New system fixes ceramic arcing cathodes reliably.

To date an appropriate fixturing system for using ceramic cathodes in arc-evaporation was missing. A carrier plate and a cathode ring now enable the use of tungsten-carbide, chromium-silicon or titanium-diboride.

Hard and extremely durable: ceramic coatings make an ideal protective layer for tools and components. To date, ceramic and brittle materials could only be deposited by means of the reactive magnetron sputtering method, in part because of the lack of an appropriate fixing system for arc evaporation. But now we have developed a suitable fixing system for ceramic and brittle composite materials.

When it comes to coating tools, arc evaporation is generally a more efficient method than magnetron sputtering. A threaded hole in the arc cathode usually fixes the coating material in the coating system. Ceramic and brittle composite materials are unsuitable for this type of mechanical machining, which they would not withstand intact. Therefore until recently tungsten carbide, for example, could only be applied to the various substrates by means of the magnetron sputtering method.

We have now developed a new fixing system facilitating the use of ceramic and brittle composite materials as cathodes in arc evaporation. The system comprises an integrated carrier plate and a cathode ring. As the various cathode materials have different thermal
expansion coefficients, molybdenum is also available as an alternative to copper as a material for the carrier plate. The cathode ring made from molybdenum or ceramic materials encloses the coating material and ensures that the arc remains on the cathode material during the coating process.

The new mounting system is suitable for arc cathodes made of tungsten-carbide, chromium-silicon, titanium-diboride and titanium-chromium, among other materials. It is particularly robust and can be reused multiple times in many cases.

We are happy to advise you – for instance at the PSE conference in Garmisch:

International Conference on Plasma Surface Engineering (PSE)
Garmisch-Partenkirchen, Deutschland

As the leading powder metallurgy manufacturer, we supply sputtering targets and cathodes made of a wide range of metals and composite materials such as titanium-aluminum, aluminum-chromium, chromium, titanium, zirconium, titanium-silicon, titanium-diboride and tungsten carbide. Our products are put to the test daily as hard material coatings on tools, components and decorative items.