0708-F-035 LATHE MACHINE OPTIMUM CUTTING SPEED FOR DIFFERENT MATERIALS

ANG LIQI

A report submitted in partial fulfillment of
The requirements for the award of the degree of
Bachelor of Mechanical Engineering
With Manufacturing Engineering

Faculty of Mechanical Engineering
UNIVERSITI MALAYSIA PAHANG

NOVEMBER 2008

SUPERVISOR'S DECLARATION

We hereby declare that we have checked this project and in our opinion this project is satisfactory in terms of scope and quality for the award of the degree of Bachelor of Mechanical Engineering with Manufacturing Engineering.

Signature :
Name of Supervisor: LEE GIOK CHUI, SMP, KMN
Position : Lecturer of Faculty Mechanical Engineering
Date :

Signature :
Name of Panel : SALWANI BINTI MOHD SALLEH
Position : Lecturer of Faculty Mechanical Engineering
Date :

STUDENT'S DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged. The thesis has not been accepted for any degree and is not concurrently submitted for award of other degree.

Signature :
Name : ANG LIQI
ID Number: ME05067
Date :

To my Beloved Mother and Father

LEE SIEW DUAN
ANG TECK YOKE

LIST OF TABLES

LIST OF FIGURES

LIST OF SYMBOLS/ ABBREVIATIONS

N	Rotational speed of the workpiece
f	Feed
v	Feed rate, or linear speed of the tool along workpiece length
V	Surface speed of workpiece
l	Length of cut
Do	Original diameter of workpiece
Df	Final diameter of workpiece
Davg	Average diameter of workpiece
d	Depth of cut
t	Cutting time
Ra	Average deviation of mean surface
Rt	Maximum roughness height
Rz	Root mean square value
SFPM	Surface feet per minute
MRR	Material removal rate
FEM	Finite element analysis
BUE	Built-up-edge

UNIVERSITI MALAYSIA PAHANG

BORANG PENGESAHAN STATUS TESIS ◆

JUDUL: LATHE MACHINE OPTIMUM CUTTING SPEED FOR DIFFERENT MATERIALS

SESI PENGAJIAN: 2007/2008

Saya, **ANG LIQI (850418015017)**

mengaku membenarkan tesis (Sarjana Muda / ~~Sarjana / Doktor Falsafah~~)* ini disimpan di perpustakaan dengan syarat-syarat kegunaan seperti berikut:

1. Tesis ini adalah hakmilik Universiti Malaysia Pahang (UMP).
2. Perpustakaan dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. **Sila tandakan (√)

☐	**SULIT**	(Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972)
☐	**TERHAD**	(Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi / badan di mana penyelidikan dijalankan)
√	**TIDAK TERHAD**	

Disahkan oleh:

_____ (TANDATANGAN PENULIS)

_____ (TANDATANGAN PENYELIA)

Alamat Tetap:

13,Jln Megah 3, Tmn Megah
82000 Pontian, Johor

LEE GIOK CHUI, SMP, KMN

Tarikh: **06 NOVEMBER 2008**

Tarikh: **06 NOVEMBER 2008**

CATATAN: * Potong yang tidak berkenaan.

** Jika tesis ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa/organisasi berkenaan dengan menyatakan sekali tempoh tesis ini perlu dikelaskan sebagai SULIT atau TERHAD.

◆ Tesis dimaksudkan sebagai tesis bagi Ijazah Doktor Falsafah dan Sarjana secara Penyelidikan, atau disertasi bagi pengajian secara kerja kursus dan penyelidikan, atau Laporan Projek Sarjana Muda (PSM).

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

This project is to investigate the Lathe Machine optimum cutting speed for the three chosen materials. Previous research done on the impact of cutting parameters that affect surface roughness suggest us that among cutting parameters(cutting speed, feed rate, and depth of cut), cutting speed has the biggest impact on the surface roughness [3].Cutting speed is defined as the speed at which the work progress with respect to the tool . Feed rate is defined as the distance the tool travels during one revolution of the part. Besides surface finish, Cutting speed and feed also determine the power requirements and material removal rate. The primary factor in choosing feed and speed is the material to be cut. However, one should also consider material of the tool, rigidity of the work piece, size and condition of the lathe, and depth of cut.[4] In high-volume production, machining parameters have amplified impacts on the machine performance in terms of productivity (cycle time), reliability (tool life), and product quality (surface finish). In addition, production parameters become critical in high-volume production since they directly impact the overall order fulfillment (production makes pan and delivery reliability)[1].The three material with different hardness are chosen in this project , they are Aluminum, Mild steel and Carbon steel. [4]