

### 1.3 Blocking/De-blocking Resin Systems

**Statement:** This technology is a modification to traditional resin chemistry to prevent polymerization and cross-linking of the resin when heated and pressed in an autoclave or other common resin curing system.

**Problem addressed:** The use of secondary bonding and co-bonding techniques frequently result in unpredictable joint strengths that require the addition of mechanical fasteners while the use of the co-cure process is limited by the complexity of the part or the size of the autoclave or oven being used to mold and cure the part. A need exists for alternative manufacturing methods to fabricate unitized composite structures with reliable, certifiable joints without the need for redundant mechanical fasteners.

**Solution:** 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 de-blocked, 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.

**Technology description:** 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 de-blocked, 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 of the product:** The technology represents an excellent opportunity to streamline a complex and expensive process and reduce costs.

**Areas of application:** The technology will have great use for large composite structures including:

- Masts for wind generators.
- Ship hulls and superstructures.
- High-speed trains.
- Automotive transportation.