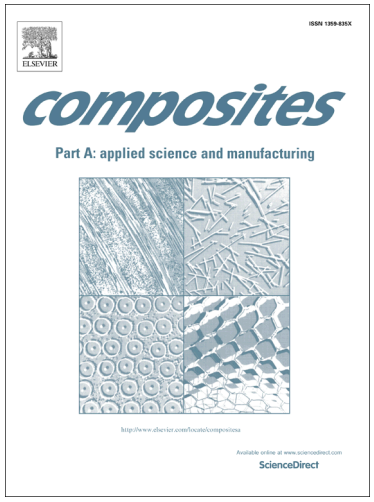

Characterization of 3D fabric permeability with skew terms

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PII: S1359-835X(16)30445-6
DOI: http://dx.doi.org/10.1016/j.compositesa.2016.12.030
Reference: JCOMA 4536

To appear in: *Composites: Part A*

Received Date: 27 September 2016
Revised Date: 13 December 2016
Accepted Date: 15 December 2016

Please cite this article as: Yun, M., Sas, H., Simacek, P., Advani, S.G., Characterization of 3D fabric permeability with skew terms, *Composites: Part A* (2017), doi: http://dx.doi.org/10.1016/j.compositesa.2016.12.030

CHARACTERIZATION OF 3D FABRIC PERMEABILITY WITH SKEW TERMS

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ABSTRACT

Flow simulations can predict resin flow behavior and void formation locations in a preform. One important parameter for simulation is the preform permeability. For thick parts with distribution media on the surface, resin flow is three dimensional and through the thickness permeability is required for simulation. If the fabric is a 3D preform or unbalanced, the through the thickness (*Kzz*) and two skew components (*Kxz* and *Kyz*) must be characterized. The skew terms influence the flow behavior and hence the void formation. In this study, we present a measurement station that provides all six independent components of the permeability tensor from one experiment. The methodology uses the location data of the flow front with time and then couples it to an optimization algorithm and our flow simulation tool, LIMS (Liquid Injection Molding Simulation). The process is automated and experimental results are superimposed on the simulation results to confirm fidelity of the values determined.

Keywords: A.Preform, B.Permeability, E.Liquid coposite moulding, E.Resin flow