AEROSPACE MATERIAL SPECIFICATION

AMS7719	REV. E

Issued 1961-01
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Revised 2015-08

Superseding AMS7719D

Nickel-Iron Alloy, Magnetic, Sheet and Strip
50Ni - 50Fe
Stamping Quality, Half-Hard Temper
(Composition similar to UNS K95000)

RATIONALE

AMS7719E results from a Five Year Review and update of this specification.

1. SCOPE

1.1 Form

This specification covers a magnetic nickel-iron alloy in the form of sheet and strip.

1.2 Application

These products have been used typically for magnetic circuit parts that require high magnetic permeability at low flux densities with the fabricated parts to be annealed in dry hydrogen, 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.

AMS2242 Tolerances, Corrosion and Heat Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Sheet, Strip, and Plate

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

AMS2807 Identification, Carbon and Low-Alloy Steels, Corrosion and Heat-Resistant Steels and Alloys, Sheet, Strip, Plate, and Aircraft Tubing

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http://www.sae.org/technical/standards/AMS7719E

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 A596/A596M Direct-Current Magnetic Properties of Materials Using the Ballistic Method and Specimens

ASTM A773/A773M D-C Magnetic Properties of Materials Using Ring and Permeameter Procedures with dc Electronic Hysteresigraphs.

ASTM E18 Rockwell Hardness of Metallic Materials

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall be an alloy containing approximately 50% nickel and 50% iron with other alloying elements in such proportions as required to provide a product meeting the requirements of 3.3.

3.2 Condition

Cold rolled to half-hard temper having a surface appearance comparable to the following commercial corrosion-resistant steel finishes as applicable (See 8.2).

3.2.1 Sheet

No. 2D finish.

3.2.2 Strip

No. 1 strip finish.

3.3 Properties

The product shall conform to the following requirements:

3.3.1 Hardness

Shall be not lower than 90 HRB, or equivalent (See 8.3), determined in accordance with ASTM E18.

3.3.2 Magnetic Properties

Shall be as shown in Table 1, determined in accordance with ASTM A596/A596M or ASTM A773/A773M on specimens as in 4.3.1, annealed by heating to 2150 °F ± 25 (1177 °C ± 14) in a dry hydrogen atmosphere having a dew point of -60 °F (-51 °C) or lower, holding at heat for 4 hours ± 0.25, and cooling in a non-contaminating atmosphere at a rate not greater than 100 °F (56 °C) degrees per hour to 1100 °F (593 °C) or lower, unless another cooling rate is recommended by the alloy producer (See 8.4).

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3.3.2.1 Maximum Permeability

Shall be as shown in Table 1.

Table 1 - Maximum permeability

Nominal Thickness Inch	Nominal Thickness Millimeter	Minimum Value
Up to 0.020, excl	Up to 0.51, excl	60 000
0.020 and over	0.51 and over	40 000

3.3.2.2 Permeability at 100 Gauss (0.01T)

Shall be as shown in Table 2.

Table 2 - Permeability at 100 gauss

Nominal Thickness Inch	Nominal Thickness Millimeter	Minimum Value
Up to 0.020, excl	Up to 0.51, excl	8000
0.020 and over	0.51 and over	6000

3.3.2.3 Induction at 100 Oersteds (7958 A/m)

Shall be not less than 15 000 gauss (1.5T).

3.4 Quality

The product, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the product.

3.5 Tolerances

Shall conform to all applicable requirements of AMS2242.

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

All technical requirements are acceptance tests and shall be performed on each heat or lot as applicable.

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4.3 Sampling and Testing

Shall be in accordance with AMS2371 and the following:

4.3.1 For magnetic property tests, one or more samples shall be selected at random from each lot.

4.4 Reports

The producer of the product shall furnish with each shipment a report showing the producer identity, the results of tests for hardness and for magnetic properties of each lot and stating that the product conforms to the other technical requirements. This report shall include the purchase order number, heat and lot numbers, AMS7719E, cooling rate if other than 100 °F (56 °C) degrees per hour, and test method used for determining magnetic properties and size, and quantity.

4.5 Resampling and Retesting

Shall be in accordance with AMS2371.

5. PREPARATION FOR DELIVERY

5.1 Identification

Shall be in accordance with AMS2807.

5.2 Protective Treatment

Product shall be protected from corrosion prior to shipment.

5.3 Packaging

The product 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 product to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT

A producer shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS

Product not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.

8. NOTES

8.1 A change bar (l) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.

8.2 Commercial corrosion-resistant steel finishes are defined in ASTM A480/A480M and AS4194.

8.3 Hardness conversion tables for metals are presented in ASTM E140.

8.4 Annealing of fabricated parts is required to produce the required properties. Dry hydrogen atmosphere is typically recommended. Vacuum or other protective atmospheres may produce magnetic properties that are not equivalent to those produced by hydrogen.

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