BOMBARDIER Toronto (de Havilland) **Proprietary Information**	**PPS 34.16** **Production Process Standard (PPS)**

Application of Urethane Compatible Primer (F23)

Issue 19

- This standard supersedes PPS 34.16, Issue 18.
- This PPS is effective as of the distribution date.
- Validation of issue status is the responsibility of the user.
- Vertical lines in the left hand margin indicate technical changes over the previous issue.
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Issue 19 - Summary of Changes (over the previous issue)

The following summaries are not detailed and are intended only to assist in alerting PPS users to changes which may affect them; refer to the applicable sections of this PPS for detailed procedure and requirements.

- Added provision for masking using masking paper and/or masking tape, as necessary.
- Added provisions for relative humidity recording and/or indicating equipment.
- Revised maximum allowable overcoat time for F23 primer.

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Tables

1 Scope

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for the spray application of urethane compatible, corrosion resistant epoxy intermediate primer to major components and complete aircraft as part of the exterior paint system.

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.

1.2 PPS 23.02 identifies application of urethane compatible, corrosion resistant epoxy intermediate primer by Finish Code F23.

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 General

3.1.1 Unless a specific issue is indicated, the issue of the reference documents specified in this section in effect at the time of manufacture shall form a part of this specification to the extent indicated herein.

3.2 Bombardier Toronto (de Havilland) Specifications

3.2.1 PPS 13.13 - Personal Protective Respiratory Equipment.

3.2.2 PPS 13.26 - General Subcontractor Provisions.

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

3.2.4 PPS 13.39 - Bombardier Toronto Engineering Process Manual.

3.2.5 PPS 23.02 - Protective Treatment and Decorative Surface Finish Code System.

3.2.6 PPS 31.17 - Solvent Usage.

3.2.7 PPS 34.11 - Priming and Painting of Aircraft Exterior Surfaces.

3.3 Bombardier Aerospace Specifications

3.3.1 BAERD GEN-023 - Contamination Control for Compressed Air.

4 Materials, Equipment and Facilities

4.1 Materials

4.1.1 Unless otherwise specified in this section, use only the materials specified; use of superseding or alternative materials is not allowed.

4.1.2 Primer, Epoxy, Polyurethane Compatible, Corrosion Resistant (Finish Code F23), to DHMS C4.18, Type III Class A Grade A or DHMS C4.18, Type III Class B Grade B. If the Class and Grade is not specified, it is acceptable to use either Class A Grade A or Class B Grade B.

4.1.3 Tack rags (e.g., DSC 375-1).

4.1.4 Abrasive paper, aluminum oxide, 180 - 200 grit.

4.1.5 Compressed air for use with spray guns. Compressed air used with spray application equipment must meet the requirements of BAERD GEN-023.

4.2 Equipment

4.2.1 Spray booths and rooms must be equipped with suitable exhaust systems such that the air flow will not cause air turbulence or excessive air currents but be adequate to prevent dried overspray from settling on primed surfaces that are still tacky. Adequate lighting must be provided, including in under-surface areas.

4.2.2 Suitable spraying equipment.

4.2.3 Dry film thickness gauge (e.g. Elcometer).

4.2.4 Viscometer, “Gardco EZ cup” Zahn #2 cup; do not use other brands of Zahn cups.

4.2.5 Mechanical paint shaker, capable of agitation of primer base component to ensure uniform distribution of solids without adversely affecting the base component.

4.2.6 Neoprene gloves (e.g., DSC 422-5).

4.2.7 Spray guns and associated equipment (e.g., HVLP, air electrostatic, high pressure air assist, etc.) capable of applying coatings to the dry film thicknesses specified herein without unacceptable defects as specified in section 6. Operate spray guns and associated equipment according to the equipment manufacturers instructions.

4.2.8 Masking paper, non-adhesive (e.g., 3M #06539, 3M #06736 “Scotchblok” or Kraft paper).

4.2.9 Masking tape utilizing rubber based adhesive (e.g., #218 or 3M #8428).

4.2.10 Relative humidity recording and/or indicating equipment: sling psychrometer or hygrometer (e.g., Extech RHT20). Relative humidity recording and/or indicating equipment must be calibrated and operated according to the manufacturers’ instructions.

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 application of urethane compatible primer (F23) according to this PPS.

4.3.2 Bombardier subcontractors must direct requests for approval to Bombardier Aerospace Supplier Quality Management. Bombardier Aerospace facilities must 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 must 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 must be detailed in the facility report. Based upon the facility report, Bombardier Toronto (de Havilland) Materials Technology may identify additional qualification and/or process control test requirements. During the facility survey, the facility requesting qualification must 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 Unless otherwise specified by Bombardier Aerospace Supplier Quality Management, for approval of subcontractor facilities to perform application of urethane compatible primer (F23) according to this PPS, completion of a test program and submission of suitable test samples representative of production parts is required. Test samples must meet the requirements specified in section 6.

5 Procedure

5.1 General

5.1.1 Unless otherwise specified, F23 prime all major components or complete aircraft which have been F19 primed before topcoating with F24 or F37 polyurethane enamel.

5.1.2 If masking is required, it is acceptable to use masking paper (ref. para. 4.2.8) and/or masking tape (ref. para. 4.2.9), as necessary.

5.2 Paint Shop Conditions

5.2.1 Do not paint when the temperature is less than 60°F (16°C) or the relative humidity is greater than 80% in the application area.

5.2.2 Use calibrated indicators to monitor and record the temperature and humidity.

5.2.3 Wash floors and platforms frequently to avoid build-up of dust and loose overspray.

5.3 Preparation of Primer

5.3.1 Do not intermix base and catalyst from different manufacturers.

5.3.2 Only use base and catalyst within their storage lives (as marked on the containers). Submit material with an expired storage life to a Bombardier approved laboratory for shelf life extension testing according to PPS 13.28.

5.3.3 Any primer components showing signs of skinning, gelling, lumping, or pigment separation shall be returned to stores.

5.3.4 Containers of catalyst showing signs of milkiness, precipitation or other deterioration shall be returned to stores.

5.3.5 Prepare primer according to the manufacturers instructions or as follows:

Step 1. Agitate the base component on a mechanical shaker for 10 - 15 minutes.

Step 2. For PRC-DeSoto CA7755 primer, stir the activator component (CA7755BE) thoroughly by hand for 5 minutes before mixing.

Step 3. Mix base, hardener and catalyst, or activator, as applicable, in the ratio specified in Table 1.

Step 4. Allow the mixture to react for the time specified in Table 1.

Step 5. For spray application, reduce the primer to the spraying viscosity specified by the manufacturer using the thinner specified in Table 1. If no thinner is specified, thinning is not allowed. Do not thin primer to be used for touch-up. Verify the spray viscosity against the specified requirements with a “Gardco EZ cup” Zahn #2 cup. Ensure that the cup is thoroughly cleaned after every use. If there is reason to doubt the accuracy of the cup (e.g., clogging of the orifice) submit the cup for calibration or replace with a new certified cup.

Table 1 - Preparation of F23 Primer

F23 TYPE III	COMPONENTS	MIXING RATIO (By Volume)	MANUFACTURER	REACTION OR INDUCTION TIME at 75 - 84°F (24- 29°C) (Note 1)	REDUCING RATIO (By Volume)	POT LIFE
DHMS C4.18 Type III, Class A, Grade A	515X349 Base	1	PRC-DeSoto Int'l	30 minutes minimum	N/A	6 hours
	910X533 Catalyst	1				
	4500-PB-60X Base	1	Tempo Aerospace Inc.	15 - 30 minutes	N/A	6 hours
	4500-C-60X Catalyst	1				
	425IP0501 Base	1	Tristar Coating Ltd.	30 minutes minimum	—	6 hours
	420C0078 Catalyst	1				
	SB41 or SB43 Thinner	—		—	Note 2	
DHMS C4.18 Type III, Class B, Grade B	CA7755A Base	1	PRC-DeSoto Int'l	30 minutes minimum	N/A	2 hours
	CA7755BE Activator	1				
	10P20-44 Base	3	Akzo Nobel Aerospace Coatings	N/A	—	4 hours
	EC-273 Catalyst	1				
	TR-114 Thinner	—			Note 2	
	EP-2-Y1 Base	2	Axon Products Inc.	60 minutes minimum	N/A	2 - 3 hours
	EH-12 Hardener	1				
	SC-11 Catalyst	1				

Notes
1. Allow the base and catalyst/activator to react for the reaction (induction) time specified, if any, before reduction. Reaction (induction) time is temperature dependent and lower temperatures require a longer reaction (induction) time.
2. Add thinner as required to obtain spraying viscosity (to a maximum of 1/8 of the total mixed volume). If no thinner is specified, thinning is not allowed.

5.4 Preparation of Parts

5.4.1 Prepare components or completed aircraft for priming according to PPS 34.11.

5.5 Application of Primer

5.5.1 Apply one even coat of F23 primer to obtain a dry film thickness of 0.0003" - 0.0005".

5.6 Curing of Primer

5.6.1 Allow F23 primer to air dry for a minimum of 2 hours, and not more than the maximum overcoat time specified by the primer manufacturers' technical data sheet, at a temperature of not less than 60°F (16°C) and relative humidity between 30% and 80% before topcoating according to PPS 34.11.

5.6.1.1 If the primer manufacturer does not specify an applicable maximum overcoat time, the maximum allowable overcoat time shall be considered to be 24 hours.

5.6.1.2 If F23 primer air dries longer than the maximum allowable overcoat time, scuff it using 180 - 200 grit aluminum oxide abrasive paper, solvent clean the surfaces according to PPS 31.17, and re-prime according to section 5.5.

5.7 Rework of Damaged or Defective Coatings

5.7.1 Taking care not to penetrate the aluminum cladding on the surface of the skin, remove damaged or defective F23 primer by sanding with 180-200 grit aluminum oxide abrasive paper and wiping with a tack rag.

5.7.2 Re-prime the damaged area according to the procedure specified in this standard.

6 Requirements

6.1 Visual Examination

6.1.1 Visually examine F23 primer coatings for defects such as scratches, runs, dried overspray or other irregularities detrimental to the topcoat appearance.

6.1.2 Touch up damaged or defective coatings according to section 5.7.

6.2 Film Thickness

6.2.1 The dry film thickness of F23 primer, as measured with a film thickness gauge, shall be 0.0003" - 0.0005".

7 Safety Precautions

7.1 The safety precautions specified herein are specific to Bombardier Toronto (de Havilland) to meet Canadian Federal and Provincial government environmental, health and safety regulations. It is recommended that other facilities consider these safety precautions; however, suppliers, subcontractors and partners are responsible for ensuring that their own environmental, health and safety precautions satisfy the appropriate local government regulations.

7.2 Observe general shop safety precautions when performing the procedure specified herein.

7.3 Do not smoke or eat in paint spraying areas.

7.4 Ensure the spray booths and rooms are equipped with suitable exhaust systems. Paint spray rooms must be equipped with forced or induced ventilation systems capable of maintaining sufficient ventilation to meet Occupational Health and Safety Act requirements.

7.5 Wear protective respiratory equipment according to PPS 13.13 when applying primer.

7.6 Keep all containers closed when not in use.

7.7 Do not have open flames or naked lights in priming areas. Do not use infrared or other heat lamps in the paint booth (i.e., any area where paint or primer is being applied).

7.8 Wear protective coveralls, rubber gloves, and splash goggles when handling mixed F23 or its components.

7.9 Avoid skin contact with mixed F23 or its components. If contact occurs, thoroughly wash the affected area with soap and water.

7.10 Avoid eye contact with F23 or its 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.

8 Personnel Requirements

8.1 This PPS has been categorized as a “Controlled Special Process” by PPS 13.39. Refer to PPS 13.39 for personnel requirements.

9 Additional Information

9.1 Store primer in a dry area at a temperature of 40°F - 100°F (4°C - 38°C); for optimum storage life, a temperature of 60°F - 80°F (16°C - 27°C) is recommended. Clearly mark containers with the storage life expiry date. Refer to PPS 13.28 for the storage life of primer catalyst and base. Submit all base or catalyst that has exceeded its storage life to a Bombardier approved laboratory for shelf life extension testing according to according to PPS 13.28.

9.2 Promptly solvent clean equipment according to PPS 31.17 to avoid dried paint on or in the equipment.