

Material properties contained in material data sheets for lead alloyed and lead free copper alloys

		Basis lead alloyed	Basis lead alloyed	similar without lead	lead free, "machinable"	lead free, "machinable"	lead free, "machinable" (available in Japanese only) CuZnBi2Sn0.5
		CuZn39Pb3	CuZn39Pb2	CuZn37	CuZn21Si3 (ECOBASS®)	CuZn42	example (Bi-alloyed)
Cu	%	57,5	60,5	63	76	58	59
Zn	%	39,2	37,5	37	21	42	0
Pb	%	3,3	2	0	0	0	0
Si	%	0	0	0	3	0	0
P	%	0	0	0	0,03	0	0
Sn	%	0	0	0	0	0	0.5
Bi	%	0	0	0	0	0	2,2
el. conductivity	MS/m	14,6	14	15,5	4,5	14,6	not specified
thermal conduction	W/(m*K)	113	109	121	33	113	94,7
thermal expansion	10 ⁻⁶ /K	21,4	20,4	20,2	not specified	20	21,8
density	g/cm ³	8,46	8,44	8,44	8,25	8,4	8,41
E-Modulus	Gpa	96	102	110	85	105	94,6
UTS (min)	Mpa	340	380	345	430 - 700 (thick - thin walled)	450	430
UTS (max)	Mpa	600	540	680	not specified	750	
TS (min)	Mpa	180	140	120	300 - 450	200	195
TS (Max)	Mpa	480	520	590	not specified	690	
Elongation	%	von 10 - 40	von 10 - 45	von 10 - 60	von 10 - 20	von 7 - 35	
hardness (min)	HB	90	80	70	not specified	not specified	91
hardness (max)	HB	175	160	180	not specified	not specified	
machining index (CuZn37Pb3 =100%)	%	100	90	30	80	not specified	not specified
cold working		4	3	1	2	2	
hot working	1 best	1	1	2	1	1	
resistance welding	to	3	3	2	2	2	
arc welding	6 worst	4	4	3	2	3	
brazing		3	3	1	1	2	
soldering		1	1	1	1	1	
polishing mechanical		2	2	1	2	not specified	
polishing electrolytic		4	3	3		not specified	
galvanizing		1	1	1	2	not specified	
Corrosion		not specified SCC, possible (NH ₃)	not specified SCC, possible (NH ₃)	not specified SCC, possible (NH ₃)	resistant to seawater largely free from SCR	not specified similar to CuZn39Pb3	
tubes		8 - 250 mm	8-160 mm	6-130 mm	15 - 155 mm		not specified
profiles		2,5 - 150 mm	2,5 -150 mm	2,5 -130 mm	6 - 130 mm	10 - 150 mm ²	
bars		2 - 250 mm	2 - 125 mm	2 - 100 mm	2 - 70 mm		