

Hastelloy X (UNS N06002) — Material Data Sheet

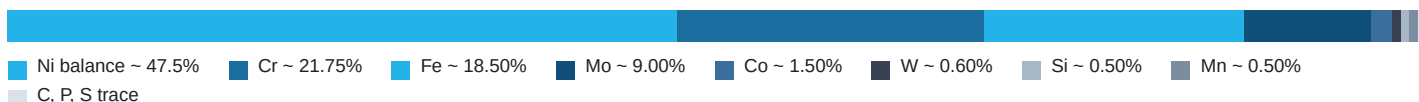
ASTM B572 rod · UNS N06002 · Hastelloy® X (Ni-Cr-Fe-Mo)

Solid-solution nickel-chromium-iron-molybdenum alloy for high-temperature strength and oxidation resistance

The combustion-zone alloy — oxidation resistant to 2200 °F with good creep strength — for gas-turbine, furnace and afterburner hardware.

TENSILE, B572 ANNEALED	95 ksi min	CHROMIUM / MOLYBDENUM	20.5–23 / 8–10 %
YIELD, B572 ANNEALED	35 ksi min	MAX SERVICE TEMPERATURE	About 2200 °F (oxidation)
ELONGATION	35 % min	MAGNETIC	No

Nominal composition



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

Chemical composition — Hastelloy X (N06002) per ASTM B572 Table 2

Element	Symbol	Min %	Max %
Nickel	Ni	balance	—
Chromium	Cr	20.5	23.0
Iron	Fe	17.0	20.0
Molybdenum	Mo	8.0	10.0
Cobalt	Co	0.5	2.5
Tungsten	W	0.2	1.0
Carbon	C	0.05	0.15
Silicon	Si	—	1.00
Manganese	Mn	—	1.00
Phosphorus	P	—	0.04
Sulfur	S	—	0.03

Values per ASTM B572-06(2016) Table 2 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Physical properties (typical)

DENSITY	0.297 lb/in ³ (8.22 g/cm ³)
MODULUS OF ELASTICITY	28.6 × 10 ⁶ psi (197 GPa)
MELTING RANGE	2300–2470 °F
MAGNETIC	No

Heat treatment

Not age hardenable. Solution annealed and rapidly cooled.

Rod properties — Hastelloy X per ASTM B572 Table 3, solution annealed

Condition and size	Tensile strength, min (ksi)	Yield strength 0.2%, min (ksi)	Elongation, min (%)
Solution annealed — rod 5/16 to 3½ in.	95	35	35

Values per ASTM B572-06(2016) Table 3 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Applicable standards

ASTM B572	UNS N06002 rod
ASME SB-572	Boiler and Pressure Vessel Code equivalent
ASTM B435	Alloy X plate, sheet and strip
AMS 5754	Aerospace alloy X bar and forgings

Forms we supply in Hastelloy X

- Full-thread studs and stud bolts
- Hex and heavy hex bolts
- Socket head cap screws
- Hex nuts in the same alloy
- Threaded rod
- Machined components from certified bar

Typical applications

- Gas-turbine combustor and transition-duct hardware
- Afterburner and exhaust components
- Industrial furnace muffles, rollers and fixtures
- Petrochemical furnace hardware
- Aircraft engine and APU fasteners