

**AEROSPACE
MATERIAL
SPECIFICATION**

Submitted for recognition as an American National Standard

SAE AMS 5500C

Issued 5-1-68
Revised 4-1-86

Superseding AMS 5500B

**STEEL SHEET, CORROSION RESISTANT, LAMINATED
Surface Bonded**

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

AMS 2350 - Standards and Test Methods

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 American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM E353 - Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

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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 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, determined by wet chemical methods in accordance with ASTM E353 or by spectrographic or other analytical methods approved by 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 in. + 0.0002 (0.05 mm + 0.005) thick or 0.003 in. + 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 in. (0.008 mm).

3.2.1 Sheet shall be of the following thicknesses and combinations of laminations and solid base:

| 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 | | | | | | |
| 0.016 | 0.40 | X | X | | | | | |
| 0.020 | 0.50 | X | X | | | | | |
| 0.032 | 0.80 | X | X | | | | | |
| 0.047 | 1.18 | X | X | | | | | |
| 0.062 | 1.55 | X | X | X | X | | | |
| 0.094 | 2.35 | X | X | X | X | | | |
| 0.125 | 3.00 | X | X | X | X | X | X | X |

3.3 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.

3.3.1 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.

3.4 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, Millimetre | |
|----------------------------------------|-----------------------|-------|
| | plus | minus |
| Up to 0.20, incl | 0.02 | 0.012 |
| Over 0.20 to 0.25, incl | 0.038 | 0.012 |
| Over 0.25 to 0.40, incl | 0.038 | 0.02 |
| Over 0.40 to 0.52, incl | 0.05 | 0.02 |
| Over 0.52 to 0.82, incl | 0.08 | 0.05 |
| Over 0.82 to 1.20, incl | 0.12 | 0.05 |
| Over 1.20 to 1.58, incl | 0.15 | 0.05 |
| Over 1.58 to 2.00, incl | 0.18 | 0.05 |
| Over 2.00 to 2.35, incl | 0.22 | 0.08 |
| Over 2.35 to 2.72, incl | 0.25 | 0.08 |
| Over 2.72 to 3.00, incl | 0.30 | 0.08 |

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: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and shall be performed on each heat or lot as applicable.
- 4.3 Sampling: Shall be in accordance with AMS 2371.
- 4.4 Reports:
- 4.4.1 The vendor of sheet shall furnish with each shipment a report showing the results of tests for chemical composition of each heat and stating that the sheet conforms to the other technical requirements of this specification. This report shall include the purchase order number, heat number, AMS 5500C, shim stock thickness, foil thickness, percentage of total thickness which is laminated, size, and quantity.
- 4.4.2 The vendor of finished or semi-finished parts shall furnish with each shipment a report showing the purchase order number, AMS 5500C, contractor or other direct supplier of sheet, part number, and quantity. When sheet for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of sheet to determine conformance to the requirements of this specification and shall include in the report either a statement that the sheet conforms or copies of laboratory reports showing the results of tests to determine conformance.
- 4.5 Resampling and Retesting: Shall be in accordance with AMS 2371.