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AEROSPACE MATERIAL SPECIFICATION

SAE AMS 5553E

Issued FEB 1965
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Submitted for recognition as an American National Standard

Superseding AMS 5553D

NICKEL, SHEET AND STRIP
Low (0.02 max) Carbon
Annealed

UNS N02201

1. SCOPE:

1.1 Form:

This specification covers nickel in the form of sheet and strip.

1.2 Application:

These products have been used typically for parts requiring excellent corrosion resistance, and/or strong magnetic properties, but usage is not limited to such applications.

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.

AMS 2262	Tolerances, Nickel, Nickel Alloy, and Cobalt Alloy Sheet, Strip, and Plate
MAM 2262	Tolerances, Metric, Nickel, Nickel Alloy, and Cobalt Alloy Sheet, Strip, and Plate
AMS 2269	Chemical Check Analysis Limits, Wrought Nickel, Nickel Alloys, and Cobalt Alloys
AMS 2371	Quality Assurance Sampling and Testing, Corrosion and Heat Resistant Steels and Alloys, Wrought Products and Forging Stock
AMS 2807	Identification, Carbon and Low-Alloy Steels, Corrosion and Heat Resistant Steels and Alloys, Sheet, Strip, Plate, and Aircraft Tubing

2.2 ASTM Publications:

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

ASTM E 8 Tension Testing of Metallic Materials
ASTM E 8M Tension Testing of Metallic Materials (Metric)
ASTM E 18 Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E 39 Chemical Analysis of Nickel
ASTM E 384 Microhardness of Materials

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

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

3. TECHNICAL REQUIREMENTS:
(R)

3.1 Composition: Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 39, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 – Composition

Element	min	max
Nickel	99.0	--
Carbon	--	0.02
Manganese	--	0.35
Silicon	--	0.35
Sulfur	--	0.010
Cobalt	--	1.00
Iron	--	0.40
Copper	--	0.25

3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2269.

3.2 Condition:
(R)

Cold rolled, annealed, and, unless annealing is performed in an atmosphere yielding a bright finish, descaled having a surface finish comparable to the following commercial corrosion-resistant steel finishes, as applicable (See 8.2).

3.2.1.1 Sheet: No. 2D finish.

3.2.1.2 Strip: No. 1 strip finish.
(R)

3.3 Properties:

The product shall conform to the following requirements:

3.3.1 Tensile Properties: Shall be as shown in Table 2, determined in accordance with ASTM E 8 or ASTM E 8M.

TABLE 2A - Tensile Properties, Inch/Pound Units

Nominal Thickness Inch	Tensile Strength ksi, min	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches %, min
0.005 to 0.010, excl	45.0	--	--
0.010 to 0.015, incl	50.0	30.0, max	30
Over 0.015 to 0.049, incl	50.0	12.0, min	30
Over 0.049 to 0.109, incl	50.0	12.0, min	35
Over 0.109 to 0.250, incl	50.0	12.0, min	40

TABLE 2B - Tensile Properties, SI Units

Nominal Thickness Millimeters	Tensile Strength MPa, min	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm %, min
0.13 to 0.25, excl	310	--	--
0.25 to 0.38, incl	345	207, max	30
Over 0.38 to 1.24, incl	345	83, min	30
Over 1.24 to 2.77, incl	345	83, min	35
Over 2.77 to 6.35, incl	345	83, min	40

3.3.2 Hardness: Shall be not higher than 66 HRB, or equivalent (See 8.3), determined in accordance
(R) with ASTM E 18; for thin gages where superficial hardness testing is impractical, microhardness testing in accordance with ASTM E 384 may be used. Product shall not be rejected on the basis of hardness if the tensile properties of 3.3.1, determined on product taken from the same sample as that with nonconforming hardness or from another sample with similar nonconforming hardness, are acceptable.

3.4 Quality:

The product, 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 product.