LAMINERIES MATTHEY
NOTZ group advanced metal solutions

Alloy 3

		DIN	EN	UNS (ASTM)	AISI	LMSA
Designation	**CuNi2Be**	2.0850	CW110C	C17510	-	**A300** **A350**

Chemical composition

Cu	Ni	Be	Co	Fe	Si	Al	Autres
Balance	1.40 - 1.80	0.30 - 0.40	0.30 max.	0.10 max.	0.10 max.	0.20 max.	0.50 max.

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

Alloy 3 is a Copper-Nickel-Beryllium with high electrical conductivity, around 50% that of pure copper and higher than that of alloy 25. Alloy 3 is mainly used in applications requiring moderate mechanical strength and high electrical conductivity. This alloy is non-magnetic and has excellent resistance to thermal fatigue. Alloy 3 corrosion resistance is similar to that of pure copper, and it resists to salt atmospheres (seawater), non-oxidizing acids and diluted alkaline solutions. Moreover, this alloy resists to stress corrosion cracking in both sulfide and chloride solutions. Alloy 3 has good brazing properties and an average weldability. Alloy 3 can be hardened with a precipitation hardening treatment, which considerably increases its mechanical strength. The hardening treatment is carried out at temperature of 400 - 450 ºC for around 2 - 3 hours.

Lamineries MATTHEY offers alloy 3 in the in the form of precision thin strips in various metallurgical tempers. Moreover, the strips can also be hardened in factory in various metallurgical tempers (reference LMSA A350).

Typical uses

Spring contacts, electric and electronic contacts and connectors, spring contacts for manufacturing connectors, load connectors, relays, signal connectors, coaxial connectors.

Typical manufacturing range

		Thickness (mm)	Width (mm)	Length (mm)
Rolled products	Strip in coils [1]	0.005 - 0.400	1.5 - 200.0	-
	Strip as sheets [1]	0.015 - 0.400	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				Heat Treatment	$Rp_{0.2}$ (N/mm^2)	R_m (N/mm^2)	A_{50mm} (%)	Hardness HV
A	TB00	R240	soft	-	140 - 320	240 - 380	20 - 35	60 - 130
½H	TD02	R410	½ hard	-	340 - 480	410 - 510	5 - 20	120 - 160
¼H	-	R480	hard	-	370 - 560	480 - 590	2 - 10	140 - 180
HR	-	R550	extra hard	-	450 - 650	550 - 700	2 - 8	160 - 200
After age hardening (in factory) **LMSA A350**								
HTC	-	R520	soft + hardened	420ºC / 3h	340 - 520	520 - 620	5 - 15	150 - 200
AT	TF00	R690	soft + hardened	420ºC / 3h	550 - 690	690 - 900	10 - 25	195 - 275
HT	TH04	R750	½ hard +hardened	420ºC / 3h	650 - 870	750 - 940	8 - 20	216 - 287
HTR	-	R820	hard + hardened	420ºC / 3h	750 - 970	820 - 1040	1 - 8	240 - 290

Physical properties [1]

Modulus of elasticity	kN/mm²	138
Poisson ratio		0.29
Density	g/cm³	8.83
Melting point / Melting range	°C	1040
Linear dilatation coefficient	10^{-6}·/ °C	17.6
Thermal conductivity at 20°C	W/m °K	240
Electrical resistivity at 20°C	µΩcm	2.9 - 3.8
Electrical conductivity at 20°C	MS/m	26.0 - 34.8
Electrical conductivity at 20°C	% IACS	45.0 - 60.0
Magnetic properties		Nonmagnetic
Magnetic Permeability		1.000

[1] Values after hardening.

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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