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Dual Lock™ Reclosable Fasteners

SJ3550CF (Type 250)

SJ3551CF (Type 400)

SJ3552CF (Type 170)

Dual Lock Reclosable Fastener Black with a clear acrylic adhesive

Product Information

February, 2007

Product Description

3M™ Dual Lock™ Reclosable Fasteners are comprised of a continuous thick film backing with stems protruding from one side of the backing. The self supporting flexible stems have mushroom shaped heads. The base film, the stems and mushroom heads are manufactured from black polyolefin materials. 3M™ Dual Lock™ Reclosable Fastener SJ3552CF is a type 170, 3M™ Dual Lock™ Reclosable Fastener SJ3550CF is a type 250 and 3M™ Dual Lock™ Reclosable Fastener SJ3551CF is a type 400. The type refers to the approximate number of stems per square inch.

The clear acrylic adhesive combined with the black backing allows for the appearance of an all black fastener. The acrylic adhesive is well suited for applications exposed to high temperatures, humidity or for high surface energy materials. If a clear appearing fastener is desired, we suggest you evaluate our 3M™ Dual Lock™ Reclosable Fasteners SJ3560, SJ3561 or SJ3562 which has the same clear acrylic adhesive, but on a clear backing.

These Dual Lock reclosable fasteners can be engaged in the following combinations of increasing strength: Dual Lock reclosable fasteners type 170 to type 250, type 170 to type 400, type 250 to type 250 and type 250 to type 400. Dual Lock reclosable fasteners can also engage with many loop materials, such as 3M™ Scotchmate™ Reclosable Fasteners. This combination allows a quick grab closure with high strength, but reduced cycle life. See the technical bulletin, *3M™ Dual Lock™ and 3M™ Scotchmate™ Reclosable Fastener Combinations* (70-0709-3929-6).

When two pieces of Dual Lock reclosable fasteners are pressed together, the stems flex and the mushroom heads slide past each other. After passing the mushroom heads on the opposing mating piece, the stems snap back into their original position, interlocking with the mushroom heads on the opposing piece. The audible SNAP indicates engagement has occurred. This provides a strong reclosable attachment system. These Dual Lock reclosable fasteners can provide high tensile strength but the Dual Lock reclosable fasteners can easily be opened by simply cleaving or peeling open the closure.

Dual Lock reclosable fasteners can reduce the number of, or replace, conventional fasteners such as screws, clips, rivets, snaps and bolts in many applications. This product construction is especially suited for outdoor applications, where elevated temperatures, the potential for direct exposure to sunlight or ultra-violet light may occur, or in the presence of high moisture levels.

Product Construction

Note: The following information is not product release requirements, nor product specifications. Rather this data represents typical performance using standard test methods. This is intended for use as a guide to assist in selection of Dual Lock reclosable fasteners for further evaluation. Customer specifications should not be based solely on the data presented in this document. It is recommended that the customer test the product under expected use conditions in the desired application to determine actual suitability and performance.

Fastener Products	3M™ Dual Lock™ Reclosable Fastener		
	SJ3552CF	SJ3550CF	SJ3551CF
Type: Approx. Stems/In² (Stems/cm²)	170 (26)	250 (39)	400 (62)
Material of Construction	Black Polypropylene Black Polypropylene Clear Acrylic Adhesive		
Standard Color	Black		
Thickness^(a) Unmated ± 15%	0.14" (3.5 mm)	0.14" (3.5 mm)	0.14" (3.5 mm)
Selvage Edges	None		
Weight^(a)	0.035 oz/in ² (0.16 g/cm ²)	0.037 oz/in ² (0.16 g/cm ²)	0.040 oz/in ² (0.18 g/cm ²)
Liner	Clear 4.0 mil (0.10 mm) thick silicone treated polyolefin liner printed with 3M Dual Lock in red.		

a) All thickness and weight values are with the liner removed.

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Typical System Performance Characteristics

Note: The following information is not product release requirements, nor product specifications. Rather this data represents typical performance using standard test methods. This is intended for use as a guide to assist in selection of 3M™ Dual Lock™ Reclosable Fasteners for further evaluation. Customer specifications should not be based solely on the data presented in this document. It is recommended that the customer test the product under expected use conditions in the desired application to determine actual suitability and performance.

Unless stated differently, typical performance characteristics were measured under controlled laboratory conditions of 72°F (22°C) and 50% relative humidity. 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 SJ3552CF (Type 170) engaged to 3M™ Dual Lock™ Reclosable Fastener SJ3550CF (Type 250)	3M™ Dual Lock™ Reclosable Fastener SJ3550CF (Type 250) engaged to 3M™ Dual Lock™ Reclosable Fastener SJ3551CF (Type 400)	3M™ Scotchmate™ Reclosable Fastener Loop SJ3571 engaged to 3M™ Dual Lock™ Reclosable Fastener SJ3550CF (Type 250) ^(b)
INITIAL TENSILE (Rigid to Rigid Substrates)	Pounds_F/sq inch (Newtons/cm²) @ 72°F (22°C)/50% RH		
Dynamic Tensile Engagement Strength ^(f)	10 (6.9)	60 (41)	<1 (<0.7)
Dynamic Tensile Disengagement ^(c)	23 (16)	107 (74)	29 (20)
Static Tensile Holding Power	Holds minimum 2.2 #/in² (155 gms/cm²) for indicated time and temp.		
100°F/100% RH	10,000 minutes	10,000 minutes	10,000 minutes
200°F	10,000 minutes	10,000 minutes	10,000 minutes
220°F	10,000 minutes	10,000 minutes	10,000 minutes
250°F	3 minutes	3 minutes	300 minutes
INITIAL SHEAR (Rigid to Rigid Substrates)	Pounds_F/sq inch (Newtons/cm²)		
Dynamic Shear (1" x 1" overlap) ^(c)	11 (7.6)	70 (48)	112 (77)
Static Shear Holding Power	Holds minimum 2.2 #/in² (155 gms/cm²) for indicated time and temp.		
100°F/100% RH	7,200 minutes	10,000 minutes	10,000 minutes
200°F	10,000 minutes	10,000 minutes	10,000 minutes
220°F	10,000 minutes	10,000 minutes	10,000 minutes
250°F	3,500 minutes	3,500 minutes	3,500 minutes
PEEL AND CLEAVAGE^(c)	Pounds/inch width (Kilograms/cm width)		
Cleavage Strength (Rigid to Rigid)	8.3 (1.5)	28.5 (5.1)	12.4 (2.2)
Peel Strength ("T" Peel, Flexible to Flexible)	0.5 (0.09)	1.7 (0.3)	2.7 (0.48)
Peel Strength (90° Peel, Flexible to Rigid)	1.6 (0.28)	5.4 (0.98)	4.1 (0.73)
ENGAGED THICKNESS^(d)	Inches (mm)		
(Nominal without liner)	0.23 (5.7) ± 15%	0.23 (5.7) ± 15%	0.2 (5.0)
CLOSURE CYCLE LIFE^(e)	1,000	1,000	50
SHELF LIFE	24 months from date of manufacture when stored in original packaging at 72°F (22°C) and 50% relative humidity.		

Note: Long Term Static Load: Conditions such as engagement area, supported weight, forces on the closure, vibrations or side to side movement, as well as prolonged periods of exposure to environmental factors such as temperature, ultraviolet light or humidity plus other factors beyond the control of 3M can affect the closure strength and long term performance. Dual Lock reclosable fasteners may slip or creep in the direction of the applied forces when subjected to loads at temperatures, times, force or weights greater than indicated. The user is responsible for designing the amount of fastening area based upon the expected use conditions for the intended application. Four square inches of fastening area per pound (57.3 sq. cm/kilogram) of static load is suggested as a starting point for such evaluations.

- a) The expected system performance of Dual Lock reclosable fasteners are in approximately the following increasing order of strengths: Dual Lock reclosable fastener SJ3552CF engaged to Dual Lock reclosable fastener SJ3550CF < (less than) Dual Lock reclosable fastener SJ3551CF engaged to Dual Lock reclosable fastener SJ3552CF ~ (approximately equal to) Dual Lock reclosable fastener SJ3550CF engaged to Dual Lock reclosable fastener SJ3550CF < Dual Lock reclosable fastener SJ3550CF engaged to Dual Lock reclosable fastener SJ3551CF. The combinations of Dual Lock reclosable fastener SJ3551CF engaged to Dual Lock reclosable fastener SJ3551CF and Dual Lock reclosable fastener SJ3552CF engaged to Dual Lock reclosable fastener SJ3552CF are not recommended.
- b) Scotchmate reclosable fastener loop engaged to Dual Lock reclosable fastener provides increased strength over standard Dual Lock or Scotchmate reclosable fastener. 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.
- c) Dual Lock reclosable fasteners SJ3550CF, SJ3551CF, SJ3552CF and Scotchmate reclosable fastener loop SJ3571 were engaged with firm pressure and disengaged at the rate of 12 inches (305 mm) per minute.
- d) Engaged thickness will decrease if a load is applied or increase if a separation force is applied.
- e) 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.

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Additional Performance Characteristics

Note: The following information is not product release requirements, nor product specifications. Rather this data represents typical performance using standard test methods. This is intended for use as a guide to assist in selection of 3M™ Reclosable Fasteners for further evaluation. Customer specifications should not be based solely on the data presented in this document. It is recommended that the customer test the product under expected use conditions in the desired application to determine actual suitability and performance.

Resistance to Chemicals: The polypropylene components and the acrylic adhesive on these products have not been tested but should resist contact with most common solvents, acid and alkaline solutions when exposed for short time periods.

Resistance to Plasticizers: The adhesive on 3M™ Dual Lock™ Reclosable Fasteners SJ3550CF, SJ3551CF and SJ3552CF has reasonable resistance to plasticizers found in many common flexible vinyl or other materials containing plasticizers. A plasticizer resistance tests consists of applying the fastener via its adhesive to a plasticized vinyl and subjecting the combination to 158°F (70°C) for one week with no applied load. After this time period there was no adhesive oozing occurring and peel tests typically show good adhesion to the substrate. Additional tests should be conducted by the user to evaluate the plasticizer resistance for the chosen application, substrates, environmental exposure and duration expected in the actual application. Other products to evaluate for plasticizer resistance are the 3M™ Dual Lock™ Reclosable Fastener SJ3560, SJ3901/4956 and SJ3901/4926 or 3M™ Scotchmate™ Reclosable Fasteners SJ3522 and SJ3523.

Flammability Resistance: Dual Lock reclosable fasteners SJ3550CF, SJ3551CF and SJ3552CF have not been tested in stand alone configurations to common flammability tests such as FMVSS-302, FAR 25.853, FAR 25.856, ASTM E162, ASTM E662 or UL94. Since these products are meant to be attached to an item, the entire assembly representative of the expected installed configuration should be tested to determine resistance to flame.

Resistance to Environmental Exposure: Temperatures at -20°F (-29°C) increase the typical closure strengths. Closure performance is significantly reduced at temperatures above 220°F (105°C). These products perform well under long term exposure to sunlight or ultraviolet radiation. Specific testing under the expected environmental conditions is recommended.

Resistance to Water or Humidity: Closure strength should not be affected after prolonged exposure to water or humidity. Once bonded to the substrate, the adhesive has excellent resistance to moisture on most surfaces under typical use conditions. Exposure to elevated heat and chlorine or bromine may compromise the adhesive performance of the 3M™ Dual Lock™ Reclosable Fasteners.

Volatile Outgassing: Volatile outgassing, per ASTM E595, is one important test in determining the suitability of materials for spacecraft. Generally products with no adhesive or those with acrylic adhesives such as these have lower volatile outgassing values. 3M™ Dual Lock Reclosable Fasteners SJ3550CF, SJ3551CF and SJ3552CF 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/>.

Washing and Dry Cleaning: The adhesive present on these Dual Lock reclosable fastener products typically makes them unsuitable for washing or dry cleaning processes. If a Dual Lock reclosable fastener is cleaned or washed, care must be exercised to avoid the mushroom stems from becoming entangled with loop materials and fabrics that may be present.

These Dual Lock reclosable fastener products have not been tested for appearance or performance after exposure to the following conditions:

- **Gas or steam sterilization or autoclaving processes.**
- **Common fungus growth tests (ASTM G21 or MIL Std 810F Method 508.5).**
- **Static discharge during application, use or removal.**

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Available Sizes	Standard Widths ^(a) in. ± 1/16" (mm) ± 1.6	Roll Length Yards (Meters)	3M™ Dual Lock™ Reclosable Fasteners		
			SJ3550CF (Type 250)	SJ3551CF (Type 400)	SJ3552CF (Type 170)
	3/4" (19 mm)	50 (45.7)	√ ^(b)	√ ^(b)	√ ^(b)
	1" (25.4 mm)	50 (45.7)	√	√	√
	1 1/2" (38.1 mm)	50 (45.7)	√	–	–
	2" (50.8 mm)	50 (45.7)	√	√	–
	6" (152.4 mm)	50 (45.7)	√	–	–
Fabricated Forms^(c)			Cut Pieces		

- a) 3M™ Dual Lock™ Reclosable Fasteners SJ3550CF, SJ3551CF and SJ3552CF products are available on 3" fiber core. All of these products are supplied with the liner to the edge of the adhesive. There are no extended liners or selvage edges 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) It is not recommended to mate Dual Lock reclosable fastener SJ3550CF type 250 to type 250 for widths less than 0.75". If narrow widths are required, it is suggested that any of the following combinations be evaluated: Dual Lock reclosable fastener SJ3550CF engaged to Dual Lock reclosable fastener SJ3551CF, Dual Lock reclosable fastener SJ3550CF engaged to Dual Lock reclosable fastener SJ3552CF or Dual Lock reclosable fastener SJ3551CF engaged to Dual Lock reclosable fastener SJ3552CF.
- c) Dual Lock 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.

Design Considerations

The following information is intended to assist the designer considering the use of 3M™ Dual Lock™ Reclosable Fasteners with a pre-applied pressure sensitive adhesive. Product performance depends upon a number of factors, including the fastener selected, the conditions in which the Dual Lock reclosable fastener is applied, 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 or desired end use.

Many factors can affect the application, engagement and use of Dual Lock reclosable fasteners. Before trying to apply, engage or use the fasteners the customer should consult the technical bulletin, *3M™ Dual Lock™ Reclosable Fasteners – Roll Goods Design Criteria* (70-0709-4009-6).

Surface Preparation

The amount and type of surface preparation required will depend upon the surfaces to which Dual Lock reclosable fasteners SJ3550CF, SJ3551CF or SJ3552CF are attached and the expected product use exposure conditions. Refer to the technical bulletin below for surface preparation requirements when using pressure sensitive adhesives.

Attachment Techniques

The most common technique for attaching Dual Lock reclosable fasteners SJ3550CF, SJ3551CF or SJ3552CF is direct attachment using its pre-applied pressure sensitive adhesive. Complete details to consider before attaching these products using this method are found in the technical bulletin, *3M™ Dual Lock™ Reclosable Fasteners – Attachment using Pressure Sensitive Adhesives or Heat Bonding* (70-0709-4006-2).

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Application Ideas

3M™ Dual Lock™ Reclosable Fastener SJ3550CF, SJ3551CF and SJ3552CF can replace conventional mechanical fasteners in a wide range of assembly and attachment applications where reclosability is desired. They provide a firm adhesive bond to a wide variety of surfaces, including, but not limited to those listed below. Because product performance will depend on actual conditions within any specific application, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular material purpose or suitable for the user's method of application.

Metals

Aluminum Steel
Not suitable for powder coated paints.

Plastics

Acrylic Rigid Vinyl
Polycarbonate Polystyrene
Not suitable for low surface energy plastics such as polyethylene or polypropylene.

Miscellaneous Materials

Glass Sealed Wood
Gel Coated Finishes

Dual Lock reclosable fasteners SJ3550CF, SJ3551CF and SJ3552CF have shown to be useful for:

Seat cushions in marine applications
Removable medical equipment

Equipment access doors
Vibration and sound dampening control
Attachment of computer accessories

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Certification/ Recognition

MSDS: 3M has not prepared an 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 or safety hazard. However, use or processing of the products in a manner not in accordance with the directions for use may affect their performance and present potential health or safety hazards.

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

Product Use

All statements, technical information and recommendations contained in this document are based upon tests or experience that 3M believes are reliable. However, many factors beyond 3M's control can affect the use and performance of a 3M product in a particular application, including the conditions under which the product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application.

Warranty and Limited Remedy

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ISO 9001:2000 - ISO/TS 16949:2002

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