

Copper-aluminium casting alloy **AMB 3** alloy 1600

AMB 3 is a corrosion-resistant construction material with low permeability. The material has good strength values and very good toughness. AMB 3 is insensitive to stress corrosion cracking. In the event of fouling by marine organisms or the formation of aeration elements, selective corrosion may occur. For this reason, sufficient fresh water flow must be ensured in the event of corrosion stress.

ZOLLERN brand	AMB 3
EN designation	EN standard, none
EN material no:	EN standard, none

// ISO / national designations	
DIN 1714	G-CuAl8Mn
DIN 1714	2.0962

// Composition (mass fraction in %)				
Cu	Al	Fe	Ni	Mn
min. 82.0	7.0 – 9.0	max 1.5	1.0 – 2.0	5.0 – 6.5
Pb	Si	Sn	Zn	Other
max. 0.1	max. 0.1	max. 0.2	max. 0.5	max. 0.8

// Strength properties at room temperature				
(minimum values)				
Not standardised	R _m N/mm ²	R _{p0.2} N/mm ²	A ₅ %	HB
Sand casting	440	180	18	105
Centrifugal casting	500	200	18	105

// Strength properties at elevated temperatures (reference values)

Temperature	°C	20	150	200	250	300
Tensile strength	R _m N/mm ²	560	520	500	480	460
0.2% limit	R _{p0.2} N/mm ²	205	200	195	195	190
Elongation	A ₅ %	22	28	32	35	37

// Physical properties (reference values)

Density at 20°C	7.5 kg/dm ³
Melting temperature/range	1030 – 1050°C
Specific heat capacity at 20°C	0.431 J/g x °C
Thermal conductivity	0.34 W/cm °C
Electrical conductivity at 20°C	2 – 4 MS/m 3.5 – 7 % IACS
Electrical resistance at 20°C	0.25 - 0.50 Ω mm ² /m
Coefficient of linear expansion from 20°C to 200°C	18 x 10 ⁻⁶ °C ⁻¹
Shrinkage	1.5 – 2 %
Young's modulus	110 KN/mm ²
Permeability	< 1.05

// Dynamic strength values at room temperature (reference values)

Bending fatigue strength R _{bw} at 30 x 10 ⁶ load cycles	220 N/mm ²
Notched impact energy (ISO - V/KV)	30 joules

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Areas of application

AMB 3 is used for

- Valve bodies and their accessories
- Board harnesses, radiator and engine parts, propeller and other propulsion parts if, in addition to corrosion resistance, low permeability is required.
- Other applications are pump housings and pump impellers for seawater pumps

Machinability

Carbide tools are needed for turning and milling and sharp drill bits are needed for drilling and thread cutting. This results in machinability that is better than that of austenitic steel.

Shorter rolling and flowing chips are formed.

Relaxation annealing approx. 550 – 580°C

Soft soldering not recommendable

Brazing poor, fluoride and chloride containing and chloride-containing fluxes are necessary (type F – SH 1), silver solders are advantageous, e.g. L-Ag44 or L-Ag55Sn

Welding good, both TIG, MIG and manual electrode welding are possible. Suitable filler metal e.g. CuAl9Ni4Fe2Mn2 = CF310G or S-CuAl8Ni2 or analytically equivalent bars

Galvanisability possible, good cleaning and pretreatment necessary

