SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS-QQ-A-250/18 REV. A

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Superseding AMS-QQ-A-250/18

Aluminum 7075, Plate and Sheet
Alclad One Side

(Composition similar to UNS A97075)

RATIONALE

AMS-QQ-A-250/18A has been reaffirmed to comply with the SAE five-year review policy.

NONCURRENT NOTICE

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of August, 2007. It is recommended, therefore, that this specification not be specified for new designs.

"NONCURRENT" refers to those specifications which have previously been widely used and which may be required for production or processing of existing designs in the future. The Aerospace Materials Division, however, does not recommend these specifications for future use in new designs. "NONCURRENT" specifications are available from SAE upon request.

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NOTICE

This document has been taken directly from Federal Specification QQ-A-250/18F 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 one side 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 alclad one side 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 a thin layer of an aluminum alloy (7072) anodic to the core bonded to one surface.

1.2 Classification:

1.2.1 Tempers: The plate and sheet are classified in one of the following tempers as specified (See 6.2 and 6.3): 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) Percent		Cladding (7072) Percent	
	Minimum	Maximum	Minimum	Maximum
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	0.28	-	-
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 the specified limits, further analysis shall be made to determine that these elements are not 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 of the material perpendicular to the direction of final rolling, except for material under 9 inches in width, shall conform to 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 Table II for the temper specified.

TABLE II. Mechanical Properties (See 6.5)

Temper	Thickness Inches	Tensile Strength, minimum ksi	Yield Strength at 0.2 percent Offset, minimum ksi	Elongation in 2 in. or 4 times D 1/, 2/, minimum Percent
O	0.015 thru 0.062	3/ 38.0	3/ 21.0	10
	0.063 thru 0.187	3/ 39.0	3/ 21.0	10
	0.188 thru 0.499	3/ 39.0	3/ 21.0	10
	0.500 thru 1.000	4/, 3/ 40.0	--	10
T6 and	0.012 thru 0.039	73.0	63.0	7
T62 5/	0.040 thru 0.062	74.0	64.0	8
	0.063 thru 0.187	75.0	65.0	8
	0.188 thru 0.249	76.0	66.0	8
T651	0.250 thru 0.499	76.0	66.0	9
and	0.500 thru 1.000	4/ 78.0	4/ 68.0	7
T62 5/	1.001 thru 2.000	4/ 77.0	4/ 67.0	6
F	All	6/	6/	6/

1/ Not required for material 1/2 inch or less in width.
2/ D represents specimen diameter.
3/ Maximum.
4/ These properties are those of the core material inasmuch as the tests are made on a round specimen machined from the plate. The minimum tensile and yield strength across the whole section of the plate will be about 1 1/2 percent lower than these values.
5/ Material in the T62 temper is not available from material producers.
6/ No requirements.

3.2.2 Mechanical Properties After Heat-Treatment: In addition to conforming to 3.2.1, material in the annealed (O) and the as-fabricated (F) tempers, without the subsequent imposition of cold work or forming operations, shall after proper solution heat treatment and aging, also conform to the requirements of Table II for the T62 temper. 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 T62 temper.

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 Inch	Tempers	
	O	T6 and T62
0.012 thru 0.020	1	7
0.021 thru 0.032	1	7
0.033 thru 0.063	2	8
0.064 thru 0.091	3	9
0.092 thru 0.125	4	10
0.126 thru 0.249	5	11
0.250 thru 0.499	6	13

3.3 Cladding Thickness:

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

TABLE IV. Cladding Thickness

Thickness of Finished Plate or Sheet	Average Thickness of Cladding on the Finished Plate or Sheet; minimum percent of plate or sheet thickness
Inches	
Under 0.063	3.2
0.063 thru 0.187	2
0.188 and over	1/ 1.2

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

3.3.2 Thickness of Cladding: If question arises concerning the thickness of cladding of the finished sheet or plate, samples examined in accordance with AMS-QQ-A-250 shall show an average thickness of cladding not less than that specified in Table IV.

3.4 Internal Defects:

When specified (See 6.2), plate shall be ultrasonically inspected (See AMS-QQ-A-250). Acceptance limits shall be as specified in Table V.

TABLE V. Ultrasonic Discontinuity Acceptance Limits 1/

Thickness Inches	Maximum weight per piece Pounds	Discontinuity Class 2/
0.500 thru 1.499	2,000	B
1.500 thru 2.000	2,000	A

1/ Discontinuities in excess of those listed in Table V 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 noncritical areas.
2/ The discontinuity class limits are defined in MIL-I-8950.