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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 5687K

Issued JUL 1948
Revised JUL 1994

Superseding AMS 5687J

Submitted for recognition as an American National Standard

NICKEL ALLOY, CORROSION AND HEAT RESISTANT, WIRE
74Ni - 15.5Cr - 8.0Fe
Annealed

1. SCOPE:

1.1 Form:

This specification covers a corrosion and heat resistant nickel alloy in the form of wire.

1.2 Application:

This wire has been used typically for lock wire and wire cloth requiring oxidation resistance superior to that of the 18-8 type corrosion-resistant steels, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2269 Chemical Check Analysis Limits, Wrought Nickel Alloys and Cobalt Alloys
AMS 2371 Quality Assurance Sampling and Testing, Corrosion and Heat Resistant Steels and Alloys, Wrought Products and Forging Stock

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM E 8 Tension Testing of Metallic Materials
ASTM E 8M Tension Testing of Metallic Materials (Metric)
ASTM E 354 Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

(R)

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 354, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Carbon	--	0.15
Manganese	--	1.00
Silicon	--	0.50
Phosphorus	--	0.040
Sulfur	--	0.015
Chromium	14.00	17.00
Nickel	72.00	--
Iron	6.00	10.00
Cobalt	--	1.00
Columbium	--	1.00
Titanium	--	0.50
Tantalum	--	0.05
Aluminum	--	0.35
Copper	--	0.50

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

3.2 Condition:

Cold-drawn from hot finished wire or rod, 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 or ASTM E 8M.

TABLE 2A - Maximum Tensile Strength, Inch/Pound Units

Nominal Diameter Inch	Tensile Strength ksi Coiled or Spooled	Tensile Strength ksi Straight Lengths
0.002 to 0.015, incl	130	--
Over 0.015 to 0.040, incl	115	--
Over 0.040	110	125

TABLE 2B - Maximum Tensile Strength, SI Units

Nominal Diameter Millimeters	Tensile Strength MPa Coiled or Spooled	Tensile Strength MPa Straight Lengths
0.05 to 0.38, incl	896	--
Over 0.38 to 1.02, incl	793	--
Over 1.02	758	862

3.3.2 Wrapping: Wire shall withstand, without cracking, wrapping at room temperature five full, closely-spaced turns 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, and free from foreign materials and from imperfections detrimental to usage of the wire.

3.5 Tolerances:

Shall be as specified in Table 3.

TABLE 3A - Diameter Tolerances, Inch/Pound Units

Nominal Diameter Inches	Tolerance, Inch Plus and Minus
0.0020 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	0.0020

TABLE 3B - Diameter Tolerances, SI Units

Nominal Diameter Millimeters	Tolerance, Millimeter Plus and Minus
0.051 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	0.051

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:
(R)

The vendor of wire shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the wire conforms to the requirements of this specification.

4.2 Classification of Tests:

Tests for all technical requirements are acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling and Tests:
(R)

Shall be in accordance with AMS 2371. Sampling for wrapping test shall be as specified in AMS 2371 for bend testing.

4.4 Reports:

The vendor of wire shall furnish with each shipment a report showing the results of tests for chemical composition of each heat and for tensile properties and wrapping of each lot. This report shall include the purchase order number, heat and lot number, AMS 5687K, nominal size, and quantity.

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.