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A View on Recent Finishes in Textiles

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Abstract: Finishing is the heart of textile processing. Finishing of textile fabric is carried out to increase attractiveness and serviceability of the fabric. Different finishing treatments are available to get various effects, which add value to the basic textile material. Processing is important to make it usable but finishing gives value addition and makes the garment attractive and comfortable. Finishing can incorporate desirable properties too. Fabric finishes are wet or dry treatments that complete a textile.
Keywords: Finishing, Textile material, Processing, Properties, Comfortable

I. INTRODUCTION

Finishing is the last stage of fabric processing. It covers a wide range of processes which make an unattractive, 'greige' fabric turn into an attractive one. It is possible to carry out finishing at different stages of textile production. Thus, a fiber, yarn, fabric or garment can be subjected to the finishing process, though most efficient results are obtained at the fabric stage.

Today's consumers demand clothes and other textile products which look good, are comfortable, stay clean, keep fresh, smell nice and have simple care instructions. This might have seemed an impossible task for the manufacturers the decade ago but is a reality today. Chemical manufacturers world over continues to update their product lines with textile chemicals that are more efficient environment friendly and economical. However, the search for new fabric finishes continues with an ever-increasing emphasis on multifunctional processing additives.[1]

II. TYPES OF FINISHING

A. Bio Polishing

It defines biopolishing as a finishing process for cellulosic fabrics and garments. Biopolishing improves clrapahilitv and softness, resistance to pilling.[2]

It stated that the surface modification of cellulosic fabrics to improve their cleaner surface conferring cooler feel, brightner luminosit'v of colours, softer feel and more resistance to pilling using cellulases is often knon as bio-polishing. This treatment can be applied to knit and woven cellulosic fabrics such as cotton, viscose and linen and their blends. The elimination of superficial microfibre of the cotton fibre through the action of cellulase enzymes is obtained by the controlled hydrolysis of cellulose leaving the surface of the fibres free and conferring a more even look.[3]

It is observed that enzymes degrade naturally and replaces harsh chemicals in the process, due to high catalytic power less quality is required, process is easy to control and terminate multiple post-washes can be avoided, permanent nature of the finish even after laundering, durable improvement in handle and feel. [4]

The emphasizes that It is becoming a common practice in Europe to apply Bio-Polish to that which either eliminate the surface damage, or atleast reduces it. Furthermore, biopolishing is at its most effective when applied at the very last stage.[5]

B. Silicone Finishing

Silicone finish opines that the growth of si I 1corics larticularly in textiles has been enormous over the last few decades as it imparts particular hand along with flexibility, drapability. compressibility and elastic recovery to the textile fabrics. Softening and water repellency are almost synonymous with silicone finishing in textiles. Softening of textiles heconies an important finishing process of many after treatment processes in a textile chemical processing industry. The hand of a fabric is a subjective sensation felt by the skin when a textile fabric is touched with the finger tips and gently compressed. The perceived softness of a tetile is the combination of several measurable ph) sical phenomena such as elasticity, compressibility and smoothness.

Almost all the natural fibres. by providence arrangement, have some percentage of wax which makes the fibre naturally soft. The classical example is cotton, the most widely used fibre. However, the presence of wax, both on the surface and on the bulk of a fibre, makes it resistant for wetting. unfortunately the lack of water absorbency makes the fibres unsuitable for dyeing and printing which are the primary objectives of a textile processing unit.

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Therefore, in order to make the fibre suitable for dyeing, various preparatory processes such as desizing, scouring, bleaching, etc. are carried out, which actually remove the natural softening agents to make the fibres more absorbent. Therefore, generally after dyeing and printing, the fabrics become harsh and stiff. Finishing with softeners can overcome this deficiency and even improve on the original suppleness. Ftc softening treatments impart soft handle smoothness and enhance flexibility, drape and pliability. Other properties improved by softners include the feeling of added fullness, antistatic properties and sewability.

With chemical softeners, textiles can achieve an agreeable, soft hand and some smoothness. Silicone based softeners impart excellent soft hand combined with various other properties such as water repellency, superior smoothness. - greasy feel, excellent body, improved crease resistance. etc.

It quotes that cotton fibres undergo various mechanical, chemical processes starting from its spinning, sizing, desizing, mercerizing, dyeing, etc. on the way to become a fabric / garment. Cotton loses its nature and becomes harsh to touch or feel as the chemicals are sometimes strong alkali or strongly reacting with cotton molecules. Thus, it becomes necessary to add reasonable long lasting feel or smoothness to the fabric. Silicone serves the exact purpose here, it meets all the requirements as a finishing chemical with excellent durability, softness and its molecular versatility helps processors to meet different tastes of customer by providing smooth, buttery, silky, limpy. wet. leathery, etc., finishes.[6]

It opines that a flowing soft handle promising a high wearing comfort is often the decisive criterion for the purchase of textiles, and therefore it is the determining actor for the marketability of clothing textiles. It goes without saying that textiles need a handle correction with softening substances in the initial finishing after processes likes bleaching, dyeing and curing and also adds that finishing carried out on silicone basis, outlives many household washings so that such textiles can be enjoyed for a long time.[7]

C. Elastomeric Finishing

It is of the opinion that elastomeric finishes are also referred to as stretch or elastic finishes and are particularly important for knitwear. These finishes are currently achieved only with silicone-based products. The main effect is durable elasticity, because not only must extensibility to enhanced, but recovery from deformation is of crucial importance. Atler all stresses and disturbing forces have been released, the fabric should return to its original shape.[8]

Elastomeric finishes are preferred when a lesser degree of elasticity, combined with other useful performances is desired. The individual fibres of an elastomeric fabric must be completely covered with a thin film of an elastic material without any fibre-to-fibre bonding. The film causes a high degree of recovery from deformation owing to its particular structure of widely spaced cross links. The fabric shade after treatment with elastomeric finishes may be significantly altered from the original shade, therefore, good communications between the dyeing and functioning departments are necessary.

D. Mosquito Repellent Finish

Mosquito repellent finish protects human beings from mosquito bites, thereby promising safety from mosquito-borne diseases. Malaria, dengue fever (DF), Nile fever, dengue hemorrhagic fever (DHF), chicken gunia and filariasis, are serious public health problems in tropical regions, especially in Africa and Asia. These diseases are transmitted to human beings only through mosquito bites. Since there is no effective vaccine available for the control of these diseases, prevention of mosquito bites is one of the main strategies to control or minimize incidence of these diseases [9]. This repellence of plant material has been exploited for thousands of years by man, most simply by hanging bruised plants in houses, a practice that is still in wide use throughout the developing countries.[10]. “Natural” smelling repellents are preferred because plants are perceived as a safe and trusted means of mosquito bite prevention[11].

Ultra Violet (UV) finish “People who are winning mile after mile on the wheel focus on keeping the body fit. As soon as the sun shines, bikers are on the street or in the mountains. Cyclists are performance oriented and sit in the saddle for hours-even in bright sunshine. Being in sun has many positive attributes, with, unfortunately, some negative effects like heat, as well as the need to protect against the ever more aggressive UV rays”. UV radiation can lead to acute and chronic reactions and damage such as acceleration of skin ageing,[12]. The prevention of UV radiation damage has become more and more important in recent years because UV radiation has detrimental effects on human skin. Therefore, an adequate level of sun protection is necessary for the protection of human skin. In an effort to reduce UV radiation exposure, individual are encouraged to use sunscreens, sunglasses and UV protective clothing, [13]. Growing awareness of health and hygiene has increased the demand for textiles having ultraviolet radiation protection. The key environmental factor of skin cancer is the cumulative ultraviolet radiation exposure of an individual. Retention of ultraviolet radiation into the top layer of the skin leads to roughening, blotches, wrinkles, squamous cells and basal cell cancer. Persons working in the open atmosphere are prone to keratose, the precursor of skin cancer.

Because of the ever-increasing incidence of skin cancer, clothing is an important means of reducing exposure to ultraviolet inhibitors that absorb energy in this region. These finishes are also referred to as sun protection and UV blockers. Many dyes and fluorescent whitening agents absorb ultraviolet energy. Fabrics with these finishes or modifications may be promoted with a sun-protective factor (SPF), [14]. Clothing is generally relied upon as a source of ultraviolet protection factor (UPF) of a fabric, which is a quantitative measurement of the effectiveness of the fabric to protect the human skin against ultraviolet radiation. This can significantly vary depending on the manufacturing parameters of the fabrics: fiber type, structural characteristics of the fabric (weave construction, yarn number, thread count, cover factor) colour and dyeing intensity and the presence of optical brightening agents and pigments. Some textiles provide only limited UV protection. Therefore, the development of UV protection finishing agents is increasingly becoming the focus of functional textile finishes. UV protection agents formulated for fabrics are roughly classified as either organic or inorganic. Inorganic UV protection agents achieve the UV blocking through the scattering and reflection of UV radiation,[15]. The important function performed by garments is to protect the wearer from harmful rays of sun. The rays in the wavelength region of 150 to 400 nm are known as ultraviolet radiations. This wavelength is further divided in UVC (100-280 nm), UVB (280-315 nm) and UVA (315-400nm). The most important UV source is the sun and therefore almost every living organism is exposed to UV radiations. UVC radiations are absorbed by the ozone layer and do not reach the surface of the earth. Several type of UV stabilizers are available, the most common being benzophenones and phenylbenzotriazoles. These molecules are able to absorb the damaging UV rays of sunlight, [16]. Apart from drastically reducing exposure to the sun, the most frequently recommended form of UV protection is the use of sunscreen, hat, and proper selection of clothing. Because fabric is composed of fibers that can absorb, reflect or scatter radiant energy, it has the ability to absorb block most of the incident radiant energy and prevent it from reaching the skin. However, a fabric's ability to block UVR is dependent on several parameters. Principal parameters include fiber chemistry, fabric construction, particularly porosity , thickness, weight, moisture content and wet processing. The history of the fabric such as dye concentration, fluorescent whitening agents, UV absorbers and other finishing chemicals that may have been applied to the textile material, [17].

E. Fragrance finish

Fragrance finish The human sense of smell registers not only the quality of different odour but also combines it automatically and often unconsciously with feelings ranging from agreeable to unpleasant. Therefore they attract, adsorb and store various gaseous or volatile substances from their surroundings. This high adsorption capacity can become a problem with unpleasant smelling substances under desorption conditions. Desorption is accelerated by temperature, time and the possibility of gaseous exchange. Because unpleasant odours have a negative impact on textiles and their comfort properties, there is a need for anti-odour finishing, [18]. Odour control is a hot topic in the apparel and hosiery arenas. Odour can be controlled by applying an antimicrobial finish, removing the odour molecules as they are formed or covering up the odour with a fragrance,[19]. The addition of fragrance to textiles has been carried out for many years in the form of fabric conditioners in the wash and during tumble drying all are designed to lend a fresh aroma to the textile. However, no matter the quality of the technology 26 used to impart the fragrance, the effect is relatively short lived. Numerous attempts have been made at adding fragrance directly to fiber and fabrics but all fail to survive one or two wash cycles,[20]. Microencapsulated peppermint could be used for active sportswear, it also claimed to have muscle easing properties, another advantage for active sportswear end uses, [21]. Novel odour adsorption finishes have been initially promoted in active and sports apparel applications,[22].

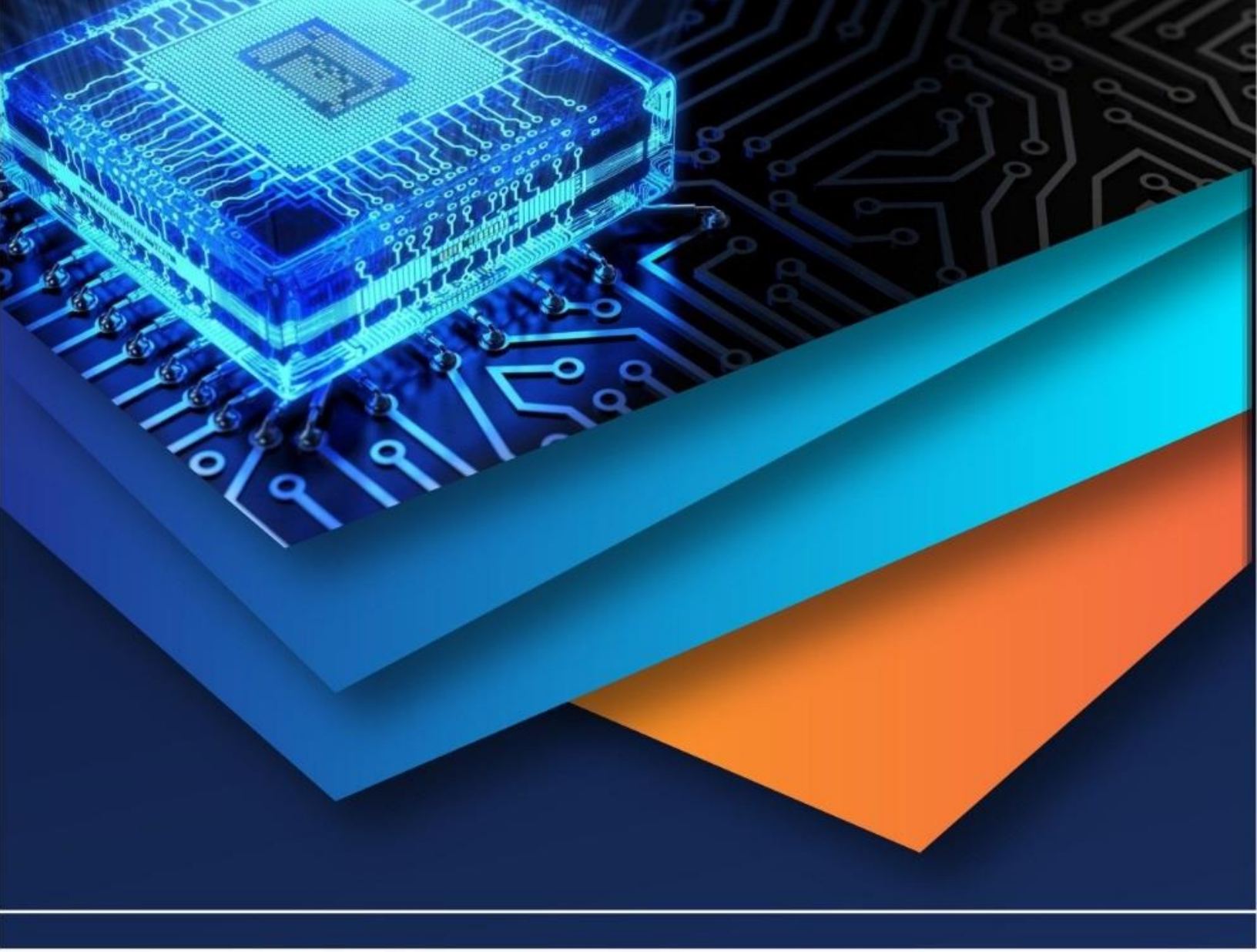
III. CONCLUSION

From the above description, we get to know that, there are many advancements going on in applications of functional textile finishing. By application of functional finishes desirable properties can be imparted to fabric and it also gives value addition. In the field of functional finishes many innovative ideas are being explored. In next decade new concepts may be introduce for imparting desirable properties to fabric and garments.

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