

Flexible cauls for composites manufacturing





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Flexible cauls are used to intensify or redistribute pressure in composite manufacturing processes. They can accommodate significant profile variations related to ply drops and also help to control sharp radii or other geometric features.

Traditionally, elastomeric cauls are produced by laying up elastomeric sheet stock on a dummy part. Although a straight-forward approach to replicating a component's part facing dimensions, it has several drawbacks; no adjustment is possible to allow for the caul's thermal expansion during processing, neither is there adjustment for intensifying the form of radii and it does not allow for caul elastomer shrinkage resulting in a reduced lifecycle.

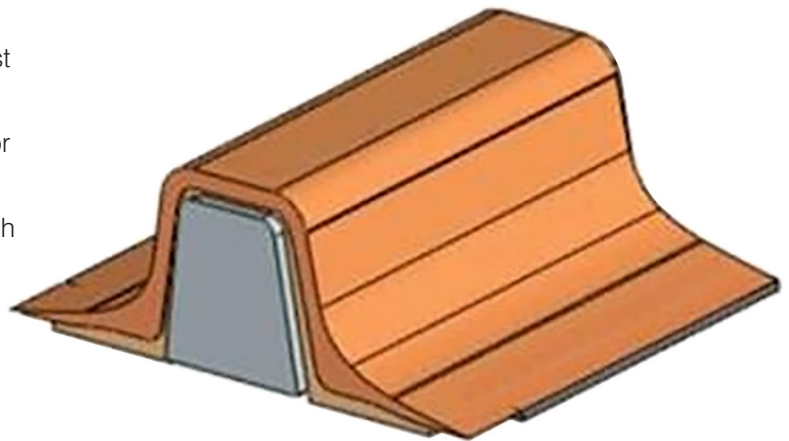
Presented by Rubbercraft, this technical paper will outline the limitations with traditional techniques; comparing bagging methods, with varying ply drop regions, to the use of geometrically controlled elastomeric cauls for the processing of sharp radii on high-aspect ratio stiffeners.

The experimentation based research details important parameters beginning with the material selection, and its preparation, followed by the die design to allow the cauls to be extruded. In-depth description and analysis of the experiment provides revealing results and significant conclusions to potentially support forward manufacturing process selections.

A must read...

The use of solid elastomeric mandrels offers a low cost manufacturing process for high-aspect ratio stiffeners. The paper illustrates the benefits of using 'designed for purpose' elastomeric cauls to produce complex structures with dimensional accuracy of profile and with the potential to lower tooling cost.

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