

Nimonic® 80A (UNS N07080) — Material Data Sheet

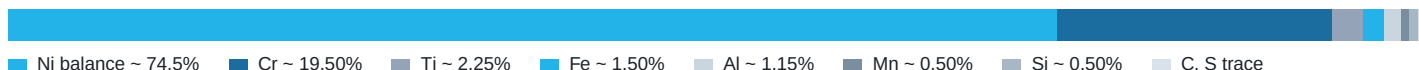
ASTM B637 · UNS N07080 · Alloy 80A

Precipitation-hardening nickel-chromium alloy with Ti and Al

The exhaust-valve and turbine-bolting superalloy: an 80/20 nickel-chromium alloy age hardened by titanium and aluminium, creep resistant to 1500 °F.

TENSILE, FULLY HEAT TREATED	135 ksi min	SERVICE	Creep-rated to about 1500 °F
YIELD, FULLY HEAT TREATED	90 ksi min	CHROMIUM	18.00–21.00 %
ELONGATION	20 % min	MAGNETIC	No

Nominal composition



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

Chemical composition — Nimonic 80A (UNS N07080)

Element	Symbol	Min %	Max %
Carbon	C	—	0.10
Manganese	Mn	—	1.00
Silicon	Si	—	1.00
Sulfur	S	—	0.015
Chromium	Cr	18.00	21.00
Titanium	Ti	1.80	2.70
Aluminium	Al	0.50	1.80
Iron	Fe	—	3.00
Nickel	Ni	balance	—

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	0.296 lb/in ³ (8.19 g/cm ³)
MODULUS OF ELASTICITY	32.0 × 10 ⁶ psi (222 GPa)
THERMAL EXPANSION (68–212 °F)	7.1 µin/in·°F
MAGNETIC	No

Heat treatment

Solution treat at 1950 ± 25 °F for 8 hours and air cool, stabilize at 1560 ± 25 °F for 24 hours and air cool, then age at 1290 ± 25 °F for 16 hours and air cool (B637 Table 2). B637 lists the condition as solution treated, stabilized and precipitation hardened. Machining is done in the solution-treated condition where possible.

Mechanical properties — Nimonic 80A (UNS N07080)

Condition	Tensile strength, min (ksi)	Yield strength 0.2% offset, min (ksi)	Elongation, min (%)	Reduction of area, min (%)	Hardness
Solution treated + stabilized + precipitation hardened — all	135	90	20	—	—

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 (N07080)
BS HR 1 / HR 201	British aerospace bar and forging specifications for Nimonic 80A
SAE AMS 5741	Aerospace bar specification for Alloy 80A
DIN 2.4952	European designation NiCr20TiAl

Forms we supply in Nimonic 80A

- Studs and stud bolts
- Hex and heavy hex bolts
- Nuts and washers
- Springs and pins
- Machined components from certified bar

Typical applications

- Exhaust valves for diesel and gas engines
- Gas turbine blades, discs and bolting
- Steam turbine bolting above 1000 °F
- Hot-section springs and fasteners
- Nuclear boiler and reactor fasteners
- Furnace and heat-treatment hardware