Mohit Gupta, University West

Title: “Liquid Feedstock Plasma Sprayed Coatings for Improved Engine Performance”

Abstract

Increased functional, environmental and economic demands on today’s gas turbines require improved coatings that are capable of withstanding higher operating temperatures, show increased durability, and at the same time, are cheaper to produce.

Liquid feedstock plasma spraying involves usage of a liquid feedstock in form of a suspension or solution precursor to deposit fine droplets ranging from sub-microns to a few microns in size. Employing a liquid feedstock can produce a variety of coating microstructures over a wide range of porosity typically not possible with conventional powder plasma spraying. The columnar structure produced by suspension plasma spraying (SPS) has been of particular interest for thermal barrier coating (TBC) applications as it could provide both low thermal conductivity and high durability along with possibly lower manufacturing cost. Solution precursor plasma spraying (SPPS) also needs to be explored if it could achieve these microstructures. In case of environmental barrier coating (EBC) applications, SPS has the potential to create highly dense coatings.

In this presentation, latest developments in liquid feedstock plasma sprayed TBCs and EBCs will be included. Recent work on the influence of bondcoat fabrication process and topcoat-bondcoat interface characteristics on lifetime of SPS TBCs will be also presented.

Biography

Mohit Gupta is employed as Associate Professor at University West, Trollhättan, Sweden since September 2018, and is Head of Division of Mechanical Engineering since March 2024. He graduated from University West as a PhD in Production Technology in January 2015 by defending his thesis titled 'Design of Thermal Barrier Coatings – A modelling approach'. Prior to that, he obtained his Master of Science Degree in Mechanical Engineering from University West in 2010 and Bachelor of Technology Degree in Mechanical Engineering from Indian Institute of Technology Kanpur, India in 2009. His current research interests include Suspension Plasma Spraying (SPS) and High Velocity Air-Fuel (HVAF) spraying of ceramic and metallic materials for a wide range of applications such as thermal barrier coatings (TBCs), wear resistant coatings and multifunctional coatings.