SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 7733C

Issued NOV 1970
Revised JAN 2003
Reaffirmed SEP 2007

Superseding AMS 7733B

Steel Wire, Copper Clad, Round
99Fe - 0.45Mn (0.13C max)
Annealed

RATIONALE

This document has been reaffirmed to comply with the SAE 5-year Review policy.

1. SCOPE:

1.1 Form:

This specification covers a low-carbon steel in the form of round wire clad with phosphorus-deoxidized copper.

1.2 Application:

This wire has been used typically for electronic components requiring essentially soft magnetic properties but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or www.sae.org.

AMS 2259	Chemical Check Analysis Limits, Wrought Low-Alloy and Carbon Steels
AMS 2370	Quality Assurance Sampling of Carbon and Low-Alloy Steels, Wrought Products and Forging Stock

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or www.astm.org.

ASTM B 379	Phosphorized Coppers, Refinery Shapes
ASTM E 350	Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron
ASTM F 219	Testing Fine Round and Flat Wire for Electron Devices and Lamps

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

3.1.1 Basis Wire (Core): Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 350 or by spectrochemical or other analytical methods acceptable to purchaser:

TABLE 1 - Composition

Element	min	max
Carbon	--	0.13
Manganese	0.30	0.60
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 phosphorus deoxidized copper (not less than 99.90% by weight copper) conforming to ASTM B 379, Type DLP.

3.2 Condition:

Annealed.

3.3 Properties:

Wire shall conform to the following requirements:

3.3.1 Tensile Properties: Shall be as shown in Table 2, determined in accordance with ASTM F 219, using a tester with constant rate of extension and a precision of ±1%.

TABLE 2 - Tensile Properties

Property		Value
Yield Strength		
Center Stress, + 15%		36.0 ksi
Working Range		10.5 ksi
Elongation, min		
Nominal Diameter Inch	Nominal Diameter Millimeter	
0.012 to 0.020, incl	0.30 to 0.50, incl	15%
0.025 to 0.040, incl	0.62 to 1.00, incl	20%

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.

3.5 Tolerances:

3.5.1 Cladding (Sheath) Thickness: The completed core-and-sheath cross-section shall be 18 to 26% 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: Wire shall be supplied in the sizes and to the, tolerances shown in Table 3.

TABLE 3A - Diameter Tolerances, Inch/Pound Units

Nominal Diameter Inch	Tolerance, Inch plus and minus
0.012	0.0002
0.014	0.0002
0.016	0.0002
0.020	0.0003
0.025	0.0003
0.032	0.0005
0.040	0.0005

TABLE 3A - Diameter Tolerances, SI Units

Nominal Diameter Millimeter	Tolerance, Millimeter plus and minus
0.30	0.005
0.35	0.005
0.40	0.005
0.50	0.008
0.62	0.008
0.80	0.012
1.00	0.012

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of wire shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the wire conforms to specified requirements.

4.2 Classification of Tests:

All technical requirements are acceptance tests and shall be performed on each lot.

4.3 Sampling:

Shall be in accordance with AMS 2370.

4.4 Reports:

The vendor of wire shall furnish with each shipment a report showing the results of tests for composition of each heat and for tensile properties and cladding thickness of each lot and stating that the wire conforms to the other technical requirements. This report shall include the purchase order number, manufacturer's identification, heat and lot numbers, AMS 7733C, size, and quantity.

4.5 Resampling and Retesting:

Shall be in accordance with AMS 2370.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

5.1.1 Wire shall be wound on spools, without splicing, in lengths of not less than 100 ft (30 m). Spools shall be packaged in such a manner as to minimize, during shipment and storage, damage from normal hazards.