# Ultra-precision machining of stainless steel using coated carbide tool


## Abstract

**Purpose:** This paper discusses the experimental work carried out to investigate the performance of coated carbidetool in ultra-precision machining of stainless steel and evaluates whether this tool can be used to fabricate a cavitywith high form accuracy and surface finish on a stainless steel mould insert.

**Design/methodology/approach:** The results obtained in the turning process and the machining of cavity ona mould insert under various conditions and parameters are examined.

**Findings:** The experimental results obtained in the turning tests gave an important insight of the appropriateparameters and the condition to be used in the machining of cavity on a mould insert. The cavity machined on thestainless steel mould insert with the coated carbide tool in the presence of natural oil has superior form accuracyand surface finish.

**Research limitations/implications:** Further research is needed to investigate the performance of the coatedcarbide tools in machining profiles of other shape and diameter.

**Practical implications:** Profile with a superior form accuracy and surface finish can be machined on a stainlesssteel mould insert using a coated carbide tool instead of using a PCBN tool, a much more expensive tool.

**Originality/value:** The paper presents original information on the ultra-precision machining of tool steels at lowspeeds. The paper is of interest to manufacturing engineers.


Liew Yun Hsien