

Designation	DIN	EN Nr.	UNS (ASTM)	AISI	LMSA
CuSn3Zn9	-	CW454K	C42500	-	B330

Chemical composition

Cu	Zn	Sn	Ni	Pb	Fe	P	Others
Balance	7.50 - 10.0	1.50 - 3.50	≤ 0.20	≤ 0.10	≤ 0.20	≤ 0.20	≤ 0.20

Values (Weight %). In order to achieve maximum homogeneity and consistent quality, the actual manufacturing tolerances are tighter and more precisely than the composition indicated.

Main technical properties and features

CuSn3Zn9 is a tin brass, it has very good tribological properties (low coefficient of friction), very good cold formability, good electrical conductivity combined with good mechanical strength and high hardness. It has excellent spring properties. In addition, CuSn3Zn9 alloy has an outstanding resistance to stress corrosion cracking and corrosion, and is particularly resistant to seawater and industrial atmosphere. Alloy CuSn3Zn9 can be easily welded. The annealing temperature is comprised between 425 and 700 °C, and stress relieving can be performed in the range 200 - 300 °C. It has a moderate machinability index of 30 % (compared to 100 % for CuZn39Pb3).

Typical uses

CuSn3Zn9 alloy in cold rolled strip form can be used for springs, switches, relays, contacts, components for electrical and automotive industry, membranes, stamped parts.

Typical manufacturing range

	Thickness (mm)	Width (mm)	Length (mm)
Rolled products Strip in coils ^[1]	0.010 - 2.000	1.5 - 200.0	-
Strip as sheets ^[1]	0.010 - 1.500	10.0 - 200.0	100 - 3000

^[1] Not all our production possibilities are presented here. Other dimensions or product forms available upon request. Some combinations of thicknesses and widths are not possible.

Mechanical properties of strips

Temper			R _m (N/mm ²)	R _{p0.2} (N/mm ²)	A _{50mm} (%)	Hardness HV	R/t (90°) G / B ^[1]
R320	H080	soft annealed	320 - 380	230 max.	25	80 - 110	0 / 0
R380	H110	¼ hard	380 - 430	200 min.	16	110 - 140	0 / 0
R430	H140	½ hard	430 - 520	330 min.	6	140 - 170	0 / 0
R510	H160	¾ hard	510 - 600	430 min.	3	160 - 190	0 / 1.0
R580	H180	hard	580 - 690	520 min.	-	180 - 210	1.0 / 2.0
R660	H200	extra hard	660 min.	610 min.	-	200 min.	3.0 / 9.0

^[1] Minimum bend radius at 90°. R = radius, t = strip thickness, G = "Good way", perpendicular to rolling direction and B = "Bad way", parallel to rolling direction. Values for strip thickness t ≤ 0.5 mm.

Other tempers can be guaranteed, according to other standards such as EN 1652 or 1654, for example.

Physical properties

Modulus of elasticity	kN/mm ²	125 (soft annealed R320) / 110 (cold rolled)
Poisson ratio		0.34
Density	g/cm ³	8.75
Melting point	°C	1030
Linear dilatation coefficient	10 ⁻⁶ / °C	18.4
Thermal conductivity at 20°C	W/m K	120
Heat Capacity at 20°C	J/(kg. K)	380
Electrical resistivity at 20°C	μΩcm	6.3
Electrical conductivity at 20°C	MS/m	16
Electrical conductivity at 20°C	% IACS	28
Magnetic properties		Non-magnetic (when free from iron precipitates)

Tolerances (strip and foil)

Thickness	Thickness (mm)		EN Standard		Lamineries MATTHEY		
	≥	<	10140 Precision	10258 Precision	LMSA Standard	LMSA Precision	LMSA Extreme
<p>The table shown is an outline of our typical thickness tolerances available. They are tighter than industry standards.</p> <p>Our "LMSA Precision" and "LMSA Extreme" tolerances are available upon request.</p>	-	0.025	-	-	-	-	± 0.001
	0.025	0.050	-	-	± 0.003	± 0.002	± 0.0015
	0.050	0.065	-	± 0.003	± 0.003	± 0.0025	± 0.002
	0.065	0.100	-	± 0.004	± 0.004	± 0.0035	± 0.003
	0.100	0.125	± 0.005	± 0.006	± 0.005	± 0.004	± 0.003
	0.125	0.150	± 0.005	± 0.006	± 0.005	± 0.005	± 0.004
	0.150	0.250	± 0.010	± 0.008	± 0.008	± 0.006	± 0.004
	0.250	0.300	± 0.010	± 0.009	± 0.009	± 0.007	± 0.005
	0.300	0.400	± 0.010	± 0.010	± 0.010	± 0.007	± 0.005
	0.400	0.500	± 0.015	± 0.012	± 0.012	± 0.008	± 0.006
	0.500	0.600	± 0.015	± 0.014	± 0.014	± 0.010	± 0.007
	0.600	0.800	± 0.015	± 0.015	± 0.015	± 0.010	± 0.007
	0.800	1.000	± 0.015	± 0.018	± 0.018	± 0.012	± 0.009
	1.000	1.200	± 0.020	± 0.020	± 0.020	± 0.015	± 0.012
	1.200	1.250	± 0.020	± 0.020	± 0.020	± 0.015	± 0.012
	1.250	1.500	± 0.020	± 0.020	± 0.020	± 0.015	± 0.014
Width	Our width tolerances "Standard" is +0.2, -0.0 (or ± 0.1 mm upon request). They are available for slit widths < 125 mm and thicknesses < 1.00 mm. Special tolerances upon request.						
Camber	Width (mm)		Camber max. (mm/m)				
<p>Our tolerance "LMSA Standard" respects the EN Standard 1654 (Length of measurement 1000 mm). Other tolerances upon request.</p>	>	≤	LMSA Standard		LMSA Extreme		
			≤ 0.5 mm	> 0.5 mm	≤ 0.5 mm	> 0.5 mm	
	3	6	12	-	6	-	
	6	10	8	10	4	5	
	10	20	4	6	2	3	
20	250	2	3	1	1.5		
Surface	Special surface qualities upon request						
Flatness	Special requirement on the longitudinal or transversal flatness upon request						

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