



Polyurethane Protective Tapes

To Reduce Aircraft Floor Subsystem Corrosion Damage

Installation Bulletin

July 2003

Introduction


This bulletin describes the recommended procedures for installing 3M™ Polyurethane Protective Tapes as a fluid barrier in aircraft interiors to help reduce aircraft floor subsystem corrosion. It details the necessary steps to assess and prepare a substrate, seal panel joints, and apply the adhesive backed film to aircraft floor panels. It also describes the techniques used for cutting and trimming, splices, panel joints and surface protrusions.


3M currently offers several different fluid barrier products for use on aircraft flooring that have been qualified to various OEM and industry performance requirements. Most often used are 3M™ Polyurethane Protective Tapes 8663DL, 8672, 8693DL and 8694. Please consult your maintenance procedures or engineering to determine which product(s) have been approved for use in your application.

3M Product	OEM Approvals	Utility	Appearance	Applications
8663DL	Boeing Service Letters 737-SL-53-034 for 737, and 757-SL-53-018 for 757	Wide area coverage	Clear	Legacy applications
8672		Seal floor panel joints		
8693DL	BMS8-346 Type II Class 2*	Wide area coverage	Milk white with contact clarity	For applications where enhanced flame retardant properties are required.
8694	BMS8-346 Type II Class 1*	Seal floor panel joints		

*BMS8-346 Type II has flame retardant requirements for applications beyond BMS8-346 Type I and legacy uses.

HEALTH AND SAFETY

 Caution
<p>When handling any chemical products, read the manufacturers' container labels and the Material Safety Data Sheets (MSDS) for important health, safety and environmental information.</p> <p>To obtain MSDSs for 3M products:</p> <ul style="list-style-type: none"> • By fax, call 1-800-364-0768 in the United States and Canada. For other locations call 650-556-8417 for all other locations, or • Visit us at http://www.3M.com then select MSDS search, or • By mail, or in case of an emergency, call 1-800-364-3577 or 651-737-6501. <p>When using any equipment, always follow the manufacturers' instructions for safe operation.</p>

 Caution
<p>Any activity performed for a long period of time in an awkward position or with a high amount of force is potentially a risk for causing musculoskeletal strain, pain or injury. When applying film, follow these practices to improve comfort and avoid injury:</p> <ul style="list-style-type: none"> • Wear approved safety shoes when required. • Wear kneepads when kneeling is necessary. • Cranial and hearing protection should be used as conditions demand. • Alternate your tasks between crew members during the application. • Avoid awkward reaching. • Perform stretches or exercises to improve circulation.

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Shelf Life and Storage

- Apply tape within two years of receipt.
 - Store tape rolls in their original container. Return all partially used rolls to the original shipping container, and to protect the tape edges, replace the roll-end inserts.
 - Store the tape in a clean, dry area under standard warehouse conditions.
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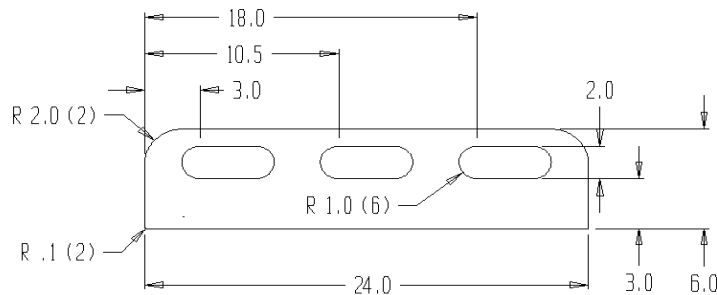
Tools and Equipment

The following tools and equipment are recommended to use for substrate preparation and installation of tape. Item quantities should be determined based on the size and requirements of the installation.

- 3M™ Polyurethane Protective Tape 8663DL or 8693DL (24" wide) for broad area coverage
- 3M™ Polyurethane Protective Tape 8672 or 8694 (4" wide) to seal floor panel seams
- Knee pads
- Permanent marking pen
- Utility knife
- Scissors
- X-ACTO® knife or surgeons scalpel
- Applicators
 - Small plastic squeegees
 - 3M™ Doodlebug™ Handblock 6473, or
 - Wide felt squeegee
- Tape measure – 12' minimum
- Scratch awl
- Hard plastic scraper
- Cleaning rags
- Isopropyl Alcohol 91%
 - Substitutions: Methyl Ethyl Ketone, acetone or other solvent approved for use
- Poly gloves (Nitrile), latex free

Tool Suppliers

- Utility knife: Stock No. 70070539856 or equivalent
- X-ACTO® knife: McMaster-Carr-Elmhurst, Illinois, Telephone: 630-833-0300
- Small plastic squeegee: Bondo™ plastic spreaders, 1 set of 3 sizes, reorder #357; Dynatron/Bondo Corp. Atlanta, GA.
- 3M™ Doodlebug™ Handblock 6473: Stock No. 61500018819
- Wide felt squeegee: Felt available from McMaster-Carr-Elmhurst, Illinois: 3/8" F-11 polyester needled felt, adhesive coated, Part No. 8877K37. See drawing below for applicator dimensions.
- Scratch awl: McMaster-Carr-Elmhurst, Illinois, Part No. 19195A22 or equivalent. Telephone: 630-833-0300.
- Isopropyl Alcohol (91%): available anywhere rubbing alcohol (70%) is sold.



MATERIAL: Acrylic or Polycarbonate, 0.25" Thick
Wrap Applicator Bottom Edge to Handle Slots with 7" x 24" x 3/8" Felt

WIDE APPLICATOR SQUEEGEE

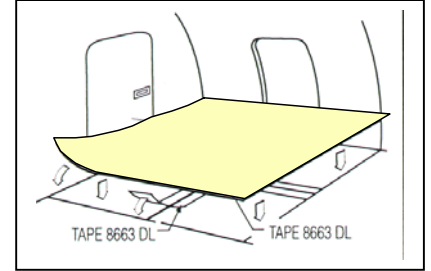
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Installation Procedure

Please read and understand these instructions before attempting the installation. Proper installation of 3M™ Polyurethane Protective Tape to the aircraft flooring can provide many years of service and help minimize subsystem corrosion. Installation of Polyurethane Protective Tape to the aircraft floor system requires the following steps:

- 1) Application Survey
- 2) Surface Preparation and Cleaning
- 3) Tape Application
 - liner removal
 - floor panel seam sealing with Polyurethane Protective Tape
 - floor covering with Polyurethane Protective Tape
- 4) Final Inspection



Application Survey

Prior to any installation, conduct a survey of the surfaces where tape will be applied. Substrate conditions will determine the methods necessary to prepare the surface before applying the tape. It will also help you plan the application to optimize the size and placement of individual tape sheets and splices, and to determine the location of areas where special application techniques will be required (e.g. surface protrusions, wall/edge dams, etc.). Inspect the surfaces for imperfections that may interfere with tape adhesion. Foreign matter and old seam tape or sealants are examples that may reduce tape adhesion to unacceptable levels and should be removed prior to installation of the tape.

Surface Preparation and Cleaning

Caution

Before handling any chemical products, always read the container label and the MSDS. Local air quality regulations may regulate or prohibit the use of surface preparation and cleaning materials based on solvent (VOC) content.

- Repair or replace any damaged floor panels.
- Remove all tapes, adhesives and sealants from the floor panels. Use only approved scrapers and other tools that will not damage the substrate.
- Remove any dirt, oils or other surface contaminants with an approved surface cleaner or Isopropyl Alcohol. Other detergents and solvents, approved for use on the substrate, may also be used.

Tape Application

General Recommendations

- The intent is to create a shallow containment well to prevent fluids from migrating to underlying structures and initiating corrosion in those structures.
- Floor covering tapes are supplied with liners on one or both sides of the tape. Remove only the adhesive-side liner for installation. The topside liner is removed after tape installation and before an adjacent sheet is applied.
- Typically, teams of two installers are recommended for most tape applications. It is also helpful if each installer is equipped with the tools described in the “Tools and Equipment” section of this bulletin.
- Always make sure the surfaces are dry before applying tape. **Do not use a wet application technique recommended for other uses of the Polyurethane Protective Tapes.**
- Normally, a 3M™ Doodlebug™ Pad Holder 6473 or wide felt squeegee are useful for applying full sheet widths; and the smaller plastic squeegee is useful for installing tape on floor panel seams and for working around surface protrusions, in corners and small sites. Use a squeegee with a clean, smooth edge. Replace it when the edge feels rough to the touch.
- Adjacent sheets should be overlapped at least ½ inch.

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Tape Application
(continued)

Liner Removal

Remove only as much liner as required for your application method. Usually 4-6 inches is a good starting point. With experience, and a flat, uniform surface, this can be increased accordingly. The procedure for removing the liner is to pull it away from the tape starting near the edge of the tape with a sharp, continuous motion. Except for small tape pieces, it is recommended to have one person hold the tape sheet near the corners, while another person pulls the liner down away from the sheet. The following methods are recommended to initiate adhesive liner removal:

Method 1: While holding the tape near a corner in one hand, carefully separate the tape and liner at the corner using a utility knife. See Figure 1. As the liner and tape separate, fold the liner over to keep them separated and assist in gripping and pulling them apart. Applying a piece of strapping (filament) tape or packaging tape to the adhesive liner (3M logo side) at the corner will assist initiating removal of the liner.

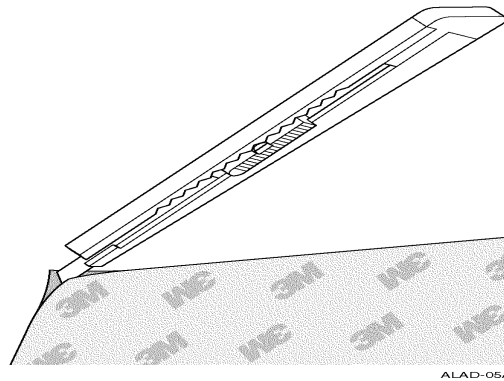


Figure 1: Separate Tape and Adhesive Liner with Blade

Method 2: While facing the adhesive liner side (3M logo side) and holding the tape near a corner in one hand, bend and roll the edge near the corner with your thumb towards the liner side. See Figure 2. Repeat several times until the liner separates from the tape. Carefully grip the separated liner between fingertips and pull away from the tape. This method is somewhat difficult and requires the ability to grip 1/16”– 1/8” tape. Applying a piece of strapping (filament) tape or packaging tape to the adhesive liner (3M logo side) at the corner will assist initiating removal of the liner. See Figure 3.

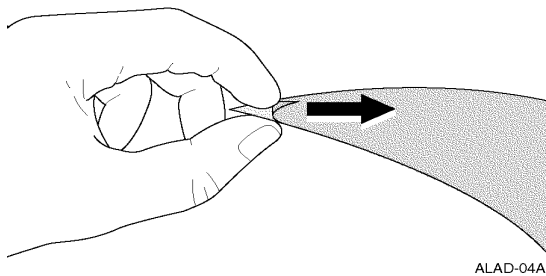


Figure 2: Roll liner corner away from tape

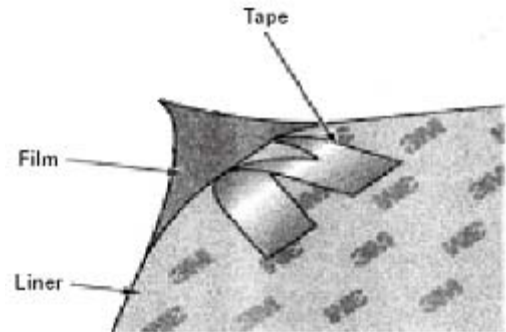


Figure 3: Remove liner with a piece of tape

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Tape Application (continued)

Floor Panel Seam Sealing Application

Floor panel joints may be sealed with narrow strips of 3M™ Polyurethane Protective Tape 8672 or 3M™ Polyurethane Protective Tape 8694 prior to installing the large sheets of film. It is optional to seal these joints with a sealant prior to using tape (consult your maintenance procedures).

1. If a polysulfide or other curing sealant is applied to floor panel seams, install tape over the sealant before the sealant has cured, only if you can determine that the sealant contains no volatile organic solvents.
NOTE: Polyurethane Protective Tape 8672 can be applied over wet sealant containing solvents, however MEK or Toluene will damage the adhesive system used on Polyurethane Protective Tape 8694. Use solvent free sealants or allow sealants to cure before application of Polyurethane Protective Tape 8694 on the seams.
2. With a scissors, cut a length of tape to cover the length of the panel joint. If the panel joint terminates at a wall or other structure, allow approximately 1” excess tape beyond the end of the panel to construct an edge dam of tape up the wall or structure.
3. If using Polyurethane Protective Tape 8672, separate 4-8 inches of adhesive liner from the tape. Fold the released adhesive liner away from the exposed adhesive. Polyurethane Protective Tape 8694 is provided without an adhesive liner.
4. With minimum finger contact, grasp the tape inside the corners and hold close to the application site. With the help of another installer, align the tape over the panel seam and lightly tack the tape leading edge to the panel surface. Before continuing, recheck the alignment of the tape along the seam.
5. Lightly squeegee the tape into position using the recommended small plastic squeegee. It helps to have the second person hold the tape under light tension several inches beyond the tack line and to remove the adhesive liner. This helps maintain a flat, unwrinkled tape surface.
6. If wrinkles or bubbles begin to appear, it is best to back the tape off the surface a few inches with sharp, uniformly applied pulls on the tape where the adhesive liner is still attached, then re-adhere the tape without bubbles. Continue this sequence until the tape is applied.
7. After the tape is applied, repeat the squeegee operation across the entire surface using firm strokes with the squeegee, or rub firmly by hand. This will increase adhesive conformation to the surface and ‘chase’ air out through the edges.
8. If using Polyurethane Protective Tape 8694, remove the topside liner before proceeding. A piece of packaging tape or strapping (filament) tape may be applied to a corner of the liner to aid removal. See Figure 3.

Floor Covering Application

1. Plan the installation such that overlap seams of tape are not positioned directly above taped floor panel joints.
2. Around the perimeter of the installation, and around other structures, allow approximately 1” of additional floor covering tape beyond the edge of the floor panel to provide a fluid dam at the intersection of the floor panel and wall or structure. When floor panels terminate without an intersecting wall or butting structure, cargo liner laminate may be used along the panel edge to provide a vertical stiffener for an edge dam.
3. Prior to installing the floor covering tape, cover any hard points protruding from the floor surface with piece of Polyurethane Protective Tape 8694 or Polyurethane Protective Tape 8672 tape. Allow for 1-2 inches of seam tape beyond the limits of the surface protrusion. Use a small plastic squeegee to conform the tape around the protrusion. Applying heat to the tape will assist conforming it to the protrusion.
4. Cut a sheet of floor covering tape to fit a site location.
5. Separate 4-8 inches of adhesive liner from the tape. See Figure 1 and Figure 2. Fold the released liner away from the exposed adhesive.

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Tape Application (continued)

Floor Covering Application (continued)

6. With minimum finger contact, grasp the tape inside the corners and hold close to the application site. With the help of another installer, align the tape over the panel and lightly tack the tape leading edge to the panel surface. Before continuing, recheck the side edge alignment.
7. Using the recommended applicator, begin at the initial tack line and with constant pressure on the squeegee, adhere the tape as the liner is removed. A second installer is helpful to maintain tape alignment and remove the liner as the first person operates the squeegee.
8. When hard point surface protrusions are encountered, lightly lay the tape over the hard point and mark a cutout location on the tape with a marking pen. With a scissors or utility knife, trim out the tape to allow the sheet to fit around the protrusion previously covered with seam tape.
9. Continue this sequence until all liner is removed from the sheet and the tape is adhered to the floor.
10. After the liner is removed, repeat the squeegee operation across the entire surface using firm strokes with the squeegee. This will increase adhesive conformation to the surface and 'chase' air out through the edges.
11. Using a small plastic squeegee, conform the tape perimeter up any adjacent walls or other structures. At corners, the tape can be slit and overlapped to form a sealed corner.
12. Remove the topside liner of each sheet before the adjacent tape is applied. A piece of packaging tape or strapping (filament) tape may be applied to a corner of the liner to aid removal. See Figure 3.
14. Where fasteners must be installed through the tape, use a scratch awl, X-ACTO[®] knife, surgeons scalpel or similar tool, to puncture the tape at each fastener location. This will allow for easier reattachment of the fastener after the tape is installed.
15. Overlap adjacent sheets by ½ inch minimum.
NOTE: Remember to remove the top liner from an installed sheet before overlapping the next adjacent sheet.

Final Inspection of Tape Installation

- Inspect each application site to confirm that the tape was applied as planned with the correct overlaps, edge configuration, adhered edges; and that the surface protrusions are covered and trimmed properly.
- Inspect and confirm that all fastener holes have been punctured.
- Inspect any movable structures or equipment to ensure that the tape will not hinder their operation. Perform an operational test of each piece of equipment or structure if necessary to confirm unhindered operation.

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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. Address correspondence to: 3M Aerospace and Aircraft Maintenance Division, 3M Center, Building 220-9W-14, St. Paul, MN 55144-1000. Our fax number is 651-737-2275. If you are outside of the US, please contact your nearest 3M office or one of the following branches:

Australia 61-2-498-9711 tel 61-2-498-9710 fax	Austria 01-86686-298 tel 01-86686-229 fax	Canada 800-410-6880 ext. 6018 tel 800-263-3489 fax	China 86-21-62753535 tel 86-21-62190698 fax
France 30-31-6234 tel 30-31-6195 fax	Germany 02131-14-2344 tel 02131-14-3647 fax	Italy 02-7035-2177 tel 02-7035-2125 fax	Japan 03-3709-8245 tel 03-3709-8743 fax
Korea 02-3771-4114 tel 02-786-7429 fax	Netherlands 31-71-5-450-272 tel 31-71-5-450-280 fax	South Africa 11-922-9111 tel 11-922-2116 fax	Switzerland 01-724-9114 tel 01-724-9068 fax
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Important Notice

3M MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of application. Please remember that many factors can affect the use and performance of a 3M product in a particular application. The materials to be bonded with the product, the surface preparation of those materials, the product selected for use, the conditions in which the product is used, and the time and environmental conditions in which the product is expected to perform are among the many factors that can affect the use and performance of a 3M product. Given the variety of factors that can affect the use and performance of a 3M product, some of which 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.

Limitation of Remedies And Liability

If the 3M product is proved to be defective, THE EXCLUSIVE REMEDY, AT 3M'S OPTION, SHALL BE TO REFUND THE PURCHASE PRICE OF OR TO REPAIR OR REPLACE THE DEFECTIVE 3M PRODUCT. 3M shall not otherwise be liable for loss or damages, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including, but not limited to, contract, negligence, warranty, or strict liability.

ISO 9001

This product was manufactured under a 3M quality system registered to ISO 9001 standards.

For Additional Product Safety and Health Information, See Material Safety Data Sheet.



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