AEROSPACE MATERIAL SPECIFICATION

AMS4465™	REV. B
Issued 2009-09 Revised 2021-07 Superseding AMS4465A	

Aluminum Alloy, Clad One Side Sheet
0.6Mg - 0.35Si - 0.28Cu (No. 23 Brazing Sheet)
As Fabricated

RATIONALE

AMS4465B is the result of a Five-Year Review and update of the specification. The revision prohibits unauthorized exceptions (3.3.1.1.1, 3.7, 4.4.1, 5.1.1, 8.6), updates condition (3.2), allows SI tensile testing (Table 3, 8.4), and allows prior revisions (8.5).

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of sheet, clad on one side.

1.1.1 This specification covers product from 0.010 to 0.249 inch (0.25 to 6.32 mm), inclusive, in thickness (see 8.7).

1.2 Application

This sheet has been used typically for brazed assemblies that are subjected to heat treatment after joining, 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 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
ARP1917	Clarification of Terms Used in Aerospace Metals Specifications

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https://www.sae.org/standards/content/AMS4465B

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 B660 Packaging/Packing of Aluminum and Magnesium Products

ASTM B666/B666M Identification Marking of Aluminum and Magnesium Products

2.3 ANSI Accredited Publications

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

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

ANSI H35.2 Dimensional Tolerance for Aluminum Mill Products

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

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Tables 1 and 2, determined in accordance with AMS2355.

Table 1 - Composition, core (6951)

Element	Min	Max
Silicon	0.20	0.50
Iron	--	0.8
Copper	0.15	0.40
Manganese	--	0.10
Magnesium	0.40	0.8
Zinc	--	0.20
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

Table 2 - Composition, cladding (4045)

Element	Min	Max
Silicon	9.0	11.0
Iron	--	0.8
Copper	--	0.30
Manganese	--	0.05
Magnesium	--	0.05
Zinc	--	0.10
Titanium	--	0.20
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

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3.2 Condition

As fabricated (F) (refer to ANSI H35.1/H35.1M).

3.3 Properties

The sheet shall conform to the following applicable requirements, determined in accordance with AMS2355 on the mill product:

3.3.1 After Solution and Precipitation Heat Treatment

Sheet shall have the following properties after solution and precipitation heat treatment to the -T62 temper in accordance with AMS2772 for 6951 alloy.

3.3.1.1 Tensile Properties

Shall be shown in Table 3.

3.3.1.1.1 Mechanical property requirements for product outside the range covered by 1.1.1 shall be agreed upon between purchaser and producer and reported per 4.4.1.

Table 3A - Minimum tensile properties, inch/pound units (see 8.2 and 8.4)

Nominal Thickness Inches	Tensile Strength ksi	Yield Strength at 2% Offset ksi	Elongation in 2 Inches or 4D %
0.010 to 0.020, incl	35.0	30.0	6
Over 0.020 to 0.249, incl	35.0	30.0	8

Table 3B - Minimum tensile properties, SI units (see 8.2 and 8.4)

Nominal Thickness Millimeters	Tensile Strength MPa	Yield Strength at 2% Offset MPa	Elongation in 50 mm or 4D %
0.25 to 0.51, incl	241	207	6
Over 0.51 to 6.32, incl	241	207	8

3.3.1.2 Bending

Sheet shall withstand, without cracking, bending with the clad side out (convex side) at room temperature through an angle of 180 degrees around a diameter equal to the bend factor shown in Table 4 times the nominal thickness of the sheet with axis of bend parallel to the direction of rolling.

Table 4 - Bending parameters

Nominal Thickness Inches	Nominal Thickness Millimeters	Bend Factor
0.010 to 0.036, incl	0.25 to 0.91, incl	3
Over 0.036 to 0.064, incl	Over 0.91 to 1.63, incl	4
Over 0.064 to 0.128, incl	Over 1.63 to 3.25, incl	5
Over 0.128 to 0.249, incl	Over 3.25 to 6.32, incl	6

3.4 Cladding

Shall be applied to one face of the core.

3.4.1 Cladding Thickness

The average cladding thickness shall be shown in Table 5.

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Table 5 - Average cladding thickness

Total Thickness of Composite Product Inches	Total Thickness of Composite Product Millimeters	Cladding Thickness Percent of Total Thickness Min, Average	Cladding Thickness Percent of Total Thickness Max, Average
0.010 to 0.090, incl	0.25 to 2.29, incl	8	12
Over 0.090	Over 2.29	4	6

3.5 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.

3.6 Tolerances

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

3.7 Exceptions

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

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

4.2.1 Acceptance Tests

Composition (3.1), tensile properties after solution and precipitation heat treatment (3.3.1.1), and tolerances (3.6) are acceptance tests and, except for composition, shall be performed on each inspection lot.

4.2.2 Periodic Tests

Bending after solution and precipitation heat treatment (3.3.1.2) and cladding thickness (3.4.1) are periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling and Testing

Shall be in accordance with AMS2355.

4.4 Reports

The vendor of clad sheet shall furnish with each shipment a report stating that the product conforms to the composition and showing the numerical results of tests to determine conformance to the other acceptance test requirements. This report shall include the purchase order number, inspection lot number, AMS4465B, size, and quantity. The report shall also identify the producer and the size of the mill product.

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