

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 / rødgoods Alloy type: Classic bronze																											
Main usage: Bearings and sliding elements Components for hydraulics, valves, bushings Friction rings/discs					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																											
Main properties: Excellent machinability Good wear resistance Good resistance to corrosion against air, water/seawater and some weak acids																																
Chemical composition in %: EN 1982:2024 <table><tr><td>Cu</td><td>Ni</td><td>P</td><td>Pb</td><td>Sn</td><td>Zn</td><td>Al</td><td>Fe</td><td>S</td><td>Sb</td><td>Si</td></tr><tr><td>81,0 – 85,0</td><td>Max. 2,0</td><td>Max. 0,1</td><td>5,0 – 8,0</td><td>6,0 – 8,0</td><td>2,0 – 5,0</td><td>Max. 0,01</td><td>Max. 0,2</td><td>Max. 0,1</td><td>Max. 0,3</td><td>Max. 0,01</td></tr></table>											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
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Mechanical properties: EN 1982:2024 <table><tr><td rowspan="3">Casting process and designation</td><td>Tensile Strength R_m</td><td>0,2% proof strength R_{p0,2}</td><td>Elongation A</td><td>Hardness HBW</td></tr><tr><td>MPa Min.</td><td>MPa Min.</td><td>% Min.</td><td>Min.</td></tr><tr><td>Continuous GC</td><td>260</td><td>120</td><td>12</td><td>70</td></tr><tr><td>Centrifugal GZ</td><td>260</td><td>120</td><td>12</td><td>70</td></tr></table> * Information values only;											Casting process and designation	Tensile Strength R _m	0,2% proof strength R _{p0,2}	Elongation A	Hardness HBW	MPa Min.	MPa Min.	% Min.	Min.	Continuous GC	260	120	12	70	Centrifugal GZ	260	120	12	70			
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Properties and information's (3 Excellent; 2 Good; 1 Poor/not recommendable) <table><tr><td> 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 </td><td> 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 </td><td> Surface Treatment: Polishing: Mechanical: 1-2 Electrolytic/chemical: 2 Galvanizing: 2 Hot Dipping: 2 </td></tr></table>											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																			
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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)
$3 \leq w \leq 18$	3000, 4000	± 50
$18 < w \leq 30$	3000, 4000	± 100
$30 < w \leq 50$	2000, 3000, 4000	± 150
$50 < w \leq 80$	2000, 3000	± 200
$80 < w \leq 120$	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 ($L \geq 1m$)
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
$3 \leq w \leq 18$	2,0	1,5	1,0
$18 < w \leq 30$	3,0	2,3	1,5
$30 < w \leq 50$	4,0	3,0	2,0
$50 < w \leq 80$	6,0	4,5	3,0
$80 < w \leq 120$	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
$3 \leq t \leq 6$	0,3	0,3 – 0,5
$6 < t \leq 10$	0,4	0,4 – 0,8
$10 < t \leq 18$	0,5	0,5 – 1,2
$18 < t \leq 30$	0,6	0,6 – 1,8
$30 < t \leq 40$	0,7	0,7 – 2,8
$40 < t \leq 60$	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
$1,6 \leq d/w \leq 3$	$\pm 0,10$	$\pm 0,05$
$3 < d/w \leq 6$	$\pm 0,15$	$\pm 0,08$
$6 < d/w \leq 10$	$\pm 0,20$	$\pm 0,11$
$10 < d/w \leq 18$	$\pm 0,25$	$\pm 0,14$
$18 < d/w \leq 30$	$\pm 0,30$	$\pm 0,17$
$30 < d/w \leq 50$	$\pm 0,60$	$\pm 0,20$
$50 < d/w \leq 80$	$\pm 0,70$	$\pm 0,37$

* 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)	
	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
$10 \leq d/w \leq 50$	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
$1,6 \leq w \leq 3$	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 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
$10 \leq w \leq 18$	2,0
$18 < w \leq 30$	3,0
$30 < w \leq 60$	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
$w \leq 25$	≤ 1000
$25 < w$	≤ 2000

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