

UNIVERSITI TEKNOLOGI MARA

**TECHNICAL PROPERTIES OF
POLYESTER FABRIC PRODUCED
WITH DIFFERENT WEFT
DENSITIES**

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ABSTRACT

Physical and technical properties of woven fabric together play an important role to produce good quality fabric. The objective of this study is to analyse the effect of polyester woven fabric technical properties which includes air permeability, abrasion resistance, wrinkle recovery, stiffness and friction when produced with different weft densities. Weft density refers to the number of weft yarn in centimeter. In addition, this study aims to investigate the relationships between physical and technical properties of fabric using Pearson Correlation Coefficient. Plain polyester woven fabric was produced using Sulzer Rapier Loom machine with three different weft densities, which are 15 weft per centimeter (wfc), 20wfc and 25wfc. The fabric samples underwent both physical and technical testing. Physical measurements includes cloth cover factor, crimp, weight, and thickness. The results were analyzed using Pearson Correlation Coefficient. It is revealed that the changes in weft densities has an effect on the performance of the fabric's technical properties. The fabric stiffness and friction were directly proportional to the increment number of weft density. Meanwhile, fabric abrasion resistance, air permeability and wrinkle recovery were inversely proportional to fabric weft density. Furthermore, results have also shown the analysis using Pearson correlations Coefficient for all technical properties which include fabric weight, thickness, cloth cover factor, density and crimp have high relationships toward the technical properties except for abrasion resistance.

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CHAPTER ONE

INTRODUCTION

1.1 Research Background

The fabric technical and physical properties play an important role in the textile industry. It determines the end quality and uses. These properties are related to each other, where the physical properties of fabric affects the performance of the fabric's technical properties. Furthermore, physical and technical properties of fabrics are important to be considered to produce high quality product that can meet customer's satisfaction. Quality of fabric is required in the textile industry to ensure the garment produced can be used long term with a good performance such as good drapability, comfort and strength. In order to produce good quality garments, it is important to identify the technical properties of fabric. Besides the aesthetic properties, the technical properties of the fabric are considered as a decisive quality parameter [1]. There are many parameters that influence the technical properties of woven fabric such as fiber properties, structures, and molecular properties. The weaving conditions such as speed of weaving, warp tension, and weft density are also several parameters that give effect to technical properties of fabric [2]. In addition, fabric characteristics, yarn, fiber and the finishing process also generally affect the technical properties [2].

There are many types of technical properties of fabric in textile and they play a decisive role to make sure the garment produced serves its purpose. This study, focuses on identifying the technical properties which includes abrasion resistance, wrinkle recovery, air permeability, stiffness and friction of the fabric with different weft densities.

All the technical properties of apparel also relate to the physical properties during production. Fabric density, cloth cover factor, yarn type, thickness and structure are several examples of physical properties. This study focuses on different weft density of fabrics. Weft density refers to the numbers of weft yarn in centimeter. So, when identifying the technical properties of fabric, it is important to consider the physical properties. This is to ensure the fabric produced is high quality with good performance.