BOMBARDIER
Toronto Site
PROPRIETARY INFORMATION

PPS 25.57

PRODUCTION PROCESS STANDARD

APPLICATION OF DHMS A6.10 TYPE I ADHESIVE

Issue 8
- This standard supersedes PPS 25.57, Issue 7.
- 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 bonding aircraft parts using DHMS A6.10 Type I adhesive.

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 BAERD GEN-023 - Contamination Control for Compressed Air.

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 13.39 - Bombardier Toronto Engineering Process Manual.

3.5 PPS 25.66 - Cleanliness Requirements for Application of Adhesives.

3.6 PPS 31.17 - Solvent Usage.

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

4 MATERIALS, EQUIPMENT AND FACILITIES

4.1 Materials

4.1.1 DHMS A6.10 Type I room temperature curing nitrile-based adhesive.

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

4.2 Equipment

4.2.1 Compressed air shall meet the requirements of BAERD GEN-023.

4.2.2 Abrasive paper, aluminum oxide, 50 - 80 grit size and 120 - 180 grit size.

4.2.3 Bristle brush.

4.2.4 Rubber or stitch roller.

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 to perform bonding aircraft parts using DHMS A6.10 Type I adhesive according to this PPS.

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 bonding aircraft parts using DHMS A6.10 Type I adhesive according to this PPS, completion of a test program and submission of suitable test samples representative of production parts may be required. Test samples shall meet the requirements specified by Bombardier Toronto Engineering.

5 PROCEDURE

5.1 Preparation of Parts

5.1.1 Prepare parts as follows:

Step 1. Ensure bonding surfaces of aluminum alloy and cadmium plated parts are primed with F19 primer according to PPS 34.08.

Step 2. Prepare the bonding surfaces according to Table I.

5.1.2 Do not touch prepared surfaces with bare hands or allow the surface to be contaminated. Wear clean cotton gloves when handling prepared bonding surfaces.

TABLE I - PREPARATION OF PARTS FOR 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 120-180 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 120-180 grit abrasive paper. Step 2. Solvent clean according to PPS 31.17.
Unprimed Formica, Arborite, etc.	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. Step 3. Solvent clean according to PPS 31.17.
Wood (except balsa)	Step 1. Sand bonding surfaces with 50-80 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. Sand bonding surfaces with 120-180 grit abrasive paper. Step 2. Remove residual dust with clean compressed air.

5.2 Preparation of Adhesive

5.2.1 Before use, stir the adhesive thoroughly in its own container.

5.3 Bonding

5.3.1 General

5.3.1.1 Perform bonding in a clean area according to PPS 25.66.

5.3.2 Open Time Method

5.3.2.1 Use the open time method if only a small area is to be bonded or if one or both of the materials is porous.

5.3.2.2 Bond using the open time method as follows:

Step 1. Apply a thin, uniform coat of adhesive to both bonding surfaces using a suitable bristle brush making as few strokes as possible.

Step 2. Allow the adhesive to air dry until it becomes tacky but does not transfer to the finger when touched.

Step 3. On porous surfaces, apply another coat to ensure that sufficient adhesive remains on the surface and allow the second coat to air dry.

Step 4. Press the parts together and roll down with a rubber or stitch roller to ensure intimate contact over the full bonding surface.

5.3.3 Re-activation Method

5.3.3.1 Use the re-activation method if large areas of non-porous material is to be bonded or a strong intimate bond is desired.

5.3.3.2 Bond using the re-activation method as follows:

Step 1. Apply a thin, uniform coat of adhesive to both bonding surfaces using a suitable bristle brush making as few strokes as possible.

Step 2. Allow the adhesive to air dry for at least one hour. If the parts will not be bonded on the same shift that the adhesive is applied, cover the adhesive with a layer of Kraft paper after the adhesive has air dried to a tack-free condition.

Step 3. Re-activate the adhesive coating by wiping with a clean cloth dampened with the solvent specified in PPS 31.17.

Step 4. Press the parts together and roll down with a rubber or stitch roller to ensure intimate contact over the full bonding surface.

5.4 Curing

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

5.5 Clean-Up

5.5.1 Solvent clean adhesive from tools and equipment according to PPS 31.17.

6 REQUIREMENTS

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

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

6.3 Assemblies shall be allowed to cure at room temperature (65°F minimum) for at least 24 hours before being 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 when applying adhesive in confined areas.

7.5 Avoid skin contact with adhesive. If skin contact occurs, wash thoroughly with soap and water.

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 MAINTENANCE

9.1 Store adhesive according to the precautions necessary for flammable materials.

9.2 Store adhesive at a temperature of 60°F to 80°F (16°C to 26°C).

9.3 Refer to PPS 13.28 for the storage life of DHMS A6.10 Type I adhesive. Ensure containers of adhesive are clearly marked with the storage life expiry date.

9.4 When not in use, keep containers of adhesive tightly closed.