BOMBARDIER
Toronto Site
PROPRIETARY INFORMATION

PPS 25.50

PRODUCTION PROCESS STANDARD

USE OF DSC 233 RTV SILICONE ADHESIVE/SEALANT

Issue 13
- This standard supersedes PPS 25.50, Issue 12.
- Vertical lines in the left hand margin indicate 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.

Signed original on file. Validation of paper prints is the responsibility of the user.

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1 SCOPE

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for bonding and sealing aircraft parts and assemblies using DSC 233 RTV (Room Temperature Vulcanizing) silicone adhesive/sealant.

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 21.21 - General Sealing Practices.

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 DSC 233 RTV silicone adhesive/sealant.

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

4.2 Equipment

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

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

4.2.3 Protective gloves, neoprene (e.g., DSC 422-5) or rubber (e.g., DSC 422-2).

4.2.4 Suitable spatula.

4.2.5 Rubber or stitch roller.

4.3 Facilities

4.3.1 This PPS has been identified as a “Critical or Special” process according to PPS 13.39 and as such only facilities specifically approved according to PPS 13.39 are authorized to perform bonding and sealing aircraft parts and assemblies using DSC 233 RTV (Room Temperature Vulcanizing) silicone adhesive/sealant according to this PPS.

4.3.2 Bombardier subcontractors shall direct requests for approval to Bombardier Supplier Quality Management. Bombardier 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 and sealing aircraft parts and assemblies using DSC 233 RTV (Room Temperature Vulcanizing) silicone adhesive/sealant 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 specified in section 6.

5 PROCEDURE

5.1 General

5.1.1 One part RTV silicone rubber adhesive/sealant consists of a silicone polymer pre-mixed with filler and curing agents. Exposure to moisture in the air during application promotes the reaction which cures the polymer.

5.1.2 RTV silicone adhesive/sealant is available in a number of colours and types. It is important to use the type specified on the engineering drawing.

5.2 Preparation of Parts

5.2.1 Wear clean cotton gloves when handling bonding surfaces. Do not touch or contaminate prepared surfaces with bare hands or other foreign objects.

5.2.2 Ensure the bonding surfaces of aluminum alloy parts and cadmium plated parts have been primed with F19 according to PPS 34.08.

5.2.3 Immediately before applying adhesive, prepare the bond surfaces as specified in Table I.

TABLE I - PREPARATION OF PARTS 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, Kevlar and graphite 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. Step 3. Solvent clean according to PPS 31.17.
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.

5.3 Bonding

5.3.1 Perform bonding in a clean area as specified in section 6.2.

5.3.2 Bond as follows:

Step 1. Apply a thin, uniform coat of adhesive to both bonding surfaces using a suitable spatula.

Step 2. Assemble the parts in the correct alignment and roll down with a rubber or stitch roller or press down firmly with the fingers to ensure intimate contact over the full bonding area.

Step 3. Maintain light pressure until the adhesive has cured sufficiently to prevent accidental separation.

5.4 Sealing

5.4.1 Apply RTV silicone sealant according to PPS 21.21.

5.5 Curing

5.5.1 Allow assemblies to cure at room temperature (65°F minimum) for at least 4 hours before further handling.

5.5.2 Allow assemblies to cure at room temperature (65°F minimum) for at least 24 hours before further working of the part or installation in the aircraft.

5.6 Clean-Up

5.6.1 Remove uncured adhesive/sealant from tools and equipment by solvent cleaning according to PPS 31.17.

5.6.2 Remove cured adhesive/sealant with a non-metallic scraper. Take care to prevent damage to parts or tools while removing cured adhesive/sealant.

6 REQUIREMENTS

6.1 General

6.1.1 Bonded parts and assemblies shall have intimate contact over the full bonding area.

6.1.2 Visual indication of poor adhesion is cause for rejection.

6.1.3 Before further handling, bonds shall cure for a minimum of 4 hours at room temperature (65°F minimum).

6.1.4 Before being further worked or installed in the aircraft, bonds shall cure for a minimum for 24 hours at room temperature (65°F minimum).

6.2 Bonding Area Conditions

6.2.1 The cleanliness of the bonding area (e.g., tables, floors, equipment, walls, etc.) shall be checked and cleaned as necessary to ensure that dust accumulation, dirt or other contamination will not be evident. Maintain records of dates of cleaning.

6.2.2 Maintain the temperature and relative humidity of the bonding areas within the range specified in Figure 1. Bonding when the relative humidity is below 30% will increase the chance of static discharge and worker discomfort, but will not affect part quality.

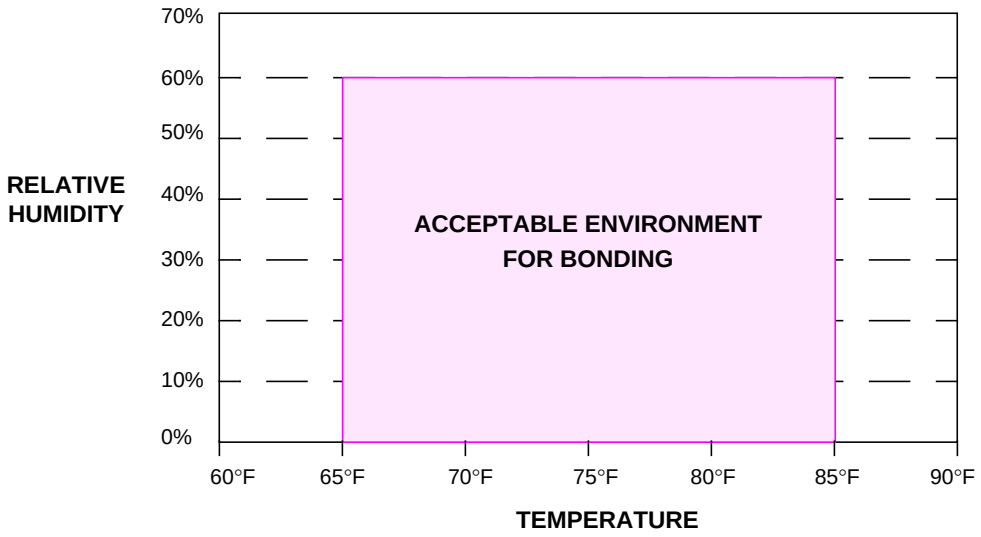

FIGURE 1 - TEMPERATURE AND HUMIDITY LIMITS

7 SAFETY PRECAUTIONS

7.1 Observe standard plant safety precautions when performing the procedure specified herein.

7.2 Keep adhesive/sealant away from fire and other sources of ignition.

7.3 Wear protective gloves when handling adhesive/sealant. Do not use protective hand cream which may cause contamination.

7.4 Avoid eye contact with adhesive/sealant. 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.

7.5 Avoid skin contact with adhesive/sealant. If skin contact occurs, wash the affected area thoroughly with soap and water.

7.6 Avoid ingesting the adhesive/sealant. If ingestion occurs, immediately contact the Health Centre and a physician.

7.7 Ensure adequate ventilation is supplied when applying adhesive/sealant in confined areas. Avoid inhalation of fumes or vapours from adhesive/sealant.

7.8 Refer to PPS 31.17 for the safety precautions for handling and using solvents.

8 PERSONNEL REQUIREMENTS

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

9 STORAGE OF ADHESIVE/SEALANT

9.1 Store DSC 233 RTV silicone adhesive/sealant at a temperature of 60°F to 80°F (16°C to 26°C) according to the precautions necessary for flammable materials.

9.2 Refer to PPS 13.28 for the storage life of the adhesive/sealant.

9.3 Ensure adhesive/sealant containers are clearly marked with the storage life expiry date.

9.4 Keep adhesive/sealant containers tightly closed when not in use.

10 ADDITIONAL INFORMATION

10.1 Before use, remove any cured adhesive/sealant from the neck of the tube.

10.2 The adhesive/sealant cannot be worked after 15 minutes of air contact (it will "skin over").

10.3 Take the following precautions to prevent paint adhesion problems on surfaces contaminated with adhesive/sealant:

- Completely mask off all surfaces adjacent to the bond/seal area.
- Discard adhesive/sealant-contaminated cleaning cloths after each single use.