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**DATA SHEET:
GSM CW612N**

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FREE MACHINING

The logo for HUG, featuring the word "HUG" in a bold, white, sans-serif font, enclosed within a white circular border.

HUG

High copper content alloy for free machining.

Due to the high copper content, it has excellent cold deformability performance and good machinability for chip removal. The GSM alloy complies with the 4MS "Positive list" for materials in contact with drinking water.

NAME OF ALLOY

UNI EN: CW612N - CuZn39Pb2

ASTM: C37700

DIN: 2.0380

BS: CZ120

CHEMICAL COMPOSITION UNI EN 12164 ED.2016

Cu	Pb*	Sn	Fe	Ni*	Al	Si*	Zn	Other elements
min. 59.0 max. 60.0 %	1.6 2.2 %	≤0.3 %	≤0.3 %	≤0.1 %	≤0.05 %	≤0.03 %	difference	≤0.2 %

*Limitation according 4MS. Elements not listed must be ≤0.02 %.
Group of restriction of the surface in contact with drinking water: B,D.

HEAT TREATMENTS

STRESS RELIEVING

Enables the redistribution of tensions induced by mechanical processing of cold plastic deformation, reducing the risk of stress corrosion cracking. The treatment consists of heating the items to 200°C - 250°C for 2 hours and cooling within the furnace. The validation of the stress relieving treatment can be performed with the ISO 6957 test.

ANNEALING

Re-crystallizes the alloy, reducing its hardness and increasing its ductility. The temperature of the treatment varies from 450°C to 550°C for an amount of time relative to the required results. The high temperature can induce changes in the surface appearance and in the tolerance of the finished part.

MECHANICAL PROPERTIES UNI EN 12164 ED.2016

Condition of material	Diameter in mm		Hardness HB*		Rm	Rp _{0.2} N/mm ²		Elongation %
	from	to (included)	min.	max.	min.	min.	max.	min.
M	All		As a product					
R360	6 (5)	80 (60)	-	-	360	-	300	20
H070	6 (5)	80 (60)	70	100	-	-	-	-
R410	2	40 (35)	-	-	410	230	-	12
H100	2	40 (35)	100	145	-	-	-	-
R500	2	14 (10)	-	-	500	350	-	8
H120	2	14 (10)	120	-	-	-	-	-

*the hardness value is determined in the mid-range
The values in brackets refer to the hexagonal section bar.
The standard condition produced by Almag is R410 for Rm or H100 for hardness.
Any other conditions must be requested when ordering - subject to feasibility request.

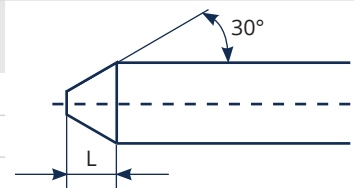
TECHNOLOGICAL PROPERTIES		low excellent	
Structure	$\alpha+\beta$	Machinability	
Density	8.4 kg/cm ²	Weldability	
Electrical conductivity	27% IACS	Hot forming	
Coeff. of thermal expansion	20.7 10 ⁻⁶ /K	Cold forming	
Thermal conductivity*	120 W/(m K)	Corrosion resistance**	Not resistant
Specific heat	380 J/(kg K)		
Elasticity module	105 kN/mm ²	*at room temperature **use care to ascertain compatibility with chemical substances	
Melting point	880-900 °C		

DIMENSIONS, TOLERANCES, AND STRAIGHTNESS UNI EN 12164 ED.2016							
ROUND section bar				HEXAGONAL and SQUARE			
Nominal diameter (mm)		TOLERANCES			Nominal key (mm)		Tolerance mm
from	to included	Class A	Class B	Class C	from	to included	
6	10	0 - 0.06	0 - 0.036	0 - 0.025	6	10	0 - 0.09
10	18	0 - 0.07	0 - 0.043		10	18	0 - 0.11
18	30	0 - 0.08	0 - 0,052		18	30	0 - 0.13
30	50	0 - 0.16			30	50	0 - 0.16
50	80	0 - 0.19			50	60	0 - 0.19

The standard tolerance for the round bar is Class A. Any different tolerances must be agreed upon when ordering
Semi-finished products can be supplied from Ø63 to Ø80 mm with Class A tolerances

Diameter (mm)	Length of bar (mm)	Tolerance (mm)	Diameter or Key (mm)	Deviation from straightness in mm	
				Every 400 mm	Every m of length L ≥ 1
2	30	3000 o 4000	+/- 50		
30	50	3000 o 4000	+/- 100		
50	80	3000	+/- 100		
Round section bar					
10	50		0.4	1.0 x L	
Hexagonal and square section bar					
10	50		0.6	1.5 x L	

BAR FINISHING AND PACKAGING					
Diameter or Key (mm)		Chamfer Length L mm		Tip Length L mm	
5	10	0.2	1.5	2	7
10	20	0.2	2	3	10
20	30	0.2	3	4	12



Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier

Ends of round bars	finishing with chamfer and tip up to and including Ø40 mm finishing with chamfer and cut greater than Ø40 mm
Ends of hexagonal bars	finishing with chamfer and cut
Bar surface	pickled
Packaging	1000 kg bundle – 3/5 metal straps different bundle packagings and quantities are possible upon request
Identification	adhesive label on bundle strap
Stress relieving	the polygonal bar was subjected to stress relieving treatment

COMPANY WITH
MANAGEMENT SYSTEM
CERTIFIED BY DNV GL
= ISO 9001 =
= ISO 14001 =
= OHSAS 18001 =



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