SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS5555 REV. E

Issued 1958-11
Reaffirmed 2000-10
Revised 2013-04

Superseding AMS5555D

Nickel and Wire Ribbon
99Ni

(Composition similar to UNS N02205)

RATIONALE

AMS5555E revises Bending (3.3.3), adds requirements for welding wire (3.2.2, 3.5.3 and 5.1.5), and is a Five Year Review and update of this specification.

1. SCOPE

1.1 Form

This specification covers a nickel in the form of round wire and rectangular ribbon.

1.2 Application

These products have been used typically as weldable leads for electronic component parts or as filler wire for welding, 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 724-776-4970 (outside USA), www.sae.org.

AMS2269 Chemical Check Analysis Limits, Wrought Nickel Alloys and Cobalt Alloys

AMS2371 Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steels and Alloys, Wrought Products and Forging Stock

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS5555E

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 E 8/E 8M Tension Testing of Metallic Materials

ASTM E 290 Bend Test of Materials for Ductility

ASTM E 354 Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

2.3 American Welding Society Publications

Available from American Welding Society 550 N.W. LeJeune Road, Miami, FL 33126, Tel: 1-800-443-9353, www.aws.org.

AWS A5.02 Specification for Filler Metal, Standard Sizes, Packaging and Physical Attributes

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 354, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 – COMPOSITION

Element	min	max
Nickel + Cobalt	99.00	--
Magnesium	0.01	0.08
Titanium	0.01	0.05
Manganese	--	0.35
Iron	--	0.20
Carbon	--	0.15
Silicon	--	0.15
Copper	--	0.15
Sulfur	--	0.008

3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS2269.

3.2 Condition

Cold drawn or cold rolled; bright annealed.

3.2.1 Cold working compounds, oxides, and dirt shall be removed by cleaning processes which will not be harmful to application of the cleaned product

3.2.2 When the procuring activity specifies that the product is for welding, the physical attributes shall be in accordance with AWS A5.02.

3.3 Properties

The product shall conform to the following requirements:

3.3.1 Tensile Strength

Shall be not higher than 75.0 ksi (517 MPa), determined in accordance with ASTM E 8/E 8M.

3.3.2 Wrapping

Wire shall withstand, without cracking, wrapping at room temperature five full, closely-spaced turns around a diameter equal to the nominal diameter of the wire.

3.3.3 Bending

Ribbon shall be tested in accordance with ASTM E 290 using a sample with its axis of bending parallel to the direction of rolling, and shall withstand, without cracking, bending at room temperature through an angle of 180 degrees around a diameter equal to the nominal thickness of the ribbon. In case of dispute, the results of tests using the guided bend test of ASTM E 290 shall govern.

3.4 Quality

The product, as received by purchaser, shall be uniform in temper and cross section. Surfaces shall be free scale, corrosion, cracks, seams, scratches, slivers, dirt, grease, oil, streaks, stains, pit marks, burns, dents, blisters, laps, grooves, inclusions, and other imperfections detrimental to usage of the product; magnification up to 30X may be used to determine conformance.

3.5 Tolerances

Shall conform to the following except as provided in 3.5.3:

3.5.1 Round Wire

Shall be as shown in Table 2.

TABLE 2A - ROUND WIRE TOLERANCES, INCH/POUND UNITS

Nominal Diameter Inch	Tolerance, Inch plus and minus
0.015 to 0.020, incl	0.0004
Over 0.020 to 0.030, incl	0.0005
Over 0.030 to 0.045, incl	0.0006

TABLE 2B - ROUND WIRE TOLERANCES, SI UNITS

Nominal Diameter Millimeters	Tolerance, Millimeter plus and minus
0.38 to 0.51, incl	0.010
Over 0.51 to 0.76, incl	0.013
Over 0.76 to 1.14, incl	0.015

3.5.1.1 Round wire shall not be out-of-round by more than one-half the diametral tolerance.

3.5.2 Rectangular Ribbon

3.5.2.1 Thickness

Shall be as shown in Table 3.

TABLE 3 - RECTANGULAR RIBBON THICKNESS TOLERANCES

Nominal Thickness Inch	Nominal Thickness Millimeters	Tolerance plus and minus Inch	Tolerance plus and minus Millimeter
0.004 to 0.025, incl	0.10 to 0.64, incl	0.0007	0.018

3.5.2.2 Width

Shall be as shown in Table 4.

TABLE 4 - RECTANGULAR RIBBON WIDTH TOLERANCE

Nominal Width Inch	Nominal Width Millimeters	Tolerance plus and minus Inch	Tolerance plus and minus Millimeter
0.015 to 0.062, incl	0.38 to 1.57, incl	0.002	0.05

3.5.3 When the procuring activity specifies that the product is for welding, wire sizes and tolerances shall be in accordance with AWS A5.02 (See 8.4).

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The vendor of the product 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 product conforms to specified requirements.

4.2 Classification of Tests

All technical requirements are acceptance tests and shall be performed on each lot.

4.3 Sampling and Testing

Shall be in accordance with AMS2371.

4.4 Reports

The vendor of the product shall furnish with each shipment a report showing the results of tests for composition of each heat and stating that the product conforms to the other technical requirements. This report shall include the purchase order number, heat and lot number, AMS5555E, nominal size, and quantity.

4.5 Resampling and Retesting

Shall be in accordance with AMS2371.

5. PREPARATION FOR DELIVERY

5.1 Packaging and Identification

5.1.1 Wire and ribbon shall be supplied in coils or on spools of a type and size agreed upon by purchaser and vendor.

5.1.2 Coils shall be individually wrapped with waterproof paper or packed in waterproof drums. Spools shall be boxed.