



Dual Lock™ Reclosable Fasteners

SJ3244 (Type 170)

SJ3245 (Type 250)

SJ3246 (Type 400)

Technical Data

July, 2007

Product Description

3M™ Dual Lock™ Reclosable Fasteners SJ3244, SJ3245 and SJ3246 are nominally a 0.140" (3.6 mm) thick fastener comprised of a polypropylene backing having a Type 170, 250 or 400 stem pattern (approximate number of stems per square inch). 3M™ Dual Lock Reclosable Fasteners can reduce the number of or replace conventional fasteners such as screws, clips, rivets, snaps and bolts in many applications.

These Dual Lock reclosable fasteners are made to be attached using a unique pressure sensitive adhesive. This adhesive allows improved adhesion to low surface energy substrates without the use of primers or adhesion promoters common with many other adhesive systems.

Dual Lock reclosable fasteners consist of continuous strips with mushroom shaped tops on polypropylene stems protruding from the polypropylene backing. When two pieces of Dual Lock reclosable fasteners are pressed together, the mushroom heads interlock with one another giving an audible SNAP, providing a fast reclosable attachment system. For easy separation, simply cleave or peel open the closure.

For optimum performance, these Dual Lock reclosable fasteners can be mated in the following combinations: Type 170 to Type 250, Type 170 to Type 400, Type 250 to Type 250 or Type 250 with Type 400. In some cases mating with 3M™ Scotchmate™ Reclosable Loop Fasteners provide higher closure strength, but reduced cycle life.

Product Construction

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

Product Number	3M™ Dual Lock™ Reclosable Fasteners		
	SJ3244	SJ3245	SJ3246
Type: (Aprox. Stems/in ²)	170	250	400
Material of Construction			
Fastener	Polypropylene		
Adhesive	Acrylic		
Liner	5 mil (1.3 mm) Polypropylene		
Color			
Fastener	Black		
Adhesive	Gray		
Liner	White non-printed		
Weight: ounces/in ² (grams/cm ²)	0.031 (0.135)	0.033 (0.143)	0.036 (0.156)
Unmated Height: ± 15%	0.14" (140 mils, 3.6 mm)		
Maximum Curvature	0.072" per inch		

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System Performance Physical Properties and Performance Characteristics

Note: The following technical information is not product release requirements, but rather represent typical performance using standard test methods and is intended for use as a guide to assist in selection of 3M™ Dual Lock™ Reclosable Fasteners for further evaluation. This technical information should not be used for setting standards.

Unless stated differently, typical system performance characteristics were measured under controlled laboratory conditions of 72°F (22°C) and 50% relative humidity to obtain maximum reliability. The user should evaluate products in the actual application to ensure suitable performance for the intended use.

				System Performance ^(a)		
				3M™ Dual Lock™ Reclosable Fastener SJ3244 (Type 170) engaged to 3M™ Dual Lock™ Reclosable Fastener SJ3245 (Type 250)	3M™ Dual Lock™ Reclosable Fastener SJ3245 (Type 250) engaged to 3M™ Dual Lock™ Reclosable Fastener SJ3246 (Type 400)	3M™ Dual Lock™ Reclosable Fastener SJ3245 (Type 250) ^(b) engaged to 3M™ Scotchmate™ SJ3571 loop
TENSILE (Rigid to Rigid Substrates)				Pounds _F /sq inch (kNewtons/m ²) @ 72°F/50% RH		
Dynamic Tensile Engagement Force				20 (138)	47 (320)	<1 (<6.9)
Dynamic Tensile Disengagement Force ^(c)				23 (160)	100 (690)	36 (250)
Static Tensile Holding Power				Holds 2.2 #/in ² (155 grams/cm ²) for indicated time and temperature		
100°F/100% RH				10,000 minutes	10,000 minutes	8,000 minutes
200°F				600 minutes	800 minutes	1,000 minutes
220°F				300 minutes	300 minutes	300 minutes
SHEAR (Rigid to Rigid Substrates)				Pounds _F /sq inch (kNewtons/m ²)		
Dynamic Shear (1" x 1" overlap) ^(c)				8.4 (58)	86 (590)	80 (550)
Static Shear Holding Power				Holds 2.2 #/in ² (155 grams/cm ²) for indicated time and temperature		
100°F/100% RH				10,000 minutes	10,000 minutes	10,000 minutes
220°F				100 minutes	100 minutes	100 minutes
ENGAGED THICKNESS^(d) (Nominal without liner)				Inches (mm) ± Tolerance		
				0.24 (6.1) ± 10%	0.24 (6.1) ± 10%	0.20 (5.0) ± 20%
CLOSURE CYCLE LIFE^(e)				1,000	1,000	50
SHELF LIFE^(f)				24 months	24 months	24 months

Note: Long Term Static Load: Conditions such as temperature variations, engagement area, supported weight or prolonged periods of exposure to environmental factors can affect the closure strength and long term static load performance. Fasteners may slip or creep in the direction of the static load forces at temperatures or weights greater than indicated. The user is responsible for designing the amount of fastening area based upon the specific conditions for the application. Four square inches of fastening area per pound of static load is suggested as a starting point for such evaluations.

- System performance tests are determined by measuring the performance of the entire mated reclosable fastener system (two - 1/16 in. thick non-anodized aluminum plates joined together with the indicated fasteners). Dual Lock reclosable fastener SJ3244 (Type 170) engaged to Dual Lock reclosable fastener SJ3245 (Type 250) typically has the lowest performance, whereas Dual Lock reclosable fastener SJ3245 (Type 250) engaged to Dual Lock reclosable fastener SJ3246 (Type 400) has the highest performance for this family of Dual Lock reclosable fasteners. Dual Lock reclosable fastener SJ3245 engaged to Dual Lock reclosable fastener SJ3245 (Type 250 to Type 250) and Dual Lock reclosable fastener SJ3244 to Dual Lock reclosable fastener SJ3246 (Type 170 to Type 400) have similar performance and are approximately midway between the performance of the Type 170 to Type 250 and the Type 250 to Type 400. The combinations of Dual Lock reclosable fastener SJ3244 engaged to Dual Lock reclosable fastener SJ3244 or Dual Lock reclosable fastener SJ3246 engaged to Dual Lock reclosable fastener SJ3246 are not recommended as the former is too weak and the later may be too strong potentially causing part damage or creating ergonomic issues.
- 3M™ Scotchmate Reclosable Loop Fastener engaged to Dual Lock reclosable fastener may provide increased closure strength over standard Dual Lock reclosable fastener combinations. Due to this increased strength, extra care should be given to ensure the maximum bond strength is obtained to the substrates being joined. Failure to obtain bond strengths to the substrate that are sufficiently high may cause the fastener to release from the substrate upon disengagement.
- Dual Lock reclosable fastener was engaged to Dual Lock reclosable fastener or 3M™ Scotchmate™ Reclosable Fastener SJ3571 with firm pressure and disengaged at the rate of 12 inches (305 mm) per minute.
- Engaged thickness is measured with a 1/2" diameter pressure foot with a 34 gram weight and will decrease if a load is applied or increase if a separation (tensile) force is applied.
- Cycle Life is the number of cycles (openings and closings) that the fastener is subjected to while maintaining 50% or greater of the original peel values.
- Shelf life is from date of manufacture when stored in original packaging at 60° to 80°F (16° to 27°C) and 40 to 60% relative humidity.

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Additional Performance Characteristics

Note: The following technical information and data is intended as a user guide representing typical performance and should not be used for specifications.

Solvent Resistance: The polypropylene components of these products have not been tested but should resist attack by most common solvents, acid and alkaline solutions when exposed for short time periods.

Plasticizer Resistance: The adhesive on these products have not been tested for plasticizer resistance commonly found in flexible vinyl or other materials containing high levels of plasticizing material. If your product contains plasticizers it is recommended that the suitability of this adhesive system on your substrates be evaluated under expected exposure conditions.

Flammability Resistance: 3M™ Dual Lock™ Reclosable Fasteners SJ3244, SJ3245 and SJ3246 have not been tested to common flammability tests such as FMVSS-302, FAR 25.853, ASTM E162, ASTM E662, BSS-7239 or UL94.

Environmental Effects: Temperatures between -40°F (-40°C) and 200°F (93°C) should have minimal affect on closure strengths. Adhesive performance is reduced at temperatures above 158°F (70°C). These polypropylene products will have good outdoor weathering resistance if exposed to ultraviolet light and moisture.

Water (Humidity) Resistance: Closure strength of these polypropylene fasteners maintains its strength better than nylon or polyester hook and loop products after prolonged exposure to water. Once properly bonded to the substrate the adhesive bond has high resistance to moisture under typical use conditions.

Volatile Outgassing: Volatile outgassing, as per ASTM E595, is one important test in determining the suitability of materials for spacecraft. Generally products with no adhesive have lower volatile outgassing values. Dual Lock reclosable fasteners SJ3244, SJ3245 and SJ3246 have not been tested to ASTM E595. Products tested at the Goddard Space Flight Center can be found at the following web site:
<http://outgassing.nasa.gov/>.

Sterilization/Autoclaving: These products have not been exposed to gas, steam or gamma sterilization, or autoclaving. It is recommended that the customer evaluate the suitability of the Dual Lock product for these methods under typical conditions.

Washing and Dry Cleaning: These products have not been evaluated for resistance to washing and dry cleaning. Care must be exercised as the stems, acting as hooks, may become engaged with many loop materials. Additionally the adhesive may soften upon exposure to these cleaning conditions and possibly transfer adhesive residue to other materials.

Fungus Resistance: These products have not been tested for fungus resistance and should be evaluated by the customer under conditions applicable to the expected end use.

Static Discharge: These products have not been tested for static discharge during liner removal, closure opening or adhesive removal from the substrate once a fastener has been applied. If your application requires use of these fasteners in areas where static discharge is of a concern, the fasteners should be tested under expected use conditions.

Available Sizes	Standard Widths ^{(a), (b)} in. ± 1/16" (mm) ± 1.6	Roll Length Yards (Meters)	Dual Lock	Dual Lock	Dual Lock
			SJ3244 (Type 170)	SJ3245 (Type 250)	SJ3246 (Type 400)
1" (25.4 mm)		50 yds. (45.7 meters)	X	X	X
2" (50.8 mm)		50 yds. (45.7 meters)		X	
3" (76.2 mm)		50 yds. (45.7 meters)		X	
6" (152.4 mm)		50 yds. (45.7 meters)		X	

(a) All of the 3M™ Dual Lock™ Reclosable Fastener SJ3244, SJ3245 and SJ3246 products are available on a 3" i.d. fiber core. All of these products are supplied with the liner to the edge of the adhesive. There are no extended liners or selvage edge with any of the standard products listed above. Contact your 3M authorized distributor or 3M representative for details on supplying special sizes or configurations.

(b) Reclosable Fasteners can be fabricated in many custom shapes and sizes to fit your product design and manufacturing process. Contact your local 3M authorized converter or 3M representative for additional options, configurations and ordering information.

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Attachment Techniques

The following information is intended to assist the designer considering the use of 3M™ Dual Lock™ Reclosable Fasteners with a pressure sensitive adhesive. Product performance depends upon a number of factors, including the fastener selected, the conditions in which the fastener is applied and the time and environment in which it is expected to perform. Because many of these factors are uniquely within the user's knowledge and control, it is required that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's substrates, method of application and desired end use.

Design Considerations: As a general rule, four square inches of fastener area per pound of static tensile or shear load is suggested as a starting point for evaluation. More or less area may be needed depending on specific conditions or end use applications.

Rounding the corners, recessing the product into the substrate and providing raised edges around the reclosable fastener can reduce the possibility of edge or corner lifting and improve the overall appearance on the fastener on the finished product. Mechanically securing the corners of the reclosable fastener can also reduce the possibility of edge lifting, but may reduce the closure performance.

Attachment Methods: The two most common techniques for attaching 3M™ Dual Lock™ Reclosable Fasteners SJ3244, SJ3245 and SJ3246 are summarized below. For complete details on techniques and options for attaching 3M™ Dual Lock™ Reclosable Fasteners please see the technical bulletin "Attachment of 3M™ Scotchmate™ and Dual Lock™ Reclosable Fasteners" (70-0709-3929-6).

1) Pressure Sensitive Adhesive attachment: The use of pressure sensitive adhesives eliminates or reduces the need for sewing, solvent activation, dielectric or ultrasonic bonding and bulk adhesive bonding. This can result in simplicity, greater safety and lower installation costs. Pressure sensitive products can be applied manually or automatically using a variety of equipment choices. Contact your 3M sales representative to discuss automated equipment options.

Substrate Surface Preparation: Adhesive backed 3M™ Reclosable Fasteners such as these Dual Lock reclosable fastener products should be applied to surfaces that are clean, dry, and free of oil, grease, dust, mold release agents or other contaminants that could reduce the adhesion. Highly textured substrate surfaces or surface contaminants may reduce the ultimate adhesion levels. It is recommended to remove any surface contaminants or minimize surface texture or roughness that may reduce adhesion by using a method suited for the type and quantity of surface contaminants or texture present.

In exceptional cases, especially when removing silicone mold release agents or on rough or porous surfaces, it may be necessary to sand or abrade the surface, use an adhesive primer, or surface sealer to optimize bond performance. The selection of priming or sealing materials will depend on the substrates and the environmental conditions the product will be exposed to during use, as well as regulations concerning use of certain materials or chemicals.

Note: When using cleaning agents such as solvents or abrasives, it is important to follow all manufacturer's precautions and directions for use as well as government regulations or customer requirements.

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Attachment Techniques (continued)

Attachment Procedure: To obtain an optimum bond to any surface, both the reclosable fasteners and the substrates should have equilibrated at temperatures between 70°F (21°C) and 100°F (38°C) for a minimum of 1 hour before application. Remove the adhesive liner from the fastener's adhesive and without touching the adhesive apply the adhesive side of the reclosable fastener to the pre-cleaned and prepared surface. Using finger pressure, press the reclosable fastener onto the substrate to obtain initial surface contact between the adhesive and substrate. If the substrate is flexible, make sure it is laying on a hard flat surface so as to permit uniform application of the adhesive.

The reclosable fastener is rolled down, to increase contact of the adhesive with the substrate's surface, by one of two methods. Extra care must be exercised when rolling down 3M™ Dual Lock Reclosable Fasteners to prevent bending of the stems which can compromise the closure strength. The following methods allow adequate pressure to be applied to the Dual Lock reclosable fastener without damaging the stems.

a) The first method uses a hand roller, with the wheel covered with a Dual Lock Type 170 reclosable fastener such as 3M™ Dual Lock™ Reclosable Fastener SJ3542. The Dual Lock reclosable fastener covered roller is rolled three times in each direction over the Dual Lock reclosable fastener adhered to the substrate.

b) The second method consists of placing a strip of plainback Dual Lock Type 170 reclosable fastener, such as 3M™ Dual Lock™ Reclosable Fastener SJ3442 or 3M™ Dual Lock™ Reclosable Fastener SJ3742 to the previously adhered Dual Lock reclosable fastener. A rubber roller with no Dual Lock reclosable fastener on the roller is rolled over the backside of the plainback material. This will engage the two Dual Lock reclosable fastener pieces. After rolling down three times in each direction, the strip of plainback Dual Lock reclosable fastener can be removed and used to roll down the next piece of Dual Lock reclosable fastener in a similar manner.

Dwell Time before Handling or Applying a Load: Parts with properly chosen and applied reclosable fasteners with pressure sensitive adhesives can be handled immediately. Adhesive bond strength increases after application with time, pressure and/or temperature, as the adhesive further wets out the substrate surface. Dwell time is important for achieving a firm adhesive bond before applying a load or using. Once attached to the substrate, this adhesive achieves approximately 50% of the ultimate bond strength within 1 hour, 90% after 24 hours and the ultimate bond strength is obtained within 72 hours at 72°F (22°C) and 50% relative humidity. A 24-hour minimum dwell time is recommended before applying a load or disengaging. The use of primers or adhesion promoters may reduce the time required to achieve the ultimate bond strength.

2) Mechanical Attachment: Dual Lock reclosable fasteners SJ3244, SJ3245 and SJ3246 may also be mechanically attached to difficult to adhere to substrates such as textured plastics and wood by using staples, screws or rivets. The head of the mechanical reclosable fastener should be flat and large enough to resist pull through when the fastener is disengaged. The head of the reclosable fastener should also be recessed as much as possible below the surface of the 3M™ Dual Lock™ mushroom capped stems to prevent interference with (dis)engagement properties.

The use of resin coated, chisel divergent staples appear to provide excellent attachment to thick sections of soft and hardwood surfaces.

The end use customer should review the attachment needs for suitability to their specific application. Further applications using other attachment methods may be possible based upon customer needs and evaluations.

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Application Ideas

- * 3M™ Dual Lock™ Reclosable Fasteners SJ3244, SJ3245 and SJ3246 can be bonded directly to a variety of low surface energy substrates without the use of primers or adhesion promoters commonly used with many adhesive systems. The most common of these substrates are polypropylene and polyethylene.
- * Dual Lock reclosable fasteners SJ3244, SJ3245 and SJ3246 can be used for attaching:
 - Console housing covers
 - Access panels for fuses and similar devices
 - Door trim panels
 - Other applications in various transportation markets.

Certification/Recognition

MSDS: 3M has not prepared a MSDS for these products which are not subject to the MSDS requirements of the Occupational Safety and Health Administration's Hazard Communication Standard, 29 C.F.R. 1910.1200(b)(6)(v). When used under reasonable conditions or in accordance with the 3M directions for use, these products should not present a health and safety hazard. However, use or processing of these products in a manner not in accordance with the directions for use may affect their performance and present potential health and safety hazards.

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

Product Use

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