



AEROSPACE MATERIAL SPECIFICATION

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

AMS 5817B
Superseding AMS 5817A

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STEEL WELDING WIRE, CORROSION AND MODERATE HEAT RESISTANT
13Cr - 2.0Ni - 3.0W

1. SCOPE:

- 1.1 Form: This specification covers a corrosion and moderate heat resistant steel in the form of welding wire.
- 1.2 Application: Primarily for use as filler metal for gas-tungsten-arc or gas-metal-arc welding of corrosion-resistant steels of similar composition where the weld area is required to have strength and corrosion resistance comparable to those of the parent metal.

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 2248 - Chemical Check Analysis Limits, Wrought Heat and Corrosion Resistant Steels and Alloys
- AMS 2350 - Standards and Test Methods
- AMS 2371 - Quality Assurance Sampling of Corrosion and Heat Resistant Steels and Alloys, Wrought Products Except Forgings and Forging Stock
- AMS 2813 - Packaging of Welding Wire, Standard Method
- AMS 2814 - Packaging of Welding Wire, Premium Quality
- AMS 2815 - Identification, Welding Wire, Line Code System
- AMS 2816 - Identification, Welding Wire, Color Code System
- AMS 5508 - Steel Sheet, Strip, and Plate, Corrosion and Moderate Heat Resistant, 13Cr - 2.0Ni - 3.0W
- AMS 5616 - Steel Bars, Forgings, Tubing, and Rings, Corrosion and Moderate Heat Resistant, 13Cr - 2.0Ni - 3.0W

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

- ASTM E18 - Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
- ASTM E353 - Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

- 2.3 U.S. 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

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3. TECHNICAL REQUIREMENTS:

- 3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E353, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other analytical methods approved by purchaser:

	min	max
Carbon	0.15 -	0.20
Manganese	--	0.50
Silicon	--	0.50
Phosphorus	--	0.04
Sulfur	--	0.03
Chromium	12.00 -	14.00
Nickel	1.80 -	2.20
Tungsten	2.50 -	3.50
Molybdenum	--	0.50
Aluminum	--	0.15
Copper	--	0.50
Tin	--	0.05

- 3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2248.

- 3.2 Condition: Cold drawn, annealed, and descaled.

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

- 3.2.2 Drawing compounds, oxides, dirt, and other surface contamination shall be removed by cleaning 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 Response to Heat Treatment: Weld metal deposits, approximately 1/4 in. (6.5 mm) thick, on AMS 5508 or AMS 5616 steel shall have hardness not lower than 42 HRC, determined in accordance with ASTM E18, after being heated to 1800°F ± 10 (980°C ± 5), held at heat for 15 - 30 min., and cooled in air.

- 3.3.3 Spooled Wire: Shall conform to 3.3.3.1 and 3.3.3.2, unless otherwise agreed upon by purchaser and vendor.

- 3.3.3.1 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. (380 mm) and not greater than 30 in (760 mm) in diameter.

- 3.3.3.2 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, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from internal and external imperfections detrimental to welding operations, operation 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:

TABLE I

Form	Nominal Diameter Inch	Tolerance, Inch	
		plus	minus
Cut Lengths	0.030, 0.045, 0.062, 0.078	0.002	0.002
Cut Lengths	0.093, 0.125, 0.156, 0.188	0.003	0.003
Spools	0.007, 0.010, 0.015, 0.020	0.0005	0.0005
Spools	0.030, 0.035, 0.045	0.001	0.002
Spools	0.062, 0.078, 0.093	0.002	0.002

TABLE I (SI)

Form	Nominal Diameter Millimetres	Tolerance, Millimetre	
		plus	minus
Cut Lengths	0.75, 1.15, 1.55, 2.00	0.05	0.05
Cut Lengths	2.35, 3.20, 4.00, 4.75	0.08	0.08
Spools	0.20, 0.25, 0.40, 0.50	0.015	0.015
Spools	0.75, 0.90, 1.15	0.03	0.05
Spools	1.55, 2.00, 2.35	0.05	0.05

3.5.2 Length: Cut lengths shall be furnished in 18, 27, or 36 in. (450, 675, or 900 mm) lengths as ordered, and shall not vary more than +0, -0.5 in (-13 mm) from the length ordered.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of wire shall supply all samples for vendor's tests 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 sample and 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 requirements for composition (3.1), response to heat treatment (3.3.2), and tolerances (3.5) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for weldability (3.3.1), cast (3.3.3.1), and helix (3.3.3.2) are classified as periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

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

4.4 Reports: