

Analysis of a Brick Made by Polythene and Silica Using Finite Element Analysis

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Polythene waste is an eyesore prevailing in today's society which leads to the contamination of environment and air when discarding or burning. A method of obtaining high strength bricks by aggregating polyethylene (PE) with sand (silica) at various percentages can be introduced as a method of effective utilization of waste polythene. In this research Finite Element Analysis (FEA) is used in order to analyse the brick according to its complex material structure. Finite element method is a numerical computerized technique used for predicting the reactions of objects to real-world forces, vibration, heat, fluid flow, and other physical effects. FEA reduces number of physical prototypes and experiments and optimize components in design phase in order to develop better products efficiently and effectively. Time, money and effort for wrong experimental methods can be saved by using FEA. In this research Femap software is used for the overall analysis. Composite formed by polythene and silica is mapped in the software platform. Number of models were analysed by changing the applied temperature level and force level. Post processing data of the analysis were used in order to determine the optimum result. According to the analysis results a temperature between 120°C to 180°C should be supplied to the brick while it is compressed by 20N to 60N force.

Keywords: Polythene silica brick, Finite Element Analysis (FEA), Femap