

Datasheet: EN Cu-ETP / CW004A 99,90% Pure Copper Hot 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 Hot rolled Products of CW004A

Dimensions: EN 1652:1997*

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

Tolerance on thickness for nominal widths w (mm)							
Nominal thickness t (mm)	$w \leq 700$		$700 < w \leq 1000$		$1000 < w \leq 1500$		$1500 < w$
	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), CuNi30MnFe (CW354H) and CuZn20Al2As (CW702R).

2) For alloys CuAl8Fe3 (CW303G), CuNi10FeIMN (CW352H), CuNi30MnFe (CW354H) and CuZn20Al2As (CW702R).

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

Dimensions: EN 1652:1997*

Tolerances on width of plate and sheet

Nominal thickness <i>t</i> (mm)	Tolerance on thickness for nominal widths <i>w</i> (mm)		
	<i>w</i> ≤ 350	350 < <i>w</i> ≤ 1250	1250 < <i>w</i>
<i>t</i> ≤ 2,0	+2,0 0	+6,0 0	By agreement
2,0 < <i>t</i> ≤ 5,0	+4,0 0	+8,0 0	
5,0 < <i>t</i>	+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)	<i>t</i> ≤ 15	± 50
Fixed length (FL)	<i>t</i> ≤ 5,0	+10 0
	5,0 < <i>t</i>	+15 0

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

Dimensions: EN 13599:2014*

Squareness of cut plate and sheet

Nominal width <i>w</i> (mm)	Maximum allowable differences between diagonals, for lengths <i>l</i> (mm)		
	1000 < <i>l</i> ≤ 2000	2000 < <i>l</i> ≤ 3000	3000 < <i>l</i>
350 < <i>w</i> ≤ 700	6	7	8
700 < <i>w</i> ≤ 1250	8	9	10
1250 < <i>w</i>	By agreement		

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

Dimensions: EN 1652:1997*

Tolerances on diameter for circles

Nominal diameter <i>d</i> (mm)	Maximum allowable differences between diagonals, for lengths <i>l</i> (mm)		
	1000 < <i>l</i> ≤ 2000	2000 < <i>l</i> ≤ 3000	3000 < <i>l</i>
<i>d</i> ≤ 500	± 1	± 1,5	± 2
500 < <i>d</i> ≤ 1000	± 2	± 2,5	± 3
1000 < <i>d</i> ≤ 2000	± 3	± 3,5	± 4
700 < <i>d</i>	-	-	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 ≤ 1,0	1,0 < t ≤ 4,0
3 < w ≤ 8	12	-
8 < w ≤ 15	8	10
15 < w	4	6

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