AEROSPACE MATERIAL SPECIFICATION

AMS4315™	REV. B

Issued 2005-07
Reaffirmed 2011-08
Revised 2022-08

Superseding AMS4315A

Aluminum Alloy, Sheet and Plate
5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr
7075: (-T76 Sheet, -T7651 Plate)
Solution and Precipitation Heat Treated
(Composition similar to UNS R97075)

RATIONALE

AMS4315B results from a Five-Year Review and update of this specification with changes to add provisions for use of AS6279 (Section 2, 3.7), prohibit unauthorized exceptions (3.3.1.1, 3.6, 4.4.1, 5.1.1, 8.4), update form (1.1), applicable documents (Section 2), metric elongation heading (Table 2B), relocate property statement previously in notes (3.3.1.2), corrected/added metric values for electrical conductivity (3.2.2), and allow the use of the immediate prior specification revision (8.3).

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of sheet and plate up to 2.000 inches (50.80 mm), inclusive, in thickness (see 8.5).

1.2 Application

This product has been used typically for structural applications requiring material with high strength and resistance to exfoliation-corrosion, but usage is not limited to such applications.

1.2.1 Certain design and processing procedures may cause these products to become susceptible to stress-corrosion cracking; ARP823 recommends practices to minimize such conditions.

2. APPLICABLE DOCUMENTS

The issue of the following document in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
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SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS4315B/

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2355 Quality Assurance, Sampling and Testing Aluminum Alloys and Magnesium Alloy Wrought Products (Except Forging Stock), and Rolled, Forged, or Flash Welded Rings

AMS2772 Heat Treatment of Aluminum Alloy Raw Materials

ARP823 Minimizing Stress-Corrosion Cracking in Wrought Heat-Treatable Aluminum Alloy Products

AS6279 Standard Practice for Production, Distribution, and Procurement of Metal Stock

AS7766 Terms Used in Aerospace Metals Specifications

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM B594 Ultrasonic Inspection of Aluminum-Alloy Wrought Products

ASTM B660 Packaging/Packing of Aluminum and Magnesium Products

ASTM B666/B666M Identification Marking of Aluminum and Magnesium Products

ASTM G34 Exfoliation Corrosion Susceptibility in 2XXX and 7XXX Series Aluminum Alloys (EXCO Test)

ASTM G47 Determining Susceptibility to Stress-Corrosion Cracking of 2XXX and 7XXX Aluminum Alloy Products

2.3 ANSI Accredited Publications

Copies of these documents are available online at https://webstore.ansi.org/.

ANSI H35.1/H35.1M Standard Alloy and Temper Designation System for Aluminum

ANSI H35.2 Dimensional Tolerances for Aluminum Mill Products

ANSI H35.2M Dimensional Tolerances for Aluminum Mill Products (Metric)

2.4 U.S. Government Publications

Copies of these documents are available online at https://quicksearch.dla.mil.

QQ-A-250/24 Aluminum Alloy, 7075, Plate and Sheet (Improved Exfoliation Resistant)

2.5 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with AMS2355.

Table 1 - Composition

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

3.2 Condition

The product shall be supplied in the following condition; heat treatments shall be performed in accordance with AMS2772.

3.2.1 Sheet

Solution and precipitation heat treated to the T76 temper (refer to ANSI H35.1/H35.1M).

3.2.2 Plate

Solution heat treated, stress-relieved by stretching to produce a nominal permanent set of 2%, but not less than 1-1/2%, nor more than 3%, and precipitation heat treated to the T7651 temper (refer to ANSI H35.1/H35.1M).

3.2.2.1 Plate shall receive no straightening operations after stretching.

3.3 Properties

Product shall conform to the following requirements, determined in accordance with AMS2355 on the mill produced size.

3.3.1 Tensile Properties

Shall be as specified in Table 2.

Table 2A - Minimum tensile properties, inch/pound units (see 8.2)

Temper	Thickness Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %
T76	0.063 to 0.249, incl	73.0	62.0	8
T7651	Over 0.249 to 0.499, incl	72.0	61.0	8
	Over 0.499 to 1.000, incl	71.0	60.0	6
	Over 1.000 to 2.000, incl	71.0	60.0	5

Table - 2B Minimum tensile strength properties, SI units (see 8.2)

Temper	Thickness Millimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
T76	1.60 to 6.32, incl	503	428	8
T7651	Over 6.32 to 12.67, incl	497	421	8
	Over 12.67 to 25.40, incl	490	414	6
	Over 25.40 to 50.80, incl	490	414	5

3.3.1.1 Mechanical property requirements for product outside of the range covered by Table 2 shall be agreed upon between purchaser and producer and reported per 4.4.1 (see 8.3).

3.3.1.2 The mechanical properties above were taken from QQ-A-250/24 and have not been substantiated by AMS statistical procedures.

3.3.2 Electrical Conductivity

3.3.2.1 If the conductivity is 38% IACS (22.0 MS/m) or higher, and the tensile properties meet the minimum limits specified herein, the material is acceptable.

3.3.2.2 If the conductivity is at least 36% IACS (21.0 MS/m) but less than 38% IACS (22.0 MS/m), the material may be tested as specified in 3.3.3 and 3.3.4 and accepted if it passes these tests. As alternatives, the product may be given an additional precipitation heat treatment, or reheat treated, and retested.

3.3.2.3 If the conductivity is lower than 36.0% IACS (21.0 MS/m), the product is not acceptable and may be given an additional precipitation heat treatment, or entirely reheat treated, and retested.

3.3.3 Exfoliation Resistance

Plate shall not exhibit exfoliation corrosion at the T/10 plane greater than that illustrated by Photo B, Figure 2 of ASTM G34.

3.3.4 Stress-Corrosion Test

Specimens, cut from plate 0.750 inch (19.05 mm) and over in nominal thickness, shall show no evidence of stress-corrosion cracking when tested in accordance with ASTM G47 and stressed in the short-transverse direction to 25.0 ksi (172 MPa).

3.4 Quality

Product, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the material.

3.4.1 When specified, each plate 0.500 to 2.000 inch (12.70 to 50.8 mm) in nominal thickness, shall be ultrasonically inspected in accordance with ASTM B594 and shall meet ultrasonic Class A.

3.5 Tolerances

Shall conform to all applicable requirements of ANSI H35.2 or ANSI H35.2M.

3.6 Exceptions

Any exceptions shall be authorized by the purchaser and reported as in 4.4.1.

3.7 Production, distribution, and procurement of metal stock shall comply with AS6279. This requirement becomes effective 18 months after publication of AMS4315B.