SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

AMS 4730F

Issued MAY 1948
Revised MAY 2007

Superseding AMS 4730E

Nickel-Copper Alloy Wire, Corrosion-Resistant
67Ni - 31Cu
Annealed (400)

(Composition similar to UNS N04400)

RATIONALE

AMS 4730F is a Five Year Review and update of this specification.

1. SCOPE

1.1 Form

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

1.2 Application

This product has been typically used for woven wire cloth and screen, and for lockwire, 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 724-776-4970 (outside USA), www.sae.org.

AMS 2269	Chemical Check Analysis Limits, Wrought Nickel Alloys and Cobalt Alloys
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 ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM E 8	Tension Testing of Metallic Materials
ASTM E 76	Chemical Analysis of Nickel-Copper Alloys

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 76, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - COMPOSITION

Element	min	max
Nickel	63.0	70.0
Iron	--	2.5
Manganese	--	1.0
Silicon	--	0.5
Carbon	--	0.3
Sulfur	--	0.024
Copper	remainder	

3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS 2269.

3.2 Condition

Cold-drawn, annealed, and descaled if necessary.

3.3 Properties

Wire shall conform to the following requirements:

3.3.1 Tensile Properties

Shall be as specified in Table 2, determined in accordance with ASTM E 8.

TABLE 2A - TENSILE PROPERTIES, INCH/POUND UNITS

Nominal Diameter Inch	Tensile Strength ksi, maximum Coils or Spools	Tensile Strength ksi, maximum Cut Lengths
0.002 to 0.015, incl	105	--
Over 0.015 to 0.040, incl	100	--
Over 0.040	90	90

TABLE 2B - TENSILE PROPERTIES, SI UNITS

Nominal Diameter Millimeters	Tensile Strength MPa, maximum Coils or Spools	Tensile Strength MPa, maximum Cut Lengths
0.05 to 0.38, incl	724	--
Over 0.38 to 1.02, incl	689	--
Over 1.02	621	621

3.3.2 Bending

Wire shall withstand, without cracking, bending at room temperature through an angle of 180 degrees around a diameter equal to the nominal diameter of the wire.

3.4 Quality

Wire, 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 wire.

3.5 Tolerances

Shall conform to the following:

3.5.1 Diameter

Shall be as shown in Table 3.

TABLE 3A – DIAMETRAL TOLERANCES, INCH/POUND UNITS

Nominal Diameter Inch					Tolerance, Inch plus and minus
	0.002	to	0.0044,	incl	0.0002
Over	0.0044	to	0.0079,	incl	0.00025
Over	0.0079	to	0.0149,	incl	0.0003
Over	0.0149	to	0.0199,	incl	0.0004
Over	0.0199	to	0.031,	incl	0.0005
Over	0.031	to	0.045,	incl	0.0006
Over	0.045	to	0.079,	incl	0.0007
Over	0.079	to	0.1875,	incl	0.0010
Over	0.1875	to	0.406,	incl	0.0015
Over	0.406	to		incl	0.002

TABLE 3B – DIAMETRAL TOLERANCES, SI UNITS

Nominal Diameter Millimeters					Tolerance, Millimeters plus and minus
	0.05	to	0.112,	incl	0.005
Over	0.112	to	0.201,	incl	0.0064
Over	0.201	to	0.378,	incl	0.008
Over	0.378	to	0.505,	incl	0.010
Over	0.505	to	0.79,	incl	0.013
Over	0.79	to	1.14,	incl	0.015
Over	1.14	to	2.01,	incl	0.018
Over	2.01	to	4.762,	incl	0.025
Over	4.762	to	10.31,	incl	0.038
Over	10.31	to		incl	0.05

3.5.2 Out-of-Roundness

Round wire shall not be out-of-round by more than one-half the total tolerance given in 3.5.1.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The vendor of wire shall supply all samples for vendor 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 of this specification are acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling

Shall be in accordance with AMS 2371.

4.4 Reports

4.4.1 The vendor of wire shall furnish with each shipment a report showing the results of tests for composition of each heat and for tensile and bending properties of each lot. This report shall include the purchase order number, lot number, AMS 4730F, size, and quantity.

4.4.2 The vendor of finished or semi-finished parts shall furnish with each shipment a report showing the purchase order number, AMS 4730F, 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 either a statement that the wire conforms or copies of laboratory reports showing the results of tests to determine conformance.

4.5 Resampling and Retesting

Shall be in accordance with AMS 2371.

5. PREPARATION FOR DELIVERY

5.1 Wire shall be supplied on spools or in coils except when straight lengths are ordered.

5.2 Identification

5.2.1 Spools and Coils

Shall be marked with a durable tag or label showing not less than the manufacturer's identification, purchase order number, AMS 4730F, nominal size, and quantity. Boxes or drums shall be marked with the same information.

5.2.2 Straight Lengths

Shall have attached to each bundle or enclosed in each box a durable tag marked with the information of 5.2.1. When boxed, the box shall be marked with the same information.

5.3 Packaging

5.3.1 Spools and Coils

Coils shall be individually wrapped with waterproof paper or packed in waterproof drums. Spools, when ordered, shall be boxed.

5.3.2 Straight Lengths

Shall be bundled or boxed.

5.3.3 Wire shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the wire to ensure carrier acceptance and safe delivery.