SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS5672 REV. C

Issued 1970-05
Revised 1987-10
Noncurrent 2001-10
Reaf Nonc 2012-04

Superseding AMS5672B

Steel Wire, Corrosion Resistant
11.8Cr - 8.5Ni - 0.30(Cb + Ta) - 1.1Ti - 2.0Cu
Precipitation Hardenable, Spring Temper
(Composition similar to UNS45500)

RATIONALE

AMS5672C has been reaffirmed to comply with the SAE five-year review policy.

NONCURRENT NOTICE

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of October 2001. It is recommended, therefore, that this specification not be specified for new designs.

"NONCURRENT" refers to those materials which have previously been widely used and which may be required on some existing designs in the future. The Aerospace Materials Division, however, does not recommend these as standard materials for future use in new designs. Each of these "NONCURRENT" specifications is available from SAE.

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SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS5672C

1. SCOPE:

1.1 Form:

This specification covers a corrosion-resistant steel in the form of wire.

1.2 Application:

Primarily for springs requiring corrosion resistance and high strength up to 600 °F (315 °C).

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 15096-0001.

2.1.1 Aerospace Material Specifications:

AMS 2248	Chemical Check Analysis Limits, Wrought Corrosion and Heat Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron 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 ASTM, 1916 Race Street, Philadelphia, PA 19103.

ASTM A370	Mechanical Testing of Steel Products
ASTM E353	Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

2.3 U.S. Government Publications:

Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, 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 E353 or by spectrochemical or other analytical methods approved by purchaser:

	min	max
Carbon	--	0.05
Manganese	--	0.50
Silicon	--	0.50
Phosphorus	--	0.025
Sulfur	--	0.025
Chromium	11.00	12.50
Nickel	7.50	9.50
Columbium + Tantalum	0.10	0.50
Titanium	0.80	1.40
Copper	1.50	2.50
Molybdenum	--	0.50
Nitrogen	--	0.015

3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2248.

3.2 Condition:

Spring temper, cold drawn to required size.

3.2.1 Wire ordered for coiling on automatic spring-winding machines shall be coated with a suitable lubricant.

3.3 Properties:

Wire shall conform to the following requirements; tensile and wrapping tests shall be performed in accordance with ASTMA370:

3.3.1 Tensile Properties: Wire, as cold-drawn, shall have the tensile strength specified in Table I, Column A. Wire shall have the tensile strength specified in Table I, Column B, after being precipitation heat treated by heat to 850 °F ± 10 (455 °C ± 5), holding at heat for 30 min. ± 3, and cooling in air.

TABLE I

Nominal Diameter Inch	Column A As Cold-Drawn Tensile Strength psi, min	Column B Precipitation-Hardened Tensile Strength, psi min	Column B Precipitation-Hardened Tensile Strength, psi max
0.010 to 0.040, incl	245,000	310,000	340,000
Over 0.040 to 0.050, incl	235,000	305,000	335,000
Over 0.050 to 0.060, incl	225,000	300,000	330,000
Over 0.060 to 0.075, incl	220,000	295,000	325,000
Over 0.075 to 0.085, incl	215,000	290,000	320,000
Over 0.085 to 0.095, incl	210,000	285,000	315,000
Over 0.095 to 0.110, incl	200,000	278,000	308,000
Over 0.110 to 0.125, incl	195,000	272,000	302,000
Over 0.125 to 0.150, incl	190,000	265,000	295,000
Over 0.150 to 0.500, incl	180,000	260,000	290,000

TABLE I (SI)

Nominal Diameter Millimetres	Column A As Cold-Drawn Tensile Strength MPa, min	Column B Precipitation-Hardened Tensile Strength, MPa min	Column B Precipitation-Hardened Tensile Strength, MPa max
0.25 to 1.00, incl	1690	2135	2345
Over 1.00 to 1.25, incl	1620	2105	2310
Over 1.25 to 1.50, incl	1550	2070	2275
Over 1.50 to 1.88, incl	1515	2035	2240
Over 1.88 to 2.12, incl	1480	2000	2205
Over 2.12 to 2.38, incl	1450	1965	2170
Over 2.38 to 2.75, incl	1380	1915	2125
Over 2.75 to 3.00, incl	1345	1875	2080
Over 3.00 to 3.75, incl	1310	1825	2035
Over 3.75 to 12.50, incl	1240	1795	2000

3.3.2 Wrapping: Wire, as cold-drawn, 0.162 in. (4.00 mm) and under in nominal diameter shall withstand, without cracking, wrapping at 77 °F ± 9 (25 °C ± 5) one full turn around a diameter equal to the nominal diameter of the wire. Wire, as cold-drawn, over 0.162 in. (4.00 mm) in nominal diameter shall withstand, without cracking, wrapping at 77 °F ± 9 (25 °C ± 5) one full turn around a diameter equal to twice the nominal diameter of the wire.

3.4 Quality:

3.4.1 Wire, as received by purchaser, shall be uniform in quality and condition, cylindrical, and free from kinks, twists, scrapes, splits, and other imperfections detrimental to usage of the wire.

3.4.2 The surface of the wire shall have a smooth, cold-drawn finish free from pits, abrasions, and other surface imperfections.

3.5 Tolerances:

Shall be in accordance with Table II and 3.5.2.

3.5.1 Diameter:

TABLE II

Nominal Diameter Inch	Tolerance, Inch Plus and Minus
0.010 to 0.015, incl	0.0003
Over 0.015 to 0.041, incl	0.0005
Over 0.041 to 0.312, incl	0.001
Over 0.312 to 0.500, incl	0.002

TABLE II (SI)

Nominal Diameter Millimetres	Tolerance, Millimetre Plus and Minus
0.25 to 0.38, incl	0.008
Over 0.38 to 1.00, incl	0.012
Over 1.00 to 7.80, incl	0.02
Over 7.80 to 12.50, incl	0.05

3.5.2 Out-of-Roundness: Wire shall not be out-of-round by more than one-half the total permissible tolerance specified for diameter in Table II.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of wire 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 wire conforms to the requirements of this specification.