

# Bronze

## Chemical Composition

### CHEMICAL COMPOSITION EN 12166

Designation of the material		Composition in % (mass fraction)									
Classification of symbols	Numerical classification	Min. Cu	Min. P	Max. P	Max. Fe	Max. Ni	Max. Pb	Min. Sn	Max. Sn	Max. Zn	excluded
CuSn6	CW452K	Remainder	0.01	0.4	0.1	0.2	0.02	5.5	7	0.2	0.2
CuSn8	CW453K	Remainder	0.01	0.4	0.1	0.2	0.02	7.5	8.5	0.2	0.2

## Equivalents

Classification of symbols	Numerical classification	US (AISI)	Japan (JIS)	China (GB)
CuSn6	CW452K	C51900	C 5191	
CuSn8	CW453K			

## Mechanical properties

**MECHANICAL PROPERTIES EN 12166:1998**

Designations		Nominal thickness <sup>1)</sup>				Tensile strength Rm		Conventional yield strength at 0.2% Rp <sub>0.2</sub>	
		mm			N/mm <sup>2</sup>				
Material		State	Metallurgical condition	from	above	to	min.	max.	N/mm <sup>2</sup>
Classification of symbols	Numerical classification								
CuSn6	CW452K		M						
		Annealed	R380	0.1	-	0.5	380	480	(170)
			R370	-	0.5	1.5	370	470	(170)
			R360	-	1.5	4.0	350	440	(160)
			H085	1.5	-	4.0	-	-	-
			R340	-	4.0	20.0	340	430	(150)
			H080	-	4.0	20.0	-	-	-
		1/4 Hard	R480	0.1	-	0.5	480	580	(320)
			R460	-	0.5	1.5	460	560	(310)
			R430	-	1.5	4.0	430	530	(290)
			H125	1.5	-	4.0	-	-	-
			R120	-	4.0	20.0	420	520	(280)
			H120	-	4.0	20.0	-	-	-
		1/2 Hard	R590	0.1	-	0.5	590	710	(450)
			R560	-	0.5	1.5	560	670	(430)
			R530	-	1.5	4.0	530	630	(410)
			H165	1.3	-	4.0	-	-	-
			R510	-	4.0	8.0	510	610	(390)
			H155	-	4.0	8.0	-	-	-
		3/4 Hard	R700	0.1	-	0.5	700	830	(510)
			R770	-	0.5	1.5	670	730	(530)
R630	-		1.5	4.0	630	740	(550)		

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Designations		Nominal thickness <sup>1)</sup>					Tensile strength Rm		Conventional yield strength at 0.2% Rp <sub>0,2</sub>
		mm			N/mm <sup>2</sup>				
Material		State	Metallurgical condition	from	above	to	min.	max.	N/mm <sup>2</sup>
Classification of symbols	Numerical classification								
			H190	1.5	-	4.0	-	-	-
			R600	-	4.0	8.0	600	710	(520)
			H185	-	4.0	8.0	-	-	-
		Hard	R630	0.1	-	0.5	830	980	(810)
			R730	-	0.5	1.5	790	950	(770)
			R710	-	1.5	4.0	740	960	(730)
			H215	1.5	-	4.0	-	-	-
		Hard Spring	R980	0.1	-	0.5	980	-	(990)
			R950	-	0.5	1.5	950	-	(930)
			R900	-	1.5	4.0	900	-	(890)
			H245	1.5	-	4.0	-	-	-
			M						
		Annealed	R440	0.1	-	0.5	440	530	(200)
			R420	-	0.5	1.5	420	320	(190)
			R400	-	1.5	4.0	400	490	(180)
			H090	1.5	-	4.0	-	-	-
			R390	-	4.0	20.0	380	470	(170)
			H085	-	4.0	20.0	-	-	-
		1/4 Hard	R530	0.1	-	0.5	530	690	(550)
			R510	-	0.5	1.5	510	610	(540)
			R490	-	1.5	4.0	490	590	(520)
			H145	1.5	-	4.0	-	-	-
			R550	-	4.0	20.0	480	550	(310)
			H140	-	4.0	20.0	-	-	-
			R630	0.1	-	0.5	630	750	(480)
			R210	-	0.5	1.5	610	720	(470)

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Designations				Nominal thickness <sup>1)</sup>			Tensile strength Rm		Conventional yield strength at 0.2% Rp <sub>0,2</sub>
				mm			N/mm <sup>2</sup>		
Material		State	Metallurgical condition	from	above	to	min.	max.	N/mm <sup>2</sup>
Classification of symbols	Numerical classification								
CuSn8	CW453K	1/2 Hard	R590	-	1.5	4.0	590	690	(440)
			H160	1.5	-	4.0	-	-	-
			R560	-	4.0	8.0	560	680	(430)
			H175	-	4.0	8.0	-	-	-
		3/4 Hard	R750	0.1	-	0.5	750	890	(650)
			R720	-	0.5	1.5	720	840	(620)
			R690	-	1.5	4.0	690	790	(590)
			H230	1.5	-	4.0	-	-	-
			R650	-	4.0	8.0	650	750	(560)
			H195	-	4.0	8.0	-	-	-
		Hard	R870	0.1	-	0.5	870	1000	(840)
			R840	-	0.5	1.5	840	950	(810)
			R790	-	1.5	4.0	790	900	(760)
			H230	1.5	-	4.0	-	-	-
		Hard Spring	R1000	0.1	-	0.5	1000	-	(1000)
			R950	-	0.5	1.5	950	-	(950)
R900	-		1.5	4.0	900	-	(900)		
H265	1.5		-	4.0	-	-	-		

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## Finishes

- Can be supplied with a tinned or nickel plated surface finish, or others on request.

## Tolerances

### DIAMETER TOLERANCES OF ROUND WIRE EN12166

Nominal diameter value		Tolerances				
From	To	Class A	Class B	Class C	Class D	Class E
-	0.25	± 0.005	-	-	-0.025;0	-0.006;0
0.25	0.5	± 0.005	-	-	-0.03;0	-0.010;0
0.5	1.0	± 0.012	-	-	-0.03;0	-0.014;0
1.0	2.0	± 0.02	-0.10;0	-0.05;0	0.0	-0.025;0
2.0	4.0	± 0.03	-0.10;0	-0.05;0	0.0	-0.025;0
4.0	8.0	± 0.04	-0.12;0	-0.05;0	-0.05;0	-0.030;0
8.0	10.0	± 0.06	-0.15;0	-0.09;0	-0.06;0	-0.035;0
10.0	18.0	± 0.08	-0.18;0	-0.11;0	-0.07;0	-0.040;0

### STANDARD LENGTH TOLERANCES

NOMINAL LENGTH	TOLERANCE
L ≤ 1000 mm.	+/- 1 mm.
1000 < L ≤ 4000	- 0mm. / +3 mm.