

NICKEL-IRON ALLOY WIRE, COPPER CLAD, ROUND
42Ni - 56.5Fe
Annealed

REAFFIRMED

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1. SCOPE:

- 1.1 Form: This specification covers a nickel-iron alloy in the form of round wire clad with electrolytic copper.
- 1.2 Application: Primarily for weldable leads, terminals, and inter-connections for electronic components where magnetic properties are essential and where glass-to-metal seals are 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 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 B5 - Electrolytic Tough-Pitch Copper Refinery Shapes
- ASTM E8 - Tension Testing 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

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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 Basis Wire (Core): Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E354 or by spectrographic or other analytical methods approved by purchaser:

	min	max
Carbon	--	0.15
Manganese	0.75 -	1.25
Silicon	--	0.30
Phosphorus	--	0.02
Sulfur	--	0.02
Nickel	41.00 -	43.00
Iron	55.00 -	58.00

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

3.1.2 Cladding (Sheath): Shall be electrolytic copper (not less than 99.90% by weight copper) conforming to ASTM B5.

3.2 Condition: Annealed.

3.3 Properties: Wire shall conform to the following requirements:

3.3.1 Tensile Strength: Shall be not greater than 85,000 psi (585 MPa), determined in accordance with ASTM E8.

3.3.2 Bending: Wire shall withstand, without evidence of cracking or of separation of the cladding (sheath) from the basis wire when examined under 10X magnification, bending in accordance with ASTM E290 at room temperature through an angle of 180 deg around a diameter equal to the nominal diameter of the wire.

3.4 Quality: Wire, as received by purchaser, shall be uniform in quality, condition, temper, and cross-section. Surfaces, evaluated at up to 30X magnification, shall be free from scale, corrosion, cracks, seams, scratches, slivers, dirt, grease, oil, streaks, stains, pit marks, burns, dents, blisters, laps, grooves, inclusions, and other imperfections detrimental to usage of the wire.