

Olin Brass introduces Alloy C19020 to meet the needs of the automotive, electronic and electrical markets. This alloy is licensed by Olin Brass from Dowa Metals in Japan. It was developed as Alloy NB105 to meet increasing requirements of current carrying capacity, stiffness, formability and service temperature survivability being demanded by the automotive and electronic industries. For higher electrical conductivity or strength requirements, consider C19720 or C18080.

**Chemical Composition**

|                           |                   |
|---------------------------|-------------------|
| <b>Copper<sup>1</sup></b> | <b>Remainder</b>  |
| <b>Nickel</b>             | <b>0.50-3.0%</b>  |
| <b>Tin</b>                | <b>0.30-0.9%</b>  |
| <b>Phosphorous</b>        | <b>0.01-0.20%</b> |

1. Cu plus Named Elements = 99.8%

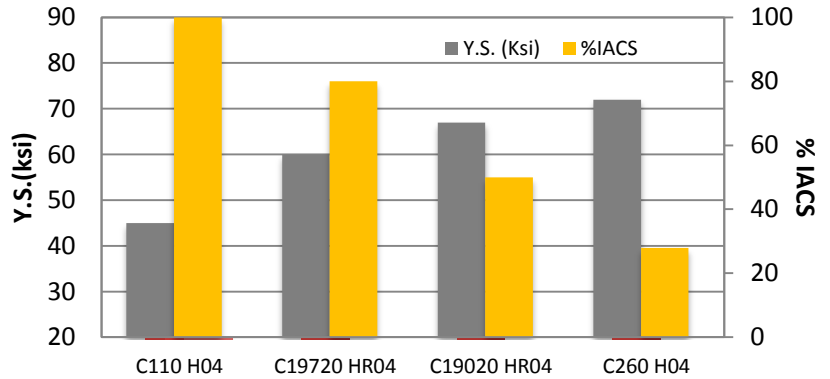


Figure 1: Comparison of Yield Strength and Electrical Conductivity performance of select automotive connector materials.

**Physical Properties**

|                                    | English Units                     | Metric Units           |
|------------------------------------|-----------------------------------|------------------------|
| Density                            | 0.322 lb/in <sup>3</sup> @ 68°F   | 8.91 g/cm <sup>3</sup> |
| Thermal Conductivity               | 115 BTU-ft/ft <sup>2</sup> -hr-°F | 200 W/m <sup>0</sup> K |
| Electrical Resistivity             | 20.74 ohm circ mils/ft            | 3.45 microhm-cm        |
| Electrical Conductivity (annealed) | 50% IACS*                         | 0.290 megamho/cm       |
| Modulus of Elasticity              | 18,800,000 psi                    | 129 kN/mm <sup>2</sup> |
| Coeff. Of Thermal Expansion        |                                   |                        |
| 68-572°F (20-300°C)                | 9.7 PPM/°F                        | 17.5 PPM/°C            |

\*International Annealed Copper Standard

**Mechanical Properties**

| Temper <sup>1</sup> | Tensile Strength |                   | Yield Strength <sup>2</sup> |                   | % Elongation <sup>2</sup> | Typical 90° Bend Formability GW/BW <sup>3</sup> |     |
|---------------------|------------------|-------------------|-----------------------------|-------------------|---------------------------|---|-----|
|                     | ksi              | N/mm <sup>2</sup> | ksi                         | N/mm <sup>2</sup> |                           |   |     |
| 1/2 Hard            | 58-70            | 400-485           | 63                          | 435               | 7                         | 0.5   | 0.5 |
| Hard                | 65-74            | 450-510           | 67                          | 460               | 5                         | 0.8   | 1.0 |
| Extra Hard          | 71-80            | 490-550           | 73                          | 505               | 4                         | 1.3   | 1.8 |
| Spring Hard         | 77 Min           | 530 Min           | 74 Min                      | 510 min           | 3                         | 2.0   | 2.8 |

<sup>1</sup> Mechanical properties subject to change. All tempers listed are made to a Tensile Strength specification unless otherwise noted.

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

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