

EMI Shielding Tapes
Product Selection Guide



Trusted Performance

from the
Tape Experts



3M™ EMI Shielding Tapes

A wide variety of tapes for EMI shielding and grounding

- Copper, aluminum, and tin-plated copper foil backings
- Conformable copper-plated fabric backing
- Smooth and embossed foil surfaces
- Conductive and nonconductive acrylic adhesives
- Liners on all tapes for diecutting and handling ease

3M™ EMI Shielding Tapes are well suited for applications requiring reliable point-to-point electrical contact, particularly EMI shielding, grounding and static charge draining.

Economical EMI shielding

Shielding tapes are designed to contain signals emitted from your components, thus preventing interference with other circuits. They also can be used to seal out random signals in the environment to protect sensitive equipment. Typical applications include shielding around electronic cabinet doors and panels, individual electronic components and cables. The ease of installation offered by the pressure-sensitive adhesive saves labor and provides cost-effective, long-term shielding.

EMI troubleshooting and prototyping

3M shielding tapes also simplify the trial-and-error aspect

of EMI troubleshooting. When a source of EMI leakage is located, shielding tape easily and effectively solves the problem.

The tapes have a multitude of uses in electronic design and in test and QC laboratories for prototyping and troubleshooting.

Static charge drainage

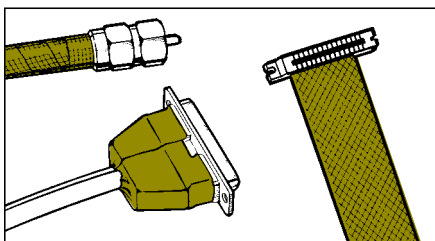
These tapes also offer an easy way to eliminate potentially dangerous static build-up on solid state devices, CRTs and computer peripherals. The secure bond and excellent “through-the-adhesive” conductivity provide dependable grounding.

Fast and easy application

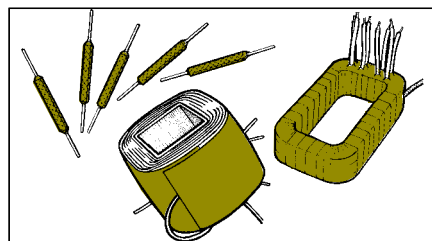
For best results, the application surface must be clean and dry. To maximize electrical and physical contact to the substrate, it is important that you use the correct application pressure (generally 5 to 10 PSI [3,5 to 7,0 N/cm²]) and position the tape correctly the first time.

Talk to your 3M sales representative about which standard dispensers are best suited for your production process and how to maximize performance with automated equipment.

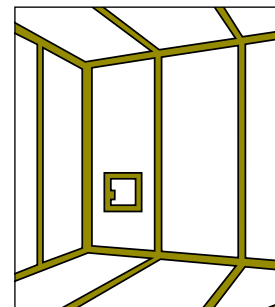
Typical Shielding Tape Applications



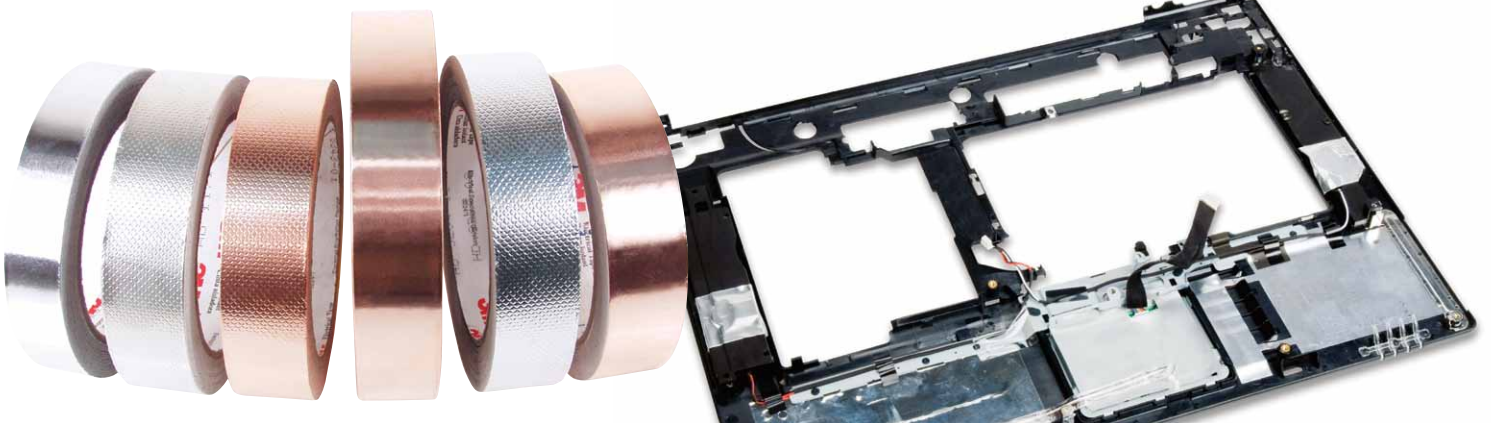
3M™ Shielding Tapes are used as ground planes or shields for electronic cables and connectors. The tape is bonded to the cable's conductive sheath and to the metallic lip of the connector to provide a complete shield from end to end.



3M™ Shielding Tapes are commonly used between transformer coil windings to reduce electrostatic coupling and around the outside of coils, relays, and other components to prevent broadband EMI emissions.

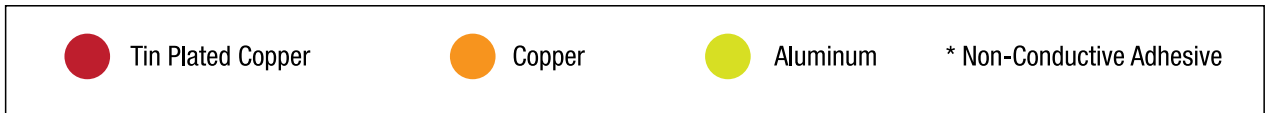
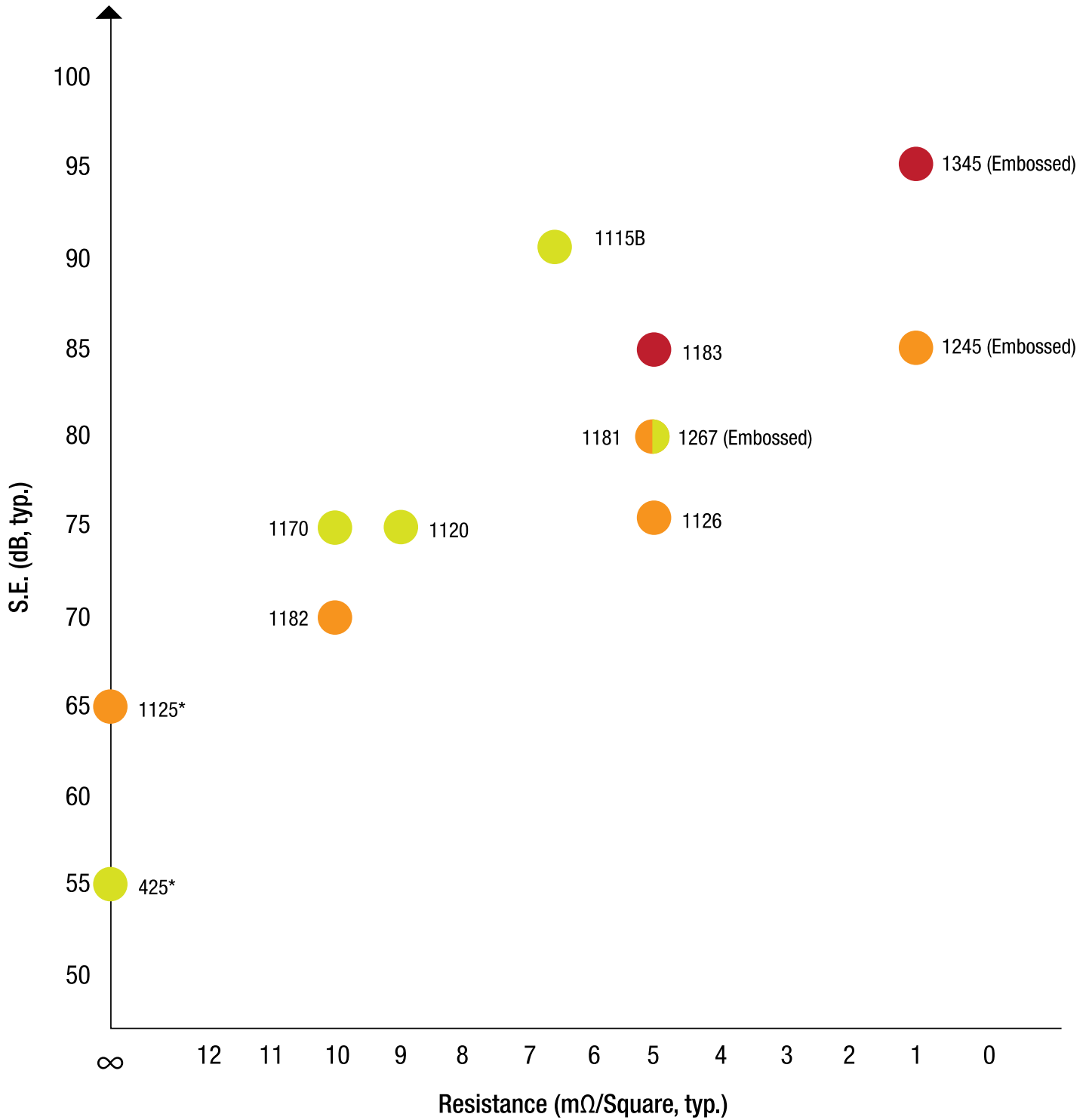


3M™ Shielding Tapes provide effective, economical shielding of seams and apertures in shielded rooms.



3M™ EMI Shielding Tapes

Shielding Effectiveness (S.E.) for selected tapes



Tape Construction

Smooth foil backings with conductive adhesive

3M™ EMI Shielding Tapes 1170 (aluminum), 1181 (copper) and 1183 (tin-plated copper) are smooth-backed foil tapes that establish secure electrical contact with the application surface by means of a unique adhesive. Broadly distributed conductive particles in the adhesive provide a multitude of low-resistance paths between the backing and the substrate. (Figure 1)

Embossed foil backings

The backings of 3M™ Shielding Tapes 1245 (copper), 1267 (aluminum) and 1345 (tin-plated copper) are impressed with an embossed pattern (Figure 2) that protrudes through the acrylic adhesive to make direct electrical contact with the application surface. This reliable “through-the-adhesive” conductivity system provides stable contact resistance and a high level of shielding effectiveness.

Tin-plated foil backings

The copper used in 3M EMI Shielding Tapes 1183 (smooth backing) and 1345 (embossed backing) is plated on both sides with tin to provide exceptional solderability and resistance to corrosion and oxidation. The tapes are designed to remain conductive even after oxidation.

Conductive adhesive on both sides

3M Shielding Tape 1182 is a copper foil tape coated on both sides with conductive acrylic adhesive. This unique construction offers an excellent method of grounding and bonding conductive surfaces. It also exhibits low thermal resistance. Tape 1182 is supplied with a removable liner on each side for ease of handling.

Smooth foil backing with nonconductive adhesive

3M Shielding Tape 1194 is a smooth-backed copper tape that features the same high quality solvent-resistant, acrylic adhesive as other 3M foil tapes. Good solderability makes it an economical choice for applications like connector and cable shielding, grounding, electrostatic shielding between transformer windings, outer wrap for coils, and attachment of connector tabs on rolled film-and-foil capacitors.

Conductive fabric tape

3M Fabric Tape CN-3190 is an anti-corrosion polyester rip-stop fabric backing with an electrically conductive acrylic adhesive. It provides effective copper-nickel shielding with excellent flexibility and conformability as well as light weight and high strength.

Adhesive

Both the conductive and nonconductive versions use the same acid-free, corrosion-resistant acrylic resin.

Figure 1 Smooth Backing with Conductive Adhesive

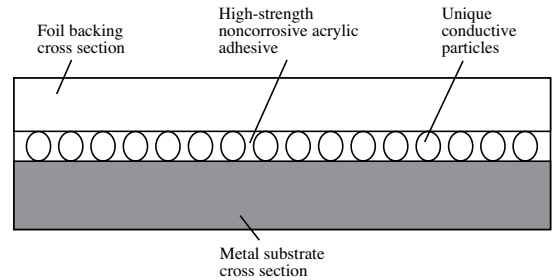
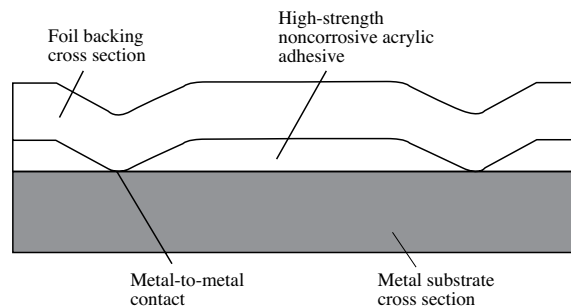
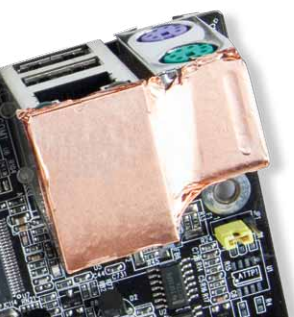
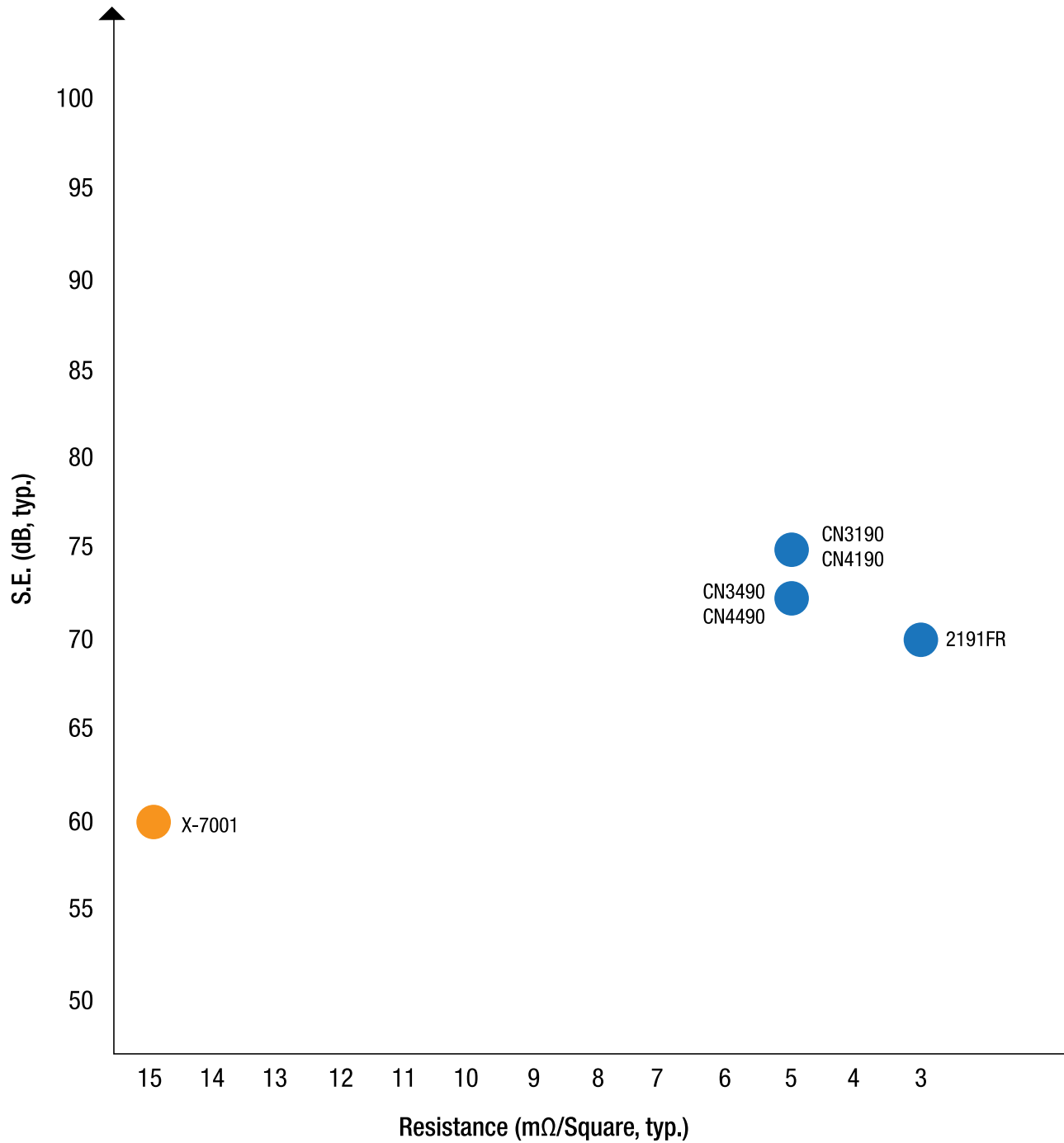


Figure 2 Embossed Backing with “Through-the-Adhesive” Contact



3M™ Conductive Fabrics















Shielding Effectiveness (S.E.) for selected fabrics







Technical Information – 3M™ EMI Shielding Tapes

Note: Values shown are typical and are not recommended for specification purposes.

Product specifications will be provided upon request.

Smooth Backing, Conductive Adhesive									
Tape	Product Description	Roll Length ³	Backing Thickness	Total Thickness	Breaking Strength ⁴	Adhesion to Steel ⁴	Flame Retardant ⁵	Electrical Resistance ⁶	
425	 Aluminum foil, acrylic adhesive	60 yds	2.8 mil (0,07 mm)	4.6 mil (0,12 mm)	30 lb/in (52 N/10 mm)	47oz/in (5.1 N/10 mm)	N/A		
1115B	 Aluminum foil, acrylic adhesive	60 yds	4.5 mil (0,114 mm)	6.0 mil (0,152 mm)	40 lb/in (70 N/10 mm)	52 oz/in (5.6 N/10 mm)	N/A	0.0065	
1120	 Aluminum foil, acrylic adhesive	36 yds	2.0 mil (0,05 mm)	4.0 mil (0,10 mm)	16 lbs/in (28 N/10 mm)	36 oz/in (3.9N/10mm)		0.009	
1126	 Copper foil, acrylic adhesive	36 yds	1.4 mil (0,04 mm)	3.5 mil (0,088 mm)	25 lb/in (44 N/10 mm)	36 oz/in (3.9N/10mm)		0.003	
1170	 Aluminum foil, conductive adhesive	18 yds	2.0 mil (0,05 mm)	3.2 mil (0,08 mm)	20 lb/in (35 N/10 mm)	35 oz/in (3,8 N/10mm)		0.010	
1181	 Copper foil, conductive adhesive ¹	18 yds	1.4 (0,04 mm)	2.6 mil (0,07 mm)	25 lb/in (44 N/10 mm)	35 oz/in (3,8 N/10 mm)		0.005	
1182	 Copper foil, conductive adhesive ¹ on both sides	18 yds	1.4 mil (0,05 mm)	3.5 mil (0,09 mm)	25 lb/in (44 N/10 mm)	35 oz/in (3,8 N/10 mm)		0.010	
1183	 Tin-plated copper foil, conductive adhesive ¹	18 yds	1.4 mil (0,04mm)	2.6 mil (0,07mm)	25 lb/in (44 N/10mm)	35 oz/in (3,8 N/10mm)		0.005	

Smooth Backing, Nonconductive Adhesive									
Tape	Product Description	Roll Length ³	Backing Thickness	Total Thickness	Breaking Strength ⁴	Adhesion to Steel ⁴	Flame Retardant ⁵	Electrical Resistance ⁶	
1125	 Copper foil, acrylic adhesive	36 yds	1.4 mil (0,04 mm)	3.5 mil (0,088 mm)	25 lb/in (44 N/10 mm)	40 oz/in (4,4 N/10 mm)		N/A	
1194	 Copper foil, nonconductive adhesive	36 yds	1.4 mil (0,04 mm)	3.0 mil (0,08 mm)	25 lb/in (44 N/10mm)	40 oz/in (4,4 N/10mm)		N/A	


¹ Conductive particles in the adhesive provide the electrically conductive path between the substrate and the backing. (Figure 1, page 2)

² The embossed pattern provides the electrically conductive path through the adhesive. (Figure 2, page 2)

³ Multiple-length rolls and custom slit widths up to 23" (58.4cm) are available by special order.



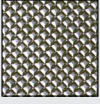



Test methods:








⁴ ASTM D 1000

⁵ Most 3M foil shielding tapes are UL Recognized () for flame retardancy per UL 510, Product Category OANZ 2, File E17385.

⁶ Resistance measured through the adhesive. MIL-STD-202 Method 307 maintained at 5 PSI (3,4 N/sq cm) measured over 1 sq in. surface area.

3M™ EMI Shielding Tapes

Embossed Backing, Conductive-through-Adhesive									
Tape		Product Description	Roll Length ³	Backing Thickness	Total Thickness	Breaking Strength ⁴	Adhesion to Steel ⁴	Flame Retardant ⁵	Electrical Resistance ⁶
1245		Embossed copper foil, conductive-through-adhesive ²	18 yds	1.4 mil (0,04 mm)	4.0 mil (0,10 mm)	25 lb/in (44 N/10 mm)	35 oz/in (3,8 N/10 mm)		0.001
1267		Embossed aluminum foil, conductive-through-adhesive ²	18 yds	2.0 mil (0,05 mm)	5.0 mil (0,13 mm)	20 lb/in (35 N/10 mm)	35 oz/in (3,8 N/10 mm)		0.005
1345		Embossed tin-plated foil, conductive-through-adhesive ²	18 yds	1.4 mil (0,04 mm)	4.0 mil (0,10 mm)	25 lb/in (44 N/10 mm)	35 oz/in (3,8 N/10 mm)		0.001

Conductive Fabric, Copper-Nickel									
Tape		Product Description	Roll Length ³	Backing Thickness	Total Thickness	Breaking Strength ⁴	Adhesion to Steel ⁴	Flame Retardant ⁵	Electrical Resistance ⁶
CN-3190		Anti-corrosion metallized polyester rip-stop fabric, conductive adhesive	54.5 yds	3.1 mil (0,08 mm)	4.3 mil (0,11 mm)	40 lb/in (70 N/10 mm)	31 oz/in (0,341 N/mm)		0.005
CN-3490		Anti-corrosion, metallized non-woven fabric, conductive adhesive	54.5 yds	2.4 mil (0,06 mm)	2.4 mil (0,06 mm)	35 lbs/in(16 kgf/25 mm)	30 oz/in (800 gf/25 mm)	N/A	0.005
CN-4190		Anti-corrosion, metallized polyester rep-stop fabric, conductive adhesive	54.5 yds	4.3 mil (0,11 mm)	3.1 mil (0,08 mm)	35 lbs/in(16 kgf/25 mm)	40 oz/in(4.4 N/10 mm)	N/A	0.005
CN-4490		Anti-corrosion, metallized non-woven fabric, conductive adhesive	109.3 yds	2.0 mil (0,05 mm)	2.0 mil (0,05 mm)	35 lbs/in(16 kgf/25 mm)	40 oz/in(4.4 N/10 mm)	N/A	0.005
X-7001		Anti-corrosion, metallized polyester fabric, conductive adhesive both sides	10.9 yds	4.3 mil (0,11 mm)	0,11 mm	35 lbs/in(16 kgf/25 mm)	6.4 N/cm	N/A	0.015 (over a 25x25 mm area)
2191FR		Anti-corrosion, metallized non-woven fabric, conductive adhesive		5.3 mil (0,135 mm))	5.5 mil (0,14 mm)	108 N/cm	2.1 N/cm		0.003 (over a 25x25 mm area)


¹ Conductive particles in the adhesive provide the electrically conductive path between the substrate and the backing. (Figure 1, page 2)

² The embossed pattern provides the electrically conductive path through the adhesive. (Figure 2, page 2)

³ Multiple-length rolls and custom slit widths up to 23" (58.4cm) are available by special order.

Test methods:

⁴ ASTM D 1000

⁵ Most 3M foil shielding tapes are UL Recognized () for flame retardancy per UL 510, Product Category OANZ 2, File E17385.

⁶ Resistance measured through the adhesive. MIL-STD-202 Method 307 maintained at 5 PSI (3,4 N/sq cm) measured over 1 sq. in. surface area.

Long-term proven durability and reliability

3M has been providing adhesive-backed foil tapes for EMI (electromagnetic interference) shielding and grounding applications for well over 40 years. Test results and actual in-use experience have proven the stability and effectiveness of the backings and adhesives over long periods of time.

3M was one of the first in the industry to introduce shielding tape with conductive adhesive, first with embossed foil backing for “through the adhesive” conductivity, and first with tin-plated copper backing for improved shielding, solderability, and corrosion resistance.

Excellent shielding effectiveness

Consistent manufacturing processes allow 3M™ EMI Shielding Tapes to exhibit the low contact resistance necessary to achieve the level of shielding effectiveness shown on the graph at the bottom of page 2.

Customer Service

In addition to the high standard of quality that goes into each roll of shielding tape, 3M customers receive other important value-added benefits. Customer Service, Technical Service, and Manufacturing resources are dedicated to maintaining the highest level of service, quality, and delivery. 3M also

offers the unique advantage of global product support and availability through a worldwide network of subsidiaries and distributors.

Our technically trained sales force is supported by an extensive nationwide network of distributors who can provide prompt and efficient service and delivery in response to all of your shielding tape requirements. Many of our distributors also offer diecutting and fabricating services.

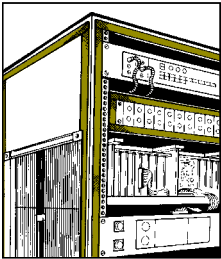
Your “How To” Resource

Whether you need assistance to select a shielding tape to meet a specific production requirement or to increase productivity or product performance, our technical expertise is always available.

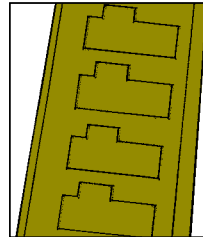
3M EMI Shielding Tapes are supplied on easily removable liners and in widths to meet customer needs. Multiple-length rolls are also available.

For any inquiries or requests regarding 3M EMI Shielding Tapes, please contact Customer Service by phone at 800-676-8381 or by FAX at 800-828-9329.

More Shielding Tape Applications



3M™ Shielding Tapes provide a reliable, durable contact surface for conductive gaskets for EMI shielding of the doors and panels of electronic cabinets and enclosures.



3M™ Shielding Tapes are supplied on liners for easy handling and die-cutting. Many 3M authorized distributors and converters provide fabrication services.

3M is a trademark of 3M company.

Important Notice

Before using these products, you must evaluate them and determine if they are suitable for your intended application. You assume all risks and liability associated with such use.

Warranty; Limited Remedy; Limited Liability.

3M's product warranty is stated in its Product Literature available upon request. 3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF

MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

If these products are defective within the warranty period stated above, your exclusive remedy shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product. Except where prohibited by law, 3M will not be liable for any indirect, special, incidental or consequential loss or damage arising from these 3M products, regardless of the legal theory asserted.



Electrical Markets Division

6801 River Place Blvd.
Austin, TX 78726-9000
USA

800-676-8381
Fax 800-828-9329
www.3M.com/oem

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