

AEROSPACE MATERIAL SPECIFICATION

SAE

AMS 4783C

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Superseding AMS 4783B

Submitted for recognition as an American National Standard

BRAZING FILLER METAL, HIGH TEMPERATURE
50Co - 8.0Si - 19Cr - 17Ni - 4.0W - 0.80B
2050° - 2100°F (1121° - 1149°C) Solidus-Liquidus Range

UNS S30040

1. SCOPE:

- 1.1 Form: This specification covers a cobalt alloy in the form of wire, rod, strip, foil, and powder and a viscous mixture (paste) of powder in a suitable binder.
- 1.2 Application: Primarily for joining cobalt alloys requiring corrosion and oxidation resistant joints with good strength at elevated temperatures.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The applicable issue of referenced publications shall be the issue in effect on the date of the purchase order.

- 2.1 ASTM Publications: Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 214 - Sieve Analysis of Granular Metal Powders
ASTM D 638 - Tensile Properties of Plastics
ASTM D 638M - Tensile Properties of Plastics (Metric)
ASTM E 354 - Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

- 2.2 U.S. Government Publications: Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

- 2.2.1 Military Standards:

MIL-STD-2073-1 - DOD Materiel, Procedures for Development and Application of Packing Requirements

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3. TECHNICAL REQUIREMENTS:

- 3.1 Composition: Shall conform to the following percentages by weight,
 Ø determined by wet chemical methods in accordance with ASTM E 354, by spectrochemical methods, or by other analytical methods acceptable to purchaser:

	min	max
Carbon	0.35 -	0.45
Silicon	7.50 -	8.50
Phosphorus	--	0.02
Sulfur	--	0.02
Chromium	18.00 -	20.00
Nickel	16.00 -	18.00
Tungsten	3.50 -	4.50
Boron	0.70 -	0.90
Iron	--	1.00
Titanium	--	0.05
Aluminum	--	0.05
Zirconium	--	0.05
Selenium	--	0.005 (50 ppm)
Other Elements, each (3.1.2)	--	0.03
Other Elements, total (3.1.2)	--	0.15
Cobalt	remainder	

- 3.1.1 The requirements of 3.1 apply to wire, strip, foil, and paste after removal of the binder.

- 3.1.2 Determination not required for routine acceptance.

- 3.2 Condition: The product shall be supplied in the following condition:

- 3.2.1 Wire, Strip, and Foil: Powder bonded in a suitable binder.

Ø

- 3.2.2 Rod: As cast, with fins and projections removed.

- 3.2.3 Powder: As fabricated.

- 3.2.4 Paste: Shall consist of 84 - 90% by weight powder in a suitable binder and
 Ø shall not contain flux.

- 3.3 Properties: Filler metal shall conform to the following requirements:

- 3.3.1 Wire, Strip, and Foil:

- 3.3.1.1 Burn-Off of Binder: The binder used for bonding powder to form wire, strip, and foil and the binder of the viscous mixture to form paste
 Ø shall burn off, leaving no adherent residue, when the product is heated to 1000°F (538°C) or higher.

3.3.1.2 Tensile Strength: Shall be not lower than 360 psi (2.48 MPa), determined in accordance with ASTM D 638 or ASTM D 638M, Speed B.

3.3.1.3 Metallic Content: The ratio of the volume of powder to volume of the binder shall be the largest possible consistent with the requirements of 3.3.1.1 and 3.3.1.2.

3.3.2 Rod and Powder: Shall have properties as agreed upon by purchaser and vendor.

3.3.3 Paste: Shall have a shelf life of not less than six months from date of manufacture; not more than thorough mixing shall be required to restore paste for use during that time.

3.3.3.1 Paste shall leave no adherent residue when heated in a protective atmosphere to 1000°F (538°C) or higher.

3.4 Quality: The product, as received by purchaser, shall be uniform in color, quality, and condition and free from foreign materials and from imperfections detrimental to its working qualities. Rod and powder shall have a metallic luster. Wire, strip, and foil shall be clean, sound, smooth, and free from ragged edges, splitting, damaged ends, and other imperfections detrimental to their usage.

3.5 Size and Tolerances: The product shall be supplied in the following standard sizes and to the tolerances shown:

3.5.1 Wire:

3.5.1.1 Nominal Diameters:

Inch	Millimeters
0.031	0.79
0.062	1.57
0.125	3.18
0.188	4.78

3.5.1.2 Diameter Tolerance: ± 0.004 inch (± 0.10 mm).

3.5.2 Rod:

3.5.2.1 Nominal Diameters: As ordered.

3.5.2.2 Diameter Tolerance: $\pm 10\%$ of diameter ordered.

3.5.2.3 Concentricity: When long lengths are supplied as welded composites of cast lengths, the diameters of the adjacent sections shall be concentric within ± 0.031 inch (± 0.79 mm).

3.5.3 Strip and Foil: As agreed upon by purchaser and vendor.

3.5.4 Powder:

- 3.5.4.1 Nominal Size: Powder shall be supplied in accordance with the following limits on particle size distribution unless some other distribution is specified. Tests shall be in accordance with ASTM B 214.

Mesh Designation

U.S. Standard Sieve

140F mesh

On a No. 100 sieve - 0.5% maximum
On a No. 140 sieve - 10% maximum
Through a No. 325 sieve - 55% maximum

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 performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.
- 4.2 Classification of Tests: Tests for all technical requirements are acceptance tests and shall be performed on each lot.
- 4.3 Sampling and Testing: Shall be in accordance with the following.
- 4.3.1 A lot shall be all product, other than powder or paste, which has been tested and found to conform to 3.1, in the same temper and size, and presented for vendor's inspection at one time.
- 4.3.2 A lot of powder shall be a uniform blend of powder produced from one or more furnace charges, each meeting the requirements of 3.1, and presented for vendor's inspection at one time.
- 4.3.3 A lot of paste shall be that paste produced from a single lot of powder combined with binder from the same manufacturing batch and presented for vendor's inspection at one time.
- 4.3.4 Composition: One sample from each lot.
- 4.3.5 Properties: One sample from each lot.
- 4.3.6 Other Technical Requirements: As agreed upon by purchaser and vendor.
- 4.4 Reports: The vendor of the product shall furnish with each shipment a report showing the results of tests on each lot to determine conformance to the composition requirements and stating that the product conforms to the other technical requirements. This report shall include the purchase order number, lot number or numbers, AMS 4783C, form, size, and quantity.
- 4.5 Resampling and Retesting: Not applicable.