

Selecting natural fibres for bio-based materials with conflicting criteria

ABSTRACT

Abstract: Proper material selection enhances both desired physical and meta-physical properties of the end user products. Due to the growing awareness of the environmental issues as well as the industrial sustainability, the Natural Fiber Composites (NFCs) have recently emphasized to be implemented in various industrial applications. The final product features of such composites depend on the integrated characteristics of both matrix and fillers properties. Selecting an appropriate natural fiber type to form an NFC is affected by several factors and criteria. Up-to-date, natural fibers are evaluated regarding limited number of criteria. This study, introduces a proper integrated evaluation and selection scheme for the natural fibers and their capabilities considering integrated evaluation. Results demonstrate that better evaluation of natural fibers regarding wide range of criteria would lead to better decisions regarding selecting the suitable NFCs for industrial applications and enhance achieving better performance. Such evaluations should consider combined economic and environmental characteristics as well as technical ones. New potential fiber types can be discovered and utilized through better evaluations using combined desired criteria.

Keyword: Natural fibers; Fibers' selection; Date palm fibers; Polymeric composites; Capability performance; Conflicting criteria