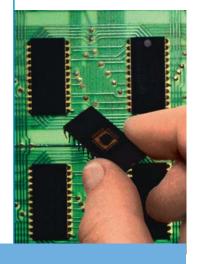
# 3M

# **Electronics Assembly Solutions**



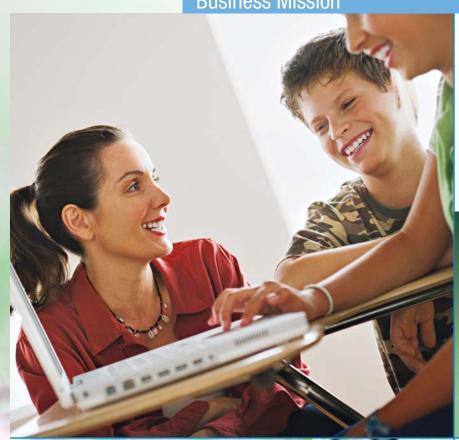


3M Company, operating in more than 60 countries, has over 60,000 products.

These products, based on 40 technology platforms, have been developed by 6,500 3M Product Developers Worldwide.



# **Business Mission**



3M Electronics is dedicated to continue building on our technologies and our expertise, and being your first choice for next generation design, process, and material solutions.







**Attaching** 

**Bonding** 

Sealing

**Packaging** 

**Shipping** 

Identifying

Securing

**Protecting** 

Lapping

**Polishing** 

Conducting

**Damping** 

**Shielding** 

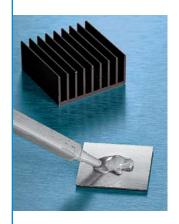
Cleaning

**Filtering** 

3M Electronics offers a broad range of specialized solutions for today's demanding electronics assembly applications. From adhesives, tapes, abrasives and coatings to technologies designed to detect tampering and water intrusion, 3M offers you more ways to speed assembly...add functionality...and improve the reliability of your products.

As a 3M customer, you're backed by a global network of sales, manufacturing and technical resources – dedicated to helping you apply 3M technologies to their full advantage.

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#### 3M™ Thermally Conductive Adhesive Transfer Tape % Wet-Out of Heat Sink to Glass Slide



Dark areas show adhesive wet-out.

Increased wet-out improves both mechanical and thermal performance. Relative darker color indicates surface contact has occurred. Boron nitride filler appears lighter in color versus aluminum oxide filler

#### 3M<sup>™</sup> Thermally Conductive Adhesive Transfer Tapes 8805, 8810, 8815, 8820.

High temperature adhesion with good dielectric strength. Applies quickly and easily using die-cut shapes.



# Specialty Products for Thermal Management Applications

#### **3M™ EMI/RFI/Shielding, Thermally Conductive Cushioning Pads**

3M™ Hyper-Soft Thermally Conductive Interface Pads are derived from two classes of hybrid conductive and flame retardant materials, used to augment the heat dissipation effect of conventional heat sinks and other passive devices. Silicone-based pads are available for applications that require higher conductivity. Specialty EMI shielding pads are also available that feature non-metallic, electromagnetic absorbing particles built in to 3M™ Hyper-Soft Thermally Conductive Interface Pads. These specialty pads offer improved shielding over regular type pads. They help prevent device malfunctions caused by electromagnetic noise. These incredibly soft and flexible pads are highly conformable for more efficient heat transfer.

#### **3M<sup>™</sup> Thermally Conductive Epoxies**

This range of liquid adhesives has minimal odor and superior structural adhesion strength. Dispensing is easy for high output, in-line automated manufacturing and manual application.

Adhesive flows and fills micro-spaces on surfaces. Ultra-thin bond line helps achieve low thermal impedance.

#### **3M<sup>™</sup> Thermally Conductive Interface Materials**

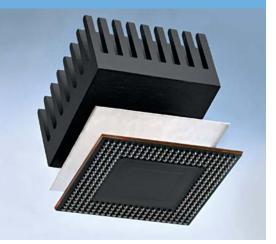
Product	Typical Applications
Product	71 11
8805, 8810, 8815, 8820	Thermally conductive adhesive transfer tapes with high mechanical strength, improved surface wet-out, and excellent shock performance. Applications requiring thin bonding with good thermal transfer; components, flex circuit and power transformer bonding to heat sinks or other cooling devices.
9889FR	Flame retardant thermally conductive acrylic soft tape for applications requiring gap filling and bonding with good thermal transfer; plasma display, IC packages, PCB bonding to heat sinks, metal cases, and other cooling devices.
5506, 5591\$	Thermally conductive interface pads (silicone) for applications requiring gap filling and superior thermal performance without bonding. Provides IC package and PCB thermal interfacing with heat sinks or other cooling devices, and metal cases.
TC-2707, TC-2810 and DP 190 Gray	Thermally conductive epoxies for applications requiring high adhesive strength, good surface wet-out, gap filling and good thermal transfer. Provides IC package and PCB thermal interfacing with heat sinks or other cooling devices.
5503*	Thermal pad with EMI absorbing characteristics. Used to assist cooling of IC packages and other IC devices.
5502S, 5590H**	Thermally conductive interface pads use an acrylic elastomer for applications that require a non-silicone thermal pad. Provides IC package and PCB thermal interfacing with heat sinks or other cooling device, and metal cases.

- \* 5503 and 5506 are also available with a polyester film on one side to provide a non-tacky surface.
- \*\* "S" designation signifies a polyester film on one side to provide a non-tacky surface.
- "H" designation signifies a product with one non-tacky surface without the use of a PET film.



#### Power Transistor Attachment

3M™ Thermally Conductive Adhesive Transfer Tape 8810 replaces silicone grease and screws for attaching transistors to heat sink.



#### **Heat Sink**

3M<sup>™</sup> Thermally Conductive Adhesive Transfer Tape bonds a heat sink to a component and provides a thermal path for component cooling.

# 3M<sup>™</sup> Thermally Conductive Interface Materials Selection Guide

		Descr	iption		Adhesion	The	rmal Perfor	mance	Dielec	tric Prope	rties		
Product		Product	Filler	Liner	Peel Strength		lmp	edance	Dielectric	Dielectric	Volume	UL	Continuous Operating
	Material Type	Thickness mil (mm)	Туре	Туре	@ 72 hr. Dwell at RT N/cm	W/m-K	Thickness mil (mm)	°C-in²/W (°C-cm²/W)	Strength KV/mm	Constant 1KHz	Resistivity ohm/cm	Flammability Rating	Temperature Range °F (°C)
3M™ Hig	jh Adhesi	ion Therma	lly Condu	ctive Adh	esive Transfer	Tape							
8805		5 (0.13)		Silicone-	5.8		5 (0.13)	0.48 (3.10)			5.2 X 10 <sup>11</sup>		
8810	Filled Acrylic	10 (0.25)	Ceramic	Treated Polyester;	8.3	0.6	10 (0.25)	0.88 (5.68)	38	3.5 @ 35	3.9 X 10 <sup>11</sup>	NA	212 (100) per UL746C or
8815	Polymer	15 (0.38)	Coramio	Dual	9.8	0.0	15 (0.38)	1.17 (7.55)	00	MHz	3.8 X 10 <sup>11</sup>	101	3M test method
8820		20 (0.51)		Liner	11.9		20 (0.51)	1.50 (9.68)			3.8 X 10 <sup>11</sup>		
3M™ The	ermally Co	onductive A	crylic So	ft Tape (T	CAST)								
9889FR	Filled Acrylic Polymer	40 (1.02)	Ceramic	Paper	3.7 on Al	0.5	40 (1.02)	_	_	_	_	UL 94 V-2	Up to 176 (80)
3M™ The	ermally (	onductive I	Interface I	Pade						1			
SIVI III	Filled	20 (0.51)	interrace i		No adhesive		20 (0.51)	0.49 (3.16)					212-302
5506*	Silicone Elastomer, Gray	40 (1.02) 60 (1.52) 80 (2.03)	Ceramic	Poly- Coated Polyester	layer, highly conformable, slightly tacky	2.3	40 (1.02) 60 (1.52) 80 (2.03)	0.71 (4.58) 0.94 (6.06) 1.1 (7.10)	0.12	18.6	1.15 X 10 <sup>11</sup>	UL 94 V-1	(100-150), depending on the application
		20 (0.51)					20 (0.51)	, ,					
		40 (1.02)			No adhesive		40 (1.02)						212-302°
5591S***	Silicone	60 (1.52)	Ceramic	PET	layer, highly conformable.	1.0	60 (1.52)	_	5.9	_	1.0 X 10 <sup>11</sup>	3M VØ	(100-150), depending on the
		80 (2.03)			slightly tacky		80 (2.03)						application
		100 (2.54)					100 (2.54)						
3M™ The	ermally C	onductive I	Interface I	Pads (Acı	rylic)								
		20 (0.51)			No adhesive		20 (0.51)						176-212
5502S***	Acrylic	40 (1.02)	Ceramic	PET	layer, highly	2.3	40 (1.02)	_	1.0	14.5	_	UL-VO	(80-100),
33023	Aciyiic	60 (1.52)	Octamic	1.51	conformable,	2.0	60 (1.52)	_	1.0	14.5		OL-VO	depending on the
		80 (2.03)			slightly tacky		80 (2.03)						application
		20 (0.51)			No adhesive		20 (0.51)						176-212 (80-100),
5590H***	Acrylic	40 (1.02)	Ceramic	PET	layer, highly conformable,	3.0	40 (1.02)	_	33	_	2.7 X 10 <sup>12</sup>	3M VØ	depending on the
		60 (1.52)			slightly tacky		60 (1.52)						application
3M™ EM	II Shieldir	ng/Thermal	Conducti	vity									
		20 (0.51**)			No adhesive		20 (0.51**)						
FF00*	Filled	40 (1.02)	Ceramic	DET	layer, highly	47	40 (1.02)			44.4	4 7 V 4012		
5503*	Silicone Elastomer	60 (1.52)	and Ferrite	PET	conformable,	1.7	60 (1.52)	_	4.4	11.1	1.7 X 10 <sup>12</sup>	UL-VO	_
		80 (2.03)			slightly tacky		80 (2.03)						
3M™ The	ermally C	onductive I	Epoxies										
OM THE	ormany o	onaaoavo	-ролюо										
			Aluminum										
DP 190		_	Silicate/	_	_	0.38	_	_	32.7	_	5.0 X 10 <sup>11</sup>		
Gray			Carbon Black										
			Diaon										He to 010 (100)
	Two-part	1 (0.03)					1 (0.03)	0.05 (0.32)				NA	Up to 212 (100), depending on the
	ероху	5 (0.13)					5 (0.13)	0.27 (1.74)					application
TC 2707		10 (0.25)	Aluminum	_	_	0.72	10 (0.25)	0.54 (3.48)	2.1	14.6	2.4 X 10 <sup>11</sup>		
		15 (0.38)	Metal				15 (0.38)	0.82 (5.29)					
		20 (0.51)					20 (0.51)	1.09 (7.03)					
TC 2810		2 (0.05)	Ceramic	_	_	1.0	2 (0.05)	0.05 (0.32)	3.0	4.6	7.6 X 10 <sup>11</sup>		
. 5 2010		_ (0.00)					_ (0.00)	0.00 (0.02)	3.0				l

<sup>\* 5503</sup> and 5506 are also available with a polyester film on one side to provide a non-tacky surface. Product numbers are 5503S and 5506S.

<sup>\*\*</sup> Only 5503S version is available in 0.5 mm thickness

<sup>\*\*\* &</sup>quot;S" designation signifies a polyester film on one side to provide a non-tacky surface.
"H" designation signifies a product with one non-tacky surface without the use of a PET film.

## 3M<sup>™</sup> Electromagnetic Compatible Products

# **3M™ Electrically Conductive Adhesive Transfer Tapes** XYZ-Axis Conductivity

3M™ Electrically Conductive Adhesive Transfer Tapes are designed to help you save time in a variety of specialized electronics assembly operations – from attaching EMI shields and gaskets to grounding and bonding flexible circuits and PCBs – while improving the performance and reliability of your finished products.

These long-lasting adhesive transfer tapes can eliminate the need for screws and mechanical fasteners – while allowing the use of lighter, more compact fabric and layered foil shielding materials.

And, unlike other electrically conductive adhesives that can be messy and difficult to handle, 3M delivers advanced adhesive and conductive properties in an easy-to-use, pressure-sensitive tape that can be hand or machine applied and die cut to virtually any shape!

Duaduat	Adhesive Product Thickness		Conta	ct Resista	nce (Foil/Ri	gid Plate)	Applications/Notes	
Product	μ	Туре	Alum/Alum	Alum/SS	Copper/SS	Copper/Copper	Applications/Notes	
9712	110	Acrylic	< 24 Ω	< 22 Ω	-	< .66 Ω	Connect/bond/ground EMI/RFI shields & gaskets to electronic devices. Static dissipation. 3M's most cost-effective solution for applications with moderate electrical requirements.	
9713	90	Acrylic	< 2.5 Ω	< 2.0 Ω	< 1.0 Ω	< 0.5 Ω	Connect/bond/ground EMI/RFI shields & gaskets to electronic devices. Static dissipation. Attaching conductive fabric/foam core EMI gaskets to electronic cabinetry. 3M's high performing isotropic electrically conductive tape.	
9719	90	Silicone	< 2.5 Ω	< 2.0 Ω	< 1.0 Ω	< 0.5 Ω	Attach low surface energy EMI/RFI shields and gaskets to electronic devices. Suitable for high temp performance (up to 400°F/204°C).	

#### **3M™ Electrically Conductive Adhesive Transfer Tape**

An easy-to-use, pressure sensitive tape designed for connecting, bonding and grounding flex circuits, PCBs and EMI/RFI shields and gaskets. Applied at room temperature – no thermal bonding required! Not recommended for extreme high or low temperatures.

Product	Adhesive Thickness µ	Particle Type	Applications/Notes
9703	50	Silver Coated Nickel	Good adhesion; reworkable. For connecting/bonding/grounding flex circuits, printed circuit boards, EMI/RFI shields & gaskets; PSA attachments at room temp. Not recommended for extreme high or low temps. Low outgassing.
9705	50	Silver Coated Nickel	Good adhesion; reworkable. For connecting/bonding/grounding flex circuits, printed circuits boards, EMI/RFI shields & gaskets; PSA attachments at room temp. Not recommended for extreme high or low temps. Standard outgassing.





# 3M™ Electromagnetic Compatible Products ACF Interconnect Solutions/EMI/RFI Shielding

#### **3M™ Anisotropic Conductive Film (ACF) Adhesives**

Heat-bondable, Z-Axis conductive films, consisting of thermoplastic and thermoset adhesives randomly loaded with conductive particles. These particles allow interconnection of circuit lines through the adhesive thickness (the Z-Axis), but are spaced far enough apart for the product to be electrically insulating along the plane of the adhesive.

Product	Adhesive Thickness µ	Particle Type	Minimum Pitch µ	Applications/Notes
5363	40	Gold-Plated Nickel	200	For connecting copper on polyimide flex to PCB and flex-to-flex. Excellent high temperature reliability. Fast bond time.
5552R	19	Gold-Plated Nickel w/Polymer Core	<100	For connecting copper on polyimide flex-to-glass.
7303	74	Silver-Coated Glass	500	For connecting silver ink on polyester or copper on polyimide flex-to-PCB and flex-to-flex. Excellent resistance to low temps and solvents.
7313	63	Silver-Coated Glass	500	For connecting silver ink on polyester or copper on polyimide flex-to-PCB and flex-to-flex. Bonds at low temperatures; compatible with automated processes. Stored at room temperature.
8794	60	Silver-Coated Filler	1000	Good adhesion to substrates such as ABS, PVC and Melinex®, commonly used to bond and connect micromodules to antennae for Smart Card applications. Also ideal for any applications where fast bond times and reliable connections are required. Stored at room temperature.
9703	50	Silver-Coated Nickel	1000	Good adhesion; reworkable. For connecting/bonding/grounding flex circuits, printed circuits boards, EMI/RFI shields & gaskets; PSA attachments at room temp. Not recommended for extreme high or low temps. Low outgassing.
9705	50	Silver-Coated Nickel	1000	Good adhesion; reworkable. For connecting/bonding/grounding flex circuits, printed circuits boards, EMI/RFI shields & gaskets; PSA attachments at room temp. Not recommended for extreme high or low temps. Standard outgassing.

If you are looking for a more conformable adhesive than our scrim-based products, try our conductive particle based 2 mil XYZ adhesive. Contact your local 3M representative for more information.

#### **3M™ Grounded Heat Sink Bonding Film 7373**

This electrically conductive thermoset adhesive film is comprised of a 2-mil thick, high-performance hybrid epoxy-acrylate adhesive filled with silver-coated glass particles. Provides a stable electrical connection and a thin, low thermal impedance bond line. 7373 film gives you greater design flexibility and improved electrical performance over bolts, rivets and other mechanical fasteners, and can be die-cut into virtually any shape.

Product	Adhesive Thickness (µ)	Particle Type	Applications/Notes
7373	50	Silver-Coated Glass	Ideal for grounded bonding of high frequency PCBs, such as cellular base station amplifiers, to heat sink spreaders. It is also used for multi-layer lamination and electrical connection between PCB layers.







# 3M<sup>™</sup> Electromagnetic Compatible Products

These solutions include an innovative line of 3M™ Electromagnetic Compatible Products that can control electromagnetic interference from internal sources, limit EMI susceptibility from external sources and help manufacturers meet high certification standards around the world.

- Provide electromagnetic compatibility
- Shield or absorb electromagnetic and radio frequency interference
- Ground sensitive electronic components and boards
- Cushion components
- Protect cables
- Provide conductive properties

3M™ EMC Products can provide EMI/RFI shielding and absorbing, static charge grounding, anti-static masking, cushioning, mechanical protection and conductive properties for a wide variety of applications.

Product	Backing	Adhesive	Total Thickness mils (mm)	Features	Electrical Resistance m ohms	Adhesion to Steel oz/in (N/cm)	Product Certification
3M™ Alun	ninum Foil					<u> </u>	
1120	2 mil aluminum foil	Acrylic Conductive	4.0 (0.102)	For EMI shielding, static charge draining, grounding. Good for cable wrap. Easily die cut.	9	36 (3.9)	UL 510
1170	2 mil aluminum foil	Acrylic Conductive	3.2 (0.081)	For EMI shielding, static charge draining, grounding. Easily die cut.	10	35 (3.8)	UL 510
AL-25BT	1 mil aluminum foil	Acrylic Conductive	2.4 (0.061)	For EMI shielding, static charge draining, grounding. Easily die cut.	10	31 (3.4)	UL 510
AL-25DC	1 mil aluminum foil	Acrylic Conductive Coated on Both Sides	3.3 (0.084)	For EMI shielding, static charge draining, grounding. Easily die cut.	35	31 (3.4)	_
AL-50BT	2 mil aluminum foil	Acrylic Conductive	3.1 (0.079)	For EMI shielding, static charge draining, grounding. Easily die cut.	10	31 (3.4)	UL 510
1115	5 mil aluminum foil	Acrylic Conductive	7.0 (0.177)	For EMI shielding, static charge draining, grounding. Easily die cut.	5	52 (5.6)	_
3M™ Alum	inum Foil Lan	ninated with	Polvester F	ilm			
AL-36FR	1 mil aluminum foil + polyester film	Acrylic Conductive	2.4 (0.061)	Foil backing laminated with polyester film. Good resistance to oxidation, solvents and oils. Easily die cut.	20	22 (2.4)	UL 510
AL-36NC	1 mil aluminum foil + polyester film	Acrylic Non- Conductive	2.2 (0.055)	Foil backing laminated with polyester film. Good resistance to oxidation, solvents and oils. Easily die cut.	NA	20 (2.2)	_
AL-37BLK	1 mil aluminum foil + black matte polyester film	Acrylic Conductive	2.8 (0.071)	Foil backing laminated with polyester film. Matte surface finish. Good electrical insulation, resistance to oxidation, solvents and oils. Easily die cut.	50	31 (3.4)	UL 510
AL-40BLK	1 mil aluminum foil + black glossy polyester film	Acrylic Conductive	2.8 (0.071)	Foil backing laminated with polyester film. Glossy surface finish. Good electrical insulation, resistance to oxidation, solvents and oils. Easily die cut.	50	31 (3.4)	UL 510
3M™ Copp	per Foil						
1125	1.4 mil copper foil	Acrylic Non- conductive	3.5 (0.089)	For EMI shielding on a wide range of applications. Easily die cut.	NA	40 (4.4)	UL 510
1126	1.4 mil copper foil	Acrylic Conductive	3.5 (0.089)	For EMI shielding, static charge draining when grounded. Easily die cut.	3	36 (3.9)	MIL-T-47012
1181	1.4 mil copper foil	Acrylic Conductive	2.6 (0.066)	For EMI shielding, static charge draining, grounding. Easily die cut.	5	35 (3.8)	UL 510
1182	1.4 mil copper foil	Acrylic Conductive Coated on Both Sides	3.5 (0.089)	Typically used to bond two surfaces, both physically and electrically. Also can provide EMI shielding, static charge draining, grounding. Easily die cut.	10	35 (3.8)	UL 510
1183	1.4 mil tin-plated copper foil	Acrylic Conductive	2.6 (0.066)	Oxidation resistant for long-term EMI shielding, static charge draining, grounding. Solderable and easily die cut.	5	35 (3.8)	UL 510
1194	1.4 mil copper foil	Acrylic Non- conductive	2.6 (0.066)	For EMI shielding, static charge draining, grounding. Easily die cut.	NA	40 (4.4)	UL 510
CU-35C	1.4 mil copper foil	Acrylic Conductive	2.8 (0.07)	For grounding and EMI shielding. Solderable and easily die cut.	5	35 (3.8)	UL 510
3M™ Emb	ossed Foil						
1245	copper foil	Acrylic Non- conductive	4.0 (0.102)	For EMI shielding, static charge draining, grounding. Solderable and easily die cut.	1	35 (3.8)	UL 510
	Embossed aluminum foil	Acrylic Non- conductive	5.0 (0.127)	For EMI shielding, static charge draining, grounding. Solderable and easily die cut.  Oxidation resistant for long-term EMI	5	35 (3.8)	UL 510
1267		Acrylic Non-		shielding, static charge draining,	1	45 (4.9)	UL 510
1345	Embossed tin-plated copper foil	conductive	4.0 (0.102)	grounding. Solderable and easily die cut.		10 (110)	

6

# 3M<sup>™</sup> Electromagnetic Compatible Products

Product	Backing	Adhesive	Total Thickness mils (mm)	Features	Electrical Resistance m ohms	Adhesion to Steel oz/in(N/cm)	Product Certification
3M™ Meta	allized Cloth						
2191FR	Nickel on copper-plated polyester ripstop fabric	Acrylic Conductive	5.5 (0.140)	Lightweight, conformable, oxidation resistant and high strength for EMI shielding and grounding. Easily die cut.	3	19 (2.1)	UL 510
AG-2300	Silver-coated polyester fabric	Acrylic Conductive	4.3 (0.110)	Lightweight, conformable, oxidation resistant and high strength for EMI shielding and grounding. Easily die cut.	5	31 (3.4)	_
AU-2190	Gold-coated polyester fabric	Acrylic Conductive	4.3 (0.110)	Lightweight, conformable, oxidation resistant and high strength for EMI shielding and grounding. Easily die cut.	5	31 (3.4)	_
X-7001	Copper-plated polyester ripstop fabric	Acrylic Conductive Coated on Both Sides	4.3 (0.110)	Typically used to bond two surfaces, both physically and electrically. Also can provide EMI shielding, static charge draining, grounding. Lightweight, conformable and easily die cut.	15	59 (6.4)	_
CN 3190	Nickel on copper-plated polyester ripstop fabric	Acrylic Conductive	4.3 (0.110)	Lightweight, conformable oxidation resistant and high strength for EMI shielding and grounding.	1	35 (3.8)	_
3M™ Mes	h and Sleeving						
DS & FS Series	Braided glass fibers overwound with tin-plated copper foil	None	N/A	EMI mesh sleeves for cables and harnesses. Excellent strain relief and heat stability, flexible, oxidation resistant. Solderable.	N/A	N/A	UL VW-1 (UL FR-1)
VA Series	Sleeves braided with polyester fibers and polyester fibers over-wound with tin-plated copper foil	None	N/A	EMI mesh sleeves for cables and harnesses. Excellent strain relief and heat stability, flexible, oxidation resistant. Solderable, lightweight.	N/A	N/A	-
3M™ EMI	Shielding Shee	ts and Films	3				
1380	High-metal magnetic sheet between polymer film layers	Rubber Thermo- setting	11.8 (0.300)	Excellent high-µ magnetic shielding at low frequency. Soft magnetic sheet sandwiched between layers of film. Thin, flexible, lightweight and easily die cut.	N/A	N/A	_
AL-10S	Epoxy FR film + aluminum foil	None	7.8 (0.198)	Softened aluminum foil with flame- retardant film on one side. Excellent EMI shielding for PCBs and assemblies. Lightweight , flexible and easily die cut.	N/A	N/A	UL 510
AL-1010S	Double epoxy FR film + aluminum foil	None	13.8 (0.351)	Softened aluminum foil with flame- retardant film on both sides. Excellent EMI shielding for PCBs and assemblies. Lightweight, flexible and easily die cut.	N/A	N/A	UL 510
CU-10S	Epoxy FR film + copper foil	None	6.7 (0.170)	Softened copper foil with flame-retardant film on one side. Excellent EMI shielding for PCBs and assemblies. Lightweight , flexible and easily die cut.	N/A	None	UL 94 VO
CU-1010S	Copper foil + double epoxy film	None	11.8 (0.300)	Softened copper foil with flame-retardant film on both sides. Excellent EMI shielding for PCBs and assemblies. Lightweight , flexible and easily die cut.	N/A	None	_
3M™ Gasl	kets and Condu	ctive Mater	ials				
3245	Reverse embossed copper foil	Acrylic Conductive	5.9 (0.150)	For EMI shielding, static charge draining, grounding. Solderable, easily die cut.	1	46 (5.0)	UL 510
3M™ Abso	orbing Materia	s					
AB-2000 Series	Silicone rubber with magnetic filler	Acrylic Adhesive	10.6-62.2 (0.27-1.58)	EMI absorbing: can suppress radiated noise in broadband frequency. Thin, flexible and easily die cut. In 7 standard thicknesses.	N/A	35 (3.8)	_

3M offers a wide range of EMI/RFI shielding tapes and absorbing materials, mesh and sleeving products, gaskets and conductive materials.





Personal Computer
Memory Cards – 3M™
Bonding Films provide a
bond stronger than high
strength pressure sensitive
tapes. Bonding film
adheres stainless steel lids
to the connectors and
plastic frames.





### 3M<sup>™</sup> Bonding Films

3M™ Bonding Films combine some of the best features of 3M film and hot melt adhesive technologies, providing excellent performance on a variety of substrates ranging from fabrics, polyolefins and liquid crystal polymers to temperature sensitive materials and metals. Choice of bond strengths from temporary to permanent.

#### **Features and benefits:**

- Precise, uniform film thicknesses allow consistent bond lines
- Available in precise die-cut shapes and sizes, for neat manual or automated application
- Bonds in seconds with heat to help eliminate fixturing. Speeds assembly.
- Provides a dielectric insulating layer
- Choice of overlap shear strength on aluminum as high as 2500 psi

Product	Base Resin	Color	Standard Thickness mils	Bond/ Cure Time	Bondline Temp. °F (°C)	Approx. Percent Elongation	Overlap Shear Strength	180° Peel Strength piw	Key Characteristics
406	EAA	Clear	3	2-5 sec	320 (160)	750	1090 on al	16.6 on ss	Good adhesion to metal. Clear.
583	Nitrile Phenolic	Brown	2	5 min	250 (121)	800	630 on al	10 on al	Heat or solvent activated.
588	Nitrile Phenolic	Yellow	6	5 min	250 (121)	250	880 on al	20 on al	Heat activatable only.
615	Polyester	Tan	4	2-5 sec	280 (138)	300	810 on al	15 on al	Good adhesion to a variety of substrates.
615 S	Polyester	Tan	6 & 9	2-5 sec	280 (138)	-	810 on al	15 on al	Scrim version of 615.
620	Polyester	Tan	6	2-5 sec	280 (138)	100	825 on al	16 on ss	3 layers, 2 mils each. One is a dielectric.
668	Polyester	Tan	4	2-5 sec	320 (160)	1000	860 on al	20 on ss	High temperature resistance. Slight tack.
690	Polyester	Tan	8	2-5 sec	280 (138)	300	810 on al	15 on al	Good adhesion to a variety of substrates.
AF-111	Ероху	Off White	10	60 min	250 (121)	10	5300	38	Excellent heat resistance & structural bond strength. Cures @ 250°F (121°C).
AF-42	Ероху	Translucent	3	60 min	350 (177)	250	4600	55	Excellent heat resistance & structural bond strength. Cures @ 350°F (177°C).

# 3M<sup>™</sup> Protective Tapes

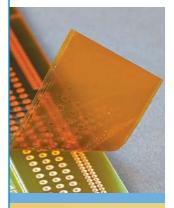
3M<sup>™</sup> Protective Tapes are designed to provide short-term protection for critical surfaces, such as LCD displays, high-gloss coated metals and glass, against scratches and marring during manufacturing, packaging and shipping.

Product/Color	Tape Structure Backing/ Adhesive	Backing Thickness mils/mm	Total Thickness mils/mm	Adhesion to Steel oz./in. (N/100mm)	Tensile Strength Ibs/in. (N/100 mm)	Elongation at Break %	Temp. Range °F (°C)	Comments
<b>ASTM Test Method</b>		D-3652	D-3652	D-3330	D-3759	D-3759		
335/Pink	Polyester Film/Rubber	0.9 (0.02)	1.6 (0.040)	2 (2)	24 (420)	125	-60 - 150 (-50 - 66)	Low tack protective tape.
336/Transparent	Polyester Film/Rubber	0.9 (0.02)	1.4 (0.036)	1 (1)	24 (420)	90	-60 - 150 (-50 - 66)	Low tack protective tape.

# 3M<sup>™</sup> High Temperature Tapes

 $3M^{\text{TM}}$  High Temperature Tapes provide masking protection for a variety of applications and can withstand temperatures ranges from -100°F (38°C) up to 500°F (260°C). Take a look at the selection guide below to choose the high temperature tape that will work for you.

Product/Color	Tape Structure (Backing /Adhesive)	Total Thickness mils (mm)	Adhesion to Steel oz./in. (N/100mm)	Tensile Strength Ibs./in. (N/100 mm)	Elongation at Break %	Temperature Range °F (°C)	Comments			
ASTM Test Method		D-3652	D-3330	D-3759	D-3759					
Scotch® High Temper	ature Maski	ng Tape								
High Temperature 214	Crepe Paper/ Rubber	6.7 (0.17)	27 (29)	24 (420)	10	Up to 350 (177) Up to 1 hour	High temperature: Stain resistant.			
Performance Masking 2364	Crepe Paper /Natural- Synthetic Rubber Blend	6.5 (0.16)	36 (39)	23 (402)	10	Up to 300 (149) for 30 min.	High temperature.			
Scotch® High Temperature Vinyl Tapes										
Fine Line 4737S	Opaque Blue Vinyl Film/Rubber	5.1 (0.13)	14 (15)	14 (245)	150	Up to 325 (163) Up to 1 hour	High temperature.			
Fine Line 4737T	Translucent Blue Vinyl Film/Rubber	5.1 (0.13)	14 (15)	17 (297)	150	Up to 325 (163) Up to 1 hour)	Cost effective. High temperature performance.			
3M <sup>™</sup> Circuit Board Fa	brication Ta	pes								
Circuit Plating Tape 851/Green	Polyester/ S/R Blend	3.6 (0.09)	29 (27)	27 (476)	124	40 – 170 (4 – 77)	Performance. Silicone plating.			
Circuit Plating Tape 1278/Blue	Polyester/ Rubber	2.8 (0.07)	31 (34)	25 (431)	116	40 – 170 (4 – 77)	SMOBC masking. Non-silicone adhesive.			
Circuit Plating Tape 1279/Orange	Polyester/ S/R Blend	4.1 (0.10)	34 (37)	25 (438)	120	40 – 170 (4 – 77)	Economy. Silicone plating.			
Circuit Plating Tape 1280/Red	Polyester/ S/R Blend	3.6 (0.09)	31 (34)	30 (525)	135	40 – 170 (4 – 77)	Performance. Silicone plating.			
General Purpose Vinyl 4731/ Purple	Vinyl/ Rubber	7.0 (0.18)	20 (22)	18 (315)	245	40 – 170 (4 – 77)	Electroplating. Flame retardant and weather resistant.			
3M™ High Temperatu										
Polyimide 5413/Amber	Polyimide/ Silicone	2.7 (0.07)	20 (22)	33 (578)	60	-100 – 500 (-73 – 260)	High temperature film.			
Water Soluble 5414/Transparent	PVA/ Synthetic	2.5 (0.06)	7 (8)	6.2 (116)	98	0 – 500 (-18 – 260)	Water soluble.			
Low Static Polyimide 5419/Amber	Polyimide/ Silicone	2.7 (0.07)	20 (22)	33 (578)	60	-100 – 500 (-73 – 260)	Low static wave solder.			
Low Static Polyimide 5433/Amber	Polyimide/ Silicone	2.7 (0.07)	20 (22)	33 (578)	60	-100 – 500 (-73 – 260)	Linered 5419 tape.			
General Purpose Polyimide 7413T/ 7413TL / Amber	Polyimide/ Silicone	2.5 (0.06)	25 (27)	30 (525)	60	-100 – 500 (-73 – 260)	High temperature performance.			
Low Static, Non-Silicone Polyimide 7419	Polyimide/ Acrylic	1.8 (.046)		33 (578)	60	Up to 500 (260)	Non silicone, low static.			
3M™ High Temperatu	re Flectrical	Insulating.	Tanes							
	Polyimide			00 (500)		Up to 356	Tough, thin, puncture-			
Polyimide 92	Film	3.0/0.076	25 (28)	30 (530)	55	(180)	resistant film designed for high-temperature			
Polyimide 1093	Polyimide Film	2.5/0.063	20 (22)	35 (620)	50	Up to 356 (180)	applications. For insulation and motor applications. UL certified.			
Polyimide 1205	Polyimide Film	3.0/0.076	35 (38)	30 (530)	55	Up to 311 (155)	Solvent-resistant, tough, thin, puncture-resistant film			
Polyimide 1206	Polyimide Film	2.2/0.55	35 (38)	30 (530)	35	Up to 311 (155)	designed for high- temperature applications. Good cover layer for flexible			
Polyimide 1218	Polyimide Film	3.0/0.076	19 (20)	19 (340)	55	Up to 356 (180)	circuits and for insulating applications. UL certified.			





# 3M<sup>™</sup> Optically Clear Adhesive Tapes

3M<sup>™</sup> Optically Clear Adhesives are formulated specifically for electronic displays. These transparent, film-free isotropic adhesives allow accurate color and full display brightness, while providing a long-lasting, high strength bond.

#### **Visual Accuracy**

- Light transmission >99% when corrected for reflection losses
- Haze level <1%</li>
- Free of birefringence

- Refractive index of 1.48
- Specifically designed and manufactured to eliminate common adhesive visual defects, such as bubbles, dirt and gels

#### **Durable Adhesion**

3M<sup>™</sup> Optically Clear Laminating Adhesives are based on the latest in a series of developments for specific adhesive applications. Building on 3M adhesive technology, the industry standard for graphic attachment and membrane switch assembly, Optically Clear Adhesives are formulated with the following performance characteristics:

- High cohesive and peel strengths, for reliably bonding most transparent film substrates to glass
- Controlled caliper providing uniform spacing
- High temperature, humidity and UV light resistance
- Long term durability without yellowing, delaminating or degrading

Product	Thickness mils (micron)	to Glass oz./in (N/dm)	Temperature Range  °F (°C)	Comments
ASTM Test Method	D-3652	D-3330-E		
8141	1 (25)	26 (28)	-40 – 185 (-40 – 85)	Low acid, highly compliant for bonding smooth or textured surfaces. Limited build in adhesion.
8142	2 (50)	32 (35)	-40 – 185 (-40 – 85)	2 mil version of adhesive tape 8141.
8161	1 (25)	36 (43)	-40 – 185 (-40 – 85)	For bonding smooth, transparent surfaces. Easy to convert with improved bubble resistance in laminates exposed to high temperature and humidity. High adhesion build, especially to polar surfaces.
8185	5 (125)	72 (86)	-40 – 185 (-40 – 85)	For bonding smooth, transparent surfaces. Easy to convert with improved bubble resistance in laminates exposed to high temperature and humidity. High adhesion build, especially to polar surfaces.
8187	7 (175)	98 (118)	-40 - 185 (-40 - 85)	7 mil version of adhesive tape 8187.
8171	1 (25)	39 (47)	-40 – 185 (-40 – 85)	High adhesion build to polar surfaces. Specifically designed for outgassing substrates like polymethylmethacrylate and polycarbonate.
8172	2 (50)	42 (51)	-40 – 185 (-40 – 85)	2 mil version of adhesive tape 8171.



These products have an Adhesive Transfer Tape backing/adhesive structure.



# Electronic Thin Attachment Films 3M™ Adhesive Transfer Tapes

		A alle e d	Line	er				Adhes	sion*		Chem	Temp F	Range
Product	Description/ Application Ideas	Adhesive Caliper mils	Type C	<b>aliper</b> mils	Master Size	Specs	Metal	HSE Plastic	LSE Plastic	Foam	Resist	<b>Low</b> °F (°C)	High °F (°C)
Ĭ	h Temperature Acrylic Excellent heat resistance in high-temp	Liner 100	HTL										
9077**	environments. For applications that require both higher processing and operating temperatures.	2	58# PCK	4.2	60" x 180 yds	_	10	7	1	2	10	-40 (-40)	530 (276)
3M™ Hig	h Temperature Acrylic	100		<u>'</u>			1	'	ı	·	1		
F9460PC	High performance industrial joining and metal fabrication.	2	58# PCK	4.2	60" x 180 yds	UL	10	7	1	2	10	-40 (-40)	500 (260)
F9469PC	High performance industrial joining and metal fabrication.	5	58# PCK	4.2	60" x 180 yds	UL	10	7	1	2	10	-40 (-40)	500 (260)
F9473PC	High performance industrial joining and metal fabrication.	10	58# PCK	4.2	60" x 180 yds	UL	10	7	1	2	10	-40 (-40)	500 (260)
3M™ Ultr	a-High Temperature A	crylic 100	HT		<u>'</u>		'		'		<u>'</u>	'	
9082	Excellent heat resistance in high-temp environments. For applications that require		White DK	3.2	48" x 180 yds	_	10	7	1	2	10	-40 ( 40)	530
	both higher processing and operating temperatures.		iller		iou yus							(-40)	(276)
9085	Thicker version of transfer tape 9082.	5	White DK liner	3.2	48" x 180 yds	_	10	7	1	2	10	-40 (-40)	530 (276)
3M™ Hig	h Performance Acrylic	200MP		ı			ı	ı		ı	1	ı	ı
467MP	Graphic attachment and general industry joining.  Industry standard for	2	58# PCK	4.2	48" x 180 yds	UL M***	10	9	1	3	9	-40 (-40)	400 (204)
468MP	graphic attachment and die cut parts.	5	58# PCK	4.2	48" x 180 yds	UL M***	10	9	1	3	9	-40 (-40)	400 (204)
3M™ Hig	h Tack Acrylic 300 Attach gaskets and a	I			ı								
927	variety of industrial foam materials. Thicker version of	2	60# DK	3.7	48" x 180 yds 48" x		7	9	9	9	6	-40 (-40) -40	250 (121) 250
950	transfer tape 927.	5	60# DK	3.7	180 yds	UL M***	7	9	9	9	6	(-40)	(121)
3M™ Lov	v Surface Energy Acryl	ic 300 LSE											
9453LE	Film linered version of transfer tape 9453LE for rotary processing.	3.5	PET	2.0	54" x 180 yds	UL	9	10	10	1	7	-40 (-40)	300 (148)
9471LE	Bonds graphics to powder coatings, LSE plastics and oily materials.	2	58# PCK	4.2	54" x 180 yds	UL	9	10	10	1	7	-40 (-40)	300 (148)
9472LE	Thicker adhesive for textured LSE plastics and powder coatings.	5	58# PCK	4.2	54" x 180 yds	UL	9	10	10	1	7	-40 (-40)	300 (148)
3M™ Hig	h Tack Acrylic 300MP			,					ı		,		,
9770	Economical bonding for LSE materials and for lamination to open and closed cell foams.	2	58# PCK	4.2	48" x 180 yds	M***	7	7	8	8	7	-40 (-40)	250 (121)
6035PC	Resists fogging for automotive interior fabric joining applications.	5	58# PCK	4.2	60" x 180 yds		7	7	8	8	7	-40 (-40)	250 (121)
3M™ Hig	h Performance Acrylic	350											
9482PC	High tack and shear strength; excellent adhesion to plastics and foams.	2	62# PCK	4.2	48" x 180 yds	UL	9	10	10	9	8	-40 (-40)	450 (232)
9485PC	A 5 mil version of transfer tape 9482PC.	5	62# PCK	4.2	48" x 180 yds	UL	9	10	10	9	8	-40 (-40)	450 (232)
3M™ Acr	ylic Adhesive Tape 420												
9752PC	High tack, can be applied in temperatures as low as 32°F (0°C).	2	58# PCK	4.2	54" x 360 yds		7	7	8	4	6	-40 (-40)	450 (232)
9755PC	Thicker version of transfer tape 9752PC for textured surfaces.	5	58# PCK	4.2	54" x 360 yds		7	7	8	4	6	-40 (-40)	450 (232)
Adhaaian	levels of 1-10 ten being t		***		-11 90-	non-wove			! ***M mea		10004	D.T 4	

\*Adhesion levels of 1-10, ten being the highest. \*\*Double coated with non-woven carrier

\*\*\*M means Mil-P-19834B Type 1

3M™ Laminating Adhesives for the electronics market segment include thin attachment adhesive transfer tapes and double coated tapes solutions. The thin attachment solutions are designed to attach a wide variety of substrates ranging from metal and plastics to gaskets. 3M™ Adhesive Transfer Tapes and Double Coated Tapes offer outstanding performance from low surface energy to high temperature resistance applications.

# **High Temperature Acrylic 100**

- Up to 500°F (260°C) shortterm heat resistance and excellent solvent resistance.
- High peel strength compared to other acrylic formulations.
- Exceptional shear strength even at elevated temperatures.
- Exhibits low outgassing characteristics.

# **Ultra High Temperature Acrylic 100HT**

- Up to 530°F (276°C) shortterm heat resistance and outstanding solvent resistance.
- High peel strength compared to other acrylic formulations.
- Exceptional shear strength even at elevated temperatures.

# High Performance Acrylic 200MP

- Up to 400°F (204°C) shortterm heat resistance and excellent solvent resistance.
- Outstanding adhesion to metal and high surface energy plastics.
- Excellent shear strength to resist slippage and edge lifting.
- Short term repositionability for placement accuracy.



#### Low Surface Energy Acrylic 300LSE

- Up to 300°F (148°C) shortterm heat resistance.
- Outstanding adhesion to low surface energy plastics, powder coated paints and lightly-oiled metals.
- Good chemical and humidity resistance.

#### **High Tack Acrylic 300MP**

- Up to 250°F (121°C) shortterm heat resistance for automotive interior applications.
- Designed especially to bond to most plastics and foams.
- Economical attachment of graphics

#### High Performance Acrylic 300MP

- Up to 450°F (232°C) shortterm heat resistance.
- Excellent solvent resistance to LSE materials.

#### **Acrylic 420**

- Up to 450°F (232°C) shortterm heat resistance.
- High tack adhesive.



# Electronic Thin Attachment Films 3M™ Double Coated Tapes

				L	iner				Adhes	sion*		Chem	Temp	Range
Product	Description/ Application Ideas	Tape Caliper mils	Carrier Type	Туре	Caliper mils	Master Size	Specs	Metal	HSE Plastic	LSE Plastic	Foam	Resist	<b>Low</b> °F (°C)	High °F (°C)
3M™ Hig	h Performance Acryli	c 200MP												
9492MP	2.5 mil version of double coated tape 9495MP.	2.5	PET	58# PCK	4.2	48" x 180 yds		10	9	1	2	9	-40 (-40)	400 (204)
9495MP	Double-coated version of transfer tape 468MP. Offers improved handling and ease of die cutting.	5.7	PET	58# PCK	4.2	54" x 180 yds	UL	10	9	1	2	9	-40 (-40)	400 (204)
3M™ Low Surface Energy Acrylic 300 LSE														
9495LE	Double-coated version of transfer tape 9472LE. Improved handling and ease of die cutting.	6.7	PET	58# PCK	4.2	54" x 180 yds	UL	9	10	10	1	7	-40 (-40)	300 (148)
3M™ Hig	3M™ High Tack Acrylic Tapes 300MP/300LSE													
9609	Thick double-coat for cell phone lens attachment. Provided on 6" core only.	9.0	PET	83# PCK	6.2	48" x 180 yds		7	7	8	9	7	-40 (-40)	250 (121)
9690	Double-coated version of transfer tape 9695 for foam lamination and graphic attachment.	5.6	PET	83# PCK	6.2	54" x 180 yds		7	7	8	9	7	-40 (-40)	250 (121)
9693	3.5 mil version of double coated tape 9690 for cell phone lens attachment.	3.5	PET	83# PCK	6.2	54" x 180 yds		7	7	8	9	7	-40 (-40)	250 (121)
3M™ Dif	ferential Adhesive 30	OMP/300L	.SE											
9490LE	Adhesive 300 MP for foam laminating. Adhesive 300LSE bonds to powder coated metals, oily metals and LSE plastic.	6.7	PET	58# PCK	4.2	54" x 180 yds		7 9	7 10	8 10	8	7 7	-40 (-40)	300 (148)
3M™ Hic	gh Performance Acryli	c 350												
9500PC	High performance with good chemical resistance.	5.6	PET	61.5# PCK	4.5	48" x 108 yds		9	10	10	1	8	-40 (-40)	450 (232)
3M™ Sili	icone Differential Adh	esive 350	)											
9731	Differential adhesive—silicone adhesive on face side. Silicone keypad attachment, printer toner cartridge refurbishing.	5.5	PET	PET/ PCK	2.9/5.0	38" x 108 yds		9	10	10	1	8	-40 (-40)	450 (232)
3M <sup>™</sup> Acrylic Adhesive 420														
9783	3.5 mil version of double coated tape 9795 for cell phone lens attachment.	3.5	PET	83# PCK		54" x 180 yds		7	7	8	4	6	-40 (-40)	450 (232)
9795	Double coated version of transfer tape F9755PC for foam lamination and graphic attachment	5.6	PET	83# PCK		54" x 180 yds		7	7	8	4	6	-40 (-40)	450 (232)
9799	Thick double coat for cell phone lens attachment.	9.0	PET	83# PCK		48" x 180 yds		7	7	8	4	6	-40 (-40)	450 (232)

<sup>\*</sup>Adhesion levels of 1-10. Ten being the highest.

### 3M<sup>™</sup> Performance Label Materials

#### **Applications and general properties of 3M™ Performance Label Materials**

Application	Unique Application Needs	Product Family/Description	Product	Thickness (Face/Adhesive only) mils	Color
Identifying/	Informing/Warning				
		Thermal Transfer Polyester with	7871	3.8	Gloss white
Certification,	Thermal transfer printable, with	High Holding Adhesive 350	7868	3.1	Gloss white
Instruction,	adhesion to difficult surfaces for	, , , , , , , , , , , , , , , , , , ,	7872	3.8	Matte platinum
or Warning Label	life of the product.	Thermal Transfer Polyester with High Performance	FM033202	3.3	Gloss white
Luboi		Adhesive P1650	FM043702	3.3	Matte Silver
			7815	3.1	Matte white
	Cost effective thermal transfer printable, with adhesion to many	Thermal Transfer Polyester with	7816	2.8	Gloss white
Identification	surfaces for life of the product.	High Precision Adhesive 310	7818	4.1	Matte silver
and	ourraces for me or and product		7875	2.8	Platinum
Information Label	Low cost, general purpose	Thermal Transfer Polyester	OFM03402	2.9	Gloss white
Labor	thermal transfer label material with adhesion to many surfaces for life of the product.	with High Performance Adhesive P1400	OFM03502	2.9	Matte white
	Label stock is recycling				
Recyclable Label	compatible with PC, ABS, PS, HIPS & PC/ABS plastics. Thermal transfer printable.	Recycling Compatible ABS with High Holding Adhesive 350	8000	4.2	Matte white
	Permanent yet cleanly removable		5770	2.8	Matte white
Re-work Label	on many substrates. Low- outgassing adhesive resists flagging and edge lifting on disk	Thermal Transfer Polyester with Removable Adhesive 550	5771	3.1	Gloss white
	drive applications.				
Tracking			7015	0.1	Maille 12
	Cost effective thermal transfer	Thermal Transfer Polyester with	7815	3.1	Matte white
Inventory	printable, with adhesion to many surfaces for life of product.	High Precision Adhesive 310	7816 7875	2.8 2.8	Gloss white Platinum
Control	· ·			-	
Label	Low cost, general purpose thermal transfer label material with adhesion to many surfaces	Thermal Transfer Polyester with High Performance Adhesive P1400	OFM03402 OFM2402	2.9 2.9	Gloss white  Matte Silver
	for life of the product.  Barcode printable with high	High Temperature Polyimide	7011 DMI	4.0	Motto white
PCB	temperature resistance. Survives	(Kapton™) with High Temp	7811-DMI 7812-TT	4.0 4.0	Matte white Matte white
Tracking Label	solder processing.  High temperature resistance.	Adhesive 100 High Temperature Acrylate with	7012-11	4.0	watte wille
Label	Thermal transfer printable.	High Temp Adhesive 150	3923	2.8	Matte white
Laser Markable	Laser etchable film, durable	Laser Etch Acrylate with High	7847	3.6	Matte black on white
Label Material	label construction.	Holding Adhesive 350	7848	3.6	Matte silver on black
					on black
Securing					
	Tamper indicating stocks	VOID Tamper Indicating Polyester	7381/7866	3.0	Gloss white
	designed to provide a "void" message in the facestock when	with High Holding Adhesive 350	7380	3.0	Matte white
	removal is attempted.	VOID Tamper Indicating Polyester with Tackified Adhesive P1410	FMV22 FMV02	2.9 2.9	Gloss white Bright silver
	Tamper indicating material	With facking Adhesive 1 1410			
	designed to provide triangle	Triangle Tamper Indicating	FMV01202	2.9	Bright silver
Tamper Indicating	pattern when removal is attempted .	Polyester with Tackified Adhesive P1410	FMV01402	2.9	Gloss white
Label	Tamper evident material destructs if attempts are made to remove from substrate. Thermal transfer printable.	Destructible Vinyl with High Holding Adhesive 350	7613	2.8	Matte white
	Tamper evident material destructs if attempts are made to remove from substrate. Dot matrix printable.	Destructible Vinyl with High Holding Adhesive 200	7885	3.0	Matte white
Protecting					
	Ultra clear, printable label material				
Maritin	for lens protection applications. Low tack adhesive with clean removability.	Highly Transparent Polyester with Removable Adhesive	76991	2.0	Ultra clear
Masking	High tack adhesive with ultra	Thermal Transfer Polyester with Ultra Removable Adhesive R3500	FM1542	2.8	Gloss clear
	clean removal.	Press Printable Polypropylene with Ultra Removable Adhesive R3500	FP0862	2.8	Clear
	Protects surface of label from	Non-topcoated Polyester with High Performance Adhesive P1400	OFM010N	1.8	Gloss clear
Overlaminate	abrasion, sunlight, chemicals, or moisture. Film liner offers	Thermal Transfer Polyester with High Tack Adhesive 400	7744FL	2.1	Matte clear
	excellent graphic appearance.	Non-topcoated Polyester with High Tack Adhesive 400	7730FL	1.8	Gloss clear
	I	Thigh lack Auticoive 400	12		

#### Technology and capability for identifying, informing, tracking, warning, protecting, and securing.

With 3M adhesives, topcoats, facestocks and liners, you can mix and match to achieve about 150,000 combinations. That means technology and solutions for most labeling requirements for notebook and desktop computers, printers, peripherals, mobile phones, and more. 3M also helps you put that technology to work just about anywhere in the world with global service, expertise, and a customer-focused attitude.

- Trained sales and technical team representing years of materials and application experience
- Application Development Specialists to help customers optimally mix and match label materials
- Broad customization capability in the performance labels industry
- Testing laboratory for label properties and performance
- Custom quotation within 48 hours anywhere in the world
- · Samples available





### 3M<sup>™</sup> Damping Polymers

3M<sup>™</sup> Viscoelastic Damping Polymers have been proven to reduce vibration and shock problems in electronics, appliances, automobiles and aircraft. These versatile materials can be adapted to a wide variety of applications, including cover constrained layer dampers; multi-layer laminates using metal or polymeric films; free layer dampers; suspension dampers; isolators; panel, pipe and wing dampers; and more.

#### **Market Application Areas**

- Automotive, including body panels and under the hood
- Aerospace, including spacecraft and commercial aircraft
- Electronics, including speakers and touch pads
- Sporting goods, including golf clubs and tennis racquets
- Appliances, including washing machines

<b>Note:</b> This technica
information and data
should be considered
representative of
typical only, and
should not be used
for specification
purposes

Product	Thickness mils	Liner	Adhesion to Stainless Steel oz./in. (N/100mm) <sup>1</sup>	Typical Performance Characteristics
110P02	2	Paper	88 (96)	Good damping performance at higher temperature:     104-221°F (40-105°C).
110P05	5	Paper	38 (42)	Heat and pressure needed for bonding
112P02	2	Paper	100 (109)	Good damping performance at 32-142°F (0-65°C)     Pressure only for adequate bonding at room temperature (70°F/21°C) for
112P05	5	Paper	144 (158)	many applications

#### **Performance Versatility**

- Choice of enhanced acrylic polymer for improved vibration damping
- Choice of good to excellent thermal stability for long term applications at moderate temperatures, or short term high temperature exposure
- Damping in temperatures ranging from as low as 32°F (0°C) to as high as 221°F (105°C)
- Select Loss Factor and Storage Modulus values to meet requirements



- Select a polymer to bond with pressure only, or with heat and pressure
- Choice of liners to meet different handling requirements
- Wide range of thicknesses to meet design requirements
- Use with a variety of substrates
- Capable of laminating layers to create thicker products
- High or low initial tack, depending on precision of placement



Damping polymers for voice coil motors

### 3M™ Ultra-Pure Damping Polymers

3M understands that small vibrations in disc drive operations can lead to reduced drive performance and eventually to breakdown.  $3M^{TM}$  Ultra Pure Viscoelastic Damping Polymers are low outgassing adhesives that reduce chemical contamination and corrosive ions that can enter critical damping area environments.

Product	Adhesion to Steel oz./in. (N/100mm) <sup>1</sup>	<b>Temperature Range</b> °F (°C)		
ASTM Test Method	D-3330			
242F01	70 (77)	32-150 (0-65)		
242F02	80 (88)	32-150 (0-65)		
242NR01	35 (38)	32-150 (0-65)		
242NR02	100 (109)	32-150 (0-65)		

These products have an Adhesive Transfer Tape backing/adhesive structure.

# 3M<sup>™</sup> Ultra Clean, Very Low Outgassing Tapes

3M pioneered the development of silicone free, very low outgassing and low ionics pressure sensitive adhesive and liner technology. That market leadership continues today, with continuous additions to this product family of single-sided, double-sided and free standing adhesive transfer tapes, labels and damping polymers – each offering multiple choices of silicone free liners. These products build on established market leading outgassing performance by enhancing specific chemical attributes which demanding customers have identified.

- Silicone free adhesive and liner combinations low outgassing and low potential for corrosion, odor and fogging
- Variety of adhesive choices: temporary; permanent but still removable; and permanent
- Various release levels of silicone free liners
- Ultra-pure damping polymers available in die cut shapes

Product	Tape Structure (Backing/ Adhesive)	Backing Thickness mils	Total Thickness mils	Adhesion to Steel oz./in. (N/100mm) <sup>1</sup>	Tensile Strength Ibs/in. (N/100 mm)	Elongation at Break %	Comments
ASTM Test Method		D-3652	D-3652	D-3330	D-3759	D-3759	
3M™ Single-Side	d Tapes						
Very Low Outgassing 6670	Polyester/ Hydrocarbon	1.5	1.7	2.6 (2.8)	46.1 (807.7)	192	Low tack process aid. Temp range up to 248°F (120°C)
Very Low Outgassing Polyester 6690	Polyester/ Acrylic	1.9	2.9	27 (29.7)	52 (TBD)	120	Non-silicone film liner
Very Low Outgassing 6692	Polyester/ Acrylic	1.9	2.9	18 (19.8)	52 (TBD)	120	Non-silicone film liner
Polyester 8333	Polyester/ Acrylic	0.9	1.8	31 (34.1)	27 (TBD)	120	General purpose
Very Low Outgassing High Shear Polyester 8439	Polyester/ Acrylic	0.9	1.8	29 (31.9)	29 (TBD)	120	High shear
Very Low Outgassing High Shear Polyester 8439FL	Polyester/ Acrylic	0.9	1.8	29 (31.9)	29 (TBD)	120	Linered, high shear

Refer to technical
data sheets to get
outgassing data
for the specific
product you need.

Droduct	Adhasivas Tyna	Thickness	Linor	Coro	Adhe	sion Static	Shear	Total	Outgas*	Total lonics**
	7.0. 30									
55799	Polyester/ Acrylic	1.9	2.9	27 (2	29.7)	52 (TBD)	1:	20	Non-silico	ne film liner
55334	Polyester/ Hydrocarbon	1.5	1.7	2.6	(2.8)	46.1 (807.7)	1	92		e up to 248°F

Product	Adhesives Type	Thickness mils	Liner Core		Adhesion oz./1/2 in.	Static Shear RT 1,000 g	Total Outgas* µg/cm²	Total lonics**  µg/cm²					
3M™ Ultra-	3M™ Ultra-Clean Laminating Adhesives												
501FL	Acrylic/Permanent	1	FL	Plastic	72	>10,000 min	0.3~1.5	<0.15					
502FL	Acrylic/Permanent	2	FL	Plastic	105	>10,000 min	0.5~2.5	<0.15					
504FL	Acrylic/Permanent	4	FL	Plastic	132	>10,000 min	2.0~8.0	<0.15					



Note: In the product codes, FL denotes 2 mil PET. DS low extractable silicone liner. NR denotes non-silicone liners on both sides

Low tack process aid

<sup>- 2</sup> mil PET, 4 mil polyethylene

<sup>\*</sup> Modified ASTM 4626 - Hydrocarbons, organic acids, esters, alcohols, phenols, acrylates, acetates, etc.

<sup>\*\*</sup> Typical total ionics by ion chromatograph - chloride, nitrate, sulfate

When liquid water contacts the tape edge, the absorbent indicator layer quickly changes from white to red. Not affected by heat and humidity.

### Warranty and Security Tapes

#### **3M™ Water Contact Indicator Tapes**

3M™ Water Contact Indicator Tapes provide a fast, accurate and easy way to positively detect water intrusion into sensitive electronic devices. This family of products offers excellent temperature and humidity resistance, while quickly turning bright red on contact with liquid water. The red color change is irreversible after drying. 3M Water Contact Indicator Tapes are long lasting, and have shown exceptional resistance to wash-out and bleach-out from strong oxidizers.

#### **Water Contact Product Selection Matrix**

Product	5557	5557NP	5558	5559
Caliper	10.2 mils	8.6 mils	6 mils	5 mils
Film Overlam	Yes	No	Yes	No
Thermal Transfer Printable	Yes	Fair	Yes	Fair
Other Print Techniques	Yes	Yes	Yes	Yes
Indication Speed	Good	Best	Good	Best
Humidity Resistance	Best	Better	Better	Good
Liner Type	2 mil Film	2 mil Film	3.2 mil DK	3.2 mil DK
UL-969	Yes	No	No	No

**3M™ Water Contact Indicator Tape 5557** is the workhorse of this product family, and offers a comprehensive package of environmental stability, indication speed, total caliper and printability.

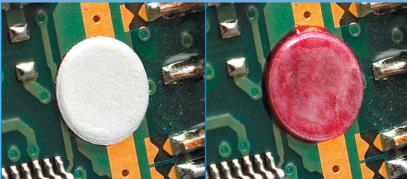
**3M™ Ultrathin Water Contact Indicator Tapes 5558** and **5559** offer a thinner total caliper, where tight geometries dictate a very low thickness water indicator product.

**3M™ Water Contact Indicator Tape 5557NP** is a new addition to this family. The product retains most of the premium attributes of 5557 indicator tape, while offering enhanced indication speed through removal of the top film layer.



Indicator layer and polyester liner combine for easy and accurate diecutting, including high efficiency rotary.





Before After

# 3M<sup>™</sup> Cleanroom Tapes

3M™ Cleanroom Tape Products are specifically prepared and packaged for direct introduction and application into cleanroom manufacturing facilities. Their plastic cores and double polyethylene bag packaging eliminate contamination from dirty cardboard and paper products.

**3M™ Cleanroom Tape 1251** is a general purpose vinyl tape, used for applications including color coding, sealing, floor marking and isolation of maintenance activities. Available in one transparent and two color tape variations.

**3M™ Cleanroom Tape 1254** offers a very high tack formulation, suitable for creating temporary barriers during cleanroom construction or maintenance.

Product/Color	Tape Structure (Backing/ Adhesive)	Backing Thickness mils (mm)	Total Thickness mils (mm)	Adhesion to Steel oz./in. (N/100mm) <sup>1</sup>	Tensile Strength Ibs/in. (N/100 mm)	Elongation at Break %	Temperature Range °F (°C)	Comments
ASTM Test Method		D-3652	D-3652	D-3330	D-3759	D-3759		
1251 White/Yellow /Transparent	Vinyl/Rubber	4.1 (0.10)	5.2 (0.13)	23 (25)	16 (280)	130	40 –170 (4 – 77)	General purpose. Clean room.
1254/Transparent	Polyester/ Rubber	1.4 (0.04)	4.1 (0.10)	145 (160	25 (440)	18	40 – 200 (4 – 93)	Very high tack. Clean room.
1258/Amber	Polyimide/ Silicone	1.0 (0.03)	2.7 (0.07)	20 (22)	33 (578)	60	-100 – 500 (-73 – 260)	High temperature Low static.
3305/Transparent	Polyester/ Rubber	1.6 (0.04)	2.7 (0.07)	120 (131)	43 (753)	180	40 – 200 (4 – 93)	Very high tack. De-taping applications.

#### **3M<sup>™</sup> Anti-Static Tapes**

Product	Backing	Adhesive	Breaking Strength oz/in (N/cm)	Features	Remove from Roll volts	Adhesion to Steel oz/in (N/cm)	Remove from Stainless Steel volts
40	Polyester Film	Antistatic Polymer Conductive	20 (35)	General use utility tape for electronic components and assemblies. Antistatic conductive polymer adhesive. Clear.	5	15 (1.7)	5
40PR	Polyester Film	Antistatic Polymer Conductive	20 (35)	General use utility tape for electronic components and assemblies. Antistatic conductive polymer adhesive. Clear, printed with antistatic symbol.	5	15 (1.7)	5





# 3M<sup>™</sup> VHB<sup>™</sup> Tapes

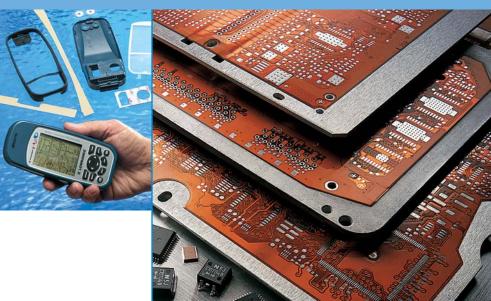
3M<sup>™</sup> VHB<sup>™</sup> Tapes provide the convenience and simplicity of a tape fastener and are ideal for use in many interior and exterior bonding applications. In many situations, they can replace rivets, spot welds, liquid adhesives and other permanent fasteners. These 3M<sup>™</sup> VHB<sup>™</sup> Tapes are made with acrylic foam which is viscoelastic in nature. This gives the foam energy absorbing and stress relaxing properties which provides these tapes with their unique characteristics. The acrylic chemistry provides outstanding durability and performance.

- Bond with high holding strength for static and dynamic strength
- Provide a continuous bond to distribute stress over entire area
- Damp vibration
- Holds up to high temperature, cold, temperature cycling, UV light, moisture and solvents
- Seal against environmental conditions
- Join dissimilar materials
- Separates metals to reduce potential for galvanic corrosion



Die cut to precisely fit any shape, size or profile.

Virtually invisible fastening helps keep surface smooth and clean to enhance design and appearance.



Thin VHB Foam Tapes provide excellent shock and vibration resistance without the cure times of silicone.

### 3M<sup>™</sup> Light Cure Adhesives

3M<sup>™</sup> Light Cure Adhesives offer an advanced new approach to bonding. Their superior depth of cure, rapid cure speed and easy dispensability can save valuable processing time in both UV and visible light curing assembly environments.

Light Cure Adhesives are ideally suited for demanding designs and sophisticated components – offering strong and durable adhesion in both indoor and outdoor applications plus clean, thin bond lines for improved aesthetics. And 3M's technical know-how and support can be a critical resource in bringing your products to market faster.

#### **Features**

- Reduced processing time
- · Clean, thin bond lines
- Superior depth of cure
- Cure-on-demand performance
- Cure when exposed to UV or visible light
- Resistant to corrosion
- Compatible with manual, semi-automatic or fully automatic dispensing systems

#### **Advantages**

#### **UV Curing**

- Fast curing under 1 second
- Ideal for thin films, thin coatings and bonding applications on heat-sensitive substrates
- Provides long pot life
- No special storage required

#### **Visible Light Curing**

- Ideal for curing through thicker sections
- Cures through colored or UVabsorbing materials
- Poses fewer safety risks to eyes and skin
- Lower energy consumption and maintenance costs

#### **Typical Applications**

- Electronics assembly
- Eyewear
- Traffic lighting
- Vehicle signal and emergency lights
- Needles and syringes
- Appliances
- Indoor and outdoor lighting reflectors and housings
- ...plus thousands of other uses!



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

#### LC-1112 LC-1113 LC-1211 LC-1212 LC-1213 LC-1214 **Product** UV **Cure Mechanism** U٧ Visible, UV Visible, UV Visible, UV Visible, UV Cure Speed UV (sec)<sup>1</sup> < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 Cure Speed, Visible (sec)2 2 NA NA <5 2 <5 Light Yellow Colorless Colorless Light Yellow Light Yellow Red Viscosity @72°F (cP)3 15,460 641 488 12.720 560 44,000 Colorless Colorless Light Yellow Light Yellow Light Yellow Yellow Color Shore D Hardness<sup>4</sup> 83 71 69 83 69 40 Overlap Shear Strength, 411 522 436 455 566 540 PC-PC (psi)5 Comments Flexible bond. Flexible bond. Flexible bond. Very flexible bond. Semi-riaid Semi-riaid Improved glass Passes 3M Improved glass Color change Passes 3M corrosion test Improved and metal and metal indicator (red to corrosion test on copper and light yellow). on copper and aluminum. <sup>6</sup> Passes 3M aluminum ( metal corrosion test adhesion on copper and aluminum. <sup>6</sup>

NA = Not Applicable
'EFOS Ultracure 100ss Plus,
5 mil thickness
'3M™ Curing Light VL1, 5 mil thickness

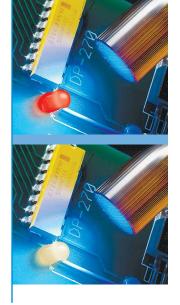
<sup>3</sup>Brookfield DV-I+, ASTM D 1084 <sup>4</sup>ASTM D 2240 <sup>5</sup>ASTM D1002 \*3M corrosion test (non-bias): adhesive coated on metal-sputtered PET film, cured, stored at 85°C/85% R.H. for two weeks. inspected for corrosion.

#### **AFTER**

By changing from red to light yellow, LC-1214 indicates full cure.

#### **BEFORE**

Red color of LC-1214 provides visualization aid for positioning.



# 3M<sup>™</sup> Plastic Bonding Adhesive

#### For bonding small joints in lens/case assembly and more

3M<sup>™</sup> Plastic Bonding Adhesive 2665 is a moisture-curing urethane that applies warm and sets like a hot melt adhesive, but with a long open time for easy assembly of parts requiring a thin bond line.

#### Lower overall assembly with improved efficiency, productivity, and yield

- High tack holds parts together for immediate handling and fast production
- 4-minute open time allows initial repositioning even with thin bond lines that would otherwise cure too quickly for assembly
- Low viscosity holds bead shape and size in small, defined areas
- One-component formulation eliminates potential inconsistencies of metering and mixing
- 100% solids provides a low-VOC system with no drying equipment and no attack on plastics
- · Bonds and seals simultaneously

# High performance for lens/case and housing assembly in cell phones and notebooks, MP3 players, portable batteries, and other consumer electronics

- Thin, tough and flexible bond lines help improve fit, appearance, and reliability
- High strength bonds plastics and metals, dissimilar substrates, and even hard-to-bond plastics such as polycarbonate
- Improved appearance without the whitening from cyanoacrylate and cracking from ultrasonic welding



High tack beads

with long open time

for thin bond lines

Characteristic	3M™ Plastic Bonding Adhesive 2665	Ultrasonic Welding	3M™ Cyanoacrylate Adhesive
Production speed	Fast with very high tack yet long open time for assembly	Very fast	Bonds on contact
Bond thin plastic joints	Bond lines less than 1mm wide	Difficult; potential vibration damage	May flow beyond bond area
Bond dissimilar plastics/materials	Hard-to-bond plastics can be bonded after simply wiping off	Attach only similar materials	Bonds dissimilar plastics/materials
Bond strength	Very strong even in small areas; flexible to withstand impact	Very strong	Very strong but brittle and can crack
Appearance	Virtually invisible; no blooming	Can scratch and crack plastics	Causes blooming
Complete seal	Complete	Incomplete	Complete



# 3M<sup>™</sup> Epoxy and Hot Melt Adhesives

#### 3M™ Scotch-Weld™ Electronic Grade Epoxy

For assembly of sophisticated electronics where outgassing and corrosion of material bonds are a concern, our two-part 3M™ Scotch-Weld™ Electronic Grade (EG) Epoxies are an excellent alternative to mechanical fasteners and lower-grade adhesives. Scotch-Weld EG Epoxies produce far lower contamination levels of ionic and outgassing impurities than typical epoxy adhesives. This makes Scotch-Weld EG Epoxies ideal for the fabrication and assembly of critical components.

Product	Viscosity cps	Mixed Work Life @ 74°F (23°C)	Shear Strength Aluminum PSI	180° Peel Strength Aluminum piw				
3M <sup>™</sup> Scotch-Weld <sup>™</sup> Elec	3M™ Scotch-Weld™ Electronic Grade Epoxy							
DP-100	B-12,000 A-14,000 @ 74°F (23°C)	3- 5 min	1500	2				
DP-100 Plus Clear	B-7,000 A-10,000 @77°F (25°C)	3- 4 min	3500	13				
DP-125	B-4,000 A-6,000 @77°F (25°C)	18-28 min	2500*	35*				
DP-190 Gray	B-100,000 A-60,000 @80°F (27°C)	90 min	2200*	20*				
DP-270 Clear/Black	B-22,000 A-18,000 @ 74°F (23°C)	60-70 min	2400	2				
DP-420	B-35,000 A-10,000 @ 74°F (23°C)	20 min	4400	49				
DP-460	B-35,000 A-10,000 @ 74°F (23°C)	60 min	4600	50				
DP-460 EG	B-35,000 A-10,000 @ 74°F (23°C)	60 min	4600	50				
DP-4XL EG	B-35,000 A-10,000 @ 74°F (23°C)	5-6 hr	4500	45				
DP-810	B-18,000-22,000 A-18,000-22,000 @ 74°F (23°C)	8-10 min	4200	30				
DP-810 Black	B-18,000-22,000 A-18,000-22,000 @ 74°F (23°C)	8-10 min	4200	30				
3M <sup>™</sup> Scotch-Weld <sup>™</sup> Hot	Melt Adhesives							
3748 Off-white	5000 @ 374°F (190°C)	NA	200 FR-4	40 FR-4				
3748 VO Light Yellow	6500 @ 374°F (190°C)	NA	220 FR-4	35 FR-4				

<sup>\*</sup>RT cure with 160° F (71°C), 2 hour post cure.



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3M offers dispensing systems to meet the most exacting fabrication and assembly applications.

# Abrasives for Electronics Finishing

Eliminate defects and achieve the precision finish your operation demands with advanced abrasive products from 3M. These advanced, cost-effective abrasives bring superior consistency to lapping and polishing fiber optics, wafer substrates, memory disks, and other photonic and electronic components.

#### **3M<sup>™</sup> Diamond Lapping Films**

A cleaner, more consistent alternative to diamond compounds and slurries. 3M™ Diamond Lapping Films can reduce polishing time, achieve superior flatness and edge finish, and eliminate slurry disposal problems.

#### **Key Features and Benefits**

- · Faster cut
- · Increased throughput
- · Flatter surface, no rounding

- Better finish, no chipping
- Long abrasive life minimizes disc changes

#### **Applications**

- Polishing fiber optic connectors and rigid memory discs
- Texturing thin film discs

- Roll superfinishing
- Flat lapping applications

Product	Backing Type	Backing Thickness mils (mm)	Bonding Resins	
621X	Plain Back	0.5	Standard Resin	
631X	Plain Back	1.0	Standard Resin	
641X	Plain Back	1.5	Standard Resin	
651X	Plain Back	2.0	Standard Resin	
661X/668X	Plain Back/PSA	3.0	Standard Resin	
661XA	Plain Back/PSA	3.0	Microreplication Technology	
661XU	Plain Back/PSA	3.0	Precision Coated	
662XW/666XW	Plain Back/PSA	3.0	Type H, Tough resin system with higher diamond content	
663X/664X	Plain Back/PSA	3.0	Type P, Hard Resin	
Available in discs, rolls and sheets.				



### 3M™ Trizact™ Diamond Lapping Film

Helps reduce finishing times with our innovative microreplicated structured abrasives. As these film-backed abrasives are used, fresh minerals are continuously exposed, ensuring a fast and extremely consistent cut rate through the long life of the abrasive.

- Superior durability
- · Higher cut rate
- Finer finish

- Helps improve productivity
- Helps improve yield

Product	Mineral Size	Backing	Bonding Resins	Mineral	
3M <sup>™</sup> Trizact <sup>™</sup> Diamond Lapping Film 661XA	.5 μ, 2 μ and 9 μ (nominal)	Polyester Film	Medium Resin Hardness	Diamond	
Available in roll, sheet and disc form. Maximum diameter and width is 10".					

# Abrasives for Electronics Finishing

#### **3M<sup>™</sup> Lapping Films**

3M™ Lapping Films have precisely graded mineral coated on a high strength polyester backing to provide a uniform, consistent finish. These high-quality films provide a precision finish every time.

#### **Key Features and Benefits**

- Uniform coating
- Tight mineral particle distribution
- Full line offering
- PSA/non-PSA offered

#### **Applications**

- Polishing fiber optic connectors and rigid memory discs
- Texturing thin film discs

- Roll superfinishing
- Flat lapping applications

Product	Backing Type	Backing Thickness mils (mm)	Bonding Resins
061X	Polyester	3	Standard
254X	Plain	2	Standard
261X	Plain	3	Standard
262X	Plain	3	Softer resin
263X	Plain	3	Type P, Hard resin
265X	PSA	3	Standard
266X	PSA	3	Type P, Hard resin
268X	PSA	3	Standard
452X	Plain	2	Type F-2
461X	Plain	3	Standard
462X	Plain	3	Harder resin
463X	Plain	3	Easy breakdown resin for MT connector polishing
464X	Plain	3	Type P, Hard resin
466X	PSA	3	Type P, Hard resin
468X	PSA	3	Standard
468XW	PSA	3	Easy breakdown resin for MT connector polishing
468XY	PSA	3	Harder resin
562X	Polyester	3	Standard
863X	Polyester Film	3	Standard
863XW	Polyester Film	3	Standard
869X	PSA	3	Standard
869XW	PSA	3	Standard







# Abrasives for Electronics Finishing

### **3M<sup>™</sup> Polishing Films**

Our polishing films help you consistently meet geometry and fiber height requirements in your MT connector polishing operation. Our polishing films give you a cleaner, more consistent alternative to compounds or slurries.

- Micron-graded particles, resin bonded to a polyester backing
- Better control of fiber protrusions
- Improved throughput

- Fewer rejects
- · Elimination of slurry cleanup
- Reduced equipment maintenance costs

Product (plain back)	Product (PSA backing)	Mineral
591X	598X	Cerium Oxide
291X	298X	Aluminum Oxide
491X	498X	Silicon Carbide
961M	968M	None

Available in roll, sheet and disc form.



#### **3M<sup>™</sup> Wetordry<sup>™</sup> Polishing Paper**

Comprised of micron graded particles, slurry coated onto a non-woven synthetic backing. The superior flexibility of this product allows for fast and easy finishing and polishing, even on highly contoured surfaces.

- · Use wet or dry
- Precision micron grading for a uniform, consistent finish
- Shortens hand-sanding and buffing time
- Reduces finishing steps and saves time
- Color-coded micron grading for easy selection
- Pressure Sensitive Adhesive (PSA) and 3M<sup>™</sup> Hookit<sup>™</sup> Attachment Systems backing available

			Color/Grade					
Product	Backing	Mineral	Lt. Green 1 µ	Mint 2 µ	Pink 3µ	Blue 9 µ	Grey 15 µ	Green 30 µ
281Q	Regular	Aluminum Oxide	Х	Х	Χ	Х		
286Q	PSA	Aluminum Oxide	Х	Χ	Χ	Х		
286Q	Hookit Attachment Systems	Aluminum Oxide			Χ	Χ		
481Q	Regular	Silicon Carbide					Х	Х
486Q	PSA	Silicon Carbide					Х	Х
486Q	Hookit Attachment Systems	Silicon Carbide					Х	Х

Available in roll, sheet and disc form.



# Can also be used to repair:

Plastic/glass

CDs/DVDs

Windshields

Jewelry

Acrylic

Metal surface polishing

#### **CUNO** Electronics Filtration

CUNO, a 3M company, has developed innovative filtration and purification products by partnering with our customers to solve their critical contamination problems. We proactively evaluate future trends and technology requirements early in the process, allowing us to deliver customized new products when you need them.

With over 200 patents worldwide, CUNO offers some of the most advanced and novel products available for filtration in the electronics industry, used in applications ranging from DI water and high purity chemicals to CMP. In fact, CUNO filtration and purification systems are the preferred choice for DI water applications where critical cleaning of integrated circuits, video displays, printed circuit boards and data storage devices is essential.

#### NanoSHIELD™ Filters with Hollow Fiber Technology (HFT)

Provides up to 2 times more surface area and up to 5 times higher flow rates at the same pressure drop, compared to pleated membrane cartridges

- Allows use of smaller, less costly filter housings that reduce hold-up volume
- Faster filter change-out times
- Reduces total cost-of-ownership
- Thicker membrane maximizes depth of filtration and particle removal efficiency

New product offerings from CUNO include:

- NanoSHIELD™ Hollow Fiber Filter Cartridges and Capsules for high purity chemical applications
- OPTIMA<sup>™</sup> Filter
   Cartridges and Capsules for CMP applications

#### **Zeta Plus® Trace Metal Purifiers**

Specially engineered to remove ionic and organic contaminants from high-purity electronic grade chemicals. Patented design removes ionic contaminants throughout the entire depth of the media, for greater efficiency, increased flow and extended lifetime.

**Zeta Plus 40Q Purifiers** contain multiple ion exchange groups that reduce trace metals such as Na, Fe, K and Ca to single digit parts per billion levels in single pass or recirculation mode applications.

**ZetaCarbon Purifiers** contain activated carbon to remove organic contaminants in a single pass from plating applications used by hard drive, CD/DVD, PCB and integrated circuit manufacturers.

#### **Charge Modified Membranes**

Eletropor II Filter Cartridges offer superior flow and advanced particle retention for ultrapure water (UPW) applications. Patented charge modification technology combines both mechanical sieving (pore size) and electro-kinetic adsorption (positive charge) to enhance particle removal of submicron contaminants like colloidal silica and bacteria fragments.

- · Long filter life
- · High flow rates
- Low pressure drop





#### 3M<sup>™</sup> Novec<sup>™</sup> Aerosol Cleaners

3M<sup>™</sup> Novec<sup>™</sup> Aerosol Cleaners give you a new way to meet today's electronics and precision cleaning challenges – combining fast, effective cleaning performance with a wide margin of safety for workers and a favorable environmental profile. They offer an excellent alternative to HCFC 141b-based cleaners.

#### Features of 3M's proprietary Novec Aerosol Cleaner technology

- Non-flammable
- Low toxicity
- · Non-ozone depleting

- Non-corrosive
- Fast drying, virtually no residue.
- Contain no HCFCs, HFCs, nPB or HAPs

#### **Novec Aerosol Cleaners offer great value**

Based on high performance proprietary 3M formulations, Novec Aerosol Cleaners contain more active solvent, resulting in more cleanings per ounce than many competitive cleaners.

#### **Novec Aerosol Cleaners Cleaning Performance**

	Novec Contact Cleaner	Novec Electronic Degreaser	Novec Flux Remover
Particulate	+++	+++	+++
Krytox® 0il	+++	++	++
Silicone Oil	+	+++	+++
Mineral Oil	+	+++	+++
Motor Oil	+	+++	+++
Lithium Grease	-	++	++
Wheel Bearing Grease	-	++	++
Hydraulic Fluid	+	+++	+++
Noncorrosive Coating	-	+++	+++
RA Flux	-	++	+++
RMA Flux	-	++	+++
R Flux	-	+++	+++
Plastic Compatibility	+++	++*	++*

<sup>\*</sup> Test on plastics before using. May damage ABS, PS, acrylic and polycarbonate.



Rating Cleaning Performance

Recommended

+++ Excellent ++ Very Good + Moderate - Not





#### 3M<sup>™</sup> Novec<sup>™</sup> Aerosol Cleaners

#### **3M<sup>™</sup> Novec<sup>™</sup> Contact Cleaner**

- Non-flammable, low toxicity
- Ideal for electrical or energized equipment and components
- Excellent for cleaning fiber optic connectors
- Removes oils, light grease, silicones, Krytox® oil, dust and particulates from sensitive electronic and electrical equipment
- · Plastic-compatible

#### **Environmental, Health and Safety Information**

	Novec Contact Cleaner	HCFC-141b
Ozone Depletion Potential - ODP <sup>1</sup>	0.00	0.10
Global Warming Potential - GWP <sup>2</sup>	320	700
Atmospheric Lifetime -ALT (years)	4.1	9.2
Flashpoint	None	None
Flammability Range in Air	None	7.6 - 17.7 <sup>3</sup>
Exposure Guideline (ppmV, 8 hr time weighted average)	750	500

<sup>1</sup>CFC-11 = 1 0

 $^{2}$ GWP-100 year integration time horizon,  $CO_{2} = 1.0$ 

3Vol% by ASTM E681-94 @ 100°C



#### **3M™ Novec™ Electronic Degreaser**

- Non-flammable, low toxicity
- Effectively removes oils, greases and handling soils from electric motors, electrical equipment, precision devices and other electro-mechanical or sensitive devices
- Industrial strength cleaner
- Test on plastics before using may damage acrylics, polycarbonates, ABS and PS

#### **Environmental, Health and Safety Information**

	Novec Electronic Degreaser	HCFC-141b	HCFC-225ca	nPB	Perchloroethylene
Ozone Depletion Potential - ODP1	0.00	0.1	0.03	0.013-0.1	0.0
Global Warming Potential - GWP <sup>2</sup>	41	700	180	Low	Low
Hazardous Air Pollutant <sup>3</sup>	No	No	No	No	Yes
Exposure Guidelines (ppmV, TWA)	200	500	50	10	25
Margin of Safety (MOS) <sup>4</sup>	10	25	2.5	0.5	-1
10EC 11 - 1 0		4MO	S in usa —	Evnosura Guida	lling

CFC-11 = 1.0

 $^2$ GWP-100 year integration time horizon,  $CO_2 = 1.0$   $^3$ As defined by the U.S. EPA in the Clean Air Act of 1990

4MOS in use = Exposure Guideline
Assumed 20 ppmV 8hr TWA exposure

#### 3M™ Novec™ Flux Remover

- Non-flammable, low toxicity
- Effectively removes rosin solder fluxes, waxes and similar contaminants found in electronics
- Industrial strength cleaner is also effective in removing hydrocarbon, silicone and fluorochemical oils and greases encountered in the maintenance of electronic devices
- Test on plastics before using may damage acrylics, polycarbonates, ABS and PS

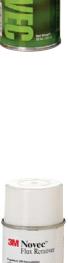
#### **Environmental, Health and Safety Information**

	Novec Flux Remover	HCFC-141b	HCFC-225ca	nPB	Perchloroethylene
Ozone Depletion Potential - ODP <sup>1</sup>	0.00	0.1	0.03	0.013-0.1	0.0
Global Warming Potential - GWP <sup>2</sup>	41	700	180	Low	Low
Hazardous Air Pollutant <sup>3</sup>	No	No	No	No	Yes
Exposure Guidelines (ppmV, TWA)	200	500	50	10	25
Margin of Safety (MOS) <sup>4</sup>	10	25	2.5	0.5	1.2

 $^{1}$ CFC-11 = 1.0

 $^2$ GWP-100 year integration time horizon,  $CO_2 = 1.0$   $^3$ As defined by the U.S. EPA in the Clean Air Act of 1990

 $^4$ MOS in use =  $\frac{\text{Exposure Guideline}}{\text{Assumed 20 ppmV 8hr TWA exposure}}$ 



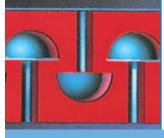
#### **Fasteners**

#### 3M™ Dual Lock™ Reclosable Fasteners

#### A reclosable system to replace unsightly mechanical fasteners.

3M™ Dual Lock™ Reclosable Fasteners invisibly attach access doors and panels, signs, display components, and many other frequently removed parts. When the mushroom-shaped stems interlock, closure strength of the system is high enough to replace mechanical fasteners in many applications.

Yet you can readily open and close Dual Lock Reclosable Fasteners hundreds of times. Depending on your application, select non adhesive-backed or adhesive-backed versions. Adhesive-backed versions bond to bare or painted metal, sealed wood, glass, many plastics including plasticized vinyl, and more. 3M™ Dual Lock™ Reclosable Fasteners Low Profile is thinner than standard Dual Lock Reclosable Fasteners, performs similar to the 250/250 stem combination and is clear for color matching.







Pre-cut 3M™ Dual Lock™ Reclosable Fasteners hold access panels in electronic equipment. Pre-cut shapes are available with pressure sensitive or plain backing. Popin stems, slide-in pieces or mechanical attachments provide alternative options.



# **3M<sup>™</sup> Scotchmate<sup>™</sup> Reclosable Fasteners** Industrial-strength fasteners for easy opening and closing.

When your products require thousands of easy openings and secure closings, 3M™ Scotchmate™ Hook and Loop Reclosable Fasteners give you choices that improve your product and save production time. When closing, tiny, stiff hooks on one side of the fastener mesh with pliable loops on the other. For opening, simply peel one side away.

Choose adhesive-backed or plain-back fasteners. The pressure sensitive adhesives bond on contact to a variety of substrates. Adhesive formulations are designed with a wide range of performance characteristics including: flame resistance, high shear strength, low and high temperature resistance, and plasticizer resistance for use with most vinyls.



Die-cut Scotchmate reclosable fasteners secure metal edge molding around an internally-illuminated sign. The molding holds the sign face in place and is readily removed for bulb replacement.

#### **Protective Products**

# **3M™ Bumpon™ Protective Products, Standard and Custom Shapes** Take the edge off noise, put an end to scratches.

Wherever slamming, scratching, nicking, scuffing, sliding, vibration or noise could be a problem for your product – or make your product a problem – 3M™ Bumpon™ Protective Products provide a margin of safety. You have a choice of permanently resilient pads, feet, buttons, strips, bumpers or spacers.

- Pressure sensitive adhesives bond fast and permanently when pressed to most clean, dry and smooth surfaces.
- Resilient elastomer will not dry out, rot, or embrittle; cushions and damps noise indefinitely.
- High coefficient of friction resists skidding on most surfaces.
- Contains no corrosive plasticizer or vulcanizing agent to chemically mar surfaces.
- Easy to apply; separate from liner and "bump it on" with no screws, rivets, or application equipment.
- Custom 3M<sup>™</sup> Bumpon<sup>™</sup> Protective Products expand the possibilities for shape, size, color and applications beyond the standard line. Performance and savings are the same.

For feet on a monitor stand, low profile 3M<sup>™</sup> Bumpon<sup>™</sup> Protective Products perform more reliably than high-profile, because low profile better withstands the load and shear stress. High profile allows better heat dissipation on electrical or electronic equipment.



Match the shape size and color to the application with off-the-shelf standards, custom shapes, or die-cuts from roll stock.

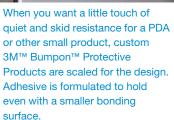
Customize with a choice of adhesives for secure adhesion to either low surface energy or high surface energy plastics.







Customized clear cushions made from 3M™ Bumpon™ Protective Product material blend with the laptop's computer base. High coefficient of friction helps keep the computer in place.





Durable, pressure sensitive acrylic or rubber adhesives go on fast with just finger pressure. Saves time and money with no screw holes, glue mess, or drying time.

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3M™ Bumpon™ Protective Products

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