NEWSLETTER DTI TRIBOLOGY CENTRE

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Tribology Centre releases new low-temperature HiPIMS chromium nitride coating (CrN-HP)

Our family of chromium nitride (CrN) coatings is expanding with the release of a new coating, CrN-HP, developed on our HiPIMS PVD unit **Hi**gh **P**ower **I**mpulse **M**agnetron **S**puttering).

Smart rings from Oura coated with wear-resistant CrN-HP (see www.ouraring.com).

Coatings produced by the HiPIMS technology are known to be more dense, smoother, having fewer defects as well as better coverage of edges and corners.

The CrN-HP coating is approximately 15% harder than conventional chromium nitride deposited by DC sputtering. The process temperature for the CrN-HP coating is max. 180 °C.

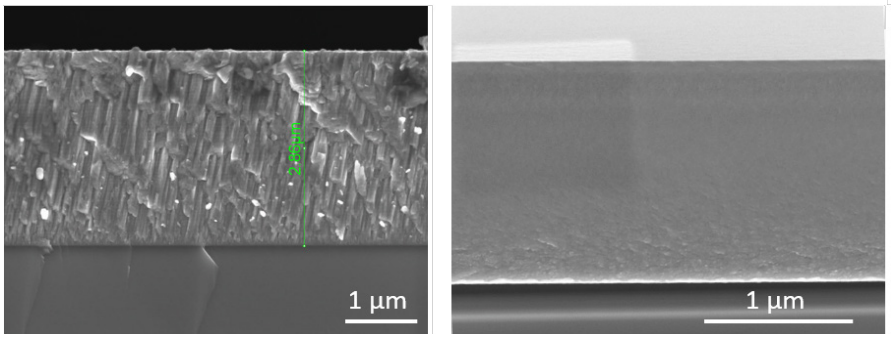
Since the CrN-HP coating is very smooth, dense and ductile with a high hardness, it is an all-round coating that can improve the performance of a wide variety of tools, wear parts and machine components. The use of CrN-HP is beneficial in connection with plastic injection moulding where it increases the lifetime of the moulds even when dealing with severely abrasive dyes or fillers. At the same time, it improves the demoulding properties ensuring a high and constant quality of the moulded parts minimizing scrap.

The CrN-HP coating has also shown superior performance on knife edges for metal cutting by increasing both the hardness of the cutting edge as well as minimizing the risk of metal-metal adhesion. This improves both the quality of the cutting process and the parts and the lifetime of the involved tools.

Due to its ductility, the hardness of the underlying material is not crucial making it an optimal choice on all steel types including low-temperature tempered steels as well as aluminum and copper alloys. CrN-HP may also substitute hexavalent chromium (Cr (VI)) because it is very dense and thus more corrosion-resistant. Its appealing visual appearance and its hardness makes it highly applicable as a wear-resistant decorative coating.

HiPIMS chromium nitride (CrN-HP)	
Hardness (HV)	2100
Process temperature (°C)	< 180
Thickness (µm)	1-5

The Tribology Centre is in the process of releasing three new HiPIMS coatings: chromium nitride (CrN-HP), titanium diboride (TiBto-HP) for machining in aluminium, titanium alloys and non-ferrous metals, and an all-round wear-resistant coating for machining in hard steel, stainless steel, titanium- and nickel-based alloys (Versal-HP) based on a doped TiAlN.



SEM images of conventional DC-sputtered CrN (left) and CrN deposited by HiPIMS (right). Note the coarse grains, often seen in conventional DC-sputtered CrN.

For more information, please contact

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