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

AEROSPACE MATERIAL SPECIFICATION

AMS 4188

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Revised

ALUMINUM ALLOY WELDING WIRE

1. SCOPE:

1.1 Form: This specification covers aluminum alloys in the form of welding wire.

1.2 Application: Primarily for use as filler metal for gas-metal-arc and gas-tungsten-arc welding, including repair welding, of aluminum alloy castings. Where casting service conditions require good corrosion resistance, maximum strength, and homogeneity, filler metal should be of the same alloy as the casting.

1.3 Classification: The welding wires specified herein and in the applicable detail specification are defined by nominal composition and alloy designation which appear as part of the title of each detail specification.

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 2814 - Packaging of Welding Wire, Premium Quality
AMS 2815 - Identification, Welding Wire, Line Code System
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 Detail Specifications: The requirements for a specific welding wire shall consist of all the requirements specified herein in addition to the requirements specified in the applicable detail specification. In case of any conflict between the requirements of this basic specification and an applicable detail specification, the requirements of the detail specification shall govern.

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3.2 Condition: As extruded and sized or as drawn, as ordered, 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: Wire shall be supplied in the sizes and to the tolerances shown in 3.5.1 and 3.5.2, unless otherwise specified.

3.5.1 Diameter:

3.5.1.1 Extruded Wire:

TABLE I

Form	Nominal Diameter Inch	Tolerance, Inch plus	Tolerance, Inch minus
Cut Lengths	0.047, 0.062, 0.078, 0.094, 0.125	0.007	0.007
Spools	0.030, 0.035, 0.047, 0.062, 0.094	0.002	0.002

TABLE I (SI)

Form	Nominal Diameter Millimetres	Tolerance, Millimetre plus	Tolerance, Millimetre minus
Cut Lengths	1.19, 1.57, 1.98, 2.39, 3.18	0.18	0.18
Spools	0.76, 0.89, 1.19, 1.57, 2.39	0.05	0.05

3.5.1.2 Drawn Wire:

TABLE II

Form	Nominal Diameter Inch	Tolerance, Inch plus	Tolerance, Inch minus
Cut Lengths	0.047, 0.062, 0.078, 0.094, 0.125	0.003	0.003
Spools	0.030, 0.035, 0.047,	0.001	0.002
Spools	0.062, 0.094	0.002	0.002

TABLE II (SI)

Form	Nominal Diameter Millimetres	Tolerance, Millimetre plus	Tolerance, Millimetre minus
Cut Lengths	1.19, 1.57, 1.98, 2.39, 3.18	0.08	0.08
Spools	0.76, 0.89, 1.19	0.03	0.05
Spools	1.57, 2.39,	0.05	0.05

3.5.2 Length: Cut lengths shall be furnished in 36-in. (914 mm) lengths and shall not vary more than +0, -1 in. (-25 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 requirements for composition (3.2 of applicable detail specification) and for 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 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 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, material specification number, nominal size, and quantity from each lot.

4.4.2 When castings or assemblies requiring use of this welding wire are supplied, the casting supplier or assembly manufacturer may inspect each lot of wire or may use the wire vendor's inspection report 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, material specification number, casting or assembly number, and quantity.

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 accordance with AMS 2816 is specified by purchaser. Tab marking of cut lengths is permissible.

5.3 Packaging and Marking:

5.3.1 Wire shall be packaged and the packages marked in accordance with AMS 2814.

5.3.2 Packages of wire shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the wire to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.