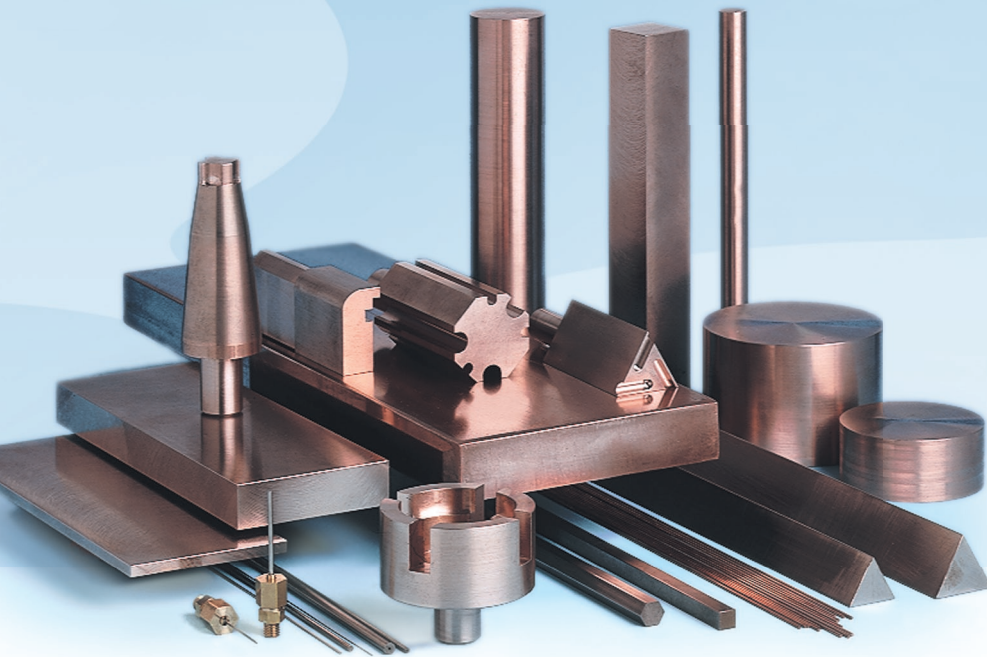


High Performance Materials for EDM Applications

SPARKAL®



A Step ahead in Technology.

PLANSEE

PLANSEE is the world's leading manufacturer of powder metallurgically processed refractory and special metals. Tungsten based SPARKAL® products and components are distinguished by their high density, high wear resistance and porosity free structure, good machinability and high efficiency. PLANSEE offers a wide range of WCu composite materials covering the most suitable solution for your individual application.

Material properties			
	SPARKAL® X	SPARKAL® X FIN	SPARKAL® A
Chemical composition (%)	W 75 Cu 25	W 80 CuNi 20	Cu 98 Rest 2
Density (g/cm ³)	14.8	15.6	8.3
Hardness (HV 5)	240	270	70
Electrical conductivity (% IACS)	40	20	70
Electrical resistance ($\mu\Omega$ cm ² /cm)	4.3	8.4	2.5
Modulus of elasticity (MPa)	250000	280000	120000

Typical values depending on geometry and product dimensions

Application areas of SPARKAL® materials

	SPARKAL® X	SPARKAL® X FIN	SPARKAL® A
Spark erosion of complex geometries in steel	•		
Spark erosion of hardmetals (general)	•		
EDM drilling of small holes in hardmetals		•	
EDM removing of drills and tips		•	
EDM of hardened steels			•
EDM drilling of small holes in steels		•	
Sharpening of polycrystalline diamond (PCD) cutting tools	•		

Manufacturers recommendations for areas of application for SPARKAL® materials

Recommendations for machining

Drilling

Through holes

Drill	High speed steel with Co (8%)
Tip angle (°)	120 - 130
Clearance angle at the main cutting edge (°)	10
Clearance angle at the periphery (°)	8 - 10
Cutting speed (m/min)	12 - 20
Lubrication	Emulsion

Blind Holes

Drill	Hard metal (grade ISO K10 - K20)
Tooling geometry	As for high speed steel
Cutting speed (m/min)	35 - 40
Lubrication	Emulsion

Turning

Hardmetal grade	ISO K10 - K20
Rake angle (°)	6 - 8
Clearance angle (°)	7
Cutting speed (m/min)	60 - 100
Feed (mm/U)	≤ 0.3
Condition of machining	Emulsion

Milling

Hardmetal grade	ISO K10 - K20
Rake angle (°)	10
Clearance angle (°)	7 - 10
Approach angle of the main cutting edge (°)	45
Cutting speed (m/min)	80 - 100
Feed (mm/U)	≤ 0.3
Condition of machining	Dry

Grinding

Centerless grinding	Grinding wheels made of corundum in the hardness K, L, M
Grain	40 - 60 with intermediate structure
Binder	Resin binder
Cutting speed (m/s)	28 - 32
Feed	0.02 - 0.10 max
Lubrication	Emulsion

Details about quality and recommendations about the use of materials and products are for descriptive purposes. They are based on the results of our research and development work and on practical experiences. Statements about certain properties are made to the best of our knowledge but are offered without guarantee. Statements on these matters shall always require specific agreement in writing.