



# AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.  
TWO PENNSYLVANIA PLAZA, NEW YORK, N. Y. 10001

## AMS 5501A

Superseding AMS 5501

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STEEL FOIL, CORROSION RESISTANT  
19Cr - 9.5Ni (SAE 30304)  
Cold Rolled, 125,000 psi

1. SCOPE:

1.1 Form: This specification covers a corrosion resistant steel in the form of foil.

1.2 Application: Primarily for liners of filament-wound pressure vessels.

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., Two Pennsylvania Plaza, New York, New York 10001.

2.1.1 Aerospace Material Specifications:

AMS 2242 - Tolerances, Corrosion and Heat Resistant Steel and Iron Base Alloy Sheet, Strip, and Plate and Titanium and Titanium Alloy Sheet, Strip, and Plate

AMS 2248 - Chemical Check Analysis Limits, Wrought Heat and Corrosion Resistant Steels and Alloys

AMS 2350 - Standards and Test Methods

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

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

ASTM A370 - Mechanical Testing of Steel Products

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

2.3 Government Publications: Available from Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.

2.3.1 Federal Standards:

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

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E353, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other approved analytical methods.

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	min	max
Carbon	--	0.08
Manganese	--	2.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	18.00 - 20.00	
Nickel	8.00 - 11.00	
Molybdenum	--	0.75
Copper	--	0.75

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

3.2 Condition: Cold rolled, solution heat treated, descaled, and rerolled (No. 2 Strip Finish).

3.3 Properties:

3.3.1 Tensile Properties: Shall be as follows, determined in accordance with ASTM A370:

Tensile Strength, min	125,000 psi (862 MN/m <sup>2</sup> )
Yield Strength at 0.2% Offset, min	75,000 psi (517 MN/m <sup>2</sup> )
Elongation in 2 in. (50.8 mm), min	15%

3.3.1.1 For widths 9 in. (229 mm) and over, tensile test specimens shall be taken with the axis perpendicular to the direction of rolling. For widths less than 9 in. (229 mm), tensile test specimens shall be taken with the axis parallel to the direction of rolling.

3.3.2 Bending: Material 0.010 in. (0.254 mm) and under in nominal thickness, tested with specimens 0.750 in. (19.05 mm) in width, shall withstand without cracking, bending in accordance with ASTM A370 at room temperature through the angle indicated below around a diameter equal to the bend factor times the nominal thickness of the material with axis of bend parallel to the direction of rolling.

Type of Bend	Angle deg (rad), min	Bend Factor
Free Bend	180 (3.14)	1
V-Block	135 (2.36)	2

3.4 Quality: The product shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

3.5 Tolerances: Unless otherwise specified, tolerances for material 0.005 in. (0.127 mm) and over in thickness shall conform to all applicable requirements of AMS 2242; for thicknesses under 0.005 in. (0.127 mm), tolerances shall be as agreed upon by purchaser and vendor.

#### 4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor 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 assure that material 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 routine control tests.