



# Technical Data Sheet

3M™ Membrane Switch Product with  
Adhesive 200MP 7993MP

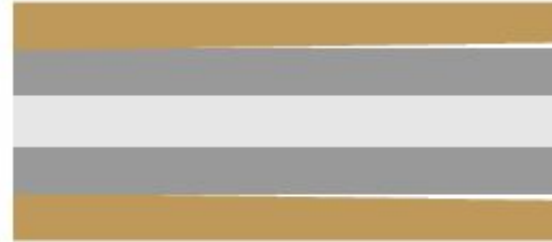
## Product Description

Finite Element Analysis (FEA) data is available for this product at: [3m.com/FEA](https://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 | Value                            |
|----------------------|-------------|----------------------------------|
| Adhesive Type        |             | 200MP Acrylic                    |
| Adhesive Carrier     |             | Polyester Film (PET)             |
| Carrier Thickness    |             | 0.03 mm                          |
| Total Tape Thickness | ASTM D3652  | 0.05 mm                          |
| Liner Print          |             | 200MP                            |
| Liner                |             | 94# Polycoated Kraft Paper (PCK) |
| Liner Thickness      |             | 0.18 mm                          |

## Typical Performance Characteristics

## 90° Peel Adhesion

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

| Temperature | Substrate          | Value                 |
|-------------|--------------------|-----------------------|
| 23 °C       | PET                | 5 N/cm <sup>1</sup>   |
| 23 °C       | Polycarbonate (PC) | 5.6 N/cm <sup>1</sup> |
| 23 °C       | Aluminum           | 7 N/cm <sup>1</sup>   |
| 23 °C       | Stainless Steel    | 7 N/cm <sup>1</sup>   |
| 70 °C       | PET                | 7.9 N/cm <sup>1</sup> |
| 70 °C       | Polycarbonate (PC) | 6.8 N/cm <sup>1</sup> |
| 70 °C       | Aluminum           | 8.6 N/cm <sup>1</sup> |
| 70 °C       | Stainless Steel    | 9 N/cm <sup>1</sup>   |

<sup>1</sup> 304 mm/min (12 in/min)

Substrate: Stainless Steel  
 Backing: 2 mil PET

| Attribute Name   | Test Method | Temperature | Test Condition | Value                    |
|------------------|-------------|-------------|----------------|--------------------------|
| Static Shear     | ASTM D3654  | 23 °C       | 1000 g         | 10,000+ min <sup>1</sup> |
| Static Shear     | ASTM D3654  | 70 °C       | 500 g          | 10,000+ min <sup>1</sup> |
| Tensile Strength | ASTM D2370  |             |                | 3,609 lb/in              |

<sup>1</sup> 13 x 25 mm (0.5 x 1 in) sample area, test terminated at 10,000 minutes

| Attribute Name                    | Value               |
|-----------------------------------|---------------------|
| Short Term Temperature Resistance | 149 °C <sup>1</sup> |
| Long Term Temperature Resistance  | 93 °C <sup>2</sup>  |

<sup>1</sup> Short Term (minutes, hour)

<sup>2</sup> 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 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 300 °F (149°C) and for intermittent longer periods (days, weeks) up to 250°F (121°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) | $4.5 \times 10^{-4} \text{ m/m/}^\circ\text{C}$ |
| Surface Resistivity              | ASTM D257   | 23 °C       |                           | $>5.6 \times 10^{16} \Omega$                    |

| Attribute Name        | Test Method  | Temperature | Test Condition  | Value                                 |
|-----------------------|--------------|-------------|-----------------|---------------------------------------|
| Dissipation Factor    | ASTM D150    | 23 °C       |                 | 0.012                                 |
| Dielectric Strength   | ASTM D149    |             |                 | 1,700 V/mil <sup>1</sup>              |
| Insulation Resistance | Mil-I-46058C |             | 100 VDC, 60 sec | $6.5 \times 10^{12} \Omega$           |
| Volume Resistivity    | ASTM D257    | 23 °C       |                 | $2.7 \times 10^{15} \Omega\text{-cm}$ |

<sup>1</sup> Short time method (air)

## Handling/Application Information

### Application Examples

- 3M™ Single Coated Membrane Switch Spacers are ideal for circuit layers, metal dome placement and lead protection

## 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 UI 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, FDA, California Proposition 65, REACH and RoHS, can be found at [3M.com/regs](http://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](http://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.

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