

Advanced Manufacturing Seminar Series

Friday, February 12, 2021

10:00 AM – 11:30 AM (Pacific Time)

Registration link: https://usc.zoom.us/webinar/register/WN_ZxgMTiUmR6qUWLVuvT-HLg

Aerospace-Grade Composites Without Autoclaves – A New Paradigm for Prepregs

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Abstract: Composite parts for aerospace structures have traditionally traveled through the autoclave en route to service. The journey begins when sheets of prepreg (fibers pre-impregnated with polymer resin) are laid onto a contoured tool in specified orientations, then cured by heating. The pressures provided during autoclave cure cycles have ensured consistent yields of low-defect laminates that meet the exacting performance and safety standards of the aerospace industry. The process robustness imparted by the use of autoclaves has fostered confidence amongst engineers, greatly expanding the deployment of composite materials. Examples of the widespread use include the 787 and A350 “all-composite” aircraft, as well as military aircraft and space vehicles. However, expanded use has created demand for increased production rates, and thus engineers have sought ways to bypass autoclaves, albeit without sacrificing material quality. The search has spawned the advent of vacuum-bag-only (VBO) prepregs designed to be cured in conventional ovens, which in principle should accelerate production throughput and reduce costs. In this seminar, basic principles involved in the design, use, and production of VBO prepregs will be presented, as well as perspectives on opportunities for future developments.



Biography: Prof. Nutt is the M.C. Gill Professor and founding director of the M.C. Gill Composites Center at the University of Southern California (USC). He joined USC in 1994, and his group focuses on understanding physical and chemical processes occurring during the manufacture of composite materials.