

ASTM A193 Grade B8MN Class 1B (316N Stainless) — Material Data Sheet

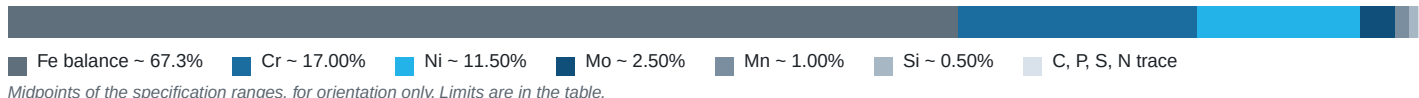
ASTM A193 / ASME SA-193 · UNS S31651 · AISI 316N

Nitrogen-strengthened molybdenum-bearing austenitic stainless, Class 1B solution treated or Class 2 strain hardened

316N stainless bolting — the chloride resistance of 316 with 80 ksi tensile and 35 ksi yield in the solution-treated condition.

TENSILE	80 ksi min	COMPANION NUT	ASTM A194 8MN
YIELD	35 ksi min	MAGNETIC	No in the annealed condition
NITROGEN	0.10–0.16 %	MARKING	B8MN

Nominal composition



Chemical composition — ASTM A193 B8MN (AISI 316N, UNS S31651)

Element	Symbol	Min %	Max %
Carbon	C	—	0.08
Manganese	Mn	—	2.00
Phosphorus	P	—	0.045
Sulfur	S	—	0.030
Silicon	Si	—	1.00
Chromium	Cr	16.0	18.0
Nickel	Ni	10.0	13.0
Molybdenum	Mo	2.00	3.00
Nitrogen	N	0.10	0.16

Values per ASTM A193/A193M-24, Tables 1 and 2 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Physical properties (typical)

DENSITY	0.289 lb/in ³ (8.00 g/cm ³)
MODULUS OF ELASTICITY	28.0 × 10 ⁶ psi (193 GPa)
MAGNETIC	No in the annealed condition

Heat treatment

Class 1B and 1D: carbide solution treated. Class 1A (B8MNA): solution treated in the finished condition. Strain-hardened Class 2 is a separate page.

Mechanical properties — ASTM A193 B8MN Class 1B and 1D

Nominal diameter (in.)	Tensile strength, min (ksi)	Yield strength 0.2% offset, min (ksi)	Elongation in 4D, min (%)	Reduction of area, min (%)	Hardness, max
Class 1B / 1D — all diameters	80	35	30	40	223 HBW / 96 HRB

Values per ASTM A193/A193M-24, Tables 1 and 2 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team. Class 1 sizes ¾ in. and smaller may be 241 HBW / 100 HRB. Strain-hardened Class 2 properties are on the B8MN Class 2 page.

Applicable standards

ASTM A193 / ASME SA-193	Alloy-steel and stainless steel bolting for high-temperature or high-pressure service
ASTM A194 GRADE 8MN	Companion nuts
ASME BPVC SECTION II PART D	Higher allowable stresses for 316N

Forms we supply in A193 B8MN Class 1B

- 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

- Offshore and coastal flange bolting designed to 316N allowables
- Large-diameter 316 studs
- Chemical and pharmaceutical process piping
- Seawater and desalination equipment