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ERRY YULIAN TRIBLAS ADESTA

MOHAMMAD YEAKUB ALI

AKM NURUL AMIN

**DESIGN FOR MANUFACTURE**

Towards Improved Manufacturability



**IIUM Press**

# DESIGN FOR MANUFACTURE

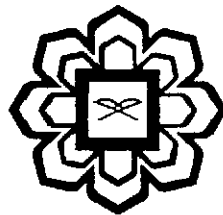
## Towards Improved Manufacturability

### EDITORS

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MOHAMMAD YEAKUB ALI

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## Surface Roughness Studies in Die-sink EDM of Tungsten Carbide using Copper Tungsten Electrode

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### 1. Introduction

Machining is a process of removing a unit volume of material from a work piece. Many new alloys have been developed to meet the increasingly severe condition of stress, temperature and corrosion imposed by the needs of our industrial civilization. Some of these materials such as aluminum and magnesium are easy to machine, but others such as high alloy steels, nickel base alloy become more difficult to cut as their useful properties improved [1]. Due to the increase in discovering stronger and more in need properties of material, leads to new approach way of machining. Hence machining had been divided into two parts, traditional and non-traditional machining.

Traditional machining relies on direct mechanical contact between the tool and the workpiece and this fundamental physical requirement inherently limits the processes [2]. Non-traditional machining is applied to a wide variety of mechanical, electrical, thermal and chemical material removal processes developed mostly after about 1940. These alternate manufacturing processes have evolved in response to increasing demand in industry for better, more consistent work-piece quality and higher production efficiency in the processing of hard, tough materials, work-piece with unusual finishing requirement and part with complex shapes that require processing beyond the normal capabilities of the traditional machining processes [3]. Non-traditional machining can be categorized in two ways, processes in which there is a non-traditional mechanism of interaction between the tool and work-piece and processes in which non-traditional media are used to transfer of energy from the tool to the work-piece. Non-traditional mechanism include chemical, electrochemical, thermal, and mechanical with high impact velocity. Non-traditional media include solids, abrasive, aqueous and non-aqueous liquids, gas, plasma, ions, electrons and photons [2].

Electrical Discharge Machining (EDM), developed in the mid 1970s, is a non-traditional manufacturing process based on removing material from a part by means of a series of repeated