BOMBARDIER Toronto (de Havilland) **Proprietary Information**	**PPS 2.23** **Production Process Standard (PPS)**

Installation of Delron Sandwich Panel Fasteners

Issue 11

- This standard supersedes PPS 2.23, Issue 10.
- 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; deleted paragraphs have not been marked.
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Issue 11 - 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 section(s) of this PPS for detailed procedure and requirements.

- Added new sub-section 3.1 and para. 3.1.1, to ensure correct usage of reference specifications.
- Created new sub-section 3.2, to identify PPS document references as Bombardier Toronto (de Havilland) process specifications.
- Added new para. 4.1.1, to prevent inappropriate material substitution.
- Deleted all reference to use of Hysol #6C epoxy adhesive.
- Added para. 7.1, to clarify applicability of the safety precautions specified herein.

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1 Scope

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for installation of series 100 Delron sandwich panel fasteners (hereafter referred to as inserts).

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.

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) Process Specifications

3.2.1 PPS 1.09 - Drilling and Reaming.

3.2.2 PPS 13.26 - General Subcontractor Provisions.

3.2.3 PPS 25.52 - Bonding using DHMS A6.12 Type I Adhesive.

3.2.4 PPS 25.66 - Cleanliness Requirements for Application of Adhesives.

3.2.5 PPS 31.17 - Solvent Usage.

4 Materials and Equipment

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 DHMS A6.12 Type I adhesive.

4.1.3 Delron sandwich panel inserts as specified on the engineering drawing. Refer to Figure 1 for a breakdown of Delron insert part numbers. Refer to Figure 2 for a general description of a Delron sandwich panel insert.

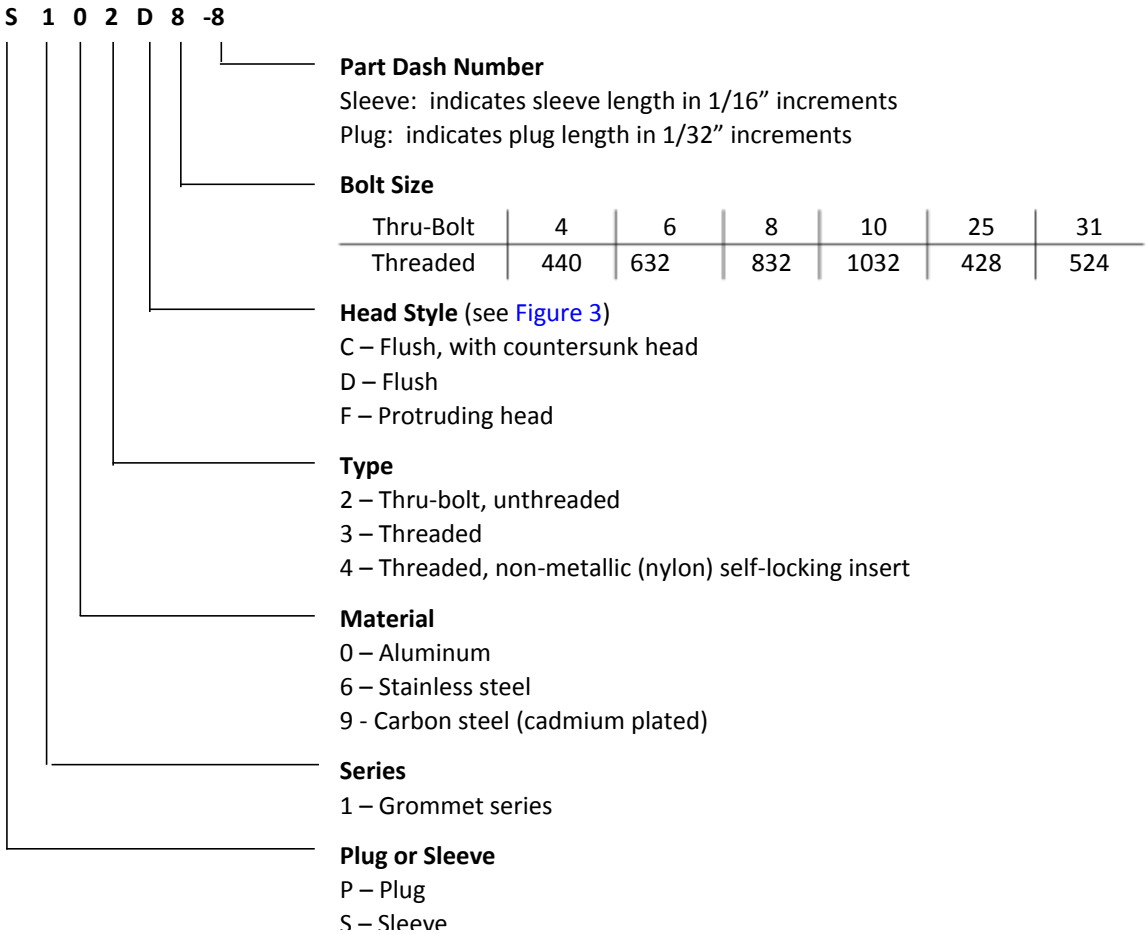

Figure 1. Delron Insert Part Number Breakdown

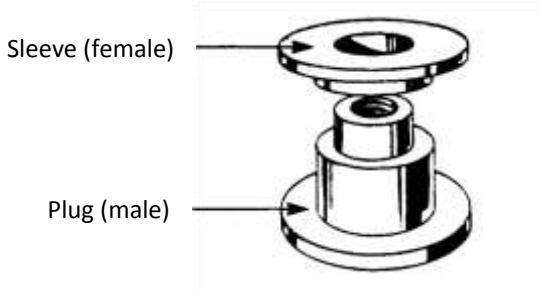

Figure 2. Delron Sandwich Panel Insert (General Description)

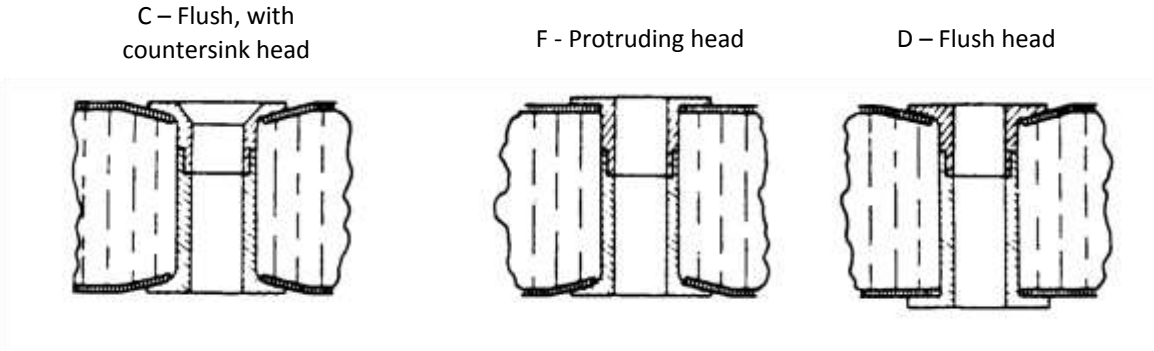

Figure 3. Delron Insert Head Styles

4.2 **Equipment**

4.2.1 Arbor press.

4.2.2 Vixen file (e.g., SD8066).

5 **Procedure**

5.1 **General**

5.1.1 Delron series 100 sandwich panel inserts are two piece, grommet-type assemblies used to facilitate attachment of sandwich panels to aircraft structural members.

5.1.2 Prepare and apply adhesive in a clean bonding area as defined by PPS 25.66.

5.2 **Insert Configurations**

5.2.1 For normal thickness panel inserts the thread, if any, is in the sleeve (female) part of the assembly. For thin panel inserts the thread is in the plug (male) part of the assembly.

5.3 Preparation of Panels

5.3.1 Drill holes for Delron inserts according to PPS 1.09 using the drill size specified in Table 1. Drill all holes square to the surface of the panel.

5.3.2 After final drilling, remove standing burrs from the exit side of the insert hole using a vixen file or similar flat deburring tool. Remove folded in burrs by running through the hole with the applicable drill.

Table 1. Insert Drill Sizes

Delron Insert Size				Pre-Drill Diameter	Final Drill	
102 Series	103 Series	104 Series	106 Series		Diameter	TS.561.11.15 Piloted Drill
4	440	440	---	---	#1 (0.228")	---
6	632	---	---	---	L (0.290")	---
8	832	---	---	---	L (0.290")	---
10	1032	632	632	1/8"	P (0.323")	MK 24
---	---	832	832	1/8"	P (0.323")	MK 24
---	---	1032	1032	1/8"	T (0.358")	MK 25
25	428	---	---	1/8"	25/64" (0.390")	MK 26
---	---	428	428	1/8"	27/64" (0.421")	MK 11
31	524	---	---	---	31/64" (0.484")	---
---	---	524	524	1/8"	33/64" (0.515")	MK 27

5.4 Preparation of Adhesive

5.4.1 Prepare DHMS A6.12 Type I adhesive according to PPS 25.52. Refer to PPS 25.52 for the pot life of mixed adhesive.

5.5 **Installation of 102 Series Inserts**

5.5.1 Install 102 series inserts as follows:

Step 1. Insert the specified sleeve and plug into the panel and ensure that they are properly aligned.

Step 2. Squeeze the plug into the sleeve using the method outlined in section 5.7.

5.6 **Installation of 103, 104 & 106 Series Inserts**

5.6.1 Bond the threaded portion of the insert to the panel as follows:

Step 1. Solvent clean the bonding surface of the panel and the insert head according to PPS 31.17.

Step 2. Prepare adhesive according to section 5.3.

Step 3. Apply a thin coat of the prepared adhesive to the **wall surface** of the hole and to the **shank** of the insert. Take care to ensure adhesive is not applied to the area where the insert will mate with the upper or lower skins of the sandwich panel (adhesive in this area would interfere with electrical bonding and grounding). Ensure that the bonding area meets the cleanliness requirements specified in PPS 25.66. Refer to PPS 25.52 for particular bonding instructions relating to the use of DHMS A6.12 Type I adhesive.

Step 4. Within one minute of application of the adhesive, insert the mating section of the insert into the panel and squeeze the plug into the sleeve using the method specified in section 5.7.

Step 5. Allow bonded inserts to set for the cure time specified in PPS 25.52.

5.7 **Power Squeeze Method of Installation**

5.7.1 Squeeze the plug into the sleeve of the insert as follows:

Step 1. Support the panel so that the surface is at a right angle to the press.

Step 2. Align the sleeve and plug by inserting a mandrel into the insert or into the press post as shown in Figure 4. For flush head inserts, use a flush head mandrel to align the sleeve and plug.

Step 3. Using an Arbor press, apply sufficient pressure to fully seat the plug in the sleeve.

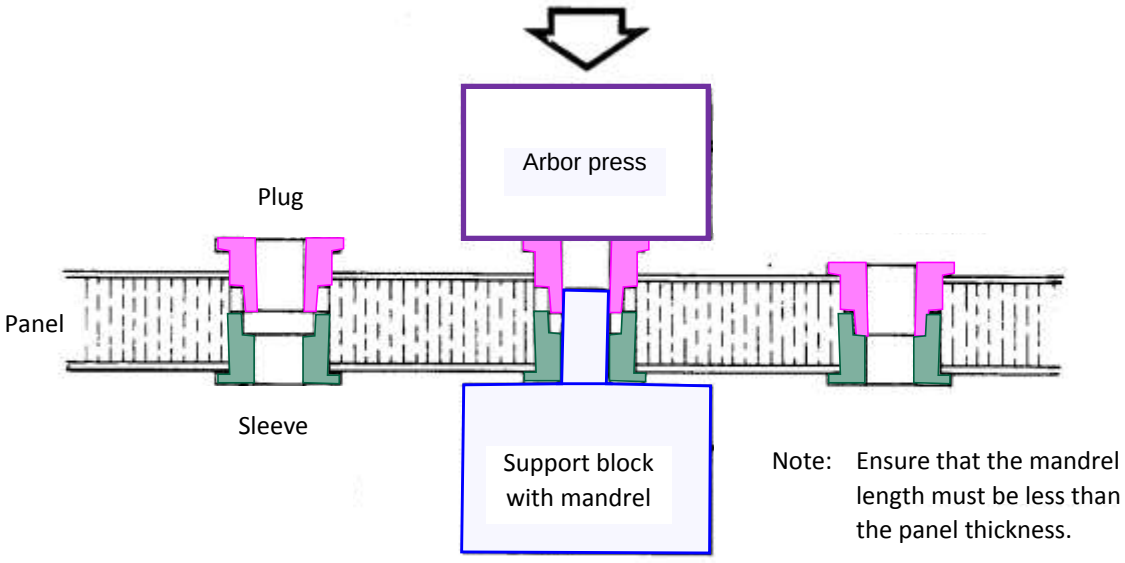

Figure 4. Installation of Delron Inserts using an Arbor Press

5.8 **Clean-Up**

5.8.1 Remove excess uncured adhesive from tools and parts using the solvent specified in PPS 31.17.

6 **Requirements**

6.1 The bore of installed inserts shall be at right angles to the surface of the panel.

6.2 Type, size and layout of the parts shall be according to engineering drawing requirements.

6.3 There must be no indication of adhesive in the area between the insert and either the upper or lower skins of the sandwich panel.

6.4 Flush type inserts, either C or D style, must not protrude above the skin of the sandwich panel as equipment mounted on the sandwich panel must be in contact with the skin. In flush head installations, the sleeve and plug (or one section only) may be forced apart somewhat by the springback of the depressed material; this is acceptable only if the insert does not protrude above the skin of the panel.

6.5 Check installed inserts (103, 104 and 106 series) for rigidity by screwing in the applicable screw or bolt beyond the locking element. Inserts which are loose or show any evidence of rotation are not acceptable.

6.6 Mixing of adhesive and bonding shall only have been performed in a clean bonding area as defined by PPS 25.66.

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 Refer to PPS 25.52 for the safety precautions for use of DHMS A6.12 Type I adhesive.

8 Personnel Requirements

8.1 Personnel must have a good working knowledge of the applicable procedure and requirements as specified herein and must have exhibited their competency to their supervisor.

9 Storage of Adhesives

9.1 Store DHMS A6.12 Type I adhesive according to PPS 25.52.