

Designation	DIN	EN No.	UNS (ASTM)	AISI	LMSA
<b>CuBe2</b>	2.1247	CW101C	C17200	-	A150

### Chemical composition (weight %)

Cu	Be	Co + Ni	Co + Ni + Fe	Pb
Balance	1.80 - 2.00	0.2% min.	0.6% max.	0.02% max.

Copper plus additions equal 99.5% minimum.

In order to achieve maximum homogeneity and consistent quality, the actual tolerances on both alloy components and impurities are significantly tighter and more precisely defined than the standard composition indicated.

### Main technical properties and features

Beryllium copper CuBe2 achieves the highest strength and hardness 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 Brush 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 change from 1 to 6X the thickness of the strip (see table). The alloy Brush 190 provides a unique combination of very high strength and high conductivity, high fatigue strength limit and an excellent thermal strength relaxation behaviour.

### Typical manufacturing range

		Thickness (mm)	Width (mm)	Length (mm)
<b>Rolled products</b>	Strip in coils <sup>1)</sup>	0.015 - 2.000	1.5 - 200.0	-
	Strip as sheets <sup>1)</sup>	0.015 - 1.500	10.0 - 200.0	100 - 3000

1) Not all our production possibilities are presented here. Other dimensions or other product forms available upon request. Certain combinations of thicknesses and widths are not possible.

### Mechanical properties of strips

Temper				Rp <sub>0.2</sub> (N/mm <sup>2</sup> )	Rm (N/mm <sup>2</sup> )	A <sub>50mm</sub> (%)	Hv (N/mm <sup>2</sup> )	R/t (90°) T/L <sup>2)</sup>
AM	R690	H210		480-680	690 -760	16-50	210-250	0.0/0.0
¼ HM	R750	H240	Alloy 190 has the same	550-760	750-830	15-50	240-280	0.5/0.5
½ HM	R830	H260	chemical composition as	690-870	830-930	12-18	260-310	0.5/1.0
HM	R930	H290	alloy Brush 25, but it is	750-950	930-1040	9-15	290-350	2.0/2.0
SHM <sup>1)</sup>	R1030	H310	delivered Mill hardened. No	860-970	1030-1100	9-14	310-360	2.8/3.2
XHM <sup>1)</sup>	R1100	H350	further heat treatment is	970-1150	1100-1250	4-10	350-390	4.0/5.0
XHMS	R1200	H360	necessary.	1030-1250	1200-1320	3-9	360-420	5.0/10.0
Hardened <sup>3)</sup>	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 = thickness of the strip, G = "Good way" and B = "Bad way".

3) Special temper dedicated to the watch industry

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## Physical properties

Modulus of elasticity	kN/mm <sup>2</sup>	131
Poisson ratio		0.285
Density	kg/dm <sup>3</sup>	8.36
Melting point / Melting range	°C	870 – 980
Linear dilatation coefficient (20-300°C)	10 <sup>-6</sup> / °C	17
Thermal conductivity at 20°C	W/m °K	105
Electrical resistivity	μΩcm	10-6
Electrical conductivity	MS/m	10-16
Electrical conductivity	% IACS	17-28
Magnetic properties		Non magnetic (Slightly diamagnetic)
Permeability		μ = 1.0006

## Typical uses

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



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## Tolerances

Thickness	Thickness (mm)		EN Standard		Lamineries MATTHEY SA		
	≥	<	10140 Precision	10258 Precision	LMSA Standard	LMSA Precision	LMSA Extreme
<p>The table shown is an outline of our typical thickness tolerances available, which are tighter than industry standards.</p> <p>Upon request: our "Precision" and "Extreme" tolerances are also available.</p>	0.025	0.025	-	-	-	-	± 0.001
	0.050	0.050	-	-	± 0.003	± 0.002	± 0.0015
	0.065	0.065	-	± 0.003	± 0.003	± 0.0025	± 0.002
	0.100	0.100	-	± 0.004	± 0.004	± 0.0035	± 0.003
	0.125	0.125	± 0.005	± 0.006	± 0.005	± 0.004	± 0.003
	0.150	0.150	± 0.005	± 0.006	± 0.005	± 0.005	± 0.004
	0.250	0.250	± 0.010	± 0.008	± 0.008	± 0.006	± 0.004
	0.300	0.300	± 0.010	± 0.009	± 0.009	± 0.007	± 0.005
	0.400	0.400	± 0.010	± 0.010	± 0.010	± 0.007	± 0.005
	0.500	0.500	± 0.015	± 0.012	± 0.012	± 0.008	± 0.006
	0.600	0.600	± 0.015	± 0.014	± 0.014	± 0.010	± 0.007
	0.800	0.800	± 0.015	± 0.015	± 0.015	± 0.010	± 0.007
	1.000	1.000	± 0.015	± 0.018	± 0.018	± 0.012	± 0.009
	1.200	1.200	± 0.020	± 0.020	± 0.020	± 0.015	± 0.012
	1.500	1.500	± 0.020	± 0.020	± 0.020	± 0.015	± 0.012

### Width

Our width tolerance is + 0.2 -0.0 mm (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 extrêmes	
			≤ 0.5 mm	> 0.5 mm	≤ 0.5 mm	> 0.5 mm
<p>Our tolerance "standard" respects the EN Standard 1654 (Length of measurement 1000 mm).</p> <p>Other tolerances upon request.</p>	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