DE HAVILLAND AIRCRAFT OF CANADA LIMITED

BOMBARDIER

Toronto Site

PPS 34.03 - APPLICATION OF POLYURETHANE ENAMEL (F24 & F37)

Issue 32
- This Production Process Standard (PPS) supersedes PPS 34.03, Issue 31.
- Vertical lines in the left hand margin indicate technical changes over the previous issue.
- Direct PPS related questions to christie.chung@dehavilland.com.
- This PPS is effective as of the distribution date.

THIS PPS IS CO-OWNED BY DE HAVILLAND AIRCRAFT OF CANADA LIMITED AND BOMBARDIER INC.

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

Issue 32 - 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.

- Specified this is a jointly owned PPS by both De Havilland Aircraft of Canada Limited and Bombardier Inc.
- Added F24 and F37 finish coded to PPS title.
- Specified for DASH 8 program, the following BA specifications are frozen at the specified revision; BAERD GEN-007, Rev. C; BAERD GEN-023, Rev A; and BAPS 138-055, Rev. D.
- Specified for laboratory approval for DASH 8 program shall be to DAGER-006.
- Allowed use of alternate equipment cleaning methods, provided all equipment is completely free of primer and contaminants prior to the next use of such equipment.

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1 SCOPE

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for the spray application of polyurethane enamel (Finish Codes F24 and F37 as per PPS 23.02) to detail parts and assemblies.

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.

1.2 Refer to PPS 34.11 for the procedure and requirements when painting major components (i.e., rudder, flaps, etc.) or complete aircraft with the exterior paint system.

1.3 Alternatively, where application of baking enamel (Finish Code F5) to DHMS C4.07 Type I or Type II according to PPS 34.39 is specified, it is acceptable to instead apply polyurethane enamel (Finish Code F24 Type 4) to DHMS C4.04 Type 4, Class A as specified herein.

1.4 This PPS is co-owned by De Havilland Aircraft of Canada Limited (DHC) and Bombardier Inc. (BA) due to its applicability for both the DHC DASH 8 and BA Lear 45 programs. Frozen revisions of Bombardier documents (e.g., BAPS, BAERD GEN, BAMS, etc.) specified herein apply only to the DASH 8 program.

2 HAZARDOUS MATERIALS

2.1 Before receipt at DHC or BA, all materials must be approved and assigned Material Safety Data Sheet (MSDS) numbers by the DHC/BA 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 DHC/BA Environment, Health and Safety Department.

3 REFERENCES

3.1 BAERD GEN-007, Rev. C - Quality Control of Heat Treating Equipment and Hot Forming Equipment.

3.2 BAERD GEN-018 - Engineering Requirements for Laboratories.

3.3 BAERD GEN-023, Rev. A - Contamination Control for Compressed Air.

3.4 BAPS 138-055, Rev. D - Accelerated Curing of Organic Compounds.

3.5 DAGER-006 - Engineering Requirements for Laboratories.

3.6 EHS-OP-005 - Hazardous Materials Management, *DHC and BA internal operating procedure*.

3.7 PPS 13.13 - Personal Protective Respiratory Equipment.

3.8 PPS 13.26 - General Subcontractor Provisions.

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

3.10 PPS 13.39 - DASH 8 & Lear 45 Critical and Special Processes PPS Index.

3.11 PPS 17.02 - Abrasive Blasting.

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

3.13 PPS 31.07 - Cleaning and Stripping of Painted Surfaces.

3.14 PPS 31.17 - Solvent Usage.

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

3.16 PPS 34.11 - Priming and Painting of DASH 8 Aircraft Exterior Surfaces.

3.17 PPS 34.16 - Application of Urethane Compatible Primer (F23).

3.18 PPS 34.20 - Application of F42 Urethane Enamel.

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 Polishing Compound, Met-All No. 1187, Dars Met-All Industries.

4.1.3 Protective wrapping material - Brown Kraft paper, Kimpac K41, AIRCAP C120 or D120 bubble film, Poly Foam.

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

4.1.5 Polyurethane enamels:

- DHMS C4.04 Type 2, Class A - high fluid resistance, standard flexibility, gloss, lustreless, pigmented or clear, Finish Code F37. F37 polyurethane enamel has higher resistance to hydraulic fluids, and is intended for use on spars, wing roots, etc.
- DHMS C4.04 Type 4, Class A - Fluid resistant, high flexibility, gloss, pigmented or clear, Finish Code F24 Type 4. F24 Type 4 polyurethane enamel has high flexibility, and is intended for use as an aircraft decorative exterior top coat.
- DHMS C4.04 Type 6, Class A or B - Flexible, rain erosion resistant, Finish Code F24 Type 6. F24 Type 6 polyurethane enamel is flexible, and is intended as a rain erosion resistant decorative exterior topcoat.
- MIL-PRF-85285.

4.2 Equipment

4.2.1 Lint free cheesecloth or filtermesh.

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

4.2.3 Tack cloths (e.g., DSC 375-1).

4.2.4 Abrasive paper, aluminum oxide, 180 - 220 grit size (e.g., 3M TRI-M-ITE).

4.2.5 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.

4.2.6 Masking paper, non-adhesive (e.g., 3M #06539, 3M #06736 "Scotchblok" or Kraft paper).

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

4.2.8 Coating thickness gauge (e.g., Elcometer or Micrometer).

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

4.2.10 Viscometer, "Gardco EZ cup" Zahn #2 cup; do not use other brands of Zahn cups.

4.2.11 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.

4.2.12 Cure oven or area (conventional or infrared (IR)), used for accelerated cure to handle, qualified according to BAPS 138-055, Rev. D (including temperature uniformity survey according to BAERD GEN-007, Rev. C).

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 perform application of polyurethane enamel according to this PPS.

4.3.2 Subcontractors must direct requests for approval to DHC or BA Quality.

4.3.3 Facility approval must 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, DHC or BA Engineering 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 DHC or BA Quality.

4.3.3.1 For approval of subcontractor facilities to perform application of polyurethane enamel 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 visual examination and film thickness requirements specified in section 6.

4.3.3.2 All testing and evaluation specified herein must only be performed by DHC/BA Toronto Materials Laboratory or by laboratories accredited according to DAGER-006 (DASH 8) or BAERD GEN-018 (Lear 45), as applicable.

5 PROCEDURE

5.1 General

5.1.1 Polyurethane enamels are fluid resistant top coats for application on F19 and F23 primed surfaces.

5.1.2 Except as noted, apply the enamel (F24 Type 4, F24 Type 6 or F37) specified by the engineering drawing, engineering order, or product specification. In place of F37 enamel (DHMS C4.04 Type 2), it is acceptable to substitute F24 Type 4 enamel (DHMS C4.04 Type 4). MIL-PRF-85285 enamel may only be used when specifically so instructed by the engineering drawing.

5.1.3 Classes of F24 and F37 are as follows:

- Class A - For application with conventional spraying equipment, including air or airless spray.
- Class B - For application with electrostatic spray equipment as well as conventional equipment.

5.1.4 Grades of F24 and F37 are as follows. When the grade of F24 or F37 enamel is not specified on the engineering drawing, EO or product specification, either grade specified in DHMS C4.04 is acceptable.

- Grade A - High VOC - conventional solvent.
- Grade B - Low VOC (420 g/l maximum) - conventional solvent (high solids).

5.1.5 When the type of F24 to use is not specified on the engineering drawing, E.O. or product specification, or when F24 Type 1 or Type 2 is specified, use the type of enamel specified below, according to the application (if in doubt as to the applicable application, refer to Liaison Engineering):

- interior furnishings - apply F42 according to PPS 34.20
- applications requiring high fluid resistance - apply F37
- all other applications - apply F24 Type 4 or Type 6

5.1.5.1 F24 Type 3 have been superseded by F42 finish code (DHMS C4.22). Type to be specified by on the engineering drawing. If no Type is specified, refer to Liaison Engineering.

5.1.6 If masking is required, it is acceptable to use masking paper (ref. paragraph 4.2.6) and/or masking tape (ref. paragraph 4.2.7), as necessary.

5.2 Paint Shop Conditions

5.2.1 Do not paint when the temperature is less than 60°F (16°C) or when the relative humidity is less than 30% or greater than 80%. Use calibrated indicators to monitor and record temperature and humidity conditions.

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

5.3 Preparation of Enamel

5.3.1 Do not intermix base, catalyst and thinners from different manufacturers.

5.3.2 Only use base and catalyst within their storage lives (as marked on the containers). Submit base or catalyst which is beyond it's storage life for storage life extension testing according to PPS 13.28. Dispose of unacceptable base or catalyst according to EHS-OP-005.

5.3.3 Dispose of base component showing signs of skinning, gelling, lumping, pigment separation or any other deterioration according to EHS-OP-005.

5.3.4 Catalyst is sensitive to moisture and must be kept in tightly closed containers. Dispose of catalyst showing signs of milkiness, precipitation, darkening in colour or other signs of deterioration according to EHS-OP-005.

5.3.5 Do not use accelerators in enamel to paint detail parts and assemblies.

5.3.6 Do not mix freshly mixed enamel with an aged mixture. For best appearance, it is recommended that a fresh mix of enamel be prepared for application of the second coat.

5.3.7 Prepare enamel according to the manufacturers instructions, or as follows:

Step 1. Open the can and use a paddle to break up any caked paint at the bottom of the can.

Step 2. Close the can and agitate the base component on a mechanical paint shaker (ref. paragraph 4.2.2) for a minimum of 1 minute and a maximum of 20 minutes.

Step 3. Hand mix the base and catalyst in the ratio specified in Table I.

Step 4. Allow the base/catalyst mixture to stand for the reaction time specified in Table I.

Step 5. Strain the mix through a clean, lint free cheesecloth or filter mesh.

Step 6. For spray application, reduce the mixture to the spraying viscosity specified by the manufacturer using the thinner specified in Table I. Do not reduce enamel 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.

5.3.7.1 Prepare MIL-PRF-85285 enamel according to the manufacturers instructions.

TABLE I - PREPARATION OF POLYURETHANE ENAMEL

FINISH CODE	COMPONENTS (NOTE 1)	MIXING RATIO (BY VOLUME)	MANUFACTURER	REACTION TIME	REDUCING RATIO (BY VOLUME)	POT LIFE (HOURS)
F24 Type 4 DHMS C4.04 Type 4 Class A Grade A	6600 Series Base	1	Tempo Paint & Varnish Co.	15 - 30 minutes	Reduce to obtain correct viscosity	6
	6600-C-1 Catalyst	1				
	6600-S-1 Thinner	---		---		
	620H Base	1	Tristar Coatings	15 minutes minimum	Reduce to obtain correct viscosity	6
	620C Catalyst (Note 2)	1				
	SB61 Thinner	---		---		
F24 Type 6 DHMS C4.04 Type 6 Class B Grade A	24-F2 Series Base	1	Akzo Nobel (Note 3)	30 minutes minimum	Reduce to obtain correct viscosity	6
	PC 101 Catalyst	1				
	TR-20 Thinner	---		---		
	FE 102 Series Base	2	PRC-DeSoto International	30 minutes minimum	3	6
	102 Catalyst	1				
	T609 Thinner	1		---	1	
	620H Base	1	Tristar Coatings	15 minutes minimum	Reduce to obtain correct viscosity	6
	620C Catalyst (Note 2)	1				
	SB61 Thinner	---		---		

TABLE I - PREPARATION OF POLYURETHANE ENAMEL

FINISH CODE	COMPONENTS (NOTE 1)	MIXING RATIO (BY VOLUME)	MANUFACTURER	REACTION TIME	REDUCING RATIO (BY VOLUME)	POT LIFE (HOURS)
F24 Type 6 DHMS C4.04 Type 6 Class B Grade B (High Solids)	ECL-G-XXX Base	2	Akzo Nobel	15 - 30 minutes	Reduce to obtain correct viscosity	White:4 Colour:3 Clear:4
	PC-233 Catalyst	1				
	TR-109 Thinner	---		---		
	ECL-F-XXX Base	3	Akzo Nobel	15 - 30 minutes	Reduce to obtain correct viscosity	2
	PC-233 Catalyst	1				
	TR-109 Thinner	---		---		
	Base: CA8000/SXXX Gloss	2	PRC-DeSoto International	None	Note 4	C: 3-4 C1: 3 C2: 2 CT: 3-4 CT1: 3 CT2: 2
	Catalyst: CA8000Z	1				
	CA8000XX Thinners: C, C1, C2, CT, CT1 or CT2	1				
	Base: CA8020/SXXX Semi-Gloss	2	PRC-DeSoto International	None	Note 4	C: 3-4 C1: 3 C2: 2 CT: 3-4 CT1: 3 CT2: 2
	Catalyst: CA8020D	1				
	CA8000XX Thinners: C, C1, C2, CT, CT1 or CT2	1				
	Base: CA8010/SXXX Flat	2	PRC-DeSoto International	None	Note 4	C: 3-4 C1: 3 C2: 2 CT: 3-4 CT1: 3 CT2: 2
	Catalyst: CA8010D	1				
	CA8000XX Thinners: C, C1, C2, CT, CT1 or CT2	1				
	Base: CA8800/B900	2	PRC-DeSoto International	None	Note 4	Note 5
	Catalyst: CA8800Z	1				
	CA8800F Thinners: F1, F2, F3, F4or FR	1				
F37 DHMS C4.04 Type 2 Class A Grade A	4600 Series Base	1	Tempo Paint & Varnish Co.	30 minutes minimum	Reduce to obtain correct viscosity	6
	4600-C-1 Catalyst	1				
	4600-S-1 Thinner	---		---		
	4700 Series Base	2	Tempo Paint & Varnish Co.	30 minutes minimum	Reduce to obtain correct viscosity	6
	4700-C-1 Catalyst	1				
	4600-S-1 Thinner	---		---		

TABLE I - PREPARATION OF POLYURETHANE ENAMEL

FINISH CODE	COMPONENTS (NOTE 1)	MIXING RATIO (BY VOLUME)	MANUFACTURER	REACTION TIME	REDUCING RATIO (BY VOLUME)	POT LIFE (HOURS)

Notes:

1. Catalyst is sensitive to moisture and must be kept in tightly closed containers. If catalyst takes on a milky cast, discard it according to EHS-OP-005.
2. If the engineering drawing specifies an F24 low gloss or semi-gloss finish, use Tristar Coatings 620H base and SB61 thinner with either 620CL (low gloss) or 620CS (semi-gloss) catalyst; mix the enamel in the same fashion as when using 620C catalyst except that for when using 620CL (low -gloss) catalyst mix 2 parts 620H base with 1 part 620CL catalyst.
3. Akzo Nobel series 24-F2 enamel is to be used for detail graphics only. Do not use this paint for the base colour of the plane.
4. If necessary, it is acceptable to add up to 5% more thinner to CA8000, CA8010, CA8020 or CA8800 enamel to obtain the correct viscosity.
5. The pot life of the mixed CA8800 clearcoat is dependent of the ambient temperature and the thinner used. Higher temperatures and faster thinners will shorten pot life. Use of CA8800FR thinner is recommended if the ambient temperature is above 75°F (24°C); at 77°F (25°C) the pot life of CA8800 clearcoat prepared with CA8800FR thinner is 3 hours.

5.4 Preparation of Parts (See Flow Chart 1)

5.4.1 F19 Primed Surfaces

5.4.1.1 For F19 primed surfaces which have been either heat cured or room temperature cured for more than 48 hours, to obtain proper topcoat adhesion reactivate as follows:

Step 1. Scuff the surface using aluminum oxide abrasive paper (180 grit for vibrating sanders, 200 grit for hand abrading).

Step 2. Dust off scuffed areas with a clean wiper.

Step 3. Reactivate the primer according to PPS 31.17.

Step 4. Apply a light coat of F23 primer (0.0003” - 0.0005”), according to PPS 34.16.

Step 5. Allow to air dry for 2 - 24 hours.

Step 6. Use a tack cloth to remove loose particles (i.e., dust, etc.) immediately before painting.

5.4.1.2 For F19 primed surfaces which have been cured for 12 to 48 hours at room temperature, to obtain proper topcoat adhesion solvent clean according to PPS 31.17 and then wipe surfaces with a tack cloth immediately before painting.

5.4.1.3 For F19 primed surfaces which have been cured for less than 12 hours at room temperature, to obtain proper topcoat adhesion use a tack cloth to remove loose particles (i.e., dust, etc.) immediately before painting.

5.4.2 Top-Coated Surfaces

5.4.2.1 When polyurethane enamel is being applied to a previously top-coated surface, it is necessary to apply the enamel within the time frame specified by the manufacturer.

5.4.2.2 Wipe parts with a tack cloth to remove loose particles (i.e., dust, etc.) immediately before applying the polyurethane enamel.

5.4.3 Unprimed/Unpainted Surfaces

5.4.3.1 Unless otherwise specified on the engineering drawing, do not apply polyurethane enamel directly to a part which is not primed or painted and is not a label. Prepare such unprimed surfaces as follows:

Step 1. Prime the surface with F19 primer according to PPS 34.08.

Step 2. Allow the primer to cure according to PPS 34.08.

Step 3. Prepare the surface according to section 5.4.1.

5.5 Application of Enamel (See Flow Chart 1)

5.5.1 When applying polyurethane enamel to DASH 8 aircraft exterior surfaces according to PPS 34.11, measure the dry film thickness of the primer coat (or previously top-coated surface) at the locations specified in PPS 34.11. When painting detail parts and small assemblies, during each shift when parts are being painted check the primer (or previously top-coated surface) dry film thickness on randomly selected parts before applying the enamel coating so that a determination of the enamel dry film thickness can be made.

5.5.2 Begin painting immediately after surface preparation.

5.5.3 Avoid using airless spray equipment to apply high solids enamel (e.g., HS 420) as microblisters or haze may result.

5.5.4 Except as follows, apply an even tack coat of enamel, followed by an equally thick final full coat to obtain a dry film thickness of 0.0020" to 0.0025". Allow the first coat of enamel to dry tack-free before applying the second coat. For best appearance, it is recommended that a completely fresh mix of enamel be prepared for application of the second coat.

5.5.4.1 In limited areas where it is difficult or impractical to achieve the minimum required dry film thickness, it is acceptable for the total dry film thickness to range from 0.0013" - 0.0025".

5.5.4.2 In limited areas where it is difficult or impractical to restrict the dry film thickness to the maximum specified (e.g., in the bottom of deep recesses), it is acceptable for the total dry film thickness to range from 0.0020" - 0.0035".

5.5.4.3 For the following pure TiO2 white topcoats, apply to a total dry film thickness of 0.002" - 0.005":

- DSC 302-0960G, 6600-W1, 82W11, 82W911, G8157, 555U and 6600-W73.
- Akzo Nobel Aerospace Coatings: 24-F2-10 and 24-F20-10.
- PPG Aerospace PRC DeSoto: 821X679 (DS1000) and 821K045 (HS420).

5.6 Curing of Enamel

5.6.1 Before exposure to oil, fuel or hydraulic fluid, polyurethane enamel must be fully cured. **Full cure** of F24 and F37 enamel is assured if the part is allowed to cure at a minimum of 77°F (25°C) and 50% relative humidity for at least 7 days (168 hours). Allow for a longer cure time at temperatures below 77°F (25°C) or at relative humidity levels other than 50% (i.e., higher **or** lower); do not allow the cure temperature to drop below 60°F (16°C). Cure MIL-PRF-85285 enamel according to the manufacturers instructions.

5.6.2 Although it will have no effect on the required full cure time, it is acceptable to accelerate the **cure to handle** time for F24 and F37 enamel to facilitate handling and transport of painted parts. If the following accelerated cure to handle procedure is not performed, parts must be allowed to full cure before handling or transport. Ovens or areas (conventional or infrared (IR)) used for accelerated cure to handle must be qualified according to BAPS 138-055 (including temperature uniformity survey according to BAERD GEN-007).

Step 1. Allow solvent to flash off coated surfaces at 75°F ± 5°F (24°C ± 3°C). For F24 Type 4 and F37 coated surfaces, allow solvent to flash off for a minimum of 30 minutes; for F24 Type 6 coated surfaces, allow solvent to flash off for a minimum of 1 hour.

Step 2. Heat the parts to 80°F - 160°F (27°C - 71°C) and allow to cure for the time shown in Figure 1 (e.g., at a temperature of 150°F (66°C), the cure to handle time is 2 hours).

Step 3. Allow the parts to cool to room temperature.

Step 4. Protective wrap according to section 5.9 before handling or transporting.

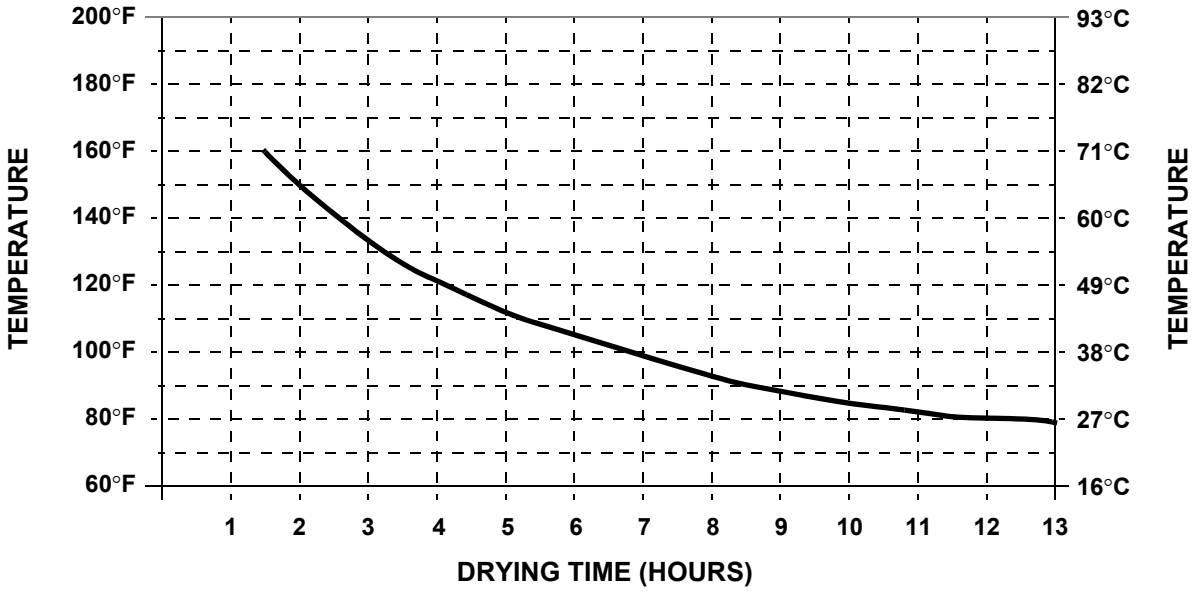

FIGURE 1 - ACCELERATED CURE TO HANDLE SCHEDULE FOR F24 AND F37

5.7 Clean-Up

5.7.1 Clean equipment promptly to avoid dried paint on or in the equipment.

5.7.2 Remove uncured polyurethane enamel from tools and other areas using the solvent specified in PPS 31.17. Use of alternate cleaning method are acceptable, provided all equipment is completely free of primer and contaminants prior to the next use of such equipment.

5.7.3 Dispose of excess mixed polyurethane enamel or raw components according to EHS-OP-005.

5.8 Rework of Damaged or Defective Coatings

5.8.1 Dried Overspray

5.8.1.1 Remove dried overspray by wiping with the solvent specified in PPS 31.17 or by polishing with Met-All polishing compound after allowing the coating to cure for at least 24 hours.

5.8.2 Small Pits and Scratches

5.8.2.1 Touch up small pits and scratches by brush.

5.8.2.2 In small repair areas touched up by brush application of primer, it is acceptable to vary from the dry film thickness limitations specified in section 5.5 provided that complete primer coverage is visually verified. Take care to avoid application of an excessively thick or thin primer coating beyond the dry film thickness limitations specified in section 5.5.

5.8.3 Other Minor Defects

5.8.3.1 Repair coatings with other minor defects as follows:

Step 1. Abrade the defective coating using 180 - 220 grit abrasive paper or strip it according to PPS 31.07.

Step 2. Feather the old finish adjacent to the stripped area by sanding with abrasive paper.

Step 3. Wipe the abraded area clean with a tack cloth.

Step 4. Apply the applicable pre-treatment coating to the exposed base material (metal or plastic), lapping slightly over the old finish.

Step 5. Re-paint the area according to the procedures specified in this standard.

5.8.4 Major Defects

5.8.4.1 Repair coatings with major defects as follows:

Step 1. Completely strip coatings on metal surfaces using chemical stripper according to PPS 31.07 or by abrasive blasting according to PPS 17.02. Abrade coatings on fibre-reinforced composites with 180 - 220 grit abrasive paper to remove defects.

Step 2. Re-paint parts according to the original painting sequence.

5.9 Protection for Transport or Storage

5.9.1 Individually wrap painted parts in protective wrapping material (see paragraph 4.1.3) and place them in cardboard boxes for transport or storage.

6 REQUIREMENTS

6.1 General

6.2 All testing and evaluation specified herein must only be performed by DHC/BA Toronto Materials Laboratory or by laboratories accredited according to paragraph 4.3.3.2.

6.3 Visual Examination

6.3.1 Check painted surfaces for damage (such as scratches), defects (such as blemishes, runs, sags, pits, streaks, excessive orange peel, dried overspray, blisters, peeling, solvent popping, etc.) and other irregularities that impair appearance or protective qualities. Rework defective coatings according to section 5.8.

6.4 Film Thickness

6.4.1 Except as noted in paragraph 5.8.2.2, the dry film thickness of applied polyurethane enamel must be as specified in section 5.5. Coatings that fail to meet the film thickness requirements are not acceptable.

6.4.1.1 Before measuring the dry film thickness, allow the coating to at least cure to handle according to Figure 1. Take care when measuring the dry film thickness to avoid damaging the coating, especially when the coating has not fully cured.

6.4.1.2 When applying polyurethane enamel to DASH 8 aircraft exterior surfaces according to PPS 34.11, check the dry film thickness at the locations specified in PPS 34.11. For detail parts and small assemblies, during each shift when parts are being painted check the total dry film thickness on the randomly selected parts where the primer dry film thickness was measured. If the enamel coating fails to meet the dry film thickness requirements, determine and rectify the cause of the failure before processing any more parts.

6.4.1.3 Check dry film thickness at locations where the primer thickness was previously measured and recorded. Use a micrometer to check the dry film thickness on previously unprimed surfaces of fibre-reinforced composites. Use a micrometer or electronic thickness gauge on previously primed parts. If thickness measurement on parts is not practical, measure the thickness on a test panel sprayed with the production parts.

6.5 Paint Shop Conditions

6.5.1 Paint spray rooms must be equipped with forced or induced ventilation systems capable of maintaining sufficient ventilation to meet the requirements of the Occupational Health and Safety Act. The air must be introduced into the room in such a manner as not to cause turbulence or excessive air currents yet must be sufficient to prevent dried overspray from settling on surfaces which have already been primed but remain tacky.

6.5.2 Adequate lighting must be provided.

6.5.3 Floors must be washed as frequently as required to avoid build-up of dust and loose overspray.

6.5.4 Painting must not be done when the temperature is less than 60°F (16°C) or when the relative humidity is less than 30% or more than 80%. Calibrated temperature and humidity indicators must be provided and the temperature and humidity must be recorded.

7 DHC/BA TORONTO SAFETY PRECAUTIONS

7.1 The safety precautions specified herein are specific to DHC/BA to meet Canadian Federal and Provincial government environmental, health and safety regulations. It is strongly 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 standard plant safety precautions when performing the procedure specified herein.

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

7.4 Catalysts may contain isocyanates. All operators must be familiar with the safety precautions listed herein before handling or using these materials.

7.5 Do not smoke, eat, or drink in paint spraying areas.

7.6 Wear protective respiratory equipment according to PPS 13.13.

7.7 Ensure spray booths and spray rooms are equipped with suitable exhaust systems.

7.8 Do not have open flames or unprotected lights in areas where painting operations are carried out. Do not use infra-red or other heat lamps in the paint booths (i.e. any area where paint is being applied).

7.9 Dispose of containers, rags, wipers or paper, contaminated with mixed polyurethane enamel catalyst, according to EHS-OP-005.

7.10 If mixed raw catalyst spills, clear the immediate area of all personnel and clean the spill according to EHS-OP-005.

7.11 Wear protective coveralls, neoprene rubber gloves (see paragraph 4.2.9) and DHC/BA approved splash goggles when handling mixed polyurethane enamel or its components.

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 DISPOSAL OF CHEMICAL WASTES

9.1 Dispose of all chemical wastes according to national legislation and local regulations. At BA or DHC, dispose of chemical wastes according to EHS-OP-005.

9.2 At BA or DHC, dispose of chemical contaminated work clothes, rags, etc., into Red Containers labelled “Waste Rags”.

10 STORAGE

10.1 Always use the oldest stock first (i.e., first in/first out (FIFO) basis).

10.2 Store enamel components 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. Refer to PPS 13.28 for the storage life of F24 and F37 enamel base and catalyst. Refer to the manufacturers instructions for storage of MIL-PRF-85285 enamel base and catalyst.

FLOW CHART 1 - SURFACE PREPARATION AND PAINTING