

NOTICE OF
ADOPTIONADOPTION NOTICE
15 August 1990 for
AMS 5857
1 January 1990

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Title of Document: Steel Bars and Wire, Corrosion Resistant
19Cr - 10Ni - (SAE 30304)

High Yield Strength
Solution Heat Treated and Cold Worked

Date of Specific Issue Adopted: 1 January 1990

Releasing Non-Government Standards Body: SAE

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Air Force - 11
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Military Coordinating Activity
Air Force - 11

(Project No: 9510-0767)

FSC 9510

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AEROSPACE MATERIAL SPECIFICATION

AMS 5857

Issued 1-1-90

Submitted for recognition as an American National Standard

STEEL BARS AND WIRE, CORROSION RESISTANT
19Cr - 10Ni (SAE 30304)
High Yield Strength
Solution Heat Treated and Cold Worked

UNS S30400

1. SCOPE:

- 1.1 Form: This specification covers a corrosion-resistant steel in the form of cold worked bars and wire.
- 1.2 Application: Primarily for parts, such as high strength bolts, requiring corrosion and heat resistance up to 700°F (371°C). Product should not be subjected to temperatures exceeding 700°F (371°C) during fabrication or in service.

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.

2.1.1 Aerospace Material Specifications:

- 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 of Corrosion and Heat Resistant Steels and Alloys, Wrought Products Except Forgings 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 A 262 - Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels

ASTM A 370 - Mechanical Testing of Steel Products

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 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 E 353, by spectrochemical methods, or by other analytical methods acceptable to purchaser:

	min	max
Carbon	--	0.08
Manganese	--	2.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	18.00 - 20.00	
Nickel	8.00 - 12.00	
Molybdenum	--	0.75
Copper	--	0.75

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 cold worked.

3.3 Properties: Bars and wire shall conform to the following requirements:

3.3.1 Tensile Properties: Shall be as specified in Table I, determined in accordance with ASTM A 370.

TABLE I

Nominal Diameter or Distance Between Parallel Sides Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset psi, min	Elongation in 4D %, min	Reduction of Area %, min
Up to 0.750, incl	125,000	100,000	12	35
Over 0.750 to 1.000, incl	115,000	80,000	15	35
Over 1.000 to 1.250, incl	105,000	65,000	20	35
Over 1.250 to 1.500, incl	100,000	50,000	28	45
Over 1.500 to 1.750, incl	95,000	45,000	30	45

TABLE I (SI)

Nominal Diameter or Distance Between Parallel Sides Millimetres	Tensile Strength MPa, min	Yield Strength at 0.2% Offset MPa, min	Elongation in 4D %, min	Reduction of Area %, min
Up to 19.05, incl	862	689	12	35
Over 19.05 to 25.40, incl	793	552	15	35
Over 25.40 to 31.75, incl	724	448	20	35
Over 31.75 to 38.10, incl	689	345	28	45
Over 38.10 to 44.45, incl	655	310	30	45

3.3.2 Susceptibility to Intergranular Attack: The product, after solution heat treatment and prior to cold working, shall pass the intergranular corrosion test performed in accordance with ASTM A 262, Practice E.

3.4 Quality: The product, 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 product.

3.5 Sizes: Except when exact lengths or multiples of exact lengths are ordered, straight bars and wire will be acceptable in mill lengths of 6 - 20 feet (1.8 - 6.1 m) but not more than 10% of any shipment shall be supplied in lengths shorter than 10 feet (3 m).

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

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product 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 product conforms to the requirements of this specification.