PURITY TECH
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Technical Report on the Antibacterial Effectiveness of Silver-Treated Carbon-Based Fabrics

1. Introduction

This report presents the results of a microbiological test conducted on two different types of carbon-based fabrics in order to evaluate the effectiveness of silver treatment in reducing surface bacterial load. The test was carried out by the Experimental Zooprophylactic Institute of Lombardy and Emilia-Romagna between 29 May and 3 June 2025.

2. Description of the Analyzed Samples

Four samples were analyzed, divided into two main groups. Samples with untreated activated carbon were not considered in this analysis. Samples with activated carbon treated with silver ions included Sample 3, a fabric intended for a small office environment with three occupants, and Sample 4, a fabric intended for a large office environment with six occupants.

3. Microbiological Results

The samples treated with silver showed extremely low bacterial load values, below the limit of detectability. Sample 3 presented microorganisms detected but less than 4 CFU/cm², and Sample 4 presented microorganisms detected but less than 4 CFU/cm². These values indicate an effective antibacterial action of the silver treatment.

4. Interpretation of the Results

Silver ion treatment demonstrated marked effectiveness in reducing bacterial load. The antimicrobial action of silver is well documented in scientific literature, as it is capable of interrupting bacterial cellular processes and inhibiting proliferation. The use of such fabrics in high-occupancy indoor environments can significantly contribute to improved hygienic conditions.

5. Considerations on Indoor Air Quality

In enclosed environments, microbial proliferation can be favored by poor ventilation and high occupant density. Several studies demonstrate that materials with antibacterial properties can positively influence indoor air quality and reduce the risk of cross-contamination. The use of active surfaces, such as silver-treated fabrics, represents an effective solution especially in professional, educational and healthcare environments.

6. Conclusion

The microbiological analysis confirmed the effectiveness of silver treatment in reducing bacterial load on carbon-based fabrics. These results support the use of treated materials in contexts where hygiene is fundamental to public health.