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400 COMMONWEALTH DRIVE, WARRENDALE PA 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 4191B
Superseding AMS 4191A
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UNS A92319

ALUMINUM ALLOY WELDING WIRE
6.3Cu - 0.30Mn - 0.18Zr - 0.15Ti - 0.10V (2319)

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 or gas-tungsten-arc welding of high temperature aluminum alloys where the joint is capable of being heat treated to a strength level comparable to that 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 Specification (AMS) shall apply.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Materials 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 2815 - Identification, Welding Wire, Line Code System
AMS 2816 - Identification, Welding Wire, Color Code System

3. TECHNICAL REQUIREMENTS:

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

	min	max
Copper	5.8	6.8
Manganese	0.20	0.40
Zirconium	0.10	0.25
Titanium	0.10	0.20
Vanadium	0.05	0.15
Iron	--	0.30
Silicon	--	0.20
Zinc	--	0.10
Magnesium	--	0.02
Beryllium	--	0.0008
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

Printed in U.S.A.

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 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	Tolerance, Inch minus
Cut Lengths	0.047, 0.062, 0.078, 0.094	0.003	0.003
Cut Lengths	0.125, 0.156, 0.188, 0.250	0.003	0.003
Spools	0.030, 0.035, 0.047	0.001	0.002
Spools	0.062, 0.078, 0.094, 0.125	0.002	0.002

TABLE I (SI)

Form	Nominal Diameter Millimetres	Tolerance, Millimetres plus	Tolerance, Millimetres minus
Cut Lengths	1.20, 1.55, 2.00, 2.35	0.08	0.08
Cut Lengths	3.20, 4.00, 4.70, 6.25	0.08	0.08
Spools	0.75, 0.90, 1.20	0.03	0.05
Spools	1.55, 2.00, 2.35, 3.20	0.05	0.05

3.5.2 Length: Cut lengths shall be furnished in 36 in. (900 mm) lengths unless 27 in. (675 mm) or 18 in. (450 mm) lengths are ordered, and shall not vary more than +0, -1/2 in. (-12.5 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 any confirmatory testing deemed 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) Ø 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) are Ø classified as periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

Ø 4.3 Sampling: Shall be in accordance with AMS 2355.

4.4 Reports:

4.4.1 The vendor of wire shall furnish with each shipment three copies of a report stating that the wire conforms to the chemical composition and other technical requirements of this specification. This report shall include the purchase order number, lot number, AMS 4191B, nominal size, and quantity from each lot.

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, AMS 4191B, part or assembly number, and quantity.

Ø 4.5 Resampling and Retesting: Shall be in accordance with AMS 2355.

5. PREPARATION FOR DELIVERY:

5.1 Layer Winding: Wire furnished on spools shall be closely wound in layers but adjacent turns within a layer need not necessarily be touching; shall be wound so as to avoid producing kinks, waves, and sharp bends; and shall be free to unwind without restriction caused by overlapping or wedging. The outside end of the spooled wire shall be so treated that it may be readily located.

5.2 Identification: Wire shall be identified in accordance with AMS 2815 unless identification in Ø accordance with AMS 2816 is specified by purchaser. Tab marking of cut lengths is permissible.

5.3 Packaging and Marking: Shall be in accordance with AMS 2813.

6. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS: Wire not conforming to this specification or to modifications authorized by purchaser will be subject to rejection.

8. NOTES:

8.1 Marginal Indicia: The phi (Ø) symbol is used to indicate technical changes from the previous issue of this specification.

8.2 Dimensions in inch/pound units are primary; dimensions in SI units are shown as the approximate equivalents of the inch/pound units and are not to be construed as standard for wire produced to SI dimensions.