

Incoloy® 925 (UNS N09925) — Material Data Sheet

ASTM B637 · UNS N09925 · Alloy 925

Age-hardenable nickel-iron-chromium alloy with Mo and Cu, sour-service

Age-hardened 925: an iron-nickel alloy with 140 ksi strength, sour-gas and chloride resistance and NACE approval — the economical downhole and wellhead fastener alloy.

TENSILE	140 ksi min	NICKEL	42.0–46.0 %
YIELD	105–110 ksi min by condition	SOUR SERVICE	NACE MR0175 / ISO 15156 listed
HARDNESS	38 HRC max	MAGNETIC	No

Nominal composition



■ Fe balance ~ 26.3% ■ Ni ~ 44.00% ■ Cr ~ 21.00% ■ Mo ~ 3.00% ■ Cu ~ 2.25% ■ Ti ~ 2.15% ■ Mn ~ 0.50% ■ C, Si, P, S, Nb, Al trace

Midpoints of the specification ranges, for orientation only. Limits are in the table.

Chemical composition — Incoloy® 925 (UNS N09925)

Element	Symbol	Min %	Max %
Carbon	C	—	0.03
Manganese	Mn	—	1.0
Silicon	Si	—	0.5
Phosphorus	P	—	0.03
Sulfur	S	—	0.03
Chromium	Cr	19.5	22.5
Molybdenum	Mo	2.5	3.5
Niobium	Nb	—	0.5
Titanium	Ti	1.9	2.40
Aluminium	Al	0.1	0.5
Copper	Cu	1.5	3.0
Nickel	Ni	42.0	46.0
Iron	Fe	22.0	—

Values per ASTM B637-16 Tables 1 and 3 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Physical properties (typical)

DENSITY	0.292 lb/in ³ (8.08 g/cm ³)
MODULUS OF ELASTICITY	29.0 × 10 ⁶ psi (200 GPa)
THERMAL EXPANSION (68–212 °F)	7.4 µin/in·°F
MAGNETIC	No

Heat treatment

Solution anneal at about 1850 °F, then age harden with a two-step treatment at about 1365 °F and 1150 °F. Hardness held at or below 38 HRC for sour service.

Mechanical properties — Incoloy® 925 (UNS N09925)

Condition and nominal diameter (in.)	Tensile strength, min (ksi)	Yield strength 0.2% offset, min (ksi)	Elongation, min (%)	Reduction of area, min (%)	Hardness
Cold worked, solution annealed and aged — 1] to 3 in.	140	105	18	25	38 HRC max
Hot worked, solution annealed and aged — 1 in. and over	140	110	18	25	38 HRC max

Values per ASTM B637-16 Tables 1 and 3 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Applicable standards

ASTM B637	Precipitation-hardening nickel alloy bars, forgings and forging stock
NACE MR0175 / ISO 15156-3	Cracking-resistant alloys for sour service
API 6A	Wellhead and Christmas-tree equipment

Forms we supply in Incoloy 925

- Studs and stud bolts
- Hex and heavy hex bolts
- Nuts and washers
- Socket head cap screws
- Machined components from certified bar

Typical applications

- Tubing hangers, packers and downhole tools
- Wellhead and valve bolting in sour gas
- Valve stems and pump shafts in brine
- Marine and offshore fasteners needing strength above 825
- Chemical process hardware with reducing acids