

Technical Data Sheet

3M™ Membrane Switch Product with
Adhesive 200MP 7959MP

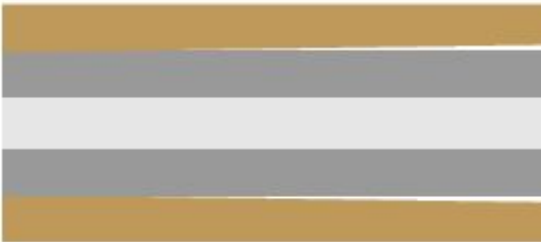
Product Description

Finite Element Analysis (FEA) data is available for this product at: [3m.com/FEA](https://www.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

- The High Performance Acrylic Adhesive 200MP offers excellent short-term heat resistance and will perform at temperatures up to 400°F (204°C)
- The 200MP adhesive provides high resistance to solvents and humidity
- The 2 mil nominal adhesive tape delivers excellent shear strength to metal surfaces
- 3M Membrane Switch products use the 200MP adhesive, which provides long lasting membrane switches
- 3M™ Double Coated Membrane Switch Spacers feature 2.0 mil adhesive layer 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 ¹ |
| Carrier Thickness | | | 0.13 mm |
| Adhesive Thickness | | Backside | 0.05 mm ² |
| Total Tape Thickness | ASTM D3652 | | 0.23 mm |
| Liner Print | | | 200MP |
| Primary Liner Type | | | 58# Polycoated Kraft Paper (PCK) ³ |
| Secondary Liner Type | | | 58# Polycoated Kraft Paper (PCK) ³ |
| Primary Liner Thickness | | | 0.11 mm |
| Secondary Liner Thickness | | | 0.11 mm |

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

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

| Attribute Name | Temperature | Substrate | Value |
|--------------------|-------------|--------------------|------------------------|
| 90° Peel Adhesion | 22 °C | Stainless Steel | 9.1 N/cm ¹ |
| 90° Peel Adhesion | 70 °C | Stainless Steel | 10.2 N/cm ² |
| 180° Peel Adhesion | 23 °C | Stainless Steel | 9.3 N/cm ² |
| 90° Peel Adhesion | 23 °C | Aluminum | 9.4 N/cm ² |
| 90° Peel Adhesion | 23 °C | Polyester (PET) | 3.8 N/cm ² |
| 90° Peel Adhesion | 23 °C | Polycarbonate (PC) | 9.7 N/cm ² |

¹ 12 in/min (300 mm/min)

² 304 mm/min (12 in/min)

Substrate: Aluminum
Temperature: 23 °C
Dwell Time: 72 h

| Attribute Name | Test Method | Value |
|------------------------|----------------------|----------------------|
| Overlap Shear Strength | ASTM D1002, ISO 4587 | 2.1 MPa ¹ |

¹ Pressure was obtained via a Mechanical Press set at 138 kPa (20 psi) for 15 seconds on 25 x 25 mm (1 x 1 in) sample Crosshead speed 304 mm/min (12 in/min).

Static Shear

Substrate: Stainless Steel
Dwell Time: 72 h
Backing: 2 mil Aluminum Foil
Test Method: ASTM D3654

| Temperature | Test Condition | Value |
|-------------|----------------|-------------------------|
| 23 °C | 1000 g | 10,000 min ¹ |
| 70 °C | 500 g | 10,000 min ¹ |

¹ 25 x 25 mm (1 in x 1 in) sample area, test terminated after 10,000 minutes

Substrate: Stainless Steel
Temperature: 23 °C
Dwell Time: 72 h
Backing: 2 mil Aluminum Foil
Test Method: ASTM D3654

| Attribute Name | Environmental Condition | Test Condition | Value |
|-----------------------------------|-------------------------|----------------------------------|-------------------------|
| Short Term Temperature Resistance | 204 °C (400 °F) | 500 g wt for at least 60 min | 60 min ¹ |
| Long Term Temperature Resistance | 149 °C (300 °F) | 500 g wt for at least 10,000 min | 10,000 min ¹ |

¹ 6.5 cm² (1 in²) Sample area

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 90°F (32°C) 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 158°F (70°C)

4 hours at -20°F (-29°C)

4 hours at 73°F (22°C)

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 to 400°F (204°C) and for intermittent longer periods (days, weeks) up to 300°F (149°C).

Lower Temperature Service Limit: -40°F (-40°C).

Electrical and Thermal Properties

| Attribute Name | Test Method | Temperature | Test Condition | Value |
|----------------------------------|-------------|-------------|---------------------------|---|
| Coefficient of Thermal Expansion | ASTM D696 | | First Heat (125 ~ 175 °C) | $3.5 \times 10^{-1} \text{ m/m/}^{\circ}\text{C}$ |
| Thermal Conductivity | ASTM C518 | 43 °C | | 0.171 W/m/K^1 |

¹ results listed are at 43 °C (109° F)

| Attribute Name | Test Method | Temperature | Value |
|---------------------|-------------|-------------|---------------------------------------|
| Dissipation Factor | ASTM D150 | 23 °C | 0.013 |
| Dielectric Strength | ASTM D149 | | 1,661 V/mil ¹ |
| Volume Resistivity | ASTM D257 | 23 °C | $7.8 \times 10^{14} \Omega\text{-cm}$ |
| Breakdown Voltage | | | 15,683 V |

¹ Short time method (air)

Handling/Application Information

Application Examples

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

Storage and Shelf Life

Store under normal conditions of 16° to 27°C (60° to 80°F) and 40 to 60% relative humidity in the original packaging, out of direct sunlight. For best performance, use this product within 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, USCPSP, California Proposition 65, REACH 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

Precautionary Information: Refer to product label and Material Safety Data Sheet for health and safety information before using the product. For information, please contact your local 3M Office. You can click or scan QR code to see contact detail or visit www.3M.com Important Information: All statements, technical information and recommendations contained in this document are based upon tests or experience that 3M believes are reliable. However, many factors beyond 3M's control can affect the use and performance of a 3M product in a particular application, including the conditions under which the product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method or application. All questions of liability relating to this product are governed by the terms of the sale subject, where applicable, to the prevailing law. Values presented have been determined by standard test methods and are average values not to be used for specification purposes. Our recommendations on the use of our products are based on tests believed to be reliable but we would ask that you conduct your own tests to determine their suitability for your applications. This is because 3M cannot accept any responsibility or liability direct or consequential for loss or damage caused as a result of our recommendations.

ISO Statement

This product was manufactured under a 3M quality system registered to ISO 9001 standards.

3M™ Centre
Cain Rd, Binfield, Bracknell RG12 8HT, United Kingdom
3m.co.uk/iatd

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