

Datasheet: EN CuSn6 / CW452K Classic Bronze Rolled product for general purposes Alumeco ApS 06-03-2025				Internal alloy name: CW452K Metal: Bronze Chemical Symbol: CuSn6 EN: CuSn6 UNS: C51900 SIS: 5428 GB: QSn6-0,2 JIS: C5191 Also known as: - Alloy type: Classic Bronze																											
Main usage: - Springs for contacts and electrical purposes - Switches and relays, terminals - Brushings and gears - Pump parts - Welding wire and electrodes				Important norms and literature: General Standards EN 1982:2024: Copper and copper alloys – Ingots and castings Geometric Tolerance EN 1652:1997: Copper and copper alloys - Plate, sheet, strip and circles for general purposes																											
Main properties: - High strength and hardness - Good cold deformation capabilities - Great soldering and welding capabilities																															
Chemical composition in %: EN 1982:2024 <table><tr><td>Cu</td><td>Sn</td><td>P</td><td>Fe</td><td>Ni</td><td>Pb</td><td>Zn</td><td>Other</td></tr><tr><td>Rest</td><td>5,5 – 7,0</td><td>0,01 – 0,4</td><td>Max. 0,1</td><td>Max. 0,2</td><td>Max. 0,02</td><td>Max. 0,2</td><td>Max. 0,2</td></tr></table>								Cu	Sn	P	Fe	Ni	Pb	Zn	Other	Rest	5,5 – 7,0	0,01 – 0,4	Max. 0,1	Max. 0,2	Max. 0,02	Max. 0,2	Max. 0,2								
Cu	Sn	P	Fe	Ni	Pb	Zn	Other																								
Rest	5,5 – 7,0	0,01 – 0,4	Max. 0,1	Max. 0,2	Max. 0,02	Max. 0,2	Max. 0,2																								
Mechanical properties: EN 1652 <table><tr><td>Material condition</td><td>Tensile strength R_m N/mm² (MPa)</td><td>Yield stress R_{0,2} N/mm² (MPa)</td><td>Elongation A_{50mm} Min. %</td><td>Elongation A Min. %</td><td>Hardness HBW</td></tr><tr><td>R500</td><td>500 – 590</td><td>Min. 450</td><td>8</td><td>10</td><td>-</td></tr><tr><td>R560</td><td>560 – 650</td><td>Min. 500</td><td>5</td><td>-</td><td>-</td></tr><tr><td>R640</td><td>640 – 730</td><td>Min. 600</td><td>3</td><td>-</td><td>-</td></tr></table> * Information values only;								Material condition	Tensile strength R _m N/mm ² (MPa)	Yield stress R _{0,2} N/mm ² (MPa)	Elongation A _{50mm} Min. %	Elongation A Min. %	Hardness HBW	R500	500 – 590	Min. 450	8	10	-	R560	560 – 650	Min. 500	5	-	-	R640	640 – 730	Min. 600	3	-	-
Material condition	Tensile strength R _m N/mm ² (MPa)	Yield stress R _{0,2} N/mm ² (MPa)	Elongation A _{50mm} Min. %	Elongation A Min. %	Hardness HBW																										
R500	500 – 590	Min. 450	8	10	-																										
R560	560 – 650	Min. 500	5	-	-																										
R640	640 – 730	Min. 600	3	-	-																										
Physical properties: <table><tr><td>Density (20 °C)</td><td>Solidification range</td><td>Electrical conductivity</td><td>Thermal conductivity (20 °C)</td><td>Thermal expansion (20 - 300 °C)</td><td>E – modulus (20 °C)</td></tr><tr><td>g/cm³</td><td>°C</td><td>%IACS</td><td>W/m K</td><td>µm m⁻¹ K⁻¹</td><td>N / mm²</td></tr><tr><td>8,82</td><td>900 – 1050</td><td>15,5</td><td>75</td><td>18,5</td><td>102000</td></tr></table>								Density (20 °C)	Solidification range	Electrical conductivity	Thermal conductivity (20 °C)	Thermal expansion (20 - 300 °C)	E – modulus (20 °C)	g/cm ³	°C	%IACS	W/m K	µm m ⁻¹ K ⁻¹	N / mm ²	8,82	900 – 1050	15,5	75	18,5	102000						
Density (20 °C)	Solidification range	Electrical conductivity	Thermal conductivity (20 °C)	Thermal expansion (20 - 300 °C)	E – modulus (20 °C)																										
g/cm ³	°C	%IACS	W/m K	µm m ⁻¹ K ⁻¹	N / mm ²																										
8,82	900 – 1050	15,5	75	18,5	102000																										
Properties and information's (3 Excellent; 2 Good; 1 Poor/not recommendable) <table><tr><td> Machinability (Zerspanbarkeitsindex): 20* *(CuZn39Pb3 = 100) Forming Methods: Hot Formability: 1 Cold Formability: 2 Corrosion resistance: Atmosphere: 2-3 Waters and alkaline: 2 Acids, Ammonia, etc.: 1 </td><td> Joining Methods: Soldering: 3 Brazing: 2 Oxy-acetylene welding: 2 Gas-shielded arc welding: 2 TIG welding: 2 MIG welding: 2 Gluing/adhesion: 2 </td><td> Surface Treatment: Polishing: Mechanical: 2 Electrolytic/chemical: 2 Galvanizing: 2-3 Hot Dipping: 2-3 </td></tr></table>								Machinability (Zerspanbarkeitsindex): 20* *(CuZn39Pb3 = 100) Forming Methods: Hot Formability: 1 Cold Formability: 2 Corrosion resistance: Atmosphere: 2-3 Waters and alkaline: 2 Acids, Ammonia, etc.: 1	Joining Methods: Soldering: 3 Brazing: 2 Oxy-acetylene welding: 2 Gas-shielded arc welding: 2 TIG welding: 2 MIG welding: 2 Gluing/adhesion: 2	Surface Treatment: Polishing: Mechanical: 2 Electrolytic/chemical: 2 Galvanizing: 2-3 Hot Dipping: 2-3																					
Machinability (Zerspanbarkeitsindex): 20* *(CuZn39Pb3 = 100) Forming Methods: Hot Formability: 1 Cold Formability: 2 Corrosion resistance: Atmosphere: 2-3 Waters and alkaline: 2 Acids, Ammonia, etc.: 1	Joining Methods: Soldering: 3 Brazing: 2 Oxy-acetylene welding: 2 Gas-shielded arc welding: 2 TIG welding: 2 MIG welding: 2 Gluing/adhesion: 2	Surface Treatment: Polishing: Mechanical: 2 Electrolytic/chemical: 2 Galvanizing: 2-3 Hot Dipping: 2-3																													

Tolerances for Rolled Products of CW452K

Dimensions: EN 1652:1997*

Tolerances on thickness of hot rolled products (plate, sheet, strip and circles)

Nominal thickness t (mm)	Tolerance on thickness for nominal widths w (mm)						1500 < w
	$w \leq 700$		700 < $w \leq 1000$		1000 < $w \leq 1500$		
	1)	2)	1)	2)	1)	2)	
$t \leq 2,5$	By agreement						By agreement
$2,5 < t \leq 5,0$	$\pm 0,25$	$\pm 0,30$	$\pm 0,30$	$\pm 0,35$	$\pm 0,35$	$\pm 0,45$	
$5,0 < t \leq 7,5$	$\pm 0,35$	$\pm 0,45$	$\pm 0,40$	$\pm 0,50$	$\pm 0,45$	$\pm 0,55$	
$7,5 < t \leq 10$	$\pm 0,45$	$\pm 0,60$	$\pm 0,50$	$\pm 0,65$	$\pm 0,55$	$\pm 0,75$	
$10 < t \leq 15$	$\pm 0,75$	$\pm 0,95$	$\pm 0,80$	$\pm 1,00$	$\pm 0,90$	$\pm 1,10$	
$15 < t \leq 25$	$\pm 0,95$	$\pm 1,20$	$\pm 1,05$	$\pm 1,30$	$\pm 1,30$	$\pm 1,60$	
$25 < t \leq 50$	$\pm 1,30$	$\pm 1,60$	$\pm 1,40$	$\pm 1,75$	$\pm 1,50$	$\pm 1,90$	
$50 < t$	$\pm 1,50$	$\pm 1,90$	$\pm 1,65$	$\pm 2,05$	$\pm 1,80$	$\pm 2,20$	

1) For all materials except for CuAl8Fe3 (CW303G), CuNi10FeIMN (CW352H), CuNi30MnIFe (CW354H) and CuZn20Al2As (CW702R).

2) For alloys CuAl8Fe3 (CW303G), CuNi10FeIMN (CW352H), CuNi30MnIFe (CW354H) and CuZn20Al2As (CW702R).

* Values are referred from Table 4 of EN 1652:1997

Dimensions: EN 1652:1997*

Tolerances on thickness of cold rolled products (sheet, strip and circles)

Nominal thickness t (mm)	Tolerance on thickness for nominal widths w (mm)			
	$w \leq 350$	350 < $w \leq 700$	700 < $w \leq 1000$	1000 < $w \leq 1250$
$0,1 < t \leq 0,2$	$\pm 0,018$	-	-	-
$0,2 < t \leq 0,3$	$\pm 0,022$	$\pm 0,03$	$\pm 0,04$	-
$0,3 < t \leq 0,4$	$\pm 0,025$	$\pm 0,04$	$\pm 0,05$	$\pm 0,07$
$0,4 < t \leq 0,5$	$\pm 0,030$	$\pm 0,05$	$\pm 0,06$	$\pm 0,08$
$0,5 < t \leq 0,8$	$\pm 0,040$	$\pm 0,06$	$\pm 0,07$	$\pm 0,09$
$0,8 < t \leq 1,2$	$\pm 0,050$	$\pm 0,07$	$\pm 0,09$	$\pm 0,10$
$1,2 < t \leq 1,8$	$\pm 0,060$	$\pm 0,08$	$\pm 0,10$	$\pm 0,11$
$1,8 < t \leq 2,5$	$\pm 0,070$	$\pm 0,09$	$\pm 0,11$	$\pm 0,13$
$2,5 < t \leq 3,2$	$\pm 0,080$	$\pm 0,10$	$\pm 0,13$	$\pm 0,17$
$3,2 < t \leq 4,0$	$\pm 0,10$	$\pm 0,12$	$\pm 0,15$	$\pm 0,20$
$4,0 < t \leq 5,0$	$\pm 0,12$	$\pm 0,14$	$\pm 0,17$	$\pm 0,23$
$5,0 < t \leq 6,0$	$\pm 0,14$	$\pm 0,16$	$\pm 0,20$	$\pm 0,26$
$6,0 < t \leq 7,0$	$\pm 0,16$	$\pm 0,19$	$\pm 0,23$	$\pm 0,29$
$7,0 < t \leq 8,0$	$\pm 0,18$	$\pm 0,22$	$\pm 0,26$	$\pm 0,32$
$8,0 < t \leq 9,0$	$\pm 0,20$	$\pm 0,25$	$\pm 0,29$	$\pm 0,35$
$9,0 < t \leq 10,0$	$\pm 0,22$	$\pm 0,28$	$\pm 0,32$	$\pm 0,38$

* Values are referred from Table 5 of EN 1652:1997

Dimensions: EN 1652:1997*

Tolerances on width of cold rolled strip

Nominal thickness t (mm)	Tolerance on thickness for nominal widths w (mm)						
	$w \leq 50$	50 < $w \leq 100$	100 < $w \leq 200$	200 < $w \leq 350$	350 < $w \leq 500$	500 < $w \leq 700$	700 < $w \leq 1250$
$0,1 < t \leq 1,0$	+0,2 0	+0,3 0	+0,4 0	+0,6 0	+1,0 0	+1,5 0	+2,0 0
$1,0 < t \leq 2,0$	+0,3 0	+0,4 0	+0,5 0	+1,0 0	+1,2 0	+1,5 0	+2,0 0
$2,0 < t \leq 2,5$	+0,5 0	+0,6 0	+0,7 0	+1,2 0	+1,5 0	+2,0 0	+2,5 0
$2,5 < t \leq 3,0$	+1,0 0	+1,1 0	+1,2 0	+1,5 0	+2,0 0	+2,5 0	+3,0 0
$3,0 < t \leq 4,0$	+2,0 0	+2,3 0	+2,5 0	+3,0 0	+4,0 0	+5,0 0	+6,0 0

* Values are referred from Table 6 of EN 1652:1997

Dimensions: EN 1652:1997* Tolerances on width of plate and sheet			
Nominal thickness t (mm)	Tolerance on thickness for nominal widths w (mm)		
	$w \leq 350$	$350 < w \leq 1250$	$1250 < w$
$t \leq 2,0$	+2,0 0	+6,0 0	By agreement
$2,0 < t \leq 5,0$	+4,0 0	+8,0 0	
$5,0 < t$	+8,0 0	+10,0 0	

* Values are referred from Table 7 of EN 1652:1997

Dimensions: EN 1652:1997* Tolerances on length of plate, sheet and strip cut for lengths up to 5000 mm		
Length	Nominal thickness (mm)	Tolerance on length (mm)
As Manufactured (ML)	$t \leq 15$	± 50
Fixed length (FL)	$t \leq 5,0$	+10 0
	$5,0 < t$	+15 0

* Values are referred from Table 8 of EN 1652:1997

Dimensions: EN 1652:1997* Squareness of cut plate and sheet			
Nominal width w (mm)	Maximum allowable differences between diagonals, for lengths l (mm)		
	$1000 < l \leq 2000$	$2000 < l \leq 3000$	$3000 < l$
$350 < w \leq 700$	6	7	8
$700 < w \leq 1250$	8	9	10
$1250 < w$	By agreement		

* Values are referred from Table 9 of EN 1652:1997

Dimensions: EN 1652:1997* Tolerances on diameter for circles			
Nominal diameter d (mm)	Maximum allowable differences between diagonals, for lengths l (mm)		
	$1000 < l \leq 2000$	$2000 < l \leq 3000$	$3000 < l$
$d \leq 500$	± 1	$\pm 1,5$	± 2
$500 < d \leq 1000$	± 2	$\pm 2,5$	± 3
$1000 < d \leq 2000$	± 3	$\pm 3,5$	± 4
$700 < d$	-	-	By agreement

* Values are referred from Table 10 of EN 1652:1997

Dimensions: EN 1652:1997* Edgewise curvature c		
Nominal width w (mm)	Maximum edgewise curvature c for thicknesses t (mm)	
	$t \leq 1,0$	$1,0 < t \leq 4,0$
$3 < w \leq 8$	12	-
$8 < w \leq 15$	8	10
$15 < w$	4	6

* Values are referred from Table 11 of EN 1652:1997