



Rolled Products

Facts & Figures

Aurubis Rolled Products

- > 200,000** • **metric tons of foil, strip, sheet and plate** are produced worldwide annually by Aurubis.
- > 98 %** • of **global strip demand** is covered by Aurubis' alloy portfolio.
- 50** • metric tons is the size of the **biggest copper and brass coil in the world**, produced by Aurubis.
- 4** • **rolling mills** in Europe and the US.
- 4** • **tin-plating lines** in Europe and the US.



**Min. 0.025 mm
to max. 200 mm**

extensive thickness range –
from foil to plate.

Rolled Products fabrication

Chicago (US)

Buffalo (US)

Avellino (Italy)

Mortara (Italy)

Yverdon-les-Bains (Switzerland)

Lyon (France)

Barcelona (Spain)

Emmerich (Germany)

Fehrbellin (Germany)

Hamburg (Germany)

Group headquarters

Lünen (Germany)

Röthenbach (Germany)

Stolberg (Germany)

Strass (Germany)

Zutphen (Netherlands)

Brussels (Belgium)

Olen (Belgium)

Birmingham (United Kingdom)

Pori (Finland)

Västerås (Sweden)

Finspång (Sweden)

St. Petersburg (Russia)

Dolný Kubín (Slovakia)

Pirdop (Bulgaria)

Istanbul (Turkey)

Prague (Czech Republic)

Dubai (UAE)

Bangkok (Thailand)

Ho Chi Minh City (Vietnam)

Singapore (Singapore)

Seoul (Korea)

Tokyo (Japan)

Taipei (Taiwan)

Shanghai (China)

Hong Kong (China)

Raw materials

Concentrates and recycling materials are the raw materials from which copper is produced.



Products

The copper is processed into products. Some products are already the result of copper production.



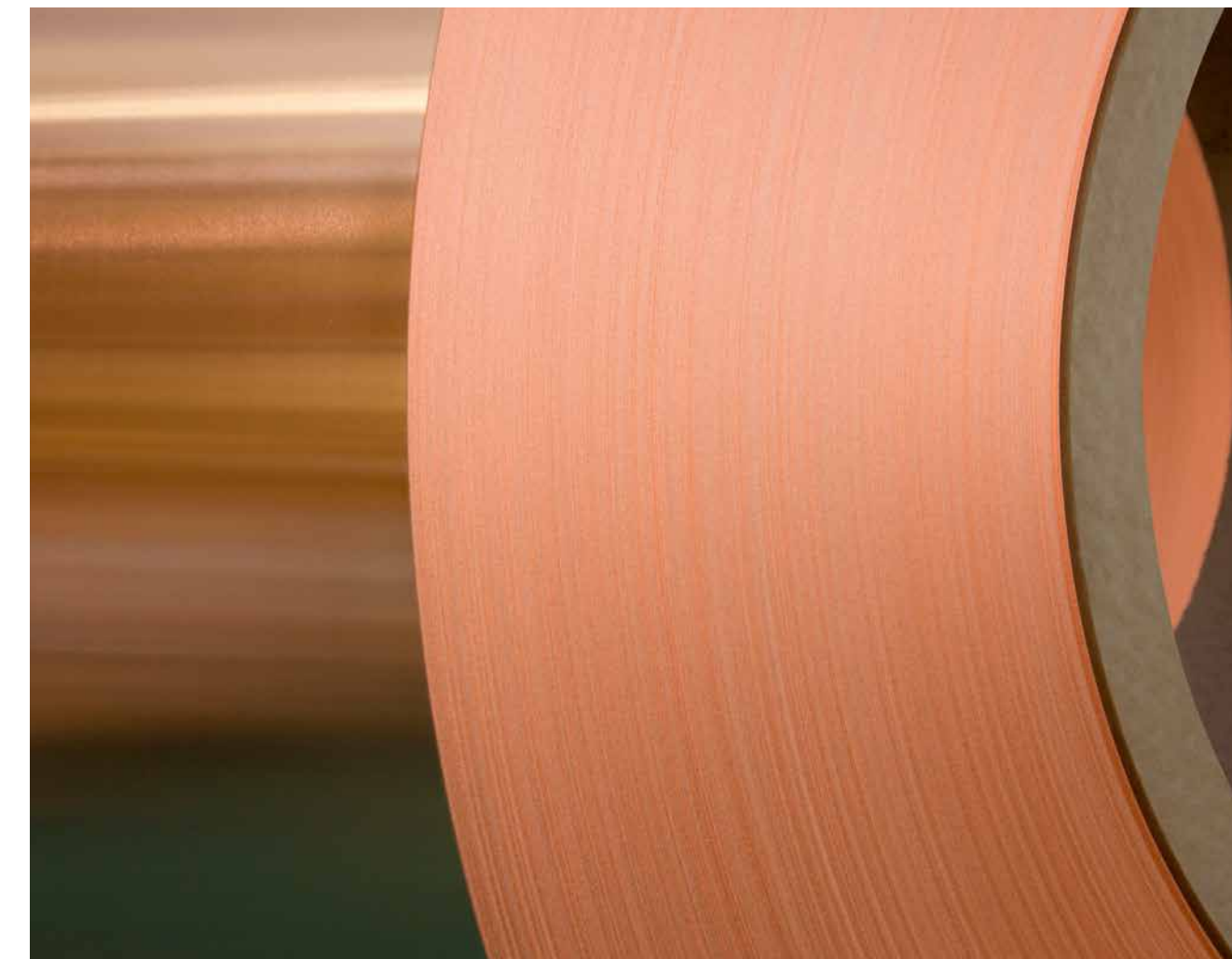
Slitting Centers

Service Centers located near our customers cut strips to the desired dimensions.



Sales and distribution

An international sales and distribution network markets our products.



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Aurubis Group

Our copper for your life



The company's history is characterized by its dynamics and flexibility, from our founding as a stock corporation in 1866 to today.

Nowadays, the Aurubis Group is ideally positioned; with about 6,500 employees at production sites in Europe and the US and sales offices all over the world,

Aurubis is one of the leading integrated copper groups. Aurubis stands for innovative processes, cutting-edge technology, exemplary environmental protection, customer value and profitability.

Uniquely, Aurubis combines copper production with processing copper into tailor-made products.

As a fully integrated global copper company, Aurubis is a leader in smelting, fabricating, refining and recycling copper.

Aurubis shares are part of the Prime Standard Segment of the Deutsche Börse and are listed in the MDAX, the European Stoxx 600 and the Global Challenges Index (GCX).

Aurubis Rolled Products

Synergies & strengths

RELIABILITY

Aurubis is one of the leading strip producers worldwide, covering the products that are in demand today – from basic alloys to High Performance Alloys (HPAs) and specialty alloys.

Global market leaders in the automotive, electronics and electrical industry trust Aurubis' production capabilities, financial stability, competence and long-term commitment to the copper industry.

Aurubis' alloy portfolio contains over 70 top quality copper and copper alloys: from high purity oxygen-free copper to brass alloys, copper-tin alloys, special

CuproBraz[®] alloys and High Performance Alloys.

Aurubis understands its customers' markets, needs and requirements. Our focus is on markets where the specific, conductivity-related properties of copper add value for our customers.

Customers benefit from our quality, productivity, process efficiency and innovation. Aurubis values long-term relationships and strives to build those relationships with its business partners.

OPERATING GLOBALLY – ACTING LOCALLY

As a global player with four rolling mills in Europe and the US, a network of slitting centers and sales offices as well as distribution partners around the world, Aurubis provides its customers worldwide with excellent local services to ensure customer proximity to emerging and developing markets.

Aurubis fabricates its flat rolled products in Buffalo (US), Pori (Finland), Stolberg (Germany) and Zutphen (Netherlands) and has a variety of materials and production capabilities.

All of these factors make Aurubis a global and local partner.



Offering the broadest range

Aurubis is the fabricator with the world's largest product portfolio of foil, strip, sheet, plate and circles produced according to special customer requirements.



CABLE STRIP

Strip for radio frequency and submarine cable and cable wrap for power cable have been part of the production program for decades.

Aurubis' core expertise is in continuous casting and rolling to thin gauges with tight tolerances and homogeneous properties. New applications – such as deep-water dynamic sea cables for floating oil and gas platforms – have been developed to serve customer needs.

* as coil, spooled and as ContiCoil®



CONNECTOR STRIP

Responding to the high demands in the automotive, electrical and electronics industry, Aurubis offers connector and stamped grid products with standard and High Performance Alloys (HPAs). The extensive portfolio is produced with bare or tin-coated surfaces* to the highest standards in the industry.



STRIP FOR ENGINE COOLING

Aurubis is the worldwide market leader in copper and brass strip for engine cooling applications utilizing soft solders and CuproBraz® technology. The CuproBraz® technology was specifically developed for manufacturing heavy-duty mobile and industrial heat exchangers. New brass and copper alloys offer high durability, high thermal performance and corrosion resistance – maintaining their mechanical properties at elevated operating temperatures of more than 290°C (554°F).



INDUSTRIAL STRIP

Aurubis provides a full range of copper and copper alloy strip for almost any industrial application in standard dimensions or custom made to special requirements. Coil weights and inner and outer diameters are tailor-made to follow the customer's individual production processes and the requirements of their equipment.

Please ask for our special leaflets as required.



SHEETS, PLATES AND CIRCLES

Aurubis' sheet and plate have an unrivaled range of dimensions that are unique in the marketplace and manufactured for various applications and critical parts of many diverse products. The variety of Aurubis' products is matched by the number of applications in which they are found – from MRI scanners to printed circuit boards (PCBs), printing plates for engraving and even sputtering targets.



ARCHITECTURAL SOLUTIONS

Aurubis offers a wide range of copper-based architectural products and services for the building and construction industry. These include copper 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 brown pre-oxidation.

Alloys

More than 98 % of global strip demand is covered by our alloy portfolio.



PURE COPPER ALLOYS AND LOW-ALLOYED COPPER								
ISO	UNS	EN	JIS	CU+	Buffalo	Pori	Stolberg	Zutphen
Cu-OFE (OF-Cu)	C10100	CW009A	C1011	CU+	C101	Cu-OFE	PNA 203	
Cu-OF	C10200	CW008A	C1020	CU+	C102	Cu-OF		
Cu-HCP (SE-Cu 57)	C10300	CW021A		CU+	C103	Cu-HCP	PNA 210	SM0013
Cu-XLP / Cu-PHC (SE-Cu 58)	C10300	CW020A		CU+	C103	Cu-XLP	PNA 209	SM0011
CuAg0.03 (OF) (CuAg0.03P)	C11300			CU+			PNA 202	
CuAg0.04 (OF)	C10400	CW017A		CU+		CuAg0.04 (OF)		
CuAg0.045 (OF)						CuAg0.05 (OF)		
CuAg0.10P	C10700	CW016A		CU+		CuAg0.10P	PNA 217	
CuAg0.10	C10700	CW013A		CU+		CuAg0.10		
CuAg0.10 (OF)	C10700	CW019A		CU+		CuAg0.10 (OF)		
Cu-ETP (E-Cu)	C11000	CW004A	C1100	CU+	C110	Cu-ETP	PNA 211	
Cu-DLP	C12000	CW023A	C1201	CU+	C120	Cu-DLP	PNA 220	
Cu-DHP (SF-Cu)	C12200	CW024A	C1221	CU+	C122	Cu-DHP	PNA 219	
Cu-DHP	C12210	CW024A	C1220	CU+		Cu-DHP		SM0028
CuTe0.02Sn0.02	C14530			CU+	C1453			SM0300
CuSn0.04						CuSn0.04		SM0700
CuSn0.09						CuSn0.09		SM0701
CuSn0.15	C14415	CW117C		CU+	C14415	CuSn0.15	PNA 216	SM0702
CuSn0.2	C14410			CU+	C1441		PNA 215	
CuFe0.1P	C19210			CU+	KFC*		PNA 214	
CuZn0.5		CW119C			CuZn0.5		PNA 218	

BRASS								
ISO	UNS	EN	JIS	CU+	Buffalo	Pori	Stolberg	Zutphen
CuZn5	C21000	CW500L	C2100	CU+	C210		PNA 221	
CuZn10	C22000	CW501L	C2200	CU+	C220		PNA 222	SM1090
CuZn12.5	C22600			CU+	C226			
CuZn15	C23000	CW502L	C2300	CU+	C230	Nordic Brass	PNA 223	SM1085
CuZn20	C24000	CW503L	C2400	CU+	C240		PNA 224	
CuZn28		CW504L		CU+			PNA 225	
CuZn30	C26000	CW505L	C2600	CU+	C260		PNA 226	SM1070
CuZn30As	C26130	CW707R		CU+				SM2870
CuZn33	C26800	CW506L	C2680	CU+	C268		PNA 227	SM1067
CuZn35	C26800		C2680	CU+				SM1065
CuZn35P								SM2965
CuZn36	C27000	CW507L		CU+	C270		PNA 248	SM1064
CuZn37	C27200	CW508L	C2720	CU+	C272/C274		PNA 243	SM1063
CuZn40	C28000	CW509L	C3712	CU+	C280		PNA 260	
CuZn42 BlueBrass®							PNA 277	

ALLOYED BRASS								
ISO	UNS	EN	JIS	CU+	Buffalo	Pori	Stolberg	Zutphen
CuZn11.5Sn1	C42200			CU+	C422			
CuZn9.5Sn2	C42500		C4250	CU+	C425		PNA 330	
CuZn14Fe0.8Sn0.8	C66430			CU+	OCPX		PNA 331	

COPPER-TIN ALLOYS								
ISO	UNS	EN	JIS	CU+	Buffalo	Pori	Stolberg	Zutphen
CuSn2Fe0.1P0.03	C50715			CU+				KLF-5*
CuSn2Zn2.2Fe0.1P0.03	C50725			CU+				KLF-5Z*
CuSn1							PNA 298	
CuSn2							PNA 288	
CuSn4	C51100	CW450K	C5111	CU+	C511	Nordic Bronze	PNA 284	
CuSn5	C51000	CW451K	C5102	CU+	C510		PNA 285	
CuSn6	C51900	CW452K	C5191	CU+	C519		PNA 282	
CuSn8	C52100	CW453K		CU+	C521		PNA 283	
CuSn4 Adv.	C51180			CU+			PNA 294**	
CuSn4Fe0.1P0.03	C51190			CU+				KLF-7*
CuSn8 Adv.	C52180			CU+			PNA 293**	
CuSn10	C52400			CU+	C524		PNA 292	
CuSn12							PNA 295	

SPECIAL CuproBraz® ALLOYS								
ISO	UNS	EN	JIS	CU+	Buffalo	Pori	Stolberg	Zutphen
CuCr0.2								SM0502
CuZn15Fe0.8	C66420			CU+				SM2385
Cu64ZnNi3	C74400			CU+				SM2464

SPECIAL BRONZE								
ISO	UNS	EN	JIS	CU+	Buffalo	Pori	Stolberg	Zutphen
CuAl5Zn5Sn1						Nordic Royal	PNA 319	
CuNi10Fe1Mn	C70600	CW352H		CU+			PNA 334	

HIGH PERFORMANCE ALLOYS								
ISO	UNS	EN	JIS	CU+	Buffalo	Pori	Stolberg	Zutphen
CuZr0.1	C15100			CU+	C151		PNA 296	
CuMg0.1	C15500			CU+	C155		PNA 297	
CuMg0.7	C18665			CU+	C18665		PNA 395	
CuNi1.5Si	C19010			CU+	C1901		PNA 290	
CuFe2P	C19400	CW107C	C1940	CU+	C194		PNA 212	
CuFe2PMg	C19400			CU+	C194		PNA 206	
CuFe0.7MgP	C19700			CU+	C197		PNA 205	
CuSn1.2Ni0.8P0.07	C19040			CU+	CAC5*			
CuNi0.5Sn0.5	C19022			CU+	UNILLOY			
CuNi1.8Si0.4Zn1.1Sn0.1Mg0.01	C64760			CU+	CAC60*			
CuNi3SiMg	C70250			CU+	C7025		PNA 370	
CuNi2Si0.4	C70260	CW111C		CU+	C7026			

Aurubis also supplies slightly modified alloys with special properties, e.g. in accordance with Oeko-Tex Standard 100 and US Federal Regulations. * available in US ** available in EU

CU+ = Antimicrobial Copper

Technology with outstanding possibilities



SLITTING CENTERS

Aurubis has established a network of slitting and distribution centers in Europe (Italy, Netherlands, Slovakia, United Kingdom) and Asia and cooperates with partners worldwide. Furthermore, the slitting centers also function as service centers.

QUALITY ASSURANCE

Aurubis monitors and documents product quality using a Quality Management System. All rolling mills are certified in accordance with ISO/TS 16949 and/or DIN EN ISO 9001:2008.



Aurubis has the largest continuous casting production capacities worldwide.

Several state-of-the-art casting technologies such as cake casting (with consecutive hot rolling) and vertical and horizontal strip casting (both with consecutive cold rolling) are used to produce consistent and high quality rolled products.

These different technologies provide high flexibility, custom products and efficient mono-manufacturing of large lot sizes.

Aurubis produces the largest copper coils in the world with the tightest tolerances.

In addition, Aurubis uses the most efficient technology and offers innovative assistance in Research & Development as

well as technical cooperation for customers. The technical center for developing and manufacturing thermal management solutions offers accelerated corrosion tests and wind tunnel tests for radiators and charge air coolers, for instance.

Aurubis has the variety of material and production capabilities to meet customer requirements.

Electrical and electronics industries

HIGH PURITY, EXCELLENT SURFACES AND MICRO-ALLOYED COMPOSITIONS

The main consumers of copper are in the electrical and electronics industry due to the excellent electrical and thermal conductivity of copper. Copper is an ideal material for heavy gauge printed circuit

boards (PCBs), switches, different components, transformers, heat sinks and base plates, bus bars, commutators and many other demanding applications such as direct copper bonding (DCB).

The combination of chemical composition and excellent sur-

face quality of higher thicknesses or dimensions covers different applications.

The properties of pure copper can still be improved by micro-alloyed amounts of silver that enable use under high, demanding temperatures.

UNIQUE RANGE OF DIMENSIONS

	Thickness in mm	Width in mm	Thickness in inches	Width in inches
Industrial strip	0.075 – 7.000	5 – 1219	0.0030 – 0.2756	0.197 – 48.000
Engine cooling strip	0.025 – 0.500	5 – 320	0.0010 – 0.0197	0.197 – 12.598
Cable strip & foil	0.025 – 0.500	5 – 635	0.0010 – 0.0197	0.197 – 25.000
Industrial foil	0.025 – 0.100	10 – 600	0.0010 – 0.0040	0.394 – 23.622
Sheets < 2 mm / 0.0787 inch	0.300 – 2.000	350 – 1219	0.0118 – 0.0787	13.780 – 48.000
Sheets > 2 mm / 0.0787 inch	2.000 – 6.000	540 – 1100	0.0787 – 0.2366	21.598 – 43.307
Plates	6.000 – 200	100 – 1100	0.2362 – 7.8740	3.937 – 43.307
Circles	0.300 – 3.000	65 – 1050	0.0118 – 0.1181	2.559 – 41.338

Ratio of width to thickness on request.

Tin-plated solutions

Aurubis operates two hot-dip tinning and two electroplating lines in Europe and the US and supplies customers with tinned products.

We offer additional types of coatings, such as TN, TQ, silver and copper-nickel, via service partners.

PROPERTIES AND APPLICATIONS

In order to meet the high demands of the automotive, electrical and electronics industries on connectors and stamped grids – such as low insertion

forces, good corrosion resistance and good solderability – the strip used is required to have repeated surface treatments.

Three main processes are used for coating: hot-dip tinning, electroplating and electro-

plating with a subsequent reflow treatment.

Accordingly, copper and copper alloy strip can be coated with a variety of metals. Pure tin coatings are particularly important due to their economic efficiency.

HOT-DIP TINNING			
Strip thickness in mm		Tin layer thickness incl. tolerances (standard tin-plating 99.9%)	Main properties
0.10 – 1.50	Air level mechanical wipe	0.8 – 1.5 µm	Low insertion force
		1.0 – 3.0 µm	Low insertion force, corrosion protection
		2.0 – 4.0 µm	Good corrosion protection
		3.0 – 6.0 µm	
		4.0 – 8.0 µm	Good solderability
		5.0 – 10.0 µm	
		10.0 – 16.0 µm	Special applications

ELECTROPLATING		
Strip thickness in mm		Main properties
0.20 – 0.80	Tin matte / bright / brushed	Good electrical contact, low insertion force and / or corrosion protection
	Tin reflowed	Mitigates whiskers
	Nickel	Special applications and diffusion barrier (underlayer)
	TN (available in US)	Very low insertion force
	TQ (available in US)	Long-term solderability
0.10 – 4.0	Tin matte / bright / brushed	Good electrical contact, low insertion force and / or corrosion protection
0.10 – 2.0	Tin reflowed	Mitigates tin whiskers
	Advanced reflow tin	Long-term solderability
	Super thin advanced reflow tin (STAR)	Very low insertion force
	Nickel	Special applications and diffusion barrier (underlayer)
	Silver	High corrosion protection, higher temperature resistance

Copper underlayer and selective plating on request.

■ In-house production



Before, during and of course also after purchase, Aurubis offers its customers comprehensive commercial, technical and logistical services, geared entirely to the needs of our customers.

Outstanding service

COMMERCIAL SERVICES

- » Copper market expertise and many years of experience
- » Strong and financially healthy long-term copper supply
- » Provision of 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
- » Laboratory with facilities for extensive, state-of-the-art physical and chemical analyses including scanning electron microscopy
- » Recycling concepts for our customers to increase economic efficiency
- » Integrated supply chain from concentrate to strip

LOGISTICS

- » Maximum reliability of supply and flexibility, thanks to the integrated copper supply
- » Joint projects with our customers to optimize the production chain
- » Worldwide availability due to the international sales network: Operating globally – acting locally

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Our Copper for your Life

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