

An Integrated Approach to Find the Effect of Strain Rate on Ultimate Tensile Strength of Randomly Oriented Short Glass Fiber Composite in Combination with Artificial Neural Network

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Abstract : In this study tensile testing was performed on randomly oriented short glass fiber/epoxy resin composite specimens which were prepared using hand lay-up method. Samples were tested over a wide range of strain rate/loading rate from 2mm/min to 40mm/min to see the effect on ultimate tensile strength of the composite. A multi layered 'back propagation artificial neural network of supervised learning type' was used to analyze and predict the tensile properties with strain rate and temperature as given input and output as UTS to predict. Various network structures were designed and investigated with varying parameters and network sizes, and an optimized network structure was proposed to predict the UTS of short glass fiber/epoxy resin composite specimens with reasonably good accuracy.

Keywords : glass fiber composite, mechanical properties, strain rate, artificial neural network

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020