



AEROSPACE MATERIAL SPECIFICATION

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

AMS 4190C

Superseding AMS 4190B

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ALUMINUM ALLOY WELDING WIRE 5.2Si (4043)

1. SCOPE:

- 1.1 Form: This specification covers an aluminum alloy in the form of welding wire.
- 1.2 Application: Primarily for use as filler metal for gas-metal-arc and 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 2350 - Standards and Test Methods
- AMS 2355 - Quality Assurance Sampling and Testing of Aluminum-Base and Magnesium-Base Alloys, Wrought Products (Except Forgings and Forging Stock) and Flash Welded Rings
- AMS 2813 - Packaging of Welding Wire, Standard Method
- AMS 2816 - Identification, Welding Wire, Color Code System

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

2.2.1 Military Specifications:

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

3. TECHNICAL REQUIREMENTS:

- 3.1 Composition: Shall conform to the following percentages by weight, determined in accordance with AMS 2355:

ϕ		min	max
	Silicon	4.5	6.0
	Iron	--	0.8
	Copper	--	0.30
	Titanium	--	0.20
	Zinc	--	0.10
	Manganese	--	0.05
	Magnesium	--	0.05
	Beryllium	--	0.0008
	Other Impurities, each	--	0.05
	Other Impurities, total	--	0.15
	Aluminum	remainder	

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3.2 Condition: As drawn, in a temper which will provide proper feeding of the wire in machine-welding equipment. Wire shall be furnished on disposable spools for machine welding and in cut lengths for manual welding, as ordered.

3.2.1 Oxides, dirt, and drawing compounds 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.

3.4 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: Unless otherwise specified, 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	0.062, 0.094, 0.125, 0.156, 0.188, 0.250	0.003	0.003
Spools	0.030, 0.047, 0.062, 0.094, 0.125	0.001	0.002

TABLE I (SI)

Form	Nominal Diameter Millimetres	Tolerance, Millimetre	
		plus	minus
Cut Lengths	1.57, 2.39, 3.18, 3.96, 4.78, 6.35	0.08	0.08
Spools	0.76, 1.19, 1.57, 2.39, 3.18	0.03	0.05

3.5.2 Length: Cut lengths shall be furnished in 36 in. (914 mm) lengths unless 27 in. (686 mm) or 18 in. (457 mm) lengths are ordered, and shall not vary more than +0, -1/2 in. (-13 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 (3.3.1) and tolerance (3.5) requirements are classified as acceptance tests.

4.2.2 Periodic Tests: Tests to determine conformance to weldability (3.3.1) requirements are classified as periodic tests.