

Datasheet: EN Cu-ETP / CW004A 99,9% Pure Copper Rod, bar and wire for general electrical purposes Alumeco ApS 18-03-2025				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 and fasteners Electrical installations Electronic products Lightning rods and grounding				Important norms and literature: General Standards EN 13601:2013: Copper and copper alloys – Copper rod, bar and wire for general electrical purposes Geometric Tolerance: EN 13601:2013: Copper and copper alloys – Copper rod, bar and wire for general electrical purposes								
Main properties: High thermal and electrical conductivity Excellent forming properties												
Chemical composition in %: EN 13601:2013												
Cu		Bi		Pb		O		Other elements				
Each		Together										
99,90		Max. 0,0005		Max. 0,005		Max. 0,040		-				
0,03												
Mechanical properties: EN 13601:2013												
Material Condition	Round, Square & Hexagonal	Rectangular		Tensile strength R _m	0,2% proof strength R _{p0,2}	Elongation		Hardness HBW				
		mm				Min. %						
	mm	Thickness	Width	MPa Min.	MPa	A _{100mm}	A					
D	2 – 160	0,5 – 40	1 – 200					COLD WORKED WITHOUT SPECIFIED PROPERTIES				
R200	2 – 160	1 – 40	1 – 200	200	Max.120	25	35	-				
H065	2 – 80	0,5 – 40	1 – 200	-	-	-	-	65 – 90				
R230	30 – 80	10 – 40	10 – 200	230	Min. 160	-	18	-				
R250	2 – 10	1 – 10	5 – 200	250	Min. 200	8	12	-				
	10 – 140	10 – 40	10 - 200	250	Min. 180	-	15	-				
H085	2 – 40	0,5 – 20	1 – 120	-	-	-	-	85 – 110				
R280	20 – 60	20 – 40	20 – 160	280	Min. 240	-	10	-				
* Information values only;												
Physical properties:												
Density (20 °C)	Solidification range	Material condition		Electrical conductivity	Volume resistivity	Mass resistivity	Thermal conductivity	E – modulus				
(20 °C)							(20 °C)	(20 °C)				
g/cm³	°C			% IACS	Min.	Max.	Max.	W/m K	N / mm²			
		D		96,6	0,01786	0,1588						
8,93	1083	R200, R230, H065, R250		100	0,01724	0,1533	394	110.000				
		H085, R280		98,3	0,01754	0,1559						
Properties and information's (3 Excellent; 2 Good; 1 Poor/not recommendable)¹												
Machinability (Zerspanbarkeitsindex): 2* *(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 Kupferverband;												

Tolerances for Rods, Bars and Wires of CW004A

Tolerances for Rods, Bars and Wires of Steel in			Dimensions in millimetres	
Dimensions: EN 13601:2013*				
Dimensional tolerances for round, square and hexagonal rod and wire				
Nominal sizes	Tolerances			
	Round rod and wire (diameter) Class A	Square and hexagonal rod and wire (width across-flats) Class A		
$2 \leq D/W \leq 3$	0 - 0,06	-		
$3 < D/W \leq 6$	0 - 0,08	0 - 0,12		
$6 < D/W \leq 10$	0 - 0,09	0 - 0,15		
$10 < D/W \leq 18$	0 - 0,11	0 - 0,18		
$18 < D/W \leq 30$	0 - 0,13	0 - 0,21		
$30 < D/W \leq 50$	0 - 0,16	0 - 0,25		
$50 < D/W \leq 80$	0 - 0,19	0 - 0,30		
$80 < D/W \leq 120$	0 - 0,35	0 - 0,54		
$120 < D/W \leq 160$	0 - 0,60	0 - 0,63		

* Values are referred from Table 5 of EN 13601:2013

Dimensions: EN 13601:2013*							
Tolerances on width and thickness of bar and rectangular wire						Dimensions in millimetres	
Nominal width	Tolerance on width	Tolerance on nominal thickness for range of thickness					
		$0,5 \leq t \leq 3$	$3 < t \leq 6$	$6 < t \leq 10$	$10 < t \leq 18$	$18 < t \leq 30$	$30 < t \leq 40$
$1 \leq W \leq 10$	$\pm 0,08$	$\pm 0,05$	$\pm 0,06$	$\pm 0,08$	-	-	-
$10 < W \leq 18$	$\pm 0,10$	$\pm 0,05$	$\pm 0,06$	$\pm 0,08$	$\pm 0,10$	-	-
$18 < W \leq 30$	$\pm 0,15$	$\pm 0,05$	$\pm 0,07$	$\pm 0,09$	$\pm 0,10$	$\pm 0,15$	-
$30 < W \leq 50$	$\pm 0,20$	$\pm 0,06$	$\pm 0,09$	$\pm 0,10$	$\pm 0,12$	$\pm 0,15$	$\pm 0,20$
$50 < W \leq 80$	$\pm 0,25$	$\pm 0,09$	$\pm 0,10$	$\pm 0,12$	$\pm 0,15$	$\pm 0,18$	$\pm 0,25$
$80 < W \leq 120$	$\pm 0,30$	-	$\pm 0,12$	$\pm 0,15$	$\pm 0,18$	$\pm 0,23$	$\pm 0,30$
$120 < W \leq 160$	$\pm 0,40$	-	-	$\pm 0,18$	$\pm 0,20$	$\pm 0,25$	$\pm 0,35$
$160 < W \leq 200$	$\pm 0,50$	-	-	$\pm 0,20$	$\pm 0,25$	$\pm 0,30$	$\pm 0,40$

* Values are referred from Table 6 of EN 13601:2013

Dimensions: EN 13601:2013*		
Radii for rounded corners of rod, bar and wire		Dimensions in millimetres
Nominal thickness <i>t</i> or width <i>W</i> across-flats	Corner radius	Tolerance on corner radius
0,5 ≤ <i>t</i> / <i>W</i> ≤ 1	0,5 * <i>t</i> / <i>W</i>	-
1 < <i>t</i> / <i>W</i> ≤ 3	0,5	-
3 < <i>t</i> / <i>W</i> ≤ 6	0,8	± 0,2
6 < <i>t</i> / <i>W</i> ≤ 10	1,0	± 0,3
10 < <i>t</i> / <i>W</i> ≤ 30	1,6	± 0,4
30 < <i>t</i> / <i>W</i> ≤ 80	2,5	± 0,5
80 < <i>t</i> / <i>W</i> ≤ 120	4,0	± 1,0
120 < <i>t</i> / <i>W</i> ≤ 160	6,0	± 1,0

* Values are referred from Table 8 of EN 13601:2013

Dimensions: EN 13601:2013*	
Tolerance on fixed lengths (FL)	
Ordered length	Tolerance
$L \leq 3000$	+5 0
$3000 < L \leq 6000$	+10 0
$6000 < L \leq 10000$	+15 0

* Values are referred from Table 9 of EN 13601:2013

Dimensions: EN 13601:2013*
Maximum twist of square or hexagonal rod or rectangular bar

Nominal width W mm	Maximum permitted twist v mm	
	In any 1 m length	In total length L (in m)
$10 \leq W \leq 18$	1,0	$1,0 \times L$
$18 < W \leq 30$	1,5	$1,5 \times L$
$30 < W \leq 50$	2,0	$2,0 \times L$
$50 < W \leq 80$	3,0	$3,0 \times L$
$80 < W \leq 120$	4,5	$4,5 \times L$
$120 < W \leq 200$	6,0	$6,0 \times L$

* Values are referred from Table 10 of EN 13601:2013

Dimensions: EN 13601:2013*
Straightness of rod and bar

Nominal diameter, width across-flats, thickness or width	Maximum deviation from straightness (See Figure 5 in EN 13601:2013)		
	h_2 in any length l_2 of 400 mm	h_1 for total length l_1	
$10 \text{ mm} \leq$	0,8 mm	$1 \text{ m} \leq l_1 \leq 4 \text{ m}$	$> 4 \text{ m}$
		$2,00 \text{ mm} \times l_1$	by agreement

* Values are referred from Table 11 of EN 13601:2013

Dimensions: EN 13601:2013*
Flatness of bar

Nominal width W mm	Maximum deviation from flatness e for nominal thickness mm	
	$1 \leq t \leq 6$	$6 < t \leq 40$
$10 \leq W \leq 30$	0,2	0,15
$30 < W \leq 50$	0,3	0,2
$50 < W \leq 80$	0,4	0,25
$80 < W \leq 120$	0,5	0,3
$120 < W \leq 200$	-	0,5

Where the ratio nominal width: nominal thickness is greater than 15:1, the deviation from flatness shall be agreed between the purchaser and the supplier.

* Values are referred from Table 12 of EN 13601:2013

Dimensions: EN 13601:2013*
Sampling rate

Nominal diameter or width across-flats w mm	Mass of inspection lot for one test sample kg
$0,1 < d/W \leq 0,8$	≤ 100
$0,8 < d/W \leq 3,0$	≤ 250
$3,0 < d/W \leq 10,0$	≤ 500
$10,0 < d/W \leq 25,0$	≤ 1000
$25,0 < d/W \leq 50,0$	≤ 1500
$50,0 < d/W$	≤ 2000

For wire with polygonal or rectangular cross-section, the diameter of a round wire of equivalent cross-sectional area.

* Values are referred from Table 13 of EN 13601:2013