



mkm
we live copper

Bars and profiles





OUR ASPIRATION

Carrying every form of energy. Bar none.

Energy in the 21st century is demanding. It has to be ecologically viable, available at all times, efficient and cheap – which is what makes its generation, handling and distribution so complex. Power distribution systems (such as busbars), transformers and other electrical components used in the wind power and off-shore industries, can no longer function without copper. The red metal is also crucial to the building of electrical machinery and to the automotive industry. Copper can withstand the harshest environments without corroding, and has the best possible thermal conductivity. Because of its outstanding properties, the use of copper has been on the rise for years.

MKM has been one of the leading suppliers of bars and profiles since 1909. We offer a wide range of flat bars, round bars, square bars and drawing-based profiles made from copper and low-alloyed copper alloys. As an experienced and reliable partner, MKM has long been keeping pace with changes in the market and supplying pioneering products. The latest trends involve additional alloying and oxygen-free copper (Cu-OF/Cu-OFE) – and we're involved in those things too. We manufacture in compliance with all of the major standards such as EN, ASTM, GOST and JIS as well as fulfilling specialised requirements.

Switch quicker. With MKM copper.

Not all coppers are created equal. Specialised types of copper and alloys are used for different applications. Cu-ETP is used for switchgear and construction jobs, whereas high quality applications – such as those involving vacuums – require Cu-OF/Cu-OFE qualities. The maritime industry demands almost exclusively cupronickel alloys.

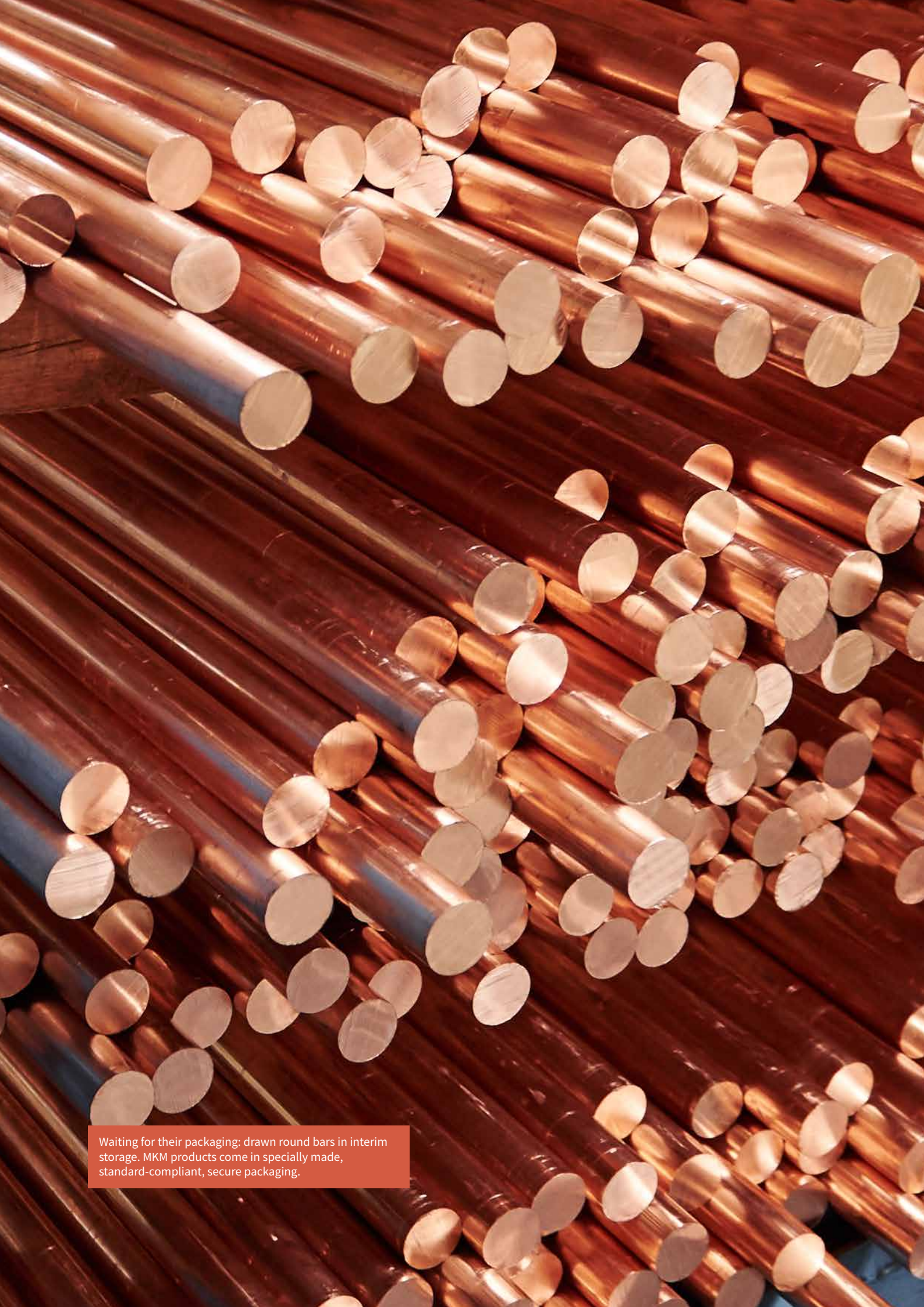
Our expertise – your gain

The secret to producing the best copper lies in the manufacturing process. When we at MKM talk of years of experience, we mean over a hundred. Since our foundation in 1909 we have been casting, extruding and drawing bars and profiles in a variety of materials and finishes, product forms, lengths and diameters.

MKM's production process is fully integrated. That way we keep our production cycle closed. After all, only good primary material can be turned into the best semi-finished products. Our technology guarantees that every application receives exactly the right material. It sets standards in the market.

By opting for MKM bars and profiles you are choosing:

- clean, bare surfaces
- tinned surface finishes available up to 6 m length
- a product manufactured and tested using tolerances based on general industrial standards or customer standards
- comprehensive assistance and advice during the selection process
- a durable, vibrant, versatile and maintenance-free material
- a material that is light and flexible to process
- a recyclable, ecologically and economically competitive material
- maximum variety of product forms and thicknesses
- integrated production – from casting the bolt to the finished bar – all from a single source
- more than a century of experience across the entire spectrum of copper production and processing
- a highly qualified workforce
- comprehensive advice and support for:
 - product development
 - surface qualities
 - new material qualities and alloys
 - optimising the use of materials
 - new applications
 - improving business and technological processes
- product- and order-specific packaging



Waiting for their packaging: drawn round bars in interim storage. MKM products come in specially made, standard-compliant, secure packaging.

All good things come in threes. Our production.

Production process for bars and profiles

Casting

We use our vertical continuous billet casting system to cast a wide range of copper types including low alloyed copper into formats for the production of semi-finished goods. Each casting batch is only released for further processing once it has been analysed. The figures from this analysis are stored in a database to assure traceability.



Billet store

Pressing

Once it has been sawn into convenient sections, we heat the billets up to pressing temperature. It is then pressed into bars and profiles in a 30.9 MN extrusion press. MKM also offers the production of bars using the Conform process.



Press

Drawing

Cold forming by means of drawing equipment is used to achieve certain mechanical properties, dimensional tolerances and finishes. Furthermore, some of the bars are supplied pressed for forging applications.



Drawing system

Flat bars

These are excellent for bending and can be used in many different areas.

Use:

- Switchgear construction (low and medium voltage)
- Power distribution systems (busbars)
- Transformers/electrical components
- Electrical machine construction
- Wind power
- Automotives

MKM supplies flat bars from 15 x 3 mm to a maximum width of 210 mm and 20 mm thickness, thereby covering every requirement in the field. We offer numerous intermediate dimensions as well as all the standard sizes. Our flat bars can be made with rounded or sharp edges, and with semi-circular sides as well.

If required we can supply bars with limited tolerances and hardness/strength ratings. We can offer short and fixed lengths with a length tolerance of 1 mm.

We also offer flat bars tinned so as to fulfil our customers' needs more fully.

Width in mm	Thickness in mm												
	3	4	5	6	8	10	12	15	20	25	30	40	50
10													
15													
20													
30													
40													
50													
60													
70													
80													
90													
100													
110													
120													
130													
140													
150													
160													
200													
210													

Flat bars rounded (RD) and sharp-edged (SH) as well as semi-circular (CE). Other dimensions on request.

Round bars/square bars

MKM copper bars are highly suitable for special technological procedures such as cold impact extrusion.

Use:

- Electrical engineering
- Machine-building
- Contact materials for current-carrying contact components

MKM supplies round bars of between 6 mm and 230 mm for a wide range of electrotechnical applications. As well as our main material Cu-ETP, we supply an increasing number of our customers with Cu-OF and Cu-OFE bars which are used for demanding applications such as those in vacuum engineering. Copper bars can be made with diameters of up to 152 mm, drawn, with very good surface finishes and

restricted tolerances as well as strength and hardness ratings compliant with customer specifications. Because of the high quality of MKM copper and because we can offer a straightness of 1 mm/m, our round bars, made from a special alloy called V-copper, can be processed on modern, high-performance automatic lathes. If required, our round bars can be supplied with chamfered ends for turning plants.

Separate eddy-current testing is used to guarantee blemish-free finishes for special requirements. We also offer CuSP (sulphur copper) bars which are especially good for machining.

As well as drawn bars, MKM offers a considerable range of pressed bars for hot pressing (forging) copper parts. Square bars, which can be supplied drawn up to SW 110, as well as hexagonal bars, complete our range.

	Diameter/edge lengths in mm																								
	6	8	10	15	20	25	30	35	40	45	50	60	70	80	90	100	110	120	130	140	150	152	200	230	
Square, pressed																									
Square, drawn																									
Round, pressed																									
Round, drawn																									

Strength and hardness rating compliant with DIN EN 13601 and MKM factory standards

Copper alloys

CuNi10Fe1Mn

MKM supplies round, square, hexagonal and flat bars that fulfil the most exacting demands. Cupronickel alloys withstand seawater. Alloying with iron and manganese maintains this resilience even under more demanding conditions such as higher flow speeds and temperatures.

Use:

- Shipbuilding
- Offshore industry
- System and apparatus engineering

CuCr1Zr

CuCr1Zr offers, in the form of round, square and hexagonal bars, high strength ratings even at raised temperatures, combined with excellent tempering and wear resistance and optimum softening temperatures.

Use:

- Electrical engineering
- Machine-building
- Contact materials and current-carrying springs
- Welding and soldering (electrodes, electrode mounts, electrode shafts, nozzles and so on)
- Equipment manufacturing

Profiles

MKM supplies an increasing amount of profiles, especially complex drawing-based profiles. These profiles can be supplied pressed or drawn, up to a maximum cross-sectional area of 10.000 mm².

Our specialised profiles provide our customers with efficient, custom solutions to their products and enable them to save on materials as well.

When we manufacture complex drawing-based profiles we rely on our years of experience and our own tool-making facilities featuring a machining centre and the latest EDM technology. Our technicians can gladly advise you in person on how to draw up appropriate delivery specifications.

Use:

- Electrical engineering
- Machine-building
- Contact materials for current-carrying contact components

Drawing-based profiles made to customer requirements

The illustration shows drawing-based profiles that we have made for some of our customers. Other profiles based on drawings are available at any time on request.



Tinned bars

MKM also offers the production of tinned bars. These are tinned electrolytically on our new, fully integrated system.

Careful quality control at every stage of production, from bolt casting all the way to the tinning process, allows us to guarantee ultimate quality in our tinned bars, including a glistening, unblemished finish.

We can offer you tinned bars and profiles at attractive prices, combined with a high degree of flexibility and quick delivery. We can tin as follows in conjunction with our copper bar and profile manufacturing range:

- Width: up to 200 mm
- Length: maximum 6 m
- Coating thickness: 5 to 30 µm
- Standard approx. 8 µm

Facts and figures

Cu materials/alloys

European standard		DIN standard (former)		ASTM	Manufacturing standard	Typical properties/application
Cu-ETP	CW004A	E-Cu 58 E-Cu 57	2.0065 2.0060	C11000	DIN EN 13601	Standard alloy for electrical components, main application in switchgear construction
Cu-HCP Cu-PHC	CW021A CW020A	SE-Cu	2.0070	C10300	DIN EN 13601	Hydrogen-resistant, very high conductivity, easy to weld
Cu-OF	CW008A	OF-Cu	2.0040	C10200	DIN EN 13601	Hydrogen-resistant, very high conductivity, easy to weld
Cu-OFE	CW009A			C10100	DIN EN 13601	High purity, Cu 99.99% for vacuum switching systems, semiconductors, electronic valves
CuAg0,10	CW013A	CuAg0,1	2.1203	C11600	DIN EN 13601	For electric motors/transport technology
CuAg0,10P	CW016A	CuAg0,1P	2.1191	C11700	DIN EN 13601	Main alloy for the construction of generators
Cu-DHP	CW024A	SF-Cu	2.0090	C12200	DIN EN 12163	Very easy to weld, without particular conductivity requirements
CuSP	CW114C	CuSP	2.1498	C14700	DIN EN 12164	Good machining properties, used for parts manufactured on automatic lathes, for contact components, welding nozzles
CuCr1Zr	CW106C	CuCrZr	2.1293	C18150	DIN EN 12163/ 12167	Very strong copper alloy with good conductivity, used for contact components and for resistance welding (automotive industry)
CuNi10Fe1Mn	CW352H	CuNi-10Fe1Mn	2.0872	C70600	DIN EN 12163 / 12167	Very good corrosion-resistance against seawater. Used in shipbuilding and apparatus engineering

We can also supply other CuAg materials such as CuAg0.2, CuAg0.03, CuAg0.04.

Products can be supplied compliant with other international standards such as JIS and GOST, by arrangement.



Freshly pressed in rank and file:
Press rings in interim storage.
Each ring weighs up to 600 kg.

Product areas



STRIP

MKM supplies preliminary strip, industrial strip, transformer strip, cable and HF cable strip and roofing strip. We manufacture all of our strip products using our Conti-M® technology which we developed inhouse, using continuous casting technology to achieve a uninterrupted 24/7 process.



SHEETS, PLATES AND DISCS

MKM offers sheets, plates and discs in a wide range of dimensions. Our rolling mill is supplied by our own foundries. Our strengths lie in a rich range of more than fifty alloys. We can also produce plates and discs to customer specific drawings on request.



WIRE

MKM supplies the entire spectrum of wire rod, from thick, medium and fine wire to stranded wire and wire rope. Our fully integrated Contirod® technology allows us to offer copper wire products and alloy wire products (plain and tinned) with a wide range of finishes.



TUBES

MKM supplies tubes of different lengths, diameters and thicknesses. Our HETCU® (installation tubing) and HETCOOL® (refrigeration, air conditioning and medical technology) product families are extremely well established in the market. Consistent quality management from our own continuous casting plant, right through to the tube drawing process guarantees seamless tubing with outstanding quality.



BARS

MKM is one of Europe's leading producers of copper bars and profiles. Our production range encompasses a wide range of sizes in various grades of copper. We also produce customised profiles based on technical drawings.



CUSTOM SOLUTIONS

MKM develops solutions tailored entirely to its customers' requirements. With the technical means and many years of experience, we regularly find unconventional solutions.

We can manufacture any of our products in compliance with the relevant DIN standards, internationally established standards and custom requirements.
All of our packaging is appropriate to the products it contains.

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