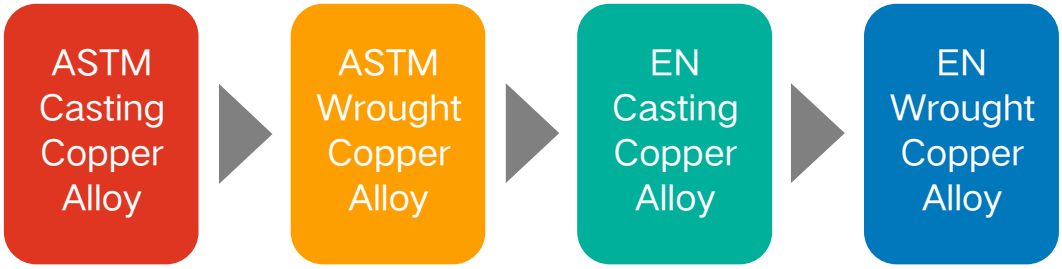
Self-Lubrication Options for Bronze Bearings

Guide To Bronze Sleeve Bearings, Custom Bearing Parts



Self-lubricating Bearing， Applications: Industrial - Selecting Bronze Bearing Materials

Types of Bronze Bearing Materials
Phosphor Bronze:
Composition: Copper, tin, and phosphorus.
Properties: Excellent corrosion resistance, high strength, and good wear resistance. Ideal for low-friction applications and fatigue resistance.
Applications: Electrical connectors, marine components.
Aluminum Bronze:
Composition: Copper, aluminum, iron, and nickel.
Properties: High strength and excellent wear resistance; particularly effective in marine environments.
Applications: Heavy-duty applications like propeller shafts and industrial machinery.
Leaded Tin Bronze:
Composition: Copper with tin and lead.
Properties: Superior self-lubricating properties and good wear resistance.
Applications: Heavy machinery bearings, automotive components.
Manganese Bronze:
Composition: Copper, zinc, and manganese.
Properties: Good corrosion resistance and high strength; suitable for high-impact loads.
Applications: Gearboxes and industrial equipment.

Silicon Bronze:
Composition: Copper with silicon and small amounts of zinc.
Properties: Excellent thermal and electrical conductivity along with good corrosion resistance.
Applications: Electrical applications and marine hardware.
Nickel Aluminum Bronze:
Composition: Copper, aluminum, iron, nickel, with manganese and tin.
Properties: High strength and excellent corrosion resistance; suitable for harsh environments.
Applications: Marine applications such as pumps and valves.
Graphite Bronze:
Composition: Composite of bronze with graphite as a lubricant.
Properties: Self-lubricating with low friction coefficients; enhances longevity and reduces maintenance needs.
Applications: Applications requiring reliability under heavy loads.

ASTM Casting Copper Alloy

Type	Symbol
Tin Bronze	C83600
Tin Bronze	C84400
Lead Free Brass	C86200
Lead Free Brass	C86300
Lead Free Brass	C86400
Lead Free Brass	C86500
Silicon Brass	C87400
Silicon Brass	C87500
Silicon Brass	C87850
Tin Bronze	C90300
Tin Bronze	C90500
Tin Bronze	C90700
Tin Bronze	C90800
Tin Bronze	C91600
Tin Bronze	C91700
	C93200
	C93400
	C93500
	C93700
	C93800
	C93900
	C94000
	C94100
	C94300
	C94500
Aluminum Bronze	C95200
Aluminum Bronze	C95210
Aluminum Bronze	C95220
Aluminum Bronze	C95400
Aluminum Bronze	C95410
Aluminum Bronze	C95500
Aluminum Bronze	C95510
Aluminum Bronze	C95520
Aluminum Bronze	C95800
Aluminum Bronze	C95900

ASTM Wrought Copper Alloy

Type	Symbol
Naval Brass	C46400
Naval Brass	C48200
Naval Brass	C48500
Tin Bronze	C54400
	C62300
	C62400
	C63000
	C63020
	C63200
	C63600
	C64200
	C65100
	C65500
Lead Free Brass	C67300
Lead Free Brass	C67310
Lead Free Brass	C67400
Lead Free Brass	C67410
Lead Free Brass	C67420
Lead Free Brass	C67500
Lead Free Brass	C67600
Silicon Brass	C69300
Silicon Brass	C69400
Silicon Brass	C69430

EN Casting Copper Alloy

Type	Symbol	Number
Silicon Brass	CuZn16Si4-C	CC761S
Special Brass	CuZn33Pb2Si-C	CC751S
Special Brass	CuZn35Pb2Al-C	CC752S
Special Brass	CuZn37Pb2Ni1AlFe-C	CC753S
Special Brass	CuZn25Al5Mn4Fe3-C	CC762S
Special Brass	CuZn32Al2MnFe1-C	CC763S
Special Brass	CuZn34Mn3Al2Fe1-C	CC764S
Special Brass	CuZn35Mn2Al1Fe1-C	CC765S
Tin Bronze	CuSn10-C	CC480K
Tin Bronze	CuSn11P-C	CC481K
Tin Bronze	CuSn12-C	CC483K
Tin Bronze	CuSn12Ni2-C	CC484K
	CuSn3Zn8Pb5-C	CC490K
	CuSn5Zn5Pb5-C	CC491K
	CuSn7Zn2Pb3-C	CC492K
	CuSn7Zn4Pb7-C	CC493K
	CuSn5Pb9-C	CC494K
	CuSn10Pb10-C	CC495K
	CuSn7Pb15-C	CC496K
	CuSn5Pb20-C	CC497K
	CuSn6Zn4Pb2-C	CC498K
	CuSn5Zn5Pb2-C	CC499K
	CuAl10Fe2-C	CC331G
	CuAl10Ni3Fe2-C	CC332G
	CuAl10Fe5Ni5-C	CC333G

EN Wrought Copper Alloy

Type	Symbol	Number
	CuNi2Si	CW111c
	CuSi1	CW115c
	CuSi3Mn1	CW116C
Silicon Brass	CuZn31Si1	CW708R
Naval Brass	CuZn36pb2Sn1	Cw711R
Naval Brass	CuZn36Sn1Pb	CW712R
Naval Brass	CuZn37Pb1Sn1	CW714R
Naval Brass	CuZn39Sn1	CW719R
Special Brass	CuZn23Al6Mn4Fe3Pb	CW704R
Special Brass	CuZn25Al5Fe2Mn2Pb	CW705R
Special Brass	CuZn35Ni3Mn2AlPb	Cw710R
Special Brass	CuZn37Mn3Al2PbSi	CW713R
Special Brass	CuZn38AlFeNiPbSn	CW715R
Special Brass	CuZn38Mn1Al	CW716R
Special Brass	CuZn39Mn1AlPbSi	CW718R
Special Brass	CuZn40Mn1Pb1	CW720R
Special Brass	CuZn40Mn1Pb1AlPbSn	CW721R
Special Brass	CuZn40Mn1Pb1FeSn	CW722R
Special Brass	CuZn40Mn2Fe1	CW723R
Aluminum Bronze	CuAl8Fe3	CW303G
Aluminum Bronze	CuAl9Ni3Fe2	CW304G
Aluminum Bronze	CuAl10Fe1	CW305G
Aluminum Bronze	CuAl10Fe3Mn2	CW306G
Aluminum Bronze	CuAl10Ni5Fe4	CW307G
Aluminum Bronze	CuAl11Fe6Ni6	CW308G
Tin Bronze	CuSn6	CW452K
Tin Bronze	CuSn4PbZn4	CW456K

ASTM
Casting
Copper Alloy

C83600

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
84.0-86.0	4.0-6.0	0.005	0.3	-	1	4.0-6.0	0.005	0.05	4.0-6.0

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
248	131	15	60

ASTM
Casting
Copper Alloy

C84400

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
78.0-82.0	2.3-3.5	0.005	0.4	-	1	6.0-8.0	0.005	1.5	7.0-10.0

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
207	103	16	55

ASTM
Casting
Copper Alloy

C86200

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
60-66	0.2	3.0-4.9	2.0-4.0	2.5-5.0	1	0.2	-	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
621	310	18	180

ASTM
Casting
Copper Alloy

C86300

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
60-66	0.2	5.0-7.5	2.0-4.0	2.5-5.0	1	0.2	-	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
758	427	14	225

ASTM
Casting
Copper Alloy

C86400

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
56-62	0.5-1.5	0.5-1.5	0.4-2.0	0.1-1.5	1	0.5-1.5	-	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
450	170	20	105

ASTM
Casting
Copper Alloy

C86500

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
55-60	1	0.5-1.5	0.4-2.0	0.1-1.5	-	0.4	-	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
483	172	25	130

ASTM
Casting
Copper Alloy

C87400

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
79	-	0.8	-	-	-	1	2.5-4	2.5-4.0	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
379	165	18	100

ASTM
Casting
Copper Alloy

C87500

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
79	-	-	-	-	-	0.5	3.0-5.0	3.0-5.0	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
462	207	21	134

ASTM
Casting
Copper Alloy

C87850

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
74-78	0.3	-	0.09	0.1	0.2	0.1	0.4	2.7-3.4	0.05-0.2

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
448	172	8	103

ASTM
Casting
Copper Alloy

C90300

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
86.0-89.0	7.5-9.0	0.01	-	-	1	0.3	0.01	1.5	3.0-5.0

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
303	152	18	70

ASTM
Casting
Copper Alloy

C90500

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
86.0-89.0	9.0-11.0	0.01	0.2	-	1	0.3	0.01	1.5	1.0-3.0

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
300	172	10	75

ASTM
Casting
Copper Alloy

C90700

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
88.0-90.0	10-12.0	0.01	0.15	-	0.5	0.5	0.01	1.5	0.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
276	172	10	80

ASTM
Casting
Copper Alloy

C90800

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
85.0-89.0	11-13.0	0.01	0.15	-	0.5	0.25	0.01	0.3	0.25

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
280	150	5	90

ASTM
Casting
Copper Alloy

C91600

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
86.0-89.0	9.7-10.8	0.01	0.2	-	1.2-2.0	0.25	0.01	0.3	0.25

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
303	152	16	85

ASTM
Casting
Copper Alloy

C91700

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
84.0-87.0	11.3-12.5	0.01	0.2	-	1.2-2.0	0.25	0.01	0.3	0.25

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
303	152	16	85

ASTM
Casting
Copper Alloy

C93200

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
81.0-85.0	6.3-7.5	0.01	0.2	-	1	6.0-8.0	0.01	1.5	2.0-4.0

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
241	138	10	65

ASTM
Casting
Copper Alloy

C93400

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
82.0-85.0	7.0-9.0	0.01	0.2	-	1	7.0-9.0	0.01	1.5	0.8

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
234	138	10	60

ASTM
Casting
Copper Alloy

C93500

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
83.0-86.0	4.3-6.0	0.01	0.2	-	1	8.0-10.0	0.01	0.05	2

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
221	110	10	60

ASTM
Casting
Copper Alloy

C93700

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
78.0-82.0	9.0-11.0	0.01	0.7	-	0.5	8.0-11.0	0.01	1.5	0.8

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
241	138	10	60

ASTM
Casting
Copper Alloy

C93800

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
75.0-79.0	6.3-7.5	0.01	0.15	-	1	13.0-16.0	0.01	1.5	0.8

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
207	110	10	55

ASTM
Casting
Copper Alloy

C93900

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
76.5-79.5	5.0-7.0	0.01	0.4	-	0.8	14.0-18.0	0.01	1.5	1.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
172	110	7	63

ASTM
Casting
Copper Alloy

C94000

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
69.0-72.0	12.0-14.0	0.01	0.25	-	0.5-1.0	14.0-16.0	0.01	0.05	0.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
172	110	7	80

ASTM
Casting
Copper Alloy

C94100

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
72.0-79.0	4.5-6.5	0.01	0.25	-	1	18.0-22.0	0.01	1.5	1

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
172	117	7	50

ASTM
Casting
Copper Alloy

C94300

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
67.0-72.0	4.5-6.5	0.01	0.15	-	1	23.0-27.0	0.01	1.5	0.8

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
145	103	7	48

ASTM
Casting
Copper Alloy

C94500

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	6.0-8.0	0.01	0.15	-	1	16.0-22.0	0.01	1.5	1.2

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
172	83	7	50

ASTM
Casting
Copper Alloy

C95200

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Min86.0	-	8.5-9.5	2.5-4.0	-	-	-	-	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
469	179	20	125

ASTM
Casting
Copper Alloy

C95210

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Min86.0	0.1	8.5-9.5	2.5-4.0	1	1	-	0.25	0.05	0.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
469	179	20	125

ASTM
Casting
Copper Alloy

C95220

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	-	9.5-10.5	2.5-4.0	0.5	2.5	-	-	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
485	195	20	150

ASTM
Casting
Copper Alloy

C95400

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Min83.0	-	10.5-11.5	3.0-5.0	0.5	1.5	-	-	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
586	221	12	170

ASTM
Casting
Copper Alloy

C95410

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Min83.0	-	10.0-11.5	3.0-5.0	0.5	1.5-2.5	-	-	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
586	221	12	170

ASTM
Casting
Copper Alloy

C95500

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Min78.0	-	10.0-11.5	3.0-5.0	3.5	3.0-5.5	-	-	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
655	290	10	192

ASTM
Casting
Copper Alloy

C95510

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Min78.0	0.2	9.7-10.9	2.0-3.5	1.5	4.5-5.5	-	-	-	0.3

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
655	345	8	248

ASTM
Casting
Copper Alloy

C95520

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Min74.5	0.25	10.5-11.5	4.0-5.5	1.5	4.2-6.0	0.03	0.15	-	0.3

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
862	655	2	262

ASTM
Casting
Copper Alloy

C95800

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Min79.0	-	8.5-9.5	3.5-4.5	0.8-1.5	4.0-5.0	0.03	0.1	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
586	241	18	159

ASTM
Casting
Copper Alloy

C95900

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	-	12.0-13.5	3.0-5.0	1.5	0.5	-	-	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
515	345	1	241

ASTM
Wrought
Copper Alloy

C46400

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
59-62	0.5-1.0	-	0.1	-	-	0.2	-	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
380-600	170-450	Jun-50	106-200

ASTM
Wrought
Copper Alloy

C48200

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
59-62	0.5-1.0	-	0.1	-	-	0.4-1.0	-	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
386-600	172-400	Jun-40	95-180

ASTM
Wrought
Copper Alloy

C48500

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
59-62	0.5-1.0	-	0.1	-	-	1.3-2.2	-	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
386-600	172-400	Jun-40	95-180

ASTM
Wrought
Copper Alloy

C54400

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	3.5-4.5	-	0.1	-	-	3.5-4.5	-	-	1.5-4.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
300-850	190-760	6-30	100-150

ASTM
Wrought
Copper Alloy

C62300

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	0.6	8.5-10.0	2.0-4.0	0.5	1	-	0.25	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
500-900	241-359	5-40	110-200

ASTM
Wrought
Copper Alloy

C62400

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	0.2	10-11.5	2.0-4.5	0.3	-	-	0.25	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
600-950	276-359	5-25	120-200

ASTM
Wrought
Copper Alloy

C63000

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	0.2	9.0-11.0	2.0-4.0	1.5	4.0-5.5	-	0.25	-	0.3

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
600-1100	345-600	Sep-45	140-225

ASTM
Wrought
Copper Alloy

C63020

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Min74.5	0.25	10-11.0	4.0-5.5	1.5	4.2-6.0	0.03	-	-	0.3

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
621-1200	345-517	9-30	140-240

ASTM
Wrought
Copper Alloy

C63200

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	-	8.7-9.5	3.5-4.3	1.2-2.0	4.0-4.8	0.02	0.1	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
621-950	310-365	9-25	120-210

ASTM
Wrought
Copper Alloy

C63600

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	0.2	3.0-4.0	0.15	-	0.15	0.05	0.7-1.3	-	0.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
414-579	-	64-29	110

ASTM
Wrought
Copper Alloy

C64200

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	0.2	6.3-7.6	0.3	0.1	0.25	0.05	1.5-2.2	-	0.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
517-703	241-469	32-22	110

ASTM
Wrought
Copper Alloy

C65100

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	-	-	0.8	0.7	-	0.05	0.8-2.0	-	1.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
276-655	103-476	Jul-55	85-200

ASTM
Wrought
Copper Alloy

C65500

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	-	-	0.8	0.5-1.3	0.6	0.05	2.8-3.8	-	1.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
386-1000	145-483	3-63	85-240

ASTM
Wrought
Copper Alloy

C67300

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
58-63	0.3	0.25	0.5	2.0-3.5	0.25	0.4-3	0.5-1.5	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
400-650	240-360	8-26	100-170

ASTM
Wrought
Copper Alloy

C67310

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
58.25-62	0.3	0.25	0.35	2.0-3.5	0.25	0.5-1.75	0.5-1.5	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
400-650	240-360	8-26	100-170

ASTM
Wrought
Copper Alloy

C67400

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
57-60	0.3	0.5-2	0.35	2.0-3.5	0.25	0.5	0.5-1.5	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
483-750	234-430	10-28	140-200

ASTM
Wrought
Copper Alloy

C67410

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
55.5-59	0.5	1.3-2.3	1	1.0-2.4	2	0.8	0.7-1.3	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
483-750	234-430	10-28	140-200

ASTM
Wrought
Copper Alloy

C67420

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
57-58.5	0.35	1.0-2.0	0.15-0.55	1.5-2.5	0.25	0.25-0.8	0.25-0.7	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
483-750	234-430	10-28	140-200

ASTM
Wrought
Copper Alloy

C67500

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
-	0.5-1.5	0.25	0.8-2	0.05-0.5	-	0.2	-	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
448-579	207-414	33-19	115-200

ASTM
Wrought
Copper Alloy

C67600

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
57-60	0.5-1.5	-	0.4-1.3	0.05-0.5	-	0.5-1	-	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
448-579	207-414	33-19	115-200

ASTM
Wrought
Copper Alloy

C69300

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
73-77	0.2	-	0.1	0.1	0.1	0.09	2.7-3.4	0.04-0.15	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
530-689	276-393	8-35	110

ASTM
Wrought
Copper Alloy

C69400

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
80-83	-	-	0.2	-	-	0.3	3.5-4.5	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
552-689	276-393	25-20	110

ASTM
Wrought
Copper Alloy

C69430

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
80-83	-	-	0.2	-	-	0.3	3.5-4.5	0.03-0.06	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
552-689	276-393	25-20	110

EN
Casting
Copper

CuZn16Si4-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
78.0-83.0	0.3	0.1	0.6	0.2	1	0.8	3.0-5.0	0.03	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
530	370	5	150

EN
Casting
Copper

CuZn33Pb2Si-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
63.5-66.0	0.8	0.1	0.25-0.5	0.15	0.8	0.8-2.0	0.65-1.1	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
400	280	5	110

EN
Casting
Copper

CuZn35Pb2Al-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
61.5-64.5	0.4	0.3-0.7	0.35	0.15	0.25	1.5-2.5	0.02	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
280	120	10	70

EN
Casting
Copper

CuZn37Pb2Ni1AlFe-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
58.0-61.0	0.8	0.4-0.8	0.5-0.8	0.2	0.5-1.2	1.8-2.5	0.05	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
300	150	15	90

EN
Casting
Copper

CuZn25Al5Mn4Fe3-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
60.0-67.0	0.2	3.0-7.0	1.5-4.0	2.5-5.0	3	0.2	0.1	0.03	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
750	480	5	190

EN
Casting
Copper

CuZn32Al2MnFe1-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
59.0-67.0	1	1.0-2.5	0.5-2.0	1.0-3.5	2.5	1.5	1	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
430	150	10	100

EN
Casting
Copper

CuZn34Mn3Al2Fe1-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
55.0-65.0	0.3	1.0-3.0	0.5-2.5	1.0-4.0	3	0.3	0.1	0.03	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
620	260	14	150

EN
Casting
Copper

CuZn35Mn2Al1Fe1-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
57.0-65.0	1	0.5-2.5	0.5-2.0	0.5-3.0	6	0.5	0.1	0.03	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
500	200	18	120

EN
Casting
Copper

CuSn10-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
88.0-90.0	9.0-11.0	0.01	0.2	0.1	2	1	0.02	0.2	0.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
280	170	10	80

EN
Casting
Copper

CuSn11P-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
87.0-89.5	10.0-11.5	0.01	0.1	0.05	0.1	0.25	0.01	0.5-1.0	0.05

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
330	170	4	85

EN
Casting
Copper

CuSn12-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
85.0-88.5	11.0-13.0	0.01	0.2	0.2	2	0.7	0.01	0.6	0.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
280	150	5	90

EN
Casting
Copper

CuSn12Ni2-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
84.5-87..5	11.0-13.0	0.01	0.2	0.2	1.5-2.5	0.3	0.01	0.05-0.4	0.4

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
300	180	10	85

EN
Casting
Copper

CuSn3Zn8Pb5-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
81.0-86.0	2.0-3.5	0.01	0.5	-	2	3.0-6.0	0.01	0.05	7.0-9.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
220	100	12	70

EN
Casting
Copper

CuSn5Zn5Pb5-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
83.0-87.0	4.0-6.0	0.01	0.3	-	2	4.0-6.0	0.01	0.1	4.0-6.0

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
250	110	13	65

EN
Casting
Copper

CuSn7Zn2Pb3-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
85.0-89.0	6.0-8.0	0.01	0.2	-	2	2.5-3.5	0.01	0.1	1.5-3.0

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
270	130	12	70

EN
Casting
Copper

CuSn7Zn4Pb7-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
81.0-85.0	6.0-8.0	0.01	0.2	-	2	5.0-8.0	0.01	0.1	2.0-5.0

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
260	120	12	70

EN
Casting
Copper

CuSn5Pb9-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
80.0-87.0	4.0-6.0	0.01	0.25	0.2	2	8.0-10.0	0.01	0.1	2

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
200	100	9	60

EN
Casting
Copper

CuSn10Pb10-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
78.0-82.0	9.0-11.0	0.01	0.25	0.2	2	8.0-11.0	0.01	0.1	2

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
220	110	8	70

EN
Casting
Copper

CuSn7Pb15-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
74.0-80.0	6.0-8.0	0.01	0.25	0.2	0.5-2.0	13.0-17.0	0.01	0.1	2

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
200	90	8	65

EN
Casting
Copper

CuSn5Pb20-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
70.0-78.0	4.0-6.0	-	0.25	0.2	0.5-2.5	18.0-23.0	0.01	0.1	2

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
180	90	7	50

EN
Casting
Copper

CuSn6Zn4Pb2-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
86.0-90.0	5.5-6.5	0.01	0.25	-	1	1.0-2.0	0.01	0.05	3.0-5.0

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
240	110	12	70

EN
Casting
Copper

CuSn5Zn5Pb2-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
-	4.0-6.0	-	-	-	0.6	3	-	-	4.0-6.0

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
250	110	13	65

EN
Casting
Copper

CuAl10Fe2-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
83.0-89.5	0.2	8.5-10.5	1.5-3.5	1	1.5	0.1	0.2	-	0.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
550	200	15	130

EN
Casting
Copper

CuAl10Ni3Fe2-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
80.0-86.0	0.2	8.5-10.5	1.0-3.0	2	1.5-4.0	0.1	0.2	-	0.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
550	220	20	120

EN
Casting
Copper

CuAl10Fe5Ni5-C

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
76.0-83.0	0.1	8.5-10.5	4.0-5.5	3	4.0-6.0	0.03	0.1	-	0.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
650	280	13	150

EN
Wrought
Copper

CuNi2Si

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	-	-	<0.2	<0.1	1.6-2.5	<0.02	0.4-0.8	-	-

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
260-750	90-600	35-8	60-200

EN
Wrought
Copper

CuSi1

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	-	-	<0.8	<0.7	-	"	0.05"	0.8-2.0	<0.02

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
<1.5	260-750	150-350	50-5

EN
Wrought
Copper

CuSi3Mn1

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	-	<0.05	<0.2	0.7-1.3	-	<0.05	2.7-3.2	<0.05	<0.4

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
380-900	260-890	50-3	85-240

EN
Wrought
Copper

CuZn31Si1

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
66.0-70.0	-	-	<0.4	-	<0.5	<0.8	0.7-1.3	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
460-600	250-370	30-12	115-170

EN
Wrought
Copper

CuZn36pb2Sn1

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
59.0-61.5	0.5-1.0	-	<0.1	-	<0.3	1.3-2.2	-	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
360-550	200-400	35-5	110-160

EN
Wrought
Copper

CuZn36Sn1Pb

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
61.0-63.0	1.0-1.5	-	<0.1	-	<0.2	0.2-0.6	-	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
340-650	160-520	40-4	85-150

EN
Wrought
Copper

CuZn37Pb1Sn1

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
59.0-61.0	0.5-1.0	-	-	-	<0.3	0.4-1.0	-	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
360-550	200-400	30-5	110-160

EN
Wrought
Copper

CuZn39Sn1

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
59.0-61.0	0.5-1.0	-	0.1	-	0.2	0.2	-	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
380-560	130-420	40-12	110-170

EN
Wrought
Copper

CuZn23Al6Mn4Fe3Pb

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
63.0-65.0	<0.2	5.0-6.0	2.0-3.5	3.5-5.0	<0.5	0.2-0.8	<0.2	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
700-900	500-660	12-5	180-260

EN
Wrought
Copper

CuZn25Al5Fe2Mn2Pb

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
65.0-68.0	<0.2	4.0-5.0	0.5-3.0	0.5-3.0	<1.0	0.2-0.8	-	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
550-800	200-540	20-8	130-210

EN
Wrought
Copper

CuZn35Ni3Mn2AlPb

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
58.0-60.0	<0.5	0.3-1.3	<0.5	1.5-2.5	2.0-3.0	0.2-0.8	<0.1	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
450-650	220-500	50-10	95-200

EN
Wrought
Copper

CuZn37Mn3Al2PbSi

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
57.0-59.0	<0.4	1.3-2.3	<1.0	1.5-3.0	<1.0	0.2-0.8	0.3-1.3	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
540-780	290-560	25-5	140-200

EN
Wrought
Copper

CuZn38AlFeNiPbSn

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
59.0-60.7	0.3-0.6	0.1-0.5	0.1-0.4	-	0.2-0.5	0.3-0.7	-	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
400-460	160-220	25	110-130

EN
Wrought
Copper

CuZn38Mn1Al

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
59.0-61.5	<0.3	0.3-1.3	<1.0	0.6-1.8	<0.6	<1.0	<0.5	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
450-590	200-350	30-18	120-170

EN
Wrought
Copper

CuZn39Mn1AlPbSi

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
57.0-59.0	0.5	0.3-1.3	0.5	0.8-1.8	0.5	0.8	0.2-0.8	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
440-590	250-350	30-10	120-170

EN
Wrought
Copper

CuZn40Mn1Pb1

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
57.0-59.0	0.3	0.2	0.3	0.5-1.5	0.6	1.0-2.0	0.1	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
350-550	160-350	20-10	100-170

EN Wrought Copper

CuZn40Mn1Pb1AlPbSn

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
57.0-59.0	0.2-1.0	0.3-1.3	0.2-1.2	0.8-1.8	0.3	0.8-1.6	-	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
450-630	200-380	30-15	130-170

EN
Wrought
Copper

CuZn40Mn1Pb1FeSn

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
56.5-58.5	0.2-1.0	0.1	0.2-1.2	0.8-1.8	0.3	0.8-1.6	-	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
450-580	200-380	30-15	130-170

EN
Wrought
Copper

CuZn40Mn2Fe1

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
56.5-58.5	0.3	0.1	0.5-1.5	1.0-2.0	0.6	0.5	0.1	-	Rem

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
350-550	160-320	30-8	100-160

EN
Wrought
Copper

CuAl8Fe3

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	0.1	6.5-8.5	1.5-3.5	1	1	0.05	0.2	-	0.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
460-530	180-235	40-30	110-170

EN
Wrought
Copper

CuAl9Ni3Fe2

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	0.1	8.0-9.5	1.0-3.0	2.5	2.0-4.0	0.05	0.1	-	0.2

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
500-750	180-430	40-12	115-160

EN
Wrought
Copper

CuAl10Fe1

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	0.1	9.0-10.0	0.5-1.5	0.5	1	0.02	0.2	-	0.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
420-750	210-550	30-3	105-190

EN
Wrought
Copper

CuAl10Fe3Mn2

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	0.1	9.0-11.0	2.0-4.0	1.5-3.5	1	0.05	0.2	-	0.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
500-900	330-510	30-5	130-210

EN
Wrought
Copper

CuAl10Ni5Fe4

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	0.1	8.5-11.0	3.0-5.0	1	4.0-6.0	0.05	0.2	-	0.4

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
600-1100	400-530	35-5	170-220

EN
Wrought
Copper

CuAl11Fe6Ni6

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	0.1	10.5-12.5	5.0-7.0	1.5	5.0-7.0	0.05	0.2	-	0.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
750-850	500-680	10-5	200-260

EN
Wrought
Copper

CuSn6

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	5.5-7.0	-	0.1	-	0.2	-	-	0.01-0.4	0.2

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
350-1100	170-800	65-3	85-230

EN
Wrought
Copper

CuSn4PbZn4

Chemical Composition mass/%									
Cu	Sn	Al	Fe	Mn	Ni	Pb	Si	P	Zn
Rem	3.5-4.5	-	0.1	-	0.2	3.5-4.5	-	0.01-0.4	3.5-4.5

Mechanical properties			
Tensile strength Mpa(Min)	Yield strength MPa(Min)	Elongation %	Brinell hardness(HB)
300-85	190-760	30-6	100-230