

ASTM A193 Grade B8C Class 1 (347 Stainless) — Material Data Sheet

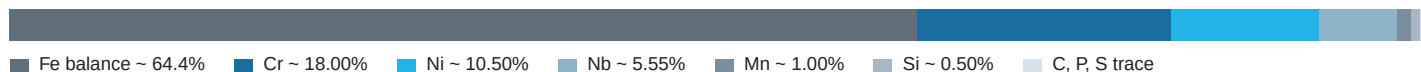
ASTM A193 / ASME SA-193 · UNS S34700 · AISI 347 (niobium stabilised)

Austenitic niobium-stabilised stainless steel; Class 1 solution treated, Class 2 strain hardened

347 stainless bolting stabilised with niobium against sensitisation — for hot hydrogen, refinery and welded stainless service between 800 and 1500 °F.

TENSILE	75 ksi min	COMPANION NUT	ASTM A194 8C
HARDNESS	223 HBW / 96 HRB max	TYPICAL SERVICE	-425 °F to 1500 °F
HEAT TREATMENT	Carbide solution treated	MARKING	B8C

Nominal composition



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

Chemical composition — ASTM A193 B8C (AISI 347, UNS S34700)

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	17.0	19.0
Nickel	Ni	9.0	12.0
Niobium (columbium)	Nb	10 × C	1.10

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/in ³ (7.97 g/cm ³)
MODULUS OF ELASTICITY	28.0 × 10 ⁶ psi (193 GPa)
THERMAL EXPANSION (68–212 °F)	9.3 µin/in·°F
MAGNETIC	No in the annealed condition

Heat treatment

Class 1: carbide solution treated. Class 1A (B8CA): solution treated in the finished condition, 192 HBW / 90 HRB max. Strain-hardened Class 2 is a separate page.

Mechanical properties — ASTM A193 B8C Class 1 and Class 1A

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 — all diameters	75	30	30	50	223 HBW / 96 HRB
Class 1A (B8CA) — 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. Class 1 sizes ¾ in. and smaller may be 241 HBW / 100 HRB. Strain-hardened Class 2 properties are on the B8C Class 2 page.

Applicable standards

ASTM A193 / ASME SA-193	Alloy-steel and stainless steel bolting for high-temperature or high-pressure service
ASTM A320 GRADE B8C	The same material for low-temperature service
ASTM A194 GRADE 8C	Companion 347 stainless nuts
ASTM A276 / A479	347 bar stock

Forms we supply in A193 B8C Class 1

- Full-thread studs and stud bolts
- Double-end and tap-end studs
- Hex and heavy hex bolts
- Socket head cap screws
- Threaded rod (cut and rolled thread)
- Machined components from certified bar

Typical applications

- Refinery hydrotreater and reformer piping
- Hot hydrogen and hydrocarbon service
- Welded stainless vessels and heat exchangers
- Exhaust, flue and expansion-joint hardware
- Aerospace and gas-turbine ground equipment