

# C54400

Wrought

<b>Product Description:</b>	Phosphor Bronze B-2
<b>Tempers:</b>	H04 Hard
<b>Solids:</b>	3/8" to 2 1/2" O.D.
<b>Hex:</b>	3/8" to 2" O.D.
<b>Rectangles:</b>	Consult Mill
<b>Standard Lengths:</b>	144"

## Typical Uses

<b>Electrical</b>	electrical connectors
<b>Industrial</b>	bushings, gears, pinions, screw machine products, thrust washers, valve parts, sleeve bearings, thrust bearings, bearings, shafts

## Similar or Equivalent Specification

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

## Chemical Composition

Cu%	Pb%	Sn%	Zn%	Fe%	P%
Rem.	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/cu in at 68 °F)
C54400	80	0.320

# Mechanical Properties

C54400 continued

Mechanical Properties according to ASTM B139/B139M-12(2017)  
C54400  
H04 Hard

**SIZE RANGE: ¼" ROUND AND HEXAGONAL TO ½" INCLUSIVE**

Tensile Strength, min		Yield Strength, at .5% Extension Under Load, min		Elongation, in 2 in. or 50 mm min	Rockwell "B" Hardness	Remarks
ksi	MPa	ksi	MPa	%	typical HRB	
60	415			10	83	

**SIZE RANGE: OVER ½" ROUND AND HEXAGONAL TO 1" INCLUSIVE**

Tensile Strength, min		Yield Strength, at .5% Extension Under Load, min		Elongation, in 2 in. or 50 mm min	Rockwell "B" Hardness	Remarks
ksi	MPa	ksi	MPa	%	typical HRB	
55	380			12	83	

**SIZE RANGE: OVER 1" ROUND AND HEXAGONAL**

Tensile Strength, min		Yield Strength, at .5% Extension Under Load, min		Elongation, in 2 in. or 50 mm min	Rockwell "B" Hardness	Remarks
ksi	MPa	ksi	MPa	%	typical HRB	
50	345			15	80	

# 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	500 Btu/sq ft/ft hr/°F at 68 °F	86.5 W/m at 20 °C
Coefficient of Thermal Expansion	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

Joining 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

Fabrication Properties provided by CDA

## Thermal Properties

C54400 continued

Treatment	Temp./Time - US	Temp./Time - SI
Stress Temperature		
Solution Minimum		
Solution Maximum		
Solution Time		
Solution Medium		
Precipitation Value		
Precipitation Time		
Precipitation Medium		
Annealing Minimum	900	483
Annealing Maximum	1250	677
Annealing Time		
Hot Treatment Minimum		
Hot Treatment Maximum		

Thermal Properties provided by CDA