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Solid metals. Fine solutions.

Wrought copper-aluminium alloy **EBw** alloy 1550

EBw belongs to the group of aluminium multi-components bronzes. The alloy is softer and more ductile than CuAl10Ni5Fe, with comparable corrosion resistance. EBw is hot and cold formable as well as easily weldable.

ZOLLERN brand	EBw
EN designation	CuAl9Ni3Fe2
EN material no:	CW304G

EN 12420:1999 Forgings
(analysis only)
EN 1653 :2000 mechanical values

// National designations / ISO

DIN	CuAl9Ni3Fe2
DIN	2.0971
ISO	≈ CuAl10Fe5Ni5
USA	≈ C 63000 / C 63200
GB	≈ CA 105
F	≈ U - A9NFe, CuAl9Ni3Fe2, GAM11

≈ (substantial coherence)

// Composition (weight by per cent in %)

Cu	Al	Fe	Mn	Ni
Rest	8 – 9.5	1.0 – 3.0	max. 2.5	2.0 – 4.0

Pb	Si	Sn	Zn	Other
max. 0.05	max. 0.1	max. 0.1	max. 0.2	max. 0.3

// Strength properties at room temperature

	(minimum values)			
	$R_{p0.2}$ N/mm²	R_m N/mm²	A_5 %	HB
[1] Forgings according to EN 1653	180	490	20	125
[2] Forged pieces ZOLLERN VALUES	230	570	20	125

// Physical properties

Density at 20 °C	7.6 kg/dm³
Melting temperature/range	1060 – 1075 °C
Coefficient of linear expansion from 20° to 200°C	17 x 10^{-6} $°C^{-1}$
Specific heat at 20°C	0.452 J/g x °C
Thermal conductivity at 20°C	0.65 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 mm²/m
Temperature coefficient of the electrical resistance (0 - 100°C)	0.0005 $°C^{-1}$
Permeability	< 1.08

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

Rotational bending fatigue strength R_{bw} at 20 x 10^6 load cycles	300 N/mm²
Notched impact energy (ISO - V/KV)	25 joules

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Areas of application

EBw is a medium-hard Cu-Al alloy with high corrosion resistance to neutral and acidic aqueous media as well as to seawater. There is good resistance to scaling, erosion and cavitation.

Due to the good elongation values, the material is easily weldable and is suitable for welded and composite constructions, e.g. in the construction of

- heat exchangers
- oil coolers etc.
- Screws
- Bolts
- Nuts
- Drive shafts for pumps
- Large spindle nuts for presses

Machinability

Carbide tools are needed for turning and milling and sharp drills 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	650 – 720°C
Soft annealing	800 - 850°C with subsequent furnace cooling down to 650°C, then air cooling
Soft soldering	not recommendable
Brazing	poor, fluxes containing fluoride and chloride of type F - SH1 and silver solders are advantageous
Welding	good, both TIG, MIG as well as manual electrode welding is possible, filler metal e.g. CuAl-9Ni4Fe2Mn2 = CF310G or S-CuAl8Ni2
Surface treatment	polishing, chemical structuring and galvanic treatments are possible. Undercoating is advisable for electroplated coatings

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