



AEROSPACE MATERIAL SPECIFICATION

AMS5791™**REV. D**

Issued 1986-01
Reaffirmed 2015-04
Revised 2021-05

Superseding AMS5791C

Cobalt Alloy, Powder, Plasma Spray
56.5Co - 25.5Cr - 10.5Ni - 7.5W

RATIONALE

AMS5791D updates chemistry requirements (3.1), prohibits exceptions (3.5, 4.5, 5.1.3, 8.5), adds prior revisions allowance (8.4), and is the result of a Five-Year Review and update.

1. SCOPE

1.1 Form

This specification covers a cobalt alloy in the form of powder.

1.2 Application

This product has been used typically for producing plasma spray coatings to provide surfaces resistant to wear, corrosion, and abrasion, 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 supplied 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.

ARP1917 Clarification of Terms Used in Aerospace Metals Specifications

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Full document details: SAE AMS5791D

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<https://www.sae.org/standards/content/AMS5791D/>

Documents

Document Sharing Hub

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 B214 Sieve Analysis of Granular Metal Powders

ASTM B215 Sampling Metal Powders

ASTM C117 Material Finer Than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing

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

3. TECHNICAL REQUIREMENTS

3.1 Composition

Powder shall conform to the percentages by weight shown in Table 1, determined in accordance with ASTM E354 or by other analytical methods acceptable to purchaser.

Table 1 - Composition

Element	Min	Max
Carbon	0.45	0.55
Manganese	--	1.00
Silicon	--	1.00
Phosphorus	--	0.04
Sulfur	--	0.04
Chromium	24.50	26.50
Nickel	9.50	11.50
Tungsten	7.00	8.00
Iron	--	2.00
Cobalt	remainder	

3.2 Condition

Powder shall be heated by heating within the range 1750 to 1850 °F (954 to 1010 °C) in vacuum or dry hydrogen atmosphere for 2 to 4 hours to reduced surface oxides. This requirement shall be waived if powder is produced by atomizing in an inert atmosphere.

3.3 Properties

Powder shall conform to the following requirements:

3.3.1 Particle Size Determination

Powder shall be supplied with the particle size distribution shown in Table 2. Sieve analysis shall be conducted in accordance with ASTM B214 or ASTM C117; the method of testing used shall be reported.

Table 2 - Particle size determination

U.S. Standard Sieve	Minimum % by Weight
Passing through No. 170 (90 μ m)	100
Passing through No. 200 (75 μ m)	95
Retained on No. 325 (45 μ m)	90