

Influences of the Sewing Process on the Compaction Behaviour of Fibrous Preforms

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ABSTRACT

The compression behaviour of textile fabric and preforms made thereof significantly influences the subsequent process steps i.e. liquid composite moulding (LCM). These influences can range from a mere advantage in handling of assembled preforms to local changes of fibre volume fractions with their respective change in local permeability.

The phenomenon of preform structural compaction depends on the geometry of the particular preform i.e. fabric type, fabric geometry, preforming procedures and parameters, tailored reinforcements, etc. Out of plane compaction of fibrous preforms can result in possible in-plane extensions. While a stack of fabric layers is able to extend within its in-plane directions, a debulked preform utilising thermoplastic binders or appropriate sewing patterns is limited in this possible reaction.

This paper presents preliminary results of studies performed at Auckland and Kaiserslautern concerning preform compaction behaviour of stitched and unstitched fibrous reinforcements. First results of influences of the sewing technique applied for the final preform assembly step on the compaction behaviour are presented. In addition the state of the work performed within this cooperation between the Institut für Verbundwerkstoffe GmbH and the Centre for Advanced Composites Materials is provided.