

TUNGSTEN COPPER (WCU)

Tungsten copper (WCu) is a compound material with a heterogeneous microstructure. Typically a porous slug is produced from tungsten powder using presses and sintering. The remaining pores are then closed by dipping the blank in liquid copper (infiltration). WCu can also be produced using liquid phase sintering. Depending on the grit size of the tungsten powder and the press and sintering parameters, a different tungsten or copper content can be achieved. Tungsten copper brings together many typical characteristics of the single elements tungsten and copper, such as the hardness, wear and burn-off resistance of tungsten and the good electrical and thermal conductivity of copper.

Tungsten copper is used for example for EDM electrodes (EDM), heat sinks, electrical contacts, medium and high voltage circuit breakers, welding electrodes (contact and resistance welding), balance weights and more. It's often used as electrode material when the typical copper contact material (e.g. copper chromium zirconium CuCrZr) has reached the limits of its performance.

MACHINING

Machining should be carried out with carbide tools. The machining characteristics are very good. Compared to many copper alloys, thanks to the high hardness and high modulus of elasticity there is no deformation. A very good surface quality with almost completely burr and nick free edges.

Tungsten copper WCu:	75/25
Chemical composition:	
Copper (Cu) [%]	25±2
Tungsten (W) [%]	Remainder
Additive [max. %]	1
Physical properties:	
Density [g/cm ³]	14,3
Electrical conductivity [% IACS]	41-48
Linear coefficient of expansion [10 ⁻⁶ K ⁻¹]	9,5
Thermal conductivity [W/m · K ⁻¹]	190
Mechanical properties:	
Hardness [HRB]	89-102
Modulus of elasticity [GPa]	260
Tensile strength Rm [MPa]	585-654

IMPORTANT CHARACTERISTICS AND APPLICATIONS

- » Good machinability
- » High density
- » Very good dimensional stability
- » Low coefficients of expansion
- » High surface quality
- » High wear resistance
- » High thermal conductivity
- » High burn-off resistance