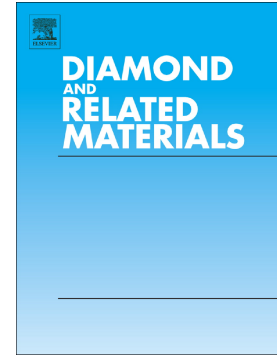


Accepted Manuscript

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PII: S0925-9635(17)30103-6
DOI: doi: [10.1016/j.diamond.2017.05.005](https://doi.org/10.1016/j.diamond.2017.05.005)
Reference: DIAMAT 6877
To appear in: *Diamond & Related Materials*
Received date: 27 February 2017
Revised date: 28 April 2017
Accepted date: 8 May 2017



Please cite this article as: L. Sorrentino, S. Turchetta, C. Bellini , Analysis of carbon fibre reinforced polymers milling by diamond electroplated tool, *Diamond & Related Materials* (2016), doi: [10.1016/j.diamond.2017.05.005](https://doi.org/10.1016/j.diamond.2017.05.005)

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Analysis of Carbon Fibre Reinforced Polymers Milling by Diamond Electroplated Tool

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Abstract

Machining of carbon fibre reinforced polymers is an important step for the integration of advanced materials into engineering applications. Machining damage due to excessive cutting forces may cause the rejection of the composite components at the final stages of their production cycle. The cutting forces are related to the surface finish and tool wear. This latter affects also the cost of processing.

This paper analyses the diamond electroplated tools milling of carbon fibre reinforced polymers and a comparison with the milling by tools with inserts is presented. In literature, the milling of carbon fibre reinforced polymers with diamond electroplated tools is little explored but it is very interesting in the phase of machining and post-machining of structural parts with complex geometry.

The analysis of the cutting forces, tool wear and surface finishing in relation to the main process parameters was carried out. A decrease of the cutting forces, of the surface roughness and of tool life was noticed passing from the tool with inserts to the diamond electroplated one.

Keywords: *carbon fibre reinforced polymers, diamond electroplated tool, tool with inserts, cutting forces, surface roughness, wear.*

1. INTRODUCTION

Composite materials are more and more considered for applications in several fields, such as aeronautic and automotive, in which high strength and low weight are demanded requirements [1-4].

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