

Wrought copper-nickel-aluminium alloy **NB 3** alloy 2530

NB 3 is a construction material with very high strength and low permeability. The material is resistant to corrosion and sea water. The fouling by marine organisms is very low. NB 3 has high cavitation and erosion resistance. Compared to CuNi14Al3, the material has a higher toughness with slightly lower strength. NB 3 complies with the material performance sheet WL 2.0880 and has been approved by the Shipbuilding and Ocean Engineering Standards Body for the shipbuilding sector in accordance with VG 81245.

ZOLLERN brand	NB 3
EN designation	None
EN material no:	None

// National designations	
WL	CuNi17Mn5Al2Fe
WL	2.0880
GB	≈ DEF STAN 835
USA	≈ C72420

≈ (substantial coherence)

// Composition (weight by per cent in %)						
Cu	Ni	Fe	Al	Mn	Other	
73.7 – 76.4	15.0 – 17.5	0.8 – 1.4	1.7 – 2.7	3.0 – 5.4	max. 0.3	

// Strength properties at room temperature					
WL 2.0880	(minimum values)				HB
	R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %		
Rods up to 32 mm thickness	550	780	15		210
Rods over 32 mm up to 60 mm thickness	500	780	15		210
Forgings and rods over 60 mm thickness	490	780	15		210

// Strength properties at elevated temperatures (reference values)						
Temperature	°C	20	200	300	400	500
0.2% limit	R _{p0.2} N/mm ²	550	525	500	475	450
Tensile strength	R _m N/mm ²	750	700	650	600	580

// Physical properties	
Density at 20 °C	8.5 kg/dm ³
Melting temperature/range	approx. 1100 - 1170°C
Coefficient of linear expansion from 20° to 200°C	16 x 10 ⁻⁶ °C ⁻¹
Specific heat at 20°C	0.415 J/g x °C
Thermal conductivity at 20°C	0.17 W/cm x°C
Electr. conductivity at 20°C	4 - 6 MS/m 7 - 10% IACS
Electr. resistance at 20°C	0.167 - 0.25 Ω mm ² /m
Permeability	< 1.03
Young's modulus	143 KN/mm ²

// Dynamic strength values at room temperature (reference values)	
Rotational bending fatigue strength R _{bw} at 30 x 10 ⁶ load cycles	220 N/mm ²
Notched impact energy (ISO - V/KV)	> 35 joules

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Areas of application

NB 3 is suitable due to its high strength values for highly stressed parts, even with simultaneous corrosion stress.

For example

- Valve parts such as spindles, seat rings and hydraulic parts.
- High-strength, non-magnetic screws, bolts and nuts for seawater use
- Gears and bevel gears.

Machinability

NB 3 is easy to machine. The machining index is about 20 due to the high strength, where CuZn39Pb3 = 100. Cutting and die-sinking is possible. NB 3 is not suitable for cold forming. Carbide tools are advantageous for turning and milling. and sharp drills for drilling and thread cutting are advantageous.

Relaxation annealing	300 – 450°C
Soft annealing	-
Soft soldering	suitable
Brazing	suitable, but fluoride and chloride containing fluxes are recommended
Welding	not recommended, similar additive materials of the same type are not available. Welding with non-matching filler metals such as CuAl9Ni4Fe2Mn2 = CF310G or S-CuNi30Fe = 2.0837 is possible.
Surface treatment	polishing and galvanic treatments are possible

