

CW614N - CuZn39Pb3



Main machining alloy, very 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 12164 Bars
EN 12165 Forgings
EN 12166 Wire
EN 12167 Profiles and edged bars
EN 12168 Hollow bars
EN 12420 Forgings
UNS C38500

Chemical composition

Cu	57.0-59.0	Weight-%
Pb	2.5-3.5	Weight-%
Zn	Rest	Weight-%

Workability

Machinability					
Hot Forming					
Cold Forming					
Mechanical Polishing					
Soft Solderability					
Hard Solderability					

Physical properties

Density (20°C)	8.46	g/cm ³
Fusion temperature	875-890	°C
Thermal conductivity	123	W/mK
Thermal capacity	380	J/kgK
Electrical conductivity	14.6 25	MS/m % IACS
Young's modulus (20°C, annealed)	97	GPa
Thermal expansion coefficient	21.4	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, CW614N is not resistant to acids and humid ammonia, especially in the non-stress-relieved state (stress corrosion cracking).

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Application examples

Fittings, sanitary industry
 Shaped turned parts
 Electrical engineering
 Mechanical and vehicle engineering

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			Hardness Brinell	
	mm	mm	MPa	MPa		A _{100mm}	A _{11,3}	A	HBW	
	da - a	da - a	min.	min.	max.	%	%	%	min.	max.
	min.	min.	min.	min.	min.	min.	min.	min.	min.	max.
M	all dimensions		as manufactured							
R360	6 - 80	5 - 60	360		350		15	20		
H090									90	125
R430	2 - 40	2 - 35	430	220		6	8	10		
H110									110	160
R500	2-14	2 - 10	500	350			3	5		
H135									135	

EN 12166 (Wire for general purposes)										
Condition	Diameter mm da - a	Ultimate Tensile Strength R_m MPa min.	Yield Strength $R_{p0,2}$ MPa		Elongation			Hardness Brinell HBW		
			min.	max.	A_{100mm} % min.	$A_{11,3}$ % min.	A % min.	min.	max.	
M	all	as manufactured								
R360	6 - 20	360		320		15	20			
H095								95	130	
R430	0,5 - 14	430	220		6	8	10			
H115	1,5 - 14							115	170	
R500	0,5 - 8	500	350			2	5			
H145	1,5 - 8							145		

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EN 12167 (Profile sand bars for general purposes)									
Condition	Diameter mm da - a	Ultimate Tensile Strength R_m MPa min.	Yield Strength $R_{p0,2}$ MPa		Elongation			Hardness Brinell	
					A_{100mm}	$A_{11,3}$	A	HBW	
			min.	max.	% min.	% min.	% min.	min.	max.
M	all	as manufactured							
R360	6 - 40	360		320		15	20		
H090								90	125
R430	3 - 20	430	220		6	8	10		
H110								110	160
R500	3 - 10	500	350		2	5	8		
H135								135	

EN 12168 (Hollow rod for free machining purposes)									
Condition	Diameter mm da - a	Ultimate Tensile Strength R _m MPa min.	Yield Strength R _{p0,2} MPa min. max.		Elongatio n A % min.	Hardness Brinell HBW min. max.		Hardness Vickers HV min. max.	
M	all	as manufactured							
R360	2 - 40	360		320	20				
H090						90	125	100	135
R430	2 - 15	430	220		10				
H110						110	160	120	170
R500	2 - 7	500	350		8				
H135						135		145	

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