

High Permeability, Out of Autoclave Prepreg for Composites

USC Case #2016-174

Market Opportunity:

High-performance composite structures are currently produced from prepregs (fiber-reinforced material impregnated with a synthetic resin) that are consolidated and cured in high-pressure, high-temperature chambers (autoclaves). Autoclave processing limits production rates and part sizes, and attaches significant costs to production. Out-of-autoclave (OoA) prepregs have been developed to address these issues, particularly for aerospace. However, manufacture of large or complex parts remains difficult because OoA prepregs do not allow adequate evacuation of entrapped air, particularly in sub-optimal process conditions, leading to high defect levels. Hence, there is a need for materials and processes capable of producing large or complex composite parts with autoclave quality and robustness.

USC Solution:

USC researchers have developed a high permeability prepreg for OoA composite manufacturing. The prepreg features a discontinuous resin distribution, which imparts high permeability in all directions and allows vacuum bag-only cure of composite parts with complex geometric features and negligible defect levels, in both ideal and sub-optimal process conditions. This prepreg enables manufacturers in aerospace and other fields to save significant cost and time during composites production.

Value Proposition

- High permeability prepreg
- Out of autoclave (OoA) fabrication with high efficiency and robustness
- Production of high quality aerospace components with lower costs and restrictions

Keywords:

Prepreg, autoclave, manufacturing, aerospace, aerostructure



Applications

- Production of composite parts without autoclaves

Stage of Development

- Tested in laboratory
- Available for exclusive and non-exclusive license

Intellectual Property

Status:

Patent Pending: US 62/442,952

Key Publication:

[“Effect of prepreg format on defect control in out-of-autoclave processing” LK Grunfelder, A Dills, T Centea, and S Nutt, Compos A 93 88-99 \(2017\) DOI](#)

Contact information

Patrick Maloney

Licensing Associate
(213) 821-6064
pmaloney@usc.edu

USC Stevens

Center for Innovation

Maximizing the translation of USC research into products for public benefit