

3M™ Electrically Conductive Double-Sided Tape 9701 Series

Product Description

3M™ Electrically Conductive Double-Sided Tape 9701 Series are an XYZ-axis electrically conductive pressure sensitive adhesive (PSA) tapes matrix. 3M tape 9701 series consists of a conductive matrix carrier metal-plated non-woven fabric) and conductive PSA that is utilized for attachment to grounding surfaces. The product is an acrylic based adhesive solution and offers adhesion and grounding performance to many surface types. 3M tape 9701 series provides electrical grounding performance with small-size contacts and PSA attachment, making it an excellent solution for EMI shielding designs.

Key Features

- Excellent XYZ-axis conductivity through the adhesive
- Good conformability and quick PSA bonding
- Excellent EMI shielding performance in bond line gap
- Thicker construction option to conform to non-flat surfaces
- Reliable electrical contact and grounding to small size areas
- Easy handling and workability

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Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Release Liner
Acrylic Conductive Adhesive
Release Liner

Product Construction/ Material Description

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3M™ Electrically Conductive Double-Sided Tapes 9701 Series	
Property	Value
Color	Gray metallic
Conductive Adhesive Type	Acrylic Conductive Adhesive with Conductive Non-woven
Release Liner	Transparent PET release liner

Note: The product is available in 1050 mm x 100 meters. Contact your local 3M representative for more information.

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Typical Physical Properties and Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes. Final product specifications and testing methods will be outlined in the product's Certificate of Analysis (COA) that is shipped with the commercialized product.

3M™ Electrically Conductive Single-Sided Tape 9701 Series		
Properties	Test Method	Typical Value
Total thickness (backing plus adhesive) 3M tape 9701-50 3M tape 9701-100	ASTM method D1000*	0.050 mm 0.100 mm
180° peel adhesion to SUS 3M tape 9701-50 3M tape 9701-100	ASTM method D1000*	1000 gf/inch 1000 gf/inch
Electrical Resistance through XY-axis	3M test method ETM-7**,***	0.2 Ω
Electrical Resistance through Z-axis	3M test method ETM-12**	0.1 Ω

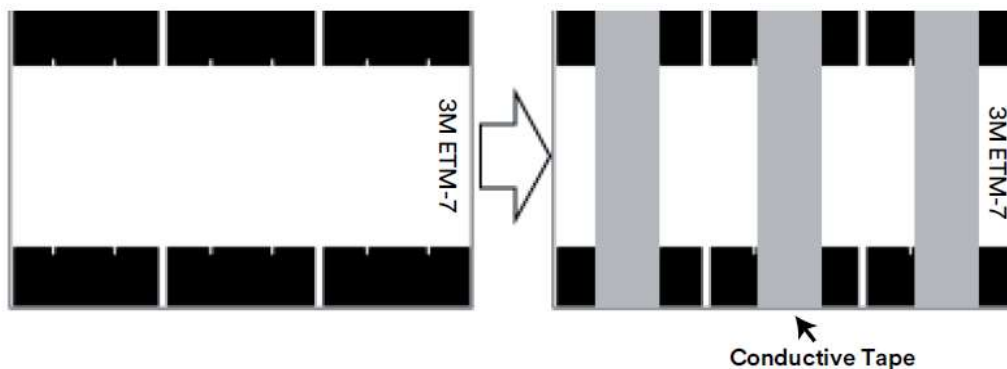
*Tested in accordance with ASTM method D1000. Each version typical adhesion value is shifted based on the foil characteristics and the associated impact on the peel adhesion test method.

**3M test method notes attached

***Test sample coupon length dimension is orientated parallel to the Machine Direction (MD) of the sample under test (roll unwind direction). MD and CD (Cross Direction) for ETM-7 testing provides different typical values

ETM-7 Test Method: XY-Axis Electrical Resistance through Adhesive**

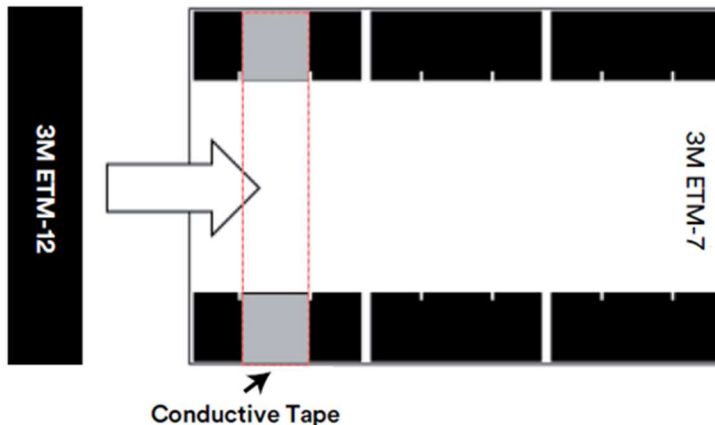
Place a strip of the single (double) side conductive tape in 10 mm x 50 mm with adhesive side down between the electrodes on 3M ETM-7 testing board. After initial hand lamination to provide for a 10 mm x 10 mm contact area between the tape and electrodes, apply a 2kg rubber roller across the tape one time. Application method simulates a typical manufacturing process that might be used to apply the tapes to a surface. After 20 minutes of dwell time, the DC resistance between the electrodes is measured with a micro-ohm meter. The resistance results are recorded after 5 ~ 30 seconds for initial resistance.



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ETM-12 Test Method: Z-Axis Electrical Resistance through Adhesive**

Place conductive tape pieces in 10 mm x 10 mm on the center of the electrodes on 3M ETM-7 testing board. Then place 3M ETM-12 testing board with the gold-plated side down on the tapes between electrodes. After initial hand lamination to provide for a 10 mm x 10 mm contact area between the tapes and electrodes, apply 2kg rubber roller across the tape one time. Application method simulates a typical manufacturing process that might be used to apply the tapes to a surface. After 20 minutes of dwell time, the DC resistance between the electrodes is measured with a micro-ohm meter. The resistance results are recorded after 5 ~ 30 seconds for initial resistance.



Applications

3M™ Electrically Conductive Double-Sided Tape 9701 Series is typically used for applications requiring excellent electrical conductivity from the application substrate through the adhesive to a second substrate. Common uses include grounding and EMI shielding in equipment and components.

Application Techniques

Note: Carefully read and follow the manufacturer's precautions and directions for use when working with solvents. Tape application below 10°C (50°F) is not suggested. Once properly applied, low temperature holding power is generally satisfactory.

The bond strength of 3M™ Electrically Conductive Single-Sided Tape 9701 Series depends on the amount of adhesive-to-surface contact developed during application and substrate type and surface conditions.

- 1) Firm application pressure helps develop better wet-out and adhesive contact and may lead to improved bond strength as well as electrical conductivity. Pressure must be applied to the bond area after assembly to help ensure sufficient wet-out of the 3M tape 9701 series adhesive to the substrates and to engage the conductive acrylic adhesive fillers with the substrates to make electrical connection. Mechanical pressure (roller, metal bar) or finger pressure at 5-15 psi. (Optimally the application conditions are determined via a set of Design of Experiments (DOE) using a range of application pressures, dwell time and temperatures (suggested initial range might include 5-15 psi, 2-5 seconds, 21°C-38°C).
- 2) Heat may be applied simultaneously with pressure to improve wetting, final bond strength and electrical conductivity. Suggested temperature range to evaluate is in the 38°C-60°C range.
- 3) To obtain optimum adhesion, the bonding surfaces must be clean, dry, and well unified. Some typical surface cleaning solvents are isopropyl alcohol or heptane.
- 4) Adhesion builds with time. Up to 24 to 72 hours may be required to reach final adhesion values.

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Storage and Shelf Life

The shelf life of 3M™ Electrically Conductive Single-Sided Tape 9701 Series is 9 months from the date of manufacture when stored in roll form, in the original packaging materials, and stored at 10°C-25°C (50°F-77°F) and <60% relative humidity.

Once the tape is removed from the original packaging materials, the tape should be converted, shipped and stored in the prescribed temperature and humidity-controlled conditions to ensure stable tape performance. Adhesion, tack, conductivity, and reliability of the tape in an application can be reduced if the tape is not controlled to the prescribed handling and usage conditions.

In addition, in some applications the tape may be converted (die cut, laminated to other materials or release/processing liners) in such a manner that the release liner that the product tape is shipped with is removed and a different release or processing/carrier liner is applied to the adhesive side of the tape. The new release/carrier liner may transfer release agents (silicone, fluoropolymer, etc.) to the tape's adhesive surface and thus reduce the applied tack and/or adhesion strength of the tape in the end user's application to a surface versus when no release/carrier liner changes have occurred. Any proposed release/carrier liners to be used with the tape should be tested with the tape to ensure that the tape's performance is not negatively impacted for the intended end use application and that shelf life is not negatively impacted. If a poor performing liner is selected for a liner exchange, it can have a significant negative impact on the conductive tape's adhesion/tack/electrical performance and/or significantly reduce shelf life.

Certificate of Analysis (COA)

The 3M Certificate of Analysis (COA) for this product is established when the product is manufactured and is deemed commercially available from 3M. The COA contains the 3M specifications, test methods and test results for the product's performance attributes that the product will be supplied against. Contact your local 3M representative for this product's COA.

This technical data sheet may contain preliminary data and may not match the COA specification limits and/or test methods that may be used for COA purposes.

Regulatory: For regulatory information about this product, contact your 3M representative.

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