BOMBARDIER
Toronto Site
PROPRIETARY INFORMATION

PPS 10.32

PRODUCTION PROCESS STANDARD

APPLICATION OF DEVCON PUTTY

Issue 5
- This standard supersedes PPS 10.32, Issue 4.
- 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.

Prepared By:	(Christie Chung)	October 10, 2013
	PPS Group	
Approved By:	(L.K. John)	October 15, 2013
	Materials Technology	
	(A. Gordon)	October 15, 2013
	Quality	

TABLE OF CONTENTS

Sections **Page**

Tables

1 SCOPE

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for the preparation and application of Devcon two-part metal-filled epoxy putty to aircraft parts and structures.

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 13.28 - Storage Life of Adhesives, Sealants, Paints and Composite Products.

3.3 PPS 31.17 - Solvent Usage.

3.4 PPS 32.08 - Application of Zinc Phosphate Coatings to Plated Parts (C5).

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

4 MATERIALS AND EQUIPMENT

4.1 Materials

4.1.1 Devcon F, aluminum putty kit.

4.1.2 Devcon A, plastic steel kit.

4.1.3 Emery Paper, 180, 240 and 320 grit size.

4.1.4 Disposable wax-free paperboard containers (e.g., MELO take-out containers).

4.2 Equipment

4.2.1 Suitable spatula or putty knife.

4.2.2 Gloves, vinyl or latex (e.g., DSC 422-2 or DSC 422-4).

5 PROCEDURE

5.1 General

5.1.1 Only use Devcon epoxy putty as a filler around door frames and other structural areas if called up on the engineering drawings. Drawings shall specify the type of putty to be used for the particular application.

5.1.2 Devcon putty material is purchased as complete kits and shall be stored, issued and used as such.

5.2 Surface Preparation

5.2.1 Solvent clean all surfaces to which Devcon putty is to be applied according to PPS 31.17.

5.2.2 Prime aluminum surfaces with F19 epoxy primer according to PPS 34.08.

5.2.3 Phosphate treat the bonding surfaces of cadmium plated parts according to PPS 32.08.

5.3 Preparation and Curing of Devcon Putty

5.3.1 Before mixing, stir the epoxy resin material thoroughly in its container, to a uniform consistency.

5.3.2 If a full kit quantity is required, add all of the hardener supplied in the kit to the container of resin compound. Mix thoroughly (approximately for 5 to 6 minutes) with a screwdriver or similar tool (continuously scrape material away from the sides and bottom of the container) until a uniform, streak-free consistency is obtained. Take care when mixing Devcon putty to avoid entrapment of air in the mixture.

5.3.3 If less than a full kit is required, mix as specified below. Refer to Table I for the mixing ratio, pot life and cure times for mixed Devcon putty.

- Intermediate Sizes (1, 2, or 3 lb units): Place resin and hardener into a clean wax free disposable container. Use a trowel or wide-blade tool to mix the material as specified in paragraph 5.3.2.
- Large Sizes (25 lb, 30 lb, or 50 lb buckets): Use a T-shaped mixing paddle or a propeller-type (e.g., Jimmy Mixer ES) on an electric drill.

TABLE I - DEVCON MIXING RATIOS

DEVCON MATERIAL	COMPONENTS	MIXING RATIO PARTS BY WEIGHT	MIXING RATIO PARTS BY VOLUME	POT LIFE (@75 ± 5°F)	FULL CURE (@75± 5°F) (see Notes 1 & 2)
Devcon F Aluminum Putty	Resin	9	4	60 minutes	16 hours
	Hardener	1	1		
Devcon A Plastic Steel	Resin	9	2.5	45 minutes	16 hours
	Hardener	1	1		

Note 1. Full cure is the time required before Devcon putty can be machined, drilled, painted, etc.
Note 2. Actual cure time will vary depending on the amount of putty, room temperature and the relative humidity. Lower room temperature, high relative humidity or a larger mass of putty will require a longer cure time.

5.4 Application of Devcon Putty

5.4.1 Spread the Devcon putty over the surface to be repaired with a putty knife. Shape and blend the putty to conform to the required contours.

5.4.2 Do not apply Devcon putty if the ambient temperature is below 60°F, as the hardening time will become excessive.

5.4.3 Allow Devcon putty to harden according to Table I before further working or finish sanding.

5.5 Finishing

5.5.1 Hardened Devcon putty may be sanded to finish contour using 180 - 240 grit emery paper, followed by sanding smooth with 320 grit emery paper.

5.6 Clean-Up

5.6.1 Remove excess Devcon from structures, parts and tools, according to PPS 31.17, before the material hardens.

6 REQUIREMENTS

6.1 Ensure that all excess material has been removed from structures and parts before it has hardened and that applied material has fully hardened before handling or further working.

6.2 Finished Devcon putty shall be smooth and uniform in appearance with no evidence of cracks, chips, dents, etc.

6.3 Evidence of lack of adhesion is not acceptable.

7 SAFETY PRECAUTIONS

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

7.2 Use Devcon in a well ventilated area, avoid prolonged breathing of fumes.

7.3 Avoid prolonged skin contact with Devcon material. Wear protective gloves when handling Devcon material. If skin contact has occurred, wash the affected area thoroughly with soap and water.

7.4 Should accidental eye contact with the Devcon materials specified herein occur, flush eyes immediately with large quantities of water at an eye wash station and report to the Health Centre.

7.5 Avoid ingestion of Devcon materials specified herein. If ingestion has occurred, obtain medical attention immediately.

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

8 PERSONNEL REQUIREMENTS

8.1 Personnel responsible for the preparation and application of Devcon two-part metal-filled epoxy putty to aircraft parts and structures shall have a good working knowledge of the applicable procedure and requirements as specified herein and shall have exhibited their competency to their supervisor.

9 STORAGE

9.1 Store Devcon two-part metal-filled epoxy putty kits in containers clearly marked with the storage life expiry date. Storage life of Devcon A and Devcon F two-part metal-filled epoxy putty kits shall be as specified in PPS 13.28.

9.2 Store Devcon two-part metal-filled epoxy kits at room temperature (60 to 90°F).

9.3 Keep containers of resins tightly closed when not in use.