Seminar

Institute for Plasma Research

Title : Diamond like Carbon Coating: Fundamentals and Related Applications in Automotive Parts

Speaker: Dr. Infant Solomon
Vellore Institute of Technology, Chennai

Date : 17th July 2020 (Friday)

Time : 03:30 PM

Venue : Online - Join the talk:
https://meet.ipr.res.in/Dr.Infant

Abstract :

The top priority of modern engineering world is to design and develop lightweight system with higher efficiency and durability. Sometimes some of the selected material can give improved efficiency with relatively less effort. On the other hand it may fail within short lifespan due to the wear and tear caused by frictional forces, corroding environment etc. Understanding of surface engineering is the key to overcome these problems and can change the surface characteristics by retaining the bulk properties of base material. The surface coating technology is an emerging field based on surface engineering, with which any desired properties can be achieved at surface level alone. Diamond like carbon (DLC) or amorphous carbon coating is one of the emerging coating techniques, which has wide range of applications in various fields like biomedical, automotives, optics and electronics as a surface coating. The advantages that lead to these applications are its biocompatibility, chemical inertness, low coefficient of friction, hardness and better optical transparency. There are various deposition techniques available for producing DLC coatings among which, the magnetron sputtering technique is chosen for this study in order to make it hydrogen free carbon coating. The coating process has been performed on various substrates related to different applications. Different optimized conditions have been achieved in improving its properties, which lead to various applications. In addition to this, the incorporation of nitrogen in carbon coatings and usage of different interlayers between substrate and DLC film has been performed for better adhesion of the coating related to specific applications.

This talk covers the brief introduction to DLC coating, and the methodology to produce DLC coatings, the process parameters and the significance of incorporation of nitrogen and some interlayers into DLC coatings for the enhancement of their performance.