



AEROSPACE MATERIAL SPECIFICATION

AMS5892™**REV. D**

Issued 1992-04
Reaffirmed 2014-06
Revised 2025-06

Superseding AMS5892C

(R) Alloy, Sheet and Strip
42Fe - 37.5Ni - 14Co - 4.8Cb (Nb) - 1.6Ti (Alloy 909)
Solution Heat Treated, Precipitation Hardenable
Multiple Melted, High Temperature, Low Expansion
(Composition similar to UNS N19909)

RATIONALE

AMS5892D is the result of a Five-Year Review and update of the specification. The revision updates composition testing and reporting (see 3.1 and 3.1.1), revises condition to allow both hot- and cold-rolling processes (see 3.3), removes microhardness and limits test thickness (see 3.5.1.2 and 8.2), adds strain rate control to tensile tests (see 3.5.1.1.1 and 3.5.2.1.1), updates bending requirements (see 3.5.1.3), updates exclusion requirements (see 8.6), and adds the alloy common name to the specification (see Title and 8.7).

1. SCOPE

1.1 Form

This specification covers a low expansion iron alloy in the form of sheet or strip 0.250 inch (6.35 mm) and under in nominal thickness.

1.2 Application

These products have been used typically for parts requiring a combination of high strength and low expansion properties up to 1200 °F (649 °C), 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.

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Documents

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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.

AMS2262	Tolerances, Nickel, Nickel Alloy, and Cobalt Alloy Sheet, Strip, and Plate
AMS2269	Chemical Check Analysis Limits, Nickel, Nickel Alloys, and Cobalt Alloys
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
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 A751	Chemical Analysis of Steel Products
ASTM E8/E8M	Tension Testing of Metallic Materials
ASTM E18	Rockwell Hardness of Metallic Materials
ASTM E21	Elevated Temperature Tension Tests of Metallic Materials
ASTM E112	Determining Average Grain Size
ASTM E139	Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials
ASTM E140	Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness
ASTM E228	Linear Thermal Expansion of Solid Materials with a Push-Rod Dilatometer
ASTM E290	Bend Testing of Material for Ductility
ASTM E1181	Characterizing Duplex Grain Sizes

2.3 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Composition shall conform to the percentages by weight shown in Table 1, determined in accordance with ASTM A751 or by other analytical methods acceptable to the purchaser.

Table 1 - Composition

Element	Min	Max
Carbon	--	0.06
Manganese	--	1.0
Silicon	0.25	0.50
Phosphorus	--	0.015
Sulfur	--	0.015
Nickel	35.0	40.0
Cobalt	12.0	16.0
Columbium (Niobium)	4.3	5.2
Titanium	1.3	1.8
Tantalum	--	0.05
Chromium	--	1.0
Aluminum	--	0.15
Boron	--	0.012
Copper	--	0.5
Iron	remainder	

3.1.1 The producer may test for any element not listed in Table 1 and include this analysis in the report of 4.4. Reporting of any element not listed in the composition table is not a basis for rejection unless limits of acceptability are specified by the purchaser.

3.1.2 Check Analysis

Composition variations shall meet the applicable requirements of AMS2269.

3.2 Melting Practice

Alloy shall be multiple melted using consumable electrode practice in the remelt cycle. If consumable electrode remelting is not performed in vacuum, electrodes which have been produced by vacuum induction melting shall be used for remelting.

3.3 Condition

Product shall be hot rolled or cold rolled, solution heat treated, and, unless solution heat treatment is performed in an atmosphere yielding a bright finish, descaled producing a uniform finish.

3.4 Solution Heat Treatment

The product shall be solution heat treated by heating to 1800 °F ± 25 °F (982 °C ± 14 °C), holding at heat for a time commensurate with section thickness, and cooling at a rate equivalent to an air cool.

3.4.1 Continuous Heat Treating

Process parameters (e.g., furnace temperature set points, heat input, travel rate, etc.) for continuous heat-treating lines shall be established by the material producer and validated by testing of product to specified requirements.

3.5 Properties

Product 0.250 inch (6.35 mm) and under in nominal thickness shall conform to the following requirements:

3.5.1 As Solution Heat Treated

3.5.1.1 Tensile Properties

Tensile properties shall be as shown in Table 2, determined in accordance with ASTM E8/E8M.