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Milling damage on Carbon Fibre Reinforced Polymer using TiAlN coated End mills (Conference Paper)

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Abstract

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This paper reports on the damage caused by milling Carbon Fibre Reinforced Composite (CFRP) with 2-flute 4 mm-diameter solid carbide end mills, coated with titanium aluminium nitride. The machining parameters considered in work are, rotation speed, feed rate and depth of cut. Experiments were designed based on Box-Behnken design and the experiments conducted on a Mikrotol DT-110 CNC micro machine. A laser tachometer was used to ascertain a rotational speed for conducting any machining trial. Optical microscopy examination reveals minimum delamination value of 4.05 mm at the spindle speed of 25,000 rpm, depth of cut of 50µm and feed rate of 3 mm/min and the maximum delamination value of 5.04 mm at the spindle speed of 35000 rpm, depth of cut of 150µm and feed rate of 9 mm/min A mathematical model relating the milling parameters and delamination has been established.

Indexed keywords

Engineering controlled terms:

Carbides Carbon fiber reinforced plastics Carbon fibers Delamination
 Fiber reinforced plastics Milling (machining) Reinforcement Titanium nitride

Box-Behnken design

Carbon fibre reinforced composites

Carbon fibre reinforced polymer

Machining parameters

Machining trials

Milling parameters

Rotational speed

Titanium aluminium nitride

Engineering main heading:

Damage detection

Funding details

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