

AEROSPACE MATERIAL SPECIFICATION



AMS 5788E

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Superseding AMS 5788D

Cobalt Alloy, Corrosion and Heat Resistant, Hard Facing Rods and Wire 62Co - 29Cr - 4.5W - 1.2C

UNS R30006

1. SCOPE:

1.1 Form:

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

1.2 Application:

These products have been used typically as a 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 form 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.

AMS 2269	Chemical Check Analysis Limits, Nickel, Nickel Alloys, and Cobalt Alloys
AMS 2813	Packaging and Marking of Packaging of Welding Wire, Standard Method
AMS 2814	Packaging and Marking of Packaging of Welding Wire, Premium Quality
AMS 2816	Identification, Welding Wire, Tab Marking Method
AMS 2819	Identification, Welding Wire, Direct Color Code System
ARP1876	Weldability Test for Weld Filler Metal
ARP4926	Alloy Verification and Chemical Composition Inspection of Welding Wire

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2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 16428-2959.

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

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 354, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Carbon	0.90	1.40
Manganese	--	0.50
Silicon	--	2.00
Phosphorus	--	0.025
Sulfur	--	0.025
Chromium	26.00	32.00
Tungsten	3.00	6.00
Nickel	--	3.00
Molybdenum	--	1.00
Iron	--	3.00
Cobalt	remainder	

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

3.1.2 For wrought material, chemical analysis of initial ingot, bar, or rod stock before drawing or rolling, is acceptable provided the processes used for drawing or rolling, annealing, and cleaning, are controlled to ensure continued conformance to chemical composition requirements.

3.2 Condition:

3.2.1 Material shall be supplied as cast, cast and centerless ground, or wrought wire, as specified.

3.2.2 Material shall be cleaned and have surfaces free from mold materials, grinding dust, drawing compounds, and other extraneous compounds that can affect composition of the welded deposit or usability of the product.

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:

The product shall be supplied in the sizes and to the tolerances shown in 3.5.1 and 3.5.2.

3.5.1 Diameter: Shall be as shown in Table 2.

3.5.1.1 Cast and Centerless Ground, or Wrought Wire:

TABLE 2 - Standard Sizes and Diameter Tolerances

Nominal Diameter Inch	Nominal Diameter Millimeters	Tolerances Plus and Minus Inch	Tolerances Plus and Minus Millimeter
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: Shall be as shown in Table 3.

TABLE 3 - As Cast Tolerances

Nominal Diameter Inch	Nominal Diameter Millimeters	Tolerances Plus and Minus Inch	Tolerances Plus and Minus Millimeter
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 specified 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 conform to the 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:

Shall be in accordance with the following:

4.3.1 One chemical analysis specimen from each melt, representative of the product at final diameter.

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 5788E, size, and quantity.

5. PREPARATION FOR DELIVERY:

5.1 Identification:

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

5.2 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.

5.3 Alloy Verification:

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

5.3.2 When spooled wire is ordered, an 8 inch (203 mm) length of wire shall be made accessible at both ends of each spool for alloy verification.