

Low cost Experimental Designs for Natural Fibre Testing

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In this study, some experimental designs have been proposed to test selected mechanical properties of natural fibres. Tests were conducted on Ekel-*Cocos nucifera*.

Investigations were carried out under different natural conditions as well as in controlled environments, in order to determine the natural and man-made degenerative effects on the mechanical properties. Experimental methods were designed in order to determine Breaking load, Young's Modulus, stress-strain curve, fatigue and creep deformation of natural fibres.

Young's Modulus was obtained using Cantilever method (in the range of 10^5 N m^{-2} depending on different conditions of the specimen), coupled with a Data Studio Photogate sensor, and was compared with the results obtained using Universal Test Machine (in the range 10^6 N m^{-2} depending on different conditions of the test material). Breaking load was also measured and compared with that obtained using the Universal Test Machine. Both fatigue and creep testing were designed using cheaper materials and the experimental methods data studio software.

The proposed designs showed high potential due to the ease of use and the low cost of these newly designed methods, which may be used as alternatives to the conventional methods.