

Characterization of a Pure Diamond-Like Carbon Film Deposited by Nanosecond Pulsed Laser Deposition

Authors : Camilla G. Goncalves, Benedito Christ, Walter Miyakawa, Antonio J. Abdalla

Abstract : This work aims to investigate the properties and microstructure of diamond-like carbon film deposited by pulsed laser deposition by ablation of a graphite target in a vacuum chamber on a steel substrate. The equipment was mounted to provide one laser beam. The target of high purity graphite and the steel substrate were polished. The mechanical and tribological properties of the film were characterized using Raman spectroscopy, nanoindentation test, scratch test, roughness profile, tribometer, optical microscopy and SEM images. It was concluded that the pulsed laser deposition (PLD) technique associated with the low-pressure chamber and a graphite target provides a good fraction of sp³ bonding, that the process variable as surface polishing and laser parameter have great influence in tribological properties and in adherence tests performance. The optical microscopy images are efficient to identify the metallurgical bond.

Keywords : characterization, DLC, mechanical properties, pulsed laser deposition

Conference Title : ICDMME 2019 : International Conference on Design, Material and Mechanical Engineering

Conference Location : London, United Kingdom

Conference Dates : December 09-10, 2019