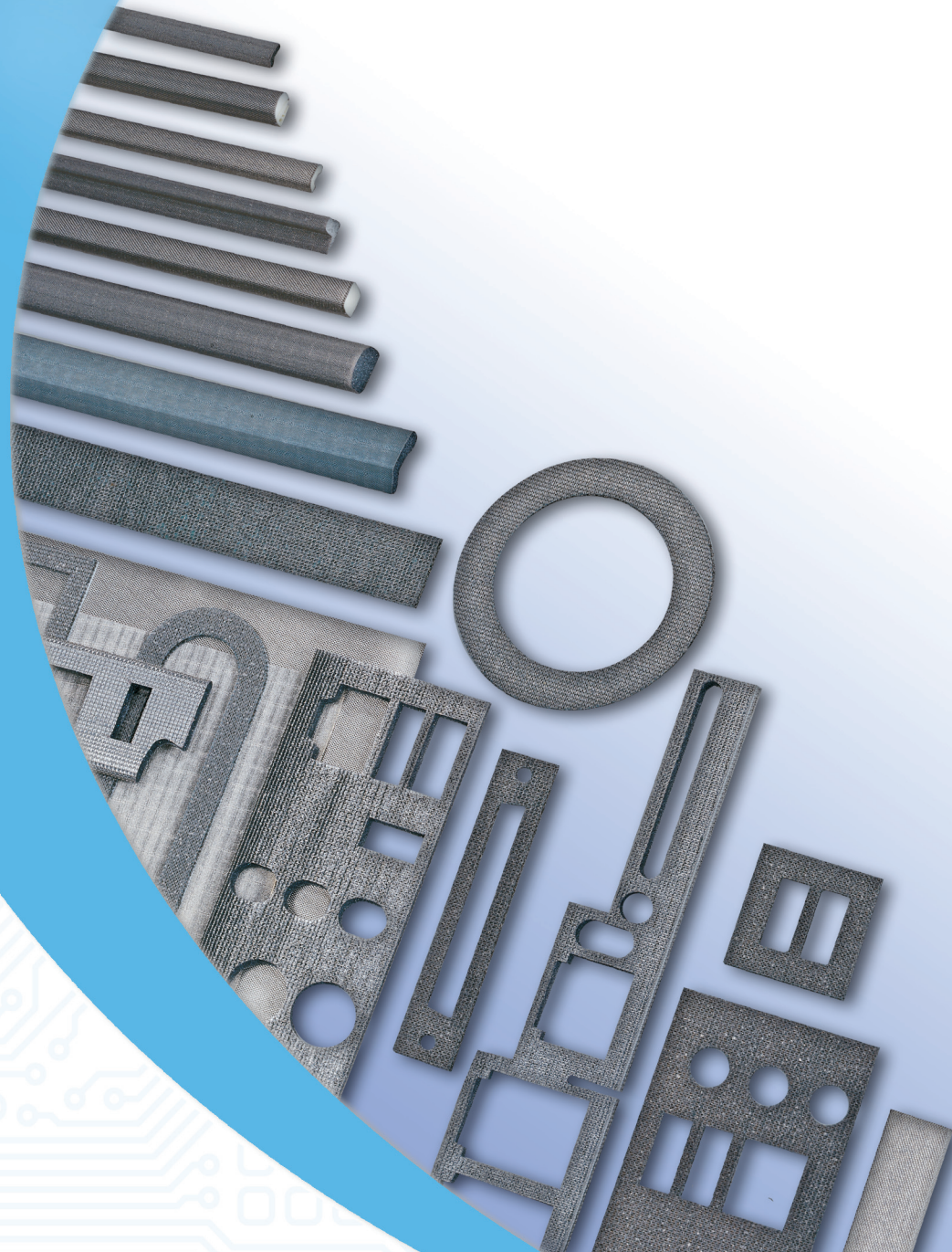


Metallized Conductive Products



Laird
TECHNOLOGIES®

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 environmental 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)



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

ENVIRONMENTALLY FRIENDLY

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

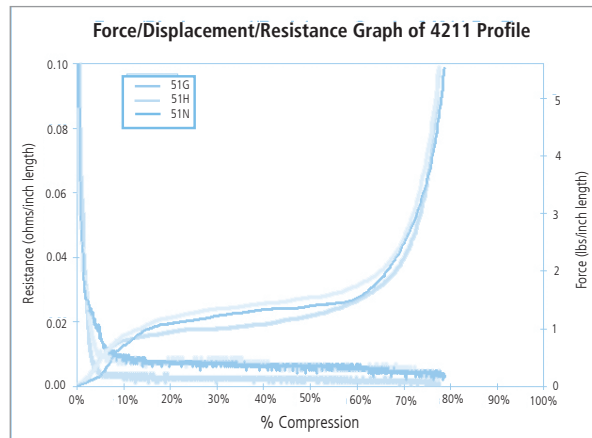
PERFORMANCE AND BENEFITS

- 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).

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.

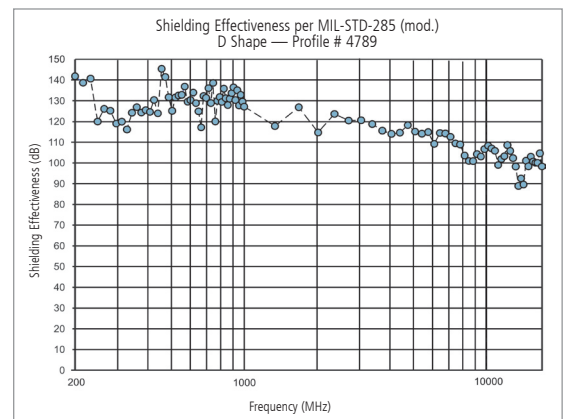
Similarly, C-Shaped Fabric-Over-Foam EMI Gaskets should typically be compressed between 50% and 75% of the gasket height.

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

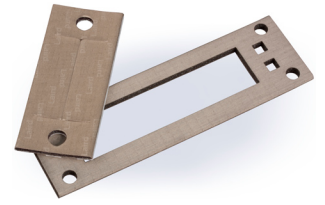
Certain combinations of materials may not be available for all Profiles or I/Os. Please consult the Engineering Department at Laird Technologies when unsure.

- 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.

FIGURE 2



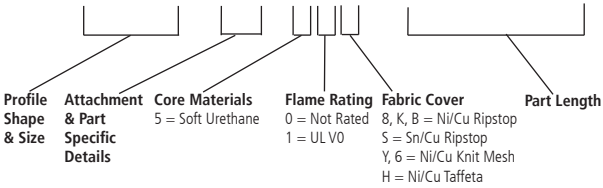
FABRIC-OVER-FOAM I/O GASKET SELECTION GUIDE



Part Number Example:

Digits: 1 2 3 4 5 6 7 8 9 10 11 12 13 14

4 6 9 3 - PA - 5 1 H - 0 1 2 0 0



* 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 RoHS Compliant	UL94-VO Rated RoHS Compliant	UL94-VO Rated RoHS Compliant Halogen-Free EcoGreen™	Typical Apps	Shielding
Ni/Cu Mesh	506		51N	Compros 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 Harsh Environment	High

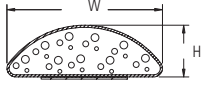


All parts listed in this catalog are lead free and RoHS compliant.



FABRIC-OVER-FOAM PROFILE SELECTION GUIDE

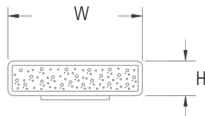
D-SHAPED



Profile Number	inches (mm) H	inches (mm) 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) H	W inches (mm) 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) H	inches (mm) 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) H	inches (mm) 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) H	inches (mm) 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)

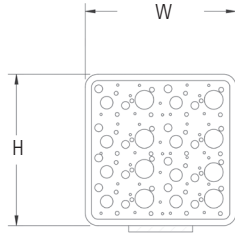
Profile Number	inches (mm) H	inches (mm) W
4055	0.157 (4,0)	0.315 (8,0)
4516	0.157 (4,0)	0.354 (9,0)
4791	0.157 (4,0)	0.394 (10,0)
4098	0.157 (4,0)	0.591 (15,0)
4704	0.158 (4,0)	0.236 (6,0)
4241	0.160 (4,1)	0.200 (5,1)
4253	0.160 (4,1)	0.280 (7,1)
4114	0.158 (4,0)	0.433 (11,0)
4115	0.160 (4,1)	0.590 (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.



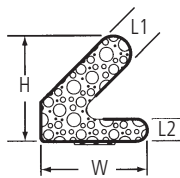
FABRIC-OVER-FOAM PROFILE SELECTION GUIDE

SQUARE SHAPED



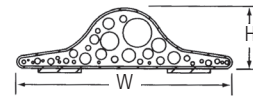
Profile Number	inches (mm) H	inches (mm) W
4520	0.080 (2,0)	0.080 (2,0)
4046	0.118 (3,0)	0.118 (3,0)
4522	0.157 (4,0)	0.157 (4,0)
4212	0.195 (5,0)	0.195 (5,0)
4048	0.236 (6,0)	0.236 (6,0)
4049	0.250 (6,4)	0.250 (6,4)
4695	0.375 (9,5)	0.375 (9,5)
4206	0.395 (10,0)	0.395 (10,0)
4084	0.500 (12,7)	0.500 (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



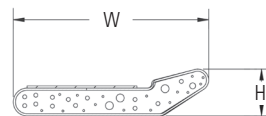
Profile Number	inches (mm) H	inches (mm) W	inches (mm) L1	inches (mm) L2
4593	0.250 (6,4)	0.280 (7,1)	0.125 (3,2)	0.060 (1,5)
4168	0.315 (8,0)	0.315 (8,0)	0.080 (2,0)	0.080 (2,0)
4198	0.385 (9,8)	0.420 (10,7)	0.115 (2,9)	0.060 (1,5)
4243	0.400 (10,2)	0.430 (10,9)	0.125 (3,2)	0.060 (1,5)
4600	0.415 (10,5)	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



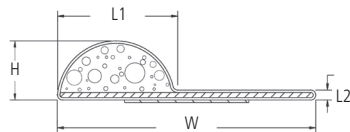
Profile Number	inches (mm) H	inches (mm) W
4630	0.070 (1,8)	0.180 (4,6)
4379	0.070 (1,8)	0.564 (14,3)
4387	0.080 (2,0)	0.675 (17,1)
4633	0.100 (2,5)	0.300 (7,6)
4131	0.140 (3,6)	0.500 (12,7)

KNIFE SHAPED



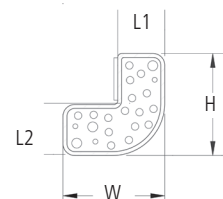
Profile Number	inches (mm) H	inches (mm) W
4797	0.106 (2,7)	0.445 (11,3)
4097	0.106 (2,7)	0.315 (8,0)
4796	0.110 (2,8)	0.450 (11,4)
4205	0.250 (6,4)	0.750 (19,1)
4106	0.312 (7,9)	0.707 (18,0)
4189	0.350 (8,9)	0.750 (19,1)

P-SHAPED



Profile Number	inches (mm) H	inches (mm) W	inches (mm) L1	inches (mm) 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



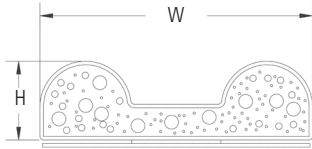
Profile Number	inches (mm) H	inches (mm) W	inches (mm) L1	inches (mm) L2
4117	0.130 (3,3)	0.130 (3,3)	0.060 (1,5)	0.065 (1,7)
4054	0.209 (5,3)	0.130 (3,3)	0.063 (1,6)	0.071 (1,8)
4502	0.400 (10,2)	0.300 (7,6)	0.175 (4,4)	0.140 (3,6)

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

FABRIC-OVER-FOAM PROFILE SELECTION GUIDE

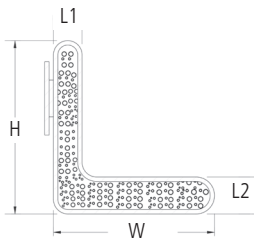


DOUBLE D-SHAPED



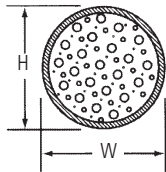
Profile Number	inches (mm) H	inches (mm) W
4299	0.110 (2,8)	0.382 (9,7)

L-SHAPED



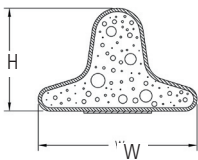
Profile Number	inches (mm) H	inches (mm) W	inches (mm) L1	inches (mm) L2
4469	0.216 (5,5)	0.354 (9,0)	.138 (3,5)	.118 (3,0)
4534	0.591 (15,0)	0.551 (14,0)	.098 (2,5)	.126 (3,2)

ROUND SHAPED

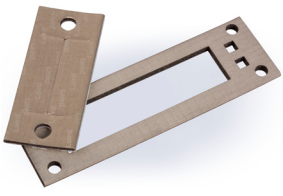


Profile Number	inches (mm) H	inches (mm) W
4201	0.100 (2,5)	0.100 (2,5)
4372	0.125 (3,2)	0.125 (3,2)

T-SHAPED



Profile Number	inches (mm) H	inches (mm) 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)

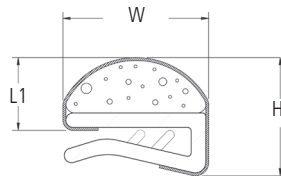


FABRIC-OVER-FOAM I/O SELECTION GUIDE

DIVERSE ASSEMBLY OPTIONS

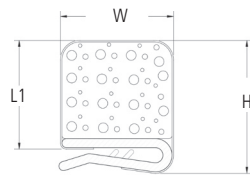
Multiple attachment options provide a variety of ways to install critical EMI products. Pressure Sensitive Adhesive (PSA) has been complemented with the Easy Peel® release liner and rigid clip configurations. These mechanical attachment options enable you to take advantage of existing tooling on doors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

D-SHAPED CLIP



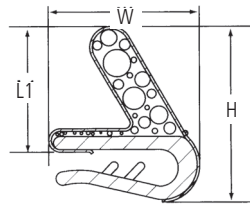
Profile Number	inches (mm) H	inches (mm) W	inches (mm) L1
4110	0.203(5,2)	0.250 (6,4)	0.125 (3,2)
4111	0.243(6,2)	0.250 (6,4)	0.165 (4,2)
4039	0.304(7,7)	0.480 (12,2)	0.195 (5,0)
4033	0.35(8,9)	0.480 (12,2)	0.240 (6,1)
4121	0.358(9,1)	0.250 (6,4)	0.280 (7,1)
4040	0.41(10,4)	0.480 (12,2)	0.300 (7,6)
4038	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) H	inches (mm) W	inches (mm) 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) H	inches (mm) W	inches (mm) L1
4E42	0.335 (8,5)	0.284 (7,3)	0.240 (6,1)

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

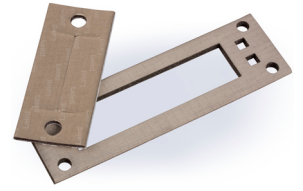
PROFILE GASKET TOLERANCES

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.

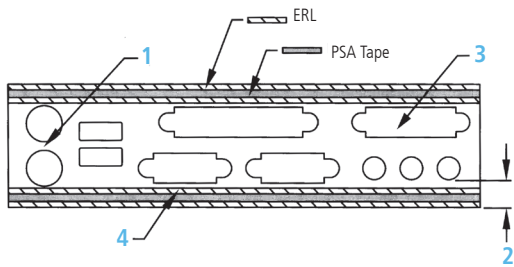
FABRIC-OVER-FOAM I/O SELECTION GUIDE



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	$\pm .020''$ ($\pm 0.5\text{mm}$)

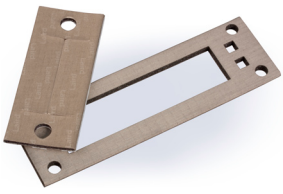
If different tolerances are required, please consult Engineering. See page 26 for contact information.



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.

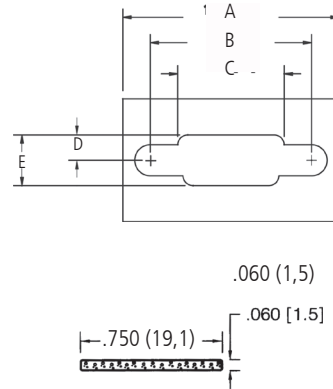
The recommended operating compression for Fabric-Over-Foam EMI gaskets will vary depending on the shape and size of the particular gasket. Typically, I/O gaskets should be compressed between 30% and 50% of the foam height.



FABRIC-OVER-FOAM I/O GASKET SELECTION GUIDE

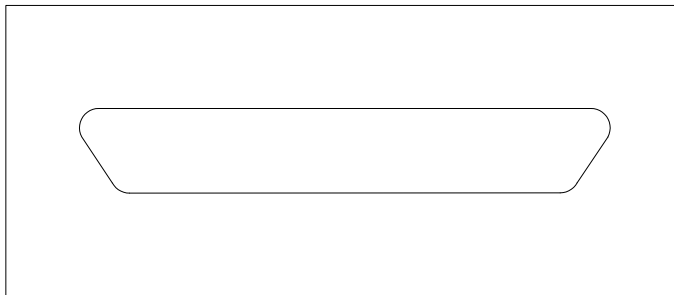
D-SUB CONNECTOR SERIES

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



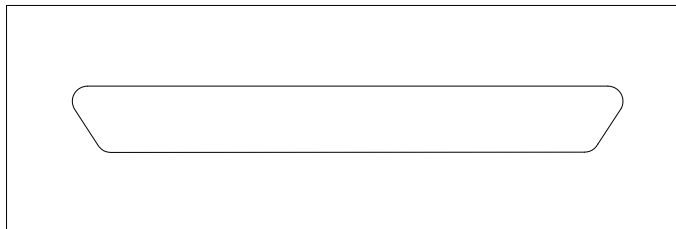
SCSI + 50 PIN CONNECTOR, PART NUMBER 4164-FE

Usage: Peripheral, Hard Disk, CD-ROM

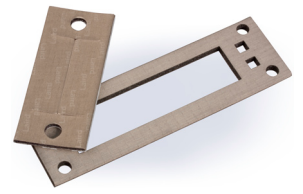


SCSI + 68 PIN CONNECTOR, PART NUMBER 4164-FF

Usage: Peripheral, External Hard Drive

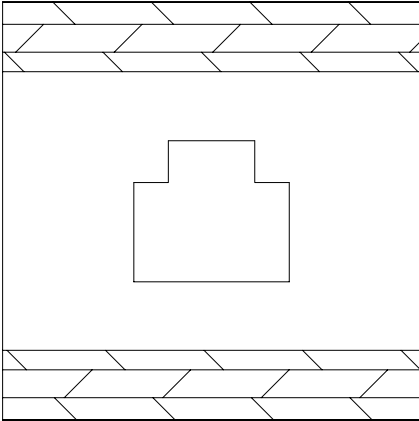


FABRIC-OVER-FOAM I/O GASKET SELECTION GUIDE



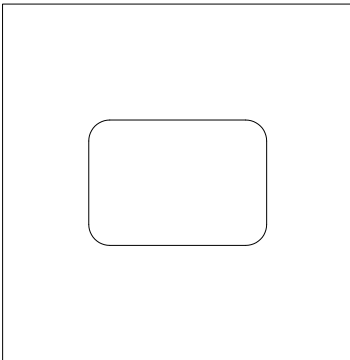
RJ-11 CONNECTOR, PART NUMBER 4164-FH

Usage: Telecom, Ethernet Networking



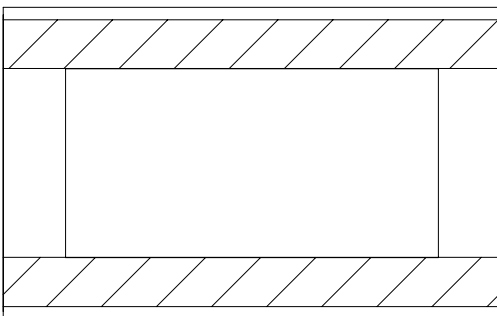
USB PORT 4 PIN CONNECTOR, PART NUMBER 4219-EB

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

Electron[®] 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, Electron 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, Electron 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, Electron 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 Inches (mm)	Surface Resistivity ¹ (Ohms / square) (ASTM F390*)	Shielding ² at 100 MHz/1GHz (dB)	Tensile Strength ³ CD/MD4 (lb/in) (ASTM D5035*)	Weight (oz / yd ²) (LT 500)	Max. Short Duration 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

¹ Product Specifications

² Measured per Typical values

³ Typical values for unplated fabric.

⁴ 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.

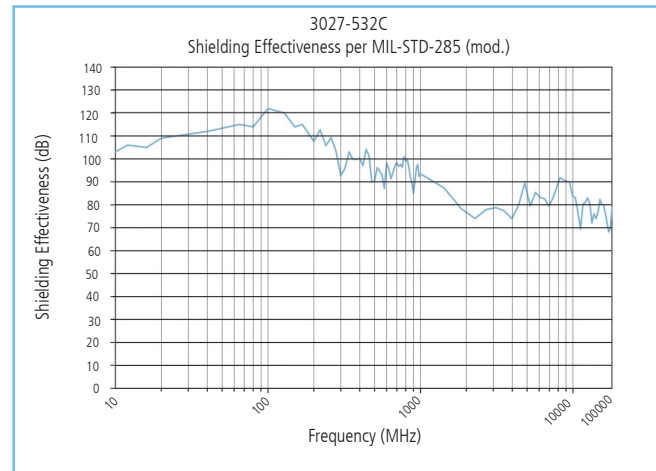


MRI "A" FABRIC

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

ELECTRICAL PROPERTIES

Surface Resistivity ASTM F390 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 (ASTM D5035) lb./in (N/100mm)	Elongation, MD (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 Flectron® 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.

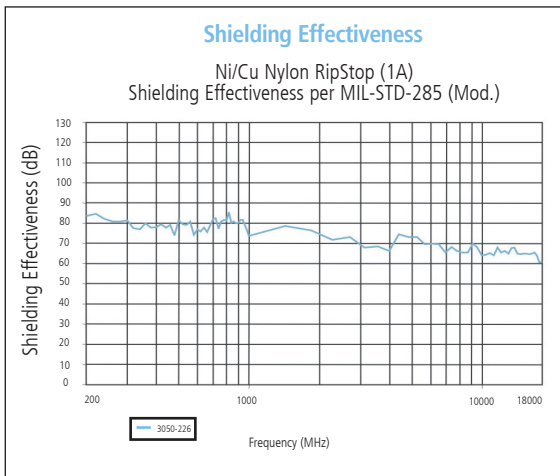
The proprietary anti-fray coating of High-Flex® EMI shielding tapes virtually eliminates concerns of loose conductive fibers and their potential to cause board level damage. Other significant advantages over other fabric and foil shielding tapes include:

- 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	Flectron® 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 (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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