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Membrane Switch Products with Adhesive 200MP

7945MP • 7952MP • 7953MP • 7955MP • 7956MP
7957MP • 7959MP • 7961MP • 7962MP • 7965MP
7993MP • 7995MP • 7997MP • 9045MP • 9056MP
9057MP • 9059MP • 9061MP

Technical Data **November, 2013**

Product Description

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.

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

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Construction Information

3M™ Double Linered 200MP Adhesive Transfer Tape products offer:

- High adhesive strength for a long-lasting durable bond
- High cohesive strength to resist lifting and separation especially in harsh environments
- Smooth adhesive for a uniform graphic appearance
- Environmental stability for a long-aging performance
- Moisture stable liner for easy, layflat processing
- Easy differential release liners for fast, consistent processing

Product	Adhesive Thickness mils (mm)	Liner 1 Type Liner 1 Thickness mils (mm)	Liner 2 Type Liner 2 Thickness mils (mm)
7952MP	2.0 mils (0.05 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)
7962MP	2.0 mils (0.05 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)	83# Polycoated Kraft Paper (PCK) 6.2 mils (0.16 mm)
7955MP	5.0 mils (0.13 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)
7965MP	5.0 mils (0.13 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)	83# Polycoated Kraft Paper (PCK) 6.2 mils (0.16 mm)

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Construction Information (continued)

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

Product	Adhesive 1 Thickness mils (mm)	Carrier Type Carrier Thickness mils (mm)	Adhesive 2 Thickness mils (mm)	Liner 1 Type Liner Thickness mils (mm)	Liner 2 Type Liner Thickness mils (mm)
7953MP	1.5 mils (0.04 mm)	Polyester Film (PET) 0.5 mils (0.01 mm)	1.5 mils (0.04 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)
7945MP	2.0 mils (0.05 mm)	Polyester Film (PET) 1.0 mils (0.03 mm)	2.0 mils (0.05 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)
7956MP	2.0 mils (0.05 mm)	Polyester Film (PET) 2.0 mils (0.05 mm)	2.0 mils (0.05 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)
7957MP	2.0 mils (0.05 mm)	Polyester Film (PET) 3.0 mils (0.08 mm)	2.0 mils (0.05 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)
7959MP	2.0 mils (0.05 mm)	Polyester Film (PET) 5.0 mils (0.13 mm)	2.0 mils (0.05 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Construction Information (continued)

Product	Adhesive 1 Thickness mils (mm)	Carrier Type Carrier Thickness mils (mm)	Adhesive 2 Thickness mils (mm)	Liner 1 Type Liner Thickness mils (mm)	Liner 2 Type Liner Thickness mils (mm)
7961MP	2.0 mils (0.05 mm)	Polyester Film (PET) 7.0 mils (0.18 mm)	2.0 mils (0.05 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)
9045MP	2.0 mils (0.05 mm)	Polyester Film (PET) 1.0 mils (0.03 mm)	2.0 mils (0.05 mm)	94# Polycoated Kraft Paper (PCK) 7.0 mils (0.18 mm)	94# Polycoated Kraft Paper (PCK) 7.0 mils (0.18 mm)
9056MP	2.0 mils (0.05 mm)	Polyester Film (PET) 2.0 mils (0.05 mm)	2.0 mils (0.05 mm)	94# Polycoated Kraft Paper (PCK) 7.0 mils (0.18 mm)	94# Polycoated Kraft Paper (PCK) 7.0 mils (0.18 mm)
9057MP	2.0 mils (0.05 mm)	Polyester Film (PET) 3.0 mils (0.08 mm)	2.0 mils (0.05 mm)	94# Polycoated Kraft Paper (PCK) 7.0 mils (0.18 mm)	94# Polycoated Kraft Paper (PCK) 7.0 mils (0.18 mm)
9059MP	2.0 mils (0.05 mm)	Polyester Film (PET) 5.0 mils (0.13 mm)	2.0 mils (0.05 mm)	94# Polycoated Kraft Paper (PCK) 7.0 mils (0.18 mm)	94# Polycoated Kraft Paper (PCK) 7.0 mils (0.18 mm)
9061MP	2.0 mils (0.05 mm)	Polyester Film (PET) 7.0 mils (0.18 mm)	2.0 mils (0.05 mm)	94# Polycoated Kraft Paper (PCK) 7.0 mils (0.18 mm)	94# Polycoated Kraft Paper (PCK) 7.0 mils (0.18 mm)

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Construction Information (continued)

3M™ Single Coated Membrane Switch Spacers offer:

- Smooth adhesive layer for consistent actuation and excellent sealability of switch
- High adhesive strength to resist moisture penetration, and environmental conditions
- High cohesive strength to resist lifting and separation especially in harsh environments
- High temperature resistance to resist splitting in harsh environments
- High chemical resistance to resist contamination of contacts in harsh environments
- Heat stabilized polyester for dimensional stability through broad temperature range
- Moisture stable liners for easy, layflat processing
- Easy liner release – for fast, consistent processing

Product	Adhesive Thickness mils (mm)	Carrier Type Carrier Thickness mils (mm)	Liner 1 Type Liner Thickness mils (mm)
7993MP	2.0 mils (0.05 mm)	Polyester Film (PET) 1.0 mils (0.03 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)
7995MP	2.0 mils (0.05 mm)	Polyester Film (PET) 3.0 mils (0.08 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)
7997MP	2.0 mils (0.05 mm)	Polyester Film (PET) 5.0 mils (0.13 mm)	58# Polycoated Kraft Paper (PCK) 4.2 mils (0.11 mm)

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Typical Physical, Mechanical, and Electrical Properties and Performance Characteristics

3M™ Double Linered Adhesive Transfer Tapes (for selective die cutting)

3M™ Membrane Switch Product Number	Peel Adhesion ASTM D3330, Modified 90º Peel			
		Initial (20 minutes)	72 hours @ 72°F (22°C)	72 hours @ 158°F (70°C)
	Film / Substrate	**Typical Value** oz/in (N/25mm)	**Typical Value** oz/in (N/25mm)	**Typical Value** oz/in (N/25mm)
7952MP 7962MP (2-0-0)	PET/Stainless Steel	31 (9)	97 (27)	156 (43)
	PET/Aluminum	41 (11)	76 (21)	157 (43)
	PET/PET	38 (11)	66 (18)	118 (33)
	PET/Polycarbonate	43 (12)	70 (19)	67 (19)
7953MP (1.5-0.5-1.5)	PET/Stainless Steel	50 (14)	113 (31)	160 (44)
	PET/Aluminum	32 (9)	75 (21)	152 (42)
	PET/PET	44 (12)	73 (20)	125 (35)
	PET/Polycarbonate	47 (13)	76 (21)	75 (21)
7955MP 7965MP (5-0-0)	PET/Stainless Steel	69 (19)	112 (31)	167 (46)
	PET/Aluminum	77 (21)	115 (32)	169 (47)
	PET/PET	77 (21)	95 (26)	164 (45)
	PET/Polycarbonate	84 (23	102 (28)	94 (26)

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Typical Physical, Mechanical, and Electrical Properties and Performance Characteristics (continued)

3M™ Double Coated Membrane Switch Spacers (for circuit separation)

3M™ Membrane Switch Product Number	Film / Substrate	Peel Adhesion ASTM D3330, Modified 90º Peel		
		Initial (20 minutes)	72 hours @ 72°F (22°C)	72 hours @ 158°F (70°C)
		Typical Value oz/in (N/25mm)	**Typical Value** oz/in (N/25mm)	**Typical Value** oz/in (N/25mm)
7945MP 9045MP (2-1-2)	PET/Stainless Steel	64 (18)	112 (31)	165 (45)
	PET/Aluminum	42 (12)	84 (23)	168 (56)
	PET/PET	49 (14)	67 (19)	126 (35)
	PET/Polycarbonate	50 (14)	72 (20)	84 (23)
7956MP 9056MP (2-2-2)	PET/Stainless Steel	50 (14)	113 (31)	156 (43)
	PET/Aluminum	32 (9)	75 (21)	157 (43)
	PET/PET	44 (12)	73 (20)	118 (33)
	PET/Polycarbonate	47 (13)	76 (21)	67 (19)
7957MP 9057MP (2-3-2)	PET/Stainless Steel	54 (15)	95 (26)	153 (42)
	PET/Aluminum	66 (25)	73 (20)	148 (41)
	PET/PET	37 (10)	60 (17)	136 (38)
	PET/Polycarbonate	41 (11)	66 (18)	72 (20)
7959MP 9059MP (2-5-2)	PET/Stainless Steel	30 (8)	83 (23)	134 (37)
	PET/Aluminum	31 (9)	68 (19)	124 (31)
	PET/PET	33 (9)	53 (15)	118 (33)
	PET/Polycarbonate	36 (10)	54 (15)	66 (18)
7961MP 9061MP (2-7-2)	PET/Stainless Steel	30 (8)	101 (28)	135 (37)
	PET/Aluminum	30 (8)	70 (20)	134 (37)
	PET/PET	35 (10)	61 (17)	124 (31)
	PET/Polycarbonate	37 (10)	55 (15)	67 (19)

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Typical Physical, Mechanical, and Electrical Properties and Performance Characteristics (continued)

3M™ Single Coated Membrane Switch Spacers (for circuit separation)

3M™ Membrane Switch Product Number	Film / Substrate	Peel Adhesion ASTM D3330, Modified 90º Peel		
		Initial (20 minutes)	72 hours @ 72°F (22°C)	72 hours @ 158°F (70°C)
		Typical Value oz/in (N/25mm)	**Typical Value** oz/in (N/25mm)	**Typical Value** oz/in (N/25mm)
7993MP (2-1-0)	PET/Stainless Steel	40 (11)	68 (19)	82 (23)
	PET/Aluminum	36 (10)	64 (18)	79 (22)
	PET/PET	36 (10)	46 (13)	72 (20)
	PET/Polycarbonate	38 (11)	51 (14)	62 (17)
7995MP (2-3-0)	PET/Stainless Steel	33 (9)	73 (20)	148 (41)
	PET/Aluminum	48 (13)	84 (23)	186 (51)
	PET/PET	44 (12)	63 (17)	195 (53)
	PET/Polycarbonate	42 (12)	64 (18)	147 (41)
7997MP (2-5-0)	PET/Stainless Steel	24 (7)	94 (26)	232 (64)
	PET/Aluminum	32 (9)	75 (21)	262 (72)
	PET/PET	39 (11)	66 (18)	257 (71)
	PET/Polycarbonate	36 (10)	68 (19)	135 (27)

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Typical Physical, Mechanical, and Electrical Properties and Performance Characteristics (continued)

3M™ Double Lined Adhesive Transfer Tapes (for selective die cutting)

3M™ Membrane Switch Product Number	Cohesion Static Shear ASTM D3654, 0.5 in^2		
		72°F (22°C) / 1000g	158°F (70°C) / 500g
	Film / Substrate	Typical Value Minutes	Typical Value Minutes
7952MP 7962MP (2-0-0)	PET/Stainless Steel	10,000+	10,000+
7953MP (1.5-0.5-1.5)	PET/Stainless Steel	10,000+	10,000+
7955MP 7965MP (5-0-0)	PET/Stainless Steel	10,000+	10,000+

3M™ Double Coated Membrane Switch Spacers (for circuit separation)

3M™ Membrane Switch Product Number	Cohesion Static Shear ASTM D3654, 0.5 in^2		
		72°F (22°C) / 1000g	158°F (70°C) / 500g
	Film / Substrate	Typical Value Minutes	Typical Value Minutes
7945MP 9045MP (2-1-2)	PET/Stainless Steel	10,000+	10,000+
7956MP 9056MP (2-2-2)	PET/Stainless Steel	10,000+	10,000+
7957MP 9057MP (2-3-2)	PET/Stainless Steel	10,000+	10,000+
7959MP 9059MP (2-5-2)	PET/Stainless Steel	10,000+	10,000+
7961MP 9061MP (2-7-2)	PET/Stainless Steel	10,000+	10,000+

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Typical Physical, Mechanical, and Electrical Properties and Performance Characteristics (continued)

3M™ Single Coated Membrane Switch Spacers (for circuit separation)

3M™ Membrane Switch Product Number	Cohesion Static Shear ASTM D3654, 0.5 in^2		
		72°F (22°C) / 1000g	158°F (70°C) / 500g
	Film / Substrate	Typical Value Minutes	Typical Value Minutes
7993MP (2-1-0)	PET/Stainless Steel	10,000+	10,000+
7995MP (2-3-0)	PET/Stainless Steel	10,000+	10,000+
7997MP (2-5-0)	PET/Stainless Steel	10,000+	10,000+

3M™ Double Linered Adhesive Transfer Tapes (for selective die cutting)

3M™ Membrane Switch Product Number	Cohesion Dynamic Shear ASTM D1001, 1 in^2		Tensile Strength (Yield) ASTM D2370	
	158°F (70°C)/500G		72°F (22°C)	
	Film / Substrate	Typical Value PSI / MPa	Sample Thickness Mils (Microns)	Typical Value PSI
7952MP 7962MP (2-0-0)	PET/Stainless Steel PET/Polycarbonate	103 (0.72) 80 (0.55)	2 (50)	51
7953MP (1.5-0.5-1.5)	PET/Stainless Steel PET/Polycarbonate	105 (0.72) 88 (0.61)	3.5 (88)	1593
7955MP 7965MP (5-0-0)	PET/Stainless Steel PET/Polycarbonate	97 (0.67) 80 (0.55)	5 (125)	51

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Typical Physical, Mechanical, and Electrical Properties and Performance Characteristics (continued)

3M™ Double Coated Membrane Switch Spacers (for circuit separation)

3M™ Membrane Switch Product Number	Cohesion Dynamic Shear ASTM D1001, 1 in^2 (1 in. sq.)		Tensile Strength (Yield) ASTM D2370	
	158°F (70°C)/500G		72°F	
	Film / Substrate	Typical Value PSI / MPa	Typical Value Mills (microns)	Typical Value PSI PS
7945MP 9045MP (2-1-2)	PET/Stainless Steel PET/Polycarbonate	68 (0.47) 70 (0.48)	5 (125)	2556
7956MP 9056MP (2-2-2)	PET/Stainless Steel PET/Polycarbonate	103 (0.72) 78 (0.54)	6 (150)	3971
7957MP 9057MP (2-3-2)	PET/Stainless Steel PET/Polycarbonate	79 (0.55) 66 (0.46)	7 (175)	5062
7959MP 9059MP (2-5-2)	PET/Stainless Steel PET/Polycarbonate	78 (0.54) 69 (0.48)	9 (225)	6462
7961MP 9061MP (2-7-2)	PET/Stainless Steel PET/Polycarbonate	76 (0.52) 66 (0.46)	11 (275)	7945

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Typical Physical, Mechanical, and Electrical Properties and Performance Characteristics (continued)

3M™ Single Coated Membrane Switch Spacers (for circuit separation)

3M™ Membrane Switch Product Number	Cohesion Dynamic Shear ASTM D1001, 1 in^2 (1 in. sq.)		Tensile Strength (Yield) ASTM D2370	
	158°F (70°C)/500G		72°F (22°C)	
	Film / Substrate	Typical Value PSI / MPa	Typical Value Mills (microns)	Typical Value PSI
7993MP (2-1-0)	PET/Stainless Steel PET/Polycarbonate	N/A N/A	3 (75)	3609
7995MP (2-3-0)	PET/Stainless Steel PET/Polycarbonate	N/A N/A	5 (125)	6749
7997MP (2-5-0)	PET/Stainless Steel PET/Polycarbonate	N/A N/A	7 (175)	6273

3M™ Double Linered Adhesive Transfer Tapes (for selective die cutting)

3M™ Membrane Switch Product Number	Dielectric Strength ASTM D149, Short time method (air)	Dielectric Constant/ Dissipation Factor	Volume/Surface Resistivity	
		ASTM D150 72°F (22°C)	ASTM D257 72°F (22°C)	
	Typical Value Volts/mil	Typical Value D.C./ D.F.	Typical Value V.R. Ohm – cm	Typical Value S.R. Ohm
7952MP 7962MP (2-0-0)	880	3.40 / 0.021	1.0×10^{15}	$> 5.6 \times 10^{16}$
7953MP (1.5-0.5-1.5)	1400	3.29 / 0.017	5.8×10^{14}	$> 5.6 \times 10^{16}$
7955MP 7965MP (5-0-0)	600	4.06 / 0.022	1.1×10^{15}	$> 5.6 \times 10^{16}$

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Typical Physical, Mechanical, and Electrical Properties and Performance Characteristics (continued)

3M™ Double Coated Membrane Switch Spacers (for circuit separation)

3M™ Membrane Switch Product Number	**Dielectic Strength** ASTM D149, Short time method (air)	**Dielectic Constant/ Dissipation Factor** ASTM D150 72°F (22°C)	**Volume/Surface Resistivity** ASTM D257 72°F (22°C)	
	Typical Value Volts/mil	**Typical Value** D.C./ D.F.	**Typical Value V.R.** Ohm – cm	**Typical Value S.R.** Ohm
7945MP 9045MP (2-1-2)	1500	3.48 / 0.016	5.7×10^{14}	$> 5.6 \times 10^{16}$
7956MP 9056MP (2-2-2)	1700	3.40 / 0.015	8.9×10^{14}	$> 5.6 \times 10^{16}$
7957MP 9057MP (2-3-2)	1700	3.33 / 0.013	1.3×10^{15}	$> 5.6 \times 10^{16}$
7959MP 9059MP (2-5-2)	1600	3.32 / 0.011	1.5×10^{15}	$> 5.6 \times 10^{16}$
7961MP 9061MP (2-7-2)	1500	3.42 / 0.010	2.2×10^{15}	$> 5.6 \times 10^{16}$

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Typical Physical, Mechanical, and Electrical Properties and Performance Characteristics (continued)

3M™ Single Coated Membrane Switch Spacers (for circuit separation)

3M™ Membrane Switch Product Number	Dielectic Strength ASTM D149, Short time method (air)	Dielectic Constant/ Dissipation Factor	Volume/Surface Resistivity	
		ASTM D150 72°F (22°C)	ASTM D257 72°F (22°C)	
	Typical Value Volts/mil	Typical Value D.C./ D.F.	Typical Value V.R. Ohm – cm	Typical Value S.R. Ohm
7993MP (2-1-0)	1700	2.77 / 0.012	2.7×10^{15}	$> 5.6 \times 10^{16}$
7995MP (2-3-0)	1700	3.03 / 0.009	3.3×10^{15}	$> 5.6 \times 10^{16}$
7997MP (2-5-0)	1700	3.05 / 0.008	4.8×10^{15}	$> 5.6 \times 10^{16}$

3M™ Double Linered Adhesive Transfer Tapes (for selective die cutting)

3M™ Membrane Switch Product Number	Insulation & Moisture Resistance	Coefficient of Thermal Expansion
	Mil-I-46058C (100VDC, 60 sec.)	ASTM D696 25-175°C
	Typical Value Ohms	Typical Value M/M/°C
7952MP 7962MP (2-0-0)	1.3×10^{13}	7.2×10^{-4}
7953MP (1.5-0.5-1.5)	1.7×10^{13}	6.7×10^{-4}
7955MP 7965MP (5-0-0)	8.8×10^{12}	9.2×10^{-4}

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Typical Physical, Mechanical, and Electrical Properties and Performance Characteristics (continued)

3M™ Double Coated Membrane Switch Spacers (for circuit separation)

3M™ Membrane Switch Product Number	Insulation & Moisture Resistance	Coefficient of Thermal Expansion
	Mil-I-46058C (100VDC, 60 sec.)	ASTM D696 25-175°C
	Typical Value Ohms	**Typical Value** M/M/°C
7945MP 9045MP (2-1-2)	1.0×10^{13}	6.1×10^{-4}
7956MP 9056MP 2-2-2)	1.1×10^{13}	5.1×10^{-4}
7957MP 9057MP (2-3-2)	1.1×10^{13}	5.4×10^{-4}
7959MP 9059MP (2-5-2)	1.9×10^{13}	4.7×10^{-4}
7961MP 9061MP (2-7-2)	1.6×10^{13}	4.1×10^{-4}

3M™ Single Coated Membrane Switch Spacers (for circuit separation)

3M™ Membrane Switch Product Number	Insulation & Moisture Resistance	Coefficient of Thermal Expansion
	Mil-I-46058C (100VDC, 60 sec.)	ASTM D696 25-175°C
	Typical Value Ohms	**Typical Value** M/M/°C
7993MP (2-1-0)	6.5×10^{12}	4.5×10^{-4}
7995MP (2-3-0)	9.4×10^{12}	3.9×10^{-4}
7997MP (2-5-0)	6.5×10^{12}	2.8×10^{-4}

3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

Environmental Performance

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 to300 °F (149°C) and for intermittent longer periods (days, weeks) up to 250°F (121°C).

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

Application Ideas

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

3M™ Membrane Switch Products with Adhesive 200MP

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Storage	It is suggested that products are stored at room temperature conditions of 70°F (21°C) and 50% relative humidity.
Shelf Life	If stored properly, product retains its performance and properties for 18 months from date of shipment.
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, FDA, California Proposition 65, READY and RoHS, can be found at 3M.com/regs.
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3M™ Membrane Switch Products with Adhesive 200MP

7945MP, 7952MP, 7953MP, 7955MP, 7956MP, 7957MP, 7959MP, 7961MP, 7962MP, 7965MP, 7993MP, 7995MP, 7997MP, 9045MP, 9056MP, 9057MP, 9059MP, 9061MP

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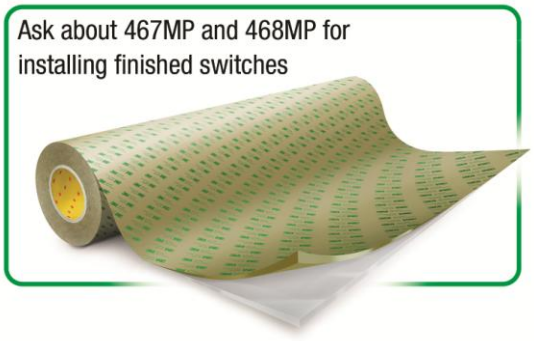
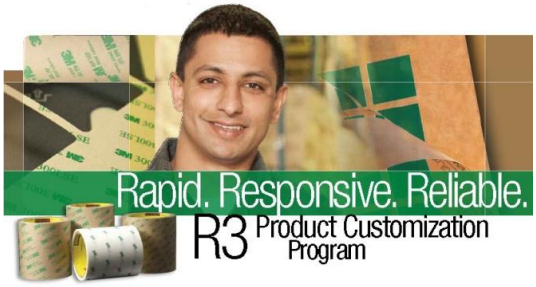
ISO 9001

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





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