CuSn4

CuSn4 | C51100

CuSn4 is a copper alloy (bronze) strengthened by a solid solution containing 4% tin. The alloy is highly suitable for cold forming processes that require high strength and hardness. It is corrosion resistant and has good solderability. It features good electrical conductivity. It is used in applications where a combination of conductivity and strength is of great importance.
Its application areas include connectors, connector springs, springs, and electrical and mechanical components.

Comparable Standarts

EN	JIS	UNS
CW450K	C511	C51100

Chemical Composition %

Cu	Zn	Sn	Fe	Pb	P
rem.	0.3 max	3.5-4.9	0.1 max	0.05 max	0,35

Physical Properties

Melting Point	1063	[°C]
Density	8.9	(g/cm³)
Cp @ 20°C	0.377	[kJ/kgK]
Thermal Conductivity	100	(W/mK)
Electrical Conductivity	≥21	%IACS
Modules of Elasticity	120	[GPa]
@20-300°C	18	[10-6/K]

Note: The specified conductivity applies to the soft condition only.

Cp specific heat

α thermal expansion coefficent

Fabrication Properties

Cold Formability	excellent
Hot Formability	not recommended
Soldering ability	excellent
Oxyacetylene welding	fair
Gas shield arc welding	good
Resistance welding	good
Machining	not recommended
Brazing	excellent

Electrical Conductivity

Electrical conductivity depends on the chemical composition, the level of cold deformation, and the grain size. A high degree of deformation and a small grain size reduce conductivity.

Typcial Uses

Automotive, electrical components, connectors, relays and conductor springs, clamps, springs, metal hose, bushings, mechanical and apparatus engineering.

Corrosion Resistance

Bronze is resistant to natural and industrial atmospheres, as well as maritime air, potable and service water (if the flow rate is not excessive), seawater, non-oxidizing acids, alkaline solutions, and neutral saline solution environments.
Bronze has low corrosion resistance to ammonia, halogenide, cyanide and hydrogen sulfide solutions and atmospheres, and oxidizing acids.
Bronze alloys have improved resistance to seawater and pitting corrosion.

Mechanical Properties

	Tensile Strength [MPa]	Yield Strength [MPa]	Elongation A50 [%]	Hardness HV [-]	Bend ratio 90° [r]		Bend ratio 180° [r]	
					GW	BW	GW	BW
R290	290-390	≤ 190	≥ 40	70-100	0	0	0	0
R390	390-490	≥ 210	≥ 11	115-155	0	0	0	0
R480	480-570	≥ 420	≥ 4	150-180	0	0	0	2
R540	540-630	≥ 490	≥ 3	170-200	0	1	2	3
R610	≥ 610	≥ 540	-	≥ 190	1	2	3	4

Other tempers are available upon request.

r = x * t (thickness t ≤ 0.5mm)

GW bend axis transverse to rolling direction. BW bend axis parallel to rolling direction.

Dimensional Specifications

Thickness (mm)	Width (mm)
0.10-0.20	10-340
0.21-1.00	5-340
1.01-4.00	15-340
4.01-5.00	25-340

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