions			
A	B	C	Order code
7,75	8,38	3,18	-3061-
9,53	9,53	4,78	-3762-

c) Solid O-strip



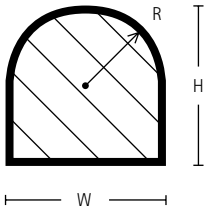
Dimensions	Recommended groove		Order code
A	depth	width	
1,02	0,89	1,09	-0410-
1,35	1,12	1,48	-0510-
1,57	1,32	1,70	-0610-
1,78	1,47	1,91	-0710-
2,03	1,65	2,16	-0810-
2,36	1,91	2,49	-0910-
2,62	2,08	2,74	-1010-
2,84	2,29	2,97	-1111-
3,02	2,44	3,15	-1112-
3,18	2,57	3,30	-1210-
3,30	2,64	3,43	-1313-
3,81	3,05	3,96	-1510-
4,06	3,28	4,22	-1610-
5,49	4,50	5,66	-2110-
6,35	5,18	6,53	-2510-

d) Hollow O-strip



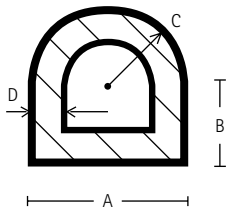
Dimensions		Order code
A	B	
1,10	0,30	-0525-
1,35	0,40	-0627-
1,78	0,64	-0727-
2,36	0,89	-0928-
2,62	1,01	-1021-
3,18	1,14	-1221-
3,96	1,27	-1522-
4,50	2,00	-1729-
6,35	3,18	-2523-
7,92	4,88	-3124-
9,53	6,35	-3725-
11,10	6,35	-4326-

e) Solid D-profile



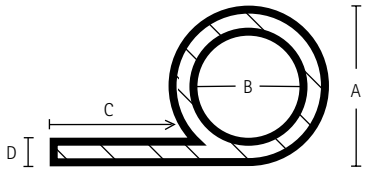
Dimensions			Recommended groove		Order code
H	W	R	depth	width	
1,63	1,40	0,79	1,42	1,65	-0531-
1,73	1,57	0,79	1,52	1,83	-0632-
1,98	2,39	1,19	1,73	2,64	-0933-
2,26	1,98	0,99	1,98	2,16	-0734-
2,54	1,57	0,79	2,24	1,83	-0635-
2,79	3,81	1,91	2,46	4,19	-1536-
3,45	3,15	1,55	3,02	3,43	-1237-
3,96	3,00	1,50	3,43	3,35	-1138-
4,45	4,52	2,26	3,86	4,83	-1739-

f) Hollow D-profile



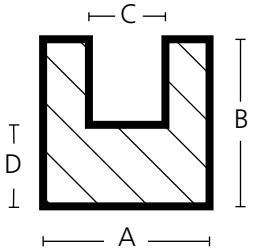
Dimensions				Order code
A	B	C	D	
3,96	1,14	1,98	1,14	-1540-
3,96	1,98	1,98	1,14	-1541-
4,75	2,36	2,36	1,27	-1842-
7,92	3,96	3,96	1,57	-3143-
7,92	5,08	2,84	1,57	-3144-
12,37	2,03	6,20	2,03	-4845-

g) Hollow P-profile



Dimensions				Order code
A	B	C	D	
5,08	2,03	16,51	1,57	-2051-
6,35	3,18	6,35	1,57	-2552-
6,35	3,18	9,53	1,57	-2553-
6,35	3,81	9,53	1,57	-2554-
7,92	4,75	14,30	1,57	-3155-
9,14	6,48	10,67	1,79	-3656-

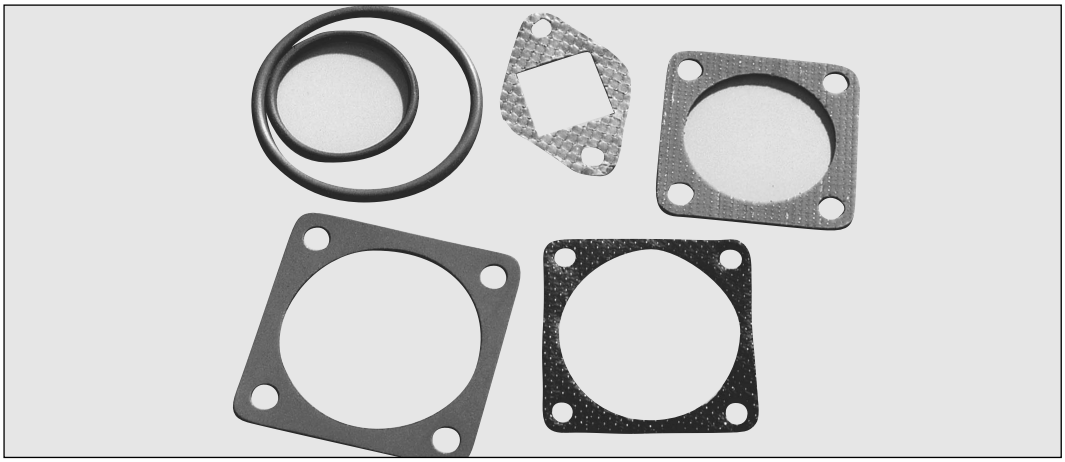
h) U-profile



Dimensions				Order code
A	B	C	D	
2,54	2,54	0,86	0,84	-1071-
3,18	3,96	1,35	0,71	-1277-
3,20	2,79	0,66	1,27	-1272-
3,20	5,72	0,51	1,91	-1273-
3,96	3,96	1,57	1,19	-1574-
3,96	4,78	1,60	1,57	-1578-
4,00	4,83	1,50	1,22	-1579-
4,45	3,96	1,19	1,91	-1775-
4,78	4,78	1,83	1,78	-1880-
6,35	6,35	1,57	1,57	-2581-
8,31	5,97	1,57	2,92	-3276-

Ordering Information for Extruded Profiles

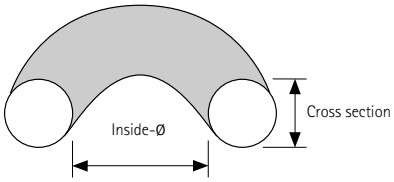
► The ordering code consists of a 10-digit number.
1) The first 4 digits decide the material, particles and composition according to the material table.
2) The digits 5 to 8 decide profile size according to table 2.
3) The 9. and 10. digit decide the durometer as per specification.



General Description

- Connector gaskets are die-cut parts available in different materials and connector series. The herein listed gaskets cover only part of our full range of connector gaskets. Due to simple tools customer specified gaskets are easily made. It is then necessary to be aware of minimum hole to edge distance (advised under specific materials). Materials and shielding performances are shown on data sheets for each material. If not specified otherwise, gaskets from BOM 6 materials will be delivered with a durometer of 60 shore.
- O-ring-gaskets are made of conductive silicone either moulded or as bonded parts and perform both EMI/RFI shielding as well as environmental sealing. Compressed wire mesh gaskets (BOM 7) are jointless and available in round or rectangular shape (also available as D-sub/IEEE gaskets).
- Ask for connector gaskets which you cannot find in the table!

Connector series



Shell size	Dim. in mm Inside ø	Cross section	Part No. MIL-C-38999 MIL-C-26482	MIL-C-81511
6	14,00	1,78	xxxx-1417-70	
8	17,17	1,78	xxxx-1717-70	
	18,77	1,78		xxxx-1817-70
9,10	20,35	1,78	xxxx-2017-70	
	21,95	1,78		xxxx-2117-70
11,12	25,12	1,78	xxxx-2517-70	
13,14	28,30	1,78	xxxx-2817-70	xxxx-2817-70
15,16	31,47	1,78	xxxx-3117-70	xxxx-3117-70
17,18	34,65	1,78	xxxx-3417-70	xxxx-3417-70
19,20	37,77	2,62	xxxx-3726-70	
21,22	40,94	2,62	xxxx-4026-70	
23,24	44,12	2,62	xxxx-4426-70	

Standard O-ring-gasket for MIL-C-38999, MIL-C-26482, MIL-C-81511 Connectors

Material

Type	Description	Part No.
BOM 6 SPG	Silver plated glass particles in silicone	6265-
BOM 6 SPC	Silver plated copper particles in silicone	6275-
BOM 6 NP	Nickel particles in silicone	6685-
BOM 6 SPN	Silver plated nickel particles in silicone	6225-
BOM 6 CP	Carbon in silicone	6655-
BOM 6 SPA	Silver plated aluminium particles in silicone	6245-

Ordering Information for O-rings

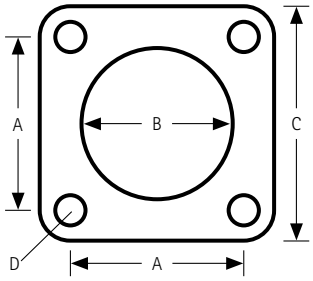
- The ordering code consists of a part number for material and a part number for connector type followed by the hardness 70 shore:

xxxx-xxxx-70
- Connector type
- Material

Material

Standard connector gaskets

				Part No. for connector type				
Type	**Description**	**Thickness**	**Part No.**	**MIL-C-5015 AN, HT, QWL MS-3100 MS-3102**	**RF**	**MIL-C-26482 JT, PT, PC MS-3110 MS-3112 MS-3119 MS-3120**	**Bendix SP**	**Special dimen-sions**
BOM 1	Monel wire in silicone	0,81 mm	1213-	-0103-	-0203-	-0303-	-0403-	-0503-
BOM 3	Monel sheet stretched in silicone	0,51 mm	3211-	-0103-	-0203-	-0303-	-0403-	-0503-
BOM 3	Monel sheet stretched in silicone	0,76 mm	3221-	-0103-	-0203-	-0303-	-0403-	-0503-
BOM 4	Aluminium sheet stretched in silicone	0,51 mm	4621-	-0101-	-0201-	-0301-	-0401-	-0501-
BOM 4	Aluminium sheet stretched in neoprene	0,51 mm	4521-	-0101-	-0201-	-0301-	-0401-	-0501-
BOM 6 SPG	Silver plated glass particles in silicone	0,81 mm	6264-	-0103-	-0203-	-0303-	-0403-	-0503-
BOM 6 SPC	Silver plated copper particles in silicone	0,81 mm	6274-	-0103-	-0203-	-0303-	-0403-	-0503-
BOM 6 NP	Nickel particles in silicone	0,81 mm	6684-	-0103-	-0203-	-0303-	-0403-	-0503-
BOM 6 SPN	Silver plated nickel particles in silicone	0,81 mm	6224-	-0103-	-0203-	-0303-	-0403-	-0503-
BOM 6 CP	Carbon particles in silicone	0,81 mm	6654-	-0103-	-0203-	-0303-	-0403-	-0503-
BOM 6 SPA	Silver plated aluminium part. in silicone	0,81 mm	6244-	-0103-	-0203-	-0303-	-0403-	-0503-



Standard gasket for RF-connector

Connector type	Dimensions in mm			
	A	B	C	D
BN	12,70	11,10	17,45	2,77
BNC	12,70	11,10	17,45	2,77
C	18,26	15,88	25,40	4,37
HN	23,01	19,05	30,18	3,56
LC	36,50	31,75	50,80	6,53
N	18,26	15,88	25,40	4,37
UHF	24,61	25,40	32,54	4,37

Standard gasket for AN, HT and QWL, MIL-C-5015, MS-3100, MS-3102 connector

Shell size	Dimensions in mm			
	A	B	C	D
8	15,09	12,70	22,23	4,37
10	18,26	15,88	25,40	4,37
12	20,65	19,05	27,79	4,37
14	23,01	22,23	30,16	4,37
16	24,61	25,40	32,54	4,37
18	27,00	28,56	34,93	5,15
20	29,36	31,75	38,10	5,15
22	31,75	34,93	41,28	5,15
24	34,93	38,10	44,45	5,15
28	39,70	44,45	50,80	5,15
32	44,45	50,80	57,15	5,56
36	49,23	55,58	63,50	5,56
40	55,58	61,93	69,85	5,56
44	60,33	70,64	76,20	5,56
48	66,68	76,99	82,55	5,56

Standard gasket for JT, PT and PC, MIL-C-26482, MS-3110, MS-3112, MS-3119, MS-3120 connector

Shell size	Dimensions in mm			
	A	B	C	D
6	11,91	9,53	17,48	3,30
8	15,09	12,70	20,62	3,30
10	18,26	15,88	23,83	3,30
12	20,65	19,05	26,19	3,30
14	23,01	22,23	28,56	3,30
16	24,61	25,40	30,96	3,30
18	27,00	28,56	33,32	3,30
20	29,36	31,75	36,53	3,30
22	31,75	34,93	39,70	3,30
24	34,93	38,10	42,88	3,96

Standard gasket for Bendix-SP-connector

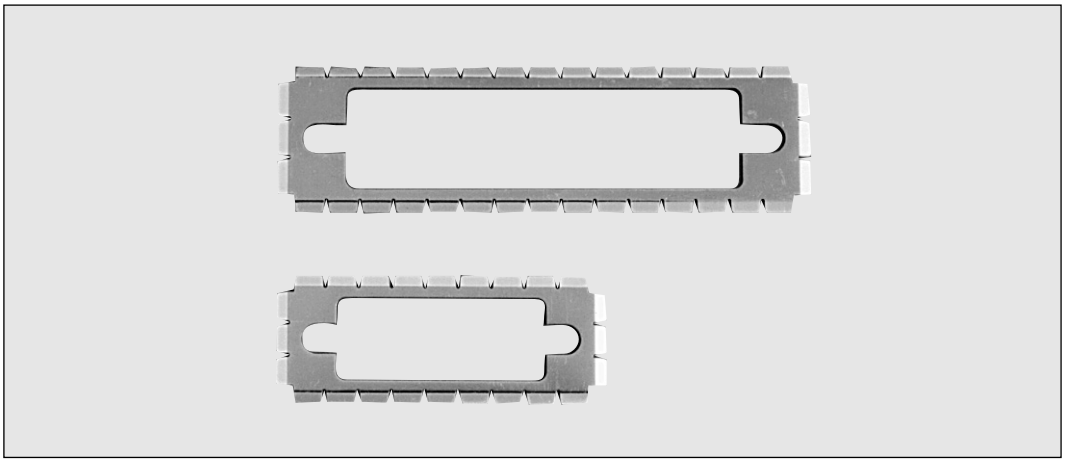
Shell size	Dimensions in mm			
	A	B	C	D
6	16,28	9,53	24,21	4,06
8	18,64	12,70	26,59	4,06
10	20,62	15,88	28,56	4,06
12	23,83	19,05	31,75	4,06
14	26,19	22,23	34,93	4,06
16	28,56	25,40	36,50	4,06
18	30,56	28,56	38,51	4,06
20	32,94	31,75	42,47	4,06
22	34,93	34,93	44,45	4,06

Ordering code for connector gaskets

► The ordering code consists of the part no. for material and for connector series followed by the shell size (or type for RF connectors):

xxxx-xxxx-xx

- xx — Connector shell size or type
- xxxx — Connector series
- xxxx — Material



General Description

- Connector gaskets are die-cut parts available in different materials and for different connector series. The herein listed gaskets cover only part of our full range of connector gaskets. Due to simple tools customer specified gaskets are easily made. In this case you must be aware of the minimum hole to edge distance (advised under specific materials). Materials and shielding performances are shown on the individual data sheets.

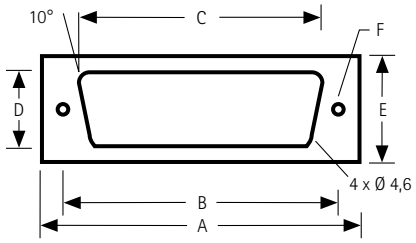
- If not specified otherwise, gaskets from BE 6 materials will be delivered with a durometer of 60 shore.

Material

Standard-D-sub connector gaskets

Type	Description	Thickness	Material code
BOM 1	Monel wire in silicone	0,81 mm	1213-
BOM 3	Monel sheet stretched in silicone	0,51 mm	3211-
BOM 3	Monel sheet stretched in silicone	0,76 mm	3221-
BOM 4	Aluminium sheet stretched in silicone	0,51 mm	4621-
BOM 4	Aluminium sheet stretched in neoprene	0,51 mm	4521-
BOM 6 SPG	Silver plated glass particles in silicone	0,81 mm	6264-
BOM 6 SPC	Silver plated copper particles in silicone	0,81 mm	6274-
BOM 6 NP	Nickel particles in silicone	0,81 mm	6684-
BOM 6 SPN	Silver plated nickel particles in silicone	0,81 mm	6224-
BOM 6 CP	Carbon in silicone	0,81 mm	6654-
BOM 6 SPA	Silver plated aluminium part. in silicone	0,81 mm	6244-

Front mounting



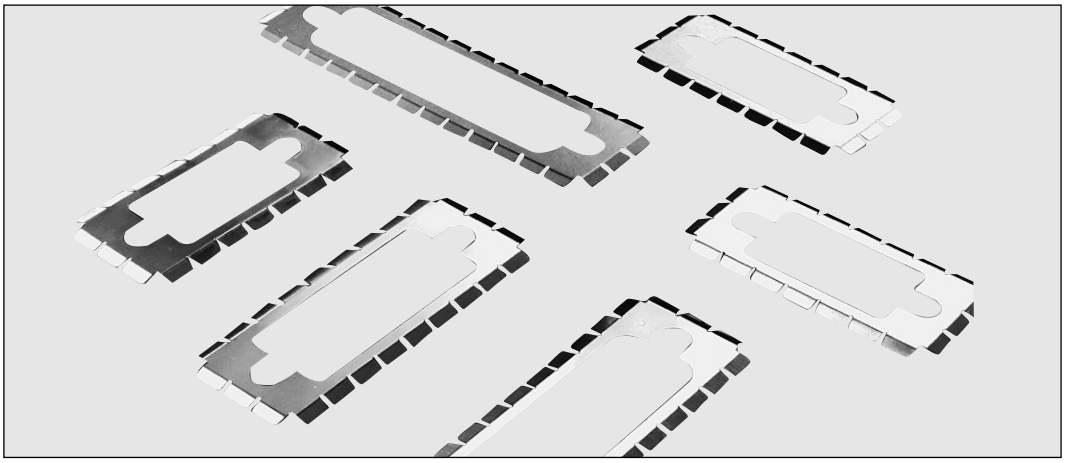
Shell size	A ± 0,5	B ± 0,13	C ± 0,25	D ± 0,25	E ± 0,5	F ± 0,13	Order code
	Dimensions in mm						
9	33,35	25,00	19,86	11,43	19,05	3,56	-DF09
15	41,68	33,33	28,20	11,43	19,05	3,56	-DF15
25	55,58	47,04	41,91	11,43	19,05	3,56	-DF25
37	71,86	63,50	58,37	11,43	19,05	3,56	-DF37
50	69,60	61,11	55,88	16,82	21,85	3,56	-DF50

Rear mounting

Shell size	A ± 0,5	B ± 0,13	C ± 0,25	D ± 0,25	E ± 0,5	F ± 0,13	Order code
	Dimensions in mm						
9	33,35	25,00	16,89	9,40	19,05	3,56	-DR09
15	41,68	33,33	25,22	9,40	19,05	3,56	-DR15
25	55,58	47,04	38,94	9,40	19,05	3,56	-DR25
37	71,86	63,50	55,40	9,40	19,05	3,56	-DR37
50	69,60	61,11	53,01	12,19	21,85	3,56	-DR50

Ordering information for D-Sub Connector Gaskets

- The ordering code consists of the material code followed by the order code:
  xxxx-xxxx
  - Order code
  - Material code



General Description

- The „D“ Connector Gasket Series is a new line of beryllium copper or stainless steel gaskets for RFI/EMI shielding and grounding of a wide range of „D“ subminiature connectors. Featuring miniature fingers on all four sides, the new connector gaskets more effectively close gaps due to fabrication tolerances and misaligned or irregular surfaces than is possible with a solid flange design.
- Material thickness for all is 0,076 mm.
- Available with numerous plating options, the connector gaskets can be mounted from the front or rear. They fit most commonly used 9-pin up to 50-pin connectors.

Finish Code

	XX
Clean and bright	02
Gold	03
Silver	04
Tin lead	07
Bright tin	08
Bright nickel	09
Zinc/clear chromate	15
Electroless nickel	18

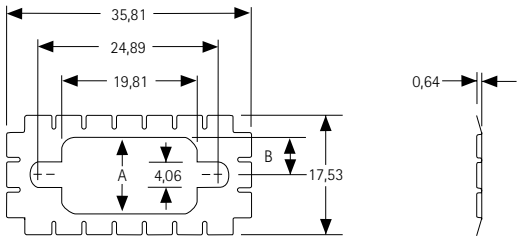
Tolerances

- Outside dimensions: ± 0,5 mm
- Others: ± 0,25mm

Material Code

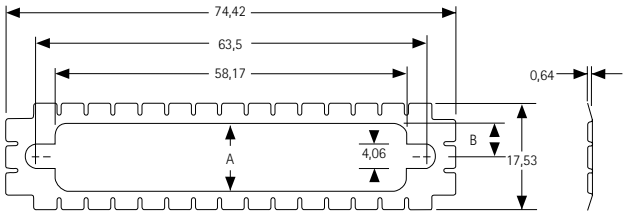
No. Pins	Stainless steel	Beryllium copper
9	9D10-xx	9D12-xx
	9D20-xx	9D22-xx
15	15D10-xx	15D12-xx
	15D20-xx	15D22-xx
25	25D10-xx	25D12-xx
	25D20-xx	25D22-xx
37	37D10-xx	37D12-xx
	37D20-xx	37D22-xx
50	50D10-xx	50D12-xx
	50D20-xx	50D22-xx

9 PINS



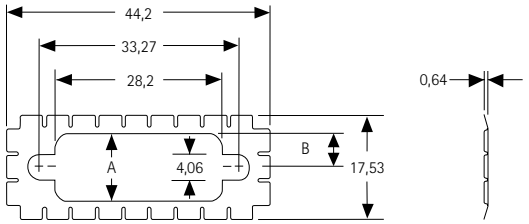
		Dimensions in mm	
		A	B
9D10	Stainless steel	11,18	5,59
9D12	Beryllium copper	11,18	5,59
9D20	Stainless steel	8,89	4,57
9D22	Beryllium copper	8,89	4,57

37 PINS



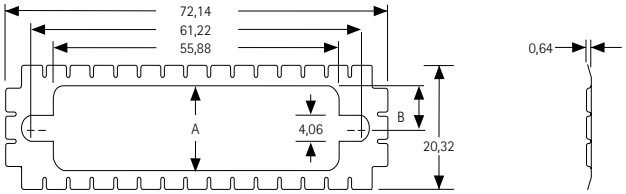
		Dimensions in mm	
		A	B
37D10	Stainless steel	11,18	5,59
37D12	Beryllium copper	11,18	5,59
37D20	Stainless steel	8,89	4,57
37D22	Beryllium copper	8,89	4,57

15 PINS



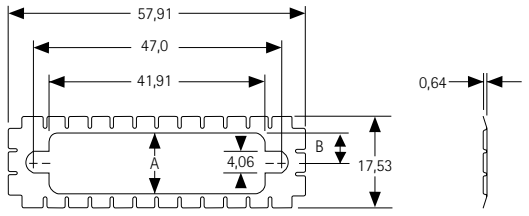
		Dimensions in mm	
		A	B
15D10	Stainless steel	11,18	5,59
15D12	Beryllium copper	11,18	5,59
15D20	Stainless steel	8,89	4,57
15D22	Beryllium copper	8,89	4,57

50 PINS



		Dimensions in mm	
		A	B
50D10	Stainless steel	13,97	7,11
50D12	Beryllium copper	13,97	7,11
50D20	Stainless steel	11,43	5,84
50D22	Beryllium copper	11,43	5,84

25 PINS



		Dimensions in mm	
		A	B
25D10	Stainless steel	11,18	5,59
25D12	Beryllium copper	11,18	5,59
25D20	Stainless steel	8,89	4,57
25D22	Beryllium copper	8,89	4,57

Ordering Information

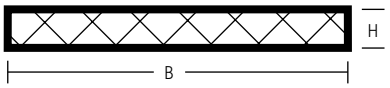
- The ordering code consists of the material code, followed by the finish code.
  xxDxx-xxxx
  - Finish code
  - Material code

General Description

- Flat band is a knitted metal gaze consisting of 2 layers of commercial wire. It can be used to shield short cables by simply wrapping the band around the relevant cable.
- Flat band is also used to ensure proper contact between e.g. 2 metal plates that are rivetted together. To compensate uneven surfaces the flat band is simply placed between the 2 metal plates before they are rivetted together.

- **Monel = Alloy of copper (30 %) and nickel (67 %).**
  SCF = Tinned copperclad steel. Steel (64 %), copper (34 % min), tin (2 %).

Flat band



Dimensions in mm

H	B	Order code
0,5	10	-0500
	18	-0501
	25	-0502
	40	-0503
	55	-0511
	60	-0504

Mechanical Tolerances

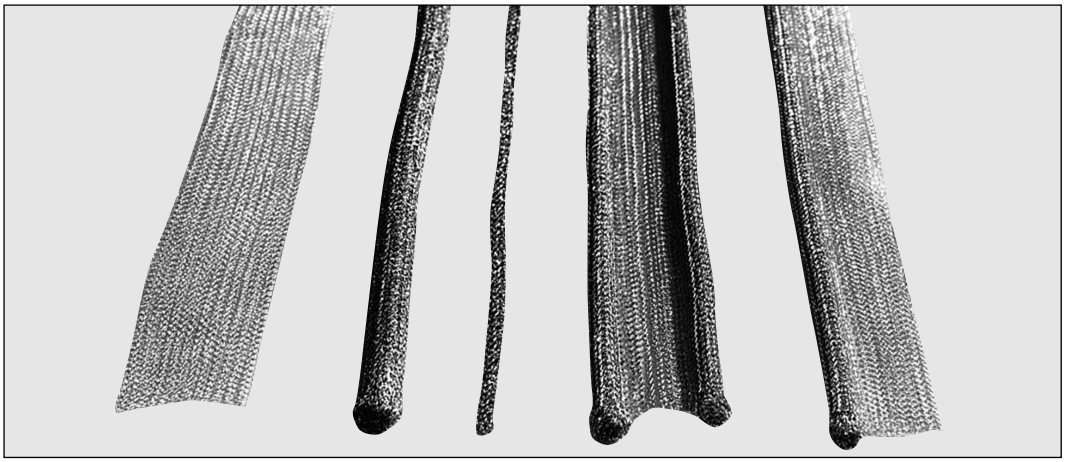
- Hight: ± 0,2 mm
- Width: ± 5,0 mm

Ordering Information

- The ordering code consists of the material code, followed by the order code for dimensions:
  BOM-xxxx-xxxx
  └ Order code
  └ Material

Material Code

Monel	Alu	Stainless steel	SCF
-7011-	-7012-	-7013-	-7014-



General Description

- BOM 7 gaskets are made from knitted metal wire and supplied in different shapes and dimensions. All commercial metal wires can be used, although monel and stainless steel followed by SCF and aluminium are the most popular wires. SCF provides remarkably good magnetic shielding whereas monel offers very good shielding performance and corrosion resistance. Monel has a high tensile strength and is often selected when using aluminium enclosures.
- Standard forms are O-strip, rectangular, O-strip with fin and double O-strip with fin, other shapes are possible. For connector gasket applications, BOM 7 can be compressed to round or rectangular jointless gaskets. In addition, we provide knitted metal gaze in 0,5 mm thickness and 10 - 60 mm width for cable shielding. Due to our highly flexible production methods BOM 7 can be manufactured to practically all dimensions in-between those herein listed and which are only examples to show some of the possibilities. All BOM 7 gaskets are also available covering an elastomer core - these are our BOM 8 products.
  BOM 7 materials are suitable for moulded and extruded metal enclosures. As all metal gaskets have a limited elasticity, it is important to be aware of the closing force. This should not exceed 20 % when opening and closing the enclosure frequently. With 40 % compression permanent deformation should be expected. Therefore compression > 40 % should be used only when gasket is replaced after each opening of enclosure.

- **Monel = Alloy of copper (30 %) and nickel (67 %).**
  SCF = Tinned copperclad steel. Steel (64 %), copper (34 % min), tin (2 %).

- Please note that listed metric dimensions are converted from U.S. inch standard dimensions. We are fully capable of meeting both metric dimensions and inches.
- Optionally for mounting provisions, some of the gaskets can be provided with non-conductive adhesive tapes. Please note, that due to the nature of the knitted wires, the adhesive tape is considered only as mounting provision and not as dependable solution. Consult factory for feasibility.

Specifications

- **Monel:** Ø 0,114 mm as per DIN 17743/17750 Material-no. 2.4360
- **Aluminium:** Ø 0,127 mm AMS-4182, Alloy 5056
- **Stainless steel:** Ø 0,114 mm as per DIN 17440 Material-no. 1.4301
- **Sn, Cu, Fe:** Ø 0,114 mm ASTM-B-520

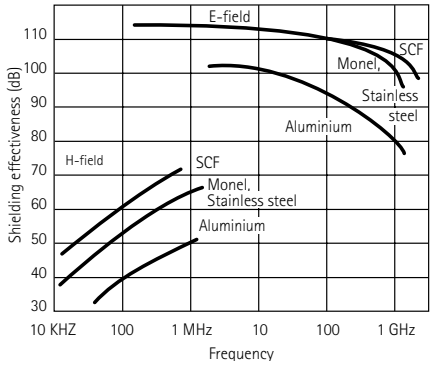
Mechanical Tolerances

- 1,5 - 5 mm: + 0,4 - 0 mm
- > 5,0 - 10 mm: + 0,6 - 0 mm
- > 10,0 - 17 mm: + 0,8 - 0 mm

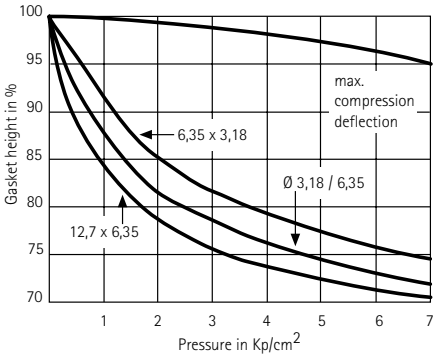
Material Code

Monel	Alu	Stainless steel	SCF
-7011-	-7012-	-7013-	-7014-

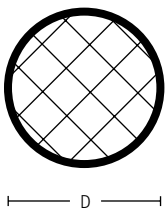
Shielding Performance



Compression Force

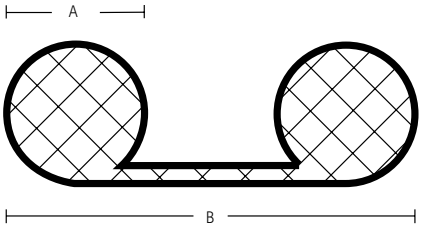


O-strip



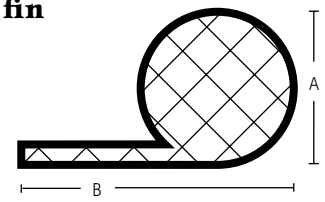
Dimensions in mm D	Order code
1,6	-0100
2,4	-0101
3,2	-0102
4,0	-0103
4,8	-0104
6,4	-0105
7,9	-0106
9,5	-0107
11,1	-0108
12,7	-0109

Double O-strip with fin



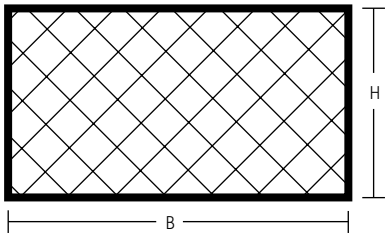
Dimensions in mm A	B	Order code	Dimensions in mm A	B	Order code
1,6	13,5	-0301	4,0	18,0	-0329
	15,9	-0302	4,8	15,9	-0311
	19,1	-0303		19,1	-0312
	22,2	-0304		22,2	-0313
2,0	25,0	-0323		25,4	-0314
2,4	13,5	-0305	6,4	19,1	-0315
3,2	13,5	-0306		22,2	-0316
	15,9	-0307		25,4	-0317
	19,1	-0308	9,5	25,4	-0318
	22,2	-0309		31,8	-0319
	25,4	-0310			

O-strip with fin



Dimensions in mm		Order code
A	B	
1,6	13,5	-0401
	15,9	-0402
	19,1	-0403
2,4	13,5	-0405
	19,1	-0406
3,2	13,5	-0409
	14,3	-0410
	15,9	-0411
	19,1	-0412
4,0	13,5	-0413
	19,1	-0414
4,8	13,5	-0416
	15,9	-0417
	19,1	-0418
	22,2	-0419
6,4	13,5	-0420
	15,9	-0421
	19,1	-0422
	22,2	-0423
	25,4	-0424
7,9	15,9	-0425
	19,1	-0426
	22,2	-0427
9,5	15,9	-0428
	19,1	-0429
	22,2	-0430
	25,4	-0431
11,1	19,1	-0432
	22,2	-0433
	25,4	-0434
12,7	19,1	-0435
	22,2	-0436
	25,4	-0437

Rectangular strip

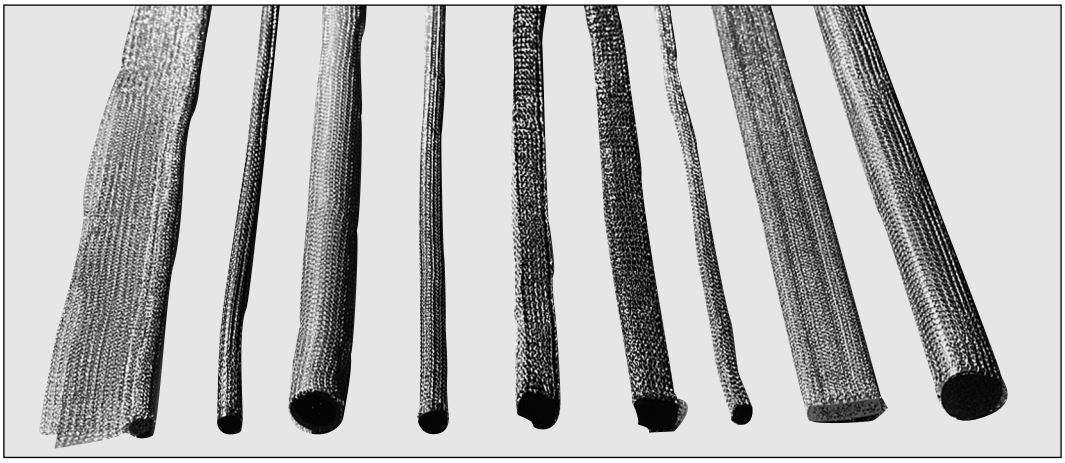


Dimensions in mm		Order code
H	B	
1,6	1,6	-0200
	3,2	-0201
	4,8	-0202
	6,4	-0203
	7,9	-0204
	9,5	-0205
	12,7	-0206
	15,9	-0207
	19,1	-0208
	25,4	-0209
2,4	2,4	-0210
	3,2	-0211
	4,8	-0212
	6,4	-0213
	7,9	-0214
	9,5	-0215
	12,7	-0216
	15,9	-0217
3,2	3,2	-0218
	4,0	-0219
	4,8	-0220
	6,4	-0221
	7,9	-0222
	9,5	-0223
	12,7	-0224
	15,9	-0225
	19,1	-0226
	25,4	-0227

Dimensions in mm		Order code
H	B	
4,8	4,8	-0228
	6,4	-0229
	7,9	-0230
	9,5	-0231
	12,7	-0232
	15,9	-0233
	19,1	-0234
	25,4	-0235
6,4	6,4	-0236
	7,9	-0237
	9,5	-0238
	12,7	-0239
	15,9	-0240
	19,1	-0241
7,9	7,9	-0243
9,5	9,5	-0244

Ordering Information

- The ordering code consists of the material code, followed by the order code:
  BOM-xxxx-xxxx
  - Material code
  - Order code



General Description

- BOM 8 gasket strips are elastomer cores usually with 2 layers of knitted wire mesh around if not indicated otherwise. These gaskets combine excellent shielding performance with high elasticity and provide an additional environmental sealing. As elastomer core we use mainly sponge neoprene or silicone. For hollow strips we use solid silicone as core to secure better elasticity whereas solid neoprene can only be used with a certain wall thickness due to stability reasons. Standard profiles are round, tubular or rectangular. Other profiles are possible on request. The wires used are mainly monel, a nickel-copper alloy with good ageing qualities and elasticity performance as well as high tensile strength. SCF offers the best H-field EMI shielding. Additional wire materials are stainless steel and aluminium. When selecting the wire, please consider the electrochemical compatibility to avoid galvanic corrosion. Optimum shielding is achieved with 2 layers of wire and 25 % compression with a closing force of 1,4 kp/cm^2.
- For very soft gasket strips, PU-foam is used. To maintain the elasticity of the foam, all PU-foam gasket strips only have 1 layer of knitted wire. In addition, the soft foam restricts possible rectangular profiles to those with larger dimensions.
- BOM 8 is not only available in continuous lengths but also as custom made gasket.
- For mounting purposes some of the gaskets can optionally be provided with a non-conductive adhesive tape. Consult factory for feasibility.
- Suitable for enclosures and doors with low closing force as well as in sheet metal and moulded enclosures. Simple attachment by pressing into place or glueing the gasket into the groove (glue only spotwise). To facilitate assembly further, BOM 8 is also available with fin or as double round with fin.

- **Monel = Alloy of copper (30 %) and nickel (67 %).**
  SCF = Tinned copperclad steel. Steel (64 %), copper (34 % min), tin (2 %).

Material Code

Elastomer	Mesh			
	Monel	Alu	Stainless steel	SCF
Sponge neoprene	-8011-	-8012-	-8013-	-8014-
Solid neoprene	-8111-	-8112-	-8113-	-8114-
Sponge silicone	-8211-	-8212-	-8213-	-8214-
Solid silicone	-8311-	-8312-	-8313-	-8314-
PU-foam	-8411-	-8412-	-8413-	-8414-
Sponge EPDM	-8511-	-8512-	-8513-	-8514-

Specifications

Mesh

- Monel: Ø 0,114 mm, DIN 17743/17750
- Aluminium: Ø 0,127 mm, AMS-4182, Alloy 5056
- Stainless steel: Ø 0,114 mm, DIN 17440
- SCF: Ø 0,114 mm, ASTM-B-520

Elastomer

- Sponge neoprene: MIL-R-6130, Type 2
  Grade A,
  similar to shore 15 - 25
  Cell-size:
  approx. 0,2 - 0,5 mm
  Density:
  180 - 240 kg/m³
  Temperature:
  - 31° to + 100°C
  Colour: black

- Solid neoprene: MIL-R-6855, Class 2
  Shore 60 - 70
  Temperature:
  - 54° to + 100°C
  Colour: black

- Sponge silicone: AMS-3195,
  similar to shore 15 - 25
  Temperature:
  - 75° to + 205°C

- Solid silicone: ZZ-R-765, Class 2
  Shore 50 - 70
  Temperature:
  - 62° to + 260°C

- PU-foam: Polyether-base
  with 80 kg/m³
  Temperature:
  - 40° to + 80°C
  Colour: grey
  or: Polyetherurethane-base
  with 150 kg/m³
  Temperature:
  - 30° to + 70°C
  Colour: yellow

- Sponge EPDM: Density:
  550 - 650 kg/m³
  Temperature:
  - 40° to + 100°C
  Colour: black

Dimensions

- Advised dimensions are for the elastomer core including wire mesh
- (e.g. BE-8011-2004 is a neoprene core Ø 6 mm with 2 layers of monel and a total cross section of Ø 6,35 mm).

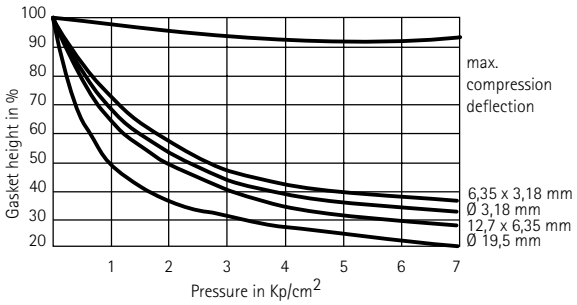
Mechanical Tolerances

- Knitted mesh all dimensions
  2 - 5 mm: + 0,4 - 0,0 mm
  > 5 -10 mm: + 0,5 - 0,3 mm
  > 10 mm: + 1,5 - 0,5 mm

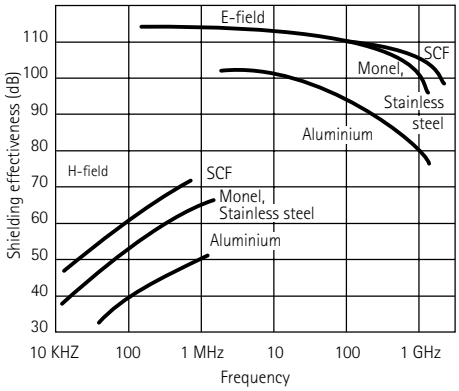
Recommended Groove Size for O-strip Gaskets

- with 10 % compression:
  depth: Ø x 0,9 width: Ø x 1,1
- with 20 % compression:
  depth: Ø x 0,8 width: Ø x 1,2

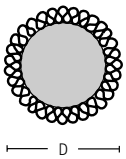
Compression Force



Shielding Performance



Standard O-strip



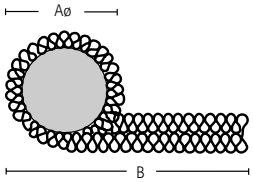
Dimensions in mm

D	Order code	D	Order code
1,6	-2000*	8,5	-2015
2,3	-2032**	9,5	-2006
2,4	-2001	10,5	-2013
2,5	-2027**	11,1	-2007
3,2	-2002	12,7	-2008
4,8	-2003	14,3	-2009
5,5	-2014	15,9	-2010
6,4	-2004	19,1	-2011
7,5	-2030	25,4	-2012
7,9	-2005		

* only solid silicone with 1 layer knitted wire mesh
**only sponge neoprene with 1 layer knitted wire mesh

► **Note:**
As standard, all cross sections between 1,5 - 25 mm can be made in steps of approximately 0,5 mm.

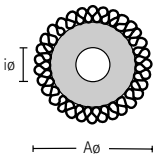
O-strip with fin



Dimensions in mm

A	B	Order code	A	B	Order code
1,6	13,5	-2301	6,4	13,5	-2320
	15,9	-2302		15,9	-2321
	19,1	-2303		19,1	-2322
2,4	13,5	-2305		22,2	-2323
	19,1	-2306		25,4	-2324
3,2	13,5	-2309	7,9	15,9	-2325
	14,3	-2310		19,1	-2326
	15,9	-2311		22,2	-2327
	19,1	-2312	9,5	15,9	-2328
4,0	13,5	-2313		19,1	-2329
	19,1	-2314		22,2	-2330
4,8	13,5	-2316		25,4	-2331
	15,9	-2317	11,1	19,1	-2332
	19,1	-2318		22,2	-2333
	22,2	-2319		25,4	-2334
			12,7	19,1	-2335
				22,2	-2336
				25,4	-2337

Tubular standard profile

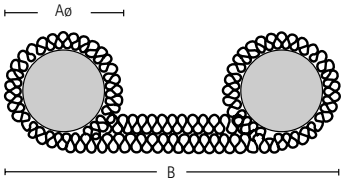


Dimensions in mm		Order code
AØ	Elastomer core iØ x wall thickness	
2,4	1,00 x 0,30	-2101*
3,2	1,50 x 0,40	-2102
4,8	2,00 x 1,00	-2103
6,4	4,00 x 1,00	-2104
7,9	4,00 x 1,75	-2105
9,5	4,50 x 2,25	-2106
10,0	6,50 x 1,50	-2115
12,7	7,00 x 2,50	-2108
14,5	11,00 x 1,50	-2109
15,8	8,00 x 3,50	-2110

*only one layer knitted wire mesh

► **Note:**
Most elastomer cores are made from solid silicone. Tubular profiles are also available in solid neoprene as long as the wall thickness is big enough for a good stability. As standard, all outer-Ø with cross sections between 2,0-25 mm can be supplied in approx. 0,5 mm steps. Also the inner-Ø can be supplied in different dimensions depending on availability of manufacturers.

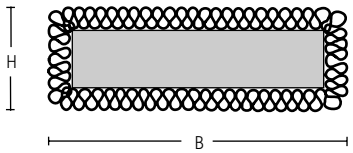
Double O-strip with fin



Dimensions in mm

A	B	Order code	A	B	Order code
1,6	13,5	-2401	4,8	15,9	-2411
	15,9	-2402		19,1	-2412
	19,1	-2403		22,2	-2413
	22,2	-2404		25,4	-2414
2,4	13,5	-2405	6,4	19,1	-2415
2,5	25,4	-2420		22,2	-2416
3,2	13,5	-2406		25,4	-2417
	15,9	-2407	9,5	25,4	-2418
	19,1	-2408		31,8	-2419
	22,2	-2409			
	25,4	-2410			

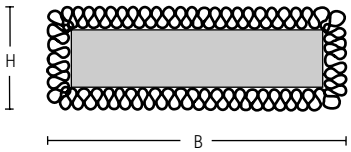
Rectangular standard profile



Dimensions in mm		Order code
H	B	
2,4	3,2	-2202
	4,8	-2203
	6,4	-2204
3,2	3,2	-2205
	4,8	-2206
	6,4	-2207
	9,5	-2208
	12,7	-2209
4,8	4,8	-2210
	6,4	-2211
	9,5	-2212
6,4	6,4	-2213
	9,5	-2214
	12,7	-2215
8,5	12,5	-2295
9,5	14,5	-2292
10,5	15,5	-2219
	16,5	-2217
	26,5	-2263

►**Note:**
For gaskets with PU-foam see table beside

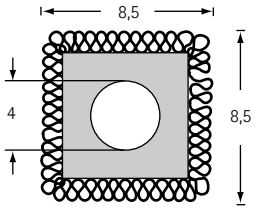
Rectangular standard profile (PU-foam only)



Dimensions in mm		Order code
H	B	
2,4	6,4	-2204
3,2	6,4	-2207
	9,5	-2208
	12,7	-2209
4,8	4,8	-2210
	6,4	-2211
	9,5	-2212
6,4	6,4	-2213
	9,5	-2214
	12,7	-2215

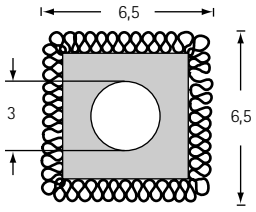
Square profile with round hole

► Order code: BOM-80xx-2500



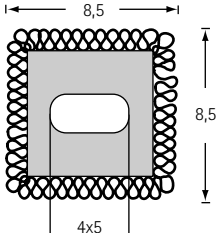
Square profile with round hole

► Order code: BOM-83xx-2501



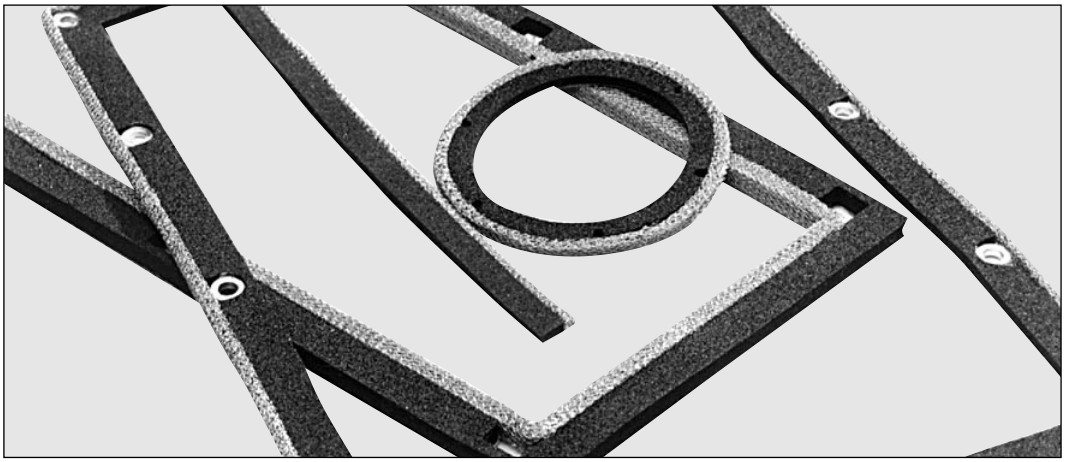
Square profile with oblong hole

► Order code: BOM-85xx-2502



Ordering Information

► The ordering code consists of the material code, followed by the order code for dimensions:
BOM-xxxx-xxxx
└ Order code
└ Material



General Description

- BOM 8 combi gasket consists of knitted wire mesh adhered to a sponge elastomer. Wire mesh knitted over elastomer is shown separately on pages xx to xx.This combination provides both EMI/RFI shielding as well as environmental seal. Combi gaskets are available in continuous lengths and different profiles or as frame gasket made per customer specification. Combi gaskets can be supplied with an adhesive backing on the elastomer to facilitate assembly.
- Special combinations are possible at any time. Gaskets shown herein only indicate some of the possibilities. The recommended compression is 20 % of the total thickness.
- BOM 8 gaskets can compensate major uneven spots and are therefore often preferred as lid gasket in enclosures. Despite the low compression required, the gasket provides a constant shielding performance and environmental seal and will not be affected adversely even in case of repeated opening / closing. The combi gasket can also be equipped with compression stops as additional protection.
- Please note that dimensions are metric standards and can at any time be converted into inches.
- **Monel = Alloy of copper (30 %) and nickel (67 %)**
  SCF = Tinned copperclad steel. Steel (64 %), copper (34 % min), tin (2 %).

Specifications

Mesh:

► Monel:	Ø 0,114 mm, DIN 17743/17750
► Aluminium:	Ø 0,127 mm, AMS-4182, Alloy 5056
► Stainless steel:	Ø 0,114 mm, DIN 17440
► SCF:	Ø 0,114 mm, ASTM-B-520

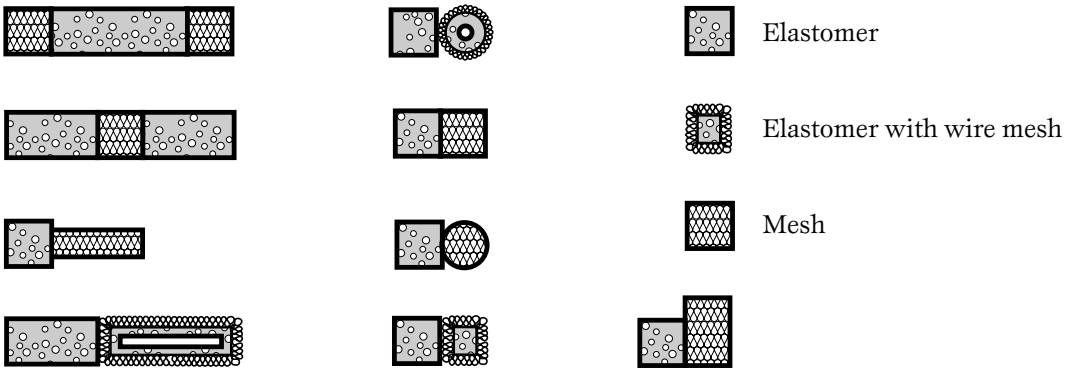
Elastomer:

► Sponge neoprene:	MIL-R-6130, Type 2 Grade A, similar to shore 15 - 25 Temperature: - 31° to + 100°C Colour: black
► Sponge silicone:	AMS-3195, similar to shore 15 - 25 Temperature: - 75° to + 205°C
► Sponge EPDM:	Density: 550 - 650 kg/m3 Temperature: - 40° to + 100°C Colour: black

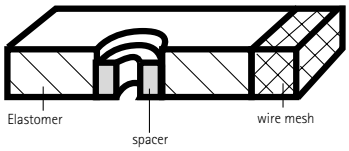
Mechanical Tolerances

▶ Sponge elastomer:	Height	2 - 3 mm:	± 0,4 mm
		> 3 - 12 mm:	± 0,8 mm
	Width up to	25 mm:	± 0,8 mm
▶ Knitted mesh:	all dim.	2 - 5 mm:	+ 0,4 - 0
		> 5 - 10 mm:	+ 0,5 - 0,3
		> 10 mm:	+ 1,5 - 0,5

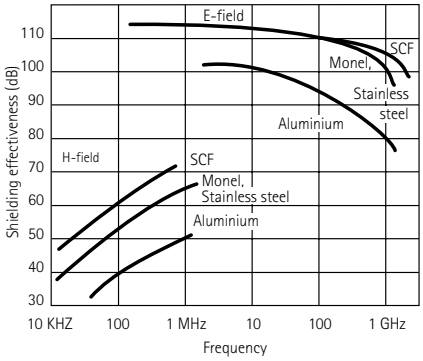
Examples of Special Compositions



Gasket with compression stop



Shielding Performance



Material Code

Elastomer	Mesh			
	Monel	Alu	Stainless steel	SCF
Sponge neoprene	-4011-	-4012-	-4013-	-4014-
Sponge silicone	-4211-	-4212-	-4213-	-4214-
Sponge EPDM	-4511-	-4512-	-4513-	-4514-

Standard strip

Dimensions in mm

Elastomer		Mesh		Order code
Height	Width	Width	Height	
H	**B**	**C**	**D**	
2	6	3	2	-1001
	9	3	2	-1002
	13	3	2	-1003
	16	3	2	-1004
	19	3	2	-1005
3	3	3	3	-1006
	5	3	3	-1007
	6	3	3	-1008
	6	6	3	-1009
	9	3	3	-1010
	10	3	3	-1049
	11	3	3	-1037
	12	3	3	-1090
	13	3	3	-1011
	13	6	3	-1012
	13	13	3	-1013
	16	3	3	-1014
	19	3	3	-1015
5	5	3	3	-1016
	6	3	4	-1017
	6	3	5	-1018
	9	3	5	-1019
	13	3	5	-1020
	19	6	5	-1021
6	6	3	6	-1022
	13	3	6	-1023
9	6	3	9	-1025
	13	6	9	-1026

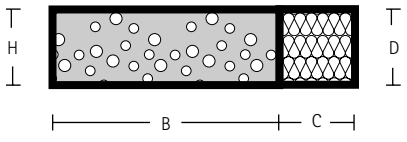
Ordering Information

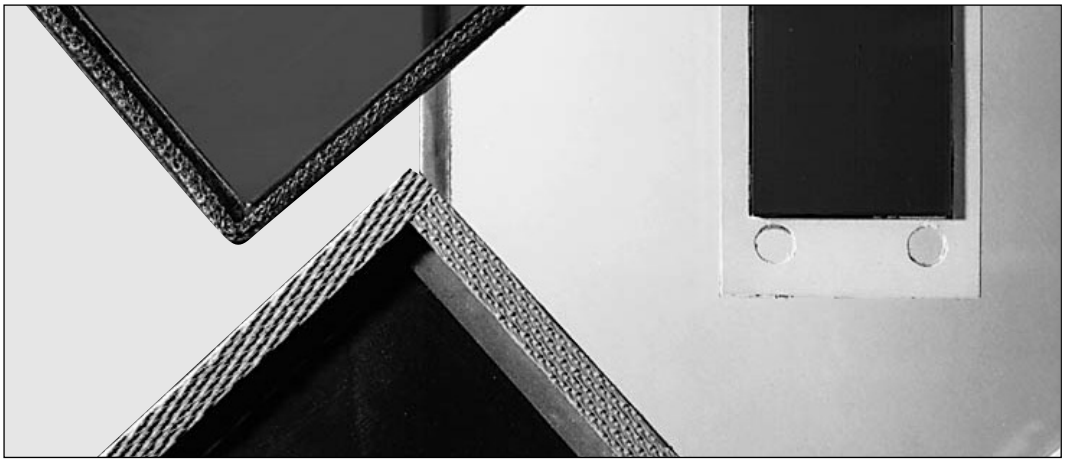
- The ordering code consists of the material code, followed by the order code for dimensions and additionally the digit whether adhesive back or not.

BOM-xxxx-xxxx-x
- 1 with adhesive back
- 0 without adhesive back
- Order code
- Material

Combinations as following will make sense:

- Elastomer: Height H from 2 .. 10 mm
  Width B from 3 .. 25 mm
- Mesh: Height D from 2 .. 10 mm
  Width C from 2 .. 18 mm





General Description

- Shielded windows consist of one or more window layers with a conductive intermediate layer. Applicable for all visual display systems, e.g. in meters and monitors.
- Due to the various possibilities our standard is custom-made production. The window should be selected according to following criteria:
  1. window material
  2. color of material
  3. dimensions
  4. anti-reflectivity
  5. intermediate layers
  6. construction
  7. gasket type
  8. frame finish
- Shielded windows are generally used for all kind of electric displays, e.g. LCD, LED, plasma and EL displays, etc.

Orientation

- 90° - 45° - 30° - 15°

Tolerances

1. Outer dimensions

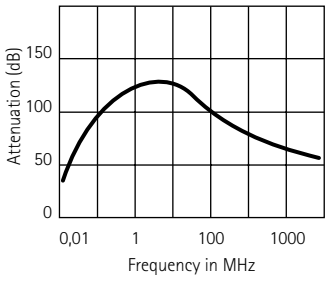
	Glass	Acrylic
up to 600 mm	± 0,5	± 0,2
> 600 mm	± 2,0	-

2. Material thickness (per material sheet)

	Glass	Acrylic
up to 4 mm	± 0,2	± 0,3
> 4 mm	± 0,4	± 0,5

Shielding Test Data

- Measured on shielded window 300 x 300 mm.
- Mesh: Blackened silver plated stainless steel 100 opi.



Window Material

- Glass, plexiglass (acryl), makrolon (polycarbonate) and PVC can be selected.
- Besides the use of two layers of the same material, following combinations are possible:
  - glass - PVC
  - glass - polycarbonate
  - glass - acryl
- For further details see also construction table

Color

- Base color of all materials is transparent/clear. However, for some applications it may be more advantageous to color the material yellow, green, red or amber.
- The base material for acrylic windows is colored whereas for glass windows the adhesive foil between the panes is colored.
- Please consider that with colored materials the light transmission will be affected.

Dimensions

- Outer dimensions: There is no standard outer dimension, all windows are custom-made.
- Material thickness: The material thickness for glass starts from 0,8 - 1,2 mm, for acrylic from 0,8 mm and for polycarbonate from 1,5 mm. The variety of available material thicknesses helps to meet almost all customer requirements. For a final glass-glass window the shielding mesh and the adhesive add 0,8 mm when laminated together.
- For further details see also construction table.

Anti Reflectivity

- All materials can be supplied with anti reflective surface to avoid glaring and to enhance contrast. Different proceedings can be used.

Anti reflectivity for glass:

- Multi layer coating per MIL SPEC 675 B (less than 0,6 % remaining reflection)
- Single layer coating per DIN 58197 (less than 1,5 % remaining reflection)
- Chemical etching:
  - 5 % reflection (R11G or GW 80)
  - 9 % reflection (R19G or GW 100)
  - 13 % reflection (R27G or GW 120)

Anti reflectivity for plastics

- Chemical etching is the standard procedure for a good anti reflectivity with plastics which comes out very strong.
- A special coating, giving a scratch resistance in addition to anti reflectivity, can influence the intensity of reflectivity.

Intermediate Layers

- The intermediate layer for EMI/RFI shielding is a woven microstructure mesh. Mesh materials are copper, stainless steel or silver plated stainless steel.
- The mesh can be blackened so as to enhance contrast on the display. This does not affect the shielding performance. To avoid interferences between mesh grid pattern and monitor or display ("Moiré fringes") simply change the orientation of the mesh by turning it a little. The number of openings per inch (opi) determine the shielding effectiveness, but also the light transmission.
- In applications with a very high resolution display which does not allow the use of a mesh, a highly conductive, transparent foil can be laminated onto the glass or it can be equipped with a conductive ITO coating.

- Note: The mesh is also available as individual part for other applications.

Selection of mesh and its shielding performance

Mesh	Surface	Open. per inch	Wire ø	E-field 1 MHz	E-field 10 MHz	E-field 100 MHz	E-field 400 MHz	P-field 1 GHz	P-field 10 GHz	Max. size available	Open area %
Copper	blackened	70	0,07	110	111	98	68	64	38	1200 x 1000 mm	65
Copper	blackened	100	0,05	107	111	85	70	58	-	1200 x 1000 mm	64
Stainless steel	bright	100	0,025	110	105	88	76	62	-	1200 x 1000 mm	81
Silver plated stainless steel	blackened	100	0,025	128	112	92	86	80	74	700 x 700 mm	81
Silver plated stainless steel	blackened	165	0,05	130	124	106	100	81	61	700 x 700 mm	46
Silver plated stainless steel	blackened	200	0,025	128	108	98	88	86	68	700 x 700 mm	64

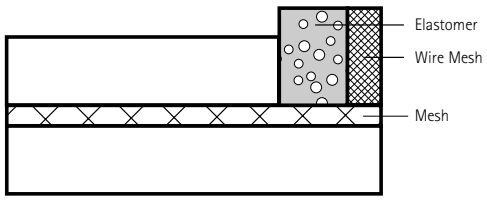
Selection of Conductive Coatings

- ITO coating (Indium-Tin-Oxide) from 100 Ω to 5 Ω/square. Substrate size on request.
- Gold coating down to 5 Ω/square
- It is recommended to have an additional protective coating over the conductive coating when glass is used. This gives a protection for the metalized surface and at the same time provides anti reflectivity.

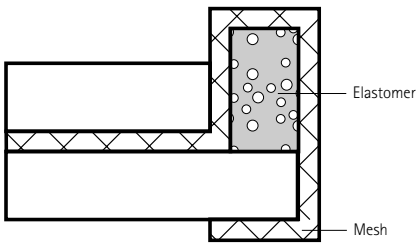
Construction

- Depending on the application the window consists of a carrier with a laminated mesh on the rear or the mesh is laminated between two carriers (the window).
- The mesh overlaps the carrier to serve as contact area for the gasket or installation.
- Plastic will be laminated either with adhesives or with high temperatures.
- Glass will be laminated in vacuum with double sided adhesive foils. Please note that a fully laminated glass window using a PVB interlayer (PVB = Polyvinyl Butyral) as adhesive cannot be cleaned with solvents, because the solvent will damage the PVB interlayer.

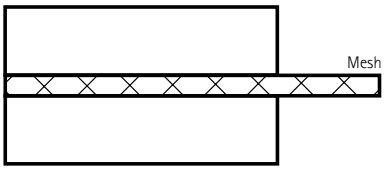
Schematic illustration



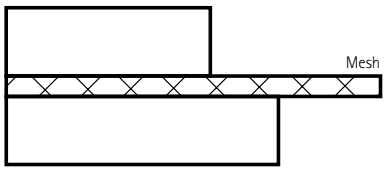
Step construction with RF-gasket



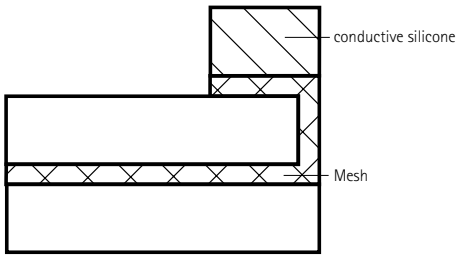
Step construction with mesh over elastomer core



plain ending



Step construction



Plain end with conductive silicone gasket

Table construction

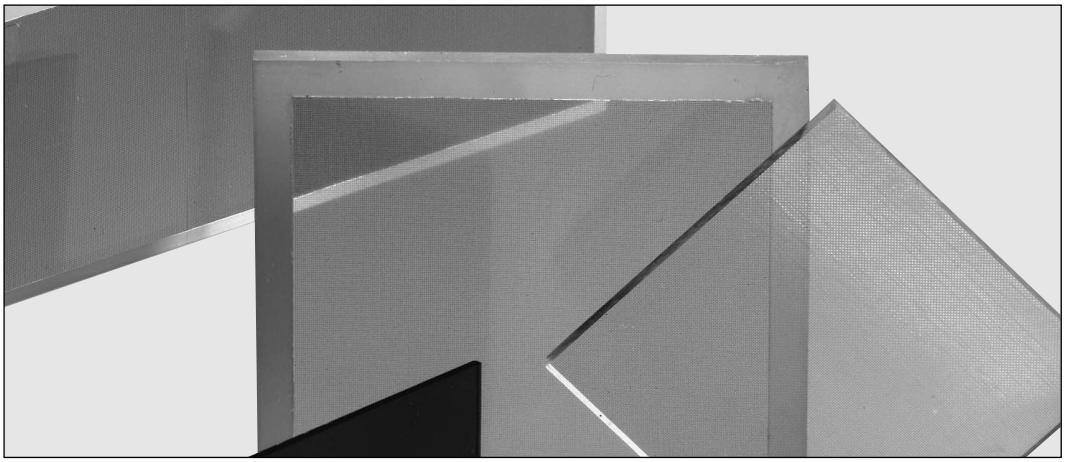
Laminate	Total material thickness min.	max.	Temp. range °C	Construc-tion	Form	Conductive medium Mesh	Conductive coating	Filter	Anti-reflectivity Refraction of light	Anti-reflection
Glass/ glass	2,4	on request	- 55 ... ... + 75	plain end. stepconstr.	flat, curved	see mesh selection	> 4 Ω /square	grey, green, red, orange	chem. etching	Multi layer
Glass/ poly-carbonate	3,0	on request	- 55 ... ... + 60	plain end. stepconstr.	flat, curved in 1 direction	see mesh selection	> 4 Ω /square	grey, different colours	chem. etching	Multi layer
Glass/ acrylic	2,2	on request	- 55 ... ... + 60	plain end. stepconstr.	flat, curved	see mesh selection	> 4 Ω /square	grey, green, red, orange	chem. etching	Multi layer
Glass/ polyester	1,7	on request	- 40 ... ... + 70	plain end.	flat, curved in 1 direction	see mesh selection	> 4 Ω /square	grey, green, red, orange	chem. etching	Multi layer
Poly-carbonate/ polycarbonate	3,8	on request	- 55 ... ... + 60	plain end. stepconstr.	flat, curved in 1 direction	see mesh selection	> 10 Ω /square	grey	chem. etching	-
Acrylic/ acrylic	1,3	on request	- 50 ... ... + 60	plain end. stepconstr.	flat, curved	see mesh selection	> 1000 Ω /square	different colours of acrylicglass	chem. etching	-
Polyester/ polyester	1,3	on request	- 40 ... ... + 70	plain end.	flat	see mesh selection	> 10 Ω /square	grey, green, red, orange	chem. etching	-

Gasket Type

- To achieve shielding effectiveness, a good contact between mesh and enclosure is required. The contact can either be established in a direct way or by means of a conductive gasket. When selecting the gasket you should consider the characteristics that have to be met by the finished product with regards to environmental seal (IP-protection etc.).
- For a choice of gasket and contact methods please contact our sales department.

Frame Finish

- Windows can be supplied from the factory as complete units. The finish is made according to customer specification and facilitates the assembly. The appropriate gasket is integrated in the frame to provide a good contact between mesh and enclosure.



General Description

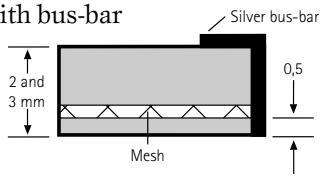
- A micro-structure wire mesh is stretched in a mould and then cast into acrylic. Due to a special moulding technique, the wire mesh is smoothly embedded in the sheet and will therefore only cause a minimum of optical disturbances. If the shielded window is placed in front of a data display, there might occur interference phenomena followed by varying light intensities on the screen (Moiré fringes). A turn of the mesh by a few degrees may reduce these disturbances.
- Custom-made shielded windows with specific dimensions will be cut out of this sheet. Afterwards a groove will be milled all the way round the edge of the sheet in a step construction. This groove will be plated with silver (silver busbar) and provides the contact to the wire mesh. The window can then be mounted on the chassis by means of a conductive gasket or by using a conductive adhesive. Shielded windows used in front of a display should be mounted in a way that the mesh side of the window is placed as close to the LED/LCD as possible.
- New: UV-block with 390 nm excellent protection of LCDs.

Material

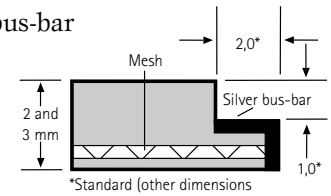
- **Type of plastic:** Cast acrylic
  Max. size: 1150 x 850 mm
  Thickness: 2 mm, 3 mm
  Tolerances: + /- 0,2 mm
- **Mesh** Stainless steel, 100 OPI
  Surface: bright or blackened
  Wire diameter: 0,025 mm
  Light transmission: 81 %
- **Silver paint:** Electrodag 1415

Construction

- Butt edge with bus-bar



- Step with bus-bar



*Standard (other dimensions and step versions are possible)

Filter

- In addition to the EMI shielding requirements, the shielded window can be used as contrast filter. More than 55 different transparent colours are available making it possible to choose a contrast filter adapted to the wave length (colour) of the signal source (display). This allows for the greatest possible light transmission while simultaneously excluding secondary light to achieve a clear and easily read signal.

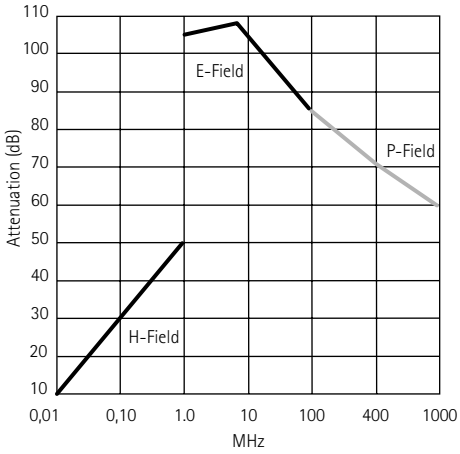
Reflection

- Reflections from shielded windows can be eliminated by using a uniquely developed surface treatment, consisting of optical micro-particles. The surface density can be applied in 5 standard types to suit the individual product, eliminating possible glare from surroundings without luminous loss or distortion of the visual signal. This surface treatment can be applied to the complete shielded window or to selected parts of it only.

with mat.-finish	Reflection in %
A 1	64 – 65
A 2	61 – 62
A 3	58 – 59
A 4	55 – 56
A 5	49 – 50

Shielding Performance

- Test Window:
  250 x 250 mm according to modified MIL-STD 285



Mechanical Properties

	Test	Unit	Values
Tensile strength	DIN 53455	N/mm²	65 – 68
Compressive strength	DIN 53454	–	125
Flexural strength	DIN 53452	–	120
Impact strength	DIN 53453	kj/m²	12
Modulus of elasticity	DIN 53457	N/mm²	3000
Elongation at break	DIN 53455	%	3 – 4
Hardness	DIN 53456	N/mm²	175

Thermal Properties

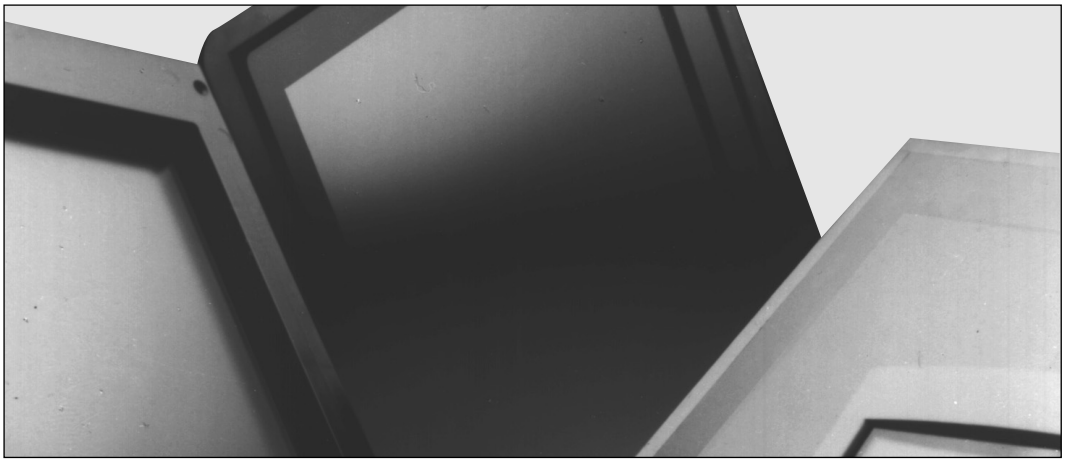
	Test	Unit	Val.
Heat stability – Vicat	DIN 53460	°C	110
Forming temperature	–	°C	150 – 170
Coefficient of linear thermal expansion	VDE 0304	mm/m °C	0,08
Specific heat	–	kj/kg K	1,46

Other Properties

	Test	Unit	Values
Specific gravity	DIN 53479	g/cm³	1,18 – 1,19
Water absorption	at 20° C / 24 h	%	0,17

Ordering Code

- The ordering code consists of the material code, followed by a new assigned P/N (including all necessary dimensions, tolerances and process steps):
  BOM-DCA-xxxx
  - xxxx: New P/N will be assigned after order is placed
  - DCA: Material code



General Description

- Based on indium tin oxide (ITO), ITO coatings can be applied to either glass or plastic substrates. Preferred materials are polycarbonate, glass, acrylic and polyethylene. Material thicknesses must not have any specific values except for polycarbonate which is limited to 2 and 3 mm. ITO coatings exhibit a high level of electrical conductivity and visible transparency. For optimum transmittance, the thickness of coatings is chosen to relate to the wavelength of each particular application. Normally coatings are designed for optimum transmittance at 500nm. The table below illustrates the salient properties of standard coatings.

Table of coatings

Designation	Sheet Resistivity Ω/square	Visible transmittance*	Transmittance at 550 nm*
IVINOX 1000 T	5000	90,5 %	90,5 %
IVINOX 1010 T	500	89 %	90 %
IVINOX 115 T	40	88 %	89 %
IVINOX 120 T	20	85 %	87 %
IVINOX 125 T	10	83 %	79 %

* Measured on glass substrate. (Uncoated glass has transmittance 91 %)

Application

- The ITO coating can be supplied to substrates measuring up to 1000 x 1000 mm. As the process is carried out at low temperatures in a vacuum, a variety of plastics including polycarbonate and acrylic as well as glass can be coated. A flexible system for handling the substrate allows both flat and curved surfaces, as well as a wide range of injection moulded shapes, to be coated. ITO coatings are ideal for use in a wide variety of EMI/RFI shielding and ESD protection applications. These include EMC solutions for display apertures in electronic equipment, protection of LCDs and conductive coatings for touchscreens and membranes. ITO coatings can be applied to free-issue parts or we can provide fully machined and finished windows or display covers in polycarbonate, acrylic or glass. Windows can be screen printed in standard or conductive inks and can also incorporate hard anti-glare, scratch-resistant and anti-fog features.

Shielding Effectiveness

- Chart below illustrates the variation of shielding effectiveness with sheet resistivity of IVINOX coatings deposited onto polycarbonate substrates. Measurements were carried out using the insertion loss method at frequencies from 10 MHz to 10 GHz under far field plane wave conditions.

Standard Tolerances

Outer dimensions:

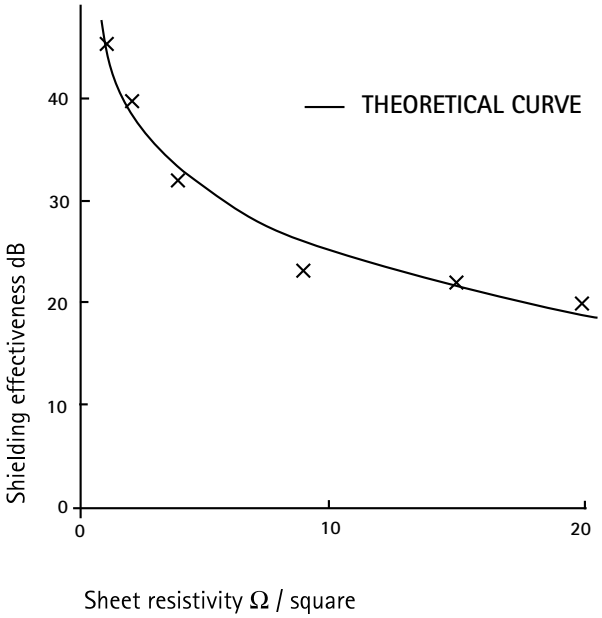
- For polycarbonate or glass ± 0,2 mm

Material thickness:

- Polycarbonate ± 10 %
- Allycarbonate ± 0,25 mm
- Glass ± 0,25 mm

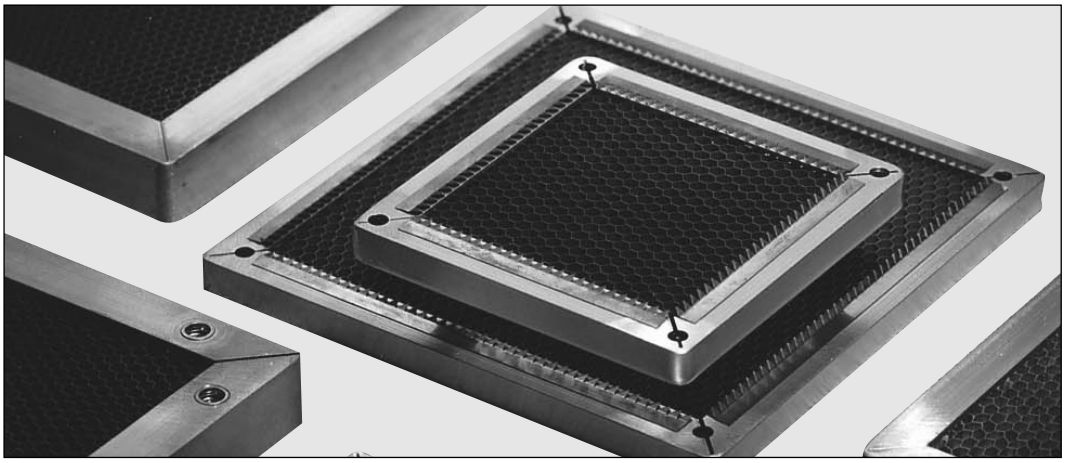
Shielding effectiveness of IVINOX coatings under plane wave conditions

- In high impedance electric fields 10 and 20 Ω/square IVINOX can give equivalent voltage attenuation to 2 mm thick aluminium plate.



Ordering Information

- Each ITO-coated window is made according to customer specifications, so no standard ordering code is given. With the order acknowledgement a part number will be assigned which is also valid for re-ordering.



General Description

- Honeycomb filters serve as ventilation panels with shielding effect. Depending on application, filters can be a honeycomb filter or a mesh metal filter. Preferred is a perforated aluminium filter assembled into a corresponding frame. The perforation gives a better shielding due to extended contact between the wave formed sheets creating the honeycomb cells. To extend the performance further, it is possible to use 2 pieces honeycomb in half thickness turned by 90° around one another and again assembled into corresponding standard frames. If a spraywater protection is needed or air must flow in a certain direction, the honeycomb will be cut to angles of 30°, 45° oder 60° towards horizontal. Honeycomb and frame consist of the same material to minimize electromagnetic corrosion. Aluminium chromated or tin plated comes as standard.
- The following equivalent serves as a general rule for the electrical field-shielding:

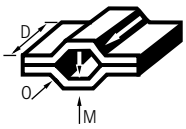
  $A = 27{,}3 \cdot (D/O)$, where is:
  A = Shielding in dB
  D = Depth of cell
  O = Largest opening diameter
- Low-cost version: The miter cut profile P9 is put on a honeycomb 6,35 mm and moulded to stick on the filter. The frame keeps in place by the way the profile is formed and is not welded. The surface treatment is yellow aludine. The honeycomb will be supplied with gaskey BOM-8211-2205 put into the existing groove. Optionally it can also be provided with mounting drillings in the hollow part of the profile.
- Alternatively to the honeycomb a filter with wire mesh is acceptable where shielding requirements are limited. Behind a protective grid several layers of a wave formed woven mesh arrange an airfilter. To stop fine dust as well, viscosic oil can be added to the mesh. Frame would be a U-profile or flange profile. Exact dimensions, hole pattern or threaded inserts are made at customers specifications. To ensure good contact with enclosure we suggest to integrate an BOM 8 gasket.
- Applicable in ventilation openings on shielded enclosures, containers and shelters.

Note:

- The aluminium honeycomb is also available without frame as component. The surface then is only chromated. Delivery is in pre-cuts, either rectangular or round, per customers dimensions up to max. available size.

Specifications

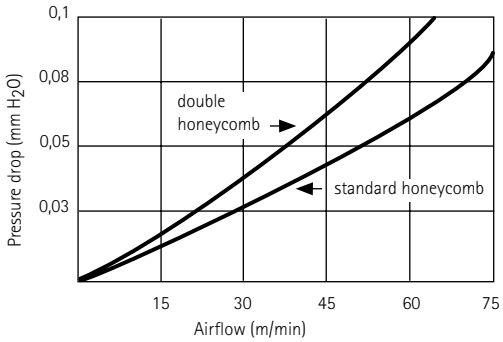
Honeycomb

Material	corrosion resistant aluminium
Surface finish	chromated, tin plated, nickel plated (when framed)
Dimensions 	O = 3,18 mm O = 6,35 mm D = 6,35 and 12,7 mm D = 25,4 mm M = 0,05 mm M = 0,05 mm
Honeycomb compound	adhered and perforated
Honeycomb slant	90° (30°, 45°, 60° high volume only)
max. honeycomb size	approx. 2000 X 1000 mm without compound

Frame

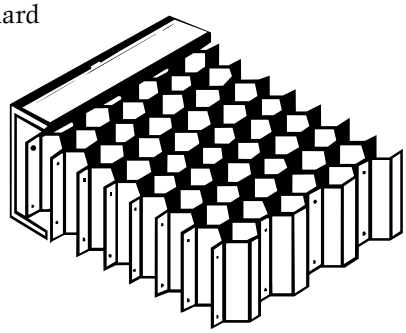
Material	ALMgSi 0,5, DIN 1725/48		
Surface finish	chromated MIL-G-5541	tin plated MIL-G-10727	nickel plated
Dimensions	generally limitiation by surface treatment: 600 X 700 mm P1,P2,P6,P7: approx. 600 X 600 mm without holes approx. 600 X 480 mm with holes P3,P4,P5,P8: approx. 980 X 760 mm without holes approx. 740 x 480 mm with holes		
Mech. tolerances	up to 200 mm: ± 0,4 mm > 200 - 600 mm: ± 0,8 mm > 600 mm: ± 1,6 mm		

Airflow Aluminium

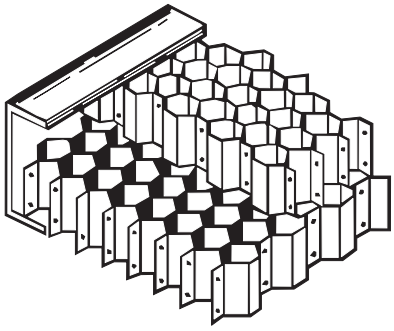


Construction Honeycomb

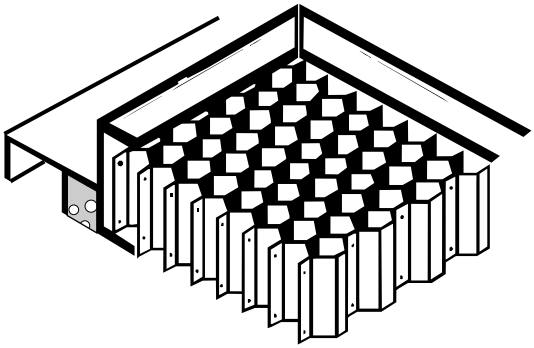
► Standard



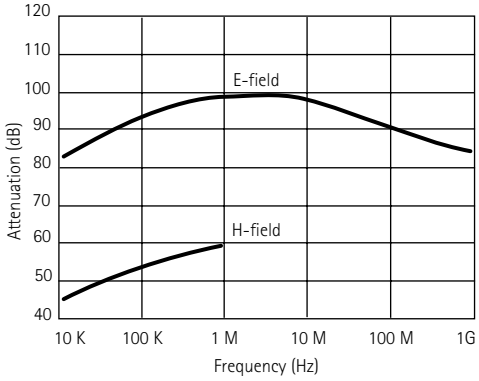
► Double honeycomb



► Low-cost version

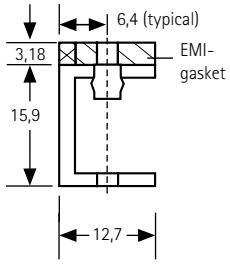


Shielding Performance



Construction
Frames

► Type P 1



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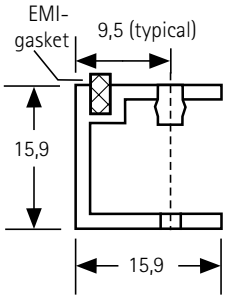
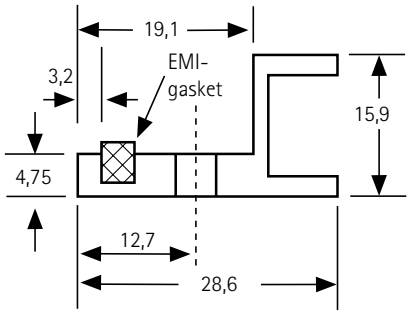
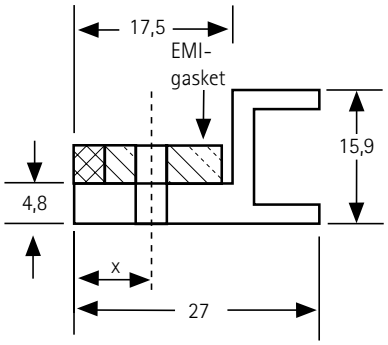


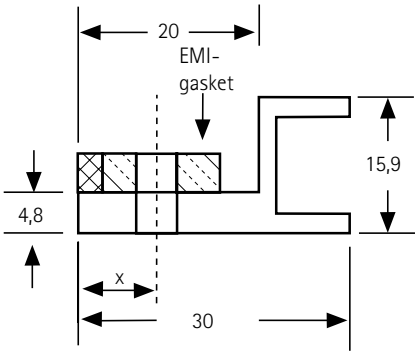
► Type P 3



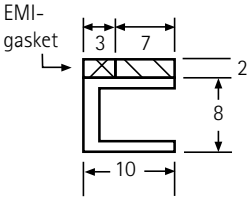
► Type P 4



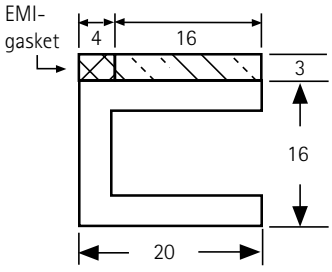
► Type P 5



► Type P 6



► Type P 7

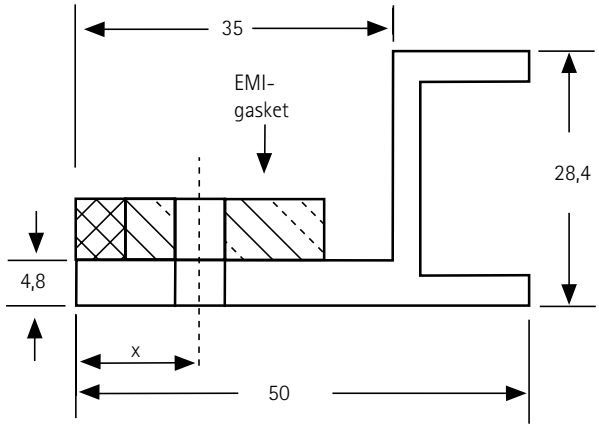


Note:
x = Dimensions can be advised from customer

Tolerances Frame Profiles

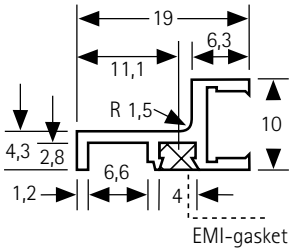
► All dimensions: ± 0,25 mm

► Type P 8



Note:
x = Dimensions can be advised from customer

► Type P 9



Mounting

All standard alu-honeycomb filters will be delivered without mounting holes. Optionally mounting holes or threaded rivet inserts are possible.

EMI gasket
All shown EMI gaskets are optionally, except for frame P9 where it is already integrated.
Recommended gasket for frame P2 and P3:
BOM-70xx-0212 (2,36 x 4,75 mm)

Ordering Information

► Each vent panel is made according to customers specification, so no standard ordering code is given. A universal tool for framing ensures a cost effective production. With the order confirmation a part number will be assigned which is also valid for re-ordering.

General Description

- When producing highly conductive contact surfaces it is of great importance to maintain this performance for a very long time.

Following particulars should be regarded:

- The surfaces to be assembled (e.g. by seaming, riveting, point welding, bolting) must be properly cleaned. This will remove protective films with substantially poorer conductivity than metal parts to be jointed as well as impurities from oil, dirt and oxide film.

- For enclosures with limited requirements to the shielding effectiveness the removing of protective films can be avoided when using gaskets capable to break through this film e.g. BOM 1 and some contact strips.

- To obtain a sufficient contact poorly conductive films between the surfaces to contacting must be permanently avoided. Poorly conductive films may appear through electrochemical corrosion – where agressive media penetrate between the joint of different metals. To avoid the corrosion the following should be considered:
  - The contact force will be giving a sufficient connection when so big that a cold welding in the µm-level around contact area takes place.
  - A rough protection in the contact area against the direct affect from humidity (corrosive atmosphere) can be achieved by using gaskets, conductive compounds or thorough painting after assembly.

- Metals to be joined should be chosen so that in reference with the electrochemical voltage the potential difference is kept as small as possible. The electrochemical voltage ranges are shown in table “electrochemical compatibility“. Metals and alloys which can be considered to comply directly are divided into groups. Generally matching metals are acceptable when within a potential difference of 0,5 Volts (see table “electrochemical compatibility“). With a higher potential difference an elimination by using surface coating or an intermediate layer is recommended to bring the level within ≤ 0,5 Volts.

- By exception, when the enclosure is exposed directly to harsh environment the potential difference should not exceed 0,25 Volt between the metals.

- Also to be considered is that fittings (bolts, washers, rivets etc.) have to match the potential difference as well.

- Table “electrochemical compatibility“ shows metals and alloys (or paintings) in groups. Within each group the potential difference is smaller than 0,05 Volt. The values are measured with a saturated mercury chloride electrode in salt water at room temperature.

International Environmental Protection Levels

- Protection levels for enclosures and cabinets will be indicated by IP (International protection) and 2 digits.

Example: IP 55

- First digit: 5
  dust protected
- Second digit: 5
  protected against water jets

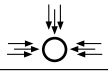
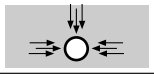
Evaluation of classification

- The DIN test results do not completely exclude all possible non-protections, therefore we recommend a separate individual test with the actual equipment in critical cases.

Protection against contact and substances

First digit	Contact	Substances	
0	Non-protected	Non-protected	
1	with large surface parts of the body	Solid objects Ø > 50 mm	
2	with fingers	Solid objects Ø > 12 mm	
3	with tools and wires Ø > 2,5 mm	Solid objects Ø > 2,5 mm	
4	with tools and wires Ø > 1,0 mm	Grain size objects Ø > 1 mm	
5	completely protectecd	Dust-protected	
6	completely protected	Dust-tight	

Water protection

Second digit	Water	
0	Non-protected	
1	Protected against dripping water	
2	Protected against dripping water when tilted up to 15°	
3	Protected against spraying water	
4	Protected against splashing water	
5	Protected against water jets	
6	Protected against heavy seas	
7	Protected agains the effects of immersion	
8	Protected against submersion	

ELECTROCHEMICAL COMPATIBILITY

Group No.	Metal	EMF V	Compatible pairs
1	Gold, solid and plating; gold platinum alloy; platinum-cast-metal (the most cathodic group)	+ 0,15	
2	Rhodium plate on copper with silver clad	+ 0,05	
3	Silver, solid or plating; alloys with high content of silver	0	
4	Nickel, solid or plating; monel-metal copper-nickel-alloy with high nickel content	- 0,15	
5	Copper solid or plating; Cu-Zn- or Cu-Sn-alloys with low zinc as well as tin content; silver solder; Cu-Ni-Zn-alloys; copper-nickel-alloys with high copper content; nickel-chromium-alloys; stainless austenitic steels	- 0,20	
6	Commercial standard Cu-Zn and Cu-Sn-alloys	- 0,25	
7	Cu-Zn- and Cu-Sn-alloys with high zinc as well as tin content; (naval-brass; Muntz-metal)	- 0,30	
8	Stainless steel with 18 % chromium	- 0,35	
9	Chromium plating; tin plating; stainless steel with 12 % chromium	- 0,45	
10	Tinplate, terneplate, tin-lead-solder	- 0,50	
11	Lead, solid or plating. Alloys with high lead content	- 0,55	
12	Aluminium, all kinds of mould-alloys similar to Al-Cu-Mn-Mg-Si-alloys (Duraluminium)	- 0,60	
13	Steel, carbon steel and low alloyed steel; Armco-steel	- 0,70	
14	Aluminium, mould alloys except the Al-Cu-Mn-Mg-Si-alloys (Duraluminium-types); aluminium cast alloy with silicone	- 0,75	
15	Aluminium, all cast alloys without silicone, cadmium plating and chromate	- 0,80	
16	Hot dip galvanized sheet metal; galvanized steel	- 1,05	
17	Zinc, die-casting-alloys on zinc base, zinc plating	- 1,10	
18	Magnesium, alloys on magnesium base or mould alloys (the most anodic group)	- 1,60	

EMF = Electro-Motive Force

General Description

- The table below gives general orientation concerning physical and chemical performances for the elastomers commonly used by us.
- Ratings are based on the experience of the rubber processing industry and official information from raw material manufacturers in different countries. A commitment to the listings is impossible as changes in material formula may cause different performances.

	Silicone	Fluorosilicone	Natural rubber	Ethylene Propylene Ter-Polymere	Polychloroprene rubber
Characteristics	**SI**	**FSI**	**NR**	**EPDM**	**CR**
Tensile strength non-reinforced	6	6	1	5	3
Tensile strength reinforced	4	4	1	3	2
Elongation at break	4	4	1	3	2
Elongation	3	3	2	3	3
Abrasion resistance	5	5	2	3	2
Tear strength	6	6	2	3	2
Temperature max. °C	+ 200	+ 200	+ 90	+ 150	+ 120
Temperature min. °C	- 80	- 80	- 50	- 40	- 30
Ageing survivability	1	1	3	1	2
Ozone resistance	1	1	4	1	2
Gasoline/Petrol resistance	5	1	6	5	2
Oil and grease resistance	1	1	6	4	2
Acid resistance	5	4	3	1	2
Alcalic resistance	5	4	3	2	2
Hot Water	5	4	3	2	3

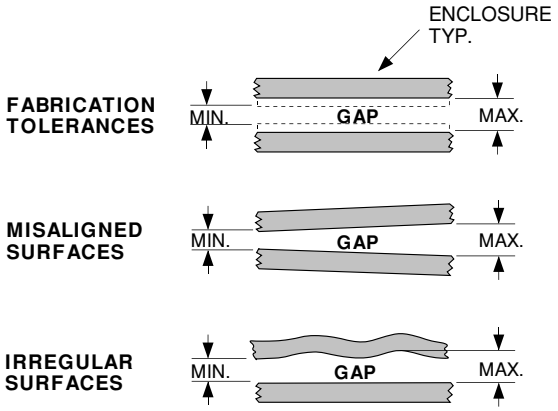
1 = excellent 2 = very good 3 = good 4 = acceptable 5 = poor 6 = insufficient

Attenuation Management

For maximum attenuation of a gasketed gap, the contact resistance of the mounting joint and closing joint must be very low and remain so throughout the life of the product. While a gasket may have the potential for very high attenuation under ideal conditions, over time oxidation, corrosion and dirt at the mounting and closing joints may reduce effectiveness. Factors influencing contact resistance over the life of the product are pressure (closing force), plating, and wiping action. Our engineers can help you determine the optimal specifications to ensure sustained attenuation.

Compression Management

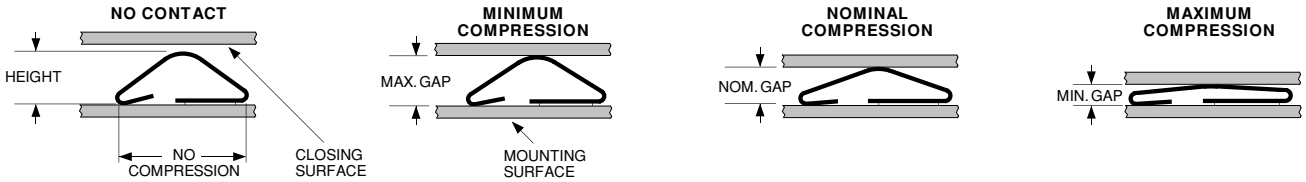
The purpose of shielding is to occupy and thereby shield the gap that exists between two adjoining surfaces. In order to be effective, shielding gaskets must be able to occupy both the maximum and minimum gaps, which exist due to fabrication tolerances, misalignment of surfaces, or irregular surfaces. Proper compression management is essential to ensure effective EMI shielding. Tech-Etch will be pleased to assist you in specifying the most effective gasket for your requirements.



OPERATING RANGE = MAX. GAP - MIN. GAP

Beryllium Copper Gaskets

- At the maximum gap the gasket should be compressed approximately 25 % .
- Gaskets may be compressed to 50 % of their height or more.



Material Descriptions

Beryllium Copper (BeCu)
BeCu alloy 25 (CA172) is used in these applications for maximum spring properties of strength and fatigue resistance. Consult the factory for high temperature applications.

Chemical Composition
Beryllium .....1.80-2.00 %
Cobalt plus nickel .....0.20 % Min.
Cobalt + nickel + iron .....0.6 % Max.
Copper .....Balance

Physical Properties (heat treated)
Electrical conductivity (% IACS).....22-25
Modulus of elasticity (psi) .....18.5 x 10^6

Mechanical Properties (heat treated)

Temper (1,000 psi)	1/4 HT	1/2 HT
Tensile strength	175 Min.	185 Min.
Yield strength .2 % offset	150 Min.	160 Min.

EMI Shielding Performance

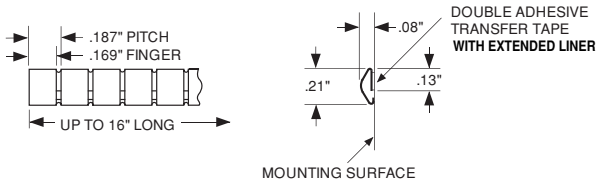
Material	H-Field 100kHz	E-Field 10MHz	P-Field 1GHz
BeCu	> 110 dB	> 110 dB	< 110 dB

187P21
SOFT NO-SNAG FINGERS

Performance Range

	25% Compression - 50% Compression		
Standard 0,05 Thk.	*	to	*

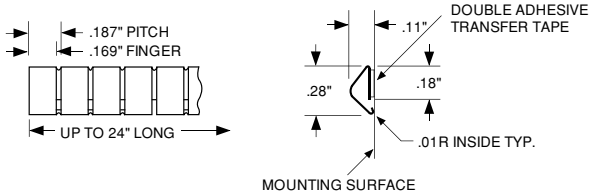
*Note: Consult factory for performance data.



187P28
SOFT NO-SNAG FINGERS

Performance Range

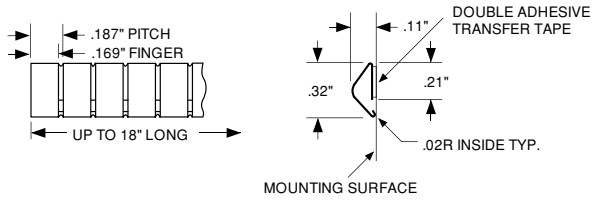
	25% Compression - 50% Compression		
Standard 0,05 Thk.	22 kg/m	to	48 kg/m



187P32
SOFT NO-SNAG FINGERS

Performance Range

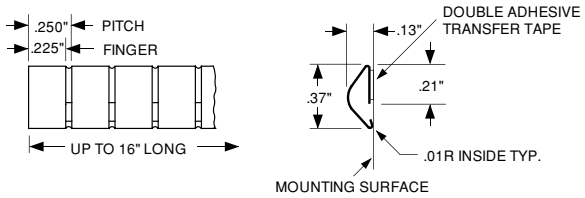
	25% Compression - 50% Compression		
Standard 0,05 Thk.	21 kg/m	to	39 kg/m



250P37
SOFT NO-SNAG FINGERS

Performance Range

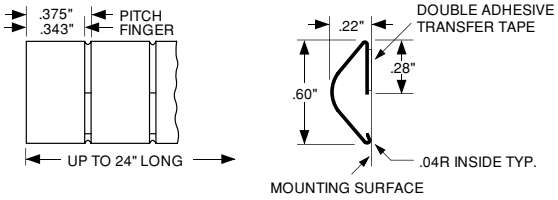
	25% Compression - 50% Compression		
Standard 0,05 Thk.	15 kg/m	to	31 kg/m



375P60
SOFT NO-SNAG FINGERS

Performance Range

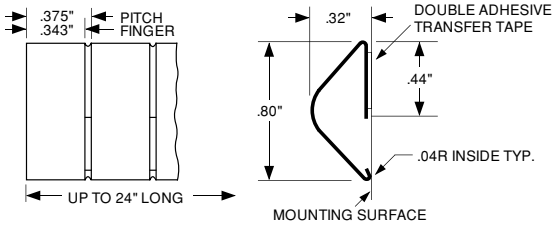
	25% Compression - 50% Compression		
Standard 0,089 Thk.	15 kg/m	to	30 kg/m
"TF" Style 0,05 Thk.	3 kg/m	to	11 kg/m



375P80
SOFT NO-SNAG FINGERS

Performance Range

	25% Compression - 50% Compression		
Standard 0,10 Thk.	10 kg/m	to	25 kg/m

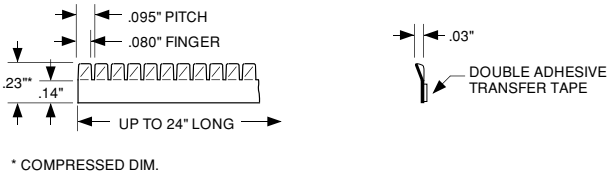


95T
PANEL GASKETS

Performance Range

	25 % Compression - 50 % Compression		
Standard 0,08 Thk.	18 kg/m	to	71 kg/m
"TF" Style 0,05 Thk.	4 kg/m	to	15 kg/m

Note: Also available in 7,6 meter rolls. Available in Stainless Steel.

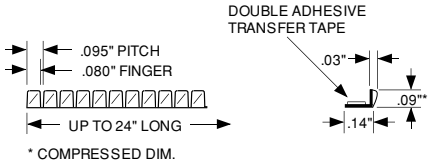


95T90°
PANEL GASKETS

Performance Range

	25 % Compression - 50 % Compression		
Standard 0,08 Thk.	18 kg/m	to	76 kg/m
"TF" Style 0,05 Thk.	4 kg/m	to	15 kg/m

Note: Available in Stainless Steel.

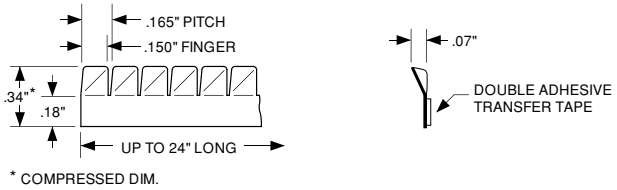


165T
PANEL GASKETS

Performance Range

	25 % Compression - 50 % Compression		
Standard 0,08 Thk.	13 kg/m	to	33 kg/m
"TF" Style 0,05 Thk.	3 kg/m	to	10 kg/m

Note: Also available in 7,6 meter rolls. Available in Stainless Steel.

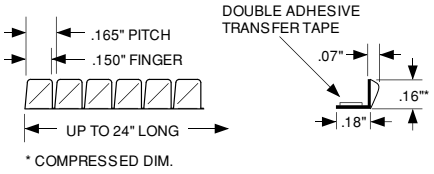


165T90°
PANEL GASKETS

Performance Range

	25 % Compression - 50 % Compression		
Standard 0,08 Thk.	13 kg/m	to	33 kg/m
"TF" Style 0,05 Thk.	3 kg/m	to	10 kg/m

Note: Available in Stainless Steel.

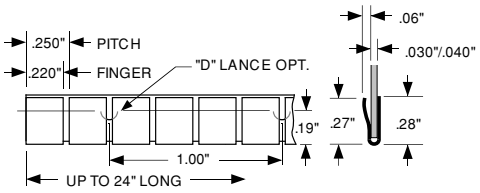


250C040
LOW PROFILE

Performance Range

	25 % Compression - 50 % Compression		
Standard 0,15 Thk.	22 kg/m	to	124 kg/m
"TF" Style 0,089 Thk.	10 kg/m	to	45 kg/m

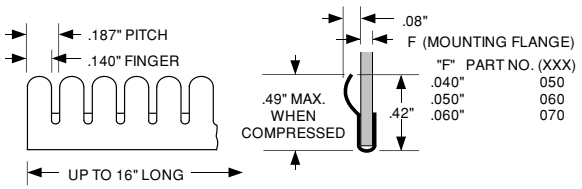
Note: Optional D Lance as shown.



187RF2CXXX
CYLINDRICAL RADIUS

Performance Range

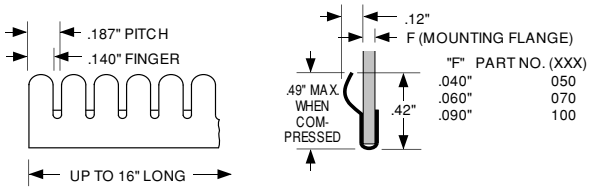
	25 % Compression - 50 % Compression		
Standard 0,13 Thk.	34 kg/m	to	208 kg/m



187RF1CXXX
CYLINDRICAL RADIUS

Performance Range

	25% Compression - 50% Compression
Standard 0,13 Thk.	18 kg/m to 125 kg/m
"TF" Style 0,089 Thk.	Consult the Factory

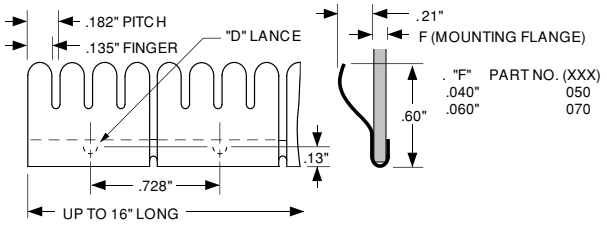


182RF8CXXXL
CYLINDRICAL RADIUS

Performance Range

	25% Compression - 50% Compression
Standard 0,13 Thk.	5 kg/m to 24 kg/m

Note: Non-standard lance location(s).

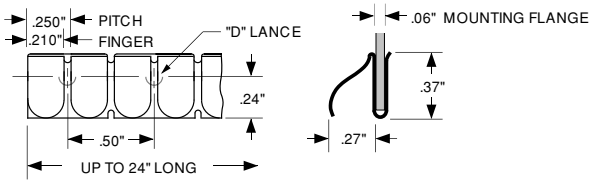


250K2C070L
REVERSE BEND CONTACTS

Performance Range

	25% Compression - 50% Compression
Standard 0,13 Thk.	12 kg/m to 28 kg/m

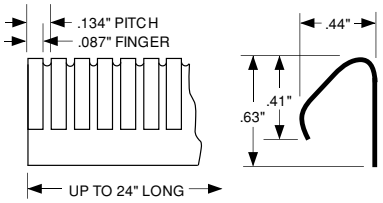
Note: Non-standard lance location(s). Also available in 7,6 meter rolls. Scores for break off between 12,7 mm increments optional.



134D
REVERSE BEND CONTACTS

Performance Range

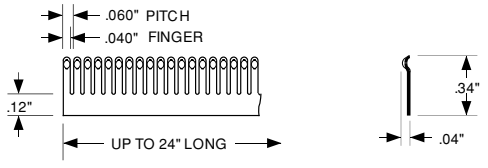
	25% Compression - 50% Compression
Standard 0,25 Thk.	24 kg/m to 68 kg/m



60R
SPHERICAL RADIUS

Elastic performance data available for specific customer gap requirements. Consult factory.

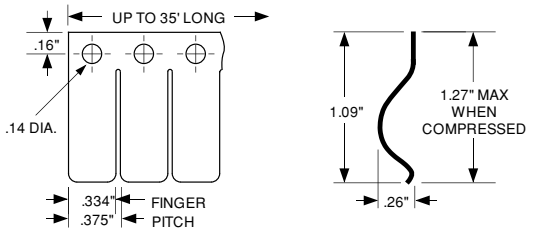
Standard 0,10 Thk.



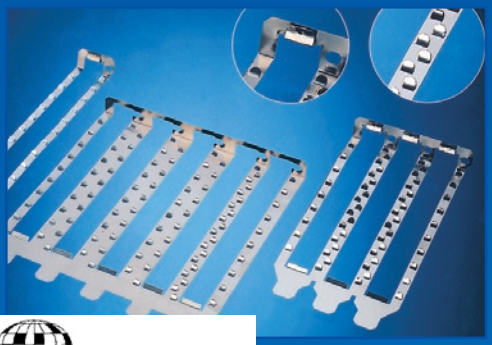
375A
STRIP GASKETS

Performance Range

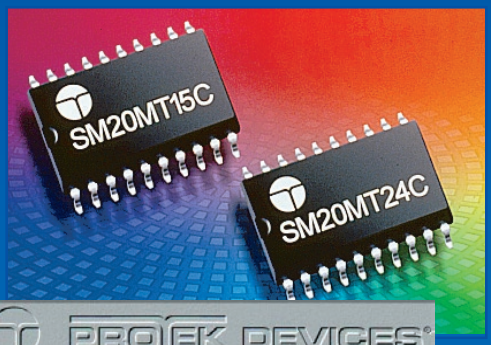
	25% Compression - 50% Compression
Standard 0,13 Thk.	22 kg/m to 61 kg/m



Other products:

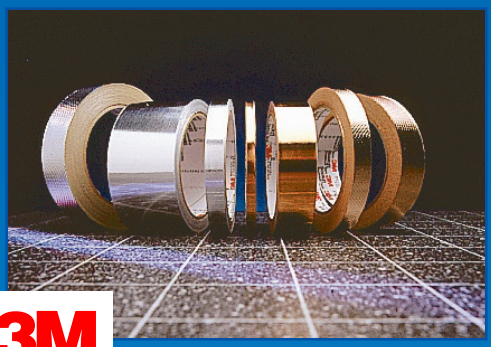


Globe Manufacturing



PROTEK DEVICES

Steward



3M

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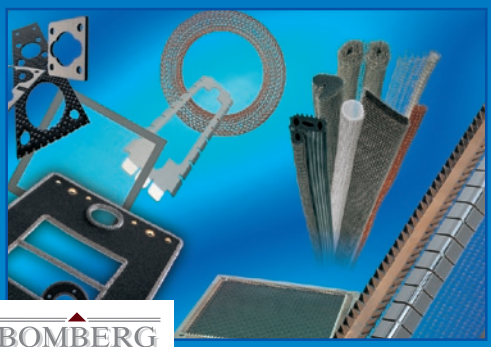
Keramische Folien GmbH



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