

# AEROSPACE MATERIAL SPECIFICATION



AMS 5766C

Issued MAY 1972  
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Reaffirmed SEP 2000

Superseding AMS 5766B

Alloy, Corrosion and Heat Resistant, Bars and Forgings  
21Cr - 32.5Ni - 0.38Ti - 0.38Al - 45Fe  
Solution Heat Treated

UNS N08800

## 1. SCOPE:

### 1.1 Form:

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

### 1.2 Application:

These products have been used typically for low-stressed parts requiring corrosion and oxidation resistance particularly where such parts may require welding during fabrication, but usage is not limited to such applications.

## 2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

### 2.1 SAE Publications:

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

AMS 2261	Tolerances, Nickel, Nickel Alloy, and Cobalt Alloy Bars, Rods, and Wire
MAM 2261	Tolerances, Metric, Nickel, Nickel Alloy, and Cobalt Alloy Bars, Rods, and Wire
AMS 2269	Chemical Check Analysis Limits, Wrought Nickel Alloys and Cobalt Alloys
AMS 2371	Quality Assurance Sampling and Testing, Corrosion and Heat Resistant Steels and Alloys, Wrought Products and Forging Stock
AMS 2374	Quality Assurance Sampling and Testing, Corrosion and Heat Resistant Steel and Alloy Forgings
AMS 2806	Identification, Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels and Corrosion and Heat Resistant Steels and Alloys
AMS 2808	Identification, Forgings

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## 2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM E 8 Tension Testing of Metallic Materials

ASTM E 8M Tension Testing of Metallic Materials, Metric

ASTM E 354 Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

## 2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage

## 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 E 354, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Carbon	--	0.10
Manganese	--	1.50
Silicon	--	1.00
Phosphorus	--	0.035
Sulfur	--	0.015
Chromium	19.00	23.00
Nickel	30.00	35.00
Titanium	0.15	0.60
Aluminum	0.15	0.60
Copper	--	0.75
Iron	remainder	

3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2269.

## 3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Bars and Forgings: Hot finished and solution heat treated.

3.2.1.1 Surface finish of bars shall be as ordered.

3.2.2 Forging Stock: As ordered by the forging manufacturer.

3.3 Properties:

The product shall conform to the following requirements:

3.3.1 Tensile Properties: Shall be as specified in Table 2 for bars and forgings 4.0 inches (102 mm) and under in nominal diameter or distance between parallel sides, determined in accordance with ASTM E 8 or ASTM E 8M.

TABLE 2 - Minimum Tensile Properties

Property	Value
Tensile Strength	65.0 ksi (448 MPa)
Yield Strength at 0.2% Offset	25.0 ksi (172 MPa)
Elongation in 4D	30%

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.

3.4.1 Grain flow of die forgings, except in areas which contain flash-line end grain, shall follow the general contour of the forgings showing no evidence of re-entrant grain flow.

3.5 Tolerances:

Bars shall conform to all applicable requirements of AMS 2261 or MAM 2261.

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 performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

#### 4.2 Classification of Tests:

Tests for all technical requirements are acceptance tests and shall be performed on each heat or lot as applicable.

#### 4.3 Sampling and Testing:

Shall be as follows:

4.3.1 Bars and Forging Stock: In accordance with AMS 2371.

4.3.2 Forgings: In accordance with AMS 2374.

#### 4.4 Reports:

The vendor of the product shall furnish with each shipment a report showing the results of tests for chemical composition of each heat and for the tensile properties of each lot. This report shall include the purchase order number, heat and lot number, AMS 5766C, size, and quantity. If forgings are supplied, the part number and the size and melt source of stock used to make the forgings shall also be included.

#### 4.5 Resampling and Retesting:

Shall be as follows:

4.5.1 Bars and Forging Stock: In accordance with AMS 2371.

4.5.2 Forgings: In accordance with AMS 2374.

### 5. PREPARATION FOR DELIVERY:

#### 5.1 Sizes:

Except when exact lengths or multiples of exact lengths are ordered, straight bars will be acceptable in mill lengths of 6 to 24 feet (1.8 to 7.3 m) but not more than 25% of any shipment shall be supplied in lengths of 6 to 9 feet (1.8 to 2.7 m) except that for bars weighing over 25 pounds per foot (37 kg/m), short lengths down to 2 feet (610 mm) may be supplied.

#### 5.2 Identification:

Shall be as follows:

5.2.1 Bars: In accordance with AMS 2806.

5.2.2 Forgings: In accordance with AMS 2808.