

SOUTHERLY ALLOY

Inconel 625 Bar and Rod | UNS N06625 | Werkstoff Nr. 2.4856

ASTM B446 / ASME SB446 / SAE AMS 5666 — Nickel-Chromium-Molybdenum-Niobium Alloy Bar and Rod

Product Description

Inconel 625 bar and rod is a solid-solution-strengthened nickel-chromium-molybdenum-niobium alloy combining very high strength with outstanding resistance to pitting, crevice corrosion and chloride stress-corrosion cracking. UNS N06625 bar is commonly supplied to ASTM B446 / ASME SB446 in round, square, hex, flat and forged sections for marine, aerospace, chemical processing, oil and gas and power generation.

Chemical Composition (per ASTM B446, typical limits)

Element	Content	Element	Content
Nickel (Ni)	Balance	Manganese (Mn)	0.50% max.
Chromium (Cr)	20.0–23.0%	Silicon (Si)	0.50% max.
Molybdenum (Mo)	8.0–10.0%	Phosphorus (P)	0.015% max.
Niobium + Tantalum (Nb + Ta)	3.15–4.15%	Sulfur (S)	0.015% max.
Iron (Fe)	5.00% max.	Aluminum (Al)	0.40% max.
Cobalt (Co)	1.00% max.	Titanium (Ti)	0.40% max.
Carbon (C)	0.10% max.		

Mechanical Properties (minimum values, per ASTM B446)

Condition	Tensile	Yield 0.2%	Elongation
Grade 1 — Annealed (≤101.6 mm dia.)	≥827 MPa	≥414 MPa	≥30%
Grade 1 — Annealed (101.6–254 mm dia.)	≥758 MPa	≥345 MPa	≥25%
Grade 2 — Solution annealed (all sizes)	≥690 MPa	≥276 MPa	≥30%

** Grade 1 is annealed at ≥871°C (1600°F); Grade 2 is solution annealed at ≥1093°C (2000°F), with or without a stabilization anneal ≥982°C (1800°F). Grade 1 is normally used up to ~593°C, Grade 2 above for creep/rupture service. The governing ASTM B446 grade, size and condition prevail.*

Physical Properties

Property	Value	Property	Value
Density	8.44 g/cm³	Melting Range	1290–1350°C
Strengthening	Solid-solution (Mo, Nb)	Service Temperature	Cryogenic to ≈980°C

Applicable Standards

Standard	Scope
ASTM B446	Nickel-chromium-molybdenum-niobium alloy bar and rod (principal)
ASME SB446	ASME bar and rod specification for pressure applications
ASTM B443 / B444	Related UNS N06625 plate, sheet, strip / seamless pipe and tube
SAE AMS 5666	Alloy 625 bar, forgings and rings — annealed (aerospace)
DIN 17752 / 2.4856	European nickel alloy bar designation and standard
ISO 9723 / 9724	Nickel and nickel alloy bar / rod
BS 3076 NA21 / VdTÜV 499	UK nickel alloy bar / German pressure equipment approval

Available Dimensions & Forms

Product Form	Typical Supply	Length
Round Bar	6–500 mm dia.	Single Random, Double Random or Custom
Round Rod	3–50 mm dia.	Single Random, Double Random or Custom
Bright Bar	6–150 mm dia.	Single Random, Double Random or Custom
Square Bar	10–150 mm	Single Random, Double Random or Custom
Hex Bar	10–150 mm A/F	Single Random, Double Random or Custom
Flat Bar	3–100 mm thick × 10–300 mm wide	Single Random, Double Random or Custom
Forged Bar	100–500 mm dia. or custom forged section	Custom
Precision-Ground Rod	3–100 mm dia., tight tolerance	Custom

Available dimensions depend on the manufacturing route, standard, material condition, and order quantity. Please confirm your required diameter, section, and length in the inquiry.

Surface Finishes

Surface Condition	Typical Characteristics / Applications
Hot Finished	As-hot-worked; general industrial applications and subsequent machining
Cold Drawn	Improved dimensional accuracy and surface finish, with increased strength from cold working
Bright Finished	Smooth, bright surface with improved dimensional control; cleaner surface appearance
Peeled	Machined surface with controlled diameter and improved uniformity; for further machining or finishing
Centerless Ground	Precision-ground surface with close dimensional tolerances and consistent diameter
Polished	Fine surface finish reducing roughness and improving appearance
Rough Turned	Large-diameter or forged bars; controlled dimensions with machining allowance

Southerly Alloy — nickel alloy bar, rod, pipe, tube, plate and fittings. Values are for reference; the mill test certificate prevails for final acceptance.