

# Material Datasheet: CuZn39Pb3

**MACHINING / HOT STAMPING BRASS RODS** 

# CuZn39Pb3

Standard alloy for machining rods CuZn39Pb3 is the benchmark material for machining, with a machinability index of 100 %. Therefore, it is the perfect material for applications where high-speed machining forming is required, ensuring maximum productivity and tool life on high speed repetition work. Furthermore, it also has excellent hot working properties, which makes it ideal for parts that need a posterior demanding machining.

MATERIAL DESIGNATION						
ASBW	International	EN	UNS	JIS	Further Restrictions**	
B14	CuZn39Pb3	CW614N	C38500	C3603 C3604	4 MS Common Approach, Part B	

REFEREN	ICE CHE	MICAL	СОМРО	SITION	IN % (M	AIN ELE	EMENTS	) *		
Material	Cu	Pb	Ni	Fe	As	Sn	AI	Bi	Zn	Other elements
B14**	58,0	3,0	0,2	0,2	-	0,2	0,03	-	Rem.	≤ 0.2 %

\* Deviations from these values may occur within the restrictions of the relevant standard specifications.

\*\* ASBW / B14 complies with the restrictions to the chemical composition of the signed materials in the table, according to the specified in the 4 MS Common Composition List, on customer request.

### FABRICATION PROPERTIES

### FORMING

Machinability (CuZn39Pb3 = 100 %)	100%
Cold Workability	Poor
Hot Workability	Excellent

#### JOINING

Resistance Welding (Butt Welding)	Fair
Inert Gas Shielded Arc Welding	Poor
Gas Welding (Most Commonly Oxyacetylene)	Not Recommended
Hard Soldering	Fair
Soft Soldering	Excellent
Brazing	Fair

#### POLISHING

Mechanical	Good
Electrolytic	Poor
Electroplating	Excellent

HEAT TREATMENT	
Melting Range	860 - 890 °C
Hot Working	630 – 700 °C
Soft Annealing	420 – 580 °C Duration: 1 – 3 h
Thermal Stress Relieving	160 - 280 ℃ Duration: 1 - 3 h

PRODUCT STANDARDS	
Rod	EN 12164 EN 12165
Section	EN 12167

## CORROSION RESISTANCE

Machining brass is quite resistant to organic substances and to neutral or alkaline compounds. In comparison, homogeneous  $\alpha$ -brass has a much more satisfactory corrosion resistance due to its microstructure. As for the stress corrosion cracking and dezincification, specially under conditions as warm, acidic waters and ammoniacal atmospheres, they should be taken into consideration, even more when the material is not under a stress relieved condition.

Physical properties*						
Material Density [g/cm³]	Electrical Co	onductivity [% IACS]	Thermal Conductivity [W/(m.K)]	Thermal Expansion Coefficient (0 - 300 °C) [10 <sup>-6</sup> /K]	Modulus of Elasticity [GPa]	
8,46	14,56	25	113	21,4	96	

\* Refence values at room temperature

Mechanical properties												
Round r	Round rods/polygonal rods acc. to EN 12164											
	Width across		Tensile strength	Yield s	trength		Elongation		Hard	ness		
Temper	Dian	neter	fla	its	Rm	Rp0.2		A100	A11.3	А	н	В
remper	from	to	from	to	MPa	MPa	MPa	[%]	[%]	[%]		
	[mm]	[mm]	[mm]	[mm]	min.	min.	max.	min.	min.	min.	min.	max.
М	a	.11	a	II	as manufactured - without specified mechanical properties							
R360	6	80	5	60	360	-	350	-	15	20	-	-
H090	6	80	5	60	-	-	-	-	-	-	90	125
R430	2	60	2	40	430	220	-	6	8	10	-	-
H110	2	60	2	40	-	-	-	-	-	-	110	160
R500	2	14	2	10	500	350	-	-	3	5	-	-
H135	2	14	2	10	_	_	_	_	_	_	135	-

Rectang	ular rods							ac	c. to EN	12167
Thiskness		Tensile strength Yield strength			Elongation	I	Hardness			
Temper	THICKNESS		Rm	Rp0.2		A100	A11.3	А	Н	В
remper	from	to	MPa	MPa	MPa	[%]	[%]	[%]		
	[mm]	[mm]	min.	min.	max.	min.	min.	min.	min.	max.
М		all	as ma	nufactur	ed – witho	out specif	ied mechar	nical prop	erties	
R360	6	40	360	-	320	-	15	20	-	-
H090	6	40	-	-	-	-	-	-	90	125
R430	3	20	430	220	-	6	8	10	-	-
H110	3	20	-	-	-	-	-	-	110	160
R500	3	10	500	350	-	2	5	8	-	-
H135	3	10	-	-	-	-	-	-	135	-

Rods				acc. to EN 12165
Temper	Diameter from to [mm] [mm]		Hard H min.	Iness IB max.
Μ	all		As manı	Ifactured
H080	8	80	80	125

FINISHING AND P	ACKAGING
Bar ends	Marked according to customer's specification
Bar surface	Standard machining rods: bright, stripped surface
	Standard stamping rods: Dark and uniform surface
Packaging	Size range up to 10 mm: The rods are packed loose in a wooden box and protected with oiled paper (net weight of approx. 500 kg). Each box is strapped with 4 steel straps to ensure material integrity during shipping.
	Size range > 10 mm: ASBW machining rods are supplied by standard in bundles either of approximately 1.000 kg or 500 kg. Different bundle weights are also possible upon costumer's request. Each bundle is steel strapped three times on cardboard and both ends are protected with litter, to ensure the material integrity during the transportation
Identification	Adhesive label on bundle strap: customer - number of customer's order - EN Standard of the material - ASBW material code and LOT number ensuring production tracking - rod length - ASBW's PO number - ASBW's Quality Approval Seal

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