



NEWSLETTER DTI TRIBOLOGY CENTRE

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Tribology Centre acquires state-of-the-art HiPIMS coating unit

The Tribology Centre at Danish Technological Institute has invested in a new industrial HiPIMS CC800® coating unit from Cemecon AG, which is equipped with the newest HiPIMS (High Power Impulse Magnetron Sputtering) technology. This flagship model combines all the advantages of classical DC sputtering with the capabilities of the latest HiPIMS development. The HiPIMS technology allows for deposition of coatings with an increased plasma flux of ionized metal ions, which makes it possible to tailor PVD coatings towards e.g. a higher density, other crystal phases or to obtain alloys of immiscible elements.

Hence, HiPIMS offers new ways of synthesizing new and better performing coatings. The system is equipped with a total of six sputter cathodes (evaporation sources), four of which can be operated in either HiPIMS or DC mode. The additional two DC cathodes can be used to provide more complex multilayer coatings, adding dopants, provide tailored colour of top coatings, or simply to increase the deposition rates.

The absolutely free combination of these technologies within one process gives an unlimited range of coating possibilities. Deposition rates of 2 $\mu\text{m}/\text{h}$ and process times of down to 4–5 hours can be achieved in pure HiPIMS mode. Simultaneous operation of all 6 cathodes will enable coating rates of a densely packed batch close to 3 $\mu\text{m}/\text{h}$.

The machine is perfect for the ongoing development of our optimized coating families and customized coating processes. Our research team has already many ideas of how to develop coating recipes on the new HiPIMS platform.

Initially, we will focus on developing a new coating for cutting tools targeting milling in hardened steel (above

Rockwell 58) and for tooling in stainless steel. Among the potential coating candidates will be transition metal nitrides like AlCrN, TiCN, TiAlN or alloys obtained by adding different dopants.

The trend of adding dopants has been part of the evolution going from more generalized solutions towards more specialized coatings characterized by having improved milling performance in dedicated material types.

The HiPIMS flagship will arrive at the Tribology Centre at the end of May 2018 and is expected to be ready for production before the summer holiday.



Infrastructure being made ready for the arrival of the new HiPIMS unit.



Photo of the HiPIMS CC800® flagship.

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