Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 7732A
Superseding AMS 7732

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STEEL WIRE, COPPER CLAD
99Fe - 0.32Mn

1. SCOPE:

1.1 Form: This specification covers a low-carbon steel in the form of round wire clad with electrolytic copper.

1.2 Application: Primarily for electronic components requiring soft magnetic properties.

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., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2259 - Chemical Check Analysis Limits, Wrought Low-Alloy and Carbon Steels
AMS 2350 - Standards and Test Methods
AMS 2370 - Quality Assurance Sampling of Carbon and Low-Alloy Steels, 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 A370 - Mechanical Testing of Steel Products
ASTM B5 - Electrolytic Copper Wire, Bars, Cakes, Slabs, Billets, Ingots, and Ingot Bars
ASTM E350 - Chemical Analysis of Carbon Steel , Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron

2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Federal Standards:

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

2.3.2 Military Standards:

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

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

SAE Technical Board rules provide that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

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3.1.1 Basis Wire (Core): Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E350, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other analytical methods approved by purchaser: ø

	min	max
Carbon	--	0.08
Manganese	0.25	- 0.40
Phosphorus	--	0.04
Sulfur	--	0.05

3.1.1.1 Check Analysis: Composition variations shall meet the applicable requirements of AMS 2259.

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

3.2 Condition: Cold drawn or cold rolled, annealed, cleaned, clad, and annealed.

3.3 Properties: Wire shall conform to the following requirements; tensile and bend testing shall be performed in accordance with ASTM A370: ø

3.3.1 Tensile Strength: Shall be 50,000 - 100,000 psi (345 - 690 MPa).

3.3.2 Bending: Finished wire shall withstand, without evidence of cracking or of separation of the cladding (sheath) from the basis wire when examined under 10X magnification, bending 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 internal and external imperfections detrimental to usage of the wire. ø

3.5 Tolerances:

3.5.1 Cladding (Sheath) Thickness: The completed core-and-sheath cross-section shall be 27 - 35% by weight copper. At any cross-section, the maximum thickness of the sheath shall not exceed twice the minimum thickness of the sheath.

3.5.2 Diameter: Unless otherwise specified, wire shall be supplied in sizes and to the tolerances shown in Table I.

TABLE I

Nominal Diameter Inch	Tolerance, Inch plus and minus
0.012	0.0003
0.014	0.0004
0.016	0.0004
0.020	0.0005
0.025	0.0005
0.032	0.0005
0.040	0.0005

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TABLE I(SI)

Nominal Diameter Millimetres	Tolerance, Millimetre plus and minus
0.30	0.008
0.35	0.010
0.40	0.010
0.50	0.013
0.65	0.013
0.80	0.013
1.00	0.013

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of wire 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 ensure that the wire conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for composition (3.1.1 and 3.1.2), tensile strength (3.3.1), quality (3.4), and tolerances (3.5) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for bending (3.3.2) are classified as periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling: Shall be in accordance with AMS 2370; a lot shall be all wire of the same nominal diameter from the same heat of steel processed at the same time and presented for vendor's inspection at one time.

4.4 Reports:

4.4.1 The vendor of wire shall furnish with each shipment three copies of a report showing the results of tests for chemical composition of each heat and for tensile strength of each lot and stating that the wire conforms to the other technical requirements of this specification. This report shall include the purchase order number, lot number, material specification number and its revision letter, size, and quantity.

4.4.2 The vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number and its revision letter, contractor or other direct supplier of wire, part number, and quantity. When wire for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of wire to determine conformance to the requirements of this specification, and shall include in the report a statement that the wire conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

4.5 Resampling and Retesting: Shall be in accordance with AMS 2370.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

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