

AEROSPACE MATERIAL SPECIFICATION

SAE AMS5819

REV. A

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Revised 2001-11
Reaffirmed 2012-10
Superseding AMS5819

Cobalt Alloy, Corrosion and Heat Resistant, Hardfacing Rod and Wire
62Co - 27Cr - 2.9Ni - 5.5Mo

(Composition similar to UNS R30021)

RATIONALE

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

1. SCOPE:

1.1 Form:

This specification covers a corrosion and heat-resistant cobalt alloy in the form of welding rods or wrought wire.

1.2 Application:

These products have been used typically for corrosion and heat resistant hard coating, but usage is not limited to such applications.

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 canceled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or www.sae.org.

AMS 2269	Chemical Check Analysis Limits, Nickel, Nickel Alloys, and Cobalt Alloys
AMS 2813	Packaging and Marking of Packages of Welding Wire, Standard Method
AMS 2814	Packaging and Marking of Packages of Welding Wire, Premium Quality
AMS 2816	Identification, Welding Wire, Tab Marking Method
AMS 2819	Identification, Welding Wire, Direct Color Code System

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<http://www.sae.org/technical/standards/AMS5819A>

SAE WEB ADDRESS:

2.1 (Continued):

- ARP1876 Weldability Test for Weld Filler Metal Wire
ARP4926 Alloy Verification and Chemical Composition Inspection of Welding Wire

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or www.astm.org.

ASTM E 354 Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Rod and wire 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	0.20	0.30
Manganese	--	1.00
Silicon	--	1.00
Phosphorus	--	0.02
Sulfur	--	0.02
Chromium	25.00	29.00
Nickel	2.00	3.75
Molybdenum	5.00	6.00
Boron	--	0.006
Iron	--	3.00
Cobalt	remainder	

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

3.2 Condition:

As cast or cast and centerless ground rods or wrought wire, as specified.

3.2.1 Product shall be furnished on spools for automatic welding or in cut lengths for manual welding, as ordered.

3.2.2 For wire furnished on spools, butt welding is permissible provided both ends to be joined are alloy verified using a method capable of distinguishing the alloy from all other alloys processed in the facility, or the repair is made at the processing station. The butt weld shall not interfere with uniform, uninterrupted feeding of the wire in machine welding.

3.3 Properties:

The product shall melt quickly, shall flow freely without bubbling or boiling, and shall produce an adherent deposit free from porosity due to blowholes, gas cavities, or slag inclusions. ARP1876 may be used to resolve disputes.

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 coating operations or properties of the deposited alloy.

3.5 Sizes and Tolerances:

Rod and wire shall be supplied in the sizes and to the tolerances shown in 3.5.1 and 3.5.2.

3.5.1 Diameter:

3.5.1.1 Cast and Centerless Ground Rods and Wrought Wire: Shall be as shown in Table 2.

TABLE 2 - Standard Sizes and Diameter Tolerances

Nominal Diameter Inch	Nominal Diameter Millimeters	Tolerance Inch Plus and Minus	Tolerance Millimeter Plus and Minus
0.030, 0.045, 0.062	0.76, 1.14, 1.57	0.005	0.13
0.078, 0.094, 0.125	1.98, 2.39, 3.18	0.010	0.25
0.156, 0.188, and over	3.96, 4.78, and over	0.031	0.79

3.5.1.2 As Cast Rods: Shall be as shown in Table 3.

TABLE 3 - As Cast Tolerances

Nominal Diameter Inch	Nominal Diameter Millimeters	Tolerance Inch Plus and Minus	Tolerance Millimeter Plus and Minus
1/16 and Over	1.6 and Over	1/32	0.8

3.5.2 Concentricity: When lengths are supplied as welded composites of cast lengths, the diameters of adjacent sections shall be concentric within the diametral tolerances shown in Table 2.

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 the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

4.2 Classification of Tests:

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

4.3 Sampling and Testing:

One chemical analysis specimen from each heat, representative of the product at final diameter, shall be taken.

4.4 Reports:

The vendor of the product shall furnish with each shipment a report showing the results of tests for chemical composition of each heat and stating that the product conforms to the other technical requirements. This report shall include the purchase order number, heat and lot numbers, AMS 5819A, size, and quantity.

5. PREPARATION FOR DELIVERY:

5.1 Wire from each spool or package of cut lengths shall be alloy verified by a method acceptable to purchaser. The alloy verification procedures of ARP4926 are recommended.

5.1.1 An 8-inch (203-mm) length of wire shall be made accessible at both ends of each spool for alloy verification.

5.1.2 Wire on each spool or in each package of cut lengths shall be from the same heat of alloy.

5.2 Identification:

Shall be in accordance with AMS 2816 unless AMS 2819 or another method is specified by purchaser.

5.3 Packaging and Marking:

Shall be by standard method in accordance with AMS 2813 unless premium quality method in accordance with AMS 2814 or another method is specified by purchaser.