

Description	CuNi12Zn25Pb1	DIN	EN Nr.	UNS (ASTM)	AISI	WCA
		-	CW404J	C79200	-	401

Chemical composition

Zn	Cu	Fe	Mn	Ni	Pb	Sn	Others
Balance	60.00 - 63.00	≤ 0.30	≤ 0.50	11.00 - 13.00	0.50 - 1.50	≤ 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

The CuNi12Zn25Pb1 is a copper-nickel-zinc alloy containing 12% nickel, 25% zinc and about 1% lead. This alloy presents a good resistance to atmospheric corrosion, organic compound, neutral and alkaline solutions. The corrosion resistance in oxidizing environment is low. This alloy is more sensitive to stress corrosion cracking than brasses. The CuNi12Zn25Pb1 has a microstructure composed of alpha (α) phase and lead precipitates. The alloy presents a good cold deformability but limited at high temperatures. Thanks to the presence of lead in its composition, the alloy presents an excellent machinability compared to lead-free copper-nickel-zinc alloys, however it presents a poor solderability. A poor soldering operation can lead to the decrease of zinc content on the surface, which results in a degradation of the corrosion behaviour.

The CuNi12Zn25Pb1 alloy has excellent galvanizability. Laser weldability is not good. The annealing temperature is typically between 620°C and 700°C. To reduce the presence of internal stress, stress relief annealing between 300°C - 350°C can be performed.

Typical uses

Relay springs, hinges for glasses, connectors, components for the watch industry, pressure membranes, etc. Various parts for precision, electronic as well as optical instruments. Parts made by stamping, bending, and cutting.

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 - 120	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 - 410	≥ 45	80 - 115
R410	H110	½ hard	410 - 470	≥ 30	110 - 145
R470	H140	¾ hard	470 - 540	≥ 15	140 - 170
R540	H165	hard	540 - 610	≥ 5	165 - 190
R610	H185	extra hard	610 min.	-	185 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	135
Poisson ratio		0.34
Density	g/cm ³	8.7
Melting point / Melting range	°C	1060 / 1110
Linear dilatation coefficient	10 ⁻⁶ /°C	17.7
Thermal conductivity at 20°C	W/m °K	32
Electrical resistivity	μΩcm	28.7
Electrical conductivity	MS/m	3.3
Electrical conductivity	% IACS	6.0
Specific heat at 20°C	J/(kg.K)	380
Magnetic properties		Non-magnetic

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

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

