



ASM International Bengaluru Chapter

Cordially invite you to ASM Online Technical Talk

Titled

“Aircraft Materials: Opportunities and Challenges – HAL’s Perspective”.

BY

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Date & Time: 19.03.2022, Saturday at 5:00 pm IST

Zoom Link:

<https://us02web.zoom.us/j/81353015940?pwd=Wk5mWGRxVy9saUJBMzBYRzhvVWlkUT09>

Zoom Meeting ID: 813 5301 5940

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Time	Program Outline
4.40-4.45 pm	Login in Through ZOOM
4.45-5.00 pm	Networking with participants and speaker
5.00-5.02 pm	Welcome Speech by Chairman
5.02-5.04 pm	Introduction of the Speaker by Secretary
5.04-6.10 pm	Talk by Speaker
6.10-6.20 pm	Q & A
6.20-6.25 pm	Vote of Thanks by Secretary and Log off

ABSTRACT

Aircraft Materials: Opportunities and Challenges – HAL's Perspective

Metals and alloys play a crucial role in manufacturing and construction because of their desirable quality and combination of properties. Hindustan Aeronautics Limited (HAL) is primarily engaged in Design & Development, Manufacturing, Maintenance, Repair and Overhaul (MRO) of Aircrafts, Helicopters and Aero-engine for defence applications. These platforms are either indigenously designed and developed such as ALH, LCH, LUH, HTT-40 and LCA or manufactured under the Transfer of Technology (ToT) such as Su-30MkI, HAWK, Dornier etc. HAL needs to support these platforms for repair and overhaul. Foundry and Forge (F&F) Division caters the needs of Forgings and Castings of various projects of HAL since 1953. F&F Division developed around 6000 castings/forgings so far to support the existing platforms.

The presentation gives a brief account of the various programs, production units and R&D Centres of HAL spread across the country. This is followed by criteria for the Designers in the selection of Aircraft Materials today. The trends in major aircraft materials used in HAL under various projects over the period, is brought out. The presentation illustrates the challenges faced by the organisation at the Development stages in Magnesium alloys, Aluminium alloys and Composites as structural materials and Ni- and Ti- alloys as powerplant materials thereby ensuring the serviceability of fleets. The presentation also comprises of some of the niche areas which has compelled HAL to develop some of the components indigenously either for reasons of propriety or overcome the monopoly in supplies by the OEM. For example: Shape memory alloy development as ferrules in LCA and metallo-ceramic friction materials for brake applications of Indian Military Programmes be it fixed wing or rotary wing. In the Additive Manufacturing sector, one of the Divisions has set up the metal rapid prototyping (RPT) for the parts used in the Development of Engines at the level of design prove out. F&F Division has also set up sand RPT replacing the hard Tools.

ABOUT THE SPEAKER



Dr. R.R. Bhat

Dr. R.R. Bhat obtained his M.Tech. (Process Metallurgy) and Ph. D. (Metallurgical Engineering) from NITK Surathkal (formerly KREC Surathkal). He worked as Research Associate in National Institute of Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram and Indian Institute of Technology, Kharagpur between 1993-95. He joined CSIR-NML, Jamshedpur as Scientist in 1995 and worked there till 2001 in the then Metal Processing Division. Since August 2001, he worked as Chief Metallurgist in Central Materials and Processes Laboratory at Foundry and Forge (F&F) Division of Hindustan Aeronautics Limited, Bangalore.

He had retired as Additional General Manager from F&F Division in June 2021. He was the Head of both Central Materials and Processes Laboratory as well as Quality Engineering Department at F&F Division. His professional experience includes alloy development, materials testing and characterisation, indigenisation, failure analysis, rationalisation of aerospace metallic materials, certification from internal, export customers and regulatory authorities. He has guided more than 25 B.Tech. and M.Tech. students from Metallurgical, Material Science & Mechanical Engineering disciplines from various Engineering Colleges including IIT Chennai, NITK Surathkal.

He is the recipient of “2011 Metallurgist of the Year Award” from Ministry of Steel, GoI, received AeSI award for Indigenisation of Aeronautical Equipment Award in 2015 from Aeronautical Society of India (AeSI) and received “National Failure Analyst” award for the Year 2017 in June 2018 by the Society for Failure Analysis (SFA), Hyderabad. For his significant contribution to the Indian Engineering Industry, NITK Surathkal conferred him “Distinguished Alumnus Award” during the Diamond Jubilee Celebration held on September 15, 2019.

He is a member of various professional bodies. He is Fellow of the Institute of Engineers (FIE) and Fellow of Indian Institute of Metals (FIIM). He served as Secretary of ASM International Bangalore Chapter between 2010-2014. He is currently the Chairman of Indian Institute of Metals (IIM) Bangalore Chapter. He has published more than 75 papers in peer reviewed International/ National journals and has 3 patents to his credit.

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