

# 3M™ Polyurethane Protective Boots

## Technical Data Sheet

### Product Description

3M™ Polyurethane Protective Boots SJ8542HS, SJ8545HS, SJ8641, SJ8663, SJ8663HS, SJ8665, SJ8667, J8667HS, SJ8674, SJ8671, SJ8672 and SJ8681HS are made of an abrasion-resistant polyurethane and are resistant to ultraviolet light. They can be painted or applied over painted surfaces. They are available in a variety of shapes and colors for many industrial and common aircraft applications (including radomes, wing tips, landing gear pods, etc.). The product is constructed with a durable, solvent-resistant, pressure-sensitive acrylic adhesive, and protected with an easy-release liner.

### Typical Physical Properties and Performance Characteristics

#### 3M SJ8665 Boots

#### Notes:

- 1) The following technical information and data should be considered representative or typical only and should not be used for specification purposes.
- 2) ASTM = American Society for Testing and Materials.
- 3) Metric values are listed in parenthesis.

#### A. Dimensions

<b>Approximate Applied Thickness:*</b>	0.012 inch (0.30 mm) Film 0.002" (0.05 mm) Adhesive 0.014" (0.35 mm) Total Applied Thickness
<b>Approximate Weight:</b>	0.09 lb/ft <sup>2</sup> (440 g/m <sup>2</sup> )

\*There is a gradual decrease in thickness, typically 0.009 in (0.23 mm) minimum overall, at the base of the boot.

#### B. Typical Physical Properties and Performance Characteristics

Property	Test Method	Units	Typical Value
Tensile Strength @ Break	ASTM D882*	Lb/in (N/100 mm)	94 (1646)
Elongation % @ Break	ASTM D882*	%	458
Taber Abrasion	H-18, 1000g wt, 1000 cycle	Loss in grams	<0.10
Hardness	ASTM-D2240*	Shore A	80
Dielectric Strength	ASTM-D1000*	Volts	14,000

Dielectric Constant	@ 5.6 GHz	-	3.018 2.940
Peel Adhesion @ 70°F (21°C) to:	ASTM D-1000* 24 Hr. Dwell	oz/in (N/100 mm)	92.6 (101.4) 68.3 (74.8) 111.5 (122.0) 78.8 (86.3) 77.1 (84.4) 108.2 (118.4)
Solvent Resistance	24 Hour Immersion		
Motor Oil			Little or no apparent effect
Distilled Water			Little or no apparent effect
Hydraulic Fluid**			Little or no apparent effect
JP-4/JP-5 Aviation Fuel			Slight edge penetration
Diesel Fuel			Slight edge penetration

For general edge seal, 3M recommends 3M™ Scotch-Weld™ Repair Paste RP-2110 (Black) or 3M™ Scotch-Weld™ Repair Paste RP-2220 (Clear)

\* Testing is substantially equivalent to the ASTM method referenced

\*\* 3M Polyurethane Protective Boots are not resistant to Skydrol™ hydraulic fluid. Edge sealing with 3M™ Scotch-Weld™ Epoxy Adhesive EC-2216 can significantly reduce the effect of Skydrol migrating under edges of boot and tape.

## Typical Properties and Characteristics

### Dielectric Data

#### Description

Measure Dk and tan delta at 2.5 GHz and 9.4 GHz, at room temperature (23°C)

#### Method

##### Split Post Resonator Method

Sample #	Sample Description	Frequency (MHz)	er'	tan delta micro rads	tan delta	thickness mm	Frequency (MHz)	er'	tan delta micro rads	tan delta	thickness mm
Reference	fused quartz	2464	3.783	-47	<0.0001	1.067					
	PTFE	2481	2.047	206	0.0002	0.609					
1	SJ8665	2465	2.952	46900	0.0469	1.065	9404	2.859	34400	0.0344	0.720
2	SJ8667HS	2456	3.047	49800	0.0498	1.405	9404	2.912	36800	0.0368	0.700
3	SJ8671	2463	3.015	50000	0.0500	1.105	9392	2.910	36300	0.0363	0.741
4	RP-2110	2460	3.080	115300	0.1153	1.200	9481	2.908	79700	0.0797	0.300
5	RP-2220	2465	2.953	51400	0.0514	1.045	9402	2.930	37000	0.0370	0.700

Reference: Document from the MIKON 2004 Conference, titled: 700 MHz SPLIT POST DIELECTRIC RESONATOR FOR MEASUREMENTS OF THE COMPLEX PERMITTIVITY OF MATERIAL

Typical Physical Properties and Performance Characteristics	For typical physical and performance characteristics of	refer to technical data pages for 3M™ Polyurethane Protective Tape:
	SJ8542HS	8542HS
	SJ8545HS	8545HS
	SJ8641	8641
	SJ8663	8663
	SJ8663HS	8663HS
	SJ8667HS	8667HS
	SJ8671	8671
	SJ8672	8672
	SJ8681HS	8681HS
	SJ8667	8667
	SJ8674	8674

**Suggested Surface Preparation Procedures**

Although this procedure refers to a “radome” structure, the procedure is valid for other types of structures such as wing tips, drop tanks, navigational light lens, etc. Please ensure products meet all applicable specifications, standards, and maintenance manual requirements for the platform being worked on and validate all aircraft approvals against current technical documentation.

The radome must be in good condition before a boot is applied. The surface must be smooth without dirt or paint “nibs”. If defects are present in the paint, lightly sand the paint with 320 grit sandpaper. If there is a multicolor paint scheme on the radome insure that there are no paint edges to interfere with the adhesion of the boot in these areas. Paint lines can be minimized by the use of Scotch® Fine Line Tape 218 during the paint process. Paint lines can be reduced after paint cure by light sanding with 320 grit sandpaper. Loss of gloss during any sanding process will not be noticeable after the boot is applied. Freshly painted radomes, should be allowed to cure or dry for a minimum of 48 hours at 72°F (22°C) before applying a boot. Paint cure can be accelerated by baking the radome at 150°F (66°C) for 8 hours. Please check with paint manufacturer for the correct cure time and conditions.

**Removal of Existing Boot**

Lift edge of the boot and remove by slowly, carefully peeling back the boot at 180° (back against itself). To make the removal easier, soften the adhesive by using a wallpaper steamer or use hot water and a sponge. Warm the boot to approximately 120°F [49°C]. 3M™ Tape and Residue Remover can also be used to remove the Boot in its entirety.



### Suggested Installation Procedures

Note: This installation procedure does not apply to 3M™ Polyurethane Protective Boot SJ8641. See SJ8641 authorizing installation documents.



#### Step 1

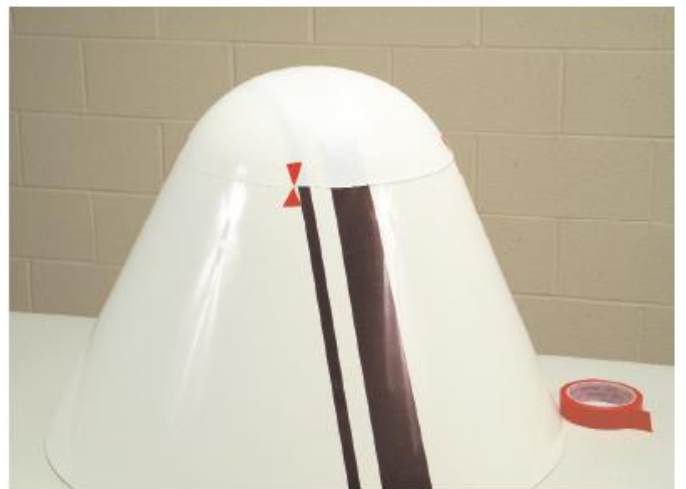
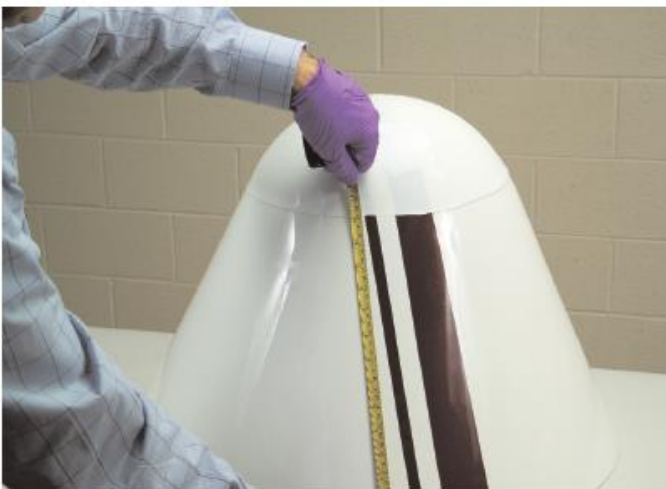
Make sure hands are clean and free of oils and grease. Clean the radome/part and the boot (top side and bottom side) with 3M™ Protective Tape Application Solution to remove the white powder. This will ensure maximum adhesion.

Note: Use a clean, lint-free, silicone-free cloth or cheese cloth. Do not use shop rags as they might be contaminated with silicones.

#### Step 2

Trim the boot with a pair of scissors about ¼ inch above the trim line (trim line is usually located 1/2 inch above the base) that is found on most boots. Make clean, smooth cuts - avoid jagged edges.

Note: To document the installation in the aircraft log books, save the boot identifier tag that is on the base of the boot.



#### Step 3

Position the boot over the radome/part (adhesive/white liner side down against radome/part). Measure distance from the bottom of the boot to the base of the radome/part at several points around the circumference to ensure it is centered and properly positioned.

**Step 4**

Use 3M™ Vinyl Tape 471 to mark three index points on the radome/part (one on the top of the radome and two on the sides approximately 90° apart) clearly establishing the top, center point, so the boot can be repositioned properly. Then mark the three index points on the boot aligned with the marks on the radome.

**Step 5**

Remove the boot from the radome/part and turn the boot inside out taking care not to wrinkle the boot.



**Step 6**

Spray the radome/part and boot with 3M Application Solution. Then place the boot back on the radome (liner will be facing up). Using thumb nail, lift edge of liner from the boot to expose a small portion of adhesive. Spray 3M Application Solution on the adhesive. When removing the remainder of the liner, continuously spray 3M Application Solution on the exposed boot.

Note: Using the radome/part as a holder for the boot is important when removing the liner. This prevents the boot from sticking to itself - making it unusable.



**Step 7**

Remove the 3M™ Polyurethane Protective Boot from the radome/part, turn inside out again. The adhesive side should be facing the radome/part. Heavily spray radome/part and boot with 3M™ Protective Tape Application Solution allowing for easy repositioning. The more 3M Application Solution used, the easier the application will be.

**Step 8**

Apply the boot to the radome/part taking care to match the index points at the top and sides of the radome. Reposition and reapply 3M Application Solution as needed until proper fit is achieved.



**Step 9**

Reapply 3M Application Solution to the outside of the boot. Starting at the center of the radome/part, use 1-2 inch strokes with the squeegee provided with the boot to smooth out the boot - removing the trapped 3M Application Solution and air bubbles. Apply only light pressure to squeegee.

**Step 10**

Continue using short strokes working your way down to the base. If a bubble is trapped, carefully peel boot back, reapply 3M Application Solution and use squeegee to re-adhere. Use a clean, lint-free, silicone-free cloth to absorb the liquid at the edges of the boot. This helps the edge of the boot to stay attached to the surface of the radome/part. Remove index markings.

Note: Small bubbles (>1/8 inch) will evaporate by themselves in less than one week. These small bubbles can be removed by using a small 1 cc syringe if necessary; however, this procedure should be kept to an absolute minimum and should not be used in the center, blunt frontal area of the boot.



### Step 11

Dry the surface of the boot with a clean cloth. If the boot is installed on an aircraft, allow to dwell 6 to 8 hours at 70°F (21°C) before flight. If an edge sealer is used, please follow the TDS recommended cure time.

### Special Note for Treatment of Diverter Strips on Aircraft Radomes

If static diverters are present on the radome, either segmented or solid diverters, you must not cover them with the 3M™ Polyurethane Protective Boot. Apply the 3M Boot as described on pages 3 & 4, then carefully trim the material of the 3M Boot from the edge of the diverter strip using small scissors. Take extreme caution not to score or cut or otherwise damage the paint on the radome. When this trimming operation is complete, finish by neatly applying 3M™ Scotch-Weld™ Repair Paste RP-2110 to seal the edges of the 3M boot to the radome around the cutout for the diverter. Masking tape works well to insure a neat application of the edge sealant.

### Painting

3M Polyurethane Protective Boots may be painted --see 3M™ Technical Bulletin Polyurethane Protective Tape, Paint Instructions (70-0702-6358-0).

### Erosion Protection Boots and Pre-Cut Protection Patches Information

For more information regarding 3M Solutions for Erosion Protection Boots and Pre-Cut Protection Patches, please visit our web site: <https://www.3m.com/boots>. If you require a custom 3M Boot or Patch, please follow the instructions in the link: "[Request a custom sized boot here.](#)" located in the web page above.

### Authorization to Use

Ensure products meet all applicable specifications, standards, and maintenance manual requirements for the platform being worked on and validate all aircraft approvals against current technical documentation.

### Environmental Health and Safety

- 3M™ Polyurethane Protective Boots are 100% solids and contain no hazardous air pollutants (HAPs).
- This product is considered to be an article.
- Before handling any chemical products, always read the container label and the SDS.
- When using solvents, extinguish all ignition sources, including pilot lights. Read and follow manufacturer's warnings and directions for use.
- Local air quality regulations may regulate or prohibit the use of surface preparation and cleaning materials based on solvent (VOC) content.

### Shipping and Storage

No special/hazardous labeling or packaging required and no regulations for air, ground or water shipment for this product. Keep boot in a clean area, away from excessive moisture and out of direct sunlight. Store boots in the shipping carton. Return unused boots to the shipping carton. Shelf life: Two (2) years from date of manufacture.

### Precautionary Information

Refer to product label and Safety Data Sheet (SDS) for health and safety information before using this product. For SDS and/or other regulatory documents visit our website [https://www.3m.com/3M/en\\_US/company-us/SDS-search/](https://www.3m.com/3M/en_US/company-us/SDS-search/).

### Additional Information

In the U.S. call toll free 1-800-235-2376, or fax 1-800-435-3082 or 651-737-2171. For U.S. Military, call 1-866-556-5714. If you are outside of the U.S., please contact your nearest 3M representative.

Technical Data Sheet  
3M™ Polyurethane Protective Boots

*These products are manufactured under a 3M Quality Management System registered to the AS9100 standard*

**Technical Information:** The technical information, guidance, and other statements contained in this document or otherwise provided by 3M are based upon records, tests, or experience that 3M believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed. Such information is intended for people with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license under any 3M or third party intellectual property rights is granted or implied with this information. **Product Selection and Use:** Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. As a result, customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment and reviewing all applicable regulations and standards (e.g., OSHA, ANSI, etc.). Failure to properly evaluate, select, and use a 3M product and appropriate safety products, or to meet all applicable safety regulations, may result in injury, sickness, death, and/or harm to property. **Warranty, Limited Remedy, and Disclaimer:** Unless a different warranty is specifically stated on the applicable 3M product packaging or product literature (in which case such warranty governs), 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If a 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price. **Limitation of Liability:** Except for the limited remedy stated above, and except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity), regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability.



Automotive & Aerospace Solutions Division  
3M Center  
St. Paul, MN 55144-1000  
Phone 1-800-328-1684  
Web [www.3M.com/aerospace](http://www.3M.com/aerospace)

Issue date: 4/2019

3M, Scotch and Scotch-Weld are trademarks of 3M Company. All other trademarks are the property of their respective owners.  
© 3M 2019. All rights reserved.