LAMINERIES MATTHEY
NOTZ group advanced metal solutions

CuNi18Zn20

Maillechort M18

		DIN	EN Nr.	UNS (ASTM)	AISI	LMSA
Designation	**CuNi18Zn20**	2.0740	CW409J	C76400	-	**B410**

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 (B420) 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 and 700 °C. To decrease the presence of internal stress, a stress-relieving heat treatment between 300 - 350 °C is possible.

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, folding or bending and cutting.

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/mm²)	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 guaranteed, according to other standards such as EN 1652 or 1654, for example.

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Physical properties

Modulus of elasticity	kN/mm²	135
Poisson ratio		0.34
Density	g/cm³	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

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

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

Thickness (mm)		EN Standard		Lamineries MATTHEY		
≥	<	10140 Precision	10258 Precision	LMSA Standard	LMSA Precision	LMSA 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 "LMSA Standard" respects the EN Standard 1654 (Length of measurement 1000 mm).
Other tolerances upon request.

Width (mm)		Camber max. (mm/m)			
		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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