

BOMBARDIER

Toronto (de Havilland)

PROPRIETARY INFORMATION

PPS 25.69

PRODUCTION PROCESS STANDARD

BONDING USING SCOTCH-WELD 3532 AND SCOTCH-WELD 3549 ADHESIVES

- Issue 2
- This standard supersedes PPS 25.69, 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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Quality

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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 Scotch-Weld 3532 and Scotch-Weld 3549 structural adhesives.
 - 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.
- 3.6 [PPS 34.08](#) - Application of Epoxy Polyamide Primer and Enamel.
- 3.7 QAMTR 007 - Testing of Adhesives.

4 MATERIALS AND EQUIPMENT

4.1 Materials

- 4.1.1 Scotch-Weld 3532 B/A two-part component polyurethane adhesive (3M Company).
- 4.1.2 Scotch-Weld 3549 B/A two-part component polyurethane adhesive (3M Company).

4.2 Equipment

- 4.2.1 Weighing scales, triple beam balance type, capable of weighing to within ± 0.5 grams.
- 4.2.2 Spatula, trowel or flow equipment.
- 4.2.3 Neoprene gloves (e.g., DSC 422-5).
- 4.2.4 Lint-free cotton gloves (e.g., DSC 422-1).

5 PROCEDURE

5.1 General

- 5.1.1 Perform bonding in a clean area according to [PPS 25.66](#).

5.2 Preparation of Parts

- 5.2.1 Ensure that the bonding surfaces of aluminum alloy parts have been primed with F19 according to [PPS 34.08](#).
- 5.2.2 Immediately before applying adhesive, solvent clean the bonding surface of each part according to [PPS 31.17](#).
- 5.2.3 Do not touch prepared surfaces with bare hands nor contaminate the surface. Wear clean cotton gloves at all times when handling prepared bonding surfaces.

5.3 Preparation of Adhesive

- 5.3.1 Both Scotch-Weld 3532 B/A and Scotch-Weld 3549 B/A are two-component base/accelerator mixtures.
- 5.3.2 Mixing ratios, pot life and cure times of the adhesive are shown in [Table I](#).
- 5.3.3 Stir the base/accelerator mixtures thoroughly to obtain a homogeneous air-free mix.
- 5.3.4 Mix only sufficient material for the job on hand or which will be used up within the pot life of the material. Dispose of excess material upon expiration of the material pot life.

TABLE I - ADHESIVES MIXING/CURING DATA

ADHESIVE SYSTEM	ADHESIVE COMPONENT	MIXING RATIO (BY WEIGHT)	POT LIFE (NOTE 1)	CURE TO HANDLE (@ 75 ± 5°F)	FULL CURE (@ 75 ± 5°F)
Scotch-Weld 3532 B/A	Base	100	5 to 15 minutes	12 hours (Note 2)	24 hours
	Accelerator	109			
Scotch-Weld 3549 B/A	Base	100	40 to 70 minutes	3 days (Note 3)	7 days
	Accelerator	109			
Note 1. The pot life is the time during which mixed adhesive remains suitable for application at 75 ± 5°F. The time indicated is for a 100 gram mix unless otherwise specified.					
Note 2. Alternatively, cure for 30 minutes at 75 ± 5°F followed by heat cure for 60 to 70 minutes at 120 ± 5°F.					
Note 3. Alternatively, cure for 1 hour at 75 ± 5°F followed by heat cure for 12 hours at 120 ± 5°F.					

5.4 Bonding

- 5.4.1 Using a suitable spatula, trowel or flow equipment, apply a thin, uniform coat (0.005" to 0.020") of adhesive to both bonding surfaces.
- 5.4.2 Immediately following the application of the adhesive, assemble the parts to be bonded in the correct alignment and apply pressure with clamps or weights so as to ensure intimate contact over the full bonding area.

5.5 Curing

- 5.5.1 Allow assemblies to cure to handle according to [Table I](#) before further working of the part or installation on the aircraft.

5.6 Clean-Up

- 5.6.1 Remove uncured adhesive from tools and equipment according to [PPS 31.17](#).

6 REQUIREMENTS

6.1 General

- 6.1.1 Bonded parts must have intimate contact over the full bonding surface.
- 6.1.2 Reject the part if visual inspection indicates poor adhesion.
- 6.1.3 Bonded parts must be cured according to [section 5.5](#) before being further worked or installed into the aircraft.

6.2 Receipt Testing and Shelf Life Extension

- 6.2.1 Perform receipt and shelf life extension testing of Scotch-Weld 3532 B/A and Scotch-Weld 3549 B/A adhesives according to QAMTR 007.

7 SAFETY PRECAUTIONS

- 7.1 *Observe general shop safety precautions when performing the procedure specified herein.*
- 7.2 *Keep adhesive components away from fire and other sources of ignition.*
- 7.3 *Wear protective gloves when handling adhesive or adhesive components. Do not use protective hand cream which may cause contamination.*
- 7.4 *Avoid eye contact with adhesive and adhesive components. 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 and adhesive components. If skin contact occurs, wash the affected area thoroughly with soap and water.*
- 7.6 *Avoid ingesting adhesive or adhesive components. If ingestion occurs, immediately contact the Health Centre and a physician.*
- 7.7 *Wear protective respiratory equipment according to [PPS 13.13](#) when applying adhesive. Ensure adequate ventilation is supplied when applying adhesives in confined areas.*
- 7.8 *Refer to [PPS 31.17](#) for the safety precautions for handling and using solvents.*

8 PERSONNEL REQUIREMENTS

- 8.1 Personnel responsible for bonding aircraft parts and assemblies using Scotch-Weld 3532 B/A and Scotch-Weld 3549 B/A structural adhesives 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 Scotch-Weld 3532 B/A and Scotch-Weld 3549 B/A adhesives 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.
- 9.3 Clearly mark the containers of base and accelerator with storage life expiry date.
- 9.4 Keep adhesive component containers tightly closed when not in use.