

de Havilland Material Specification

TITLE:	SILICONE RUBBER SHEET AND STRIP, GENERAL PURPOSE
SPECIFICATION NUMBER:	DHMS P 1.34
ISSUE:	C
AMENDMENT:	--
DATE:	October 25, 2005
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REVISION RECORD

Issue	Page	Description and Reason for Change
A	4	Flammability of Type 2 material has been changed.
Amd.1	8	Add Para. 7.3.1 Add "Any changes.....Data Sheet", to Para. 8.
B		This is a complete revised issue. Detail changes have not been noted.
Amd. 1	8	QPL: supplier's name and address have been changed.
Amd. 2	2	Para. 1: wording changed.
	3	Table 1: Grey colour added.
Amd. 3	2 & 3	Para. 2.2 & 3.1: Reference to AMS Revision added.
Amd. 4	8	QPL: -4 - Grey material added. -3, Grade 1 - Product designation changed.
C		This is a complete revised issue. Detail changes have not been noted. Added White material to Table I and QPL

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1 SCOPE

This specification covers the requirements for a general purpose silicone rubber in the form of sheet and strip.

1.1 Classification

Silicone rubber products supplied to this specification shall be one of the following types and grades, as specified on the purchase order.

Type 1 - See **Para.3.4**

Type 2 - See **Para.3.4**.

Grade 1 - 35-45 Durometer Hardness

Grade 2 - 45-55 Durometer Hardness

Grade 3 - 55-65 Durometer Hardness.

2 APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. In the event of conflicting requirements between this and the specifications listed below, the requirements of this specification shall govern. Where a specific issue of a document is not specified, the current issue shall be used.

2.1 U.S. Government Specifications

2.1.1 Federal Aviation Administration

FAR 25.853 (a), APP. F, PART I (1)(iv) - Flammability Requirements
Amd. 25-86

FAR 25.853 (b), APP. F, PART I (2)(ii) - Flammability Requirements
Amd. 25-86

2.1.2 Federal Standards

Federal Standard 595 - Colours

2.2 Aerospace Material Specifications

AMS 3301, Rev. F - Silicone Rubber, General Purpose, 35-45

AMS 3302, Rev. F - Silicone Rubber, General Purpose, 45-55

AMS 3303, Rev. F - Silicone Rubber, General Purpose, 55-65.

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3 REQUIREMENTS

3.1 Material

The silicone rubber products shall be capable of meeting all the requirements of the applicable AMS, plus the additional requirements specified herein.

Grade 1 - AMS 3301, Rev. F

Grade 2 - AMS 3302, Rev. F

Grade 3 - AMS 3303, Rev. F

3.2 Preproduction Samples

The supplier shall submit five (5) samples (6.5"x 10.5") in the case of sheet material or 12" long in the case of strip or tubing of the initial batch of material manufactured to this specification for approval of the colour to the Fed. Std. 595 colour chip number, as specified in **Table 1**. De Havilland Inc. (DHI) may elect to assign a special DHI Colour Standard code number where a Fed. Std. 595 colour is not available. One sample shall be designated as the Master Standard, with the remaining four samples being used as working standards.

Table 1: Colour

Dash Number	Colour	Fed. Std. 595 Colour No.
- 1	Beige	37722
- 2	Brown	20045
- 3	Black	37038
- 4	Grey	36492
- 5	White	17886

3.3 Colour

3.3.1 Where the drawing or Purchase order calls for a specific colour (Fed. Std. 595 or DHI Colour standard code number), the colour shall be cross-referenced by the applicable dash number noted in **Table 1** and in the Qualified Products List.

3.3.2 The silicone rubber product shall have an even colour density and shall match the Fed. Std. 595 colour chips and the Master Standard referenced in **Para.3.2**. Comparison shall be made by placing the sample side by side with the control sample in a Macbeth Industrial colour matching unit, or equivalent. The direction of illumination shall be normal to the surfaces being compared. Both "North Sky Daylight" (7500 K) and "Horizon Sunlight" (2300 K) shall be used to compare colours.

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3.4 Flammability

The silicone rubber Products of each grade shall meet the flammability requirements as follows:

Type 1 FAR 25.853 (a), APP. F, PART I (1)(iv), Amd. 25-86

Type 2 FAR 25.853 (a), APP. F, PART I (1)(iv), Amd. 25-86 and 45° burn through test only of FAR 25.853 (b), APP. F, PART I (2)(ii) Amd. 25-86.

4 TEST SPECIMENS AND TEST METHODS

Unless otherwise specified, tests shall be conducted in accordance with respective specification as listed in **Table 2**.

5 QUALITY ASSURANCE

5.1 Qualification

5.1.1 A supplier is responsible for the performance of all qualification testing, as specified in **Table 2** of this specification. A three lots/batches qualification is required.

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 advised 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 and Quality Assurance Departments of de Havilland Inc.

5.1.6 Requalification 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 in the contract or purchase order, the supplier is responsible for all acceptance tests, as specified in **Table 2** of this specification.

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- 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 2**. 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.

Table 2: Qualification and Batch Acceptance Tests

Test	Reference	Qualification	Acceptance
Hardness	AMS 3301	x	x
	AMS 3302	x	x
	AMS 3303	x	x
Tensile Strength	"	x	
Elongation	"	x	
Tensile Strength at 100% Elongation	AMS 3301 or 3302	x	
Tear Resistance	AMS 3301	x	
	AMS 3302	x	
	AMS 3303	x	
Specific Gravity	"	x	
Lubricating Oil Resistance	"	x	
Dry Heat Resistance	"	x	
Compression Set	"	x	
Low Temperature	"	x	
Weathering	"	x	
Corrosion	"	x	
Quality	"	x	x
Colour	Fed. Std. 595 and Para.3.3	x	x
Flammability (Type 1)	FAR 25.853 (a), APP. F, PART I (1)(iv), Amd. 25-86	x	x
(Type 2)	FAR 25.853(b), APP F, PART I(2)(ii), Amd.25-86	x	x

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6 ORDERING DATA**6.1 Prerequisite**

- 6.1.1 Products furnished to this specification for production use shall be qualified and listed on the Qualified Products List prior to the issuing of a Purchase Order.
- 6.1.2 Prior to the shipment of each batch of material, a 6.5" x 10.5" or 12" long sample (depending on forms, taken from the lot of material to be shipped, shall be forwarded to DHI for lot approval.

6.2 Procurement Documents

- 6.2.1 Procurement documents shall specify the following:
 - Title, Number, Issue and Amendment Number of this Specification.
 - Type, Grade (1, 2 or 3), Dash Number and Colour
 - Form (sheet or strip)
 - Width, Length and Thickness
 - Manufacturer's Material Designation
 - Total Quantity

7 PREPARATION FOR DELIVERY**7.1 Identification**

Each roll or package shall be permanently and legibly marked with the following information:

- Manufacturer's Name and Product Identification
- de Havilland Specification Number and Issue
- Type, Grade (1, 2 or 3) Dash Number and Colour
- Form (sheet or strip)
- Width, Length and Thickness
- Purchase Order Number
- Batch or Lot Number.

7.2 Preservation and Packing

The silicone rubber product shall be packaged in such a manner as to ensure that the product will not be damaged during shipment and storage and will be protected against damage from exposure to moisture, weather or any normal hazard.

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7.3 Shipping Documentation

The shipping document shall show the following information:

- de Havilland Purchase Order Number
- de Havilland Specification Number and Issue
- Manufacturer's Product Designation
- Type, Grade (1, 2 or 3) Dash Number and Colour
- Form (sheet or strip)
- Width, Length and Thickness
- Number of Packages
- Total Quantity
- Batch or Lot Number

7.3.1 Each shipment shall contain a copy of Material Safety Data Sheet.

8 HEALTH AND SAFETY DATA

When supplying samples for qualification per **Para.5.1.2**, the supplier shall submit a Material Safety Data Sheet (MSDS) complying with the "Controlled Products Regulations" of the Hazardous Products Act (also known as W.H.M.I.S. Regulations). The document must state all hazardous ingredients, safe-handling procedures, first-aid measures, fire and explosion data, re-activity data, physical properties, preparation information and procedures for storage and disposal.

This (MSDS) must then be supplied with a completed DH 4339 "Application To Introduce A New Material" form to the Material Safety Committee.

Upon receipt of DH 4340 "Recommendation" form that approves the use of the material, it can then be included on the Qualified Products List.

NOTE: Any changes in the formulation of the material require a re-submission of the Material Safety Data Sheet.

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QUALIFIED PRODUCTS LIST

MANUFACTURER'S NAME AND ADDRESS	MANUFACTURER'S PRODUCT IDENTIFICATION NO.	MATERIAL SAFETY DATA SHEET NO.	DE HAVILLAND QUALIFICATION SHEET NO.	DATE OF PRODUCT APPROVAL
	Type 1 and 2	N/A	PQS #1	July 8, 1986
Freudenberg Nok, 65 Spruce St., Tillsonburg, Ontario. N4G 4H3 Ph: (519) 842-3641	-1 Beige Grade 1 - 70836 Grade 2 - 70338 Grade 3 - 70831			
	-2 Brow Grade 1 - 70230 Grade 2 - 70833 Grade 3 - 70821			
	-3 Black Grade 1 - 70834 Grade 2 - 70835 Grade 3 - 70740			
	-4 Grey Grade 1 - 72083 Grade 2 - 70851 Grade 3 - 70232	N/A	PQS #2	September 16, 1998
	-5 White Grade 1 - 72268 Grade 2 - 72269 Grade 3 - 72270		PQS #3	October 25, 2005