



<b>AEROSPACE MATERIAL SPECIFICATION</b>	<b>AMS4730™</b>	<b>REV. J</b>
	Issued	1948-05
	Revised	2022-10
Superseding AMS4730H		
Nickel-Copper Alloy Wire, Corrosion-Resistant 67Ni - 31Cu Annealed (400) (Composition similar to UNS N04400)		

## RATIONALE

AMS4730J is the result of a Five-Year Review and update of the specification. The revision prohibits unauthorized exceptions (3.3.1.1, 3.6, 4.4.2, 5.2.3, 8.4), updates the testing and reporting requirements for composition (3.1, 3.1.1), adds strain rate control (3.3.1.2), and allows prior revisions (8.3).

### 1. SCOPE

#### 1.1 Form

This specification covers a corrosion-resistant nickel-copper alloy in the form of wire 0.002 inch (0.05 mm) in diameter and larger.

#### 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 +1 724-776-4970 (outside USA), [www.sae.org](http://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

AS7766 Terms Used in Aerospace Metals Specifications

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## 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](http://www.astm.org).

ASTM E8/E8M Tension Testing of Metallic Materials

ASTM E140 Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness Rockwell Hardness

ASTM E1473 Chemical Analysis of Nickel, Cobalt, and High-Temperature Alloys

## 2.3 Definitions

Terms used in AMS are defined in AS7766.

## 3. TECHNICAL REQUIREMENTS

### 3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with ASTM E1473 or by other analytical methods acceptable to purchaser.

**Table 1 - Composition**

Element	Min	Max
Nickel	63.0	70.0
Iron	--	2.5
Manganese	--	2.0
Silicon	--	0.5
Carbon	--	0.3
Sulfur	--	0.024
Copper	remainder	

3.1.1 Producer may test for any element not listed in Table 1 and include this analysis in the report of 4.4. Reporting of any element not listed in the composition table is not a basis for rejection, unless limits of acceptability are specified by the purchaser.

#### 3.1.2 Check Analysis

Composition variations shall meet the applicable requirements of AMS2269.

### 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 E8/E8M.

- 3.3.1.1 Tensile property requirements for product outside of the range covered by Table 2 shall be agreed upon between purchaser and producer and reported in 4.4.2.
- 3.3.1.2 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  $\pm 0.002$  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 0.5 mm/mm/min) or equivalent crosshead speed as a function of gage length. The requirement for compliance becomes effective for material produced 1 year after the publication date of this document.

**Table 2A - Tensile properties, inch/pound units**

Nominal Diameter Inches	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 Inches		Tolerance, Inches 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.

### 3.6 Exceptions

Any exceptions shall be authorized by the purchaser and reported as in 4.4.2.

## 4. QUALITY ASSURANCE PROVISIONS

### 4.1 Responsibility for Inspection

The producer of wire shall supply all samples for producer 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 AMS2371.