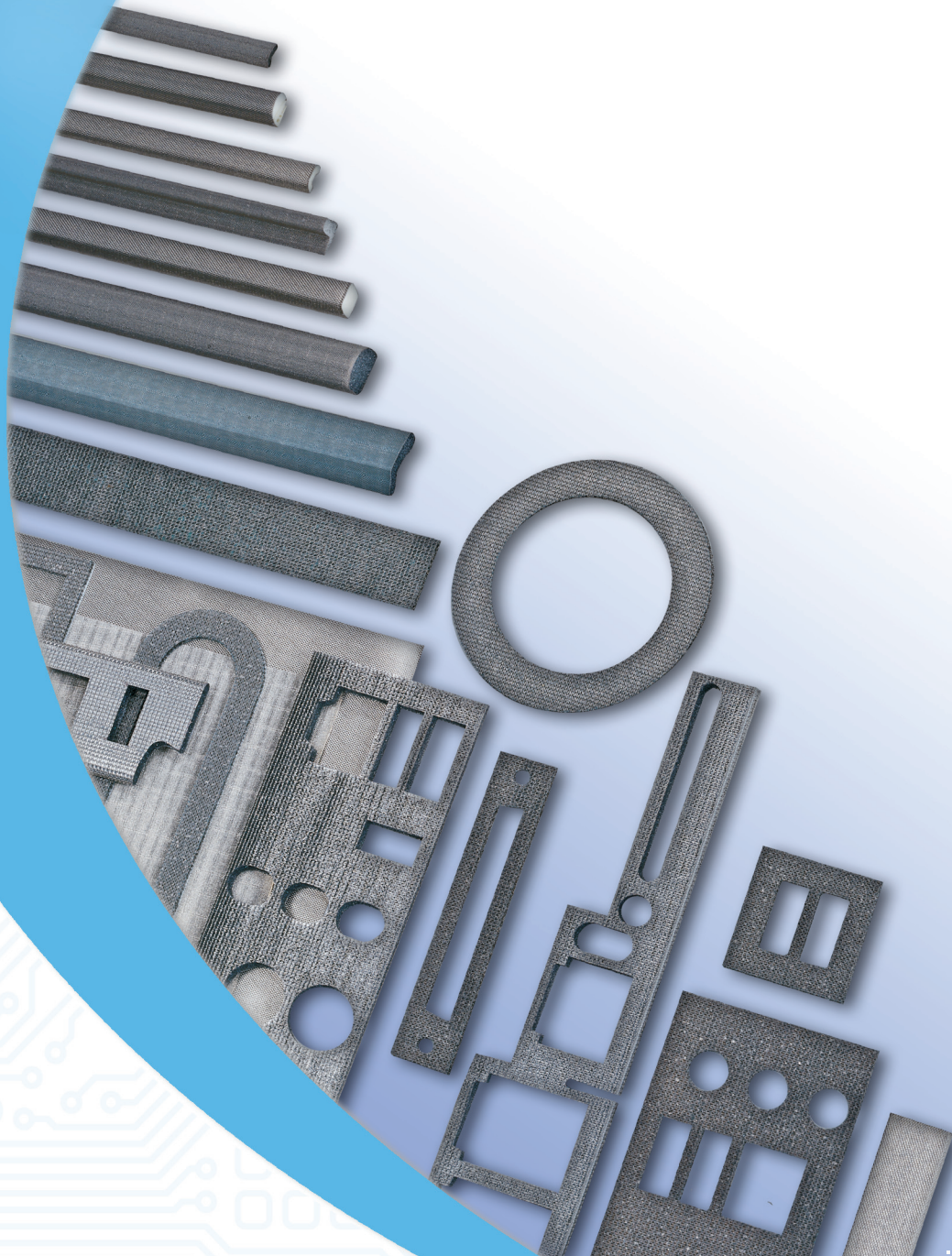


# Metallized Conductive Products



Innovative **Technology**  
for a **Connected** World

# ABOUT LAIRD TECHNOLOGIES

Laird Technologies designs and manufactures customized, performance-critical products for wireless and other advanced electronics applications.

The company is a global market leader in the design and supply of electromagnetic interference (EMI) shielding, thermal management products, mechanical actuation systems, signal integrity components, and wireless antennae solutions, as well as radio frequency (RF) modules and systems.

Laird Technologies is the world leader in the design and manufacture of customized, performance-critical products for wireless and other advanced electronics applications. Laird Technologies partners with its customers to customize product solutions for applications in many industries including:

- Network Equipment
- Handsets
- Telecommunications
- Data Transfer & Information Technology
- Computers
- Automotive Electronics
- Aerospace
- Defense
- Medical Equipment
- Consumer Electronics
- Industrial

Laird Technologies offers its customers unique product solutions, dedication to research and development, as well as a seamless network of manufacturing and customer support facilities across the globe.

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# ECOGREEN™

## ENVIRONMENTALLY FRIENDLY FABRIC-OVER-FOAM SHIELDING GASKETS

Laird Technologies is pleased to introduce the next generation in RoHS-compliant EMI shielding technology.

While Laird Technologies' Fabric-Over-Foam EMI gaskets are RoHS compliant, we are proactively strengthening our compliancy by engineering halogen-free EcoGreen™ shields.

Not only are the patented EcoGreen™ shields environmentally friendly, they offer high EMI shielding effectiveness, extremely low compression forces, abrasion-resistant metallized fabrics, large service temperature ranges, and multiple profile/gasket options.

Laird Technologies' shields are flame retardant and pass the stringent UL94-VO burn test.

### KEY FEATURES

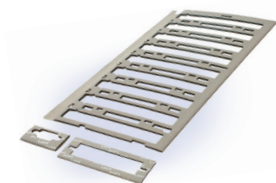
- Halogen-free; meets IEC 61249-2-21 standard
- Profiles and I/O gaskets are available with pressure sensitive adhesive (PSA) tape
- Profiles can be cut to specified lengths, kiss-cut release liner or mitered to form frame configurations
- Shielding effectiveness of > 100 dB
- Extremely low compression force allows the use of lighter weight materials with less fastening and hinge hardware.
- Low surface resistivity as low as < 0.07 ohms/square provides improved conductivity (ASTM F390\*)
- Service temperature range from -40°F to 158°F (-40°C to 70°C)

### APPLICATIONS

- Computer servers
- Desktop computers
- Digital cameras
- Internal/external hard drives
- Liquid Crystal Displays (LCDs)
- Medical equipment
- Notebook computers
- Plasma Display Panels (PDPs)
- Printers
- Set-top boxes
- Telecommunications enclosure cabinets

### AGENCY APPROVALS

- UL designation V0 041
- UL file #OCDT2.E170327
- UL yellow card (found at [www.ul.com](http://www.ul.com))



## ECOGREEN™

Laird Technologies is pleased to introduce the next generation in RoHS compliant EMI shielding technology. Presently all of Laird Technologies' Fabric-Over-Foam EMI gaskets are RoHS compliant. Laird Technologies is proactively strengthening our compliancy by engineering EcoGreen™ shields that are halogen-free. Not only are the patented EcoGreen™ shields environmentally friendly, but they also offer high EMI shielding effectiveness, extremely low compression forces, abrasion resistant metallized fabrics, large service temperature ranges and multiple profile/gasket options. Since Laird Technologies' shields are flame retardant, the shields pass the stringent UL94-V0 burn test.

## TYPICAL APPLICATIONS:

- Computer servers
- Desktop computers
- Digital cameras
- Internal and external hard drives
- Liquid Crystal Displays (LCDs)
- Medical equipment
- Notebook computers
- Plasma Display Panels
- Printers
- Set top boxes
- Telecommunications enclosure cabinets

## AGENCY APPROVALS

- UL designation V0 041
- UL File #OCDT2.E170327
- UL Yellow Card can be found at [www.ul.com](http://www.ul.com)

## ENVIRONMENTALLY FRIENDLY

- Halogen-free; per the IEC 61249-2-21 standard

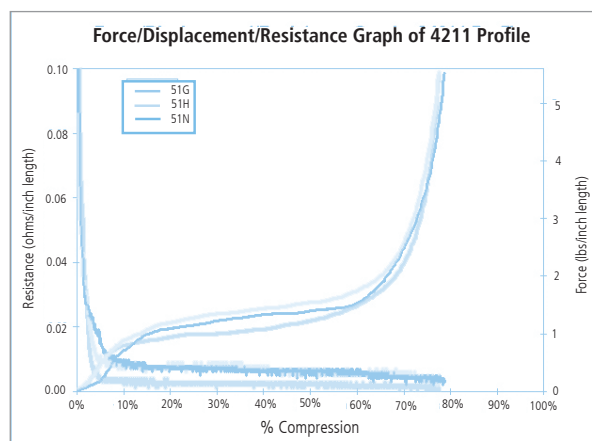
## PERFORMANCE AND BENEFITS

- Profiles and I/O gaskets are available with a pressure sensitive adhesive (PSA) tape
- Profiles can be cut to specified lengths, kiss-cut release liner or mitered to form frame configurations

## HIGH SHIELDING EFFECTIVENESS

- Shielding effectiveness of > 100 dB
- Extremely low compression forces allow lighter weight materials, with less fastening and hinge hardware.
- Low surface resistivity as low as <0.07 ohms/square provides improved conductivity (ASTM F390)
- Service temperature range from - 40°F to 158°F (- 40°C to 70°C)

FIGURE 1



## Fabric

| Product Number | Fabric Type | Metal Coating | Conductivity      | Application            | Benefits                                  |
|----------------|-------------|---------------|-------------------|------------------------|---|
| 51G            | Ripstop     | Ni/Cu         | <0.07 ohms/square | I/O or Profile Gaskets | Flame retardant, high abrasion resistance |
| 51H            | Taffeta     | Ni/Cu         | <0.07 ohms/square | I/O or Profile Gaskets | Flame retardant, abrasion resistant       |
| 51N            | Knit Mesh   | Ni/Cu         | <0.10 ohms/square | I/O or Profile Gaskets | Low cost, flame retardant                 |

## Foam

| Foam Type            | Compression Set (ASTM D 3574) | Color    | Application            | Benefits  |
|----------------------|-------------------------------|----------|------------------------|---|
| Urethane (Polyester) | 5-10%                         | Charcoal | I/O or Profile Gaskets | Simple, moderate shapes, low compression force/compression set, flame retardant |

## Pressure Sensitive Adhesive

| Pressure Sensitive Adhesive | Thickness | Benefits                                    |
|-----------------------------|-----------|---|
| Acrylic Non-conductive      | 0.005"    | High Peel Strength, Temperature Resistant   |
| Acrylic Conductive          | 0.004"    | Electrically Conductive in Z-Axis Direction |



# METALLIZED FABRIC-OVER FOAM SHIELDING GASKETS

Laird Technologies is a fully integrated manufacturer of profile and Input/Output (I/O) EMI shielding gaskets. The metallized Fabric-Over-Foam product line has been expanded greatly due to our committed efforts in new product development and meeting or surpassing regulatory requirements.

This catalog is designed to provide helpful information to engineers on our expanded product line. In this section, you will find benefits for Fabric-Over-Foam gaskets, material options and an extensive list of profile and I/O sizes and configurations.

Laird Technologies specializes in quick turnaround of custom shapes and sizes of EMI shielding gaskets. If you don't find exactly what you need, our engineers will help you design the right solution to your shielding problem.

A sampling for standard profiles are shown; custom configurations and sizes can be designed to meet your specific requirements. Profiles are shown in ascending order by height (starting on page X).

## BENEFITS OF FABRIC-OVER-FOAM GASKETS

- Shielding effectiveness of >100 dB across a wide spectrum of frequencies (see figure 2).
- Extremely low compression forces allow for use of lighter materials (see figure 1).
- Low Surface Resistivity as low as 0.07 ohms/square dependent on the fabric. Fabric-Over-Foam gaskets provide improved conductivity (ASTM F390).
- A wide range of flame retardant gaskets are available (UL recognized per UL94 V0 or UL94 HB). UL yellow cards available on request.
- Abrasion resistant metallized fabrics show virtually no degradation in shielding performance. See chart on page X.
- Urethane core provide low compression set ensuring long-term reliability of gasket performance. Contact Engineering for profile specific data.
- Service temperatures from -40°F to 158°F (-40°C to 70°C).
- Available in Nickel/Copper (Ni/Cu) and Tin/Copper (Sn/Cu) to ensure galvanic compatibility with a wide variety of host materials. Both versions display no significant performance degradation after environmental exposure per the Accelerated Aging Test (ASTM B845-93 Method H).
- Prototype samples can be provided quickly utilizing laser technology, CAD/CAM equipment, and customer supplied drawings in DWG®, DXF®, IGS, PRT®, DRW®, STP®, and CT® file formats.
- Profile and I/O gaskets are available with a variety of pressure sensitive adhesive (PSA) tapes, including Easy Peel® with extra wide release liner to facilitate quick assembly.
- Profile gaskets can be cut to specified lengths, kiss-cut on release liner, or mitered to form frame configurations.

The recommended operating compression for Fabric-Over-Foam EMI Gaskets will vary depending on the shape and size of the particular gasket.

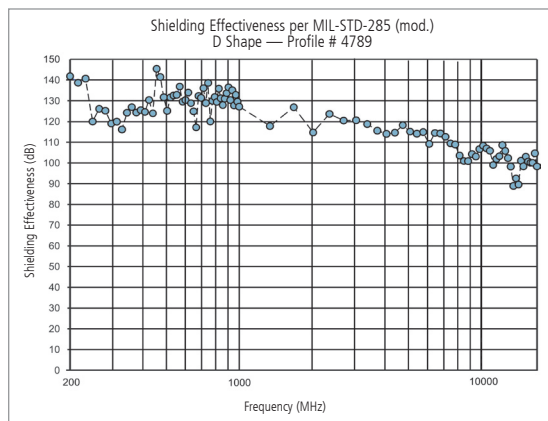
Typically, D-Shaped, Rectangular Shaped, and Square Shaped Fabric-Over-Foam EMI Gaskets should be compressed between 30% and 50% of the foam height.

Similarly, C-Shaped Fabric-Over-Foam EMI Gaskets should typically be compressed between 50% and 75% of the gasket height.

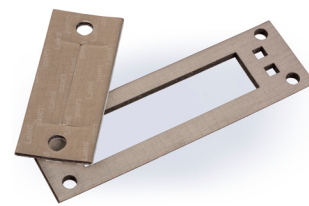
Force Displacement Resistance (FDR) graphs are available upon request. Please contact engineering when unsure.

Certain combinations of materials may not be available for all Profiles or I/Os. Please consult the Engineering Department at Laird Technologies when unsure.

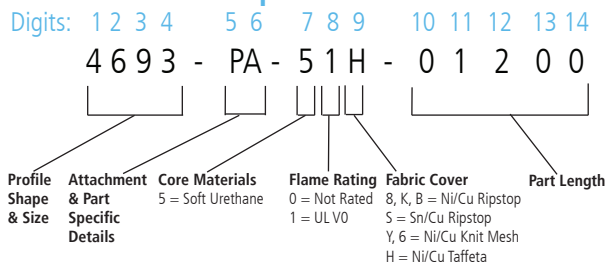
FIGURE 2



# FABRIC-OVER-FOAM I/O GASKET SELECTION GUIDE



## Part Number Example:



\* Certain combinations of materials may not be available for all Profiles or I/Os.  
Please consult the Engineering Department at Laird Technologies when unsure.

See back cover for contact information.

## DIGITS 1 THROUGH 4

Designate profile number. Select profile or I/O and sizes from pages 9-13 (Profile) or 15-17 (I/O).

## DIGITS 5 THROUGH 6

Designate part-specific attributes of the product including cutouts, notches, tape and a variety of other customized details. PA STD PSA / PB STD PSA W/ ERL / PC STD CPSA

## DIGITS 7 THROUGH 9

Designate the core materials, flame rating and fabric cover combinations. Select these options from the recommended list in the table below.

## DIGITS 10 THROUGH 14

Designate the part length in inches to two decimal places. For the example shown above, the "01200" denotes a 12.00 inch (304,8mm) long gasket).

| Fabric        | Non-Rated<br>RoHS Compliant | UL94-V0 Rated<br>RoHS Compliant | UL94-V0 Rated<br>RoHS Compliant<br>Halogen-Free EcoGreen™ | Typical Apps                    | Shielding |
|---------------|-----------------------------|---------------------------------|---|---------------------------------|-----------|
| Ni/Cu Mesh    | 506                         |                                 | 51N   | Compos Only                     | Medium    |
| Ni/Cu Taffeta | 501                         |                                 | 51H   | Comp/Shear                      | High      |
| Ni/Cu NRS     | 50B                         |                                 | 51G   | Comp/Shear                      | High      |
| Ni/Cu NRS     |                             | H1K                             |   | C-Fold Only                     | High      |
| Sn/Cu NRS     |                             |                                 | 51S   | Comp/Shear<br>Harsh Environment | High      |



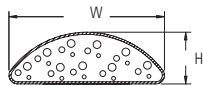
All parts listed in this catalog are lead free and RoHS compliant.





# FABRIC-OVER-FOAM PROFILE SELECTION GUIDE

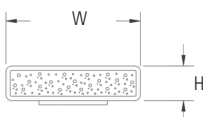
## D-SHAPED



| Profile Number | inches (mm)<br>H | inches (mm)<br>W |
|----------------|------------------|------------------|
| 4584           | 0.040 (1,0)      | 0.150 (3,8)      |
| 4320           | 0.050 (1,3)      | 0.140 (3,6)      |
| 4541           | 0.050 (1,3)      | 0.250 (6,4)      |
| 4358           | 0.060 (1,5)      | 0.098 (2,5)      |
| 4184           | 0.060 (1,5)      | 0.150 (3,8)      |
| 4548           | 0.060 (1,5)      | 0.250 (6,4)      |
| 4356           | 0.070 (1,8)      | 0.180 (4,6)      |
| 4052           | 0.080 (2,0)      | 0.080 (2,0)      |
| 4283           | 0.080 (2,0)      | 0.157 (4,0)      |
| 4181           | 0.080 (2,0)      | 0.394 (10,0)     |
| 4053           | 0.090 (2,3)      | 0.090 (2,3)      |
| 4912           | 0.090 (2,3)      | 0.150 (3,8)      |
| 4375           | 0.094 (2,4)      | 0.200 (5,1)      |
| 4240           | 0.100 (2,5)      | 0.300 (7,6)      |
| 4742           | 0.120 (3,0)      | 0.150 (3,8)      |
| 4202           | 0.120 (3,0)      | 0.250 (6,4)      |
| 4078           | 0.120 (3,0)      | 0.360 (9,1)      |
| 4090           | 0.125 (3,2)      | 0.090 (2,3)      |

| Profile Number | H inches (mm)<br>H | W inches (mm)<br>W |
|----------------|--------------------|--------------------|
| 4906           | 0.130 (3,3)        | 0.188 (4,8)        |
| 4692           | 0.140 (3,6)        | 0.250 (6,4)        |
| 4228           | 0.150 (3,8)        | 0.150 (3,8)        |
| 4123           | 0.150 (3,8)        | 0.354 (9,0)        |
| 4112           | 0.158 (4,0)        | 0.433 (11,0)       |
| 4120           | 0.160 (4,1)        | 0.240 (6,1)        |
| 4295           | 0.170 (4,3)        | 0.250 (6,4)        |
| 4609           | 0.180 (4,6)        | 0.400 (10,2)       |
| 4787           | 0.200 (5,1)        | 0.250 (6,4)        |
| 4134           | 0.197 (5,0)        | 0.394 (10,0)       |
| 4607           | 0.200 (5,1)        | 0.480 (12,2)       |
| 4242           | 0.250 (6,4)        | 0.250 (6,4)        |
| 4542           | 0.248 (6,3)        | 0.291 (7,4)        |
| 4789           | 0.250 (6,4)        | 0.375 (9,5)        |
| 4368           | 0.299 (7,6)        | 0.272 (6,9)        |
| 4105           | 0.375 (9,5)        | 0.500 (12,7)       |
| 4060           | 0.500 (12,7)       | 0.500 (12,7)       |

## RECTANGLE SHAPED



| Profile Number | inches (mm)<br>H | inches (mm)<br>W |
|----------------|------------------|------------------|
| *4570          | 0.015 (0,4)      | 0.200 (5,1)      |
| *4577          | 0.015 (0,4)      | 0.276 (7,0)      |
| *4572          | 0.015 (0,4)      | 0.394 (10,0)     |
| *4300          | 0.017 (0,4)      | 0.826 (21,0)     |
| *4058          | 0.020 (0,5)      | 0.157 (4,0)      |
| *4569          | 0.020 (0,5)      | 0.196 (5,0)      |
| *4500          | 0.020 (0,5)      | 1.217 (30,9)     |
| *4501          | 0.020 (0,5)      | 1.970 (50,0)     |
| *4850          | 0.030 (0,8)      | 0.900 (22,9)     |
| 4245           | 0.040 (1,0)      | 0.120 (3,0)      |
| 4223           | 0.040 (1,0)      | 0.157 (4,0)      |
| 4220           | 0.040 (1,0)      | 0.200 (5,1)      |
| 4404           | 0.040 (1,0)      | 0.236 (6,0)      |
| 4215           | 0.040 (1,0)      | 0.275 (7,0)      |
| 4208           | 0.040 (1,0)      | 0.395 (10,0)     |
| 4219           | 0.040 (1,0)      | 0.510 (13,0)     |
| 4259           | 0.040 (1,0)      | 0.600 (15,2)     |
| 4677           | 0.040 (1,0)      | 0.709 (18,0)     |
| 4532           | 0.040 (1,0)      | 0.750 (19,1)     |
| 4597           | 0.040 (1,0)      | 0.900 (22,9)     |
| 4297           | 0.040 (1,0)      | 1.000 (25,4)     |
| 4363           | 0.040 (1,0)      | 1.126 (28,6)     |
| 4179           | 0.040 (1,0)      | 1.431 (36,3)     |
| 4512           | 0.040 (1,0)      | 1.640 (41,7)     |
| 4270           | 0.040 (1,0)      | 1.770 (45,0)     |
| 4573           | 0.040 (1,0)      | 1.840 (46,7)     |
| 4394           | 0.040 (1,0)      | 3.300 (83,8)     |
| 4246           | 0.050 (1,3)      | 0.090 (2,3)      |
| 4088           | 0.050 (1,3)      | 0.220 (5,6)      |
| 4086           | 0.060 (1,5)      | 0.850 (21,6)     |
| 4273           | 0.060 (1,5)      | 0.125 (3,2)      |
| 4056           | 0.060 (1,5)      | 0.200 (5,1)      |
| 4157           | 0.060 (1,5)      | 0.280 (7,1)      |
| 4629           | 0.060 (1,5)      | 0.394 (10,0)     |
| 4051           | 0.060 (1,5)      | 0.500 (12,7)     |
| 4455           | 0.060 (1,5)      | 0.551 (14,0)     |
| 4430           | 0.060 (1,5)      | 0.591 (15,0)     |
| 4626           | 0.060 (1,5)      | 0.608 (15,4)     |
| 4606           | 0.060 (1,5)      | 0.620 (15,7)     |
| 4579           | 0.060 (1,5)      | 0.650 (16,5)     |
| 4164           | 0.060 (1,5)      | 0.750 (19,1)     |

| Profile Number | inches (mm)<br>H | inches (mm)<br>W |
|----------------|------------------|------------------|
| 4170           | 0.060 (1,5)      | 0.866 (22,0)     |
| 4225           | 0.060 (1,5)      | 0.900 (22,9)     |
| 4080           | 0.060 (1,5)      | 1.000 (25,4)     |
| 4599           | 0.060 (1,5)      | 1.063 (27,0)     |
| 4518           | 0.060 (1,5)      | 1.235 (31,4)     |
| 4079           | 0.060 (1,5)      | 1.330 (33,8)     |
| 4161           | 0.060 (1,5)      | 1.370 (34,8)     |
| 4163           | 0.060 (1,5)      | 1.400 (35,6)     |
| 4591           | 0.060 (1,5)      | 1.455 (37,0)     |
| 4091           | 0.060 (1,5)      | 1.525 (38,7)     |
| 4628           | 0.060 (1,5)      | 1.575 (40,0)     |
| 4231           | 0.060 (1,5)      | 1.615 (41,0)     |
| 4679           | 0.060 (1,5)      | 1.693 (43,0)     |
| 4408           | 0.060 (1,5)      | 1.740 (44,2)     |
| 4148           | 0.060 (1,5)      | 1.878 (47,7)     |
| 4169           | 0.060 (1,5)      | 1.900 (48,3)     |
| 4160           | 0.060 (1,5)      | 2.305 (58,5)     |
| 4235           | 0.060 (1,5)      | 2.52 (64,0)      |
| 4596           | 0.060 (1,5)      | 3.091 (78,5)     |
| 4907           | 0.060 (1,5)      | 3.780 (96,0)     |
| 4071           | 0.062 (1,6)      | 0.300 (7,6)      |
| 4171           | 0.062 (1,6)      | 0.870 (22,1)     |
| 4143           | 0.062 (1,6)      | 2.000 (50,8)     |
| 4268           | 0.070 (1,8)      | 0.160 (4,1)      |
| 4302           | 0.070 (1,8)      | 0.551 (14,0)     |
| 4199           | 0.070 (1,8)      | 0.650 (16,5)     |
| 4410           | 0.070 (1,8)      | 1.063 (27,0)     |
| 4688           | 0.079 (2,0)      | 0.118 (3,0)      |
| 4392           | 0.079 (2,0)      | 0.354 (9,0)      |
| 4094           | 0.080 (2,0)      | 0.160 (4,1)      |
| 4186           | 0.080 (2,0)      | 0.200 (5,1)      |
| 4602           | 0.080 (2,0)      | 0.236 (6,0)      |
| 4096           | 0.080 (2,0)      | 0.275 (7,0)      |
| 4650           | 0.080 (2,0)      | 0.295 (7,5)      |
| 4601           | 0.080 (2,0)      | 0.315 (8,0)      |
| 4357           | 0.080 (2,0)      | 0.394 (10,0)     |
| 4182           | 0.080 (2,0)      | 0.400 (10,2)     |
| 4675           | 0.080 (2,0)      | 0.535 (13,6)     |
| 4359           | 0.080 (2,0)      | 0.710 (18,0)     |
| 4571           | 0.080 (2,0)      | 0.787 (20,0)     |
| 4200           | 0.080 (2,0)      | 0.827 (21,0)     |

All dimensions shown are in inches (millimeters) unless otherwise specified.  
\* Gaskets less than 0.040" thick are constructed without foam.



# FABRIC-OVER-FOAM PROFILE SELECTION GUIDE



## Rectangle Shaped Continued

| Profile Number | inches (mm)<br>H | inches (mm)<br>W |
|----------------|------------------|------------------|
| 4361           | 0.080 (2,0)      | 0.900 (22,9)     |
| 4325           | 0.080 (2,0)      | 0.984 (25,0)     |
| 4194           | 0.080 (2,0)      | 1.126 (28,6)     |
| 4389           | 0.080 (2,0)      | 1.259 (32,0)     |
| 4315           | 0.080 (2,0)      | 1.345 (34,2)     |
| 4531           | 0.080 (2,0)      | 1.550 (39,4)     |
| 4263           | 0.080 (2,0)      | 1.615 (41,0)     |
| 4260           | 0.080 (2,0)      | 1.842 (46,8)     |
| 4262           | 0.080 (2,0)      | 1.736 (44,1)     |
| 4355           | 0.080 (2,0)      | 5.340 (135,6)    |
| 4339           | 0.090 (2,3)      | 0.200 (5,1)      |
| 4903           | 0.090 (2,3)      | 0.535 (13,6)     |
| 4248           | 0.090 (2,3)      | 1.060 (26,9)     |
| 4254           | 0.090 (2,3)      | 1.370 (34,8)     |
| 4255           | 0.090 (2,3)      | 1.655 (42,0)     |
| 4256           | 0.090 (2,3)      | 1.700 (43,2)     |
| 4801           | 0.100 (2,5)      | 0.265 (6,7)      |
| 4082           | 0.100 (2,5)      | 0.375 (9,5)      |
| 4612           | 0.100 (2,5)      | 0.500 (12,7)     |
| 4133           | 0.100 (2,5)      | 0.354 (9,0)      |
| 4285           | 0.100 (2,5)      | 1.330 (33,8)     |
| 4582           | 0.100 (2,5)      | 1.500 (38,1)     |
| 4330           | 0.100 (2,5)      | 1.625 (41,3)     |
| 4083           | 0.110 (2,8)      | 0.240 (6,1)      |
| 4042           | 0.118 (3,0)      | 0.125 (3,2)      |
| 4619           | 0.118 (3,0)      | 0.197 (5,0)      |
| 4272           | 0.118 (3,0)      | 0.315 (8,0)      |
| 4286           | 0.118 (3,0)      | 0.394 (10,0)     |
| 4583           | 0.118 (3,0)      | 0.787 (20,0)     |
| 4126           | 0.118 (3,0)      | 1.717 (43,6)     |
| 4209           | 0.120 (3,0)      | 0.155 (3,9)      |
| 4210           | 0.120 (3,0)      | 0.355 (9,0)      |
| 4264           | 0.120 (3,0)      | 0.750 (19,1)     |
| 4536           | 0.120 (3,0)      | 1.551 (39,4)     |
| 4788           | 0.125 (3,2)      | 0.250 (6,4)      |
| 4694           | 0.125 (3,2)      | 0.500 (12,7)     |
| 4065           | 0.125 (3,2)      | 0.600 (15,2)     |
| 4247           | 0.125 (3,2)      | 0.700 (17,8)     |
| 4376           | 0.125 (3,2)      | 0.720 (18,3)     |
| 4064           | 0.125 (3,2)      | 1.000 (25,4)     |
| 4603           | 0.125 (3,2)      | 1.125 (28,6)     |
| 4066           | 0.125 (3,2)      | 1.250 (31,8)     |
| 4158           | 0.125 (3,2)      | 1.400 (35,6)     |
| 4239           | 0.125 (3,2)      | 1.615 (41,0)     |
| 4238           | 0.125 (3,2)      | 1.850 (47,0)     |
| 4693           | 0.130 (3,3)      | 0.190 (4,8)      |
| 4062           | 0.130 (3,3)      | 0.380 (9,7)      |
| 4694           | 0.130 (3,3)      | 0.500 (12,7)     |
| 4632           | 0.125 (3,2)      | 1.625 (41,3)     |
| 4575           | 0.125 (3,2)      | 2.000 (50,8)     |
| 4615           | 0.138 (3,5)      | 0.197 (5,0)      |
| 4594           | 0.138 (3,5)      | 0.350 (8,9)      |
| 4525           | 0.140 (3,6)      | 0.512 (13,0)     |
| 4203           | 0.150 (3,8)      | 0.100 (2,5)      |
| 4047           | 0.150 (3,8)      | 0.500 (12,7)     |
| 4533           | 0.156 (4,0)      | 0.630 (16,0)     |
| 4799           | 0.156 (4,0)      | 0.650 (16,5)     |
| 4914           | 0.156 (4,0)      | 0.709 (18,0)     |
| 4499           | 0.157 (4,0)      | 0.197 (5,0)      |
| 4741           | 0.157 (4,0)      | 0.256 (6,5)      |

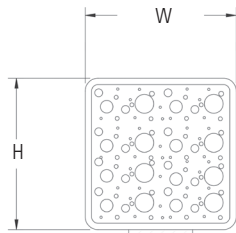
| Profile Number | inches (mm)<br>H | inches (mm)<br>W |
|----------------|------------------|------------------|
| 4055           | 0.157 (4,0)      | 0.315 (8,0)      |
| 4516           | 0.157 (4,0)      | 0.354 (9,0)      |
| 4791           | 0.157 (4,0)      | 0.394 (10,0)     |
| 4098           | 0.157 (4,0)      | 0.591 (15,0)     |
| 4704           | 0.158 (4,0)      | 0.236 (6,0)      |
| 4241           | 0.160 (4,1)      | 0.200 (5,1)      |
| 4253           | 0.160 (4,1)      | 0.280 (7,1)      |
| 4114           | 0.158 (4,0)      | 0.433 (11,0)     |
| 4115           | 0.160 (4,1)      | 0.590 (15,0)     |
| 4249           | 0.160 (4,1)      | 0.790 (20,1)     |
| 4257           | 0.160 (4,1)      | 0.880 (22,4)     |
| 4252           | 0.160 (4,1)      | 0.985 (25,0)     |
| 4250           | 0.160 (4,1)      | 1.375 (34,9)     |
| 4251           | 0.160 (4,1)      | 1.700 (43,2)     |
| 4142           | 0.177 (4,5)      | 0.354 (9,0)      |
| 4370           | 0.180 (4,6)      | 2.000 (50,8)     |
| 4902           | 0.196 (5,0)      | 0.315 (8,0)      |
| 4258           | 0.190 (4,8)      | 1.625 (41,3)     |
| 4698           | 0.195 (5,0)      | 0.130 (3,3)      |
| 4211           | 0.195 (5,0)      | 0.395 (10,0)     |
| 4674           | 0.197 (5,0)      | 0.512 (13,0)     |
| 4360           | 0.197 (5,0)      | 0.591 (15,0)     |
| 4281           | 0.200 (5,1)      | 3.900 (99,1)     |
| 4365           | 0.216 (5,5)      | 0.394 (10,0)     |
| 4100           | 0.216 (5,5)      | 0.500 (12,7)     |
| 4786           | 0.217 (5,5)      | 0.394 (10,0)     |
| 4528           | 0.217 (5,5)      | 0.709 (18,0)     |
| 4087           | 0.225 (5,7)      | 0.218 (5,5)      |
| 4701           | 0.250 (6,4)      | 0.375 (9,5)      |
| 4795           | 0.250 (6,4)      | 0.500 (12,7)     |
| 4798           | 0.250 (6,4)      | 0.600 (15,2)     |
| 4226           | 0.250 (6,4)      | 0.750 (19,1)     |
| 4224           | 0.250 (6,4)      | 1.000 (25,4)     |
| 4705           | 0.256 (6,5)      | 0.236 (6,0)      |
| 4740           | 0.256 (6,5)      | 0.394 (10,0)     |
| 4649           | 0.275 (7,0)      | 0.394 (10,0)     |
| 4568           | 0.275 (7,0)      | 0.511 (13,0)     |
| 4113           | 0.276 (7,0)      | 0.433 (11,0)     |
| 4227           | 0.283 (7,2)      | 1.180 (30,0)     |
| 4222           | 0.295 (7,5)      | 0.591 (15,0)     |
| 4237           | 0.295 (7,5)      | 1.500 (38,1)     |
| 4057           | 0.315 (8,0)      | 0.157 (4,0)      |
| 4687           | 0.315 (8,0)      | 0.236 (6,0)      |
| 4216           | 0.315 (8,0)      | 0.395 (10,0)     |
| 4610           | 0.335 (8,5)      | 0.394 (10,0)     |
| 4702           | 0.375 (9,5)      | 0.250 (6,4)      |
| 4081           | 0.375 (9,5)      | 0.500 (12,7)     |
| 4070           | 0.375 (9,5)      | 0.750 (19,1)     |
| 4192           | 0.375 (9,5)      | 1.000 (25,4)     |
| 4176           | 0.394 (10,0)     | 0.787 (20,0)     |
| 4513           | 0.413 (10,5)     | 0.394 (10,0)     |
| 4173           | 0.413 (10,5)     | 0.512 (13,0)     |
| 4524           | 0.452 (11,5)     | 0.472 (12,0)     |
| 4391           | 0.500 (13,0)     | 0.984 (25,0)     |
| 4172           | 0.591 (15,0)     | 0.394 (10,0)     |
| 4233           | 0.600 (15,2)     | 1.000 (25,4)     |
| 4136           | 0.670 (17,0)     | 0.591 (15,0)     |
| 4900           | 0.700 (17,8)     | 0.500 (12,7)     |
| 4686           | 0.709 (18,0)     | 0.394 (10,0)     |
| 4744           | 0.787 (20,0)     | 0.580 (14,7)     |

All dimensions shown are in inches (millimeters) unless otherwise specified.



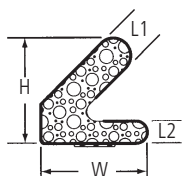
# FABRIC-OVER-FOAM PROFILE SELECTION GUIDE

## SQUARE SHAPED



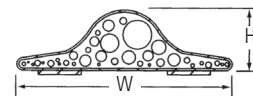
| Profile Number | inches (mm)<br>H | inches (mm)<br>W |
|----------------|------------------|------------------|
| 4520           | 0.080 (2,0)      | 0.080 (2,0)      |
| 4046           | 0.118 (3,0)      | 0.118 (3,0)      |
| 4522           | 0.157 (4,0)      | 0.157 (4,0)      |
| 4212           | 0.195 (5,0)      | 0.195 (5,0)      |
| 4048           | 0.236 (6,0)      | 0.236 (6,0)      |
| 4049           | 0.250 (6,4)      | 0.250 (6,4)      |
| 4695           | 0.375 (9,5)      | 0.375 (9,5)      |
| 4206           | 0.395 (10,0)     | 0.395 (10,0)     |
| 4084           | 0.500 (12,7)     | 0.500 (12,7)     |
| 4204           | 0.670 (17,0)     | 0.670 (17,0)     |
| 4517           | 0.750 (19,1)     | 0.750 (19,1)     |
| 4089           | 0.787 (20,0)     | 0.787 (20,0)     |

## C-FOLD SHAPED



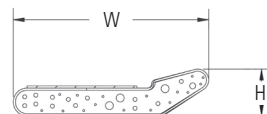
| Profile Number | inches (mm)<br>H | inches (mm)<br>W | inches (mm)<br>L1 | inches (mm)<br>L2 |
|----------------|------------------|------------------|-------------------|-------------------|
| 4593           | 0.250 (6,4)      | 0.280 (7,1)      | 0.125 (3,2)       | 0.060 (1,5)       |
| 4168           | 0.315 (8,0)      | 0.315 (8,0)      | 0.080 (2,0)       | 0.080 (2,0)       |
| 4198           | 0.385 (9,8)      | 0.420 (10,7)     | 0.115 (2,9)       | 0.060 (1,5)       |
| 4243           | 0.400 (10,2)     | 0.430 (10,9)     | 0.125 (3,2)       | 0.060 (1,5)       |
| 4600           | 0.415 (10,5)     | 0.450 (11,4)     | 0.135 (3,4)       | 0.650 (1,7)       |
| 4529           | 0.465 (11,8)     | 0.420 (10,7)     | 0.115 (2,9)       | 0.060 (1,5)       |
| 4697           | 0.675 (17,1)     | 0.590 (15,0)     | 0.165 (4,2)       | 0.156 (4,0)       |
| 4703           | 0.947 (24,1)     | 0.550 (14,0)     | 0.157 (4,0)       | 0.170 (4,3)       |

## BELL SHAPED



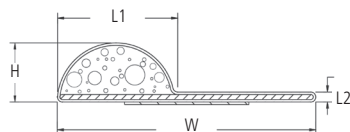
| Profile Number | inches (mm)<br>H | inches (mm)<br>W |
|----------------|------------------|------------------|
| 4630           | 0.070 (1,8)      | 0.180 (4,6)      |
| 4379           | 0.070 (1,8)      | 0.564 (14,3)     |
| 4387           | 0.080 (2,0)      | 0.675 (17,1)     |
| 4633           | 0.100 (2,5)      | 0.300 (7,6)      |
| 4131           | 0.140 (3,6)      | 0.500 (12,7)     |

## KNIFE SHAPED



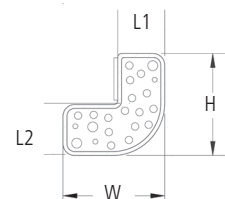
| Profile Number | inches (mm)<br>H | inches (mm)<br>W |
|----------------|------------------|------------------|
| 4797           | 0.106 (2,7)      | 0.445 (11,3)     |
| 4097           | 0.106 (2,7)      | 0.315 (8,0)      |
| 4796           | 0.110 (2,8)      | 0.450 (11,4)     |
| 4205           | 0.250 (6,4)      | 0.750 (19,1)     |
| 4106           | 0.312 (7,9)      | 0.707 (18,0)     |
| 4189           | 0.350 (8,9)      | 0.750 (19,1)     |

## P-SHAPED



| Profile Number | inches (mm)<br>H | inches (mm)<br>W | inches (mm)<br>L1 | inches (mm)<br>L2 |
|----------------|------------------|------------------|-------------------|-------------------|
| 4150           | 0.118 (3,0)      | 0.520 (13,2)     | 0.242 (6,1)       | 0.020 (0,50)      |
| 4699           | 0.145 (3,7)      | 0.520 (13,2)     | 0.150 (3,8)       | 0.020 (0,50)      |
| 4792           | 0.200 (5,1)      | 0.480 (12,2)     | 0.170 (4,3)       | 0.090 (2,3)       |
| 4537           | 0.374 (9,5)      | 0.887 (22,5)     | 0.500 (13,0)      | 0.051 (1,0)       |

## J-SHAPED



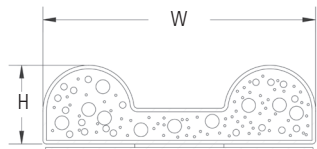
| Profile Number | inches (mm)<br>H | inches (mm)<br>W | inches (mm)<br>L1 | inches (mm)<br>L2 |
|----------------|------------------|------------------|-------------------|-------------------|
| 4117           | 0.130 (3,3)      | 0.130 (3,3)      | 0.060 (1,5)       | 0.065 (1,7)       |
| 4054           | 0.209 (5,3)      | 0.130 (3,3)      | 0.063 (1,6)       | 0.071 (1,8)       |
| 4502           | 0.400 (10,2)     | 0.300 (7,6)      | 0.175 (4,4)       | 0.140 (3,6)       |

All dimensions shown are in inches (millimeters) unless otherwise specified.

# FABRIC-OVER-FOAM PROFILE SELECTION GUIDE

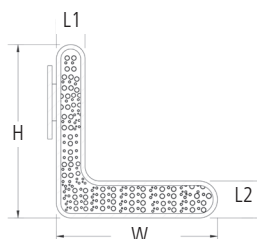


## DOUBLE D-SHAPED



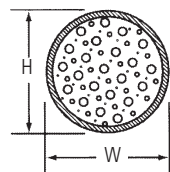
| Profile Number | inches (mm)<br>H | inches (mm)<br>W |
|----------------|------------------|------------------|
| 4299           | 0.110 (2,8)      | 0.382 (9,7)      |

## L-SHAPED



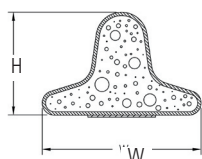
| Profile Number | inches (mm)<br>H | inches (mm)<br>W | inches (mm)<br>L1 | inches (mm)<br>L2 |
|----------------|------------------|------------------|-------------------|-------------------|
| 4469           | 0.216 (5,5)      | 0.354 (9,0)      | .138 (3,5)        | .118 (3,0)        |
| 4534           | 0.591 (15,0)     | 0.551 (14,0)     | .098 (2,5)        | .126 (3,2)        |

## ROUND SHAPED

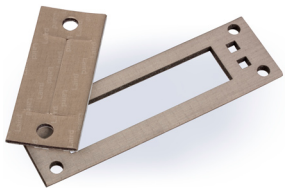


| Profile Number | inches (mm)<br>H | inches (mm)<br>W |
|----------------|------------------|------------------|
| 4201           | 0.100 (2,5)      | 0.100 (2,5)      |
| 4372           | 0.125 (3,2)      | 0.125 (3,2)      |

## T-SHAPED



| Profile Number | inches (mm)<br>H | inches (mm)<br>W |
|----------------|------------------|------------------|
| 4349           | 0.157 (4,0)      | 0.244 (6,2)      |
| 4857           | 0.172 (4,4)      | 0.244 (6,2)      |
| 4A58           | 0.152 (3,9)      | 0.235 (6,0)      |

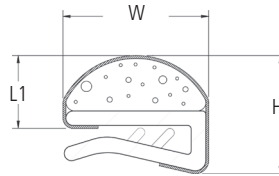


# FABRIC-OVER-FOAM I/O SELECTION GUIDE

## DIVERSE ASSEMBLY OPTIONS

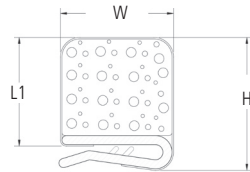
Multiple attachment options provide a variety of ways to install critical EMI products. Pressure Sensitive Adhesive (PSA) has been complemented with the Easy Peel® release liner and rigid clip configurations. These mechanical attachment options enable you to take advantage of existing tooling on doors and enclosures as well as offer alternate attachment methods to better meet design requirements.

### D-SHAPED CLIP



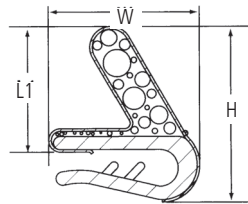
| Profile Number | inches (mm)<br>H | inches (mm)<br>W | inches (mm)<br>L1 |
|----------------|------------------|------------------|-------------------|
| 4110           | 0.203(5,2)       | 0.250 (6,4)      | 0.125 (3,2)       |
| 4111           | 0.243(6,2)       | 0.250 (6,4)      | 0.165 (4,2)       |
| 4039           | 0.304(7,7)       | 0.480 (12,2)     | 0.195 (5,0)       |
| 4033           | 0.35(8,9)        | 0.480 (12,2)     | 0.240 (6,1)       |
| 4121           | 0.358(9,1)       | 0.250 (6,4)      | 0.280 (7,1)       |
| 4040           | 0.41(10,4)       | 0.480 (12,2)     | 0.300 (7,6)       |
| 4038           | 0.43(10,9)       | 0.490 (12,4)     | 0.310 (7,9)       |
| 4043           | 0.43(10,9)       | 0.490 (12,4)     | 0.310 (7,9)       |
| 4085           | 0.43(10,9)       | 0.490 (12,4)     | 0.310 (7,9)       |
| 4041           | 0.568(14,4)      | 0.480 (12,2)     | 0.458 (11,6)      |

### RECTANGLE SHAPED CLIP



| Profile Number | inches (mm)<br>H | inches (mm)<br>W | inches (mm)<br>L1 |
|----------------|------------------|------------------|-------------------|
| 4913           | 0.440 (11,2)     | 0.375 (9,5)      | 0.360 (9,1)       |
| 4413           | 0.485 (12,3)     | 0.390 (9,9)      | 0.405 (10,3)      |

### C-FOLD WITH CLIP



| Profile Number | inches (mm)<br>H | inches (mm)<br>W | inches (mm)<br>L1 |
|----------------|------------------|------------------|-------------------|
| 4E42           | 0.335 (8,5)      | 0.284 (7,3)      | 0.240 (6,1)       |

All dimensions shown are in inches (millimeters) unless otherwise specified.

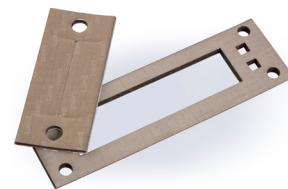
## PROFILE GASKET TOLERANCES

| Profile                     | Tolerance Inches (Millimeters) |
|-----------------------------|--------------------------------|
| Height & Width              | ± .020 (0,5)                   |
| Length Inches (Millimeters) | Tolerance Inches (Millimeters) |
| 1 to 6 (25,4 – 152,4)       | ± .030 (0,8)                   |
| >6 to 11 (152,4 – 279,4)    | ± .050 (1,3)                   |
| >11 to 48 (279,4 – 1219,2)  | ± .100 (2,5)                   |
| >48 to 70 (1219,2 – 1778,0) | ± .187 (4,7)                   |
| >70 to 96 (1778,0 – 2438,4) | ± .250 (6,4)                   |

For parts shorter than 1 inch (25,4mm), or longer than 96" (2438,4mm), please consult Engineering for tolerances. See back cover for contact information.

All dimensions shown are in inches (millimeters) unless otherwise specified.

# FABRIC-OVER-FOAM I/O SELECTION GUIDE

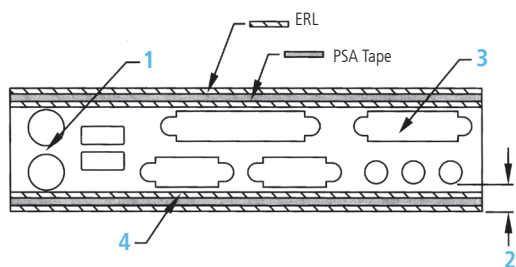


The following pages show examples of standard I/O gaskets used in computer and telecommunication applications. If you have different requirements, the Engineering Department will design gaskets to the specifications you supply. Laird Technologies will design your I/O from a fully detailed print, drawing file, or the actual panel to which the gasket is to be applied.

## I/O GASKET TOLERANCES

|                  |                                    |
|------------------|------------------------------------|
| Height tolerance | $\pm .020"$ ( $\pm 0.5\text{mm}$ ) |
| Width tolerance  | $\pm .020"$ ( $\pm 0.5\text{mm}$ ) |
| Length tolerance | $\pm .020"$ ( $\pm 0.5\text{mm}$ ) |
| Cutout tolerance | $\pm .020"$ ( $\pm 0.5\text{mm}$ ) |

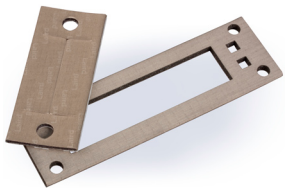
If different tolerances are required, please consult Engineering. See page 26 for contact information.



## BASIC I/O GASKET DESIGN

1. Space between required cutouts should match or exceed 0.060" (1,5mm).
2. Distance from the edge of a cutout should be at least 0.060" (1,5mm) from the edge of the gasket. In most cases, a slot can be used in place of a hole that is positioned too close to the gasket edge.
3. All cutouts and locations are designed customer specifications.
4. Pressure Sensitive Adhesive (PSA) and Extended Release Liner (ERL) can be applied in parallel with the long edge of the gasket.

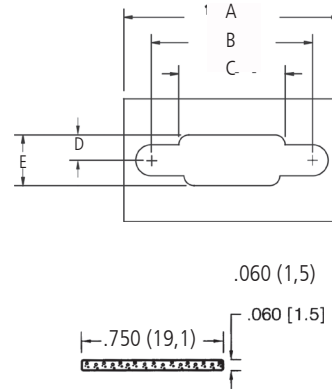
The recommended operating compression for Fabric-Over-Foam EMI gaskets will vary depending on the shape and size of the particular gasket. Typically, I/O gaskets should be compressed between 30% and 50% of the foam height.



# FABRIC-OVER-FOAM I/O GASKET SELECTION GUIDE

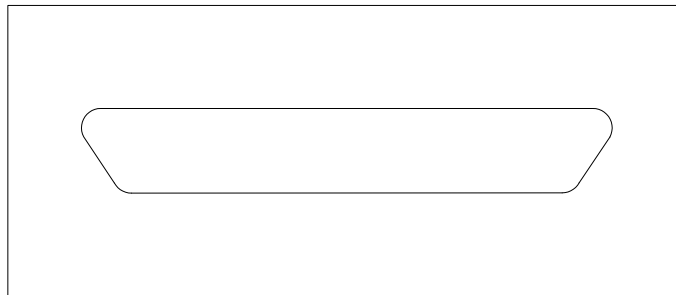
## D-SUB CONNECTOR SERIES

| Laird Part number | D-Sub Pins | D-Sub Design | PSA |
|-------------------|------------|--------------|-----|
| 4N64EA51N00138    | 9          | Female       | No  |
| 4N64EB51N00138    | 9          | Male         | No  |
| 4N64EC51N00171    | 15         | Female       | No  |
| 4N64ED51N00171    | 15         | Male         | No  |
| 4N64EE51N00225    | 25         | Female       | No  |
| 4N64EF51N00225    | 25         | Male         | No  |
| 4N64EG51N00290    | 37         | Female       | No  |
| 4N64EH51N00290    | 37         | Male         | No  |
| 4N64EJ51N00281    | 50         | Female       | No  |
| 4N64EK51N00281    | 50         | Male         | No  |
| 4N64EL51N00138    | 9          | Female       | Yes |
| 4N64EM51N00138    | 9          | Male         | Yes |
| 4N64EM51N00171    | 15         | Female       | Yes |
| 4N64EP51N00171    | 15         | Male         | Yes |
| 4N64ER51N00225    | 25         | Female       | Yes |
| 4N64ES51N00225    | 25         | Male         | Yes |
| 4N64ET51N00290    | 37         | Female       | Yes |
| 4N64EU51N00290    | 37         | Male         | Yes |
| 4N64EV51N00281    | 50         | Female       | Yes |
| 4N64EW51N00281    | 50         | Male         | Yes |



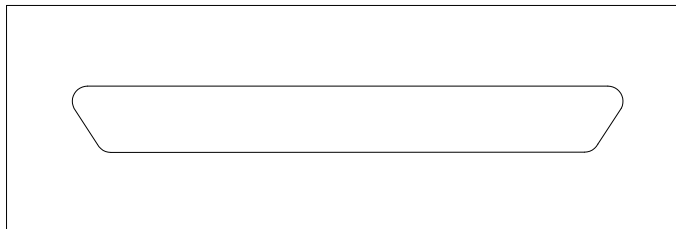
## SCSI + 50 PIN CONNECTOR, PART NUMBER 4164-FE

Usage: Peripheral, Hard Disk, CD-ROM

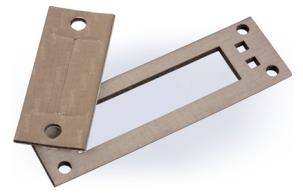


## SCSI + 68 PIN CONNECTOR, PART NUMBER 4164-FF

Usage: Peripheral, External Hard Drive

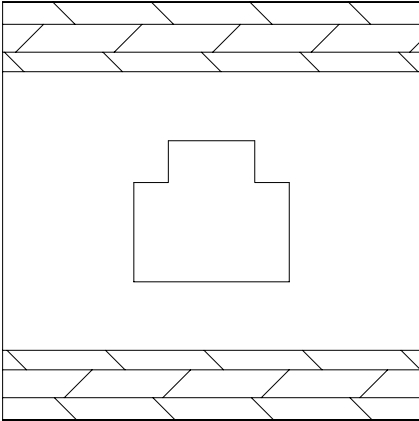


# FABRIC-OVER-FOAM I/O GASKET SELECTION GUIDE



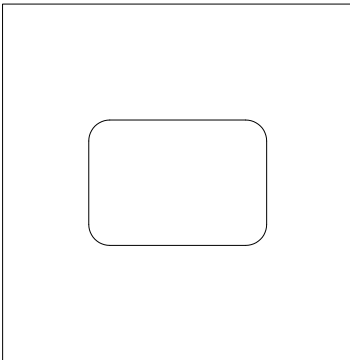
## RJ-11 CONNECTOR, PART NUMBER 4164-FH

Usage: Telecom, Ethernet Networking



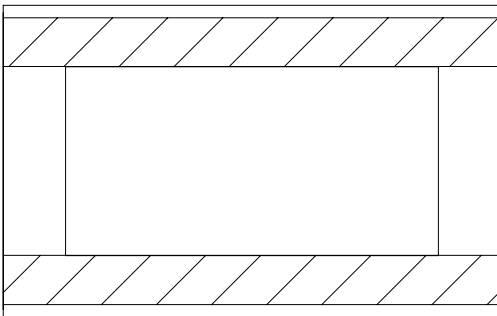
## USB PORT 4 PIN CONNECTOR, PART NUMBER 4219-EB

Usage: Multi-use, hot plug-and-play



## IEEE 1394 I/O 4 Pin Connector, Part Number 4051-EE

Usage: Plug-and-Play Serial Port (Digital Cameras, Printers, Keyboards, Mouse)







# CONDUCTIVE FABRIC

Flectron® metallized fabric combines highly conductive metals with lightweight fabric to meet a diverse range of EMI/RFI shielding requirements. Manufactured with Laird Technologies' patented technology, Flectron metallized fabric is available in various woven and non-woven substrate configurations.

Whether used as an architectural shielding product to shield complete rooms, or as the shielding material in EMI gaskets, tapes, and shield laminates, Flectron fabrics provide a highly effective shielding system that is cost-effective and easily applied.

Laird Technologies uses a patented technology for applying thin metal coatings of copper and nickel to woven and nonwoven fabrics. As a result, Flectron metallized materials have the flexibility, conformability and breathability of a fabric with the electrical properties of a metal. This means low surface and through resistivity and excellent shielding effectiveness.

## FLECTRON® PRODUCTS DATA SUMMARY

|                                     | Product No. | Nominal Thickness<br>Inches (mm) | Surface<br>Resistivity <sup>1</sup><br>(Ohms / square)<br>(ASTM F390*) | Shielding <sup>2</sup> at<br>100 MHz/1GHz<br>(dB) | Tensile Strength <sup>3</sup><br>CD/MD4 (lb/in)<br>(ASTM D5035*) | Weight<br>(oz / yd <sup>2</sup> )<br>(LT 500) | Max. Short<br>Duration<br>Temperature (°C) |
|-------------------------------------|-------------|----------------------------------|--|---|--|---|--|
| Ni/Cu Polyester Nonwoven            | 3027-217    | 0.016 (0.4)                      | < 0.07   | 105/90  | 7.5/18.5   | 2.8 – 4.5                                     | 210  |
| Ni/Cu Polyester Nonwoven UL94 VTM-0 | 3027-235    | 0.016 (0.4)                      | < 0.07   | 100/100   | 7.5/18.5   | 3.6 - 5.7                                     | 210  |
| Ni/Cu Polyester Taffeta             | 3035-535    | 0.0045 (0.114)                   | < 0.07   | 80/80   | 50/75  | 2.2 – 3.1                                     | 210  |
| Ni/Cu Polyester Taffeta UL94 V0     | 3035-216    | 0.008 (0.2)                      | < 0.07   | 80/70   | 50/75  | 6†  | 100  |
| Ni/Cu Polyester Mesh                | 3070-500    | 0.007 (0.178)                    | < 0.1  | 70/60   | 20/20  | 1.3 – 2.3                                     | 210  |
| Ni/Cu Nylon Ripstop                 | 3050-525    | 0.005 (0.1)                      | < 0.07   | 85/75   | 25/50  | 2.1 – 2.7                                     | 200  |
| Ni/Cu Nylon Ripstop UL94 V0         | 3050-517    | 0.008 (0.2)                      | < 0.07   | 85/75   | 25/50  | 5.0 – 6.0                                     | 100  |

NA = Not Applicable

<sup>1</sup> Product Specifications

<sup>2</sup> Measured per Typical values

<sup>3</sup> Typical values for unplated fabric.

<sup>4</sup> CD = cross machine direction, MD = machine direction

† Nominal Value

\* Modified

All dimensions shown are in inches (millimeters) unless otherwise specified.

# CONDUCTIVE FABRIC



For specific material properties, see data summary chart (page 22)

| Product No. | Material                            | Description  | Application  |
|-------------|-------------------------------------|--|--|
| 3027-217    | Ni/Cu Polyester Nonwoven            | The base layer is the highly conductive copper, with an outer layer of nickel for corrosion resistance. Combines the properties of these metals with the lightweight, flexibility and breathability of a nonwoven material. Offers excellent surface conductivity, shielding effectiveness, and corrosion resistance.  | Protects against EMI/RFI and ESD for a variety of applications and environments: architectural shielding, gaskets, tapes, shielding materials and ribbon.      |
| 3027-235    | Ni/Cu Polyester Nonwoven UL94 VTM-0 | Combines highly conductive copper and corrosion resistant nickel with the lightweight, flexibility and breathability of a nonwoven material. Offers excellent surface conductivity, shielding effectiveness and corrosion resistance. This product achieves the UL94 VTM-0 flammability rating.                        | Protects against EMI/RFI and ESD for a variety of applications and environments: architectural shielding, gaskets, tapes, shielding laminates, and grounding.  |
| 3035-535    | Ni/Cu Polyester Taffeta             | Combines highly conductive copper and corrosion resistant nickel with the lightweight, flexibility, conformability, strength and uniform appearance of a woven. Nickel/Copper Polyester Taffeta offers excellent surface conductivity, shielding effectiveness, and reflectivity.                                      | Protects against EMI/RFI for a variety of applications and environments: enclosures, curtains, gaskets, cable wrap, tapes, shielding laminates, and grounding. |
| 3035-216    | Ni/Cu Polyester Taffeta UL94 V0     | Combines highly conductive copper and corrosion resistant nickel with the lightweight, flexibility, conformability, strength and uniform appearance of a woven material. Provides excellent surface conductivity, shielding effectiveness and a UL94 V0 rating.  | Protects against EMI/RFI for a variety of applications and environments: enclosures, curtains, gaskets, cable wrap, tapes, shielding laminates, and grounding. |
| 3070-500    | Ni/Cu Polyester Mesh                | Combines highly conductive copper and corrosion resistant nickel with the lightweight, flexibility, conformability, breathability and uniform appearance of a knitted mesh. Mesh offers excellent surface conductivity, shielding effectiveness, and reflectivity for a variety of applications.                       | Protects against EMI/RFI for a variety of applications and environments: enclosures, curtains, gaskets, cable wrap, tapes, shielding laminates, and grounding. |
| 3050-525    | Ni/Cu Nylon Ripstop                 | This technology combines highly conductive copper and corrosion resistant nickel with the lightweight, drapability, strength, flexibility, conformability, and attractive appearance of a Nylon Ripstop. Nickel/Copper Nylon Ripstop offers excellent surface conductivity, shielding effectiveness, and reflectivity. | Protects against EMI/RFI: enclosures, curtains, gaskets, tapes, shielded laminates, infrared camouflage, and radar reflector.                                  |
| 3050-517    | Ni/Cu Nylon Ripstop UL94 V0         | This technology combines highly conductive copper and corrosive resistant nickel with the drapability, strength, flexibility, and attractive appearance of a Nylon Ripstop fabric. Provides excellent surface conductivity, shielding effectiveness, and UL94 V0 rating.   | Protects against EMI/RFI: enclosures, cables, tapes, and grounding.  |

All dimensions shown are in inches (millimeters) unless otherwise specified.

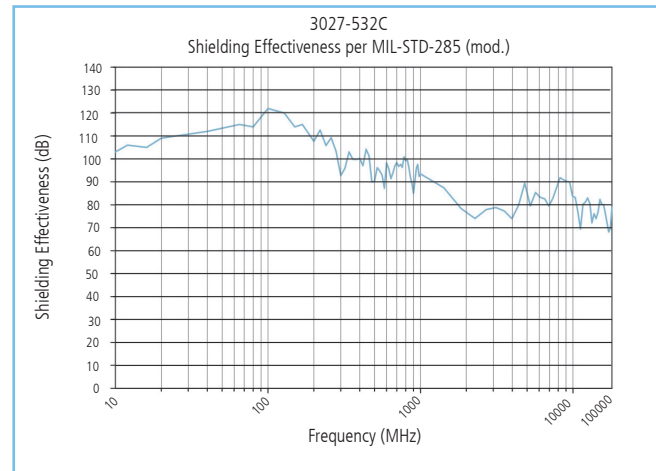


# MRI "A" FABRIC

## MRI "A" FABRIC

Laird Technologies' MRI "A" Fabric is an EMI/RFI shielding product that is manufactured using a patented, proprietary technology. The base layer is a metallized non-woven fabric plated with highly conductive copper and nickel for corrosion resistance. This is bonded to a thin layer of solid aluminum. The resulting material is a lightweight architectural material with superior shielding effectiveness and outstanding resilience. Specifically, this product provides superior shielding effectiveness well in excess of industry standards throughout the MRI frequency range. The product can be applied using several standard construction techniques depending upon the installation requirements or specifications. Because of the relative ease of installation with this product, construction time and therefore, the time to get the MRI facility on-line is greatly reduced.

- Flexible and lightweight
- Corrosion resistant and highly conductive
- Provides excellent shielding
- Excellent electrical properties
- Fewer seams required
- NFPA Class A Flame rating



## PHYSICAL PROPERTIES

| Substrate   | Metal                                   | Thickness<br>(ASTM D1777)       | Total Weight<br>oz./yd <sup>2</sup> | Max. Short Duration<br>Temp. (g/m <sup>2</sup> ) | Standard Roll<br>Width inches (cm) |
|---|---|---------------------------------|-------------------------------------|--|------------------------------------|
| Composite Polyester<br>Non-woven Fabric<br>and Foil | Fabric: Nickel/Copper<br>Foil: Aluminum | 0.016 +/- 0.002<br>(406 +/- 51) | 7.5 +/- 1.3<br>(254 +/- 44)         | 194°F<br>(90°C)                                  | 51<br>(130)                        |

## ELECTRICAL PROPERTIES

| Surface Resistivity ASTM F390<br>ohms/square | Shielding Effectiveness dB (typical) |        |         |         |         |
|--|--------------------------------------|--------|---------|---------|---------|
|  | 25.4 MHz                             | 64 MHz | 100 MHz | 168 MHz | 400 MHz |
| < 0.07                                       | >108*                                | >115*  | >122*   | >115*   | >107*   |

\* Values exceed the dynamic range of the test equipment and were measured in actual MRI shielded enclosures.

## MECHANICAL PROPERTIES

| Tensile Strength CMD/MD<br>(ASTM D5035)<br>lb./in (N/100mm) | Elongation, MD<br>(ASTM D5035) |
|---|--------------------------------|
| 20/60 (350/1050)  | 8%                             |

All dimensions shown are in inches (millimeters) unless otherwise specified.

# CONDUCTIVE TAPE



## HIGH-FLEX® CONDUCTIVE FABRIC SHIELDING TAPE

High-Flex® conductive fabric shielding tapes offer exceptional conformability and conductivity for dynamic flex applications. High-Flex® tapes are constructed of Electron® nickel/copper metallized ripstop with a conductive pressure sensitive adhesive (PSA). This reliable tape design provides outstanding shielding performance while offering superior abrasion and corrosion resistance under high dynamic flex conditions.

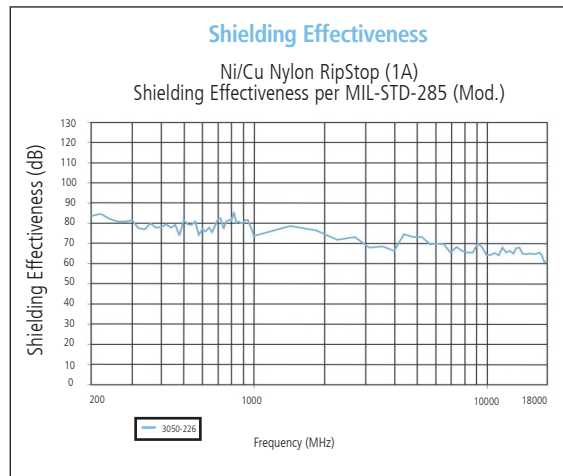
The proprietary anti-fray coating of High-Flex® EMI shielding tapes virtually eliminates concerns of loose conductive fibers and their potential to cause board level damage. Other significant advantages over other fabric and foil shielding tapes include:

- Thinner design provides superior flexibility and durability.
- High conductivity and shielding effectiveness.
- Adhesive system provides high peel strength.
- Easy die-cutting and processing.
- Superb adhesion of nickel copper plating.
- Eliminates the potential of injury due to the sharp edges of metal foil tapes.

High-Flex® EMI shielding tape is available in standard roll widths from 0.394" (10 mm) to 1.969" (50 mm) in 0.197" (5 mm) increments and roll lengths of 65.62' (20 M). Master rolls are available in sizes up to 1.4 meter widths and 300 meter lengths. For your unique design requirements, custom die-cut parts are also available.

Some typical applications for High-Flex® EMI shielding tapes include:

- Shielding cables on notebook computers, copiers or other electronic equipment.
- "Fix-it" applications in test laboratories.
- Shielding over a component in which high conformability is essential.
- Shielding or grounding in weight sensitive applications.
- Shielding or grounding for electronic equipment where vibration may be present during operation.



### TAPE CONSTRUCTION

|          |  |
|----------|--|
| Carrier  | Electron® Nickel Copper Ripstop Fabric (1A)    |
| Adhesive | Conductive Pressure Sensitive Acrylic Adhesive |
| Liner    | Kraft Paper                                    |

### PERFORMANCE CHARACTERISTICS

|                                  |  |
|----------------------------------|--|
| Conductive Tape Thickness        | 0.006 inches (0.15 mm)                                     |
| Liner Thickness                  | 0.005 to 0.006 inches (0.13 mm to 0.15 mm)                 |
| Tensile Strength (ASTM D5035)    | 50 lb / in.  |
| Weight (LT 500)                  | 2.3 to 3.0 oz./sq. yard<br>(78.0 to 118.7 grams/sq. Meter) |
| XY Sheet Resistivity (ASTM F390) | < .07 ohms/sq.   |
| Peel Strength                    | 30 oz./in. (33 N/100 mm)                                   |
| Abrasion Resistance (ASTM D3886) | > 1,000,000 Cycles   |
| Temperature Range                | -40°F to 212°F (Min/Max) (-40°C to 100°C)                  |
| Shielding Effectiveness          | > 60 dB up to 18GHz  |

### ORDERING INFORMATION:

Digits: 1 2 3 4 5 6 7 8 9 10 11  
1 A 0 2 5 0 R 0 2 0 0

#### Digits 1 and 2

Designate conductive tape product line and fabric options: 1A = Nickel Copper Ripstop Fabric

#### Digits 3 through 6

Designate width in millimeters to one decimal place. In the example shown above, the 0250 indicates a 25 mm wide roll).

#### Digit 7

Designates the form the tape is provided in:  
R = Roll K = Kiss-Cut in Pieces P = Pieces

#### Digits 8 through 11

Designate the roll length in meters to one decimal place. The above example 0200 indicates a roll length of 20 meters).

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