

Abstract Submitted
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Preparation of self-adhesive n-TiC/a-C:H coatings with internal layered structure by hybrid PVD-PECVD process¹ PETR VASINA, PAVEL SOUCEK, MAREK ELIAS, VILMA BURSIKOVA, Masaryk University, Brno, Czech Republic, ABDELAZIR EL MEL, PIERRE-YVES TESSIER, Univ Nantes, CNRS, IMN, France, MASARYK UNIVERSITY, BRNO, CZECH REPUBLIC TEAM, UNIV NANTES, CNRS, IMN, FRANCE TEAM — Nanocrystalline titanium carbide embedded in an (hydrogenated) amorphous carbon matrix shows high hardness and Young's modulus combined together with low wear and low friction coefficient. However considerable deficiency of these coatings is usually reported to be insufficient adhesion to the substrates. In this paper, we report the deposition procedure which leads to deposition of the coatings several μm thick with simultaneously good mechanical properties and good adhesion to the silicon substrate despite that no usually recommended interlayer to promote the adhesion is used. Carefully chosen deposition conditions leads to a deposition of coatings with an internal layered structure consisting of two parts with different microstructure separated by a very sharp transition. We attributed the formation of reported layered structure to the gradual increase of the temperature of the substrate in a certain range given by our experimental conditions.

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