BOMBARDIER
Toronto (de Havilland)
PROPRIETARY INFORMATION

PPS 13.27

PRODUCTION PROCESS STANDARD

Trimming and Repair of Insulation Blankets

Issue 8
- This standard supersedes PPS 13.27, Issue 7.
- Vertical lines in the left hand margin indicate technical changes over the previous issue.
- This PPS is effective as of the distribution date.
- Validation of issue status is the responsibility of the user. Signed original on file.

- This standard specifies manufacturing processes which are critical to the lightning protection and Transport Canada certification of Bombardier aircraft.
- It is imperative that the procedure specified herein be strictly adhered to.
- The current issue of this PPS and any subsequent revisions to the procedure and requirements specified herein must be authorized by an undersigned Transport Canada design approval designee (DAD).

Stan Giri (Stan Giri, DAD 275) October 28, 2016
Flammability

Approved By:
Hamid Reza (Hamid Reza) November 4, 2016
Systems Engineering

Bruce Campbell (Bruce Campbell) November 16, 2016
Materials Technology

Stephen Pitt (Stephen Pitt) November 17, 2016
Quality

Prepared By:
Michael Wright (Michael Wright) October 28, 2016
Production Process Standards

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1 Scope

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for trimming and repair of primary, outboard, insulation blankets (or insulation “bricks”) and secondary, inboard “top cover” insulating blankets, as required.

1.1.1 This PPS complements the engineering drawings that specify its use as an authorized instruction. The procedure specified in this PPS must 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.

2 Hazardous Materials

2.1 Before receipt at Bombardier Toronto (de Havilland), all materials must be approved and assigned Material Safety Data Sheet (MSDS) numbers by the Bombardier Toronto (de Havilland) 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 (de Havilland) Environment, Health and Safety Department.

3 References

3.1 General

3.1.1 Unless a specific issue is indicated, the issue of the reference documents specified in this section in effect at the time of manufacture shall form a part of this specification to the extent indicated herein.

3.2 Bombardier Toronto (de Havilland) Specifications

3.2.1 PPS 13.26 - General Subcontractor Provisions.

3.2.2 PPS 38.02 - Installation of Heating and Insulating Blankets.

4 Materials and Equipment

4.1 Materials

4.1.1 Unless otherwise specified in this section, use only the materials specified; use of superseding or alternative materials is not allowed.

4.1.2 Insulation tape, 2.0" width typ. (for special applications a wider width tape may be used), as specified below:

- DSC 91-21 (white) Tedlar tape, flame retardant, pressure sensitive.
- DSC 91-23 (opaque white) polyether ether ketone (PEEK) tape, reinforced, pressure sensitive.
- DSC 91-26 (dull white) polyether ether ketone (PEEK) tape, reinforced, pressure sensitive.

4.2 Equipment

4.2.1 Blanket cutting kit - scissors, profiling knife, straight edge or ruler, electric iron, black marker, black pen and tape measure.

5 Procedure

5.1 General

5.1.1 For the purposes of this PPS, wherever the term “insulation bricks” is used this should be understood to indicate primary, outboard, insulating blankets.

5.1.2 For the purposes of this PPS, wherever the term “top cover insulation blankets” is used this should be understood to indicate secondary, inboard, insulation blankets.

5.1.3 For the purposes of this PPS, wherever use of insulation tape” is specified, use only insulation tape specified in para. 4.1.2.

5.1.4 Except for trimming or cutting of fire barrier material (see para. 5.1.4.1), trimming and repair of top cover insulation blankets and insulation bricks may be performed as specified herein without MRB or RNC authority.

5.1.4.1 Do not trim or cut **fire barrier** material without Flam DAD approval. Fire barrier material is included in all “top cover” insulation blankets below the aircraft centerline, as well as in some of the insulation “bricks” below the aircraft centerline.

5.1.5 Reference to MRB in this PPS includes Bombardier Toronto (de Havilland) Material Review Board and Bombardier Toronto (de Havilland) delegated Material Review Board, only.

5.1.6 Where pieces of bagging film are joined and overlapped, ensure that the insulation tape is centred over the exposed edge of the film to overlap approximately equally onto both pieces of film. Do not apply excessive insulation tape.

5.1.7 When trimming or repairing insulation blankets, ensure that drain holes are not covered by insulation tape or film.

5.1.8 Top cover insulation blankets and insulation bricks are susceptible to damage such as tears and cuts; take care to avoid damage at all times. For compliance with flammability

regulations, in the event of damage which cannot be acceptably repaired (ref. section 5.4) the insulation blanket or brick must be discarded and replaced.

5.2 Trimming of Insulation Bricks

5.2.1 Trim insulation bricks to allow for proper fit and installation on the aircraft as follows:

Step 1. Determine what trimming, if any, is required. Slits and cut-outs may be made as necessary to adjust for clearances or to provide a fit which is tight to the structure.

Step 2. Mark any necessary slits or cut-outs on the insulation brick.

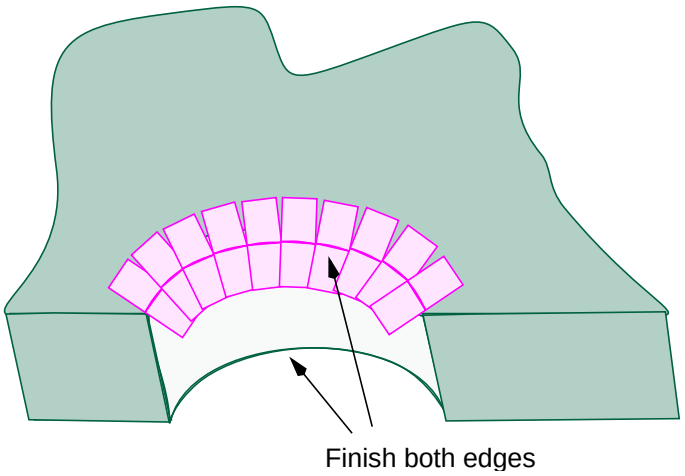
Step 3. Trim the insulation brick as required using scissors and/or a profiling knife. When cutting the bagging film, it is recommended that the cuts be made so that as much as possible the bagging film may be folded down over the cut edges to assist in covering the cut-outs and minimize the bagging film edges which will need to be sealed using insulation tape. For slits or narrow slots in the insulating brick which can be conveniently sealed using only insulation tape, use of bagging film may not be necessary. It is acceptable for the cut-outs in the insulating brick to be slightly oversize as specified below but no undersize is allowed; take care not to remove too much material:

- Maximum oversize for slits: 1.00" (in length)
- Maximum oversize for cut-outs: 0.25" around perimeter

Step 4. Finish bagging film edges using insulation tape according to para. 5.2.1.1 or para. 5.2.1.2, as applicable. Ensure edges are properly aligned before applying tape. For slits or narrow slots to be sealed using insulation tape, apply the tape according to para. 5.2.1.3.

Step 5. As much as possible, seal film and insulation tape with a 300°F (149°C) electric iron.

5.2.1.1 Finish bagging film edges of radius (curved) cut-outs using slightly overlapping strips of insulation tape approximately as shown in the adjacent figure.



Finishing Film Edges of Radius (Curved) Cut-Outs

5.2.1.2 Finish film edges at the corners of cut-outs using insulation tape as follows:

Step 1. Determine the width and length of insulation tape needed based on the edge to be sealed. Allow approximately 1" extra length of insulation tape to allow approximately ½" overlap on each end of the tape at corners as shown below.

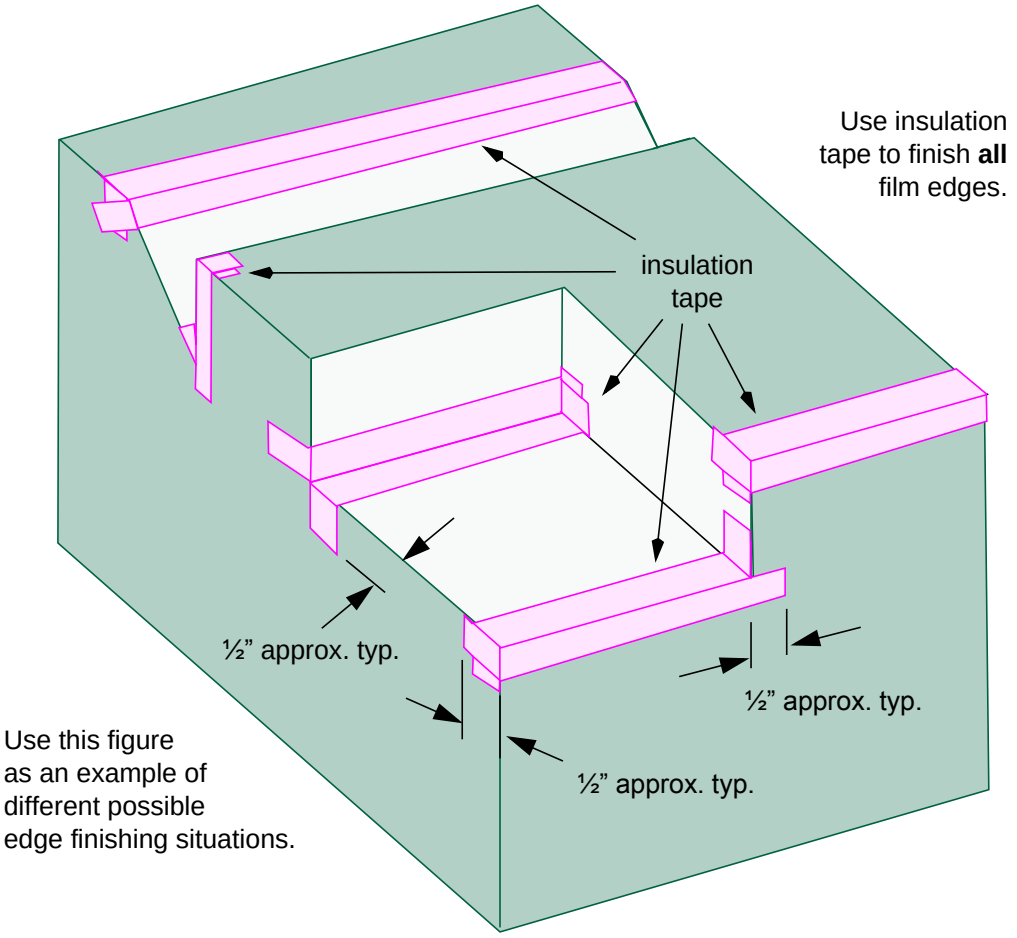


Figure 1. Finishing Film Corner Edges

Step 2. On each end of the length of insulation tape make an approximately ½" lengthwise cut in the centre of the tape as shown below.

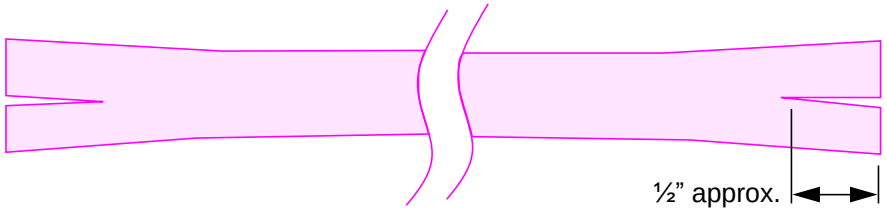


Figure 2. Preparation of Insulation Tape Ends

Step 3. Fold the length of insulation tape in half and peel off the backing from one of the halves.

Step 4. Slide the insulation tape into, or over, the edge to be finished, ensuring a tight fit.

Step 5. Apply the peeled side of the insulation tape to the edge to be finished.

Step 6. Peel off the remaining backing from the insulation tape and apply down.

Step 7. If necessary, fit an aluminum angle into, or over, the edge to be finished, as applicable, and press down on the insulation tape to ensure proper tape adhesion.

5.2.1.3 For slits or narrow slots which can be conveniently sealed using insulation tape, seal all sides of the slit or slot as follows:

Step 1. Determine the width and length of insulation tape needed based on the edge of the slit or slot to be sealed. Allow approximately 1" extra length of tape to allow approximately 1/2"overlap on each end of the tape at corners as shown below.

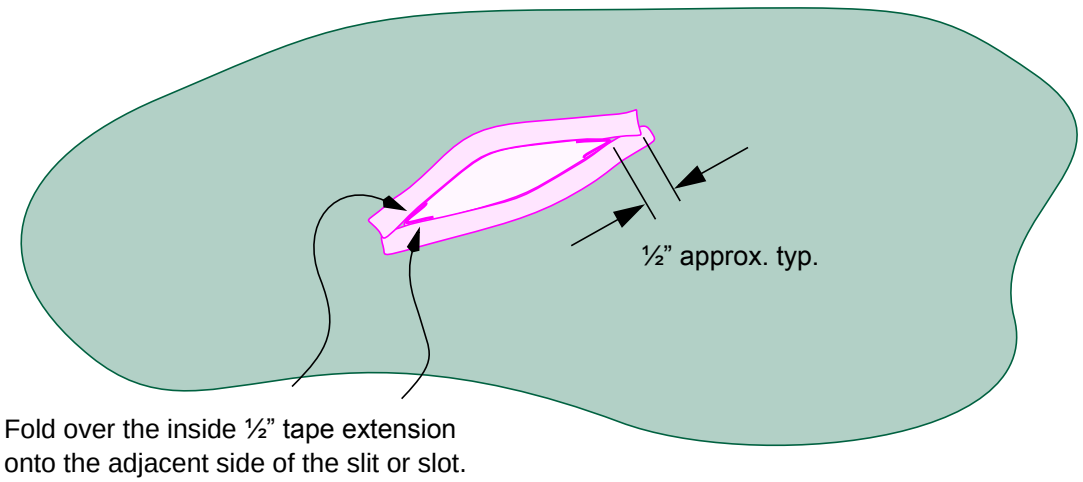


Figure 3. Sealing of Slits and Narrow Slots

Step 2. On each end of the length of insulation tape, make an approximately ½" lengthwise cut in the centre of the tape as shown in Figure 2.

Step 3. Fold the length of insulation tape in half and peel off the backing from one of the halves.

Step 4. Pry open the slit or slot.

Step 5. Slide the un-peeled half of the insulation tape into the slit or slot.

Step 6. When the insulation tape is properly positioned, apply the peeled side of the tape to the bagging film.

Step 7. Peel off the remaining backing from the insulation tape and apply down.

Step 8. Use an aluminum angle to press down on the insulation tape to ensure proper tape adhesion.

Step 9. Repeat as the preceding steps as necessary to completely seal the slit or slot.

5.3 Trimming of Top Cover Insulation Blankets

5.3.1 Unless explicitly otherwise specified on the engineering drawing, trimming of top cover insulation blankets is limited to the flap area of the insulation blanket **only** (i.e., no cut-outs, slits or slots in the core material). Trim only as much of the flap as necessary to fit the insulation blanket properly; do not over trim. Trim the flap using scissors and/or a profiling knife. Refer to PPS 38.02 for the procedure for installation of top cover insulating blankets.

5.3.2 After trimming, finish bagging film edges using insulation tape as follows:

Step 1. Determine the width and length of insulation tape needed based on the edge to be sealed.

Step 2. Fold the length of insulation tape in half and peel off the backing from one of the halves.

Step 3. Slide the insulation tape over the edge to be finished, ensuring a tight fit.

Step 4. Apply the peeled side of the insulation tape to the edge to be finished. Ensure edges are properly aligned before applying tape.

Step 5. Peel off the remaining backing from the insulation tape and apply down.

Step 6. As much as possible, seal film and insulation tape with a 300°F (149°C) electric iron.

5.4 Repair of Tears or Cuts in Bagging Film

5.4.1 MRB or RNC authority is not needed to repair tears or cuts in top cover insulation blanket or insulation brick **bagging film** according to para. 5.4.2 only if **all** of the following conditions are met. If **any** of the specified conditions are not met, the insulating blanket is not acceptable and must be discarded and replaced.

- Ensure that the structural integrity of the insulation bagging material can be maintained by the insulation tape repair, if in doubt refer to MRB for disposition.
- For top cover insulation blankets, there must be no separation of, or damage to, the core material (i.e., if cuts or tears extend through the bagging film to the core material, the insulating blanket is not acceptable and must be discarded and replaced).
- There must be no moisture found within the insulation.

5.4.2 If, and only if, all of the applicable conditions specified in para. 5.4.1 are met, it is acceptable to repair tears or cuts in bagging film using insulation tape as follows:

Step 1. Cut a length of insulation tape approximately 1" longer than the length of the tear.

Step 2. Fold the length of insulation tape in half and peel off the backing from one of the halves.

Step 3. Using the un-peeled half of the insulation tape, position the tape over the tear with approximately ½" overlap onto the bagging film on both sides and on each end of the tear.

Step 4. When the insulation tape is properly positioned, apply the peeled side of the tape to the bagging film.

Step 5. Peel off the remaining backing from the insulation tape and apply down.

Step 6. Seal the insulation tape with a 300°F (149°C) electric iron.

6 Requirements

6.1 Do not trim or cut **fire barrier** material without Flam DAD approval.

6.2 Ensure that the maximum trimming limits have not been exceeded. Unless explicitly otherwise specified on the engineering drawing, trimming of top cover insulation blankets is limited to the flap area of the insulation blanket **only** (i.e., no cut-outs, slits or slots in the core material).

6.3 Top cover Insulating blankets and insulation bricks must fit in their assigned location without excessive gaps and shall be free of wrinkles.

6.4 The edges of trimmed areas must be finished with insulation tape.

6.5 If possible, film and insulation tape applied to trimmed areas or repairs must be heat sealed with a 300°F (149°C) electric iron.

7 Safety Precautions

7.1 **The safety precautions specified herein are specific to Bombardier Toronto (de Havilland) to meet Canadian Federal and Provincial government environmental, health and safety regulations. It is recommended that other facilities consider these safety precautions; however, suppliers, subcontractors and partners are responsible for ensuring that their own environmental, health and safety precautions satisfy the appropriate local government regulations.**

7.2 **Observe general shop safety precautions when performing the procedure specified herein.**

7.3 **Take care when using the electric iron to avoid skin contact with the heating surface. Allow the iron to cool before storage.**

8 Personnel Requirements

8.1 Personnel must have a good working knowledge of the applicable procedure and requirements as specified herein and must have exhibited their competency to their supervisor.