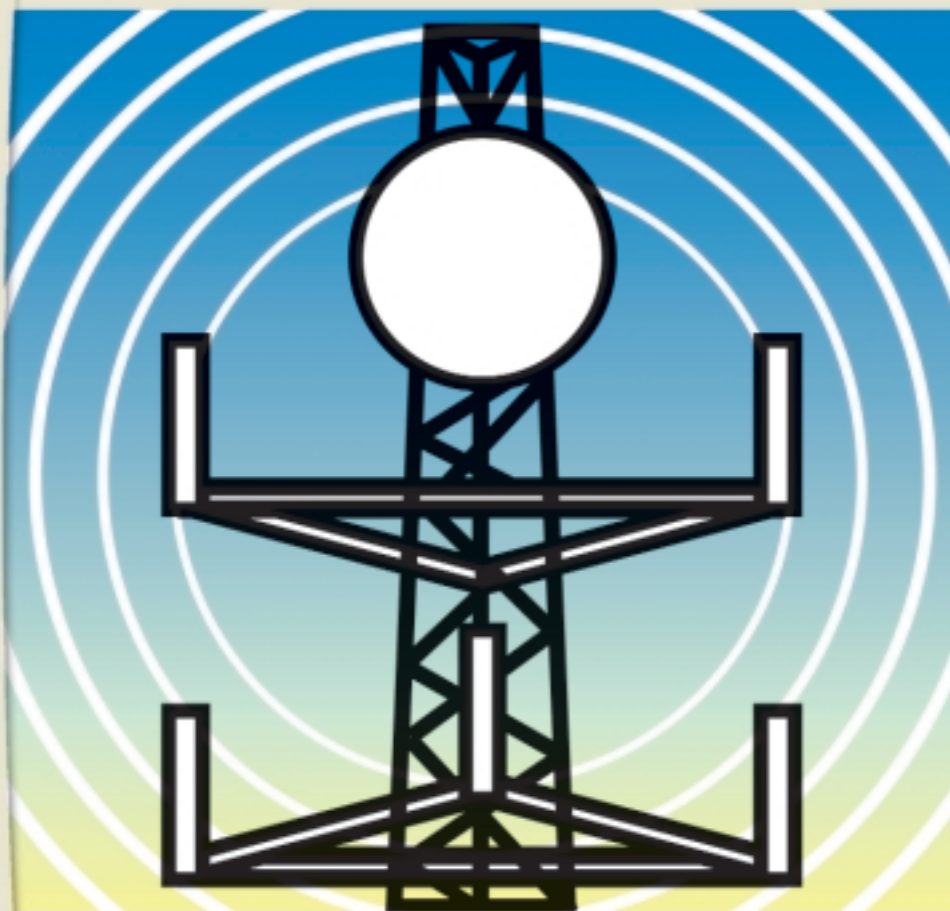


**Wieland**



Semi-finished products for  
high-frequency radio technology

Wieland

# Semi-finished products in copper materials – basic elements of modern information technology

## Copper materials

Telecommunication and data transmission play a major role in everyday life in the third millennium.

The technologies used here rely to a great extent on copper and copper alloys and their special outstanding combination of following characteristics:

- electrical conductivity
- diamagnetic properties
- strength
- formability
- corrosion resistance
- machinability
- weldability
- plating characteristics

## Partnership

The Wieland Group melts and casts its own customized prematerials for further processing into a wide variety of product forms.

We are a competent and innovative partner to our customers.



*Plug and screw connectors made from precision rod*



*Coaxial cable with outer conductors of copper strip and inner conductors of copper tube or strip*

## Applications

Copper strip with its excellent weldability is an important prematerial for the production of coaxial cables. Seamless copper tubing is a proven semi-finished product in coaxial cables and waveguides up to 300 mm in diameter.

Casings and carriers of the plug and screw connectors for high-frequency radio applications are made from rods or – the smaller sizes – of wire.

# Copper strip for coaxial cables

Modern information technology would be unthinkable without copper and copper alloy strip, whether for radio shielding, data transmission, or as electric conductors.

The Langenberg works can draw on many years of experience in the production of weldable copper strip. Its ultramodern measurement and control systems use advanced methods such as FFT analysis, which allows the early recognition and reduction of systematic variations in the strip thickness. Our state-of-the-art quality management system accompanies all the processes from the receipt of rolled sheet metal, which we source from top producers, right through to the delivery of the finished products.

For the production of particularly long cables, Wieland recommends non-welded strip in lengths up to, for example, 6,000 m for a strip thickness of 0.25 mm (coil weight: approx. 15 kg/mm strip width). Fixed strand lengths can also be supplied if required.

Wieland copper strip for coaxial cables receives a special surface treatment which provides not only good processing characteristics but also protection against corrosion.

The packaging materials and methods we use ensure maximum protection of the strip edges and surface. Special packaging to the customer's requirements can be agreed on request.



*Copper strip is a high-quality pre-material for the production of coaxial cables.*

## Available dimensions

Thickness	0.1 – 2 mm	0.004" – 0.08"
Width	7 – 400 mm	0.3" – 16"

Strip length as a function of strip thickness or as agreed.

## Available copper grades

Wieland	DIN		EN	ASTM		Electrical conductivity	
Symbol	Symbol Material No.	Composition (%)	Symbol Material No.	Symbol UNS-No.	Composition (%)	MS/m	% IACS
E-Cu58 / K 32	E-Cu58 2.0065	Cu ≥ 99.90 Oxygen 0.005 - 0.040	Cu-ETP CW 004 A	ETP C11000	Cu ≥ 99.90	≥ 58.0 ≥ 58.6 <sup>1)</sup>	≥ 100 ≥ 101 <sup>1)</sup>
SE-Cu57 / K 12	SE-Cu 2.0070	Cu ≥ 99.90 P ≈ 0.003	Cu-HCP CW 021 A	OFXLP C10300	Cu+P ≥ 99.95 P 0.001 - 0.005	≥ 57.0 <sup>3)</sup>	≥ 98.28 <sup>3)</sup>
SE-Cu58 / K 14			Cu-PHC CW 022 A			≥ 58.0 <sup>3)</sup>	≥ 100 <sup>3)</sup>
SW-Cu / K 15	SW-Cu 2.0076	Cu ≥ 99.90 P 0.005 - 0.014	Cu-DLP CW 023 A	DLP C12000	Cu ≥ 99.90 P 0.004 - 0.012	52 <sup>2)</sup>	89.7 <sup>2)</sup>
SF-Cu / K 19	SF-Cu 2.0090	Cu ≥ 99.90 P 0.015 - 0.040	Cu-DHP CW 024 A	DHP C12200	Cu ≥ 99.90 P 0.015 - 0.040	46 <sup>2)</sup>	79.3 <sup>2)</sup>
OF-Cu / K 11	OF-Cu 2.0040	Cu ≥ 99.95	Cu-OF CW 008 A	OF C10200	Cu ≥ 99.95	≥ 58.0	≥ 100
OFE-Cu / K 09			Cu-OFE CW 009 A	OFE C10100	Cu ≥ 99.99	≥ 58.6	≥ 101

<sup>1)</sup> on request   <sup>2)</sup> mean value   <sup>3)</sup> not applicable to OFXLP

# Tubing for coaxial cables and waveguides

One of the specialty products of Buntmetall Amstetten is level-wound copper tubing (LWC) for use as the inner conductor in coaxial cables. The tubing is supplied with an absolutely bright and clean surface. Its internal purity permits it to be inserted in a connector at any point of the coiled length.

Another specialty product is straight tube (round or sectional) made from copper or copper alloys in diameters up to 300 mm. This tube is used in coaxial cables and for waveguides.

All our tubes are supplied hard-drawn or soft-annealed and packaged to the customer's specifications.

## Available dimensions

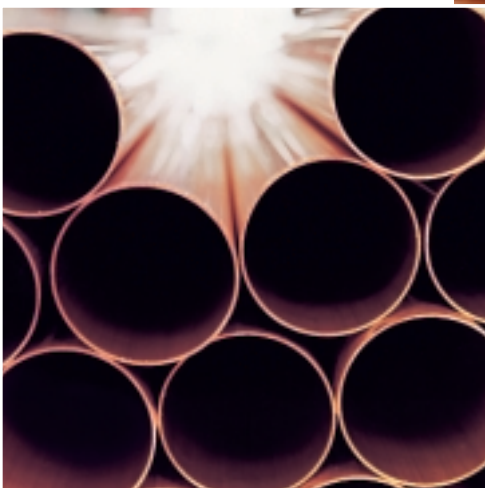
Level-wound round tubing		
Outside diameter	4.76 – 30.6 mm	0.2" – 1.2"
Wall thickness	0.28 – 2.5 mm	0.01" – 0.1"
Coil weight	max. 450 kg	max. 1000 lbs
Strand length	to customer specification	

Round tubing, straight		
Outside diameter	4 – 300 mm	0.16" – 12"
Wall thickness	0.28 – 40 mm	0.01" – 1.6"

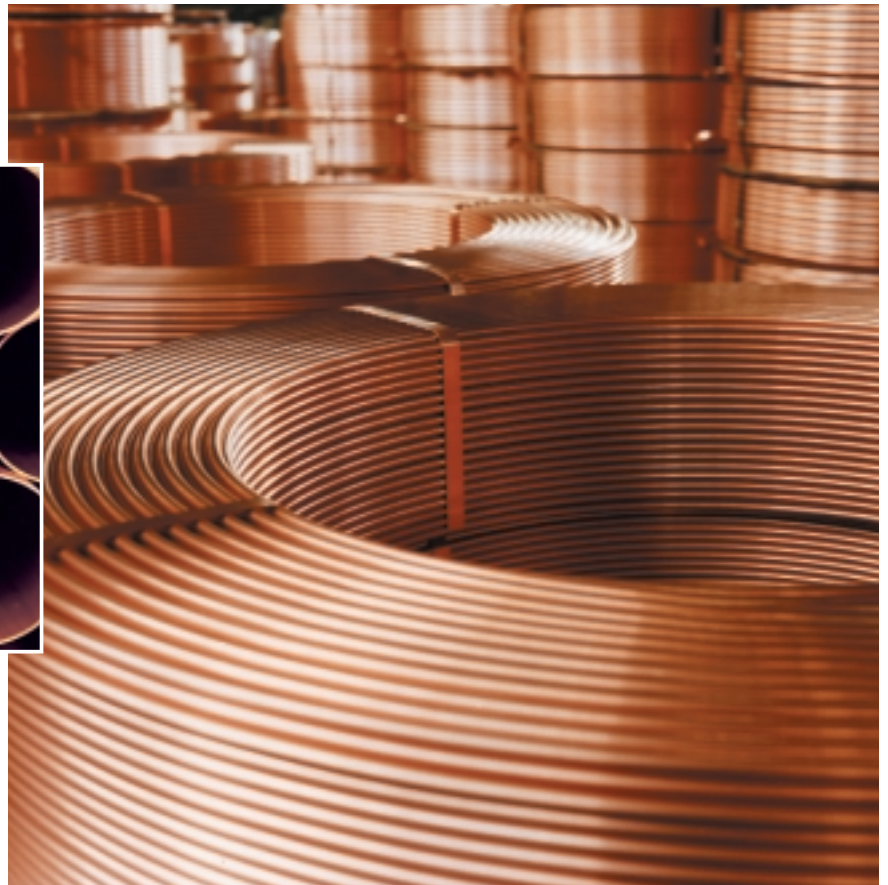
Round tubing in M37 is available from stock in many sizes.

Sectional tubing, straight		
Outside diameter	5 – 230 mm	0.2" – 9"
Wall thickness	0.1 – 17.5 mm	0.004" – 0.7"

The wall thickness depends on the outside diameter and other factors.  
Min. inside cross sectional area 20 mm<sup>2</sup>/0.030 sq. inch.



Round tubing in straight lengths



Layer-wound copper tubing

# Rod and wire for plug and screw connectors

Rod and wire are the prematerial for a wide range of components in high-frequency radio applications, such as plug and screw connectors.

The close tolerances of W5000 and W5006 precision rod (tolerance class h9) permit optimum processing.

Spray compacted alloys can also be used. They have a very fine-grained and homogeneous microstructure.

The Wieland size range of over 300 dimensions enables us to cover practically all of our middle-European customers' demands from stock at short notice. More detailed information is contained in our Stock Programme, which we will be happy to send you on request.

All products are packaged to customer specifications.



*Round and polygonal brass rods*

## Available dimensions

Round rods	Diameter 2 – 250 mm	0.08" – 10"
Polygonal rods	Width across flats 3 – 100 mm Rectangular up to max. 80 x 150 mm	0.12" – 4" 3" x 6"
Polygonal wire	Width across flats 2.5 – 10 mm	0.1" – 0.4"
Round wire	Diameter 1.5 – 14 mm	0.06" – 0.6"
Sectional wire	Diameter of circumscribed circle 2.5 – 20 mm	0.1" – 0.8"

Many dimensions in Z33 and Z21 are available from stock. Specified limits depend on the dimension and material.

# Range of materials and semi-finished products

Materials					Types of semi-finished products				Cold working	Machining	Resistance welding	Electrical conductivity (Reference value) % IACS
Wieland	EN-designation		UNS	JIS	Strip	Tube/sectional tube	Rod and wire	Sections, sectional wire				
Symbol	No.	No.	No.									
K09/K10	Cu-OFE	CW009A	C10100	C1011	●	●/●	●	●	↑	↓	→	101
K11	Cu-OF	CW008A	C10200	-	●	●/-	-	-	↑	↓	→	100
K12	Cu-HCP	CW021A	C10300	-	●	●/●	●	●	↑	↓	→	98
K14	Cu-PHC	CW020A	C10300	-	●	-/-	-	-	↑	↓	→	100
K15	Cu-DLP	CW023A	C12000	C1201	●	-/-	-	-	↑	↓	→	90
K19/K20	Cu-DHP	CW024A	C12200	C1220	●	●/●	●	●	↑	↓	→	77
K30/K32	Cu-ETP	CW004A	C11000	C1100	●	●/●	●	●	↑	↓	→	98
K55	CuNi3SiMg	**NS	C70250	-	●	-/-	●	-	↗	↓	→	35
K60	CuCr1Zr	CW107C	C18200	-	-	●/-	●	●	↑	→	→	75
K65	CuFe2P	CW107C	C19400	-	●	●/●	●	-	↑	↓	→	60
K81	CuSn0,15	-	C14415	-	●	-/-	●	-	↑	→	→	85
K88	CuCrAgFeTiSi	**NS	C18080	-	●	-/-	●	-	↗	↓	→	80
M10	CuZn10	CW501L	C22000	C2200	●	●/●	●	●	↑	→	↗	43
M30	CuZn30	CW505L	C26000	C2600	●	●/●	●	●	↑	→	↗	28
M37/M38	CuZn37	CW508L	C27200	C2720	●	●/●	●	●	↑	↓	↗	26
Z21	CuZn38Pb2	CW608N	C35000	-	●	●/●	●	●	↗	↑	→	24
Z23	CuZn36Pb3	CW603N	C36000	C3601	-	●/●	●	●	↗	↑	→	22
Z29	CuZn39Pb2	CW612N	C37700	C3771	-	●/-	●	●	→	↑	→	24
Z32/Z33	CuZn39Pb3	CW614N	C38500	C3603	-	●/-	●	●	↓	↑	→	25
S23	CuSn3Zn9	CW703R	C68800	-	●	-/-	-	-	↑	→	↗	16
BC2	CuSn4Pb4Zn4	CW456K	C54400	-	-	●/-	●	-	↗	↗	→	19
B14	CuSn4	CW450K	C51100	C5111	●	-/-	-	-	↑	↓	↗	18
B05/B15	CuSn5	CW451K	C51000	C5102	●	●/●	●	●	↑	↓	↗	17
B06/B16	CuSn6	CW452K	C51900	C5191	●	●/●	●	●	↑	↓	↗	16
B09/B18	CuSn8	CW453K	C52100	C5212	●	●/●	●	●	↑	↓	↗	11
N12/N22	CuNi12Zn24	CW403J	C75700	-	●	●/●	●	●	↑	↓	↑	7
N18/N29	CuNi18Zn20	CW409J	-	-	●	●/●	●	●	↑	↓	↑	6
N31	CuNi7Zn39Pb3Mn2	CW400J	-	-	-	-/-	●	●	→	↑	↗	5
N32	CuNi12Zn30Pb1	CW406J	-	-	-	-/-	●	●	→	↗	↗	7
N37	CuNi18Zn19Pb1	CW408J	-	-	-	-/-	●	●	→	→	↗	6
PSI-LV7	CuMn20Ni20*	**NS	-	-	-	●/-	●	●	↗	→	→	2

\* Reference composition of spray-formed materials \*\* Not standardised

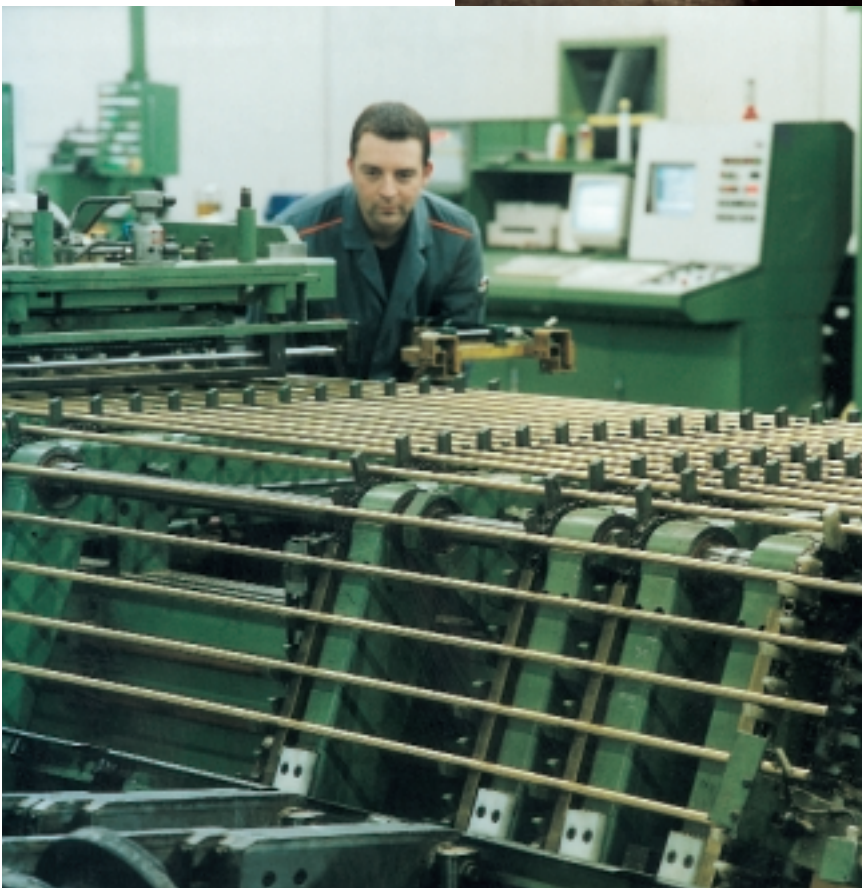
**Other alloys are available upon request.  
Please don't hesitate to contact us!**

↑	excellent
↗	good
→	fair
↓	poor

# Quality

Wieland semi-finished products are manufactured on state-of-the-art equipment to the stringent rules of our quality control regime. This is based on our Quality Management System in accordance with EN ISO 9001 or ISO/TS 16949 and it enables us to achieve the highest quality at all the operating steps, from the starting material to the finished product. All deliveries can be accompanied by a quality certificate, if required.

*Before a melt is released for casting, its chemical composition is determined from a sample taken from the holding furnace.*



*Automatic inspection of precision brass rods*

**Wieland**

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