

Inconel 718 (UNS N07718) — Technical Data Sheet

Grade data sheet covering bar and rod, pipe and tube, and plate — values are minimum requirements per the governing ASTM specification.

Chemical Composition (ASTM B637 / B983 / B670)

Element	Content
Nickel (Ni)	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%
Cobalt (Co)	1.00% max.
Carbon (C)	0.08% max.
Manganese (Mn)	0.35% max.
Silicon (Si)	0.35% max.
Copper (Cu)	0.30% max.
Phosphorus (P)	0.015% max.
Sulfur (S)	0.015% max.
Boron (B)	0.006% max.

Minimum Room-Temperature Mechanical Properties

Product Form	Standard	Condition	Tensile Strength	Yield Strength, 0.2% Offset	Elongation
Bar and forgings	B637	Solution treated + aged	≥ 1275 MPa (185 ksi)	≥ 1034 MPa (150 ksi)	≥ 12%
Plate, sheet, and strip up to 25.4 mm	B670	Solution treated + aged	≥ 1241 MPa (180 ksi)	≥ 1034 MPa (150 ksi)	≥ 12%
Plate over 25.4 to 57.2 mm	B670	Solution treated + aged	≥ 1241 MPa (180 ksi)	≥ 1034 MPa (150 ksi)	≥ 10%
Seamless pipe and tube	B983	Solution annealed + precipitation hardened	≥ 1034 MPa (150 ksi)	≥ 862 MPa (125 ksi)	≥ 20%

Physical Properties (Approx.)

Property	Value
Density	8.19 g/cm³ (0.296 lb/in³)
Melting Range	1260–1336 °C (2300–2440 °F)
Elastic Modulus	200 GPa (29.0 × 10³ ksi)
Thermal Conductivity	11.4 W/m·°C at 20 °C
Specific Heat	435 J/kg·°C
Expansion Coefficient	13.0 µm/m·°C (20–100 °C)
Typical Aged Hardness	36–44 HRC
Alloy Type	Nickel-chromium-iron, precipitation hardenable
Strengthening	Gamma-double-prime Ni3Nb precipitation on double aging

Standards and Designations

Standard / Designation	Product / Application
ASTM B637 / ASME SB637	Bar, forgings, and forging stock (aged)
ASTM B983 / ASME SB983	Seamless pipe and tube (precipitation hardened)
ASTM B670 / ASME SB670	Plate, sheet, and strip, elevated-temperature service
ASTM B906 / B829	General requirements for flat-rolled and seamless product
SAE AMS 5662 / 5663	Bar and forging stock, solution treated and aged
SAE AMS 5589 / 5590	Seamless tube and hydraulic tubing
SAE AMS 5596 / 5597	Sheet, strip, and plate
DIN 17751 / 17752	European tube and bar standards, W.Nr. 2.4668
ISO 6207	Nickel alloy seamless tube
NACE MR0175 / ISO 15156	Sour-service qualification (reference)
API 6A	Wellhead and downhole equipment compliance
UNS N07718 · W.Nr. 2.4668 · EN NiCr19NbMo	Designations

Typical Supply Dimensions

Product Form	Typical Supply Range
Bar and rod	3–300 mm dia. by section and condition
Seamless pipe	OD 6–219 mm, wall 0.5–15 mm
Hot-finished pipe	OD up to 610 mm, heavier wall
Plate and sheet	0.25–57.2 mm thick, cut to length and width

Supply Conditions and Finishes

Surface Condition	Typical Use
Solution Annealed & Pickled	Standard condition for forming and welding stock
Aged	Final high-strength condition after double aging
Bright / Ground	Machined or ground finish on bar and precision components
As-Worked	Hot-worked or cold-worked surface for further fabrication

Values are for reference; the mill test certificate prevails for final acceptance. Dimensions, conditions, and surface finishes are confirmed at quotation.

Southerly Alloy — nickel alloy bar, rod, pipe, tube, plate and fittings · [www.southerly-alloy.com](#) · Values are for reference; the mill test certificate prevails for final acceptance.