

Designation	CuBe2	DIN	EN	UNS (ASTM)	AISI	LMSA
		2.1247	CW101C	C17200	-	A100

Chemical composition

Cu*	Be	Co + Ni	Co + Ni + Fe	Pb
Balance	1.80 - 2.00	0.20 min.	0.60 max.	0.02 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.
*Copper plus additions > 99.5%

Main technical properties and features

Copper Beryllium Alloy 25 achieves the highest strength and hardness available among all copper alloys after age hardening, and is consequently very widely used. It exhibits excellent bendability and general formability prior to ageing, especially in the tempers A (TB00), ¼ H (TD01) and ½ H (TD02). After forming and in the fully age hardened condition, the Alloy 25 provides a unique combination of very high strength and high conductivity, high fatigue strength limit and an excellent thermal strength relaxation behaviour.

Typical uses

Spring contacts, diaphragms, bellows, electric and electronic contacts and connectors, switches, relays, bearings, resistance welding electrodes, various parts for the watch industry such as wheels, watch hands, balances, levers etc.

Typical manufacturing range

	Thickness (mm)	Width (mm)	Length (mm)
Rolled products Strip in coils ^[1]	0.005 - 2.000	1.5 - 200.0	-
Strip as sheets ^[1]	0.015 - 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				Heat Treatment	R _{p0.2} (N/mm ²)	R _m (N/mm ²)	A _{50mm} (%)	Hardness HV	R/t (90°) G / B ^[2]
A	TB00	R410	soft	-	190 - 380	410 - 540	35-60	90 - 150	0 / 0
A ^[1]	-	R430	soft + skin pass	-	210 - 380	430 - 560	35-60	100 - 150	0 / 0
¼H	TD01	R510	¼ hard	-	420 - 560	510 - 610	15-35	120 - 180	0 / 0
½H	TD02	R580	½ hard	-	530 - 660	580 - 690	8-25	180 - 215	0.5 / 1.0
H	TD04	R680	hard	-	650 - 800	680 - 830	2-8	215 - 250	1.0 / 2.9
H+	-	R800	springs	-	750 min.	800 min.	-	240 min.	-

After age hardening (by the customer)

AT	TF00	R1130	soft + hardened	3h / 315°C	960-1210	1130-1350	3 - 10	350-410	-
¼HT	TH01	R1190	¼ hard +hardened	2h / 315°C	1050-1300	1190-1420	3 - 6	360-430	-
½HT	TH02	R1270	½ hard +hardened	2h / 315°C	1100-1350	1270-1490	1 - 5	370-440	-
HT	TH04	R1310	hard + hardened	2h / 315°C	1150-1420	1310-1520	1 - 3	380-450	-

^[1] The temper "soft + skin pass" is not given in the EN standard. The skin pass improves the surface quality of the soft temper.

^[2] Minimum bend radius at 90°. R = radius, t = strip thickness, G = "Good way", perpendicular to rolling direction and B = "Bad way", parallel to rolling direction.

Physical properties

Modulus of elasticity	kN/mm ²	125, 131 ^[1]
Poisson ratio		0.285
Density	g/cm ³	8.25, 8.36 ^[1]
Melting point / Melting range	°C	875 - 985
Linear dilatation coefficient	10 ⁻⁶ / °C	17 from 20 to 200°C
Thermal conductivity at 20°C	W/m °K	110
Electrical resistivity	μΩcm	9 - 11, 8 - 6 ^[1]
Electrical conductivity	MS/m	9 - 11, 13 - 16 ^[1]
Electrical conductivity	% IACS	15 - 19, 22 - 28 ^[1]
Magnetic properties		Nonmagnetic (slightly diamagnetic)
Permeability		μ = 1.0006

[1] Values before and after hardening, respectively.

Tolerances (strip and foil)

Thickness	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	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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