

Alloys directory

Common name	Material description Castings / Ingots	World specifications*		
		European Castings / Ingots	British	American
Tin bronze	CuSn10Zn2-C / CuSn10Zn2-B	–	G1	C90500
	CuSn11P-C / CuSn11P-B	CC481K / CB481K	PB1	C90700
	CuSn12-C / CuSn12-B	CC483K / CB483K	PB2	C90800
	CuSn12Ni2-C / CuSn12Ni2-B	CC484K / CB484K	CT2	C91700
	CuSn10-C / CuSn10-B	CC480K / CB480K	CT1	C90500
main alloy	CuSn5Zn5Pb2-C / CuSn5Zn5Pb2-B	CC499K / CB499K		
Leaded tin bronze	CuSn11Pb2-C / CuSn11Pb2-B	CC482K / CB482K	PB4	C92700
	CuSn7Zn2Pb3-C / CuSn7Zn2Pb3-B	CC492K / CB492K	LG4	C92400
High-leaded tin bronze	CuSn7Zn4Pb7-C / CuSn7Zn4Pb7-B	CC493K / CB493K	–	C93200/ SAE660
	CuSn5Pb9-C / CuSn5Pb9-B	CC494K / CB494K	LB4	C93500
	CuPb10Sn10-C / CuPb10Sn10-B	CC495K / CB495K	LB2	C93700 / SAE64
	CuSn7Pb15-C / CuSn7Pb15-B	CC496K / CB496K	LB1	C93800
	CuSn6Pb16-C / CuSn6Pb16-B	–	–	C93900/ SAE67
Leaded bronze / Gun Metal	CuSn5Zn5Pb5-C / CuSn5Zn5Pb5-B	CC491K / CB491K	LG2	C83600
	CuSn3Zn8Pb5-C / CuSn3Zn8Pb5-B	CC490K / CB490K	LG1	C84400
Low lead alloy for drinking water	CuSn4Zn2PS-C / CuSn4Zn2PS-B	CuSn4Zn2PS-C / CuSn4Zn2PS-B	–	C83470
	CuSi4Zn9MnP-C / CuSi4Zn9MnP-B	CC246E / CB246E	–	–
	CuNi7Si2	–	–	–
	CuZn36Pb-C / CuZn36Pb-B	CC770S / CB770S	–	C33500
	CuZn39Pb2 / CuZn39Pb3 / CuZn40Pb2	CW612N / CW614N/ CW617N	–	–
	CuZn38As	CW511L	–	C27453
	CuSn8Zn4	–	–	C90300
Al bronze	CuAl10Fe5Ni5-B	CB333G	AB2	C95800
	CuAl11Fe6Ni6-B	CB334G	–	–

CuSn10Zn2-C / CuSn10Zn2-B

Common name	Material description	World specifications		
		European	British	American
Tin bronze	CuSn10Zn2-C / CuSn10Zn2-B	-	G1 (BS 1400)	C90500 (ASTM B 505)

Other name: Rodgods 5456, Tinbronze, CAS403, BrO10Z2, C92610A, BC 3, SAE J462, AMS 4845, JIS H5111.

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (BS 1400:1985, Castings)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	Rem.	9.5	-	1.75	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	Rem.	10.5	1.5	2.75	1.0	0.01	0.15	-	-	0.1	0.02	-	-	-	0.03	-	-

Fe+Sb+As=0.20% max

Total of impurities 0.50%

Chemical Composition in %, (BS 1400:1985, Ingots)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	Rem.	9.7	-	1.75	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	Rem.	10.5	1.5	2.75	1.0	0.01	0.15	-	0.02	0.1	0.02	-	-	-	0.03	-	-

Fe+Sb+As=0.20% max

Total of impurities 0.50%

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	300 N/mm2
Rp0.2	Proof Strength min.	140 N/mm2
A	Elongation min.	9 %
HB	Brinell hardness min.	90 HBW

Properties:

- √ hard, strong, tough, resistant to wear;
- √ good machinability and corrosion resistant to sea water.

Application:

- √ worm wheels;
- √ gears;
- √ bushings for heavy loads and low speeds;
- √ good resistance to pounding.
- √ suitable for marine pumps and valves.
- √ plain bearing shells, moderately stressed slide and coupling components.

CuSn11P-C/ CuSn11P-B, (CC481K / CB481K)

Common name	Material description	World specifications		
		European	British	American
Tin bronze	CuSn11P-C/ CuSn11P-B	CC481K / CB481K (EN 1982)	PB1 (BS 1400)	C90700 (ASTM B 505)

Other name: Def Stan 02 838 Part 1, NES 838 Part 1, SAE 65c, NES 838, C90710 (AS 1565:1985), 904D (AS 1565:1974)
The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	87.0	10.0	-	-	-	-	-	-	0.5	-	-	-	-	-	-	-	-
Max	89.5	11.5	0.25	0.05	0.10	0.01	0.10	0.05	1.0	0.05	0.01	0.05	-	-	-	-	-

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	87.0	10.2	-	-	-	-	-	-	0.6	-	-	-	-	-	-	-	-
Max	89.3	11.5	0.25	0.05	0.10	0.01	0.10	0.05	1.0	0.05	0.01	0.05	-	-	-	-	-

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	350 N/mm2
Rp0.2	Proof Strength min.	170 N/mm2
A	Elongation min.	5 %
HB	Brinell hardness min.	85 HBW

Properties:

√ material combines high mechanical strength with good ductility, corrosion resistance and wear resistance

Application:

√ industrial Restaurant Equipment,
√ bearings for heavy loads and relatively low speeds,
√ bearings,
√ gear boxes,
√ speed reducers,
√ valve bodies,
√ worm gears

CuSn12-C / CuSn12-B, (CC483K /CB483K)

Common name	Material description	World specifications		
		European	British	American
Tin bronze	CuSn12-C / CuSn12-B	CC483K /CB483K (EN 1982)	PB2 (BS 1400)	C90800 (ASTM B 427)

Other name: SS 5465-15, DS 5465, NS 16508, JIS PBC2C, AS C90810, BpO10Φ1, GC-CuSn12.
The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	85.0	10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	89.0	13.0	0.7	0.5	2.0	0.01	0.2	0.2	0.6	0.05	0.01	0.15	-	-	-	-	-

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	85.5	11.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	88.5	13.0	0.6	0.4	2.0	0.01	0.2	0.2	0.2	0.05	0.01	0.15	-	-	-	-	-

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	300 N/mm2
Rp0.2	Proof Strength min.	150 N/mm2
A	Elongation min.	6 %
HB	Brinell hardness min.	90 HBW

Properties:

- √ material with good antifriction properties;
- √ highest wear resistance of the continuous casting materials.

Application:

- √ machine tool spindle bearings, which require the highest precision e.g.;
- √ precision turning lathes;
- √ grinders and gears;
- √ piston pin bushes;
- √ press bearings;
- √ high stress spindle nuts;
- √ high speed warm wheels and rims.

CuSn12Ni2-C / CuSn12Ni2-B (CC484K / CB484K)

Common name	Material description	World specifications		
		European	British	American
Tin bronze	CuSn12-C / CuSn12-B	CC484K / CC484K (EN 1982)	CT2 (BS 1400)	C91700 (ASTM B 427)

Other name: JIS CIn2, ASTM C92500, SEA 640, CDA 925, GC-CuSn12Ni.

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se	
Min	84.5	11.0	-	-	1.5	-	-	-	0.05	-	-	-	-	-	-	-	
Max	87.5	13.0	0.3	0.4	2.5	0.01	0.2	0.2	0.4	0.05	0.01	0.1	-	-	-	-	

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	84.0	11.3	-	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-
Max	87.0	13.0	0.2	0.3	2.4	0.01	0.15	0.10	0.4	0.04	0.01	0.05	-	-	-	-	-

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	300 N/mm2
Rp0.2	Proof Strength min.	180 N/mm2
A	Elongation min.	10 %
HB	Brinell hardness min.	90 HBW

Properties:

√ construction material with very good wear resistance;
√ corrosion and sea water resistant.

Application:

√ annular and tubular construction elements;
√ nuts moved under load;
√ high stress high- speed worm and helical wheel rims;
√ automotive synchronizer rings.

CuSn10-C /CuSn10-B (CC480K / CB480K)

Common name	Material description	World specifications		
		European	British	American
Tin bronze	CuSn10-C /CuSn10-B	CC480K / CB480K (EN 1982)	CT1 (BS 1400)	C90500 (ASTM B 505)

Other name: ASTM C92700, ASTM C90700, GOST BrO10Z2-K, JIS BC 3, AS C92610A, DIN CuSn10Zn 2.1086.01, SAE 62, CDA 905, NS 16510/16512, БрО10Ц2, G-CuSn10.

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu*	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	88.0	9.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	90.0	11.0	1.0	0.5	2.0	0.01	0.2	0.1	0.2	0.05	0.02	0.2	-	-	-	-	-

* Including nickel.

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu*	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	88.5	9.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	90.5	11.0	0.8	0.5	1.8	0.01	0.15	0.1	0.05	0.04	0.01	0.15	-	-	-	-	-

* Including nickel.

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	280 N/mm2
Rp0.2	Proof Strength min.	170 N/mm2
A	Elongation min.	10 %
HB	Brinell hardness min.	80 HBW

Properties:

√ engineering material with high elongation;
√ corrosion and sea water resistant.

Application:

√ housing and pump cases
√ guide and running wheels and impellers for pumps and water turbines

CuSn5Zn5Pb2-C / CuSn5Zn5Pb2-B (CC499K / CB499K)

Common name	Material description	World specifications		
		European	British	American
main alloy	CuSn5Zn5Pb2-C / CuSn5Zn5Pb2-B	CC499K / CB499K (EN 1982)	-	-

This material can be used for drinking water products.

Other name: The alloy complies with DIN 50930-6, ГОСТ БрО6Ц6С3

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	84.0	4.0	0.2	4.0	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Max	88.0	6.0	3.0	6.0	0.6	0.01	0.3	-	0.04	0.04	0.01	0.1	0.02	0.02	0.02	0.02	-

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	84.0	4.2	0.2	4.5	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Max	87.5	6.0	3.0	6.5	0.6	0.01	0.3	-	0.03	0.04	0.01	0.1	0.02	0.02	0.02	0.02	-

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	250 N/mm2
Rp0.2	Proof Strength min.	110 N/mm2
A	Elongation min.	13 %
HB	Brinell hardness min.	65 HBW

Properties:

- ✓ engineering material with the highest elongation;
- ✓ corrosion and water proof;
- ✓ for air gas and water fittings;
- ✓ min content of Pb.

Application:

- ✓ plain copper sanitary pipes;
- ✓ pipe fittings;
- ✓ bathroom fixtures;
- ✓ tubes for boilers and
- ✓ boiler accessories
- ✓ designed for potable water
- ✓ low-pressure valves,
- ✓ pipe fittings,
- ✓ gasoline and oil-line fittings,
- ✓ fire extinguishing equipment fittings

CuSn11Pb2-C / CuSn11Pb2-B, (CC482K)

Common name	Material description	World specifications		
		European	British	American
Leaded tin bronze	CuSn11Pb2-C / CuSn11Pb2-B	CC482K / CB482K (EN 1982)	PB4 (BS 1400)	C92700 (ASTM B 505)

Other name: Def Stan 02 838 Part 1, NES 838 Part 1, SAE 65c, NES 838, C90710 (AS 1565:1985), 904D (AS 1565:1974)

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	83.5	10.5	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	87.0	12.5	2.5	2.0	2.0	0.01	0.20	0.2	0.4	0.08	0.01	0.2	-	-	-	-	-

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	83.5	10.7	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	86.5	12.5	2.5	2.0	2.0	0.01	0.15	0.2	0.05	0.08	0.01	0.20	-	-	-	-	-

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	280 N/mm2
Rp0.2	Proof Strength min.	150 N/mm2
A	Elongation min.	5 %
HB	Brinell hardness min.	90 HBW

Properties:

√ material combines high mechanical strength with good ductility, corrosion resistance and wear resistance

Application:

√ industrial Restaurant Equipment,
√ bearings for heavy loads and relatively low speeds,
√ bearings,
√ gear boxes,
√ speed reducers,
√ valve bodies,
√ worm gears

CuSn7Zn2Pb3-C / CuSn7Zn2Pb3-B, (CC492K / CB492K)

Common name	Material description	World specifications		
		European	British	American
Leaded tin bronze	CuSn7Zn2Pb3-C / CuSn7Zn2Pb3-B	CC492K / CB492K (EN 1982)	LG4 (BS 1400)	C92400

Other name: NES 838, C92410A, 2.1052.03.

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu*	Sn**	Pb	Zn	Ni**	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	85.0	6.0	2.5	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	89.0	8.0	3.5	3.0	2.0	0.01	0.2	-	0.10	0.10	0.01	0.25	-	-	-	-	-

* Including nickel.

** (Sn +1/2 Ni) content shall be in the range 7.0% to 8 %.

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu*	Sn**	Pb	Zn	Ni**	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	85.0	6.2	2.7	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	88.5	8.0	3.5	3.2	2.0	0.01	0.20	-	0.03	0.08	0.01	0.25	-	-	-	-	-

* Including nickel.

** (Sn +1/2 Ni) content shall be in the range 7.0% to 8 %.

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	270 N/mm2
Rp0.2	Proof Strength min.	130 N/mm2
A	Elongation min.	12 %
HB	Brinell hardness min.	70 HBW

Properties:

√ material with good stability and expansion,
√ good for casting,
√ sea water resistant.

Application:

√ bearings of cranes and elevators;
√ minor machine tool bearings;
√ piston pin bushes for load up to 50N/mm2;
√ bearing for packing machines and electric motors;
√ general bearing in mechanical engineering;
√ valve and gate seat rings;
√ guide bushes in hydraulic cylinders;
√ slip rings.

CuSn7Zn4Pb7-C (CC493K / CB493K)

Common name	Material description	World specifications		
		European	British	American
High-leaded tin bronze	CuSn7Zn4Pb7-C / CuSn7Zn4Pb7-B	CC493K / CB493K (EN 1982)	-	C93200/ SAE 660 (ASTM B 505)

Other name: ISO CuSn7Pb7Zn3, UNE C-3530, DS 5426, GC-CuSn7ZnPb.

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	81.0	5.2	5.0	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	86.0	8.0	8.0	5.0	2.0	0.01	0.2	-	0.1	0.1	0.01	0.3	-	-	-	-	-

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	81.0	6.2	5.2	2.3	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	85.0	8.0	8.0	5.0	2.0	0.01	0.20	-	0.03	0.08	0.01	0.30	-	-	-	-	-

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	260 N/mm2
Rp0.2	Proof Strength min.	120 N/mm2
A	Elongation min.	12 %
HB	Brinell hardness min.	70 HBW

Properties:

- √ material for plain bearings in mechanical engineering with medium loads;
- √ very good emergency running;
- √ high wear resistance;
- √ sea water resistant.

Application:

- √ bearings of cranes and elevators;
- √ minor machine tool bearings;
- √ piston pin bushes for load up to 50N/mm2;
- √ bearing for packing machines and electric motors;
- √ general bearing in mechanical engineering;
- √ valve and gate seat rings;
- √ guide bushes in hydraulic cylinders;
- √ slip rings.

CuSn5Pb9-C / CuSn5Pb9-B (CC494K / CB494K)

Common name	Material description	World specifications		
		European	British	American
High-leaded tin bronze	CuSn5Pb9-C / CuSn5Pb9-B	CC494K / CB494K (EN 1982)	LB4 (BS 1400)	C93500 (ASTM B 505)

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	80.0	4.0	8.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	87.0	6.0	10.0	2.0	2.0	0.01	0.25	0.2	0.1	0.10	0.01	0.5	-	-	-	-	-

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	80.0	4.2	8.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	86.5	6.0	10.0	2.0	2.0	0.01	0.20	0.2	0.1	0.08	0.01	0.5	-	-	-	-	-

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	200 N/mm2
Rp0.2	Proof Strength min.	100 N/mm2
A	Elongation min.	9 %
HB	Brinell hardness min.	60 HBW

Properties:

Most commonly used bearing alloy, found in bearings operating at moderate loads and moderate-to-high speeds, as in electric motors and appliances.

- ✓ material for plain bearings in mechanical engineering with medium loads;
- ✓ very good emergency running;
- ✓ high wear resistance;

Application:

- ✓ bearings of cranes and elevators;
- ✓ minor machine tool bearings;
- ✓ bearing for packing machines and electric motors;
- ✓ general bearing in mechanical engineering;
- ✓ valve and gate seat rings;
- ✓ guide bushes in hydraulic cylinders;
- ✓ slip rings.

CuPb10Sn10-C / CuPb10Sn10-B (CC495K / CB495K)

Common name	Material description	World specifications		
		European	British	American
High-leaded tin bronze	CuPb10Sn10-C / CuPb10Sn10-B	CC495K / CB495K (EN 1982)	LB2 (BS 1400)	C93700 / SAE64 (ASTM B 505)

Other name: Blybronze, BrO10S10, CAC603.

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	78.0	9.0	8.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	82.0	11.0	11.0	2.0	2.0	0.01	0.25	0.2	0.10	0.10	0.01	0.5	-	-	-	-	-

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	78.0	9.2	8.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	81.5	11.0	10.5	2.0	2.0	0.01	0.20	0.2	0.10	0.08	0.01	0.5	-	-	-	-	-

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	220 N/mm ²
Rp0.2	Proof Strength min.	110 N/mm ²
A	Elongation min.	8 %
HB	Brinell hardness min.	70 HBW

Properties:

Most commonly used bearing alloy, found in bearings operating at moderate loads and moderate-to-high speeds, as in electric motors and appliances.

- ✓ material for plain bearings in mechanical engineering with medium loads;
- ✓ very good emergency running;
- ✓ high wear resistance;

Application:

- ✓ bearings of cranes and elevators;
- ✓ minor machine tool bearings;
- ✓ bearing for packing machines and electric motors;
- ✓ general bearing in mechanical engineering;
- ✓ valve and gate seat rings;
- ✓ guide bushes in hydraulic cylinders;
- ✓ slip rings.

CuSn7Pb15-C / CuSn7Pb15-B (CC496K)

Common name	Material description	World specifications		
		European	British	American
High-leaded tin bronze	CuSn7Pb15-C / CuSn7Pb15-B	CC496K / CC496K (EN 1982)	LB1 (BS 1400)	C93800 (ASTM B 505)

Other name: CAC604, CuPb15Sn, CuSn8Pb15Ni

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	74.0	6.0	13.0	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-
Max	80.0	8.0	17.0	2.0	2.0	0.01	0.25	0.2	0.10	0.10	0.01	0.5	-	-	-	-	-

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	74.0	6.2	13.2	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-
Max	79.5	8.0	17.0	2.0	2.0	0.01	0.25	0.2	0.10	0.08	0.01	0.5	-	-	-	-	-

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	200 N/mm2
Rp0.2	Proof Strength min.	90 N/mm2
A	Elongation min.	8 %
HB	Brinell hardness min.	65 HBW

Properties:

Most commonly used bearing alloy, found in bearings operating at moderate loads and moderate-to-high speeds, as in electric motors and appliances.

- √ material for plain bearings in mechanical engineering with medium loads;
- √ very good emergency running;
- √ high wear resistance;

Application:

- √ bearings of cranes and elevators;
- √ minor machine tool bearings;
- √ bearing for packing machines and electric motors;
- √ general bearing in mechanical engineering;
- √ valve and gate seat rings;
- √ guide bushes in hydraulic cylinders;
- √ slip rings.

CuSn6Pb16-C / CuSn6Pb16-B

Common name	Material description	World specifications		
		European	British	American
High-leaded tin bronze	CuSn6Pb16-C / CuSn6Pb16-B	-	-	C93900/ SAE67 (ASTM B 505)

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (ASTM B 505-18, Continuous castings)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	76.5	5.0	14.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	79.5	7.0	18.0	1.5	0.8	0.05	0.40	-	1.5	0.08	0.005	0.50	-	-	-	-	-

Ni value includes Co

Cu + Sum of Named Elements 98.9% min.

Mechanical Properties (ASTM B 505-18, Continuous castings)

Rm	Tensile strength min.	172 N/mm2
Rp0.2	Proof Strength min.	110 N/mm2
A	Elongation min.	5 %
HB	Brinell hardness min.	-

Properties:

Most commonly used bearing alloy, found in bearings operating at moderate loads and moderate-to-high speeds, as in electric motors and appliances.

- √ material for plain bearings in mechanical engineering with medium loads;
- √ very good emergency running;
- √ high wear resistance;

Application:

- √ bearings;
- √ pump bodies,
- √ pump impellers for mine water

CuSn5Zn5Pb5-C / CuSn5Zn5Pb5-B (CC491K / CB491K)

Common name	Material description	World specifications		
		European	British	American
Leaded bronze / Gun Metal	CuSn5Zn5Pb5	CC491K / CB491K (EN 1982)	LG2 (BS 1400)	C83600 (ASTM B 505)

Other name: SS 5204-15, JIS BC6, GOST BrO5Z5S5, AS C83600A, NS 16530, БрО5Л5С5, G-CuSn5Zn5Pb.
The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu*	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	83.0	4.0	4.0	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	87.0	6.0	6.0	6.0	2.0	0.01	0.3	-	0.1	0.1	0.01	0.25	-	-	-	-	-

* Including nickel.

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu _a	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	83.0	4.2	4.2	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	86.5	6.0	5.8	6.5	2.0	0.01	0.25	-	0.03	0.08	0.01	0.25	-	-	-	-	-

* Including nickel.

Mechanical Properties (EN 1982:2017, Continuous castings)

R _m	Tensile strength min.	250 N/mm ²
R _{p0.2}	Proof Strength min.	110 N/mm ²
A	Elongation min.	13 %
HB	Brinell hardness min.	65 HBW

Properties:

√ engineering material with the highest elongation;
√ corrosion and water proof;
√ for air gas and water fittings.

Application:

√ low-pressure valves;
√ pipe fittings;
√ gasoline and oil-line fittings;
√ fire extinguishing equipment fittings;
√ small gears;
√ pump parts;
√ general plumbing.

CuSn3Zn8Pb5-C / CuSn3Zn8Pb5-B (CC490K / CB490K)

Common name	Material description	World specifications		
		European	British	American
Leaded bronze / Gun Metal	CuSn3Zn8Pb5-C / CuSn3Zn8Pb5-B	CC490K / CB490K (EN 1982)	LG1 (BS 1400)	C84400 (ASTM B 505)

Other name: C83810, BrO3Z7S5N1, C83810A, CuSn3Zn8Pb6Ni1, Rodgods 5214

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu*	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	81.0	2.0	3.0	7.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	86.0	3.5	6.0	9.5	2.0	0.01	0.5	-	0.05	0.10	0.01	0.30	-	-	-	-	-

* Including nickel.

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu*	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	81.0	2.2	3.5	7.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	85.5	3.5	5.8	10.0	2.0	0.01	0.50	-	0.03	0.08	0.01	0.25	-	-	-	-	-

* Including nickel.

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	220 N/mm ²
Rp0.2	Proof Strength min.	100 N/mm ²
A	Elongation min.	12 %
HB	Brinell hardness min.	70 HBW

Properties:

Most commonly used bearing alloy, found in bearings operating at moderate loads and moderate-to-high speeds, as in electric motors and appliances.

- ✓ material for plain bearings in mechanical engineering with medium loads;
- ✓ very good emergency running;
- ✓ high wear resistance;

Application:

- ✓ bearings of cranes and elevators;
- ✓ minor machine tool bearings;
- ✓ bearing for packing machines and electric motors;
- ✓ general bearing in mechanical engineering;
- ✓ valve and gate seat rings;
- ✓ guide bushes in hydraulic cylinders;
- ✓ slip rings.

CuSn4Zn2PS-C / CuSn4Zn2PS-B

Common name	Material description	World specifications		
		European	British	American
Low lead alloy for drinking water	CuSn4Zn2PS-C / CuSn4Zn2PS-B	CuSn4Zn2PS-C / CuSn4Zn2PS-B (DIN SPEC 2701:2018-12)	-	C83470 (ASTM B 505)

Other name: CAC411

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	90.0	3.0	-	1.0	-	-	-	-	0.01	0.20	-	-	-	-	-	-	-
Max	96.0	5.0	0.10	3.0	0.3	0.01	0.3	-	0.10	0.6	0.01	0.1	0.02	0.02	0.02	0.02	-

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	90.0	3.2	-	1.5	-	-	-	-	0.01	0.20	-	-	-	-	-	-	-
Max	95.5	5.0	0.10	3.0	0.3	0.01	0.3	-	0.10	0.6	0.01	0.1	0.02	0.02	0.02	0.02	-

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	250 N/mm2
Rp0.2	Proof Strength min.	110 N/mm2
A	Elongation min.	13 %
HB	Brinell hardness min.	65 HBW

Properties:

It is a lead-free alternative alloy for sanitary fittings.

Alloy can be used as a medium-hard construction material.

The addition of phosphorus and sulfur replaces the lead in traditional machining materials.

Application:

This alloy can be used for drinking water products, mainly used in the valve parts industry and as pipe connectors.

CuSi4Zn9MnP-C / CuSi4Zn9MnP-B

Common name	Material description	World specifications		
		European	British	American
Low lead alloy for drinking water	CuSi4Zn9MnP-C / CuSi4Zn9MnP-B	CC246E / CB246E (EN 1982)	-	-

"The European Committee for Standardization (CEN) draws attention to the fact that compliance with EN 1982:2017 may involve the use of a patent concerning the alloy CuZn21Si3P-B (CB768S) and CuZn21Si3P-C (CC768S) given in Table H.2 as well as concerning the alloy CuSi4Zn4MnP-B (CB245E) and CuSi4Zn4MnP-C (CC245E) given in Table P.1 as well as concerning the alloy CuSi4Zn9MnP-B (CB246E) and CuSi4Zn9MnP-C (CC246E) given in Table P.2"

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	Rem.	-	-	7.0	-	-	-	0.03	0.05	-	2.5	-	-	-	-	-	-
Max	-	0.3	0.10	11.0	0.10	0.3	0.3	0.09	0.15	-	4.5	-	-	-	-	-	-

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	Rem.	-	-	7.0	-	-	-	0.03	0.05	-	2.5	-	-	-	-	-	-
Max	-	0.3	0.10	11.0	0.10	0.3	0.3	0.09	0.15	-	4.5	-	-	-	-	-	-

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	320 N/mm2
Rp0.2	Proof Strength min.	130 N/mm2
A	Elongation min.	15 %
HB	Brinell hardness min.	85 HBW

Properties:

Alloy for metallic materials used for products in contact with drinking water.

Application:

This material can be used for drinking water products

CuNi7Si2

Common name	Material description	World specifications		
		European	British	American
Low lead alloy for drinking water	CuNi7Si2	-	-	-

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se	Ag	Te
Min	Rem.	-	-	-	6.0	-	-	-	-	-	1.7	-	-	-	-	-	-	-	-
Max	-	0.02	0.02	0.02	7.4	0.02	0.2	0.02	0.05	-	2.3	-	-	-	0.02	-	-	0.02	0.02

Others total <0.05
Sum metallic pollutions <0.3
O<0.003

Mechanical Properties

Rm	Tensile strength min.	- N/mm2
Rp0.2	Proof Strength min.	- N/mm2
A	Elongation min.	- %
HB	Brinell hardness min.	- HBW

Properties:

Alloy for metallic materials used for products in contact with drinking water.

Application:

This material can be used for products in contact with drinking water.



CuZn36Pb-C / CuZn36Pb-B

Common name	Material description	World specifications		
		European	British	American
Low lead alloy for drinking water	CuZn36Pb-C / CuZn36Pb-B	CC770S / CB770S (EN 1982)	-	-

Other name: C33500, CB752S

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Castings)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	62.0	-	0.2	Rem.	-	0.5	-	-	0.02	-	2.7	-	0.04	-	-	-	-
Max	64.0	0.3	1.6	-	0.2	0.7	0.3	0.1	0.10	-	3.5	-	0.14	-	-	-	-

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	61.5	-	0.2	Rem.	-	0.5	-	-	0.02	-	2.7	-	0.04	-	-	-	-
Max	63.5	0.3	1.6	-	0.2	0.7	0.3	0.1	0.10	-	3.5	-	0.14	-	-	-	-

Mechanical Properties (EN 1982:2017, Continuous castings)

Rm	Tensile strength min.	280 N/mm2
Rp0.2	Proof Strength min.	110 N/mm2
A	Elongation min.	10 %
HB	Brinell hardness min.	70 HBW

Properties:

Alloy for metallic materials used for products in contact with drinking water.

Application:

This material can be used for drinking water products.

CuZn39Pb2 (CW612N) / CuZn39Pb3 (CW614N) / CuZn40Pb2 (CW617N)

Common name	Material description	World specifications		
		European	British	American
Low lead alloy for drinking water	CuZn39Pb2 / CuZn39Pb3 / CuZn40Pb2	CW612N / CW614N / CW617N (EN 12164:2016)	-	-

Other name: C37700, C37710, C38500, C37800, C38000, C3603, C3604, C3771, C3651, CZ 120, CZ121Pb3, CZ 22, LS59-3
The equivalence between the standards is not absolute and some variations in composition can exist.

CW612N Chemical Composition in % (EN 12164:2016)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	59.0	-	1.6	Rem.	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	60.0	0.3	2.5	-	0.3	0.05	0.3	-	-	-	-	-	-	-	-	-	-

Others total max. 0.2

CW614N Chemical Composition in % (EN 12164:2016)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	57.0	-	2.5	Rem.	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	59.0	0.3	3.5	-	0.3	0.05	0.3	-	-	-	-	-	-	-	-	-	-

Others total max. 0.2

CW617N Chemical Composition in % (EN 12164:2016)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	57.0	-	1.6	Rem.	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	59.0	0.3	2.5	-	0.3	0.05	0.3	-	-	-	-	-	-	-	-	-	-

Others total max. 0.2

Properties:

Alloy for metallic materials used for products in contact with drinking water.

Application:

CW612N and CW617N materials can be used for drinking water products.

CW614N materials can be used for drinking water products

CW612N has a high content in copper, with excellent machinability properties, allowing a good chip removal due to the content in lead. Furthermore, it also has excellent hot working properties, which makes it ideal for parts that suffer a significant deformation in hot stamping process.

CW614N is the benchmark material for machining, with a machinability index of 100 %. Therefore, it is the perfect material for applications where machinable or machining forming is required, ensuring maximum productivity and tool life on high speed repetition work. CW617N is the benchmark material for hot stamping brass rods. This alloy perfectly combines hot stamping and machining properties, making it the best solution for parts of high complexity that require demanding machining operations after stamping. It is also perfect for producing parts that only require free machining operations.

CuZn38As (CW511L)

Common name	Material description	World specifications		
		European	British	American
Low lead alloy for drinking water	CuZn38As	CW511L (EN 12164:2016)	-	C27453 (ASTM B283)

Other name: Ecomerica

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in % (EN 12164:2016)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	61.5	-	-	Rem.	-	-	-	-	-	-	-	-	0.02	-	-	-	-
Max	63.5	0.1	0.2	-	0.3	0.05	0.1	-	-	-	-	-	0.15	-	-	-	-

Others total max. 0.2

Properties:

Alloy for metallic materials used for products in contact with drinking water.

Application:

CuZn38As materials can be used for drinking water products, the high copper content makes the alloy an excellent material for stamping with a good dezincification values. The reduced lead content makes the alloy compliant with requirement for drinking water. It can be used for water qualities that require dezincification resistant material.

CuSn8Zn4

Common name	Material description	World specifications		
		European	British	American
Low lead alloy for drinking water	CuSn8Zn4	-	-	C90300 (ASTM B 505)

Other name: GREEN ALLOYS, alloys without lead, alloys with very low lead content
The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in % (ASTM B 505, Castings)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se
Min	86.0	7.5	-	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Max	89.0	9.0	0.30	5.0	1.0	0.005	0.2	-	0.05	0.05	0.005	0.2	-	-	-	-	-

Mechanical Properties (ASTM B 505, Castings)

Rm	Tensile strength min.	303 N/mm2
Rp0.2	Proof Strength min.	152 N/mm2
A	Elongation min.	18 %
HB	Brinell hardness min.	-

Properties:

Hard, strong, tough, resistant to wear and fine-grained, good machinability and corrosion-resistant to sea water, good resistance to pounding. It resists corrosion from seawater and stands up to impacts and wear. It also machines easily and can be cast.

Application:

Worm wheels, gears, bushings for heavy loads and low speeds,
valves, plumbing fixtures, portable water applications, gears, marine fittings and pump components.
Typical applications include aircraft landing-gear bushings, trunnion and trolley wheel bearings, and wristpin bushings.

CuAl10Fe5Ni5-B (CB333G)

Common name	Material description	World specifications		
		European	British	American
Al bronze	CuAl10Fe5Ni5-B	CC491K / CB491K (EN 1982)	AB2 (BS 1400)	C95800 (ASTM B 505)

Other name: JIS Al BC 3, GOST BrA10Z4N4L, ASTM C95520, AS C95810, GC-CuAl10Ni, БрА9ж4н4мц1, БрА10ж4н4л
The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in %, (EN 1982:2017, Ingots)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se	Mg
Min	76.0	-	-	-	4.0	8.8	4.0	-	-	-	-	-	-	-	-	-	-	-
Max	82.5	0.1	0.03	0.4	5.5	10.5	5.3	2.5	-	-	0.10	-	-	0.05	0.01	-	-	0.05

Properties:

- √ sea water resistant.
- √ having higher mechanical properties and better corrosion resistance

Application:

- √ superheated steam fittings;
- √ headers and baffle plates in mechanical;
- √ as well as petrochemical engineering;
- √ marine screw propellers;
- √ stern tubes;
- √ running wheels;
- √ pump cases.

CuAl10Fe5Ni5-B (CB334G)

Common name	Material description	World specifications		
		European	British	American
Al bronze	CuAl11Fe6Ni6-B	CB334G (EN 1982)	-	-

Other name: BrA11Z6N6, 2.0980, CuAl11Ni, CW308G

The equivalence between the standards is not absolute and some variations in composition can exist.

Chemical Composition in % (EN 12164:2016)

	Cu	Sn	Pb	Zn	Ni	Al	Fe	Mn	P	S	Si	Sb	As	Cr	Bi	Cd	Se	Mg
Min	72.0	-	-	-	4.3	10.3	4.2	-	-	-	-	-	-	-	-	-	-	-
Max	81.5	0.20	0.04	0.40	7.5	12.0	7.0	2.5	-	-	0.10	-	-	-	-	-	-	0.05

Properties:

- √ sea water resistant.
- √ having higher mechanical properties and better corrosion resistance

Application:

- √ superheated steam fittings;
- √ headers and baffle plates in mechanical;
- √ as well as petrochemical engineering;
- √ marine screw propellers;
- √ stern tubes;
- √ running wheels;
- √ pump cases.