

Preface

Materials are the backbone of any aerospace structure. Advances in materials have always been attributed to success in aerospace science and technology. The performance characteristics of modern aerospace vehicles are, to a large degree, result of high performance materials and manufacturing technology used in air frames and propulsion systems.

Colossal contributions have been made in quintessential areas of research in the last three to four decades in the alloy design to meet the ever increasing demand of structural designers. An outcome of the research is the development of superalloys for high temperature applications, advanced high strength aluminium and aluminium-copper-lithium alloys for aircraft/launch vehicles, magnesium alloys for automobiles, copper alloys for high heat flux applications in rocket thrust chambers. In order to further improve the performance of an alloy, coating technologies have been developed and are being regularly used in aircraft industry for turbine blades.

There is a large requirement of materials that usually gets unnoticed from non-aerospace players i.e. special purpose materials like magnetic materials, electronic materials, glasses, ceramics, composites and glass ceramics that are of high value and which are under 'restricted for import' category. Technological know-how of strategic materials development is often not openly shared among the members of the scientific community. Some of them being for dual use purposes are not available for import and need special attention for indigenizing them. Further, the importance of testing and characterization need not be overemphasized in the successful realization of materials, components and systems meeting the specifications.

This proceedings contain selected peer reviewed papers from the International Conference on Advances in Materials and Manufacturing Processes for Strategic Sectors (ICAMPS-2015) organized by The Indian Institute of Metals (IIM), Trivandrum Chapter, India during May 13-15, 2015 in Trivandrum, India. ICAMPS-2015 aimed at formulating an integrated multi-disciplinary approach involving R & D organizations, academia and industries.

173 papers contained in this volume were selected on the basis of their scientific quality and relevance to the theme of the conference. All papers published in this volume were peer reviewed by the subject experts. These papers were categorized into 11 chapters covering all aspects of advanced materials and manufacturing techniques. The papers represent the latest development in the field of materials and manufacturing technology, spanning from fundamentals to new technologies and applications. Specifically, the papers cover the topics of processing of advanced materials and their characterization for performance critical applications. We believe that this book provides a valuable reference for researchers in the fields of materials and metallurgical engineering, manufacturing science and technology who wish to further understand the processing of materials, microstructure-mechanical property correlations underlying mechanisms and create innovative and practical techniques and processes.

We wish to express our deep sense of appreciation to all the members of ICAMPS-2015 organizing committee and various sub-committees as well as to all the reviewers for their tremendous efforts and dedication. We profusely thank all the invited speakers who readily agreed to give lectures at the conference. Finally, we would like to thank all the authors for their contributions to these proceedings.

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