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Faissal Chegdani, Mohamed El Mansori

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Friction scale effect in drilling natural fiber composites

Faissal CHEGDANI*, Mohamed EL MANSORI

Arts et Métiers ParisTech, MSMP Laboratory (EA7350), Rue Saint Dominique BP508

Châlons-en-Champagne, France

ABSTRACT

This work aims to investigate the multiscale tribological behavior when drilling natural fiber composites by changing the tool-composite interface trough the modification of the tool coating. Drilling experiments were carried out on bidirectional flax fibers reinforced polypropylene resin using the same drilling tool geometry with three different coating properties. Results show that the tribo-mechanical behavior of the drilling operation is affected by changing the tool coating at different scale levels. This multiscale behavior is related to the intrinsic friction properties of each coating nature that influence the tribo-contact at the interface between the cutting tool edge and the composite surface.

KEYWORDS

Natural fiber composites; Friction; Tool coating; Machining.

* Corresponding author : F. Chegdani
E-mail : faissal.chegdani@ensam.eu