



XYZ-Axis Electrically Conductive Adhesive Transfer Tape for LSE Substrates and High Temperature Applications

9719

Technical Data

October, 2003

Product Description

3M™ XYZ-Axis Electrically Conductive Adhesive Transfer Tape 9719 is a silicone adhesive isotropically conductive pressure sensitive tape. Tape 9719 conducts electricity through the thickness (Z-axis) and in the plane of the adhesive (X, Y planes) and is suitable for low surface energy (LSE*) EMI/RFI shield and EMI/RFI gasket attachment to metal surfaces. The tape consists of a high performance, low surface energy 3M adhesive loaded with conductive fibers. The result is a double-sided tape providing both good adhesion and good electrical performance. The conductive fibers in tape 9719 also provide improved handling characteristics.

XYZ-Axis Electrically Conductive tape 9719 is suitable for attaching low surface energy (LSE) EMI shields to electronic and electrical devices where high temperature performance (up to 400°F [204°C]) is required. Tape 9719 may be used with many types of foil laminate shields, to provide a customized shielding solution. This tape may also be used to attach conductive fabric/foam core EMI gaskets to electronic cabinetry. Tape 9719 may be applied in strips or die cut to specific shapes and sizes. Compared to screws or other mechanical connectors, tape 9719 provides reduced assembly time and a solid bond line with no gaps which might result in EMI emission.

Construction

Product	Tape 9719
Adhesive Type:	Filled, Silicone Adhesive
Filler Type:	Conductive Fibers
Release Liner:	Polyester based, specially designed dual lined product.
Approximate Thickness:	
Tape Only:	.004 in. (0.10 mm)
Release Liner Combination:	.004 in. (0.10 mm)

*LSE: Low Surface Energy. The examples of low surface energy substrates include Teflon, Tedlar (PVF), silicone, etc.

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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.

Electrical Properties

Contact Resistance:	Substrate Tested (Foil/Rigid Plate)			
	Aluminum/ Aluminum	Aluminum/ Stainless Steel	Copper/ Stainless Steel	Copper/ Copper
	< 2.5 Ω	< 2.0 Ω	< 1.0 Ω	< 0.5 Ω

Based upon four wire (Kelvin probe) resistance measurements made with crossed pieces of Foil/3M™ XYZ-Axis Electrically Conductive Adhesive Transfer Tape 9719/Rigid plate construction using a 1.0 in x 1.0 in square piece of tape 9719. The rigid metal surface was prepared with a Scotch-Brite™ pad to roughen the surface and cleaned with isopropyl alcohol.

Minimum Overlap Length:	1/4 in. (6 mm)
Minimum Overlap Width:	1/2 inch (12 mm)

Adhesion Properties

Substrate	Adhesion in oz/in (g/cm)				
	15 min at 72°F (22°C)	1 hr at 72°F (22°C)	24 hr at 72°F (22°C)	1 hr at 158°F (70°C)	24 hr at 158°F (70°C)
Stainless Steel	> 30 (335)	> 30 (335)	> 30 (335)	> 30 (335)	> 30 (335)
Aluminum	> 30 (335)	> 30 (335)	> 30 (335)	> 30 (335)	> 30 (335)
Copper	> 30 (335)	> 30 (335)	> 30 (335)	> 30 (335)	> 30 (335)
Silicone Rubber	> 20 (226)	> 20 (226)	> 20 (226)	> 20 (226)	> 20 (226)

Based on 90 degree peel geometry following ASTM D3330 test method. Aluminum foil (2 mil thick) was used as the flexible tape backing for tape 9719. The substrates listed are all rigid materials. The 158°F (70°C) aged samples were peeled at ambient temperature after aging and are indicative of typical long term aging.

Operative Temperature Range in a bonded form and Shelf Life

Short Term Exposure (minutes, hours)	Long Term (days, weeks)
400°F (204°C)	400°F (204°C)

Shelf Life of Tape in Roll Form: 12 months from date of manufacture when stored in original cartons at 70°F (21°C) and 50% relative humidity.

Available Sizes*

Available Widths:	Standard Length	Maximum Length
1/4 inch - 14 inch (5 mm - 381 mm)	36 yd (32.9 m)	108 yd (98.8 m)
Nominal Slitting Tolerance:	1/32 in (0.8 mm)	

*Special requirements for wider widths or longer lengths should be discussed with 3M Customer Service personnel.

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Application Techniques

- To obtain maximum adhesion, the bonding surfaces must be clean and dry. Isopropyl Alcohol or Non-polar solvent such as Heptane or Toluene can be used as a cleaning solvent.*
- Bond strength is dependent upon the amount of adhesive-to-surface contact developed. This wetted area can be increased by applying 3M™ XYZ-Axis Electrically Conductive Adhesive Transfer Tape 9719 firmly with a roller or finger pressure to exclude air entrapment. Adhesion is optimized when the substrates are flat or conformable substrates. Adhesion increases after application, up to 24 hours later, due to increased wetting by the tape.
- Electrical performance is dependent upon the nature of the metal and its surface. Most metal surfaces give enhanced electrical performance with tape 9719 when the surface has been lightly abraded. 3M™ Scotch-Brite™ pads are recommended for preparing the metal surface.
- Tape 9719 should be applied between 60°F - 100°F (15°C - 38°C).
- Tape 9719 can be removed by separating the parts using torque for rigid parts or peel for flexible ones. Remove the adhesive by pulling off as much as possible by hand. Residual adhesive may be removed by rubbing with your finger or by application of 3M Packaging Tape over the residual adhesive followed by removal of the packaging tape. The surfaces should be cleaned again before applying a new piece of tape 9719. The force required to separate the parts and/or remove the adhesive can be reduced by softening the adhesive by heating to 158°F - 212°F (70°C - 100°C) or using solvents such as Heptane or Toluene.*

***Note:** When using solvents, extinguish all ignition sources and follow manufacturer's precautions and directions for use.

General Information

Tape 9719 provides good adhesion to low surface energy (such as Silicone, Teflon) and/or other metal surfaces and provides low electrical resistance that is stable over time. The pressure sensitive nature and fiber reinforcement of tape 9719 makes this product convenient to use. It is easy to release from the liners and provides good handling properties.

Application Ideas

- Attaching Foil Laminate EMI Shields
Tape 9719 is suitable for attaching foil laminate EMI shields to electronic and electrical devices. These shields typically consist of either copper or aluminum foils laminated to PVC. Tape 9719 provides good adhesion (initial and ultimate) as well as low electrical resistance. Tape 9719 may be applied in strips or die cut to specific shapes and sizes. Compared to screws or other mechanical connector, tape 9719 provides reduced assembly time and a solid bond line with no gaps for EMI emission.
- Attaching EMI Gaskets
Tape 9719 may also be used for attaching silicone EMI gaskets to electronic cabinets, such as server cabinets or disk drive array cabinets. These gaskets typically consist of LSE conductive fabric over a foam core, and come in a variety of shapes and sizes. Tape 9719 may be cut into strips as narrow as 1/8 inch to provide adhesion for even the narrowest of gaskets. Tape 9719 may also be pre-applied to the gasket for reduced final cabinet assembly time. In many cases, tape 9719 eliminates the need to chemically prime the LSE gasket, which is otherwise difficult to bond.

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Application Ideas (continued)

- Grounding Computer Antistatic and Glare Reduction Screens
Computer antistatic and glare reduction screens need to be electrically attached to the grounding mechanism. 3M™ XYZ-Axis Electrically Conductive Adhesive Transfer Tape 9719 penetrates through anti-smudge coatings over the conductive layer to make an electrical connection. Placing tape 9719 along the edges of such a screen provides many connection points to the antistatic coating resulting in good electrical performance.
- Assembly of EMI Cages in Telecommunications Equipment
Tape 9719 is ideal for assembly of an EMI cage to a printed circuit board, often required in telecommunications equipment. The EMI cages are typically constructed from aluminum frames and lids to protect components on the PCB from EMI/RFI. The metal frame needs to be grounded to a wide copper trace etched around the perimeter of the components to be protected. Tape 9719 is applied as a die cut in the shape of the etched perimeter trace, then the frame is bonded to the perimeter trace. Tape 9719 provides for rapid assembly and grounding in one step. Compared with solder attach or liquid conductive adhesive attachment of the EMI cage, tape 9719 reduces assembly time and exposure to elevated temperatures.

For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-800-362-3550. Address correspondence to: 3M Electronics Markets Materials Division, Building 21-1W-10, 900 Bush Avenue, St. Paul, MN 55144-1000. Our fax number is 651-778-4244. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-787-750-3000. In Mexico, phone: 52-70-04-00.

Precautionary Information

MSDS: 3M has not prepared a MSDS for these products which are not subject to the MSDS requirements of the Occupational Safety and Health Administration's Hazard Communication Standard, 29 C.F.R. 1910.1200(b)(6)(v). When used under reasonable conditions or in accordance with the 3M directions for use, these products should not present a health and safety hazard. However, use or processing of the product in a manner not in accordance with the directions for use may affect their performance and present potential health and safety hazards.

TSCA: These products are defined as articles under the Toxic Substances Control Act and therefore, are exempt from inventory listing requirements.

Product Use

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