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Hard and dense Diamond like carbon coatings deposited by Deep Oscillations Magnetron Sputtering

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Abstract

Recent developments in the automotive industry to improve engine efficiency and minimize pollutant emissions are driving the need for higher operating temperatures and loading densities in internal combustion engines. Future engines for internal combustion engines will require coatings with increased temperature stability (up to 500 ºC) and wear resistance as compared to present day solutions. Hard tetrahedral DLC coatings (ta-C coatings) very low coefficient of friction and performed very well under mixed and boundary lubrication, and, thus, they are very attractive for automotive industry. In this work, DLC coatings were deposited by deep oscillations magnetron sputtering (DOMS), a variant of high power magnetron sputtering (HiPIMS). The main objective is to increase the sp3 content in the films, as compared to d.c. magnetron