

# C54400

Standard-stocked product	Extruded and drawn
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Product description	Phosphor bronze B-2
Tempers	H04 hard
Solids	3/8" to 2 3/4" O.D.
Hex	3/8" to 2" O.D.
Standard lengths	144"

## Typical uses

### Electrical

Electrical connectors

### Industrial

Bearings, bushings, gears, pinions, screw machine products, shafts, sleeve bearings, thrust bearings, thrust washers, valve parts

## Similar or equivalent specification

CDA	ASTM	SAE	AMS	Federal	Military	Other
C54400	B139 B139M	J461 J463				

## Chemical composition

Cu (%)	Pb (%)	Sn (%)	Zn (%)	Fe (%)	P (%)
Remain	3.00-4.00	3.50-4.50	1.50-4.50	0.10	0.01-0.50

Chemical composition according to ASTM B139/B139M-12(2017)

Note: Cu + sum of named elements, 99.5% min. Single values represent maximums.

## Machinability

Copper alloy UNS no.	Machinability rating	Density (lb/in <sup>3</sup> at 68 ° F)
C54400	80	0.320

C54400 continued

## Mechanical properties

Mechanical properties according to ASTM B139/B139M-12(2017)

C54400

H04 hard

Size range  $\frac{1}{16}$ " to  $\frac{1}{4}$ " round and hexagonal inclusive

Tensile strength, min		Yield strength, at 0.5% extension under load, min		Elongation, 4x diameter or specimen thickness, min	Rockwell "B" hardness	Remarks
ksi	MPa	ksi	MPa	%	typical HRB	
65	450			8	86	

Size range  $\frac{1}{4}$ " to  $\frac{1}{2}$ " round and hexagonal inclusive

Tensile strength, min		Yield strength, at 0.5% extension under load, min		Elongation, 4x diameter or specimen thickness, min	Rockwell "B" hardness	Remarks
ksi	MPa	ksi	MPa	%	typical HRB	
60	415			10	86	

Size range over  $\frac{1}{2}$ " to 1" round and hexagonal inclusive

Tensile strength, min		Yield strength, at 0.5% extension under load, min		Elongation, 4x diameter or specimen thickness, min	Rockwell "B" hardness	Remarks
ksi	MPa	ksi	MPa	%	typical HRB	
55	380			12	86	

Size range over 1" round and hexagonal

Tensile strength, min		Yield strength, at 0.5% extension under load, min		Elongation, 4x diameter or specimen thickness, min	Rockwell "B" hardness	Remarks
ksi	MPa	ksi	MPa	%	typical HRB	
50	345			15	86	

## C54400 continued

### Physical properties

	US customary	Metric
Melting point – liquidus	1830 °F	999 °C
Melting point – solidus	1700 °F	927 °C
Density	0.320 lb/in <sup>3</sup> at 68 °F	8.89 gm/cm <sup>3</sup> at 20 °C
Specific gravity	8.89	8.89
Electrical conductivity	19% IACS at 68 °F	0.111 MegaSiemens/cm at 20 °C
Thermal conductivity	50 Btu/sq ft/ft hr/°F at 68 °F	86.5 W/m at 20 °C
Coefficient of thermal expansion 68-572	9.6 · 10 <sup>-6</sup> per °F (68-572 °F)	16.6 · 10 <sup>-6</sup> per °C (20-300 °C)
Specific heat capacity	0.09 Btu/lb/°F at 68 °F	377.1 J/kg at 20 °C
Modulus of elasticity in tension	15000 ksi	103420 MPa
Modulus of rigidity	5600 ksi	38610 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
Spot weld	Not recommended
Seam weld	Not recommended
Butt weld	Fair
Capacity for being cold worked	Good
Machinability rating	80

Fabrication properties provided by CDA

### Thermal properties

Treatment	Minimum*	Maximum*
Annealing	900	1250

Thermal properties provided by CDA

\*Temperature is measured in Fahrenheit.

### Common fabrication processes

Blanking, drawing, forming and bending, machining, shearing, stamping

Common fabrication processes provided by CDA