



## reliability & stability

Due to its characteristics the material diamond, compared to traditional materials, serves a various range of applications and leads in those to more stable and reliable production processes.

● Two complete different examples show how diamond and especially the HF-CVD (Hot Filament Chemical Vapour Deposition) diamond coatings by CONDIAS can be used for a wide range of industries and applications.

Diamond coatings by CONDIAS on silicon carbide as a substrate material work very successful in tribological applications like mechanical seals made of for pumps, compressors and magnetic couplings which have to meet extremely high quality requirements. CONDIAS participated in a publicly funded research project on diamond coated ceramics. This diamond layer prevents that insufficient lubrication due to dry running leads to a considerable increase of temperature and thus sliding faces and seals are not damaged. All over the world this innovative coating technology is applied by Eagle

Burgmann Industries for oil, water and gas seals used under heavy wear conditions e.g. in large pump stations or complex power plant facilities.

Additionally diamond coatings by CONDIAS ensure a high water quality and its monitoring on the International Space Station ISS. For this purpose a TOC on-line analyzer is used that is developed and manufactured by O.I. Analytical (USA). The NASA has high demands on a stable and reliable process with low maintenance and an easy handling. All these requirements are met by the DIACHEM® electrodes that have been customized for this special application and for the specific conditions in space. The system has been running successfully since spring 2009.



## Technology

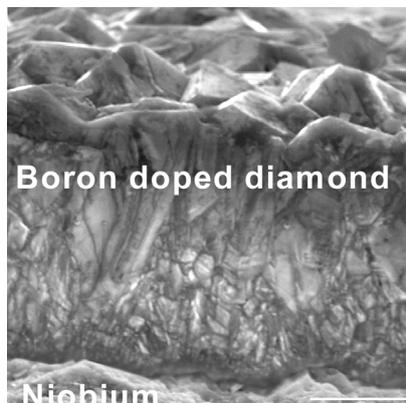
The HF-CVD diamond coatings have specific characteristics. The advantage for applications using these diamond layers are related to the mechanical and thermal characteristics of diamond. The most important properties of diamond coatings by CONDIAS are high hardness, extremely high thermal conductivity, resistance to corrosion and chemical stability.



DiamondFaces® by EagleBurgmann being coated into HFCVD module

CONDIAS offers customized electrodes or coatings on different substrate materials like niobium, silicon or silicon carbide. The thickness of coating is available according to customer's specifications.

The characteristics of diamond and the individual coatings by CONDIAS result in products that are stable and reliable in undefined conditions with the advantage of low maintenance efforts.



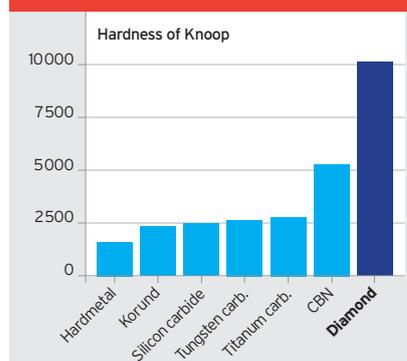
Boron doped diamond

Niobium

### Thermal conductivity



### Hardness



Benefits of HF-CVD coating by CONDIAS:

- high hardness
- high thermal conductivity
- resistance to mechanical and chemical corrosion
- adaptation to customer's specifications

## Potential

In the future HF-CVD coatings by CONDIAS are useful for applications where a combination of requirements e.g. protection against mechanical and chemical corrosion are necessary. So the protection against corrosion in extreme environments is ensured. Additionally the coatings are useful for those applications where improvements of tribological characteristics are helpful to ensure a stable and reliable process.

## Contact

CONDIAS GmbH  
Fraunhofer Str. 1b  
25524 Itzehoe  
Germany

Tel.: +49 (0)48 21 / 80 40 87 - 0  
Fax: +49 (0)48 21 / 80 40 87 - 11  
Mail: info@condias.de