

ASTM A193 Grades B8LN and B8MLN (304LN / 316LN) — Material Data Sheet

ASTM A193 / ASME SA-193 · UNS S30453 · S31653 · AISI 304LN · 316LN

Low-carbon nitrogen-bearing austenitic stainless for welded and cryogenic service, Class 1 solution treated

304LN and 316LN bolting — low carbon for weld-zone corrosion resistance, nitrogen to recover the strength that low carbon gives away.

TENSILE, CLASS 1	75 ksi min	CARBON	0.030 % max
YIELD, CLASS 1	30 ksi min	NITROGEN	0.10–0.16 %
HARDNESS, CLASS 1	223 HBW / 96 HRB max	COMPANION NUT	ASTM A194 8LN / 8MLN

Nominal composition



■ Fe balance ~ 69.8% ■ Cr ~ 19.00% ■ Ni ~ 9.50% ■ Mn ~ 1.00% ■ Si ~ 0.50% ■ C, P, S, N trace

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

Chemical composition — ASTM A193 B8LN (AISI 304LN, UNS S30453)

Element	Symbol	Min %	Max %
Carbon	C	—	0.030
Manganese	Mn	—	2.00
Phosphorus	P	—	0.045
Sulfur	S	—	0.030
Silicon	Si	—	1.00
Chromium	Cr	18.0	20.0
Nickel	Ni	8.0	11.0
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 1 and 1D: carbide solution treated. Class 1A: solution treated in the finished condition.

Mechanical properties — ASTM A193 B8LN and B8MLN Classes 1, 1A 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 1 / 1D — all diameters	75	30	30	50	223 HBW / 96 HRB
Class 1A (B8LNA / B8MLNA) — all diameters	75	30	30	50	192 HBW / 90 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. No Class 2 (strain-hardened) condition is listed for these grades.

Chemical composition — ASTM A193 B8MLN (AISI 316LN, UNS S31653)

Element	Symbol	Min %	Max %
Carbon	C	—	0.030
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.

Applicable standards

ASTM A193 / ASME SA-193	Alloy-steel and stainless steel bolting for high-temperature or high-pressure service
ASTM A320 GRADES B8LN / B8MLN	Low-temperature service
ASTM A194 GRADES 8LN / 8MLN	Companion nuts

Forms we supply in A193 B8LN / B8MLN

- 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

- LNG and cryogenic piping and vessels
- Nuclear plant bolting
- Welded stainless assemblies
- Chemical service where sensitisation must be avoided