Emil Müller GmbH
Metallwerk – Hespert
Tubes in Copper
and Copper-Alloys

EMH-Nickel Silver Tubes in CuNi18Zn20

CuNi18Zn20 is a lead-free nickel silver which has a silvery colour and good resistance to tarnishing due to its high nickel content. Being a single-phase material, it has excellent cold working properties. A very high mechanical strength can also be achieved. Nickel silver is characterised by good temperature resistance necessary for welding and soldering. This alloy is used mainly in the music industry and optical industry.

Chemical Composition *

Cu	62 %
Ni	18 %
Zn	balance

* Standard values in % by weight

Material Description

EN	CuNi18Zn20, CW409J
UNS	not standardized
DIN*	CuNi18Zn20, 2.0740
BS*	NS106
NF*	CuNi18Zn20

* former national standards

Physical Properties *

Electrical conductivity	
MS/m	3.6
% IACS	2
Thermal conductivity	
W/(m*K)	30
Thermal expansion coefficient	
(0 – 300 °C) 10^{-6}/K	16.5
Density	
g/cm³	8.73
Modulus of elasticity	
GPa	132

* Standard values at room temparature
1 GPa = 1 kN/mm²
1 MS/m =1 m/Ω • mm

Processing Properties

Forming

Machinability (CuZn39Pb3 = 100%)	25 %
Cold forming	excellent
Hot forming	fair

Joining

Resistance welding	excellent
Inert gas shielded arc welding	excellent
Hard soldering	excellent
Soft soldering	excellent

Surface Treatment

Polishing	
mechanical	excellent
electrolytical	excellent
Electroplating	excellent

Heat Treatment

Melting point	1,050 – 1,100 °C
Hot forming	900 – 980 °C
Soft annealing	600 – 750 °C, 1-3 h
Thermal stress-relieving	300 – 400 °C, 1-3 h

Corrosion Resistance

Nickel silver generally has a good resistance to corrosion as far as atmospheric influences, organic substances (perspiration, environmental influences) as well as alkaline and neutral saline solutions are concerned.

Mechanical Properties (attainable values, depending on the dimension and form)

Standard values		from (soft)	to (hard)
R_m	[MPa]	430	1,060
$R_{p\,0,2}$	[MPa]	150	960
A_5	[%]	50	2
HB		100	190

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