

SMART MOULD DEVELOPMENT FOR AUTOMATED OUT-OF-AUTOCLAVE COMPOSITES MANUFACTURING

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Automation of composites manufacturing is a hot topic as more markets are interested in larger series (automotive, wind). Automation offers the potential of a better worker environment, higher quality products and more consistency in product quality. On the other hand, there are still significant challenges in introducing composites automation due to the investments associated with automation equipment, and the limited flexibility of many automation solutions.

In the framework of two R&D projects, Inholland Composites is working together with composites and automation SMEs to develop cost-effective composites manufacturing methods based on vacuum infusion.

In this paper, intermediate results from these projects are presented. First of all, infusion control is developed where the flow front is tracked using pattern recognition/vision systems. The infusion can then be controlled using automated valves in the resin inflow or vacuum lines. This can be implemented for a standard vacuum infusion set-up with vacuum foil or using a silicon top mould. The silicon top mould offers the possibility of easier automation of the manufacturing process with respect to applying sealant ('tacky') tape and vacuum foil. See for an example Figure 1.

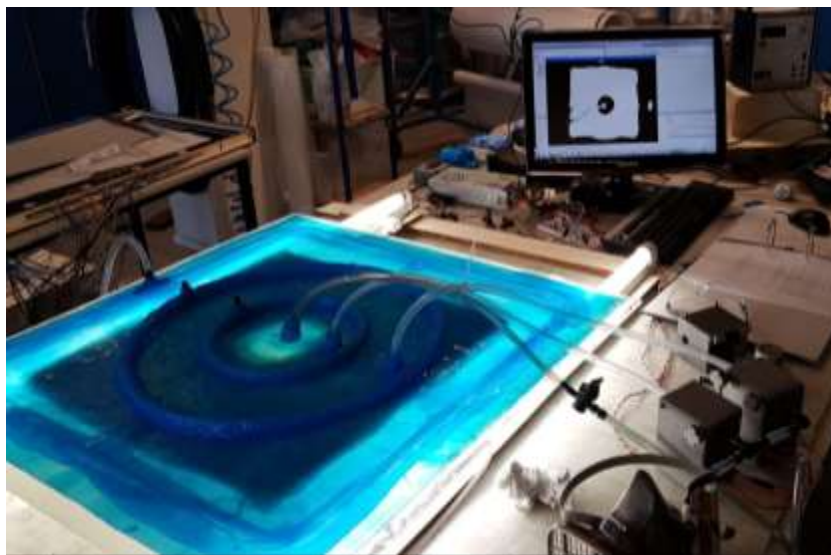


Figure 1: Test set-up for automated infusion control

Second, the potential of augmented reality is explored, where e.g. a projection of the future flow front, or mould temperatures can be visualised.

Finally, the possibilities of automatic product release using sonic actuators is explored (e.g. Figure 2).



Figure 2: Prototype actuator for automated mould release