



Editorial

Perhaps Aerospace Sciences and Technologies is unparalleled in its stupendous outreach it has made and making to the mankind when it comes to knowledge explorations and its applications, be it as pure curiosity persuasion or in search of solutions to human endeavours. The study of evidences for existence of life in distant planet or to study the pattern of automobile traffic at various times in a metropolis could be accomplished and facilitated. Further, the quest to conquer distance and do so speedily is a perennial desire in mankind. Towards this goal the role of High Energy Materials (HEMs) is significant and unique since they are more powerful but relatively insensitive to heat, impact, friction, spark and such stimuli. The term HEMs/EMs is generally used for any material that can attain a highly energetic state mostly by chemical reactions.

All explosive, propellant, pyro technique formulations coming under this term (HEMs) consists of a mixture of several ingredients: a metallic fuel (to enhance energy output) a polymeric binder (to impart mechanical integrity and also to act as a fuel), a plasticizer (to facilitate processing), a curing agent (to cure the binder) and other additives to impart (special features). Currently composite propellants are extensively used both in space exploratory missions and military missile operations.

The International Conference on High Energy Materials held at Indian Institute of Technology Madras, Chennai in association with the High Energy Materials Society of India and Satish Dhawan Space Centre, ISRO attracted novelty, innovation and the emerging frontiers in high energy materials which is the foundation for continuum in sustained growth of the quest to conquer distance, precision in mission deployment and understanding exotic findings in outer space. Conference was spread over three days with five parallel sessions with each session having six presentations or more. Besides this there were Plenary lectures and two poster presentation sessions. Presentations covered wide range of topics including explosives, propellants, modelling and simulations in its performance, quality assurance and safety in all sectors like Space, Defence and Civil. While the application of HEMs include the pilot seat ejection system in a combat aircraft, to tunnelling and quarrying and in rockets to launch satellites largely and to control their motions significantly and precisely. The domain knowledge reveals the depth of understanding of critical assessment required for each application area the power per unit volume, insensitivity to shock friction and such engineering encounters for its safe and immaculate performance.

The limitation to bring selected papers in the form of a Special Issue of the Journal from the Conference presentations has been perhaps the onerous but absorbing assignment for the sheer potential of the HEMs in its boundless applications envisaged. This special issue has twelve papers as invaluable representation of the scientific endeavours in HEMs in miniscule. There has been delay due to Covid pandemic reigning for long but Editors from

Contd/-

the Aeronautical Society of India in particular take pleasure in appreciating the relevance of HEMs in its publication of this special issue for the significant hind sight role, HEMs plays in Aerospace projects and performance.

We have great pleasure to extend our sincere thanks to all the authors and contributors for making it possible to bring-out the Special Issue. The Editorial Committee records its appreciation to Smt Chandrika R Krishnan, Shri AKM Kumaran and Shri R Hemanth Kumar of the Journal Office for their excellent work in formatting, proof reading, cover design etc. We also record our appreciation to Shri V Krishnamoorthy, Director, Repromen Offset Printers, Bangalore for his efforts to print the Special Issue.

Editorial Committee for Special Issue :

Shri KPS Murthy
President
High Energy Materials Society of
India, Pune

Dr Nagendra Kumar
Dept Aero Engineering
Indian Institute of Technology
Bombay, Mumbai

Prof PA Ramakrishna
Dept Aero Engineering
Indian Institute of Technology
Madras, Chennai

Dr R Balasubramaniam
Editor
Journal of Aerospace Sciences
and Technologies
The Aeronautical Society of India
Bangalore

Dr S Kishore Kumar
Associate Editor
Journal of Aerospace Sciences
and Technologies
The Aeronautical Society of India
Bangalore

Dr P Raghothama Rao
Associate Editor
Journal of Aerospace Sciences
and Technologies
The Aeronautical Society of India
Bangalore