CuZn38Pb2 (CW608N)
Technical Data Sheet & Cross-Reference Guide

1. Material Identification (At a Glance)

CuZn38Pb2 is a leaded, free-machining brass commonly designated as CW608N in the EN system. It is typically supplied as wrought rod/bar and is used for precision turned parts where chip control and productivity matter.

Item	Value
EN symbolic designation	CuZn38Pb2
EN numerical designation	CW608N
Common classification	Leaded (free-machining) brass
Typical product forms	Rod/bar, profiles; wire; strip/sheet (depending on standard/product)
Typical applications	Shaped turned parts, precision mechanical components, fittings/valves, electrical/mechanical engineering

2. Applicable Standards (Common References)

Standards depend on product form (rod, wire, profiles, strip/sheet) and customer requirements. The list below captures frequently cited EN product standards for CuZn38Pb2 / CW608N.

Standard	Product form	Typical scope (high-level)
EN 12164	Rod	Rod for free-machining purposes (mechanical properties by temper/size)

Standard	Product form	Typical scope (high-level)
EN 12165	Forging stock	Wrought and unwrought forging stock
EN 12166	Wire	Wire for general purposes
EN 12167	Profiles / rectangular bar	Profiles and rectangular bar for general purposes
EN 1652	Plate/sheet/strip	Wrought products for general purposes (product-dependent)

3. Chemical Composition

Chemical composition is defined by the relevant product standard; the values below are commonly stated ranges/limits for CW608N.

Element	Typical range / limit	Units	Notes
Cu	60.0 – 61.0	wt.%	Principal element range
Pb	1.6 – 2.5	wt.%	Chip breaking; improves machinability
Zn	Remainder	wt.%	Balance to 100%
Al	max 0.05	wt.%	Impurity limit (product-standard dependent)
Fe	max 0.2	wt.%	Impurity limit
Ni	max 0.3	wt.%	Impurity limit
Sn	max 0.2	wt.%	Impurity limit
Others	max 0.2	wt.%	Total of other elements (typical listing)

Microstructural note (typical): CW608N is commonly described as a heterogeneous α/β' brass, with lead being insoluble and present as finely dispersed particles at grain boundaries, supporting chip breakage.

4. Physical Properties (Typical Values)

Values vary with product form, temper, and test method. The table below aggregates commonly published indicative values.

Property	**Typical value**	**Units / conditions**
Density	8.4 – 8.44	g/cm³ (20 °C)
Solidification / melt range	885 – 900	°C (indicative)
Thermal conductivity	109 – 110	W/m·K (20 °C)
Electrical conductivity	24	% IACS
Electrical conductivity	14	MS/m (indicative)
Specific heat capacity	379	J/kg·K (indicative)
Young’s modulus	102	GPa (20 °C, annealed)
Thermal expansion (CTE)	20.4 – 20.7	µm/m·K (20–300 °C, indicative)

Figures (indicative):

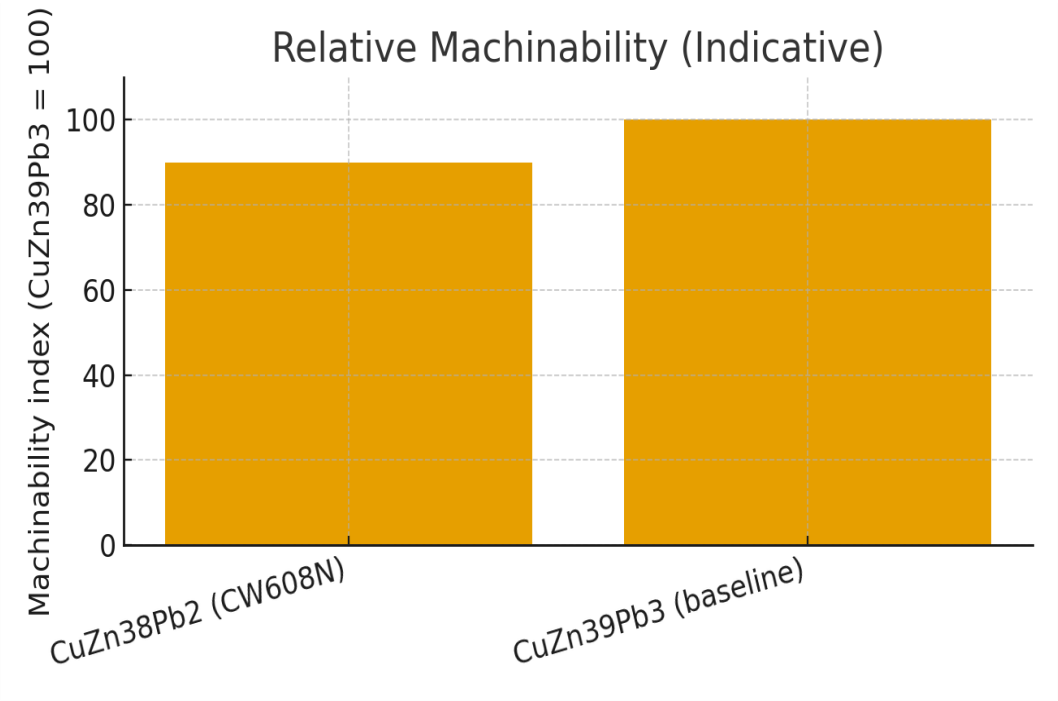

Figure 1. Relative machinability index often cited for CW608N vs a CuZn39Pb3 baseline.

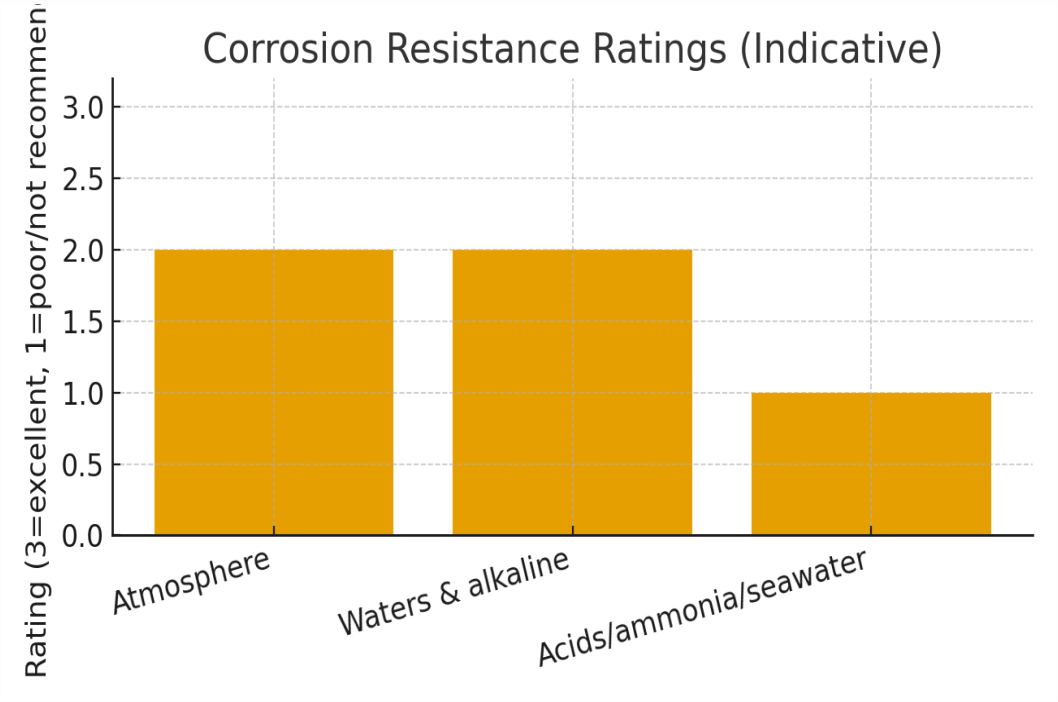

Figure 2. Indicative corrosion resistance ratings (1–3 scale, where 3 is best).

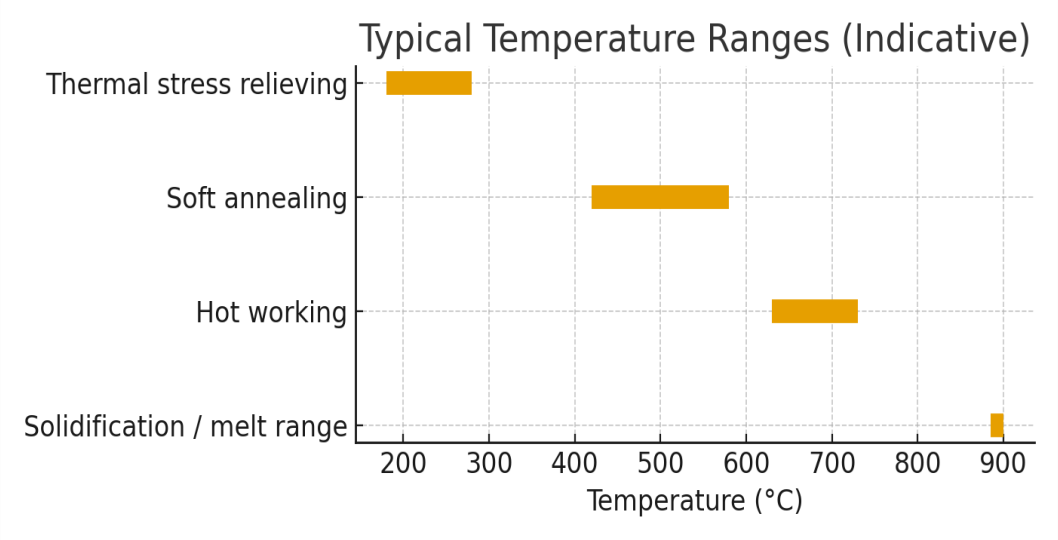

Figure 3. Typical temperature windows for working/heat-treatment operations (indicative).

5. Mechanical Properties (Room Temperature, EN Temper Designations)

Mechanical properties are specified by product standard, temper, and size range. The table below summarizes frequently listed EN conditions for rod.

Condition	**Diameter range (mm)**	**Width across flats (mm)**	**Tensile strength Rm (MPa)**	**0.2% proof / yield Rp0.2 (MPa)**	**Hardness (HBW) / Elongation (min.)**
R360	6–80	5–60	≥ 360	≤ 300 (as listed in some tables)	A: 15–20% (min, size-dependent)
H070	6–80	5–60	—	—	HBW 70–100
R410	2–40	2–35	≥ 410	≥ 230	A: 10–12% (min, size-dependent)
H100	2–40	2–35	—	—	HBW 100–145

Condition	Diameter range (mm)	Width across flats (mm)	Tensile strength Rm (MPa)	0.2% proof / yield Rp0.2 (MPa)	Hardness (HBW) / Elongation (min.)
R500	2–14	2–10	≥ 500	≥ 350	A: 5–8% (min, size-dependent)
H120	2–14	2–10	—	—	HBW ≥ 120 (indicative)
M (as manufactured)	> 80	—	—	—	No specified mechanical properties

Note: the letters/numbers in EN tempers (e.g., R360, H100) indicate minimum strength/hardness levels; exact requirements vary by standard edition and product form.

6. Fabrication, Joining, and Surface Treatment (Qualitative)

The qualitative ratings below are commonly used to quickly communicate process suitability. Always validate with your supplier’s product standard and internal trials.

Category	Process / attribute	Typical rating / comment
Machining	Machinability index (CuZn39Pb3 = 100)	≈ 90 (indicative)
Forming	Hot formability	Good (often rated 2 on a 1–3 scale)
Forming	Cold formability	Good/Fair (often rated 2 on a 1–3 scale)
Joining	Soft soldering	Good to excellent (product-dependent)

Category	Process / attribute	Typical rating / comment
Joining	Hard soldering / brazing	Fair (often rated lower than soldering)
Joining	Oxy-acetylene / gas welding	Not recommended / poor
Joining	TIG/MIG / gas-shielded arc welding	Not recommended / poor
Finishing	Mechanical polishing	Good
Finishing	Electroplating	Good to excellent
Adhesion	Gluing/adhesion	Fair to good

7. Corrosion and Service Environment Notes

Machining brasses are commonly described as reasonably resistant to many organic substances and to neutral/alkaline environments. However, warm acidic waters and ammoniacal atmospheres require attention due to risks such as dezincification and stress corrosion cracking (SCC), particularly if the material is not stress-relieved.

Environment	Typical suitability	Common notes
Atmospheric exposure	Generally acceptable	Depends on humidity and pollutants; protective films may form
Neutral / alkaline waters	Often acceptable	Validate for chloride, temperature, and flow conditions
Warm acidic waters	Caution	Dezincification and SCC may occur under unfavorable conditions
Ammonia / humid ammoniacal atmosphere	Caution / avoid	SCC susceptibility increases under residual or applied stress

Environment	Typical suitability	Common notes
Seawater	Caution / avoid	Often listed as poor for leaded machining brasses

Stress-relief guidance (typical): stress corrosion cracking can be reduced by stress-relief heat treatment (commonly cited around ~250 °C), subject to product form and customer specification.

8. Heat Treatment and Working Temperatures (Indicative)

The values below are commonly listed indicative ranges used as practical guidance.

Operation	Temperature range	Units	Typical duration / notes
Hot working	630 – 730	°C	Application-dependent
Soft annealing	420 – 580	°C	Often 1–3 h (indicative)
Thermal stress relieving	180 – 280	°C	Often 1–3 h (indicative)
Stress relief (SCC mitigation)	~250	°C	Commonly cited reference value; confirm specification
Solidification / melt range	885 – 900	°C	Not a processing setpoint; melt/ solidification window

9. Equivalent / Near-Equivalent Grades (Cross-Reference)

Cross-references are commonly used for communication, but they are not guaranteed substitutes. Always verify composition limits, mechanical property requirements, product form, and standard edition.

System / standard family	Designation	Commonly cited as	Notes
EN	CuZn38Pb2	Symbolic designation	Often paired with CW608N
EN	CW608N	Numerical designation	Used widely for CuZn38Pb2
UNS / ASTM	C37700	Common cross-reference	Often listed as an equivalent for CW608N
BS	CZ128	Common cross-reference	Often listed in cross-reference charts for CW608N
JIS	C3771	Common cross-reference	Some listings map CW608N → JIS C3771 (bar/rod context)
JIS	C3561	Alternate listing	Some supplier lists map CW608N → JIS C3561; verify by standard/ product form
GB (China)	HPb60-2	Common cross-reference	Listed in some supplier datasheets for CW608N
SIS (Sweden)	5168	Supplier-listed cross-reference	May appear in supplier documentation

9.1 Near-Equivalent EN Grades (Same Family)

If CW608N is unavailable, engineers sometimes look at nearby EN grades within the leaded machining brass family; these are not drop-in substitutes but can be short-listed for evaluation.

EN grade	Typical difference (high-level)	Why it may be considered	Primary caution
CW606N (CuZn37Pb2)	Slightly higher Cu / lower Zn	Similar lead range and machinability	Confirm required strength and corrosion behavior
CW612N (CuZn39Pb2)	Slightly higher Zn / lower Cu	Similar lead range; widely stocked in some markets	Confirm dimensional stability and mechanical property class
CW614N (CuZn39Pb3)	Higher Pb range	Highest machinability in many families; chip control	Lead content and compliance constraints; property differences
CW617N (CuZn40Pb2)	Different Cu/Zn balance	Common fittings-machining brass in many markets	Not identical: verify corrosion and mechanical requirements

10. Lead Content and Compliance Considerations

CW608N is a leaded brass. Many industry regulations and customer standards restrict lead use, especially for drinking-water contact and some consumer-facing applications. Always validate applicability for your target market and intended service environment.

Topic	What to check	Why it matters
Regulatory limits	Lead content limits and exemptions (region- and industry-specific)	May disqualify the alloy for certain applications

Topic	What to check	Why it matters
Drinking water contact	Local requirements (e.g., low-lead mandates)	Many jurisdictions restrict leaded copper alloys
Material certification	Mill test reports / certificates per order requirements	Traceability and acceptance testing

References (Public Datasheets Used for This Compilation)

• HME Brass Europe: Materials Data Sheet CW608N / CuZn38Pb2 (PDF)

• Alumeco: EN CuZn38Pb2 / CW608N rods datasheet (PDF, May 2025)

• ASBW: CuZn38Pb2 (CW608N) material datasheet (PDF)

• Bronmetal: Brass bars – International Equivalences (PDF)

• SteelNumber: CuZn38Pb2 / CW608N designation overview (web page)

• Matthey (document title includes CuZn38Pb2): technical note on structure and SCC stress relief (PDF)

Disclaimer: This document aggregates indicative values from public datasheets for quick engineering reference. For design release, procurement, and compliance, rely on the governing standard edition and supplier certification for the specific product form and temper.

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