

## **Magnesium hydroxide reinforced kenaf fibers/epoxy hybrid composites: mechanical and thermomechanical properties**

### **ABSTRACT**

The present article deals with the fabrication of magnesium hydroxide (MH) filler reinforced kenaf/epoxy hybrid composites with different loading (10%, 15%, 20% and 25% by wt). Tensile, impact, flexural, morphological, thermal stability and dynamic mechanical properties of the developed MH/kenaf/epoxy hybrid composites were evaluated and compared. The analysis of the results revealed that the incorporation of the stiff MH particles into the kenaf/epoxy composites enhanced their tensile, flexural and impact properties, as well as their residual content. Enhancement in both storage ( $E'$ ) and loss ( $E''$ ) moduli, as well as a considerable decrease in damping factor ( $\tan \delta$ ), was observed in the hybrid composites, compared to the kenaf/epoxy composites. Moreover, a remarkable improvement in properties was noticed for the 20% MH hybrid composites, which was ascribed to better dispersion and interfacial interaction between the kenaf fibers and the epoxy within composites, enabling more efficient interfacial stress transfer. Overall, the 20% MH/kenaf/epoxy hybrid composites presented better mechanical strength, thermal stability and dynamic properties compared to the rest of the hybrid composites developed in this study.

**Keyword:** Kenaf fibers; Epoxy; Magnesium hydroxide; Thermal stability; Dynamic mechanical properties; Damping factor