



To Evaluate The Geometrical Properties Of Bamboo Woven Fabric Suitable For Mobility People

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Abstract: The study presented in this paper is on bamboo woven fabrics geometrical properties , which is commonly used for apparel production. Clothing serves to convey a person's personal style while also providing protection, utility, and comfort. To satisfy human needs and ensure garment functionality, each of these factors must be met. Disabilities frequently result in unique functional requirements for clothing and other textile products in the home. Clothing can also be used to conceal physical problems, if that is possible. In everyday life, the sitting position is fairly prevalent. As a result, all apparel should be comfortable in this position. This is especially crucial for disabled persons who, due to their infirmities, are confined to a sitting position for the remainder of their lives. These are persons who need wheelchairs because they have reduced mobility due to paraplegia, multiple sclerosis, cerebral palsy or other injuries. The geometric features of bamboo woven fabric are examined to see whether it is suitable for garment design. This paper discusses research on using new technology to improve clothing design that is tailored to an individual's specific wants and expectations. it is found that bamboo woven fabric is better textile for disabled people and to provide solution for clothing issues.

Key words: Geometrical properties, Bamboo woven fabric, Disabilities, Clothing issues, New technology

I. INTRODUCTION

The garment and textile industry is experimenting with various materials in order to find new ways to be more sustainable. Bamboo cloth, for example, is regularly recognized for its environmental friendliness. However, the term "bamboo cloth" refers to a variety of materials. Some fabrics are good to the environment, while others are not. Each cloth's manufacturing procedure reveals which bamboo fibre is the most environmentally friendly. For many years, bamboo fibre has been employed in a variety of applications, including construction, decorating, slope control, and high-performance composites. Superior tensile strength, great ultra violet protection, biodegradable and antibacterial qualities, brightness high moisture absorption, softness, and high flexibility under flexible are all advantages of regenerated bamboo fibres. Regenerated bamboo cellulose fibre provides superior comfort in a variety of applications due to its excellent moisture absorption capacity, breathability, and quick drying behavior. Intimate garments, hygiene goods and sanitary materials, nonwovens, and home furnishings all use regenerated bamboo fibre. Bamboo textiles are in more demand in the market due to its properties of antibacterial, biodegradability, softness, high moisture absorption capacity, and UV protection. Bamboo has a lot to offer in its natural state. It has a vast geographical range and a wide range of applications. It has a wide network of growth patterns and can withstand high temperatures as a grass. Bamboo, on the other hand, is essential for many animal and plant species to survive

The standard of living is rising these days. The need for novel textile materials with new or better qualities that are required for increased comfort or industrial uses is increasing in all fields. Garments for persons with disabilities should have both functional and aesthetic elements, transforming them from bulky and hiding to convenient, appealing, and functional. In response to the growing demand for more comfortable, healthier, and environmentally friendly products, the textile industry has concentrated its research and development efforts on the use of renewable and biodegradable materials, as well as environmentally sound textile production processes. In this field, a new type of regenerated fibre has developed as a viable alternative to conventional fibres. Textiles are used in a variety of medical purposes, including healthcare and sanitation. The product range comprises disposable and non-disposable items such as surgical gowns, masks, surgical drapes, gloves, towels, sanitary napkins, baby diapers, and other items. Bamboo fibre has unique attributes that make it perfect for textile production. It has a great water absorption capacity, able to absorb three times its own weight in water. Bamboo fibre is naturally sterilizing, possesses moisture-transfer properties, and dries quickly. As a result, this fibre is rapidly being utilized in sanitary goods such as newborn diapers, sanitary towels and absorbent pads, as it does not induce skin allergies. The findings of a brief pilot study on fabric preferences revealed that

geometric parameters such as thread count, yarn count, GSM, and fabric thickness are essential, and are suitable for designing garments to mobility people.

2. METHODOLOGY:

2.1 Evaluation of geometrical characteristics of bamboo woven fabric

2.1.1 Yarn count/linear density

Yarn count was determined by using Beasley balance. To determine the yarn count of the marbling fabric Beasley balance apparatus was used. This apparatus used to find the fixed weight and fixed length of a yarn is Beasley balance, Fabric, template, dissecting needle was used to find the count of yarn in the marbling dyed fabric. With the help of the sizing template, two parallel lines were marked on the fabric, and then the fabric was cut along these two lines. The yarns were removed from the fabric with the help of pointing needles. Once the center beam is balanced against the datum line, threads which were removed are placed on (Calibrated Rider) on the slot provided on the center beam of the balance. Yarns removed from the fabric were placed one by one on the suspender Hook of the center beam, till the center beam is balanced. Once the center beam was balanced and it came exactly against the datum line, yarns were removed and counted and this number is the Count of yarn. The same process was continued for all the samples which had to be constructed and the average is mentioned in the table below



Figure 2.1 Beasley balance

2.1.2 Thread count/fabric count

Thread count or fabric count can be determined using pick glass with dissecting needle, this is done mainly to understand the fabric count or the thread count of the bamboo woven fabric. The number of warp yarns per inch and the number of weft yarns per inch is determined by pick glass. Determination of threads per inch is done by using two different methods by Pick counting glass or Fabric dissection or unraveling the cloth

In the Pick counting glass method, the counting glass is a small magnifying glass in a stand over a square exactly one inch each way. The number of threads in the fabric directly gives the number of threads per inch. This is the method generally used.

Fabric dissection or unraveling the cloth, in this method a known width is unraveled and the threads are counted. This method is used where the threads are difficult to distinguish as in felted threads or where the structure is complex, as in pile fabrics. Pick glass was used to identify the yarn count in five different places and the pick glass was placed on those selected five different warp and weft directions required for the count, and the average was calculated.



Figure 2.2 Thread count determination

2.1.3 Fabric weight

Fabric weight can be determined by using Grams per square meter. Fabric cutter and weighing machine are the apparatus used. Fabric gsm is checked by GSM cutter. It is mainly used for woven, nonwoven & knitted.



Table 2.3 Fabric weight

2.1.4 Fabric thickness

The fabric thickness tester is used to determine the thickness of the cloth. The purpose of this test was to determine the thickness of the bamboo woven fabric. The cloth is held between two plane parallel plates, with a known arbitrary pressure applied and maintained between them. The distance between the plates is then precisely measured. The fabric thickness tester was used to determine the fabric thickness. Clean paper was used to clean the presser foot and anvil, and weights were put to the presser foot and gauge, which were then set to zero. The thickness was measured five times and the average value was taken.



Figure2.4 Fabric thickness

3. RESULTS AND ANALYSIS

The following data were collected about bamboo woven fabric by evaluation of geometrical characteristics. Which are essential factor for clothing of mobility people in garment designing.

Table 3.1 Geometric properties of bamboo fabric

Geometric properties	
Yarn count	31/32
EPI	. 80
PPI	72
GSM	1.32
Fabric thickness	0.23

The geometrical properties of bamboo woven fabric are an important aspect in the design of garments for mobility individuals. In addition to clothing comfort, style and durability, which involves psychological, sensory, and relief are needed. type of fibre , yarn characteristics, fabric construction, finishing techniques, and clothing situations are all important aspects that influence garment comfort. Bamboo fibre is a regenerated cellulosic fibre derived from bamboo. This study explored the thread count, yarn count, GSM and fabric thickness requirements for clothing of physically handicapped people (cerebral palsy). Bamboo fiber has unique properties that make it perfect for textile production.

4. CONCLUSION

The qualified data were presented that addressed categories of concern to the researcher. The geometrical properties of sustainable bamboo woven fabric findings attested to positive approach toward clothing and a general tolerance toward the need for support by those whose condition made assistance imperative. For those whose physical condition permitted it, independence in dressing was a contributing factor in self adequacy. This study explored the thread count, yarn count, GSM and fabric thickness requirements for clothing of physically handicapped people(cerebral palsy). It validate the physical concerns that were managed by those in a variety of situations, those using support devices of various types, those living alone or with others, those requiring assistance, and those more independent.

5. REFERENCES

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