



## RESULTS OBTAINED FROM THE APPLICATION OF TREATMENTS ON THE COMPONENT MATERIALS OF MATTRESS COVERS

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**Abstract:** *The chemical treatments applied to the materials used in the manufacture of mattress covers play an important role in improving the technical and functional characteristics of the final product. These treatments are intended to give materials special properties, such as wear resistance, protection against microorganisms, moisture or other degradation factors. In addition, they can help increase the durability and useful life of mattress covers, thus ensuring a higher level of performance and safety for users. The present paper demonstrates that these chemical treatments are not just simple additions, but essential components for adapting mattress covers to different environments and uses. In the case of home use, the treatments provide protection against dirt, dust or dust mites, helping to maintain a hygienic and healthy sleeping environment. In the palliative care sector or in the hospital environment, these treatments are becoming even more important, being essential for preventing the spread of infections and ensuring a safe environment for patients and healthcare staff. Also, the correct application of chemical treatments to the materials used in the manufacture of mattress covers can significantly influence their mechanical strength, reducing the risk of damage over time, such as tears or discolorations. Increased durability not only extends the life cycle of the product, but also helps to reduce the environmental impact by decreasing the frequency of replacement.*

**Key words:** *domestic use, chemical treatments, hospital regime.*

### 1. INTRODUCTION

The mattress cover plays an important role in ensuring comfort and hygiene in the use environment, being in direct and constant contact with the user's body [1]. Due to prolonged exposure, any chemical treatment applied to the materials used to make it must be carried out responsibly and in accordance with safety regulations, in order to prevent health risks. [2], [3], [4]. The use of irresponsible chemical treatments can have serious consequences for users' health [5]. For example, certain chemicals can cause allergic reactions, manifested by skin irritation, itching, redness, or rashes. In the case of people sensitive to certain substances, these reactions can be more severe and can even lead to respiratory problems, such as asthma or shortness of breath, especially if vapor or chemical particles are released into the air [6], [7]. In addition to the risk of allergic reactions, improper chemical treatments can also affect the quality of the air in the environment and lead to the accumulation of toxic substances in the human body, especially if they are inhaled or absorbed through the skin [8]. Additionally, certain substances can weaken the structure of the fibers, reducing the durability and strength of the cover, leading to faster wear and tear and the need

for frequent product replacement [4]. For this reason, it is very important that the chemical treatments applied to the textiles for mattress covers are effective, but also safe for health. In addition, it is important that these treatments are rigorously tested to avoid the release of harmful compounds into the environment or the air in the room [9].

## 2. GENERAL INFORMATION

In the present paper, a thorough analysis of the materials used to make two types of mattress covers was carried out: one intended for domestic use and the other oriented towards the medical care regime. This analysis aimed to evaluate the quality, durability and technical characteristics of the materials used according to the specific requirements of each type of case, as well as to identify any differences in composition, treatments applied and performance.



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

Thus, the aim was to adapt the materials to meet the comfort, hygiene and safety needs of the end users, depending on the environment of use.

*Table 1: Domestic cover (mattress) treatment*

Treatment	<b>LIKROLL</b>
Recipe	Citric Acid 0.2% Elastofin STO501 1.4%, Temp:160 <sup>0</sup> C
Request width	229-231 cm
Request weight	268-282 gr/m <sup>2</sup>
Composition	18% Viscose + 82% Polyester
Color	Opera+Black+Basalt grey

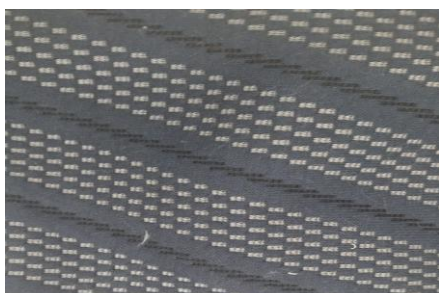
*Table 2: Treatment cover (mattress) for hospital use*

Treatment	<b>PADDER</b>
Recipe	Active Biotic + AbioFlame 14% Temp:140 <sup>0</sup> C
Request width	239-241 cm
Request weight	345-360 gr/m <sup>2</sup>
Composition	18% Viscose + 3,5% Elastane + 78,5% Polyester
Color	Natural, Nude

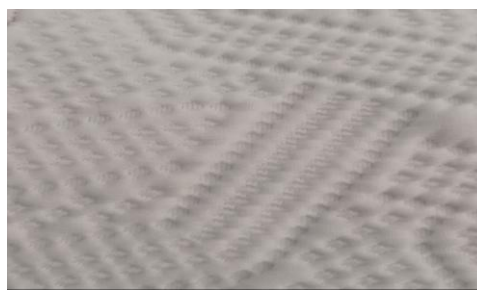
In this work, the materials used to make two types of mattress covers were approached and tested, using the Squeezing Pader Machine. The main aim was to obtain basic information on the

chemical treatment applied to the fibres in these covers, in order to assess the impact and effectiveness of these treatments on the final characteristics of the products.

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



*Fig. 1: Treated material for cover (mattress) for household use*



*Fig. 2: Treated material for cover (mattress) for hospital use*

The main components of each mattress cover tested and their compositions observed are summarized in Tables 1 and 2. The different components of the mattress cover for domestic use were mixtures of Citric Acid 0.2% Elastofin STO501 1.4%, at a 100% control weight/weight control, Temp:160<sup>0</sup>C, compared to the cover intended for hospital use, which consists of the Active Biotic treatment and AbioFlame JASMIN 14%, Temp:140<sup>0</sup>C. It has a different treatment because it requires an immersion treatment, to get that 100% to 150% solution load. The destination of this material requires special treatment to ensure an antimicrobial effect. Being a knit made of a mixture of viscose fibers (18%) in a mixture with polyester (over 75%), an increased fireproofing treatment is required, and it will also be used in the medical environment.

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

It is very important to study how these treatments retain their effectiveness over time, as well as the possible risks or adverse effects on the health of users, especially in the case of frequent or long-term use. Thus, further studies could include monitoring the behaviour of materials under real conditions of use.

## 5. CONCLUSIONS

The present paper highlights the analysis of the differences between the finishing treatments applied to knitted materials, especially those intended for mattress covers made of yarns based on fibers of natural vegetable origin.

In conclusion, the continuation of these studies and innovations are essential steps to achieve safer, more sustainable and environmentally friendly products, in line with current trends in sustainable development and public health. These research directions can have a significant impact on the mattress cover materials industry, especially in the context of increasing awareness of environmental protection and user health.



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