

# C89844 Lead-free replacement for C844

	Continuous cast	GreenAlloys™
Product description	Bismuth tin bronze	
Solids	1/2" to 10" O.D.	
Tubes	1 1/8" to 9" O.D.	
Rectangles	Up to 15"	
Standard lengths	144"	
Shape/form	Semi-finished, mill stock or near-net shapes, anode, bar stock, billet/bloom, squares, hex, plate, profile or structural shape, flats/rectangular bar	
Compliance	C89844 is compliant with key legislation including (1) Federal Safe Drinking Water Act - SDWA, (2) S. 3874 Federal Reduction of Lead in Drinking Water Act, (3) California AB1953, and (4) Vermont Act 193	

## Typical uses

### Plumbing

Fittings/valves for potable water

## Chemical composition

Cu (%)	Pb (%)	Sn (%)	Zn (%)	Fe (%)	P (%)	Ni (%) <sup>1</sup>	Al (%)	Bi (%)	S (%)	Sb (%)	Si (%)
83.00-86.00	0.20	3.00-5.00	7.00-10.00	0.30	0.05	1.00	0.005	2.00-4.00	0.08	0.25	0.005

Chemical composition provided by CDA

<sup>1</sup>Ni value includes Co.

Note: Cu + sum of named elements, 99.3% min. Single values represent maximums.

## Machinability

Copper alloy UNS no.	Machinability rating	Density (lb/in <sup>3</sup> at 68 ° F)
C89844	70	0.31

## Mechanical properties

Tensile strength, min		Yield strength, at 0.5% extension under load, min		Elongation, in 2 in. or 50 mm, min	Brinell hardness (500 kg load)	Remarks
ksi	MPa	ksi	MPa	%	typical BHN	
28	193	13	90	5	55	

## Physical properties

	US customary	Metric
Melting point – liquidus	1850 °F	1010 °C
Melting point – solidus	1550 °F	853 °C
Density	0.31 lb/in <sup>3</sup> at 68 °F	8.58 gm/cm <sup>3</sup> at 20 °C
Specific gravity	8.58	8.58
Electrical conductivity	16.8% IACS at 68 °F	0.095 MegaSiemens/cm at 20 °C
Thermal conductivity	46.7 Btu/sq ft/ft hr/°F at 68 °F	80.9 W/m at 20 °C
Coefficient of thermal expansion 68-392	10 · 10 <sup>-6</sup> per °F (68-392 °F)	17.3 · 10 <sup>-6</sup> per °C (20-200 °C)
Specific heat capacity	0.08 Btu/lb/°F at 68 °F	335.2 J/kg at 20 °C
Modulus of elasticity in tension	13000 ksi	89622 MPa

Physical properties provided by CDA

## Fabrication properties

Technique	Suitability
Soldering	Excellent
Brazing*	Good
Oxyacetylene welding	Not recommended
Gas shielded arc welding	Not recommended
Coated metal arc welding	Not recommended
Machinability rating	70

Fabrication properties provided by CDA

\*Since brazing is performed within the hot-short range, strain must be avoided during brazing and cooling.

## Casting characteristics

Casting attribute	Level
Casting yield	High
Drossing	Medium
Effect of section size	High
Fluidity	Medium
Gassing	Medium
Patternmakers shrinkage (inches per foot)	3/16
Shrinkage in solidification	Medium

Casting characteristics provided by CDA