SAE The Engineering Society For Advancing Mobility Land Sea Air and Space ®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 5500D

Issued 1 MAY 1968
Revised 1 APR 1991

Superseding AMS 5500C

An American National Standard

STEEL, CORROSION RESISTANT, LAMINATED, SHEET
Surface Bonded

UNS S30200

1. SCOPE:

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

1.2 Application: Primarily for shims in which thickness is 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 SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

2.1.1 Aerospace Material Specifications:

AMS 2248 Chemical Check Analysis Limits, Wrought Corrosion and Heat Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys

AMS 2371 Quality Assurance Sampling of Corrosion and Heat Resistant Steels and Alloys, Wrought Products Except Forgings and Forging Stock

2.2 ASTM Publications: Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

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

2.3 U.S. Government Publications: Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

2.3.1 Military Standards:

MIL-STD-163 - Steel Mill Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

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

	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 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 inch ± 0.0002 (0.05 mm ± 0.005) thick or 0.003 inch ± 0.0003 (0.08 mm ± 0.008) thick, or partly of such laminations combined with a single thicker lamination, 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 I.

TABLE I

Nominal Thickness Of Shim Stock Inch	mm	All Laminated, 0.002 in. (0.05 mm) Laminations	All Laminated, 0.003 in. (0.08 mm) Laminations	Half Solid, Half Laminated 0.002 in. (0.05 mm) Laminations	Half Solid, Half Laminated 0.003 in. (0.08 mm) Laminations	Three Quarters Solid, One Quarter Laminated 0.002 in. (0.05 mm) Laminations	Three Quarters Solid, One Quarter Laminated 0.003 in. (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 without the aid of mechanical devices, for adjustment of shim thickness, 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 Ø 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 Ø 120°F ± 3 (49°C ± 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 specified in Table II. Ø

TABLE II

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
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 I (SI)

Nominal Total Thickness Millimeters	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