SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4190H

Issued 1948-05
Revised 2003-02
Noncurrent 2008-01

Superseding AMS 4190G

Aluminum Alloy, Welding Wire
5.2Si (4043)

(Composition similar to UNS A94043)

RATIONALE

AMS 4190G has been designated NonCurrent based on results of a survey to aerospace users and producers.

NONCURRENT NOTICE

This specification has been declared “NONCURRENT” by the Aerospace Materials Division, SAE, as of January 2008. It is recommended, therefore, that this specification not be specified for new designs.

“NONCURRENT” refers to those specifications which have previously been widely used and which may be required for production or processing of existing designs in the future. The Aerospace Materials Division, however, does not recommend these specifications for future use in new designs. “NONCURRENT” specifications are available from SAE upon request.

Similar but not necessarily identical products are covered in the following specification. However, this is provided for information only and does not constitute authority to substitute this specification for the “NONCURRENT” specification.

AWS A5.10, ER4043

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

1. SCOPE:

1.1 Form:

This specification covers an aluminum alloy in the form of welding wire.

1.2 Application:

This wire has been used typically as filler metal for gas-metal-arc or gas-tungsten-arc welding of aluminum alloys of similar composition, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or www.sae.org.

AMS 2355	Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings
MAM 2355	Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings, Metric (SI) Units
AMS 2813	Packaging and Marking of Packages of Welding Wire, Standard Method
AMS 2814	Packaging and Marking of Packages of Welding Wire, Premium Quality
AMS 2816	Identification, Welding Wire, Tab Marking Method
AMS 2819	Identification, Welding Wire, Direct Color Code System
ARP 1876	Weldability Test for Weld Filler Metal Wire
ARP 4926	Alloy Verification and Chemical Composition Inspection of Welding Wire

3. TECHNICAL REQUIREMENTS:

3.1 Wire Composition:

Shall conform to the percentages by weight shown in Table 1, determined in accordance with AMS 2355 or MAM 2355.

TABLE 1 - Composition

Element	min	max
Silicon	4.5	6.0
Iron	--	0.8
Copper	--	0.30
Manganese	--	0.05
Magnesium	--	0.05
Zinc	--	0.10
Titanium	--	0.20
Beryllium	--	0.0008 (8 ppm)
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.1.1 Chemical analysis of initial ingot, bar, or rod stock before drawing is acceptable provided the processes used for drawing or rolling, annealing, and cleaning are controlled to ensure continued conformance to composition requirements, and the facility employs procedures to ensure traceability of wire to the originally analyzed source.

3.2 Condition:

As drawn, in a temper and with a surface finish which will provide proper feeding of the wire in machine welding equipment.

3.3 Fabrication:

3.3.1 Butt welding is permissible provided both ends to be joined are identified by chemical analysis or the repair is made at the wire processing station. The butt weld shall not interfere with uniform, uninterrupted feeding of the wire in machine welding equipment.

3.3.2 Drawing compounds, oxides, dirt, oil, and other foreign material 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.

3.4 Weldability:

Melted wire shall flow smoothly and evenly during welding and shall produce acceptable welds. ARP1876 may be used to resolve disputes.

3.5 Quality:

Wire, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to welding operations, operation of welding equipment, or properties of the deposited weld metal.

3.6 Sizes and Tolerances:

Wire shall be supplied in the sizes and to the tolerances shown in 3.6.1 and 3.6.2.

3.6.1 Diameter: Shall be as shown in Table 2.

TABLE 2A - Sizes and Diameter Tolerances, Inch/Pound Units

Form	Nominal Diameter Inch	Tolerance Inch Plus	Tolerance Inch Minus
Cut Lengths	0.047, 0.062, 0.079, 0.094, 0.098, 0.125, 0.156, 0.188, 0.197, 0.250	0.003	0.003
Spools	0.030, 0.035, 0.039, 0.047,	0.001	0.002
Spools	0.062, 0.079, 0.094, 0.098, 0.125	0.002	0.002

TABLE 2B - Sizes and Diameter and Tolerances, SI Units

Form	Nominal Diameter Millimeter	Tolerance Millimeter Plus	Tolerance Millimeter Minus
Cut Lengths	1.19, 1.57, 2.00, 2.39, 2.50, 3.18, 3.96, 4.78, 5.00, 6.35	0.08	0.08
Spools	0.76, 0.89, 1.00, 1.19,	0.025	0.05
Spools	1.57, 2.00, 2.39, 2.50, 3.18	0.05	0.05

3.6.2 Lengths: Cut lengths shall be furnished in 36-inch (914-mm) lengths unless 27 inch (686-mm) or 18-inch (457-mm) lengths are ordered, and shall not vary more than +0, -0.5 inch (-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 the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the wire conforms to specified requirements.