March, 2005

3M™ Fastener SJ3518FR Loop Flame Resistant

Product Description



3M™ Reclosable Fasteners offer advanced closure alternatives to zippers, screws, snaps, hooks, bolts and more. They offer greater design flexibility, faster product assembly, smoother and cleaner exterior surfaces and improved product performance in many applications. The hook and loop fasteners consist of two strips of nylon fabric which engage to form a quick fastening attachment. Simply pull the strips apart by hand to disengage.

The woven hook is covered with about 300 tiny, stiff hooks, per square inch (46/cm²). The woven loop is covered with thousands of soft, pliable napped loops, providing for thousands of openings and closings (cycles). The hook and loop are preshrunk to insure maximum dimensional stability and flatness.

These hook and loop fasteners are coated on the backside with a unique flame resistant synthetic rubber based pressure sensitive adhesive formulated to meet the requirements of the EU Directive 2003/44/EC amending the Council Directive 76/769/EEC, http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l 042/l 04220030215en00450046.pdf concerning chemical usage in products and also compliant with EU directives 2002/95/EC commonly referred to as RoHS as well as 2003/11/EC, the 24th ammendment to the 76/769/EEC prohibiting the use of pentabromodiphenylethers and octabromodiphenylethers in leather goods and textiles. Scotchmate reclosable fasteners also provide flame resistance when tested per FAR 25.853 and other common flammability tests. These fasteners are easily and conveniently attached to a variety of substrates and functions over a range of temperature and humidity conditions.

Product Features

Commonly paired with 3M™ Hook Fastener SJ3519FR, this loop fastener can also engage with other 3M™ Hook Fasteners.

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Technical Information Note

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

Typical Physical Properties

Property	Values		Test Condition	Notes
Adhesive Color	Translucent White			
Thickness	3.2 mm	4/32 in	Maximum unmated without liner	Thickness depends upon the amount of compression load on the pieces.
Engaged Thickness (Nominal without liner)	3.9 mm	150 mil		
Thickness Tolerance	± 20 %			
Selvedge Edge	2.4 ∓ 0.8 mm	3/32 ± 1/32 in		
Material	Loop - Nylon 6,6			
Backing	Nylon 6,6			
Adhesive	Flame Resistant Synthetic Rubber			
Liner	Polypropylene film with red “3M™ Scotchmate™” printing			
Liner Thickness	0.08 mm	3 mil		
Liner Color	White			
Weight (Without liner)	0.065 g/cm²	0.015 oz/in²		

Color

Black, White, Beige
(Other colors are available as special orders. The adhesive may produce a yellow tint to some light colored hook and loop products. Therefore, 3M recommends the user to evaluate the products to see if it meets their color requirements. See your 3M authorized distributor or 3M representative for color selection guide and minimum requirements.)

Typical Performance Characteristics

Static Tensile	Test Condition
4,000 min	49°C (120°F)
4,000 min	60°C (140°F)
2,000 min	70°C (158°F)
180 min	38°C (100°F)/100% R.H.

Property: Static Tensile
notes: Holds 1.1lb/in² (77.5 g/cm²) for indicated time and temperature

Static Shear	Test Condition
5,000 min	49°C (120°F)
7,000 min	60°C (140°F)
2,000 min	70°C (158°F)
2,000 min	38°C (100°F)/100% R.H.

Property: Static Shear
notes: Holds 1.1 lb/in² (77.5 g/cm²) for indicated time and temperature Long Term Static Load: Conditions such as temperature variations, engagement area, closure pressure and vibrations or side to side movement after engagement or exposure to prolonged periods of moisture, ultraviolet or other environmental factors can affect the closure strength and long term static load performance. Reclosable fasteners may slip or creep in the direction of the static load forces when subjected to static loads 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 (57.3 sq. cm/kilogram) of static load is suggested as a starting point for such evaluations.

Property	Values		Substrate	Notes	Method
Dynamic Tensile (Engage)	<0.69 N/cm²	<1.0 lb/in²	Rigid to Rigid	Engaged with firm pressure and disengaged, peeled or cleaved at the rate of 12 inches (305 mm) per minute.	
Dynamic Tensile (Disengage)	8.07 N/cm²	11.7 lb/in²	Rigid to Rigid	Engaged with firm pressure and disengaged, peeled or cleaved at the rate of 12 inches (305 mm) per minute.	
Dynamic Shear	16.2 N/cm²	23.4 lb/in²	Rigid to Rigid	1" x 1" overlap; engaged with firm pressure and disengaged, peeled or cleaved at the rate of 12 inches (305 mm) per minute.	

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Typical Performance Characteristics (continued)

Property	Values		Substrate	Notes	Method
Cleavage Strength	950 g/cm width	5.3 lb/in width	Rigid to Rigid	System performance tests are determined by measuring the performance of the entire mated reclosable fastener system consisting of two non-anodized aluminum plates joined together with the indicated fasteners. The “T” peel test only measures the closure performance per ASTM D5170 and was not adhered to aluminum panels. The 90° peel has one of the mated fasteners attached to a non-anodized aluminum panel, while the other mated fastener is not attached to an adherend and is disengaged at 90° angle during the peel. Engaged with firm pressure and disengaged, peeled or cleaved at the rate of 12 inches (305 mm) per minute.	ASTM D5170
T-Peel Adhesion	380 g/cm width	2.1 lb/in width	Flexible to Flexible	System performance tests are determined by measuring the performance of the entire mated reclosable fastener system consisting of two non-anodized aluminum plates joined together with the indicated fasteners. The “T” peel test only measures the closure performance per ASTM D5170 and was not adhered to aluminum panels. The 90° peel has one of the mated fasteners attached to a non-anodized aluminum panel, while the other mated fastener is not attached to an adherend and is disengaged at 90° angle during the peel. Engaged with firm pressure and disengaged, peeled or cleaved at the rate of 12 inches (305 mm) per minute.	

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Typical Performance Characteristics (continued)

Property	Values		Substrate	Notes	Method
90° Peel Adhesion	360 g/cm width	2 lb/in width	Flexible to Rigid	System performance tests are determined by measuring the performance of the entire mated reclosable fastener system consisting of two non-anodized aluminum plates joined together with the indicated fasteners. The “T” peel test only measures the closure performance per ASTM D5170 and was not adhered to aluminum panels. The 90° peel has one of the mated fasteners attached to a non-anodized aluminum panel, while the other mated fastener is not attached to an adherend and is disengaged at 90° angle during the peel. Engaged with firm pressure and disengaged, peeled or cleaved at the rate of 12 inches (305 mm) per minute.	
Cycle Life	5,000			Cycle Life is the number of cycles (openings and closings) that the fastener is subjected to while maintaining 50% or greater ofthe original peel values.	

Flammability Test

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.

Flammability Tests		3M™ Reclosable Fastener SJ3518FR (loop)	3M™ Reclosable Fastener SJ3519FR (hook)
FAR 25.853 Para. (a)(1)(ii) 12 Second Vertical Test	**Spec. (max., average) of three**		
Burn Length (inches)	8	2.2	1.8
Extinguish Time[a] (seconds)	15	2.5	2
Drip Ext. Time (seconds)	3	1	2

a) Extinguish time refers to the time it takes the burning matter to extinguish after the flame source is removed. SE means the flame extinguished before removal of the flame.

Typical Environmental Performance

Chemical and Environmental Exposure

Solvent Resistance: The nylon components resist incidental attack by most common solvents and alkaline solutions. Acid solutions may cause deterioration of the fastener. The adhesive on 3M™ Scotchmate™ Reclosable Fasteners SJ3518FR and SJ3519FR may be affected by many common organic laboratory solvents and transportation fluids (gasoline, motor oil, etc.). If increased solvent resistance is desired and flammability is not critical, our nylon 3M™ Scotchmate™ Reclosable Fasteners SJ3571, SJ3572 and SJ3595 or our polyester 3M™ Scotchmate™ Reclosable Fasteners SJ3576 or SJ3577 could be evaluated. If greater resistance of the fastener to acid solutions is desired, our polyester 3M™ Scotchmate™ Reclosable Fasteners SJ3586FR and SJ3587FR could be evaluated.
Plasticizer Resistance: The adhesive on Scotchmate reclosable fasteners SJ3518FR and SJ3519FR may be affected by plasticizers found in many common flexible vinyl or other material that may result in softening or adhesion loss over time. These products are not recommended for adhering to plasticized materials. If plasticizer resistance is desired and flammability resistance is not required, nylon 3M™ Scotchmate™ Reclosable Fasteners SJ3522 and SJ3523 could be evaluated.
Flammability Resistance: 3M™ Scotchmate™ Reclosable Fasteners SJ3518FR and SJ3519FR have not been tested to other standard flammability tests such as FMVSS-302, ASTM E-162, ASTM E-662, BSS-7239, UL94 and others.
Environmental Effects: Temperatures down to -20°F (-29°C) increases the typical closure strengths. If products will be exposed to outdoor weathering or ultraviolet exposure then black is suggested or our polyester 3M™ Scotchmate™ Reclosable Fasteners SJ3586FR or SJ3587FR can be evaluated.
Water (Humidity) Resistance: Closure strength of nylon hook and loop fasteners may decrease after prolonged exposure to moisture due to water absorption by the cut nylon ends for hook products. Closure strength is regained when dried. Improved water resistance of the closure can be obtained by using polyester hook and loop (Scotchmate reclosable fasteners SJ3586FR or SJ3587FR). Once bonded the adhesive 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 acrylic or no adhesive have lower volatile outgassing values. Scotchmate reclosable fasteners SJ3518FR and SJ3519FR have not been tested for outgassing and would not be expected to pass ASTM E595. Products tested at the Goddard Space Flight Center can be found at the following web site: http://outgassing.nasa.gov/. If flame resistance is not critical, then our nylon 3M™ Scotchmate™ Reclosable Fasteners SJ3571, SJ3572 and SJ3595 or our polyester 3M™ Scotchmate™ Reclosable Fasteners SJ3576 or SJ3577 could be evaluated.
Sterilization/Autoclaving: Scotchmate reclosable fasteners SJ3518FR and SJ3519FR have not been exposed to gas or steam sterilization, or autoclaving. Plain back products such as nylon 3M™ Scotchmate™ Reclosable Fasteners SJ3418FR, SJ3419FR or polyester 3M™ Scotchmate™ Reclosable Fasteners SJ3486FR or SJ3487FR have not been exposed to sterilization or autoclaving, but would be expected to perform better than adhesively coated products.
Washing and Dry Cleaning: Scotchmate reclosable fasteners SJ3518FR and SJ3519FR, attached to fabrics will typically shrink less than 5% unless the fabric has greater shrinkage amounts. Washing or dry cleaning of these products is not recommended due to adhesive softening that could transfer trace adhesive residues to other materials.
Fungus Resistance: Scotchmate reclosable fasteners SJ3518FR and SJ3519FR have not been tested for fungus resistance per ASTM G-21 nor MIL STD 810F Method 508.5 and should be evaluated by the customer under conditions applicable to the expected end use.
Static Discharge: Scotchmate reclosable fasteners SJ3518FR and SJ3519FR have not been tested for static charge released 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.

Handling/Application Information

Application Ideas

Scotchmate reclosable fasteners SJ3518FR and SJ3519FR can 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 and suitable for the user's method of application.

		Plastics	
Paper	Cardboard	Acrylic	Polypropylene
Glass	Sealed Wood	Polycarbonate	Polystyrene
Fabrics	Bare and Painted Metal	Polyethylene	Rigid Vinyl

Not recommended for attaching to flexible vinyl or plasticized plastics.
Scotchmate reclosable fasteners SJ3518FR and SJ3519FR has shown to be useful for:

Anti-scratch surface	Vibration and sound dampening control
Panels in Rail Vehicles	Airline Interiors and Seating
Insulation Blanket Closures	Electronic Cover Plates

Directions for Use

The following information is intended to assist the designer considering the use of adhesively coated 3M™ Scotchmate™ Reclosable Fasteners. Product performance depends upon a number of factors, including the fastener selected, the conditions in which the fastener is applied and the time and environmental conditions 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 3M products to determine whether it is fit for a particular purpose and suitable for the user's substrates, method of application and desired end use.
The three most important techniques for attaching Scotchmate reclosable fasteners SJ3518FR and SJ3519FR to various substrates are summarized below. For complete details on techniques and options for attaching Scotchmate reclosable fasteners please see the technical bulletin "Attachment of 3M™ Scotchmate™ and Dual Lock™ Reclosable Fasteners" (70-0709-3929-6).
Design Considerations: As a general rule, four square inches of fastener area per pound of static load to be supported 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 lifting, and improve the overall appearance of 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.
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: Highly textured substrate surfaces may reduce the ultimate adhesion levels and care should be given to minimize the surface texture or roughness. Adhesive backed 3M™ Reclosable Fasteners such as 3M™ Scotchmate™ 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. It is recommended to remove any surface contaminants that may reduce adhesion by using a method suited for the type and quantity of surface contaminants present.
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.
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 both the substrates and the environmental conditions the product will be exposed to during use.
Attachment Procedure: To obtain an optimum bond to any surface, both the fasteners and the target surface 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 and without touching the adhesive apply the adhesive side of the fastener to the pre-cleaned and prepared surface. Using finger pressure, press the 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. Use of a rubber hand roller, press platen or similar device is recommended to ensure full contact of adhesive with the substrate. Three passes in each direction, with special attention paid to rolling down the edges, should be adequate.

Handling/Application Information (continued)

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. Once attached to the substrate, a 1-hour minimum dwell time is recommended before applying a load or disengaging. This dwell time is important for achieving a firm adhesive bond before applying a load or using. This adhesive achieves approximately 50% of the ultimate bond strength within 20 minutes, 90% after 1 hour and the ulitmate bond strength is obtained within 24 hours at 72°F (22°C) and 50% relative humidity. The use of primers or adhesion promoters may reduce the time required to achieve the ultimate bond strength.
2) Heat (Press) Bonding: 3M™ Scotchmate™ Reclosable Fasteners SJ3518FR (hook) and SJ3519FR (loop) can be attached to many fabric and foam articles by press bonding. The fastener is initially adhered to the article using finger pressure. Bond strength is increased by applying heat and pressure through the substrate to the adhesive side of the fastener for given pressure, times and heating period. For properly chosen press bonding conditions the product can be used immediately after cooling, usually a matter of minutes. Once applied these fasteners should not be washed or dry cleaned. Product performance will depend upon the nature of the fabric or foam and other conditions within any specific application. For this reason it is essential that the user evaluate the product to determine if it is fit for a particular purpose and suitable for the user's method of application.

Typical Press Bonding Conditions:
Bonding Temperature: 250 to 425°F (121 to 218°C)
Bonding Pressure: 30 to 100 psi (207 to 690 kPa)
Bonding Time: 3 to 30 seconds.

3) Mechanical Attachment: Scotchmate reclosable fasteners SJ3518FR and SJ3519FR may also be mechanically attached to difficult to adhere to surfaces such as textured plastics and wood by using staples, screws or rivets. The head of the mechanical fastener should be flat and large enough to resist pull through when the fastener is disengaged. The head of the fastener should also be recessed as much as possible below the surface of the hook or loop 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.

Storage and Shelf Life

Shelf life is 18 months from date of manufacture when stored in original packaging between 60° to 80°F (16° to 27°C) and 40 to 60% relative humidity.

Family Group

	SJ3519FR	SJ3518FR
Thickness (mm) Test Condition: Maximum unmated without liner	2.4	3.2
Color	Black, White, Beige	Black, White, Beige
Engaged Thickness (Nominal without liner) (mm)	3.9	3.9
Material	Hook - Nylon 6	Loop - Nylon 6,6
Backing	Nylon 6,6	Nylon 6,6
Adhesive	Flame Resistant Synthetic Rubber	Flame Resistant Synthetic Rubber
Liner	Polypropylene film with red "3M™ Scotchmate™" printing	Polypropylene film with red "3M™ Scotchmate™" printing
Liner Thickness (mm)	0.08	0.08
Liner Color	White	White

References

1. 3m.com Product Page
   Url: https://www.3m.com/3M/en_US/company-us/all-3m-products/~/3M-Flame-Resistant-Loop-Fastener-SJ3518FR?N=5002385+3293241232&rt=rud
2. Safety Data Sheet
   Url: https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=SJ3518FR

ISO Statement

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001:2000 and ISO/TS 16949:2002 standards.

Recognition/Certification

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 the 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. Military Spec. MIL-F-21840G: 3M™ Scotchmate™ Reclosable Fasteners SJ3518FR and SJ3519FR meet the physical requirements of Mil spec. MIL-F-21840G, Type III Class 3. Note that Class 5 requirements are met by mating Scotchmate reclosabele fastener SJ3518FR to 3M™ Scotchmate™ Reclosable Fastener SJ3586FR. C.I.D. A-A-55126A: CID A-A-55126A supersedes mil spec. MIL-F-21840G. Scotchmate reclosable fasteners SJ3518FR and SJ3519FR have not been tested to the requirements of this CID as the CID has lower performance and contains errors and omissions.

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.

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