

ALLOY
DATA



MECHANICAL AND PHYSICAL PROPERTIES OF Alloy C51180

Olin Alloy C5118 is a dispersion and solid solution strengthened alloy developed for use in the electronic and automotive connector market. It offers users considering alloy C521 similar formability with higher electrical conductivity at the same strengths. Should higher strengths be required, consider Olin Alloys C5218 or C5248. For more information contact Olin Market Development Engineering at 618-258-5255, OlinBrass.com, or email us at info@olinbrass.com.

**Table 1
Composition Limits of C5118**

Copper¹	Remainder
Tin	3.5-4.9%
Iron	0.05-0.20%
Nickel	0.05-0.20%
Phosphorus	0.01-0.35%
Zinc	0.30% Max.
Lead	0.05% Max.

1. Copper plus Named Elements, 99.5%

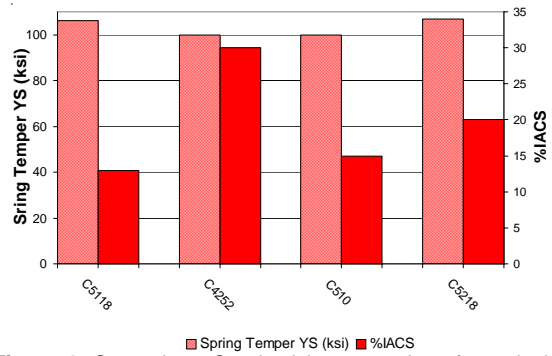


Figure 1: Strength vs Conductivity comparison for typical alloys used in telecom and miniature electronics connector applications.

**Table 2
Physical Properties of C5118**

	English Units	Metric Units
Density	0.321 lb/in ³ @ 68°F	8.9 gm/cm ³ @ 20°C
Thermal Conductivity	50 Btu-ft/ft ² -hr-°F @ 68°F	87.9 W/mK @ 20°C
Electrical Resistivity	51.85 ohm circ mils/ft @ 68°F	8.62 microhm-cm @ 20°C
Electrical Conductivity (Annealed)	20% I.A.C.S. † @ 68°F	12 MS/m Megmho/cm @ 20°C
Modulus of Elasticity	16,000,000 psi	110 kN/mm ²
Coefficient of Thermal Expansion 68-572°F (20-300°C)	9.9 PPM/°F	17.8 PPM/°C

† International Annealed Copper Standard

**Table 3
Mechanical Properties of C5118**

Temper	Tensile Strength		Nominal Yield Strength (0.2% Offset)		Nominal % Elong. in 2 Inch (51mm)	90° Bend Formability GW/BW ^{2,3}
	ksi	N/mm ²	ksi	N/mm ²		
1/2 Hard	69 – 84	475 – 580	70	480	22	0.0/0.0
3/4 Hard	80 – 92	550 – 635	82	565	18	0.0/0.5
Hard	85 – 100	585 – 690	87	600	12	0.3/1.5
Ex. Hard	97 – 112	670 – 770	101	695	8	0.6/2.8
Spring	105 – 119	725 – 820	107	740	5	1.2/4.0
Ex.Spring	110 – 122	760 – 840	112	770	3	

2. R/T = Bend Radius/Material Thickness @ < 0.016" (0.4mm) thick 11/16 inch (17.5mm) wide.
3. Relief annealed product recommended for maximum formability.

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