

Basic Study on Micro End-milling

- Cutting Phenomena of Side Cutting -

Abstract

Ultraprecision parts are in high demand in the machinery, electronic, and medical industries. Technologies such as micro-electromechanical systems (MEMS) and ultraprecision

machining are used in micromachining to manufacture these parts. The focus of this study is mechanical machining using a micro end mill. In this paper, we experimented with a variety of cutting phenomena that occur during actual machining processes to achieve high machining accuracy, high finished-surface quality, and long tool life. Through examination of these phenomena, micromachining achieved high-accuracy, high-grade machining by considering the dynamic vibrational behavior and elastic contact of the tools. In addition, we suggest criteria for determining the tool life of a micro end-mill.