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# Quality characterisation of apparel

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# Quality characterisation of apparel

The book is based on quality of various types of apparels, which are export-oriented. Characterisation of performance, durability, and colour fastness is covered along with mandatory regulations on flammability, fibre composition and care labels. Safety aspects of children's apparel are very important and have been covered extensively in this book with different case studies on product review.

The unique feature of this book is that the topics are oriented on actual practical way in which manufacturing units, buying agent and retailers are facing challenges on day-to-day basis in their business. This book is very rare on its topic selection and reflects the practical working knowledge of the author.

To understand the quality-related issues in apparel and to solve the problem of failures in performance of a garment, this book would be of great use. This will help the apparel industry people to cut down quality-related rejections and also would be of an immense use for the freshers in the industry for good informative exposures.

This book will be useful for textile/garment manufacturers, buying offices, retailers and the educational cluster of garment/fashion.

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This book arose out of a need, when interacting with the apparel fecundity at different parts of the world, for a comprehensive guideline on the quality of various merchandise products to which different stakeholders could be referred. The approach to the subject and the topics covered are those, which have been developed over the years on the global platform in apparel sectors by retailers and regulatory bodies. The apparel industry has had a long history of producing different merchandise products in accordance with the necessity of various classes of consumers and the nature of their utilisation. Due to this various quality parameters have been evaluated and benchmarked by following international standard norms to match the performance requirements of different apparel products. This book is then a distillation of these collective efforts and hopefully a concise document of wisdom inculcated over the years in the evaluation of quality of apparel.

The book is aimed at textile and apparel industry professionals, retailers, factory heads, buying offices and students intending to join the industry in the areas of quality assurance. In order to produce and deliver better quality products to the customer adherence to the appropriate specification, standard, law and regulation applicable for the merchandise is important. Thus, the emphasis throughout the book is on standard and mandatory regulatory test methods. Many of the apparel merchandise benchmarked are intended to evaluate the same property but specification and regulation may vary because of their different export destinations. It is worthwhile to mention that when referring to any tests and regulations to consult an up-to-date version of the relevant document. This is because the actual standard contains the detailed information, which is not possible to cover in a book of this nature, and furthermore international standards and regulations are constantly being revised and updated due to the change of performance expectations and better consumer protection.

Safety of children's apparel has been given more importance in quality during recent years by the apparel retailers in the globe but is the least

discussed subject available in the published literature. The commitment towards this important aspect of quality is expected from the apparel manufacturers to supply and meet the requirement of global retailers. Failure to focus on the necessary safety issues results in product recall. Thus, the book covers about the use of different accessories, which can be attached in children's apparel with the associated safety review product evaluation and, regulatory approaches.

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**Abstract:** Global business in apparel sector is dependent on quality characterisation because major buyers want to ensure about the quality of the merchandise prior to the delivery to the consumers. The first chapter discusses the importance of product quality, which is dependent on fibre and fabric type, weight, style, finish, accessories used, country of export and above all the intended end use. The chapter then discusses about the essential elements, which are to be addressed as per international standard norms and the role of regulatory and specialty tests to build customer confidence, and to enhance profitability.

**Keywords:** Quality, testing protocol, drycleaning, performance, safety

## 1.1 Importance of quality characterisation

In the apparel sector quality control is practiced right from the initial stage of sourcing raw materials to the stage of finished garment. Product quality is assured in terms of fibres, yarns, fabric construction, colour fastness, durability, surface designs, garment construction and the final finished item. However, quality expectations for export are related to the type of customer segments and the retail outlets. In today's competitive business of apparel export, characterisation of quality is an important and indispensable aspect. Global standards in apparel are technology driven, benchmarked by the major buyers and ultimately product oriented<sup>1</sup>. Tolerances in the degree of product proficiency can not be ignored since too slack standards may allow excessively inferior merchandise to pass through, whilst, standards that are too rigid and may result in acceptable merchandise being unnecessarily rejected. Thus, quality evaluation of garments as per international standard norms is essential for export. This is not only to ensure a quality product but also to endorse the product safety, prevent recalls, reduce returns, minimise customer complaints and promote repeat sales. It is well known that testing protocols are the summaries of applicable requirements, which cover all facets of

performance, evaluating safety and quality as well as labelled claims. Due to ever increasing fashion trend, different fibre, construction, style, colour and finish dominate the apparel world to cater to the requirements of various categories of customers. But, unfortunately, no single universal characterisation protocol is available in the garment trade to cover the entire product range. Testing protocol changes depending on the fibre and fabric type, weight, style, finish, accessories used, country of export and above all the intended end use of the product. It is also vital to bear in mind that all standards and regulations encapsulated in the protocol have one or both of the following aims: safety and quality. While quality is related more toward general consumer satisfaction, safety is an important concern as products not meeting regulations can jeopardize the health of the purchaser. Thus, characterisation of apparels that are earmarked for export is essential to satisfy both the regulation and performance requirement. Any deviation in production with respect to product specification and quality as per the required minimum performance standard goes against the interest of consumers; the ultimate end users whose expectation are always been regarded as vital in commercial decision-making process of an apparel retailer. Due to above consequences, the brand image gets affected owing to poor presentation and performance of an apparel product under question.

## **1.2 Current scenario**

Apparel trade in post quota regime has transformed the business world to a global village. The old concept derived from four P(s) – product, price, place and promotion has been replaced with a new pattern, the four C(s) – consumer, cost, convenience and communication<sup>2</sup>. Undoubtedly, there is more competition on a level playing field since dependence on quota-profile is no more be an advantage of any country. To survive in this network, there is a paradigm shift toward attitude in working out strategies in the garment arena. Assurance of international standards, product innovation and adaptability to changing tastes of consumers are some of the areas of current interest. To win over apparel consumers, manufacturers, brands and retailers are struggling hard to identify ‘product value’. Undoubtedly, fashion sells, but only to a certain level, beyond which many consumers are searching values in apparel. Traditionally, ‘value’ has been defined as a function of price and quality<sup>3</sup>. There is a section of this niche market that is price conscious, but largely this section is also driven by brand awareness syndrome and would not mind to spend more to buy branded apparel of premium quality. Thus, today’s consumers are redefining value to include reliability of the

product performance – they are asking whether product is assured in actual use or not.

- Does the garment shrink?
- Will it loose colour?
- What about its durability?
- Will the garment torque?
- Are there any harmful substances in the garment?

These are some of the inevitable questions that need to be addressed in the real life situation on garment performance toward actual end use.

### **1.3 Essential elements of quality characterisation**

Aesthetics in apparel are not desired to be sacrificed for durability and performance. But reverse is the case in various practical situations. Thus, when consumers buy apparels they suspect about the quality and expect some change in shape and colour after refurbishing. But the degree, to which this happens, entails the difference between satisfaction and disappointment. Prediction of such performance is only possible through comprehensive quality evaluation. Inherent properties of apparel are important to the consumer according to the application area. They may be highly specialised in nature, or otherwise normal and purely basic. But there is a core series of tests that are applicable to evaluate the product depending on the end use. There exist internationally recognised standards applicable in Europe and United States and broadly denoted as ISO, BS, EN, BS EN, DIN, ASTM, and AATCC. In addition, many other countries such as India, Australia, Japan, France and Canada regulate the quality evaluation through the standards. Even, some of the very reputed retailers around the world have their own standards and test methods, e.g. Marks & Spencer, J.C. Penny, etc. Methodology and equipment may or may not vary but basic objectives remain the same, i.e. appropriate checking of quality to predict the performance of the merchandise and by which one can determine the acceptance of the product or otherwise with reference to the expected minimum tolerance level.

#### **1.3.1 Dimensional properties**

A common concern in apparel performance characterisation is the dimensional stability. Accelerated test methods<sup>4-5</sup> are applied to wash and dry at the recommended conditions, and careful measurement of any changes in dimensions determines the product ability to withstand the 'care label' recommendations. Side seam twisting or garment torque<sup>6</sup> for knitted goods is the most common problem, which can be quantified by appropriate

test method. Controversy arises while marking and taking measurement. Proper understanding of the test method, appropriate application and right interpretation of the test result are important to assure the desired characterisation.

### 1.3.2 Colour fastness properties

Apparel products fade due to various actions. It can be a particular problem with lower cost materials and processes, where insufficient care has been taken during dyeing, or sometimes because of the limitations of technology. In general, the tests measure the degree to which the colour changes when treated in a way that simulates the conditions of use such as washing<sup>7</sup>, drycleaning<sup>8</sup>, water<sup>9</sup>, perspiration<sup>10</sup>, rubbing<sup>11</sup>, chlorine and non-chlorine bleach<sup>12</sup>, chlorinated water<sup>13</sup>, light<sup>14</sup>, gas fume fading<sup>15</sup>, ozone fading<sup>16</sup> and print durability. Many tests also measure the degree of colour transfer on uncoloured fibres in the same environment. Keeping in view of the application of various linings and varieties of different fibre panel in the same apparel, the use of fibre types as per standard, namely acetate, cotton, nylon, polyester, acrylic and wool, is an essential part in certain tests to judge staining behaviours. Selection of an appropriate testing standard and adherence to its methodology are of paramount importance in arriving at a conclusion of the suitability of apparel intended for a specified end use. Conditions required for testing fashion apparel fading when exposed to light are being different with respect to testing the fading of upholstery in a car interior. These different end uses need to be accounted for during quality evaluation, even though the fading of either product under their normal conditions of use will cause a problem.

### 1.3.3 Durability and surface appearance

Durability of a garment is another important criterion to predict its permanence in use. Consumer often enquires this fact before final selection of the apparel product. It is basically the power of a garment to resist stress or force. Test procedure typically subjects the material to stress of some kind and measures the amount of force at which it fails. Most common tests measure tensile<sup>17</sup>, tear<sup>18</sup> and bursting strength<sup>19</sup>. Deterioration of surface appearance due to abrasion and pilling are other areas wherein customer dissatisfaction is quite common. This can not be ignored since often garments develop unsightly ball of fibre, which are noticed to the surface of the fabric. Sometimes those are of a slightly different colour from the main fabric and can ruin the wearability of the

article. Pilling tests<sup>20</sup> provide the valuable guidance of the pilling performance of fabrics.

## **1.4 Role of regulatory and specialty tests in quality characterisation**

Customers of 21st century are also safety and health conscious. Thus, it is well accepted that they will not mind to pay extra for this cause to have an additional protection. Specialised quality characterisation in apparel includes flammability, fibre composition, restricted harmful substances and performance tests such as water and oil repellence, stain resistance, bacterial resistance, or breathability, yellowing in storage, etc. Out of these, fibre composition test is more of a protective regulation against dishonesty. Consumer paying a high price for a silk garment would be most unhappy to discover that it was made of polyester. Protection of the consumer interest surely supplements by determining the fibre composition as per international standard methods of testing. The fibre content label required by Federal law in US to be permanently attached in each garment must indicate the percentage of each fibre present in the garment. Regulatory consumer product testing of flammability and restricted substances in adult and children apparel are important from the point of view of safety and health. If risk involved in wearing of a garment is known beforehand by flammability performance testing or clothing and analysed qualitatively and quantitatively for potentially harmful substances such as formaldehyde, harmful azo dyes or carcinogenic and allergenic dyes, heavy metal content, phthalates, PCP or TeCP and organotin compounds, it definitely protects the interest of consumers from different segments. Testing for harmful substances plays a significant role in the considerations made when buying textiles. This is demonstrated by the results of a trend analysis survey commissioned by the German OEKOTEX® Certification Centre and carried out by the consulting firm BBE Retail Experts in the Netherlands, Austria, Switzerland, Portugal, Italy, France and Spain<sup>21</sup>. In opinions of the specialist retailers surveyed, product quality, social aspects, skin compatibility and testing for harmful substances were the most important parameters for customers when buying textiles and were regarded correspondingly by the retailers in their ordering behaviour. On a scale from 1 to 5, with 1 = unimportant to 5 = very important, these factors constantly received ratings ranging between 4.2 and 4.6. When asked about the significance of testing for harmful substances, the rating of 4.2 from Germany was consistent with the average of the ratings of the seven other European countries surveyed.

## 1.5 Customer satisfaction related to quality

In the apparel sector, it is well perceived that quality is a multi-dimensional aspect. There are many areas of quality, based on which the garment exporters are supposed to work. Quality of the production, quality of the design of the garment, quality of purchase, quality of final inspection, quality of the sales, quality of marketing of the final product are some of the important measures. But quality of the final product is ultimately integrated to customer satisfaction. Quality increases the value of a product or service, establishes brand name, and builds up reputation for the garment exporter, which in turn results to build consumer confidence, high sales and foreign exchange for the country<sup>22</sup>. It is worthwhile to mention that the responsibility of production of appropriate quality garment and right characterisation as per international standard norms lies with different agencies such as retailer, buying agent, vendor and consumer testing service laboratory associated with garment business.

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