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Superseding AMS-QQ-A-200/15A

Aluminum Alloy Bar, Rod, and Shapes, Extruded, 7075-T76
Improved Exfoliation Resistance

A97075

RATIONALE

AMS-QQ-A-200/15B stabilizes this document because equivalent technical requirements are contained in AMS4317.

STABILIZATION NOTICE

AMS-QQ-A-200/15B has been declared "STABILIZED" by AMS Committee D and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist. AMS Committee D has never performed a technical update of this document. 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) specification be used for future procurement. This listing does not constitute authority to substitute this specification for the "STABILIZED" specification.

AMS4317 Aluminum Alloy, Extruded Bar, Rod, and Shapes 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr 7075-T76(51X) Solution Heat Treated and Overaged

NOTICE

This document has been taken directly from Federal Specification QQ-A-200/15B and contains only minor editorial and format changes required to bring it into conformance with the publishing requirements of SAE technical standards.

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The complete requirements for procuring aluminum alloy 7075-T76 bar, rod, and shapes extruded described herein shall consist of this document and the latest issue of AMS-QQ-A-200.

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1. SCOPE AND CLASSIFICATION:

1.1 Scope:

This specification covers the specific requirements for aluminum alloy 7075-T76 bar, rod, and shapes produced by extrusion (See AMS-QQ-A-200/11 for specific requirements for 7075 extrusions in other tempers).

1.1.1 Tempers: Bar, rod, and shapes are classified in the following tempers as specified (See 6.2): T76, T76510, or T76511. Definitions of tempers are specified in AMS-QQ-A-200.

2. APPLICABLE DOCUMENTS:

See AMS-QQ-A-200.

3. REQUIREMENTS:

3.1 Chemical Composition:

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

TABLE I. CHEMICAL COMPOSITION ^{1/}

Element	Percent	
	Minimum	Maximum
Copper	1.2	2.0
Magnesium	2.1	2.9
Manganese	--	0.30
Chromium	0.18	0.28
Titanium	--	0.20
Iron	--	0.50
Silicon	--	0.40
Zinc	5.1	6.1
Other Elements, each	--	0.05
Other Elements, total ^{2/}	--	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.

^{2/} The sum of those "Others" metallic elements 0.010 percent or more each, expressed to the second decimal before determining the sum.

3.2 Mechanical Properties:

Mechanical properties of as-supplied material in the longitudinal (extrusion) direction shall conform to property requirements specified in Table II, except as exempted from elongation requirements by AMS-QQ-A-200.

TABLE II. MECHANICAL PROPERTIES

Temper	Specified Thickness, (bar and shapes); diameter, rod Inches	Area Square Inches	Ultimate Tensile Strength minimum ksi	Yield Strength at 0.2 percent Offset or at extension indicated		Elongation in 2 inches or 4 times specimen diameter minimum percent
				minimum ksi	Extension under load inch per inch	
All (T76, T76510, And T76511)	up thru 0.049	all	73.0	63.0	0.0082	7
	0.050 - 0.125	all	74.0	64.0	0.0082	7
	0.125 - 0.249	up thru 20	74.0	64.0	0.0082	7
	0.250 - 0.499	up thru 20	75.0	65.0	0.0084	7
	0.500 - 1.000	up thru 20	75.0	65.0	0.0084	7
	1.001 - 2.000	up thru 20	75.0	65.0	0.0084	7
	2.001 - 3.000	up thru 20	74.0	64.0	0.0082	7
	3.001 - 4.000	up thru 20	74.0	63.0	0.0082	7

3.3 Internal Defects:

When specified (See 6.2), rod, bar, and shapes shall be ultrasonically inspected (See AMS-QQ-A-200). Acceptance limits shall be as specified in Table III. All extrusions in the inspection lot shall be inspected.

TABLE III. ULTRASONIC DISCONTINUITY ACCEPTANCE LIMITS ^{1/}, ^{2/}

Thickness (bar and shapes), inches ^{3/}	Maximum Weight of Piece (pounds)	Maximum Width to Thickness Ratio	Discontinuity Class ^{4/}
0.500 - 1.499	600	10 to 1	B
1.500 and over	600	10 to 1	A

^{1/} Discontinuities in excess of those listed in Table III 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/} Requirements for ultrasonic inspection for sizes, maximum weights, and discontinuity classes differing from those shown in Table III and for rod shall be specified in the contract provided the techniques and standards are agreed to by the procuring activity and the contractor (See 6.2).

^{3/} For thickness of a shape, see definition for shape in AMS-QQ-A-200.

^{4/} Discontinuity class limits are defined in MIL-STD-2154.

3.4 Resistance to Exfoliation Corrosion and Stress-Corrosion Cracking:

3.4.1 Exfoliation Corrosion: Material, tested in accordance with 4.2.4, shall not show exfoliation corrosion equivalent to or in excess of that depicted in Figure 2 of ASTM G 34-72 for category B. The frequency of tests shall be in accordance with AMS-QQ-A-200.

3.4.2 Stress-Corrosion Cracking: Extrusions, 0.750-inch and over in thickness, shall exhibit no susceptibility to stress-corrosion cracking under the conditions of the test specified in 4.2.5. The frequency of tests shall be in accordance with AMS-QQ-A-200.

3.4.3 Lot Acceptance Control Criteria: Resistance to exfoliation corrosion and stress-corrosion cracking for each inspection lot of material shall be determined by the following control criteria (See 4.1.2 and 4.2.6).

Determine electrical conductivity and mechanical properties.

If the conductivity is 38.0 percent International Annealed Copper Standards (IACS) or higher, and the tensile properties meet the minimum limits specified herein, the material is acceptable.

If the conductivity is at least 36.0 percent IACS but less than 38.0 percent IACS, and the tensile properties meet the limits specified herein, the material shall either be tested as specified in 4.2.4 or be reprocessed.

If the conductivity is below 36.0 percent IACS, the material is not acceptable and must be reprocessed.

3.5 Marking of Extrusions:

In addition to marking as required in AMS-QQ-A-200, each extrusion shall be marked with its appropriate inspection lot number in at least one location.

4. QUALITY ASSURANCE PROVISIONS:

See AMS-QQ-A-200 and the following:

4.1 Sampling:

4.1.1 For Chemical Analysis, Mechanical Properties, and for Exfoliation Corrosion and Stress-Corrosion Cracking Tests: Samples for chemical analysis, determination of mechanical properties, exfoliation corrosion, and stress-corrosion cracking tests shall comply with the applicable requirements of AMS-QQ-A-200.

4.1.2 For Conductivity Tests: Conductivity shall be measured on the same specimens used for mechanical property tests. Conductivity shall be measured prior to testing for mechanical properties.

4.2 Test Methods:

4.2.1 Chemical Analysis: Samples selected in accordance with 4.1.1. shall be analyzed to determine conformance to 3.1 using the test methods specified in AMS-QQ-A-200.

4.2.2 Mechanical Properties: Samples selected in accordance with 4.1.1 shall be prepared for testing and tested in accordance with AMS-QQ-A-200 to determine conformance to 3.2.

4.2.3 Ultrasonic Inspection: When ultrasonic inspection is specified (See 6.2), extrusions shall be inspected in accordance with MIL-STD-2154 to determine conformance to 3.3.