**BOMBARDIER**
*Toronto Site*
**PROPRIETARY INFORMATION**

# PPS 16.27

**PRODUCTION PROCESS STANDARD**

# APPLICATION OF POLYURETHANE PROTECTIVE TAPE AND RADOME BOOTS

Issue 4
- This standard supersedes PPS 16.27, Issue 3.
- Vertical lines in the left hand margin indicate technical changes over the previous issue.
- Direct PPS related questions to christie.chung@aero.bombardier.com or (416) 375-7641.
- This PPS is effective as of the distribution date.

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## 1 SCOPE

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for applying polyurethane protective radome boots and polyurethane protective tape to aircraft exterior surfaces and clear polycarbonate lens covers to protect against rain and particle erosion.

1.1.1 This PPS complements the engineering drawings that specify its use as an authorized instruction. The procedure specified in this PPS shall be followed to ensure compliance with all applicable specifications. In general, if this PPS conflicts with the engineering drawing, follow the engineering drawing. The requirements specified in this PPS are necessary to fulfil the engineering design and reliability objectives.

1.1.2 Refer to PPS 13.26 for the subcontractor provisions applicable to this PPS.

1.1.3 Procedure or requirements specified in a Bombardier BAPS, MPS, LES or P. Spec. do not supersede the procedure or requirements specified in this PPS. Similarly, the procedure and requirements specified in this PPS are not applicable when use of a BAPS, MPS, LES or P. Spec. is specified.

## 2 HAZARDOUS MATERIALS

2.1 Before receipt at Bombardier Toronto, all materials shall be approved and assigned Material Safety Data Sheet (MSDS) numbers by the Bombardier Toronto Environment, Health and Safety Department. Refer to the manufacturer's MSDS for specific safety data on any of the materials specified in this PPS. If the MSDS is not available, contact the Bombardier Toronto Environment, Health and Safety Department.

## 3 REFERENCES

3.1 PPS 13.26 - General Subcontractor Provisions.

3.2 PPS 31.17 - Solvent Usage.

3.3 PPS 34.11 - Priming and Painting of DASH 8 Aircraft Exterior Surfaces.

## 4 MATERIALS AND EQUIPMENT

### 4.1 Materials

4.1.1 Adhesive cleaner, 3M #8984 or DuPont #3919S.

4.1.2 Abrasive paper, 3M (400 grit aluminum oxide).

4.1.3 Adhesion promoter, 3M #86.

4.1.4 Masking tape, 1/2" and 1" wide.

4.1.5 Polyurethane protective radome boot (PPRB), 3M SJ-8665, dimensions pre-formed to the contour of the aircraft radome.

4.1.6 Polyurethane protective tape (PPT), 3M outdoor grade #8671, dimensions pre-cut to engineering drawing with thickness of 0.014".

4.1.7 Polyethylene tape, coloured, Tesa 51136.

4.1.8 Scotch-Brite pads, 3M #7447 maroon.

4.1.9 Wetting solution, 25% isopropyl alcohol, 75% water with 8 drops/litre of household liquid dish detergent.

### 4.2 Equipment

4.2.1 Marking pen, water soluble felt tip.

4.2.2 Plastic squeeze bottle (e.g., 3M PA-1).

4.2.3 Spray bottle, approximately1/2 litre capacity.

## 5 PROCEDURE

### 5.1 General

5.1.1 Polyurethane protective tape (PPT) is used to protect aircraft exterior surfaces and clear polycarbonate lens covers from rain and particle erosion.

5.1.2 Polyurethane protective radome boots (PPRB) are used to protect painted radomes of DASH 8 aircraft from rain and particle erosion.

5.1.3 Polyethylene tape is used to protect PPT on the lens covers before installation. The polyethylene tape shall be carefully removed before aircraft flight. Do not scratch the PPT during removal of polyethylene tape.

5.1.4 Do not apply PPT or PPRB until the aircraft exterior paint has fully cured according to PPS 34.11.

5.1.5 Do not apply PPT or PPRB when the temperature of the PPT, PPRB or application surface is below 60°F.

5.1.6 Apply small sections (less than 36 $in^2$) or simple shapes of PPT dry according to paragraph 5.3.1. Apply large sections (36 $in^2$ or above) or intricate shapes of PPT wet according to paragraph 5.3.2. Wet installation prevents pre-adhesion which can result in creases and air bubbles in the tape.

5.1.7 Prepare polycarbonate lens covers according to paragraph 5.2.1. Apply PPT to completely cover the lens according to paragraph 5.3.1 or paragraph 5.3.2.

### 5.2 Preparation of Surfaces

5.2.1 Prepare the surface of polycarbonate lens covers as follows:

Step 1. Mask-off the area surrounding the application surface using 1" wide masking tape.

Step 2. Solvent clean the surface according to PPS 31.17.

5.2.2 Solvent clean prepare painted radome exterior surfaces according to PPS 31.17.

5.2.3 Prepare painted exterior surfaces as follows:

Step 1. Mask-off the area surrounding the application surface using 1" wide masking tape.

Step 2. Wipe the surface using a clean cotton cloth saturated with adhesive cleaner.

Step 3. Solvent clean the surface according to PPS 31.17.

Step 4. Lightly abrade the surface with abrasive paper.

Step 5. Lightly abrade the surface with a Scotch-Brite pad.

Step 6. Solvent clean the surface according to PPS 31.17.

Step 7. If specified on the engineering drawing apply a thin even coat of adhesion promoter with a suitable size brush. Use the minimum amount necessary to ensure complete coverage. Allow the promoter to air dry for a minimum of 20 minutes but no more than 1 hour before applying the PPT.

### 5.3 Application of Polyurethane Protective Tape (PPT)

5.3.1 Apply polyurethane protective tape (PPT) to simple shapes or small sections (less than 36 $in^2$) using the dry application procedure as follows:

Step 1. Remove the liner from the adhesive side of the PPT. If the tape is long and narrow, remove short sections of the liner (approximately 12") at a time.

Step 2. Align the PPT on the application surface and press one edge to the painted surface.

Step 3. Apply firm overlapping strokes to the PPT using a plastic squeegee to ensure intimate contact with the surface.

Step 4. If there are entrapped air bubbles, remove the bubbles by puncturing one end of the air bubble with a pin and remove the air through the pin hole using a plastic squeegee.

Step 5. Apply a sheet of polyethylene tape (paragraph 4.1.7) completely over the PPT to protect the tape from scratches during transport.

5.3.2 Apply polyurethane protective tape (PPT) to intricate shapes or large sections (greater than 36 $in^2$) using the wet application procedure as follows:

Step 1. Remove the liner from the adhesive side of the PPT.

Step 2. Spray wetting solution on the application surface and the PPT's adhesive surface to prevent the squeegee from sticking.

Step 3. Apply the PPT from the top and work downward using a plastic squeegee. Use firm overlapping strokes to smooth out the PPT and remove the air bubbles. If there are flush head rivets or butt joints between skin panels on the application surface, ensure air bubbles and wetting solution are removed completely.

Step 4. Dry excess wetting solution from the surface of the PPT and surrounding structure using a clean cloth. Do not use alcohol to clean or dry the PPT's surface as this would dull the surface.

Step 5. Allow the PPT to air dry for 16-24 hours and check for entrapped air bubbles. If there are entrapped air bubbles, puncture one end of the air bubble with a pin and remove the air through the pin hole using a plastic squeegee.

Step 6. Apply a sheet of polyethylene tape (paragraph 4.1.7) completely over the PPT to protect the tape from scratches during transport.

## 5.4 Application of Polyurethane Protective Radome Boots (PPRB)

5.4.1 Apply polyurethane protective radome boots (PPRB) using the wet application procedure as follows:

Step 1. Place an orientation mark on the centre of the radome tip using a marking pen.

Step 2. Position the PPRB over the radome leaving the adhesive liner in the PPRB intact and rotate the PPRB to determine the optimum fit.

Step 3. Trace the orientation mark applied to the radome surface onto the exterior surface of the PPRB.

Step 4. Turn the PPRB inside out and place it over the radome disregarding the orientation marks.

Step 5. Remove the adhesive liner and completely saturate the exposed adhesive surface with wetting solution.

Step 6. With the adhesive side facing downward, place the PPRB over the radome and align it to the orientation marks.

Step 7. After proper alignment, squeegee the surface of the PPRB starting at the top centre and work down and outward using firm overlapping strokes to smooth out the PPRB and remove the air bubbles.

Step 8. Allow the PPRB to air dry for 16-24 hours and check for air bubbles. If there are entrapped air bubbles, remove the bubbles by puncturing one end of the air bubble with a pin and remove the air through the pin hole using a plastic squeegee.

Step 9. Mask the outside circumference near the bottom of the PPRB to provide a trim line at the base of the radome using 1/2" masking tape.

Step 10. Trim away excess PPRB material along the top edge of the masking tape using a suitable trimming knife. Use extreme caution not to damage the surrounding painted exterior surface.

## 6 REQUIREMENTS

6.1 Ensure that there are no air bubbles trapped between the PPT or PPRB and the application surface.

6.2 Ensure that PPT or PPRB is firmly adhered to the application surface.

6.3 Ensure that the PPT or PPRB are free of scratches, blisters, wrinkles or other damage.

## *7 SAFETY PRECAUTIONS*

*7.1 Safety precautions applicable to the materials and procedures specified herein shall be defined by the subcontractor performing the work for Bombardier Toronto.*

## 8 PERSONNEL REQUIREMENTS

8.1 Personnel responsible for the application of polyurethane protective tape or radome boots shall have a good working knowledge of the applicable procedure and requirements as specified herein and shall have exhibited their competency to their supervisor.