



**DEVELOPMENT OF SQUEEZE AND DYING OF BATIK
PRINTING SYSTEM FOR HERITAGE PRESERVATION**



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**BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY
WITH HONOURS**

2022

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA

TAJUK: **DEVELOPMENT OF SQUEEZE AND DYING OF BATIK PRINTING SYSTEM FOR HERITAGE PRESERVATION**

SESI PENGAJIAN: **2020/21 Semester 1**

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**DEVELOPMENT OF SQUEEZE AND DYING OF BATIK PRINTING
SYSTEM FOR HERITAGE PRESERVATION**

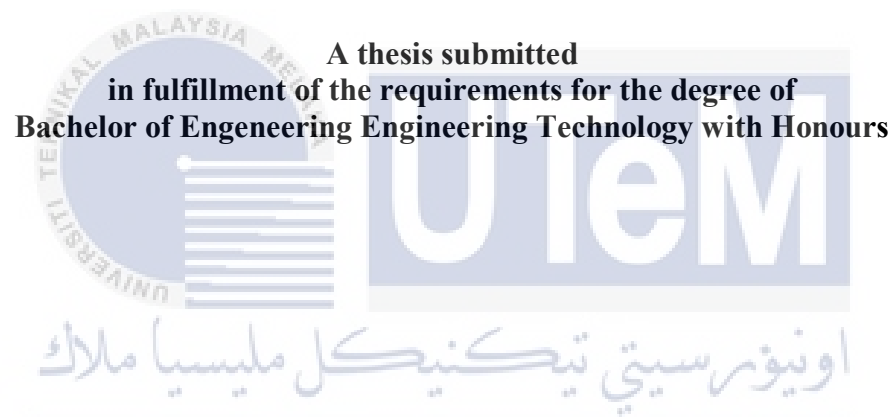
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FOR HERITAGE PRESERVATION**

MOHAMAD FARHAN FIRDAUS BIN EHYAK



Faculty of Mechanical and Manufacturing Engineering Technology

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2022

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APPROVAL

I hereby declare that I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the Bachelor of Mechanical Engineering Technology with Honours.

Signature : Suriati

Supervisor Name : TS. DR. SURIATI BINTI AKMAL

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DEDICATION

For my mother, Siti Morni binti Ibrahim and father, Ehyak bin Marsab



ABSTRACT

Malaysia is the country that have various attractive traditional craft. Batik is one of the traditional unique craft that have long history in Malaysia. Batik Malaysia certificated as one of the caraft that have their own attractiveness and known globally. Batik is one of the technique to decorate unique pattern by using floral motive. There are few type of batik traditional technique in craft industry. Written Batik, Block batik and Screen Printing Batik are known technique that used in Malaysia carft. As it known, most batik industry in Malaysia still used traditional technique. However, there are few problem occurs when using traditional technique. Traditional batik technique require a lot of process and ecah process consume a lot of time. Other than that, batik manufacturer faces another problem where they have lack of workers. This problems effect the quantity of the product. They not be able to do massive produce of batik. A research will be conducted in order to overcome this problem. A machine will be developed to help the batik manufacturer to ease them to produce baik in high quantity.

ABSTRAK

Negara Malaysia merupakan sebuah negara yang kaya dengan hasil kraf yang menarik. Batik merupakan salah satu produk yang mempunyai sejarah yang panjang di Malaysia. Batik di Malaysia juga diiktiraf sebagai salah satu kraf yang mempunyai daya tarikan tersendiri dan terkenal di peringkat global. Batik merupakan salah satu teknik tradisional di Malaysia untuk menghiasi kain dengan rekaan corak yang unik yang kebiasaanya bermotifkan flora. Terdapat beberapa jenis batik yang ada di dalam industri kraf. Antaranya batik tulis, batik blok dan batik skrin. Seperti yang diketahui, industri batik Malaysia masih mengekalkan teknik tradisional. Hal ini telah menimbulkan beberapa masalah yang dihadapi oleh pengusaha batik. Proses tradisional batik memerlukan proses yang banyak dan memakan masa. Kekurangan pekerja yang dihadapi oleh pengusaha batik menyebabkan mereka mengalami kesuilitan untuk menyiapkan batik pada kuantiti yang banyak. Oleh itu, sebuah kajian akan dilakukan untuk mengatasi masalah ini. Sebuah mesin akan dibangunkan bagi membantu para pengusaha batik untuk memudahkan mereka melakukan proses batik.

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ACKNOWLEDGEMENTS

In the Name of Allah, the Most Gracious, the Most Merciful

I would like to thank and honor Allah, my Creator and Sustainer, for everything I have received since the beginning of my life. I would like to thank Universiti Teknikal Malaysia Melaka (UTeM) for providing the study platform. Thank you also to Malaysia's Ministry of Higher Education (MOHE) for your financial support.

My heartfelt gratitude goes to my main supervisor, Ts.Dr. Suriati binti Akmal, for all of her help, counsel, and inspiration. Her unwavering patience in mentoring and imparting invaluable insights will be remembered for the rest of my life. Also, I would like to thank and appreciate Professor Madya Ir. Dr. Mohd Hadzley bin Abu Bakar of Universiti Teknikal Malaysia Melaka (UTeM) for her help and support in completing the research. Als, I would give appreciation to Professor Ir. Dr. Hambali bin Arep@Ariff and Madam Anitaakmar binti Kamarolzaman from Universiti Teknikal Malaysia Melaka (UTeM) for all of their assistance and support.

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LIST OF SYMBOLS AND ABBREVIATIONS

- No list of symbols and abbreviations found



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CHAPTER 1

INTRODUCTION

1.1 Background

Malaysia is well-known for its arts and crafts. Malaysian crafts include forest-based, earth-based, metal-based, and textile-based crafts (Malaysian Handicraft Development Corporation). This craft has also been shown to be capable of showing culture, aesthetic value, intellectual refinement, and life in the history of social values and culture. Malaysia's batik industry has already been in working since the early nineteenth century, and it now makes a significant contribution to the growth of the economy. Batik is an another craft product that is highly valued by Malaysians.

Malaysian batik has been recognized as one of the world's most renowned local crafts by the World-Asia Pacific Craft Council (WCC-APR). According to DIKN's National Creative Industry Policy, textile arts, specifically batik-based products, are classified as part of the Creative Arts and Culture Industry. This industry is also a main source of growth and cultural diversification in developed countries. DIKN defines the creative industry in the Malaysian context through its research on formed countries such as the United Kingdom, Singapore, South Korea, New Zealand, and Australia as the mobilization and production of personal or group abilities and talents based on creativity, innovation, and innovation toward this acquisition of income growth and income level to the country through the emphasis on aspects of works and intellectual property in line with the culture. It is possible to conclude

that the creative sector is focused on art for the economy, with the participation of talented individuals. These corporate parties have financial and image implications for the country.

1.2 Problem Statement

The main issue is that most batik manufacturing requires learning and experience. It takes a lot of time and commitment to develop the knowledge and skills of batik manufacturing. This is because there are many processes to go through it and a lot of time is required to do batik. Recent study shows that the batik manufactures shows that 38.1% of respondents agree that people from Malaysia does not appreciate local batik and 76.2% responds that manufactures are lack of workers. From this data, it shown that lack of people nowadays does not appreciate the beauty of batik itself. (Akhir, N. H. M., & Ismail, N. W, 2015)

Wan Mohd Hafiz Wan Mohd Arifin, General Manager of Noor Arfa Holdings Sdn Bhd, was very upset in his statement when the younger generation is more interested in popularising Indonesian batik and spreading so that it becomes an indirect trend in the local batik industry is getting dimmer. Social media is now the primary and most popular channel among young people. We cannot place all of the blame on them. The selfie, wefie, and viral trend is a global phenomenon that is extremely popular all over the world. Young people are extremely enthusiastic about highlighting something new and exciting, modern, and in line with the latest fashion trends.

N. H. M. Akhir's report analyses the issues in the growth of Terengganu's batik sector. The sector has a 76.2 percent labour shortfall. The percentage of unemployed workers raises the question of why this occurs when many institutions in Malaysia offer skills in the

field of textiles, particularly in batik design arts, such as UiTM, National Craft Institute, advanced batik design certificates, and Youth Skills Institutions, Associated Colleges, which have produced many graduates in the art of batik design. It can be stated that many liners have graduated with abilities in this sector, allowing them to cover shortages and deficiencies in the local batik industry.

1.3 Research Objective

The main objective is to developing the roller of the machine. Another related adjective of this project is:

- a) To determine the type of ink used for the machine.
- b) To study the functionality of ink transferring mechanism.
- c) To develop machine that have suitable mechanism to transfer the ink

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CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Flexographic printing is a high-speed rotating printing technology used in graphic arts and packaging printing on roll-to-roll materials such as cardboard, paper, or foil. This high-throughput technology has been used effectively in a wide range of printed electronics applications, including micro-scale conductive networks, printed rechargeable zinc-based batteries, and roll-to-roll processed polymer solar cell modules.

Flexography is a roll-fed web printing technique. Flexographic printing is frequently used to print large quantities of labels and packaging. Printing on a variety of films, foils, papers, corrugated board, and paperboard at speeds ranging from 500 to 2000 feet per minute is possible with presses.

Adhesive and shrink-sleeve labels like bottle wraps, ice cream cartons, folding cartons, shopping bags, plastic bags, pouches, packets, gift wrap, tissue, envelopes, wallpaper, and disposable plates and cups are all printed on flexo presses.

2.2 Functionality of Flexography

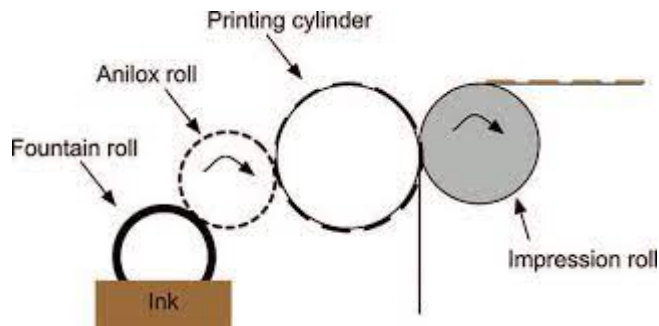


Figure 2.1: show the flexographic system

For each color, a flexible photopolymer plate is wrapped around a rotating cylinder. The graphics and text for each color are raised from the surface of the plate, similar to letterpress printing. Only the plate's raised areas are inked. A fountain roller, an anilox roller, the plate cylinder, and the impression cylinder are the four types of rollers commonly found in flexographic printing.

The fountain roller transports ink from an ink pan to an ink-metering "anilox" roller made from steel or ceramic, and then to the plate cylinder. As the paper passes between both the plate cylinder and a polished metal impression cylinder, ink is applied to the substrate. The pressure required to transfer the ink from the plate to the substrate is applied by the impression cylinder.

The anilox roller is used in flexography to transfer a uniform thickness of ink to the flexible printing plate. Each anilox roller has finely carved cells with different ink capacities. As an optional step, the doctor blade scrapes the anilox roller surface to make sure that only ink from the engraved cells is delivered to the printing plate.

2.2.1 Impression Roller

The imprint cylinder acts as a rigid support for the blanket, allowing it to press a strong, solid impression on the printing substrate. An impression cylinder is sometimes known as a backup roll or a back cylinder. The gripper, a shaft having fingers that grasp and hold the incoming printing substrate and hold it in register under the blanket before releasing the printed sheet to be transported to the delivery pile, is positioned in the cylinder gap that interrupts its circumference.

2.2.2 Anilox Roller

. An anilox roll is a rigid cylinder made of steel or aluminium that is coated with an industrial ceramic, often Chromium oxide powder, and has millions of very fine dimples known as anilox cells carved on its surface. The anilox roller is a critical component of the ink system in flexographic printing, transferring the necessary ink film thickness onto the printing plate and then onto the printed material. The volume of ink that transfers to the printing plates impacts the colour strength and print quality. The amount of ink that must be transferred to the substrate is determined by the type of substrate, the type and viscosity of inks, the type of printing plates, and other parameters. The amount of ink transmitted by the anilox roller is determined by its cell geometry, and there are three major cell features that influence ink transfer: cell volume, line screen, and cell angle.

2.2.3 Plate Cylinder

Flexography is a rotary direct-printing technology that employs a flexible relief printing plate made of photopolymer or elastomer that transfers low-viscosity printing inks to the substrate. The printing plate is attached to the plate cylinder (also known as the printing