

Experimental investigation of machining parameter on hole quality in drilling Ti-6Al-4V

Abstract

Titanium alloys (Ti-6Al-4V) are greatly recommended for high performance applications because of their outstanding properties such as low weight, high corrosion resistance and high strength. However, drilling Ti-6Al-4V generates high cutting temperature, especially during high speed drilling (HSD), increased the chemical reactivity of Ti-6Al-4V, thus leading to poor hole quality. High cutting speed increases the temperature during the drilling process, therefore, it is important to consider this factor to achieve better hole quality. This study focuses on the correlation of machining parameter and the quality of the hole produced in terms of hole diameter, roundness and surface roughness. The experiment was conducted using a 6 mm diameter of coated (TiAlN) carbide tool under MQL and MQCL conditions with varying cutting speeds of 65, 75, 85 and 95 m/min and constant 0.02 mm/rev feed rate.