

# C89831 Lead-free replacement for C844

	Continuous cast	GreenAlloys™
<b>Product description</b>	Bismuth tin bronze	
<b>Solids</b>	1/2" to 10" O.D.	
<b>Tubes</b>	1 1/8" to 9" O.D.	
<b>Rectangles</b>	Up to 15"	
<b>Standard lengths</b>	144"	
<b>Shape/form</b>	Semi-finished, mill stock or near-net shapes, anode, bar stock, billet/bloom, squares, hex, plate, profile or structural shape, flats/rectangular bar	
<b>Compliance</b>	C89831 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

### Industrial

Bushings, high-speed/high-pressure bearings

## Chemical composition

Cu (%) <sup>1</sup>	Pb (%)	Sn (%)	Zn (%)	Fe (%)	P (%)	Ni (%) <sup>2</sup>	Al (%)	Bi (%)	S (%)	Sb (%)	Si (%)
87.00-91.00	0.10	2.70-3.70	2.00-4.00	0.30	0.05	1.00	0.005	2.70-3.70	0.08	0.25	0.005

Chemical composition provided by CDA

<sup>1</sup>0.01 - 2.0% as any single or combination of Ce-La or other rare earth(x) elements as agreed upon. (x)ASM International definition: one of the group of chemically similar metals with atomic numbers 57 through 71 commonly referred to as lanthanides. <sup>2</sup>Ni value includes Co.  
Note: Cu + sum of named elements, 99.0% min. Single values represent maximums.

## Machinability

Copper alloy UNS no.	Machinability rating	Density (lb/in <sup>3</sup> at 68 ° F)
C89831	85	0.318

## 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	
29	200	13	90	5	55	

## Physical properties

	US customary	Metric
Melting point – liquidus	1893 °F	1033 °C
Melting point – solidus	1518 °F	825 °C
Density	0.318 lb/in <sup>3</sup> at 68 °F	8.81 gm/cm <sup>3</sup> at 20 °C
Specific gravity	8.81	8.81
Electrical conductivity	20.38% IACS at 68 °F	0.117 MegaSiemens/cm at 20 °C
Thermal conductivity	50 Btu/sq ft/ft hr/°F at 68 °F	86.6 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	0.092 Btu/lb/°F at 68 °F	385.4 J/kg at 20 °C
Modulus of elasticity in tension	13700 ksi	94458 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	Poor
Machinability rating	85

Fabrication properties provided by CDA

## Casting characteristics

Casting attribute	Level
Casting yield	High
Drossing	Low
Effect of section size	Low
Fluidity	Medium
Gassing	Medium
Patternmakers shrinkage (inches per foot)	5/32
Shrinkage in solidification	Low

Casting characteristics provided by CDA