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Development of Eco-friendly Materials Based on Micro-filled Resin: Process Study and Mixture Optimization

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Abstract : The matrix is made up of resin mixed with fillers. However, with the growing demand to reduce CO2 emissions, the market is increasingly leaning toward eco-friendly materials. In this context, this research focuses on developing an environmentally friendly material, with or without sand, by following various stages using micro-filled resin. Three manufacturing techniques will be explored: infusion, RTM-Eco, and molding. The process begins with incorporating sand directly into the resin matrix, a critical step in creating this type of composite. To achieve this, two mixing methods will be tested: one by hand and the other using a mechanical mixer. The best method will be selected based on key criteria, such as achieving a uniform sand distribution and determining the optimal sand-to-resin ratio. The final material must meet specific requirements, including strong mechanical performance, high-temperature resistance, cost-efficiency, and outstanding durability against corrosion.

Keywords : micro-charging of sand particles, laminated composites, polymer, resin, corrosion
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