

Wrought copper-aluminium alloy **AMB 1** alloy 1510

The material **AMB 1** is a wear-resistant, corrosion-resistant construction and sliding material. Due to its good cold formability, it is also suitable for pressed and drawn profile bars.

ZOLLERN brand	AMB 1
EN designation	CuAl10 Fe3Mn2
EN material no:	CW306G

EN 12420:1999 Forgings
EN 12163:1998 Bars, drawn

// National designations / ISO

DIN	CuAl10Fe3Mn2
DIN	2.0936
ISO	CuAl10Fe3
USA	≈ C 62300
GB	≈ CA 103
F	U - A10Fe

≈ (substantial coherence)

// Composition (weight by per cent in %)

Cu	Al	Fe	Mn	Ni
Rest	9.0 – 11.0	2.0 – 4.0	1.5 – 3.5	max. 1.0
Pb	Si	Sn	Zn	Other
max. 0.05	max. 0.2	max. 0.1	max. 0.5	max. 0.2

// Strength properties at room temperature

(minimum values)					
[1] EN 12420:1999 [2] EN 12163:1998 min. 250 kg	R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	HB	
[1] Forgings / Die pressed parts up to 80 mm thickness	250	590	10	125	
[1] Forgings over 80 mm thickness	200	560	12	120	
[2] Rods, drawn up to 30 mm Ø thickness or SW	approx. 510	690	6	170	

// Strength properties at elevated temperatures (reference values)

Temperature	°C	20	200	300	400	500
0.2% limit	R _{p0.2} N/mm ²	350	350	330	190	70
Tensile strength	R _m N/mm ²	700	690	530	210	80
Elongation	A ₅ %	17	24	33	90	65

// Physical properties

Density at 20 °C	7.6 kg/dm ³
Melting temperature/range	1045 – 1090°C
Coefficient of linear expansion	
from - 200° to 20°C	14 x 10 ⁻⁶ °C ⁻¹
from 20° to 100°C	16 x 10 ⁻⁶ °C ⁻¹
from 20° to 300°C	17 x 10 ⁻⁶ °C ⁻¹
Specific heat at 20°C	0.435 J/g x °C
Thermal conductivity at 20°C	0.34 W/cm x °C
Electr. conductivity at 20°C	3 - 4 MS/m 5 - 7 % IACS
Electr. resistance at 20°C	0.25 - 0.33 Ω mm ² /m
Temperature coefficient of the electrical resistance (0 - 100°C)	0,0008 °C ⁻¹
Permeability	< 1.5
Young's modulus	117 KN/mm ²

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

Rotational bending fatigue strength R _{bw} at 20 x 10 ⁶ load cycles	260 N/mm ²
Notched impact energy (ISO - V/KV)	40 joules

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Application examples

AMB 1 is a medium-hard Cu-Al alloy with good corrosion resistance to neutral and acidic aqueous media as well as to seawater. There is good resistance to scaling, erosion and cavitation. In addition to its use as a corrosion-resistant construction material, AMB 1 is also suitable as a sliding material.

For example,

- worm wheels
- bearing bushes
- cages for roller bearings are made from it.

It is also suitable for bearings with intermittent, dynamically occurring loads.

Machinability

Carbide tools are needed for turning and milling and sharp tools are needed for drilling and thread cutting. This results in a machinability that is better than that of austenitic stainless steel. Shorter rolling and flowing chips are formed. Cutting and die-sinking is easily possible.

Relaxation annealing	approx. 550 - 600°C
Soft annealing	700 - 750°C with subsequent cooling in air
Soft soldering	not recommendable
Brazing	poor, fluxes containing fluoride and chloride of type F - SH 1 and silver solders are advantageous
Welding	good, both TIG, MIG and manual electrode welding is possible. Filler material e.g. CuAl10Fe1 = CF3056 or CuAl9NiFe2Mn2 = CF310G
Surface treatment	polishing, chemical structuring and galvanic treatments are possible. Undercoating is advisable for electroplated coatings

