# AEROSPACE MATERIAL SPECIFICATION

| AMS4779™ | REV. L |
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Issued 1960-06
Reaffirmed 2012-02
Revised 2022-12

Superseding AMS4779K

Nickel Alloy, Brazing Filler Metal
94Ni - 3.5Si - 1.8B
1800 °F (982 °C) Solidus, 1950 °F (1066 °C) Liquidus
(Composition similar to UNS N99640)

RATIONALE

AMS4779L is the result of a Five-Year Review and update of the specification. The revision prohibits unauthorized exceptions (3.5, 4.4.1, 5.1.2.2, 8.6) and allows prior revisions (8.5).

## 1. SCOPE

### 1.1 Form

This specification covers a nickel alloy in the form of wire, rod, strip, foil, and powder and a viscous mixture (paste) of the powder in a suitable binder.

### 1.2 Application

This filler metal has been used typically for joining corrosion and heat-resistant steels and alloys requiring corrosion and oxidation resistant joints with good strength at elevated temperatures, but usage is not limited to such applications. This filler metal has also been used as a corrosion and oxidation resistant hard coating.

### 1.3 Safety - Hazardous Materials

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

## 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.





**TO PLACE A DOCUMENT ORDER:** **Tel: 877-606-7323 (inside USA and Canada)**
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**SAE WEB ADDRESS:** **http://www.sae.org**

**For more information on this standard, visit**
https://www.sae.org/standards/content/AMS4779L/

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.

AS7766 Terms Used in Aerospace Metals Specifications

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM E18 Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials

ASTM E140 Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness

2.3 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.

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

AWS A5.8 Specification for Filler Metals for Brazing and Braze Welding

2.4 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Product shall meet the requirements of AWS A5.8 BNi-4 and the following:

3.2 Condition

The product shall be supplied in the following condition:

3.2.1 Wire and Strip

Powder bonded in a suitable binder.

3.2.2 Rod

As cast, with fins and projections removed.

3.2.3 Foil and Powder

As fabricated.

3.2.4 Paste

Shall consist of 84 to 90% by weight powder in a suitable binder and, unless otherwise ordered, shall not contain flux.

3.3 Properties

Filler metal shall conform to the following requirements:

3.3.1 Wire and Strip

3.3.1.1 Burn-Off of Binder

The binder used for bonding powder to form wire and strip shall burn off, leaving no adherent residue, when the product is heated to 1000 °F (538 °C), or higher.

3.3.2 Paste

3.3.2.1 Paste shall have a shelf life of not less than 6 months; not more than thorough mixing shall be required to restore paste for use during that time.

3.3.3 When used as a hard coating, alloy shall melt quickly and shall flow freely under neutral oxyacetylene flame, without bubbling or boiling, to produce an adherent deposit free from porosity due to blow-holes, gas cavities, or slag inclusions.

3.3.3.1 Alloy, deposited as in 3.3.3, shall have hardness not lower than 20 HRC, or equivalent (see 8.3), determined in accordance with ASTM E18.

3.4 Quality

The product, as received by purchaser, shall be uniform in color, quality, and condition and free from foreign materials and from imperfections detrimental to its working qualities. Rod and powder shall have a metallic luster. Wire, strip, and foil shall be clean, sound, smooth, and free from ragged edges, splitting, damaged ends, and other imperfections detrimental to usage of the product.

3.4.1 Powder

3.4.1.1 Mesh Designation

Shall be 140C, 140F, or 325, in accordance with the AWS A5.8 limits on particle size distribution. When a mesh designation is not specified, 140F mesh shall be supplied.

3.5 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 the product 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 product conforms to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

All technical requirements, other than shelf life of paste (3.3.2.1) and hard coating characteristics (3.3.3 and 3.3.3.1), are acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests

Shelf life of paste (3.3.2.1) and hard coating characteristics (3.3.3 and 3.3.3.1) are periodic tests and shall be performed at a frequency selected by the producer unless frequency of testing is specified by purchaser.

4.3 Sampling and Testing

Shall be in accordance with the following:

4.3.1 Composition

One sample shall be taken from each furnace charge except that powder produced from consecutive furnace charges and collected together, without teardown of the atomizing equipment, shall constitute a batch, from which one sample shall be taken.

4.3.2 Properties Except Shelf Life of Paste

One sample from each lot.

4.3.2.1 A lot shall be all product, other than powder or paste, as defined by AWS A5.01 Class S3.

4.3.2.2 A lot of powder shall be a uniform blend of powder produced from one or more furnace charges, except as modified by 4.3.1, each meeting the composition requirements of this specification, and presented for producer's inspection at one time.

4.3.2.3 A lot of paste shall be that paste produced from a single lot of powder, combined with binder from the same manufacturing batch, and presented for producer's inspection at one time.

4.4 Reports

The producer of the product shall furnish with each shipment a report showing the producer's name and the country where melted (e.g., final melt in the case of metal processed by multiple melting operations), the composition of each lot, and stating that the product conforms to the other technical requirements. This report shall include the purchase order number, lot number or numbers, AMS4779L, form, 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 AMS4779L(EXC) because of the following exceptions:" and the specific exceptions shall be listed (see 5.1.2.2).

4.5 Resampling and Retesting

Not applicable.

5. PREPARATION FOR DELIVERY

5.1 Identification

5.1.1 Shall be as agreed upon by purchaser and producer.

5.1.2 Each exterior container or package shall be permanently and legibly marked with not less than the following information:

Nickel alloy, brazing filler metal
AMS4779L
Lot number
Manufacturer's identification
Product form
Nominal dimensions
Weight