

Mechanical and Thermal Characterization of Washout Tooling for Resin Transfer Molding

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Abstract : Compared to autoclave based processes, Resin Transfer Molding (RTM) offers several key advantages. This includes high internal and external complexity, less waste, lower volatile emissions, higher production rates, and excellent surface finish. However, the injection of high pressure-high temperature resin presents a tooling challenge in cases where trapped geometries exist. Tooling materials that can sustain these conditions and be easily removed would expand the use of RTM. We have performed research on developing an RTM suitable tooling material called 'RTMCore' for use in forming trapped geometries. RTMCore tooling materials can withstand the injection of high temperature-high pressure resin but be easily removed with tap water. RTM properties and performance capabilities are reviewed against other washout systems. Our research will cover the preliminary characterization of tooling system properties, mechanical behavior, and initial results from an RTM manufacturing trial. Preliminary results show the material can sustain pressures greater than 13 MPa and temperatures greater than 150°C.

Keywords : RTM, resin transfer molding, trapped geometries, washout tooling

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