

**AEROSPACE
MATERIAL
SPECIFICATION****SAE AMS5500****REV. E**

Issued 1968-05
Revised 2002-01
Reaffirmed 2012-10

Superseding AMS5500D

Steel, Corrosion-Resistant, Laminated, Sheet
Surface Bonded

(Composition similar to UNS S30200)

RATIONALE

AMS5500E has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:**1.1 Form:**

This specification covers a corrosion-resistant steel in the form of laminated sheet.

1.2 Application:

This sheet has been used typically for shims in which thickness is adjusted by removal of laminations as required, 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 canceled 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 2248 Chemical Check Analysis Limits, Corrosion and Heat-Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys

AMS 2371 Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steels and Alloys, Wrought Products and Forging Stock

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2.2 ASTM Publications:

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

ASTM E 353 Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

3.1.1 Laminations: Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 353, by spectrochemical methods, or by other analytical methods acceptable to purchaser:

TABLE 1 - Composition

Element	min	max
Carbon	--	0.15
Manganese	--	2.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	17.00	19.00
Nickel	8.00	10.00
Molybdenum	--	0.75
Copper	--	0.75

3.1.1.1 Check Analysis: Composition variations shall meet the applicable requirements of AMS 2248.

3.1.2 Adhesive: Shall be of a composition which will meet the fabrication and quality requirements of this specification.

3.2 Fabrication:

The corrosion-resistant steel comprising the laminations shall be in the annealed or 1/4 hard temper. The laminated shim stock shall consist completely of laminations each $0.002\text{ inch} \pm 0.0002$ ($0.05\text{ mm} \pm 0.005$) thick or $0.003\text{ inch} \pm 0.0003$ ($0.08\text{ mm} \pm 0.008$) thick, or partly of such laminations combined with a single thicker lamination (See Table 2), as ordered, bonded together by an adhesive such that individual laminations may be peeled for adjustment of shim thickness. The thickness of each layer of adhesive shall not exceed 0.0003 inch (0.008 mm).

3.2.1 Sheet shall be of the thicknesses and combinations of laminations and solid base shown in Table 2.

TABLE 2 - Thicknesses and Combinations of Laminations and Solid Base

Nominal Thickness of Shim Stock Inch	Nominal Thickness mm	All Laminated, (0.002 inch (0.05 mm) Laminations	All Laminated, (0.003 inch (0.08 mm) Laminations	Half Solid, Half Laminated (0.002 inch (0.05 mm) Laminations	Half Solid, Half Laminated (0.003 inch (0.08 mm) Laminations	Three Quarters Solid, One Quarter Laminated (0.002 inch (0.05 mm) Laminations	Three Quarters Solid, One Quarter Laminated (0.003 inch (0.08 mm) Laminations
0.006	0.15	X					
0.008	0.20	X					
0.010	0.25	X					
0.012	0.31	X					
0.015	0.38	X	X				
0.016	0.41	X	X				
0.020	0.51	X	X				
0.021	0.53	X	X				
0.032	0.81	X	X				
0.033	0.84	X	X				
0.047	1.19	X	X				
0.048	1.22	X	X				
0.062	1.58	X	X	X	X		
0.063	1.60	X	X	X	X		
0.078	1.98	X	X	X	X		
0.080	2.03	X	X	X	X		
0.093	2.37	X	X	X	X		
0.094	2.39	X	X	X	X		
0.109	2.77	X	X	X	X		
0.121	3.07	X	X	X	X	X	X
0.125	3.18	X	X	X	X	X	X

3.3 Construction:

3.3.1 General Requirements: Laminations, and solid stock when applicable, shall be bonded together throughout the whole surface area in a manner which will permit peeling of the laminations for adjustment of shim thickness without the aid of mechanical devices, and without separation of the remaining laminations and solid part. Laminations shall be bonded together in such a manner that any shape can be cut from the material using suitable tools, without separation. Laminations shall remain intact without separation during normal handling. Requirements shall be applicable to laminations not less than eight hours after completion of bonding.

3.3.2 Surface Roughness: Flat surfaces of laminations, and solid stock when applicable, shall have a maximum roughness of 63 RA (microinches) on original surfaces and on metallic surfaces after peeling.

3.3.3 Water Resistance: Sheet shall withstand total immersion in water at $120^{\circ}\text{F} \pm 3$ ($49^{\circ}\text{C} \pm 3$) for at least three hours without separation of laminations or any evidence of corrosion.

3.4 Quality:

Sheet, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from dents, creases, and other imperfections detrimental to usage of the sheet.

3.5 Tolerances:

Shall be as shown in Table 3.

TABLE 3A - Tolerances, Inch/Pound Units

Nominal Total Thickness Inch	Tolerance, Inch Plus	Tolerance, Inch 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
Over 0.125 to 0.156, incl	0.015	0.003
Over 0.156 to 0.187, incl	0.018	0.003
Over 0.187 to 0.190, incl	0.018	0.005

TABLE 3B - Tolerances, SI Units

Nominal Total Thickness Millimeters	Tolerance, Millimeter	Tolerance, Millimeter
	Plus	Minus
Up to 0.20, incl	0.025	0.013
Over 0.20 to 0.25, incl	0.038	0.013
Over 0.25 to 0.41, incl	0.038	0.025
Over 0.41 to 0.53, incl	0.05	0.025
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
Over 3.18 to 3.96, incl	0.38	0.08
Over 3.96 to 4.75, incl	0.46	0.08
Over 4.75 to 4.83, incl	0.46	0.13

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:

All technical requirements are acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling and Testing:

Shall be in accordance with AMS 2371.