CuZn39Pb1 – CW611N

Machining alloy, good machinability, very good hot working properties
Available in bars / hollow bars / wire

All data are reference values and are not to be used as a basis for constructive stress calculation.

Designations

EN ISO 12164 Bars
EN ISO 12165 Forgings
EN ISO 12167 Profiles and edged bars
EN ISO 12168 Hollow bars
EN ISO 12420 Forgings
UNS C37000

Chemical Composition

Cu	59.0-60.0	Weight-%
Pb	0.8-1.6	Weight-%
Zn	Rest	Weight-%

Workability

Machinability					
Hot Forming					
Cold Forming					
Mechanical Polishing					
Soft Solderability					
Hard Solderability					

Physical Properties

Density (20°C)	8.47	g/cm³
Fusion temperature	885 - 900	°C
Thermal conductivity	120	W/mK
Thermal capacity	380	J/kgK
Electrical conductivity	15,0 28	MS/m % IACS
Young's modulus (20°C, annealed)	98	GPa
Thermal expansion coefficient	21.2	$10^{-6}K^{-1}$

Microstructure

Heterogeneous structure of α- and β'-mixed crystals. Lead is insoluble in this alloy and precipitates in finely distributed form at the grain boundaries. Lead has a grain refining effect on the microstructure and improves machinability.

Corrosion Resistance

Depending on the material condition, the area of application, the medium and heat treatment, CW611N is not resistant to acids and humid ammonia, especially in the non-stress-relieved state (stress corrosion cracking).

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Potential Application Examples

Fittings, sanitary industry*

Shaped turned parts

Electrical engineering

Mechanical and vehicle engineering

*(the alloy is currently in the process of being approved for drinking water applications.

Mechanical Properties at Room Temperature

EN 12164 (Rod for free machining purposes)											
Condition	Diameter	Width across-flats	Ultimate Tensile Strength R_m	Yield Strength $R_{p\,0,2}$		Elongation A_{100mm}	Elongation $A_{11,3}$	Elongation A	Hardness Brinell	
	mm	mm	MPa	MPa		%	%	%	HBW	
	da - a	da - a	min.	min.	max.	min.	min.	min.	min.	max.
M	all dimensions		as manufactured							
R360	6 - 80	5 - 60	360		300		15	20		
H070									70	100
R410	2 - 40	2 - 35	410	230		8	10	12		
H100									100	145
R500	2-14	2 - 10	500	350		3	5	8		
H120									120	

EN 12166 (Wire for general purposes)									
Condition	Diameter	Ultimate Tensile Strength R_m	Yield Strength $R_{p\,0,2}$		Elongation A_{100mm}	Elongation $A_{11,3}$	Elongation A	Hardness Brinell	
	mm	MPa	MPa		%	%	%	HBW	
	da - a	min.	min.	max.	min.	min.	min.	min.	max.
M	all	as manufactured							
R360	0,5 - 20	360		300	10	15	20		
H080	1,5 - 20							80	110
R410	0,5 - 14	410	220		8	10	12		
H100	1,5 - 14							100	160
R500	0,5 - 8	500	350			2	5		
H130	1,5 - 8							130	

HME Brass Euope Miraustraße 10-14 13509 Berlin Germany

Email: info@hmemetal,com www.hmemetal.com

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EN 12167 (Profile sand bares for general purposes)									
Condition	Diameter	Ultimate Tensile Strength R_m	Yield Strength $R_{p\ 0,2}$		Elongation			Hardness Brinell	
					A_{100mm}	$A_{11,3}$	A		
	mm	MPa	MPa		%	%	%	HBW	
	da - a	min.	min.	max.	min.	min.	min.	min.	max.
M	all	as manufactured							
R360	3 - 20	360		300	10	15	20		
H070								70	100
R410	3 - 10	410	220		8	10	12		
H100								100	145
R500	3 - 10	500	350		2	5	8		
H120								120	

EN 12168 (Hollow rod for free machining purposes)									
Condition	Diameter	Ultimate Tensile Strength R_m	Yield Strength $R_{p\ 0,2}$		Elongation	Hardness Brinell		Hardness Vickers	
					A				
	mm	MPa	MPa		%	HBW		HV	
	da - a	min.	min.	max.	min.	min.	max.	min.	max.
M	all	as manufactured							
R360	2 - 20	360		300	20				
H070						70	100	80	110
R410	2 - 10	410	250		12				
H100						100	145	110	155
R500	2 - 7	500	350		8				
H120						120		130	

This data sheet is for general information only and is not subject to revision.

HME Brass Euope Miraustraße 10-14 13509 Berlin Germany

Email: info@hmemetal,com www.hmemetal.com