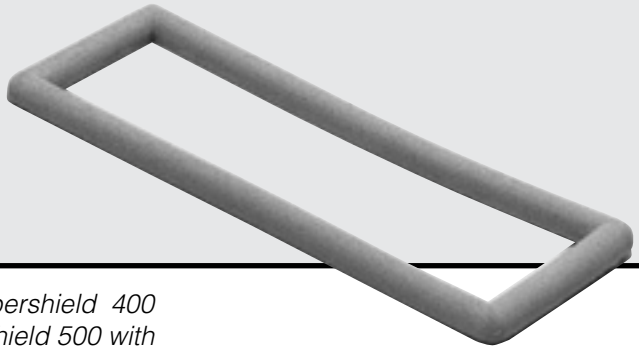
1000 Series Supershield



Supershield is a silicone elastomer filled with conductive metal particles to provide high shielding effectiveness and an environmental seal.

The Supershield family uses eight basic conducting media: Supershield 100 with carbon, Supershield 200 with nickel graphite, Supershield 300 with silver (low density), Supershield 400 with silver nickel, Supershield 500 with silver aluminum, Supershield 600 with silver plated glass, Supershield 700 with pure silver, and Supershield 800 with silver-plated copper.

Values other than Specific Gravity were determined at the indicated durometer compound. Material specifications (with the exception of specific gravity) may vary at other durometers.

Supershield can be supplied in a variety sizes, standard extrusion sections, or as standard or custom die-cut gaskets.

Material Specifcations

Per MIL-DTL-83528

Series	Carbon 100	Nickel Graphite 200	Nickel Graphite 200(FL)	Silver Low D. 300	Silver Nickel 400	Silver Nickel 400(FL)	Silver Aluminum 500	Silver Aluminum 500(FL)	Silver Glass 600	Silver Glass 600(FL)	Silver Pure 700	Silver Pure 700(FL)	Silver Pure 700	Silver Copper 800	Silver Copper 800(FL)	Silver Copper 800	Silver Copper 800
Elastomer	Silicone	Silicone	Fluoro-silicone	Silicone	Silicone	Fluoro-silicone	Silicone	Fluoro-silicone	Silicone	Fluoro-silicone	Silicone	Fluoro-silicone	Silver Silicone	Silicone	Fluoro-silicone	Silicone	Silicone
Color	Black	Dark Gray	Dark Gray	Tan	Tan	Tan	Blue*	Blue*	Tan	Tan	Tan	Tan	Tan	Tan	Tan	Tan	Tan
Specific Gravity, gm/cc	1.2	1.95	1.95	1.7	4.0	4.4	2.0	2.0	1.9	1.9	3.5	4.0	4.0	3.5	4.0	4.8	3.5
Durometer Shore A	70	30-70	65	45	75	70	65	70	65	65	65	75	80	65	75	80	85
MIL-DTL-83528 Type	N/A	N/A	N/A	J	L	-	B	D	M	-	E	F	H	A	C	G	K
Volume Resistivity, Ohm-cm	7.0	0.1	0.1	0.01	0.005	0.012	0.008	0.012	0.006	0.006	0.002	0.002	0.005	0.004	0.01	0.007	0.005
Operating Temp.: Min C	-55°	-55°	-55°	-55°	-55°	-55°	-55°	-55°	-55°	-55°	-55°	-65°	-55°	-55°	-55°	-45°	-45°
Operating Temp.: Max C	200°	150°	150°	160°	125°	160°	160°	160°	160°	160°	160°	160°	160°	125°	125°	125°	125°
Compression Deflection % Min.	3.5	3.5	3.0	8.0	3.5	3.5	3.5	3.5	3.5	3.5	2.5	3.5	2.5	3.5	3.5	2.5	2.5
Tensile Strength, P.S.I.	650	150	150	150	200	180	200	180	200	200	300	250	400	200	180	600	400
Elongation % Min.	100%	100%	100%	50%	100%	60%	100%	60%	100%	100%	200%	100%	90%	100%	100%	20%	100%
Elongation % Max.	-	-	-	250%	300%	260%	300%	260%	300%	300%	500%	300%	290%	300%	300%	N/A	300%
Compression Set %	40	35	25	35	32	30	32	30	30	30	45	60	60	32	35	N/A	35
Tear Strength lb./in.	40	40	35	20	30	35	30	35	30	30	50	40	60	25	35	70	40
Shielding Effectiveness (100 Mhz)	80	100	100	100	120	120	120	120	100	100	120	120	120	120	120	120	120
Shielding Effectiveness (500 Mhz)	80	100	100	100	120	120	120	120	100	90	120	120	120	120	120	120	120
Shielding Effectiveness (2 Ghz)	60	100	100	90	120	115	115	115	90	90	120	120	120	120	120	120	120
Shielding Effectiveness (10 Ghz)	50	100	100	90	110	110	115	115	90	90	120	120	120	120	115	120	120

* May also be special ordered in Tan.

Sheet Materials

Sheet Sizes

L W	Sequential #
10.00" x 10.00"	0002
10.00" x 15.00"	0007
10.00" x 20.00"	0004
12.00" x 12.00"	0003
12.00" x 18.00"	0001
15.00" x 20.00"	0005
17.80" x 20.50"	0006
24.00" x 24.00"	0008

Sheet Thicknesses

.020" Thick
.030" Thick
.032" Thick
.040" Thick
.060" Thick
.062" Thick
.093" Thick
.125" Thick

Note: Add "FL" to the end of the Part Number for Fluorosilicone. Values other than specific gravity were determined with indicated durometers. Other durometers are available but may alter values.

FOR SIZES NOT SHOWN, PLEASE ASK!

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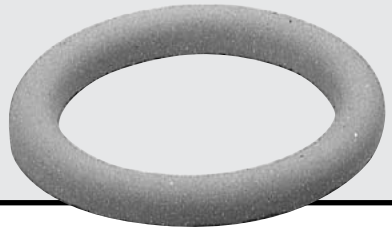
1000 Series Supershield

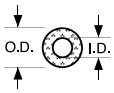


Extrusions

Round

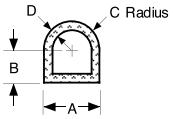
D (Dia.)	Sequential #	D (Dia.)	Sequential #
0.040	1010	0.125	1005
0.053	1011	0.130	1015
0.062	1001	0.139	1006
0.070	1002	0.150	1016
0.080	1012	0.160	1007
0.093	1003	0.188	1008
0.103	1004	0.216	1017
0.112	1013	0.250	1009
0.119	1014		

Hollow Round



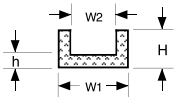
O.D. (in.)	I.D. (in.)	Sequential #
0.070	0.025	2026
0.093	0.035	2027
0.103	0.040	2028
0.125	0.045	2029
0.125	0.062	2021
0.156	0.050	2022
0.177	0.079	2030
0.250	0.125	2023
0.312	0.192	2031
0.375	0.250	2025
0.437	0.250	2032

Hollow "D"



A	B	C	D	Sequential #
0.156	0.045	0.078	0.045	4041
0.156	0.078	0.078	0.045	4042
0.187	0.093	0.093	0.050	4043
0.250	0.125	0.125	0.065	4044
0.312	0.156	0.156	0.062	4045
0.487	0.080	0.244	0.080	4048

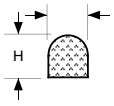
Channel



H	h	W1	W2	Sequential #
0.100	0.033	0.100	0.034	5051
0.110	0.050	0.126	0.026	5052
0.156	0.047	0.156	0.062	5053
0.156	0.075	0.175	0.047	5054
0.225	0.075	0.126	0.020	5057
0.235	0.115	0.327	0.062	5058

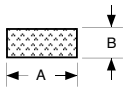
FOR SIZES NOT SHOWN, PLEASE ASK!

Solid "D"



H	W	Sequential #
0.064	0.055	3041
0.068	0.062	3031
0.078	0.094	3032
0.089	0.078	3033
0.094	0.094	3042
0.100	0.062	3034
0.110	0.150	3035
0.131	0.122	3043
0.136	0.124	3036
0.156	0.118	3037
0.156	0.156	3044
0.175	0.178	3038
0.188	0.188	3039
0.250	0.250	3040

Rectangular Solid



A	B	Sequential #
0.032	0.032	6061
0.060	0.080	6062
0.063	0.042	6063
0.093	0.093	6076
0.095	0.062	6064
0.120	0.075	6065
0.125	0.062	6066
0.156	0.062	6067
0.250	0.062	6068
0.500	0.075	6069
0.500	0.125	6070
0.500	0.188	6071
0.500	0.250	6077
0.750	0.062	6072
0.880	0.062	6073
1.000	0.250	6074
1.180	0.062	6075

How To Order

1000 Series - Supershield

Example: Part number 1016-0650-0041 is 1000 Series Supershield with silver plated glass conductive particles in .06 in. thick sheet with a 50 durometer hardness. **Unless standard, the sequential number is assigned by the factory.**

1 0 X X – Y Y Z Z – X X X X – FL

1000 SERIES

CONFIGURATION (X)
1 Sheet
2 Extruded Strip
3 Molded
4 Fabricated Part (Custom)
5 Standard Die Cut Connector or Waveguide

CONDUCTING MEDIA (X)
1 Carbon (100)
2 Nickel Graphite (200)
3 Silver Low Density (300)
4 Silver Nickel (400)
5 Silver Aluminum (500)
6 Silver Plated Glass (600)
7 Pure Silver (700)
8 Silver Plated Copper (800)
9 Other

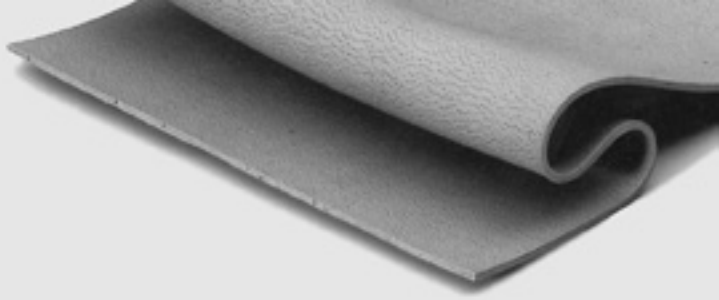
SHEET THICKNESS (YY)
00 Non-sheet
02 .020" Thick
03 .030" Thick
04 .040" Thick
06 .060" Thick
09 .093" Thick
12 .125" Thick
32 .032" Thick
62 .062" Thick

DUROMETER (ZZ)
See Page 40 Chart for Standard Durometer

SEQUENTIAL (XXXX)

FLUOROSILICONE
Add "FL" if required.

4000 Series Multishield



Multishield is a composite material containing excellent shielding with an efficient environmental seal. The material is manufactured with a matrix of wires embedded in silicone rubber and aligned perpendicular to the contact surfaces. Multishield is available in strips up to 5/8 in. wide, sheets up to 9 in. wide, custom gaskets and standard gaskets.

Application Notes

Adhesive Mounting

Multishield can be bonded to sheet metal using a thin film of RTV 3145 (or equivalent) or 3M 9472 PSA pressure sensitive adhesive. Pressure must be applied to the bond for the duration of the adhesive cure time to assure good contact of the wires to metal.

Die Cut gaskets

Custom gaskets can be fabricated from solid or sponge multishield using inexpensive rule dies. See Fig. 1 for tolerancing and design guides. For standard product connector and waveguide gaskets, see page 36.

Picture Frame Gaskets

Picture frame gaskets can be fabricated from solid or sponge multishield strip material. Corner joints are bonded with RTV 3145. See Fig. 1 below for tolerances and design guides.

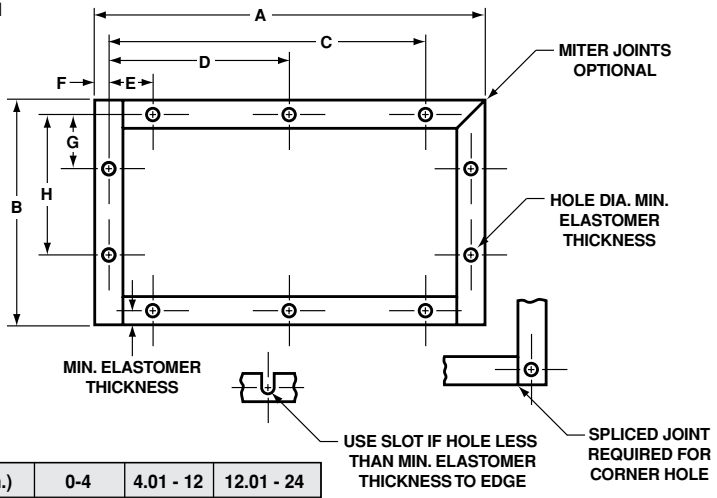
Compression Range

Recommended compression range is 5-10% for solid and 20-25% for sponge material.

Compression Stops

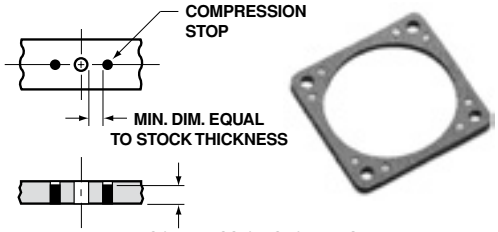
Compression stops are recommended to control the amount of compression at assembly and to prevent excess compression at the fastener locations. Aluminum compression stops are available. See Fig. 2 for design guides.

Fig. 1



Length (in.)	0-4	4.01 - 12	12.01 - 24
A, B	±.020	±.031	±.040
C, D, E, F, G, H	±.010	±.015	±.020

Fig. 2



Material Specifications

Solid Silicone ..... A-A-59588, Class II, Grade 40 (Formerly ZZ-R-765)

Temperature Range ..... -60°C to 219°C

Sponge Silicone AMS-3195

Temperature Range ..... -75°C to 205°C

Aluminum Wire ..... AMS 4182, Alloy 5056

Monel Wire ..... QQ-N-281 Class A

Wire Density / In.²

Silicone Solid ..... 900 ±15%

Silicone Sponge ..... 600 ±15%

Seal ..... Waterproof

EMI Shielding Performance

Wire Type	Material	H-Field 200kHz	E-Field 10MHz	P-Field 1GHz
Monel	Sponge	70 dB	120 dB	125 dB
Monel	Solid	70 dB	125 dB	125 dB
Aluminum	Sponge	70 dB	85 dB	70 dB
Aluminum	Solid	70 dB	100 dB	100 dB

Sheet Materials

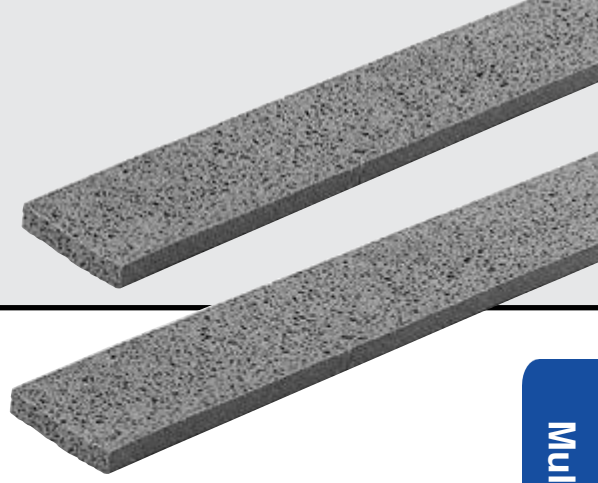
Width (in.)	Thick (in.)	Part Number
3.0	.032	4010 - YYZA - 0062
4.5	.032	4010 - YYZA - 0063
6.0	.032	4010 - YYZA - 0064
9.0	.032	4010 - YYZA - 0066
3.0	.045	4010 - YYZA - 0001
4.5	.045	4010 - YYZA - 0002
6.0	.045	4010 - YYZA - 0003
9.0	.045	4010 - YYZA - 0005
3.0	.062	4010 - YYZA - 0006
4.5	.062	4010 - YYZA - 0007
6.0	.062	4010 - YYZA - 0008
9.0	.062	4010 - YYZA - 0010
3.0	.094	4010 - YYZA - 0011
4.5	.094	4010 - YYZA - 0012
6.0	.094	4010 - YYZA - 0013
9.0	.094	4010 - YYZA - 0015
3.0	.125	4010 - YYZA - 0016
4.5	.125	4010 - YYZA - 0017
6.0	.125	4010 - YYZA - 0018
9.0	.125	4010 - YYZA - 0020
3.0	.156	4010 - YYZA - 0059
3.0	.188	4010 - YYZA - 0058

FOR SIZES NOT SHOWN, PLEASE ASK!

Thickness Tolerance Sheet & Strip Material	
.032 in. - .045 in.	+.010 -.005
.062 in. - .250 in.	±.010

See next page for How To Order.

4000 Series Multishield



Strip Materials

Width (in.)	Thick (in.)	Part Number
.125	.032	4020 - YYZA - 0070
.188	.032	4020 - YYZA - 0071
.250	.032	4020 - YYZA - 0072
.313	.032	4020 - YYZA - 0073
.125	.045	4020 - YYZA - 0074
.188	.045	4020 - YYZA - 0075
.250	.045	4020 - YYZA - 0076
.313	.045	4020 - YYZA - 0077
.375	.045	4020 - YYZA - 0078
.500	.045	4020 - YYZA - 0079
.625	.045	4020 - YYZA - 0080
.125	.062	4020 - YYZA - 0021
.188	.062	4020 - YYZA - 0022
.250	.062	4020 - YYZA - 0023
.313	.062	4020 - YYZA - 0024
.375	.062	4020 - YYZA - 0025
.500	.062	4020 - YYZA - 0026
.625	.062	4020 - YYZA - 0027
.125	.094	4020 - YYZA - 0028
.188	.094	4020 - YYZA - 0029
.250	.094	4020 - YYZA - 0030
.313	.094	4020 - YYZA - 0031
.375	.094	4020 - YYZA - 0032
.500	.094	4020 - YYZA - 0033
.625	.094	4020 - YYZA - 0034
.125	.125	4020 - YYZA - 0035
.188	.125	4020 - YYZA - 0036
.250	.125	4020 - YYZA - 0037
.313	.125	4020 - YYZA - 0038
.375	.125	4020 - YYZA - 0039
.500	.125	4020 - YYZA - 0040
.625	.125	4020 - YYZA - 0041
.750	.125	4020 - YYZA - 1017
.125	.156	4020 - YYZA - 0042
.125	.188	4020 - YYZA - 0043
.188	.188	4020 - YYZA - 0044
.250	.188	4020 - YYZA - 0045
.313	.188	4020 - YYZA - 0046
.375	.188	4020 - YYZA - 0047
.500	.188	4020 - YYZA - 0048
.625	.188	4020 - YYZA - 0049
.125	.250	4020 - YYZA - 0050
.188	.250	4020 - YYZA - 0051
.250	.250	4020 - YYZA - 0052
.313	.250	4020 - YYZA - 0053
.375	.250	4020 - YYZA - 0054
.500	.250	4020 - YYZA - 0055
.625	.250	4020 - YYZA - 0056
.750	.250	4020 - YYZA - 1183

FOR SIZES NOT SHOWN, PLEASE ASK!

How To Order

Sheet

By part number in feet, usually supplied in lengths of 3 feet (approximately) or joined multiples.

Strip

Use part number listed in Strip Materials box and specify number of feet needed. Standard strip length is 3 feet. Bonded, continuous lengths are available on special order.

4000 Series - Multishield

Example: Part number 4030-2020-0310 is Silicone solid Monel Multishield with no adhesive, fabricated to customer's requirements of thickness and outline. **Unless standard, the sequential number is assigned by the factory.**

4 0 X X – Y Y Z A – X X X X – MAT'L THICK

- **4000 SERIES**
- **CONFIGURATION (XX)**
  10 Sheet
  20 Strip
  30 Custom Part
  40 Standard Die-Cut Connector or Waveguide
- **ELASTOMER (YY)**
  20 Silicone Solid
  50 Silicone Sponge
- **WIRE TYPE (Z)**
  2 Monel
  3 Aluminum
- **ADHESIVE (A)**
  0 No Adhesive
  1 Pressure Sensitive
- **SEQUENTIAL (XXXX)**
- **MAT'L THICK**
  032 = .032" For 4040 Standard Connectors Only

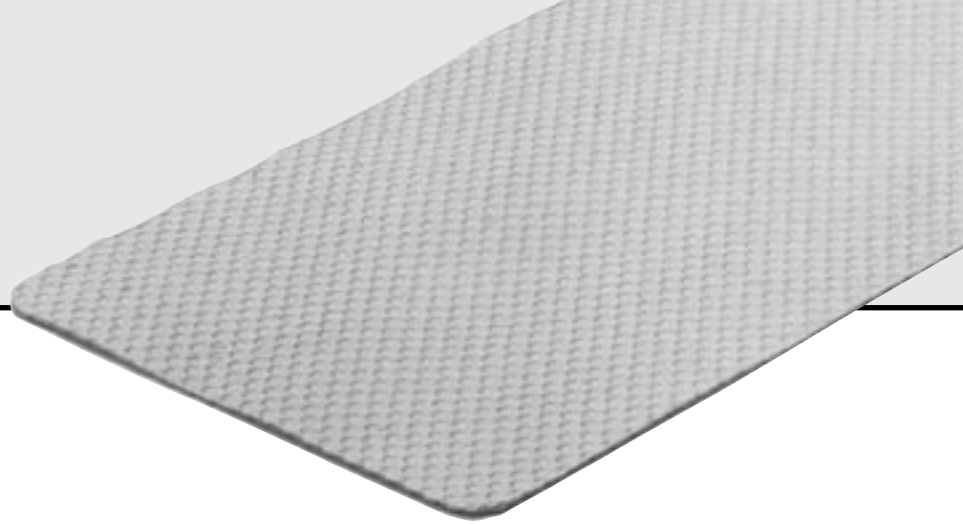
For material specifications and performance data refer to page 32.

Custom Gaskets

Multishield die-cut gaskets, like those pictured here, are available in both standard and custom configurations. See page 36 for standard gaskets.

Strip Width Tolerance		
Width	Solid	Sponge
Up to .250 in.	±0.015	±0.031
.250 in. to .375 in.	±0.031	±0.031
.375 in. to .750 in.	±0.031	±0.046
.750 in. to 1.000 in.	±0.046	±0.062

5000 Series Monoshield



Monoshield is intended for applications where the gasket is limited to 0.02 in. thickness and gap irregularities do not exceed 0.003 in. The material consists of a fine monel or aluminum which is expanded (as per MIL-S-46044) and impregnated with a 50 durometer silicone rubber. The manufacturing process exposes approximately 225 points of contact per square inch to provide an efficient EMI shield with a pressure seal good up to 50 PSI between mating surfaces. These gaskets should not be reused after having been compressed.

Monoshield can be supplied with or without silicone impregnation in sheets or die cut gaskets. For custom die cut gaskets, use the guide in Fig. 1.

Material Specifications

Expanded Monel..... QQ-N-281

Expanded Aluminum..... QQ-A-250

Solid Silicone Elastomer..... A-A-59588, Class II, Grade 50 (Formerly ZZ-R-765)

Contacts (approx.)..... 225/inch²

Temperature Range..... -60 to 219°C

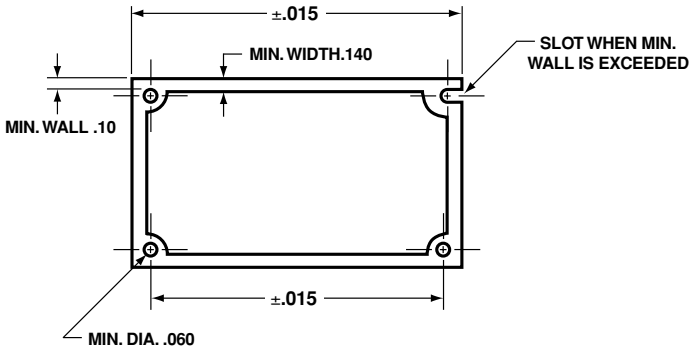
EMI Shielding Performance

	H-Field 100kHz	E-Field 10MHz	P-Field 1GHz
Monoshield	55 dB	>120 dB	85 dB

Standard Gaskets

Please refer to the Standard Product Connector and Waveguide Gaskets Section on page 36.

Fig. 1



Standard Sheet Sizes

Elastomer	Thickness x Width	Part Number
None	.020 in. x 12.0 in.	5012-Y000-0001
None	.030 in. x 12.0 in.	5013-Y000-0001
Silicone (solid)	.020 in. x 12.0 in.	5012-Y050-0001
Silicone (solid)	.030 in. x 12.0 in.	5013-Y050-0001
Thickness tolerances all types ±0.004 in. Lengths up to 25 ft.		

FOR SIZES NOT SHOWN, PLEASE ASK!

How To Order

5000 Series - Monoshield

Example: Part number 5012-2050-0110 is .020 thick silicone (solid) 5000 Series Monoshield with monel expanded metal die-cut to customer requirements. **Unless standard, the sequential number is assigned by the factory.**

5 0 X T – Y Y Z Z – X X X X

5000 SERIES

SEQUENTIAL (XXXX)

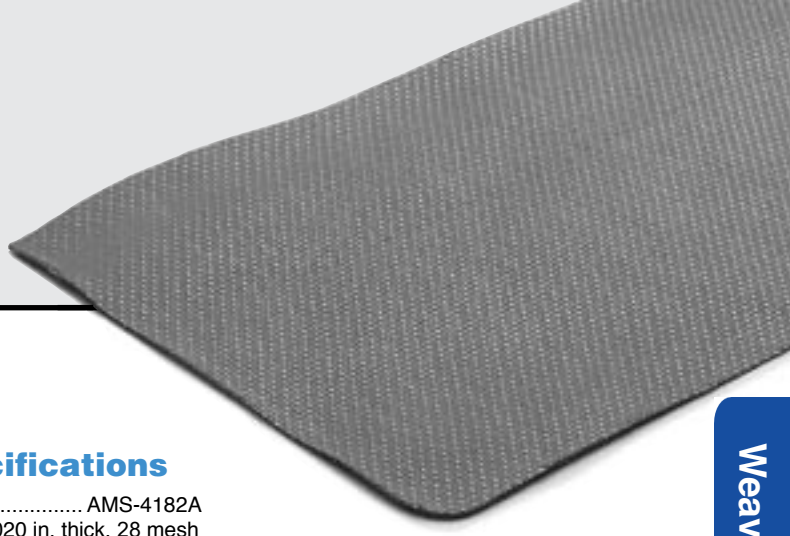
ELASTOMER (ZZ)
00 None
50 Silicone (solid)

Metal (YY)
20 Monel
30 Aluminum

THICKNESS (T)
2 .020 in. Thick
3 .030 in. Thick

CONFIGURATION (X)
1 Sheet (12.0 in. wide)
3 Fabricated Part (Custom)
7 Standard Die Cut Connector or Waveguide

5500 Series Weaveshield



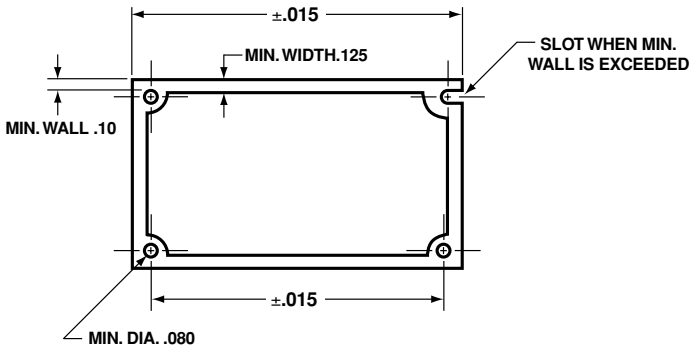
Weaveshield is a composite EMI and pressure seal gasket material used for very small gaps having a joint unevenness of no more than 0.002 in. The material is comprised of a woven aluminum wire screen impregnated with either a neoprene or silicone elastomer. A closing force of 70 to 110 PSI is recommended to obtain a moisture seal. Under favorable conditions, a pressure seal can be obtained. Weaveshield can be supplied in sheets or die cut gaskets. For custom die cut gaskets, use the guide in Fig.1.

Weaveshield can be supplied in sheets to your size specifications, or as custom die-cut gaskets like those pictured below.

Standard Gaskets

Please refer to the Standard Product Connector and Waveguide Gaskets Section on page 36.

Fig. 1



Material Specifications

Aluminum..... AMS-4182A
0.020 in. thick, 28 mesh

Neoprene or Equivalent..... AMS-3222
< 50 durometer
-40 to 100° C (-40 to 212° F)

Silicone AMS-3302D
< 50 durometer
-60 to 260° C (-76 to 500° F)

EMI Shielding Performance

	H-Field 100kHz	E-Field 10MHz	P-Field 1GHz
Weaveshield	43 dB	>100 dB	57 dB

Standard Sheet Sizes

Elastomer	Thickness x Width	Aluminum Wire	Part Number
Neoprene	.020 in. x 12.0 in.	28 mesh	5510-3225-0002
Silicone	.020 in. x 12.0 in.	28 mesh	5510-3255-0002

Thickness tolerances all types ±0.004 in.
Lengths up to 25 ft.
Consult factory for other widths.

FOR SIZES NOT SHOWN, PLEASE ASK!

How To Order

5500 Series - Weaveshield

Sequential number is assigned by the factory, and shows customer requirement in feet.

5 5 X X – Y Y Z Z – X X X X

5500 SERIES

CONFIGURATION (XX)
10 Sheet
30 Fabricated Part (Custom)
40 Standard Die Cut Connector or Waveguide

WIRE TYPE (YY)
32 Aluminum (28 mesh) .020 Thick

ELASTOMER (ZZ)
24 Neoprene .016 in.
25 Neoprene .020 in.
54 Silicone .016 in.
55 Silicone .020 in.

SEQUENTIAL (XXXX)