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BOMBARDIER
Toronto (de Havilland)
PROPRIETARY INFORMATION

PPS 25.67

PRODUCTION PROCESS STANDARD

BONDING USING DSC 548-1 ADHESIVE

Issue 2
- This standard supersedes PPS 25.67, Issue 1.
- 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 bonding aircraft parts and assemblies using DSC 548-1 two part epoxy adhesive.

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. 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 (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 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 25.66 - Cleanliness Requirements for Application of Adhesives.

3.5 PPS 31.17 - Solvent Usage.

4 MATERIALS AND EQUIPMENT

4.1 Materials

4.1.1 DSC 548-1 (L-301, J.D. Lincoln Inc.) adhesive.

4.1.2 Abrasive paper, aluminum oxide, 50 to 80 grit and 120 to 180 grit.

4.1.3 Disposable wax-free paperboard containers (e.g., Melo take-out food containers).

4.1.4 Clamps, vacuum table, platen press or masking tape.

4.2 Equipment

4.2.1 Weighing scales, triple beam balance type or equivalent, capable of weighing to ± 0.5 grams.

4.2.2 Lint-free cotton gloves (e.g., DSC 422-1).

4.2.3 Suitable bristle brush, spatula or mohair roller.

5 PROCEDURE

5.1 Preparation of Parts

5.1.1 Immediately before applying adhesive, ensure the bonding surfaces are free of any contaminants (e.g., dust, dirt, etc.). Prepare the bonding surfaces according to Table I immediately before bonding.

5.1.2 Always wear clean lint-free cotton gloves when handling bonding surfaces. Do not touch or contaminate prepared surfaces with bare hands or other foreign objects.

TABLE I - CLEANING OF BONDING SURFACES FOR ADHESIVE BONDING

MATERIAL	CLEANING PROCEDURE
All F19 primed parts	Solvent clean according to PPS 31.17.
Unprimed metal parts	Solvent clean according to PPS 31.17.
Unprimed fibreglass (including Kevlar laminates and composites)	Step 1. Lightly scuff the bonding surfaces with 120 to 180 grit abrasive paper. Step 2. Solvent clean according to PPS 31.17.
Unprimed phenolic (except Formica, Arborite, etc.)	Step 1. Lightly scuff the bonding surfaces with 120 to 180 grit abrasive paper. Step 2. Solvent clean according to PPS 31.17.
Unprimed Formica, Arborite, etc.	Solvent clean according to PPS 31.17.
Unprimed plastic parts (except Kevlar and fibreglass)	Solvent clean according to PPS 31.17.
Rubber parts (neoprene, nitrile, Buna-N, etc.)	Solvent clean according to PPS 31.17.
Rubber parts (silicones)	Step 1. Solvent clean according to PPS 31.17. Step 2. Lightly scuff the bonding surfaces with 120 to 180 grit abrasive paper.
Wood (except balsa)	Step 1. Sand bond surfaces with 50 to 80 grit abrasive paper. Step 2. Remove residual dust with clean compressed air.
Porous materials (Velcro, fabrics, balsa, cork, etc.)	Do not clean porous materials in any way. If the bonding surface is contaminated, refer the part to Liaison Engineering.
Rulon A	Solvent clean according to PPS 31.17.
Flexible polyurethane foam	Solvent clean according to PPS 31.17.
Rigid polyurethane foam	Step 1. Lightly scuff the bonding surfaces with 120 to 180 grit abrasive paper. Step 2. Remove residual dust with clean compressed air.

5.2 Preparation of Adhesive

5.2.1 DSC 548-1 is a two component paste adhesive which will cure at room temperature. Colour coded components allow for visual check for thorough mixing (see Table II).

TABLE II - PHYSICAL PROPERTIES OF DSC 548-1

ADHESIVE	PART	COLOUR
DSC 548-1	A	Light Green
	B	Tan
	Mixed A + B	Cream

5.2.2 Prepare DSC 548-1 adhesive as follows:

Step 1. Thoroughly stir Part A and Part B in their separate containers.

Step 2. Weigh out Part A as specified in Table III in a disposable mixing container in even 100 gram increments or fraction thereof as required for the work on hand.

Step 3. Weigh the correct proportion of Part B according to Table III directly in the Part A container on the scale. Do not weigh Part B into a separate container.

Step 4. Stir the mix of Part A and Part B to obtain a homogeneous air-free mixture (see Table II).

5.2.3 Discard excess material upon expiration of the pot life.

TABLE III - MIXING RATIO FOR DSC 548-1 ADHESIVE

ADHESIVE	COMPONENTS	MIXING RATIO (PARTS BY WEIGHT)	POT LIFE (NOTE 1)
DSC 548-1	Part A	100	1 hour
	Part B	50	

Note 1. The pot life is the time during which mixed adhesive remains suitable for application at 75 ± 5°F and 50% relative humidity (R.H.). Higher temperature and R.H. will shorten the pot life.

5.3 Bonding

5.3.1 Bonding

5.3.1.1 When bonding to Kevlar laminates or composites, ensure the bonding area is free of any release agents.

5.3.1.2 Bond as follows:

Step 1. Apply a thin, uniform coat of adhesive (5 to 10 mil thick) to both bonding surfaces using a suitable bristle brush, spatula or mohair roller.

Step 2. Assemble the parts in the correct alignment and apply pressure using clamps, vacuum table, platen press or masking tape to ensure intimate contact over the full bonding area. If the assembly manual specifies that fasteners are to be installed in bonded parts at the time of bonding, position the parts with Cleco temporary fasteners and install permanent fasteners before expiry of the pot life of the adhesive.

Step 3. Allow the bond to cure according to section 5.4. If the accelerated cure is used, record the date, time and oven temperature on the work order adjacent to the operation. If fasteners have been installed during the pot life of the adhesive and have immobilized the bond, the assembly may be handled before the entire cure time has elapsed.

5.4 Curing

5.4.1 Allow the bond to cure at room temperature (65°F minimum) for at least 24 hours or 2 hours at 150°F before further working the assembly or installing it in the aircraft.

5.4.2 Full cure of adhesive is 7 days at room temperature (65°F minimum).

5.5 Clean-Up

5.5.1 Remove adhesive from tools and equipment by solvent cleaning according to PPS 31.17.

6 REQUIREMENTS

6.1 Bonded parts and assemblies shall have intimate contact over the full bonding surface.

6.2 Visual indication of poor adhesion shall be cause for rejection.

6.3 Bonded assemblies shall be allowed to cure at room temperature (65°F minimum) for a minimum of 24 hours or 2 hours at 150°F before being further worked or installed in the aircraft.

7 SAFETY PRECAUTIONS

7.1 Observe general shop 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 Keep adhesive away from fire and other sources of ignition.

7.4 Ensure sufficient ventilation is supplied at all times when using adhesive. Avoid inhalation of fumes or vapours from adhesive.

7.5 Wear protective respiratory equipment according to PPS 13.13 when working with adhesive.

7.6 Avoid skin contact with adhesive. Do not use protective hand cream as it may contaminate cleaned or adhesive coated surfaces. If skin contact occurs, wash thoroughly with soap and water.

7.7 Avoid eye contact with adhesive. If eye contact occurs, immediately flush eyes in a directed stream of water for at least 15 minutes while forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. Contact the Health Centre and a physician.

7.8 Wash hands thoroughly with soap and water immediately after using adhesive.

8 PERSONNEL REQUIREMENTS

8.1 Personnel responsible for bonding aircraft parts and assemblies using DSC 548-1 two part epoxy adhesive must have a basic understanding of the procedure and requirements as specified herein and must have exhibited their familiarity to their supervisor.

9 STORAGE

9.1 Store solvents according to PPS 31.17.

9.2 Store DSC 548-1 adhesive at a temperature of 60 to 80°F (16 to 27°C) and maximum relative humidity of 50%.

9.3 Refer to PPS 13.28 for the storage life of the adhesive.

9.4 Clearly mark containers of DSC 548-1 with the storage life expiry date of the adhesive.

9.5 When not in use, keep containers of DSC 548-1 adhesive tightly closed.