The NASA
LangleyEdge
NASA LANGLEY RESEARCH CENTER

Double-Vacuum-Bag Process for Composite Fabrication

Fabrication of void-free, high-performance composites.

NASA Langley Research Center is actively seeking partnerships and collaborations to commercialize its Double-Vacuum-Bag Process for Composite Fabrication technology

The Market Opportunities

- Double-Vacuum-Bag (DVB) process is designed to enable fabrication of high-performance composites where solvent-based or reactive resin matrix systems are used. DVB provides a simple and effective means for eliminating the voids typically found with use of such matrix systems.
- DVB process provides superior volatile management and control of resin content in composite fabrication.
- DVB process has broad application in composite manufacturing and can eliminate the need for autoclave curing.
- The DVB technology can also be adapted in molding processes such as resin film infusion (RFI), resin transfer molding (RTM) and vacuum assisted resin transfer molding (VARTM).

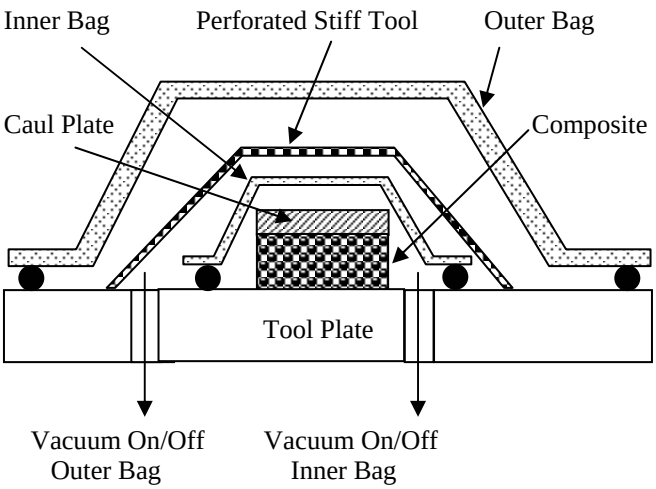
The Benefits

- DVB process affords superior volatile management in the fabrication of composites with reactive resin matrices such as polyimides and phenolics.
- DVB process affords control of matrix resin bleeding during composite fabrication. Resin volume fraction in the cured composite is easily controlled especially for low viscosity resin matrix systems.

The Technology

Single-vacuum-bag (SVB) processing in an oven is one of the most cost effective out-of-autoclave fabrication techniques for fiber-reinforced resin matrix composites. However, this processing technique is often ineffective when a reactive resin matrix or solvent containing matix or prepreg is present.

Reactive resin systems typically generate reaction by-products (e.g., water) during curing at elevated temperatures. In order to produce a void-free quality laminate, it is imperative to deplete these volatiles and solvents before commencing forced consolidation. The traditional SVB assembly inherently hinders and/or retards the volatiles depletion mechanisms during composite fabrication because a vacuum-generated compaction force is applied to the laminate during volatile depletion. An innovative DVB assembly was designed to overcome such a deficiency. DVB process eliminates the compaction force generated by vacuum suction while, in the meantime, maintaining the vacuum effectiveness for the volatile depletion. This invention has been proven and validated to be effective for volatile management and resin content control in composites with reactive resin matrices such as polyimides and phenolics and solvent containing prepregs.



Oven DVB Molding Assembly

Additional Information

To discuss in detail how this technology can profit you and your business, please contact:

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