DE HAVILLAND AIRCRAFT OF CANADA LIMITED

PPS 13.23

PRODUCTION PROCESS STANDARD

PROPRIETARY INFORMATION

PREPARATION & USE OF DHMS P1.30 RESIN

Issue 8
- This standard supersedes PPS 13.23, Issue 7.
- Vertical lines in the left hand margin indicate technical changes over the previous issue.
- Direct PPS related questions to PPS.Group@dehavilland.com or (416) 375-7641.
- This PPS is effective as of the distribution date.

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Issue 8 - 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 “De Havilland Canada”.
- Specified where use of DHMS P1.30 Grade 2A is specified, use DHMS P1.30 Grade 2.
- Added new DHMS P1.30 Grade 2 Huntsman Epocast 1648 A/B resin system.
- Specified to remove tape after potting.
- Specified to always use the oldest stock first (i.e., first in/first out (FIFO) basis).
- Added new Disposal of Chemical Wastes section.

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1 SCOPE

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for the preparation and application of DHMS P1.30 resin.

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 Canada, all materials shall be approved and assigned Material Safety Data Sheet (MSDS) numbers by the De Havilland Canada 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 De Havilland Canada 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 DHMS P1.30 - Resin, Epoxy Base, Low Density, Honeycomb Core Filler.

4 MATERIALS AND EQUIPMENT

4.1 Materials

4.1.1 DHMS P1.30 resin, epoxy base (See Table I).

4.1.2 Epoxy resin filler, Cab-O-Sil.

4.1.3 Masking tape, 1/2" wide.

4.2 Equipment

4.2.1 Sealant gun cartridge or syringe.

4.2.2 Spatula.

5 PROCEDURE

5.1 General

5.1.1 The epoxy resin specified herein is intended for use as a potting compound for inserts, bearing points, etc. and as edge fillers for honeycomb core sandwich panels.

5.2 Preparation of Resins

5.2.1 Carefully weigh out the resin components of the grade defined on the engineering drawing and thoroughly stir to a homogeneous mixture. Refer to Table I for the mixing ratio and pot life for each of the resins referenced.

5.2.2 Mix only sufficient material for the job on hand or which will be used up within the expected pot life of the material. Discard excess material upon expiration of the pot life or immediately after the material becomes too stiff to apply readily.

5.3 Potting Cells

5.3.1 Pot cells as follows:

Step 1. Using strips of 1/2" wide masking tape, mask off the area to be filled.

Step 2. Prepare a sufficient quantity of potting compound according to Table I.

Step 3. Load the potting compound into a suitable sealant gun cartridge or syringe. Small areas of potting may be done from the mixing container using a spatula.

Step 4. Fill the cells in the masked off areas slowly to prevent inclusion of air in the cells. Injection fill cores 3/4" thick or greater. Do not pot edge cells which will require edge filling after curing and de-moulding.

Step 5. After initial filling, observe the cells and re-fill as necessary.

Step 6. Remove masking tape.

5.4 Curing

5.4.1 Allow the material to cure according to Table I before further handling.

TABLE I - DHMS P1.30 RESIN MIXING RATIOS

DHMS P1.30 RESIN (Note 1)	ADHESIVE COMPONENTS	MIXING RATIO PARTS/WEIGHT	POT LIFE (Note 2)	CURE TO HANDLE (@ 75 ± 5°F) (Note 3)	FULL CURE (@ 75 ± 5°F) (Note 4)
GRADE 1	Magnobond 76-1-A RESIN	100	30 to 50 minutes	24 hours	7 days (Note 5)
	Magnobond 76-1-B HARDENER	20			
	Magnobond 77-3-A RESIN	100	30 to 55 minutes	24 hours	7 days (Note 6)
	Magnobond 77-3-B HARDENER	14			
	Magnobond 77-4-A RESIN	100	30 to 55 minutes	24 hours	7 days (Note 6)
	Magnobond 77-4-B HARDENER	14			
GRADE 2 (Note 10)	Epocast 1648-A RESIN	100	15 to 25 minutes	6 hours (Note 7)	7 days (Note 8)
	Epocast 1648-B HARDENER	20			
	Epocast 8623-A RESIN	100	50 to 70 minutes	6 hours (Note 7)	24 hours (Note 9)
	Epocast 9861 HARDENER	20			
GRADE 2A (Fast Cure) (Note 10)	Epocast 8623-A RESIN	100	12 to 18 minutes (50 gram mix)	3 hours	24 hours
	Epocast 946 HARDENER	14			
	Where use of DHMS P1.30 Grade 2A is specified, use DHMS P1.30 Grade 2 as specified herein.				
GRADE 3 (Note 11)	Dynamold SF14A RESIN	100	60 to 180 minutes	24 hours	7 days (Note 5)
	Dynamold SF14B HARDENER	10			
	CG1305-A RESIN	100	60 to 120 minutes	24 hours	7 days (Note 5)
	CG1305-B HARDENER	20			
GRADE 5	Corfil 615 RESIN	100	30 to 120 minutes	6 hours (Note 12)	24 hours
	Corfil DTA HARDENER	7			

Note 1. Grade 2 and Grade 2A resin may be used interchangeably.
Note 2. 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 3. Do not torque fastener inserts until the resin has cured according to the full cure schedule.
Note 4. If included as part of the lay-up, the resin will be fully cured during the lay-up cure.
Note 5. Alternatively, cure for 24 hours at 75 ± 5°F followed by heat curing for 5 hours at 125 ± 5°F.
Note 6. Alternatively, cure for 5 hours at 75 ± 5°F followed by heat curing for 5 hours at 125 ± 5°F.
Note 7. Alternatively, heat cure for 3 hours at 125 ± 5°F.
Note 8. Alternatively, gel for 12 to 25 minutes at 75 ± 5°F followed by heat curing for 5 hours at 125 ± 5°F.
Note 9. Alternatively, heat cure for 5 hours at 125 ± 5°F.
Note 10. Epocast 8623/9861 and Epocast 8623/946 resin systems have been discontinued. However, it is acceptable to use until depletion of existing stock provided PPS 13.28 shelf life requirements are met.
Note 11. Cab-O-Sil epoxy resin filler, up to 5% by weight, may be added to DHMS P1.30 Grade 3 core filler when mixing.
Note 12. Alternatively, heat cure for 1 hour at 120 ± 5°F.

6 REQUIREMENTS

6.1 Filling Area Requirements

6.1.1 The floors and work surfaces shall be kept clean and free of dust and other contaminants and swept or cleaned at least once a day.

6.1.2 Do not use parting or release agents and uncured silicone bearing material in filling areas.

6.2 Temperature and Humidity Limits

6.2.1 Maintain the temperature and relative humidity of the filling areas within the range specified in Figure 1.

6.2.2 Record the temperature and relative humidity of the filling areas on continuous chart recording equipment when parts are being processed for De Havilland Canada.

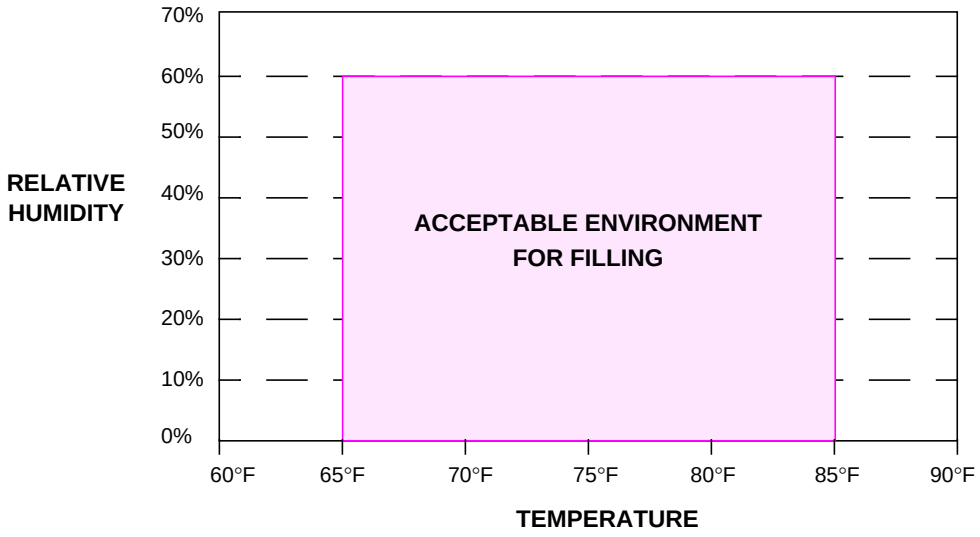

FIGURE 1 - TEMPERATURE AND HUMIDITY LIMITS

7 DE HAVILLAND CANADA SAFETY PRECAUTIONS

7.1 The safety precautions specified herein are specific to De Havilland Canada 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 Avoid ingestion of resin components. If ingestion has occurred, medical attention shall be obtained immediately.

7.4 Keep resins away from fires and other sources of ignition.

7.5 Supply sufficient ventilation when using resins in confined areas.

7.6 Avoid skin contact with skin.

8 PERSONNEL REQUIREMENTS

8.1 Personnel responsible for the preparation and application of DHMS P1.30 resin 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 De Havilland Canada, dispose of chemical wastes according to EHS-OP-005.

9.2 At De Havilland Canada, 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 DHMS P1.30 resin at 60°F to 90°F according to precautions necessary for flammable materials.

10.3 Store resins in containers clearly marked with the storage life expiry date. Storage life of resin shall be as specified in PPS 13.28. Issue resin on a first in/first out basis. Do not issue resin to production if the storage life expiry date has passed.

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