

Description	CuNi18Zn20	DIN 2.0740	EN Nr. CW409J	UNS (ASTM) C76400	AISI -	WCA 304
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Chemical composition

Zn	Cu	Fe	Mn	Ni	Pb	Sn	Others
Balance	60.0 - 63.0	≤ 0.30	≤ 0.50	17.0 - 19.0	≤ 0.03	≤ 0.03	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

Nickel silver CuNi18Zn20 provides good resistance to atmospheric corrosion, organic compounds as well as neutral and alkaline saline solutions. It is poorly resistant to oxidizing acids. The sensitivity to stress corrosion cracking of this alloy is much lower than that of brass. Nickel silver CuNi18Zn20 has an alpha single-phase structure. The alloy has excellent cold forming properties, on the other hand, its hot formability is limited. The colour is silvery, sharply greyer than that of CuNi12Zn24. Nickel silver is mainly used for the fabrication of connectors, relay springs, and in the optical and watch making industry, for example. Its machinability is rather poor. It is better to use a leaded nickel silver, e.g. CuNi12Zn25Pb1 if good machinability is necessary. Nickel silver CuNi18Zn20 can be easily polished or plated and can be brazed or welded. Its weldability by laser however is not good. Its annealing temperature is situated typically between 620°C and 700°C. To decrease the presence of internal stress, a stress-relieving heat treatment between 300°C - 350°C is possible.

Typical uses

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

Typical manufacturing range

		Thickness (mm)	Width (mm)	Length (mm)
Rolled products	Strip in coils ^[1]	0.10 - 3.50	3 - 110	-
	Strip as sheets ^[1]	0.10 - 3.50	10 - 110	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
R370	H90	soft annealed	370 - 430	40	90 - 125
R430	H120	½ hard	430 - 520	22	120 - 155
R520	H150	¾ hard	520 - 610	6	150 - 190
R610	H185	hard	610 - 700	2	185 - 210
R680	H200	extra hard	680 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	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

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

Our "WCA Precision" and "WCA 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

	Width (mm)		Camber max. (mm/m)			
	>	≤	WCA Standard		WCA Extreme	
			≤ 0.5 mm	> 0.5 mm	≤ 0.5 mm	> 0.5 mm
Our tolerance "WCA Standard" respects the EN Standard 1654 (Length of measurement 1000 mm). Other tolerances upon request.	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

