

# TEXTILE MATERIALS WITH NEW PROPERTIES USED IN CLOTHING MANUFACTURING

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**Abstract:** *The quality of textile clothing depends on the quality of prime materials and also on the technology used; this must ensure a balance between transferred heat, resulted humidity and human and environmental thermal demands, all this bringing about physiological comfort. In order to meet consumers' demands regarding the production of products which are easy to maintain and have high hygiene properties, new prime materials are searched, with a view to ensuring a wide range of clothing. Taking into consideration the acceleration of changes and the global inter-connections, a company must develop its capacity of innovation in order to bring products with new properties on the market before others do.*

**Key words:** *clothing, quality, consumer's protection.*

## 1. Introduction

In the present context of a wider Europe, an increasingly biting competition is noticeable on the market, also in the textile domain. In order to handle the growing competition, the major problem of the producers' business strategy in this domain is represented by products quality, determined by the design, the development of research activity referring to new prime materials, the use of modern technologies of production and distribution, the consideration of directives and regulations that are under elaboration, the environmental protection, ecological requirements imposed to textile products on European market etc. Clothing is one of the most important things for people, representing a protective layer against multiple external factors which can affect the human body such as ultra violets, cold,

rain etc., and also a social factor, reflecting a certain character of the people wearing it.

## 2. The Aim and Role of Textile Clothing

Textile clothing comprises products obtained as a result of the superior processing of textile and has the role of protecting the human body from the surrounding environment disturbance factors, influencing, at the same time, the individual and the collective behavior. In some cases, clothing also has the role of signaling the public function (uniforms), or even the position of a person. It is also remarkable the fact that clothing has the role to amplify and point out or create the illusion of different body properties (with its help, the silhouette can be endlessly recomposed). Thereby, through the fabric quality, the chromatic and decoration of each piece of clothing, through the ratio body / clothing and its accessories, the

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same person will have different looks in different situations.

Textile clothing is characterized by a high level of processing, requiring a big number of operations. Therefore, the production growth rhythm and the clothing sales are bigger than in the case of other categories of textile products. This group of merchandise is part of the semi-durable merchandise category, whose moral erosion, caused by the action of the fashion factor, is much bigger than in the case of mechanical-physical or chemical factors.

The quality of textile clothing depends on prime materials quality and also on the technology used; this must ensure a balance between transferred heat, resulted humidity and human and environmental thermal demands, this meaning the capacity to achieve physiological comfort.

### 3. Obtaining Textile Materials with New and Special Characteristics

In order to meet consumers' demands regarding the production of products which are easy to maintain and have high hygiene properties, new prime materials are being searched *with a view to ensuring a wide range of clothing.*

***Agro-textiles functional for environment protection.*** In Germany, according to a research program, biodegradable agro-textiles were made available, which can ensure environmental protection, meaning the diminution of the problems triggered to forests and plants by pollution with heavy metals, soil acidity, the lack of moisture and nutritive substances. Flax and hemp biodegradable cellulose fiber layers were used and mineral, nutritive and active substances were introduced in between layers, which were consolidated with biodegradable binders or by sewing.

***Materials made out of polylactide polymer chemical fibers.*** The English company Cargil Dow Polymers obtained polylactide polymers from cereals using the Nature Works procedure, which allows textile fibers to be obtained. These fibers

can be used 100% or mixed with wool, silk and cotton for obtaining clothing, furniture clothing, soil coverings, technical articles and so on. Their quality performance and low cost can predict their use for sport clothing.

***Bio-textiles*** are biologically active fiber materials obtained by using bioactive agents in the production process, through imprinting or chemical modification of the textile material, followed by the insertion of bioactive agents. Bio-textiles are named and classified according to the inserted substances and their usage, for example: anesthetics, antibacterial, anticancer, haemostatic etc. These textile materials are used for special medical clothing and in the medical field, with the role of protecting health. In their usage, the duration and speed of delivering the drug can be controlled and toxicity is minor as compared to standard methods of exposure to medicament action.

***Super-absorbent fibers*** or SAP are polymers containing reticulated acid joints (usually acrylic acid) under the form of sodium salt which can absorb water like fluids and can retain them under a certain pressure. Their usage is extended also on the sports market because they ensure the comfort by absorbing the sweat and through exchanges with the exterior environment. In the last years they have been used for packaging, storage and transportation, as they ensure a special protection to the products and consequently contribute to the merchandise safety throughout the whole logistic flow.

***Intelligent textile materials.*** From the multiple means of the word "intelligent", the one that we can give to textiles is the one that regards only their ability to adapt to some environment circumstances or the ability to provide vital information about the body which they are on. Intelligent textiles can be divided into 4 groups:

- Intelligent materials with phase exchange: through micro-enhancement placed on the texture at the same time

with the imprinting paste, which actions as a thermal-regulator for textiles;

- Textile materials which memorize the shape: these materials when heated can recover to a previous shape. The mixed metal titan-nickel, zinc-copper, thermoplastic polymers are materials which can memorize the shape. Diaplex is a polyurethane polymer made by the company Heavy Mitsubishi Industries for sports clothing and equipment for cool season;
- Chameleon material, with modified chromatic behavior, changeable by light (photo-chromatic fibers), heat (thermo-chrome fibers), electricity (electromagnetic fibers), pressure (pressure sensitive fibers), humidity (solvable chromic fibers);
- Electronic gaskets, which double the clothing, making a system capable of recording and transmitting information about the human body, acting on textiles characteristics, so that the comfort can be improved, signaling when some vital parameters become unstable so that it becomes possible to intervene rapidly to rescue someone's life.

The first intelligent textiles were created for military and navigation use, these domains having serious financing. Intelligent textiles are needed for uniforms, for protecting the soldiers from extreme weather or from physical over-stress.

**Anti-bacterial fibers** were produced taking into account the fact that people come in contact with bacteria and viruses which can then be found on skin and clothing every day. Inside textile products, bacteria divide rapidly under high temperature and moisture. The category of anti-bacterial fibers comprises the ones produced by R. Stat company. These fibers are obtained from polyamide on which a 0.2 micron thick layer of copper disulphide is placed through a chemical treatment, which is trapped inside the polymer, a thing that assures resistance to wear and multiple chemical treatments. This layer of

copper disulphide gives an excellent anti-bacterial property to fibers. The released copper ions limit the multiplication of the bacteria in the fibers. Tests carried out at Pasteur Institute showed that only 2% of R. Stat anti-bacterial fibers, which are in a textile material, diminish the present bacteria by 99%.

**Ecologic fibers** Researchers from the textile domain, in collaboration with other specialists, were able to make multiple ecologic fibers such as:

**Ecologic cotton** is obtained by growing cotton using a minimum quantity of or no chemical products. Worldwide, growing classical cotton requires 65% pesticides, 20% herbicide, 14% growing regulators, 1% fungicide and other toxic substances. Ecological cotton is obtained in small quantities, but the urge for saving the environment will change that. The natural color cotton: after long research programs, which began in 1982 in U.S.A. and Israel, natural color cotton was obtained in colors from brown and red brown to green and olive green. The fibers are commercialized under the name of Fox Fiber and Top Cot.

**Eriotex** is a new ecologic fiber made by the Finnish Company Kultartuve Oy from a plant named "The swamp cottons". The fibers obtained are warmer than wool, they draw out moisture, are resistant to fire and they are also anti-allergic and anti-static. Mixed with wool, flax or cotton, or 100%, it is used for making suits, coats, sports clothing or furniture clothing.

**Biowool** is a fiber made of ecologic wool by the Biotex Company through an ecological technology which carries the same name. This kind of fiber does not produce any type of allergy and is selected from a region in the Alps named "Alps de Provence", region considered European natural reservation. Shepherds from this region have maintained traditions since the eighteenth century using natural fields, with no fertilizer. The wool undergoes serious laboratory testing before it can be used for production.

*Ecologic hemp.* On European markets hemp textiles obtained from hemp grown on fields with very little fertilization and pesticides. The obtained products are very light, hygienic and comfortable.

*Pineapple fibers* are ecologic fibers made out of pineapple fruits. The material obtained has a sophisticated look and is less utilized than flax.

*Algae fibers* are obtained from brown algae which renew naturally. Through treatments depending on their content of gluconic and manuronic acid, they lead to obtaining biodegradable ecological polymers, which are base components of algae copolymers. These kinds of fibers are used as bandage in the medical domain, because they have the advantage of creating a healing field with great absorption power (twenty times their weight).

#### 4. Conclusions

In the circumstances of the competition between economic agents, a problem appeared in Romania regarding the preservation of the existent clientele and also of getting new clients, in parallel with the realization of a minimum level of activity efficiency.

It is also noticeable that, because of the permanent growth of clients' exigencies, the advertising accomplished out of other considerations than the outcome of multi-criteria evaluation and the transparency regarding the quality of products / services is less credible and inefficient.

Taking into consideration the acceleration of changes and the global inter-connections, a company must develop its capacity of innovation in order to bring products with new properties to the market before others do.

In the textile domain, the research and innovative activity primarily aims at

finding textile fibers with new properties, which can respond as well as possible to dynamic consumers' requests, and also at using ecologic and natural materials.

There is on-going research regarding those materials which can correspond to a specific category (clothing for sportsmen, thermo-regulating clothing, textile materials which can memorize the shape, anti-allergic fibers etc.), mixing the natural materials with the synthetic ones and applying new technologies.

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