AEROSPACE MATERIAL SPECIFICATION

AMS4731™	REV. D

Issued 1970-11
Reaffirmed 2012-10
Revised 2021-04

Superseding AMS4731C

Nickel-Copper Alloy Wire and Ribbon, Corrosion-Resistant
67Ni - 31Cu
Annealed
(Composition similar to UNS N04400)

RATIONALE

AMS4731D prohibits unauthorized exceptions (3.6, 4.4.1.1, 5.2.1, 8.5), adds strain rate control (3.3.1.1), adds country of origin to reports (4.4.1), allows prior revisions (8.4), and is the result of a Five-Year Review and update of the specification.

1. SCOPE

1.1 Form

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

1.2 Application

This product is used typically for parts where essentially nonmagnetic properties are required, 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 International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2269 Chemical Check Analysis Limits, Nickel, Nickel Alloys, and Cobalt Alloys

AMS2371 Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steels and Alloys, Wrought Products and Forging Stock

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS4731D

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM E8/E8M Tension Testing of Metallic Materials

ASTM E76 Chemical Analysis of Nickel-Copper Alloys

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the following percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E76 or by spectrographic or other analytical methods approved by purchaser:

Table 1 - Composition

Element	Min	Max
Nickel	63.0	--
Copper	28.0	34.0
Iron	--	2.5
Manganese	--	2.0
Aluminum	--	0.50
Silicon	--	0.50
Carbon	--	0.20
Phosphorus	--	0.02
Zinc	--	0.02
Sulfur	--	0.015
Lead	--	0.006
Tin	--	0.006

3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS2269.

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 ksi (585 MPa), determined in accordance with ASTM E8/E8M.

3.3.1.1 Unless otherwise specified, the strain rate shall be set at 0.005 in/in/min (0.005 mm/mm/min) and maintained within a tolerance of ±0.002 in/in/min (0.002 mm/mm/min) through 0.2% offset yield strain. The strain rate after yield may be increased to any value up to 0.5 in/in/min (or mm/mm/min) or equivalent crosshead speed as a function of gage length.

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 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 Round Wire (Cold Drawn)

Shall be as shown in Table 2.

Table 2A - Diametral tolerances, inch/pound units

Nominal Diameter Inches	Tolerance, Inches 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 2B - Diametral tolerances, SI units

Nominal Diameter Millimeters	Tolerance, Millimeters 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

Shall be as shown in Table 3.

Table 3A - Thickness tolerances, inch/pound units

Nominal Thickness (T) Inches	Tolerance, Inches 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 3B - Thickness tolerances, SI units

Nominal Thickness (T) Millimeters	Tolerance, Millimeters 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

Shall be as shown in Table 4.

Table 4A - Width tolerances, inch/pound units

Nominal Width Inches	Tolerance, Inches 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