

C90700 (Tin Bronze, 65)

Chemical Composition

(%max., unless shown as range or min.)

| | Cu ⁽¹⁾ | Al | Sb | Fe | Pb | Ni ⁽²⁾ | P ⁽³⁾ | Si | S | Sn | Zn |
|------------------|-------------------|------|-----|-----|-----|-------------------|------------------|------|-----|-----------|-----|
| Min./Max. | 88.0-90.0 | .005 | .20 | .15 | .50 | .50 | .30 | .005 | .05 | 10.0-12.0 | .50 |
| Nominal | 89.0 | - | - | - | - | - | - | - | - | 11.0 | - |

(1) In determining Cu min., Cu may be calculated as Cu + Ni.

(2) Ni value includes Co.

(3) For continuous castings, P shall be 1.5%, max.

Note: Cu + Sum of Named Elements, 99.4% min.

Mechanical Properties (measured at room temperature, 68 F (20 C))

| Temper | Section Size | Cold Work | Typ/Temp | Tensile Strength | Yield Strength | | | Rockwell Hardness | Vickers Hard. | Brinell Hard. | Shear Strength | Fatigue Strength* | Izod Impact Strength |
|-------------------------------|--------------|-----------|----------|------------------|------------------------|---------------|----------------|-------------------|---------------|---------------|----------------|-------------------|----------------------|
| | | | | | (0.5% ext. under load) | (0.2% offset) | (0.05% offset) | | | | | | |
| | in. | % | F | ksi | ksi | ksi | % B | C | F | 30T | 500 | ksi | ft-lb |
| | mm. | | C | MPa | MPa | MPa | | | | | | MPa | J |
| As Sand Cast | | | | | | | | | | | | | |
| M01 | 0.0 | 0 | TYP | 68 | 44 | 22 | - | - | 20- | - | - | 25 | 0.0 |
| | 0.0 | | | 20 | 303 | 152 | - | - | 20- | - | - | 172 | 0.0 |
| M01 | 0.0 | 0 | SMIN | 68 | 35 | 17 | - | - | 10- | - | - | - | 0.0 |
| | 0.0 | | | 20 | 241 | 117 | - | - | 10- | - | - | - | 0.0 |
| As Centrifugal Cast | | | | | | | | | | | | | |
| M02 | 0.0 | 0 | TYP | 68 | 55 | 30 | - | - | 16- | - | - | - | 0.0 |
| | 0.0 | | | 20 | 379 | 207 | - | - | 16- | - | - | - | 0.0 |
| As Continuous Cast | | | | | | | | | | | | | |
| M07 | 0.0 | 0 | SMIN | 68 | 40 | 25 | - | - | 10- | - | - | - | 0.0 |
| | 0.0 | | | 20 | 276 | 172 | - | - | 10- | - | - | - | 0.0 |
| As Permanent Mold Cast | | | | | | | | | | | | | |
| M05 | 0.0 | 0 | TYP | 68 | 55 | 30 | - | - | 16- | - | - | - | 0.0 |
| | 0.0 | | | 20 | 379 | 207 | - | - | 16- | - | - | - | 0.0 |
| As Centrifugal Cast | | | | | | | | | | | | | |
| M02 | 0.0 | 0 | SMIN | 68 | 50 | 28 | - | - | 12- | - | - | - | 0.0 |
| | 0.0 | | | 20 | 345 | 193 | - | - | 12- | - | - | - | 0.0 |

*Fatigue Strength: 100×10^6 cycles, unless indicated as $[N] \times 10^6$.

Physical Properties

| <="" b=""> | US Customary |
|----------------------------------|---|
| Melting Point - Liquidus | 1830 F |
| Melting Point - Solidus | 1528 F |
| Density | 0.317 lb/in ³ at 68 F |
| Specific Gravity | 8.770 |
| Electrical Resistivity | 107.40 ohms-cmil/ft @ 68 F |
| Electrical Conductivity | 10 %IACS @ 68 F |
| Thermal Conductivity | 40.80 Btu · ft/(hr · ft ² · °F) at 68F |
| Coefficient of Thermal Expansion | $10.20 \cdot 10^{-6}$ per °F (68-392 F) |
| Specific Heat Capacity | 0.090 Btu/lb/°F at 68 F |
| Modulus of Elasticity in Tension | 15000 ksi |
| Magnetic Permeability | 1 |