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Technical Data | August 2020

3M™ Electrically Conductive Double-Sided Tape 9723

Product Description

3M™ Electrically Conductive Double-Sided Tape 9723 is a XYZ electrically conductive pressure sensitive adhesive (PSA) tapes. 3M tape 9723 consists of a conductive matrix carrier (nickel/copper-coated conductive nonwoven fabric matrix) that is electrically conductive and designed for PSA attachment to many grounding surfaces. These tapes are acrylic-based adhesive solutions that offers high adhesion and good grounding performance to many surface types. 3M tape 9723 provides grounding performance and reliable small size contacts in a thicker format.

Key Features

- XYZ-conductivity through the adhesive
- Conformability and quick bonding
- EMI shielding in bond line gap
- Electrical contact to small size areas
- Handling and workability

Product Construction/Material Description

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes. The product is available in 500 mm x 100 meter. Contact your local 3M representative for more information.

3M™ Electrically Conductive Double-Sided Tape 9723	
Property	**Value**
Color	Face side: metallic gray Back side: metallic gray
Conductive adhesive type	Acrylic conductive adhesive
Release liner	Face side: transparent PET release liner Back side: transparent PET release liner

Shielding Effectiveness

Many factors determine the shielding effectiveness of a conductive adhesive tape, including type and thickness of the conductive layers, adhesive strength, degree of contact, smoothness of application surface and test frequency. For 3M™ Electrically Conductive Double-Sided Tape 9723, the typical shielding effectiveness is expected to be in the range of 40 dB to 60 dB, using a standard EMI shielding test method and depending on the thickness of the sample tested.

Applications

- For applications requiring excellent electrical conductivity from the application substrate through the adhesive to a second substrate
- Grounding and EMI shielding in equipment and components

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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 Double-Sided Tape 9723 depends on the amount of adhesive-to-surface contact developed during application, 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 ensure sufficient wet-out of the 3M tape 9723 adhesive to the substrates and to engage the conductive acrylic adhesive fillers with the substrates to make the 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 help 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.

Typical Physical Properties and Performance Characteristics

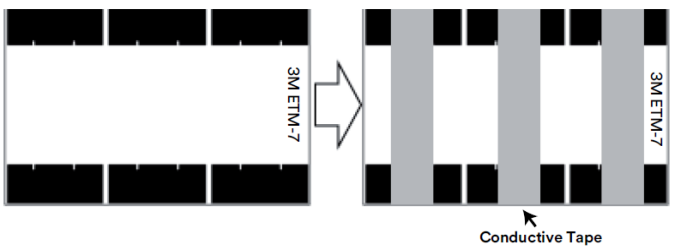
Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes. Final product specifications and testing methods will be outlined in the product's Certificate of Analysis (COA) that is shipped with the product.

3M™ Electrically Conductive Double-Sided Tape 9723		
Property	**Method[a]**	**Value**
Thickness	ASTM D1000	60 um
Adhesion to SUS	ASTM D1000	1500 gf/inch
XY-axis electrical resistance through adhesive	3M Test Method ETM-7[b]	0.3 Ω on the both sides
Z-axis resistance through adhesive	3M Test Method ETM-12[c]	0.15 Ω

[a] Methods listed as ASTM are tested in accordance with the ASTM method noted
[b,c] 3M test methods as described below.

3M Test Method ETM-7: XY-Axis Electrical Resistance through Adhesive[b]

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 are measured with a micro-ohm meter. The resistance results are recorded after 5 ~ 30 seconds for initial resistance.



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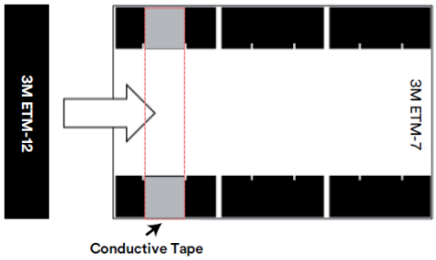
3M Test Method ETM-12: Z-Axis Electrical Resistance through Adhesive[c]

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 2 kg 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 are measured with a micro-ohm meter. The resistance results are recorded after 5 ~ 30 seconds for initial resistance.



Typical Operating Temperature Range for Acrylic-Based Pressure Sensitive Adhesives (PSAs)

3M acrylic conductive pressure sensitive adhesives (CPSAs) contain conductive fillers. The grounding and/or substrate interconnection performance of the conductive fillers within the acrylic PSA in an application will vary based on many factors including substrate types, contact grounding area, surface geometry in the bond line, flexibility of substrates, bonding conditions, applied voltage/current, application environment and environmental aging conditions/exposure.

In general, the acrylic PSA polymer itself used in acrylic CPSAs have good short term and long-term environmental stability with respect to the PSAs macro-adhesion performance to many substrates. The acrylic polymers typical long term (days-weeks) performance and short-term performance (minutes-hours) based on an adhesion test method is generally 85°C (185°F) long term and 121°C (250°F) short term.

3M CPSAs should be tested in the desired application to ensure the product is appropriate for use based on the application's specific requirements, including substrate types, contact grounding area, surface geometry in the bond line, flexibility of substrates, bonding conditions, applied voltage/current, application environment and environmental aging conditions/exposure.

Storage and Shelf Life

The shelf life of 3M™ Electrically Conductive Double-Sided Tape 9723 is 12 months from the date of manufacture when stored in the original packaging materials and stored at 21°C (70°F) and 50% relative humidity.

Certificate of Analysis (COA)

The 3M Certificate of Analysis (COA) for this product is established when the product is manufactured and deemed commercially available from 3M. The COA contains the 3M test methods, specifications limits 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.

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

Technical Information: The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

Product Use: Many factors beyond 3M's control and uniquely within user's control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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