GROUP OVERVIEW 2021

lebronze alloys



There is no substitute for experience



OUR VISION

Lebronze alloys, your strong partner to develop appropriate and optimized solutions for your success, constantly innovating to provide high performing materials for the future:



Environmentally friendly solutions



Efficient (strong, ductile, durable, etc.)



Exceeding the highest market requirements



Improving your TCO (Total Cost of Ownership)



YOUR CHALLENGES ARE OURS



Energy transition



Circular economy



Sustainable electromobility



Miniaturization



Applications for harsh environments



High requirements / standards

ABOUT US

Lebronze alloys develops and produces semi-finished products, blanks and finished components in high performance materials:

- copper alloys
- nickel alloys
- aluminum alloys
- specialty steels
- stainless steels



850 employees



Stable private shareholders since 2006



8 production sites



190 M€ turnover



More than 100 years experience



2 service centres



More than 350 alloys



45 000 t/year of foundry capacity

CORPORATE SOCIAL RESPONSIBILITY

- Heavy investment in technologies to bring cleaner and more recyclable products to the market.
- Economic and financial growth of our Group supported by everincreasing demands for transparency, and fairness.
- Commitment of all our employees and trust of our partners by implementing the best ethical and behavioural practices.
- Lebronze alloys adheres to the United Nations Global Compact and participates in various assistance programs covering health and human rights.

First commitment, implementation of actions adapted to 4 of the 17 Sustainable Development Objectives targeted by the UN:











THE ONLY FULLY INTEGRATED SPECIALITY COPPER BASED ALLOYS MANUFACTURER IN THE WORLD

From alloy smelting to finished and customized products





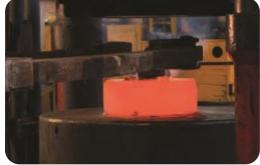
A MULTI-DISCIPLINARY KNOW-HOW

We master many unique ranges of metal processing technologies, that even allow us to provide many different ways to manufacture identical parts.

















- Continuous casting
- Semi-continuous casting
- Die precision chill casting
- Extrusion
- Hot and cold rolling
- Drawing
- Open-die forging
- Close-die forging
- Hot stamping
- Cold forming
- Machining

OUR DISTRIBUTION AND PRODUCTION NETWORK



Breteuil (France)

Workforce: 121

Forged and machined products

Bornel (France)

Workforce: 156

- Rolled products
- Special long products
- Group Research Center

Custines (France)

Workforce: 47

Forged products

Suippes (France)

Workforce: 240

- Long products of superior dimension
- Resistance welding caps

Taverny (France)

Workforce: 11

Die-cast products

Aldridge (UK)

Workforce: 6

• Storage / distribution

Rydzyna (Poland)

Workforce: 35

Machined products

Lüdenscheid (Germany)

Workforce: 134

Rods and wires of small dimension

Dongguan (China)

Workforce: 62

- Flat and long products
- Forged and machined products
- Storage / distribution

Hong-Kong

Workforce: 4

Storage / distribution

INVESTING FOR THE FUTURE



Since 2019:



6,6M€ invested in R&D



5 new alloys developed



37 new machines added into production



16 new projects co-developed together with customers



15 dedicated associates working within our laboratories to test and develop our alloys



12 new significant customers approvals and/or qualifications gained

SOME OF OUR CURRENT SUCCESS STORIES

C99®

A special machinable copper alloy with high electrical conductivity for more efficient power transmission.







Electrical mobility

Hardiall®

A spinodal, hardening alloy that can substitute Copper Beryllium







Aerospace

Alrode®

A special alloy that allows aluminum sheet in BiW, reducing its energy consumption









Automotive

STERIALL®: AN INNOVATION TO FIGHT PANDEMIC RISKS

by Lebronze alloys

10+ years of R&D and a patent pending for safer buildings: our antimicrobial solution



Steriall® uses the natural antimicrobial properties of copper. It has been optimized by Lebronze alloys to become the copper alloy solution with the most effective and most long-lasting antimicrobial power in real conditions.



peer-reviewed scientific publications, proving a 60% reduction in bacterial contamination of surfaces in real conditions over 3 years.

Steriall® is the antimicrobial copper alloy solution that has been the subject of the most



The implementation of Sterial® in a building allowed a 4-fold reduction in the number of people infected during viral outbreaks



Steriall® is widely used for architectural elements in healthcare facilities, such as nursing homes and hospitals, but also in public buildings such as factories, city halls and schools.

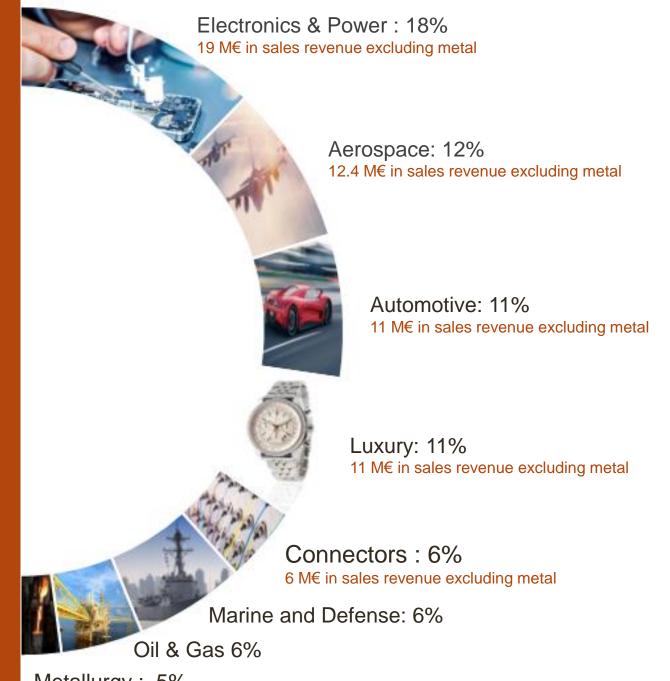
We are developing the Steriall® product range: it is also available in semi-products to be processed into complex components by our partners.

DIVERSE GROWING MARKETS

Our high-performance materials are used in more than 20 end markets: this diversity allows us to withstand sectorial crises.

We have over 2000 customers worldwide from large companies to small businesses.

Our first client accounts for less than 7% of our sales revenue.



Metallurgy: 5%

lebronze alloys

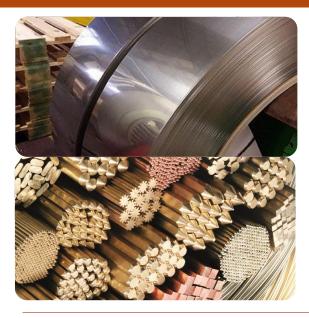
LEBRONZE ALLOYS AROUND THE WORLD



- LBA production sites and sales offices
- LBA service centers
- Partner distributors

Worldwide available stocks

OUR BUSINESS UNITS (BU)



Precision Products

The BU Precision Products mainly produces semi-products for technical components. Our materials have applications in numerous sectors, such as healthcare and electronics. The activity of PP is specialized in two forms of Precision Products: flat Products and Round Products

- **Lebronze alloys** is a worldwide reference in conception and production of **rolled products** in copper-based and nickel-based alloys, like ARCAP®, alloy 400 (Monel) and high strength alloys like Niclafor® and Declafor®.
- Lebronze alloys also provides plain wires and rods: round, square, hexagonal and profiled from 0.1mm to 42mm diameter in a wide range of products, such as low alloyed copper (C9X® range, special bronzes), special and environmental brass (EnviB) and dual nickel silvers, ARCAP®, Niclafor® and Declafor®, etc. Most of our laminated products are also available as wires or rods.



Bars & Designs

In its bars section, the BU Bars & Designs develops and manufactures semi-finished products in big volumes, rods, bars, hollows and blanks or finished components in a wide variety of high-performance copper alloys:

- Spinodal alloys CuNiSn (bars, hollow bars, customized semi-finished products)
- Bronzes-aluminium, Copper--Nickel and Copper-Chromes

In its Designs section, this BU has a comprehensive forging and machining capability range performing finished products from small intricated parts to very large components.

Our long standing know-how covers a variety of materials like copper alloys, nickel alloys, aluminum alloys, specialty steels, stainless steels, titanium and nickel superalloys.

We also design and manufacture innovative solutions for welding and automotive sectors (Powerode+®, Alrode®, etc.), semi-products as well as finished products such as welding caps.

OUR BUSINESS UNITS (BU)



Precision Products

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- Lebronze alloys also provides plain wires and rods: round, square, hexagonal and profiled from 0.1mm to 42mm diameter in a wide range of products, such as low alloyed copper (C9X® range, special bronzes), special and environmental brass (EnviB) and dual nickel silvers, ARCAP®, Niclafor® and Declafor®, etc. Most of our laminated products are also available as wires or rods.



40 MB (M€)

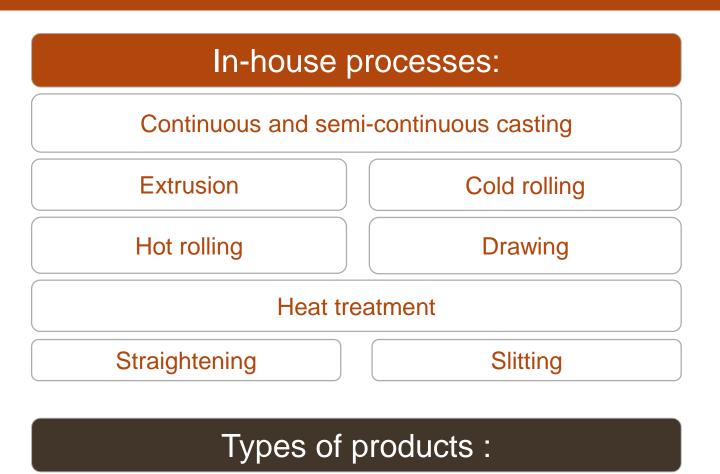


7 Distribution partners



85% of our TOP 100 PP customers have ordered 3 years in a row

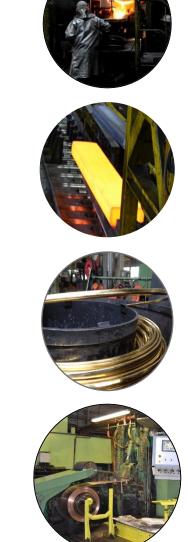
Precision Products: our process



Strips and sheets

Wires

Rods



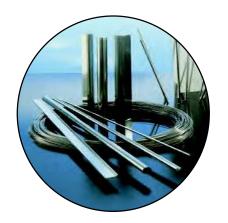
Flat Products





Lebronze alloys is a worldwide reference in conception and production of **rolled products**, **rods and wires**, in copper and nickel-based alloys, like ARCAP®, Pure Nickel and alloy 400 (Monel) corrosion resistance alloys, CuMnNi and CuNi resistive alloys and high strength alloys like Niclafor®, Declafor® and CuNiSi.



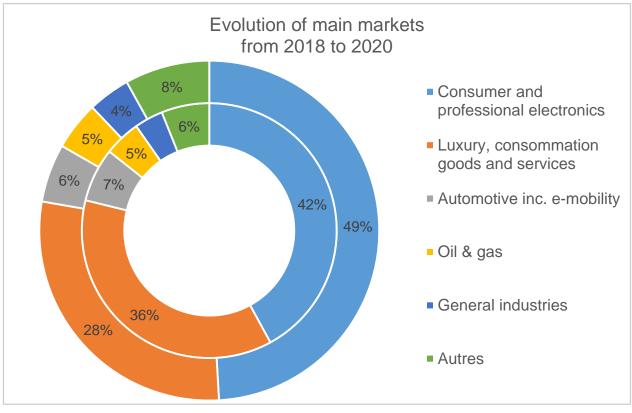


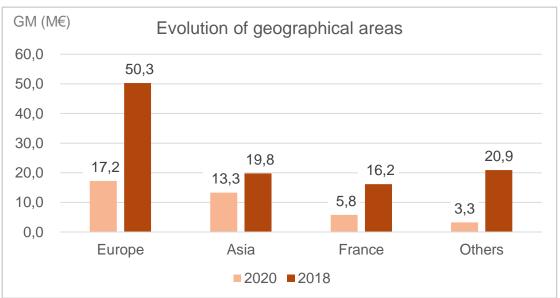




Flat products

MACRO PROCESSES	Bornel	Suzhou	Hong- Kong
Casting			
Rolling (hot & cold)			
Slitting			
Forging			
Machining			
Sales			





Flat products - Range

Current sensing

Precision and stability

Battery management (automotive), electricity meters

CuNiSi alloys

Hardness and elasticity

Automotive relays, bushings or bearings

Nickel alloys

Resistance to chlorine corrosion

Battery pack, chlorine electrolyser

Spinodal CuNiSn

High strength and hardness

Eyeframes, automotive bushings, electronic EMI shielding and miniature connectors

Nickel-silver

Formability deep drawing and solderability

Connectors, electromagnetic shielding, springs, eyewear, bearings, thermostats, pressure switches, catenaries, musical instruments, watchmaking, clocks and watches

Alloy 400 (Monel)

Resistance to chlorine corrosion and to high temperatures

Chlorine valves, Oil & Gas heaters

Resistance alloys
Precision of electrical properties

Low voltage circuit breakers, automotive electronic heating resistances



Flat products - Strip products

Strip thickness: from 0,05 to 3,5 mm

Thickness range (mm)	Thickness tolerance (mm)	
0.05 ≤ thk < 0,4	± 0.005	
0.40 ≤ thk < 1,00	± 0.008	
1.00 ≤ thk < 2,00	± 0.015	
2.00 ≤ thk < 3.50	± 1% thk	

Strip width: from 4 to 380 mm

Width tolerances					
Thickness range (mm)	Width range (mm)				
	4 ≤ wdt < 10	10 ≤ wdt < 55	55 ≤ wdt < 120	120 ≤ wdt < 380	
0.05 ≤ thk < 0.4	0/+ 0.10	0/+ 0.10	0/+ 0.20	0/+ 0.30	
0.40 ≤ thk < 1.00	0/+ 0.15	0/+ 0.15	0/+ 0.20	0/+ 0.30	
1.00 ≤ thk < 2.00	0/+ 0.15	0/+ 0.30	0/+ 0.40	0/+ 0.50	
2.00 ≤ thk < 3.50	0/+ 0.30	0/+ 0.60	0/+ 0.60	0/+ 0.70	

Round products





Lebonze alloys produces plain rods and wires: round, square, hexagonal and profiled from 0.1mm to 20mm diameter in low alloyed copper (C9X® range, special bronzes), special and environmental brass (with EnviB® range) and dual nickel silvers.

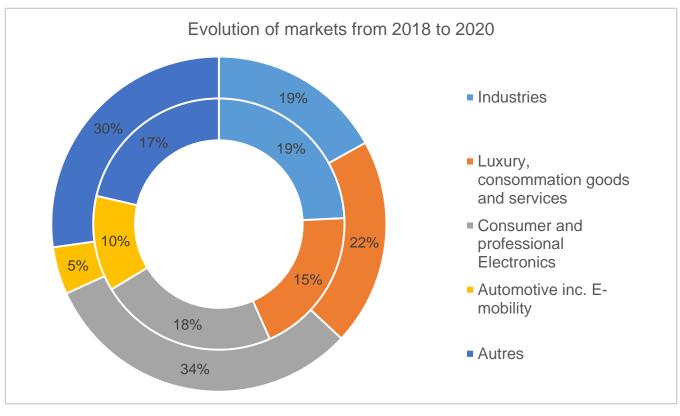


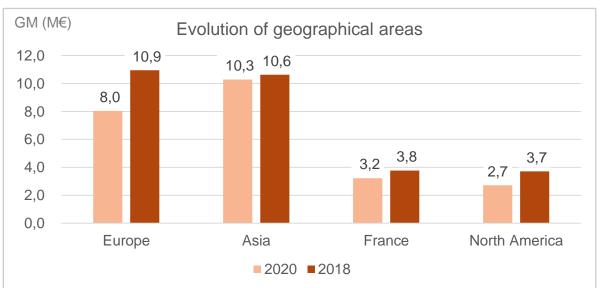




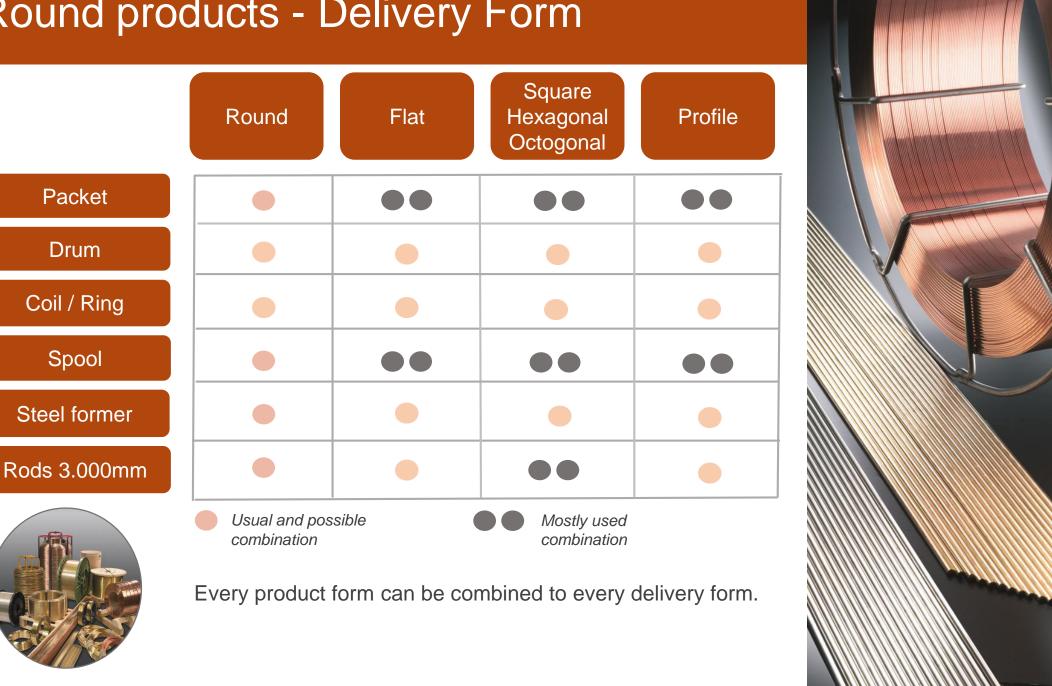
Round products

MACRO PROCESSES	Lüdenscheid	Bornel
Casting		
Extrusion	•	
Rolling	•	•
Drawing	•	•
Straightening	•	





Round products - Delivery Form





Round products - Range

Current sensing

Precision and stability

Battery management (automotive), electricity meters

CuNiSi alloys

Hardness and elasticity

Automotive relays, bushings or bearings

Nickel alloys

Resistance to chlorine corrosion

Battery pack, chlorine electrolyser

Spinodal CuNiSn

High strength and hardness

Eyeframes, automotive bushings, electronic EMI shielding and miniature connectors

Nickel-silver

Formability deep drawing and solderability

Connectors, electromagnetic shielding, springs, eyewear, bearings, thermostats, pressure switches, catenaries, musical instruments, watchmaking, clocks and watches

Alloy 400 (Monel)

Resistance to chlorine corrosion and to high temperatures

Chlorine valves, Oil & Gas heaters

Resistance alloys

Precision of electrical properties

Low voltage circuit breakers, automotive electronic heating resistances



Round products - Range

Low alloyed copper C97/C98/C99/ UC500 High connectivity

Connectors

Leaded and lead-free brass

Machined components; bolts, screws, ammunitions

Amagnetic brass

Helthcare and measurement control

Leaded and lead-free tin-bronzes

Special fasteners and resistive wires

Leaded and lead-free nickel silvers

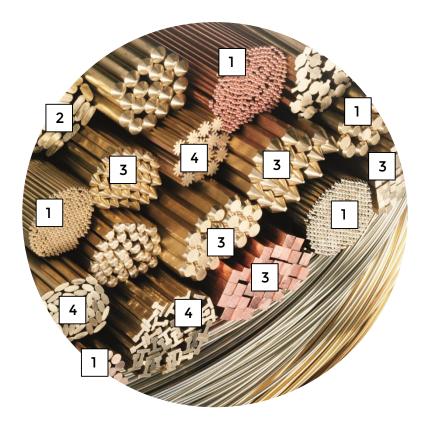
Eyewear, automotive rings, electro-magnetic shielding and miniature connectors

Pure copper

Electromagnetic components



Precision products portfolio and tolerances



Round (1)

Flat (2)

Square Hexagonal Octogonal (3)

Profile (4)

Tolerances

Tolerance H9 (standard)

1,1mm - 3,0mm \rightarrow +0/-0,025 3,1mm - 6,0mm \rightarrow +0/-0,030 6,1mm - 10,0mm \rightarrow +0/-0,036 10,1mm - 18,0mm \rightarrow +0/-0,043 **Tolerance H8**

1,1mm - 3,0mm \rightarrow +0/-0,014 3,1mm - 6,0mm \rightarrow +0/-0,018 6,1mm - 10,0mm \rightarrow +0/-0,022 10,1mm - 18,0mm \rightarrow +0/-0,027

Tolerances according to drawing or explanation

Standard tolerances H9 and H8

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

Round products - Alloys families

Brass

Cu
CopperZn
ZincPb
LeadSn
TinNi
NickelP
PhosphorusSi
Silicon

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

- **58D** CuZn39Pb3
- **60M** CuZn38Pb2
- 63NZ CuZn35Pb1
- SMBKM CuZn35Ni3Mn2AlPb...



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

- **E95** CuZn5
- **E90E** CuZn15
- **E80** CuZn20
- **E72** CuZn28
- **E70** CuZn30
- **E63FS** *CuZn36*
- **E60ST** CuZn40 ...

Brass (acc. RoHS) & anti-magnetic brass



Lead (Pb) increases machinability. In case of special requirements upon Lead content (health) we have different machinable alloys without lead:

Pb = <1000ppm = <0,1%

Pb = <900ppm = <0.09%

Pb = < 90ppm = < 0.009%

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

alloys acc. to RoHS

- EnviB1/EnviB10 CuZn40
- EnviB158/EnviB58 CuZn42
- EnviB ECO CuZn21Si3P

anti-magnetic alloys

- **60AM** CuZn38Pb2
- **61D** CuZn36Pb2

Iron (Fe) is reduced to a minimum in both alloys

Round products - Alloys families

C97/C98/C99 & low alloyed Copper

Cu
CopperZn
ZincPb
LeadSn
TinNi
NickelP
PhosphorusSi
Silicon

Mostly used in Connectors with special requirements on high conductivity.

- C97 (hardenable) CuNiPb1P
- **C98** CuNi1Pb0.5P
- **C99** *CuPb1P* ...



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

- NIB1 (hardenable) CuNi1Si
- NIB2 (hardenable) CuNi2Si
- **CRM16** *CuCrZr* ...





Mostly used in special fasteners and resistance wire.

- **BZ2** CuSn2
- **BZ3** CuSn4
- **BZ6** CuZn6
- **BZ8** CuSn8...



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

- **BZ4** CuSn4Zn4Pb4
- **BP5** CuSn5Pb1...

Round products - Alloys families

Nickel-silver



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

- **NM2/3** CuNi7Zn39Pb3Mn2
- NM6/436 CuNi12Zn37Mn6Pb2...



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

- M13 CuNi12Zn24
- M18 CuNi18Zn20...

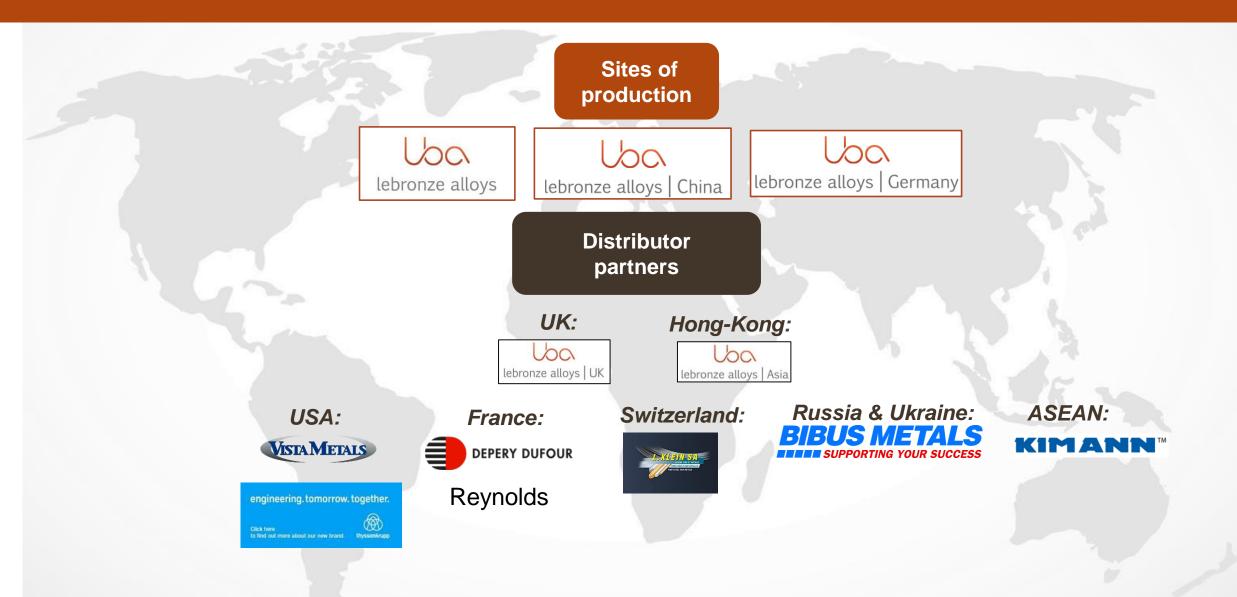




High conductivity copper for the electrical industry is used for electromechanical components.

ECU - Cu-ETP...

Precision Products - Worldwide presence



Precision Products - Worldwide presence

PP Brokers

Germany (Baviara):



Austria and Slovenia:



India:



China & Taiwan (supraconductors alloys):



Hungary:



India (pen tips alloys):



Slovaquia & Czech Republic



Thank you for your attention!

Our sales team is ready to discuss your specific challenges.

What do you need today?



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Uba lebronze alloys | Asia

Uba lebronze alloys | China

Lebronze-alloys.com contact@lebronze-alloys.com