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ERRY YULIAN TRIBLAS ADESTA
AKM Nurul Amin
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MANUFACTURING MANAGEMENT

From basic machining to quality product



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1. Introduction

Micro end milling is one of two tool based micromachining techniques nowadays that is very important for machining micro channel and other micro mold. The micro end milling used micro scale for machining. The cutting tool used for machining also in micro scale. Nowadays, the micro end milling has been used widely in the industry such as in the medical, aerospace and the telecommunication field [1].

Micro end milling operations is almost the same as the conventional end milling operations but the difference is only the dimensional. The micro end milling operations feed per tooth to tool radius (f_t / r) ratio is bigger than conventional milling in order to keep productivity. On the other hand, stresses on the tiny micro tool are bigger compare to conventional tool. These conditions will shorten the micro tool life [2].

Micro end milling is characterized by mechanical interaction of a sharp tool with the workpiece material, causing breakage inside the material along defined paths, eventually leading to removal of the useless part of the workpiece in the form of chips [3].

The kinematics process do not change as the end milling process scales down to micro scale but the cutting and surface generation mechanisms involved in the process do change. It is due to the different cutting mechanics induced by the scaling relationship between the tool geometry, workpiece micro structure, and cutting geometry [4].

Tungsten carbide in a cobalt matrix (WC-Co) is used in current manufacturing method. The fabrication of the micro end mills with sharp edges cannot be done using WC-Co