



A NEW MIXED NUMERICAL/EXPERIMENTAL TECHNIQUE FOR TRANSVERSAL PERMEABILITY OF FIBROUS REINFORCEMENTS

R.gennaro*, A. greco¹, A. maffezzoli¹

¹*Department of Engineering for Innovation, University of Salento, via per Arnesano 73100- Lecce, Italy*

**Corresponding author: riccardo.gennaro@unisalento.it*

Thermoplastic matrix composite are gaining increasing popularity in many industrial applications. Improving manufacturing technology is one the greatest challenges for the composites industry. Permeability parameters are important in simulation codes. Especially, thought-thickness permeability is a critical parameter in the optimization of complex shaped.

This work presents a new experimental method to measure transverse permeability of fibre woven fabric. The impregnation of the woven fabric was studied by means of a capillary rheometer modified by substituting the capillary with a tool, capable of sustaining the reinforcement during impregnation. The developed device allowed for the measurement of the pressure build up during reinforcement impregnation at different rates of the rheometer piston. The rheological measurements of the matrix shows a behavior only slightly deviating from Newtonian a behavior. By plotting the pressure vs the average rate in the reinforcement, its global permeability was determined according to Darcy's law. Results obtained were compared with finite element modelling results, and with Kozeny-Carman equation predictions.