

**INVESTIGATION FOR MANUFACTURE OF MICRO  
COMPONENTS USING WIRE ELECTRIC DISCHARGE  
GRINDING [WEDG] PROCESS IN HARD METALS**

**A THESIS**

*Submitted by*

**PARTHIBAN M**

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**DEPARTMENT OF MECHANICAL ENGINEERING**

**ANNA UNIVERSITY**

**CHENNAI 600 025**

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## **ABSTRACT**

In the present work, a rotary axis accessory has been designed and fabricated in order to do Wire Electric Discharge Grinding [WEDG] process by using the existing WEDM. With the use of this process micro machining of hard metals can be performed.

A numerical model has been developed to analyse the wire deflection during machining in order to set the parameters for micro machining.

In this research, micro machining of HSS, Tungsten and Carbide has been investigated with the use of various design of experiments techniques for material removal rate, diameter accuracy and surface roughness.

Higher aspect ratio for HSS and Tungsten were achieved based on the optimal parameters.

Micro tools and micro components were manufactured with carbide which can be used as a tool for further micro machining operations. Micro probes of  $\text{Ø}400\ \mu\text{m}$  were manufactured which can be subsequently used of inspection of micro parts.

Micro electrodes with copper and brass of  $\text{Ø}400\ \mu\text{m}$  were manufactured.

The di-electric fluid was added with silver nitrate chemical mixture solution to study the effects on material removal and surface roughness.

With the use of the manufactured micro electrodes, the micro hole drilling in Titanium and Molybdenum were done for the material removal and electrode wear.