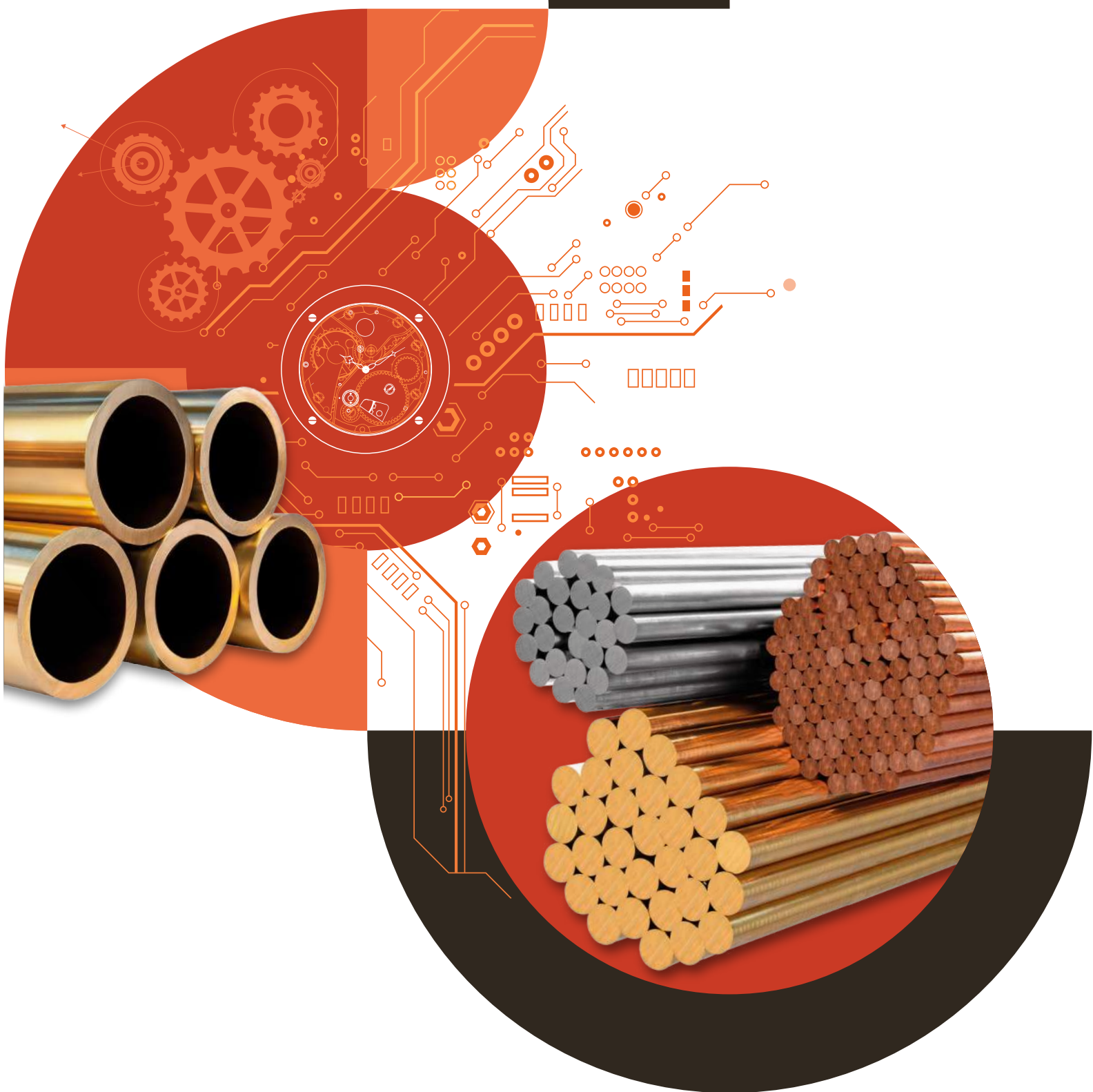


PRODUCT
CATALOG
Bars &
Hollows Bars

24

Uba
lebronze alloys



About Lebronze alloys

Lebronze alloys is a world leader in the **development** and **fully integrated production** of **high-performance copper and nickel alloys**.

Thanks to a multidisciplinary know-how, the Group provides **innovative solutions to all major industries** such as Aeronautics, Electronics, Space, Automotive, Energy, among others.

Our 6 production facilities and 730 employees manage a **unique range of metal processing technologies**: continuous and semi-continuous casting, extrusion, hot and cold rolling, drawing, open-die forging, hot stamping, closed-die forging, cold forming, machining, non-destructive testing, etc.

The Group's commitment is to find appropriate and **optimized solutions for every sector's requirements while optimizing the environmental impact of our products**.

High performance copper and nickel alloys

Fully integrated production process

Optimized environmental impact of our products

KEY FIGURES

- 6 production sites
- 4 service centers
- 730 employees
- 200 + alloys produced
- 239 M€ turnover

History of the Group

2006

The DUMONT family, some private investors as well as some key managers, take over "Le Bronze Industriel", a company founded in France in 1934 specializing in copper alloys production. This change of ownerships, with Michel DUMONT as active Chairman, marked a new period of strategic growth for the company.

2012-2016

Period of massive external growth for the company. Several major acquisitions are made such as Inoforges, Swissmetal Lüdenscheid and CLAL. These acquisitions consolidated our metallurgical expertise through a sharing of experience.

2016

Le Bronze Industriel officially becomes Lebronze alloys. It has been 10 years since the buyout and the Group has now tripled its sales.

2020

Opening of our first service center in Europe at Aldridge (UK). This service center joins an already well-established network of distributor partners around the globe and enables us to provide a greater responsiveness to our customers' needs.

2022

Marks the end of a 2-years industrial repositioning allowing the Group to focus on high added value materials.

2023-2024

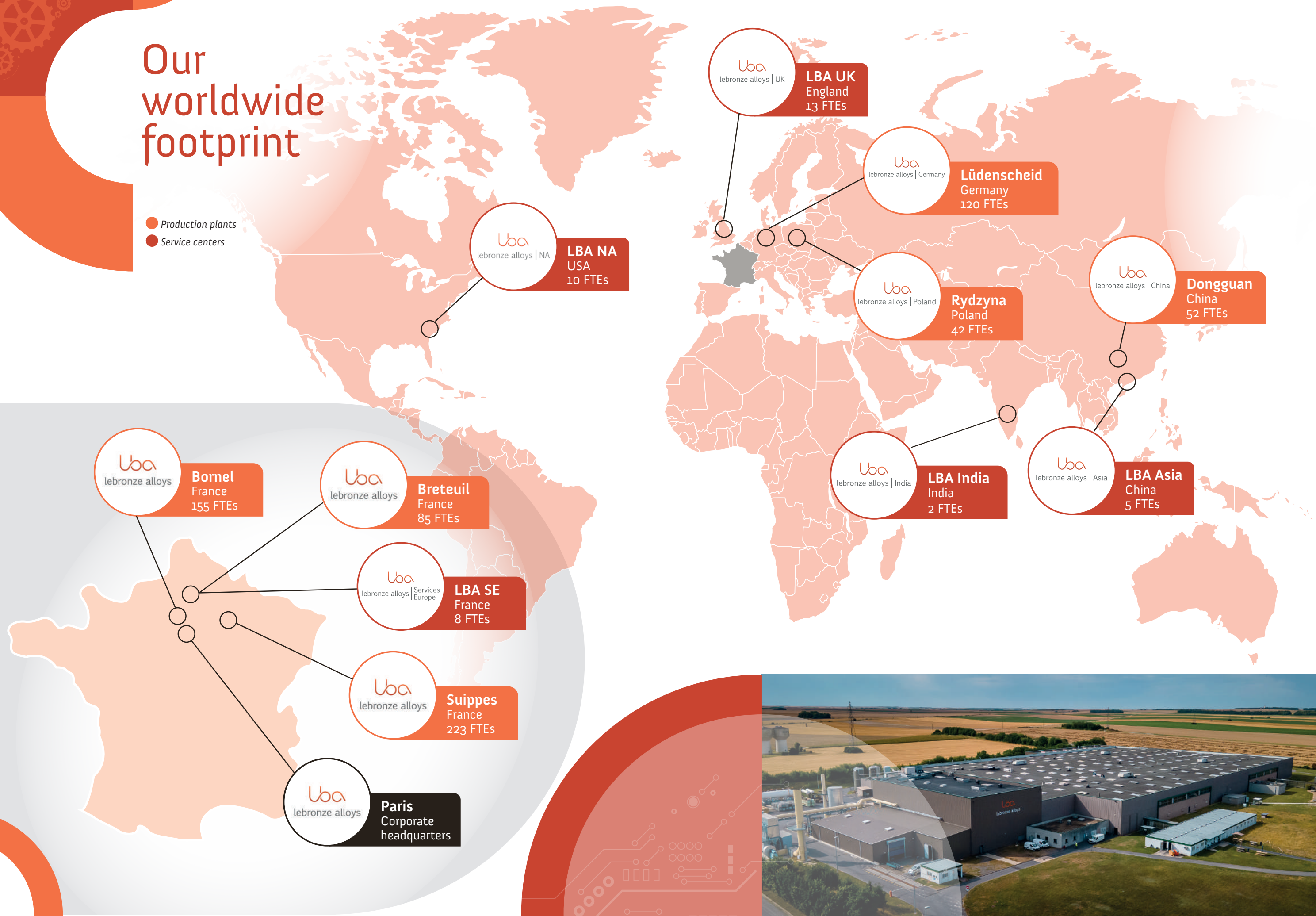
The Group counts over 730 employees, 6 production sites and 4 service centers around the world and generates 239 M€ of sales.

Over the last two years, the Group has strengthened its distribution network by opening **two new service centers**: Lebronze alloys SE (Services Europe) in Breteuil, France, and Lebronze alloys NA in Bristol, USA.



Our worldwide footprint

- Production plants
- Service centers



Product range at a glance

Lebronze alloys offers **more than 200 copper-based and nickel-based alloys** with unique properties which meet the most complex requirements. We supply these alloys in different forms:



Billets



Bars



Hollow bars



Strips



Sheets



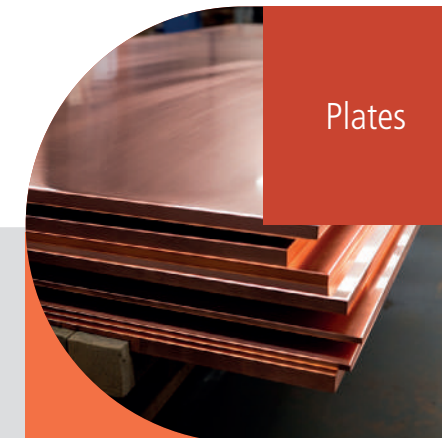
Rods



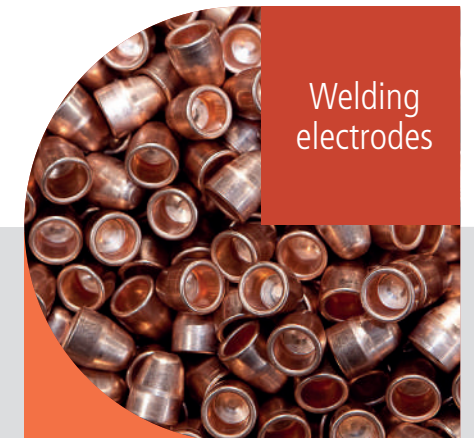
Wires



Standard & complex profiles



Plates



Welding electrodes



Marine tubes & fitting



Machined blanks and parts

A fully integrated production process

One of the Group's major strengths relies in its **fully integrated production process**, from smelting to machining and recycling.

This particularity guarantees a traceability, optimization and strict control of the final properties of our materials so they can suit to the most stringent requirements.

Melting & Casting

- Continuous wire casting
- Continuous bar casting
- Semi-continuous casting

Hot forming

- Extrusion
- Hot rolling
- Free forging
- Hot stamping

Cold forming

- Cold rolling
- Drawing straightening
- Cold stamping
- Heat treatments

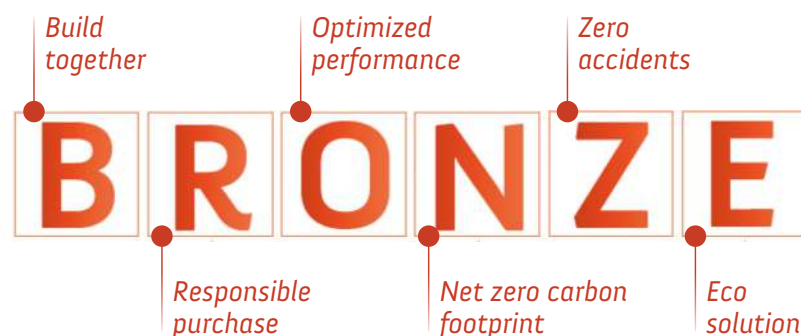
Finishing

- Machining
- Servicing
- Scrap recovery

Our sustainable development policy

To ensure the sustainability of our business, it is essential to strike the **right balance between economic performance, social impact and environmental impact.**

This balance within the Group is structured around our **6 "Bronze" pillars.** Each pillar is broken down into actions and indicators that enable us to be part of a dynamic of continuous progress and sustainability.



Build together: this pillar covers social initiatives that have a positive impact on gender, sex and age equality, as well as projects that improve the well-being of our teams at work.

Responsible purchase: purchases represent more than 50% of Group sales. It is therefore essential that we implement a responsible purchasing policy and tighten up our requirements of our suppliers.

Optimized performance: the Company's economic, industrial and environmental performance is a key factor in meeting the expectations of our relevant stakeholders.

Net zero carbon footprint: taking into account the major challenge of decarbonation, we have decided to make this a specific pillar and to build a path that meets the transformation of the Climate Act and the Paris Agreement.

Zero accidents: our processes require constant vigilance. We are taking actions to anticipate and reduce the risk of accidents as far as possible.

Eco solution: by working in collaboration with our customers and bringing innovations to the market, we are contributing to a more sustainable approach by improving the life cycle of products.

Quality

Lebronze alloys develops for all its activities a formally recognized quality management system which allows to:

- guarantee the traceability of our products, from raw material to the product delivered
- certify our products properties
- control our delivery times

Our state-of-the-art quality-check equipment include:

- **Metallurgical tests** such as traction, resilience, hardness, bending and others
- **Non destructive tests** such as Magnetic Particle Inspection (MPI), ultrasonic contact testing, liquid penetrant Inspection and others
- **Metrology, geometry and surface tests** such as surface metrology, global DEA, profile projectors and others



Our certifications

All our certificates can be consulted on our website

Aerospace certifications



Certified site: Suippes



Heat treating



Certified service center:
Lebronze alloys UK

General certifications



Certified sites: Bornel, Breteuil, Lüdenscheid, Suippes, Rydzyna.



Certified sites: Breteuil, Suippes, Rydzyna.



Certified sites: Bornel



Certified sites: Lüdenscheid, Breteuil and Suippes.

Low-beryllium copper alloys

High mechanical properties

Our Group offers a range of low-beryllium copper alloys. These alloys exhibit high mechanical properties combined with suitable electrical and thermal properties. They also present good anti-friction properties.

PRODUCT PORTFOLIO

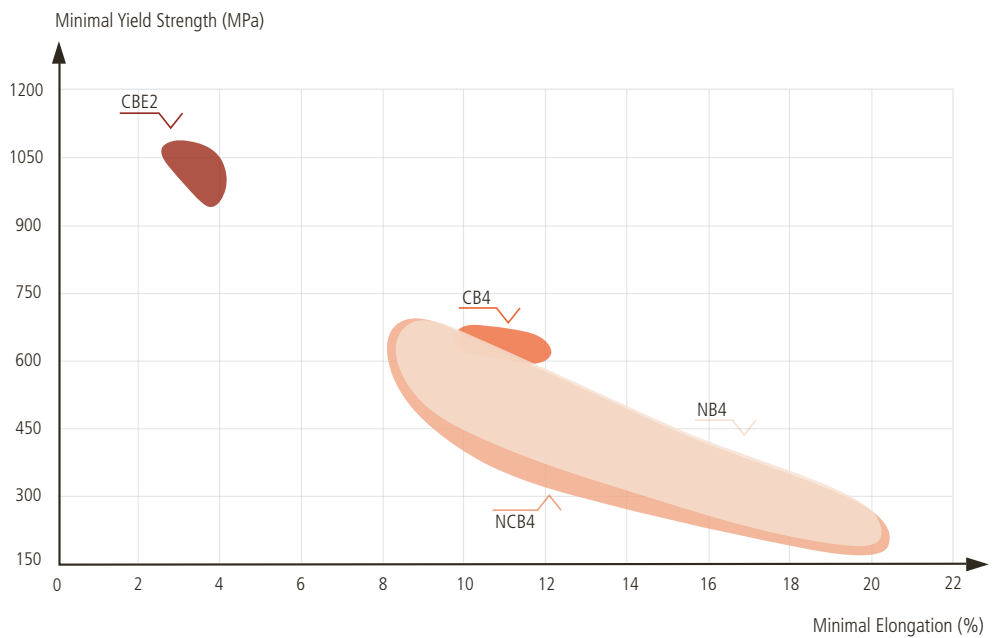
Alloy	ISO	UNS	Other designations	Aerospace specifications
CBE2	CuBe2	C17200	WN 2.1247 CW101C	AMS 4533 NFL 14-709
CB4	CuCo2Be	NA	CC112 WN 2.1285 CW104C	NA
NCB4	CuNi1Co1Be	C17540	CW103C	NA
NB4	CuNi2Be	C17510	WN 2.0850 CW110C	NA

STANDARD CAPABILITY*

Round Bars	Other Bars**	Hollow bars	Plates
ALL DIMENSIONS	ALL DIMENSIONS	ALL DIMENSIONS	ALL DIMENSIONS

*Other shapes on request
**Depending on alloy, square / flat / rectangular / hexagonal bars

KEY MECHANICAL PROPERTIES



Markets and applications

Automotive



- Rings
- Head of pistons

Industrial

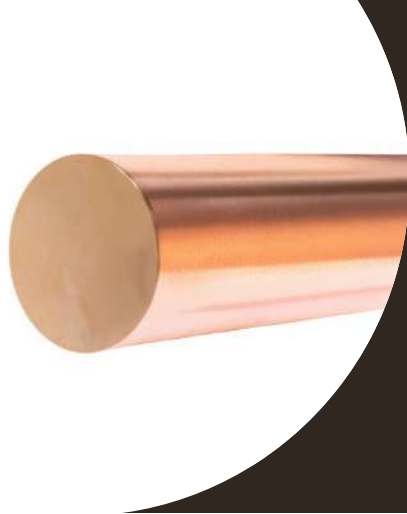


- Plungers
- Die
- Short circuit ring

Resistance welding

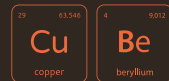


- Resistance welding of thick plates or stainless steel



CBE2

CuBe₂



CBE2 is a low-beryllium copper (CuBe₂) alloy used in various industries such as Aerospace, Automotive, and Off-highway mining. CBE2 exhibits outstanding mechanical properties with high hardness and high electrical conductivity.



MATERIAL DESIGNATION

ISO	UNS	Other designations	Aerospace specifications	Other standards
CuBe2	C17200	WN 2.1247 CW101C	AMS 4533 NFL 14-709	ASTM B196, RWMA class 4 QQC 530, DIN 17666 DIN 17672, EN 12163 EN 12165, EN 12420

CHEMICAL COMPOSITION (WEIGHT%)

Cu	Be	Co
Balance	1.9%	0.3%

PHYSICAL PROPERTIES

General properties		
Density at 20 °C (68 °F)	8.3 g/cm³	0.30 lb/in³
Thermal conductivity	110 W/m.°C	64 BTU/(h.ft.°F)
Coefficient of thermal expansion from 20 to 300 °C (68 °C to 572 °F)	17 x 10 ⁻⁶ /°C	9.44 µin/in °F
Young's modulus	130 GPa	18 855 ksi
Relative magnetic permeability	1.01	
Electrical properties		
Resistivity at 20 °C (68 °F)	6 µΩ.cm	36.09 Ω. circ mil/ft
Electrical conductivity	28 %IACS	

TYPICAL APPLICATIONS

Aerospace industry
Rings and bearing parts for aircrafts landing gears
Parts for locking mechanism

Automotive industry
Rings for formula 1 engines

Cryogenics applications
Parts for Ariane engine

Off-highway mining industry
Drilling parts for Christmas trees, deep water connections

Mould industry
Injection mould tool and insert

COMPATIBLE DOWNSTREAM PROCESS

Extrusion, forging followed by quenching and hardening, plus cold-drawing for small diameters

Cold forming in quenched condition, but the hardened condition must be obtained after forming

KEY FEATURES

Very high mechanical properties

Good anti-friction properties

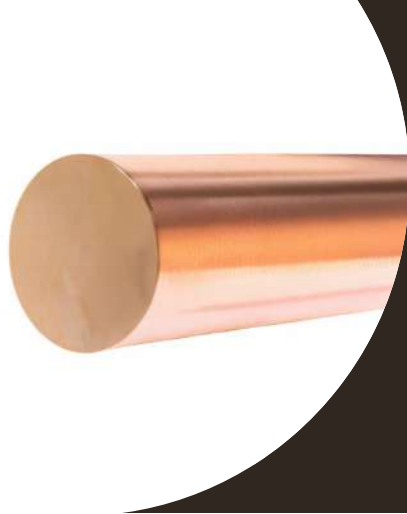
MECHANICAL PROPERTIES

Size diameter Ø or thickness a	Temper*	Yield Strength 0.2% MPa (ksi)	Tensile Strength MPa (ksi)	Elongation (%)	Hardness (HB)
For other dimensions and shapes, mechanical properties on demand					
Bars					
19.05 ≤ Ø ≤ 50.8 mm (0.75 ≤ Ø ≤ 2 in.)	TER	≥ 1 061 (≥ 154)	≥ 1 240 (≥ 180)	≥ 3	≥ 360
50.8 ≤ Ø ≤ 76.2 mm (2 ≤ Ø ≤ 3 in.)	TER	≥ 1 040 (≥ 151)	≥ 1 210 (≥ 175)	≥ 4	≥ 360
19.5 ≤ Ø ≤ 150 mm (0.75 ≤ Ø ≤ 5.9 in.)	TR	≥ 965 (≥ 140)	≥ 1 150 (≥ 167)	≥ 4	≥ 340
19.5 ≤ Ø ≤ 150 mm (0.75 ≤ Ø ≤ 5.9 in.)	T	-	≥ 570 (≥ 83)	≥ 35	≥ 150 HRB (≥ 80 HRB)
Discs and Rings					
200 ≤ Ø ≤ 400 mm (7.9 ≤ Ø ≤ 15.7 in.)	TR	≥ 850 (≥ 123)	≥ 1 050 (≥ 152)	≥ 2	≥ 320
Plates					
25 ≤ a ≤ 250 mm (1 ≤ a ≤ 10 in.)	TR	≥ 965 (≥ 140)	≥ 1 140 (≥ 165)	≥ 2	≥ 340

*TER: solution annealed and quenched, cold worked and aged
TR: solution annealed, quenched and aged
T: solution annealed and quenched

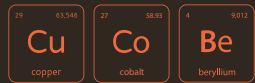
OTHER AVAILABLE FORMS

Hollow bars, billets, strips, sheets, rods, wires, standard & complex profiles, machined blanks and parts



CB4

CuCo₂Be



CB4 is a low-beryllium copper (CuCo₂Be) alloy which exhibits high mechanical properties combined with suitable electrical and thermal properties. It also has good anti-friction properties.



MATERIAL DESIGNATION

ISO	UNS	Other designations	Aerospace specifications	Other standards
CuCo2Be	NA	CC112 WN 2.1285 CW104C	NA	BS 2874, DIN 17666 DIN 17672, DIN 44759 EN 12163, EN 12165 EN 12167, EN 12420

CHEMICAL COMPOSITION (WEIGHT%)

Cu	Co	Be
Balance	2.2%	0.5%

PHYSICAL PROPERTIES

General properties		
Density at 20 °C (68 °F)	8.9 g/cm³	0.32 lb/in³
Thermal conductivity	200 W/m.°C	116 BTU/(h.ft.°F)
Coefficient of thermal expansion from 20 to 300 °C (68 °C to 572 °F)	17.5 x 10 ⁻⁶ /°C	9.72 μin/in °F
Young’s modulus	130 GPa	18 855 ksi
Relative magnetic permeability	1.01	
Electrical properties		
Resistivity at 20 °C (68 °F)	≤ 4 μΩ.cm	≤ 24.06 Ω. circ mil/ft
Electrical conductivity	43 %IACS	

TYPICAL APPLICATIONS

Automotive industry

Head of pistons for diesel engine

Industrial applications

Plungers for die casting

Die for continuous casting ingot

Short circuit ring for squirrel cage motors

Welding industry

Resistance welding of thick plates or stainless steel

COMPATIBLE DOWNSTREAM PROCESS

Extrusion, forging or die stamping followed by quenching and hardening, plus cold-drawing for small diameters

Cold forming in quenched condition, but the hardened condition must be obtained after forming

Hard brazing, but loss of mechanical properties

KEY FEATURES

High mechanical properties

Suitable electrical and thermal properties

Good antifriction properties

MECHANICAL PROPERTIES

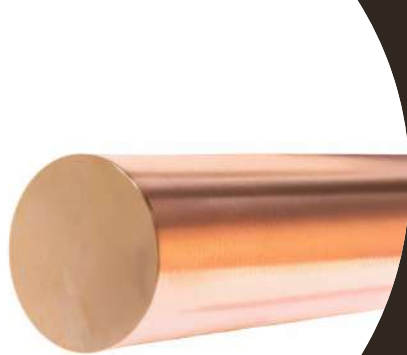
Size diameter Ø or thickness a	Temper*	Yield Strength 0.2% MPa (ksi)	Tensile Strength MPa (ksi)	Elongation (%)	Hardness (HB)
For other dimensions and shapes, mechanical properties on demand					
Round Bars					
Ø ≤ 60 mm (Ø ≤ 2.3 in.)	TR or TER	≥ 610 (≥ 88)	≥ 740 (≥ 107)	≥ 10	≥ 230
Ø > 60 mm (Ø > 2.3 in.)	TR	≥ 570 (≥ 82)	≥ 690 (≥ 100)	≥ 12	≥ 220
Flat / Square / Rectangular / Hexagonal Bars					
a ≤ 50 mm (a ≤ 2 in.)	TR or TER	≥ 610 (≥ 88)	≥ 740 (≥ 107)	≥ 10	≥ 230
a > 50 mm (a > 2 in.)	TR	≥ 570 (≥ 82)	≥ 690 (≥ 100)	≥ 12	≥ 220
Forgings					
Section ≥ 1000 mm ² (Section ≥ 1.55 in. ²)	TR	≥ 550 (≥ 80)	≥ 700 (≥ 101)	≥ 15	≥ 220

*TER: solution annealed and quenched, cold worked and aged

TR: solution annealed, quenched and aged

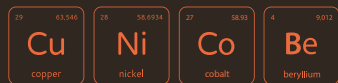
OTHER AVAILABLE FORMS

Hollow bars, plates, billets, strips, sheets, rods, wires, standard & complex profiles, machined blanks and parts



NCB4

CuNi₁Co₁Be



NCB4 is a low-beryllium copper (CuNi₁Co₁Be) alloy which exhibits high mechanical properties combined with suitable electrical and thermal properties. It also has good anti-friction properties.



MATERIAL DESIGNATION

ISO	UNS	Other designations	Aerospace specifications	Other standards
CuNi1Co1Be	C17540	CW103C	NA	RWMA class 3, AWS J1.3 EN 12163, EN 12165 EN 12167, EN 12420

CHEMICAL COMPOSITION (WEIGHT%)

Cu	Ni	Co	Be
Balance	1%	1%	0.5%

PHYSICAL PROPERTIES

General properties		
Density at 20 °C (68 °F)	8.9 g/cm³	0.32 lb/in³
Thermal conductivity	200 W/m.°C	116 BTU/(h.ft.°F)
Coefficient of thermal expansion from 20 to 300 °C (68 °C to 572 °F)	17 x 10 ⁻⁶ /°C	9.44 µin/in °F
Young’s modulus	130 GPa	18 855 ksi
Relative magnetic permeability	< 1.01	
Electrical properties		
Resistivity at 20 °C (68 °F)	3.45 µΩ.cm	20.75 Ω.circ mil/ft
Electrical conductivity	45 %IACS	

TYPICAL APPLICATIONS

- Automotive industry**
Head of pistons for diesel engine
- Industrial applications**
Plungers for die casting
Die for continuous casting ingot
Short circuit ring for squirrel cage motors
- Welding industry**
Resistance welding of thick plates or stainless steel

COMPATIBLE DOWNSTREAM PROCESS

- Extrusion, forging or die stamping followed by quenching and hardening, plus cold-drawing for small diameters
- Cold forming in quenched condition, but the hardened condition must be obtained after forming
- Hard brazing, but loss of mechanical properties

KEY FEATURES

- High mechanical properties
- Suitable electrical and thermal properties
- Good anti-friction properties

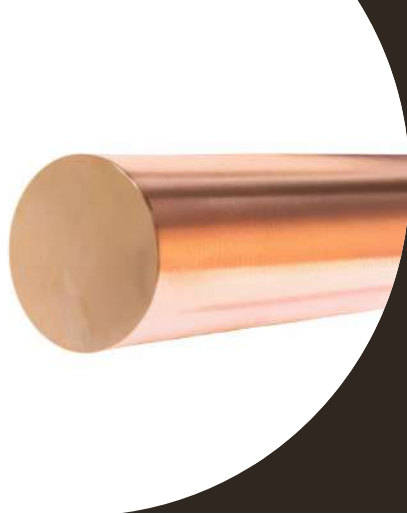
MECHANICAL PROPERTIES

Size diameter Ø or thickness a	Temper*	Yield Strength 0.2% MPa (ksi)	Tensile Strength MPa (ksi)	Elongation (%)	Hardness	
					(HB)	(HRB)
For other dimensions and shapes, mechanical properties on demand						
Round Bars						
12.7 ≤ Ø ≤ 50.8 mm (0.5 ≤ Ø ≤ 2 in.)	TER	≥ 650 (≥ 94)	≥ 760 (≥ 110)	≥ 9	≥ 240	≥ 100
12.7 ≤ Ø ≤ 50.8 mm (0.5 ≤ Ø ≤ 2 in.)	TE	≥ 320 (≥ 45)	≥ 450 (≥ 65)	≥ 15	≥ 120	≥ 70
12.7 ≤ Ø ≤ 304.8 mm (0.5 ≤ Ø ≤ 12 in.)	TR	≥ 520 (≥ 75)	≥ 690 (≥ 100)	≥ 9	≥ 230	≥ 98
12.7 ≤ Ø ≤ 304.8 mm (0.5 ≤ Ø ≤ 12 in.)	T	≥ 70 (≥ 10)	≥ 240 (≥ 35)	≥ 20	≤ 95	≤ 50
Flat Bars						
19.05 ≤ a ≤ 63.5 mm (3/4 ≤ a ≤ 2.5 in.)	TER	≥ 650 (≥ 94)	≥ 750 (≥ 109)	≥ 8	≥ 240	≥ 103
Plates**						
a ≥ 19.05 mm (a ≥ 3/4 in.)	TR	≥ 550 (≥ 80)	≥ 690 (≥ 100)	≥ 10	≥ 230	≥ 98
a ≥ 19.05 mm (a ≥ 3/4 in.)	T	≥ 170 (≥ 25)	≥ 240 (≥ 35)	≥ 20	≤ 90	≤ 45

*TER: solution annealed and quenched, cold worked and aged
TE: solution annealed, quenched and cold worked
TR: solution annealed, quenched and aged
T: solution annealed and quenched
**Width: 305 - 686 mm (12 - 27 in.) - max I Section: 70 000 mm² (108 in.²)

OTHER AVAILABLE FORMS

Hollow bars, billets, strips, sheets, rods, wires, standard & complex profiles, machined blanks and parts



NB4

CuNi₂Be



NB4 is a low-beryllium copper (CuNi₂Be) alloy which exhibits high mechanical properties combined with suitable electrical and thermal properties. It also has good anti-friction properties.



MATERIAL DESIGNATION

ISO	UNS	Other designations	Aerospace specifications	Other standards
CuNi2Be	C17510	WN 2.0850 CW110C	NA	AWS J1.3, RWMA class 3 ASTM B 441, DIN 17666 DIN 17672, EN 12163 EN 12167

CHEMICAL COMPOSITION (WEIGHT%)

Cu	Ni	Be
Balance	2%	0.4%

PHYSICAL PROPERTIES

General properties		
Density at 20 °C (68 °F)	8.9 g/cm³	0.32 lb/in³
Thermal conductivity	230 W/m.°C	133 BTU/(h.ft.°F)
Coefficient of thermal expansion from 20 to 300 °C (68 °C to 572 °F)	17 x 10 ⁻⁶ /°C	9.44 µin/in °F
Young’s modulus	130 GPa	18 855 ksi
Relative magnetic permeability	< 1.01	
Electrical properties		
Resistivity at 20 °C (68 °F)	3.83 µΩ.cm	23.04 Ω.circ mil/ft
Electrical conductivity	45 %IACS	

TYPICAL APPLICATIONS

- Automotive industry**
Head of pistons for diesel engine
- Industrial applications**
Plungers for die casting
Die for continuous casting ingot
Short circuit ring for squirrel cage motors
- Welding industry**
Resistance welding of thick plates or stainless steel

COMPATIBLE DOWNSTREAM PROCESS

- Extrusion, forging or die stamping followed by quenching and hardening, plus cold-drawing for small diameters
- Suitable for cold forming in quenched condition, but the hardened condition must be obtained after forming
- Suitable for hard brazing, but loss of mechanical properties

KEY FEATURES

- High mechanical properties
- Suitable electrical and thermal properties
- Good anti-friction properties

MECHANICAL PROPERTIES

Size diameter Ø or thickness a	Temper*	Yield Strength 0.2% MPa (ksi)	Tensile Strength MPa (ksi)	Elongation (%)	Hardness	
					(HB)	(HRB)
For other dimensions and shapes, mechanical properties on demand						
Bars						
12.7 ≤ Ø ≤ 50.8 mm (0.5 ≤ Ø ≤ 2 in.)	TER	≥ 660 (≥ 95)	≥ 760 (≥ 110)	≥ 9	≥ 240	≥ 100
12.7 ≤ Ø ≤ 50.8 mm (0.5 ≤ Ø ≤ 2 in.)	TE	≥ 320 (≥ 45)	≥ 450 (≥ 65)	≥ 15	≥ 120	≥ 70
12.7 ≤ Ø ≤ 304.8 mm (0.5 ≤ Ø ≤ 12 in.)	TR	≥ 520 (≥ 75)	≥ 690 (≥ 100)	≥ 9	≥ 230	≥ 98
12.7 ≤ Ø ≤ 304.8 mm (0.5 ≤ Ø ≤ 12 in.)	T	≥ 70 (≥ 10)	≥ 240 (≥ 35)	≥ 20	≤ 95	≤ 50
Plates**						
a ≥ 19.05 mm (a ≥ 0.75 in.)	TR	≥ 550 (≥ 80)	≥ 690 (≥ 100)	≥ 10	≥ 230	≥ 98
a ≥ 19.05 mm (a ≥ 0.75 in.)	T	≥ 170 (≥ 25)	≥ 240 (≥ 35)	≥ 20	≤ 90	≤ 45

*TER: solution annealed and quenched, cold worked and aged
TE: solution annealed, quenched and cold worked
TR: solution annealed, quenched and aged
T: solution annealed and quenched
**Width: 305-686 mm (12-27 in.) / Section: ≤ 70 000 mm² (108 in²)

OTHER AVAILABLE FORMS

Hollow bars, billets, strips, sheets, rods, wires, standard & complex profiles, machined blanks and parts



lebronze alloys

Métallurgie d'exception

www.lebronze-alloys.com