General information Business Unit „wire&rod“

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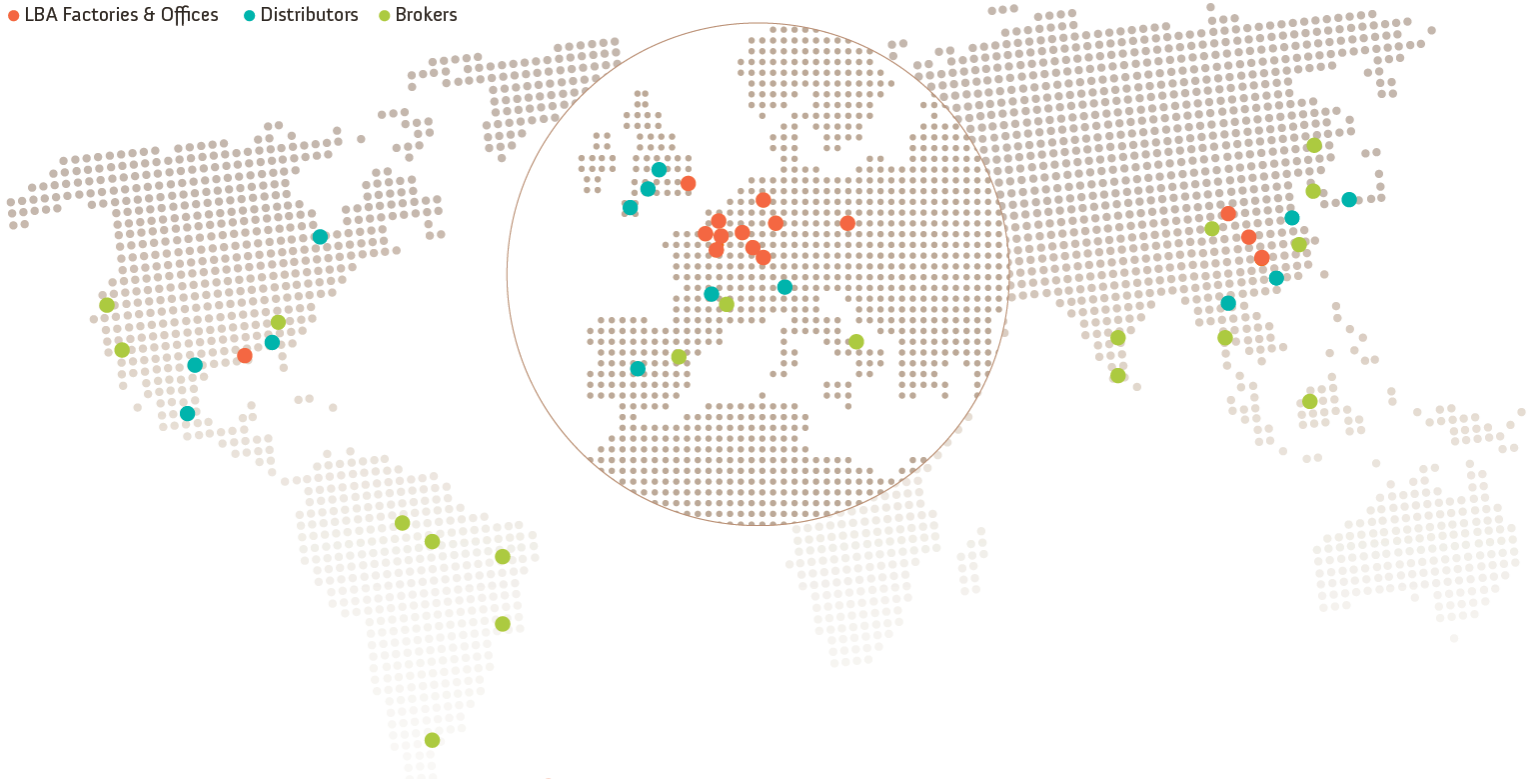
lebronze alloys

Group overview
Key facts

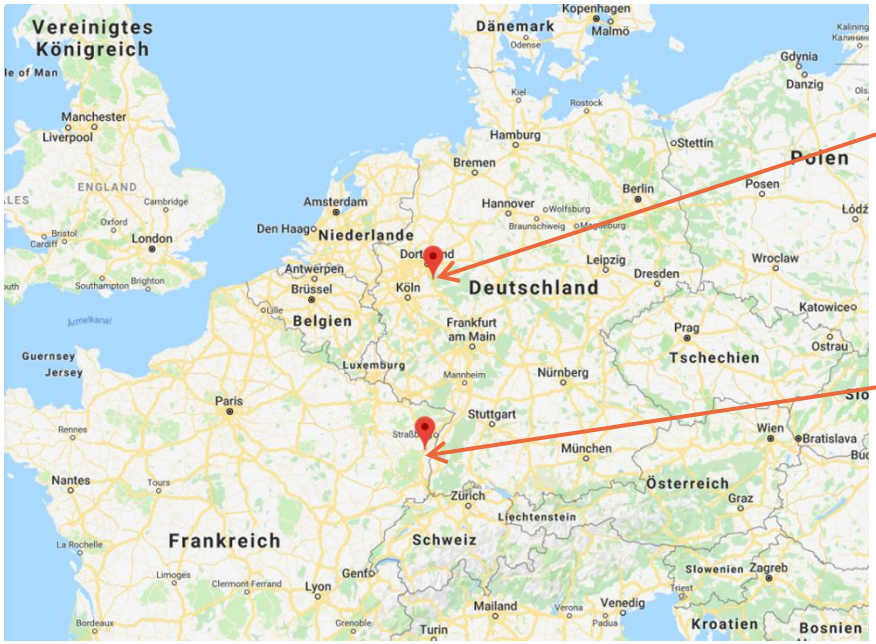
lebronze alloys



> 250 Mil.	Turnover in €
> 1.300	Employees
15	Production facilities
6	Foundries
4	Business Units
1	Headquarter (Paris)

Relevant plants & contacts Business Unit „wire&rod“

lebronze alloys



Luedenscheid in Germany

- Foundry
- Continuous & semi-continuous billet casting
- Drawing
- Annealing & Finishing

Sélestat in France

- Foundry
- Continuous horizontal wire casting
- Rolling
- Drawing
- Annealing & Finishing

Lebronze alloys Germany GmbH Luedenscheid
D 58507 Luedenscheid, Altenaer Str. 109

Tel +49 2351 181 - 0

Lebronze alloys S.A.S. Sélestat
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Tel +33 38892 - 0922

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Sales Manager Mrs. Ute Schmidt	Tel +49 2351 181 - 235 | Mobile: +49 173 2995 950 | u.schmidt@lebronze-alloys.de
Sales Manager Mr. Domenic Troilo	Tel +49 2351 181 - 245 | Mobile: +49 151 2354 1761 | d.troilo@lebronze-alloys.de
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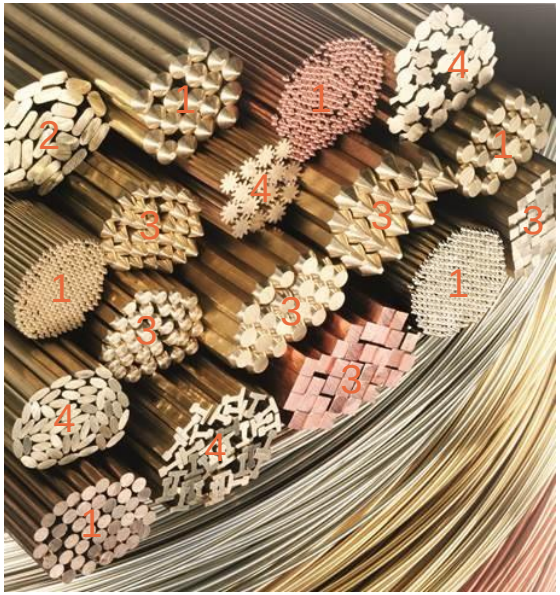
Product overview
Product forms & tolerances

lebronze alloys



1 Round

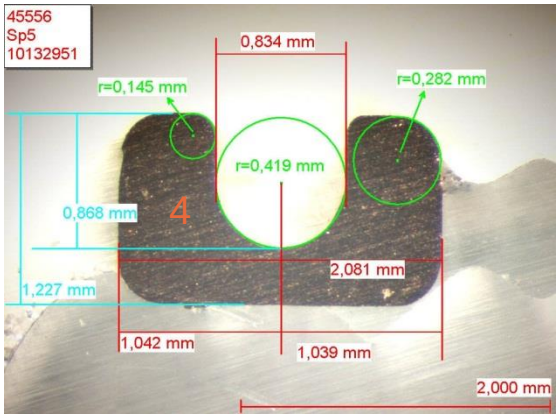
tolerance H9 (standard)	tolerance H8
1,1mm - 3,0mm → +0/-0,025	1,1mm - 3,0mm → +0/-0,014
3,1mm - 6,0mm → +0/-0,030	3,1mm - 6,0mm → +0/-0,018
6,1mm - 10,0mm → +0/-0,036	6,1mm - 10,0mm → +0/-0,022
10,1mm - 18,0mm → +0/-0,043	10,1mm - 18,0mm → +0/-0,027

2 Flat

Tolerances according to drawing or explanation

3 Square / Hexagonal / Octagonal

Standard tolerances H9 and H8



4 Profile

Special drawing from client with diameters and tolerances, many different geometries are possible.

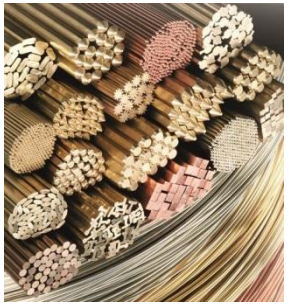
Product overview
Delivery forms

lebronze alloys

1 Wire in packets
2 Wire in drums
3 Wire in coils / rings
4 Wire on spools
5 Wire on steel former

6 Rods 3.000mm in wooden box

Every delivery form can be combined to every product form



	Packet	Drum	Coil/Ring	Spool	Steel former	Rods 3.000mm
Round	X	X	X	X	X	X
Flat	XX	X	X	XX	X	X
Square&Hex&Octag.	XX	X	X	XX	X	XX
Profile	XX	X	X	XX	X	X

X = usual and possible combination | XX = mostly used combination

Alloy family 1
Brass

lebronze alloys

Cu	Zn	Pb	Sn	Ni	P	Si
Copper	Zinc	Lead	Tin	Nickel	Phosphor	Silicon

Examples for alloys

CuZn39Pb3 → 58D | CuZn38Pb2 → 60M | CuZn35Pb1 → 63NZ | CuZn35Ni3Mn2AlPb → SMBKM …

Ø Product range

Standard diameters Business Unit Within lba group of companies

Wire min. 0,80mm - max. 13,00mm | Rods min. 1,00mm - max. 10,00mm
no further possibilities

Application & Industries

Perfect for machined pieces with high requirements on drilling and turning processes and sometimes it is additionally important to have cold forming abilities.

Cu	Zn	Pb	Sn	Ni	P	Si
Copper	Zinc	Lead	Tin	Nickel	Phosphor	Silicon

Examples for alloys

CuZn5 → E95 | CuZn10 → E90E | CuZn15 → E85 | CuZn20 → E80 | CuZn28 → E72 | CuZn30 → E70 | CuZn36 → E63FS | CuZn40 → E60ST …

Ø Product range

Standard diameters Business Unit Within lba group of companies

Wire min. 0,07mm - max. 13,50mm | Rods min. 1,00mm - max. 10,00mm
bigger diameters are possible on demand

Application & Industries

Perfect for cold forming. It is mostly used in the fasteners sector for bolts, screws and nuts but also for ammunition and redrawing.

Alloy family 2
Brass (acc. RoHS) & anti-magnetic

lebronze alloys

Cu	Zn	Pb	Sn	Ni	P	Si
Copper	Zinc	Lead	Tin	Nickel	Phosphor	Silicon

Examples for EnviB alloys acc. to RoHS

CuZn40 → EnviB1/EnviB10 | CuZn42 → EnviB158/EnviB58 | CuZn21Si3P → EnviBECO
Five alloys with three options regarding PB content: Pb = <1000ppm = <0,1% or <900ppm = <0,09% or <90ppm = <0,009%

Examples for anti-magnetic alloys

Iron (Fe) is reduced to a minimum in both alloys: CuZn38Pb2 → 60AM | CuZn36Pb2 → 61D

Ø Product range

Standard sizes Business Unit
Within lba group of companies

Wire min. 0,07mm - max. 13,50mm | Rods min. 1,00mm - max. 10,00mm
bigger diameters are possible on demand

Application & Industries EnviB

Lead (Pb) increases the machinability. EnviB is perfect for industries with „no-lead-policies“ (health) but the alloy still needs to be machinable.

Application & Industries anti-magnetic

Another challenge depending on application (medical and measurement control) is to have no magnetic interfearence (low permeability).

Alloy family 3
C97/C98/C99 & low alloyed Copper

lebronze alloys

Cu	Zn	Pb	Sn	Ni	P	Si
Copper	Zinc	Lead	Tin	Nickel	Phosphor	Silicon

Examples for alloys

CuNiPb1P → C97 (hardenable) | CuNi1Pb0,5P → C98 | CuPb1P → C99 …

Ø Product range

Standard sizes Business Unit Within lba group of companies

Wire min. 0,07mm - max. 13,00mm | Rods min. 1,00mm - max. 10,00mm
bigger diameters are possible on demand

Application & Industries

Mostly used for Connectors with special requirements on high conductivity.

Cu	Zn	Pb	Sn	Ni	P	Si
Copper	Zinc	Lead	Tin	Nickel	Phosphor	Silicon

Examples for alloys

CuNi1Si → NIB1 (hardenable) | CuNi2Si → NIB2 (hardenable) | CuCrZr → CRM16 …

Ø Product range

Standard sizes Business Unit Within lba group of companies

Wire min. 0,07mm - max. 13,00mm | Rods min. 1,00mm - max. 10,00mm
bigger diameters are possible on demand

Application & Industries

Perfect for cold formed screws and nuts with special requirements on electrical conductivity and fasteners in the railway sector.

Alloy family 4
Tin-bronze

lebronze alloys

Cu	Zn	Pb	Sn	Ni	P	Si
Copper	Zinc	Lead	Tin	Nickel	Phosphor	Silicon

Examples for alloys

CuSn2 → BZ2 | CuSn4 → BZ3 | CuSn6 → BZ6 | CuSn8 → BZ8 …

Ø Product range

Standard sizes Business Unit Within lba group of companies

Wire min. 0,07mm - max. 10,00mm | Rods min. 1,00mm - max. 10,00mm
no further possibilities

Application & Industries

Mostly used for special fasteners and resistence wire.

Cu	Zn	Pb	Sn	Ni	P	Si
Copper	Zinc	Lead	Tin	Nickel	Phosphor	Silicon

Examples for alloys

CuSn4Zn4Pb4 → BZ4 | CuSn5Pb1 → BP5 …

Ø Product range

Standard sizes Business Unit Within lba group of companies

Wire min. 0,80mm - max. 10,00mm | Rods min. 1,00mm - max. 10,00mm
no further possibilities

Application & Industries

Mostly used for special RF-connector pins and for automotive connectors.

Alloy family 5
Nickel-silver

lebronze alloys

Cu	Zn	Pb	Sn	Ni	P	Si
Copper	Zinc	Lead	Tin	Nickel	Phosphor	Silicon

Examples for alloys

CuNi7Zn39Pb3Mn2 → NM2/3 | CuNi12Zn37Mn6Pb2 → NM6/436 …

Ø Product range

Standard sizes Business Unit Within lba group of companies

Wire min. 0,80mm - max. 11,00mm | Rods min. 1,00mm - max. 10,00mm
bigger diameters are possible on demand

Application & Industries

Used for ball point pen tips within the industry of writing instruments and precision machined parts (like locking pins) within the locking industry.

Cu	Zn	Pb	Sn	Ni	P	Si
Copper	Zinc	Lead	Tin	Nickel	Phosphor	Silicon

Examples for alloys

CuNi12Zn24 → M13 | CuNi18Zn20 → M18 …

Ø Product range

Standard sizes Business Unit Within lba group of companies

Wire min. 0,07mm - max. 10,00mm | Rods min. 1,00mm - max. 10,00mm
no further possibilities

Application & Industries

Mostly used for eyewear and for jewelery in the luxury sector.

Alloy family 6
Pure Cu

lebronze alloys

Cu	Zn	Pb	Sn	Ni	P	Si
Copper	Zinc	Lead	Tin	Nickel	Phosphor	Silicon

Examples for materials

Cu-ETP → ECU | CUSC | CUOF …

Ø Product range

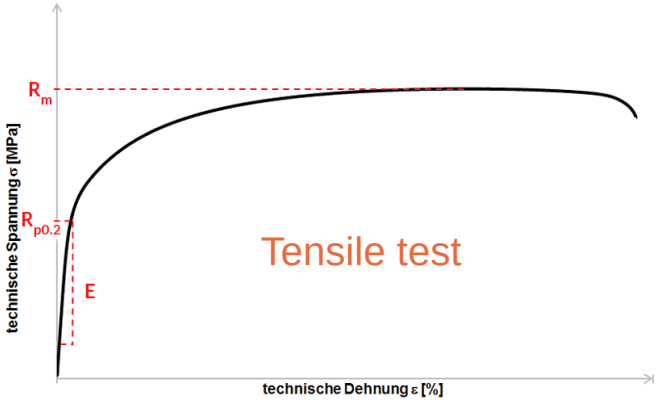
Standard sizes Business Unit Wire min. 0,07mm - max. 13,00mm | Rods min. 1,00mm - max. 10,00mm
Within lba group of companies no further possibilities

Application & Industries

High conductivity copper for the electrical industry is used for electromechanical components.

Technical basics
Technical specifications

lebronze alloys



Tensile strength (Rm)

Indication in MPa (Megapascal) or N/mm². It defines the highest force point needed to tear up the material (then constriction, then crack). Thinner diameters usually achieve higher tensile strength due to the higher cold solidification due to the higher deduction. Wire usually achieves higher tensile strength than rods, as the wire machines much higher forces than the rod machines.

Yield strength / Proof strength Rp 0,2

Indication in MPa (Megapascal) or N/mm ². Defines the end of the elastic area and the beginning of the plastic deformation. The material returns to its original state by the time of this degree. In the case of deformation beyond this value, irreversible deformation is created.

Hardness

Measures resistance to plastic deformation. The hardness increases with a growing tensile strengths. Four different methods are used in our industry:
Hardness Vickers (HV) | Hardness Brinell (HB) | Hardness Rockwell Vickers (HRV) | Hardness Rockwell Brinell (HRB)

Elongation in %

The increase in the gauge length, usually expressed as a percentage of the original gauge length.

IACS

The electrical conductivity is a physical size that indicates the ability of a substance to conduct electrical current and is given in percent. Some of our materials are specifically designed for high conductivity above 60% up to 100%.

Machinability

Machinability is the property of a material to be processed by machining and is given in percent. Some of our materials are specifically designed for cutting processes with a machinability up to 100%.

Technical basics
Details required for calculation

lebronze alloys

To calculate the correct article it is essential for us to know the details. Missing details cause wrong calculations:

Material & alloy	Which material or which alloy?
Form	Round wire, flat wire, profile or rod
Diameter	Ø in mm or Diameter flat wire or profile drawing
Tensile strenght Rm	in MPa or N/mm² as minimal value or spread
Delivery form wire Delivery form rod	Packages, coils, rings or on steel former wooden box (standard) usually in 3.000mm lengths
Amount	Delivery per lot and annual amount
Techn. Specification	Are there any further technical specifications?

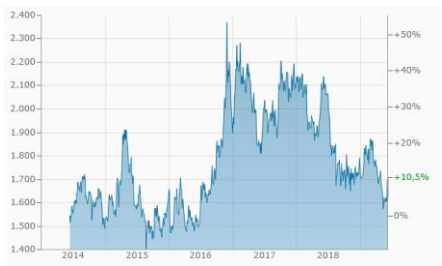
Metalprice

All our quotes are based on the daily prices of the LME (London Metal Exchange, stock exchange for our materials). Subject to composition, metal losses and other elements like interests, transports and premiums.

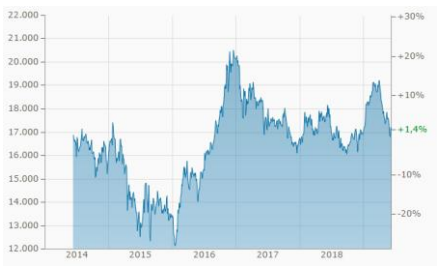
Copper (Cu)
5 years in €

Zinc (Zn)
5 years in €

Lead (Pb)
5 years in €



Tin (Sn)
5 years in €



Scrap buyback and how it works in 6 steps

lebronze alloys

1. The client tells us what he wants to sell: Quantity, alloy, target price expectation, delivered or to be collected
2. We will contact internally our group purchasing director of Lebronze
3. He tells us if we need scrap/chips and what our price will be
4. We communicate our price, specifications and payment terms to the client (standard is 60 days net, never cash discount)
5. If it fits for both sides, our material purchasing will place an order
6. We pick up the scrap/chips or wait for arrival and the client sends us an invoice