



# AEROSPACE MATERIAL SPECIFICATION

AMS5788™

REV. G

Issued 1950-06  
Revised 2018-06  
Reaffirmed 2023-05

Superseding AMS5788F

Cobalt Alloy, Corrosion- and Heat-Resistant,  
Hard Facing Rods and Wire  
62Co - 29Cr - 4.5W - 1.2C  
(Composition similar to UNS R30006)

## RATIONALE

AMS5788G revises properties (3.3.1), reports (4.4.1), and identification (5.1.1) and results from a Five-Year Review and update of this specification.

AMS5788G 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, coating rods, or wrought wire.

#### 1.2 Application

This wire has been used typically as bare wire filler metal for application of a heat and corrosion 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 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](http://www.sae.org).

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

AMS2813 Packaging and Marking of Packages of Welding Wire, Standard Method

AMS2814 Packaging and Marking of Packages of Welding Wire, Premium Quality

AMS2816 Identification, Welding Wire, Tab Marking Method

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SAE WEB ADDRESS:

For more information on this standard, visit  
<https://www.sae.org/standards/content/AMS5788G/>

- AMS2819 Identification, Welding Wire, Direct Color Code System
- ARP1876 Weldability Test for Weld Filler Metal Wire
- ARP1917 Clarification of Terms Used in Aerospace Metals Specifications
- ARP4926 Alloy Verification and Chemical Composition Inspection of Welding Wire

## 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](http://www.astm.org).

- ASTM E354 Chemical Analysis of High Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

## 3. TECHNICAL REQUIREMENTS

### 3.1 Composition

Wire shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E354, 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 AMS2269.

- 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.

3.3.1 Any exceptions shall be authorized by purchaser and reported as in 4.4.4.

### 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

Shall be as shown in Table 2.

**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 producer of the product shall supply all samples for producer'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 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 producer of the product shall furnish with each shipment a report showing the results of tests for 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, AMS5788G, size, and quantity.

4.4.1 When material produced to this specification has exceptions taken to the technical requirements listed in Section 3 (see 5.1.1), the report shall contain a statement "This material is certified as AMS5788G(EXC) because of the following exceptions." and the specific exceptions shall be listed.

### 5. PREPARATION FOR DELIVERY

#### 5.1 Identification

Shall be by tab marking in accordance with AMS2816 unless color coding in accordance with AMS2819 or another method is specified by purchaser.

5.1.1 When technical exceptions are taken (see 4.4.1), the material shall be marked with AMS5788(EXC).

#### 5.2 Packaging and Marking

Shall be by standard method in accordance with AMS2813 unless premium quality method in accordance with AMS2814 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 producer. 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.

### 6. ACKNOWLEDGMENT

A producer shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

### 7. REJECTIONS

Product not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.