METALLURGICA SAN MARCO

Data Sheet:
CW610N

FREE MACHINING

Updated 06 / 23

ALLOY: CW610N

Standard low-lead alloy, also known as Muntz Metal.

ALLOY DESIGNATION

UNIEN: CW610N - CuZn39Pb0.5	**ASTM:** C36500	**DIN:** 2.0372	**BS:** CZ123-CZ137	**GOST:** LS60-1

CHEMICAL COMPOSITION UNI EN 12164 ED.2016

Cu	Pb	Sn	Fe	Ni	Al	Zn	Other elements
min 59.0% max 60.5%	0,2% 0,8%	≤0.2 %	≤0.2 %	≤0.3 %	≤0.05 %	difference	≤0.2 %

HEAT TREATMENTS

STRESS RELIEVING

It specifically allows redistribution of tension induced by machining or cold plastic deformation, reducing the risk of stress corrosion cracking.

TREATMENT: heating of parts at 200°C to 250°C for 2 hours and cooling within the furnace. Validation of stress relief treatment can be performed with the ISO 6957 test.

ANNEALING

Recrystallization of the alloy reduces hardness and increases ductility. The treatment temperature ranges from 450°C to 550°C for a period of time relative to the intended result. The high temperature can cause variations in the surface appearance and tolerances of the finished part.

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TECHNOLOGICAL PROPERTIES

Structure	Density	Electrical conductivity	Coeff. of thermal expansion	Thermal conductivity*	Specific heat	Elasticity module	Melting point
α+β	8.40 g/cm^2	28% IACS	20.8 10^{-6}K	123 W/(m K)	380 J/(kg K)	105 N/mm^2	885-900 °C

low ○○○○○○○ excellent

Machinability: ●●○○○○○
Weldability: ●●●○○○○
Hot forming: ●●●○○○○

Cold Forming: ●●●○○○○
Corrosion resistance**: ○○○○○○○

*at room temperature.
**compatibility with chemical substances should be carefully checked.

MECHANICAL PROPERTIES UNI EN 12164 ED.2016

Condition of material	Diameter in mm		Hardness HB*		Rm	Rp0,2.N/mm²		Elongation %
	from	to (included)	min.	max	min.	min.	max	min.
M	ALL		AS MANUFACTURED					
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	-	-	-	-	-

*Hardness values are determined in the mid-range.
Values in brackets refer to the hexagonal section bar.
The standard condition produced by Metallurgica San Marco is R410 per Rm o H100 for the hardness.
Other conditions must be requested at the time of order after a feasibility inquiry.

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DIMENSIONS, TOLERANCES, AND STRAIGHTNESS UNI EN 12164 ED.2016

ROUND section bar					HEXAGONAL and SQUARE section bar		
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. Different tolerances must be defined when ordering.
Supplies of semi-finished products from Ø63 to Ø80 mm with Class A tolerances are possible.

Diameter (mm)		Lenght of bar (mm)	Tolerance (mm)
2	30	3000 o 4000	+/- 50
30	50	3000 o 4000	+/- 100
50	80	3000	+/- 100

Diameter (mm)		Deviation from straightness in mm	
		Every 400 mm	Every m of length L ≥ 1
Round section bar			
10	50	0.4	1,0 x L
Hexagonal and square section bar			
10	50	0.6	1.5 x L

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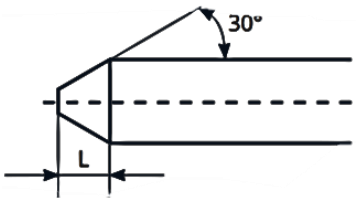
FINISHING AND PACKAGING

Diameter or Key (mm)		Diameter or Key (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 at the discretion of the supplier.

Ends of round bars	finishing with chamfer and point up to and including Ø55 mm.
	finishing with saw cut greater than Ø55 mm.
Ends of hexagonal bars	Finishing with chamfer and cut. Other finishing available on request.
Bar surface	Pickled.
Packaging	1000 kg bundle - 3/5 metal straps. Different bundle packaging and quantities are possible on specific request.
Identification	Adhesive label on strap or bar ends.
Stress relieving	Polygonal bar undergoes the heat treatment of stress relief.

TECHNICAL NOTES

Also called "Leaded Muntz Metal," it is characterized by its ability to work discretely with the tool and good hot formability.
Due to its excellent mechanical properties and copper concentration, it is used to fabricate parts used in heat exchangers.