

Designation	CuBe2	DIN 2.1247	EN Nr. CW101C	UNS (ASTM) C17200	AISI -	LAM A150
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Chemical composition

Cu*	Be	Co + Ni	Co + Ni + Fe	Pb
Balance	1.80 - 2.00	≥ 0.20	≤ 0.60	≤ 0.02

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 CuBe2 achieves the highest strength available among all copper alloys after age hardening, and is consequently very widely used. The alloy 190 has the same chemical composition as the alloy 25 but it is delivered mill-hardened. As no further age hardening is necessary, there is no distortion of the finished parts and the customer avoids the expensive hardening process. It exhibits various bendability according to the different tempers: a bending at 90° is possible independently of thickness, bending direction and radius for the AM temper, for the other tempers from ¼ HM to XHMS, the minimal radius of bending can change from 1 to 6x the thickness of the strip. The alloy 190 provides a unique combination of very high strength and high conductivity, high fatigue strength limit and an excellent thermal strength relaxation behaviour.

Typical uses

Contacts springs for the manufacture of connectors, switchblades, bellows, diaphragms, many parts for the clock industry: needles, wheels, springs, etc.

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 _{p0.2} (N/mm ²)	R _m (N/mm ²)	A _{50mm} (%)	Hardness HV	R/t (90°) G / B ^[2]
AM	R690	H210		480 - 680	690 - 760	16 - 23	210 - 250	0 / 0
¼ HM	R750	H240	Alloy 190 has the same chemical composition as alloy 25, but it is delivered mill hardened. No further heat treatment is necessary.	550 - 760	750 - 830	15 - 20	240 - 280	0.5 / 0.5
½ HM	R830	H260		690 - 870	830 - 930	12 - 18	260 - 310	0.5 / 1.0
HM	R930	H290		750 - 950	930 - 1040	9 - 15	290 - 350	2.0 / 2.0
SHM ^[1]	R1030	H310		860 - 970	1030 - 1100	9 - 14	310 - 360	2.8 / 3.2
XHM ^[1]	R1100	H350		970 - 1150	1100 - 1250	4 - 10	350 - 390	4.0 / 5.0
XHMS	R1200	H360		1030 - 1250	1200 - 1320	3 - 9	360 - 420	5.0 / 10.0
Treated ^[3]	R1200	H360		-	1200 - 1320	-	360 - 420	-

^[1] These tempers are not given in the EN standard.

^[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.

^[3] Special temper dedicated to the watch industry

Physical properties

Modulus of elasticity	kN/mm ²	131
Poisson ratio		0.285
Density	g/cm ³	8.36
Melting point / Melting range	°C	870 - 980
Linear dilatation coefficient	10 ⁻⁶ / °C	17 from 20 to 200°C
Thermal conductivity at 20°C	W/m °K	105
Electrical resistivity	μΩcm	6 - 10
Electrical conductivity	MS/m	10 - 16
Electrical conductivity	% IACS	17 - 28
Magnetic properties		Non-magnetic (slightly diamagnetic) / μ = 1.0006

Tolerances (strip and foil)

Thickness	Thickness (mm)		EN Standard		Lamineries MATTHEY		
	≥	<	10140 Precision	10258 Precision	LMSA Standard	LMSA Precision	LMSA Extreme
<p>The table shown is an outline of our typical thickness tolerances available. They are tighter than industry standards.</p> <p>Our "LMSA Precision" and "LMSA Extreme" tolerances are available upon request.</p>	-	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)				
<p>Our tolerance "LMSA Standard" respects the EN Standard 1654 (Length of measurement 1000 mm). Other tolerances upon request.</p>	>	≤	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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