



# AEROSPACE MATERIAL SPECIFICATION

**AMS5839™****REV. D**

|            |         |
|------------|---------|
| Issued     | 1995-12 |
| Reaffirmed | 2006-04 |
| Revised    | 2021-12 |

Superseding AMS5839C

Nickel Alloy, Corrosion and Heat-Resistant, Welding Wire  
59Ni - 22Cr - 2.0Mo - 14W - 0.35Al  
(Composition similar to UNS N06231)

## RATIONALE

AMS5839D is the result of a Five-Year Review and update of the specification. The revision prohibits unauthorized substitution (3.3, 4.4.1, 5.3.1, 8.4), adds country of origin to reports (4.4), and allows prior revisions (8.5).

### 1. SCOPE

#### 1.1 Form

This specification covers a corrosion and heat-resistant nickel 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 parts fabricated from alloy 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 International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), [www.sae.org](http://www.sae.org).

|         |                                                                    |
|---------|--------------------------------------------------------------------|
| AMS2813 | Packaging and Marking of Packages of Welding Wire, Standard Method |
| AMS2814 | Packaging and Marking of Packages of Welding Wire, Premium Quality |
| AMS2816 | Identification, Welding Wire, Tab Marking Method                   |
| AMS2819 | Identification, Welding Wire, Direct Color Code System             |

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SAE WEB ADDRESS:

For more information on this standard, visit  
<https://www.sae.org/standards/content/AMS5839D/>

ARP1917 Clarification of Terms Used in Aerospace Metals Specifications

ARP4926 Alloy Verification and Chemical Composition, Inspection of Welding Wire

## 2.2 AWS Publications

Available from American Welding Society, 8669 NW 36 Street, #130, Miami, FL 33166-6672, Tel: 1-800-443-9353 or 305-443-9353, [www.aws.org](http://www.aws.org).

AWS A5.01 Welding Consumables - Procurement of Filler Metals and Fluxes

AWS A5.14 Specification for Nickel and Nickel-Alloy Bare Welding Electrodes and Rods

## 3. TECHNICAL REQUIREMENTS

### 3.1 Composition:

Wire shall meet the technical requirements of AWS A5.14 ERNiCrWMo-1 with the following additional chemistry controls:

Titanium shall be 0.10 max.

### 3.2 Sizes and Tolerances

Wire shall be supplied in the sizes and to the tolerances shown in AWS A5.14. Smaller diameter wires when ordered shall be supplied in sizes and tolerances shown in 3.2.1.

#### 3.2.1 Diameter

Shall be as shown in Table 1.

**Table 1A - Sizes and diameter tolerances, inch/pound units**

| Form        | Nominal Diameter<br>Inches | Tolerance<br>Inches<br>Plus | Tolerance<br>Inches<br>Minus |
|-------------|----------------------------|-----------------------------|------------------------------|
|             |                            |                             |                              |
| Cut Lengths | 0.030, 0.035, 0.045        | 0.001                       | 0.002                        |
| Spools      | 0.007, 0.010, 0.015        | 0.0005                      | 0.0005                       |

**Table 1B - Sizes and diameter tolerances, SI units**

| Form        | Nominal Diameter<br>Millimeters | Tolerance<br>Millimeters<br>Plus | Tolerance<br>Millimeters<br>Minus |
|-------------|---------------------------------|----------------------------------|-----------------------------------|
|             |                                 |                                  |                                   |
| Cut Lengths | 0.76, 0.89, 1.14                | 0.025                            | 0.05                              |
| Spools      | 0.18, 0.25, 0.38                | 0.013                            | 0.013                             |

### 3.3 Exceptions

Any exceptions shall be authorized by the purchaser and reported as in 4.4.1.

## 4. QUALITY ASSURANCE PROVISIONS

### 4.1 Responsibility for Inspection

The producer of wire shall supply all samples for producer'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.

## 4.2 Classification of Tests

### 4.2.1 Acceptance Tests

Composition (3.1), sizes and tolerances (3.2), and alloy verification (5.2) are acceptance tests and shall be performed on each heat or lot as applicable.

## 4.3 Sampling and Testing

Shall be in accordance with AWS A5.01.

## 4.4 Reports

The producer of wire shall furnish with each shipment a report showing the producer's name and country where the metal was melted (final melt in the case of metal processed by multiple melting operations) results of tests for composition of each heat, and stating that the wire conforms to the other technical requirements. This report shall include the purchase order number, heat and lot numbers, AMS5839D, nominal size, and quantity.

4.4.1 When material produced to this specification has exceptions taken to the technical requirements listed in Section 3, the report shall contain a statement "This material is certified as AMS5839D(EXC) because of the following exceptions:" and the specific exceptions shall be listed (also see 5.3.1).

## 4.5 Resampling and Retesting

Shall be in accordance with AWS A5.01.

## 5. PREPARATION FOR DELIVERY

5.1 Wire shall be supplied either on spools in one continuous length for machine welding or in cut lengths for manual welding, as ordered. Wire on each spool or in each package of cut lengths shall be from the same heat of steel.

### 5.2 Alloy Verification

5.2.1 Wire from each spool or package of cut lengths shall be alloy verified by a method acceptable to purchaser and producer. The alloy verification methods of ARP4926 are recommended.

5.2.2 An 8 inch (203 mm) length of wire shall be made accessible at both ends of each spool for alloy verification.

### 5.3 Identification

Shall be in accordance with AMS2816 unless AMS2819 or another method is specified by purchaser.

5.3.1 When technical exceptions are taken (see 4.4.1), the material shall be identified with AMS5839(EXC).

### 5.4 Packaging and Marking

Shall be in accordance with AMS2813 unless AMS2814 or another method is specified by purchaser.

## 6. ACKNOWLEDGMENT

A producer 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.