

de Havilland Inc.

Material Specification

| | |
|----------------------------------|--|
| TITLE: | SEALING COMPOUND, POLYTHIOETHER, INTEGRAL FUEL TANKS AND GENERAL PURPOSE, FAST CURING |
| SPECIFICATION NUMBER: | DHMS S 3.08 |
| ISSUE: | NC |
| AMENDMENT: | - |
| DATE: | March 6, 2003 |
| PAGE: | 1 of 8 |

Information in this document is **proprietary** to de Havilland Inc. This document must not be reproduced or distributed in the whole or in part to a third party without prior express permission in writing from de Havilland Inc.

Prepared by:

Approved by:

SIGNED ORIGINAL ON FILE

Shiraz Haniff
Materials Technology

Ken Quon
Chief, Metals Technology

:

| | | |
|--|-------------------------------|--|
| de Havilland | Material Specification | DHMS: S 3.08 ISSUE: NC |
| SEALING COMPOUND, POLYTHIOETHER, INTEGRAL FUEL TANKS AND GENERAL PURPOSE, FAST CURING | | AMD.: - DATE: March 6, 2003 PAGE: i of i |

REVISION RECORD

| Issue | Page | Description and Reason for Change |
|--------------|-------------|--|
| NC | | This is a complete new revision. |

| | | |
|--|-------------------------------|--|
| de Havilland | Material Specification | DHMS: S 3.08 ISSUE: NC |
| SEALING COMPOUND, POLYTHIOETHER, INTEGRAL FUEL TANKS AND GENERAL PURPOSE, FAST CURING | | AMD.: - DATE: March 6, 2003 PAGE: 2 of 7 |

1 SCOPE

This specification covers the requirements for a fast curing, two component fuel resistant polythioether sealing compound, for sealing and repairing fuel tanks and fuel cell cavities.

2 CLASSIFICATION

The sealing compound shall be supplied in one of the following Types:

Type 1 - Sealing compound requiring an adhesion promoter for proper adhesion. An adhesion promoter is supplied with Type 1 material and must be applied prior to the sealing compound.

Type 2 - Sealing compound that does not require an adhesion promoter for proper adhesion.

The sealing compounds shall be supplied in the following Classes with dash numbers used to designate the minimum application time in hours:

Class A - Suitable for brush application dash numbers shall be -1/4, -1/2 and -2.

Class B - Suitable for application by extrusion gun or spatula. Dash numbers shall be -1/4, -1/2 and -2.

3 APPLICABLE DOCUMENTS

The following document shall form the specification of the sealant defined herein.

SAE-AMS 3277A - Sealing Compound, Polythioether Integral Fuel Tanks and general Purpose, Fast curing Intermittent Use to 360 °F (182 °F)

BMS 3-11G - Hydraulic Fluid, Fire Resistance

ASTM D 412 - Test Methods for Rubber Properties in Tension

4 REQUIREMENTS

The sealing compounds noted shall meet all the requirements of SAE-AMS 3277A.

4.1 Storage Life

The storage life of the product shall be a minimum of 9 months from the date of manufacture, when stored at temperatures below 80°F(26°C) in original unopened containers.

4.2 Resistance to Hydraulic Fluid

The cured sealant shall be immersed in hydraulic fluid to BMS 3-11E Type IV, Class 1, Grade A at 77±5°F for 7 days. After immersion cut 3 specimens into 0.25" by 4" dumbbell specimens confirming to ASTM D 412, Die C. Pull each specimen in a tensile testing machine at a rate of 2" per minute. The minimum tensile strength and elongation should be 60 psi and 200% respectively.

| | |
|--|--|
| de Havilland Material Specification | DHMS: S 3.08 ISSUE: NC |
| SEALING COMPOUND, POLYTHIOETHER, INTEGRAL FUEL TANKS AND GENERAL PURPOSE, FAST CURING | AMD.: - DATE: March 6, 2003 PAGE: 3 of 7 |

5 QUALITY ASSURANCE

5.1 Qualification

- 5.1.1 A supplier is responsible for the performance of all qualification testing, as specified in **Table 1**. Three lots/batches of material is required for qualification.
- 5.1.2 A supplier desiring qualification shall submit one copy of a report showing actual qualification test data and a sufficient quantity of product for de Havilland evaluation tests.
- 5.1.3 Upon review of supplier's data and de Havilland tests, the supplier will be advise either of product qualification or reasons for disqualification.
- 5.1.4 Products that are qualified will be listed in the Qualified Products list of this specification.
- 5.1.5 No changes in the method of manufacture and/or formulation shall be made without notification and prior written approval of Materials Technology Department of de Havilland Inc.
- 5.1.6 Re-qualification of the product may be requested by the Purchaser if there are any changes in the method of manufacture and/or formulation.

5.2 Qualification by Similarity

Where a product has been qualified to another similar specification, the supplier may submit the qualification data applicable to this specification for consideration. The similar specification may be a government, company, or other specification where the requirements are similar to this specification.

5.3 Acceptance Tests

- 5.3.1 Unless otherwise specified the contract or purchase order, the supplier is responsible for all acceptance tests, as specified in **Table 1**.
- 5.3.2 The supplier, performing acceptance tests per **Para.5.3.1** shall furnish with each batch of product one copy of an Acceptance Test Report showing actual test data conformance to the acceptance tests specified in **Table 1**. The report shall include the supplier's batch identification.
- 5.3.3 de Havilland Inc. reserves the right to perform any or all of the tests set forth in this specification to ensure that the product continues to meet specification requirements. Any product not meeting the requirements of this specification will be returned to the supplier at the supplier's expense.

| | | |
|---|-------------------------------|--|
| de Havilland | Material Specification | DHMS: S 3.08 ISSUE: NC |
| SEALING COMPOUND, POLYTHIOETHER, INTEGRAL FUEL TANKS AND GENERAL PURPOSE, FAST CURING | | AMD.: - DATE: March 6, 2003 PAGE: 4 of 7 |

Table 1: Qualification and Batch Acceptance Tests

| Test | Qualification as per SAE -AMS 3277A | Acceptance as per SAE -AMS 3277A |
|---------------------------------|-------------------------------------|----------------------------------|
| Specific Gravity | x | |
| Hardness (Shore A Scale) | x | |
| Non-Volatile Content | x | |
| Viscosity | x | |
| Flow | x | x |
| Application Time | x | x |
| Tack Free Time | x | x |
| Standard Cure Time | x | x |
| Chalking | x | |
| Weight Loss | x | |
| Flexibility | x | |
| Resistance to Thermal Rupture | x | |
| Tensile Strength and elongation | x | |
| Peel Strength | x | |
| Resistance to Heat | x | |
| Resistance to Hydrocarbons | x | |
| Low-Temperature Flexibility | x | |
| Repairability | x | |
| Accelerated Storage Stability | x | |
| Resistance to Hydraulic Fluid | Para. 4.2 | |

5.4 Definitions

- 5.4.1 Batch is defined as the end product of all the raw materials mixed and/or manufactured at the same time and place, The weight and volume may vary, depending upon the capacity of the manufacturers facilities.
- 5.4.2 Lot is defined as the total quantity of product in a shipment taken from the same batch.

| | |
|--|---|
| de Havilland Material Specification | DHMS: S 3.08 ISSUE: NC |
| SEALING COMPOUND, POLYTHIOETHER, INTEGRAL FUEL TANKS AND GENERAL PURPOSE, FAST CURING | AMD.: - DATE: March 6, 2003 PAGE: 5 of 7 |

6 ORDERING DATA

6.1 Prerequisite

Products furnished under this specification for production use shall be qualified and listed on the Qualified Products List prior to issuing a purchase order.

6.2 Procurement documents shall specify the following:

- Title, number, issue and amendment number of this specification
- Manufacturer's Name and Product Identification (Trade name or Code number)
- Type and size of cartridges or containers
- Type and class of Material
- Total quantity

7 PREPARATION FOR DELIVERY

7.1 Packaging and Packing

The sealant shall be packed in such a manners as to assure that during shipment and storage, the product will be protected against damage from exposure to hazards that could have adverse effects on conformance to the properties per Section 4 of this specification.

7.2 Marking

Each kit shall be legibly marked with the following information:

- Sealing Compound, Polythioether, Integral Fuel Tanks, General Purpose, Fast Curing
- DHMS S3.08, Type 1 or 2 and Class A or B, e.g. -1/4, -1/2 or -2
- Manufacturers Name and Product Identification
- Batch Number
- Quantity
- Date of Manufacture
- Cartridge size
- Expiry Date

| | |
|---|---|
| de Havilland | DHMS: S 3.08 ISSUE: NC |
| Material Specification SEALING COMPOUND, POLYTHIOETHER, INTEGRAL FUEL TANKS AND GENERAL PURPOSE, FAST CURING | AMD.: - DATE: March 6, 2003 PAGE: 6 of 7 |

8 SHIPPING DOCUMENTATION

Shipping document shall show:

- Sealing Compound, Polythioether, Integral Fuel Tanks, General Purpose, Fast Curing
 - DHMS S3.08 plus Type 1 or 2 and Class A or B, e.g. -1/4, -1/2 or -2
 - Manufacturers Name and Product Identification
 - Purchase Order Number
 - Batch Number
 - Quantity
 - Cartridge Size
- Certificate of Conformance including Acceptance Test Reports
- Material Safety Data Sheets (MSDS)

9 HEALTH AND SAFETY DATA

When supplying samples for qualification per **Para.5.1.2**, the supplier shall submit a Material Safety Data Sheet as per the Ontario Occupational Health & Safety Act, Workplace Hazardous Material Information System (WHMIS) Regulations, which complies with the Canada Hazardous Products Act, Controlled Products Regulations.

Materials Technology, de Havilland Inc. must ensure that copies are provided to, and approved by, the Materials Safety Committee, Industrial Hygiene and Safety, de Havilland Inc. before testing the product.

These requirements are prerequisites to inclusion of any product on the Qualified Products List.

Any changes in the formulation of materials require the re-submission of the Material Safety Data Sheet.

| | | |
|--|-------------------------------|--|
| de Havilland | Material Specification | DHMS: S 3.08 ISSUE: NC |
| SEALING COMPOUND, POLYTHIOETHER, INTEGRAL FUEL TANKS AND GENERAL PURPOSE, FAST CURING | | AMD.: - DATE: March 6, 2003 PAGE: 7 of 7 |

QUALIFIED PRODUCTS LIST

| MANUFACTURER'S NAME AND ADDRESS | MANUFACTURER'S PRODUCT IDENTIFICATION NO. | MSDS | DE HAVILLAND QUALIFICATION SHEET NO. | DATE OF PRODUCT APPROVAL |
|------------------------------------|--|------|--|--------------------------------|
| <u>Manufacturer:</u> | TYPE 1 | | | |
| | Class B | | PQS #1 | February 1992 |
| PRC DeSoto International | PR 1826 B1/4 | | | |
| 11601 United Street | Part A | 1968 | | |
| Mojave, CA 93501 | Part B | 1969 | | |
| | PR 1826 B1/2 | | | |
| | Part A | 2925 | | |
| | Part B | 2926 | | |
| | PR 187 | 2927 | | |
| | (Adhesion Promoter) | | | |

Distributors:

PRC DeSoto International
5676 Timberlea Blvd.
Mississauga, Ontario
L4W 4M6
Tel: (905) 629-7999