

Aluminum Alloy Alclad 7075, Plate and Sheet

A87075

RATIONALE

AMS-QQ-A-250/13 has been designated Cancelled and Superseded because equivalent technical requirements are provided by other specifications.

CANCELLATION NOTICE

This specification has been declared "CANCELLED" by the Aerospace Materials Division, SAE, as of July 2011 and has been superseded by the specifications listed below. The requirements of the latest issue of the specifications listed below shall be fulfilled whenever reference is made to the cancelled AMS-QQ-A-250/13. By this action, this document will remain listed in the Numerical Section of the Index of Aerospace Material Specifications, noting that it has been superseded by the specifications listed below.

Cancelled specifications are available from SAE.

Temper	Superseding Material and Specification
O, F	7075-O or -F in accordance with AMS 4048; Aluminum Alloy Sheet and Plate, Alclad 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (Alclad 7075-0) Annealed or when specified, "As Fabricated" (Alclad 7075-F)
T6/T651	7075-T6/T651 in accordance with AMS 4049; Aluminum Alloy, Sheet and Plate, Alclad 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (Alclad 7075; -T6 Sheet - T651 Plate) Solution and Precipitation Heat Treated

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NOTICE

This document has been taken directly from Federal Specification QQ-A-250/13E, Amendment 1, 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 alclad plate and sheet described herein shall consist of this document and the latest issue of AMS-QQ-A-250.

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1. SCOPE AND CLASSIFICATION:

1.1 Scope:

This specification covers the specific requirements for 7075 aluminum alloy alclad plate and sheet; the general requirements are covered in AMS-QQ-A-250. The plate and sheet covered by this specification shall be an integral composite product consisting of a heat-treatable aluminum alloy (7075) core with thin layers of an aluminum alloy (7072) anodic to the core and of approximately equal thickness bonded to both surfaces.

1.2 Classification:

1.2.1 Tempers: The plate and sheet are classified in one of the following tempers as specified (See 6.2): O, T6, T62, T651, 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 of the core ingots or slabs and of the cladding plates used for the manufacture of the alclad plates and sheets shall conform to the requirements specified in Table I for core and cladding, respectively.

TABLE I. Chemical Composition ^{1/}

Element	Analysis			
	Core (7075)		Cladding (7072)	
	Minimum Percent	Maximum Percent	Minimum Percent	Maximum Percent
Zinc	5.1	6.1	0.8	1.3
Magnesium	2.1	2.9	-	0.10
Copper	1.2	2.0	-	0.10
Chromium	0.18	0.35	-	-
Manganese	-	0.30	-	0.10
Iron	-	0.50	-	^{2/}
Silicon	-	0.40	-	^{2/}
Titanium	-	0.20	-	-
Other Elements, each	-	0.05	-	0.05
Other Elements, total	-	0.15	-	0.15
Aluminum	Remainder		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 their specified limits, further analysis shall be made to determine that these elements are not present in excess of specified limits.

^{2/} Iron plus silicon 0.7 percent maximum.

3.2 Mechanical Properties:

3.2.1 Mechanical Properties of Material as Supplied: The mechanical properties perpendicular to the direction of 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

Temper	Thickness Inches	Tensile Strength minimum ksi	Yield Strength at 0.2 percent Offset or at extension indicated		Elongation in 2 in. or 4 times D <u>1/</u> , <u>2/</u> , minimum Percent
			Minimum ksi	Extension under load Inch/Inch	
O	0.008 thru 0.014	36.0 <u>3/</u>	20.0 <u>3/</u>	0.0041	9
	0.015 thru 0.062	36.0 <u>3/</u>	20.0 <u>3/</u>	0.0041	10
	0.063 thru 0.187	38.0 <u>3/</u>	20.0 <u>3/</u>	0.0040	10
	0.188 thru 0.499	39.0 <u>3/</u>	21.0 <u>3/</u>	0.0041	10
	<u>4/</u> 0.500 thru 1.000	40.0 <u>3/</u>	-	-	10
T6 and T62 <u>5/</u>	0.008 thru 0.011	68.0	58.0	0.0076	5
	0.012 thru 0.039	70.0	60.0	0.0078	7
	0.040 thru 0.062	72.0	62.0	0.0080	8
	0.063 thru 0.187	73.0	63.0	0.0081	8
	0.188 thru 0.249	75.0	64.0	0.0082	8
T651 and T62 <u>5/</u> <u>7/</u>	0.250 thru 0.499	75.0	65.0	0.0083	9
	<u>4/</u> 0.500 thru 1.000	78.0	68.0	0.0086	7
	<u>4/</u> 1.001 thru 2.000	77.0	67.0	0.0085	6
	<u>4/</u> 2.001 thru 2.500	76.0	64.0	0.0082	5
	<u>4/</u> 2.501 thru 3.000	72.0	61.0	0.0079	5
	<u>4/</u> 3.001 thru 3.500	71.0	58.0	0.0076	5
	<u>4/</u> 3.501 thru 4.000	67.0	54.0	0.0072	3
F	All	<u>6/</u>	<u>6/</u>	<u>6/</u>	<u>6/</u>

1/ Not required for material 1/2 inch or less in width.

2/ D represents specimen diameter.

3/ Maximum

4/ The properties for these thicknesses are those of the core alloy since the tests are made on a round specimen machined from the plate.

5/ Material in the T62 temper is not available from material producers.

6/ No requirements.

7/ The properties specified for the T62 temper are those formerly specified for the T6 temper (See 6.4).

- 3.2.2 Mechanical Properties After Heat Treatment: In addition to conforming to the requirements of 3.2.1, material in the annealed (O) and the as-fabricated (F) tempers shall, after proper solution heat-treatment and aging, also conform to the requirements of Table II for the T6 and T62 tempers. Material as received in the T6 and T651 tempers shall, after proper re-solution heat-treatment and aging, be capable of conforming to the requirements specified in Table II for the T6 and T62 tempers.
- 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"

Thickness of material	Tempers	
	O	T6 and T62
Inch		
0.008 thru 0.020	1	6
0.021 thru 0.032	1	7
0.033 thru 0.063	2	7
0.064 thru 0.091	3	8
0.092 thru 0.125	3	9
0.126 thru 0.249	4	10
0.250 thru 0.499	6	12

3.3 Cladding Thickness:

- 3.3.1 Thickness of Cladding Plates: The aluminum alloy (7072) plates that are bonded to the two sides of the aluminum alloy (7075) ingot or slab to form a composite that is to be rolled to the finished thickness shall each have a thickness as specified in Table IV.

TABLE IV. Cladding Thickness

Thickness of Finished Plate or Sheet Inches	Nominal Cladding Thickness per Side; percent of composite thickness	Average Thickness per Side of Cladding on Finished Plate or Sheet; minimum percent of plate or sheet thickness
Under 0.063	4	3.2
0.063 thru 0.187	2.5	2
0.188 and over	1.5	<u>1</u> / 1.2

1/ For plate 0.500 and over, the average cladding thickness per side shall have a maximum value of 3 percent of the plate thickness.