

**ASSESSMENT OF EMBEDDED ENERGY OF FLOOR
TILES MANUFACTURED IN SRI LANKA**

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Dissertation submitted in partial fulfillment of the requirements for the
Degree Master of Science in Electrical Installations

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Sri Lanka

April 2018

DECLARATION

I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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ABSTRACT

Floor tile manufacturing is one of the highest energy intensive industries in the world. Basically, the thermal energy is the most prominent energy component in the value. Embedded energy is a fairly a new concept which will be used to estimate how much energy had been used to produce one unit of material.

The embedded energy concept will be used to check the energy efficiency of the manufacturing.

The embedded energy comprises four components as level 01, 02, 03 and 04. Level 01 energy is the direct energy used in the manufacturing process. Level 02 is the labour component and the ancillary services. The transport and mining energy is considered as level 03 energy. The level 04 is the energy being used for manufacturing of the capital equipment or the machineries which are being used in the manufacturing process. Accessing of level 04 energy is very difficult and that energy is not considered in this research.

The fossil fuel is a limited resource to the world and in the countries like Sri Lanka, all most all the fuels are being imported. If it is strived to reduce the embedded energy or at least trying to reach the lowest values achieved by other countries will serve the world by saving energy.

The embedded energy of a typical factory in Sri Lanka is 12.58 MJ/Kg for Level 01, 0.14 MJ/Kg for the level 02 and 0.84 MJ/Kg for Level 03. Which gives the embedded energy as 13.56 MJ/Kg. According to the literature revived the internationally accepted embedded energy value is 11MJ/Kg for the floor tiles as per Inventory of Carbon and Energy.

To achieve the imbedded energy value 11 MJ/Kg is not an unrealistic task. For this the manufactures of the country have to rearrange their manufacturing processes in such a way that the wastages are minimized and the thermal energy is efficiently used.

By rearranging the production process to have the energy efficient manner will serve two purposes.

It will help to produce low embedded energy tile and lesser embedded energy means low fuel consumption in the manufacturing process. It will help to reduce the global energy demand and the unit cost of the product will be lower making it high profitable

ACKNOWLEDGEMENT

I wish to extend my deepest gratitude and affection to Dr. K.T.M. Udayanga Hemapala who encouraged and guided me to conduct this research and on preparation of final dissertation.

I extend my sincere gratitude to Dr. Nalin Wickramarachchi, Head of the Department of Electrical Engineering, Prof Lucas and all the lectures and visiting lectures of the Department of Electrical Engineering for the support extended during the study period.

I would like to take this opportunity to extend my sincere thanks to following experts who gave their support to conduct my work. Mr. Divakara, Plant manager Macson Mesh Industries, Mr. Pitipana, Production Manager, Mr. Sumanadasa, Quality control Manager of Royal Porcelain (Pvt) Ltd, Mr. Prbath Factory Manager of Lanka Tiles Ltd.

It is a great pleasure to remember the kind co-operation extended by the colleagues in the post graduate program and my friends.

Further, I would like to thank my wife Biyanka, son Dulsara, and Daughter Amalya for their scarification by bearing the hardships due to my absence at home during the study period.

TABLE OF CONTENTS

DECLARATION.....	i
ABSTRACT	ii
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF FIGURES	vii
LIST OF TABLES.....	viii
LIST OF ABBREVIATIONS	ix
1 INTRODUCTION.....	1
1.1 Background.....	1
1.2 Motivation.....	2
1.3 Aim	2
1.4 Objective of the study.....	2
1.5 Methodology.....	2
1.6 Contribution.....	3
2 LITERATURE REVIEW.....	5
2.1 Production Process of a ceramic floor tile manufacturing plant	5
2.2 Body raw materials	6
2.3 Storage of Raw Materials.....	7
2.4 Ball Mill Batching.....	7
2.5 Raw material Grinding Milling.....	7
2.6 Slip storage.....	9

2.7 Ceramic powder preparation from Spray dryer.....	9
2.8 Storage of Ceramic Powder	11
2.9 Formation of a Ceramic tile by Powder Pressing.....	11
2.10 Fast drying.....	12
2.11 Glazing & Printing Applications.....	12
2.12 Storage of Green Tiles.....	16
2.13 Firing the tiles in the kilns.....	16
2.14 Storage of Fired Tiles.....	19
2.15 Polishing, Squaring.....	19
2.16 Sorting & Packing.....	20
2.17 Storage of Finished goods.....	22
2.18 Product Classification.....	22
2.19 Product portfolio of the local manufactures.....	23
2.20 Energy Consumption in Ceramic Industry	24
2.21 Non Plastic Raw materials.....	26
2.22 Power Generation and Distribution in Sri Lanka	29
3. EMBEDDED ENERGY.....	31
3.1 Elements of the Embedded Energy.....	31
3.2 Assessing of energy in a manufacturing proses.....	33
3.3 Boundary conditions.....	34
4. DATA COLLECTION.....	36
4.1 Level 01 Energy.....	37
4.2 Level 02 Energy.....	42

4.3 Level 03 Energy	44
5.ANALYSIS OF DATA.....	46
5.1 Average monthly energy level 01.....	47
5.2 Level 01 Energy as embedded energy	49
5.3 Calculation of Embedded Energy.....	51
5.4 Benchmark embedded energy for local factories	52
5.5 Reasons for the Variations.....	53
6 SENSITIVITY ANALYSIS	54
7 CONCLUSIONS AND RECOMENDTIONS	56
7.1 Replacement of less efficient machines.....	57
7.2 Heat recovery System.....	58
7.3 Heat Recovery system Calculations.....	59
7.4 Investment for Heat recovery System	59
7.5 Overall Conclusion	60
8. REFERENCES.....	61

LIST OF FIGURES

Figure 2-1: Flow chart of the production process	5
Figure 2-2: Ball Mill used for grinding process	8
Figure 2-3: Silos used for storage of base powder	11
Figure 2-4: A pressing machine	11
Figure 2-5: A bell machine	13
Figure 2-6: A vela machine	14
Figure 2-7: A double disk machine	14
Figure 2-8: A Rotocolor machine	15
Figure 2-9: A digital Tile printer	15
Figure 2-10: A Roller Kiln	16
Figure 2-11: A Tile Polishing and Squaring Machine	20
Figure 5-1: Tile production in RPL plant in the year 2015	464
Figure 5-2: Energy Demand for RPL Factory in the year 2015	46
Figure 5-3: Level 01 Energy consumption	47
Figure 5-4: Department wise Specific Energy	47
Figure 5-5: Level 01 energy for the Kiln	48
Figure 5-6: Monthly Average energy for the Milling	48
Figure 5-7: Monthly Average energy for the Kiln	49
Figure 5-8: Level 02 Specific Energy	50
Figure 5-9: Level 02 average monthly energy for different departments	51
Figure 7-1: Weak thermal insulations	57
Figure 7-2: Exhaust flue gas system in a LPG fired Kiln	58

LIST OF TABLES

Table 2.1 Classification of tiles based on method of formation.....	22
Table 2.2 Classification based on water absorption.....	23
Table 2.3 The major tile sizes and types in RPL factory	23
Table 2.4 The major tile sizes and types in RCL factory	24
Table 4-1 Level 01 energy Milling department	37
Table 4-2 Level 01 energy Pressing department	38
Table 4-3 Level 01 energy Glazing department	39
Table 4-4 Level 01 energy Kiln department	40
Table 4-5 Level 01 energy Sorting department	41
Table 4-6 Level 02 energy for ancillary activities	42
Table 4 -7 Level 02 energy for labour activities	43
Table 4-8 Level 02 Total Energy	44
Table 4-9 Level 03 Total Energy for transportation.....	45
Table 5-1 Department wise embedded specific level 01energy	49
Table 5-2 Department wise embedded specific level 02 energy.....	50
Table 5-3 Embedded Energy Bench mark value and the local	52
Table 6-1 Level 01 Specific Energy for different Energy Sources.....	54
Table 6-2 Level 02 Specific Energy for different Energy Sources.....	54
Table 6-3 Different combinations and percentage reduction.....	55
Table 6-3 Thermal Consumption comparison.....	57

LIST OF ABBREVIATIONS

Abbreviation	Description
BTU	British Thermal Unit
CEB	Ceylon Electricity Board
CPC	Ceylon Petroleum Corporation
GWh	Giga watt hour
Kcal	kilo calorie
kWh	kilo watt hour
LKR	Sri Lankan Rupee
LNG	Liquefied Natural Gas
LOLP	Loss of Load Probability
LPG	Liquefied Petroleum Gas
LTGEP	Long Term Generation Expansion Plan
MJ	Mega joule
MW	Mega watt
NCRE	Non-Conventional Renewable Energy
NCV	Net Calorific Value
NG	Natural Gas
O&M	Operation and Maintenance
MT	Metric tonne (1,000 kg)
USD	United States Dollar
RPL	Royal Porcelain Factory
RCL	Royal Ceramics Lanka Factory
LTL	Lanka Tiles Limited Factory