



Rolled Products

 **Aurubis**

Facts and figures

Aurubis Rolled Products

- » **> 100,000 t of strip, sheet and plate** are produced by Aurubis annually.
- » **> 95 % of global demand** is covered by the Aurubis alloy portfolio.
- » **2 rolling mills** in Europe.
- » **A 430 mm wide tinning line** and close collaboration for strip and electroplated surfaces.

Aurubis Group

Metals for Progress

Aurubis is laying the groundwork for the technologies of the future with its metals. Our metals are the key to a smart, connected future.

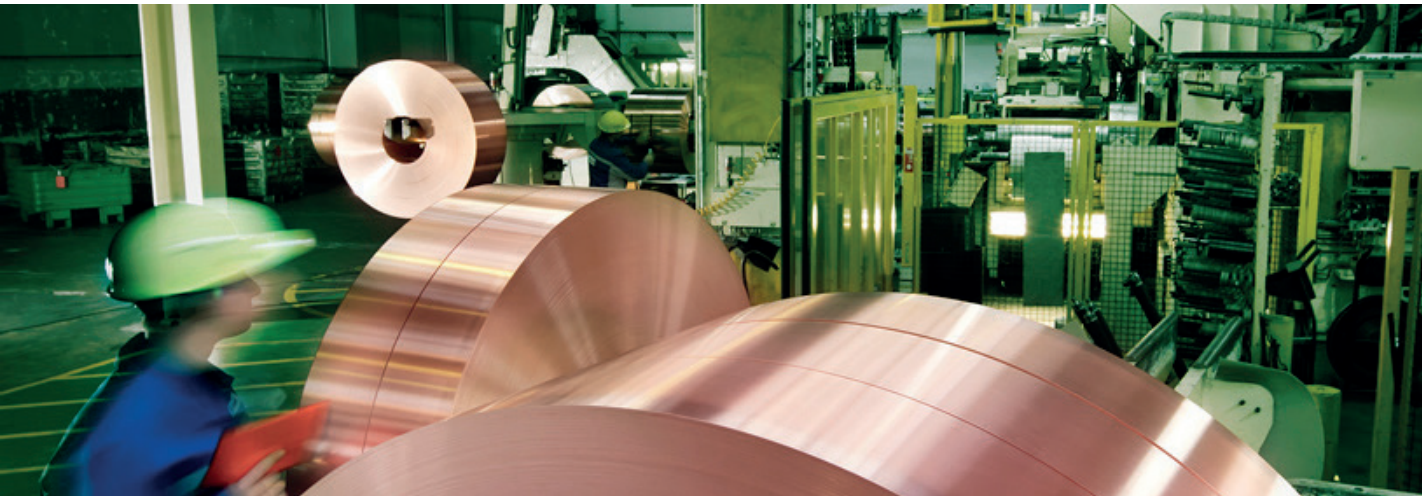
Whether for renewable energies, electric vehicles, digitalization or urbanization, the demand for metals will continue to rise.

For more than 150 years, Aurubis has produced copper and other metals that are crucial for modernization and for the ongoing advancement of our lives in the coming decades.

Aurubis has around 7,000 employees, production sites in Europe and the US, and an extensive worldwide distribution network.

Aurubis Rolled Products

Synergies & strengths



Reliability

Aurubis is one of the world's leading copper strip manufacturers, covering all of the products in demand today — from basic alloys to high-performance and specialty alloys.

Global market leaders in the automotive, electronics and electrical industries trust Aurubis' production capabilities, financial stability, and expertise — as well as our long-term commitment to the copper industry.

Today, Aurubis' alloy portfolio already covers over 50 top quality copper and copper alloy options: from high-purity, oxygen-free copper to brass, bronze and special high-performance alloys.

Aurubis understands its customers' markets, needs and requirements. Our focus is on markets where the specific, especially conductivity-related, properties of copper and copper alloys add value for our customers. Customers benefit from our quality, productivity, process efficiency, and innovative power.

Aurubis values long-term relationships and strives to build close connections with its business partners.

Operating globally — acting locally

As a global player with two rolling mills in Europe and a network of sales partners around the world, Aurubis offers its customers outstanding local service, ensuring customer proximity even in emerging and developing markets.

The Aurubis sites in Pori (Finland) and Stolberg (Germany) produce rolled products. Aurubis has a wide variety of material and production options here.

All this makes Aurubis a partner that operates globally and acts locally.

Offering a broad range

In keeping with special customer requirements, Aurubis has one of the world's largest product portfolios of strip, sheet, plate and circles.



Cable strip

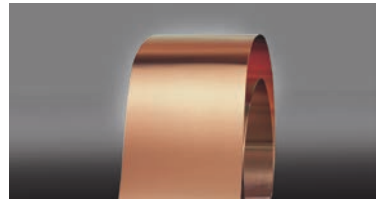
Strip products for high frequency applications and submarine cable and cable strip for energy lines have been on Aurubis' production program for decades.



Connector strip

Responding to high demand from the automotive, electrical and electronics industries, Aurubis offers the starting material for connector and stamped grid products in standard and high-performance alloys (HPAs).

The extensive portfolio is produced with bare or tin-plated surfaces* to the highest industry standards.

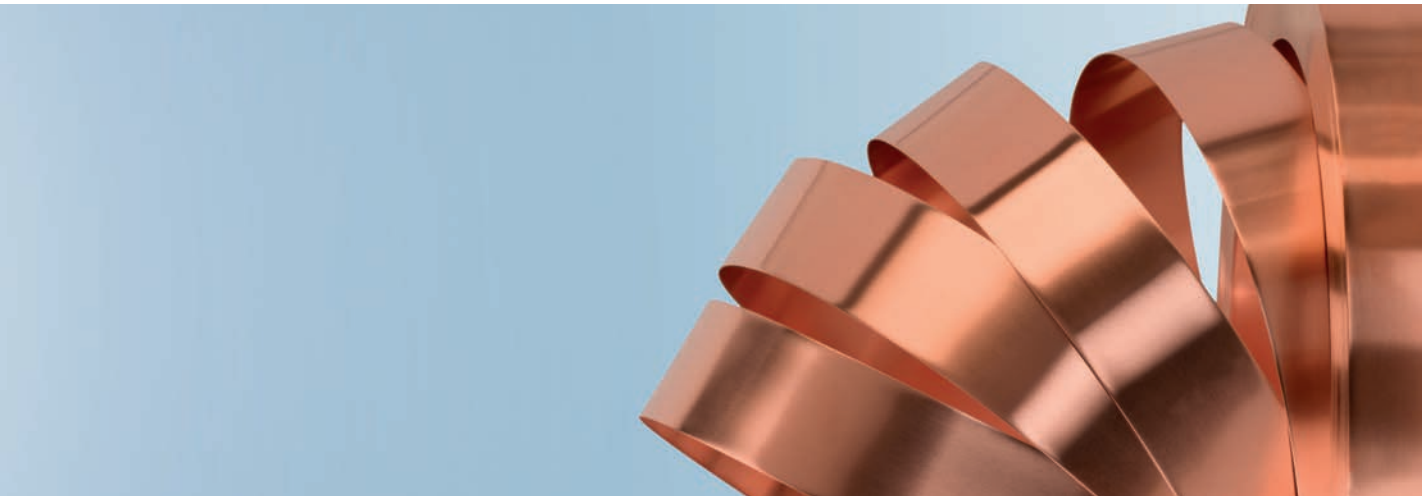


Industrial strip

Aurubis provides a full range of copper and copper alloy strip for almost any industrial application — in standard dimensions or tailored to customer specifications.

Coil weights and inner and outer diameters are tailored for the customer's individual production processes and equipment requirements.

*in rings, on coils, and as ContiCoil®.



Sheet, plate and circles

Aurubis' sheet and plate come in an unrivaled range of dimensions unique to the market and are manufactured for various applications and critical parts for many products.

The variety of Aurubis' products is matched by the number of applications in which they are found: from MRI scanners and printed circuit boards (PCBs) to printing plates for engraving, and even sputtering targets.



Architectural solutions

Aurubis offers a wide range of copper architectural products and services for the construction industry. These include copper and copper alloy sheet and strip with different surface qualities, prefabricated systems for facades, roofs and rainwater systems, and integrated roof systems. The Nordic Products™ surfaces by Aurubis include variable intensities of green or blue pre-patination and classic brown pre-oxidation.



Power electronics

Aurubis provides an extensive portfolio of high precision copper strips, wires and profiles for applications related to power electronics like copper-ceramic substrates, base plates, heat sinks (flat and pin fins), terminals, bus bars, press fits and connectors.

Specialty leaflets available upon request.

Alloys

The Aurubis alloy portfolio covers over 95 % of global copper strip demand.

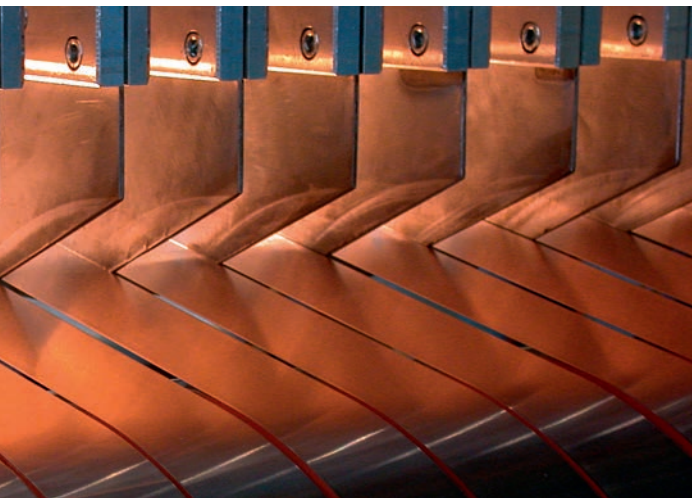
Pure copper alloys and low-alloyed copper					
ISO	UNS	EN	JIS	Pori	Stolberg
Cu-OFE (OF-Cu)	C10100	CW009A	C1011	Cu-OFE	PNA 203
Cu-OF	C10200	CW008A	C1020	Cu-OF	
Cu-HCP (SE-Cu 57)	C10300	CW021A		Cu-HCP	PNA 210
Cu-XLP / Cu-PHC (SE-Cu 58)	C10300	CW020A		Cu-XLP	PNA 209
CuAg0.03(OF) (CuAg0.03P)	C11300				PNA 202
CuAg0.04 (OF)	C10400	CW017A		CuAg0.04 (OF)	
CuAg0.045 (OF)				CuAg0.05 (OF)	
CuAg0.10P	C10700	CW016A		CuAg0.10P	PNA 217
CuAg0.10	C10700	CW013A		CuAg0.10	
CuAg0.10 (OF)	C10700	CW019A		CuAg0.10 (OF)	
Cu-ETP (E-Cu)	C11000	CW004A	C1100	Cu-ETP	PNA 211
Cu-DLP	C12000	CW023A	C1201	Cu-DLP	PNA 220
Cu-DHP (SF-Cu)	C12200	CW024A	C1221	Cu-DHP	PNA 219
CuSn0.15	C14415	CW117C		CuSn0.15	PNA 216
CuSn0.2	C14410				PNA 215
CuFe0.1P	C19210				PNA 214
CuZn0.5		CW119C			PNA 218
Brass					
ISO	UNS	EN	JIS	Pori	Stolberg
CuZn5	C21000	CW500L	C2100		PNA 221
CuZn10	C22000	CW501L	C2200		PNA 222
CuZn15	C23000	CW502L	C2300	Nordic Brass™	PNA 223
CuZn20	C24000	CW503L	C2400		PNA 224
CuZn28		CW504L			PNA 225
CuZn30	C26000	CW505L	C2600		PNA 226
CuZn33	C26800	CW506L	C2680		PNA 227
CuZn36	C27000	CW507L			PNA 248
CuZn37	C27200	CW508L	C2720		PNA 243
CuZn40	C28000	CW509L	C3712		PNA 260
CuZn42 BlueBrass®					PNA 378

Bronze alloys					
ISO	UNS	EN	JIS	Pori	Stolberg
CuSn2Fe0.1P0.03	C50715				PNA 328
CuSn1					PNA 298
CuSn2					PNA 288
CuSn4	C51100	CW450K	C5111	Nordic Bronze™	PNA 284
CuSn5	C51000	CW451K	C5102		PNA 285
CuSn6	C51900	CW452K	C5191		PNA 282
CuSn8	C52100	CW453K			PNA 283
CuSn10	C52400				PNA 292
CuSn12					PNA 295
Special bronzes					
ISO	UNS	EN	JIS	Pori	Stolberg
CuAl5Zn5Sn1				Nordic Royal™	PNA 319
CuNi10Fe1Mn	C70600	CW352H			PNA 334
High-performance alloys					
ISO	UNS	EN	JIS	Pori	Stolberg
CuCrZr	C18150				PNA 372
CuZr0.1	C15100				PNA 296
CuMg0.1	C15500				PNA 297
CuNi1.5Si	C19010				PNA 290
CuNi1.5Sn	C19005				PNA 326
CuFe2P	C19400	CW107C	C1940		PNA 212
CuFe2PMg	C19400				PNA 206
CuFe0.7MgP	C19700				PNA 205
CuNi3SiMg	C70250				PNA 370

Aurubis also supplies slightly modified alloys with special properties.

Top-tier technology

with outstanding possibilities



Slitting centers

Aurubis cooperates with a network of slitting and distribution centers in Europe and Asia.

Aurubis has very high continuous casting production capacities worldwide. State-of-the-art casting techniques such as slab casting (continuous or discontinuous, each followed by hot rolling) and continuous strip casting followed by cold rolling are used to produce high-quality rolled products.

These different techniques guarantee high flexibility, the fulfillment of special requirements, and efficient mono production for large batch sizes.

In addition, Aurubis offers customers innovative research and development services as well as opportunities for technical cooperation.

Unique range of dimensions

	Thickness in mm	Width in mm
Industrial strip	0.100 – 7.000	5 – 1,150
Cable strip	0.180 – 0.500	5 – 635
Sheet < 2 mm	0.300 – 2.000	max. 1,150
Sheet > 2 mm	2.000 – 6.000	max. 1,100
Plate	6.000 – 200	max. 1,100
Circles	0.400 – 2.000	250 – 1,050

Ratio of width to thickness on request.

Electrical and electronics industries

High purity, excellent surfaces, and customized production

The electrical and electronics industries are key consumers due to copper's excellent electrical and thermal conductivity.

Copper is an ideal material for reinforced printed circuit boards (PCBs), switches, complex components, transformers, heat sinks, baseplates, busbars, commutators and many other demanding applications, such as direct copper bonding (DCB) and advanced metal brazing (AMB).

In addition to customized production and material compositions tailored to specific products, the excellent surface quality of Aurubis copper strip provides the basis for a wide range of applications — even with greater material thicknesses.



Quality assurance

Aurubis monitors and documents product quality using a quality management system. Aurubis Stolberg is certified in accordance with IATF 16949, ISO 9001, ISO 50001, ISO 45001, ISO 14001:2015, and The Copper Mark.

Tin-plated products



Properties and applications

Strip undergoes multiple surface treatments to meet the high demands the automotive, electrical and electronics industries place on connectors and leadframes — such as low insertion and drawing forces, good corrosion protection, and good solderability. Three main processes are generally used for coating: hot-dip tinning, electroplating and electroplating with subsequent reflow treatment. In electroplating, copper and copper alloy strip can be coated with various metals. Pure tin coatings are particularly in demand due to the efficiency of the process.

Hot-dip tinning		
Strip thickness in mm	Tin layer thickness incl. tolerances (standard tin-plating 99.9%)	Main properties
0.10 – 1.50	0.8 – 1.5 µm	Low insertion force and drawing force
	1.0 – 3.0 µm	Low insertion force and drawing force, corrosion protection
	2.0 – 4.0 µm 3.0 – 6.0 µm	Good corrosion protection
	4.0 – 8.0 µm 5.0 – 10.0 µm	Good solderability
	10.0 – 16.0 µm	Special applications

In-house production.

Electroplating		
Strip thickness in mm		Main properties
≤ 5.0	Tin matte brushed/matte/bright	Good electrical contact, low insertion force and drawing force and/or corrosion protection
	Nickel	Special applications and diffusion barrier (underlayer)
≤ 1.5	Reflow tin	Mitigates tin whiskers
	Advanced reflow tin	Long-term solderability (and possibly improved insertion force and drawing force)
≤ 3.0	Silver	High corrosion protection, higher temperature resistance

Copper underlayer and selective plating on request.

BlueBrass®

lead-free. machinable. conductive.

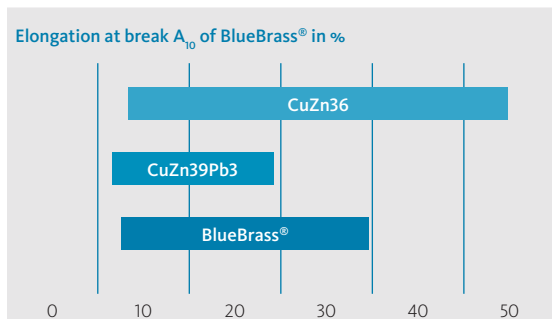
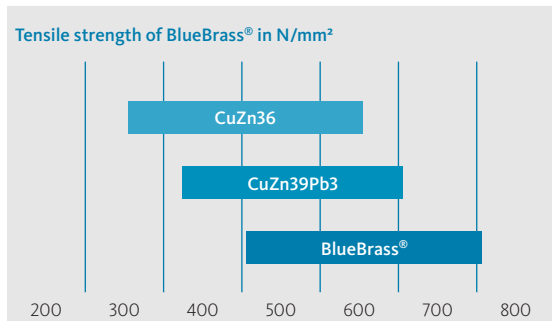


Aurubis Stolberg developed the BlueBrass® product brand of lead-free brass materials for use in watchmaking, for example. The site manufactures strip, wire and bars for cut products, such as plates for mechanical clockworks. These products are primarily made from leaded brass materials because of their good machinability.

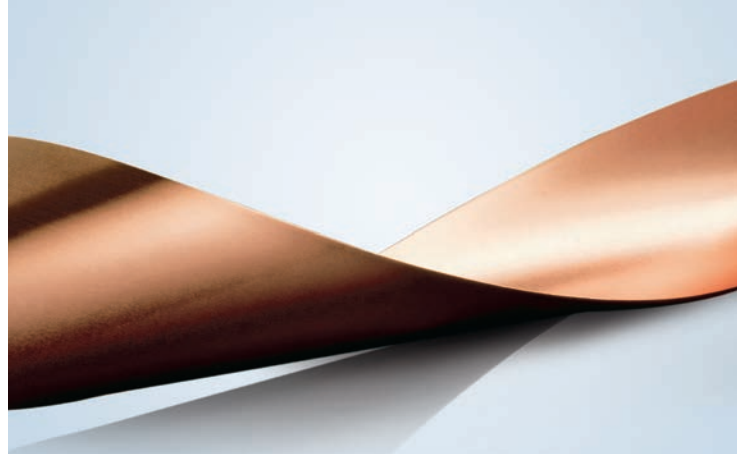
Legal standards — such as EU guidelines — are increasingly limiting the use of leaded materials to safeguard health and the environment. With BlueBrass®, Aurubis Stolberg offers mechanical clockwork manufacturers a lead-free alternative that completely conforms to current and future legal requirements. All the brass materials in the BlueBrass® family fully comply with the EU's REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) regulation, which limits the lead concentration in jewelry and watches to 500 ppm, and with the CPSIA (Consumer Product Safety Improvement Act) that permits just 100 ppm lead in watches.

All BlueBrass® alloys are 100% recyclable and compatible with existing scrap and swarf loops.

Visit www.aurubis.com/en/stolberg/products/bluebrass to see all the current alloys in the BlueBrass® family. Aurubis application engineering is available for special requirements.



Outstanding service



Before, during and, of course, after purchase, Aurubis supports its customers with extensive commercial, technical and logistical services geared entirely to their needs.

Commercial services

- › Copper market expertise and many years of experience
- › Strong and financially secure long-term copper supply
- › The latest copper market information
- › Hedging advice and support

Technical services

- › Support from our network of experienced technicians and engineers in selecting and processing semi-finished products
- › Laboratories with extensive, state-of-the-art physical and chemical analyses including scanning electron microscopy
- › Recycling concepts for our customers to increase economic efficiency — closing the loop

Logistics

- › Maximum delivery reliability thanks to the integrated supply chain — from concentrate to strip
- › Joint projects with our customers to optimize the production chain
- › Worldwide availability thanks to an international sales network: operating globally — acting locally

Sustainability — Tomorrow Metals by Aurubis: minimizing our impact

- › Tomorrow Metals is our promise to stay best in class in all current and future sustainability challenges through our metals.
- › We are committed to continually delivering more value with a lower environmental footprint. Our concept of sustainability covers the key areas of business, the environment, and people.
- › Our mission: We responsibly transform raw materials into metals for an innovative and sustainable world.



Metals for Progress

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