



TECHNICAL DATA SHEET

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INCONEL Alloy 718

Precipitation Hardenable Nickel-Chromium Alloy

Document Control

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Specification	AMS 5662 / AMS 5663 / ASTM B637 by product form	Product Form / UNS	Bar, forging, billet, ring, plate by product form/spec / UNS N07718

Engineering use note: Starter-library values are intended for engineering screening and template standardization. Verify against the latest governing specification, drawing, PO, and MTR before production release.

1. General Description

INCONEL Alloy 718 is a precipitation-hardenable nickel-chromium alloy valued for high strength, fatigue resistance, and creep-rupture performance from cryogenic temperatures to elevated service temperatures. It is widely used in gas turbine and aerospace hardware.

2. Chemical Composition (wt%)

Property	Value
Nickel + Cobalt (Ni+Co)	50.0-55.0
Chromium (Cr)	17.0-21.0
Iron (Fe)	Balance
Niobium + Tantalum (Nb+Ta)	4.75-5.50
Molybdenum (Mo)	2.80-3.30
Titanium (Ti)	0.65-1.15
Aluminum (Al)	0.20-0.80
Carbon (C)	<=0.08
Manganese (Mn)	<=0.35
Silicon (Si)	<=0.35



3. Mechanical Properties

Property	Value
Condition	Solution treated and aged (typical)
Ultimate tensile strength	≥ 1240 MPa
0.2% yield strength	≥ 1030 MPa
Elongation	≥ 12 %
Hardness	Approx. 36-45 HRC depending on condition

4. Physical Properties

Property	Value
Density	8.19 g/cm ³
Elastic modulus	200-205 GPa
Thermal conductivity	Approx. 11.4 W/m.K at room temp
Melting range	1260-1336 C

5. Heat Treatment / Processing

Common practice uses solution treatment followed by a two-step age hardening cycle. Detailed practice depends on form, grain size, required properties, and controlling aerospace specification.

6. Corrosion / Environmental Performance

Good oxidation and corrosion resistance combined with very high strength. Useful in many high-temperature environments where precipitation-hardened nickel alloys are required.

7. Key Characteristics

- High strength to elevated temperature
- Excellent fatigue resistance
- Good creep-rupture strength
- Good cryogenic toughness
- Widely qualified aerospace alloy

8. Typical Applications

- Gas turbine disks and shafts
- Rocket motor hardware
- Fasteners
- High-temperature structural parts
- Cryogenic tankage and instrumentation

9. Standards & Equivalents

AMS 5662
AMS 5663
ASTM B637
UNS N07718



10. Notes & Limitations

Properties are highly condition dependent. Always verify heat treatment and product form requirements against the applicable aerospace or customer standard.