

MANUFACTURING AND TESTING OF COMPOSITES USING RESIN TRANSFER MOULDING

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Resin Transfer Moulding offers the opportunity for significant cost savings in the fabrication of polymer matrix composite structure. However, the realization of this cost saving has been restricted by quality problems such as poor fibre volume control etc, that are inherent to the RTM process. The high performance product is normally produced by RTM technique using epoxy or polyester thermoset matrix reinforced with glass or carbon inorganic fibres. It is attractive because it offers the possibility of lower manufacturing cost and more complex shapes than traditional method. Process modelling is particularly useful in understanding designing and optimizing the process conditions. We present the numerical and experimental studies of RTM prototype in significant reduction of production type. Our RTM process details the design and fabrication of the mould which works with the help of the pressure applied externally from a pneumatic compressor. Using this method various types of composites can be made by resins. PALF fibres are used along with epoxy polymer. RTM process plays a major role in defence and aerospace industries. Mould is basically made from the EN8 steel because of its high rigidity and ability to machining in rigid conditions. Pressure of 2-3 bar is allowed to enter the mould. The basic operation of the process involves loading a few fibre reinforcement preform into a mold cavity, closing the mold, transferring resin into the mold and allowing the resin to cure. The apparatus has a glass window to observe the mold filling process and can incorporate various mold shapes such as quasi 2D panel, a 3D rectangular section. In order to achieve this objective capillary forces and its influence on impregnation of fiber bundle is examined.

