

Hastelloy C-276 (UNS N10276) — Material Data Sheet

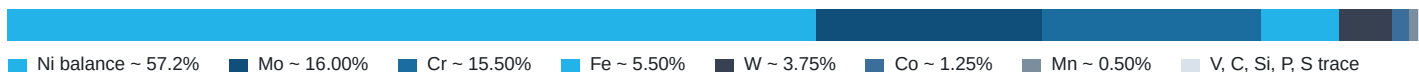
ASTM B574 rod · ASTM F468 / F467 fasteners · UNS N10276 · Hastelloy® C-276 (Ni-Mo-Cr-W)

Solid-solution nickel-molybdenum-chromium-tungsten alloy, solution annealed

The universal chemical-process alloy — resists oxidising and reducing acids, wet chlorine and sour gas — and the F468 fastener grade Ni 276.

TENSILE, B574 ANNEALED	100 ksi min	HARDNESS, F468	20–32 HRC
YIELD, B574 ANNEALED	41 ksi min	NUT PROOF STRESS, F467	110 ksi hex · 119 heavy hex
F468 FASTENER	110–140 ksi · 45 ksi yield	MAGNETIC	No

Nominal composition



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

Chemical composition — Hastelloy C-276 (N10276) per ASTM B574 Table 1

Element	Symbol	Min %	Max %
Nickel	Ni	balance	—
Molybdenum	Mo	15.0	17.0
Chromium	Cr	14.5	16.5
Iron	Fe	4.0	7.0
Tungsten	W	3.0	4.5
Cobalt	Co	—	2.5
Manganese	Mn	—	1.0
Vanadium	V	—	0.35
Carbon	C	—	0.010
Silicon	Si	—	0.08
Phosphorus	P	—	0.04
Sulfur	S	—	0.03

Values per ASTM B574-18 Table 1 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Physical properties (typical)

DENSITY	0.321 lb/in ³ (8.89 g/cm ³)
MODULUS OF ELASTICITY	29.8 × 10 ⁶ psi (205 GPa)
MELTING RANGE	2415–2500 °F
MAGNETIC	No

Heat treatment

Not age hardenable. Solution annealed and rapidly cooled; the low carbon and silicon let it be used as welded without a post-weld anneal, and it is not stress relieved.

Rod properties — Hastelloy C-276 per ASTM B574 Table 5, hot or cold finished, solution annealed

Condition and size	Tensile strength, min (ksi)	Yield strength 0.2%, min (ksi)	Elongation, min (%)
Solution annealed — all sizes	100	41	40

Values per ASTM B574-18 Table 5 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Fastener mechanical properties per ASTM F468 Table 2 (marking F468T)

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	110–140	45	110	45	25

Values per ASTM F468-23 Table 2 (verified against the specification). 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 per ASTM F467 Table 2 (marking F467T)

Nut style	Hardness, min	Proof stress, min (ksi)
Hex and hex flange	20 HRC	110
Heavy hex, large hex flange and thick	20 HRC	119

Values per ASTM F467-24 Table 2 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Applicable standards

ASTM B574	Low-carbon nickel-chromium-molybdenum alloy rod
ASTM F468 / F467	Nonferrous bolts and nuts (Ni 276, F468T / F467T)
ASME SB-574	Boiler and Pressure Vessel Code equivalent
NACE MR0175 / ISO 15156	Alloy C-276 for sour service

Forms we supply in Hastelloy C-276

- 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

- Flue-gas desulfurisation scrubbers and stack liners
- Chlorine, hypochlorite and bleach service
- Sulfuric, hydrochloric and mixed-acid process equipment
- Sour gas wellhead and downhole components
- Pharmaceutical and pulp-mill equipment