

# INFLUENCE OF WEAVE PARAMETERS ON FABRIC TEAR STRENGTH

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## ABSTRACT

The customer satisfaction for the most part is aesthetic requirements and mechanical properties. The functional properties of fabrics are very important for their usage. It is well known fact that the tear strength depends on the properties of yarns, from which fabric is manufactured as well as on the weave of the fabric. The influence of the weave on woven fabric tear strength is analysed in this paper. The aim of the present paper was to investigate the influence of the weave on tear strength. The main problem is to find a parameter with which the tear strength could be predicted.

**Key Words:** tear strength, woven fabric, weave construction, weave parameters

## 1. INTRODUCTION

Textile and clothing industry is an important sector of the economy both in Europe and worldwide. Quality of fabric structure may be outlined as the degree that a authentic product. The demands of textile consumers (and also of the users) can be various a lot of textile products. The customer satisfaction for the most part is aesthetic requirements and mechanical properties. A quite satisfactory parameter for weave estimation was developed by Brierlay, who used the weave factor  $F$  after Ashenhurst and empirically determined the order  $m$  for factor  $F$  and proposed factor  $F_m$  [1]. Usually it is considered that if the new factor correlates well with Brierlay's factor, it is good, if not – it is a big weakness of the new factor because Brierlay's factor is proved by various researchers for various fabric properties and manufacturing processes [2]. Investigations of the weave influence on various characteristics of fabric and ,particularly, on the tear strength are important and are discussed in various works.

## 2. RESULTS AND DISCUSSION

Woven fabrics from 100% viscose multifilament yarns were used for investigations. The weaves were chosen to cover various main kinds of weave construction – plain, ribs, twills (in some twill weave fabrics, the diagonal effect may also be seen clearly on the back side of the fabric), basket weave (a variation of the plain weave construction, formed by treating two or more warp yarns), and sateens (a variation of the sateens weave, produced by floating fill yarns over warp yarns). 4 healds sateen was chosen due to the possibility of manufacturing fabric from the same beam of warps and with the same density of yarns, which could be used for real fabric manufacture [3]. Sateen with higher floatining would be unusual for real fabric due to the low density of yarns in the fabric. All fabrics were manufactured by JSC “Liningas”

(Lithuania) using the same densities of threads, same looms and without any changes of technological parameters at the time of weaving. Dependences of the tear strength on the weave parameters  $P$ ,  $P_1$ ,  $P_2$ ,  $P'$  and  $F_m$  were determined. All parameters presented can be used for the strength prediction and its dependence on weave when fabrics are divided into two groups – rib-based and twill-based. The rib-based group includes plain, ribs and basket weaves, while the twill-based group includes plain, twills and sateens. Parameters  $F_m$ ,  $P$  and  $P'$  shows very good correlation with the tear strength in most cases, except for the tear strength in the weft for rib-based group fabrics. For this group the parameters  $P$  or  $P'$  need to be calculated changing the influence of parameters  $P_1$  and  $P_2$ .

### 3. REFERENCES

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