Datasheet:

EN CuSn7Zn4Pb7-C / CC493K
Classic Bronze
Bars & Rods for general purposes

Alumeco ApS
02-04-2025

Internal alloy name:	**CC493K**
Metal:	**Bronze**
Chemical Symbol:	**CuSn7Zn4Pb7-C**
EN:	**EN CuSn7Zn4Pb7-C-GC**
UNS:	**C93200**
SIS:	**-**
GB:	**-**
JIS:	**-**
Also known as:	**RG7 / Gun metal / rødgods**
Alloy type:	**Classic bronze**

Main usage:

- Bearings and sliding elements
- Components for hydraulics, valves, bushings
- Friction rings/discs

Main properties:

- Excellent machinability
- Good wear resistance
- Good resistance to corrosion against air, water/seawater and some weak acids

Important norms and literature:

General Standards
EN 1982:2024: Copper and copper alloys – Ingots and castings

Geometric Tolerance
EN 12163:2024: Copper and copper alloys – Rod for general purposes
EN 12167:2016: Copper and copper alloys – Profiles and bars for general purposes

Chemical composition in %: EN 1982:2024

Cu	Ni	P	Pb	Sn	Zn	Al	Fe	S	Sb	Si
81,0 – 85,0	Max. 2,0	Max. 0,1	5,0 – 8,0	6,0 – 8,0	2,0 – 5,0	Max. 0,01	Max. 0,2	Max. 0,1	Max. 0,3	Max. 0,01

Mechanical properties: EN 1982:2024

Casting process and designation	Tensile Strength R_m MPa Min.	0,2% proof strength $Rp_{0,2}$ MPa Min.	Elongation A % Min.	Hardness HBW Min.
Continuous GC	260	120	12	70
Centrifugal GZ	260	120	12	70

*** 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
8,83	860 - 1020	10	47	18	450 - 600	101000

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

Machinability (Zerspanbarkeitsindex): 85*
*(CuZn39Pb3 = 100)

Forming Methods:

Hot Formability:	1
Cold Formability:	1

Corrosion resistance:

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

Joining Methods:

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

Surface Treatment:

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

Tolerances for Bars of CC493K (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 A tolerance							
3 ≤ t ≤ 18	± 0,27	± 0,18	± 0,22	± 0,27	-	-	-
18 < t ≤ 30	± 0,33	± 0,18	± 0,22	± 0,27	± 0,33	-	-
30 < t ≤ 50	± 0,62	± 0,22	± 0,27	± 0,33	± 0,45	± 0,62	-
50 < t ≤ 80	± 1,20	± 0,27	± 0,33	± 0,45	± 0,52	± 0,74	± 1,00
80 < t ≤ 120	± 2,20	± 0,33	± 0,45	± 0,52	± 0,74	± 1,00	± 1,20
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 CC493K

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