

ASTM A193 Grade B8MLCuN Class 2 (254 SMO Strain Hardened) — Material Data Sheet

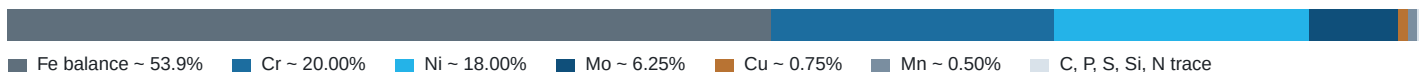
ASTM A193 Grade B8MLCuN Class 2 (254 SMO, UNS S31254) · 254 SMO®, solution treated and strain hardened

6 percent molybdenum super austenitic stainless steel, Class 1B solution treated or Class 2 strain hardened, cold worked for strength

6 percent molybdenum super-austenitic bolting cold worked to 110 ksi tensile in ¾ in. and under — seawater-grade corrosion resistance with Class 2 strength.

TENSILE (<=¾ IN.)	110 ksi min	CONDITION	Solution treated + strain hardened
YIELD (<=¾ IN.)	95 ksi min	COMPANION NUT	ASTM A194 8MLCuN
HARDNESS	321 HBW / 35 HRC max	MARKING	B8JSH

Nominal composition



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

Chemical composition — ASTM A193 B8MLCuN Class 2 (254 SMO, UNS S31254)

Element	Symbol	Min %	Max %
Carbon	C	—	0.020
Manganese	Mn	—	1.00
Phosphorus	P	—	0.030
Sulfur	S	—	0.010
Silicon	Si	—	0.80
Chromium	Cr	19.5	20.5
Nickel	Ni	17.5	18.5
Molybdenum	Mo	6.0	6.5
Copper	Cu	0.50	1.00
Nitrogen	N	0.18	0.25

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	0.288 lb/in³ (8.00 g/cm³)
MODULUS OF ELASTICITY	28.0 × 10 ⁶ psi (195 GPa)
MAGNETIC	No

Heat treatment

Carbide solution treated, then strain hardened by cold reduction of the bar before machining. Full-size tensile testing of headed Class 2 components after strain hardening is permitted by the specification. Cold-worked strength is lost above about 800 °F, so Class 2 is a moderate-temperature grade.

Mechanical properties — ASTM A193 B8MLCuN Class 2

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 2 — ¾ and under	110	95	15	45	321 HBW / 35 HRC
Class 2 — over ¾ to 1	100	80	20	45	321 HBW / 35 HRC
Class 2 — over 1 to 1¼	95	65	25	45	321 HBW / 35 HRC
Class 2 — over 1¼ to 1½	90	50	30	45	321 HBW / 35 HRC

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 2 is limited to 1½ in. Strain-hardened austenitic steel may not show uniform properties through the section, particularly over ¾ in. diameter.

Applicable standards

ASTM A193 / ASME SA-193	Alloy-steel and stainless steel bolting for high-temperature or high-pressure service
ASTM A276 / A479	S31254 bar stock
ASTM A194 GRADE 8MLCUN	Companion nuts
NACE MR0175 / ISO 15156	S31254 for sour service within its limits

Forms we supply in A193 B8MLCuN Class 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

- Seawater and brackish cooling-water flanges under high load
- Desalination high-pressure piping
- Flue-gas desulfurization scrubber bolting
- Chlorinated and bleach-plant equipment
- Offshore firewater and ballast systems