Institute Seminar on "Liquid feedstock thermal spraying: A pathway to new generation functional coatings"

Speaker: Prof. Shrikant Joshi (Former Additional Director, International Advance Research Centre for Powder Metallurgy & New Materials, India)

Venue: Room No. 101, Lab Complex (LBC), IIT Bhubaneswar

Date: 13th Nov. 2018 (Tuesday) Time: 5:45 P.M. to 6.45 P.M.

The seminar began with welcome by Dr. C. N. Bhende (PIC Seminar) followed by brief introduction of the speaker.

The presentation provided the details of the technique of liquid feedstock plasma spraying and how it is a suitable alternative to other known techniques of coating deposition. The microstructures and other properties of liquid feedstock plasma sprayed coatings were found to be similar to those coatings deposited using known technologies. During the course of the discussion, Prof. Joshi also highlighted how vertical cracks in coatings could actually be beneficial for the life of the coatings although conventional knowledge paints cracks as harmful defects. Prof. Joshi pointed out that these vertical cracks are required for strain accommodation and this helps prolong the life of the coating. There was a discussion towards this end as a question was posed on the fatigue life of the cracked coatings. He also mentioned how the bond coat underneath the thermal barrier coating would ensure that the life of the coating system is good. Also there was a question regarding the vaporization of particles when they are being hurled at high speeds towards the substrate at high temperature sunder controlled atmosphere. Prof. Joshi pointed out that the vaporization is particles is avoided because the residence time on account of the high speed of the particles is very low. Prof. Joshi also educated the audience with an overview of this group's research activities on additive manufacturing. Additive manufacturing is an emerging area of technology and Prof. Joshi's talk

highlighted the various applications where additive manufacturing will be helpful.

The seminar concluded with the Prof. Sujit Roy (Head, SMMME) felicitating Prof. Joshi with a memento of appreciation.

Biography of Prof. Shrikant Joshi

Shrikant Joshi is a Professor in the Department of Engineering Science at University West, with nearly 30 years of experience in the fields of Surface Engineering, Laser Materials Processing and now Additive Manufacturing. He is a Chemical Engineer by academic training, having obtained his M.S. and Ph.D. degrees from the Rensselaer Polytechnic Institute and University of Idaho, respectively, in USA. Prior to moving to Sweden, he has had long stints as a Scientist at the Defence Metallurgical Research Laboratory (DMRL) and the International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI), both in Hyderabad. His varied contributions have bridged basic research, technology development and its transfer for industrial implementation. His research in Surface Engineering has spanned varied coating technologies, namely conventional atmospheric & solution plasma spraying, detonation spraying, cold gas dynamic spraying, electron beam physical vapour deposition and cathodic arc PVD. His research in the field of laser materials processing has included cutting/drilling, heat treatment and alloying/cladding. His current areas of research are solution & solution-powder hybrid plasma spraying and additive manufacturing. His work has led to many industrial applications, over a dozen patent applications and more than 150 publications in peer-reviewed journals. He has also received several awards, including the ‘MRSI-ICSC

Superconductivity & Materials Science Annual Prize', the Vasvik Research Award and the Metallurgist of the Year Award. He is also a Fellow of the Indian National Academy of Engineering.