

AEROSPACE	AMS5709™	REV. J		
MATERIAL SPECIFICATION	Issued1963-07Reaffirmed2013-12Revised2019-09Superseding AMS5709H			
Nickel Alloy, Corrosion and Heat-Resistant, Bars and Forgings 58Ni - 19.5Cr - 13.5Co - 4.3Mo - 3.0Ti - 1.4Al - 0.05Zr - 0.006B				

58Ni - 19.5Cr - 13.5Co - 4.3Mo - 3.0Ti - 1.4Al - 0.05Zr - 0.006B Consumable Electrode or Vacuum Induction Melted 1975 °F (1079 °C) Solution, Stabilization, and Precipitation Heat Treated (Composition similar to UNS N07001)

# RATIONALE

AMS5709J prohibits unauthorized exceptions (3.8), revises condition (3.3.1), reports (4.4), and identification (5.2.1.1), and results from a Five-Year Review and update of this specification.

1. SCOPE

## 1.1 Form

This specification covers a corrosion and heat-resistant nickel alloy in the form of bars, forgings, and forging stock.

1.2 Application

These products have been used typically for parts, such as pins, nuts, and turbine blades, requiring high strength up to 1500 °F (816 °C) and oxidation resistance up to 1750 °F (954 °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.

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), <u>www.sae.org</u>.

- AMS2261 Tolerances, Nickel, Nickel Alloy, and Cobalt Alloy Bars, Rods, and Wire
- 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
- AMS2374 Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steel and Alloy Forgings

TO PLACE A DOCUMENT ORDER:

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SAE INTERNATIONAL AMS5709™J Page 2 of 6				
AMS2750	Pyrometry			
AMS2806	Identification Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels and Corrosion a Heat-Resistant Steels and Alloys	and		
AMS2808	Identification Forgings			
ARP1917 Clarification of 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, <u>www.astm.org</u> .				
ASTM E18	Rockwell Hardness of Metallic Materials			
ASTM E139	Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials			
ASTM E140	Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockv Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness	vell		
ASTM E354	Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cot Alloys	oalt		

#### 3. TECHNICAL REQUIREMENTS

#### 3.1 Composition

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

Element	Min	Мах
Carbon	0.02	0.10
Manganese		0.10
Silicon		0.15
Phosphorus		0.015
Sulfur		0.015
Chromium	18.00	21.00
Cobalt	12.00	15.00
Molybdenum	3.50	5.00
Titanium	2.75	3.25
Aluminum	1.20	1.60
Zirconium	0.02	0.08
Boron	0.003	0.010
Iron		2.00
Copper		0.10
Lead		0.0005 (5 ppm)
Bismuth		0.00003 (0.3 ppm)
Selenium		0.0003 (3 ppm)
Nickel	remainder	,

## Table 1 - Composition

## 3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS2269.