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DEVELOPMENT OF TECHNICAL CLOTHING FOR EVERYDAY WITH FUNCTIONAL AND SMART STRUCTURES

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ABSTRACT

This work is about how important it is to improve the comfort of everyday clothes in the consumer's life, not forgetting the aesthetical and functional factors which represent, along with comfort, three of the factors from which people choose their clothing. In this project these components and techno textiles, or functional and smart structures, were joined in basic pieces of clothing like blazers, shirts, dresses, jacket, trench coats, t-shirts, leggings, shorts, sweaters, trousers, cardigans and skirts. By using these it's possible to connect the comfort with the aesthetic and functionality with the techno textiles in everyday clothing.

Keywords: Consumer, Comfort, Functionality, Aesthetic, Smart Textiles.

INTRODUCTION

The textile structures are present in the everyday of our lives, improving our self-esteem, well-being and comfort. This project consists in the application of technical textiles, mainly used in high-performance sports using them in basic garments. The goal of this work was an improvement in the satisfaction of consumer needs, such as the importance of understanding the interactions of body-clothing-environment, not forgetting other needs such as economic, social, cultural, psychological habits, behaviors, and aesthetic professionals because the way of dressing is, by itself, a language, a way to communicate. So it is important to use these technical textiles that can help consumers adapt to the various occasions that arise in life, such as the sudden climate changes, there is a significant increase in the protection against the elements, but, at the same time, have good look and feel healthy. These materials perform functions that can provide each garment with one particular perk that adapts to the body and the environment that allows for better performance in terms of comfort and functionality to the user.

Within the field of technical textiles there are numerous materials with diverse functionality that help the user in the more precarious situations in which they might encounter themselves. Within these materials there are fibers that can be constituted by different types of existing fibers, such as natural (cotton, wool, ...) and the non-natural, the artificial fibers (viscose, acetate, ...) and the synthetic ones (polyester, polyamide, ...). In regards to the high performance fibers there are many examples, such as: **Dri-release** (dri-release.com), it's a fiber composed by 85-90% hydrophobic/synthetic ("water-hating") and and 10-15% natural/hydrophilic ("water-loving") fibers, the application in textiles (textiles, knit), provides clothing to dry faster, neutralizes odour all of this while providing a soft touch; **X-static** (x-static.cit) is a fiber made with a layer of 99,9% pure silver, which is permanently bonded to

the surface of the textile fiber, it has been used primarily as an industrial and medical product, serving high-tech industries and the Department of Defence; **TENCEL®** (lazing.com), the production process is based on a solvent spinning process and represents the greatest accomplishment in cellulosic fiber technology it has a unique fibril structure, fibrils (extremely small hairs) are the tiniest components which make up the fiber. Sub-microscopic channels between the individual fibrils regulate absorption and release of moisture. Thus, these tiny fibrils assure the optimum transportation of moisture.

Besides these examples of high performance fibers, there are also some kinds of fabric that perform high performance functions, such as: **COOLMAX®** (invista.com) which has been providing benefits to help top athletes push harder and longer. Today, fabric appeals to the fashion conscious that prefer a cool, soft but at the same time high performance fabric that fits every lifestyle. This high-performance fabrics that are soft, breathable, and moisture wicking are a great first layer, especially during high aerobic activities. It keeps chill-inducing perspiration away from your skin and moves it to the outer layers for evaporation. You stay warm, and your body stays dry. **THERMOLITE**® (invista.com) fabric and insulation provides warmth and comfort without weight, even when wet. Because it is comfortable and lightweight. The provided insulation allows freedom of movement. Its hollow-core fibers trap in air for greater insulation for light, yet heavy-duty performance. In a coat made with this fabric and insulation, you will stay warm and dry and a larger surface area allows for fast evaporation by sending moisture away from the skin to the surface of the fabric, where it quickly evaporates.

There is another brand which produces apparel with the development of pieces that allow an improved performance of clothing to harsh conditions such as outdoor sport. That brand is: **GORE-TEX®** (gore-tex.com), fabrics are created by laminating our Gore-Tex membrane to high-performance textiles, then sealing them with an innovative solution for durable waterproof protection. To construct a Gore-Tex laminate, we bond the Gore-Tex membrane between high-performance fabrics that are extremely breathable. All Gore-Tex fabrics are waterproof, windproof, and breathable. However seams and needle holes may be small, but they will still leak. That's why they must be completely sealed that's why is used *GORE-SEAM® TAPE*. This unique tape, backed by reliable Gore equipment and know-how, ensures that every seam and tiny stitch hole is sealed this improves garments by reducing their weight, refining their drape, and increasing their durability.

OTHER SECTIONS

Beside the importance in the textile and clothing it's relevant to mention the meaning of the Textile and Apparel Portuguese Companies, in Portugal textiles industries are one of the most important, that assure almost 35 thousand employments. Corporation that invest in innovation, creativity, through the development of innovative products and processes, that reaches the market in a faster way.

This is allowed by the identification of consumer trends; analysis and characterization of the state of the art and innovative potential in the concept phase; analysis of functionality; product development and prototyping; testing and validation in laboratory in actual use; scale up and simulation. But it's in the sport market that is given enormous opportunities in the textiles and apparel with the transformation of the different materials, like the conventional, such as fabrics and knits, to the functional apparel. Which Portuguese corporations operate in

products and sports equipment, in the different development areas, such as: research, selection and characterization of the innovative materials; research and characterization of products trends; evaluation and optimizing important functionalities (comfort, waterproofing, windproof, breathability, etc.); Design and products developments; body-scanning services for optimizing and evaluation to adhere, when dressed, to the body-shape.

Betting in this kind of development and innovation, by increasing exports and promoting the consumption of Portuguese products, then, it becomes possible to believe in a national economic growth.

And one of those corporations that promotes innovation, design in development new products and technologies it's the CITEVE – Centro Tecnológico das Indústrias Têxtil e do Vestuário de Portugal, a national and European institution.

RESULTS

It is based on the performance of these materials that this work develops basic clothing with textile technology, thereby recreating a new way of dressing for the everyday. Twelve pieces of clothing were proposed providing, each and every one, better performance and comfort while taking the aesthetics and functionality aspects into consideration. For the design of this clothing was taken as an example one of the biggest sporting brands in the world, Adidas by its creative and innovative way, and the developing the Adidas Sport, is increasingly beginning to conceive other kind of aesthetic concerns with clothing and fashion, like Adidas Street and Adidas Style.

Also based on trends of colors, textures, patterns dictated to autumn / winter 2012/13 came the twelve key pieces that unites comfort with aesthetics, through the kind of ***basic*** pieces with the use of **Technical Textiles**, which came from a Portuguese company called LMA (Leandro Manuel Araújo). These aspects gave the name **BasicTech** for this type of garment. The proposed pieces were as follows: **blazer** a piece made for many occasions that can be supplemented for various styles, from the most casual to the most formal. It was made with three types of technical textiles: a waterproof fabric that prevents the penetration of water and dirt which slides over the fabric, a warp knit mesh which provides breathability and ventilation and finally a 3 dimensional knit on the shoulders to ease the load on them while carrying bags and backpacks. A **Shirt** made in a jersey knit, a piece that allows greater freedom of movement due to the intrinsic properties of the material, beside this the knit is made from *Dri-release* fibers allowing faster drying, especially during times of extreme changes in temperature as well as odor neutralization which is great for use in the workplace in which presentation is very important. This was also applied to the **Leggings** and **T-shirt**. Beyond these materials, we used an *antibacterial* knit **Sweater** in a way to prevent bacterial growth caused by perspiration, because this cloth piece is in constant contact with the skin. It was also used a knit with *lycra* in **Cardigan** and **Dresses**, which allow for greater flexibility adapting well to the body the same way that was use jersey knit in the **Skirt** making it a more fluid piece. In the **Shorts** was used a interlock knit, which is a knit that can display various patterns. **Trousers** used a lightweight fabric that does not absorb moisture allowing the skin to remain dry, and keeping some breathability because it is not a waterproof fabric. Finally we have the composite textile that are obtained by the process of thermo-adhesion of two or more materials with different properties, so in this case two types of composites were used, one of them used in the **Trench Coat**, consisting of *polar/membrane/polar*, which enables one effect similar to fur at both sides and with the membrane in the middle, the other composite was used in the **Jacket** constituted by *mesh/membrane/polar*, which gives a completely different

effect on the outside giving a texture effect and a polar part inside similar to fur. The use of this textile enables waterproof, windproof and breathability, great for winters.

CONCLUSION

In conclusion this work pretends to show that it is possible to create clothing using technical textiles that are different from the conventional, which makes it possible to design different types of functional and aesthetically appealing pieces, with performance that improves the physical and psychological comfort of the consumer. In addition this work makes people realize the importance of promoting the potential that Portugal has to develop new materials, the creation and the innovation that Portuguese products provide and, perhaps, to contribute towards the economic and social issues in this country. And there is no doubt that betting in innovation, design and new products development is very important in order to realize that in Portugal we can become pioneers as one of the biggest industries of the country and the world.

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