Datasheet:

EN CuZn40Pb2 / CW617N
Brass with Lead
Rods for free machining purposes

Alumeco ApS
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Internal alloy name:	**CW617N**
Metal:	**Brass**
Chemical Symbol:	**CuZn40Pb2**
EN:	**EN CuZn40Pb2**
UNS:	**C38000**
SIS:	**SS 5168**
GB:	**-**
JIS:	**C3561**
Also known as:	**-**
Alloy type:	**Brass with lead**

Main usage:

- Sanitary, heating and industrial fixtures
- Machined parts, screws, gears, nuts and bolts
- Components for watches, glass hinges, bike valves
- Furniture fittings

Main properties:

- Excellent machinability
- Great hot formability properties
- Lower lead content compared to CW614N
- Contact with drinking water

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

Cu	Al	As	Fe	Ni	Pb	Sn	Zn	Others
57,0 – 59,0	Max. 0,05	-	Max. 0,3	Max. 0,3	1,6 – 2,5	Max. 0,3	Remaining	Max. 0,2

Mechanical properties: EN 12164/12165

Material Condition	Diameter / Bar thickness mm	Width across flats mm	Tensile Strength Rm MPa	0,2% Proof Strength $Rp_{0,2}$ MPa	Elongation $A_{11,3}$ % Min.	Elongation A % Min.	Hardness HBW	Tolerance Class
≤ 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:

Density (20 °C) g/cm³	Solidification range °C	Electrical conductivity %IACS	Thermal conductivity (20 °C) W/m K	Thermal expansion (20 - 300 °C) µm m^{-1} K^{-1}	Annealing temperature ºC	E – modulus (20 °C) N / mm²
8,44	880	28	123	21,4	450 - 600	97000

Properties and information's (3 Excellent; 2 Good; 1 Poor/not recommendable)

Machinability (Zerspanbarkeitsindex): 95*
*(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:	1-2

Surface Treatment:

Polishing:	
Mechanical:	2-3
Electrolytic/chemical:	1
Galvanizing:	2-3
Hot Dipping:	2-3

Tolerances for Rods of CW617N

Dimensions: EN 12164:2024*

Tolerances on diameter of round rod

Dimensions in millimetres

Nominal diameter	Tolerances Class B
2 ≤ *D* ≤ 3	0 - 0,025
3 < *D* ≤ 6	0 - 0,030
6 < *D* ≤ 10	0 - 0,036
10 < *D* ≤ 18	0 - 0,043
18 < *D* ≤ 30	0 - 0,052
30 < *D* ≤ 50	-
50 < *D* ≤ 80	-

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

Dimensions: EN 12164:2024*

Tolerances on width across-flats of regular polygonal rod

Dimensions in millimetres

Nominal width across-flats	Tolerances
2 ≤ *W* ≤ 3	0 - 0,06
3 < *W* ≤ 6	0 - 0,08
6 < *W* ≤ 10	0 - 0,09
10 < *W* ≤ 18	0 - 0,11
18 < *W* ≤ 30	0 - 0,13
30 < *W* ≤ 50	0 - 0,16
50 < *W* ≤ 60	0 - 0,19

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

Dimensions: EN 12164:2024*

Tolerances on straightness of rod

Dimensions in millimetres

Nominal diameter	Maximum deviation from straightness (See Figure 1 in EN 12164:2024) *h2* *depth of arch in any length l2 of 400 mm*	 *h1* *depth of arch in any length l1 of 1000 mm*
10 ≤ *D* ≤ 50	0,4	1,0

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

Dimensions: EN 12164:2024*

Corner radii for square and polygonal rod

Dimensions in millimetres

Nominal diameter or width across-flats	Preferred lengths	Tolerance on length
2 ≤ *w* ≤ 30	3000 or 4000	± 50
30 < *w* ≤ 50	3000 or 4000	± 100
50 < *w* ≤ 80	3000	± 100

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

Dimensions: EN 12164:2024*

Corner radii for square, hexagonal and octagonal rod

Dimensions in millimetres

Nominal width across-flats	Radii for sharp and rounded corners Sharp max.	 Rounded range
2 ≤ *w* ≤ 3	0,2	0,2 – 0,3
3 < *w* ≤ 6	0,3	0,3 – 0,5
6 < *w* ≤ 10	0,4	0,4 – 0,8
10 < *w* ≤ 18	0,5	0,5 – 1,2
18 < *w* ≤ 30	0,6	0,6 – 1,8
30 < *w* ≤ 50	0,7	0,7 – 2,8
50 < *w* ≤ 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 ≤ *W* ≤ 18	1,0
18 < *W* ≤ 30	2,0
30 < *W* ≤ 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 ≤ 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* ≤ 120	± 2
120 < *D* ≤ 160	± 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)	
	h2 depth of arch in any length *l2* of 400 mm	*h1* depth of arch in any length *l1* of 1000 mm
Straightness tolerances for rods over 60 mm diameter shall be agreed between the involved parties		