

**AEROSPACE  
MATERIAL  
SPECIFICATION**

**SAE** AMS 4191H

Issued	1962-06
Revised	2003-03
Noncurrent	2008-01

Superseding AMS 4191G

Aluminum Alloy, Welding Wire  
6.3Cu - 0.30Mn - 0.18Zr - 0.15Ti - 0.10V (2319)  
(Composition similar to UNS A92319)

RATIONALE

AMS 4191G 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, ER2319

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2008 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

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 where the joint is capable of being heat treated to a strength level comparable to that of the parent metal, 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](http://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

**2.1 (Continued):**

AMS 2816	Identification, Welding Wire, Tab Marking Method
AMS 2819	Identification, Welding Wire, Direct Color Code System
ARP1876	Weldability Test for Weld Filler Metal Wire
ARP4926	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	--	0.20
Iron	--	0.30
Copper	5.8	6.8
Manganese	0.20	0.40
Magnesium	--	0.02
Zinc	--	0.10
Titanium	0.10	0.20
Beryllium	--	0.0008 (8 ppm)
Vanadium	0.05	0.15
Zirconium	0.10	0.25
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 materials 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.

### 3.4 Weldability:

Melted wire shall flow smoothly and evenly during welding and shall produce acceptable welds. ARP 1876 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: Tolerances 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 Tolerances, SI Units

Form	Nominal Diameter Millimeters	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 Length: 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.