

C65100 Lead-Free Replacement

Wrought

| | |
|-----------------------------|---|
| Product Description: | Low-Silicon Bronze B |
| Tempers: | H02 Half-Hard, H04 Hard, H06 Extra-Hard |
| Solids: | 3/8" to 2" OD |
| Hex: | 3/8" to 2" OD |
| Rectangles: | Consult Mill |
| Standard Lengths: | 144" |

Typical Uses

| | |
|-------------------|---|
| Electrical | conduit, pole line hardware, motor, rotor bars |
| Fasteners | bolts, cable clamps, cap screws, machine screws, nuts, rivets, u bolts, fasteners, screws |
| Industrial | oil refinery plumbing tube, heat exchanger tube, welding rod, hydraulic pressure lines |
| Marine | hardware |

Similar or Equivalent Specification

| CDA | ASTM | ASARCON | SAE | AMS | FEDERAL | MILITARY | OTHER |
|--------|-------------|---------|-----|-----|---------|----------|-------|
| C65100 | B98 B98M | | | | | | |

Chemical Composition

| Cu% ¹ | Pb% | Zn% | Fe% | Mn% | Si% |
|------------------|------|------|------|------|---------------|
| Rem. | 0.05 | 1.50 | 0.80 | 0.70 | 0.80- 2.00 |

Chemical Composition according to ASTM B98/B98M-13

¹Cu value includes Ag.

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) |
|----------------------|----------------------|-----------------------------|
| C65100 | 30 | 0.316 |



Mechanical Properties

C65100 continued

Mechanical Properties according to ASTM B98/B98M-13
 C65100
 H02 Half-Hard

SIZE RANGE: UP TO ½" ROD 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 | % | min to max HRB | |
| 55 | 380 | 20 | 140 | 11 | 60-85 | |

SIZE RANGE: OVER ½" TO 2" ROD

| 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 | % | min to max HRB | |
| 55 | 380 | 20 | 140 | 12 | 60-85 | |

C65100
 H04 Hard

SIZE RANGE: UP TO ½" ROD

| 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 | % | min to max HRB | |
| 65 | 450 | 35 | 241 | 8 | 65-90 | |

SIZE RANGE: OVER ½" TO 2" ROD

| 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 | % | min to max HRB | |
| 65 | 450 | 35 | 241 | 10 | 65-90 | |



C65100
H06 Extra-Hard

C65100 continued

SIZE RANGE: UP TO ½" ROD

| 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 | % | min to max HRB | |
| 85 | 585 | 55 | 380 | 6 | 75-95 | |

SIZE RANGE: OVER ½" TO 1" INCLUSIVE ROD

| 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 | % | min to max HRB | |
| 75 | 515 | 45 | 310 | 8 | 75-95 | |

SIZE RANGE: OVER 1" TO 1½" ROD

| Tensile Strength, min | | Yield Strength, at .5% Extension Under Load, min | | Elongation, in 2 in. or 50 mm min | Brinell Hardness | Remarks |
|-----------------------|-----|--|-----|-----------------------------------|------------------|---------|
| ksi | MPa | ksi | MPa | % | min to max HRB | |
| 75 | 515 | 40 | 275 | 8 | 75-95 | |

Physical Properties

| | US Customary | Metric |
|----------------------------------|---|---|
| Melting Point – Liquidus | 1940° F | 1060° C |
| Melting Point – Solidus | 1890° F | 1032° C |
| Density | 0.316 lb/in ³ at 68° F | 8.75 gm/cm ³ at 20° C |
| Specific Gravity | 8.75 | 8.75 |
| Electrical Conductivity | 12% IACS at 68° F | 0.07 MegaSiemens/cm at 20° C |
| Thermal Conductivity | 330 Btu · ft/(hr · ft ² · °F) at 68° F | 57.1 W/m at 20° C |
| Coefficient of Thermal Expansion | 9.9 · 10 ⁻⁶ per °F (68°-572° F) | 17.1 · 10 ⁻⁶ 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 | 17000 ksi | 117210 MPa |
| Modulus of Rigidity | 6400 ksi | 44130 MPa |

Physical Properties provided by CDA



Fabrication Properties

| Joining Technique | Suitability |
|--------------------------------|-------------|
| Soldering | Excellent |
| Brazing | Excellent |
| Oxyacetylene Welding | Good |
| Gas Shielded Arc Welding | Excellent |
| Coated Metal Arc Welding | Fair |
| Spot Weld | Excellent |
| Seam Weld | Good |
| Butt Weld | Excellent |
| Capacity for Being Cold Worked | Excellent |
| Capacity for Being Hot Formed | Excellent |

Fabrication Properties provided by CDA

Thermal Properties

C65100 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 | 1300 | 705 |
| Hot Treatment Maximum | 1300 | 705 |

Thermal Properties provided by CDA

