

## QUANTIFYING DEFECTS IN DRILLING UD-GFRP

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**Rezumat.** *Compozitele cu matrice polimerică au devenit de la materiale exotice folosite doar în aplicații de nișă după cel de-al doilea război mondial, la materiale comune folosite în diverse aplicații. În prezent există o tendință accentuată de înlocuire a materialelor metalice cu materiale compozite, în special cu compozite polimerice, datorită proprietăților superioare ale acestora, proprietăți ce pot fi proiectate și perfecționate pentru a răspunde unor cerințe specifice. Deși aceste materiale sunt realizate la forma necesară, deseori este nevoie și o prelucrare a acestora în vederea asamblării. Găurirea este cel mai des întâlnit procedeu de prelucrare a materialelor compozite cu matrice polimerică. Un defect des întâlnit la acest tip de prelucrare îl constituie defectele muchiilor ce include și fibrele netăiate. Acest raport abordează probleme legate de proprietățile mecanice ale acestui tip de materiale cu fibre continui lungi ranforsat cu fibră de sticlă și comportarea lui la găurire.*

**Abstract.** *Fibre reinforced polymer (FRP) composites have emerged from being exotic materials used only in niche applications following the Second World War, to common engineering materials used in a diverse range of applications. Currently there is a strong tendency to replace metals with composite materials, particularly polymer composites, because of their superior properties, properties that can be designed and built to meet specific requirements. Though these composites are manufactured in near-net shape, machining is often necessary for integration and assembly. Drilling is the most frequently employed operation of secondary machining for fiber-reinforced materials owing to the need for structure joining. A commonly observed defect in drilling is edge defects which include incomplete fiber cutting. This report approaches issues related to mechanical properties of polymer matrix composites with continuous long fibers, fiberglass reinforced, and aspects of the drilling process of these types of materials for assembling of different components.*

**Keywords:** composites, twist drill, defects, UD-GFRP, drilling.

### 1. Introduction

Fibre reinforced polymer (FRP) composites have emerged from being exotic materials used only in niche applications following the Second World War, to common engineering materials used in a diverse range of applications. Currently

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