

## **Wear Mechanism of Coated and Uncoated Carbide Cutting Tool In Machining Process**

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### **ABSTRACT**

A carbide cutting tool is widely used in machining process due to its availability and being cheaper than a better performance cutting tool, such as cubic boron nitride. The carbide cutting tool also has substantial hardness and toughness that is suitable to be applied in intermittent cutting. This paper presents the case study of a wear mechanism experienced on the cutting edge of the coated and uncoated carbide tools in turning and milling processes. The wear mechanisms of carbide cutting tools were investigated in machining Inconel 718, titanium alloy Ti-6Al-4V extra-low interstitial, and aluminum metal matrix composite (AlSi/AlN MMC) at their high cutting speed regime. The tools failed primarily due to wear on the flank and rake faces. The failure mode of the carbide cutting tools was similar regardless of the machining operations and coating is believed to enhance the tool life, but once removed, the tool fails similar to that with the uncoated tool.

**KEYWORDS:** wear mechanism; carbide cutting tool; milling process; turning process; Inconel 718; Ti-6Al-4V ELI; AlSi/AlN MMC

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