

# BOMBARDIER

Toronto (de Havilland)

**PROPRIETARY INFORMATION**

# PPS 22.02

## PRODUCTION PROCESS STANDARD

### APPLICATION OF FILM LABELS AND FILM GRAPHICS

- Issue 19 - This standard supersedes PPS 22.02, Issue 18.
- Vertical lines in the left hand margin indicate changes over the previous issue.
  - Direct PPS related questions to [PPS.Group@aero.bombardier.com](mailto:PPS.Group@aero.bombardier.com) or (416) 375-7641.
  - This PPS is effective as of the distribution date.

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Quality

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## 1 SCOPE

- 1.1 This Production Process Standard (PPS) specifies the procedure and requirements for the application of pressure sensitive polyester, vinyl and glow-film labels and graphic films.
  - 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 15.04](#) - Use of Felt Tip Markers for Marking Aircraft Parts and Assemblies
- 3.3 [PPS 16.18](#) - Protective Coating of Markings, Films and Labels.
- 3.4 [PPS 22.06](#) - Screen Printing - Direct Process.
- 3.5 [PPS 22.07](#) - Screen Printing - Reverse Process.
- 3.6 [PPS 22.12](#) - Preparation of Gerber Labels.
- 3.7 [PPS 25.53](#) - EC 2262 Adhesive.
- 3.8 [PPS 31.07](#) - Cleaning and Stripping Painted Surfaces.
- 3.9 [PPS 31.17](#) - Solvent Usage.

## 4 MATERIALS AND EQUIPMENT

### 4.1 Materials

- 4.1.1 Adhesive, EC 2262, 3M Co.
- 4.1.2 Application tape, #343, 3M Co.
- 4.1.3 Scotch masking tape, 1 inch or wider, 3M Co.
- 4.1.4 Pin or sharp round pointed tool (e.g., 3M Co. Air Release Tool 391X).
- 4.1.5 Pressure sensitive film as specified on the engineering drawing.

### 4.2 Equipment

- 4.2.1 Plastic applicator/squeegee (e.g., 3M Co. PA-1, blue or gold).
  - The 3M PA-1 gold applicator is stiffer than the blue applicator, which allows maximum application pressure.
  - The 3M PA-1 blue applicator is used when you need more flexibility. It is softer, which allows you to mold it around contours and corrugations.
- 4.2.2 RHR rubber hand roller, 2 inch, 3M Part No. 75-5410-0401-8.
- 4.2.3 Low friction sleeve (e.g., 3M Co. SA-1).
- 4.2.4 Rivet brush (e.g., 3M Co. RBA-1).
- 4.2.5 Cutting tools (e.g., razor blade with a safety holder).

## 5 PROCEDURE

### 5.1 Preparation of Film Labels

- 5.1.1 Single sheets of film may be cut or trimmed to size using sharp scissors or a knife. Multiple sheets may be stacked for cutting using steel rule dies for intricate shapes or guillotine or shears for straight cuts.
- 5.1.2 Prepare labels according to the applicable PPS:
  - Silk screen printing onto pressure sensitive film according to [PPS 22.06](#) or [PPS 22.07](#), as applicable.
  - Gerber labels according to [PPS 22.12](#).

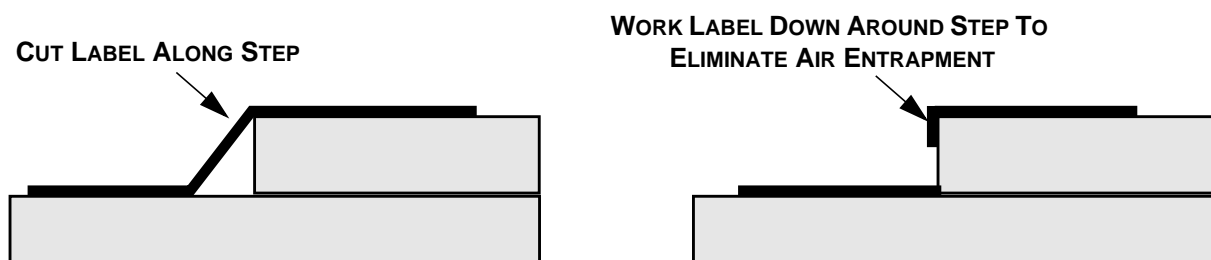
## 5.2 Preparation of Surfaces

- 5.2.1 Ensure that wood surfaces are suitably sealed before applying film labels.
- 5.2.2 For painted surfaces (including freshly painted surfaces) ensure that the paint has fully cured according to the applicable painting PPS to avoid outgassing.
- 5.2.3 Solvent clean according to [PPS 31.17](#) immediately before applying the film label.
- 5.2.4 Ensure that all finger marks, grease and dirt have been removed from surfaces to which film will be applied.
- 5.2.5 Do not touch cleaned areas with bare hands or otherwise subject to contamination.

## 5.3 Application of Pressure Sensitive Film Labels

### 5.3.1 General

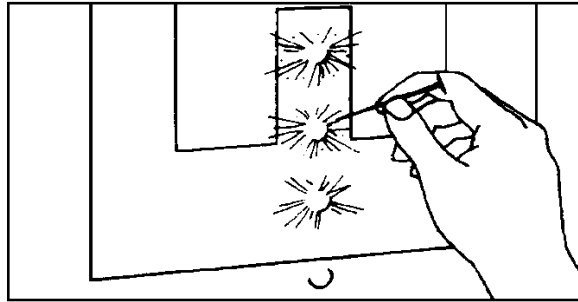
- 5.3.1.1 Do not apply pressure sensitive film labels on aircraft if the skin temperature is less than 60°F (15°C).
- 5.3.1.2 Minimize handling of exposed adhesive backing. When handling unprotected adhesive film during installation, place fingers a minimum of 1" in from the film edge.
- 5.3.1.3 For Naz-Da and Glow Film labels, use a brush to apply a thin coat of EC 2262 adhesive to the pre-coated adhesive side of the label immediately before applying the label. Prepare and allow EC 2262 adhesive to cure according to [PPS 25.53](#).
- 5.3.1.4 If a film label is applied over a stepped part (such as a doubler), cut the label along the step and work down using a plastic squeegee to eliminate any air entrapment along the step (see [Figure 1](#)).



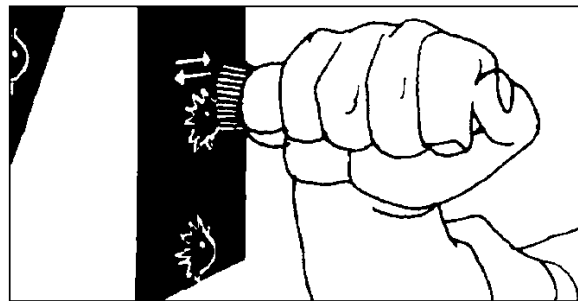
**FIGURE 1 - LABEL APPLIED OVER STEPPED PART**

5.3.1.5 If a film label has been applied over a protruding head rivet, follow the procedures outlined below after removal of the premask:

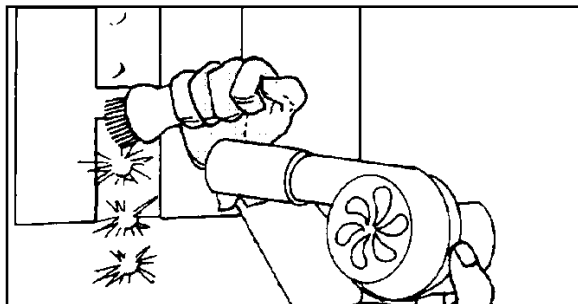
- Step 1. Puncture the label in several places around the rivet head with a pin or other sharp round pointed tool (do not use a knife or razor blade). Press entrapped air toward puncture marks with finger or squeegee.



- Step 2. Place a rivet brush on top of the rivet and, with short strokes, move the brush back and forth as illustrated.



- Step 3. Use a hot air gun with the rivet brush to obtain adequate conformation of the label around the rivet heads (Note: Ensure substrate surface does not exceed 200°F. For composite substrate, ensure the surface temperature does not exceed 160°F). Hold hot air gun several inches from the film to avoid burning or melting. Do not use solvent (i.e., isopropyl alcohol, etc.) to activate the adhesive when applying film over rivets when a hot air gun is used since film bubbling may be encountered.



- Step 4. If the label is coloured, touch up the exposed part of the rivet head with the appropriate coloured paint.

5.3.1.6 If a film label has been backed with 3M 9505 adhesive transfer tape and is to be applied onto a leather substrate, apply label as follows:

- Step 1. Apply film label onto the substrate using the top hinge method according to [section 5.3.3.3](#).
- Step 2. Using a hand roller ([paragraph 4.2.2](#)), roll side to side with even moderate pressure for approximately 10 seconds.
- Step 3. Apply low heat (maximum 200°F) using a hot air gun held approximately 1" to 1.5" away from the label surface. Utilizing a constant side to side sweeping motion, heat the label's surface for 55 to 65 seconds.
- Step 4. Immediately removing the heat source, using a hand roller, roll side to side with even moderate pressure for approximately 10 seconds.
- Step 5. Allow applied label to cure at room temperature for 48 hours.

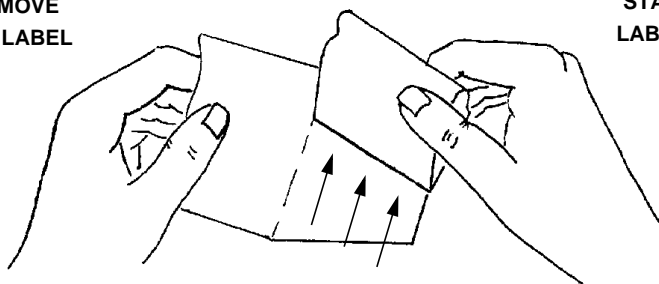
## 5.3.2 Application of Small Labels

5.3.2.1 Apply very small film labels (up to approximately 2" x 2") as follows (see [Figure 2](#)):

- Step 1. Completely remove the paper backing to expose the adhesive.
- Step 2. Align the label and press one edge to the surface by running a finger along it.
- Step 3. Hold the other edge to keep the label taut and slightly away from the surface.
- Step 4. Rub the free portion to the surface using firm overlapping strokes with a plastic squeegee. Do not allow the film label to touch the surface until the squeegee presses it down.

COMPLETELY REMOVE  
PAPER FROM THE LABEL

STARTING AT ONE END, RUB  
LABEL DOWN ONTO SURFACE

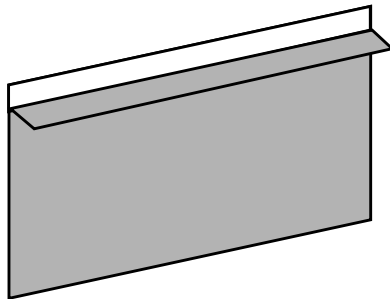


**FIGURE 2 - HAND APPLICATION OF VERY SMALL LABELS (UP TO 2" X 2")**

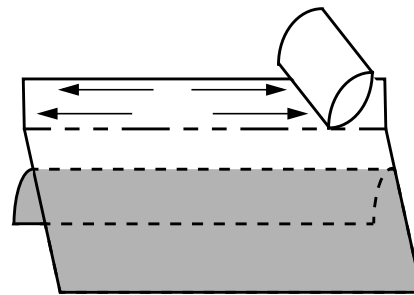
5.3.2.2 Apply small labels (up to approximately 12" x 12") as follows (see [Figure 3](#)):

- Step 1. Peel the backing paper down approximately 1" from the top of the label and fold and crease the backing paper.

- Step 2. Align the label and press the top edge to the surface by running a finger along it. Remove the backing paper from the top down, a small amount at a time, and rub the free portion of the film label to the surface using firm overlapping strokes with a plastic squeegee. Always start at the middle working out towards the label edge.



FOLD AND CREASE  
BACKING PAPER



ALIGN THE LABEL AND, STARTING FROM  
THE TOP, RUB THE LABEL DOWN ONTO THE  
SURFACE WHILE REMOVING THE BACKING

**FIGURE 3 - BACKING PAPER APPLICATION OF SMALL LABELS (UP TO 12" X 12")**

### 5.3.3 Application of Large Labels

5.3.3.1 Apply large labels according to one of the following methods:

- Application Tape Method ([section 5.3.3.2](#))
- Top Hinge Method ([section 5.3.3.3](#))
- Centre Hinge Method ([section 5.3.3.4](#))

#### 5.3.3.2 Application Tape Method

5.3.3.2.1 Apply large labels using the Application Tape Method as follows:

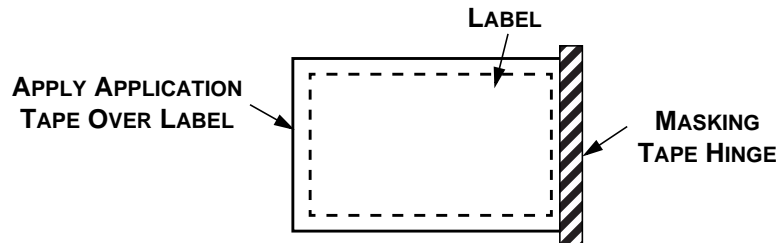
- Step 1. Loosen one corner of the paper backing to facilitate later removal.
- Step 2. Tape the label down into position on the surface, with the paper backing down, using small pieces of masking tape.



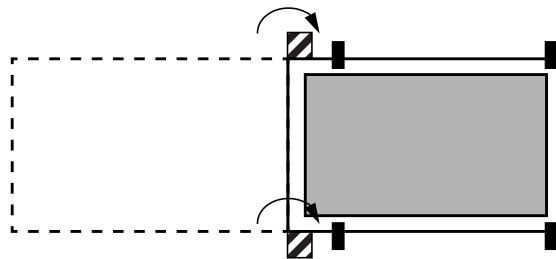
- Step 3. Cut a piece of 3M #343 application tape slightly larger than the label.
- Step 4. Place the application tape over the label and press down with a plastic squeegee. Ensure that all air bubbles and wrinkles are removed.



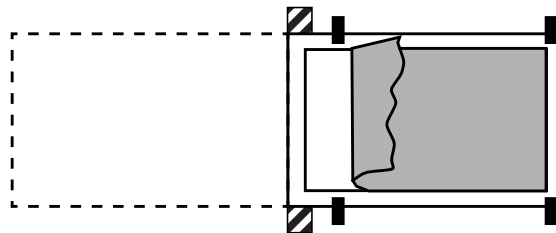
Step 5. Apply a piece of 2" wide masking tape to one edge to act as a hinge.



Step 6. Fold the application tape and film label back about the tape hinge and hold in place with small pieces of masking tape.

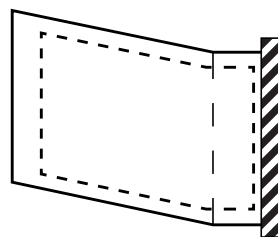


Step 7. Remove the paper backing from the label.

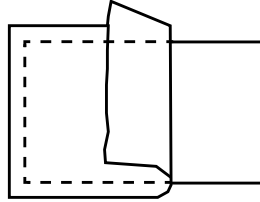


Step 8. Fold the application tape and label back into position, holding them taut and slightly away from the surface.

Step 9. Starting at the hinged end, rub the label to the surface with overlapping strokes of the plastic squeegee.



- Step 10. Remove the application tape by peeling the tape back upon itself at a 180° angle. Discard the application tape.



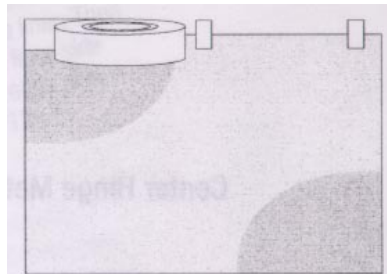
- Step 11. Remove any pieces of masking tape which are still stuck to the label.

- Step 12. Squeegee the edges of the label again.

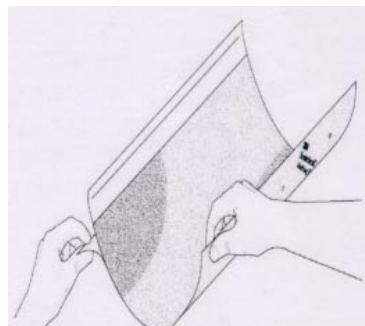
### 5.3.3.3 Top Hinge Method

- 5.3.3.3.1 Apply large labels using the Top Hinge Method as follows:

- Step 1. Position the graphic, using strips of Scotch masking tape to hold the graphic to the substrate. Then, apply a strip of masking tape 2 to 3 inch wide, horizontally across the top of the graphic.



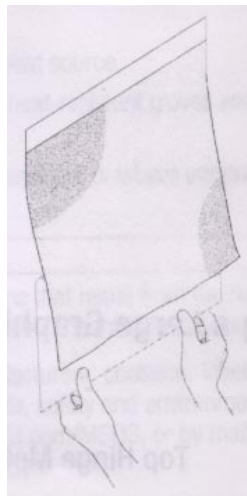
- Step 2. Raise the graphic up over the top of the hinge and peel the liner back a few inches.



- Step 3. Using care not to stretch the graphic, hold the graphic near bottom centre and begin squeegeeing at the top centre. Squeegee the graphic beginning at the centre of the tape hinge to the closest edge. Use firm pressure on the plastic applicator and overlapping strokes. Pull the squeegee, as shown below rather than pushing it. Pushing can stretch the graphic.



- Step 4. Keep the graphic away from the surface and use two hands to peel back the liner a few more inches. Then, continue squeegeeing the graphic using the technique described above.

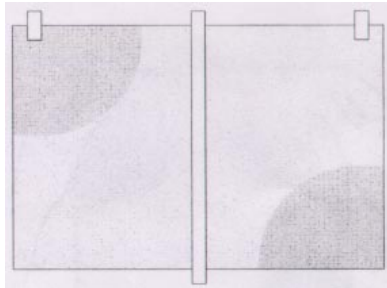


- Step 5. Continue to gradually remove the liner and squeegee until the entire graphic is applied.
- Step 6. Remove the tape hinge. Squeegee the top edge.

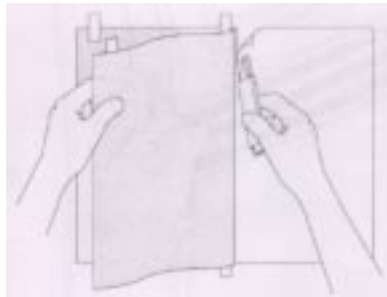
### 5.3.3.4 Centre Hinge Method

5.3.3.4.1 Apply large labels using the Centre Hinge Method as follows:

- Step 1. A centre hinge can be either vertical or horizontal, whichever is the shortest distance.
- Step 2. Position the graphic and hold it in place with 1 or 2 inch wide strips of Scotch masking tape.
- Step 3. Apply two layers of masking tape, 1 or 2 inch wide, through the centre of the graphic to make a hinge. The hinge should be perpendicular to the longest distance.

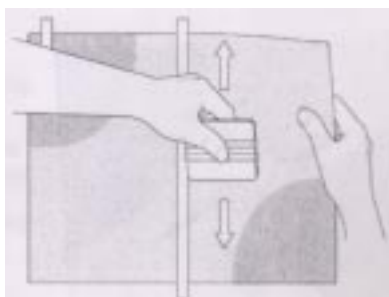


- Step 4. Fold half the graphic back over the hinge. Peel off the liner all the way to the tape hinge. Then cut just the liner along the hinge. Discard the liner. When cutting the liner, use care not to damage the substrate surface.



- Step 5. Fold the graphic back onto the substrate.

- Step 6. Gently hold the graphic away from the surface with one hand using care not to wrinkle or skew the graphic. Allow the adhesive to touch the substrate as pressure is applied during squeegeeing. Squeegee the graphic beginning at the centre of the tape hinge and working outward to the closest edge. Use firm pressure on the plastic applicator and overlap the strokes.

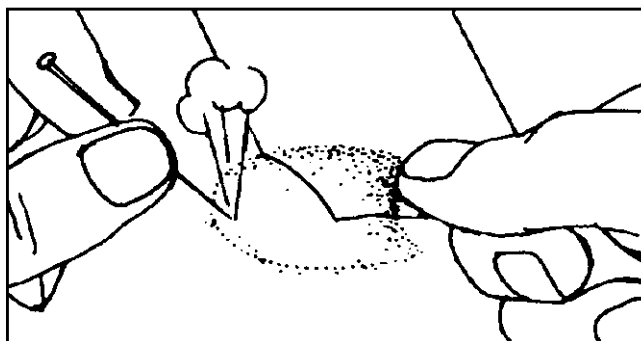


- Step 7. Remove the tape.

- Step 8. Apply the other half of the graphic in the same manner.

#### **5.3.4 Removal of Entrapped Air**

- 5.3.4.1 Check for blisters caused by air entrapped under the film label. To eliminate the bubbles, puncture the air bubble at one end of the bubble with a pin or sharp round pointed tool (do not use a knife or razor blade) and press out entrapped air with your thumb or a plastic squeegee, moving toward the puncture. See [Figure 4](#).



**FIGURE 4 - REMOVAL OF ENTRAPPED AIR**

## 5.4 Sealing of Film Labels

5.4.1 Overcoat film labels according to [PPS 16.18](#) in any of the following situations:

- All film labels applied to the exterior of the aircraft.
- Film labels which may be subject to contamination with fuel or hydraulic fluid (including the fuselage at the wing root, front and rear wing spars, engine nacelles and wheel well areas)
- If specified on the engineering drawing

## 5.5 Removal of Pressure Sensitive Film Labels

5.5.1 For labels applied according to [paragraph 5.3.1.6](#) to leather substrates, refer to Liaison Engineering for the removal procedure.

5.5.2 If necessary, remove film labels as follows:

Step 1. Using a knife or scraper, loosen and peel back the top edge of the film label.

Step 2. Slowly peel the label away from the surface. If necessary, soften the adhesive by carefully brushing the solvent specified in [PPS 31.17](#) onto the glue line.

Step 3. Discard the removed label.

5.5.3 Remove weathered labels as follows:

Step 1. Mask off the painted surfaces around the label.

Step 2. Starting at the top of the label, brush on either the solvent specified in [PPS 31.17](#) or the paint stripper specified on [PPS 31.07](#).

Step 3. As the film is softened, scrape downward with a plastic scraper, blotting up the loosened material with rags.

Step 4. Repeat the application of solvent or paint stripper and scrape until all traces of the film label have been removed.

Step 5. Completely remove all traces of paint stripper, if used, according to [PPS 31.07](#).

Step 6. Solvent clean according to [PPS 31.17](#) to remove the remaining adhesive.

## 5.6 Cleaning of Film Labels

5.6.1 Clean labels using a soft cloth with soap and water.

5.6.2 To remove oil, grease and similar soils, it may be necessary to solvent clean the surface according to [PPS 31.17](#) before using soap and water.

## 6 REQUIREMENTS

- 6.1 The applied film label shall adhere firmly to the base material.
- 6.2 The label shall be free from scratches, blisters, wrinkles or other damage and shall not be discoloured.
- 6.3 If applicable, labels shall be sealed according to [section 5.4](#) immediately after applying.

## 7 SAFETY PRECAUTIONS

- 7.1 Refer to [PPS 25.53](#) for safety precautions relating to EC-2262 adhesive.
- 7.2 Refer to [PPS 31.07](#) for safety precautions relating to paint strippers.
- 7.3 Refer to [PPS 31.17](#) for the safety precautions for handling and using solvents.
- 7.4 When using hot air guns, wear cotton gloves to avoid burning fingers.

## 8 PERSONNEL REQUIREMENTS

- 8.1 Personnel responsible for the application of pressure sensitive polyester, vinyl and glow-film labels shall have a basic understanding of the procedure and requirements as specified herein and shall have exhibited their familiarity to their supervisor.

## 9 STORAGE OF FILM LABELS

- 9.1 Keep film and processed graphic film in a clean dry area away and out of sunlight. Maintain the temperature between 40°F to 100°F.
- 9.2 Store film in its original container.
- 9.3 The total shelf life of all films is 2 years unprocessed or process within 1 year and apply within 1 year of processing.