English

Last Revision Date: September, 2023

Supersedes: May, 2022

Technical Data Sheet

3M™ Membrane Switch Product with Adhesive 200MP 9045MP

Product Details

Regulatory Info/SDS

Product Description

Finite Element Analysis (FEA) data is available for this product at: **3m.com/FEA**

3M™ High Performance Acrylic Adhesive 200MP is a popular choice and industry standard, for graphic attachment and general industrial joining applications. It provides outstanding adhesion to metal and high surface energy plastics. This adhesive provides some initial repositionability for placement accuracy when bonding to plastics. It also performs well after exposure to humidity and hot/cold cycles and provides the assurance the switch will perform through difficult environmental conditions and millions of actuations.

Product Features

- Up to 400ºF short-term heat resistance
- Excellent solvent resistance
- Excellent shear strength to resist slippage and edge lifting

3M™ Double Coated Membrane Switch Spacers feature 2.0 or 5.0 mil adhesive layers for industry-standard, high-performance requirements.

Technical Information Note

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

Typical Physical Properties

Attribute Name	Test Method	Test Condition	Value
Adhesive Type			200MP Acrylic
Adhesive Carrier			Polyester Film (PET)
Adhesive Thickness		Faceside	0.05 mm (2 mil) [1]
Carrier Thickness			0.03 mm (1 mil)
Adhesive Thickness		Backside	0.05 mm (2 mil) [2]
Total Tape Thickness	ASTM D3652		0.05 mm (2 mil)
Liner Print			200MP
Primary Liner Type			94# Polycoated Kraft Paper (PCK) [3]
Secondary Liner Type			94# Polycoated Kraft Paper (PCK) [3]
Primary Liner Thickness			0.18 mm (7 mil)

Attribute Name	Test Method	Test Condition	Value
Secondary Liner Thickness			0.18 mm (7 mil)

[1] Faceside adhesive is on the interior of the roll, exposed when unwound and liner removed.

[2] Backside adhesive is on the exterior of the roll, exposed when liner is removed.

[3] Inner liner is primary (stays with die-cut part); Outer liner is secondary (removed first)

Typical Performance Characteristics

90° Peel Adhesion

Dwell Time: 72 h
Backing: 2 mil PET
Test Method: ASTM D3330

Temperature	Substrate	Value
22 °C (72 °F)	Aluminum	9.2 N/cm (84 oz/in) [1]
22 °C (72 °F)	PET	7.3 N/cm (67 oz/in) [1]
22 °C (72 °F)	Polycarbonate (PC)	7.9 N/cm (72 oz/in) [1]
22 °C (72 °F)	Stainless Steel	12.3 mm (112 oz/in) [1]
70 °C (158 °F)	Aluminum	18.4 N/cm (168 oz/in) [1]
70 °C (158 °F)	PET	13.8 N/cm (126 oz/in) [1]
70 °C (158 °F)	Polycarbonate (PC)	9.2 N/cm (84 oz/in) [1]
70 °C (158 °F)	Stainless Steel	18.1 N/cm (165 oz/in) [1]

[1] 12 in/min (300 mm/min)

Backing: 2 mil PET

Attribute Name	Test Method	Temperature	Substrate	Value
Overlap Shear Strength	ASTM D1001	22 °C (72 °F)	Stainless Steel	0.47 MPa (68 lb/in²)
Overlap Shear Strength	ASTM D1001	22 °C (72 °F)	Polycarbonate (PC)	0.48 MPa (70 lb/in²)
Tensile Strength	ASTM D2370		Stainless Steel	2,556 lb/in

Static Shear

Substrate: Stainless Steel
Backing: 2 mil PET
Test Method: ASTM D3654

Temperature	Test Condition	Value
22 °C (72 °F)	1000g	10,000+ min [1]
70 °C (158 °F)	500g	10,000+ min [1]

[1] 1/2 in x 1 in sample area, test terminated at 10,000 minutes

Attribute Name	Value
Short Term Temperature Resistance	149 °C (300 °F) [1]
Long Term Temperature Resistance	93 °C (200 °F) [2]

[1] Short Term (minutes, hour)

[2] Long Term (day, weeks)

Typical Environmental Characteristics

Environmental Resistance

Humidity Resistance – High humidity has a minimal effect on adhesive performance. Bond strength shows no significant

reduction after exposure for 7 days at 90⁰F (32⁰C) and 90% relative humidity.

UV Resistance – When properly applied, nameplates and decorative trim parts are not adversely affected by outdoor exposure.

Water Resistance – Immersion in water has no appreciable effect on the bond strength. After 100 hours at room temperature, the high bond strength is maintained.

Temperature Cycling Resistance – High bond strength is maintained after cycling four times through:
4 hours at 158⁰F (70⁰C)
4 hours at -20⁰F (-29⁰C)
4 hours at 73⁰F (22⁰C)

Chemical Resistance – When properly applied, nameplate and decorative trim parts will hold securely after exposure to numerous chemicals including oil, mild acids and alkalis.

Bond Build-up: The bond strength of 3M™ High Performance Acrylic Adhesive increases as a function of time and temperature as the adhesive further wets the surface and reaches maximum bond strength after 72 hours at room temperature.

Temperature/Heat Resistance: 3M™ High Performance Acrylic Adhesive on polyester carriers is usable for short periods (minutes, hours) at temperatures up to300 ⁰F (149⁰C) and for intermittent longer periods (days, weeks) up to 250⁰F (121⁰C).

Lower Temperature Service Limit: -40⁰F (-40⁰C).

Electrical and Thermal Properties

Attribute Name	Test Method	Temperature	Test Condition	Value
Coefficient of Thermal Expansion	ASTM D696		First Heat (125°C to 175°C)	6.1 x 10^{-4} m/m/°C
Surface Resistivity	ASTM D257	22 °C (72 °F)		>5.6 x 10^{16} Ω

Attribute Name	Test Method	Temperature	Test Condition	Value
Dissipation Factor	ASTM D150	22 °C (72 °F)		0.016
Dielectric Strength	ASTM D149			1,500 V/mil [1]
Insulation Resistance	Mil-I-46058C		100VDC, 60 sec	1.0 x 10^{13} Ω
Volume Resistivity	ASTM D257	22 °C (72 °F)		5.7 x 10^{14} Ω-cm

[1] Short time method (air)

Handling/Application Information

Application Examples

• 3M™ Double Coated Membrane Switch Spacers are ideal for circuit separation

Industry Specifications

FDA Statement

This product might be suitable for use in indirect food contact applications. Please see the applicable Regulatory Data Sheet for more information relating to FDA compliance.

Storage and Shelf Life

It is suggested that products are stored at room temperature conditions of 70⁰F (21⁰C) and 50% relative humidity. If stored properly, product retains its performance and properties for 24 months from date of manufacture.

Recognition/Certification

TSCA: This product is defined as an article under the Toxic Substances Control Act and therefore, it is exempt from inventory listing requirements

MSDS: 3M has not prepared a MSDS for this product which is not subjected 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, this product 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 its performance and present potential health and safety hazards.

UL: These products have been recognized by Underwriters Laboratories, Inc. under Ul 746C and UL 969. For more information on the UL Certification, please visit the website at http://www.3M.com/converter, select UL Recognized Materials, then select the specific product area.

Note: One of 3M's core values is to respect our social and physical environment. 3M is committed to comply with ever-changing, global, regulatory and consumer environmental, health, and safety (EHS) requirements. As a service to our customers, 3M is providing information on the regulatory status of many 3M products. Further regulation information including that for OSHA, USCPSI, California Proposition 65, READY and RoHS, can be found at 3M.com/regs.

Automotive Disclaimer

Select Automotive Applications: This product is an industrial product and has not been designed or tested for use in certain automotive applications, such as automotive electric powertrain battery or high voltage applications, which may require the product to be manufactured in a IATF certified facility, meet a Ppk of 1.33 for all properties, undergo an automotive production part approval process (PPAP), or fully adhere to automotive design or quality system requirements (e.g., IATF 16949 or VDA 6.3). Customer assumes all responsibility and risk if customer chooses to use this product in these applications.

Information

Technical Information: The technical information, guidance, and other statements contained in this document or otherwise provided by 3M are based upon records, tests, or experience that 3M believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed. Such information is intended for people with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license under any 3M or third party intellectual property rights is granted or implied with this information.

Product Selection and Use: Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. As a result, customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment and reviewing all applicable regulations and standards (e.g., OSHA, ANSI, etc.). Failure to properly evaluate, select, and use a 3M product and appropriate safety products, or to meet all applicable safety regulations, may result in injury, sickness, death, and/or harm to property.

Warranty, Limited Remedy, and Disclaimer: Unless a different warranty is specifically stated on the applicable 3M product packaging or product literature (in which case such warranty governs), 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If a 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

Limitation of Liability: Except for the limited remedy stated above, and except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity), regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability.

Disclaimer: 3M industrial and occupational products are intended, labeled, and packaged for sale to trained industrial and occupational customers for workplace use. Unless specifically stated otherwise on the applicable product packaging or literature, these products are not intended, labeled, or packaged for sale to or use by consumers (e.g., for home, personal, primary or secondary school, recreational/sporting, or other uses not described in the applicable product packaging or literature), and must be selected and used in compliance with applicable health and safety regulations and standards (e.g., U.S. OSHA, ANSI), as well as all product literature, user instructions, warnings, and limitations, and the user must take any action required under any recall, field action or other product use notice. Misuse of 3M industrial and occupational products may result in injury, sickness, or death. For help with product selection and use, consult your on-site safety professional, industrial hygienist, or other subject matter expert. For additional product information, visit www.3M.com.

ISO Statement

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.

3M
Industrial Adhesives and Tapes Division
3M Center, Building 225-3S-06
St. Paul, MN 55144-1000
800-362-3550