

CV Sundaram Memorial Lecture

Materials In Flight

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One of the defining events of the past century was humankind's first flight in 1903. The key technology factors that determine the performance, affordability and environmental impact of flying vehicles are the optimisation of the airframe and engine structural features to maximise the lift to drag ratio, the thrust to weight ratio of the engine and the overall aircraft system, and the specific fuel consumption of the propulsion system. A significant part of story of the evolution of flight is related to the evolution of materials in flight in their effect on these metrics. We trace the use of materials in aerospace from the first flight of the Wright Brothers to the present day with a focus on efforts in our country to develop the technology and application engineering of such materials. The requirement of integrity and safety in these man-rated applications coupled with the extraordinarily demanding environment makes the materials development and application challenge unique in its many facets.