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400 Commonwealth Dr., Warrendale, PA 15096

An American National Standard

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4731B

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Superseding AMS 4731A

NICKEL-COPPER ALLOY WIRE AND RIBBON, CORROSION RESISTANT
67Ni - 31Cu
Annealed

UNS N04400

1. SCOPE:

1.1 Form: This specification covers a corrosion-resistant nickel-copper alloy in the form of wire and ribbon.

1.2 Application: Primarily for parts where essentially nonmagnetic 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 TaborAvenue, 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 E76 or by spectrographic or other analytical methods approved by purchaser:

	min	max
Nickel + Cobalt	63.0	--
Copper	28.0	34.0
Iron	--	2.5
Manganese	--	2.0
Cobalt (3.1.1)	--	1.0
Aluminum	--	0.50
Silicon	--	0.50
Carbon	--	0.20
Phosphorus (3.1.1)	--	0.02
Zinc (3.1.1)	--	0.02
Sulfur	--	0.015
Lead (3.1.1)	--	0.006
Tin (3.1.1)	--	0.006

3.1.1 Determination not required for routine acceptance.

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

3.2 Condition: Cold drawn or cold rolled, annealed, and, unless annealing is performed in an atmosphere yielding a bright finish, descaled.

3.3 Properties: The product shall conform to the following requirements:

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

3.4 Quality: The product shall be uniform in quality, condition, temper, and cross section. Surfaces shall, determined at up to 30X magnification, be free from scale, corrosion, cracks, seams, scratches, slivers, dirt, grease, oil, streaks, stains, pit marks, burns, dents, blisters, laps, grooves, inclusions, and other impperfections 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 Round Wire (Cold Drawn):

TABLE I

Nominal Diameter Inch	Tolerance, Inch plus and minus
0.0040	0.0002
0.0060	0.0002
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, Millimetres plus and minus
0.100	0.005
0.150	0.005
0.200	0.008
0.300	0.008
0.400	0.010
0.500	0.012
0.625	0.012
0.800	0.015
1.000	0.015

3.5.2 Ribbon (Cold Rolled):

3.5.2.1 Thickness:

TABLE II

Nominal Thickness (T) Inch	Tolerance, Inch plus and minus
0.002	0.050T
0.003	0.050T
0.004	0.050T
0.005	0.050T
0.006	0.050T
0.008	0.050T
0.010	0.050T
0.012	0.001
0.016	0.0015
0.020	0.0015
0.025	0.0015
0.032	0.0015
0.040	0.0015
0.051	0.0015

TABLE IN (SI)

Nominal Thickness (T) Millimetre	Tolerance, Millimetre plus and minus
0.05	1.27T
0.08	1.27T
0.10	1.27T
0.12	1.27T
0.15	1.27T
0.20	1.27T
0.25	1.27T
0.30	0.03
0.40	0.038
0.50	0.038
0.62	0.038
0.80	0.038
1.00	0.038
1.28	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	0.007
1.000	0.007

TABLE III (SI)

Nominal Width Millimetres	Tolerance, Millimetres plus and minus
0.38	0.062
0.78	0.062
1.15	0.062
1.55	0.062
2.32	0.10
3.12	0.12
4.75	0.12
6.25	0.12
9.50	0.12
12.50	0.12
15.60	0.12
18.75	0.18
25.00	0.18

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.

4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling: Shall be in accordance with AMS 2371.