



REVIEW ON SPORTS TEXTILES

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ABSTARCT

In recent days the sports textiles becomes very essential .the manifold textile raw materials production not only focused on innovation of new fibres and also with the production development of yarn and fabric production. The critical factors which affect the sports fabrics are moisture management, thermal behaviour. So this the review of the literature has focused on reviewing the work done on characteristics and application of the sportswear, fabrics used for sports textiles. In modern sportswear high function and comfort are needy. Light weight and safety characteristics are basically preferred. In sports activities high level functionality have proven quality of smart textiles. Today sports wears can sense high impact stresses on player joints and also heart rate, temperature and other physiological data during performance activities. There are three broad categories. Knitted, woven and non-woven are the types of fabric which are used in sports textile.

KEY WORDS: *sports textiles, characteristics, application, categories, fabrics used, and high performance sportswear.*

1. INTRODUCTION

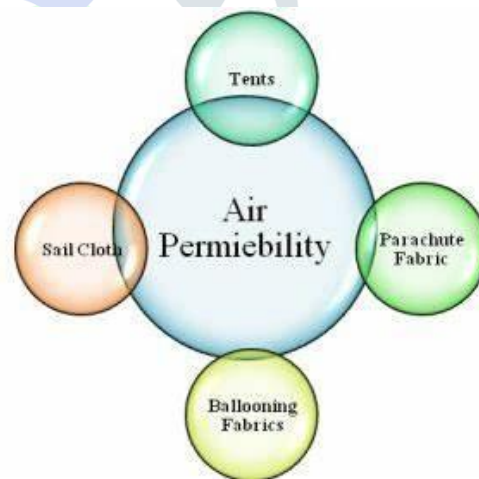
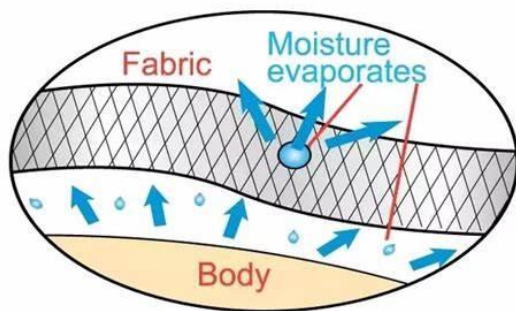
An important book that covers key trends in design and materials, the use of novel and smart fabrics and a range of specific applications is "Textile for Sportswear". Surveying the principles of textile applications in sport, including design, materials and production technology is where the book begins with. From intelligent materials to wearable technology are examined by the uses of smart textiles in sportswear. Comfort in sportswear, sportswear for protection and recent advances in sportswear technology that are currently being applied to particular sports are examined in the final sections of the text. The principles of textile applications in sport, including design, materials and production technology are reviewed. The uses of smart textiles in sportswear are examined. How recent advances in sportswear technology are being applied to particular sports are discussed. ^[1]

2. CHARACTERISTIC OF SPORTSWEAR

Optimum Heat And Moisture Regulation, Wick ability, Good Air Permeability, Durability, Dimensional Stability, Easy To Maintain And Light Weight, Soft and Pleasant Feel and Produce Cooling Effect. [2]

VARIOUS SPORTS	FUNCTIONAL REQUIREMENTS
Tennis shirts, golf, volleyball, football, rugby, baseball uniform, tracksuits	Sweat absorbing, fast drying, cooling
Skiwear, wind breakers, rain wear	Moisture vapour permeability, water proofing
Skiwear, wind breakers, track suits	Sunlight absorbing, low fluid resistance and thermal retention
Swimwear, skating dress, ski jump, downhill skiing suits, cycling dress	Low fluid resistance for water and air
Swimwear, leotards, skating dress	Opacity, stretchability
Snowboard wear, baseball uniform, football uniform	High tenacity, resistance to abrasion, stretchability

[3]



3. APPLICATION OF TEXTILES IN SPORTS

The Production of materials which are stronger, breathable, waterproof, eco-friendly and highly economical are promoted by Technical textiles. One of the main stream of technical textiles is Sport tech, which includes sportswear. Sport tech is rapidly increasing due to the increased leisure time, increased considerations of well-being, growth of indoor and outdoor sport facilities and the increasing pursuit of the adult population of activities in and out home & workplace. The revolution of textiles and leisure industry in sports is called as sports textiles. Certain sports requires high performance in the apparel. The recent development in sportswear fabrics are made to achieve high comfort and functions. In order to develop an active sportswear, certain factors like polymer science, production techniques, fibre science, lamination and

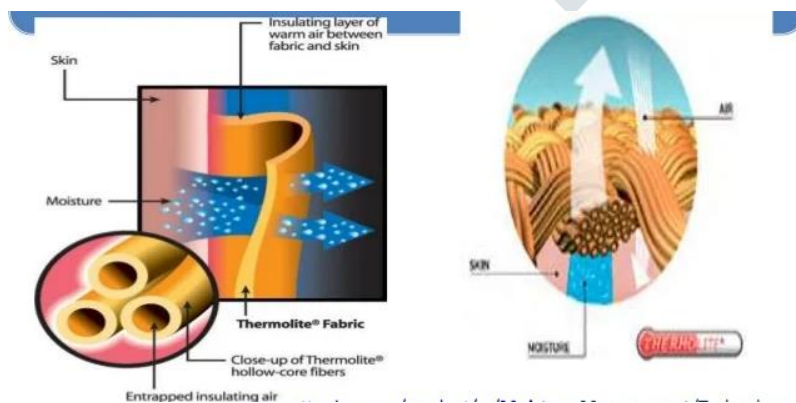
finishing techniques are taken in account to obtain a sophisticated fibre , yarns and fabrics.^[4] Sport tech comprises of technical textiles used in sports is divided into three categories such as sportswear, sports goods and sports accessories. Sportswear are aerobic clothing, athletic clothing, football clothing, cricket clothing, shorts, jackets, shirts, sweat shirts, swimming dresses, tennis wear, gloves and socks. Important characteristics for improving performance in sportswear such as athletic wear, sports shirts, sports jerseys and sports shoes are related to properties such as comfort, moisture management, elasticity and anti-bacterial property. Sports goods are football, rugby ball, volleyball, hockey sticks etc. Sports accessories are turfs, nets, rings etc. ^[5]

4. FABRICS USED IN SPORTS WEAR

The development of new products is important in sports textiles to have a continuous functional work. Under low loading conditions, the knitted fabric acquires high extensibility in order to fit, without any discomfort while pulled. This is the main reason, why knitted fabrics are preferred compared to other fabrics. Also the accessories and sports garments manufactured from the knitted fabrics have high functional properties compared to other fabrics. ^[6]

5. BASE FABRIC

In sportswear, the important factor for the comfort of a sportsperson is the base layer (i.e.), the layer worn next to the skin. In base layer, the moisture is maintained through the rapid drying of liquid moisture away from the skin. Compared to the slack fit, the tight fit garments provides more comfort. The characteristics that are taken into account for an inner fabric layers are good thermal conductivity, moisture management and tactile properties. These characteristics improve the cooling efficiency and provide necessary comfort to the wearer. B.C.Roberts et al. in 2007 studied the thermoregulatory response of base layer in the human body with hot and cold garments and found that synthetic base layer garments has more effectiveness compared to cotton base layer. This is because the synthetic base layer reduces moisture retention and maintain desired skin temperature. It is important that the temperature of body must be controlled, which implies that the heat produced must be dissipated through base layers of the fabric. Depending on the kind of sports activities, the perspiration of human body changes from half to one hour.



Blending of wool with polyester fibre and bamboo fibre gives improved moisture management properties. The increase in liquid moisture absorption rate from 20% to 35% increases the blend ratio to 50/50. ^[7]

6. COMFORT ASPECTS OF SPORTS WEAR

An important criterion for a sports wear is the Thermo physiological comfort. The factors that are taken into account are heat transmission, relative water vapour permeability to access moisture vapour transmission, air permeability to determine air passage, sweat response, specific flow rates and drying time. These factors are measured by thermal resistance, water absorption and by some other techniques. The comfort of the sportswear has also been affected by the cross sectional shape of filaments and structural parameter of fabrics. [8]

7. CATEGORIES OF SPORTS WEAR

- Basic Sportswear
- Performance Sports Wear
- Sports Leisurewear
- High Active Sports Wear [2]

8. HIGH PERFORMANCE SPORTS WEAR

The global textile industry is heavily impacted by the growth in active wear and sportswear. Sportswear is worn as an everyday fashion item and the market range is from specialist apparel for individual sports to sportswear. Only 25% of sportswear is worn for active sports or for exercise. High levels of comfort and ease of care is demanded by the customers as the user's performance is significantly enhanced by maintaining thermo-physiological comfort which can be achieved by the design of clothes that maintains body temperature and moisture output. Specially designed textile products and materials is increasingly important. In the recent years, the clothing market has seen the introduction and development of various new fibres, yarns, constructions and coatings specially designed for the sport and functional textile market. Different polymers which help to produce microfibers offer new innovative methods for new functional textiles and also to incorporate the finishing of fibres. Anti-microbial behaviour, drug delivery systems or temperature-storing capability are few examples that help in opening new markets. A Number of properties is required for special high-performance fibres used in sports textiles and many other applications to fulfil the demands of the sport and as the applications are different, the combination of properties are different too.^[9]

9. CONCLUSION

Due to its application, the sports textile become very popular, the increasing interest and leisure activity, need for sport fabric is also increased. The global market range of sportswear change due to the type of end users.

The Important application of Textiles is sports and leisure. Increase in the interest and participation of sports and leisure activities increases the consumption of textiles. Nowadays most of the fibres, yarns, fabrics and finishes are developed to satisfy the sports sector. Depending on the type of end uses, there is a change in the Global market volume of sportswear. The apparel used by the athlete must be of high withstanding capacity and stress. In sports apparel field, special apparel product gain more importance because of their

specific function in their field of sports. The factors to be considered while designing a sports wears are comfort, protection, safety to wearers, promote the performance of athletes and high fashion ability. Nowadays many brands manufactures sportswear and have a intense competition in pursuit of functions. The scope and significance in this field is in need to enforce new development, withstand global competitions and adopt the technological parameters. ^[10]

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