**BOMBARDIER**
*Toronto Site*
**PROPRIETARY INFORMATION**

# PPS 10.36

**PRODUCTION PROCESS STANDARD**

## FLAMMABILITY COMPLIANCE TEST PROCEDURE

Issue 7
- This standard supersedes PPS 10.36, Issue 6.
- Vertical lines in the left hand margin indicate changes over the previous issue.
- Direct PPS related questions to christie.chung@aero.bombardier.com or (416) 375-7641.
- This PPS is effective as of the distribution date.

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

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## 1 SCOPE

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for the preparation and testing of test panels as part of the flammability compliance test procedure.

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 Aircraft Materials Fire Test Handbook (DOT/FAA/AR-00/12) Appendix F.

3.2 Federal Aviation Regulations Part 25 - Para. 25.853 Amdt. 25-83.

3.3 Federal Aviation Regulations Part 25 - Para. 25.855 Amdt. 25-51.

3.4 LAB 054 - Test Panel for Flammability Compliance - Dash 8 - 45° Burn Through.

3.5 LAB 061 - Test Panel for Flammability Compliance to 1990 Final Rule.

3.6 PPS 10.35 - Fabrication of 250°F Cure Epoxy Resin Pre-Impregnated, Fibre Reinforced Composite Parts.

3.7 PPS 10.43 - Fabrication of 350°F Cure Epoxy Resin Pre-Impregnated, Fibre Reinforced Composite Parts.

3.8 PPS 10.48 - Fabrication of 280°F Cure, Phenolic Resin Pre-Impregnated, Fibre Reinforced Composite Parts.

3.9 PPS 13.26 - General Subcontractor Provisions.

3.10 QAMTR 033 - Flammability Compliance Verification Testing.

## 4 MATERIALS AND EQUIPMENT

### 4.1 Materials

4.1.1 For fabrication of composite assembly test panels, use only those materials specified (e.g., on the applicable LAB drawing).

4.1.2 For handling, lay-up and cure of the test panel, use only those materials specified in the composite fabrication PPS to which the test panel is being made.

### 4.2 Equipment

4.2.1 Cure the test panel using the equipment specified in the composite fabrication PPS to which the test panel is being made.

## 5 PROCEDURE

### 5.1 General

5.1.1 For the purpose of this PPS, the term "*DAD*" (Design Approval Designee) specified herein shall be considered to be Bombardier Toronto Transport Canada Flammability Design Approval Designee(s).

5.1.2 The intent of this standard is to ensure initial and on-going compliance of production components for the DASH 8 interior according to the flammability requirements to which the aircraft is certified.

5.1.3 The basic principle of this procedure is to initially and periodically manufacture test panels concurrently with selected production parts, using the same materials and manufacturing procedures as the parts and then submitting the test panel for flammability testing.

5.1.4 Flammability test plans (initial and on-going compliance) shall be submitted to the *DAD* for review and approval prior to the manufacturing of first production components.

5.1.5 The supplier shall be responsible for all flammability tests specified in flammability plans (e.g., vertical burn, heat release, smoke density).

5.1.6 Bombardier Aerospace Representative(s) and/or airworthiness regulatory authority or customer representatives may request to witness the manufacture or testing of such flammability test panels.

5.1.7 All flammability compliance testing shall be completed prior to the manufacture of first production components.

5.1.8 The certificate of conformance shall state compliance to FAR 25.853 and FAR 25.855, as applicable, and quote the Bombardier Aerospace approved flammability test plan number.

5.1.9 The Flammability *DAD* shall be contacted if the method of manufacture changes after initial flammability compliance.

### 5.2 Test Panel Documentation/Control

5.2.1 For this compliance test, use only the test panels that are noted on the engineering drawing (e.g., LAB test panels).

5.2.2 A product specification shall be prepared for each test panel to define the test panel configuration and manufacturing sequence. The specification will have provisions to record material batch numbers, represented part lot number, and relevant manufacturing parameters as considered necessary.

5.2.3 Schedule the manufacture and testing of test panels as required to ensure continued flammability compliance according to QAMTR 033.

### 5.3 Test Panel Fabrication

#### 5.3.1 Lay-Up

5.3.1.1 Construct each test panel according to the applicable flammability test plan or, for on-going Quality Assurance Testing, construct using specifications (e.g., LAB 054 or LAB 061) and the manufacturing document.

5.3.1.2 Ensure that all adhesive film, pre-impregnated cloth and core material used is from same batch and, if possible, cut from the same roll or sheet as the material used for the corresponding production part.

5.3.1.2.1 Prior to lay-up, Inspection shall record the following information on the manufacturing document:

- Batch Number
- Roll Number
- Out Time
- Ambient Temperature
- Humidity
- Date

5.3.1.3 Lay-up the test panel in the same work area and using the same tools and procedures as employed for the production parts, except for the de-bulking operation. The test panel does not require de-bulking.

### 5.3.2 Vacuum Bagging for Curing

5.3.2.1 Vacuum bag the test panel for curing according to the applicable manufacturing specification (i.e., PPS 10.35, PPS 10.43 or PPS 10.48).

### 5.3.3 Curing

5.3.3.1 Cure the test parts with the production parts according to the applicable manufacturing specification (i.e., PPS 10.35, PPS 10.43 or PPS 10.48).

### 5.3.4 Finishing

5.3.4.1 Finish the test part in a manner similar to the production parts represented (i.e., application of primer, surface finishing compound, paint, decorative film or carpet) according to the LAB drawing or the flammability test plan.

5.3.4.2 In order to facilitate production and to avoid lengthy delays, finish the test panel separately from the production parts according to the fabrication/finishing procedure specified on the manufacturing document (e.g., Process Sheet). Use the same finishing materials to finish the test part that are employed to finish the production parts at the time that the panel is prepared.

## 5.4 Testing

5.4.1 A finished flammability test panel shall be submitted with traceable documents (see paragraph 5.2.2 for the minimum data required) to a laboratory specified in paragraph 5.4.3 for flammability testing according to section 6. Upon receipt of a finished flammability test panel, the testing facility shall record the Laboratory Report number on the manufacturing document.

5.4.2 After flammability testing, the Laboratory shall record the results of the flammability test (either passed or failed) on the manufacturing document.

5.4.3 All testing and evaluation specified herein shall only be performed by the Bombardier Toronto Materials Laboratory or by laboratories accredited according to the Aircraft Materials Fire Test Handbook (see Appendix F of the Handbook for the list of approved laboratories).

# 6 REQUIREMENTS

## 6.1 Preparation of Test Coupons

6.1.1 Cut the test coupons from the test panel (e.g., as specified on LAB 054 and LAB 061).

### 6.2 Flammability, Heat Release and Smoke Density Testing

6.2.1 Subject 3 test coupons (e.g., V1 - V3 as per LAB 061) to flammability testing according to FAR 25.853 (a) Amdt. 25-83 (vertical/horizontal burn test).

6.2.2 Subject 3 test coupons (e.g., SAMPLE 1, SAMPLE 2 and SAMPLE 3 as per LAB 054) to flammability testing according to FAR 25.855 (d) Amdt. 25-83 (45° burn through).

6.2.3 Subject 3 test coupons (e.g., HR1 - HR4 as per LAB 061) to heat release testing according to FAR 25.853 (d) Amdt. 25-83 (OSU heat release).

6.2.4 Subject 3 test coupons (e.g., S1 - S4 as per LAB 061) to smoke density testing according to FAR 25.853 (d) Amdt. 25-83 (NBS smoke).

### 6.3 Test Reports

6.3.1 The approved laboratory specified in paragraph 5.4.3 that performed the testing shall issue a Laboratory Report on the results of each flammability test.

6.3.2 The flammability test panel Lab Report shall list, as a minimum, the following information:

- Test Panel Drawing Number (e.g., LAB drawing number)
- Represented Part Number
- Represented Part Lot Number
- Curing Date of Test Panel
- Date of Flammability Test
- Test Specification
- Test Results
- Specified Requirements

6.3.3 The test report conclusion shall indicate that the test coupons met or failed to meet the specified requirements.

6.3.4 The test report, together with a copy of the manufacturing document which accompanied the test panel, shall be kept on file and be available upon Bombardier Toronto's request.

## *7 SAFETY PRECAUTIONS*

*7.1 Refer to the appropriate fabrication PPS for the safety precautions required for preparation of test panels to be used in this procedure.*

## 8 PERSONNEL REQUIREMENTS

8.1 Refer to the appropriate fabrication PPS for the personnel requirements required for preparation and testing of test panels as part of the flammability compliance test procedure.