Article Abstract

Title:	**Modelling and analysis of abrasive wear performance of composites using Taguchi approach**
Author(s):	S.S. Mahapatra* and Vedansh Chaturvedi
Address(es):	Department of Mechanical Engineering, National Institute of Technology, Rourkela, India. E-mails:(mahapatrass2003@yahoo.com (S.S.Mahapatra*), *Corresponding author); ssm@nitrkl.ac.in (Vedansh Chaturvedi)
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Abstract:	Short lignocellulosic fibres are extensively used these days as reinforcing materials in many thermoset and thermoplastic matrices due to their low cost, lower density than inorganic fibres, environmentally-friendliness, and the relative ease of obtaining them. Such fibres would not contribute to the wear and tear of polymer processing equipment and may not suffer from size reduction during processing, both of which occur when inorganic fibres or fillers are used. These fibres can also be easily moulded to wide variety of shapes during composite preparation. However, modelling and analysis of behaviour of composites reinforced with short fibre drawn from agricultural resources has been studied to a limited extent. Particularly, the optimum size of short fibre just capable of transferring the load and flexibility during preparation has not been studied through a simple systematic modelling approach due to the complexity involved in its modelling aspect. To this end, an attempt has been made in this work to study the abrasive behaviour of untreated sugarcane fibre reinforced composites in a simplified manner and develop empirical model. The effect of various test parameters and their interactions have been studied using Taguchi method to find out optimal parameter setting for minimum wear (weight loss). It has been observed that fibre length plays a major role in wear phenomenon. The length of the fibre has been optimized using a popular evolutionary technique known as particle swarm optimization (PSO) and neural network. The study recommends that fibre length should be 7-8 *mm* for minimum wear of the composites.
Keywords:	Sugarcane fibre; abrasive wear; Taguchi method; PSO; neural networks