CHARACTERISTICS OF ATHLETIC APPAREL PRODUCTS

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ABSTRACT

Athletics is a term encompassing the human competitive sports and games requiring physical skill, and the systems of training that prepare athletes for competition performance. Athletic sports or contests are competitions which are primarily based on human, physical competition, demanding the qualities of stamina, fitness and skill. At this stage, the clothing comfort comes to the fore. In this study, primarily the environmental conditions for athletes were examined. The characteristics of athletes’ clothing were investigated by considering fabric properties, harmony of the body, garment pattern, manufacturing techniques and model.

Keywords: Athletics, clothing comfort, athletic garments, athletic garment manufacturing.

1. INTRODUCTION

Over the last few years, the potential sales of casual and sport clothing have been growing all over the world, so the manufacturers and researchers devoted their studies to this field. While fashion is one of the most important factors in selecting daily clothing, the clothing comfort becomes a key parameter for sport clothing.

There are many factors to consider when selecting athletic apparel products. For the best athletic performance, the garments should neither physically restrict the athlete nor psychologically detract from the player's performance due to the concerns about how he/she looks. Aesthetic factors such as school colors, garment style, and uniform size and fit must be considered [1]. Additionally, athletics apparel products should be assisting the body natural ability to regulate temperature when running in a variety of conditions. The products keep runners comfortable, protected, fit and focused on performing at their best.

2. ENVIRONMENTAL ASPECTS OF ATHLETICS

The meteorological conditions play an important role in athletics. In athletics, the environmental aspects vary over a wide range. For instance, the 1982 Farnham marathon was run in rain with an ambient temperature of 12 °C and a wind of 32 kph. The weather for the 1984 Guildford marathon was even worse. It was run on March 25th in a maximum ambient temperature of 7.6 °C, a wind gusting to more than 48 kph and heavy rain in the second half. Hot conditions pose more of a danger to runners. American College of Sports Medicine (1975) recommended that "distance races should not be conducted when the wet bulb temperature exceeds 28°C" [2].

Few field studies have examined the effect of weather conditions on endurance running performance. Although it is generally observed that race performances worsen as weather warms, there are currently no data quantifying the magnitude of performance reduction [3].
3. CLOTHING COMFORT

Comfort is a fundamental and universal need of a human being. However, it is very complex and is very difficult to define. Slater defined comfort as “a pleasant state of physiological, psychological and physical harmony between a human being and the environment” [4, 5].

Although it is difficult to describe comfort positively, discomfort can be easily described in such terms as prickle, itch, hot and cold. According to Hatch (1993), comfort is “freedom from pain and from discomfort as a neutral state”. The discomfort arises from too hot, too cold, and odorous or stale atmosphere. Comfort conditions are those that do not cause unpleasant sensation of temperature, drafts (unwanted local cooling), humidity or other aspects of the environment [5].

The skin is still the best fabric available, with regard to human physiological concerns such as breathability, thermal regulation, movement, fit, agility, sensitivity and grip. For modesty as well as climatic and environmental reasons, clothing has been adopted and modified over the centuries in an attempt to achieve the neutral state of “comfort” [6].

Internal body temperatures of people are constant, even though the environmental temperature has changed. The body profound webbing heat except an inflammatory disease, should be kept constant 37 °C and during the day approximate ±0,6°C changes. A naked person could kept constant the internal body temperature in dry air conditions between 12,5 -55°C. The body internal temperature can be kept constant even -40°C with the clothes which prevent the loss of heat [7].

The clothing comfort of sportswear is an important quality criterion. It affects not only the well-being of the wearer but also their performance and efficiency [8]. Sports apparel, driven by innovation in fibers, fabrics and garment manufacturing techniques, enables the athlete to “feel good” which, in turn, promotes better performance [6].

4. MATERIALS AND FABRICS FOR ATHLETIC APPAREL PRODUCTS

The most important parameter that determines the comfort of a cloth is the material. The type of fiber is the most crucial specification which determines important properties such as strength, durability, handle, elasticity, dyeability, luster, friction properties, moisture absorbance, heat isolation and abrasion resistance; all the physical and chemical properties of fibers and their end-products. Fiber type is the most effective parameter in defining the comfort of the end-product [9].

Polyester is the single most common fiber used for athletic apparel products. Other fibers are polyamide, polypropylene, acrylics and elastanes. Synthetic fibers can either be modified during manufacture, e.g. by producing hollow fibers and fibers with irregular cross-section, or be optimally blended with natural fibers to improve their thermo-physiological and sensory properties [10]. Natural fibers as wool and cotton are not sufficient alone in this active sport. They are often blended with other synthetic fibers or used in outer side of the double layer fabric.
Because of their unique structure, hollow fibers have been used in rather different fields of general textile use and in special-purpose products. Hollow fibers have profitable properties for some applications because of their large surface/volume ratio [11]. The cross-section of this fiber has a tubular form that contains one or more holes and gives the following advantages as over solid fibers:

- more resilience/recovery
- more bulky and fluffy
- higher heat insulation
- better cover
- lighter in weight
- higher absorption of water and perspiration [9].

Hollow polypropylene microfibers are used because of their high breathability, light weight and softness. These fibers are highly elastic and have perfect temperature control and thermal isolation. Their seamless construction ensures superb comfort next to the skin with excellent moisture delivery [9].

The fabric structures and physical properties of fabrics also play an important role for clothing comfort of the garment. In athletics garments, knitted fabrics have wider usage area in comparison with woven fabrics.

Knittings and warp knittings have special properties concerning the flexibility of the textile structure due to their mesh structure. Consequently they are predestined for tight and close-fitting sports textiles as athletic apparel products [12].

5. FEATURES OF ATHLETIC APPAREL PRODUCTS

In today’s textile industry, there are considerably increase in consumers demand on comfort, style and environmentally friendly products. Therefore, the high performance garments for athletic wear are manufactured from both natural and synthetic fibers. In the last decades, it has seen a trend toward fabric that stretches more and more to accommodate moving bodies while maintaining style and comfort.

With the increasing demand of compression garments in athletic wear in the athletics there is a growing need to understand and engineer these garments [13]. Style, reduced chaffing, injury prevention, anecdotal and research-supported evidence of performance enhancement are all reasons cited for wearing these compressive garments [14].

Compression garments made of power stretch materials, or bands of flexible but high modulus materials incorporated into garments, provide support for working muscles, and are reputed to reduce muscle fatigue and provide warmth to the muscles, resulting in more efficient performance (Figure 1). There is evidence that use of these garments can improve the cellular processes that repair structural damage to the skeletal muscle following eccentric exercise [15].
Figure 1. Compression garment for runners.

Doan et al (2003), generated a study to determine how custom-fit compression shorts affect athletic performance. Ten male and 10 female track athletes specializing in sprint or jump events, participated in the study. Testing utilized the compression shorts with loose-fitting gym shorts as the control garment. The garment is custom-fit to be hyper-compressive (15% smaller than the athlete’s measurements) and is made of 75% closed cell neoprene and 25% butyl rubber; the garment is 4.76 mm thick. Although 60m sprint time was not affected, hip flexion angle was reduced. Countermovement vertical jump height increased when the participants were wearing the custom-fit compression garment [16].

Besides, fabrics and films with high modulus and good recovery are also used in modern athletic apparel to interact with the movement of the body in other ways. Braces on knees or elbows can either protect the joint from hyperextension or provide support to a joint whose function has been compromised by a previous injury. These devices provide many amateur and aging athletes as well as Professional athletes with much needed support, without which their activities would be compromised [15].

Additionally, the stitch types are also a substantial factor that affect clothing comfort in athletic apparel products. Although overlocked stitches are flexible, strong and efficient, they give a raised bead inside which can be irritate the user especially in compression garments. Nevertheless flatlock stitch is stronger, smoother and less irritating seam. Because of these features, flatlock stitch is preferred to use on side seams or inside legs.

6. CONCLUSION

Because of the growing niche in the technical sports apparel, the companies enter this field. They analyzed the specialized needs of today’s athletes and develop high performance garments that answering these needs. Nowadays athletic garments not only provide clothing comfort, they also support athletes in their competitions.

In apparel industry, designers must have knowledge of textile properties and constructions in tandem with a basic understanding of human physiology and issues to do with survival [6]. Consequently, evaluating materials and fabrics carefully, preparing garment patterns accurately and determining stitch types appropriately are the key factors to provide and improve comfort performance of athletic apparel products.
REFERENCES


