

AEROSPACE MATERIAL SPECIFICATION

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Superseding AMS 7719C

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

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 canceled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2242 Tolerances, Corrosion and Heat Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Sheet, Strip, and Plate

MAM 2242 Tolerances, Metric, Corrosion and Heat Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Sheet, Strip, and Plate

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2.1 (Continued):

- AMS 2371 Quality Assurance Sampling and Testing, Corrosion and Heat Resistant Steels and Alloys, Wrought Products and Forging Stock
- AMS 2807 Identification, Carbon and Low-Alloy Steels, Corrosion and Heat Resistant Steels and Alloys, Sheet, Strip, Plate, and Aircraft Tubing

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

- ASTM A 596/A 596M Direct-Current Magnetic Properties of Materials Using the Ballistic Method and Specimens
- ASTM A 773/A 773M D-C Magnetic Properties of Materials Using Ring and Permeameter Procedures with dc Electronic Hysteresigraphs.
- ASTM E 18 Rockwell Hardness and Rockwell Superficial 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 E 18.

3.3.2 Magnetic Properties: Shall be as shown in Table 1, determined in accordance with ASTM A 596/A 596M or ASTM A 773/A 773M 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).

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 0.020 and over	Up to 0.51, excl 0.51 and over	60,000 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 0.020 and over	Up to 0.51, excl 0.51 and over	8,000 6,000

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 AMS 2242 or MAM 2242.

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 heat or lot as applicable.

4.3 Sampling and Testing:

Shall be in accordance with AMS 2371 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 vendor of the product shall furnish with each shipment a report showing 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, AMS 7719D, 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 AMS 2371.

5. PREPARATION FOR DELIVERY:

5.1 Identification:

Shall be in accordance with AMS 2807.

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 vendor 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.