Brass tubes

Descripción

At Bronmetal we supply high quality brass tubes for industrial and decorative applications.
We have the capacity to supply brass tubes in round, square, grooved and rectangular format.
Brass tubes have high resistance to corrosion, leading to their application in bathroom fittings and pipe connections for water and other fluids.
Among the main properties of brass, we can highlight:

- It has greater machinability and ductility than other alloys.
- Solidity against wear.
- It has high electrical conductivity.
- It has excellent properties for welding.
- Brass is a metal that can easily be recycled. Its waste can be separated with ease and re-cast as many times as necessary.
- It does not alter at extreme temperatures, between -100ºC and 200ºC and it does not fade in light.
- It has high resistance to corrosion and rust, even in saline conditions.

BRONMETAL

Alloys

COPPER-ZINC BINARY ALLOYS

Material Designation		Chemical Composition in % (m/m)									Density g/cm^3
Symbolic	Numerical	element	Cu	Al	Fe	Ni	Pb	Sn	Zn	Total other	approx.
CuZn5	CW500L	min.	94,0	–	–	–	–	–	Rest	–	8,9
		max	96,0	0,02	0,05	0,3	0,05	0,1	–	0,1	
CuZn10	CW501L	min.	89,0	–	–	–	–	–	Rest	–	8,8
		max	91,0	0,02	0,05	0,3	0,05	0,1	–	0,1	
CuZn15	CW502L	min.	84,0	–	–	–	–	–	Rest	–	8,8
		max	86,0	0,02	0,05	0,3	0,05	0,1	–	0,1	
CuZn20	CW503L	min.	79,0	–	–	–	–	–	Rest	–	8,7
		max	81,0	0,02	0,05	0,3	0,05	0,1	–	0,1	
CuZn30	CW505L	min.	69,0	–	–	–	–	–	Rest	–	8,5
		max	71,0	0,02	0,05	0,3	0,05	0,1	–	0,1	
CuZn36	CW507L	min.	63,5	–	–	–	–	–	Rest	–	8,4
		max	65,5	0,02	0,05	0,3	0,05	0,1	–	0,1	
CuZn37	CW508L	min.	62,0	–	–	–	–	–	Rest	–	8,4
		max	64,0	0,05	0,1	0,3	0,1	0,1	–	0,1	

Material Designation		Chemical Composition in % (m/m)									Density g/cm³
Symbolic	Numerical	element	Cu	Al	Fe	Ni	Pb	Sn	Zn	Total other	approx.
CuZn40	CW509L	min.	59,5	–	–	–	–	–	Rest	–	8,4
		max	61,5	0,05	0,2	0,3	0,3	0,2	–	0,2	

COPPER-ZINC-LEAD ALLOYS

Material Designation		Chemical Composition in % (m/m)											Density g/cm³
Symbolic	Numerical	element	Cu	Al	As	Fe	Mn	Ni	Pb	Sn	Zn	Total other	approx.
CuZn35Pb1	CW600N	min.	62,5	–	–	–	–	–	0,8	–	Rest	–	8,5
		max	64,0	0,05	–	0,1	–	0,3	1,6	0,1	–	0,1	
CuZn35Pb2	CW601N	min.	62,0	–	–	–	–	–	1,6	–	Rest	–	8,5
		max	63,5	0,05	–	0,1	–	0,3	2,5	0,1	–	0,1	
CuZn36Pb2As	CW602N	min.	61,0	–	0,02	–	–	–	1,7	–	Rest	–	8,4
		max	63,0	0,05	0,15	0,1	0,1	0,3	2,8	0,1	–	0,2	
CuZn36Pb3	CW603N	min.	60,0	–	–	–	–	–	2,5	–	Rest	–	8,5
		max	62,0	0,05	–	0,3	–	0,3	3,5	0,2	–	0,2	
CuZn37Pb0,5	CW604N	min.	62,0	–	–	–	–	–	0,1	–	Rest	–	8,4
		max	64,0	0,05	–	0,1	–	0,3	0,8	0,2	–	0,2	

Material Designation		Chemical Composition in % (m/m)											Density g/cm³
Symbolic	Numerical	element	Cu	Al	As	Fe	Mn	Ni	Pb	Sn	Zn	Total other	approx.
CuZn37Pb1	CW605N	min.	61,0	–	–	–	–	–	0,8	–	Rest	–	8,4
		max	62,0	0,05	–	0,2	–	0,3	1,6	0,2	–	0,2	
CuZn38Pb1	CW607N	min.	60,0	–	–	–	–	–	0,8	–	Rest	–	8,4
		max	61,0	0,05	–	0,2	–	0,3	1,6	0,2	–	0,2	
CuZn38Pb2	CW608N	min.	60,0	–	–	–	–	–	1,6	–	Rest	–	8,4
		max	61,0	0,05	–	0,2	–	0,3	2,5	0,2	–	0,2	
CuZn39Pb3	CW614N	min.	57,0	–	–	–	–	–	2,5	–	Rest	–	8,4
		max	59,0	0,05	–	0,3	–	0,3	3,5	0,3	–	0,2	
CuZn40Pb2	CW617N	min.	57,0	–	–	–	–	–	1,6	–	Rest	–	8,4
		max	59,0	0,05	–	0,3	–	0,3	2,5	0,3	–	0,2	

COPPER – ZINC ALLOYS COMPLEX

Material Designation		Chemical Composition in % (m/m)													Density g/cm³
Symbolic	Numerical	element	Cu	Al	As	Fe	Mn	Ni	P	Pb	Si	Sn	Zn	Total other	approx.
CuZn13Al1Ni1Si1	CW700R	min.	81,0	0,7	–	–	–	0,8	–	–	0,8	–	Rest	–	8,5
		max	84,0	1,2	–	0,25	0,1	0,4	–	0,05	1,3	0,1	–	0,5	

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Material Designation		Chemical Composition in % (m/m)													Density g/cm³
Symbolic	Numerical	element	Cu	Al	As	Fe	Mn	Ni	P	Pb	Si	Sn	Zn	Total other	approx.
CuZn20Al2As	CW702R	min.	76,0	1,8	0,02	–	–	–	–	–	–	–	Rest	–	8,4
		max	79,0	2,3	0,06	0,07	0,1	0,1	0,01	0,05	–	–	–	0,3	
CuZn31Si1	CW708R	min.	66,0	–	–	–	–	–	–	–	0,7	–	Rest	–	8,4
		max	70,0	–	–	0,4	–	0,5	–	0,8	1,3	–	–	0,5	
CuZn35Ni3Mn2AlPb	CW710R	min.	58,0	0,3	–	–	1,5	2,0	–	0,2	–	–	Rest	–	8,3
		max	60,0	1,3	–	0,5	2,5	3,0	–	0,8	0,1	0,5	–	0,3	
CuZn37Mn3Al2PbSi	CW713R	min.	57,0	1,3	–	–	1,5	–	–	0,2	0,3	–	Rest	–	8,1
		max	59,0	2,3	–	1,0	3,0	1,0	–	0,8	1,3	0,4	–	0,3	
CuZn38Mn1Al	CW716R	min.	59,0	0,3	–	–	0,6	–	–	–	–	–	Rest	–	8,3
		max	61,5	1,3	–	1,0	1,8	0,6	–	1,0	0,5	0,3	–	0,3	
CuZn39Mn1AlPbSi	CW718R	min.	57,0	0,3	–	–	0,8	–	–	0,2	0,2	–	Rest	–	8,2
		max	59,0	1,3	–	0,5	1,8	0,5	–	0,8	0,8	0,5	–	0,3	
CuZn40Mn2Fe1	CW723R	min.	56,5	–	–	0,5	1,0	–	–	–	–	–	Rest	–	8,3
		max	58,5	0,1	–	1,5	2,0	0,6	–	0,5	0,1	0,3	–	0,4	

International Equivalences

LEAD-FREE BRASS

EN		DIN		ASTM	BS	JIS	SN
SYMBOLIC	NUMERICAL	SYMBOLIC	NUMERICAL				
CuZn5	**CW500L**	CuZn5	2.0220	C21000	–	C2100	CuZn5
CuZn10	**CW501L**	CuZn10	2.0230	C22000	CZ101	C2200	CuZn10
CuZn15	**CW502L**	CuZn15	2.0240	C23000	CZ102	C2300	CuZn15
CuZn20	**CW503L**	CuZn20	2.0250	C24000	CZ103	C2400	CuZn20
CuZn28	**CW504L**	CuZn28	2.0261	–	–	.	CuZn28
CuZn30	**CW505L**	CuZn30	2.0265	C26000	CZ106	C2600	CuZn30
CuZn33	**CW506L**	CuZn33	2.0280	C26800	CZ107	C2680	–
CuZn36	**CW507L**	CuZn36	2.0335	C27000	CZ108	C2700	CuZn36
CuZn37	**CW508L**	CuZn37	2.0321	C27200	CZ108	C2700	CuZn37
CuZn40	**CW509L**	CuZn40	2.0360	C28000	CZ109	C2800	CuZn40

LEADED BRASS

BRONMETAL

EN		DIN		ASTM	BS	JIS	SN
SYMBOLIC	NUMERICAL	SYMBOLIC	NUMERICAL				
CuZn37Pb0,5	**CW604N**	CuZn37Pb0,5	2.0332	C33500	–	–	CuZn37Pb0,5
CuZn35Pb1	**CW600N**	CuZn36Pb1,5	2.0331	C34000	CZ118	C3501	CuZn36Pb1
CuZn35Pb2	**CW601N**	CuZn36Pb1,5	2.0331	C34200	CZ119	–	CuZn35Pb2
				C34500	CZ131		
CuZn37Pb1	**CW605N**	–	–	C35000	CZ131	C3501	–
CuZn37Pb2	**CW606N**	–	–	C35300	CZ131	C3601	CuZn37Pb2
CuZn36Pb2As	**CW602N**	–	–	C35330	CZ132	–	–
CuZN36Pb3	**CW603N**	2.0375	CuZn36Pb3	C36000	CZ124	C3601	CuZn36Pb3
						C3602	
CuZn38Pb4	**CW609N**	–	–	–	CZ121/4	C3605	–
CuZn39Pb0,5	**CW610N**	CuZn39Pb0,5	2.0372	C36500	CZ123	–	CuZn39Pb0,5
CuZn38Pb1	**CW607N**	–	–	C37000	CZ129	C3501	CuZn38Pb1
CuZn38Pb2	**CW608N**	–	–	C37700	CZ128	–	CuZn38Pb2
CuZn39Pb2	**CW612N**	CuZn39Pb2	2.0380	C37700	CZ128	C3771	CuZn39Pb2
CuZn40Pb2	**CW617N**	CuZn40Pb2	2.0402	C37800	CZ120	C3603	CuZn40Pb2
				C38000		C3604	
CuZn43Pb2Al	**CW624N**	CuZn44Pb2	2.0410	C38000	–	–	–
CuZn39Pb3	**CW614N**	CuZn39Pb3	2.0401	C38500	CZ121/3	C3603	CuZn39Pb3
						C3604	

EN		DIN		ASTM	BS	JIS	SN
SYMBOLIC	NUMERICAL	SYMBOLIC	NUMERICAL				
CuZn40Pb1Al	**CW616N**	–	–	–	–	–	CuZn40Pb1
CuZn42PbAl	**CW621N**	–	–	–	–	–	–
CuZn39Pb1	**CW719R**	CuZn38Sn1	3.0530	C46400	CZ133	–	CuZn38Sn1
CuZn31Si	**CW708R**	CuZn31Si	2.0490	–	–	–	–
CuZn37Mn3Al2PbSi	**CW713R**	CuZn40Al2	2.0550	C67410	CZ 135	–	CuZn40Al2
CuZn35Ni3Mn2AlPb	**CW710R**	CuZn35Ni	2.0540	–	–	–	–
CuZn40Mn1Pb1	**CW720R**	CuZn40Mn1Pb	2.0580	–	CZ136	–	CuZn40Mn1Pb1
CuZn40Mn2Fe1	**CW723R**	CuZn42Mn2	2.0572	–	–	–	CuZn42Mn2
CuZn20Al2As	**CW702R**	CuZn20Al2	2.0460	C68700	CZ110	C6870	–

BRONMETAL

Technical characteristics

COPPER-ZINC BINARY ALLOYS

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn5	**CW500L**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R220[a]	20	220	–	130	40	–	–	–	–
		H050[a]	20	–	–	–	–	50	75	45	70
		R260	10	260	190	–	18	–	–	–	–
		H075	10	–	–	–	–	75	105	70	100
		R320	5	320	260	–	8	–	–	–	–
		H095	5	–	–	–	–	95	125	90	120
		R440	3	440	410	–	–	–	–	–	–
		H120	3	–	–	–	–	120	–	115	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn10	**CW501L**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R240[a]	20	240	–	140	40	–	–	–	–
		H050[a]	20	–	–	–	–	50	80	45	75
		R300	10	300	180	–	20	–	–	–	–
		H075	10	–	–	–	–	75	105	70	100
		R360	5	360	280	–	8	–	–	–	–
		H100	5	–	–	–	–	100	–	95	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn15	**CW502L**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R260[a]	20	260	–	150	42	–	–	–	–
		H050[a]	20	–	–	–	–	50	80	45	75
		R310	10	310	200	–	20	–	–	–	–
		H080	10	–	–	–	–	80	110	75	105
		R370	5	370	290	–	10	–	–	–	–
		H105	5	–	–	–	–	105	–	100	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn20	**CW503L**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R260[a]	20	260	–	160	45	–	–	–	–
		H055[a]	20	–	–	–	–	55	85	50	80
		R320	10	320	200	–	25	–	–	–	–
		H085	10	–	–	–	–	85	120	80	115
		R390	5	390	300	–	10	–	–	–	–
		H115	5	–	–	–	–	115	–	110	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn30	**CW505L**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R280[a]	20	280	–	180	50	–	–	–	–
		H055[a]	20	–	–	–	–	55	85	50	80
		R350	10	350	200	–	25	–	–	–	–
		H085	10	–	–	–	–	85	120	80	115
		R420	5	420	320	–	10	–	–	–	–
		H115	5	–	–	–	–	115	–	110	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn36	**CW507L**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R290[a]	20	290	–	180	50	–	–	–	–
		H055[a]	20	–	–	–	–	55	85	50	80
		R360	10	360	180	–	25	–	–	–	–
		H080	10	–	–	–	–	80	115	75	110
		R430	5	430	300	–	12	–	–	–	–
		H110	5	–	–	–	–	110	–	105	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn37	**CW508L**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R300[a]	20	300	–	220	45	–	–	–	–
		H060[a]	20	–	–	–	–	60	90	55	85
		R370	10	370	200	–	25	–	–	–	–
		H085	10	–	–	–	–	85	120	80	115
		R440	5	440	320	–	10	–	–	–	–
		H115	5	–	–	–	–	115	–	110	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn40	CW509L	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R340[a]	20	340	–	250	35	–	–	–	–
		H075[a]	20	–	–	–	–	75	105	70	100
		R410	10	410	250	–	18	–	–	–	–
		H100	10	–	–	–	–	100	130	95	125
		R470	5	470	400	–	5	–	–	–	–
		H125	5	–	–	–	–	125	–	120	–
[a] In annealed state.											
NOTA 1 – 1 N/mm^2 equivalent to 1 Mpa.											

COPPER-ZINC-LEAD ALLOYS

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm² min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm²		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
		M	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R290[a]	10	290	–	180	45	–	–	–	–
		H060[a]	10	–	–	–	–	60	90	55	85
CuZn35Pb1	**CW600N**	R370	10	370	200	–	20	–	–	–	–
CuZn35Pb2	**CW601N**	H085	10	–	–	–	–	85	120	80	115
		R440	5	440	340	–	10	–	–	–	–
		H115	5	–	–	–	–	115	–	110	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn36Pb2As	CW602N	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R290[a]	10	290	–	250	40	–	–	–	–
		H080[a]	10	–	–	–	–	80	110	75	105
		R370	10	370	250	–	20	–	–	–	–
		H105	10	–	–	–	–	105	140	100	135
		R440	5	440	340	–	10	–	–	–	–
		H135	5	–	–	–	–	135	–	130	–

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Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn36Pb3	CW603N	M	20	–	–	–	–	–	–	–	–
		R300[a]	10	300	–	250	35	–	–	–	–
		H080[a]	10	–	–	–	–	80	110	75	105
		R400	10	400	250	–	15	–	–	–	–
		H105	10	–	–	–	–	105	140	100	135
		R460	5	460	350	–	10	–	–	–	–
		H135	5	–	–	–	–	135	–	130	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn37Pb0,5 CuZn37Pb1	CW604N CW605N	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R300[a]	20	300	–	220	45	–	–	–	–
		H060[a]	20	–	–	–	–	60	90	55	85
		R370	10	370	200	–	25	–	–	–	–
		H085	10	–	–	–	–	85	120	80	115
		R440	5	440	320	–	10	–	–	–	–
		H115	5	–	–	–	–	115	–	110	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn38Pb1 CuZn38Pb2	CW607N CW608N	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R340[a]	10	340	–	250	35	–	–	–	–
		H080[a]	10	–	–	–	–	80	110	75	105
		R410	10	410	250	–	15	–	–	–	–
		H105	10	–	–	–	–	105	140	100	135
		R470	5	470	350	–	10	–	–	–	–
		H135	5	–	–	–	–	135	–	130	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn39Pb3 CuZn40Pb2	CW614N CW617N	M	20	–	–	–	–	–	–	–	–
		R360[a]	10	360	–	250	25	–	–	–	–
		H085[a]	10	–	–	–	–	85	120	80	115
		R430	10	430	250	–	12	–	–	–	–
		H115	10	–	–	–	–	115	150	110	145
		R500	5	500	370	–	8	–	–	–	–
		H140	5	–	–	–	–	140	–	135	–
[a] In annealed state.											
NOTA 1 – 1 N/mm^2 equivalent to 1 Mpa.											

COMPLEX COPPER-ZINC ALLOYS

BRONMETAL

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2 min.	Elongation A % min.	Hardness			
Material		Metallurgical State					HV		HB	
Symbolic	Numerical						min.	max.	min.	max.
CuZn13Al1Ni1Si1	CW700R	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R380[a]	10	380	115	50	–	–	–	–
		H065[a]	10	–	–	–	65	85	60	80
		R430	10	430	220	40	–	–	–	–
		H120	10	–	–	–	120	140	115	135
		R550	5	550	330	10	–	–	–	–
		H170	5	–	–	–	170	–	165	–
CuZn20Al2As	CW702R	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R340[a]	10	340	120	45	–	–	–	–
		H070a	10	–	–	–	70	100	65	95
		R390[a]	5	390	150	40	–	–	–	–
		H085[a]	5	–	–	–	85	–	80	–

BRONMETAL

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2 min.	Elongation A % min.	Hardness			
Material		Metallurgical State					HV		HB	
Symbolic	Numerical						min.	max.	min.	max.
CuZn31Si1	**CW708R**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R440	8	440	200	20	–	–	–	–
		H115	8	–	–	–	115	155	110	150
		R490	8	490	250	15	–	–	–	–
		H145	8	–	–	–	145	–	140	–
CuZn35Ni3Mn2AlPb	**CW710R**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R490	8	490	290	15	–	–	–	–
		H125	8	–	–	–	125	165	120	160
		R540	8	540	390	10	–	–	–	–
		H145	8	–	–	–	145	–	140	–

BRONMETAL

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2 min.	Elongation A % min.	Hardness			
Material		Metallurgical State					HV		HB	
Symbolic	Numerical						min.	max.	min.	max.
CuZn37Mn3Al2PbSi	CW713R	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R540	8	540	250	10	–	–	–	–
		H145	8	–	–	–	145	185	140	180
		R590	5	590	320	8	–	–	–	–
		H155	5	–	–	–	155	195	150	190
		R640	3	640	350	5	–	–	–	–
		H165	3	–	–	–	165	–	160	–
CuZn38Mn1Al	CW716R	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		H115	8	–	–	–	115	155	110	150
		R510	8	510	270	10	–	–	–	–
		H140	8	–	–	–	140	–	135	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2 min.	Elongation A % min.	Hardness			
Material		Metallurgical State					HV		HB	
Symbolic	Numerical						min.	max.	min.	max.
CuZn39Mn1AlPbSi	CW718R	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R440	8	440	200	15	–	–	–	–
		H120	8	–	–	–	120	160	115	155
		R510	8	510	270	10	–	–	–	–
		H145	8	–	–	–	145	–	140	–
CuZn40Mn2Fe1	CW723R	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R440	8	440	170	15	–	–	–	–
		H115	8	–	–	–	115	155	110	150
		R490	8	490	270	10	–	–	–	–
		H135	8	–	–	–	135	–	130	–
[a] In annealed state										
NOTE 1 – 1 N/mm^2 equivalent to 1 Mpa.										

BRONMETAL

Tolerances

Nominal Diameter		Tolerances of mean diameter					
above	up to and inc	applicable to the mean diameter	Applicable to any diameter including deviations from the circular shape for straight lengths[a,b]	3[c]	10	± 0,06	± 0,12
				10	20	± 0,08	± 0,16
20	30	± 0,12	± 0,24				
30	50	± 0,15	± 0,30				
50	100	± 0,20	± 0,50				
100	200	± 0,50	± 1,00				
200	300	± 0,75	± 1,50				
300	450	± 1,00	± 2,00				

[a] The tolerances indicated in this column are not applicable to
• tubes in rolls or coils
• tubes with OD/T>50
• tubes in an annealed state

[b] When the diameter is measured at a distance from the ends of the tube of up to 100mm or the equivalent of to a nominal diameter (choosing the lesser of both values), unless otherwise agreed, the tolerance is allowed to be increased by multiplying it by 3.

[c] Includes 3.

Nominal exterior diameter		Tolerances of nominal wall thickness t (%)				
mm		t from 0.3 mm up to and inc. 1 mm	t above 1 mm, up to and inc. 3 mm	t above 3 mm, up to and inc. 6 mm	t above 6 mm, up to and inc. 10 mm	t above 10mm
above	up to and inc					
40	120	± 15	± 13	± 12	± 11	± 10
120	250	–	± 13	± 13	± 12	± 11
250	450	–	–	± 15	± 15	± 15
[a] Includes 3.						

3[a]	40	± 15	± 13	± 11	± 10	–

Tolerances of diameter including deviations from circular shape, tubes in rolls or coils

Nominal exterior diameter		Tolerances of nominal diameter including deviations from the circular shape	Applicable to inner diameter of winding
above	up to and inc		min.
3[a]	6	± 0,30	400
6	10	± 0,50	600
10	20	± 0,70	800
20	30	± 0,90	1000
[a] Includes 3.			

BRONMETAL

Technical characteristics

COPPER-ZINC BINARY ALLOYS

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn5	**CW500L**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R220[a]	20	220	–	130	40	–	–	–	–
		H050[a]	20	–	–	–	–	50	75	45	70
		R260	10	260	190	–	18	–	–	–	–
		H075	10	–	–	–	–	75	105	70	100
		R320	5	320	260	–	8	–	–	–	–
		H095	5	–	–	–	–	95	125	90	120
		R440	3	440	410	–	–	–	–	–	–
		H120	3	–	–	–	–	120	–	115	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn10	**CW501L**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R240[a]	20	240	–	140	40	–	–	–	–
		H050[a]	20	–	–	–	–	50	80	45	75
		R300	10	300	180	–	20	–	–	–	–
		H075	10	–	–	–	–	75	105	70	100
		R360	5	360	280	–	8	–	–	–	–
		H100	5	–	–	–	–	100	–	95	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn15	**CW502L**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R260[a]	20	260	–	150	42	–	–	–	–
		H050[a]	20	–	–	–	–	50	80	45	75
		R310	10	310	200	–	20	–	–	–	–
		H080	10	–	–	–	–	80	110	75	105
		R370	5	370	290	–	10	–	–	–	–
		H105	5	–	–	–	–	105	–	100	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn20	**CW503L**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R260[a]	20	260	–	160	45	–	–	–	–
		H055[a]	20	–	–	–	–	55	85	50	80
		R320	10	320	200	–	25	–	–	–	–
		H085	10	–	–	–	–	85	120	80	115
		R390	5	390	300	–	10	–	–	–	–
		H115	5	–	–	–	–	115	–	110	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn30	**CW505L**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R280[a]	20	280	–	180	50	–	–	–	–
		H055[a]	20	–	–	–	–	55	85	50	80
		R350	10	350	200	–	25	–	–	–	–
		H085	10	–	–	–	–	85	120	80	115
		R420	5	420	320	–	10	–	–	–	–
		H115	5	–	–	–	–	115	–	110	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn36	**CW507L**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R290[a]	20	290	–	180	50	–	–	–	–
		H055[a]	20	–	–	–	–	55	85	50	80
		R360	10	360	180	–	25	–	–	–	–
		H080	10	–	–	–	–	80	115	75	110
		R430	5	430	300	–	12	–	–	–	–
		H110	5	–	–	–	–	110	–	105	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn37	**CW508L**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R300[a]	20	300	–	220	45	–	–	–	–
		H060[a]	20	–	–	–	–	60	90	55	85
		R370	10	370	200	–	25	–	–	–	–
		H085	10	–	–	–	–	85	120	80	115
		R440	5	440	320	–	10	–	–	–	–
		H115	5	–	–	–	–	115	–	110	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn40	CW509L	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R340[a]	20	340	–	250	35	–	–	–	–
		H075[a]	20	–	–	–	–	75	105	70	100
		R410	10	410	250	–	18	–	–	–	–
		H100	10	–	–	–	–	100	130	95	125
		R470	5	470	400	–	5	–	–	–	–
		H125	5	–	–	–	–	125	–	120	–
[a] In annealed state.											
NOTA 1 – 1 N/mm^2 equivalent to 1 Mpa.											

COPPER-ZINC-LEAD ALLOYS

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm² min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm²		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
		M	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R290[a]	10	290	–	180	45	–	–	–	–
		H060[a]	10	–	–	–	–	60	90	55	85
CuZn35Pb1	**CW600N**	R370	10	370	200	–	20	–	–	–	–
CuZn35Pb2	**CW601N**	H085	10	–	–	–	–	85	120	80	115
		R440	5	440	340	–	10	–	–	–	–
		H115	5	–	–	–	–	115	–	110	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn36Pb2As	CW602N	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R290[a]	10	290	–	250	40	–	–	–	–
		H080[a]	10	–	–	–	–	80	110	75	105
		R370	10	370	250	–	20	–	–	–	–
		H105	10	–	–	–	–	105	140	100	135
		R440	5	440	340	–	10	–	–	–	–
		H135	5	–	–	–	–	135	–	130	–

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Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn36Pb3	CW603N	M	20	–	–	–	–	–	–	–	–
		R300[a]	10	300	–	250	35	–	–	–	–
		H080[a]	10	–	–	–	–	80	110	75	105
		R400	10	400	250	–	15	–	–	–	–
		H105	10	–	–	–	–	105	140	100	135
		R460	5	460	350	–	10	–	–	–	–
		H135	5	–	–	–	–	135	–	130	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn37Pb0,5 CuZn37Pb1	CW604N CW605N	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R300[a]	20	300	–	220	45	–	–	–	–
		H060[a]	20	–	–	–	–	60	90	55	85
		R370	10	370	200	–	25	–	–	–	–
		H085	10	–	–	–	–	85	120	80	115
		R440	5	440	320	–	10	–	–	–	–
		H115	5	–	–	–	–	115	–	110	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn38Pb1 CuZn38Pb2	CW607N CW608N	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R340[a]	10	340	–	250	35	–	–	–	–
		H080[a]	10	–	–	–	–	80	110	75	105
		R410	10	410	250	–	15	–	–	–	–
		H105	10	–	–	–	–	105	140	100	135
		R470	5	470	350	–	10	–	–	–	–
		H135	5	–	–	–	–	135	–	130	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2		Elongation A % min.	Hardness			
Material		Metallurgical State						HV		HB	
Symbolic	Numerical				min.	max		min.	max.	min.	max.
CuZn39Pb3 CuZn40Pb2	CW614N CW617N	M	20	–	–	–	–	–	–	–	–
		R360[a]	10	360	–	250	25	–	–	–	–
		H085[a]	10	–	–	–	–	85	120	80	115
		R430	10	430	250	–	12	–	–	–	–
		H115	10	–	–	–	–	115	150	110	145
		R500	5	500	370	–	8	–	–	–	–
		H140	5	–	–	–	–	140	–	135	–
[a] In annealed state.											
NOTA 1 – 1 N/mm^2 equivalent to 1 Mpa.											

COMPLEX COPPER-ZINC ALLOYS

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Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2 min.	Elongation A % min.	Hardness			
Material		Metallurgical State					HV		HB	
Symbolic	Numerical						min.	max.	min.	max.
CuZn13Al1Ni1Si1	CW700R	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R380[a]	10	380	115	50	–	–	–	–
		H065[a]	10	–	–	–	65	85	60	80
		R430	10	430	220	40	–	–	–	–
		H120	10	–	–	–	120	140	115	135
		R550	5	550	330	10	–	–	–	–
		H170	5	–	–	–	170	–	165	–
CuZn20Al2As	CW702R	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R340[a]	10	340	120	45	–	–	–	–
		H070a	10	–	–	–	70	100	65	95
		R390[a]	5	390	150	40	–	–	–	–
		H085[a]	5	–	–	–	85	–	80	–

BRONMETAL

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2 min.	Elongation A % min.	Hardness			
Material		Metallurgical State					HV		HB	
Symbolic	Numerical						min.	max.	min.	max.
CuZn31Si1	**CW708R**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R440	8	440	200	20	–	–	–	–
		H115	8	–	–	–	115	155	110	150
		R490	8	490	250	15	–	–	–	–
		H145	8	–	–	–	145	–	140	–
CuZn35Ni3Mn2AlPb	**CW710R**	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R490	8	490	290	15	–	–	–	–
		H125	8	–	–	–	125	165	120	160
		R540	8	540	390	10	–	–	–	–
		H145	8	–	–	–	145	–	140	–

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Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2 min.	Elongation A % min.	Hardness			
Material		Metallurgical State					HV		HB	
Symbolic	Numerical						min.	max.	min.	max.
CuZn37Mn3Al2PbSi	CW713R	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R540	8	540	250	10	–	–	–	–
		H145	8	–	–	–	145	185	140	180
		R590	5	590	320	8	–	–	–	–
		H155	5	–	–	–	155	195	150	190
		R640	3	640	350	5	–	–	–	–
		H165	3	–	–	–	165	–	160	–
CuZn38Mn1Al	CW716R	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		H115	8	–	–	–	115	155	110	150
		R510	8	510	270	10	–	–	–	–
		H140	8	–	–	–	140	–	135	–

Designations			Wall Thickness t mm max.	Tensile Strength R_m N/mm^2 min.	Yield Limit at 0,2% $R_{p0.2}$ N/mm^2 min.	Elongation A % min.	Hardness			
Material		Metallurgical State					HV		HB	
Symbolic	Numerical						min.	max.	min.	max.
CuZn39Mn1AlPbSi	CW718R	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R440	8	440	200	15	–	–	–	–
		H120	8	–	–	–	120	160	115	155
		R510	8	510	270	10	–	–	–	–
		H145	8	–	–	–	145	–	140	–
CuZn40Mn2Fe1	CW723R	**M**	**20**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
		R440	8	440	170	15	–	–	–	–
		H115	8	–	–	–	115	155	110	150
		R490	8	490	270	10	–	–	–	–
		H135	8	–	–	–	135	–	130	–
[a] In annealed state										
NOTE 1 – 1 N/mm^2 equivalent to 1 Mpa.										