



AEROSPACE MATERIAL SPECIFICATION

AMS5887™

REV. E

Issued	1990-01
Reaffirmed	2006-04
Revised	2021-10

Superseding AMS5887D

Nickel Alloy, Corrosion and Heat-Resistant,
Bars, Forgings, Rings, and Forging or Ring Stock
54Ni - 22Cr - 12.5Co - 9.0Mo - 1.2Al
Consumable Electrode or Vacuum Induction Melted
Annealed
(Composition similar to UNS N06617)

RATIONALE

AMS5887E is the result of a Five-Year Review and update of the specification. The revision updates the title to match the scope, prohibits unauthorized exceptions (3.4.1.1.4, 3.7, 4.4.2, 5.2.1.1, 8.4, 8.6), provides strain rate for tensile testing (3.4.1.1.1), and permits prior revisions (8.5).

1. SCOPE

1.1 Form

This specification covers a corrosion and heat-resistant nickel alloy in the form of bars, forgings, flash welded rings under 4 inches (102 mm) in least cross-sectional dimension, and stock of any size for forging or flash welded rings (see 8.4).

1.2 Application

These products have been used typically for parts requiring high strength and resistance to oxidation and corrosion up to 2200 °F (1204 °C) and where such parts may require welding during fabrication, 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.

AMS2261 Tolerances, Nickel, Nickel Alloy, and Cobalt Alloy Bars, Rods, and Wire

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

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SAE WEB ADDRESS:

For more information on this standard, visit
<https://www.sae.org/standards/content/AMS5887E/>

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 Alloy, Forgings
AMS2806	Identification, Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels and Corrosion and Heat-Resistant Steels and Alloys
AMS2808	Identification, Forgings
AMS7490	Rings, Flash Welded, Corrosion and Heat-Resistant Austenitic Steels, Austenitic-Type Iron, Nickel, or Cobalt Alloys, or Precipitation-Hardenable Alloys

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 E8/E8M	Tension Testing of Metallic Materials
ASTM E21	Elevated Temperature Tension Tests of Metallic Materials
ASTM E139	Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials
ASTM E354	Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with ASTM E354, or by other analytical methods acceptable to purchaser.

Table 1 - Composition

Element	Min	Max
Carbon	0.05	0.15
Manganese	--	0.50
Silicon	--	0.50
Phosphorus	--	0.015
Sulfur	--	0.015
Chromium	20.00	24.00
Cobalt	10.00	15.00
Molybdenum	8.00	10.00
Aluminum	0.80	1.50
Titanium	--	0.60
Boron	--	0.006
Iron	--	3.00
Copper	--	0.50
Nickel	remainder	

3.1.1 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 or shall be induction melted under vacuum. 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

The product shall be supplied in the following condition:

3.3.1 Bars

3.3.1.1 Hot finished or cold finished, then annealed; round bars shall be ground or turned.

3.3.1.2 Bar shall not be cut from plate (also see 4.4.1).

3.3.2 Forgings and Flash Welded Rings

Annealed and descaled.

3.3.2.1 Flash welded rings shall not be supplied unless specified or permitted on purchaser's part drawing. When supplied, rings shall be manufactured in accordance with AMS7490.

3.3.3 Stock for Forging or Flash Welded Rings

As ordered by the forging or flash welded ring manufacturer.

3.3.4 Heat Treatment

Bars, forgings, and flash welded rings shall be annealed by heating within the range 2075 to 2200 °F (1135 to 1204 °C), holding at the selected temperature within ± 25 °F (± 14 °C) for a time commensurate with cross-sectional thickness, and cooling at a rate equivalent to an air cool or faster.

3.4 Properties

The product shall conform to the following requirements:

3.4.1 Bars, Forgings, and Flash Welded Rings

3.4.1.1 Tensile Properties

Shall be as follows for product under 4 inches (102 mm) in least cross-sectional dimension, determined in accordance with ASTM E8/E8M:

3.4.1.1.1 Unless otherwise specified, the strain rate shall be set at 0.005 inch/inch/min (0.005 mm/mm/min) and maintained within a tolerance of ± 0.002 in/in/min (0.002 mm/mm/min) through 0.2% offset yield strain. The strain rate after yield may be increased to any value up to 0.5 in/in/min (or 0.5 mm/mm/min) or equivalent crosshead speed as a function of gage length.