Declaration of the Candidate and Supervisor

I A.L .K Amarasekara, hereby certify that the work described in this dissertation was carried out by me in the Department of Textile and Clothing Technology, University of Moratuwa and Hayleys mgt Knitting Mill plc .This dissertation is the result of my own work and does not incorporate without acknowledgement any material previously submitted for any university or institution for any other academic qualification.

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Signature: Date: 02-07-12

The above candidate has carried out the research for the Master degree under my supervision.

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Improving Colour Reproducibility in Bulk Production of Single Jersey Cotton knits using Reactive Dyeing

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Dissertation submitted in partial fulfillment of the requirements for the degree of Master of Science

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March 2012

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Abstract

Dyeing is a widely used operation in textile processing, and dyed textiles account for significant amount of the total textile production. Colour, particularly colour consistency, is a critical quality parameter in dyed textiles, on which is a high level of expectation is placed by apparel manufacturer, as it can lead to the mismatching of garment panels and non-conformity with customer requirements in readymade garments. Reactive dyes are popularly applied to cotton knits due to the advantages of reactive dyes such as higher level of colour fastness properties, obtaining different shades, and the applicability of various methods. However, a lack of reproducibility in some cases has been observed in reactive dyeing on cotton knits. Hence reproducibility has to be enhanced in order to obtain a cost effective, competitive and environmental friendly reactive dyeing process. Therefore this research focuses on the improvement of reproducibility of reactive dyeing on cotton knits.

The reactive dyeing process depends on certain important factors such as the level of pretreatment, quality of dyes, dyeing auxiliaries and water used, and the dye bath variables. Therefore the bulk dyeing trials are performed on the level of pretreatment and the other factors are kept constant. Thus the number of bulk dyeing trials including light, medium and dark shades, are conducted on variables such as degree of whiteness, pH level and absorbency of the material which are achieved during the pretreatment process. The recommended degree of whiteness for this reproducibility was not exactly determined because it ultimately affected to the strength of the white material. Therefore it can be concluded that the degree of whiteness should be kept as high as possible without damaging the fabric. The recommended pH level for the improvement of reproducibility was pH = 7. At this pH level, maximum level of reproducibility can be achieved. The recommended absorbency level for the improvement of reproducibility was 3 sec. according to the test method of American Association of Textile Chemists and Colorists (AATCC) 79.By maintaining the above parameters within the recommended range acceptable level of reproducibility can be achieved in dyed cotton knits.

Dedication

I lovingly dedicate this dissertation *to my wife,*

who supported me

each step of the way

Acknowledgement

I would like to take this opportunity to express my sincere thanks and gratitude to my research Supervisor Dr.(Mrs.) Samudrika Wijayapala, Senior Lecturer, Department of Textile and Clothing Technology of the University of Moratuwa.

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List of Abbreviations

Abbreviation	Description
MLR	Material to Liquor Ratio
RFT	Right First Time
KPI	Key Performance Indicator
VS	Vinyl sulphone
MCT	Mono Chloro Triazine
AOX	Aromatic Organo Halogen
AATCC	American Association of Textile Chemists and Colorists