# **C17510** Copper-Nickel-Beryllium Alloy Wire

## Introduction

As a low beryllium alloy, C17510 resides at the lower strength end of the beryllium copper strength spectrum but in comparison has a substantial increase in electrical conductivity. The alloy processes and heat treats like all beryllium coppers and can also be provided in a (HM) “Mill Hardened” temper.

To learn more please contact our sales department.

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# **C17510** Copper-Nickel-Beryllium Alloy Wire

| Chemical Composition - Limits | Chemical Composition - Nominal |
|---|---|
| Cu rem - incl Ag (99.5 min incl named elements) | Cu 97.8 |
| Be 0.2-0.6 | Be 0.4 |
| Ni 1.4-2.2 | Ni 1.8 |
| Al 0.20 max | |
| Co 0.3 max | |
| Fe 0.10 max | |
| Si 0.20 max | |

| Specifications | Fabrication Index | |
|---|---|---|
| ASTM B441 | Soldering | 4 - Very Good |
| ASTM B534 | Hot Worked | 4 - Very Good |
| | Cold Worked | 5 - Excellent |
| | Brazing | 4 - Very Good |
| | Machinability | 1 - Poor |

## Physical Properties

| | |
|---|---|
| Annealing Range (Min) | 1550 °F |
| Annealing Range (Max) | 1700 °F |
| Density | 0.317 lb/in³ |
| Electrical Resistivity (Annealed) | 21.6 Ω·cir-mil/ft @ 68 °F |
| Electrical Conductivity (Annealed) | 48% IACS @ 68 °F |
| Thermal Conductivity | 120 Btu/ft²/ft·hr/°F @ 68 °F |
| Coefficient of Thermal Expansion | 9.8 per °F (68-572 °F) |
| Modulus of Elasticity (Tension) | 19 ksi |
| Modulus of Rigidity (Tension) | 7 ksi |
| Melting Point (Solidus) | 1,750 °F |

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| | |
|---|---|
| Melting Point (Liquidus) | 1,920 °F |

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## Round Wire

| TEMPER NAME | TEMPER CODE | TENSILE STRENGTH (ksi) Min | Max | MILL LIMITS (inch) |
|---|---|---|---|---|
| Annealed | TB00 | 35.0 | 55.0 | .0010 - .1285 inch |
| Hard | TD04 | 65.0 | 80.0 | |
| AT | TF00 | 100 | 130 | |
| HT | TH04 | 110 | 140 | |

## Square Wire

| TEMPER NAME | TEMPER CODE | TENSILE STRENGTH (ksi) Min | Max | MILL LIMITS (inch) |
|---|---|---|---|---|
| Annealed | TB00 | 35.0 | 55.0 | .0100 - .0808 inch |
| Hard | TD04 | 65.0 | 80.0 | |
| AT | TF00 | 100 | 130 | |
| HT | TH04 | 110 | 140 | |

## Rolled Flat

| TEMPER NAME | TEMPER CODE | TENSILE STRENGTH (ksi) Min | Max | MILL LIMITS (inch) |
|---|---|---|---|---|
| Annealed | TB00 | 35.0 | 55.0 | Thickness: .0100 - .0500 inch<br>Width: .0150 - .2500 inch |
| 1/2 Hard | TD02 | 60.0 | 75.0 | |
| Hard | TD04 | 70.0 | 85.0 | |
| AT | TF00 | 100 | 130 | |
| 1/2 HT | TH02 | 110 | 140 | |
| HT | TH04 | 110 | 140 | |
| 1/2 HM | TM02 | 95.0 | 120 | |
| | | | | |

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## Rolled Flat

| TEMPER NAME | TEMPER CODE | TENSILE STRENGTH (ksi) | | MILL LIMITS (inch) |
|---|---|---|---|---|
| | | Min | Max | |
| HM | TM04 | 110 | 135 | |

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