

## **Realising the potential of carbon-based nanomaterials for advanced coatings**

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Carbon-based nanomaterials (such as carbon nanotubes, carbon nanofibers, graphene, graphene oxide and reduced graphene oxide) exhibit some distinctive properties due to their unique electron and lattice structure. The remarkable mechanical (strength & modulus), physical (thermal conductivity & thermal stability), chemical (corrosion resistance, adsorption capacity & impermeability to gases), tribological (lubricity) and biological (bioactivity & anti-bacterial efficacy) properties of carbon-based materials have attracted great attention of surface engineering community.

This talk will start with a historic note on evolution of coating materials to meet ever-increasing demanding for property, multi-functionality and durability of coatings, and the attractive properties of carbon-based nanomaterials and their potential in surface engineering. This is followed by an overview on the current status and challenge of applying carbon-based nanomaterials for large area surface coatings. The potential of carbon-based nanomaterials will be demonstrated by way of examples of our recent research including (i) GO thin films by electrophoretic deposition and by self-assembly; (ii) CNTs reinforced carbon-matrix nanocomposite coating by PECVD; and (iii) GO/rGO reinforced metal matrix nanocomposite coatings by selective electroplating. This talk will end with the discussion on future challenges and R&D directions.