



TECHNOLOGY SOLUTION

Manufacturing



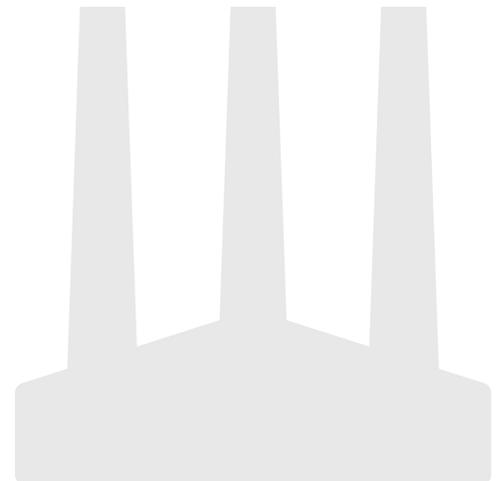
Blocking/Deblocking Resin Systems

Blocking/deblocking resin systems for use as a "co-cure-ply" in the fabrication of large-scale composite structures

Similar to resin systems currently used in composites for aerospace structural applications such as toughened epoxies, this innovation is a modification to traditional resin chemistry to prevent polymerization and crosslinking of the resin when heated and pressed in an autoclave or other common resin curing system. The chemical modification uses blocking groups to block the reactive functional groups in the resin to prevent curing reactions from completing. The blocking groups can be removed by one of several means. Once deblocked, the resin can be cured in an identical manner to an unmodified resin system. The resulting structure is one continuous part without the need for additional fasteners.

BENEFITS

- Represents an excellent opportunity to streamline a complex and expensive process and reduce cost
- May well fulfill an unmet market need
- The market for this technology may be quite large and may actually have unforeseen applications



THE TECHNOLOGY

This technology enables the fabrication of co-cured structures without the need for an autoclave or oven large enough to contain the full-scale structure. Instead, sub-components can be prepared in a less expensive, smaller autoclave or oven with co-cure plies applied to the faying surfaces. A continuous, assembled structure can be prepared using a subsequent curing process in a heated press. The co-cured structures can be designed to meet FAA certification criteria for composite structures because no adhesive bond or mechanical fasteners are needed. The structure can be treated as a single, joint-free component.

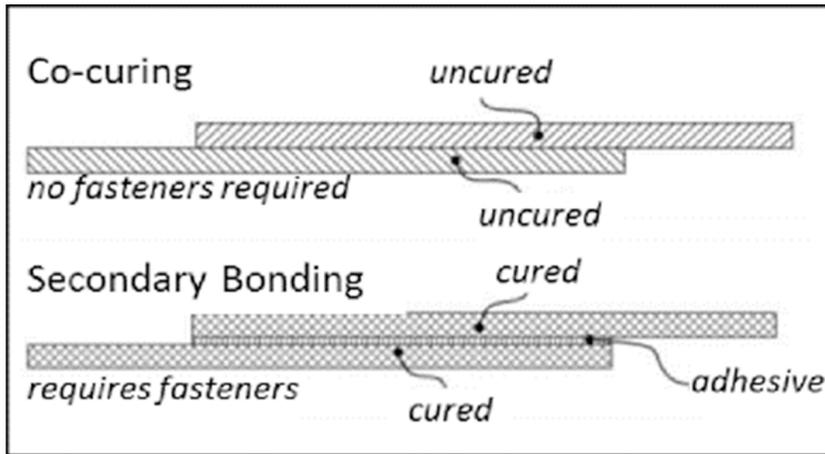


Illustration of the co-curing process. Image credit: NASA

APPLICATIONS

The technology has several potential applications:

- Presents promising applications in several industries such as:
 - General Aviation
 - Automotive
 - Marine
 - High speed rail
 - Wind turbines
 - 3D printing
- Initially for aircraft applications, especially for manufacture of fuselage parts

PUBLICATIONS

Patent No: 10,369,767; 10,549,516