

CHARACTERIZATION AND PERFORMANCE OF ELEMENTARY HEMP FIBRES: FACTORS INFLUENCING TENSILE STRENGTH

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Abstract

This paper presents the outcomes from an extensive investigation on the mechanical properties of single hemp fibres, as well as configurations and related tensile strength. The results showed that: 1) the TS increased with the decrease of the diameter of individual test pieces, compared to the configuration of multiple single fibres within the test pieces; 2) shear failure between single fibres played a significant role in the test results; 3) the TS was closely related to the length and width of hemp fibres. The length and width of hemp fibres may complicate the test results, and the use of decorticated fibres prior to decortications may double the TS of hemp fibres compared to single fibres. Reliable TS of single hemp fibres have been derived by a power regression model. The model was verified with an excellent agreement with experimentally tested results.