Quality Evaluation of Resin Transfer Molded Products

The present study introduces a new procedure to evaluate the quality of composite products using the graph theoretic approach, and a composite screw rotors process is considered (manufactured by the Resin Transfer Molding (RTM)). The composite product coming from the manufacturing processes must have good surface finish and high quality without any defects. There are several factors which affect the quality during design and manufacture of the RTM products like screw rotors. These factors form a quality digraph based on the interactions existing between them. Hence, we considered the quality digraph by defining fuzzy crisp scores for the degree of interactions between the factors. A quality index derived from quality permanent function is helpful for quality inspectors on the shop floor to decide whether the product is within benchmark limits. The benchmark limits obtained for the composite product, manufactured by the RTM process by considering the strong and weak interactions existing between the factors defined for quality, are considered as upper and lower bounds in deriving the indices. Therefore the present work proposes a quality index, which is a useful numerical index for quality assurance groups to take proper decisions on the shop floor for the manufacturing process adapted to composites (composite molders).

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