



High Performance Adhesive Transfer Tapes with Adhesive 200MP

467MP • 468MP • 467MPF • 468MPF • 467MPR • 468MPR • 7952MP • 7955MP
7962MP • 7965MP • 9172MP • 9172PT • 9185MP • 9188 • 9667MP • 9668MP • 9676

Technical Data

October, 2003

Product Description

3M™ Adhesive 200MP is a popular choice for graphic attachment and membrane switch applications because it has excellent quality, consistency and durability. In addition, as a result of 3M's innovative, proprietary process, 3M adhesive 200MP also offers the following excellent performance characteristics.

Clarity (virtually free of vapor inclusions that are commonly found in adhesives produced by the traditional solvent coating technique).

Excellent high temperature performance as well as excellent shear strength (that minimizes edge lifting and slippage of parts).

Excellent resistance to harsh environments; this adhesive can withstand splashes of organic solvents, weak acids and bases and salt water, cleaning solutions, germicides, disinfectants, oils, etc. In addition, it performs well after exposure to humidity and hot/cold cycles.

Provides some initial repositionability when bonding to plastic parts (not metal) which allows graphic parts to be lifted and repositioned if initial alignment is incorrect.

Finally, this adhesive family is provided with a variety of liner configurations to help ensure excellent process flexibility.

Constructions

| Product Number | Adhesive Type/Color ¹ | Adhesive Thickness ² (mils, mm) | Liner Color, Type, Print | Liner Caliper ³ /Liner Release ⁴ |
|-----------------------------------|----------------------------------|--|---|--|
| 3M™ Adhesive Transfer Tape 467MP | 200MP/ Clear | 2.3 mils (0.06 mm) | Tan, 58#, Polycoated Kraft, "3M 467MP 200MP Adhesive" | 4.2 mils 50 grams/inch |
| 3M™ Adhesive Transfer Tape 468MP | 200MP/ Clear | 5.2 mils (0.13 mm) | Tan, 58#, Polycoated Kraft, "3M 468MP 200MP Adhesive" | 4.2 mils 50 grams/inch |
| 3M™ Adhesive Transfer Tape 467MPF | 200MP/ Clear | 2.3 mils (0.06 mm) | Clear, Polyester (PET), No Print | 2.0 mils 20 grams/inch |
| 3M™ Adhesive Transfer Tape 468MPF | 200MP/ Clear | 5.2 mils (0.13 mm) | Clear, Polyester, No Print | 2.0 mils 20 grams/inch |
| 3M™ Adhesive Transfer Tape 467MPR | 200MP/ Clear | 2.3 mils (0.06 mm) | White, polycoated glassine paper printed with white 3M logo | 3.5 mils 55 grams/inch |
| 3M™ Adhesive Transfer Tape 468MPR | 200MP/ Clear | 5.2 mils (0.13 mm) | White, polycoated glassine paper printed with white 3M logo | 3.5 mils 55 grams/inch |
| 3M™ Adhesive Transfer Tape 7952MP | 200MP/ Clear | 2.3 mils (0.06 mm) | 1) Tan, 58#, Polycoated Kraft, "3M 200MP" 2) Tan, 58# PCK | 1) 4.2 mils 50 grams/inch 2) 4.2 mils 12 grams/inch |

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Constructions (continued)

| Product Number | Adhesive Type/Color ¹ | Adhesive Thickness ² (mils, mm) | Liner Color, Type, Print | Liner Caliper ³ /Liner Release ⁴ |
|-----------------------------------|----------------------------------|--|---|--|
| 3M™ Adhesive Transfer Tape 7955MP | 200MP/ Clear | 5.2 mils (0.13 mm) | 1) Tan, 58#, Polycoated Kraft, "3M 200MP" 2) Tan, 58# PCK | 1) 4.2 mils 50 grams/inch 2) 4.2 mils 12 grams/inch |
| 3M™ Adhesive Transfer Tape 7962MP | 200MP/ Clear | 2.3 mils (0.06 mm) | 1) Tan, 83#, Polycoated Kraft, "3M 200MP" 2) Tan, 58# PCK | 1) 6.2 mils printed 50 grams/inch 2) 4.2 mils 12 grams/inch |
| 3M™ Adhesive Transfer Tape 7965MP | 200MP/ Clear | 5.2 mils (0.13 mm) | 1) Tan, 83#, Polycoated Kraft, "3M 200MP" 2) Tan, 58# PCK | 1) 6.2 mils printed 50 grams/inch 2) 4.2 mils 12 grams/inch |
| 3M™ Adhesive Transfer Tape 9172MP | 200MP/ Clear | 2.3 mils (0.06 mm) | 1) Clear HDPE Film, No Print 2) Tan, 58# Polycoated Kraft, No Print | 1) 3.0 mils 50 grams/inch 2) 4.2 mils 7 grams/inch |
| 3M™ Adhesive Transfer Tape 9172PT | 200MP/ Clear | 2.3 mils (0.06 mm) | 1) Clear PET Film, No Print 2) Tan, 58# Polycoated Kraft, No Print | 1) 2.0 mils 40 grams/inch 2) 4.2 mils 7 grams/inch |
| 3M™ Adhesive Transfer Tape 9185MP | 200MP/ Clear | 5.2 mils (0.13 mm) | 1) Clear HDPE Film, No Print 2) Tan, 58# Polycoated Kraft, No Print | 1) 3.0 mils 70 grams/inch 2) 4.2 mils 7 grams/inch |
| 3M™ Adhesive Transfer Tape 9188 | 200MP/ Clear | 5.2 mils (0.1m) | 1) Clear HDPE Film, No Print 2) Tan, 83# Polycoated Kraft, No Print | 1) 3.0 mils 50 grams/inch 2) 6.2 mils 20 grams/inch |
| 3M™ Adhesive Transfer Tape 9667MP | 200MP/ Clear | 2.3 mils (0.06 mm) | Tan, 83#, Polycoated Kraft "3M 200MP" | 6.2 mils 60 grams/inch |
| 3M™ Adhesive Transfer Tape 9668MP | 200MP/ Clear | 5.2 mils (0.13 mm) | Tan, 83#, Polycoated Kraft "3M 200MP" | 6.2 mils 70 grams/inch |
| 3M™ Adhesive Transfer Tape 9676 | 200MP/ Clear | 2.3 mils (0.06 mm) | 1) White Polypropylene (PP), No Print 2) Tan, 58# Polycoated Kraft, No Print | 1) 3.5 mils 45 grams/inch 2) 4.2 mils 20 grams/inch |

¹The adhesive color is transparent with a very slight yellow cast. The yellow cast is not typically visible in a single adhesive layer.

²The thickness listed is based on a calculation from manufacturing controlled adhesive coat weights using a density of 1.012 g/cc. While past data pages have listed nominal thicknesses of 2 and 5 mils, the coat weight (and theoretical caliper) has not changed.

³Where two liners are listed (double-lined products, useful for selective die-cutting), liner 1) is the primary (stays with the die-cut part); liner 2) is the secondary (removed first). The polycoat on one side of the heavy lined products (83#) was changed to balance the liner. This balanced sheet will provide an improvement to the flatness of products made using the heavy liner.

⁴Typical liner release value, in grams/inch, tested at 90 ipm.

For additional double coated product constructions (adhesive/carrier/adhesive) using 3M™ Adhesive 200MP, please refer to the data page for 3M™ Membrane Switch Spacers (70-0707-1195-0) and the data page for Double Coated Tapes with 3M™ Adhesive 200MP (70-0709-3792-8).

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Constructions
(continued)

Liner Configuration Guide:

| | |
|--|---|
| General purpose steel rule die-cutting | 58# polycoated kraft (PCK) |
| Steel rule cutting nested or multi-up nameplates on common sheet | 83# PCK |
| Kiss cutting, steel rule | 83# PCK |
| Rotary die-cutting | polyester (PET) and polycoated glassine (PCG) |
| Selective die-cutting (cut adhesive before laminate) | double-lined |
| Thermoforming | HDPE, white PP |
| Part inspection | HDPE, PET |
| Embossed parts | white, PP, HDPE |
| Metal parts (punch press) | polyester or DK added |

The polycoated kraft liners are more resistant to humidity curl and wrinkling than standard plain paper liners. The film liners are the most resistant to the negative effects of humidity.

Adding Liners for 3M™ Adhesive 200MP:

- Rotary processing, adhesive only, on a densified kraft liner. In this process the adhesive will stay with the 58# PCK liner, leaving adhesive die-cuts dispensable from the densified kraft liner 4994. outside of 3M™ liner 4994⁵
- Rotary processing for finished parts. It is most efficient to use 3M™ Adhesive Transfer Tapes 467MPF or 468MPF. If a densified kraft (DK) liner is necessary, the adhesive should be first laminated to the substrate with pressure. After lamination, remove the 58# PCK liner and laminate the inside of the liner 4994 (DK). Current process limitations prevent the supply of the 3M adhesive 200MP on a DK liner. inside of 3M™ liner 4994⁵

⁵The outside of liner 4994 has the most premium silicone release (easiest release). Typical release, of the outside of liner 4994, from 3M adhesive 200MP after lamination (both before and after heat aging) is 5-10 grams/inch. For slightly higher liner release, typical values for the inside of the liner 4994 are 15-20 grams/inch when laminated to the 3M adhesive 200MP.

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.

I. Adhesion to Stainless Steel

ASTM D3330 modified (90° peel, 2 mil aluminum foil backing)

| Dwell | 2 mil (0.002 inches) | | 5 mil (0.005 inches) | |
|---------------------------------------|----------------------|---------|----------------------|---------|
| | ounces/inch | N/100mm | ounces/inch | N/100mm |
| 15 minute room temperature (RT) | 47 | 51 | 66 | 72 |
| 72 hour RT | 82 | 90 | 118 | 129 |
| 72 hour 158°F (70°C) | 168 | 184 | 181 | 198 |
| 72 hour RT - 180° peel, 2 mil al foil | 77 | 84 | 133 | 146 |

II. Adhesion to Other Surfaces

ASTM D3330 modified (90° peel, 2 mil aluminum foil backing)

| Dwell | 2 mil (0.002 inches) | | 5 mil (0.005 inches) | |
|--------------------------------------|----------------------|---------|----------------------|---------|
| | ounces/inch | N/100mm | ounces/inch | N/100mm |
| 72 hour RT aluminum | 77 | 84 | 115 | 126 |
| 72 hour RT ABS | 62 | 68 | 68 | 74 |
| 72 hour RT acrylic | 61 | 67 | 67 | 73 |
| 72 hour RT glass | 80 | 88 | 92 | 101 |
| 72 hour RT polycarbonate | 58 | 63 | 65 | 71 |
| 72 hour RT rigid PVC (unplasticized) | 52 | 57 | 69 | 76 |

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Typical Physical Properties and Performance Characteristics
(continued)

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

III. Relative High Temperature Operating Ranges

| | |
|----------------------------|---------------|
| Short term (minutes/hours) | 400°F (204°C) |
| Long term (days/weeks) | 300°F (149°C) |

IV. Static Shear

ASTM D3654 - 1" x 1" sample area - aluminum foil to stainless steel

| Temperature | Load | Minutes to Failure | |
|---------------|------------|--------------------|---------|
| | | 2 mil | 5 mil |
| 70°F (21°C) | 2000 grams | 10,000+ | 10,000+ |
| 200°F (93°C) | 1000 grams | 10,000+ | 10,000+ |
| 350°F (177°C) | 500 grams | 10,000+ | 10,000+ |
| 450°F (232°C) | 400 grams | 60 | 75 |
| 450°F (232°C) | 200 grams | 10,000+ | 10,000+ |

V. Shelf Life of Tape in Roll Form

24 months from the manufacturing date when stored at 70°F (21°C) and 50% relative humidity.

VI. Adhesion Retention after Immersion and Exposure (percent retention)

Control is 24 hour RT dwell on stainless steel, 2 mil al foil backing, 90° peel, 12 ipm

| | 3M™ Adhesive 200MP | |
|--|--------------------|--------------|
| | 2 mil | 5 mil |
| Control adhesion value in ounces/inch | 101 oz./inch | 149 oz./inch |
| gasoline - 1 hour RT immersion | 89% | 83% |
| MEK - 1 hour RT immersion | 64% | 66% |
| weak acid - 4 hour RT immersion | 86% | 86% |
| weak base - 4 hour RT immersion | 84% | 83% |
| oil (10W30) - 72 hour, 120°F (49°C) immersion | 146% | 141% |
| water - 100 hours, 70°F (21°C) | 105% | 116% |
| salt water (5%) - 72 hours, 70°F (21°C) | 105% | 93% |
| warm/humid - 7 days, 90°F (32°C) and 90% relative humidity | 131% | 101% |
| UV cabinet - 30 days, 70°F (21°C) | 147% | 93% |
| Temperature Cycle - *Three cycles | 148% | 158% |
| *One cycle is 4 hours, 158°F (70°C); 4 hours, -20°F (-29°C); 16 hours, 70°F (21°C) | | |

VII. Low Service Temperature

The glass transition temperature for 3M adhesive 200MP is -31°F (-35°C). Many applications survive below this temperature (factors affecting successful applications include: materials being bonded, dwell at RT before cold exposure and stress below the TG [i.e. expansion/ contraction stresses, impact]). Optimum conditions are: bonding high surface energy materials, longer time at RT before cold exposure and little or no stress below the Tg.

⁶Adhesive 200MP is not recommended for low energy plastics (polypropylene, polyethylene, powder coated paints). For these surfaces please refer to 3M™ Adhesives 300, 350, 300LSE and 300MP. The 3M™ Adhesive 300LSE has been used more frequently as the bond areas in applications become smaller. It offers the smooth, high performance characteristics of the 3M adhesive 200MP with higher adhesion to plastic. 3M adhesive 300LSE is ideal for polyethylene, polypropylene, powder coated paints and for applications where the bonded area to plastic is less than 1/2" wide.

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Electrical, Mechanical and Thermal Properties

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

| Property | 3M™ Adhesive 200MP | |
|---|---|---|
| | 2 mil (3M™ Adhesive Transfer Tape 467MPR was tested) | 5 mil (3M™ Adhesive Transfer Tape 468MPR was tested) |
| Insulation Resistance (test voltage = 100 VDC) Mil-I-46058C | >1 x 10 ¹⁰ ohms | >1 x 10 ¹⁰ ohms |
| Dielectric Strength – (500 vac, rms [60 hz/sec]) ASTM D149-92 | 880 volts/mil | 600 volts/mil |
| Breakdown Voltage | 1,760 volts | 3,000 volts |
| Dielectric Constant (at 1 KHz) ASTM D 150-92 | 3.40 | 4.06 |
| Dissipation Factor | 0.021 | 0.022 |
| Tensile Lap Shear – Peak Load ASTM D1002-72 (0.5 square inch on #6061 aluminum) | | 55 lbs. |
| Tensile Lap Shear – Peak Stress ASTM D1002-72 | | 109 PSI |
| Tensile Strength and Elongation ASTM D2370-82 | | 51 PSI 1915% |
| Thermal Conductivity (ASTM C 518, results listed are at 109°F) | 0.098 BTU-ft/ ft ² -hr-F 0.17 watt/m-K | 0.101 BTU-ft/ ft ² -hr-F 0.18 watt/m-K |
| Coefficient of Thermal Expansion - first heat ASTM D 696 | 28 x 10 ⁻⁵ m/m/C | -6 x 10 ⁻⁵ m/m/C |
| | - second heat | 92 x 10 ⁻⁵ m/m/C |

Specifications

Please specify 3M adhesive 200MP, 2 mil or 5 mil rather than the exact product number based on the liner configuration. The converter will select the product with the necessary liner configuration to meet the delivery requirements.

| | 3M adhesive 200MP | |
|---|-----------------------|------------------------|
| | 2 mil | 5 mil |
| Coat weight ⁷ (grains/4" x 6") (grams/ft ²) | 14 ± 12% 5.4 ± 12% | 32 ± 12% 12.4 ± 12% |
| Face Adhesion ⁸ (exposed side) ounces/inch | 30 minimum | 37 minimum |
| Back Adhesion ⁸ (liner side) ounces/inch | 30 minimum | 37 minimum |

⁷The amount of adhesive supplied, for pressure-sensitive adhesives, is controlled by the adhesive coat weight, not the adhesive caliper. Pressure-sensitive adhesives are compressible which results in high error for caliper measurements. The caliper listed in the Constructions section (page 1) has been calculated using a density of 1.012 g/cc (testing caliper is not part of the standard release testing because of the error described.)

⁸ASTM D3330, 15 minute dwell on stainless steel. For this adhesive family, the adhesion will be much higher with longer dwells on stainless steel and other high surface energy materials (please refer to the typical Physical Properties section in this document to see performance on other materials after longer dwells).

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| Available Sizes | Master Size | Slit Width (minimum) | Roll Length ⁹ | Core Size | Slit Tolerance |
|--|--|-----------------------------------|----------------------------|---------------------------|--------------------------|
| 3M™ Adhesive Transfer Tape 467MP 3M™ Adhesive Transfer Tape 468MP | 48", 54" 60" | 1/2" | 60-360 yards | 3" | ± 1/32" |
| 3M™ Adhesive Transfer Tape 467MPF 3M™ Adhesive Transfer Tape 468MPF | 54" | 1/2" | 60-360 yards | 3" | ± 1/32" |
| 3M™ Adhesive Transfer Tape 467MPR 3M™ Adhesive Transfer Tape 468MPR | Roll lengths vary by product slit width (the customer service department has more detailed information, 1-800-328-1681). | | | | |
| 3M™ Adhesive Transfer Tape 7952MP 3M™ Adhesive Transfer Tape 7955MP 3M™ Adhesive Transfer Tape 7962MP 3M™ Adhesive Transfer Tape 7965MP | 48" | 24" x 36" sheets (100/case) | If roll form: 360 yards | If roll form: 6" cores | If roll form: ± 1/32" |
| 3M™ Adhesive Transfer Tape 9172MP 3M™ Adhesive Transfer Tape 9185MP 3M™ Adhesive Transfer Tape 9676 | 48" | 1" | 60-360 yards | 3" | ± 1/32" |
| 3M™ Adhesive Transfer Tape 9667MP 3M™ Adhesive Transfer Tape 9668MP | 54" | 1" | 60-360 yards | 3" | ± 1/32" |
| 3M™ Adhesive Transfer Tape 9188 | 54" | 1" | 180 yards | 3" | ± 1/32" |

⁹Roll lengths vary by product slit width (the customer service department has more detailed information, 1-800-328-1681).

Application Techniques

For maximum bond strength (during installation of the final part) the surface should be thoroughly cleaned and dried. Typical cleaning solvents are heptane* (for oily surfaces) or isopropyl alcohol* for plastics. Use reagent grade solvents since common household materials like rubbing alcohol frequently contain oils to minimize the drying affect on skin and can interfere with the performance of a pressure-sensitive adhesive.

***Note:** Carefully read and follow the manufacturer’s precautions and directions for use when working with solvents. These cleaning recommendations may not be in compliance with the rules of certain air quality management districts in California; consult applicable rules before use.

It is necessary to provide pressure during lamination (1.5-20 pli recommended) and during final part installation (10-15 psi) to allow the adhesive to come into direct contact with the substrate. Using a hard edged plastic tool, which is the full width of the laminated part, helps to provide the necessary pressure at the point of lamination. Heat can increase bond strength when bonding to metal parts (generally this same increase is observed at room temperature over longer times, weeks). For plastic parts, the bond strength is not enhanced with the addition of heat.

The ideal adhesive application temperature range is 60°F (21°C) to 100°F (38°C). Application is not recommended if the surface temperature is below 50°F (10°C) because the adhesive becomes too firm to adhere readily. Once properly applied, at the recommended application temperature, low temperature holding is generally satisfactory (please refer to section VII of the Typical Physical Properties and Performance Characteristics).

When bonding a thin, smooth, flexible material to a smooth surface, it is generally acceptable to use 2 mils of 3M™ Adhesive 200MP. If a texture is visible on one or both surfaces, the 5 mil 3M adhesive 200MP would be suggested. If both materials are rigid, it may be necessary to use a thicker adhesive to successfully bond the components. 3M™ VHB™ Acrylic Foam Tapes may be required (please refer to the data page 70-0709-3830-6).

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Application Equipment

To apply adhesives in a wide web format, lamination equipment is required to ensure acceptable quality. To learn more about working with pressure-sensitive adhesives please refer to technical bulletin, Lamination Techniques for Converters of Laminating Adhesives (70-0704-1430-8).

For additional dispenser information, contact your local 3M sales representative, or the toll free 3M sales assistance number at 1-800-362-3550.

Application Ideas

- Long term bonding of graphic nameplates and overlays (“subsurface” printed polycarbonate or polyester) to metal and high surface energy plastics in the aerospace, medical and industrial equipment, automotive, appliance and electronic markets.
- Bonding metal nameplates and rating plates in the aerospace, medical and industrial equipment, automotive, appliance and electronic markets.
- Bonding graphic overlays for membrane switches and for bonding the complete switch to the equipment surface.
- High speed processing of parts in the medical, telecommunications and electronics markets (medical components, durable labels, flexible circuits).
- Lamination to industrial foams for rotary die-cutting of small gaskets for industrial and electronics markets.

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For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-800-223-7427 or visit www.3m.com/converter. Address correspondence to: 3M Industrial Adhesives and Tapes 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.

Certification/ Recognition

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

MSDS: These products 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, the products should not present a health and safety hazard. However, use or processing of the products in a manner not in accordance with the directions for use may affect their performance and present potential health and safety hazards.

UL: Many of these products have been recognized by Underwriters Laboratories Inc. under Standard UL 969, Marking and Labeling Systems Materials Component. For more information on the UL Certification, please visit the 3M website at <http://www.3m.com/converter>.

Product Use

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 of application.

Warranty and Limited Remedy

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ISO 9001

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

3M

Industrial Business
Converter Markets
Industrial Adhesives and Tapes Division

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