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

# PPS 16.28

**PRODUCTION PROCESS STANDARD**

# APPLICATION OF UNPAVED RUNWAY PROTECTIVE TAPE

Issue 8
- This standard supersedes PPS 16.28, Issue 7.
- Vertical lines in the left hand margin indicate changes over the previous issue.
- Direct PPS related questions to PPS.Group@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 the application of DSC 472 unpaved runway protective polyurethane tape.

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 13.13 - Personal Protective Respiratory Equipment.

3.2 PPS 13.26 - General Subcontractor Provisions.

3.3 PPS 13.28 - Storage Life of Adhesives, Sealants, Paints and Composite Products.

3.4 PPS 21.20 - Mixing and Handling Two-Part Sealants.

3.5 PPS 31.17 - Solvent Usage.

3.6 PPS 34.08 - Application of Epoxy-Polyamide Primer (F19 & F45).

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

3.8 PPS 34.16 - Application of Urethane Compatible Primer (F23).

## 4 MATERIALS AND EQUIPMENT

### 4.1 Materials

4.1.1 DSC 472 underbelly protective tape. DSC 472 tape is supplied in rolls approximately 24" wide, with 2" wide removable liner strips running lengthwise.

4.1.2 3M 86A Adhesion Promoter.

4.1.3 Masking tape, 1/2" width.

4.1.4 Sealant, 2 part epoxy, DP-420 supplied in Duo-Pak cartridge, 3M Co.

4.1.5 Sealant, DHMS S3.01 Type I or Type II sealant (i.e., PR 1422 or PR 1776, PRC-DeSoto International).

4.1.6 Abrasive paper, aluminum oxide, 180-240 grit size.

### 4.2 Equipment

4.2.1 Wiping cloths (e.g., DSC 378).

4.2.2 Tack rags (e.g., DSC 375-1).

4.2.3 Abrasive pads (e.g., 3M Canada Ltd. Type A Fine (maroon colour) Scotch-Brite).

4.2.4 Plastic squeegee (e.g., 3M PA-1).

4.2.5 Scissors.

4.2.6 Straight edge.

4.2.7 Suitable trimming knife.

4.2.8 Temporary marker.

4.2.9 Sealant applicator, Scotch-Weld EPX, 3M Co.

4.2.10 Spatula (e.g., SD9164).

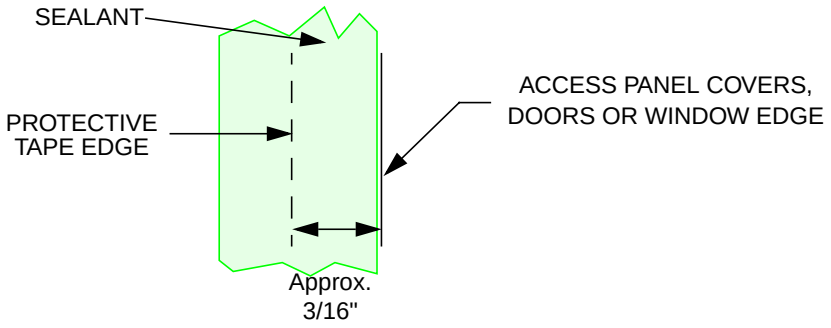
## 5 PROCEDURE

### 5.1 General

5.1.1 If specified on the engineering Paint Scheme Drawing, apply DSC 472 unpaved runway protective tape to F19 or F23 primed surfaces, at the specified locations, before the application of F24 decorative topcoat.

5.1.2 If the aircraft has been painted with an F24 topcoat before the application of the DSC 472 protective tape, apply the protective tape according to section 5.6.

5.1.3 Allow approximately 3/16" gap between the edge of the protective tape and access cover panel, door or window edge to allow for edge sealing.




## 5.2 Preparation of Aircraft

5.2.1 Prepare the aircraft for tape application as follows:

Step 1. If it has not already been done, either F19 prime according to PPS 34.08 or F23 prime according to PPS 34.11 the surface to which DSC 472 protective tape is to be applied. Allow F19 or F23 primed surface to cure for a minimum of 4 hours at room temperature.

Step 2. Apply a strip of 1/2" wide masking tape around the entire perimeter of the tape application area.

Step 3. Prepare F19 primed surface according to paragraph 5.2.1.1 for tape application. If F23 primed, prepare surface according to paragraph 5.2.1.2 for tape application.

5.2.1.1 Prepare F19 primed surface for tape application as follows:

Step 1. Roughen the surface of the F19 primer by scuffing all surfaces with aluminum oxide abrasive paper (180 grit for vibrating sanders, 220 grit for hand abrading). Pay particular attention to areas around protruding head fasteners, inside corners, etc. Take care not to penetrate the primer coating and damage the pre-treatment underneath.

Step 2. Dust off scuffed areas using a clean cloth.

5.2.1.2 Prepare F23 primed surface for tape application as follows:

Step 1. If the tape is to be applied within 24 hours of application of F23 primer, ensure surface is free of contaminants. If necessary, wipe with a clean lint-free cloth. If the tape is not to be applied over the F23 primed surface within 24 hours, scuff the F23 primed surface using Scotch-Brite abrasive pads, solvent clean according to PPS 31.17, and apply a mist coat of F23 primer. Allow the mist coat of primer to air dry for a minimum of 2 hours before applying the DSC 427 protective tape.

### 5.3 Preparation of Sealant

5.3.1 Prepare DP-420 sealant as follows:

Step 1. Insert a Duo-Pak of DP-420 sealant into the EPX sealant applicator. Lightly depress the applicator trigger to seat the applicator plunger into the cartridge cylinders. The DP-420 cartridge is designed to apply a 2:1 base/accelerator mix ratio.

Step 2. Remove the cartridge cap and expel a small amount of sealant to ensure both base and accelerator are flowing freely.

Step 3. Attach the EPX mixing nozzle to the cartridge and depress the applicator trigger to force the sealant components through the automatic mixing nozzle. Mixed DP-420 sealant has a working life of 20 minutes. After such time, remove and discard EPX mixing nozzles containing mixed sealant.

5.3.2 Prepare DHMS S3.01 sealants according to PPS 21.20.

### 5.4 Application of Protective Tape

5.4.1 Apply the protective tape as follows:

Step 1. Apply 3M 86A Adhesion Promoter to leading edge and the perimeter of the tape application area (inner edge of the masking tape) in 3" wide strip. Allow 20 minutes to dry.

Step 2. Cut the protective tape into 72" lengths (Note that the 72" length pieces are for the underbelly area, for areas other then the underbelly, measure and pre-cut the required length plus 8"). Do not pre-cut more than one piece at a time.

Step 3. Leaving the liner strips in place, lay-out the tape across the width of the aircraft underbelly in the area to which it will be applied to determine if any trimming around protrusions (e.g., antennae) is required. Butt the protective tape ends against the masking tape edges leaving a maximum gap of 3/16".

Step 4. If a protrusion is encountered during lay-out of a tape section, leave the liner backing on the tape and use a temporary marker to mark the location of the protrusion on the tape surface. Cut a hole in the tape at the location of the protrusion that is slightly smaller than the protrusion itself. When applying the tape, ensure that the protrusion fits squarely through the hole in the tape.

Step 5. Apply the first section of tape approximately halfway between the front and rear of the underbelly application area, to an area of the underbelly where no protrusions are encountered. Align the piece with a row of rivets to assure proper placement.

Step 6. Move across the width of the tape, progressively pulling back sections of liner and squeegee the tape onto the aircraft structure.

Step 7. Apply subsequent tape sections moving toward the front and rear of the aircraft. Butt the tape sections against each other with a maximum gap of 3/16".

Step 8. When the front and rear edges of the application area are reached, use a straight edge and a temporary marker to mark a trim line on the surface of the tape corresponding to the inner edge of the masking tape. Cut off the excess tape using scissors. Use extreme care while trimming to avoid scratching the aircraft surface.

Step 9. Trim the excess protective tape from the sides of all protrusion to a maximum distance of 3/16" from the sides of the protrusion along the underbelly/aircraft surface (see Figure 1). Use extreme care during trimming to avoid scratching the surface of the aircraft structure or protrusion.

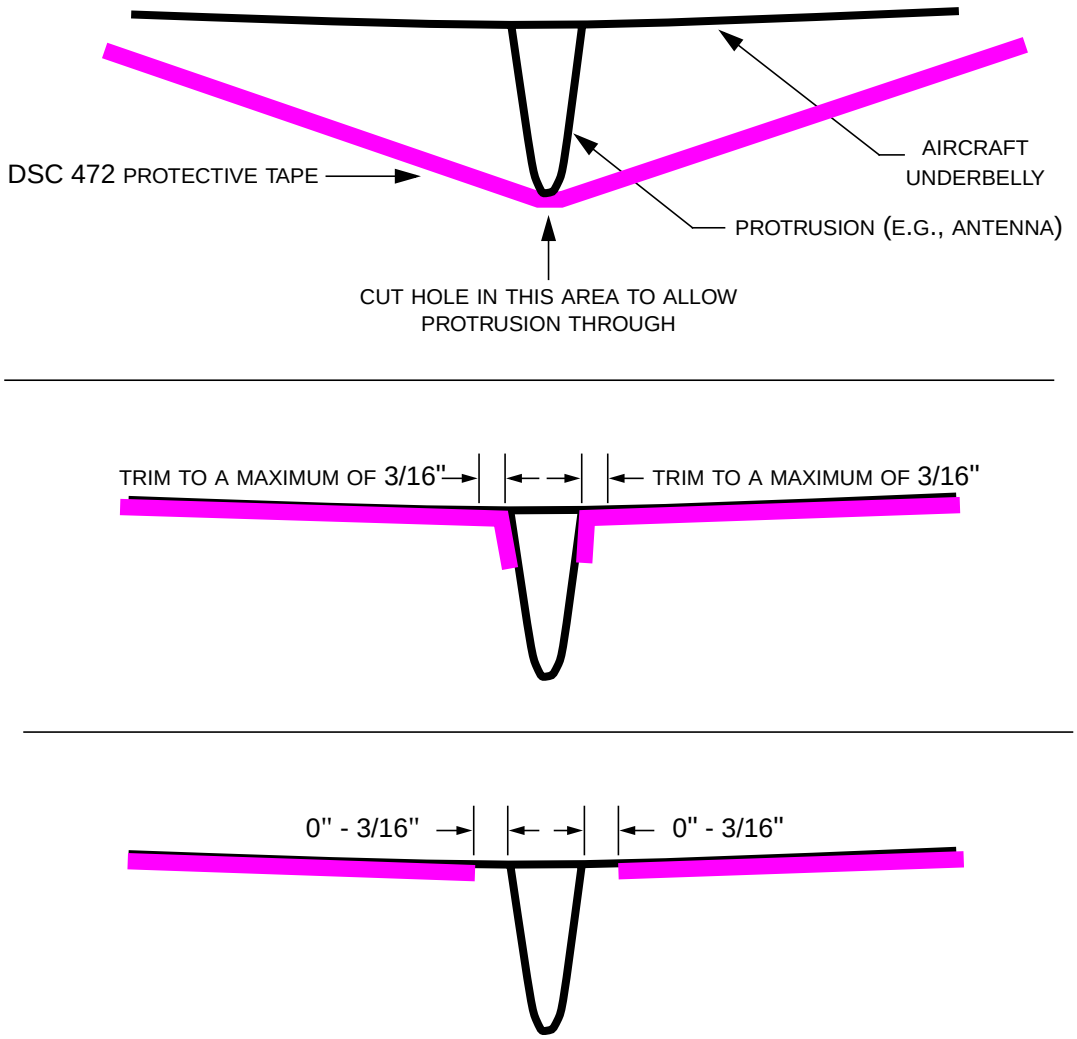



**FIGURE 1 - TRIMMING AROUND UNDERBELLY PROTRUSIONS**

Step 10. If a section of tape covers access panel covers or doors, slit the tape at the gap between the structure and the cover or door.

Step 11. Cut out wrinkles or folds in the applied tape and splice in a matching piece. Maintain a maximum gap of 3/16" around the splice.

Step 12. Remove and discard misaligned sections of tape and remove any residual sealant from the surface by solvent cleaning according to PPS 31.17 and, if necessary, scrape with a plastic spatula. After all the residual sealant has been removed, apply another section of tape.

Step 13. Edge seal gaps around protrusions, butt joints between tape sections and the perimeter of the applied tape according to section 5.5.

5.4.2 If the engineering Paint Scheme Drawing specifies the application of the protective tape to extend beyond the underbelly (i.e., up to the window area), apply protective tape to such areas only after the completion of the underbelly tape application. Trim as necessary around the window area taking extreme care during trimming to avoid scratching the surface of the aircraft structure or window.

### 5.5 Edge Sealing

5.5.1 Edge seal the protective tape as follows:

Step 1. Remove masking tape from the perimeter of the protective tape application area.

Step 2. Solvent clean the DSC 472 tape surface around protrusions, at edges and on both sides of butt joints, according to PPS 31.17.

Step 3. Apply DP-420 or DHMS S3.01 sealant around protrusions, butt joints between tape sections and the perimeter of the applied tape in approximately 3 foot increments. Avoid air entrapment in the sealant bead.

Step 4. Use a spatula to smooth out the sealant. Fair the sealant applied around the perimeter of the applied tape to form a fillet no more than 0.010" above the surface of the DSC 472 protective tape. Ensure that the sealant applied to butt joints between tape sections is within ± 0.010" flush with the surface of the DSC 472 protective tape.

Step 5. Remove excess sealant on the tape surface by solvent cleaning according to PPS 31.17.

Step 6. Allow the sealant to cure to tack free before painting according to PPS 34.11 (approximately 1 hour for DP-420, refer to PPS 21.20 for the tack free cure time for DHMS S3.01 sealant).

### 5.6 Application of Tape to F24 Painted Aircraft

5.6.1 For aircraft that have been F24 painted before application of DSC 472 tape, apply the tape as follows:

Step 1. Scuff sand the F24 topcoat to remove all gloss (i.e., remove approximately 50% of topcoat) using abrasive paper.

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

Step 3. Apply F19 primer according to PPS 34.08 or F23 intermediate primer according to PPS 34.16.

Step 4. Apply a strip of 1/2" wide masking tape around the entire perimeter of the tape application area.

Step 5. Apply DSC 472 tape according to section 5.4.

### 5.7 Painting DSC 472 Protective Tape

5.7.1 Paint the DSC 472 unpaved runway protective tape according to PPS 34.11.

## 6 REQUIREMENTS

6.1 Applied tape shall be free from wrinkles, folds and air bubbles.

6.2 The maximum gap between sections of applied tape and around protrusions shall be 3/16".

6.3 Fillets of sealant around the tape perimeter shall fair into the surrounding structure and shall be a maximum of 0.010" above the tape surface.

6.4 Sealant applied to butt joints shall be within ± 0.010" flush with the surface of the tape.

6.5 Sealant shall not overlap access panel covers, doors or window edges.

## *7 SAFETY PRECAUTIONS*

*7.1 Observe standard plant safety precautions when performing the procedure specified herein.*

*7.2 Refer to PPS 31.17 for the safety precautions for handling and using solvents.*

*7.3 Operators shall wear protective respiratory equipment according to PPS 13.13 when working with sealants.*

*7.4 Supply sufficient ventilation when using sealants in confined areas.*

*7.5 Keep sealants away from fire and other sources of ignition.*

*7.6 Smoking or eating is not permitted in areas where sealants are being used.*

*7.7 Avoid ingestion of sealants. If ingestion has occurred, obtain medical attention immediately.*

*7.8 Avoid skin contact with sealants. If contact occurs, wash the affected area thoroughly with soap and water. Should accidental eye contact occur, flush the eyes immediately with large quantities of water and report to the Health Centre.*

## 8 PERSONNEL REQUIREMENTS

8.1 Personnel responsible for the application of DSC 472 unpaved runway protective polyurethane tape to aircraft underbellies shall have a good working knowledge of the applicable procedure and requirements as specified herein and shall have exhibited their competency to their supervisor.

## 9 STORAGE

9.1 Store DSC 472 protective tape and DP-420 sealant in a dry area at a temperature of 60°F to 80°F.

9.2 Store DSC 472 protective tape in boxes, away from direct light.

9.3 Store DHMS S3.01 sealants according to PPS 21.20.

9.4 Storage life of DSC 472 protective tape, 3M 86A adhesion promoter, DHMS S3.01 sealants and DP-420 sealant shall be according to PPS 13.28.

9.5 Store F19 primer according to PPS 34.08.

9.6 Store F23 primer according to PPS 34.16.