

Datasheet: EN CuZn39Pb3 / CW614N Brass with Lead Rods for free machining purposes Alumeco ApS 06-05-2025				Internal alloy name: CW614N Metal: Brass Chemical Symbol: CuZn39Pb3 EN: EN CuZn39Pb3 UNS: C38500 SIS: SS 5170 GB: - JIS: C3603 Also known as: MS58 / Messing 58 Alloy type: Brass with lead																																																																																											
Main usage: Faucets, fittings and sanitary industry Machined parts, screws, nuts and bolts Components for watches Electrical parts, valves and electronics Main properties: Excellent machinability Reduced chip dimensions				Important norms and literature: General Standards EN 12164:2024: Copper and copper alloys – Rod for free machining purposes Geometric Tolerance EN 12164:2024: Copper and copper alloys – Rod for free machining purposes EN 12165:2024: Copper and copper alloys – Wrought and unwrought forging stock																																																																																											
Chemical composition in %: EN 12164:2024 <table><tr><td>Cu</td><td>Al</td><td>As</td><td>Fe</td><td>Ni</td><td>Pb</td><td>Sn</td><td>Zn</td><td>Others</td></tr><tr><td>57,0 – 59,0</td><td>Max. 0,05</td><td>-</td><td>Max. 0,3</td><td>Max. 0,3</td><td>2,5 – 3,5</td><td>Max. 0,3</td><td>Remaining</td><td>Max. 0,2</td></tr></table>									Cu	Al	As	Fe	Ni	Pb	Sn	Zn	Others	57,0 – 59,0	Max. 0,05	-	Max. 0,3	Max. 0,3	2,5 – 3,5	Max. 0,3	Remaining	Max. 0,2																																																																					
Cu	Al	As	Fe	Ni	Pb	Sn	Zn	Others																																																																																							
57,0 – 59,0	Max. 0,05	-	Max. 0,3	Max. 0,3	2,5 – 3,5	Max. 0,3	Remaining	Max. 0,2																																																																																							
Mechanical properties: EN 12164/12165 <table><tr><td rowspan="2">Material Condition</td><td rowspan="2">Diameter / Bar thickness</td><td rowspan="2">Width across flats</td><td rowspan="2">Tensile Strength Rm</td><td rowspan="2">0,2% Proof Strength Rp0,2</td><td colspan="2">Elongation</td><td rowspan="2">Hardness HBW</td><td rowspan="2">Tolerance Class</td></tr><tr><td>A11,3 % Min.</td><td>A % Min.</td></tr><tr><td colspan="9">≤ 80 mm Rods: EN 12164</td></tr><tr><td>R360</td><td>6 – 80</td><td>5 – 60</td><td>360</td><td>Max. 350</td><td>15</td><td>20</td><td>-</td><td rowspan="6">B</td></tr><tr><td>H090</td><td>6 – 80</td><td>5 – 60</td><td>-</td><td>-</td><td>-</td><td>-</td><td>90 – 125</td></tr><tr><td>R430</td><td>2 – 60</td><td>2 – 40</td><td>430</td><td>Min. 220</td><td>10</td><td>10</td><td>-</td></tr><tr><td>H110</td><td>2 – 60</td><td>2 – 40</td><td>-</td><td>-</td><td>-</td><td>-</td><td>110 – 160</td></tr><tr><td>R500</td><td>2 - 14</td><td>2 - 10</td><td>500</td><td>Min. 350</td><td>5</td><td>5</td><td>-</td></tr><tr><td>H135</td><td>2 - 14</td><td>2 - 10</td><td>-</td><td>-</td><td>-</td><td>-</td><td>Min. 135</td></tr><tr><td colspan="9">> 80 mm Rods: EN 12165</td></tr><tr><td>M</td><td>80 < D</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>A</td></tr></table>									Material Condition	Diameter / Bar thickness	Width across flats	Tensile Strength Rm	0,2% Proof Strength Rp0,2	Elongation		Hardness HBW	Tolerance Class	A11,3 % Min.	A % Min.	≤ 80 mm Rods: EN 12164									R360	6 – 80	5 – 60	360	Max. 350	15	20	-	B	H090	6 – 80	5 – 60	-	-	-	-	90 – 125	R430	2 – 60	2 – 40	430	Min. 220	10	10	-	H110	2 – 60	2 – 40	-	-	-	-	110 – 160	R500	2 - 14	2 - 10	500	Min. 350	5	5	-	H135	2 - 14	2 - 10	-	-	-	-	Min. 135	> 80 mm Rods: EN 12165									M	80 < D	-	-	-	-	-	-	A
Material Condition	Diameter / Bar thickness	Width across flats	Tensile Strength Rm	0,2% Proof Strength Rp0,2	Elongation		Hardness HBW	Tolerance Class																																																																																							
					A11,3 % Min.	A % Min.																																																																																									
≤ 80 mm Rods: EN 12164																																																																																															
R360	6 – 80	5 – 60	360	Max. 350	15	20	-	B																																																																																							
H090	6 – 80	5 – 60	-	-	-	-	90 – 125																																																																																								
R430	2 – 60	2 – 40	430	Min. 220	10	10	-																																																																																								
H110	2 – 60	2 – 40	-	-	-	-	110 – 160																																																																																								
R500	2 - 14	2 - 10	500	Min. 350	5	5	-																																																																																								
H135	2 - 14	2 - 10	-	-	-	-	Min. 135																																																																																								
> 80 mm Rods: EN 12165																																																																																															
M	80 < D	-	-	-	-	-	-	A																																																																																							
* Information values only;																																																																																															
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 colspan="3">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 colspan="3">N / mm²</td></tr><tr><td>8,47</td><td>875</td><td>25</td><td>117</td><td>21,4</td><td>450 - 600</td><td colspan="3">97000</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			8,47	875	25	117	21,4	450 - 600	97000																																																														
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																																																																																									
8,47	875	25	117	21,4	450 - 600	97000																																																																																									
Properties and information's (3 Excellent; 2 Good; 1 Poor/not recommendable) <table><tr><td> Machinability (Zerspanbarkeitsindex): 85* *(CuZn39Pb3 = 100) Forming Methods: Hot Formability: 2 Cold Formability: 1 Corrosion resistance: Atmosphere: 2 Waters and alkaline: 1-2 Acids, Ammonia, Seawater etc.: 1 </td><td> Joining Methods: Soldering: 3 Brazing: 2 Oxy-acetylene welding: 1 Gas-shielded arc welding: 1 TIG welding: 1 MIG welding: 1 Gluing/adhesion: 2 </td><td> Surface Treatment: Polishing: Mechanical: 2-3 Electrolytic/chemical: 1 Galvanizing: 2-3 Hot Dipping: 2-3 </td></tr></table>									Machinability (Zerspanbarkeitsindex): 85* *(CuZn39Pb3 = 100) Forming Methods: Hot Formability: 2 Cold Formability: 1 Corrosion resistance: Atmosphere: 2 Waters and alkaline: 1-2 Acids, Ammonia, Seawater etc.: 1	Joining Methods: Soldering: 3 Brazing: 2 Oxy-acetylene welding: 1 Gas-shielded arc welding: 1 TIG welding: 1 MIG welding: 1 Gluing/adhesion: 2	Surface Treatment: Polishing: Mechanical: 2-3 Electrolytic/chemical: 1 Galvanizing: 2-3 Hot Dipping: 2-3																																																																																				
Machinability (Zerspanbarkeitsindex): 85* *(CuZn39Pb3 = 100) Forming Methods: Hot Formability: 2 Cold Formability: 1 Corrosion resistance: Atmosphere: 2 Waters and alkaline: 1-2 Acids, Ammonia, Seawater etc.: 1	Joining Methods: Soldering: 3 Brazing: 2 Oxy-acetylene welding: 1 Gas-shielded arc welding: 1 TIG welding: 1 MIG welding: 1 Gluing/adhesion: 2	Surface Treatment: Polishing: Mechanical: 2-3 Electrolytic/chemical: 1 Galvanizing: 2-3 Hot Dipping: 2-3																																																																																													

Tolerances for Rods of CW614N

Dimensions: EN 12164:2024*		Dimensions in millimetres
Tolerances on diameter of round rod		
Nominal diameter	Tolerances Class B	
$2 \leq D \leq 3$	0	- 0,025
$3 < D \leq 6$	0	- 0,030
$6 < D \leq 10$	0	- 0,036
$10 < D \leq 18$	0	- 0,043
$18 < D \leq 30$	0	- 0,052
$30 < D \leq 50$	-	
$50 < D \leq 80$	-	

* Values are referred from Table 16 of EN 12164:2024

Dimensions: EN 12164:2024*		Dimensions in millimetres
Tolerances on width across-flats of regular polygonal rod		
Nominal width across-flats	Tolerances	
$2 \leq W \leq 3$	0	- 0,06
$3 < W \leq 6$	0	- 0,08
$6 < W \leq 10$	0	- 0,09
$10 < W \leq 18$	0	- 0,11
$18 < W \leq 30$	0	- 0,13
$30 < W \leq 50$	0	- 0,16
$50 < W \leq 60$	0	- 0,19

* Values are referred from Table 17 of EN 12164:2024

Dimensions: EN 12164:2024*			Dimensions in millimetres
Tolerances on straightness of rod			
Nominal diameter	Maximum deviation from straightness (See Figure 1 in EN 12164:2024)		
	h_2 depth of arch in any length l_2 of 400 mm	h_1 depth of arch in any length l_1 of 1000 mm	
$10 \leq D \leq 50$	0,4	1,0	

* Values are referred from Table 18 of EN 12164:2024

Dimensions: EN 12164:2024*			Dimensions in millimetres
Corner radii for square and polygonal rod			
Nominal diameter or width across-flats	Preferred lengths	Tolerance on length	
$2 \leq w \leq 30$	3000 or 4000	± 50	
$30 < w \leq 50$	3000 or 4000	± 100	
$50 < w \leq 80$	3000	± 100	

* Values are referred from Table 19 of EN 12164:2024

Dimensions: EN 12164:2024*			Dimensions in millimetres
Corner radii for square, hexagonal and octagonal rod			
Nominal width across-flats	Radii for sharp and rounded corners		
	Sharp max.	Rounded range	
$2 \leq w \leq 3$	0,2	0,2 – 0,3	
$3 < w \leq 6$	0,3	0,3 – 0,5	
$6 < w \leq 10$	0,4	0,4 – 0,8	
$10 < w \leq 18$	0,5	0,5 – 1,2	
$18 < w \leq 30$	0,6	0,6 – 1,8	
$30 < w \leq 50$	0,7	0,7 – 2,8	
$50 < w \leq 80$	0,8	0,8 – 4,0	

* Values are referred from Table 20 of EN 12164:2024

Dimensions: EN 12164:2024* Maximum twist of square, hexagonal and octagonal rod		Dimensions in millimetres
Nominal width across-flats W	Maximum permitted twist V in any 1 m length of rod (mm)	
$10 \leq W \leq 18$	1,0	
$18 < W \leq 30$	2,0	
$30 < W \leq 60$	3,0	

* Values are referred from Table 21 of EN 12164:2024

Dimensions: EN 12164:2024* Sampling rate	
Nominal diameter or width across-flats w (mm)	Mass of inspection lot for one test sample kg
$D/W \leq 25$	≤ 1000
$25 < D/W$	≤ 2000

* Values are referred from Table 22 of EN 12164:2024

Dimensions: EN 12165:2024* Tolerances on diameter of round forging stock		Dimensions in millimetres
Nominal diameter	Tolerances Class A	
$80 < D \leq 120$	± 2	
$120 < D \leq 160$	$\pm 2,5$	

* Values are referred from Table 10 of EN 12165:2024

Dimensions: EN 12165:2024* Tolerances on straightness of round forging stock			Dimensions in millimetres
Nominal diameter	Maximum deviation from straightness (See Figure 1 in EN 12164:2024)		
	h_2 depth of arch in any length l_2 of 400 mm	h_1 depth of arch in any length l_1 of 1000 mm	
Straightness tolerances for rods over 60 mm diameter shall be agreed between the involved parties			