

ADOPTION NOTICE

SAE-AMS5689, "STEEL, CORROSION AND HEAT RESISTANT, WIRE 18CR - 10.5NI - 0.40TI (SAE 30321) SOLUTION HEAT TREATED", was adopted on 07-JUL-93 for use by the Department of Defense (DoD). Proposed changes by DoD activities must be submitted to the DoD Adopting Activity: ASC/ENOI, Building 560, 2530 Loop Road West, Wright-Patterson AFB, OH 45433-7101. Copies of this document may be purchased from the Society of Automotive Engineers 400 Commonwealth Drive Warrendale, Pennsylvania, United States, 15096-0001. <http://www.sae.org/>

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AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard



AMS 5689E

Issued NOV 1952
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Superseding AMS 5689D

Steel, Corrosion and Heat Resistant, Wire 18Cr - 10.5Ni - 0.40Ti (SAE 30321) Solution Heat Treated

UNS S32100

1. SCOPE:

1.1 Form:

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

1.2 Application:

This wire has been used typically for screening and stitching applications requiring good corrosion resistance and which may be subjected to elevated temperatures during fabrication or in service, but usage is not limited to such applications. Wire has satisfactory oxidation resistance up to 1500 °F (816 °C) but is useful at that temperature only when stresses are low.

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 2241	Tolerances, Corrosion and Heat Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Bars and Wire
MAM 2241	Tolerances, Metric, Corrosion and Heat Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Bars and Wire
AMS 2248	Chemical Check Analysis Limits, Wrought Corrosion and Heat Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys
AMS 2371	Quality Assurance Sampling and Testing, Corrosion and Heat Resistant Steels and Alloys, Wrought Products and Forging Stock
AMS 2806	Identification, Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels and Corrosion and Heat Resistant Steels and Alloys

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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 353 Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron 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:

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 353, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Carbon	--	0.08
Manganese	--	2.00
Silicon	0.40	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	17.00	19.00
Nickel	9.00	12.00
Titanium	5x (C + N)	0.70
Molybdenum	--	0.75
Copper	--	0.75
Nitrogen	--	0.10

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

3.2 Condition:

Solution heat treated free from continuous carbide network and bright finished.

3.3 Properties:

Wire shall conform to the following requirements:

- 3.3.1 Tensile Strength: Shall be not higher than shown 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	Tensile Strength
	Coils ksi	Straight Lengths ksi
0.010 to 0.020, incl	125	135
Over 0.020 to 0.125, incl	115	125
Over 0.125 to 0.250, incl	105	115

TABLE 2B - Maximum Tensile Strength, SI Units

Nominal Diameter Millimeters	Tensile Strength	Tensile Strength
	Coils MPa	Straight Lengths MPa
0.25 to 0.51, incl	862	931
Over 0.51 to 3.18, incl	793	862
Over 3.18 to 6.35, incl	724	793

- 3.3.2 Bending: Wire shall withstand, without cracking, bending at room temperature flat on itself.

3.4 Quality:

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

3.5 Tolerances:

Shall conform to all applicable requirements of AMS 2241 or MAM 2241.