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3M Dual Lock™ Reclosable Fasteners for Transportation Industry Selection Guide

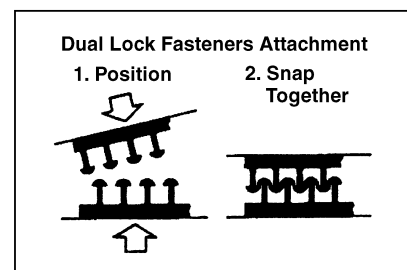
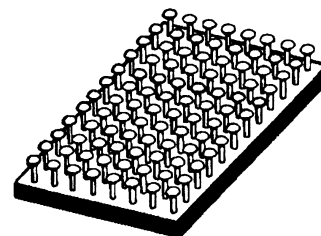
Product Information

March, 2004

General Description

3M™ Dual Lock™ Reclosable Fasteners are positive-locking, blind fasteners designed for attaching headliner, wall and door panels in the transportation industry. The products feature mushroom-shaped polyolefin stems that snap together, forming a high tensile closure. Dual Lock reclosable fasteners are used primarily to secure rigid and semi-rigid surfaces. Some examples are to prevent headliner sag, attach center consoles, instrument panel bezels, headliners, wall and door panels and other interior trim.

Dual Lock reclosable fasteners overcome the often difficult alignment and installation problems of screws and hidden fasteners. Dual Lock reclosable fasteners offer a cost effective alternative to traditional fasteners.



Benefits

1. **Easy Alignment:** Dual Lock reclosable fasteners engage in any orientation. The heads slide over each other until they are engaged with firm pressure, eliminating concerns about misalignment, premature or incomplete engagement.
2. **Reclosability:** Dual Lock reclosable fasteners can be opened and reclosed in high cycle life applications.
3. **Rattle-Free:** Dual Lock reclosable fasteners typically won't rattle loose.
4. **Blind Attachment:** Dual Lock reclosable fasteners can be attached on the backside of a trim piece where it won't interrupt the show surface.
5. **Ease of Assembly:** Dual Lock reclosable fasteners can be attached to components *before* they enter the assembly plant, reducing the number of parts and the required assembly time.
6. **Multiple Attachment Methods:** Dual Lock reclosable fasteners can be attached to a variety of surfaces by A) adhesive attachment with hot melt or pressure-sensitive adhesives, B) mechanical attachment using rigid back parts, C) high strength pop-in parts, D) sewing, E) stapling, or F) ultrasonic fusing. Custom mold-in parts for low temperature/low pressure mold applications are also available.
7. **Positive Locking:** Dual Lock reclosable fasteners fasten with an audible snap, assuring secure closure.

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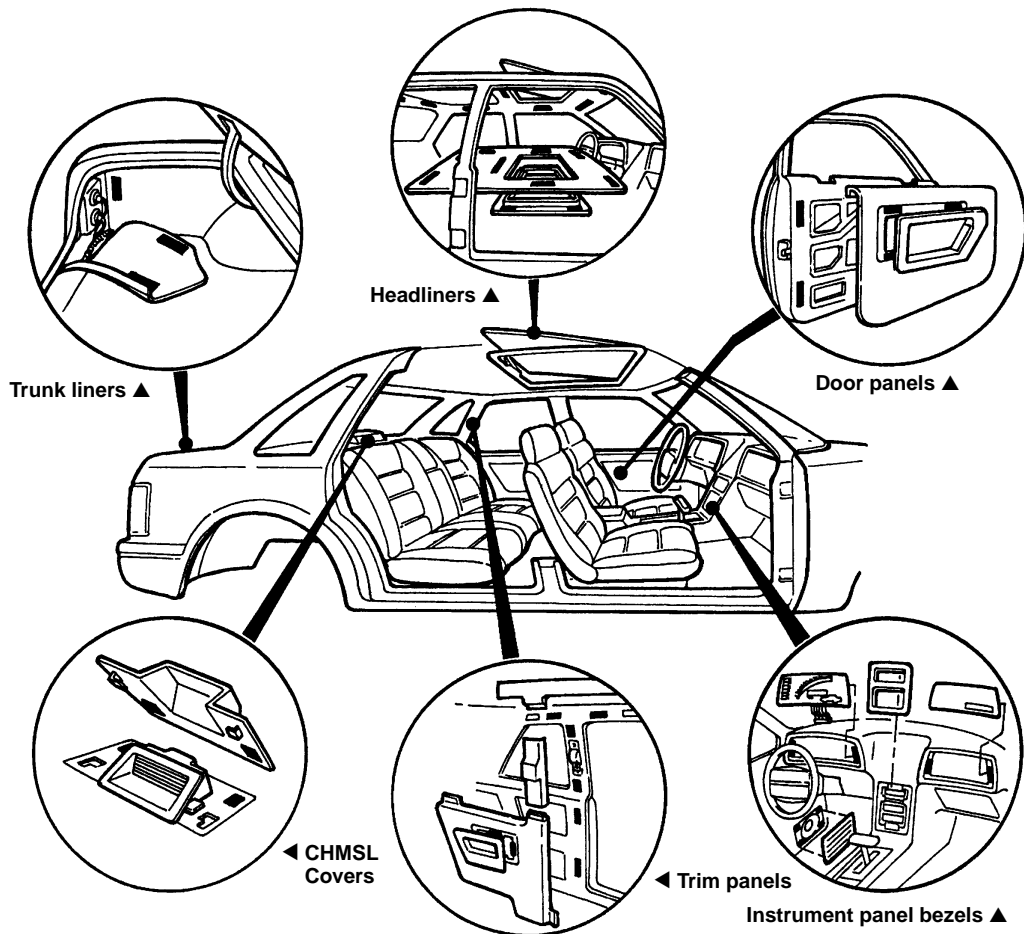
Applications

3M™ Dual Lock™ Reclosable Fasteners are available in three stem densities:

Type 170	170 stems/sq in (approximately 26 stems/sq cm)
Type 250	250 stems/sq in (approximately 39 stems/sq cm)
Type 400	400 stems/sq in (approximately 62 stems/sq cm)
Low Profile	705 stems/sq in (approximately 110 stems/sq cm)

Dual Lock Reclosable Fasteners can be mated in the following combinations:

170 to 250	Easy opening for multiple closures. low engagement force, low tensile strength.
250 to 250 170 to 400	Medium engagement force balanced with moderate tensile strength.
250 to 400	Higher engagement force balanced with high tensile strength.
Dual Lock to 3M™ Scotchmate™ Loop	Quick grab engagement giving high peel force.
Low Profile	One half the thickness of Dual Lock, easier to engage, flexible.



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Attachment Options

3M™ Dual Lock™ Reclosable Fasteners Plain Back/Pressure-Sensitive/Non-Woven Backed

All available in 50 yard rolls except as noted, up to 4 in. (101.6 mm) wide.

Plain Back Dual Lock reclosable fasteners can be attached to surfaces by sewing, stapling, ultrasonically fusing to many polypropylene materials or use of liquid adhesives which bond polypropylene.

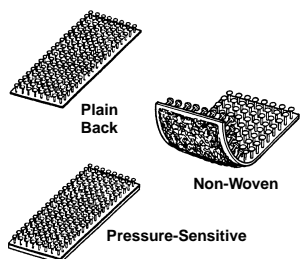
Pressure-Sensitive Dual Lock reclosable fasteners utilize 3M™ High Performance Acrylic Foam Tapes, which adhere to most automotive surfaces such as painted steel, aluminum, stainless steel and ABS. On some surfaces, primers may be required.

Non-Woven Backed Dual Lock reclosable fasteners utilizes a polyolefin non-woven loop backing to facilitate attachment with hot melt or liquid adhesives to substrates.

Recommended combinations, listed in order of increasing strength: 170 to 250, 170 to 400, 250 to 250, 705 to 705, 250 to 400, Dual Lock to 3M™ Scotchmate™ loop.

Note: Type 170 to 170 and Type 400 to 400 are not recommended combinations.

	(Approx. stems/cm ²)				Engaged Thickness ^a mils (mm)
	170	250	400	705	
Plain Back	SJ3742	SJ3780	SJ3741	–	0.14 (3.7)
Pressure-Sensitive					
5 mil Acrylic Foam Tape	–	–	–	SJ4570	0.11 (2.7)
15 mil Acrylic Foam Tape	–	SJ3787	SJ3785	–	0.18 (4.5)
15 mil Acrylic Foam Tape	–	–	–	SJ4580	0.13 (3.2)
37 mil Acrylic Foam Tape	SJ3752	SJ3781	SJ3751	–	0.21 (5.4)
43 mil Acrylic Foam Tape	SJ3244	SJ3245	–	–	0.21 (5.4)
47 mil Acrylic Foam Tape	–	–	SJ3777	–	–
60 mil Acrylic Foam Tape	–	–	SJ3788	–	–
80 mil Acrylic Foam Tape	SJ3756 ^b	SJ3789 ^b	SJ3757 ^b	–	0.31 (7.8)
5 mil Adhesive Transfer Tape	SJ3773	SJ3782	SJ3774	–	0.16 (4.1)
Non-Woven Backed	SJ3754 ^c	SJ3223 ^c	SJ3753 ^c	–	0.24 (6.1)
Rigid Back	–	SJ3768	SJ3481	–	0.24 (6.1)
			SJ3766	–	0.23 (5.8)

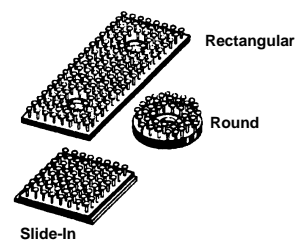


^aAll engaged thicknesses are for Type 250 engaged to Type 250 or Type 705 engaged to Type 705. ^b45 yard rolls ^cmaximum width is 3 in. (76.2 mm)

Rigid Back

Rigid Back Dual Lock reclosable fasteners are designed for mechanical attachment (such as riveting) or for sliding into retention brackets.

Identification	Dual Lock Reclosable Fastener Products		
	170	250	400
Slide-In Part	SJ3736 SJ3737	SJ3227 SJ3229	SJ3228, SJ3237, SJ3717, SJ3750
Round Part with center hole	SJ3712	SJ3251 SJ3263 SJ3755	SJ3234, SJ3235, SJ3463, SJ3465, SJ3759, SJ3762, SJ3763, SJ3765
with no center hole	–	SJ3238	SJ3236
Square Parts with holes	–	–	SJ3252, SJ3261, SJ3767
Rectangle with hole	–	–	SJ3231
Miscellaneous	–	–	SJ3735



Pop-In Parts

Pop-In parts are designed for insertion into sheet metal or plastic holes and key ways. Other sizes are available.

Identification	Dual Lock Reclosable Fastener Products		
	170	250	400
Square top with pine tree stem	–	SJ3209 SJ3222	SJ3224 SJ3748, SJ3749
Square top with single disk	–	SJ3221	SJ3731
Square top with rectangle stem	SJ3226	SJ3704 SJ3719	SJ3708, SJ3711, SJ3713
Square top on round stem	–	–	SJ3715
Twin Rose Bud	–	–	SJ3747
Square top with trapezoidal stem	–	–	SJ3709

See list of attached products for specific description and sizes.


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General Physical Properties	Material	Polyolefin (3M™ Dual Lock™ Pressure-Sensitive Reclosable Fasteners utilize polyolefin liner.)
	Color	Black or Clear
	Environmental Stability	Excellent moisture resistance. Recommended temperature range: -20°F to 220°F (-12°C to 104°C).
	Shelf Life	Product should be used within 2 years from date of manufacture when stored in original package at 72°F (22°C) and 50% R.H.
	Flammability	Dual Lock reclosable fasteners should be tested as a composite with the component it is attached to for FMVSS 302 certification. Also see the Flame Resistant Products data page (70-0707-3992-8).

Thickness

Because of the wide variety of backing options it is suggested you consult specific data page for products that may be of interest to your application.

Engaged Thickness in. (mm)

Engaged to 	Plain Back	Pressure-Sensitive*	Rigid Back**	Pop-In***
Plain Back	0.15 (3.81)	0.19 (4.82)	0.24 (6.09)	0.23 (5.84)
Pressure Sensitive*		0.22 (5.59)	0.27 (6.86)	0.27 (6.86)
Rigid Back**			0.35 (8.89)	0.35 (8.89)
Pop-In Stem***				0.35 (8.89)

Tolerance on Engaged Thicknesses is ± 20%.

*Using 0.143 in. (3.63 mm) thick material, does not include the liner

**Using 0.190 in. (4.83 mm) thick material

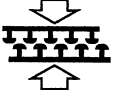
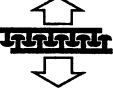
***Does not include pop-in stem

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Performance Properties

Typical system performance properties of 3M™ Dual Lock™ Reclosable Fasteners at 72°F ± 5°F (22°C ± 3°C) and 50% ± 10% R.H. attached to aluminum panels.



Note: Attachment method or use of other fasteners may affect system dynamic performance listed below.

System Dynamic Tests	Dual Lock Reclosable Fasteners				
	SJ3752 to SJ3781 170 to 250	SJ3781 to SJ3781 250 to 250*	SJ3752 to SJ3751 170 to 400	SJ3781 to SJ3751 250 to 400	SJ3781 to SJ3571 250 to Loop
Initial Engagement lbs./sq in (k Newton/m ²) 	19 (131)	29 (200)	29 (200)	40 (276)	< 1 (< 6.9)
Initial Disengagement lbs./sq in ² (k Newton/m ²) 	22 (152)	44 (303)	50 (346)	57 (393)	37 (255)

*Widths less than 3/4" should not be self mated for type 250. If widths less than 3/4" are desired a 170 to 400 combination is suggested.

Temperature Variation Chart

All Dual Lock reclosable fastener combinations will support static tensile or shear loads up to 2.2 lbs/sq in (1.0 kg/6.45 cm²) across a temperature range of -20°F to 220°F (-12°C to 104°C). Different attachment methods may change performance.

Test	Test Condition	Dual Lock 170/250 SJ3752/SJ3781	Dual Lock 250/400 SJ3781/SJ3751
Static Tensile 	1,000 g @ 120°F @ 158°F @ 200°F @ 220°F	10,000 mins. 10,000 mins. 10,000 mins. 10,000 mins.	10,000 mins. 10,000 mins. 10,000 mins. 10,000 mins.
Static Shear 	1,000 g @ 120°F @ 158°F @ 200°F @ 220°F	10,000 mins. 10,000 mins. 10,000 mins. 10,000 mins.	10,000 mins. 10,000 mins. 10,000 mins. 10,000 mins.

Specifications Conformance

Conformance to the following automotive specifications is certified on an annual basis:

General Motors: GM 2743M, GM 3618M
 Ford: WSB M15P35 A
 Chrysler: PF 8543
 PF 8858

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Rigid Backed Products – Color - Black

Product #	Selection Guide Description	Size	Stem Density
SJ3227	Slide-In rectangle	Black, 16mm x 25.4mm x 5.08mm (Thick).	250
SJ3228	Slide-In square	Black, 20mm x 20mm x 5.08mm (Thick).	400
SJ3229	Slide-In square	Black, 25.4mm x 25.4mm x 5.08mm (Thick).	250
SJ3231	Rigid backed rectangle with one hole	Black, 20mm x 30mm x 6.35mm (Thick), with one 3.2mm hole and a 7.54mm CB.	400
SJ3232	Rigid backed rectangle with one hole	Black, 20mm x 30mm x 5.08mm (Thick), with one C Bored 3.2mm hole and a 7.54mm CB.	400
SJ3234	Rigid backed circle with one hole	Black, 9/16" (14.3mm) diameter washer, with one 9.2mm diameter C Bore, on a 4.1mm hole. 5.1mm tall.	400
SJ3235	Rigid backed circle with one hole	Black, 20.6mm (13/16") diameter circle. 5.1mm (Thick), with one 9.0mm diameter C Bore, on a 4.1mm hole.	400
SJ3236	Rigid backed circle with no hole	Black, 28.5mm diameter and 5.08mm (Thick), with no hole.	400
SJ3237	Slide-In rectangle no holes	Black, 32mm x 50mm x 4.7mm (Thick).	400
SJ3238	Rigid backed circle no holes	Black, 28.6mm diameter, 5.96mm (Thick).	250
SJ3251	Rigid backed circle with one hole	Black, 28.5mm (1 1/8") diameter circle. 5.96mm thick with one 4.93mm diameter hole and a 9.53mm diameter centered counterbore.	250
SJ3252	Rigid backed square with 2 holes	Black, (38.1mm x 38.1mm) with 2 counterbored 8.33mm (0.327") x 4.22mm (0.166") holes.	400
SJ3261	Rigid backed square with 2 holes	Black, Rigid Backed Type 400 Square, 1.5" x 1.5" x 0.200", with two C Bored, 3.6mm holes, 25mm apart.	400
SJ3263	Rigid backed circle with one hole	Black, 13/16" (20.6mm) round, 5.1mm (Thick), with one 7.9mm C Bore on a 4.1mm hole.	250
SJ3463	Rigid backed circle with one hole	Same as SJ3763 .	400
SJ3465	Rigid backed circle one hole	Black, 14.29mm (9/16") diameter circle. 5.1mm (Thick), with one 4.1mm diameter hole and a 7.9mm diameter centered counterbore.	400
SJ3481	Rigid backed strips	Black, Rigid Backed Type 400 DL <ul style="list-style-type: none"> • 1" x 48", 40 pcs/box • 2" x 48", 20 pcs/box 	400
SJ3712	Rigid backed circle with one hole	Black, 28.5mm (1 1/8") diameter circle. 5.1mm (Thick) with one 4.1mm diameter hole and a 7.9mm diameter centered counterbore.	170
SJ3717	Slide-In rectangle no holes	Black, 1" (L) x 1.22" (W) x 5.1mm (Thick).	400

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Rigid Backed Products – Color - Black (*continued*)

Product #	Selection Guide Description	Size	Stem Density
SJ3735	Rigid backed diamond shaped	Black, 5.08mm (Thick), hexagon shape with two "T" slots.	400
SJ3736	Slide-In square DL area	Black, 5.08mm (Thick), 25.4mm x 31mm.	170
SJ3737	Slide-In rectangle	Black, Slide-In, Type 170 D/L, 5.08mm (Thick), D/L area is 25.4 x 28mm.	170
SJ3750	Slide-In rectangle	Black, 5.45mm (Thick) DL area is 25.4mm x 50mm.	400
SJ3755	Rigid backed circle with one hole	Black, 28.5mm (1 ¹ / ₈ " diameter circle. 5.96mm (Thick), with one 4.1mm diameter hole and a 7.9mm diameter centered counterbore.	250
SJ3759	Rigid backed circle with one hole	Black, 28.5mm (1 ¹ / ₈ " diameter circle. 5.96mm (Thick), with one 4.1mm diameter hole and a 7.9mm diameter centered counterbore.	400
SJ3762	Rigid backed circle with one hole	Black, 28.5mm (1 ¹ / ₈ " diameter circle. 5.1mm (Thick), with one 4.1mm diameter hole and a 7.9mm diameter centered counterbore.	400
SJ3763	Rigid backed circle with one hole	Black, 20.6mm (13/16") diameter circle. 5.08mm (Thick), with one 4.1mm diameter hole and a 7.9mm diameter centered counterbore.	400
SJ3764	Refer to SJ3481		
SJ3765	Rigid backed circle with one hole	Black, 14.3mm (9/16") diameter, with one 7.9mm C Bored hole on a 4.1mm hole. 5.08mm (0.200") tall.	400
SJ3766	Rigid backed rolls	Black, 0.130" thick backing. Max. width 3".	400
SJ3767	Rigid backed square with 2 holes	Black, 1.5" x 1.5" square with two 3.6 mm C Bored holes, 25mm apart.	400
SJ3768	Rigid backed rolls	Black, 0.130" thick backing. Max. width 3".	250

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Pop-In Products – Color - Black

Product #	Selection Guide Description	Size	Stem Density
SJ3209	Square top with pine tree stem	Black, 26mm square top, with a 12mm long pine tree stem, fits a 7.9mm round hole. Same base as SJ3749.	250
SJ3221	Square top with single disk stem (single disk stem similar to a cufflink)	Black, Pop-In, single disk, fits a slot in a 2.4mm panel. Same base as SJ3731.	250
SJ3222	Square top with pine tree stem	Black, 26mm square top with a 12mm long pine tree stem, fits a 7mm round hole. Same base as SJ3224.	250
SJ3224	Square top with pine tree stem	Black 26mm square top with a 12mm long pine tree stem, fits a 7mm round hole. Same base as SJ3222.	400
SJ3226	Square top with rectangular base	Black, fits a 6.5 x 10mm round hole in a 0.71 to 0.91mm (Thick) panel.	170
SJ3704	Square top with rectangular base	Black, fits a 6.5 x 10 mm round hole in a 1.3 to 1.59mm (Thick) panel.	250
SJ3708	Square top with rectangular base	Black, fits a 6.5 x 10mm round hole in a 1.8mm panel.	400
SJ3711	Square top with rectangular base	Black, fits a 6.5 x 10mm round hole in a 0.7 to 0.9mm (Thick) panel.	400
SJ3713	Square top with rectangular base	Black, fits a 6.5 x 10mm round hole in a 1.3 to 1.59mm (Thick) panel.	400
SJ3715	Square top on a round stem	Black, fits a 10mm round hole in a 1.0mm (Thick) panel.	400
SJ3719	Square top with rectangular base	Black, fits a 6.5 x 10mm hole in a 0.7-0.9mm panel.	250
SJ3731	Square top with a single disk	Black, fits a slot in a 2.4mm panel. Same base as SJ3221.	400
SJ3747	Rectangular top with twin stems	Black, 20mm x 30mm; fits a 1.0-2.0mm panel.	400
SJ3748	Square top with long pine tree stem	Black, 26mm square top, with a 16.5mm long pine tree stem, fits a 7.9mm round hole.	400
SJ3749	Square top with short pine tree stem	Black, 26mm square top, with a 12mm long pine tree stem, fits a 7.9mm hole. Same base as SJ3209.	400

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Roll Goods

Product #	Selection Guide Description	Stem Density	Length of Roll (lineal yards)
SJ3223	Black, with non-woven backing for use with liquid adhesives, hot melts, etc.	250	50
SJ3243	Black, unheaded Type 400 Dual Lock™, laminated with acrylic foam tape with a red non-silicone liner.	400	50
SJ3741	Black, Plain Back Dual Lock.	400	50
SJ3742	Black, Plain Back Dual Lock.	170	50
SJ3751	Black, 37 mil acrylic foam tape with red non-silicone liner.	400	50
SJ3752	Black, 37 mil acrylic foam tape with red non-silicone liner.	170	50
SJ3753	Black, with non-woven backing for use with liquid adhesives, hot melts, etc.	400	50
SJ3754	Black, with non-woven backing for use with liquid adhesives, hot melts, etc.	170	50
SJ3756	Black, Dual Lock with 80 mil (2.0 mm) medium density, white acrylic foam tape with a red non-silicone treated liner.	170	45
SJ3757	Black, Dual Lock with 80 mil (2.0 mm) medium density, white acrylic foam tape with a red non-silicone treated liner.	400	45
SJ3773	Black, 5 mil adhesive transfer tape with brown paper liner, green lettering.	170	50
SJ3774	Black, 5 mil adhesive transfer tape with brown paper liner, green lettering.	400	50
SJ3777	Black, 47 mil acrylic foam tape with red non-silicone liner.	400	50
SJ3780	Black, Plain Back.	250	50
SJ3781	Black, Dual Lock 37 mil acrylic foam tape with red non-silicone liner.	250	50
SJ3782	Black, 5 mil adhesive transfer tape with brown paper liner, green lettering.	400	50
SJ3785	Black, 15 mil acrylic foam tape with red non-silicone liner.	400	50
SJ3787	Black, 15 mil acrylic foam tape with red non-silicone liner.	250	50
SJ3788	Black, 60 mil acrylic foam tape with red non-silicone liner.	400	50
SJ3789	Black, Dual Lock with 80 mil (2.0 mm) medium density, white acrylic foam tape with a red non-silicone treated liner.	250	45
SJ4570	Clear, low profile with 5 mil low surface energy adhesive.	705	25 and 50
SJ4580	Clear, low profile with 15 mil clear acrylic foam tape.	705	50

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For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-800-362-3550 or visit www.3M.com/adhesives. Address correspondence to: 3M Industrial Adhesives and Tapes Division, Building 21-1W-10, 900 Bush Avenue, St. Paul, MN 55144-1000. Our fax number is 651-778-4244. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-787-750-3000. In Mexico, phone: 52-70-04-00.

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