

NICKEL SHEET AND STRIP, CORROSION AND HEAT RESISTANT
Thoria Dispersion Strengthened
2.2ThO₂

1. SCOPE:

- 1.1 Form: This specification covers thoria-dispersion-strengthened nickel in the form of sheet and strip.
- 1.2 Application: Primarily for parts required to operate in the temperature range 1800° - 2400°F (980° - 1315°C) but a protective coating is required for operation at such temperatures. Fusion welding of structural members is not recommended but the product can be brazed and resistance welded satisfactorily. Products covered by this specification are radioactive. Applicable rules and regulations pertaining to handling of radioactive material should be observed.
- 1.3 Safety - Hazardous Materials: While the materials, methods, applications and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.
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.

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2.1.1 Aerospace Material Specifications:

- 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 Alloys and Cobalt 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 E8 - Tension Testing of Metallic Materials
- ASTM E21 - Elevated Temperature Tension Tests of Metallic Materials
- ASTM E139 - Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials
- ASTM E290 - Semi-Guided Bend Test for Ductility of Metallic Materials
- ASTM E354 - Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

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: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E354 or by spectrochemical or other analytical methods approved by purchaser; the method of determining thoria (ThO₂) shall be as agreed upon by purchaser and vendor:

	min	max
Thoria	1.80	2.60
Carbon	--	0.02
Sulfur	--	0.0025
Chromium	--	0.05
Cobalt	--	0.20
Titanium	--	0.05
Iron	--	0.05
Copper	--	0.15
Nickel	remainder	

- 3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2269 except that chromium, titanium, and iron shall each vary not more than 0.001 over max; permissible variation for thoria shall be 0.01 over min or over maximum.