



lebronze alloys



Motor end Rings

Motor End Rings production

Our standard manufactured range goes up to 2000 mm (78.74") Outside Diameter. Larger diameters can be accommodated, these however are dependent upon the internal diameter and thicknesses required. Our standard method of fabrication varies dependent upon the alloy and the required dimensions; we do however make two standard distinctions as follows:

Cu-HCP / Cu ETP:

Casting + Cutting + Forging and/or Rolling + Cutting + Machining + NDT (UT) + Marking + Dimensional Controls (CMM)

CuCr1Zr / CuNi2Si:

Casting + Cutting + Forging and/or Rolling + Heat treatment + Cutting + Machining + NDT (UT) + Marking + Dimensional Controls (CMM)

From casting to machining

One of Lebronze alloys major strengths relies in its fully integrated production process, from casting thru to machining. This uniqueness guarantees complete traceability and thus a perfect control of quality. The Group offers you a faster and easier ordering process (logistic, lead time, administrative and costs).

Our forging capabilities

Forging is an outstanding solution to answer fatigue component problems when these are subjected to strong and repeated stress over time.

► Control of 3 forging techniques: closed-die forging / open die forging, ring rolling mill. Dimensional range from few grams to several tonnes

- An outside diameter up to 2500 mm for rings,
- A gross weight from 1 kg up to 8 tons for open-die forged parts,
- A gross weight from 10 grams up to 800 kg for stamped parts.

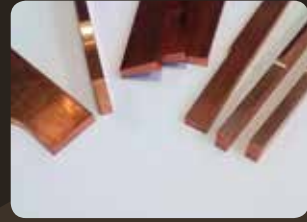
► A wide range of alloys

- Pure Copper,
- Copper alloys,
- Aluminums,
- Special steels,
- Titanium,
- Copper nickel alloys,
- Superalloys.



► Other motor parts

- Forging shaft - Motor Shaft - Drive Shaft,
- Connections parts,
- Rotor bars,
- Clamping plate,
- Shrink Collars in CuNi14Al3 (our alloy K5),
- Damper ring.



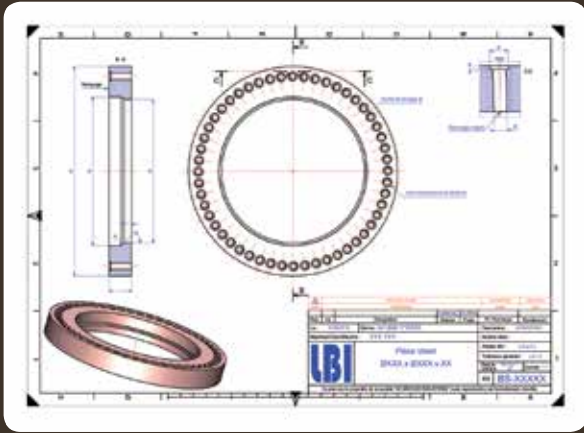
Applications

► Asynchronous motors for

- Global railway industries,
- Mining,
- Nuclear,
- Refineries,
- Quarries,
- Cement,
- Ventilation,
- Chemistry & petrochemistry,
- Wind turbines,
- Shipbuilding,
- Cranes,
- Metallurgy,
- Agriculture,
- Paper-making industry,
- Other specialized "off-highway" applications.



Customer's benefit



Forged rings have a superior fine and homogenous grain structure due to their hot transformation.

This finer and more homogenous grain structure of the forged ring tubes translates into enhanced and consistent mechanical properties.

Unlike cast rings, forged rings are easily able to be ultrasonically tested which ensures a level of consistency in quality and soundness of the product.

We support our customers thanks to our specialized engineering department and qualified TOP SOLID technicians.

► Our references

Our quality control system complies with the criteria established by:
ISO 9001: 2008 (AFAQ)

► Our references

ABB, Alstom, Transport, ATB, Morley, BHEL, Bombardier, Cegelec, Convertteam, General Electrics Hitachi, Jeumont, Leroy Somer, Siemens, Toyo, TT Electric, Voith, WEG.



| Alloy | Standards Nearest international standards | Nominal composition % | Physical properties | | | | | | | Remarks | Mechanical properties | | | | | | | | |
|--------------------------|---|---|---------------------|-------------------------------|--|---|---|-----------------------------------|-------------------------------------|---|-----------------------|-------------------|---|-------|--------------------|------|----------|-----|-------------------------------------|
| | | | 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 /K | Relative magnetic permeability | Young' s modulus kN/mm ² | | Tensile strength | | Yield strength 0,2% offset or 0,5% E.U.L. (1) | | Elongation 5,65 √S | | Hardness | | Impact strength KCU (1) or IZOD (2) |
| | | | | | | | | | | | Mpa ≥ ; * = Mpa ≤ | ksi ≥ ; * = Mpa ≤ | Mpa ≥ | ksi ≥ | % ≥ | HB | HRB | HV5 | |
| Cu b1 | NFA 51050 EN 12420 CuDHP CW024A UNS 12200 DIN 1708 SF-Cu 2.0090 | Cu : ≥99,90 P : 0,013 to 0,050 | 8,9 | 83 | 2,1 | 320 | 18 | 1,01 | 110 | Ø ≤ 1000 mm , dimension above on demand | 205 | 30 | 60 | 9 | 35 | ≥45 | | | |
| Cu HCP | EN 12420 CW021A UNS C10800 Cu OFLP DIN 1708 SE-Cu ISO 1337 | Cu : ≥99,95 Bi : ≤0,0005 Pb : ≤0,005 P : 0,002 to 0,007 Other : ≤0,03 | 8,9 | 98 | 1,75 | 320 | 18 | 1,01 | 110 | Ø ≤ 1000 mm , dimension above on demand | 205 | 30 | 40 | 6 | 35 | ≥45 | | | |
| Cu OF | NFA 51050 Cu c1 EN 12420 CuDHP CW008A ASTM B152 10200 DIN 1708 OF-Cu 2.0040 | Cu : ≥99,95 Bi : ≤0,0005 O : ≤0,0010 Pb : ≤0,005 Other : ≤0,03 | 8,9 | 100 | 1,724 | 320 | 18 | 1,01 | 110 | Ø ≤ 1000 mm , dimension above on demand | 205 | 30 | 40 | 6 | 35 | ≥45 | | | |
| Cu ETP | NFA 51050, Cu a1 EN 12420 CW004A ASTM B152 UNS 11000 DIN 1708 E1 Cu58 2.0061 | Cu : ≥99,90 Bi : ≤0,0005 O : ≤0,040 Pb : ≤0,005 Other : ≤0,03 | 8,9 | 100 | 1,724 | 320 | 18 | 1,01 | 110 | Ø ≤ 1000 mm , dimension above on demand | 205 | 30 | 40 | 6 | 35 | ≥45 | | | |
| CRM16E CuCrZr | ASTM: C18100-C18150 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 | Cu : remainder Cr : 0,4 to 1 Zr : 0,03 to 0,25 Fe : ≤ 0,08 Other : ≤0,2 | 8,9 | ≥ 75 | ≤2,3 | 320 | 17 | 1,01 | 120 | discs and rings TR condition | 380 | 55 | 280 | 41 | 15 | 130 | | | |
| NS5 CuNi2Si | 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 | Cu : remainder Ni : 2,3 Si : 0,6 | 8,8 | 38 | 4,5 | 180 | 16 | 1,01 | 130 | section ≤ 1000 mm ² - ≤ 1,55 in. TER temper | 650 | 94 | 590 | 86 | 10 | ≥195 | | | |
| | | | | | | | | | | 1000 <section ≤ 2800 mm ² - 1,55 in. ² <section ≤ 4,3 in. ² TR temper | 650 | 94 | 500 | 72 | 10 | ≥195 | | | |
| | | | | | | | | | | 2800 <section ≤ 60 000 mm ² - 4,3 in. ² <section ≤ 93 in. ² TR temper | 590 | 86 | 440 | 64 | 8 | ≥190 | | | |
| | | | | | | | | | | section> 60 000 mm ² - section > 93 in. ² TR temper | 490 | 71 | 340 | 49 | 8 | ≥160 | | | |

| Alloy | Standards Nearest international standards | Nominal composition % | Physical properties | | | | | | | Remarks | Mechanical properties | | | | | | | | |
|--------------------------|--|-----------------------------|---------------------|----------------------------------|--|---|---|-----------------------------------|---|--|-----------------------|-------------------|---|-------|-----------------------|-------|----------|-----|---|
| | | | 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 /K | Relative magnetic permeability | Young' s modulus kN/ mm ² | | Tensile strength | | Yield strength 0,2% offset or 0,5% E.U.L. (1) | | Elongation 5,65 √S | | Hardness | | Impact strength KCU (1) or IZOD (2) |
| | | | | | | | | | | | Mpa ≥ ; * = Mpa ≤ | ksi ≥ ; * = ksi ≤ | Mpa ≥ | ksi ≥ | % ≥ | HB | HRB | HRC | |
| K5 CuNiAl14Al | GAM MM 11 GAM MM 13 NFL 14702 | CuNiAl14Al | 8,6 | 9 | 19 | 30 | 17 | ≤1,01 | | section ≤2000mm ² : section ≤3,10in ² | 780 | 113 | 590 | 86 | 10 | ≥ 215 | | | |
| | | | | | | | | | | 2000mm ² < section ≤11000mm ² : 3,10in ² < section ≤17in ² | 740 | 107 | 540 | 78 | 7 | ≥ 205 | | | |
| | | | | | | | | | | section > 11000mm ² : section > 17in ² | 720 | 104 | 500 | 72 | 7 | ≥ 200 | | | |



lebronze alloys

Lebronze alloys group, is established from the integration of different companies specializing mainly in copper alloys but also aluminum alloys and speciality steels. Thanks to a diversified know-how, the group is today at the heart of heavy industries such as Aerospace, Oil & Gas, Power, Railway but also in sectors manufacturing smaller equipment and products.

With about 1300 employees and 16 complementary facilities, we offer all industrial technologies (foundry, extrusion, forging, hot stamping, wire drawing, machining, centrifugal and sand casting). The group's commitment is to find appropriate and optimized solutions for every sector's requirements.



NORTH AMERICA

 Lebronze Tuffaloy (JV)
North America
Greer (SC), U.S.A

EUROPE

Lebronze alloys

- Bomel
- Bornel
- Breteuil
- Custines
- Dangu
- Suippes
- Sélestat
- Taverny
- Trie-Château

Lebronze alloys Germany

- Lüdenscheid
- Siegen - Hundt & Weber

Non Ferrous Stockholders

- Wolverhampton, UK

Inoforges Polska

- Rydzyňa

ASIA



CLAL Metal Products

- Dongguan, China

CLAL Far East

- Hong-Kong



- Xi'an, China

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