EFFECTIVENESS OF WATERPROOF CLOTHING FABRIC USING AGENTS BASED ON NANOTECHNOLOGY

NUR AMIRA BINTI MAZLI

NUR ADLINA BINTI HASSAN

BSc. (Hons.) Textile Technology

Faculty of Applied Sciences
Universiti Teknologi MARA

JULY 2016

ACKNOWLEDGEMENT

First of all, we want to express our gratitude to ALLAH THE ALMIGHTY for the fitness and blessing. Without it, we will never complete our final year project on time. We are extremely thankful and indebted to Assoc. Prof. Dr. Khadijah Binti Omar, our respectable supervisor for this final year project for the advices and guidances towards this final year project processes from the beginning until the end. Also by her guidances of the comments and suggestions at the beginning of the process had given the sense of the direction of this paper required.

This project made possible through the help and support from everyone. We take this opportunity to express gratitude to all Textile Technology Programme members for their helps and supports. We also thank to our parents for the unceasing encouragement, supports and attentions. Also, special thanks to all degree lecturers and friends who always give us informations and very helpful.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENT	**i**
TABLE OF CONTENTS	**ii-iv**
LIST OF FIGURES	**v**
LIST OF TABLES	**vi**
ABSTRACT	**vii**
ABSTRAK	**viii**
1 INTRODUCTION	
1.1 Background of study	1
1.2 Problem statement	2-3
1.3 Objectives	3
1.4 Significance of study	3
1.5 Scope and limitation	4
2 LITERATURE REVIEW	
2.1 Waterproof fabric	5
2.1.1 History of waterproof fabric	5-6
2.1.2 Waterproof versus water repellent	6-7
2.1.3 Types of waterproof fabrics	7
a) Laminated waterproof fabrics	7
b) Coated waterproof fabrics	7-8
2.1.4 Demands of waterproof fabric	8-9

2.1.5 Properties of waterproof fabric 9-10

2.2 Mechanisms of waterproof fabric 10-12

2.3 Methods of waterproofing 13

2.3.1 Chemical reaction 13

2.3.2 Mechanical action 14

2.3.3 Waterproof film 15

2.3.4 Coating method 16

2.3.5 Laminating method 16

2.3.6 Fabric construction 17

2.3.7 Nanotechnology method 18-22

2.4 Evaluationof the effectiveness of the waterproofing treatment 23

2.5 Development in waterproof 23

3 **MATERIALS AND METHODS**

3.1 Materials and chemicals 24

3.1.1 Fabrics 24

3.1.2 Chemicals 24

3.2 Apparatus and equipment 24

3.3 Methods 25

3.3.1 Preparation of the chemicals 25

3.3.2 Treatment of the fabric with the chemicals 25

3.4 Evaluation of the effectiveness of the waterproof treatments 26

3.5 Analysis of results 26-27

ABSTRACT

EFFECTIVENESS OF WATERPROOF TREATMENT ON CLOTHING FABRIC USING AGENTS BASED ON NANOTECHNOLOGY

This study was conducted to evaluate the effectiveness of the waterproof treatment on clothing fabric using agents based on nanotechnology. Two types of agents based on nanotechnology namely AquaNano and Always Dry were used on 100% cotton fabric and 100% polyester fabric. The AquaNano agent was applied to the fabric by exhaustion method, while the Always Dry agent was applied to the fabric by sprayed method based on factory suggested method. The waterproof effect on the treated fabric was measured by several test such as impact penetration test, air permeability test and drop test. In addition, the other three tests like thickness test, tearing strength test and stiffness test were done to measure the side effects on the fabric properties after treated with nanotechnology based chemicals. The results showed that the polyester fabric has good waterproof effects on impact penetration test, drop test, tearing strength test, stiffness test and thickness test, while the cotton fabric showed the good properties on air permeability test. The Always Dry agent based on nanotechnology give better waterproof effect to polyester fabric, while AquaNano agent based on nanotechnology give better waterproof effect to cotton fabric.