



# HSM Wire International, Inc

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## Alloy 511 - Phosphor Bronze

**Description:** 511 Alloy offers an optimum combinations of engineering properties like: high strength and ductility, excellent spring properties, and good bearing qualities and wear resistance.

**Applications:** Typically used for Switch parts, Resistance wire, Electrical Connectors, Pots, Kettles, Fasteners, Lock Washers, Clutch Disks and Welding Rods.

<b>Nominal Composition:</b>	<b>Cu%</b>	<b>Sn%</b>	<b>P%</b>
	95.9%	4.0%	0.1%

### **Physical Properties - Age hardened products**

	English Units	Metric Units
<b>Specific Gravity</b>	8.86 g/cu cm	
<b>Coefficient of Thermal Expansion per °C</b>	17.80 x 10 <sup>-6</sup> (20-300°C)	
<b>Thermal Conductivity</b>	48 Btu/ft <sup>2</sup> /ft.hr/°F @ 68°F	
<b>Modulus of Elasticity - Tension</b>	16,000 ksi	
<b>Electrical Conductivity at 68 °F</b>	20% IACS	

### **Mechanical Properties**

Temper	Tensile Strength: x Ksi (Kgf/mm <sup>2</sup> - Ksi x 0.7031)	Elongation in 50 mm (2 in.), %	Yield Strength: x Ksi (0.2% offset)(Kgf/mm <sup>2</sup> - Ksi x 0.7031)
Annealed	46-54	47	22
1/4 Hard	46-58	36	35
1/2 Hard	55-70	21	56
3/4 Hard	67-82	10	72
Hard	72-87	7	76
Extra Hard	84-99	4	88
Spring	91-105	3	94
Extra Spring	96-109	2 max.	98 min.

\*To be used as a guideline only.

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