

PERMEABILITY NETWORK MODELL OF NON-CRIMP FABRICS

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ABSTRACT

Non-Crimp Fabrics (NCFs) consists of fibre bundles that are laid parallel in layers and knitted to other layers of bundles preferable laid in another direction. By this procedure openings are formed between the bundles. Each bundle consists of a large amount of fibres resulting in a two scale porosity, micrometer scale within the bundles and millimetre scale between them. This implies that there will be two types of flow during impregnation i.e. within and between the bundles were the second is likely to be of highest importance for the overall flow rate and the permeability. The placement of the bundles is limited to a certain volume but their actual position within this volume can vary. The stitching and fibres going from one bundle to the other add to the complexity. In previous works we have developed a general statistical permeability network model and a Computational Fluid Dynamic (CFD)-unit cell model for the permeability of NCFs. We will here combine these studies to yield a model that can predict the true permeability of NCFs.