

## Wieland-B05 Phosphor bronze

## Extruded/drawn products

Wieland-B05 is a phosphor bronze with a tin content of 5 % making it possible to achieve medium mechanical strength. It exhibits good resistance to wear and corrosion. Phosphor bronzes have good cold working properties. Wieland-B05 is used primarily in the UK and USA.

Chemical composition*		Material designation	
Cu	balance	EN	CuSn5, CW451K
Sn	5%	UNS	C51000
		DIN*	not standardized (~CuSn5)
		BS*	Pb102
		NF*	not standardized

\* Reference values in % by weight

\* Former national standards

Physical properties*			Fabrication properties		Corrosion resistance*	
Electrical conductivity	MS/m	10	<b>Forming</b>		In general excellent resistance to corrosion in seawater, industrial atmosphere and to stress corrosion cracking.	
	% IACS	17	Machinability	20%		
Thermal conductivity	W/(m*K)	96	(CuZn39Pb3 = 100 %)			
			Capacity for being cold worked	excellent		
Thermal expansion coefficient (0-300°C)	10 <sup>-6</sup> /K	18	Capacity for being hot worked	poor		
			<b>Joining</b>			
Density	g/cm <sup>3</sup>	8.85	Resistance welding	good		
			Inert gas shielded arc welding	excellent		
Modulus of elasticity	GPa	120	Hard soldering	excellent		
			Soft soldering	excellent		

\* Reference values at room temperature

1 GPa = 1 kN/mm<sup>2</sup>

1 MS/m = 1 m/Ω • mm<sup>2</sup>

Surface treatment			Product standards	
Polishing	mechanical	excellent	Rod	EN 12163
	electrolytic	excellent	Wire	EN 12166
Electroplating		excellent		
Heat treatment				
Melting range		930-1060 °C		
Hot working		750-850 °C		
Soft annealing		500-700 °C, 1-3 h		
Thermal stress-relieving		200-300 °C, 1-3 h		

### Mechanical properties (values can be achieved and are a function of size and form)

Reference values	from (soft/extruded)	to (hard)
R <sub>m</sub> [MPa]	330	890
R <sub>p0.2</sub> [MPa]	130	790
A <sub>5</sub> [%]	60	2
HB	80	145

(Values achievable with wire)

## Forms and sizes available

Material										
Wieland	EN designation		Outside diameter		Wall thickness		Circumscribing diameter		Diameter / width across flats	
	Brief designation	Number	from	to	from	to	from*	to	from	to
B05	CuSn5	CW451K	6	90	0.1	9				
Round tubes										
Drawn sections							2.5	100		
Extruded sections								100		
Sectional tubes								70		
Round and polygonal rods									2	100
Round wires									0.3	
Polygonal wires									2	

**Wieland - B05**

All values in mm

\* Depending on the form, cross-sections in the lower size range are also available as wire.

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