

Submitted for recognition as an American National Standard

**ALUMINUM ALLOY SHEET**  
**2.7Cu - 2.2Li - 0.12Zr (2090-T83)**  
**Solution Heat Treated, Cold Worked, and Precipitation Heat Treated**

**UNS A92090**

**1. SCOPE:**

**1.1 Form:** This specification covers an aluminum alloy in the form of sheet.

**1.2 Application:** Primarily for applications requiring the strength of AMS 4045 and 7.8% lower nominal density.

**2. APPLICABLE DOCUMENTS:** The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

**2.1 SAE Publications:** Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

**2.1.1 Aerospace Material Specifications:**

AMS 2202 - Tolerances, Aluminum Alloy and Magnesium Alloy Sheet and Plate

MAM 2202 - Tolerances, Metric, Aluminum Alloy and Magnesium Alloy Sheet and Plate

AMS 2350 - Standards and Test Methods

AMS 2355 - Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings

MAM 2355 - Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings, Metric (SI) Units

AMS 4045 - Aluminum Alloy Sheet and Plate, 5.26n - 2.5Mg - 1.6Cu - 0.23Cr, (7075; -T6 Sheet, -T651 Plate), Solution and Precipitation Heat Treated

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2.2 ASTM Publications: Available from ASTM, 1916 Race Street, Philadelphia, PA 19103.

ASTM 6660 - Packaging/Packing of Aluminum and Magnesium Products  
 ASTM G34 - Exfoliation Corrosion Susceptibility in 2XXX and 7XXX Series  
                   Aluminum Alloys (EXCO Test)  
 ASTM G85 - Modified Salt Spray (Fog) Testing

2.3 U.S Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Specifications:

MIL- H-6088 - Heat Treatment of Aluminum Alloys

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined in accordance with AMS 2355 or MAM 2355:

	min	max
Copper	2.4	3.0
Lithium	1.9	2.6
Zirconium	0.08	0.15
Magnesium	-	0.25
Titanium	-	0.15
Iron	-	0.12
Silicon	-	0.10
Zinc	-	0.10
Chromium	-	0.05
Manganese	-	0.05
Other Impurities, Each	-	0.05
Other Impurities, Total	-	0.15
Aluminum	remainder	

3.2 Condition: Solution heat treated, cold worked, and precipitation heat treated.

3.3 Properties: Shall conform to the following requirements, determined in accordance with AMS 2355 or MAM 2355:

3.3.1 Furnaces and quenching equipment shall be in accordance with the applicable requirements of MIL-H-6088.

3.3.1 Tensile Properties: Shall be as specified in Table I.

TABLE I

Nominal Thickness Inches	Specimen Orientation	Tensile Strength psi, min	Yield Strength at 0.2% Offset psi, minimum	Elongation in 2 inches %, minimum
0.040 to 0.125, incl	Longitudinal	77,000	70,000	3
	Long-Transverse	73,000	66,000	5
	Longitudinal	75,000	70,000	4
Over 0.125 to 0.249, incl	Long-Transverse	73,000	66,000	5

TABLE I (SI)

Nominal Thickness Millimetres	Specimen Orientation	Tensile Strength MPa, min	Yield Strength at 0.2% Offset psi, minimum	Elongation in 50.8 mm %, minimum
1.02 to 3.18, incl	Longitudinal	531	483	3
	Long-Transverse	503	455	5
	Longitudinal	517	483	4
Over 3.18 to 6.32, incl	Long-Transverse	503	455	5

3.3.1.1 Tensile property requirements for sheet under 0.040 inch (1.02 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

3.3.2 Exfoliation-Corrosion Resistance: Sheet shall not show exfoliation corrosion more severe than rating EB, Figure 4, of ASTM G34 when exposed for two weeks to test conditions of ASTM GB5, Annex A2.

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 AMS 2202 or MAM 2202.

#### 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 performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the sheet conforms to the requirements of this specification.

#### 4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for composition (3.1), long-transverse tensile properties (3.3.1) and, when specified, longitudinal tensile properties (3.3.1), and tolerances (3.5) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for exfoliation-corrosion resistance (3.3.2) are classified as periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling: Shall be in accordance with AMS 2355 or MAM 2355.

#### 4.4 Reports:

4.4.1 The vendor of sheet shall furnish with each shipment a report stating that the sheet conforms to the chemical composition, showing the results of tests on each inspection lot to determine conformance to the other acceptance test requirements, and stating that the sheet conforms to the other technical requirements of this specification. This report shall include the purchase order number, inspection lot number, AMS 4251, size, and quantity.