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TREATMENTS APPLIED TO THE MATERIALS IN THE COMPOSITION OF MATTRESS COVERS

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Abstract: *The chemical treatments applied to the materials used in the manufacture of mattress covers can significantly influence their quality, strength and durability. The present work has demonstrated that these treatments are important for achieving the desired performance, adapting to the different uses of the covers, whether it is for domestic use or use in the hotel sector. Addressing consumer education on the use of chemicals in textiles is key to promoting informed choices and a healthy and sustainable lifestyle. The comparative analysis of the finishing treatments of natural materials used in mattress covers highlights the fact that each treatment has specific applicability depending on the field of use. Manufacturers must consider balancing the needs of comfort, durability and aesthetics, without compromising sustainability. Thus, consumers can benefit from quality products, adapted to their specific requirements. In the present work, a detailed analysis of the materials used for the manufacture of two types of mattress covers was carried out: one intended for domestic use and the other oriented to the hotel regime. This research aimed to obtain essential information about the chemical treatment process of the fibres in the new covers and to assess the impact of these treatments on the performance and safety of the product. Future studies should focus on examining these covers and the chemical compounds they contain.*

Keywords: *chemical treatments, fibers, hotel regimen, household use.*

1. INTRODUCTION

Compliance with safety standards in the treatment of fibers for mattress covers is very important for the health protection of users [1]. Mattress manufacturers, by adopting responsible and transparent practices, contribute to a safer environment, and consumers, by informing them and making informed product choices, can positively influence the textile industry [1]. The mattress cover is in constant contact with the body, and any irresponsible chemical treatment can cause allergic reactions, irritation or even respiratory problems [2], [3], [4].

Importantly, the industry continues to improve testing standards and regulations related to consumer product safety. Awareness and education are key to helping consumers make informed choices regarding mattresses and their covers [5], [6]. Consumers can benefit from assurances of product safety through certifications such as CertiPUR-US, but there is insufficient awareness about mattress covers and additives used in these materials [7], [8]. CertiPUR-US certification guides consumers in choosing high-quality polyurethane foams without harmful compounds [7].

Collaborations between regulators, certification organisations and researchers will contribute to the development of safer and more efficient solutions for consumers [9]. Consumers may believe that certified mattresses have undergone rigorous testing and do not contain hazardous substances [6]. The finishing treatments applied to knitted materials for mattress covers play an essential role in improving the functionality, appearance and durability of the final product. The choice of the right treatment depends on the client's requirements and the intended use of the mattress. Textile finishes not only improve the performance of knitted materials, but can customize covers according to the type of customer and market. It is always recommended to choose treatments according to the analysis of the final requirements

2. GENERAL INFORMATION

The choice between natural and synthetic fibres, or the use of a blend of fibres, depends on the user's priorities in terms of comfort, durability and maintenance [10]. Mattress covers made of natural fibers offer superior comfort and are skin-friendly, while synthetic ones bring strength and functionality [10]. Fiber blends are a very effective solution, bringing together the best features of both types of fibers, which allows obtaining textile products with excellent performance, adapted to the requirements of modern consumers.

Fig. 1*: Equipment for the treatment of textile materials - Squeezing Pader Machine*

Fig. 2*: Motic microscope* [4]

Table 1: *Household cover (mattress) treatment*

Treatment	**LIKROLL**
Recipe	Citric Acid 0.2% Elastofin STO501 1.4%, Temp:150^{0}C
Request width	229-231 cm
Request weight	558-581 gr/m^2
Composition	20% Tencel, 2%Elastane, 78% Pes
Color	Opera, Black, Basalt, Black

Table 2: *Cover (mattress) treatment for hotel use*

Treatment	**PADDER**
Recipe	AbioFlame 14% Temp:130^{0}C
Request width	239-241 cm
Request weight	369-384 gr/m^2
Composition	85% Organic Cotton (Bio), 15%Hemp
Color	Natural, Natural

In the present work, the materials used to make two mattress covers (one mattress cover for domestic **Fig. 3** use and one for hotel use **Fig. 4**) were treated (on the Squeezing Pader Machine **Fig. 1**) in order to obtain basic information about the chemical treatment of the fibers in the new mattress covers.

The sample preparation and analysis were carried out using an internal standard operating procedure for the analysis of the fibrous content of the materials in the two mattress covers.

The analysis of the mattress cover and the constituent materials is an essential step in evaluating the quality and characteristics of these products. In the study, the constituent components of the two mattress covers were collected and analyzed in detail to highlight the differences in the finishing treatments applied to them, considering the various fields of use [7].

For the analysis of the mattress cover samples, a Motic **Fig. 2** microscope was used, which has technical characteristics and superior optical quality, which allows for obtaining clear and detailed images of the structures of the analyzed materials.

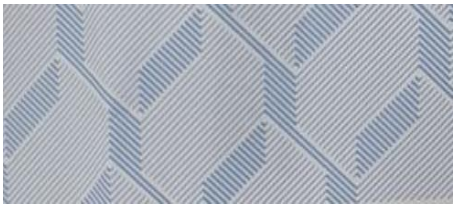

***Fig. 3**: Treated material for household cover (mattress)*

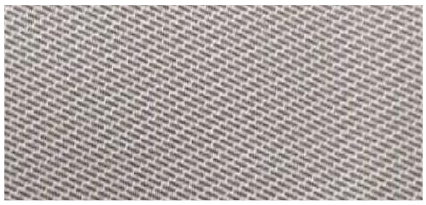

***Fig. 4**: Treated material for hotel cover (mattress)*

The main components of each mattress cover tested and their observed compositions are summarized in Tables 1 and 2. The different components of the mattress cover, for home use, were mixtures of Citric Acid 0.2% Elastofin STO501 1.4%,/pick-up 100% control weight/weight controls, Temp:1500C, compared to the cover intended for hospital use, which has in its component AbioFlame JASMIN 14%, Temp:1300C, are different and require an immersion treatment, to obtain that charge with 100% to 150% solution. Being a knit made of cotton yarn (85%) mixed with hemp (15%), it requires an increased flame retardant treatment.

The analysis carried out in this paper highlights the importance of chemical treatments in creating functional and durable mattress covers, suitable for both domestic use and the hospitality industry. The results obtained demonstrate that, in most cases, chemically treated materials offer significant advantages, thus contributing to a better user experience.

The authors' recommendations include continuing studies on the long-term impact of using these treatments and exploring environmentally friendly alternatives that can improve the performance of materials without compromising consumer health or environmental integrity. These steps are essential for innovation in the textile field and for the development of sustainable and safe products.

5. CONCLUSIONS

This paper highlights the analysis of the differences between the finishing treatments applied to knitted materials, especially those intended for mattress covers made of natural yarns.

The choice of treatments applied to mattress covers depends on individual preferences and the specific needs of the user. Each treatment has its advantages and disadvantages, and the final

decision should consider not only the short-term effects but also the long-term impact on health and comfort.

The chemical treatment of the materials used for mattress covers can significantly contribute to improving the quality, comfort and durability of products.

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