ALLOY DATA

# C15100
ASTM B747

wieland

Alloy C151 was developed by Olin Brass for specific applications demanding high electrical conductivity and excellent resistance to stress relaxation at elevated temperatures. As a precipitation hardened alloy these properties are combined with good strength and bend formability to make Alloy C151 a material that meets the demands of a wide variety of applications including electronic devices, power switching systems and automotive hybrid electrical systems.

## Chemical Composition

| | |
|---|---|
| **Copper**[1] | **Remainder** |
| **Zirconium** | **0.05 - 0.15%** |

[1] Copper plus named elements, 99.9% min

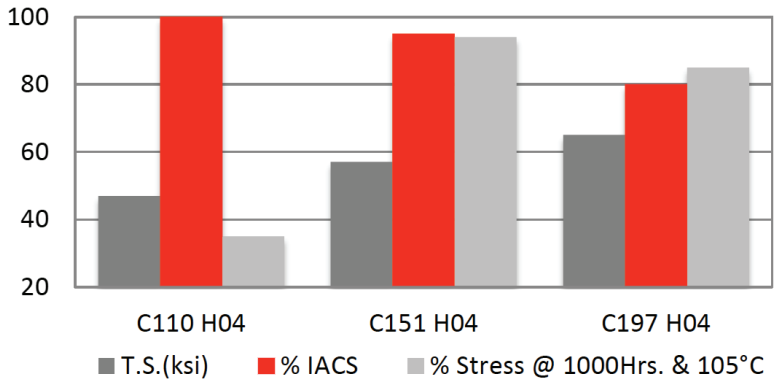


**Figure 1:** Comparison of Tensile Strength , Electrical Conductivity and Stress Relaxation performance of select highly conductive materials.

## Physical Properties

| | English Units | Metric Units |
|---|---|---|
| Density | 0.323 lb/in$^3$ @ 68ºF | 8.94 g/cm$^3$ |
| Thermal Conductivity | 208 BTU-ft/ft$^2$-hr-ºF | 371 W/mºK |
| Electrical Resistivity | 10.9 ohm circ mils/ft | 1.81 microhm-cm |
| Electrical Conductivity (annealed) | 95% IACS* | 0.551 megamho/cm |
| Electrical Conductivity (rolled) | 90% IACS* | 0.522 megamho/cm |
| Modulus of Elasticity | 17,500,000 psi | 123 kN/mm$^2$ |
| Coeff. Of Thermal Expansion | | |
| 68-572ºF (20-300ºC) | 9.7 PPM/ºF | 17.6 PPM/ºC |
| 68-392ºF (20-200ºC) | 9.4 PPM/ºF | 17.0 PPM/ºC |
| 68-212ºF (20-100ºC) | 9.1 PPM/ºF | 16.3 PPM/ºC |

*International Annealed Copper Standard

## Mechanical Properties

| Temper[1] | Tensile Strength | | Yield Strength[2] | | % Elongation[2] | Typical 90º Bend Formability GW/BW[3] | |
|---|---|---|---|---|---|---|---|
| | ksi | N/mm$^2$ | ksi | N/mm$^2$ | | | |
| Annealed | 37-42 | 255-290 | 13 | 90 | 38 | - | - |
| 1/4 Hard | 40-45 | 275-310 | 35 | 240 | 22 | 0.5 | 0.5 |
| 1/2 Hard | 43-51 | 295-350 | 42 | 290 | 10 | 0.8 | 0.8 |
| 3/4 Hard | 47-56 | 325-385 | 50 | 345 | 5 | 1.3 | 1.3 |
| Hard | 53-62 | 365-425 | 56 | 385 | 3 | 1.5 | 1.5 |
| Extra Hard | 59-65 | 405-450 | 60 | 415 | 2 | 2.0 | 2.0 |
| Spring Hard | 64-71 | 440-490 | 66 | 455 | 1 | 2.5 | 2.5 |

[1] Mechanical properties subject to change. All tempers listed are made to a Tensile Strength specification unless otherwise noted.

[2] Nominal Values [3] DATA FOR REFERENCE ONLY. R/T = Bend Radius/Material Thickness <0.016" (0.4mm) thick, 11/16 (17.5mm) wide.