

Effect of Machining Parameters on Delamination and Surface Roughness in Composite Materials: A Review

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Abstract: *The drilling of natural fiber-reinforced polymer composites (NFRCs) and their hybrid composites is a critical machining operation for facilitating parts assembly, with strict dimension tolerance requirements. Due to the comparable specific properties, eco-friendliness, and accessibility of NFRCs, they have gained significant attention in recent years compared to synthetic fiber-based composites. This review article presents an overview of past and present research studies on the drilling behavior of NFRCs and their hybrids, investigating various drilling techniques and performance parameters, analyzing drill bit geometry and materials, residual strength, and methods of improving drilling properties. Additionally, future work is proposed for developing an AI-based prediction model that identifies the delamination factor and surface roughness for a given drill tool point angle, cutting speed, and feed rate on thrust force. The challenges and recommendations for researchers are also highlighted to advance this research field.*

Keywords: composite materials, drilling, delamination, surface roughness machining parameters, mechanical properties

