



DE HAVILLAND AIRCRAFT
OF CANADA LIMITED

BOMBARDIER
Toronto Site

PPS 21.19 - SEALING REMOVABLE PARTS

- Issue 17 - This standard supersedes PPS 21.19, Issue 16.
- 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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Issue 17 - 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.
- Replaced discontinued MS-143HN with MS-143XD.
- 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 sealing removable parts, including the manufacture of formed-in-place gaskets.
 - 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.
- 1.2 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.

2 HAZARDOUS MATERIALS

- 2.1 Before receipt at DHC or BA, all materials shall 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 [PPS 13.26](#) - General Subcontractor Provisions.
- 3.2 [PPS 13.28](#) - Storage Life of Adhesives, Sealants, Paints and Composite Products.
- 3.3 [PPS 16.24](#) - Application of DSC 216 Fluorocarbon Dispersion Coating.
- 3.4 [PPS 21.20](#) - Mixing and Handling Two-Part Sealants.
- 3.5 [PPS 21.21](#) - General Sealing Practices.
- 3.6 [PPS 25.50](#) - Use of DSC 233 RTV Silicone Adhesive/Sealant.
- 3.7 [PPS 31.17](#) - Solvent Usage.

4 MATERIALS AND EQUIPMENT

4.1 Materials

- 4.1.1 DHMS S3.02 B2 low adhesion sealant.



4.1.2 Use the sealant material specified on the engineering drawing or PPS except as follows:

- Where use of DSC 234-13-5 or Parting Agent 13 is specified, use Miller-Stephenson MS-143XD PTFE Release Agent/Dry Lubricant.
- DHMS S3.01/B2 Type I sealant is replaced by DHMS S3.01/B2 Type II sealant.
- When the engineering drawing does not specify the type of DHMS S3.01 sealant, use DHMS S3.01 Class B Type II sealant.
- With the exception of fuel tank, firewalls and high temperature zones (e.g., nacelles), where use of DHMS S3.01 Type II Class B sealant is specified, it is acceptable to use BAMS 552-008 sealants as specified in [PPS 21.20](#) in place of DHMS S3.01 Type II Class B sealant.

4.1.3 DSC 233-7 paintable white silicone sealant.

4.1.4 Miller-Stephenson MS-143XD PTFE Release Agent/Dry Lubricant.

4.1.5 MR 225 release agent.

4.1.6 DSC 216-1 fluorocarbon dispersion coating.

4.1.7 Masking tape, 1" wide.

4.2 Equipment

4.2.1 Refer to [PPS 21.21](#) for equipment.

4.2.2 Suitable brush for applying release agent.

4.2.3 Protective gloves (e.g., DSC 422-2).

5 PROCEDURE

5.1 General

5.1.1 Sealing of removable parts consists of sealing parts of the aircraft structure that are removable for service or repair and includes the manufacture of formed-in-place gaskets during assembly of parts.

5.1.2 Seal areas specified on the engineering drawing.

5.1.3 Unless otherwise specified, apply sealants to the aircraft structure rather than the removable part.

5.1.4 Unless otherwise specified on the engineering drawing, use DHMS S3.02 B2 low adhesion sealant to seal faying surfaces on removable parts.



5.1.5 Except as noted below, seal butt joints around removable access panels according to the engineering drawing.

- Avoid applying DHMS S3.01 B2 butt joint seals around removable exterior panels within a period of 72 hours before painting the aircraft exterior.
- Use DHMS S3.01 B1/2 sealant when performing emergency sealing within a period of 24 to 72 hours before painting.
- When the engineering drawing does not specify the type of DHMS S3.01 sealant, use DHMS S3.01 Class B Type II sealant.
- With the exception of fuel tank, firewalls and high temperature zones (e.g., nacelles), where use of DHMS S3.01 Type II Class B sealant is specified, it is acceptable to use BAMS 552-008 sealants as specified in [PPS 21.20](#) in place of DHMS S3.01 Type II Class B sealant.

5.2 Preparation of Sealant

5.2.1 Prepare two-part sealants according to [PPS 21.20](#).

5.3 Preparation of Parts

5.3.1 Refer to [PPS 21.21](#) for general preparation of parts.

5.3.2 Before applying release agent, mask surfaces immediately surrounding the bond area.

5.3.3 Except as noted below, coat the faying surfaces of the removable part with release agent as specified in [paragraph 5.3.4](#) or [paragraph 5.3.5](#). Ensure release agent does not contact adjacent surfaces. Take care to avoid contaminating Camloc fastener receptacle holes with release agent (minute amount of contamination is acceptable but not desirable).

- For windshield application, apply the release agent to the basic structure.

5.3.4 Use MR 225 or MS-143XD when no release agent is specified. When the engineering drawing specifies REN RP803, Partall #10 or 2LR09 release agent, use MR 225 or MS-143XD. Apply two thin coats of the release agent to the faying surface of the removable part or windshield frame. Allow each coat to dry to touch between coats and before assembly or applying sealant.

5.3.5 When the engineering drawing specifies DSC 216-1 fluorocarbon dispersion coating, apply two thin spray coats according to [PPS 16.24](#).

5.4 Sealing

5.4.1 Refer to [PPS 21.21](#) for general practices for sealant application.



- 5.4.2 Fair in surplus sealant extruded at the weather edge during assembly at the joint edges with a rubber-tipped smoothing tool.

5.5 Post Sealing Procedure

- 5.5.1 Except as noted in [paragraph 5.5.1.1](#), touch-up DHMS S3.01 B2, DHMS S3.01 B1/2 or BAMS 552-008 butt joint seals, applied around access panels after exterior aircraft painting, with the appropriate paint to match the exterior paint scheme.

- 5.5.1.1 It is not necessary to paint DSC 233-7 paintable white silicone sealant used to seal butt joints around access panels on white exterior aircraft surfaces.

5.6 Curing

- 5.6.1 Refer to [PPS 21.20](#) and [PPS 25.50](#) for sealant curing information.
- 5.6.2 For aerodynamic sealing, sealant application and curing outside of the temperature and relative humidity specified in [PPS 21.20](#) may result in an unacceptable aerodynamic fillet seal (e.g., excessive shrinkage, etc.) or butt joint seal (e.g., excessive shrinkage, dragging effect on vertical surfaces, etc.).
- 5.6.3 Post "WET SEALANT" warnings on sealed areas susceptible to damage by nearby assembly operations until the sealant cures tack-free.
- 5.6.4 Fully cure formed-in-place gaskets according to [PPS 21.20](#) before disassembling or further working the assembly.
- 5.6.5 When assemblies with formed-in-place gaskets are disassembled after curing, re-apply release agent to the removable part faying surface according to [paragraph 5.3.4](#) before re-assembling.

5.7 Clean-Up

- 5.7.1 Remove excess uncured sealant from structures and parts by solvent cleaning according to [PPS 31.17](#).
- 5.7.2 After sealing, remove excess release agents from part surfaces by washing thoroughly with clean water. Ensure surfaces are thoroughly dried.
- 5.7.3 Immediately after use, remove all traces of sealant from equipment by solvent cleaning according to [PPS 31.17](#).

6 REQUIREMENTS

- 6.1 Before application of sealant, areas to be sealed shall be thoroughly cleaned.



- 6.2 Sealant type, fillet size, areas to be sealed and application shall meet the requirements specified on the engineering drawing or PPS.
- 6.3 Ensure complete adhesion of the sealant. Reject assemblies having loose sealant or visual breakaway at the fillet or coating edges.
- 6.4 Paint DHMS S3.01 B2, DHMS S3.01 B1/2 or BAMS 552-008 butt joint seals around removable exterior panels to match the exterior paint scheme.

7 DHC/BA 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 *Keep sealants and release agents away from fire and other sources of ignition.*
- 7.4 *Do not smoke or eat in areas where sealants and release agents are being applied. Avoid ingestion of sealants or release agents. If ingestion occurs, obtain medical attention immediately.*
- 7.5 *Wash hands thoroughly with soap and water immediately after working with sealants or release agents.*
- 7.6 *Ensure sufficient ventilation is supplied when using sealants or release agents in confined areas.*
- 7.7 *Avoid skin and eye contact with sealants and release agents. Wear protective gloves when handling sealants or release agents. If skin contact occurs, wash the affected area thoroughly with soap and water. Do not use protective hand cream as it may cause contamination. If eye contact occurs, immediately flush eyes for 15 minutes minimum with large quantities of water at an eye wash station and report to the Health Centre.*
- 7.8 *Store sealants and release agents in their original containers or in approved 1 gallon safety cans kept in yellow flammable material storage cabinets.*
- 7.9 *Refer to [PPS 31.17](#) for the safety precautions for handling and using solvents.*



8 PERSONNEL REQUIREMENTS

- 8.1 Personnel responsible for sealing removable parts, including the manufacture of formed-in-place gaskets, 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/BA, dispose of chemical wastes according to EHS-OP-005.
- 9.2 At DHC/BA, dispose of chemical contaminated work clothes, rags, etc., into Red Containers labelled "Waste Rags".

10 STORAGE

- 10.1 Always use oldest stock first (i.e., first in/first out (FIFO) basis).
- 10.2 Store sealants according to [PPS 21.20](#).
- 10.3 The storage life of the sealant shall be according to [PPS 13.28](#). Keep sealant containers tightly closed when not in use.