



lebronze alloys



Discover our welding solutions

► Electrodes and materials

A fully integrated manufacturing process:

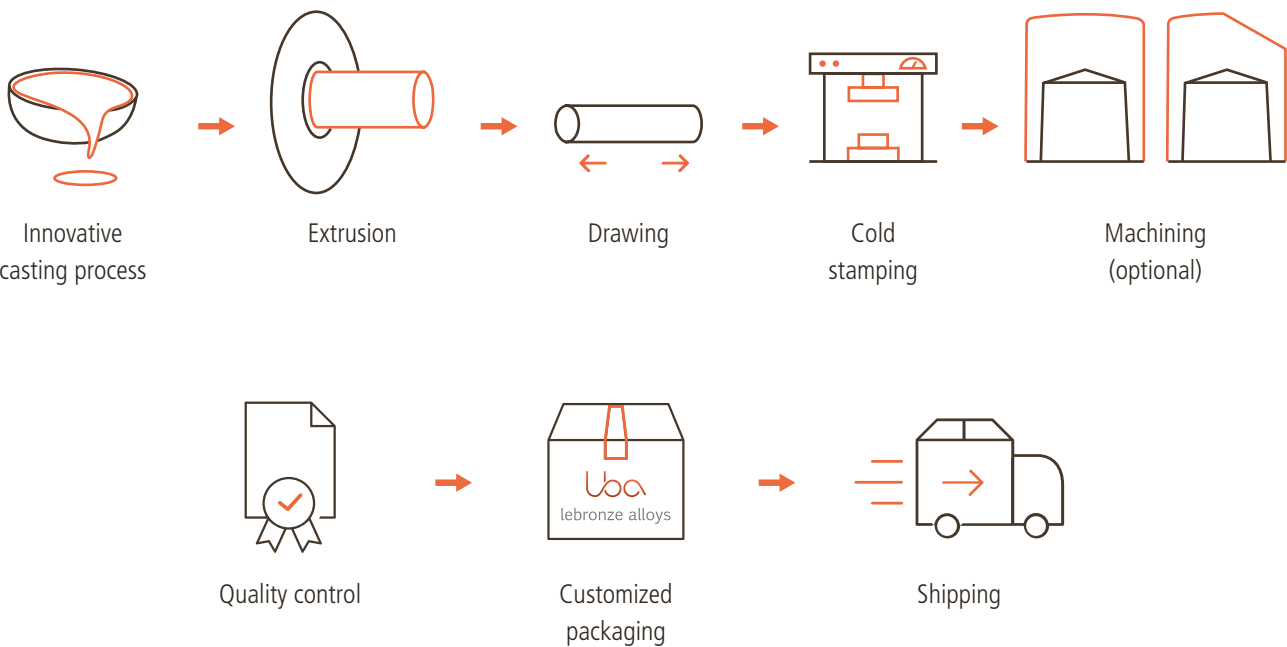
From alloy melting to finished and customized products



Being the only integrated manufacturer, Lebronze alloys has an indisputable advantage: we manufacture our own alloys to produce electrodes.

Our internal processes include casting, cold working stage, machining and non-destructive testing.

Being fully integrated ensures reactivity and complete traceability.



All our products are manufactured 100% in our own dedicated facilities and are permanently controlled by our experienced Engineering and Quality Assurance staff. This uniqueness guarantees complete traceability and thus perfect control of quality and improves the reliability of our supply chain.



Recognized experience and innovation

For over 50 years, Lebronze alloys has been an international reference in the Automotive industry for resistance welding products. Being a major partner to almost all car builders involves important duties: not only manufacturing high quality alloys and electrodes but also by being a pioneer in innovation.

Our group has always been committed to a process of continuous improvement. This allied with a Research & Development programme launched in partnership with specific automotive manufacturers led to the set up of a dedicated and exclusive patented manufacturing process for the electrodes.

The welding performance of our revolutionary electrodes offers improvements in comparison with the highest standards available within this sector.



Our solutions tailored to cover all your needs

Our 4 solutions are an ideal range of welding products, from coated or uncoated AHSS steel to aluminum sheet welding.

- **CuZr electrodes:**
The market standard for copper-zirconium (C15000), chrome-free welding caps
 - **Powerode[®], the universal high-performance electrode:**
The premium solution (C18148-C18150) for welding of steel sheets with very high purity
- **Powerode[®], the universal electrode:**
The CuCrZr (C18148-C18150) market standard solution with high purity
 - **Alrode[®], the breakthrough welding solution for aluminum and steel:**
The premium innovative solution (C18147) for welding of steel sheets and aluminum sheets with very high purity

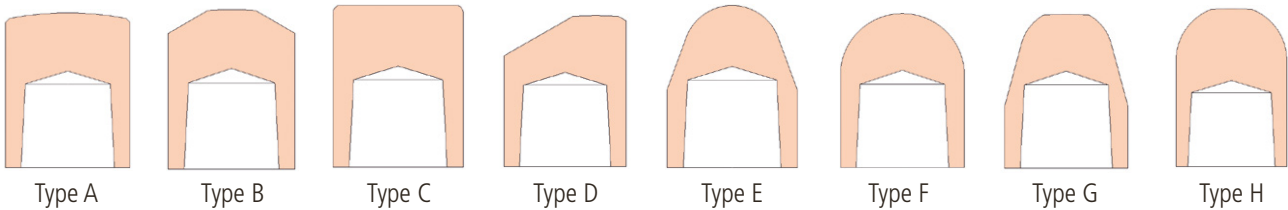
Comparison of Lebronze alloys welding solutions				
Technical Advantages	CuZr Electrode	Powerode [®]	Powerode+ [®]	Alrode [®]
Avoid sticking effect	•	•	•	•
Avoid mushrooming	•	•	•	•
Higher resistance to softening		•	•	•
Better pressure resistance		•	•	•
Higher conductivity	•		•	•
Last longer			•	•
Optimal properties for welding steel and aluminum				•

Measurements made in laboratory conditions. Non contractual.



Large range of welding electrodes

Lebronze alloys manufactures a large range of male and female spot welding electrodes.



Alloy	Standards Nearest international standards	Nominal composition %										Physical properties							Conditions TER = Quenched, cold worked and aged TR = Quenched and aged T= Quenched	Mechanical properties										
		Cu	Cr	Zr	Co	Be	Ni	Fe	P	Si	Others	Density g/cm³	Electrical conductivity (%IACS)	Electrical resistivity at 20°C (μΩ·cm)	Thermal conductivity 20° to 200°C (W/mK)	Coefficient of expansion 20° to 200° c (x10 ⁻⁶ /°C)	Relative magnetic permeability	Young' s modulus (kN/mm²)		Tensile strength		Yield strength 0.2% offset or 0.5% E.U.L.		Elongation 5,65 %S		Hardness				
																				Mpa ≥	ksi ≥	Mpa ≥	ksi ≥	% ≥	HB					
ALRODE CuCrZr	UNS : C18147	remainder	0,15 to 0,35	0,02 to 0,05							≤0,04	8,9	≥ 88	≤1,96	320	17,5	1,01	120	Cold formed Electrodes 13 ≤Ø≤20 mm 0,5 in.≤Ø≤ 0,8 in.											150
POWERODE®/ POWERODE®+ CuCr1Zr	UNS : C18148 C18150 AWS J1.3 MIL 19311 RWMA class 2 SAE CA 184 BS 2874 CC 102 EN 12163, EN 12165, EN 12420, EN 12167 CW106C, CW105C DIN 17666 WN 2.1293 DIN 17672 DIN 44759 NFA 82100 ISO 5182 A2/3 ISO 1336	remainder	0,5 to 0,8	0,03 to 0,10			≤ 0,01	0,004 to 0,02	≤0,04	8,9	≥80% /≥85 ⁽¹⁾	≤2,3	320	17,5	1,01	120	Cold formed Electrodes 13 ≤Ø≤20 mm 0,5 in.≤Ø≤ 0,8 in.											160		
																	Machined Electrodes 10 ≤Ø≤40 mm 0,40 in. ≤Ø≤ 1,57 in.											150		
																	Round rod 10 ≤ Ø ≤ 25,4 mm - 0,40 in.≤ Ø ≤ 1 in. Square, flat, hexagone, thickness 10 ≤ Ø ≤ 25,4 mm - 0,40 in.≤ Ø ≤ 1 in. TER condition						480	70	420	61	18	150		

(1) for Powerode+® only

Large range of welding products

Lebronze alloys also manufactures round bars, flat bars, plates, welding wheels, and any kind of engineered products.

- Rods and hollows from 8 to 380 mm OD
- Flats, squares and plates from 10 mm thickness
- Seam welding wheels up to 900 mm OD
- Stamped and machined connectors for welding guns

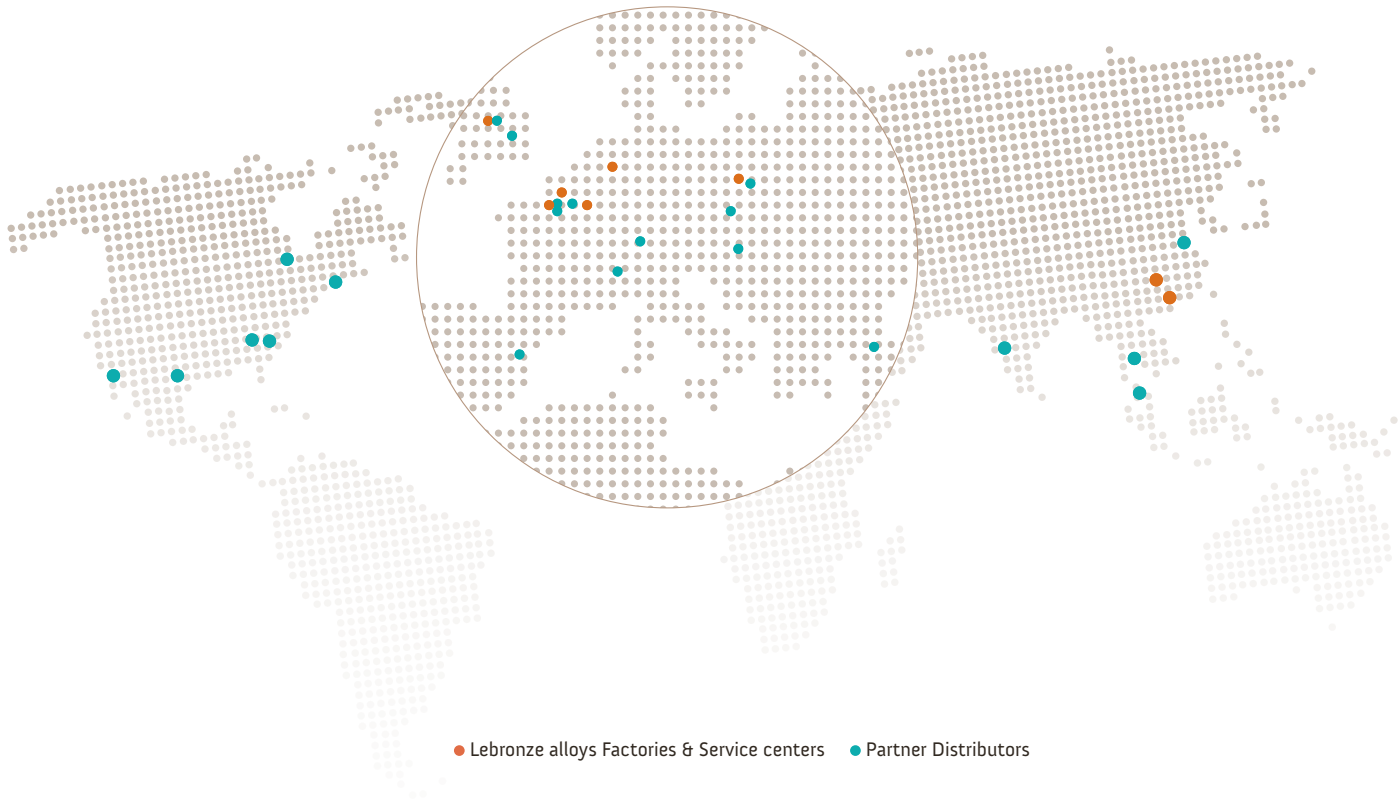


Alloy	Standards Nearest international standards	Nominal composition %									Physical properties							Conditions TER = Quenched, cold worked and aged TR = Quenched and aged T = Quenched	Mechanical properties																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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		Cu	Cr	Zr	Co	Be	Ni	Fe	Si	Others	Density	Electrical conductivity (%IACS)	Electrical resistivity at 20°C (μΩcm)	Thermal conductivity 20° to 200°C (W/mK)	Coefficient of expansion 20° to 200° C (x 10 ⁻⁶ /°C)	Relative magnetic permeability	Young's modulus (kN/mm²)		Mpa ≥	Ksi ≥	Mpa ≥	Ksi ≥	% ≥	HB																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
CRM16 CuCr12Zr	UNS : C18100-C18150 AWS J1.3 MIL 19311 RWMA class 2 SAE CA 184 BS 2874 CC 102 EN 12163, EN 12165, EN 12420, EN 12167 CW106C, CW105C DIN 17666 WN 2.1293 DIN 17672 DIN 44759 NFA 82100 ISO 5182 A2/3 ISO 1336	remainder	0,4 to 1	0,03 to 0,15			≤ 0,08		≤ 0,2	8,9	≥ 75	≤ 2,3	320	17,5	1,01	120		Round rod 26 ≤ Ø ≤ 45 mm - 1. in. < Ø ≤ 1,80 in. Square, flat, hexagone, thickness 26 to 60 mm - 1,02 in. to 2,4 in. TER condition	480	70	420	61	18	140																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
																		Round rod 45 < Ø ≤ 80 mm - 1,80 in. < Ø ≤ 3,15 in. Temper TER	440	64	360	52	18	140																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
																		Round rod 20 ≤ Ø ≤ 350 mm - 0,80 in. ≤ Ø ≤ 13,8 in. Square, flat of equivalent section TR condition	350	51	240	35	20	120																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
																		Plate 16 ≤ thickness ≤ 250 mm - 0,60 ≤ thickness ≤ 10 in. TR condition	380	55	280	41	20	120																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
																		Plate 4 ≤ thickness ≤ 10 mm - 0,16 ≤ thickness ≤ 0,40 TER condition	400	58	350	51	10	125																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
CRM16E CuCr12Zr	UNS : C18100-C18150 AWS J1.3 MIL 19311 RWMA class 2 SAE CA 184 BS 2874 CC 102 EN 12163, EN 12165, EN 12420, EN 12167 CW106C, CW105C DIN 17666 WN 2.1293 DIN 17672 DIN 44759 NFA 82100 ISO 5182 A2/3 ISO 1336	remainder	0,4 à 1	0,03 to 0,25			≤ 0,08		≤ 0,2	8,9	≥ 75	≤ 2,3	320	17	1,01	120		Discs and rings TR condition	380	55	280	41	15	130																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
ZR16X CuZr	UNS: C15000 AWS J1.3 RWMA class 1 DIN 17666 wn 2.1580 DIN 17672 ISO 5182 A2/4 EN 12163, EN 12167, EN 12420 CW120C	remainder		0,15							8,9	≥ 85	≤ 2,05	320	17	1,01	110		TER condition	320	46	280	41	18	120																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
CB4 CuCo2Be	AWS J1.3 BS 2874 CC 112 DIN 17666 wn 2.1285 DIN 17672- DIN 44759 ISO 1187- NFA 82100 ASTM B441- B534- B 870: C 17500 MIL 46087- RWMA class 3 SAE CA 184	remainder			2,2	0,5					8,9	43	≤ 4	200	17,5	1,01	130		section < 1000 mm² - < 1,550 in.² TR or TER condition	700	101	650	94	10	240																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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NS5 CuNi2Si	AWS J1.3 DIN 17666 wn 2.0855 DIN 17672 w 2.0855 DIN 44759 cl A3.2 NFL 14-701 ISO 1187 EN 12163, EN 12167, EN 12420, EN 12165 CW111C DTD 498- RWMA class 3	remainder					2,3		0,6		8,8	38	4,5	180	16	1,01	130		Section ≤ 1000 mm² - ≤ 1,55 in. TER temper	650	94	590	86	10	≥ 195																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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NS6 CuNi2Si	AWS J1.3 RWMA class 3: C18000	remainder	0,6				2,3		0,6		8,8	≥ 45	≤ 3,83	180	16	1,01	130		Rods 3,175 ≤ Ø ≤ 25,4 mm - 0,125 in. ≤ Ø ≤ 1 in.	655	95	590	86	9	≥ 195																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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																			Rods 50,8 ≤ Ø ≤ 114,3 mm - 2 in. ≤ Ø ≤ 4,5 in.	610	88	500	72	9	≥ 195																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
																			Rods 114,3 ≤ Ø ≤ 381 mm - 4,5 in. ≤ Ø ≤ 15 in.	610	88	345	50	9	≥ 195																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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lebronze alloys

World leader in high-performance specialty copper and nickel alloys



Lebronze alloys Group is a world leader in the development and fully integrated production of high-performance specialty 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 750 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.

We are a major decarbonation player for many industries. We continually strive to reduce our carbon footprint and our products are key for decarbonation applications in our customer' industries.

The Group's commitment is to find appropriate and optimized solutions for every sector's requirements.



Member of the «Coq Vert» community

contact@lebronze-alloys.com

www.lebronze-alloys.com

