



TECHNICAL DATA SHEET

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INCONEL Alloy 625

Solid-Solution Strengthened Nickel-Chromium-Molybdenum Alloy

Document Control

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Specification	AMS 5666 / ASTM B443 / ASTM B446 by product form	Product Form / UNS	Sheet, plate, bar, pipe, tube, weld consumables by spec / UNS N06625

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 625 is a nickel-chromium-molybdenum alloy with niobium addition for solid-solution strengthening. It is chosen for excellent corrosion resistance, very good fatigue strength, and useful strength across a broad temperature range without the need for precipitation hardening.

2. Chemical Composition (wt%)

Property	Value
Nickel (Ni)	58.0 min
Chromium (Cr)	20.0-23.0
Molybdenum (Mo)	8.0-10.0
Niobium + Tantalum (Nb+Ta)	3.15-4.15
Iron (Fe)	<=5.0
Titanium (Ti)	<=0.40
Aluminum (Al)	<=0.40
Carbon (C)	<=0.10
Manganese (Mn)	<=0.50
Silicon (Si)	<=0.50



3. Mechanical Properties

Property	Value
Condition	Annealed typical wrought
Ultimate tensile strength	≥ 827 MPa
0.2% yield strength	≥ 414 MPa
Elongation	≥ 30 %
Hardness	Approx. 20-30 HRC typical wrought

4. Physical Properties

Property	Value
Density	8.44 g/cm ³
Elastic modulus	205 GPa
Thermal conductivity	Approx. 9.8 W/m.K at room temp
Melting range	1290-1350 C

5. Heat Treatment / Processing

Normally used in the annealed condition. Strength is largely obtained from solid-solution chemistry rather than age hardening.

6. Corrosion / Environmental Performance

Outstanding resistance to pitting, crevice corrosion, and chloride stress-corrosion cracking, along with excellent seawater and many chemical process corrosion characteristics.

7. Key Characteristics

- Excellent corrosion resistance
- High strength without precipitation hardening
- Excellent weldability
- Good fatigue resistance
- Useful from cryogenic to elevated temperatures

8. Typical Applications

- Seawater hardware
- Chemical process equipment
- Bellows and flexible joints
- Aerospace ducting and exhaust parts
- Nuclear and offshore components

9. Standards & Equivalents

AMS 5666
ASTM B443
ASTM B446
UNS N06625



10. Notes & Limitations

Product-form specifications differ in chemistry and property presentation. Select the controlling issue that matches the purchased form.