

Numerical modeling of resin film infusion process with compaction and its application

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Summary

In this study, the efficient discrete model including the resin infusion and the fiber compaction is developed to simulate the RFI (resin film infusion) process. The non-linear governing equations are derived by the Darcy's law, the Terzaghi's law and the continuity equations. The finite element method and the finite difference method are used to discretize the proposed equations, and the VOF method is used to track the filling front. Compared with the analytical results of Park, our numerical results agree well with them. Furthermore, we analyze the RFI process of BMI/G0814, and simulate the resin pressure, the fiber volume fraction distribution, the preform thickness et al to achieve the corresponding optimizing conditions. Some effects of parameters such as the resin thickness, the bleeder thickness, and the external pressure are also discussed here.

