

Specialty Wire

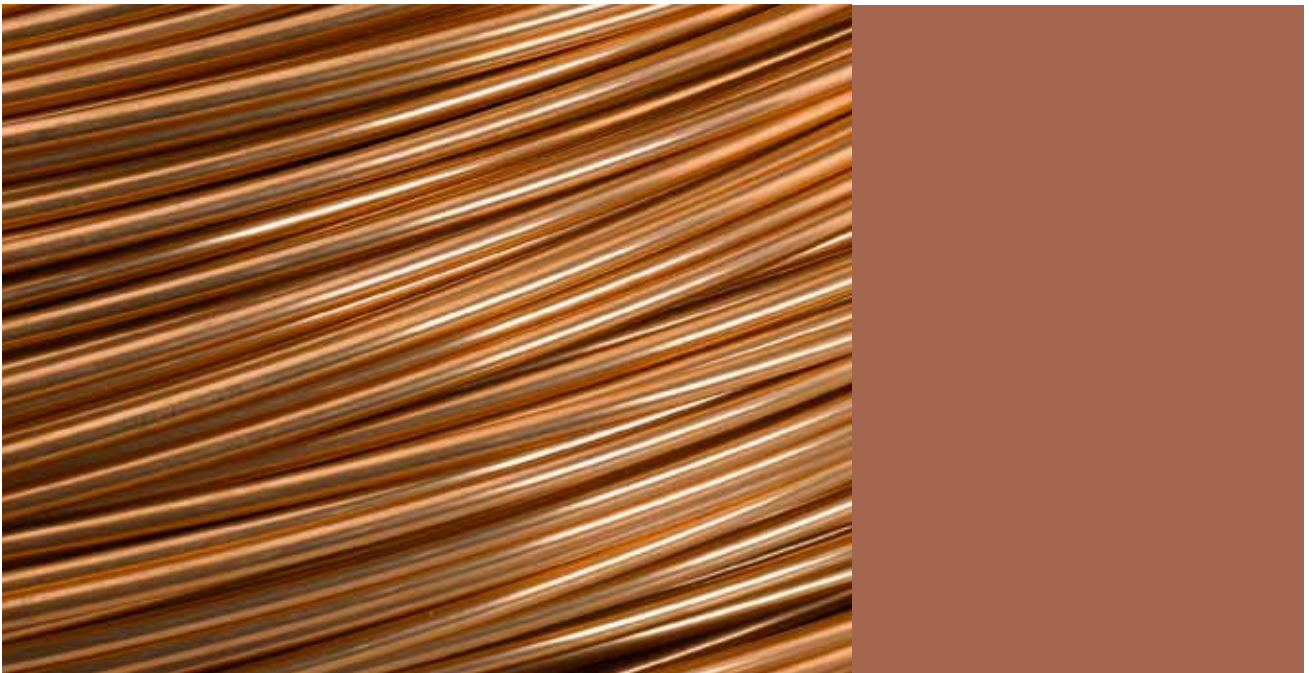
Facts & Figures

Aurubis Specialty Wire

2010 • Aurubis first cast the **lead-free, machinable brass alloy BlueBrass®** in accordance with RoHs.

> 1,000 • **profile shapes** are manufactured using our own **know-how**.

> 50 • **product-specific alloys** offer optimized properties for further processing.



Production of Specialty Wire

- Chicago (USA)**
- Buffalo (USA)**
- Avellino (Italy)**
- Mortara (Italy)**
- Yverdon-les-Bains (Switzerland)**
- Lyon (France)**
- Madrid (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)**
- St. Petersburg (Russia)**
- Dolný Kubín (Slovakia)**
- Pirdop (Bulgaria)**
- Istanbul (Turkey)**

- 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



As a fully integrated global copper company, Aurubis is a leader in smelting, fabricating, refining and recycling copper. With about 6,400 employees at production sites in Europe and the US and sales offices all over the world, the Aurubis

Group has a global position in the copper industry. Aurubis stands for innovative processes, cutting-edge technology, exemplary environmental protection, customer value and high profitability.

Aurubis

Specialty Wire

Drawn products manufactured by Aurubis are supplied to manufacturers of precision parts. They benefit from the broad range of alloys and dimensions.

At the Stolberg production site, Aurubis manufactures a large selection of special profiles in addition to round, square and hexagonal wires with a wide range of dimensions. Wire is

delivered on spools, in drums and as coiled material, thus offering a large selection of coil types and processing weights. Aurubis' focus is on markets where the specific, conductivity-related properties of copper and copper alloys provide added value to our customers.

Customers benefit from our quality, productivity, process efficiency and innovation.

Long-term customer relationships stand for reliability and confidence.

Aurubis strongly values cooperation with significant universities like the Aachen University of Technology (RWTH Aachen). The Research and Development (R&D) department at Aurubis benefits from the interdisciplinary work of its expert teams all over Europe.

Alloys

BRASS ALLOYS – CONTAINING LEAD				
ISO	UNS	EN	BS	Aurubis
CuZn35Pb2	C34200	CW601N	CZ119	PNA 263
CuZn36Pb3	C36000	CW603N	CZ124	PNA 254
CuZn37Pb2	C35300	CW606N	CZ131	PNA 273
CuZn38Pb1.5	C35300	CW608N	CZ128	PNA 259
CuZn38Pb2	C35300	CW608N	CZ128	PNA 272
CuZn39Pb2	C37700	CW612N	CZ128	PNA 250
CuZn39Pb3	C38500	CW614N	CZ121	PNA 253
CuZn40Pb2	C38000	CW617N	CZ122	PNA 251
BRASS ALLOYS – LESS DEPLETED				
ISO	UNS	EN	BS	Aurubis
CuZn39Pb0.5	C36500	CW610N	CZ137	PNA 265
CuZn40Pb0.8				PNA 255
BRASS ALLOYS – LEAD-FREE				
ISO	UNS	EN	BS	Aurubis
CuZn33	C26800	CW506L		PNA 227
CuZn36	C27000	CW507L		PNA 244
CuZn37	C27200	CW508L	CZ108	PNA 245
BLUEBRASS® *				
ISO	UNS	EN	BS	Aurubis
BlueBrass®42 CuZn42				PNA 277
BlueBrass®42e CuZn42				PNA 278
WELDING RODS				
ISO	UNS	EN	BS	Aurubis
CuZn40SiSn		CF725R		PNA 232
CuZn39Mn1SiSn		CF728R		PNA 233
CuZn40Si		CF724R		PNA 231
COPPER				
ISO	UNS	EN	BS	Aurubis
Cu-ETP (E-Cu)	C11000	CW004A	C101	PNA 211
Cu-OFE (OF-Cu)	C10100	CW009A	C110	PNA 203
CuAg0.03P	C11300	CW014A	C101	PNA 202
CuAg0.03	C11400	CW011A		PNA 201
Cu-PHC (SE-Cu58)	C10300	CW020A		PNA 209
Cu-HCP (SE-Cu57)	C10300	CW021A		PNA 210
HIGH PERFORMANCE ALLOYS				
ISO	UNS	EN	BS	Aurubis
CuFe0.8MgP	C19700			PNA 205
CuFe2P	C19400	CW107C		PNA 212
CuZr0.1	C15100			PNA 296

Aurubis provides many modified alloys with special properties.

* Please visit www.BlueBrass.com for all available BlueBrass® alloys.

Drawn and extruded products

Dimensions

QUALITY ASSURANCE

The Aurubis production site Stolberg is certified in accordance with ISO/TS 16949 and DIN EN ISO 9001:2008.



DRAWN WIRES (All dimensions in mm)					
Product	Round	Square	Hexagonal	Flat	Profile
Brass alloys containing lead	2.0 – 14.5	3.5 – 12.0	3.5 – 12.0	2.0–14.0*	Cross-section** 10 – 150 mm ²
Brass alloys lead-free	2.0 – 14.5	3.5 – 12.0	3.5 – 12.0	2.0–14.0*	Cross-section** 10 – 150 mm ²
Copper	2.0 – 14.5	3.5 – 12.0	3.5 – 12.0	2.0–14.0*	Cross-section** 10 – 150 mm ²

EXTRUDED WIRES (All dimensions in mm)					
Product	Round	Square	Hexagonal	Flat	Profile
Brass alloys containing lead	4.5 – 15.0				
Brass alloys lead-free	8.0 – 15.0			Upon request	
Copper	10.0 – 17.0				

WELDING BRASS (All dimensions in mm)					
Product	Round wire	Welding rods			
	2.0 – 6.0				
	2.0 – 4.0		Rods drawn up to a length of 1 m		

* Specifications of width to height upon request.

** Spooled circumference max. 14 mm.

Additional dimensions upon request. Please ask for our special leaflets as required.

Delivery forms

Drawn products

PACK COILING, SPOOLED

(With or without cardboard drum)



Inner Ø (mm)	Width of layer (mm)	Max. outer Ø (mm)	Weight
630	350	1,150	500 – 1,200 kg
710	350	1,150	500 – 1,100 kg
710	200	950	300 – 350 kg
500	450	1,000	500 – 1,200 kg
500	500	1,000	500 – 1,250 kg
359	278	740	450 – 550 kg

STEEL DRUM



Bore Ø (mm)	Width of layer (mm)	Max. outer Ø (mm)	Weight
80	520	1,050	500 – 1,200 kg

COILS



Inner Ø (mm)	Width of layer (mm)	Max. outer Ø (mm)	Weight
450	50 – 150	750	30 – 80 kg
550	70 – 200	850	50 – 120 kg
800	80 – 250	1,000	150 kg

TUBULAR CARRIERS



Height (mm)	Max. foot Ø (mm)	Crown Ø (mm)	Weight
800 – 1,500	1,000	ca. 480	250 – 1,000 kg

BULK COILS

(With or without cardboard drum)



Inner Ø (mm)	Height (mm)	Max. outer Ø (mm)	Weight
600	max. 1,000	1,400	max. 4,000 kg

WIRE IN CARDBOARD DRUMS



Inner Ø (mm)	Height (mm)	Max. outer Ø (mm)	Weight
400	600	630	max. 250 kg

WELDING RODS IN BOXES

(Loose in boxes or in 10/25 kg plastic bags)



Length (mm)	Width (mm)	Height (mm)	Content
1,050	320	100	100 kg
1,050	420	300	500 kg
1,050	570	320	1,000 kg

BlueBrass®

lead-free. machinable. conductive.

With BlueBrass®, Aurubis has developed a family of alloys that perfectly connects the current standards of the electrical and automotive industry with respect to conductivity, machinability and formability and the increasing demand for lead-free alloys. BlueBrass® is ideally suited for the production of lead-free connectors. Its electrical conductivity and corrosion resistance are fully comparable to those of currently used machining brass.



www.BlueBrass.com

In addition to high strength, the formability of BlueBrass®42 as compared to brass alloys containing lead is markedly increased to a level that could previously only be achieved with lead-free, poorly machinable alloys.

CHEMICAL COMPOSITION (BY WEIGHT %)	BLUEBRASS®42	BLUEBRASS®42e
Cu	57.00 – 59.00	58.00 – 58.50
Zn	Residual	Residual
Fe, Ni, Sn	0.10 – 0.50	0.10 – 0.50
Si, Mn	max. 0.10	max. 0.10
Pb	< 0.10	< 0.10

AREAS OF APPLICATION:

- » Automotive sector
- » Electrical industry
- » Construction industry
- » Air conditioning technology

PHYSICAL PROPERTIES		
Density	g / cm³	8.40
Thermal expansion coefficient	10 – 6 / K	20.00
Electrical conductivity	MS / m % IACS	14.60 25.00
Thermal conductivity	W / (mK)	113.00
Modulus of elasticity	kN / mm²	105.00

COST-EFFICIENT AND RECYCLABLE

The material is also of interest to processors of semi-finished products due to economic

factors such as the lower metal price and mixability of production scrap.

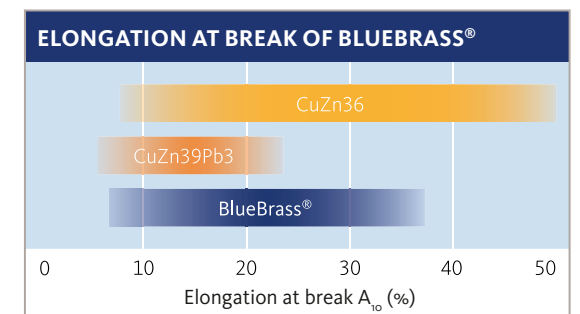
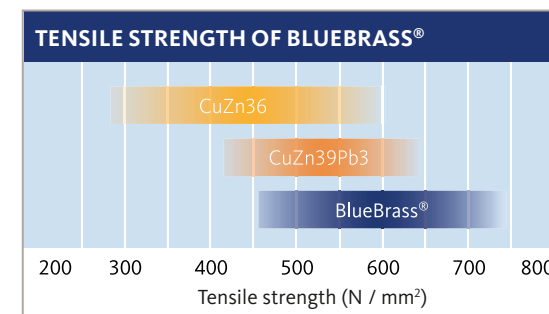
Metal and production scrap can be returned to the existing recycling loops.

SAVINGS IN PROCESSING

The high strength and good formability of BlueBrass® combined with its good machinability open up new possibilities for component manufacturing.

BlueBrass® reveals new potential for processing companies. By cold deformation and subsequent machining, they are able to produce

more stable parts while simultaneously reducing scrap.



THE BLUE BRASS® FAMILY IS GROWING

The newest alloy, BlueBrass®42e, is a product-specific alloy fulfilling the requirements

of the electrical industry (VDE standards).

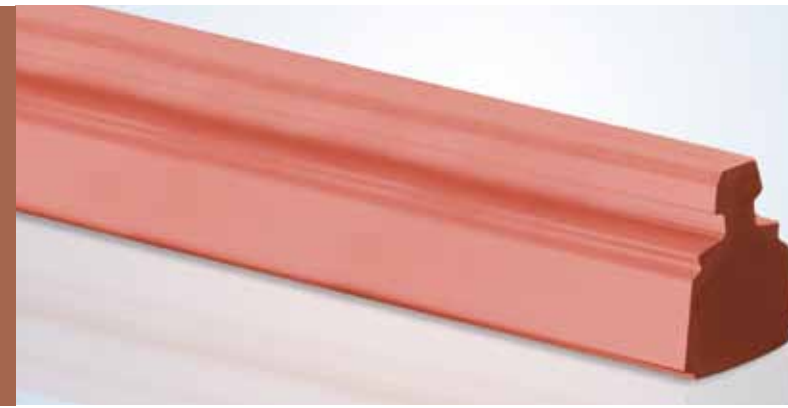


Conform™ technology

Endless variety – individual and complex

Conform™ is a technology for the continuous deforming of copper wire to manufacture flat products and profiles. A number of individual profiles can be produced according to customers' requirements, such as:

- » Bus bars
- » Contact bars
- » Switchgear
- » Circuit breakers
- » Trunking and conductor systems
- » AC and DC motors
- » Generators
- » Induction systems and electrolysis
- » Conductors
- » Commutators
- » Blade contacts



CONDUCTIVITY

Copper is the best base material for generating and transmitting electric energy with regard to the high demands on conductivity and resistance. The excellent conductivity and high resistance of copper make it an ideal base material for conducting thermal heat in electrical engineering, especially in conjunction with the simulta-

neous trend towards shrinking components. Specially produced high-purity copper cathodes with a copper content of 99.99 % ensure first-class quality of Aurubis copper profiles.

SAVINGS THROUGH COMPLEXITY

Nearly infinite coil lengths contribute to maximum processing times and optimal processing costs. The Conform™ technology is an ideal alternative to flat rolled and slit material with an extraordinary width/thickness ratio and enormous cost savings due to the reduction of production material.

PRODUCTS STANDARD CONFORM™*

Tensile strength R 220

Thickness* (mm)	Width (mm)	Width/thickness ratio	Cross-section* (mm²)	Delivery forms
Square, hexagonal, flat wire & profiles				
2 – 10	5 – 50	max. 10	10 – 300	Pack coiling, on steel spool or customer spool
Round wire				
Ø 3 – 18			7 – 255	

The mechanical properties and dimensional tolerances can be specifically set for a customer. Drawn products have clean and blank surfaces as well as edges and sides with a defined radius.

CONFORM™ + DRAWING*

Tensile strength > R 240

Thickness* (mm)	Width (mm)	Cross-section* (mm²)	Delivery forms
Square, hexagonal, flat wire & profiles			
2 – 3	5 – 20	> 10	Pack coiling, on steel spool or customer spool
3 – 6	20 – 40	> 20	
Round wire			
Ø 2 – 8		3 – 50	
Ø 8 – 15		50 – 180	

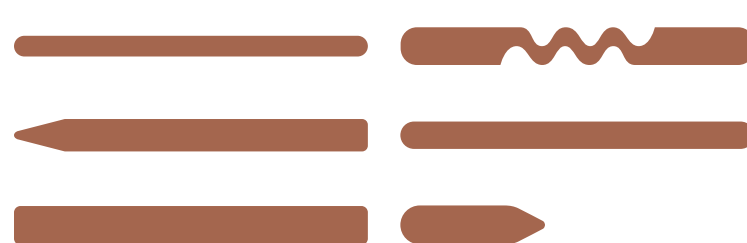
* Additional dimensions and tolerances upon request.

MATERIALS*

ISO	UNS
Cu-ETP (E-Cu)	C11000
Cu-OFE (OF-Cu)	C10100
Cu-Ag0.03	C11400
Cu-PHC (SE-Cu58)	C10300
Cu-HCP (SE-Cu57)	C10300

* Additional alloys upon request.

SAMPLE PROFILES



Flat conductors made of Cu-ETP



Due to its superior conductivity, Cu-ETP is ideally suited for flat copper conductors, e.g. for the automotive, electrical and photovoltaic industry. Applications include counter helix strip, finned tubes and connectors. Aurubis offers material with different tensile strengths, thicknesses and widths depending on the width/thickness ratio.



Cable industry

The cable industry processes counter helix strip on tangential spinners. Flat conductors by Aurubis with widths of < 10 mm in strip

lengths of 30,000 to 50,000 m enable almost disruption-free product cycles at high speeds. High process reliability enables tight tolerances. Aurubis' cus-

tomers benefit greatly from the potential copper savings on the length of the cross-section.

FLAT CONDUCTORS FOR THE CABLE INDUSTRY*	
Alloy	Cu-ETP / C11000
Thicknesses	0.10 – 0.50 mm
Widths	3.00 – 8.00 mm
Tensile strength	R 360
Delivery forms	Customer spool or DIN 630 spool



* Additional alloys and dimensions upon request.

Photovoltaic industry

Demanding photovoltaic applications depend on excellent surfaces and tight tolerances. For wider dimensions, Aurubis

provides the sophisticated production process stability and quality that are required by these markets.

FLAT CONDUCTORS FOR THE PHOTOVOLTAIC INDUSTRY*	
Alloy	Cu-ETP / C11000
Thicknesses	0.10 – 0.50 mm
Widths	3.00 – 8.00 mm
Tensile strength	R 220
Delivery forms	DIN 630 spool

* Additional alloys, dimensions and delivery forms (coils) upon request.



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



Outstanding service

COMMERCIAL SERVICES

- » Copper market expertise and several years of experience
- » Strong and financially healthy long-term copper supply
- » Provision of the latest copper market information
- » Hedging advice and support

TECHNICAL SERVICES

- » Customer support on all aspects regarding the selection and processing of semi-finished products at their production site, from material use to dimensions and surface quality
- » We value precision. Aurubis achieves the tightest tolerances on the basis of an IT-assisted tooling system for the controlled use of drawing and extrusion dies
- » Laboratories with facilities for extensive physical and chemical analyses including state-of-the-art assaying methods, such as scanning electron microscopy
- » Recycling concepts for our customers to increase economic efficiency

LOGISTICS

- » Thanks to flexible logistics and framework concepts, we are able to respond to your individual requirements
- » Joint projects with our customers to optimize the production chain
- » Integrated copper supply allows for maximum reliability of supply and flexibility
- » Worldwide availability due to the international sales network: Operating globally – acting locally

Contact for Aurubis Specialty Wire

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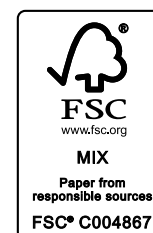
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Photos:

PR Aurubis AG



Our Copper for your Life

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