

UNIVERSITI TEKNOLOGI MARA

**APPLICATION OF LOW
TEMPERATURE
LUMINESCENT GLAZE ON LABU
SAYONG**

SITI NOOR AZILA BINTI NOORDIN

Thesis submitted in fulfillment
of the requirements for the degree of
Master of Art & Design

Faculty of Art & Design

July 2014

AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate (2011), Universiti Teknologi MARA, regulating the conduct of my study and research.

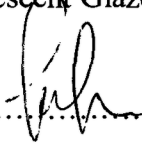
Name of student : Siti Noor Azila Binti Noordin

Student I.D No. : 2011739599

Programme : Master of Art & Design - (AD780)

Faculty : Faculty of Art & Design

Thesis Title : Application of Low Temperature
Luminescent Glaze on Labu Sayong.

Signature of student : 

Date : July 2014

ABSTRACT

Sayong fired clay is a raw material for Labu Sayong craft making in Malaysia. Labu Sayong is a pottery where it's functioning as a water vessel which the design and form was adapted from the pumpkin. Basically, the term labu is a pumpkin and Sayong is a location in Kuala Kangsar, Malaysia. Hence, it was called Labu Sayong to signify the origin of the clay and its uniqueness. Originally, Labu Sayong appeared in black with decoration on its surface where the motive of the decoration was inspired from flora and fauna. In present, Labu Sayong is one of the most iconic of the national heritage. In this thesis, the aim and motivation of the work is to revive the appearance of Labu Sayong by introducing the luminescent effect on its body without compromising its original appearance. Hence, $\text{SrAl}_2\text{O}_4:(\text{Eu}^{2+},\text{Dy}^{3+})$ ceramic compound was employed as a candidate for the luminescent materials. In the preliminary investigation, it was concluded to apply the luminescent materials on the decoration of the Labu Sayong. The $\text{SrAl}_2\text{O}_4:(\text{Eu}^{2+},\text{Dy}^{3+})$ was successfully synthesized and sintered at 1250°C for 2 hours. In this investigation, the use of glazing technique was introduced as a mean to mount the luminescent materials on Labu Sayong body. This had affected the originality of the Labu Sayong but it was very minimal. In present, there is also modification performed by other craft makers to give an added value to the Labu Sayong. Thus, the low temperature transparent glaze was composed with several recipes as an adhesive to the luminescent materials to the Labu Sayong body. The final recipes used as a mounting adhesive was 80% boric acid, 10% kaolin and 10% silica as sintered at $800^\circ\text{C}/0.5$ hours. Finally, it was determined that $\text{SrAl}_2\text{O}_4:(\text{Eu}^{2+},\text{Dy}^{3+})$ powder was successfully mounted on the Labu Sayong body via under glaze technique. The glowing of the luminescent materials was successfully measured using a photometer. The highest luminescent effect was 2.509 cd/m^2 for 2 minutes for the sample of on glaze technique. However the longest luminescent effect was 6 minutes with 0.358 cd/m^2 for under glaze sample. In general all samples were faded after 6 minutes. Finally this finding will benefit other researches and ceramic artist to embark on this innovative technique on other product and artwork and also to revive the Labu Sayong appearance as another of the significant national heritage icon as well as to preserve it.

ACKNOWLEDGEMENT

Allah is almighty. The deep gratitude and sholawat to our beloved prophet Muhammad S.A.W for bless and love.

I express my gratitude to UiTM Shah Alam, Kementerian Pendidikan Malaysia and Dean of FSSR, Prof. Dr. Mustaffa Halabi Hj. Azahari for giving their trust to me through scholarship under Young Lecturer Scheme (TPM). Special thanks also to UiTM Shah Alam, Faculty of Art and Design and Ceramic Industrial Department for accept me as a student, giving me cooperation and permission to use the material and facilities.

I feel immense pleasure in expressing my deep sense of gratitude to my thesis supervisor Dr.- Ing. Oskar Hasdinor Hassan, for his able guidance, encouragement and invaluable suggestions that made this research possible. His generosity and sincerity towards work has been much beyond his formal obligations as a supervisor, for which I shall be indebted to him.

I express my gratitude to Mrs. Nor Nazida Awang and Mr. Mohamad Rizal Salleh for their valuable knowledge and cooperation. I express heartiest thanks to all research members and research scholars of the FormGivingDesign Research Lab, UiTM Shah Alam, Mr. Rusmadiyah Anwar for supportive this research under the RAGS with 600-RMI/RAGS 5/3 (200/2012) and Excellent Fund with 600-RMI/DANA 5/3 (239/2012).

I owe special gratitude to my mother and siblings for their continuous and unconditional love and support of all my activities scholastic and otherwise. I may not express my gratitude and love in traditional ways for the endless patience, guidance and love, but I know I have utmost faith in my mother Mrs. Siti Bedah Shahidan. My mother is the most important influence in my life all that I am and all that I have become is in some way a tribute to her.

Last but not list, I deeply dedicate all this effort to my late father, Allahyarham Mr Noordin Osman; this is our dream. Al-fatihah.

TABLE OF CONTENTS

	Page
AUTHOR'S DECLARATION	ii
ABSTRACT	iii
ACKNOWLEDGEMENT	iv
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
CHAPTER ONE : INTRODUCTION	
1.1 Background of Study	1
1.2 Problem Statement	3
1.3 Aim of Study	4
1.4 Objectives of Study	4
1.5 Significance of Study	5
1.6 Hypothesis	5
1.7 Scope of Study	6
CHAPTER TWO : LITERATURE REVIEW	
2.1 Labu Sayong	7
2.1.1 Background of Labu Sayong in Malaysia	7
2.1.2 Labu Sayong Production Process Flow	9
2.2 Ceramic Bodies	12
2.2.1 Origin of Clay	12
2.2.2 Properties of Raw Clay	13
2.2.3 Particle Size and Shape	14
2.2.4 Sayong Clay	15
2.3 Types of Luminescent	15
2.3.1 Applications toward Products	15
2.3.2 Luminescent Ceramic	16