



<b>AEROSPACE MATERIAL SPECIFICATION</b>	<b>AMS7718™</b>	<b>REV. J</b>
	Issued 1981-01 Revised 2015-08 Reaffirmed 2019-05 Stabilized 2025-01  Superseding AMS7718H	
Nickel-Iron Alloy, Magnetic, Bars, Rods, Tubing, and Forgings 50Ni - 50Fe (Composition similar to UNS K95000)		

### RATIONALE

AMS7718J has been declared “STABILIZED” by SAE AMS Committee E. This document will no longer be updated and may no longer represent standard industry practice. This document was stabilized because this document is no longer state of the art, Committee E could find no users for specific product forms covered in this document and other documents contain similar but not necessarily equivalent requirements.

NOTE: Previously this document was “REAFFIRMED.” The last technical update of this document occurred in November 2012. Users of this document should refer to the cognizant engineering organization for disposition of any issues with reports/certifications to this specification; including exceptions listed on the certification. In many cases, the purchaser may represent a sub tier supplier and not the cognizant engineering organization.

### STABILIZED NOTICE

AMS7718J has been declared “STABILIZED” by SAE AMS Committee E Carbon and Low Alloy Steels and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

AMS Committee E recommends that the following similar but not identical specifications may be considered for future procurement. This listing does not constitute authority to substitute these specifications for the “STABILIZED” specification.

ASTM A753, Alloy Type 2, Bars

ASTM A753, Alloy Type 2, Forging Billet

SAE Executive Standards Committee Rules provide that: “This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user.”

SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2025 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, or used for text and data mining, AI training, or similar technologies, without the prior written permission of SAE.

**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  
http://www.sae.org

SAE WEB ADDRESS:

**For more information on this standard, visit**  
<https://www.sae.org/standards/content/AMS7718J/>

## 1. SCOPE

### 1.1 Form

This specification covers a magnetically soft nickel-iron alloy in the form of bars, rods, forgings, mechanical tubing, and forging stock.

### 1.2 Application

These products have been used typically for parts in magnetic circuits requiring high magnetic permeability and high saturation induction 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](http://www.sae.org).

AMS2241	Tolerances, Corrosion and Heat-Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Bars and Wire
AMS2243	Tolerances, Corrosion and Heat-Resistant Steel Tubing
AMS2371	Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steels and Alloys, Wrought Products and Forging Stock
AMS2374	Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steel and Alloys Forgings

SAENORM.COM : Click to view the full PDF of ams7718j

AMS2806 Identification Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels and Corrosion and Heat-Resistant Steels and Alloys

AMS2808 Identification Forgings

## 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](http://www.astm.org).

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

The product shall be supplied in the following condition:

#### 3.2.1 Bars, Rods, and Mechanical Tubing

Cold drawn, partially annealed (See 8.2), and centerless ground.

#### 3.2.2 Forgings

As ordered.

#### 3.2.3 Forging Stock

As ordered by the forging manufacturer.

### 3.3 Properties

The product shall conform to the following requirements:

#### 3.3.1 Hardness

Shall be as follows, determined in accordance with ASTM E18.

3.3.1.1 Bars and forgings 0.50 inch (12.7 mm) and under in nominal diameter or cross-sectional thickness and mechanical tubing shall have hardness not higher than 100 HRB, or equivalent (See 8.3).

3.3.1.2 Bars and forgings over 0.50 to 2.00 inches (12.7 to 50.8 mm) in nominal diameter or cross-sectional thickness shall have hardness not higher than 90 HRB, or equivalent (See 8.3).

### 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 4.3.3 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 800 °F (427 °C) or lower, unless another cooling rate is recommended by the alloy producer (See 8.2). The annealed maximum coercive force ( $H_c$ ) from 10 000 Gauss, (1.0 T) shall be 0.070 Oersted (5.57 A/m).

**Table 1 - Annealed minimum magnetic properties**

Nominal Diameter or Least Distance Between Parallel Sides Inch	Nominal Diameter or Least Distance Between Parallel Sides Millimeters	Maximum Permeability	Permeability at B = 100 Gauss (0.01T)	Induction at H = 100 Oersteds (7958 A/m)
Up to 5/16, excl	Up to 7.9, excl	50 000	6000	15 000 gauss (1.5T)
5/16 and over	7.9 and over	50 000	4000	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 be as follows:

#### 3.5.1 Bars and Rods

In accordance with AMS2241.

#### 3.5.2 Mechanical Tubing

In accordance with AMS2243.

## 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.

### 4.3 Sampling and Testing

#### 4.3.1 Bars, Rods, Mechanical Tubing, and Forging Stock

In accordance with AMS2371.