

ASTM A193 Grade B8T Class 1 (321 Stainless) — Material Data Sheet

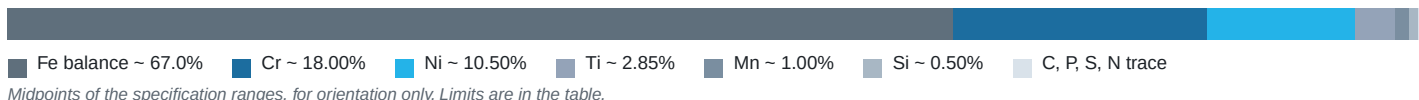
ASTM A193 / ASME SA-193 · UNS S32100 · AISI 321 (titanium stabilised)

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

321 stainless bolting stabilised with titanium — the match for 321 piping and vessels in hot, cyclic and welded service.

TENSILE	75 ksi min	COMPANION NUT	ASTM A194 8T
HARDNESS	223 HBW / 96 HRB max	TYPICAL SERVICE	-425 °F to 1500 °F
HEAT TREATMENT	Carbide solution treated	MARKING	B8T

Nominal composition



Chemical composition — ASTM A193 B8T (AISI 321, UNS S32100)

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
Titanium	Ti	5 × (C+N)	0.70
Nitrogen	N	—	0.10

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	0.286 lb/in ³ (7.92 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 (B8TA): solution treated in the finished condition, 192 HBW / 90 HRB max. Strain-hardened Class 2 is a separate page.

Mechanical properties — ASTM A193 B8T 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 (B8TA) — 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 B8T 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 B8T	The same material for low-temperature service
ASTM A194 GRADE 8T	Companion 321 stainless nuts
ASTM A276 / A479	321 bar stock

Forms we supply in A193 B8T 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

- 321 process piping and furnace headers
- Expansion joints and bellows hardware
- Exhaust manifolds and flue systems
- Welded stainless vessels and heat exchangers
- Aerospace and turbine ground-support equipment