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Tribological and mechanical properties of HIPIMS sputtered CrNx films

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CrN_x films prepared by DC magnetron sputtering or arc evaporation are still widely used in industry as a tool coating or low friction coating under oil lubrication conditions. The HIPIMS (HIgh Power Impuls Magnetron Sputtering) technology has been known as a process with higher ionization of sputtered particle that results in an altering e.g. film structure, surface roughness or mechanical properties. In our work, CrN_x films were deposited in industrial batch coater with closed field magnetic configuration. Two cathodes were used either in HIPIMS or DC mode for comparison. An influence of pulse shape and nitrogen flow on structure (XRD), surface roughness, morphology and mechanical properties of CrN_x coating were investigated. Tribological tests performed on pin-on-disk at room and high temperature on CrN_x coating prepared under different conditions shows major differences between low and high ion bombardment of substrate during film growth.

Keywords
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