BOMBARDIER

Toronto Site

PROPRIETARY INFORMATION

PPS 22.12

PRODUCTION PROCESS STANDARD

PREPARATION OF GERBER LABELS

Issue 7
- This standard supersedes PPS 22.12, Issue 6.
- 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 the creation of aircraft labels using the Gerber Thermal Print process.

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.

1.2 The procedure specified herein is an alternate procedure to that specified in PPS 22.06 and PPS 22.07.

1.2.1 As an alternate procedure to that specified in PPS 22.06 (Direct Process), coloured labels may be printed onto coloured DSC 85-6x, DSC 85-7A (white), DSC 85-7B (cloud grey) self-adhesive vinyl film using the procedure specified herein.

1.2.1.1 Where the background colour other than cloud grey or white is required for the label, DSC 85-7A white film may be overprinted with the applicable colour foil (DSC 465) to match the field colour specified by the engineering drawing.

1.2.1.2 DSC 85-6 (clear) or DSC 85-7C (reflective white) self-adhesive vinyl films shall only be used when specified by the engineering drawing.

1.2.2 As an alternate procedure to that specified in PPS 22.07 (Reverse Process), clear or coloured labels may be printed onto clear DSC 85-5 non-adhesive backed Lexan film using the procedure specified herein.

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 13.39 - Bombardier Toronto Engineering Process Manual.

3.3 PPS 22.02 - Application of Pressure Sensitive Film Labels.

3.4 PPS 22.06 - Screen Printing - Direct Process.

3.5 PPS 22.07 - Screen Printing - Reverse Process.

4 MATERIALS, EQUIPMENT AND FACILITIES

4.1 Materials

4.1.1 For direct process
- DSC 85-6x, DSC 85-7A (white), or DSC 85-7B (cloud grey) pressure sensitive self-adhesive vinyl film, as specified by the engineering drawing.
- DSC 85-6 (clear) or DSC 85-7C (reflective white) pressure sensitive self-adhesive vinyl film (use only when specified by the engineering drawing).

4.1.2 For reverse process
- DSC 85-5 clear Lexan film, FR-65 Lexedge II, non-adhesive backed.

4.1.3 Colour cartridge, GerberColor Foil Series, to DSC 465.

4.1.4 Overlaminate, DSC 85-4A matte clear, self-adhesive polyester film.

4.1.5 3M adhesive transfer tape 9505.

4.2 Equipment

4.2.1 Plotter, Gerber Edge or Gerber Edge FX.

4.2.2 Gerber film stand.

4.2.3 Label trimmer, Gerber HS15 Plus.

4.2.4 RS Royal Sovereign 55" Cold Pressure Sensitive Wide Format Roll Laminator, RSC-1402CW.

4.2.5 Clean lint-free cotton wiper.

4.3 Facilities

4.3.1 This PPS has been categorized as a Controlled Special Process according to PPS 13.39 and as such only facilities specifically approved according to PPS 13.39 are authorized for the creation of aircraft labels using the Gerber Thermal Print process.

4.3.2 Bombardier subcontractors shall direct requests for approval to Bombardier Aerospace Supplier Quality Management. Bombardier Aerospace facilities shall direct requests for approval to the appropriate internal Quality Manager.

4.3.3 Facility approval shall be based on a facility report, a facility survey and completion of a qualification test program, if required. The facility report shall detail the materials and equipment to be used, the process sequence to be followed and the laboratory facilities used to show compliance with the requirements of this PPS. Any deviation from the procedure or requirements of this PPS shall be detailed in the facility report. Based upon the facility report, Bombardier Toronto Engineering may identify additional qualification and/or process control test requirements. During the facility survey, the facility requesting qualification shall be prepared to demonstrate their capability. Once approved, no changes to subcontractor facilities may be made without prior written approval from Bombardier Aerospace Supplier Quality Management.

4.3.3.1 For approval of subcontractor facilities to perform the creation of aircraft labels using the Gerber Thermal Print process according to this PPS, completion of a test program and submission of suitable test samples representative of production parts is required. Test samples shall meet the requirements as specified by Toronto Engineering.

5 PROCEDURE

5.1 General

5.1.1 Refer to the engineering drawing for the colour to be used for the label legend and background colour.

5.2 Preparation of Film

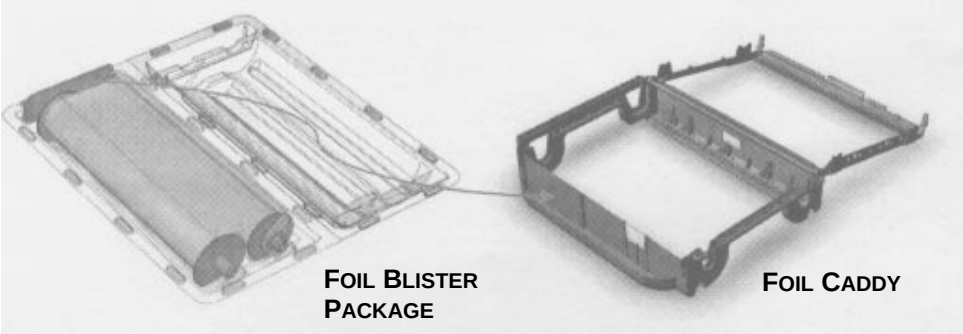
5.2.1 Ensure that the film surface is free of dust and other contaminants. If necessary, wipe the film surface with a clean lint-free cotton wiper.

5.3 Preparation of Foil Cartridges

5.3.1 Assemble the Gerber Edge FX foil cartridge for use on the Gerber Edge FX plotter as follows:

Step 1. Depress the latches on either side of the foil caddy and open the lid until it lies flat.

Step 2. Open the foil blister package that contains the foil insert and set it beside the foil caddy.



Step 3. Remove the foil ID card from the foil blister package and insert it in the slot on the front of the foil caddy so that the name is visible from the outside.

Step 4. Position the plastic strip with the RFID identifier label so that it rests between the rolls of the foil insert. Take care to avoid touching the surface of the foil as oil from your hands could damage it; always handle foil by the end plugs only.

Step 5. Holding the end plugs only, lift both of the foil insert rolls from the foil blister package and insert the front roll of foil into the slots at the front of the foil caddy. The end caps have different diameters that match the size of the slots.

Step 6. Gently pull the rear roll toward the back of the foil caddy, making sure that the plastic strip with the RFID label remains on top of the roll.

Step 7. Insert the rear roll into the rear slots in the foil caddy. Rotate the end caps to tighten the foil insert so that the foil is free of wrinkles and does not droop; loose foil can get caught in the Gerber Edge FX cartridge loader.

Step 8. Rotate the plastic strip with the RFID label toward the rear of the foil caddy. The strip should snap into slots on both sides and position the RFID label so that it shows through the open window at the back of the foil caddy. The Gerber Edge FX reads the RFID identifier label to determine the foil colour and remaining usable length; if the label is not positioned correctly in the window the Gerber Edge FX will not be able to identify the foil and it may not be possible to close the foil caddy.

Step 9. Close the foil caddy, ensuring that both front latches are secured and the foil ID card is visible. If resistance is encountered, check that the foil end caps are properly seated and that the RFID strip is not obstructing the closure.

Step 10. Save the foil blister package to store the foil insert when not in use. When unloading the foil caddy remember to return the foil ID card to the slot in the foil blister package so that it will be available the next time the foil caddy is assembled using that foil insert.

5.3.2 When finished with a particular Gerber Edge FX foil insert, disassemble the foil cartridge assembly as follows:

Step 1. Depress the latches on either side of the foil caddy and open the lid until it lies flat.

Step 2. Open an empty foil blister package and set it beside the foil caddy.

Step 3. Remove the foil ID card from the foil caddy and insert it in the slot in the foil blister package so that the name is visible from the outside.

Step 4. Rotate the plastic strip with the RFID identifier label forward so that it rests between the rolls of the foil insert. Take care to avoid touching the surface of the foil as oil from your hands could damage it; always handle foil by the end plugs only.

Step 5. Holding the end plugs only, lift the front foil insert roll of the foil insert from the foil caddy and roll it towards the rear roll. Make sure that the plastic strip with the RFID label remains on top of the rolls.

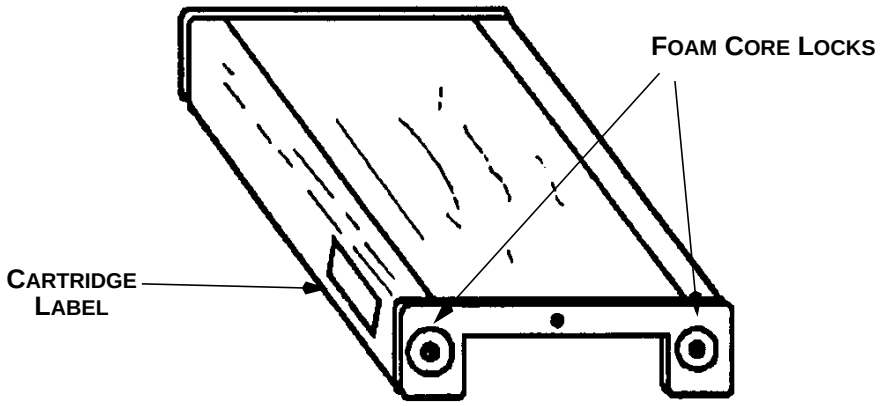
Step 6. Holding the end plugs only, remove the rear roll from the rear slots in the foil caddy.

Step 7. Transfer the foil insert into the empty foil blister package.

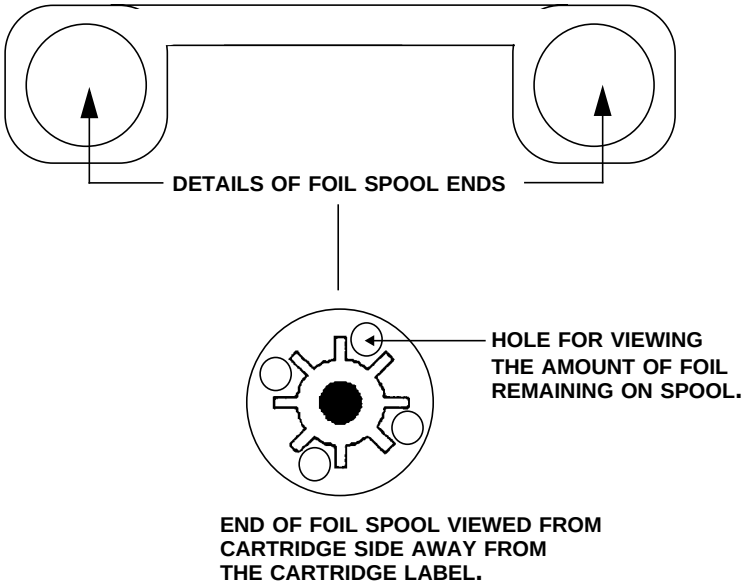
Step 8. Close the foil blister package and store. Foil blister packages are designed to be stacked with the foil ID card visible for ease of storage and quick identification.

5.3.3 Prepare GerberColor foil cartridges for use on the Gerber Edge plotter as follows:

Step 1. Remove the two foam core locks from the cartridge.



5.3.4 Estimate if there is enough foil on a cartridge to print a job by looking through the viewing hole at the amount remaining on the cartridge spool as shown below:



5.4 Label Preparation

5.4.1 Do not stack printed materials print-side to print-side. Stack with the printed side contacting the liner side of another piece of material or use a paper interleaf between the layers.

5.4.2 Prepare the label as follows:

Step 1. Download the appropriate engineering file.

Step 2. Set-up the parameters as outlined by the engineering drawing (e.g. colour). Manipulate the file as required (e.g., font and size) to ensure the engineering drawing requirements are met.

Step 3. Crop the appropriate image.

Step 4. Load the Gerber film stand with the appropriate DSC 85 film.

Step 5. Ensure that the DSC 85 film is free of dust and other contaminants. Wipe with a clean lint-free cotton wiper, if necessary.

Step 6. Load the plotter with the appropriate colour cartridge.

Step 7. Send the file to the plotter, double checking all parameters on the plotter (i.e., film type and cartridge colour).

Step 8. Repeat Step 6 and Step 7 for all colours specified on the engineering drawing.

- When using the Gerber Edge FX plotter, return foil inserts to the foil blister package according to paragraph 5.3.2 when not in use. Failure to do so may result in damage to the colour foil.
- When using the Gerber Edge plotter, return the colour cartridge to its sleeve when it is not installed in the plotter. Failure to do so may result in damage to the colour foil (Note: If you are between colours and do not want to replace the colour cartridge in its sleeve while you are working, stand it upright on the edge or spool end. Do not lay it flat so that the foil becomes contaminated).

Step 9. Remove the roll of DSC 85 film from the Gerber film stand.

Step 10. Apply DSC 85-4A overlaminate self-adhesive polyester film according to section 5.5 to direct process printed labels. Reverse printed labels on DSC 85-5 film does not require application of DSC 85-4A overlaminate.

Step 11. Load the laminated label or reverse printed Lexan film into the Gerber HS15 Plus trimmer. Set the appropriate pressure. Do not set too high a pressure as this can cut through the film and damage the Gerber HS15 Plus trimmer. Pressure setting to be determined by the operator (as a guideline, setting of 2 for thin material (e.g., 3M Scotchcal Series 220 Premium Film) and setting of 6 for thick material (e.g., DSC 85-5 film)).

Step 12. Trim the finished label to the required size and shape as specified by the engineering drawing.

Step 13. If application of 3M 9505 adhesive transfer tape is specified on the engineering drawing, apply 3M 9505 tape to the trimmed label according to section 5.6. This will be required for all DSC 85-5 reverse printed Lexan film labels.

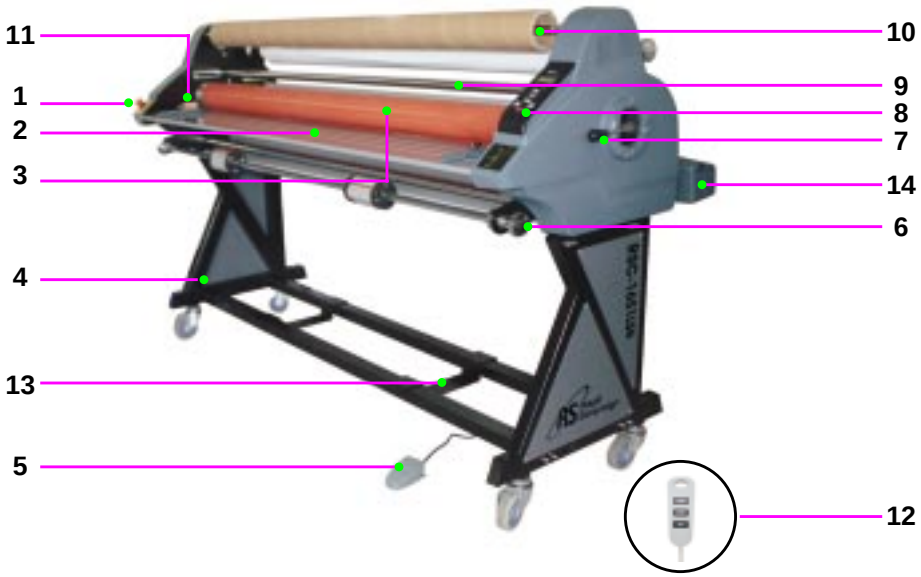
Step 14. Apply film labels to aircraft parts or structure according to PPS 22.02.

5.5 Application of DSC 85-4A Overlaminate Polyester Film to Direct Process Labels

5.5.1 Apply DSC 85-4A overlaminate polyester film using the RSC-1402CW Laminator (see Figure 1). Operate the laminator according to the manufacturer's instructions.

5.5.2 When the Royal Sovereign Laminator is not in use, place the pressure lever to the "Open Position (No. 7)".

5.5.3 Set up the laminator according to the manufacturer's instructions (i.e., pressure setting, loading of the DSC 85-4A overlaminating polyester film).



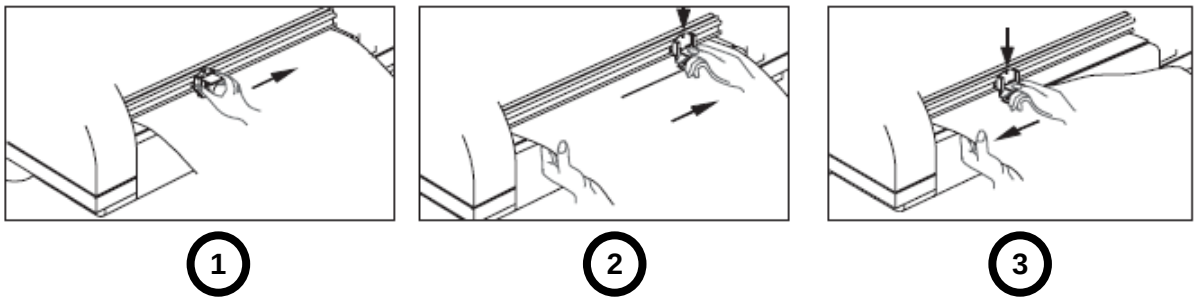
NO	PART NAME
1	EMERGENCY SWITCH
2	FEED TABLE
3	MAIL ROLLER
4	ASSEMBLY STAND
5	FOOT PEDAL
6	TENSION CONTROL KNOBS
7	PRESSURE LEVER (SEE NOTE 1)

NO	PART NAME
8	CONTROL PANEL
9	UPPER IDLE BAR
10	RELEASE LINER TAKE UP
11	LASER SYSTEM FOR SAFETY
12	REMOTE CONTROL
13	FILM SUPPORT
14	REAR-REWINDER

Note 1. Set to appropriate film thickness, as required. When the laminator is not in use, place the pressure lever to the “open position”.

FIGURE 1 - ROYAL SOVEREIGN RSC-1402CW LAMINATOR

5.5.4 After laminating, move the cutter approximately to the center of the completed label at the desired point of detachment. Grasp the film with one hand, press the cutter downward into the film label and slide it first to one end of the film, then to the other end to complete the cut.

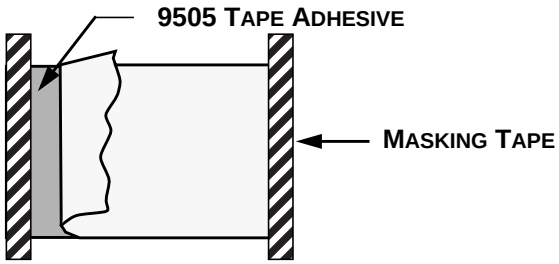


Caution: Use caution when using the cutter (i.e., be aware of your hand placement).

5.6 Application of 3M 9505 Adhesive Transfer Tape

5.6.1 Apply 3M 9505 adhesive transfer tape onto the adhesive side of the film label or graphics side of clear non-adhesive backed DSC 85-5 film labels as follows:

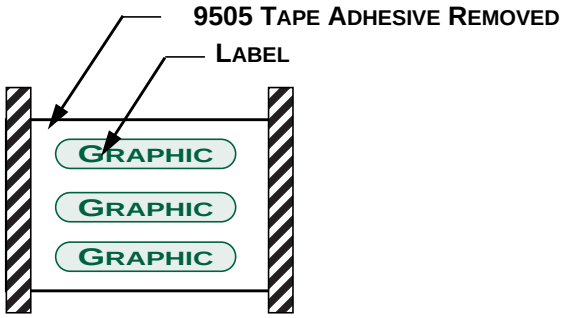
Step 1. Secure 9505 adhesive transfer tape, with adhesive backing side up, on a suitable and clean, flat work surface. Completely remove the paper backing from adhesive transfer tape exposing the adhesive surface.



Step 2. Using a clean metallic transfer tool (e.g., an Exacto knife), carefully lift trimmed label off its paper backing and transfer onto the adhesive exposed 9505 tape.

Step 3. Gently rub film label surface to ensure an intimate contact.

Step 4. If possible, without damaging the label, use an Exacto knife to carefully cut around the label edge prior to removing all exposed adhesive from the 9505 adhesive transfer tape surrounding the label.



6 REQUIREMENTS

6.1 The finish markings shall be according to the requirements of the engineering drawing.

6.2 All lettering and markings shall be clear, legible, and free from runs, smears, blisters or other defects.

6.3 All lettering and marking colours shall be as specified on the engineering drawing.

6.4 Cleanliness

6.4.1 Clean label manufacturing room at the intervals specified in Table I or sooner if any accumulation of dust, dirt or other contamination is evident. Maintain records of dates of cleaning.

TABLE I - SCHEDULE FOR CLEANING LABEL MANUFACTURING ROOM

ITEMS	MAXIMUM CLEANING TIME INTERVAL	CLEANING METHOD
Tables	Monthly	Wipe with damp cloth
Floors	Monthly	Vacuum and/or damp mop
Equipment	Monthly	Wipe with damp cloth
Walls from the floor to a height of 7 feet	6 Months (check condition at least once every 7 days and clean if necessary)	Appropriate method to remove accumulated dirt, dust, grease, etc.
Walls above 7 feet high, ceilings, beams, light fixtures, etc.	6 Months (check condition at least once every 30 days and clean if necessary)	

7 SAFETY PRECAUTIONS

7.1 General

7.1.1 Refer to the manufacturer's owners manual for the full safety precautions applicable to the Gerber Edge FX and the Royal Sovereign RSC Laminator. Some safety precautions are outlined herein.

7.1.2 The procedure specified herein presents no specific safety hazard when carried out according to accepted plant safety regulations.

7.2 RSC-1402CW Laminator

7.2.1 Keep hands and clothing (i.e., Neckties) away from rollers. The rollers have pinch points that can trap body parts or clothing and cause serious injury.

7.2.2 Do not touch the rollers when they are hot or place foreign objects inside the machine.

7.2.3 Do not cover the surface of the machine until the machine has completely cooled.

7.2.4 If an emergency happen, press the emergency switch immediately.

8 PERSONNEL REQUIREMENTS

8.1 This PPS has been categorized as a Controlled Special Process according to PPS 13.39. Refer to PPS 13.39 for personnel requirements.

9 STORAGE

9.1 Store pressure sensitive film as manufacturer supplied sheets or rolls to protect the film from contamination or damage at all times.

9.2 Store colour cartridges in a clean and protected environment.

9.3 Store colour cartridges at 40 to 60% relative humidity in a temperature range of 40 to 90°F. Avoid moisture.

9.4 Do not store colour cartridges in direct sunlight.