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Application of Digital Image Correlation Technique on Vacuum Assisted Resin Transfer Molding Process and Performance Evaluation of the Produced Materials

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Abstract : Vacuum assisted resin transfer moulding (VARTM) is a promising manufacture process for making large and complex fiber reinforced composite structures. However, the complexity of the flow of the resin in the infusion stage usually leads to nonuniform property distribution of the produced composite part. In order to control the flow of the resin, the situation of flow should be mastered. For the safety of the usage of the produced composite in practice, the understanding of the property distribution is essential. In this paper, we did some trials on monitoring the resin infusion stage and evaluation for the fiber volume fraction distribution of the VARTM produced composite using the digital image correlation methods. The results show that 3D-DIC is valid on monitoring the resin infusion stage and it is possible to use 2D-DIC to estimate the distribution of the fiber volume fraction on a FRP plate.

Keywords : digital image correlation, VARTM, FRP, fiber volume fraction
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