

## Wrought copper-aluminium alloy **VBw** Alloy 1730

**VBw** belongs to the group of high-strength aluminium multi-components bronzes. Tempering is possible up to a wall thickness of 100 mm and improves the strength. Bars should not be longer than 500 mm. The strength values are among the highest achievable with copper alloys. The material has a high corrosion resistance.

ZOLLERN brand	VBw
EN designation	CuAl11Fe6Ni6
EN material no:	CW308G

Composition according to  
ASTM B150 and AMS 4590C

### // National designations / ISO

DIN	CuAl11Ni6Fe5
DIN	2.0978
USA	≈ C63020
AMS	≈ 4590

### // Composition (weight by per cent in %)

Cu	Al	Fe	Mn	Ni
Rest	10.0 – 11.0	4.0 – 5.5	max. 1.5	4.5 – 6.0
Pb	Si	Sn	Zn	Other
max. 0.03	max. 0.15	max. 0.25	max. 0.30	max. 0.20

### // Strength properties at room temperature

	(minimum values)			
Values do not comply with ASTM B150 and AMS 4590C	R <sub>p0.2</sub> N/mm <sup>2</sup>	R <sub>m</sub> N/mm <sup>2</sup>	A <sub>5</sub> %	HB 30
Forgings up to <b>100 mm</b> thickness Quenched and tempered = TQ50	600	850	4	260
Forgings, annealed	450	750	9	190

Higher minimum values on request.  
Higher strength values are achieved at low elongation with  
VB-tempered = CW308G or EBh-W97.

### // Physical properties

Density at 20 °C	7.6 kg/dm <sup>3</sup>
Melting temperature/range	1060 – 1075 °C
Coefficient of linear expansion	
from - 200° to 20°C	15 x 10 <sup>-6</sup> °C <sup>-1</sup>
from 20° to 100°C	15 x 10 <sup>-6</sup> °C <sup>-1</sup>
from 20° to 300°C	17 x 10 <sup>-6</sup> °C <sup>-1</sup>
Specific heat at 20°C	0.452 J/g x °C
Thermal conductivity at 20°C	0.38 W/cm x°C
Electr. conductivity at 20°C	4 – 6 MS/m
Electr. resistance at 20°C	0.167 - 0.25 Ω mm <sup>2</sup> /m
Temperature coefficient of the electrical resistance (0 - 100°C)	0.0005°C <sup>-1</sup>
Permeability	< 1.6
Young's modulus	117 KN/mm <sup>2</sup>

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### Areas of application

**VBw** is a high-strength, heavy-duty material. It is particularly suitable for

- bearings with sliding speeds <1m/s.  
A hardened mating material is necessary.
- Surface pressures up to over 25 KN/mm<sup>2</sup> are possible under suitable conditions.  
For example, for toggle lever bearings, sliding strips, wear and wedge gibs in mechanical engineering, bearing bushes, rotary and swivel bearings in aircraft landing gears.

VBw has good resistance to scaling, erosion and cavitation.

### 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** max. 500°C

**Soft annealing** 800 - 900°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** TIG, MIG as well as manual electrode welding is possible. Suitable filler materials are e.g. CuAl9Ni4Fe2Mn2 = CF310G or S-CuAl8Ni2, material number 2.0922. However, the strength values of the base metal are not achieved in the weld metal and in the heat flow zone.

### Surface treatment

polishing, chemical structuring and galvanic treatments are possible. With electroplated coatings, a copper backup bar is advisable

