AEROSPACE MATERIAL SPECIFICATION

AMS-QQ-A-250/12	REV. A

Issued 1997-08
Reaffirmed 2007-04
Stabilized 2013-12

Superseding AMS-QQ-A-250/12

Aluminum Alloy 7075, Plate and Sheet

A97075

RATIONALE

AMS-QQ-A-250/12A results from a five year review of this specification.

STABILIZATION NOTICE

AMS-QQ-A-250/12A has been declared "STABILIZED" by AMS Committee D. This document will no longer be updated and may no longer represent standard industry practice. The last technical update of this document occurred in July 1997. Users of this document should refer any certification issues (e.g. exceptions listed on the certification report) to the cognizant engineering organization for their disposition. CAUTION: In many cases the purchaser is not the cognizant engineering organization (i.e. purchaser may be a sub tier supplier).

AMS Committee D recommends that the following technically equivalent (e.g. properties, fit, form, function) specifications be used for future procurement. This listing does not constitute authority to substitute these specifications for the "STABILIZED" specification.

AMS4044 Aluminum Alloy, Sheet and Plate5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr Annealed (7075-0) or when specified, As Fabricated (7075-F)

AMS4045 Aluminum Alloy Sheet and Plate 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr 7075: (-T6 Sheet, -T651 Plate) Solution and Precipitation Heat Treated

AMS4078 Aluminum Alloy Sheet and Plate 5.6Zn – 2.5Mg-1.6Cu-0.23Cr 7075: (-T73 Sheet, -T7351 Plate) Solution Heat Treated and Overaged

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NOTICE

This document has been taken directly from Federal Specification QQ-A-250/12F and contains only minor editorial and format changes required to bring it into conformance with the publishing requirements of SAE technical standards.

The original Federal Specification was adopted as an SAE standard under the provisions of the SAE Technical Standards Board (TSB) Rules and Regulations (TSB 001) pertaining to accelerated adoption of government specifications and standards. TSB rules provide for (a) the publication of portions of unrevised government specifications and standards without consensus voting at the SAE Committee level, (b) the use of the existing government specification or standard format, and (c) the exclusion of any qualified product list (QPL) sections.

The complete requirements for procuring 7075 aluminum alloy plate and sheet described herein shall consist of this document and the latest issue of AMS-QQ-A-250.

1. SCOPE AND CLASSIFICATION:

1.1 Scope:

This specification covers the specific requirements for 7075 aluminum alloy plate and sheet.

1.2 Classification:

1.2.1 Tempers: The plate and sheet are classified in one of the following tempers as specified (See 6.3 and 6.4): O, T6, T62, T73, T651, T7351, or F temper. Definitions of these tempers are specified in AMS -QQ-A-250.

2. APPLICABLE DOCUMENTS:

See AMS-QQ-A-250.

3. REQUIREMENTS:

3.1 Chemical Composition:

3.1.1 The chemical composition shall conform to the requirements specified in Table I.

TABLE I. Chemical Composition 1/

Element	Percent	
	Minimum	Maximum
Zinc	5.1	6.1
Magnesium	2.1	2.9
Copper	1.2	2.0
Chromium	0.18	0.28
Manganese	--	0.30
Iron	--	0.50
Silicon	--	0.40
Titanium	--	0.20
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	Remainder	

1/ Analysis shall routinely be made only for the elements specifically mentioned in Table I. If, however, the presence of other elements is indicated or suspected in amounts greater than the specified limits, further analysis shall be made to determine that these elements are not present in excess of specified limits

3.2 Mechanical Properties:

3.2.1 Mechanical Properties of Material as Supplied: The mechanical properties perpendicular to the direction of the final rolling, except for material under 9 inches in width, shall conform to the requirements of Table II for the temper specified. For material under 9 inches in width, the mechanical properties parallel to the direction of final rolling shall conform to the requirements of Table II for the temper specified.

TABLE II. Mechanical Properties (See 6.6)

Temper	Thickness Inches	Tensile Strength minimum ksi (UOS) 1/	Yield Strength at 0.2 percent Offset or at extension shown		Elongation in 2 inches or 4 times D 2/, 3/ minimum percent
			Minimum ksi (UOS) 1/	Extension under load inch/inch	
O	0.015 - 0.499	40.0 4/	21.0 4/	0.0040 4/	10
	0.500 - 2.000	40.0 4/	--	--	10
T6 and T62 5/	0.008 - 0.011	74.0	63.0	0.0083	5
	0.012 - 0.039	76.0	67.0	0.0085	7
	0.040 - 0.125	78.0	68.0	0.0086	8
	0.126 - 0.249	78.0	69.0	0.0087	8
T651 and T62 5/, 7/	0.250 - 0.499	78.0	67.0	0.0085	9
	0.500 - 1.000	78.0	68.0	0.0086	7
	1.001 - 2.000	77.0	67.0	0.0085	6
	2.001 - 2.500	76.0	64.0	0.0082	5
	2.501 - 3.000	72.0	61.0	0.0079	5
	3.001 - 3.500	71.0	58.0	0.0076	5
	3.501 - 4.000	67.0	54.0	0.0072	3
T73	0.040 - 0.249	67.0	56.0	0.0074	8
T7351	0.250 - 1.000	69.0	57.0	0.0075	7
	1.001 - 2.000	69.0	57.0	0.0075	6
	2.001 - 2.500	66.0	52.0	0.0070	6
	2.501 - 3.000	64.0	49.0	0.0067	6
	3.001 - 3.500	63.0	49.0	0.0067	6
	3.501 - 4.000	61.0	48.0	0.0066	6
F	All	6/	6/	6/	6/

1/ Properties are minimum, unless otherwise specified, abbreviated: UOS.
2/ Not required for material 1/2 inch or less in width.
3/ D represents specimen diameter.
4/ Maximum.
5/ Material in the T62 temper is not available from material producers.
6/ No requirements.
7/ The properties specified for the T651 temper are those formerly specified for the T6 temper.

3.2.2 Mechanical Properties After Heat Treatment: In addition to conforming to the requirements of 3.2.1, material in the tempers identified in the following paragraphs shall, after having been processed to tempers also identified therein, have properties conforming to those specified in Table II, as applicable.

3.2.2.1 Material in the Annealed (O) and As-Fabricated (F) Tempers: Material in the O and F tempers, without the subsequent imposition of cold work or forming operations, shall, after proper solution and artificial aging treatments, develop the properties specified for the T6 and T62 tempers. Material in the O and F tempers, without the subsequent imposition of cold work or forming operations, shall be heat treatable to the properties specified for the T73 temper. Such capability shall be demonstrated when specified (See 6.2 and 6.4).

3.2.2.2 Material in the T6, T73, and T7351 Tempers: Material in the T6, T73, and T7351 tempers, without the subsequent imposition of cold work or forming operations, shall be heat treatable to the properties specified for the T6 and T62 tempers. Such capability shall be demonstrated when specified (See 6.2 and 6.4).

3.2.2.3 Material in the T6 and T651 Tempers: Material in the T6 and T651 tempers shall be heat treatable to the properties specified for the T73 and T7351 tempers, as applicable. Such capability shall be demonstrated when specified (See 6.4).

3.2.3 Bend-Test: Bend specimens taken from material shall be capable of withstanding, without cracking, the bend-test specified in AMS-QQ-A-250. The values for bend factor "N" are given in Table III.

TABLE III. Bend Test Factor "N"

	Tempers	
Thickness, inch	O	T6 and T62
0.008 - 0.020	1	7
0.021 - 0.062	2	8
0.063 - 0.091	3	9
0.092 - 0.125	4	10
0.126 - 0.249	5	11
0.250 - 0.499	6	14

3.3 Internal Defects:

When specified (See 6.4), plate shall be ultrasonically inspected (See AMS-QQ-A-250). Acceptance limits shall be as specified in Table IV.

TABLE IV. Ultrasonic Discontinuity Acceptance Limits 1/

Thickness Inches	Maximum Weight per Piece pounds	Discontinuity Class 2/
0.500 - 1.499	2,000	B
1.500 - 3.000	2,000	A
3.001 - 4.000	2,000	B

1/ Discontinuities in excess of those listed in Table IV may be allowed subject to approval of the procuring activity, if it is established that they will be removed by machining or that they are in non-critical areas.
2/ The discontinuity class limits are defined in AMS-QQ-A-250.

3.4 Resistance to Stress-Corrosion Cracking:

Material 0.750 inch and thicker in the T73 and T7351 tempers shall exhibit no evidence of stress-corrosion cracking when subjected to the test specified in 4.2.

3.4.1 Acceptance Criteria for Stress-Corrosion Cracking: Resistance to stress-corrosion cracking for each lot of 7075-T73 and T7351 material shall be established by testing the previously selected tension sample to the following criteria:

a. Determine electrical conductivity and tensile properties
b. If the conductivity is below 38.0 percent International Annealed Copper Standard (IACS), the material is considered unsatisfactory and must be reprocessed, regardless of property level
c. If the conductivity is 40.0 percent IACS or higher and tensile properties meet the minimum values specified herein, the material is considered to be satisfactory
d. If conductivity is 38.0 to 39.9 percent IACS inclusive, if tensile properties meet the minimum limits specified herein, and if the yield strength does not exceed the specified minimum by more than 11.9 ksi, the material is considered to be satisfactory
e. If conductivity is below 40.0 percent IACS and the yield strength exceeds the specified minimum value by 12.0 ksi or more, the material is considered suspect
f. When material is considered suspect, it may be given additional second step aging or be reprocessed

3.5 Marking:

In addition to the marking required in AMS-QQ-A-250, material in the T6, T651, T73, and T7351 tempers shall be identified by an inspection lot number marked in at least one location on each piece.