



PUNCTURE AND TEAR OF WOVEN FABRICS

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ABSTRACT

The quite often contact of textile goods with sharp objects, results in the puncture and in many cases the tear of the textiles. Thus, the determination of the tearing strength of textile articles occupies a very distinctive position among the various textile quality control tests. The existing device-method presupposes an initial cut in the testing area of the specimen. The lack of a device simulating the accidental combined puncture and tear of a fabric was fulfilled with the development of the apparatus COMPUTE. The impact angle and the mass of the falling puncture tool that causes the tear of the fabrics are the main variables that this apparatus possesses. In this project, the effect of these two variables on the tear propagation length of woven fabrics is investigated.

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KEYWORDS: Puncture, Tear propagation, Woven fabrics, Quality control testing device

1. INTRODUCTION

It is well known that the textile quality control has become of increasing interest and the quality assessment of textiles is of vital importance for both manufacturers and consumers. An increased number of knowledgeable consumers with firm demands for specific performance behaviour and longer life textile goods, in combination with the numerous advances in technology, have made essential the better understanding of other, unknown a few years ago, properties of fibres, yarns and fabrics. This can be achieved by evaluating these properties in a more intensive kind. It is, therefore, necessary to develop and use suitable devices that obtain reliable testing methods of the quality characteristics of the various textile products.

1.1 Tearing of Fabrics

A common type of failure in textile fabrics and consequently a serious defect (with a few exceptions like bandages and adhesive tapes) is their tendency to tear easily. It may be described as the sequential breakage of yarns or groups of yarns along a line through a fabric. The tearing strength, that is usually measured as the force required to propagate a tear, may often be used to give a reasonably direct assessment of serviceability, and a fabric with low tearing strength is generally an inferior product. In contrast to the tensile strength, that involves the force required to break a large number of yarns simultaneously, and is relatively insensitive to yarn and fabric structural parameters, the tearing strength is considerably affected by changes in yarn and fabric geometry, the state of relaxation