

Description	CuSn6	DIN 2.1020	EN Nr. CW452K	UNS (ASTM) C51900	AISI -	WSA 520
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Chemical composition

Cu	Sn	Ni	Pb	Fe	Zn	P	Others
Balance	5.50 - 7.00	≤ 0.20	≤ 0.02	≤ 0.10	≤ 0.20	0.01 - 0.35	≤ 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

The alloy CuSn6 is a phosphor bronze containing 6% of tin. The presence of phosphorus enhances wear resistance and stiffness. This alloy presents a very good corrosion resistance (in sea water, polluted industrial atmosphere), an excellent stress corrosion cracking resistance, a good mechanical strength, and a good formability. The CuSn6 alloy can be welded, and brazing is strongly recommended. The annealing temperature is comprised between 450°C and 700°C, and stress relieving can be performed in the range 200°C - 350°C. This alloy presents a moderate machinability index of 20% (compared to CuZn39Pb3 equal to 100%).

Typical uses

Sliding elements where wear resistance and high mechanical strength are required, stamped parts, contact springs, relay springs, diaphragms, connectors, etc.

Typical manufacturing range

Rolled products		Thickness (mm)	Width (mm)	Length (mm)
Strip in coils ^[1]		0.10 - 1.50	3 - 140	-
Strip as sheets ^[1]		0.10 - 1.50	10 - 140	500 - 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)	A _{50mm} (%)	Hardness HV
R340	H80	soft annealed	340 - 400	55	80 - 105
R400	H105	½ hard	400 - 470	35	105 - 145
R470	H140	¾ hard	470 - 550	23	140 - 175
R550	H170	hard	550 - 640	10	170 - 200
R640	H200	extra hard	640 min.	-	200 min.

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

Physical properties

Modulus of elasticity	kN/mm ²	215 (soft), 190 (hard), 225 (soft+hardened), 210 (hard+hardened)
Poisson ratio		0.3
Density	g/cm ³	8.3
Melting point	°C	1450 - 1460
Linear dilatation coefficient	10 ⁻⁶ /°C	12.5
Thermal conductivity at 20°C	W/m °K	12.5
Electrical resistivity	μΩcm	95
Electrical conductivity	MS/m	1.1
Specific heat at 20°C	J/(kg. K)	450
Magnetic properties		Nonmagnetic (For all practical purposes, Phynox is nonmagnetic through all temperature range.)

Tolerances (strip and foil)

Thickness	Thickness (mm)		EN Standard		WEBER + CALIBRA		
	≥	<	10140 Precision	10258 Precision	WCA Standard	WCA Precision	WCA Extreme
	-	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

The table shown is an outline of our typical thickness tolerances available. They are tighter than industry standards.

Our "WSA Precision" and "WSA Extreme" tolerances are available upon request.

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

Our tolerance "WCA Standard" respects the EN Standard 1654 (Length of measurement 1000 mm).
 Other tolerances upon request.

Width (mm)		Camber max. (mm/m)			
		WCA Standard		WCA 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 requirements on the longitudinal or transversal flatness upon request

