



AEROSPACE MATERIAL SPECIFICATION

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

AMS 5683C

Superseding AMS 5683B

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ALLOY WIRE, WELDING, CORROSION AND HEAT RESISTANT 75Ni - 15.5Cr - 8.0Fe

1. SCOPE:

- 1.1 Form: This specification covers a corrosion and heat resistant nickel alloy in the form of welding wire.
- 1.2 Application: Primarily for use as filler metal for welding, but not recommended for gas-metal-arc or gas-tungsten-arc welding.

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 2269 - Chemical Check Analysis Limits, Wrought Nickel and Nickel Base Alloys
AMS 2350 - Standards and Test Methods
AMS 2371 - Quality Assurance Sampling of Corrosion and Heat Resistant Alloys, Wrought Products Except Forgings
AMS 2813 - Packaging of Welding Wire, Standard Method
AMS 2816 - Identification, Welding Wire, Color Code System

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

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 Specifications:

MIL-W-10430 - Welding Rods and Electrodes; Preparation for Delivery of

3. TECHNICAL REQUIREMENTS:

SAE Technical Board rules provide that: "All technical reports, including standards, are advisory only. Their use by anyone engaged in industry or trade 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 approved analytical methods:

Ø	min	max
Carbon	--	0.10
Manganese	--	1.00
Silicon	--	0.50
Sulfur	--	0.015
Chromium	14.00	- 17.00
Iron	6.00	- 10.00
Cobalt (3.1.1)	--	1.00
Copper	--	0.50
Nickel + Cobalt	72.00	--

- 3.1.1 Determination not required for routine acceptance.

- Ø 3.1.2 Check Analysis: Composition variations shall meet the requirements of AMS 2269.

- Ø 3.2 Condition: Cold drawn, bright finish, as-drawn temper.

- 3.2.1 Wire shall be furnished on disposable spools for machine welding and in cut lengths for manual welding, as ordered.

- 3.2.2 Drawing compounds, oxides, and dirt shall be removed by processes which will neither result in pitting nor cause gas absorption by the wire or deposition of substances harmful to welding operations.

- 3.3 Properties: Wire shall conform to the following requirements:

- 3.3.1 Weldability: Melted wire shall flow smoothly and evenly during welding and shall produce acceptable welds, determined by a procedure agreed upon by purchaser and vendor.

- 3.3.2 Spooled Wire: Shall conform to the following, unless otherwise agreed upon by purchaser and vendor:

- 3.3.2.1 Cast: Wire shall have imparted to it a curvature such that a specimen sufficient in length to form one loop, when cut from the spool and laid on a flat surface, shall form a circle not less than 15 in. or 380 mm and not greater than 30 in. or 760 mm in diameter.

- 3.3.2.2 Helix: The specimen on which cast was determined, when laid on a flat surface and measured between adjacent turns, shall show a vertical separation not greater than 1 in. (25 mm).

- 3.4 Quality: Wire shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to welding operations, operational of welding equipment, or properties of the deposited weld metal.

- 3.5 Sizes and Tolerances: Wire shall be supplied in the sizes and to the tolerances shown in 3.5.1 and 3.5.2.

3.5.1 Diameter:

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TABLE I

Form	Nominal Diameter Inch	Tolerance, Inch	
		plus	minus
Cut lengths	0.062, 0.093, 0.125, 0.156	0.003	0.003
Spools	0.035, 0.045	0.001	0.002
Spools	0.062, 0.093	0.002	0.002

TABLE I (SI)

Form	Nominal Diameter Millimetres	Tolerance, Millimetre	
		plus	minus
Cut lengths	1.57, 2.36, 3.18, 3.96	0.08	0.08
Spools	0.89, 1.14	0.03	0.05
Spools	1.57, 2.36	0.05	0.05

3.5.2 Length: Cut lengths shall be furnished in 18, 27, or 36 in. (457, 686, or 914 mm) lengths, as ordered, and shall not vary more than +0, -1/2 in. (-12.7 mm) from the length ordered.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of wire 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 wire conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to composition (3.1) and tolerance (3.5) requirements are classified as acceptance tests.

4.2.2 Periodic Tests: Tests to determine conformance to weldability (3.3.1), cast (3.3.2.1), and helix (3.3.2.2) requirements are classified as periodic tests.

Ø 4.3 Sampling: Shall be in accordance with AMS 2371 and as specified herein.

4.4 Reports:

4.4.1 The vendor of the wire shall furnish with each shipment three copies of a report showing the results of tests for chemical composition of each heat and stating that the wire conforms to the other technical requirements of this specification. This report shall include the purchase order number, heat number, material specification number and its revision letter, nominal size, and quantity from each heat.

4.4.2 When parts made of this wire or assemblies requiring use of this welding wire are supplied, the part or assembly manufacturer shall inspect each lot of wire to determine conformance to the requirements of this specification and shall furnish with each shipment three copies of a report stating that the wire conforms. This report shall include the purchase order number, material specification number and its revision letter, part or assembly number, and quantity.