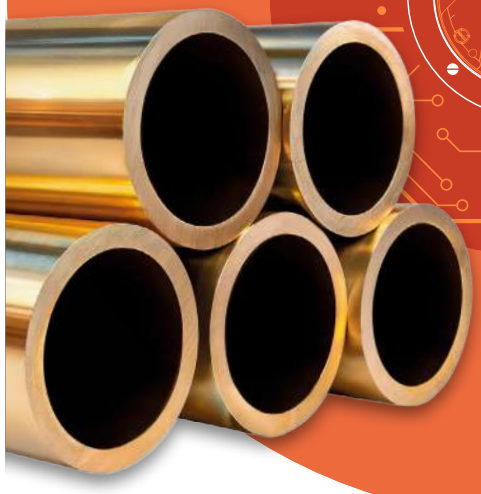
PRODUCT
CATALOG
Bars &
Hollows Bars

24

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*

LBA NA
USA
10 FTEs

LBA UK
England
13 FTEs

Lüdenscheid
Germany
120 FTEs

Rydzyna
Poland
42 FTEs

Dongguan
China
52 FTEs

LBA India
India
2 FTEs

LBA Asia
China
5 FTEs

Bornel
France
155 FTEs

Breteuil
France
85 FTEs

LBA SE
France
8 FTEs

Suippes
France
223 FTEs

Paris
Corporate headquarters

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

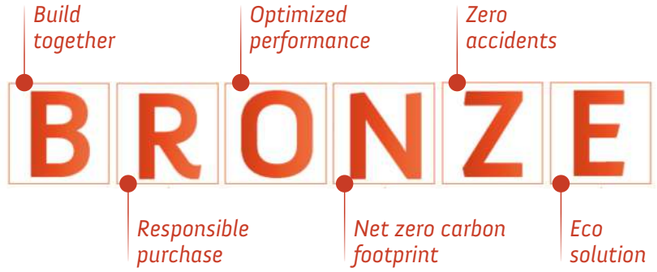
Finishing

- 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

afaq EN/AS/JISQ 9100 Aéronautique AFNOR CERTIFICATION

Certified site: Suippes

Nadcap Administered by PRI ACCREDITED

Heat treating

UKAS MANAGEMENT SYSTEMS 9963 — auva AS 9120 CERTIFIED

Certified service center: Lebronze alloys UK

General certifications

afaq ISO 9001 Qualité AFNOR CERTIFICATION

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

afaq ISO 14001 Environnement AFNOR CERTIFICATION

Certified sites: Breteuil, Suippes, Rydzyna.

afaq ISO 45001 Santé Sécurité au Travail AFNOR CERTIFICATION

Certified sites: Bornel

afaq ISO 50001 Énergie AFNOR CERTIFICATION

Certified sites: Lüdenscheid, Breteuil and Suippes.

CuNiSi alloys
Nickel Silicon Bronze alloys
High electrical and thermal properties

Our range of **nickel silicon bronze alloys**, composed of copper, nickel and silicon, is designed for applications requiring a **good combination of mechanical, electrical and thermal properties.** Main applications are in the Automotive and Plastic sectors as **bearings, bushings, mold inserts** and many more.

We provide these alloys mainly as bars, hollow bars and plates, to be processed into relatively complex components.

PRODUCT PORTFOLIO

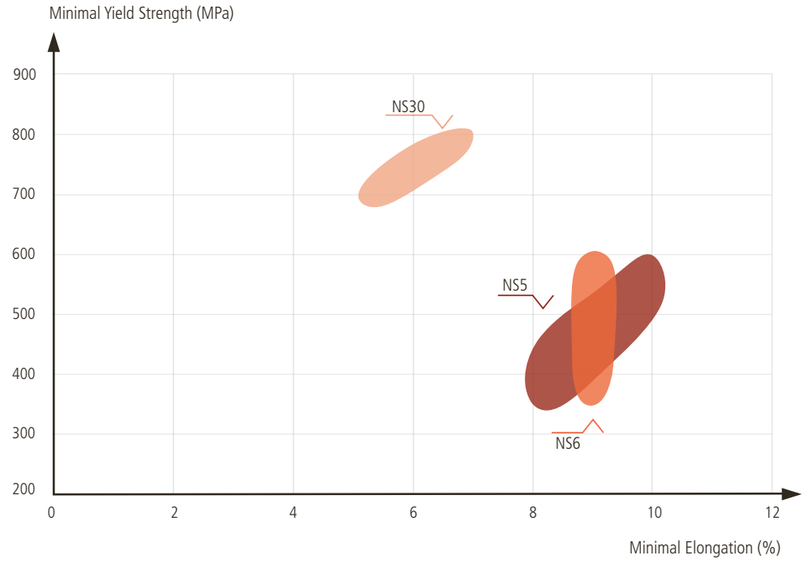
Alloy	ISO	UNS	Other designations	Aerospace specifications
NS5	CuNi2Si CuNi3Si	NA	CW111C 2.0855	NFL 14-701 DTD 498
NS6	CuNi3Si	C18000	NA	NA
NS30	CuNi7Si2Cr	NA	NA	NA

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



ESG Performance

We aim to offer our Customers products with the leading grade of environmental footprint. To achieve this, we make major investments in innovative processes aiming to optimize energy and water consumption and increasing the use of recycled raw materials. More specifically, we have developed state-of-the-art recycling know-how based on specialized purchasers for sourcing end of life materials to be processed in our Group Upcycling Workshop. Another key aspect of our ESG strategy is to offer substitutes for alloys that are not REACH and RoHS compliant.

Our CuNiSi alloys are:
- REACH and RoHS compliant
- On average produced with 94 % of recycled materials

Markets and applications

Automotive

- Bearings
- Bushings
- Inserts

Plastic

- Mold inserts
- Injection components

Other

- Pistons / plunger tips for die casting machines
- Welding shanks and wheels

NS5

$CuNi_2Si$
$CuNi_3Si$

Cu copper | Ni nickel | Si silicon

NS5 is a nickel-silicon-bronze ($CuNi_2Si$ / $CuNi_3Si$) age hardening alloy designed for high strength applications. It exhibits good electrical and thermal properties and resists mechanical wear, galling, with a moderate resistance to marine corrosion.

MATERIAL DESIGNATION

ISO	UNS	Other designations	Aerospace specifications	Other standards
CuNi2Si CuNi3Si	NA	CW111C 2.0855	NFL 14-701 DTD 498	EN 12163, EN 12167 EN 12420, EN 12165 DIN 1756

CHEMICAL COMPOSITION (WEIGHT%)

Cu	Ni	Si
Balance	2.3%	0.6%

PHYSICAL PROPERTIES

General properties		
Density at 20 °C (68 °F)	8.8 g/cm³	0.32 lb/in³
Thermal conductivity	180 W/m.°C	104 BTU/(h.ft.°F)
Coefficient of thermal expansion from 20 to 300 °C (68 °C to 572 °F)	16 x 10^{-6}/°C	8.89 µin/in °F
Young's modulus	130 GPa	18 855 ksi
Relative magnetic permeability	1.01	
Electrical properties		
Resistivity at 20 °C (68 °F)	4.5 µΩ.cm	27.07 Ω. circ mil/ft
Electrical conductivity	38 %IACS	

TYPICAL APPLICATIONS

Plunger tips for die casting machines

Aeronautics industry

Bearing cages , Short-circuit rings, Rotors, Antifriction rings

Automotive industry

Insert for plastic injection moulds

Railway industry

Connectors, Valve guides

Oil and Gas industry

Top drives short circuit rings, rotor wedges and bars, downhole tools high strength fasteners, bushings and bearings, mechanical seals, shear pins, hydraulic valve bodies, pump components and ball valves.

KEY FEATURES

High mechanical properties
Good resistance to softening at elevated and sub-zero temperatures
Good electrical and thermal properties
Corrosion resistance in marine environments
Good spark resistance
Good antifriction properties
Low magnetic permeability
Excellent antifouling behavior
Excellent cold workability in soft temper

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

MECHANICAL PROPERTIES

Size	Temper*	Yield Strength 0.2% MPa (ksi)	Tensile Strength MPa (ksi)	Elongation (%)	Hardness (HB)
For other dimensions and shapes, mechanical properties on demand					
Round / Square / Flat Bars					
Section ≤ 1000 mm² (Section ≤ 1.55 in.²)	TER	≥ 590 (≥ 86)	≥ 650 (≥ 94)	≥ 10	≥ 195
1000 < Section ≤ 2800 mm² (1.55 < Section ≤ 4.3 in.²)	TR	≥ 500 (≥ 72)	≥ 650 (≥ 94)	≥ 10	≥ 195
2800 < Section ≤ 60 000 mm² (4.3 < Section ≤ 93 in.²)	TR	≥ 440 (≥ 64)	≥ 590 (≥ 86)	≥ 8	≥ 190
Section > 60 000 mm² (Section > 93 in.²)	TR	≥ 340 (≥ 49)	≥ 490 (≥ 71)	≥ 8	≥ 160
Hollow bars					
56 ≤ OD ≤ 250 mm (2.2 ≤ OD ≤ 10 in.)	TR	≥ 440 (≥ 64)	≥ 590 (≥ 86)	≥ 8	≥ 190

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

OTHER AVAILABLE FORMS

Plates, billets, strips, sheets, rods, wires, standard & complex profiles, welding electrodes, machined blanks and parts

Disclaimer : Data for information only, non-contractual / Dimensions outside these ranges on request

NS6

$CuNi_3Si$

29	28	14
63.546	58.6934	28.085
Cu	Ni	Si
copper	nickel	silicon

NS6 is a nickel-silicon-bronze ($CuNi_3Si$) age hardening alloy. It exhibits good mechanical properties and superior electrical and thermal properties. It also has good antifriction properties.

MATERIAL DESIGNATION

ISO	UNS	Other designations	Aerospace specifications	Other standards
CuNi3Si	C18000	NA	NA	RWMA class 3 AWS J1.3

CHEMICAL COMPOSITION (WEIGHT%)

Cu	Ni	Si	Cr
Balance	2.3%	0.6%	0.6%

TYPICAL APPLICATIONS

Plunger tips for die casting machines
Parts for resistance welding
Insert for plastic injection molds

PHYSICAL PROPERTIES

General properties		
Density at 20 °C (68 °F)	8.8 g/cm³	0.32 lb/in³
Thermal conductivity	180 W/m.°C	104 BTU/(h.ft.°F)
Coefficient of thermal expansion from 20 to 300 °C (68 °C to 572 °F)	16 x 10^{-6}/°C	8.89 µin/in °F
Young's modulus	130 GPa	18 855 ksi
Electrical properties		
Resistivity at 20 °C (68 °F)	≤ 3.8 µΩ.cm	≤ 22.86 Ω. circ mil/ft
Electrical conductivity	≥ 45 %IACS	

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

Good mechanical properties
Good electrical and thermal properties
Good antifriction properties

OTHER AVAILABLE FORMS

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

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					
3.175 ≤ Ø ≤ 25.4 mm (0.125 ≤ Ø ≤ 1 in.)	TER	≥ 590 (≥ 86)	≥ 655 (≥ 95)	≥ 9	≥ 195
25.4 ≤ Ø ≤ 50.8 mm (1 ≤ Ø ≤ 2 in.)	TR	≥ 500 (≥ 72)	≥ 650 (≥ 95)	≥ 9	≥ 195
50.8 < Ø ≤ 114.3 mm (2 < Ø ≤ 4.5 in.)	TR	≥ 500 (≥ 72)	≥ 610 (≥ 88)	≥ 9	≥ 195
114.3 ≤ Ø ≤ 381 mm (4.5 ≤ Ø ≤ 15 in.)	TR	≥ 345 (≥ 50)	≥ 610 (≥ 88)	≥ 9	≥ 195
Square / Rectangular Bars					
Section ≥ 500 mm² (≥ 0.77 in²) a ≤ 25 mm (≤ 0.94 in.)	TER	≥ 590 (≥ 86)	≥ 655 (≥ 95)	≥ 9	≥ 195
a > 25 mm (a > 0.94 in.)	TR	≥ 345 (≥ 50)	≥ 610 (≥ 88)	≥ 9	≥ 195
Plates					
19.05 ≤ a ≤ 25.4 mm (0.75 ≤ a ≤ 1 in.)	TR	≥ 345 (≥ 50)	≥ 650 (≥ 95)	≥ 9	≥ 195
25.4 ≤ a ≤ 50.8 mm (1 ≤ a ≤ 2 in.)	TR	-	≥ 620 (≥ 90)	≥ 9	≥ 195
a > 50.8 mm (a > 2 in.)	TR	≥ 345 (≥ 50)	≥ 610 (≥ 88)	≥ 9	≥ 195

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

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NS30

$CuNi_7Si_2Cr$

Cu	Ni	Si	Cr
copper	nickel	silicon	chromium

NS30 is a nickel-silicon-bronze ($CuNi_7Si_2Cr$) alloy designed for applications requiring a combination of high thermal dissipation and high strength. NS30 is non-sparking and resistant to corrosion.

MATERIAL DESIGNATION

ISO	UNS	Other designations	Aerospace specifications	Other standards
CuNi7Si2Cr	NA	NA	NA	NA

CHEMICAL COMPOSITION (WEIGHT%)

Cu	Ni	Si	Cr
Balance	7%	2%	1%

PHYSICAL PROPERTIES

General properties		
Density at 20 °C (68 °F)	8.7 g/cm³	0.31 lb/in³
Thermal conductivity	135 W/m.°C	78 BTU/(h.ft.°F)
Coefficient of thermal expansion from 20 to 300 °C (68 °C to 572 °F)	16 x 10^{-6}/°C	8.89 µin/in °F
Young's modulus	130 GPa	18 855 ksi
Relative magnetic permeability	1.01	
Electrical properties		
Resistivity at 20 °C (68 °F)	5.7 µΩ.cm	34.3 Ω. circ mil/ft
Electrical conductivity	30 %IACS	

TYPICAL APPLICATIONS

Automotive industry

Fuel and CO_2 efficient touring cars, valve seats, valve guides, liners.

Bearings and bushings valvetrain components for racing cars

Plastic industry

Mold inserts for injection molding, injection and extrusion blow molding.

Injection components (manifolds) for hot runner systems

Other applications

Welding shanks and wheels. High pressure die casting plunger tips/pistons

COMPATIBLE DOWNSTREAM PROCESS

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

Suitable for hard brazing, but loss of mechanical properties

KEY FEATURES

High thermal conductivity

High strength

Excellent wear & galling resistance

Good corrosion resistance

Fair machinability

Non-sparking

Good impact & fatigue resistance

Low magnetic permeability

Stable performance at elevated temperatures up to 350 °C (662 °F)

Dimensional stability

MECHANICAL PROPERTIES

Size diameter Ø or thickness a	Temper*	Yield Strength 0.2% MPa (ksi)	Tensile Strength MPa (ksi)	Elongation (%)	Hardness	
					(HB)	(HRC)
For other dimensions and shapes, mechanical properties on demand						
Bars						
Ø ≤ 50.8 mm (Ø ≤ 2 in.)	TER	≥ 800 (≥ 116)	≥ 900 (≥ 131)	≥ 7	≥ 270	≥ 26
50.8 < Ø ≤ 127 mm (1.97 < Ø ≤ 5 in.)	TR	≥ 700 (≥ 102)	≥ 800 (≥ 116)	≥ 5	≥ 250	≥ 25
Hollow bars						
OD > 101.6 mm (OD > 4 in.) Thickness: 10-25.4 mm (0.4 to 1 in.)	TR	≥ 700 (≥ 102)	≥ 800 (≥ 116)	≥ 5	≥ 250	≥ 25
Plates						
a ≤ 50.8 mm (a ≤ 2 in.)	TR	≥ 700 (≥ 102)	≥ 800 (≥ 116)	≥ 5	≥ 250	≥ 25

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

OTHER AVAILABLE FORMS

Billets, strips, sheets, rods, wires, standard & complex profiles, machined blanks and parts

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lebronze alloys

Métallurgie d'exception

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