

de Havilland Inc.

Material Specification

TITLE:	ALUMINUM ALLOY SHEET AND PLATE D54S
SPECIFICATION NUMBER:	DHMS M2.05
ISSUE:	1
AMENDMENT:	1-2
DATE:	September 29, 1964
PAGE:	1 of 5

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1 SCOPE

This specification covers the requirements for D54S aluminum alloy.

2 INTRODUCTION

The clauses of this specification are written under the following headings:

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3 APPLICABLE SPECIFICATIONS

3.1 Standards

Federal Test Standard No. 151

Federal Standard No. 245 - Tolerances for Aluminum & Aluminum Alloys

4 REQUIREMENTS

4.1 Composition

D54S Aluminum Alloy shall be composed of the following elements in percent by weight:

Silicon	0.20
Iron	0.40
Copper	0.10
Manganese	0.50 - 1.0
Magnesium	4.0 - 4.9
Chromium	0.05 - 0.25
Zinc	-----
Titanium	-----
Others, Each	0.05
Others, Total	0.15
Aluminum	Remainder

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NOTE: Except where a range is shown, the percentages are maximum values.

- 4.1.1 The subcontractor shall furnish an analysis of each lot showing the percentage of each of the elements shown above.
- 4.1.2 Analysis shall be made regularly only for the elements specifically mentioned above. If, however, the presence of other elements is indicated in the course of routine analysis, further analysis shall be made to determine that these other elements are not present in excess of the limits specified herein.

4.2 Condition

- 4.2.1 The material shall be available in the following tempers according to thicknesses required (Ref. Table 1).

Table I

Temper	Tempers Available Thickness Range (ins)
H 32(Sheet)	.080 - .249
H 31A(Plate)	.250 - .375
H 11B(Plate)	.376 - .625
H 11A(Plate)	.626 - 1.000

4.3 Mechanical Properties

The mechanical properties shall be as follows:

Temper	Ultimate Tensile Strength PSI	Min. Yield Strength PSI	Elongation % in 2 inches Minimum
H 11A	42,000	25,000	14
H 31A	44,000	31,000	12
H 32	45,000	34,000	10*
H 11B	44,000	31,000	12

* Note: For thicknesses 0.081 to 0.125 inches, elongation is 8%.

4.4 Tolerances

The tolerances on thickness shall be as follows:

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4.4 (Continued)

<u>Thickness</u>	<u>Over 18 in. - 36 in.</u> <u>Plus or Minus</u>
.097 - .108 in.	.002
.109 - .140 in.	.0025
.141 - .172 in.	.003
.173 - .203 in.	.0035

For thicknesses greater than above, Federal Standard 245 tolerances shall apply.

4.4.1 The maximum off-flat condition shall be in accordance with Federal Standard 245.

4.5 Workmanship

The material shall be uniform in quality and condition, clean sound and free from foreign materials and from internal and external defects detrimental to fabrication or to performance of parts.

4.5.1 Rework of surface defects such as scratches and abrasion pack marks is acceptable if the defects are of a sufficiently superficial nature to subsequently blend with the overall appearance of the sheet. Such spot removal of defects by the supplier shall be permitted only where such removal does not reduce the metal thickness below the minimum dimension allowed by this specification. Pits, rolled in metal, rolled in scratches or dross are not acceptable. Light staining is not cause for rejection.

5 IDENTIFICATION

5.1 Unless otherwise specified, each plate or sheet shall be marked with DHMS M2.05, commercial number, heat number, manufacturer's identification and nominal thickness in inches. The characters shall be applied using a suitable marking fluid, and shall be capable of being removed by solvent wiping or vapour degreasing. The markings shall have no deleterious effect on the material or its performance. The characters shall be sufficiently stable to withstand ordinary handling.

6 PACKAGING

6.1 The plates and sheets shall be preserved and packaged in accordance with standard commercial practice such that the material arrives at the purchaser's dock with no surface scratches, gouges or indentations as agreed to between purchaser and supplier.

7 TESTING

7.1 Tensile test specimens shall be taken with the axis parallel to the direction of rolling.

Ref. Federal Test Standard Number 151.

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8 ORDERING DATA

8.1 Procurement documents should specify the following:

- Title, number and issue of this specification.
- Temper.
- Thicknesses and sizes of sheets or plates.

9 REJECTIONS

9.1 Material not conforming to this specification or to authorized modifications will be subject to rejection.