

Study on Machining Performance of Complex Shape Workpieces on a 5-axis Machining Center

Abstract

Workpieces with various geometries are machined on 5-axis machining centers recently, and the machining accuracy and the machining efficiency of these machines have been compared with those of conventional vertical machining centers with a ball end mill cutter. These comparisons show that when a simpler- geometries workpiece is machined, both the machining accuracy and the machining efficiency are almost the same on the both machines. On the other hand, when a more complex- geometries workpiece is machined, the superior machining accuracy and machining efficiency are achieved on a 5-axis machining center. This study was conducted based on the following conditions: 1) an end mill with a smaller L (overhang length of a tool)/ D (tool diameter) can be used to prevent chattering and 2) a square end mill can be used for higher feedrate cutting.