

Low-Silicon Bronze C65100 — Material Data Sheet

ASTM F468 / F467 fasteners · ASTM B98 rod · UNS C65100 · Low-silicon bronze B (Alloy 651)

Copper with 1.5 percent silicon — the cold-headed silicon bronze fastener alloy

The silicon bronze for cold-headed screws and bolts — 70 to 100 ksi in small sizes under F468, with the corrosion resistance and warm colour of bronze.

TENSILE, F468 (¼–¾ IN.)	70–100 ksi	NUT PROOF STRESS, F467	70 ksi hex · 76 heavy hex
YIELD, F468 (¼–¾ IN.)	55 ksi min	SILICON	0.8–2.0 %
HARDNESS, F468	75–95 HRB	MAGNETIC	No

Nominal composition

■ Cu balance ~ 97.1% ■ Si ~ 1.40% ■ Zn ~ 0.75% ■ Mn, Fe, Pb trace

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

Chemical composition — C65100 per ASTM B98 Table 1

Element	Symbol	Min %	Max %
Copper	Cu	balance	—
Silicon	Si	0.8	2.0
Manganese	Mn	—	0.7
Iron	Fe	—	0.8
Zinc	Zn	—	1.5
Lead	Pb	—	0.05

Values per ASTM B98/B98M-13(2019) Table 1 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Physical properties (typical)

DENSITY	0.316 lb/in³
MAGNETIC	No
SPARKING	Non-sparking

Heat treatment

Not heat treatable. Strength is developed by cold work; cold-headed fasteners are supplied as formed.

Fastener mechanical properties per ASTM F468 Table 2 (marking F468K)

Nominal diameter (in.)	Hardness	Full-size tensile (ksi)	Full-size yield, min (ksi)	Machined tensile, min (ksi)	Machined yield, min (ksi)	Elongation in 4D, min (%)
0.250 to 0.750	75–95 HRB	70–100	55	70	53	8
0.875 to 1.500	70–95 HRB	55–90	40	54	38	8

Values per ASTM F468-23 Table 2 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team. Full-size tensile range and yield; machined-specimen minimums in the last three columns.

Nut requirements per ASTM F467 Table 2 (marking F467K)

Nut style	Hardness, min	Proof stress, min (ksi)
Hex and hex flange	75 HRB	70
Heavy hex, large hex flange and thick	75 HRB	76

Values per ASTM F467-24 Table 2 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Bar and rod properties per ASTM B98 Table 2 (C65100 rod)

Temper and size (in.)	Tensile strength, min (ksi)	Yield strength at 0.5 % extension, min (ksi)	Elongation, min (%)
O60 soft anneal — all sizes	40	12	30
H02 half-hard — to ½	55	20	11
H02 half-hard — over ½ to 2	55	20	12
H04 hard — to ½	65	35	8
H04 hard — over ½ to 2	65	35	10
H06 extra-hard — to ½	85	55	6

Values per ASTM B98/B98M-13(2019) Table 2 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Applicable standards

ASTM F468 / F468M	Nonferrous bolts, cap screws and studs (Cu 651, F468K)
ASTM F467 / F467M	Nonferrous nuts (Cu 651, F467K)
ASTM B98 / B98M	Copper-silicon alloy rod, bar and shapes
ASTM B99	Copper-silicon alloy wire for cold heading

Forms we supply in C65100 Silicon Bronze

- Cold-headed hex bolts, cap screws and machine screws to F468
- Hex and heavy hex nuts to F467
- Studs and threaded rod
- Machined bronze hardware
- Certified B98 rod

Typical applications

- Marine and dock hardware
- Architectural, timber-frame and restoration fasteners
- Water and wastewater treatment plants
- Chemical and pulp-mill equipment
- Electrical hardware where copper conductivity and strength are both needed