



AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AMS 4508D

Superseding AMS 4508C

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BRASS SHEET, LAMINATED
70Cu - 30Zn
Surface Bonded

1. SCOPE:

- 1.1 Form: This specification covers one type of brass in the form of laminated sheet.
- 1.2 Application: Primarily for shims in which thickness is to be adjusted by removal of laminations as required.
2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Materials Specifications:

AMS 2350 - Standards and Test Methods

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM B248 - General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar

ASTM E36 - Chemical Analysis of Brasses

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

2.3.1 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

2.3.2 Military Specifications:

MIL-C-3993 - Copper and Copper-Base Alloy Mill Products, Packaging of

3. TECHNICAL REQUIREMENTS:

- 3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E36, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other approved analytical methods:

	min	max
Ø Copper	68.5	71.5
Lead	--	0.07
Iron	--	0.05
Other Elements, total	--	0.15
Zinc		remainder

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3.2 Condition: Laminated shim stock shall be fabricated from brass laminations in the quarter-hard or harder temper.

3.3 Properties: Sheet shall conform to the following requirements:

3.3.1 Fabrication:

3.3.1.1 Stock shall consist of laminations each 0.002 in. \pm 0.0002 (0.05 mm \pm 0.005) thick or 0.003 in. \pm 0.0003 (0.08 mm \pm 0.008) thick, or partly of such laminations combined with a single thicker lamination, as ordered, bonded together in such manner that individual laminations may be peeled for adjustment of shim thickness.

3.3.1.2 Sheet shall consist of the following thickness and combinations of laminations and solid base, unless otherwise specified:

Nominal Thickness of Shim Stock Inch (mm)	All Laminated, Laminations Each 0.002 in. (0.05 mm)	All Laminated, Laminations Each 0.003 in. (0.08 mm)	Half Solid, Half	Half Solid, Half	Three Quarters Solid, One Quarter	Three Quarters Solid, One Quarter
			Laminated, Laminations Each 0.002 in. (0.05 mm)	Laminated, Laminations Each 0.003 in. (0.08 mm)	Laminated, Laminations Each 0.002 in. (0.05 mm)	Laminated, Laminations Each 0.003 in. (0.08 mm)
0.006 (0.15)	X					
0.008 (0.20)	X					
0.010 (0.25)	X					
0.016 (0.41)	X	X				
0.020 (0.51)	X	X				
0.032 (0.81)	X	X				
0.047 (1.19)	X	X				
0.062 (1.57)	X	X	X	X		
0.094 (2.39)	X	X	X	X		
0.125 (3.18)	X	X	X	X	X	X

3.4 Quality:

3.4.1 Sheet, as received by purchaser, shall be uniform in quality and condition, sound, and free from \emptyset internal and external imperfections detrimental to usage of the sheet.

3.4.2 Laminations shall be bonded together in such a manner that any shape can be cut out of the shim stock without causing the laminations in the shape to separate. Normal handling shall not cause separation of laminations.

3.5 Tolerances: Unless otherwise specified, tolerances shall be as specified in Table I.

TABLE I

Nominal Total Thickness Inch	Tolerance, Inch	
	plus	minus
Up to 0.008, incl	0.001	0.0005
Over 0.008 to 0.010, incl	0.0015	0.0005
Over 0.010 to 0.016, incl	0.0015	0.001
Over 0.016 to 0.021, incl	0.002	0.001
Over 0.021 to 0.033, incl	0.003	0.002
Over 0.033 to 0.048, incl	0.005	0.002
Over 0.048 to 0.063, incl	0.006	0.002
Over 0.063 to 0.080, incl	0.007	0.002
Over 0.080 to 0.094, incl	0.009	0.003
Over 0.094 to 0.109, incl	0.010	0.003
Over 0.109 to 0.125, incl	0.012	0.003

TABLE I (SI)

Nominal Total Thickness Millimetres	Tolerance, Millimetres	
	plus	minus
Up to 0.20, incl	0.03	0.013
Over 0.20 to 0.25, incl	0.038	0.013
Over 0.25 to 0.41, incl	0.038	0.03
Over 0.41 to 0.53, incl	0.05	0.03
Over 0.53 to 0.84, incl	0.08	0.05
Over 0.84 to 1.22, incl	0.13	0.05
Over 1.22 to 1.60, incl	0.15	0.05
Over 1.60 to 2.03, incl	0.18	0.05
Over 2.03 to 2.39, incl	0.23	0.08
Over 2.39 to 2.77, incl	0.25	0.08
Over 2.77 to 3.18, incl	0.30	0.08

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of sheet shall supply all samples 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 perform such confirmatory testing as he deems necessary to ensure that the sheet conforms to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and shall be performed on each lot of sheet.

4.3 Sampling: Shall be in accordance with ASTM B248.

4.4 Reports:

4.4.1 The vendor of sheet shall furnish with each shipment three copies of a report showing the results of tests for chemical composition of each lot and stating that the product conforms to the other technical requirements of this specification. This report shall include the purchase order number, material specification number and its revision letter, shim stock thickness, foil thickness, percentage of total thickness which is laminated, size, and quantity.