FACULTY OF ENGINEERING

DEPARTMENT OF TEXTILE AND GINNING ENGINEERING

FINAL YEAR PROJECT PROPORSAL

PREDICTION OF AIR PERMEABILITY AND GSM OF A KNITTED FABRIC USING RESPONSE SURFACE METHODOLOGY

By

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ABSTRACT

The usage of knitted fabrics in textile industry has expanded worldwide and the producers and wearers are becoming more sensitive to their comfort performance in addition to the aesthetic demands. The end use and the fulfillment of customer expectations are important concerns in the Textile industry nowadays. Knitted structures should possess good air permeability property for comfort of wearers.

Air permeability and is are important factors in comfort of a fabric as they play a role in transporting moisture vapors from the skin to the outside atmosphere. Knitted fabrics are preferred structures in applications which demand comfort as a key requirement but this comfort can be varied with different fabric parameters. Therefore, there is need to control knitting and yarn parameters which affect air permeability and GSM so that to obtain knitted fabrics with required comfort.

Several studies using statistical package programs as an alternative approach to predict problems in knitted fabrics have been undertaken for example the use computational and Taguchi techniques among others. Response surface methodology can be used as an alternative technique for modeling the relationship between process inputs and output factors to predict responses and to optimize the process input factors.

The precise assessment of air permeability and GSM during design stages of textiles is of great importance as it reduces the cost in the development of new structures. In this project performance specifications for both industrial and consumer use will be prepared on the basis of air permeability and GSM which can be used in the production and purchase of fabrics where air permeability and GSM are of interest.

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First, I would like to acknowledge, recognize and appreciate my father and my God by whose ability I managed to accomplish the project through the great potential he placed in me by which I believe that I was able to carry out the different segments of the project research.

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I would also like to thank my dear intellectual supervisors Mr. Tigalana Dan and Dr Nibikora Ildephonse for the guidance, advise and support they rendered to me while carrying out the project research.

DEDICATION

I dedicate this project to my fellow enthusiasts in the field of textiles and engineering, my fellow classmates, my family members and whoever has contributed their efforts throughout my Bachelors course.

DECLARATION

I Namirembe Suzan, clearly declare that the contents in this report are original to the best of my knowledge and that the report has never been submitted to any institution or university for the award of any degree or diploma and am the true author of the report.

NAMIREMBE SUZAN

Signature: ……

Date: ……

APPROVAL

This is to certify that project research of Namirembe Suzan was under my supervision and it is ready for submission to the dean of faculty engineering of Busitema University with our approval.

Main Supervisor

MR TIGAWALANA DANIEL

Signature…….

Date…….

Co- Supervisor

DR NIBIKORA ILDEPHONSE

Signature……

Date……

LIST OF ACRONYMS

RSM: Response surface methodology

CCD: Central Composite Design

BBD: Box-Behnken Design

GSM: Grams per square meter

ANOVA: Analysis of variance

AP: Air permeability

ASTM: American Standard Method

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