Datasheet:

EN CuZn35Ni3Mn2AlPb / CW710R Complex Copper-Zinc Alloy Profiles, Bars & Rods for general purposes

Alumeco ApS
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Internal alloy name: CW710R
Metal: Brass

Chemical Symbol: CuZn35Ni3Mn2AlPb

EN: EN CuZn35Ni3Mn2AlPb
UNS: -
SIS: -
DIN: 2.0540
JIS: -

Also known as: -
Alloy type: Complex copper-zinc alloy

Main usage:

- Structure parts for machines and vehicles, piston parts
- Machined parts, screws, gears, bearings, nuts and bolts
- High load, slide- & wear-plates

Main properties:

- Great Strength
- Good resistance to corrosion against seawater

Important norms and literature:

General Standards
EN 12163:2016: Copper and copper alloys – Rod for general purposes

Geometric Tolerance
EN 12163:2016: Copper and copper alloys – Rod for general purposes
EN 12165:2024: Copper and copper alloys – Wrought and unwrought forging stock
EN 12167:2016: Copper and copper alloys – Profiles and bars for general purposes

Chemical composition in %: EN 12163:2024

Cu	Al	Fe	Mn	Ni	Pb	Si	Sn	Zn	Others
58,0 – 60,0	0,3 – 1,3	Max. 0,5	1,5 – 2,5	2,0 – 3,0	0,2 – 0,8	Max. 0,1	Max. 0,5	Remaining	Max. 0,3

Mechanical properties: EN 12163/12167

Material Condition	Diameter / Bar thickness mm	Width across flats mm	Tensile Strength Rm Min. MPa	0,2% Proof Strength $Rp_{0,2}$ MPa	Elongation Min. % $A_{100\ mm}$	Elongation Min. % $A_{11,3}$	Elongation Min. % A	Hardness HBW	Tolerance Class
≤ 80 mm Rods: EN 12163									
R490	5 – 40	5 – 40	490	Min. 290	-	15	18	-	B
H120	5 – 40	5 – 40	-	-	-	-	-	120 – 160	
> 80 mm Rods: EN 12165									
M	80 < D	-	-	-	-	-	-	-	A
Profiles & Bars: EN 12167									
R490	3 – 6	-	490	Min. 290	10	15	18	-	B
H120	3 – 6	-	-	-	-	-	-	120 – 160	

*** 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 °C	E – modulus (20 °C) N / mm²
8,3	870 – 900	10,1	50	20,7	350 - 450	93000

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

Machinability (Zerspanbarkeitsindex): 50*
*(CuZn39Pb3 = 100)

Forming Methods:

Hot Formability:	2
Cold Formability:	1

Corrosion resistance:

Atmosphere:	3
Waters and alkaline:	2
Acids, Ammonia, Seawater etc.:	1

Joining Methods:

Soldering:	1-2
Brazing:	2
Oxy-acetylene welding:	1
Gas-shielded arc welding:	2
TIG welding:	2
MIG welding:	2
Gluing/adhesion:	2

Surface Treatment:

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

Tolerances for Bars of CW710R (Rods below)

Dimensions: EN 12167:2016*
Tolerances on width and thickness of bar

Nominal thickness t (mm)	Tolerance on width	Tolerance on thickness for range of thickness (mm)					
		3 < t ≤ 6	6 < t ≤ 10	10 < t ≤ 18	18 < t ≤ 30	30 < t ≤ 50	50 < t ≤ 60
Class B tolerance							
3 ≤ t ≤ 18	± 0,15	± 0,10	± 0,12	± 0,15	-	-	-
18 < t ≤ 30	± 0,22	± 0,10	± 0,12	± 0,15	± 0,22	-	-
30 < t ≤ 50	± 0,30	± 0,13	± 0,15	± 0,18	± 0,22	± 0,30	-
50 < t ≤ 80	± 0,37	± 0,16	± 0,18	± 0,22	± 0,30	± 0,37	-
80 < t ≤ 120	± 0,45	± 0,18	± 0,22	± 0,27	± 0,35	± 0,45	-

* Values are referred from Table 17 of EN 12167:2016

Dimensions: EN 12167:2016*
Tolerances on length of bar

Nominal width *w* (mm)	Preferred (available) lengths (mm)	Tolerance on length (mm)
3 ≤ *w* ≤ 18	3000, 4000	± 50
18 < *w* ≤ 30	3000, 4000	± 100
30 < *w* ≤ 50	2000, 3000, 4000	± 150
50 < *w* ≤ 80	2000, 3000	± 200
80 < *w* ≤ 120	1000, 2000	± 200

* Values are referred from Table 18 of EN 12167:2016

Dimensions: EN 12167:2016*
Tolerances on straightness of bar, for widths 10 mm and over

Tolerance class	Maximum deviation from straightness (mm)	
	Localized over any 400 mm length	Over whole length *L* of bar in metres (*L* ≥ 1m)
A	2,4	6,0 * *L*
B	1,6	4,0 * *L*
C	0,8	2,0 * *L*

* Values are referred from Table 19 of EN 12167:2016

Dimensions: EN 12167:2016*
Maximum twist of bar

Nominal width *w* (mm)	Maximum permitted twist V in any 1000 mm length of bar (See Figure 2 in EN 12167:2016)		
	Class A	Class B	Class C
3 ≤ *w* ≤ 18	2,0	1,5	1,0
18 < *w* ≤ 30	3,0	2,3	1,5
30 < *w* ≤ 50	4,0	3,0	2,0
50 < *w* ≤ 80	6,0	4,5	3,0
80 < *w* ≤ 120	9,0	9,0	4,5
For bar of total length greater than 2000 mm, the permitted twist over the total length shall be twice the appropriate maximum given in the table for “in any 1000 mm”.			

* Values are referred from Table 20 of EN 12167:2016

Dimensions: EN 12167:2016*
Corner radii of bar

Nominal thickness *t* (mm)	Radii of corners	
	Sharp max.	Rounded range
3 ≤ *t* ≤ 6	0,3	0,3 – 0,5
6 < *t* ≤ 10	0,4	0,4 – 0,8
10 < *t* ≤ 18	0,5	0,5 – 1,2
18 < *t* ≤ 30	0,6	0,6 – 1,8
30 < *t* ≤ 40	0,7	0,7 – 2,8
40 < *t* ≤ 60	0,8	0,8 – 4,0
NOTE: A bar having rounded corners of radius greater than those covered by this table is considered to be a profile		

* Values are referred from Table 21 of EN 12167:2016

Tolerances for Rods of CW710R

Dimensions: EN 12163:2024*
Dimensional tolerances for rod

Nominal diameter or width across-flats	Tolerances	
	Class A	Class B
1,6 ≤ *d/w* ≤ 3	± 0,10	± 0,05
3 < *d/w* ≤ 6	± 0,15	± 0,08
6 < *d/w* ≤ 10	± 0,20	± 0,11
10 < *d/w* ≤ 18	± 0,25	± 0,14
18 < *d/w* ≤ 30	± 0,30	± 0,17
30 < *d/w* ≤ 50	± 0,60	± 0,20
50 < *d/w* ≤ 80	± 0,70	± 0,37

* Values are referred from Table 17 of EN 12163:2024

Dimensions: EN 12163:2024*
Tolerances on straightness of rod

Nominal diameter or width across-flats	Maximum deviation from straightness (See Figure 1 in EN 12163:2024)	
	h2 depth of arch in any length l2 of 400 mm	*h1* depth of arch in any length l1 of 1000 mm
10 ≤ *d/w* ≤ 50	2,5	6,0

* Values are referred from Table 18 of EN 12163:2024

Dimensions: EN 12163:2024*
Corner radii for square and polygonal rod

Nominal width across-flats	Radii for sharp and rounded corners	
	Sharp max.	Rounded range
1,6 ≤ *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 19 of EN 12163:2024

Dimensions: EN 12163:2024*
Maximum twist of square and polygonal rod

Nominal width across-flats *w*	Maximum permitted twist *V* in any 1 m length of rod
10 ≤ *w* ≤ 18	2,0
18 < *w* ≤ 30	3,0
30 < *w* ≤ 60	4,0

* Values are referred from Table 20 of EN 12163:2024

Dimensions: EN 12163:2024*
Sampling rate

Nominal width across-flats *w* (mm)	Mass of inspection lot for one test sample kg
w ≤ 25	≤ 1000
25 < *w*	≤ 2000

* Values are referred from Table 21 of EN 12163:2024

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		