

Edge-related effects during Arc-PVD deposition processes

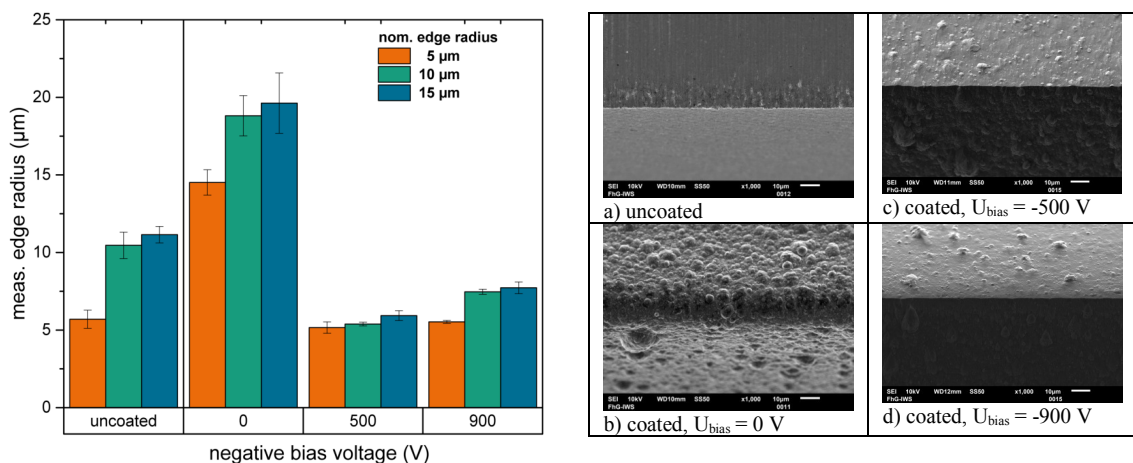
Tim Krülle^{1,*}, Frank Kaulfuß¹, Otmar Zimmer¹, Andreas Leson¹, Christoph Leyens^{1,2}

¹Fraunhofer IWS, Dresden

²TU Dresden, Institute of Materials Science

*Corresponding author e-mail: tim.kruelle@iws.fraunhofer.de

The deposition of different coatings on shaped surfaces, such as on cutting tools (drills) faces problems especially on edges. Normally the radii of such cutting edges are dramatically increased, if the coating thickness is increased. Also defects, damaging or resputtering of material on edges may occur. A multilayered coating based on AlCrSiN instead showed an interesting effect of edge sharpening during the deposition process. With this approach it would be possible to overcome the problem of edge rounding in PVD coating technology. The pictures below show different edge radii varying with the negative bias voltage and leading to a smaller edge radius as compared to the uncoated tools or tools without additional bias voltage.



Therefore the deposition process and important deposition parameters were investigated and the geometry of such edges was measured. Accompanying nano indentation hardness measurements give an overview of mechanical properties around the surface also in dependence of position and chemical composition of the coating.

REFERENCES:

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