

**INVESTIGATION OF THE RELATIONSHIP
BETWEEN LAUNDERING CYCLES AND
ABSORBENCY PROPERTIES OF TERRY FABRIC
USED IN PERIOD PRODUCTS**

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Thesis submitted in partial fulfillment of the requirements for the degree
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DECLARATION

I declare that this is my own work and this thesis/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. I retain the right to use this content in whole or part in future works (such as articles or books).

Signature:

Date: 31/07/2025

The above candidate has carried out research for the ~~PhD/MPhil~~ Masters thesis/dissertation under my supervision. I confirm that the declaration made above by the student is true and correct.

Name of Supervisor: Dr (Mrs). Gayani K. Nandasiri

Signature of the Supervisor:

Date: 31.07.2025

DEDICATION

This thesis is dedicated to my mother and father. Your unwavering love, support, and sacrifices have formed my very foundation regarding all pursuits. It was your lessons of resilience, consistently boundless encouragement, which drove me to take the lead and chase my dreams.

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ABSTRACT

The study investigates the effects of home laundering on the absorbency of terry fabric used in period products. Considering an ever-increasing demand on the market for reusable durable textiles, this research investigates the effects of laundering on the absorbency characteristics and performance of the polyester-blended terry fabric used in period products. The methodology included a quantitative, qualitative and experimental design involving three stages: pre-laundering absorbency testing, laundering cycles, and post-laundering absorbency testing. The saturated capacity test was used to provide more realistic conditions for fluid management. Preliminary results showed that the original specimens had given an average saturated gain of 547.1%, absorption of 17 ml of fluid. The saturated gain after the first accelerated cycle of laundering improved to give an average of 667.3%, with a corresponding volume absorption of 22 ml. However, in the case of a second accelerated laundering cycle, the average saturated gain reduced to 651.1%, and the absorbed volume slightly fell to 21 ml. Statistical analysis done with paired sample t-tests-confirmed significant differences in mean saturated gains between original and post-laundered samples. The absorbent capacities of gusset composite were increased up to 20 laundering cycles and then gradually decreased. According to this research evaluation, the absorbency limits of period underwear made from terry fabric after home laundering noted an absorbent range of 15ml to 19ml. These results confirm that although absorbency may initially increase after the first accelerated laundering cycle in polyester blended terry fabrics used in period products, absorbency is degraded over time after the second accelerated laundering cycle. This is certainly an indication of further research to be done on durable finishes or structural additions that could prove long-term absorbency over repeated laundering. This leads to the conclusion that period products in repeated use need products of targeted interventions in the treatments of fibers and fabric structure. The author recommends further investigation based on the loop geometry, density and loop arrangement to study the root cause and the possible methods of improving the absorbency of this absorbent core material to enhance the usability of the period products.

Keywords: Absorbency, Polyester Blended Terry Fabric, Laundering Cycles, Reusable Period Products, Textile Performance.

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LIST OF ABBREVIATIONS

Abbreviation	Description
AATCC	American Association of Textile Chemists and Colorists
NaCl	Sodium Chloride
ISO	International Standard Organization
SPSS	Statistical Package for the Social Sciences
PET	Polyethylene terephthalate

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