DE HAVILLAND AIRCRAFT OF CANADA LIMITED

PPS 16.11

PRODUCTION PROCESS STANDARD

PROPRIETARY INFORMATION

APPLICATION OF FUEL VAPOUR BARRIER COATING (F35) TO INTEGRAL FUEL TANKS

Issue 5
- This standard supersedes PPS 16.11, Issue 4.
- Vertical lines in the left hand margin indicate technical changes over the previous issue.
- Direct PPS related questions to christie.chung@dehavilland.com or (416) 375-7641.
- This PPS is effective as of the distribution date.

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M&P Engineering

Issue 5 - 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.

- Replaced throughout PPS where “Bombardier” is specified with “De Havilland Aircraft of Canada Limited” or “DHC”.
- Specified that all testing and evaluation specified herein shall only be performed by laboratories accredited according to BAERD GEN-018, Rev E.
- Revised personnel requirements to have a good working knowledge of the procedure and requirements in place of just having the basic understanding.
- Added additional DHC safety precautions.
- Added a Disposal of Chemical Wastes section.
- Specified to always use the oldest stock first (i.e., first in/first out (FIFO) basis).

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Tables

1 SCOPE

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for applying DHMS C4.20 epoxy coating (finish code F35) as a vapour barrier coating on the external surface (i.e., dry side) of integral fuel tanks.

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.

2 HAZARDOUS MATERIALS

2.1 Before receipt at De Havilland Aircraft of Canada Limited (DHC), all materials shall be approved and assigned Material Safety Data Sheet (MSDS) numbers by the DHC 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 Environment, Health and Safety Department.

3 REFERENCES

3.1 BAERD GEN-018, Rev. E - Engineering Requirements for Laboratories.

3.2 DHMS C4.20 - Fuel Vapour Barrier Coating for Aircraft Integral Fuel Tanks.

3.3 EHS-OP-005 - Hazardous Materials Management, *DHC internal operating procedure*.

3.4 PPS 13.13 - Personal Protective Respiratory Equipment.

3.5 PPS 13.26 - General Subcontractor Provisions.

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

3.7 PPS 31.17 - Solvent Usage.

4 MATERIALS AND EQUIPMENT

4.1 Materials

4.1.1 DHMS C4.20 epoxy resin coating.

4.1.2 Abrasive paper, aluminum oxide, 180 - 220 grit.

4.1.3 Polishing pad, Scotchbrite Type A Fine (Maroon) 3M Co. Ltd.

4.2 Equipment

4.2.1 Weighing scale capable of weighing to ± 0.5 grams (e.g., triple beam balance type).

4.2.2 Wax-free mixing containers.

4.2.3 Bristle paint brush for brush application of F35 coating.

4.2.4 Airless spraying equipment for spray application of F35 coating.

4.2.5 Dry film thickness gauge (e.g., Isoscope).

5 PROCEDURE

5.1 General

5.1.1 DHMS C4.20 fluid resistant epoxy resin coating is used as a fuel vapour barrier on the exterior surfaces (i.e., dry side) of integral fuel tanks.

5.1.2 Only apply fuel vapour barrier coating to areas of the fuel tank specified on the engineering drawings.

5.2 Preparation of F35 Epoxy Coating

5.2.1 DHMS C4.20 epoxy coating is a 2-part resin/catalyst system.

5.2.2 Only use base and catalyst within its storage life as marked on the container. Action storage life expired material according to paragraph 6.3.1.

5.2.3 Action base or catalyst showing signs of skinning, gelling, milkiness or any other visual evidence of deterioration within its storage life according to paragraph 6.3.2.

5.2.4 Prepare F35 epoxy coating as follows:

Step 1. Thoroughly stir the base and catalyst in their separate containers.

Step 2. Weigh out the resin (base) in a disposable mixing container in even 100 gram increments or fraction thereof as required for the work on hand.

Step 3. Weigh the correct proportion of hardener (catalyst) according to Table I directly into the resin container on the scale. Do not weigh the hardener into a separate container.

Step 4. Thoroughly stir the resin and hardener to obtain a homogeneous air-free mixture.

Step 5. If spray applying epoxy coating, reduce the mixture to spraying viscosity using Akzo Nobel Thinner TL-29, as necessary.

5.2.5 Mix only sufficient material for the job on hand or which will be used up within the pot life of the material.

5.2.6 Discard excess material upon expiration of the pot life or when the material exhibits a noticeable increase in viscosity.

TABLE I - MIXING OF DHMS C4.20 EPOXY COATING

COMPONENTS	MIXING RATIO PARTS/WEIGHT	POT LIFE
Akzo Nobel 473-13 BASE	100	60 to 90 minutes
Akzo Nobel C-31 CATALYST	7	
Akzo Nobel TL-29 THINNER	Note 1	
Note 1. Reduce with TL-29 Thinner as required to obtain correct viscosity.		

5.3 Preparation of Parts

5.3.1 Before overcoating with F35, prime and paint all parts and areas to be coated according to the protective finish treatment specified on the engineering drawing. Allow the final paint coat to cure for a minimum of 24 hours before overcoating with F35.

5.3.2 Immediately before applying F35, lightly scuff all areas to be coated with 180 - 220 grit aluminum oxide abrasive paper or a fine grade Scotchbrite abrasive pad (maroon colour) followed by solvent cleaning according to PPS 31.17.

5.4 Application of F35 Coating

5.4.1 Apply F35 coating as two thick, uniform coats over the entire surface to be covered. Application method may be either by brush (see paragraph 4.2.3) or spray (see paragraph 4.2.4). Ensure that the final film thickness meets the requirement specified in section 6.2.

5.5 Curing of Coating

5.5.1 Allow the first coat of F35 to cure according to Table II before re-coating with the second coat.

5.5.1.1 Suitably placard or mark off areas which have been coated with F35 to prevent contamination of the first coat during the cure to re-coat time.

5.5.1.2 Surfaces which have been suitably protected from contamination during curing of the first coat do not require additional cleaning before re-coating.

5.5.1.3 Locally solvent clean surfaces which have become contaminated with grease, oil, fingerprints according to PPS 31.17.

5.5.2 Allow the second coat of F35 to cure to handle according to Table I before further handling or working coated areas of the assembly.

TABLE II - CURING OF DHMS C4.20 EPOXY COATING

CURING DATA		
CURE TEMPERATURE (°F)	**CURE TO RE-COAT (TACK FREE)**	**CURE TO HANDLE (DRY HARD)**
61 to 90	5 hours	24 hours
100	2.5 hours	5 hours
125	1.5 hours	2.5 hours
150	0.5 hours	0.75 hours

5.6 Clean-Up

5.6.1 Remove uncured epoxy from tools and equipment according to PPS 31.17.

6 REQUIREMENTS

6.1 Visual Inspection

6.1.1 Visually check F35 epoxy coatings to ensure that the coating is coherent and uniform over the entire surface with no evidence of bare spots.

6.2 Film Thickness

6.2.1 The dry film thickness of F35 coating as measured with a film thickness gauge shall be 0.010" to 0.020".

6.3 Rejections

6.3.1 Submit base or catalyst components which have been rejected due to storage life expiry to a laboratory accredited to BAERD GEN-018 Rev E or DHC Materials Laboratory for storage life extension testing according to PPS 13.28.

6.3.2 Return base or catalyst components which have been rejected due to visible deterioration according to paragraph 5.2.3 within their indicated shelf life to the supplier for credit or replacement.

7 DHC SAFETY PRECAUTIONS

7.1 The safety precautions specified herein are specific to DHC 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 Keep epoxy components away from fire and other sources of ignition.

7.3 Avoid eyes or skin contact with F35 epoxy coating. Wear the necessary protective eyewear and use protective gloves when handling these material.

7.4 Supply sufficient ventilation when using epoxy resin in confined areas. Wear protective respiratory equipment as specified in PPS 13.13 when applying F35 epoxy coating.

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

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 application of fuel vapour barrier coating (F35) to integral fuel tanks 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 DISPOSAL OF CHEMICAL WASTES

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

9.2 At 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 epoxy components according to the precautions necessary for flammable materials.

10.3 Store solvents according to PPS 31.17.

10.4 Store the epoxy resin components at a temperature of 61°F to 79°F (16°C to 26°C).

10.5 Refer to PPS 13.28 for the storage life of DHMS C4.20 components.

10.6 Clearly mark containers with the storage life expiry date.

10.7 When not in use, containers of resin, catalyst and solvents shall be kept tightly closed.