Datasheet:

EN CuZn20 / CW503L
Classic Brass
Rolled Products

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Internal alloy name:	**CW503L**
Metal:	**Brass**
Chemical Symbol:	**CuZn20**
EN:	**EN CuZn20**
UNS:	**C24000**
SIS:	**SS 5114**
GB:	**H80**
JIS:	**C2400**
Also known as:	**Tombak**
Alloy type:	**Classic Brass**

Main usage:

- Electrical components – Caps, motor parts
- Industrial – Lines and hoses
- Fasteners, clamps and switch contacts
- Metals goods – decorative, jewelry, instruments, watch parts

Main properties:

- Great formability properties
- Good corrosion resistance against atmospheric and certain fluids
- Good welding and soldering properties
- Similar coloration to bronze

Important norms and literature:

General Standards
EN 1652:1998: Copper and copper alloys – Plate, sheet, strip and circles for general purposes

Geometric Tolerance
EN 1652:1998: Copper and copper alloys - Plate, sheet, strip and circles for general purposes

Chemical composition in %: EN 1652:1998

Cu	Al	Fe	Ni	Pb	Sn	Zn	Others
79,0 – 81,0	Max. 0,02	Max. 0,05	Max. 0,3	Max. 0,05	Max. 01	Remaining	Max. 0,1

Mechanical properties: EN 1652:1998

Material Condition	Thickness range mm	Rm MPa (Min. – Max.)	$Rp_{0,2}$ MPa	A_{50mm} for thickness up to 2,5 mm %	A for thickness up to 2,5 mm %	Hardness HBW	Hardness HV
R320	0,2 – 5	320 – 400	Min. 200	20	28	-	85 – 120
R400	0,2 – 5	400 – 480	Min. 320	5	12	-	120 – 155
R480	0,2 – 2	Min. 480	Min. 440	-	-	-	155 ≤

*** Information values only;**

Physical properties:

Density (20 °C) g/cm³	Solidification range °C	Electrical conductivity %IACS	Thermal conductivity (20 °C) W/m K	Thermal expansion (20 - 300 °C) µm m^{-1} K^{-1}	Annealing temperature ºC	E – modulus (20 °C) N / mm²
8,7	1025 - 1045	32,8	142	18,8	450 - 600	119000

Properties and information's (3 Excellent; 2 Good; 1 Poor/not recommendable)

Machinability (Zerspanbarkeitsindex): 25*
*(CuZn39Pb3 = 100)

Forming Methods:

Hot Formability:	2
Cold Formability:	3

Corrosion resistance:

Atmosphere:	2
Waters and alkaline:	2
Acids, Ammonia, Seawater etc.:	1

Joining Methods:

Soldering:	3
Brazing:	3
Oxy-acetylene welding:	2
Gas-shielded arc welding:	2
TIG welding:	1-2
MIG welding:	1-2
Gluing/adhesion:	2

Surface Treatment:

Polishing:	
Mechanical:	3
Electrolytic/chemical:	2
Galvanizing:	3
Hot Dipping:	3

Tolerances for Rolled Products of CW503L

Dimensions: EN 1652:1997*

Tolerances on thickness of hot rolled products (plate, sheet, strip and circles)

Nominal thickness *t* (mm)	Tolerance on thickness for nominal widths *w* (mm)						
	w ≤ 700		700 < *w* ≤ 1000		1000 < *w* ≤ 1500		1500 < *w*
	1)	*2)*	*1)*	*2)*	*1)*	*2)*	
t ≤ 2,5	By agreement						By agreement
2,5 < *t* ≤ 5,0	± 0,25	± 0,30	± 0,30	± 0,35	± 0,35	± 0,45	
5,0 < *t* ≤ 7,5	± 0,35	± 0,45	± 0,40	± 0,50	± 0,45	± 0,55	
7,5 < *t* ≤ 10	± 0,45	± 0,60	± 0,50	± 0,65	± 0,55	± 0,75	
10 < *t* ≤ 15	± 0,75	± 0,95	± 0,80	± 1,00	± 0,90	± 1,10	
15 < *t* ≤ 25	± 0,95	± 1,20	± 1,05	± 1,30	± 1,30	± 1,60	
25 < *t* ≤ 50	± 1,30	± 1,60	± 1,40	± 1,75	± 1,50	± 1,90	
50 < *t*	± 1,50	± 1,90	± 1,65	± 2,05	± 1,80	± 2,20	

1) For all materials except for CuAl8Fe3 (CW303G), CuNi10FeMN (CW352H), CuNi30MnIFe (CW354H) and CuZn20Al2As (CW702R).

2) For alloys CuAl8Fe3 (CW303G), CuNi10FeMN (CW352H), CuNi30MnIFe (CW354H) and CuZn20Al2As (CW702R).

* Values are referred from Table 4 of EN 1652:1997

Dimensions: EN 1652:1997*

Tolerances on thickness of cold rolled products (sheet, strip and circles)

Nominal thickness *t* (mm)	Tolerance on thickness for nominal widths w (mm)			
	w ≤ 350	350 < *w* ≤ 700	700 < *w* ≤ 1000	1000 < *w* ≤ 1250
0,1 < *t* ≤ 0,2	± 0,018	-	-	-
0,2 < *t* ≤ 0,3	± 0,022	± 0,03	± 0,04	-
0,3 < *t* ≤ 0,4	± 0,025	± 0,04	± 0,05	± 0,07
0,4 < *t* ≤ 0,5	± 0,030	± 0,05	± 0,06	± 0,08
0,5 < *t* ≤ 0,8	± 0,040	± 0,06	± 0,07	± 0,09
0,8 < *t* ≤ 1,2	± 0,050	± 0,07	± 0,09	± 0,10
1,2 < *t* ≤ 1,8	± 0,060	± 0,08	± 0,10	± 0,11
1,8 < *t* ≤ 2,5	± 0,070	± 0,09	± 0,11	± 0,13
2,5 < *t* ≤ 3,2	± 0,080	± 0,10	± 0,13	± 0,17
3,2 < *t* ≤ 4,0	± 0,10	± 0,12	± 0,15	± 0,20
4,0 < *t* ≤ 5,0	± 0,12	± 0,14	± 0,17	± 0,23
5,0 < *t* ≤ 6,0	± 0,14	± 0,16	± 0,20	± 0,26
6,0 < *t* ≤ 7,0	± 0,16	± 0,19	± 0,23	± 0,29
7,0 < *t* ≤ 8,0	± 0,18	± 0,22	± 0,26	± 0,32
8,0 < *t* ≤ 9,0	± 0,20	± 0,25	± 0,29	± 0,35
9,0 < *t* ≤ 10,0	± 0,22	± 0,28	± 0,32	± 0,38

* Values are referred from Table 5 of EN 1652:1997

Dimensions: EN 1652:1997*

Tolerances on width of cold rolled strip

Nominal thickness *t* (mm)	Tolerance on thickness for nominal widths w (mm)						
	w ≤ 50	50 < *w* ≤ 100	100 < *w* ≤ 200	200 < *w* ≤ 350	350 < *w* ≤ 500	500 < *w* ≤ 700	700 < *w* ≤ 1250
0,1 < *t* ≤ 1,0	+0,2 0	+0,3 0	+0,4 0	+0,6 0	+1,0 0	+1,5 0	+2,0 0
1,0 < *t* ≤ 2,0	+0,3 0	+0,4 0	+0,5 0	+1,0 0	+1,2 0	+1,5 0	+2,0 0
2,0 < *t* ≤ 2,5	+0,5 0	+ 0,6 0	+0,7 0	+1,2 0	+1,5 0	+2,0 0	+2,5 0
2,5 < *t* ≤ 3,0	+1,0 0	+1,1 0	+1,2 0	+1,5 0	+2,0 0	+2,5 0	+3,0 0
3,0 < *t* ≤ 4,0	+2,0 0	+2,3 0	+2,5 0	+3,0 0	+4,0 0	+5,0 0	+6,0 0

* Values are referred from Table 6 of EN 1652:1997

Dimensions: EN 1652:1997*

Tolerances on width of plate and sheet

Nominal thickness *t* (mm)	Tolerance on thickness for nominal widths *w* (mm)		
	w ≤ 350	350 < *w* ≤ 1250	1250 < *w*
t ≤ 2,0	+2,0 0	+6,0 0	By agreement
2,0 < *t* ≤ 5,0	+4,0 0	+8,0 0	
5,0 < *t*	+8,0 0	+10,0 0	

* Values are referred from Table 7 of EN 1652:1997

Dimensions: EN 1652:1997*

Tolerances on length of plate, sheet and strip cut for lengths up to 5000 mm

Length	Nominal thickness (mm)	Tolerance on length (mm)
As Manufactured (ML)	t ≤ 15	± 50
Fixed length (FL)	t ≤ 5,0	+10 0
	5,0 < t	+15 0

* Values are referred from Table 8 of EN 1652:1997

Dimensions: EN 1652:1997*

Squareness of cut plate and sheet

Nominal width *w* (mm)	Maximum allowable differences between diagonals, for lengths *l* (mm)		
	1000 < *l* ≤ 2000	2000 < *l* ≤ 3000	3000 < *l*
350 < *w* ≤ 700	6	7	8
700 < *w* ≤ 1250	8	9	10
1250 < *w*	By agreement		

* Values are referred from Table 9 of EN 1652:1997

Dimensions: EN 1652:1997*

Tolerances on diameter for circles

Nominal diamter *d* (mm)	Maximum allowable differences between diagonals, for lengths *l* (mm)		
	1000 < *l* ≤ 2000	2000 < *l* ≤ 3000	3000 < *l*
d ≤ 500	± 1	± 1,5	± 2
500 < *d* ≤ 1000	± 2	± 2,5	± 3
1000 < *d* ≤ 2000	± 3	± 3,5	± 4
700 < *d*	-	-	By agreement

* Values are referred from Table 10 of EN 1652:1997

Dimensions: EN 1652:1997*

Edgewise curvature c

Nominal width *w* (mm)	Maximum edgewise curvature *c* for thicknesses *t* (mm)	
	t ≤ 1,0	1,0 < *t* ≤ 4,0
3 < *w* ≤ 8	12	-
8 < *w* ≤ 15	8	10
15 < *w*	4	6

* Values are referred from Table 11 of EN 1652:1997