

## **Cutting processes of natural fiber reinforced polymer composites**

### **ABSTRACT**

Recently, natural fiber-reinforced polymers (NFRPs) have become important materials in many engineering applications; thus, to employ these materials some final industrial processes are needed, such as cutting, trimming, and drilling. Because of the heterogeneous nature of NFRPs, which differs from homogeneous materials such as metals and polymers, several defects have emerged when processing the NFRPs through traditional cutting methods such as high surface roughness and material damage at cutting zone. In order to overcome these challenges, unconventional cutting methods were considered. Unconventional cutting methods did not take into account the effects of cutting forces, which are the main cause of cutting defects in traditional cutting processes. The most prominent unconventional cutting processes are abrasive waterjet (AWJM) and laser beam (LBM) cutting technologies, which are actually applied for cutting various NFRPs. In this study, previously significant studies on cutting NFRPs by AWJM and LBM are discussed. The surface roughness, kerf taper, and heat-affected zone (HAZ) represent the target output parameters that are influenced and controlled by the input parameters of each process. However, this topic requires further studies on widening the range of material thickness and input parameter values.

**Keyword:** Natural fiber; Cutting; waterjet; Laser beam; Roughness; HAZ; Kerf