

Hastelloy B-2 (UNS N10665) — Material Data Sheet

ASTM B335 rod · F468 / F467 list the related N10001 alloy · UNS N10665 · Hastelloy® B-2 (Ni-Mo)

Solid-solution nickel-molybdenum alloy for reducing acids, solution annealed

The hydrochloric-acid alloy — 28 % molybdenum for all concentrations of HCl and other reducing acids — and the F468 fastener grade Ni 335.

TENSILE, B335 ANNEALED	110 ksi min	HARDNESS, F468 NI 335	20–32 HRC
YIELD, B335 ANNEALED	51 ksi min	NUT PROOF STRESS, F467 NI 335	115 ksi hex · 124 heavy hex
F468 NI 335 (N10001, HASTELLOY B)	115–145 ksi · 45 ksi yield	MAGNETIC	No

Nominal composition



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

Chemical composition — Hastelloy B-2 (N10665) per ASTM B335 Table 1

Element	Symbol	Min %	Max %
Nickel	Ni	balance	—
Molybdenum	Mo	26.0	30.0
Iron	Fe	—	2.0
Chromium	Cr	—	1.0
Cobalt	Co	—	1.00
Manganese	Mn	—	1.0
Carbon	C	—	0.02
Silicon	Si	—	0.10
Phosphorus	P	—	0.04
Sulfur	S	—	0.03

Values per ASTM B335-03(2018) Table 1 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Physical properties (typical)

DENSITY	0.333 lb/in ³ (9.22 g/cm ³)
MODULUS OF ELASTICITY	31.4 × 10 ⁶ psi (217 GPa)
MELTING RANGE	2375–2495 °F
MAGNETIC	No

Heat treatment

Not age hardenable. Solution annealed and water quenched; avoid the 1100–1500 °F range where intermetallics form.

Rod properties — Hastelloy B-2 per ASTM B335 Table 3

Condition and size	Tensile strength, min (ksi)	Yield strength 0.2%, min (ksi)	Elongation, min (%)
Solution annealed — 5 D16 to 3½ in.	110	51	40

Values per ASTM B335-03(2018) Table 3 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Fastener mechanical properties for the related F468 grade Ni 335, UNS N10001 Hastelloy B (marking F468S)

Nominal diameter (in.)	Hardness	Full-size tensile (ksi)	Full-size yield, min (ksi)	Machined tensile, min (ksi)	Machined yield, min (ksi)	Elongation in 4D, min (%)
All sizes	20–32 HRC	115–145	45	115	45	35

Values per ASTM F468-23 Table 2 (verified against the specification). F468 and F467 list Ni 335 as UNS N10001, the original Hastelloy B; N10665 (B-2) does not appear in either fastener specification, so B-2 fasteners are certified to B335 chemistry with properties agreed on the order. Confirm the edition called out on your purchase order with our estimating team. Full-size tensile range and yield; machined-specimen minimums in the last three columns.

Nut requirements for the related F467 grade Ni 335, UNS N10001 Hastelloy B (marking F467S)

Nut style	Hardness, min	Proof stress, min (ksi)
Hex and hex flange	20 HRC	115
Heavy hex, large hex flange and thick	20 HRC	124

Values per ASTM F467-24 Table 2 (verified against the specification). F468 and F467 list Ni 335 as UNS N10001, the original Hastelloy B; N10665 (B-2) does not appear in either fastener specification, so B-2 fasteners are certified to B335 chemistry with properties agreed on the order. Confirm the edition called out on your purchase order with our estimating team.

Applicable standards

ASTM B335	Nickel-molybdenum alloy rod
ASTM F468 / F467	Nonferrous bolts and nuts; list Ni 335 (UNS N10001, Hastelloy B) rather than N10665 B-2
ASME SB-335	Boiler and Pressure Vessel Code equivalent
ASTM B333	Alloy B-2 plate, sheet and strip

Forms we supply in Hastelloy B-2

- 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

- Hydrochloric acid production, storage and piping
- Sulfuric and phosphoric acid without oxidisers
- Acetic acid and acetic anhydride plants
- Hydrogen chloride gas handling
- Vacuum furnace fixtures