



AEROSPACE MATERIAL SPECIFICATION

AMS5920™**REV. C**

Issued 2003-04
Reaffirmed 2007-08
Revised 2024-06

Superseding AMS5920B

Cobalt-Nickel Alloy, Corrosion- and Heat-Resistant, Round Bars
19Cr - 36Co - 25Ni - 7.0Mo - 0.50Cb (Nb) - 2.9Ti - 0.20Al - 9.0Fe
Vacuum Induction Plus Vacuum Consumable Electrode Melted
Solution Heat Treated, Work-Strengthened, and Aged, Modified Strength
(Composition similar to UNS R30159)

RATIONALE

AMS5920C is the result of a Five-Year Review and update of the specification. The revision updates composition testing and reporting (see 3.1 and 3.1.1), adds strain rate control (see 3.5.1.1.1), adds recommendation to use nickel tables (see 8.3), addresses the use of prior revisions (see 8.5), and updates the exception requirements (see 8.6).

1. SCOPE

1.1 Form

This specification covers a corrosion- and heat-resistant, work-strengthened, and aged cobalt-nickel-chromium alloy in the form of bars 2 inches (50 mm) and under in nominal diameter.

1.2 Application

These bars have been used typically for parts, such as fasteners, requiring a room temperature minimum tensile strength of 170 ksi (1172 MPa) for use up to 850 °F (454 °C) in applications requiring high ductility to promote toughness and resistance to cracking under shock loading conditions, but usage is not limited to such applications. This alloy exhibits exceptionally good resistance to corrosion, crevice corrosion, and stress-corrosion cracking.

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.

AMS2261 Tolerances, Nickel, Nickel Alloy, and Cobalt Alloy Bars, Rods, and Wire

AMS2269 Chemical Check Analysis Limits, Nickel, Nickel Alloys, and Cobalt Alloys

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SAE WEB ADDRESS:

Full document details: SAE AMS5920C

For more information on this standard, visit
<https://www.sae.org/standards/content/AMS5920C>

Documents

Standard, visit Sharing Hub

AMS2283	Composition Testing Methods for Nickel- and Cobalt-Based Alloys
AMS2371	Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steels and Alloys, Wrought Products and Forging Stock
AMS2750	Pyrometry
AMS2806	Identification Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels, and Corrosion and Heat-Resistant Steels and Alloys
AS7766	Terms Used in Aerospace Metals Specifications

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.

ASTM E8/E8M Tension Testing of Metallic Materials

ASTM E18 Rockwell Hardness of Metallic Materials

ASTM E112 Determining Average Grain Size

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

3. TECHNICAL REQUIREMENTS

3.1 Composition

Composition shall conform to the percentages by weight shown in Table 1, determined in accordance with AMS2283 or by other analytical methods acceptable to the purchaser.

Table 1 - Composition

Element	Min	Max
Carbon	--	0.04
Manganese	--	0.20
Silicon	--	0.20
Phosphorus	--	0.020
Sulfur	--	0.010
Chromium	18.00	20.00
Cobalt	34.00	38.00
Molybdenum	6.00	8.00
Columbium (Niobium)	0.25	0.75
Titanium	2.50	3.25
Aluminum	0.10	0.30
Iron	8.00	10.00
Boron	--	0.03
Nickel	remainder	

3.1.1 The 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.