de Havilland Inc.

Material Specification

TITLE:	**ALUMINUM ALLOY SHEET AND PLATE - ALLOY 5083**
SPECIFICATION NUMBER:	**DHMS M2.11**
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1 SCOPE

This specification covers the requirements for 5083 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
Federal Standard No. 184

4 REQUIREMENTS

4.1 Composition

5083 Aluminum Alloy shall be composed of the following elements in percent by weight:

Silicon	0.40
Iron	0.40
Copper	0.10
Manganese	0.30 - 1.0
Magnesium	4.0 - 4.9
Chromium	0.05 - 0.25
Zinc	0.25

4.1	Titanium	0.15
	Others, Each	0.05
	Others, Total	0.15
	Aluminum	Remainder

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, or a certified report stating that the product conforms to the requirements of 4.1.

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 323 (Sheet)	.051 - .249
H 321 (Plate)	.250 - 1.000

4.3 Mechanical Properties

The mechanical properties shall be as follows:

Temper	Ultimate Tensile Strength PSI (min)	Min. Yield Strength PSI	Elongation % in 2 inches Minimum
H 323	45,000	34,000	10*
H 321	44,000	31,000	12

* Note: For thicknesses 0.051 to 0.125 inches, elongation is 8%.

4.4 Tolerances

The tolerances on thickness shall be as follows:

Thickness	Over 18 in. - 36 in. Plus or Minus
.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.

4.5 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.

5 IDENTIFICATION

5.1 Unless otherwise specified, each plate or sheet shall be marked in accordance with Federal Standard number 184. DHMS M2.11 shall be spot marked once on the end of each plate or sheet. 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 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.

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.