

wieland

# High-performance copper-alloy wire



 WITRONIC®

## Copper

Copper is one of the oldest materials and today amongst the most widely used non-ferrous metals. Wieland semi-finished products form an indispensable link between the raw material copper and the products made by our customers.

Copper-based materials are suitable for a wide range of applications due to the unique combination of various properties such as

- high electrical and thermal conductivity
- outstanding corrosion resistance
- good forming and processing properties
- excellent suitability for surface coating

Therefore, Wieland semi-finished products are used across most industries.

## High-performance copper-alloy wire

Electrical and electronic applications sometimes require material properties which are counteracting, e.g. electrical conductivity and mechanical strength. The Wieland alloy variety enables the customer to choose the optimum combination.

Wire in diameters between 0.3 and 4.5 mm is available in the following copper materials:

- high copper alloys
- bronze
- brass
- nickel silver

## High strength and high conductivity through precipitation-hardening

The trend towards miniaturisation leads to increasingly smaller electrical components and thinner cables which in turn results in higher standards for the materials used.

Special high copper alloys can be optimised through a heat treatment. The alloying elements which are finely distributed as precipitations result in a better property combination of:

- high strength
- good formability
- high conductivity
- stress relaxation resistance
- fatigue resistance

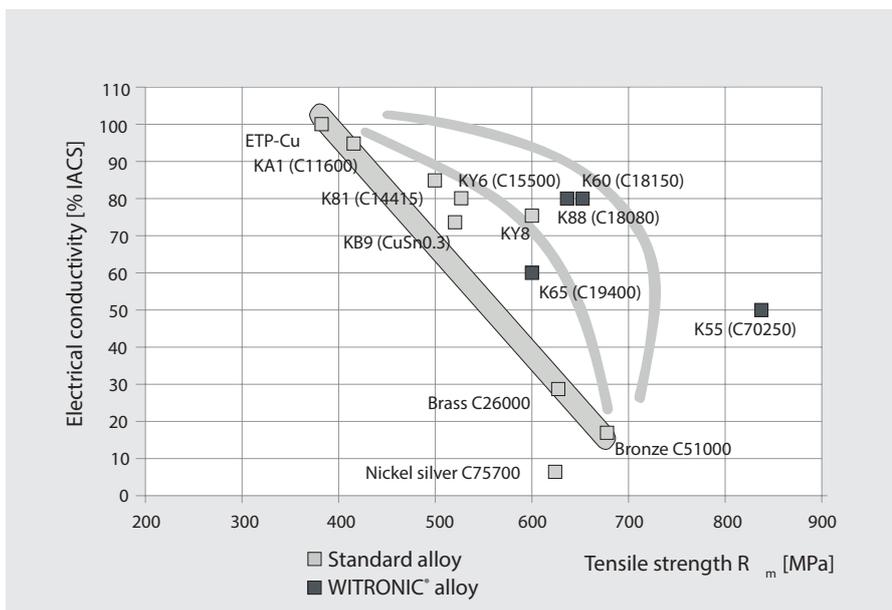
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*The high-performance precipitation hardening materials are summarised in the group of the WITRONIC alloys.*

# Material designation

Material group	Material	Wieland	EN	UNS
High copper alloys	CuSn0.15	K81	CW117C	C14415
	CuSn0.3	KB9		C14425
	CuAg0.10P	KA1	CW016A	(C11600)
	CuNi3SiMg	K55*	CW112C	C70250
	CuCr1Zr	K60*	CW106C	C18150
	CuFe2P	K65*	CW107C	C19400
	CuCrAgFeTiSi	K88*		C18080
	CuMg0.1	KY6		C15500
Bronze	CuMg0.2	KY8	CW127C	
	CuSn4	B03	CW450K	C51100
	CuSn5	B05	CW451K	C51000
	CuSn6	B06	CW452K	C51900
	CuSn8	B09	CW453K	C52100
Brass	CuZn15	M15	CW502L	C23000
	CuZn30	M30	CW505L	C26000
	CuZn36	M36	CW507L	C26800, C27000
	CuZn37	M37	CW508L	C27000, C27200
	CuZn37	M38	CW508L	C27200, C27400
Nickel silver	CuNi12Zn24	N22	CW403J	C75700
	CuNi18Zn20	N29	CW409J	~C76400

\*WITRONIC alloys





## Applications

### Electromechanical components

Bronze and brass are well-established materials for connectors. Over the years high copper alloys have been gaining in importance. Their high conductivity reduces heating from current conduction and their high strength and resistance to stress relaxation increase mechanical stability, in particular vibration resistance.

For 0.63 x 0.63 mm pins Wieland K55 and K65 have proved successful in the automotive industry.

Other electromechanical components such as coil springs are increasingly being made of high copper alloys.

### Stranded wire resistant to fatigue

High copper alloys are used for conductor wire whenever high mechanical strength, especially fatigue strength is required.

Wieland's precipitation-hardened copper alloys are a good alternative to the cadmium-containing materials which have been used so far and no longer conform to RoHS.

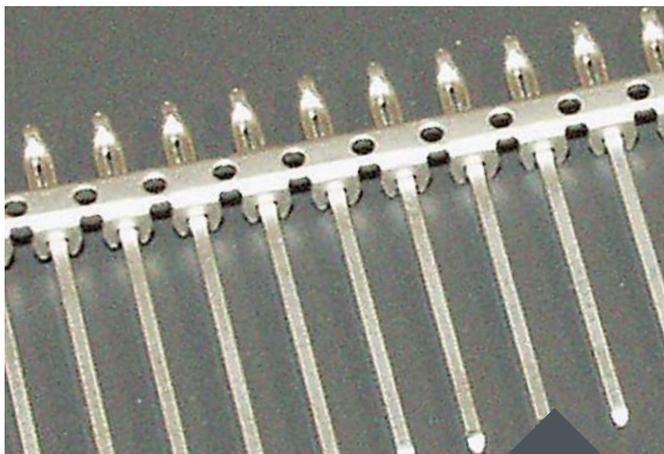
Depending on the degree of reduction, Wieland-K88 meets the requirements of EN 2083 regarding strength and strain.

### High-strength magnet wire

High copper alloys are also gaining in importance for the manufacture of enamelled wire in electric motors: Conductivity and strength enable the use of high currents and provide good resistance to vibration.

### Cold-forged components

Anode pins, screws, metallic sealing rings and ballpen tips are frequently manufactured by cold forging for which the homogeneous and fine-grained structure of Wieland materials has proved successful. The materials used are bronze, brass, nickel silver and high copper alloys.



WITRONIC®-K55



*With modern machine technology using high-performance lubricants, the wire is drawn to diameters of minimum 0.3 mm.*

## Forms of delivery

According to customer requirements the wire is delivered on plastic, wooden or steel reels carrying 50 to 1,000 kg, in bunched coils, on stems and in cardboard drums.

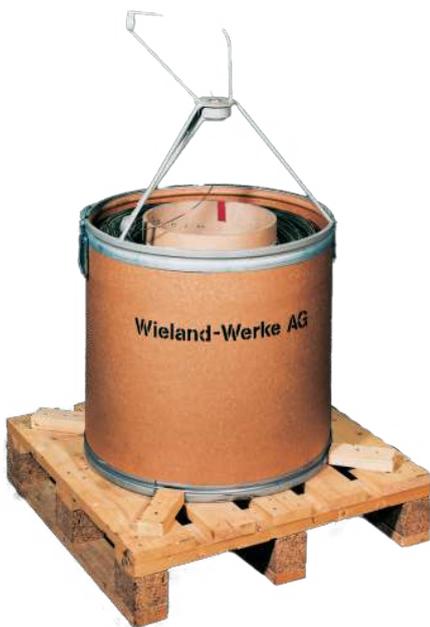
### Dimensions available

Round wire Ø 0.3 mm to 4.5 mm

Round wire Ø 0.012 inch to 0.18 inch

on request up to 14 mm/0.55 inch

Sectional wire on request



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