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Thick hard coatings for extreme loads

Wear-reducing PVD-coatings have been successfully applied in the machining, forming and plastics engineering sector for decades. Many applications do not require thicknesses of more than 3 - 5 µm. Thick hard wear protective coatings, however, offer a better protection than thin coatings do. On the other hand, their fabrication of thick hard coatings is considerably difficult. Experts of the Fraunhofer IWS Dresden are going to present a novel approach which enables a fabrication of hard coatings in a thickness range of more than 100 µm. The IWS approach offers very promising perspectives for, in particular the tool making industry.

Thick hard coatings can be reliably fabricated if the growth of coating defects is suppressed and stress conditions are controlled. Fraunhofer IWS scientists are successfully applying the system AlCrSiN/TiN to fulfill these requirements. With the help of a nano-layered structure, coatings of more than 100 µm can be reliably and economically fabricated. The structure is homogeneous and best suited for tool applications. The distribution of mechanic properties in the structure, e.g. the film hardness, is uniform. Thus, in case of need, a later surface structuring or polishing process become possible.

IWS coatings are most fitting for tools of highest surface quality such as indexable inserts, milling cutters and forming dies. Furthermore the coatings are perfectly suited for coating processes of highly loaded component surfaces, e.g. solid forming tools. Various laboratory and application tests have demonstrated that the IWS hard coatings show high hardness and abrasion stability at high surface pressures. In lubricated tribosystems they exhibit a low friction to steel surfaces and an excellent adhesion; moreover they are not prone to crack formation and fretting.

Users of hard coatings, e.g. machinery and plant manufactures are cordially invited to visit our experts at the Materials Week 2015, exhibition complex Dresden, September 14 – 17, 2015. Here you will find an excellent platform for discussion and mutual exchange of ideas. IWS scientists will be pleased to help you with their know-how. Please come and visit us in hall 3 at the joint booth of the Materials Research Network Dresden (MFD e.V.).

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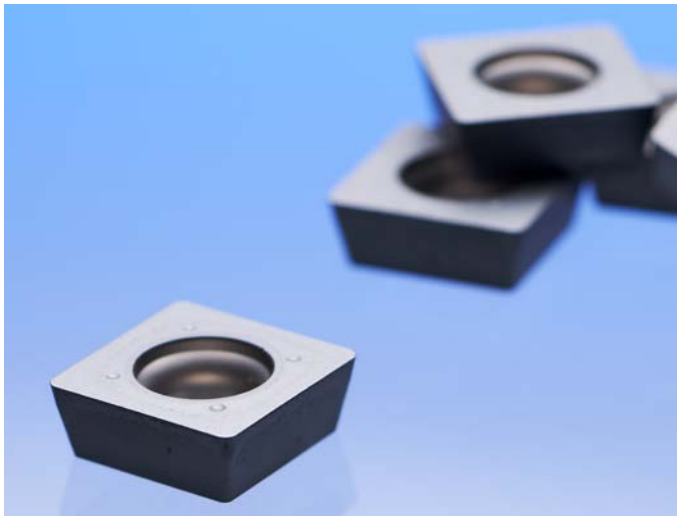
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Coated indexable insert
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Forming tool, coated with 10 μm AlCrSiN/TiN- nano-composite layer
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