



AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AMS 4782A

Superseding AMS 4782

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BRAZING FILLER METAL, NICKEL

71Ni - 10Si - 19Cr

1975° - 2075°F (1080° - 1135°C) Solidus-Liquidus Range

1. SCOPE:

1.1 Form: This specification covers a nickel alloy in the form of wire, rod, strip, and powder.

1.2 Application: Primarily for joining corrosion and heat resistant steels and alloys where corrosion and oxidation resistant joints with good strength at elevated temperatures are required. Flows well in dry, reducing or neutral atmospheres and in vacuum.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM B214 - Sieve Analysis of Granular Metal Powders

ASTM D638 - Tensile Properties of Plastics

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

2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

2.3.2 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

SAE Technical Board rules provide that: "All technical reports, including standards approved as practices recommended, are advisory only. Their use by anyone engaged in industry or trade or their use by governmental agencies is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

- 3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E354, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other analytical methods approved by purchaser:

Ø	min	max
Carbon	--	0.10
Silicon	9.75 - 10.50	
Phosphorus	--	0.02
Sulfur	--	0.02
Chromium	18.50 - 19.50	
Cobalt (3.1.2)	--	0.10
Titanium	--	0.05
Aluminum	--	0.05
Zirconium	--	0.05
Boron	--	0.03
Nickel	remainder	

- 3.1.1 The requirements of 3.1 apply to wire and strip after removal of the plastic bonding material.
- Ø 3.1.2 Determination not required for routine acceptance.
- 3.2 Condition: The product shall be supplied in the following condition:
- Ø 3.2.1 Wire and Strip: Powder bonded in a suitable plastic.
- 3.2.2 Rod: As cast, with fins and projections removed.
- 3.2.3 Powder: As fabricated.
- 3.3 Properties: Filler metal shall conform to the following requirements:
- 3.3.1 Wire and Strip:
- 3.3.1.1 Burn-Off of Plastic: The plastic used for bonding powder to form wire and strip shall burn off, leaving no undesirable residue, when the product is heated to a temperature not higher than 1800°F (980°C).
- 3.3.1.2 Tensile Strength: Shall be not lower than 360 psi (2.5 MPa), determined in accordance with
Ø ASTM D638, Speed B.
- 3.3.1.3 Metallic Content: The ratio of volume of powder to volume of plastic binder shall be the largest possible consistent with the requirements of 3.3.1.1 and 3.3.1.2.
- Ø 3.3.2 Rod and Powder: Shall have properties as agreed upon by purchaser and vendor.
- 3.4 Quality: The product, as received by purchaser, shall be uniform in color, quality, and condition and
Ø free from foreign materials and from imperfections detrimental to its working qualities. Rod and powder shall have a metallic luster. Wire and strip shall be clean, sound, smooth, and free from ragged edges, splitting, damaged ends, and other injurious imperfections.
- 3.5 Sizes and Tolerances: The product shall be supplied in the following standard sizes and to the tolerances shown, unless otherwise specified:
- 3.5.1 Wire:

3.5.1.1 Nominal Diameters:

Ø	Inch	(Millimetres)
	0.031	(0.8)
	0.062	(1.6)
	0.125	(3.2)
	0.188	(4.8)

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

3.5.2 Rod:

Ø 3.5.2.1 Nominal Diameters: Shall be as ordered.

3.5.2.2 Diameter Tolerance: ± 0.031 in. (0.8 mm).

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 in. (± 0.8 mm).

3.5.3 Strip: Shall be as agreed upon by purchaser and vendor.

3.5.4 Powder: Shall be of such fineness that not more than a trace of powder will be retained on a No. 100 sieve, not less than 90% will pass through a No. 140 sieve, and not more than 40% will pass through a No. 325 sieve, determined in accordance with ASTM B214.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and shall be performed on each lot of product.

4.3 Sampling: Shall be in accordance with the following; a lot shall be all product other than powder produced from a single furnace charge and presented for vendor's inspection at one time; a lot of powder shall be that product produced from a uniform blend of powder produced from one or more furnace charges and presented for vendor's inspection at one time:

Ø 4.3.1 Composition: One sample from each lot.

Ø 4.3.2 Properties: One sample from each lot.

Ø 4.3.3 Other Technical Requirements: As agreed upon by purchaser and vendor.

4.4 Reports:

4.4.1 The vendor of the product shall furnish with each shipment three copies of 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 of this specification. This report shall include the purchase order number, lot number, material specification number and its revision letter, form, size, and quantity from each lot.