

# C31600

Continuous Cast and Drawn

<b>Product Description:</b>	Leaded Commercial Bronze (nickel-bearing)
<b>Temper:</b>	H02 Half Hard, H04 Hard
<b>Solids:</b>	3/8" to 2" O.D.
<b>Hex:</b>	3/8" to 2" O.D.
<b>Standard Lengths:</b>	144"

## Typical Uses

<b>Builders Hardware</b>	hardware
<b>Electrical</b>	connectors
<b>Fasteners</b>	fasteners, nuts, screws
<b>Industrial</b>	screw machine parts

## Similar or Equivalent Specification

CDA	ASTM	SAE	AMS	Federal	Military	Other
C31600	B140 B140M				MIL-V-18436	

## Chemical Composition

Cu%	Pb%	Zn%	Fe%	P%	Ni%
87.50- 90.50	1.30- 2.50	Rem.	0.10	0.04- 0.10	0.70- 1.20

Chemical Composition according to ASTM B140/B140M-12(2017)

Note: Cu + Sum of Named Elements, 99.6% min. Single values represent maximums.

## Machinability

Copper Alloy UNS No.	Machinability Rating	Density (lb/in <sup>3</sup> at 68 ° F)
C31600	80	0.320

## Mechanical Properties

Mechanical Properties according to ASTM B140/B140M-12(2017)

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H02 Half Hard

**SIZE RANGE: 1/2" DIAMETER AND UNDER**

Tensile Strength, min		Yield Strength, at 0.5% Extension Under Load, min		Elongation, in 2 in. or 50 mm min	Rockwell "B" Hardness	Remarks
ksi	MPa	ksi	MPa	%	typical HRB	
50	345	30	205	7	61	

**SIZE RANGE: OVER 1/2" DIAMETER TO 1" INCLUSIVE**

Tensile Strength, min		Yield Strength, at 0.5% Extension Under Load, min		Elongation, in 2 in. or 50 mm min	Rockwell "B" Hardness	Remarks
ksi	MPa	ksi	MPa	%	typical HRB	
45	310	27	185	10	61	

**SIZE RANGE: OVER 1" DIAMETER**

Tensile Strength, min		Yield Strength, at 0.5% Extension Under Load, min		Elongation, in 2 in. or 50 mm min	Rockwell "B" Hardness	Remarks
ksi	MPa	ksi	MPa	%	typical HRB	
40	275	25	170	12	58	

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H04 Hard

**SIZE RANGE: 2" DIAMETER AND UNDER**

Tensile Strength, min		Yield Strength, at 0.5% Extension Under Load, min		Elongation, in 2 in. or 50 mm min	Rockwell "B" Hardness	Remarks
ksi	MPa	ksi	MPa	%	typical HRB	
60	415	50	345	6	72	

## Physical Properties

	US Customary	Metric
Melting Point – Liquidus	1900 °F	1038 °C
Melting Point – Solidus	1850 °F	1010 °C
Density	0.32 lb/in <sup>3</sup> at 68 °F	8.86 gm/cm <sup>3</sup> at 20 °C
Specific Gravity	8.86	8.86
Electrical Conductivity	32% IACS at 68 °F	0.187 MegaSiemens/cm at 20 °C
Thermal Conductivity	81 Btu/sq ft/ft hr/°F at 68 °F	140.2 W/m at 20 °C
Coefficient of Thermal Expansion 68-572	10.2 · 10 <sup>-6</sup> per °F (68-572 °F)	17.6 · 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	17000 ksi	117212 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
Capacity for Being Hot Formed	Poor
Machinability Rating	80

Fabrication Properties provided by CDA

## Thermal Properties

Treatment	Minimum*	Maximum*
Annealing	800	1200

Thermal Properties provided by CDA

\*Temperature is measured in Fahrenheit.