

<b>Datasheet:</b>  <b>EN Cu-HCP / CW021A</b> <b>99,95% Pure Copper</b> <b>Rod, bar and wire for general electrical purposes</b>  <b>Alumeco ApS</b> 18-03-2025				<b>Internal alloy name:</b> CW021A <b>Metal:</b> Copper  <b>Chemical Symbol:</b> Cu-HCP  <b>EN:</b> EN Cu-HCP <b>UNS:</b> C10300 <b>SIS:</b> - <b>GB:</b> TU0.003 / C10300 <b>JIS:</b> -  <b>Also known as:</b> - <b>Alloy type:</b> Electrical conducting				
<b>Main usage:</b> <ul style="list-style-type: none"> <li>• Electrical conductors</li> <li>• Industrial applications – e.g. boilers, pressure tanks, piping etc.</li> <li>• Components for impact extrusion</li> </ul>				<b>Important norms and literature:</b>  <b>General Standards</b> EN 13601:2013: Copper and copper alloys – Copper rod, bar and wire for general electrical purposes  <b>Geometric Tolerance:</b> EN 13601:2013: Copper and copper alloys – Copper rod, bar and wire for general electrical purposes				
<b>Main properties:</b> <ul style="list-style-type: none"> <li>• High thermal and electrical conductivity</li> <li>• Good atmospheric corrosion resistance</li> <li>• Good welding and soldering properties as well as resistance to hydrogen</li> </ul>								
<b>Chemical composition in %: EN 13601:2013</b>								
<b>Cu</b>	<b>Bi</b>	<b>Pb</b>	<b>Pb</b>	<b>Other elements</b>				
Min. 99,95	Max. 0,0005	0,002 – 0,007	Max. 0,005	Each	Together			
				-	0,03			
<b>Mechanical properties: EN 13601:2013</b>								
Material Condition	Round, Square & Hexagonal mm	Rectangular mm		Tensile strength R <sub>m</sub> MPa Min.	0,2% proof strength R <sub>p0,2</sub> MPa	Elongation Min. %		Hardness HBW
		Thickness	Width			A <sub>100mm</sub>	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;								
<b>Physical properties:</b>								
Density (20 °C) g/cm <sup>3</sup>	Solidification range °C	Material condition	Electrical conductivity % IACS Min.	Volume resistivity $\frac{\Omega \times \text{mm}^2}{\text{m}}$ Max.	Mass resistivity $\frac{\Omega \times \text{g}}{\text{m}^2}$ Max.	Thermal conductivity (20 °C) W/m K	E – modulus (20 °C) N / mm <sup>2</sup>	
8,94	1083	D	94,8	0,01818	0,1616	385	115.000	
		R200, R230, R250	98,3	0,01754	0,1559			
		R280	96,6	0,01786	0,1588			
<b>Properties and information's (3 Excellent; 2 Good; 1 Poor/not recommendable)<sup>1</sup></b>								
<b>Machinability (Zerspanbarkeitsindex): 20*</b> *(CuZn39Pb3 = 100)		<b>Joining Methods:</b> Soldering: 3 Brazing: 3 Laser welding: 1-2 Gas-shielded arc welding: 1 TIG welding: 2-3 MIG welding: 2-3 Spot/seam welding: 1 Butt welding: 2 Gluing/adhesion: 2			<b>Surface Treatment:</b> <u>Polishing:</u> Mechanical: 3 Electrolytic: 3  <u>Galvanizing:</u> 3  <u>Hot Dipping:</u> 3			
<b>Forming Methods:</b> Hot Formability: 2 Cold Formability: 3								
<b>Corrosion resistance:</b> Atmosphere: 2 Waters and alkaline: 2 Acids, Ammonia, Seawater etc.: 1								
<sup>1</sup> Information extracted from Kupferverband;								

## Tolerances for Rods, Bars and Wires of CW021A

Dimensions: EN 13601:2013*		
Dimensional tolerances for round, square and hexagonal rod and wire		
Dimensions in millimetres		
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 $t$ or width $W$ across-flats	Corner radius	Tolerance on corner radius
$0,5 \leq t/W \leq 1$	$0,5 * t/W$	-
$1 < t/W \leq 3$	0,5	-
$3 < t/W \leq 6$	0,8	$\pm 0,2$
$6 < t/W \leq 10$	1,0	$\pm 0,3$
$10 < t/W \leq 30$	1,6	$\pm 0,4$
$30 < t/W \leq 80$	2,5	$\pm 0,5$
$80 < t/W \leq 120$	4,0	$\pm 1,0$
$120 < t/W \leq 160$	6,0	$\pm 1,0$

\* 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 $l_1$ $1 \text{ m} \leq l_1 \leq 4 \text{ m}$	$h_1$ for total length $l_1$ $> 4 \text{ m}$
$10 \text{ mm} \leq$	0,8 mm	$2,00 \text{ mm} \times l_1$	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
$0,1 < d/W \leq 0,8$	$\leq 100$
$0,8 < d/W \leq 3,0$	$\leq 250$
$3,0 < d/W \leq 10,0$	$\leq 500$
$10,0 < d/W \leq 25,0$	$\leq 1000$
$25,0 < d/W \leq 50,0$	$\leq 1500$
$50,0 < d/W$	$\leq 2000$

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