SAE The Engineering Society For Advancing Mobility Land Sea Air and Space

400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

# AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 4732B

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Superseding AMS 4732A

## COPPER-NICKEL ALLOY WIRE AND RIBBON
## 77.5Cu - 22.5Ni

UNS G71110

THIS REVISION CONTAINS ONLY EDITORIAL CHANGES.

1. SCOPE:

1.1 Form: This specification covers one type of copper-nickel alloy in the form of wire and ribbon.

1.2 Application: Primarily for parts where low electrical resistance and essentially non-magnetic properties 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 E8 - Tension Testing of Metallic Materials
ASTM E76 - Chemical Analysis of Nickel-Copper 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 Specifications:

MIL-C-3993 - Copper and Copper-Base Mill Products, Packaging of

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E76, by spectrochemical or other analytical methods approved by purchaser:

| | min | max |
|---|---|---|
| Nickel | 21.5 | 23.5 |
| Manganese | -- | 0.35 |
| Titanium | -- | 0.05 |
| Sulfur | -- | 0.008 |
| Copper | remainder | |

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

3.2 Condition: Cold drawn or cold rolled, and annealed and descaled, or bright annealed.

3.3 Tensile Strength: Shall be not higher than 75,000 psi (515 MPa), determined in accordance with ASTM E8.

3.4 Quality: The product, as received by purchaser, shall be uniform in quality and condition, sound, smooth, and free from foreign materials and from imperfections detrimental to usage of the product.

3.5 Sizes and Tolerances: The product shall be supplied in the sizes and to the tolerances specified in 3.5.1 and 3.5.2.

3.5.1 Wire:

TABLE I

| Nominal Diameter Inch | Tolerance, Inch plus and minus |
|---|---|
| 0.0005 | 0.0001 |
| 0.0007 | 0.0001 |
| 0.0010 | 0.00015 |
| 0.0015 | 0.00015 |
| 0.0020 | 0.00015 |
| 0.0030 | 0.0002 |
| 0.0040 | 0.0002 |
| 0.0060 | 0.0003 |
| 0.0080 | 0.0003 |
| 0.0120 | 0.0003 |
| 0.0160 | 0.0004 |
| 0.0200 | 0.0005 |
| 0.0250 | 0.0005 |
| 0.0320 | 0.0006 |
| 0.0400 | 0.0006 |

TABLE I (SI)

| Nominal Diameter Millimetres | Tolerance, Millimetre plus and minus |
|---|---|
| 0.013 | 0.003 |
| 0.018 | 0.003 |
| 0.025 | 0.0038 |
| 0.038 | 0.0038 |
| 0.051 | 0.0038 |
| 0.076 | 0.005 |
| 0.102 | 0.005 |
| 0.152 | 0.008 |
| 0.203 | 0.008 |
| 0.305 | 0.008 |
| 0.406 | 0.010 |
| 0.508 | 0.013 |
| 0.635 | 0.013 |
| 0.813 | 0.015 |
| 1.016 | 0.015 |

3.5.2 Ribbon:

3.5.2.1 Thickness:

TABLE II

| Nominal Thickness Inch | Tolerance, Inch plus and minus |
|---|---|
| 0.002 | 0.0001 |
| 0.003 | 0.00015 |
| 0.004 | 0.0002 |
| 0.005 | 0.00025 |
| 0.006 | 0.0003 |
| 0.008 | 0.0004 |
| 0.010 | 0.0005 |
| 0.012 | 0.0006 |
| 0.016 | 0.0008 |
| 0.020 | 0.0010 |
| 0.025 | 0.0015 |
| 0.032 | 0.0015 |
| 0.040 | 0.0015 |
| 0.051 | 0.0015 |

TABLE II (SI)

| Nominal Thickness Millimetres | Tolerance, Millimetre plus and minus |
|---|---|
| 0.05 | 0.003 |
| 0.08 | 0.0038 |
| 0.10 | 0.005 |
| 0.13 | 0.0064 |
| 0.15 | 0.008 |
| 0.20 | 0.010 |
| 0.25 | 0.013 |
| 0.30 | 0.015 |
| 0.41 | 0.020 |
| 0.51 | 0.025 |
| 0.64 | 0.038 |
| 0.81 | 0.038 |
| 1.02 | 0.038 |
| 1.30 | 0.038 |

3.5.2.2 Width:

TABLE III

| Nominal Width Inch | Tolerance, Inch plus and minus |
|---|---|
| 0.015 | 0.0025 |
| 0.031 | 0.0025 |
| 0.046 | 0.0025 |
| 0.062 | 0.0025 |
| 0.093 | 0.004 |
| 0.125 | 0.005 |
| 0.187 | 0.005 |
| 0.250 | 0.005 |
| 0.375 | 0.005 |
| 0.500 | 0.005 |
| 0.625 | 0.005 |
| 0.750 | 0.005 |
| 1.000 | 0.005 |

TABLE III (SI)

| Nominal Width Millimetres | Tolerance, Millimetre plus and minus |
|---|---|
| 0.38 | 0.064 |
| 0.79 | 0.064 |
| 1.17 | 0.064 |
| 1.57 | 0.064 |
| 2.36 | 0.10 |
| 3.18 | 0.13 |
| 4.75 | 0.13 |
| 6.35 | 0.13 |
| 9.52 | 0.13 |
| 12.70 | 0.13 |
| 15.88 | 0.13 |
| 19.05 | 0.13 |
| 25.40 | 0.13 |



4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all samples for vendor's tests 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 sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.