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IMPARTING ROBUSTNESS

IMPARTING ROBUSTNESS TO OUT-OF-AUTOCLAVE PREPREGS

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ABSTRACT

Autoclaves have long been used to ensure robustness in the production of composite parts. However, they present a production bottleneck, as well as high capital and recurring costs. Out-of-autoclave prepregs were introduced to allow oven curing and thereby address some of these issues. These OoA prepregs rely on so-called "edge breathing" to remove gas and volatiles during cure, and thus achieve low porosity levels. Unfortunately, this strategy presents problems in practice, yielding inconsistent results. For the past decade, USC's Composites Center has attempted to restore some of the robustness intrinsic to autoclave cure by redesigning formats for OoA prepregs. These efforts will be described, along with the basic concepts underpinning the approaches employed, as well as some of the challenges faced in attempting to transition the discoveries into practice.

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B I O

Steven Nutt is the M.C. Gill Professor of Materials Science and Director of the M.C. Gill Composites Center. He earned his Ph.D. degree in Materials Science from the University of Virginia in 1982, after which he worked at NIST as an NRC Postdoctoral Fellow. He spent eight years as a faculty member at Brown University before joining USC in 1994, where he founded the M.C. Gill Composites Center. Prof. Nutt's research focuses on processing and manufacture of composite materials, particularly for aerospace applications. A distinguishing feature of his research is the use of in situ process diagnostics to provide insights into process phenomena, which in turn are applied to eliminating defects. He teaches an undergraduate course in materials science, a graduate course in crystallography, and a graduate course in composite manufacturing. He has served as Vice Dean of Research, Department Chair, and Director of the Center for Nano-Imaging.