

Datasheet: EN Cu-ETP / CW004A 99,90% Pure Copper Cold rolled Alumeco ApS 13-01-2025		Internal alloy name: CW004A Metal: Copper Chemical Symbol: Cu-ETP EN: EN Cu-ETP UNS: C11000 SS: 5010 GB: TU00 / C10100 JIS: C1100 Also known as: - Alloy type: Electrical conducting																																									
Main usage: - Automotive - Cables and wires - Clamps, connectors, fasteners and nozzles - Electrical installations - Electronic products - Industrial applications – Beverage & Chemical - Lightning rods and grounding		Important norms and literature: General Standards EN 1652: Copper and copper alloys - Plate, sheet, strip and circles for general purposes Geometric Tolerance EN 1652: Copper and copper alloys - Plate, sheet, strip and circles for general purposes																																									
Main properties: - High thermal and electrical conductivity - Excellent forming properties																																											
Chemical composition in %: EN 1652 <table><tr><td>Cu</td><td>Bi</td><td>Pb</td><td>O</td><td colspan="2">Other elements</td></tr><tr><td></td><td></td><td></td><td></td><td>Each</td><td>together</td></tr><tr><td>99,9</td><td>Max. 0,0005</td><td>Max. 0,005</td><td>Max. 0,040</td><td>-</td><td>0,03</td></tr></table>				Cu	Bi	Pb	O	Other elements						Each	together	99,9	Max. 0,0005	Max. 0,005	Max. 0,040	-	0,03																						
Cu	Bi	Pb	O	Other elements																																							
				Each	together																																						
99,9	Max. 0,0005	Max. 0,005	Max. 0,040	-	0,03																																						
Mechanical properties: EN 1652 <table><tr><td>Material Condition</td><td>Thickness range</td><td>Rm MPa</td><td>Rp0,2 MPa</td><td>A50mm for thickness up to 2,5 mm %</td><td>A for thickness up to 2,5 mm %</td><td>Hardness HBW</td><td>Hardness HV</td></tr><tr><td></td><td>mm</td><td>Min. – Max.</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>R220 (soft)</td><td>0,10 - 5</td><td>220 - 260</td><td>Max. 140</td><td>33</td><td>42</td><td>-</td><td>-</td></tr><tr><td>R240 (1/2 hard)</td><td>0,10 - 10</td><td>240 - 300</td><td>Min. 180</td><td>8</td><td>15</td><td>-</td><td>-</td></tr><tr><td>R290 (3/4)</td><td>0,10 - 10</td><td>290 - 360</td><td>Min. 250</td><td>4</td><td>6</td><td>-</td><td>-</td></tr></table> * Information values only;				Material Condition	Thickness range	Rm MPa	Rp0,2 MPa	A50mm for thickness up to 2,5 mm %	A for thickness up to 2,5 mm %	Hardness HBW	Hardness HV		mm	Min. – Max.						R220 (soft)	0,10 - 5	220 - 260	Max. 140	33	42	-	-	R240 (1/2 hard)	0,10 - 10	240 - 300	Min. 180	8	15	-	-	R290 (3/4)	0,10 - 10	290 - 360	Min. 250	4	6	-	-
Material Condition	Thickness range	Rm MPa	Rp0,2 MPa	A50mm for thickness up to 2,5 mm %	A for thickness up to 2,5 mm %	Hardness HBW	Hardness HV																																				
	mm	Min. – Max.																																									
R220 (soft)	0,10 - 5	220 - 260	Max. 140	33	42	-	-																																				
R240 (1/2 hard)	0,10 - 10	240 - 300	Min. 180	8	15	-	-																																				
R290 (3/4)	0,10 - 10	290 - 360	Min. 250	4	6	-	-																																				
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>Annealing temperature</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>°C</td><td>N / mm²</td></tr><tr><td>9,0</td><td>1070</td><td>100</td><td>390</td><td>17</td><td>-</td><td>110.000</td></tr></table>				Density (20 °C)	Solidification range	Electrical conductivity	Thermal conductivity (20 °C)	Thermal expansion (20 - 300 °C)	Annealing temperature	E – modulus (20 °C)	g/cm³	°C	%IACS	W/m K	µm m ⁻¹ K ⁻¹	°C	N / mm²	9,0	1070	100	390	17	-	110.000																			
Density (20 °C)	Solidification range	Electrical conductivity	Thermal conductivity (20 °C)	Thermal expansion (20 - 300 °C)	Annealing temperature	E – modulus (20 °C)																																					
g/cm³	°C	%IACS	W/m K	µm m ⁻¹ K ⁻¹	°C	N / mm²																																					
9,0	1070	100	390	17	-	110.000																																					
Properties and information's (3 Excellent; 2 Good; 1 Poor/not recommendable)¹ <table><tr><td> Machinability (Zerspanbarkeitsindex): 20* *(CuZn39Pb3 = 100) Forming Methods: Hot Formability: 2 Cold Formability: 3 Corrosion resistance: Atmosphere: 2 Waters and alkaline: 2 Acids, Ammonia, Seawater: 1 </td><td> Joining Methods: Soldering: 3 Brazing: 2 Oxy-acetylene welding: 1 Gas-shielded arc welding: 1 TIG welding: 1 MIG welding: 1 Spot/seam welding: 1 Butt welding: 2 Gluing/adhesion: 2 </td><td> Surface Treatment: Polishing: Mechanical: 2 Electrolytic/chemical: 3 Galvanizing: 3 Hot Dipping: 3 </td></tr></table>				Machinability (Zerspanbarkeitsindex): 20* *(CuZn39Pb3 = 100) Forming Methods: Hot Formability: 2 Cold Formability: 3 Corrosion resistance: Atmosphere: 2 Waters and alkaline: 2 Acids, Ammonia, Seawater: 1	Joining Methods: Soldering: 3 Brazing: 2 Oxy-acetylene welding: 1 Gas-shielded arc welding: 1 TIG welding: 1 MIG welding: 1 Spot/seam welding: 1 Butt welding: 2 Gluing/adhesion: 2	Surface Treatment: Polishing: Mechanical: 2 Electrolytic/chemical: 3 Galvanizing: 3 Hot Dipping: 3																																					
Machinability (Zerspanbarkeitsindex): 20* *(CuZn39Pb3 = 100) Forming Methods: Hot Formability: 2 Cold Formability: 3 Corrosion resistance: Atmosphere: 2 Waters and alkaline: 2 Acids, Ammonia, Seawater: 1	Joining Methods: Soldering: 3 Brazing: 2 Oxy-acetylene welding: 1 Gas-shielded arc welding: 1 TIG welding: 1 MIG welding: 1 Spot/seam welding: 1 Butt welding: 2 Gluing/adhesion: 2	Surface Treatment: Polishing: Mechanical: 2 Electrolytic/chemical: 3 Galvanizing: 3 Hot Dipping: 3																																									
¹Information extracted from Kunferverband:																																											

¹Information extracted from Kupferverband;

Tolerances for Cold rolled Products of CW004A

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 13599:2014*			
Squariness 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