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FLEXIBLE TOOLING FOR COMPOSITES

Trapped tooling for selectively stiffened lightweight composite structures

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Driven by market demands for reduced weight and cost together with the availability of advanced design and manufacturing resources, composite materials are being used for increasingly complex and lightweight integrated structures. Advanced computer modelling tools allow designs that have stiffness built-in to structures, taking advantage of the materials' unique properties. This allows process time and weight savings over conventional stiffener techniques using bonding of separate components or laying of additional plies. One approach is the integration of hat-stiffeners.

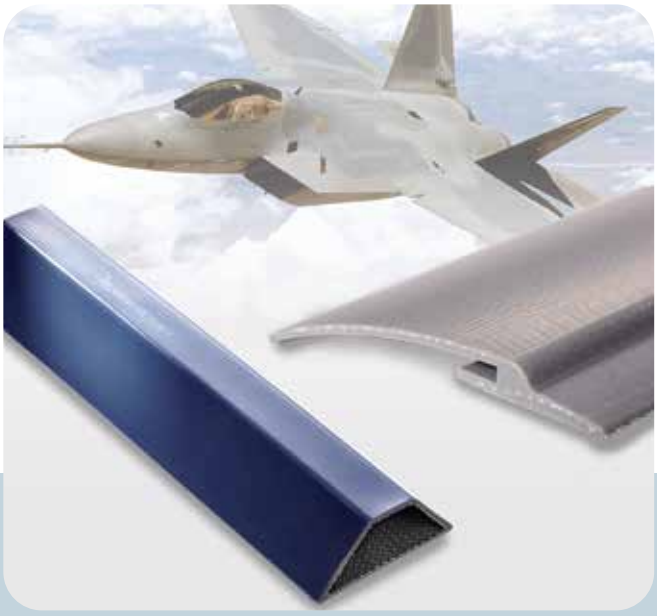
Creating what is in effect hollow features to a structure makes tooling more complex and introduces the need for trapped tooling that can be removed after the curing process. With several options available including collapsible tooling, sacrificial materials and elastomeric compounds there is clearly a need to understand the costs and limitations of each method.

Presented by Rubbercraft this technical paper will outline the trapped tooling options available and what to expect in terms of tool design, reusability, limitations and suitability for production demands. Focused on the use of elastomeric trapped tooling the paper presents a controlled experimentation covering specifics of the elastomeric material design and the preparation and processing of the composite structure produced with these tools.

The results and conclusion of the experiment outline the need for trials in a manufacturing environment and point out core considerations for design and fabrication of trapped elastomeric tooling

Benefits of attending:

There is a clear trade-off between initial tooling cost and the weight and recurring cost to produce a final part. Considering the strong market demand for weight saving and cost reductions, this paper can help assessing the options available.



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