SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS4084 | REV. D

Issued 1976-01
Revised 2005-02
Reaffirmed 2012-03

Superseding AMS4084C

(R) Aluminum Alloy Sheet
5.7Zn - 2.2Mg - 1.6Cu - 0.22Cr (7475-T61)
Solution and Precipitation Heat Treated
(Composition similar to UNS A97475)

RATIONALE

AMS4084D has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:

1.1 Form:

This specification covers an aluminum alloy in the form of sheet.

1.2 Application:

This product has been used typically for structural applications requiring sheet with high static strength, moderate fatigue strength, and high fracture-toughness, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The issue of the following documents 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.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or www.sae.org.

AMS 2355	Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings
AMS 2772	Heat Treatment of Aluminum Alloy Raw Materials
AS 1990	Aluminum Alloy Tempers

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS4084D

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959 or www.astm.org.

ASTM B 646	Fracture Toughness Testing of Aluminum Alloys
ASTM B 660	Packaging/Packing of Aluminum and Magnesium Products
ASTM B 666/B 666M	Identification of Aluminum and Magnesium Alloy Products
ASTM E 338	Sharp-Notch Tension Testing of High-Strength Sheet Materials
ASTM E 561	R-Curve Determination

2.3 ANSI Publications:

Available from ANSI, 25 West 43rd Street, New York, NY 10036 or www.ansi.org.

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

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight, shown in Table 1, determined in accordance with AMS 2355:

TABLE 1 - Composition (Alloy 7475)

Element	min	max
Silicon	--	0.10
Iron	--	0.12
Copper	1.2	1.9
Manganese	--	0.06
Magnesium	1.9	2.6
Chromium	0.18	0.25
Zinc	5.2	6.2
Titanium	--	0.06
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.2 Condition:

Solution and precipitation heat treated in accordance with AMS 2772 to the T61 temper (See AS1990).

3.3 Properties:

The product shall conform to the following requirements:

3.3.1 Tensile Properties: Sheet 0.040 inch (1 mm) and over shall be as presented, determined in accordance with AMS 2355 on the mill produced size.

3.3.1.1 Tensile properties in the long-transverse direction shall be as shown in Table 2.

TABLE 2 - Minimum Tensile Properties, Long-Transverse Direction

Tensile Strength	75.0 ksi	(517 MPa)
Yield Strength at 0.2% Offset	64.0 ksi	(441 MPa)
Elongation in 2 Inches (50.8 mm)	9%	

3.3.1.2 Tensile properties in the longitudinal direction shall be as shown in Table 3.

TABLE 3 - Minimum Tensile Properties, Longitudinal Direction

Tensile Strength	75.0 ksi	(517 MPa)
Yield Strength at 0.2% Offset	64.0 ksi	(441 MPa)
Elongation in 2 Inches (50.8 mm)	9%	

3.3.2 Critical-Stress-Intensity Factor: The critical-stress-intensity factor (K_c) shown in Table 4 shall be determined in accordance with ASTM B 646 and ASTM E 561. The test shall be performed on a middle-tension, M(T), panel of full sheet thickness having a nominal width of 16 inches (406 mm) and an initial crack length equal to one-fourth of the panel width, i.e., $2a_o/W=0.25$.

TABLE 4 - Critical-Stress-Intensity Factor

Nominal Thickness Inch	Nominal Thickness Millimeters	K_C min T-L Direction	
		ksi, inch	MPa, mm
0.040 to 0.125, incl	1.02 to 3.18, incl	75	82
Over 0.125 to 0.249, incl	Over 3.18 to 6.32, incl	60	66

3.3.3 Notch Tensile Strength/Tensile Yield Strength (NTS/TYS) Ratio: The producer may guarantee that sheet meets the critical-stress-intensity factor, (K_C) requirements based on correlation with notch tensile strength/tensile yield strength ratio in lieu of determining critical-stress-intensity factor (3.3.2) provided that a correlation has been established between the results of the two tests.

3.3.3.1 Notch tensile strength in the long-transverse direction shall be determined in accordance with ASTM E 338. The values shall be divided by the long-transverse tensile yield strength to obtain the NTS/TYS ratio.

3.4 Quality:

Sheet, 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 sheet.

3.5 Tolerances:

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

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of sheet shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the sheet conforms to specified requirements.

4.2 Classification of Tests:

Composition (3.1), tensile properties in the long-transverse direction (3.3.1.1), longitudinal tensile properties (3.3.1.2), critical-stress-intensity factor (3.3.2) or notch tensile strength/ tensile yield strength ratio (3.3.3), and tolerances (3.5) are acceptance tests and except for composition, shall be performed on each inspection lot.

4.3 Sampling and Testing:

Shall be in accordance with AMS 2355 and the following:

4.3.1 Sampling for critical-stress-intensity factor and for notch tensile strength/tensile yield strength ratio shall be as agreed upon by purchaser and vendor.

4.4 Reports:

The vendor of product shall furnish with each shipment a report stating that the sheet conforms to the composition, tolerances and showing the numerical results of tests on each inspection lot to determine conformance to the other acceptance test requirements. This report shall include the purchase order number, lot number(s), AMS 4084D, size, and quantity. The report shall also identify the producer, the product form, and the size of the mill product.

4.5 Resampling and Retesting:

Shall be in accordance with AMS 2355.