

# C64200 Lead-Free Replacement

Wrought

<b>Product Description:</b>	Aluminum Bronze
<b>Tempers:</b>	HR50 Drawn and Stress Relieved
<b>Solids:</b>	3/16" to 6" OD
<b>Hex:</b>	1/2" to 2" OD
<b>Rectangles:</b>	Consult Mill
<b>Standard Lengths:</b>	144"

## Typical Uses

<b>Automotive</b>	valve guides, automobile engine
<b>Electrical</b>	pole line hardware
<b>Fasteners</b>	nuts, bolts
<b>Industrial</b>	valve bodies, valve stems, gears, cams, valve components
<b>Marine</b>	hardware

## Similar or Equivalent Specification

CDA	ASTM	ASARCON	SAE	AMS	FEDERAL	MILITARY	OTHER
C64200	B150 B150M		J461 J463	4631	QQ-C-465B AMD1		

## Chemical Composition

Cu% <sup>1</sup>	Pb%	Sn%	Zn%	Fe%	Ni% <sup>2</sup>	Al%	Mn%	Si%	As%
Rem.	0.05	0.20	0.50	0.30	0.25	6.30- 7.60	0.10	1.50- 2.20	0.09

Chemical Composition according to ASTM B150/B150M-14

<sup>1</sup>Cu value includes Ag.

<sup>2</sup>Ni value includes Co.

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)
C64200	60	0.278

# Mechanical Properties

C64200 continued

Mechanical Properties according to ASTM B150/B150M-14  
C64200

HR50 Drawn and Stress Relieved Temper

## SIZE RANGE: UNDER 1/2" ROD

Tensile Strength, min		Yield Strength, at .5% Extension Under Load, min		Elongation, 4x diameter or specimen thickness	Rockwell "B" Hardness	Remarks
ksi	MPa	ksi	MPa	%	min to max HRB	
90	620	45	310	9	80-100	

## SIZE RANGE: 1/2" TO 1" ROD INCLUSIVE

Tensile Strength, min		Yield Strength, at .5% Extension Under Load, min		Elongation, 4x diameter or specimen thickness	Rockwell "B" Hardness	Remarks
ksi	MPa	ksi	MPa	%	min to max HRB	
85	585	45	310	12	80-100	

## SIZE RANGE: OVER 1" TO 2" ROD INCLUSIVE

Tensile Strength, min		Yield Strength, at .5% Extension Under Load, min		Elongation, 4x diameter or specimen thickness	Rockwell "B" Hardness	Remarks
ksi	MPa	ksi	MPa	%	min to max HRB	
80	550	42	290	12	80-100	

## SIZE RANGE: OVER 2" TO 3" ROD INCLUSIVE

Tensile Strength, min		Yield Strength, at .5% Extension Under Load, min		Elongation, 4x diameter or specimen thickness	Rockwell "B" Hardness	Remarks
ksi	MPa	ksi	MPa	%	min to max HRB	
75	517	35	241	15	70-95	

## SIZE RANGE: OVER 3" TO 4" ROD INCLUSIVE (M30 as hot extruded)

Tensile Strength, min		Yield Strength, at .5% Extension Under Load, min		Elongation, 4x diameter or specimen thickness	Rockwell "B" Hardness	Remarks
ksi	MPa	ksi	MPa	%	min to max HRB	
70	483	30	207	15	65-95	



**SIZE RANGE: OVER 4" TO 6" ROD (M30 as hot extruded)**

Tensile Strength, min		Yield Strength, at .5% Extension Under Load, min		Elongation, 4x diameter or specimen thickness	Rockwell "B" Hardness	Remarks
ksi	MPa	ksi	MPa	%	min to max HRB	
70	483	25	172	15	65-95	

## Physical Properties

	US Customary	Metric
Melting Point – Liquidus	1840° F	1004° C
Melting Point – Solidus	1800° F	982° C
Density	0.278 lb/in <sup>3</sup> at 68° F	7.69 gm/cm <sup>3</sup> at 20° C
Specific Gravity	7.69	7.69
Electrical Conductivity	8% IACS at 68° F	0.047 MegaSiemens/cm at 20° C
Thermal Conductivity	26 Btu · ft/(hr · ft <sup>2</sup> · °F) at 68° F	45 W/m at 20° C
Coefficient of Thermal Expansion	10 · 10 <sup>-6</sup> per °F (68°-572° F)	17.3 · 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 293° C
Modulus of Elasticity in Tension	16000 ksi	110310 MPa
Modulus of Rigidity	6000 ksi	41370 MPa

Physical Properties provided by CDA

## Fabrication Properties

Joining Technique	Suitability
Soldering	Not Recommended
Brazing	Fair
Oxyacetylene Welding	Not Recommended
Gas Shielded Arc Welding	Fair
Coated Metal Arc Welding	Fair
Spot Weld	Fair
Seam Weld	Fair
Butt Weld	Fair
Capacity for Being Cold Worked	Poor
Capacity for Being Hot Formed	Excellent
Forgeability Rating	80

Fabrication Properties provided by CDA

## Thermal Properties

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	1100	594
Annealing Maximum	1300	705
Annealing Time		
Hot Treatment Minimum	1300	705
Hot Treatment Maximum	1600	871

Thermal Properties provided by CDA

