



## C519 Phosphor Bronze 6% Alloy Wire

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### Introduction

A phosphor bronze, alloy C519 has 6% nominal tin producing higher mechanical strengths with a slight decrease in electrical conductivity when compared to C510 phosphor bronze. Often functionally interchangeable with C510 which predominates in North America, alloy C519 is generally used in Europe.

To learn more please contact our [sales department](#).

# C519 Phosphor Bronze 6% Alloy Wire

| Chemical Composition - Limits         |  | Chemical Composition - Nominal |               |
|---------------------------------------|--|--------------------------------|---------------|
| Cu rem (99.5 min incl named elements) |  | Cu 93.8                        |               |
| Sn 5.0-7.0                            |  | Sn 6.0                         |               |
| Pb 0.05 max                           |  | P 0.20                         |               |
| Zn 0.30 max                           |  |                                |               |
| Fe 0.10 max                           |  |                                |               |
| P 0.03-0.35                           |  |                                |               |
| Specifications                        |  | Fabrication Index              |               |
| ASTM B103                             |  | Soldering                      | 5 - Excellent |
| EN 12166                              |  | Hot Worked                     | 5 - Excellent |
|                                       |  | Cold Worked                    | 5 - Excellent |
|                                       |  | Brazing                        | 5 - Excellent |
|                                       |  | Machinability                  | 1 - Poor      |

## Physical Properties

|                                    |  |
|------------------------------------|--|
| Annealing Range (Min)              | 700 °F                                   |
| Annealing Range (Max)              | 1350 °F                                  |
| Density                            | 0.319 lb/in <sup>3</sup>                 |
| Electrical Resistivity (Annealed)  | 74.1 Ω·cir-mil/ft @ 68 °F                |
| Electrical Conductivity (Annealed) | 14% IACS @ 68 °F                         |
| Thermal Conductivity               | 38 Btu/ft <sup>2</sup> /ft·hr/°F @ 68 °F |
| Coefficient of Thermal Expansion   | 10 per °F (68-572 °F)                    |
| Modulus of Elasticity (Tension)    | 16 ksi                                   |
| Modulus of Rigidity (Tension)      | 6 ksi                                    |
| Melting Point (Solidus)            | 1,700 °F                                 |
| Melting Point (Liquidus)           | 1,900 °F                                 |

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## Round Wire

| TEMPER NAME | TEMPER CODE | TENSILE STRENGTH (ksi) |      | MILL LIMITS (inch) |
|-------------|-------------|------------------------|------|--------------------|
|             |             | Min                    | Max  |                    |
| Annealed    | R370        | 54.0                   | 68.0 | .0010 - .1285 inch |
| 1/4 Hard    | R460        | 67.0                   | 81.0 |                    |
| 1/2 Hard    | R560        | 81.0                   | 97.0 |                    |
| 3/4 Hard    | R670        | 97.0                   | 115  |                    |
| Hard        | R790        | 115                    | 138  |                    |
| Spring      | R950        | 138                    |      |                    |

## Square Wire

| TEMPER NAME | TEMPER CODE | TENSILE STRENGTH (ksi) |      | MILL LIMITS (inch) |
|-------------|-------------|------------------------|------|--------------------|
|             |             | Min                    | Max  |                    |
| Annealed    | R370        | 54.0                   | 68.0 | .0100 - .0808 inch |
| 1/4 Hard    | R460        | 67.0                   | 81.0 |                    |
| 1/2 Hard    | R560        | 81.0                   | 97.0 |                    |
| 3/4 Hard    | R670        | 97.0                   | 115  |                    |
| Hard        | R790        | 115                    | 138  |                    |
| Spring      | R950        | 138                    |      |                    |

## Rolled Flat

| TEMPER NAME | TEMPER CODE | TENSILE STRENGTH (ksi) |     | MILL LIMITS (inch) |
|-------------|-------------|------------------------|-----|--------------------|
|             |             | Min                    | Max |                    |

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## Rolled Flat

| TEMPER NAME | TEMPER CODE | TENSILE STRENGTH (ksi) |      | MILL LIMITS (inch)   |
|-------------|-------------|------------------------|------|--|
|             |             | Min                    | Max  |  |
| Spring      | H02         | 64.0                   | 79.0 | .0150 - .2500 inch<br><br>Thickness:<br>.0100 - .0500 inch<br><br>Width: |
| Spring      | O60         | 48.0                   | 63.0 |  |
| Spring      | H04         | 80.0                   | 96.0 |  |