



# 93% REDUCTION IN BACTERIA IN AN OFFICE ENVIRONMENT

The BioCote® Office Study: Increasing productivity with a more hygienic office space.

An open plan office space presents an optimum environment for the spread of illness caused by microbes; hot desking, shared facilities, common contact surfaces, circulated air and extended interactions at close proximity. Each employee's own unique microbiome contributes and interferes with the microbiome of the office environment. It is when one person's microbiome interacts with another's directly, through person to person contact, or indirectly through contact with shared surfaces or products that cross contamination can occur. This presents ideal circumstances for illness causing and sometimes antibiotic resistant microbes to pass from employee to employee. With these factors in mind, it is apparent how the modern office environment can present a challenge when trying to maintain a healthy and productive space.

## Aim

To understand the role silver based antimicrobial technology can play in reducing the number of contaminating microbes on products and surfaces in a real-life office environment by comparing natural bacterial populations on BioCote® protected products and standard non-antimicrobial products within the same office environment.

## Method

A small, open plan office space, occupied by a maximum of 15 people, was selected as suitable for the purposes of this environmental study. Existing products within the office environment were removed and replaced with equivalent products, however these new products incorporated antimicrobial technology. The antimicrobial products were: adjustable height desks, chairs, computer peripherals (mouse & keyboard), whiteboard and accessories (pens, erasers), a point of use water dispenser and wall mounted liquid hand soap dispensers, all treated with BioCote® Antimicrobial Technology. The products were introduced to the office for a period of time prior to the commencement of the study in order to allow sufficient time for them to adjust to the specific office microbiome and provide an opportunity for them achieve a level of contamination comparable with the untreated products being monitored over the time of the study.

Throughout the period between April and September 2017, all products were used in exactly the same way by the office workers, and both sets of products were subjected to the same, standard

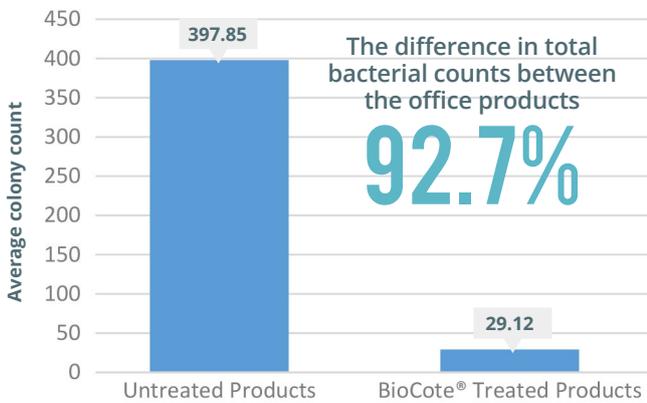


cleaning regime. Over this same period of time environmental data, in the form of regular surface swabbing was collected too, the purpose being to observe bacterial counts and obtain additional information on the diversity of the microbial communities present (data not shown here).

Both treated and untreated products were swabbed weekly between April and September

2017. Swab data was collected on afternoons to ensure products had been used in the office. Swabbing was performed using a dry cotton swab with moisture in the form of sterile phosphate buffered saline (PBS) before being plated onto agar and cultivated in a microbiology laboratory. The laboratory isolated and counted bacteria, as well as recording colony diversity of the bacteria recovered from the treated and untreated products.

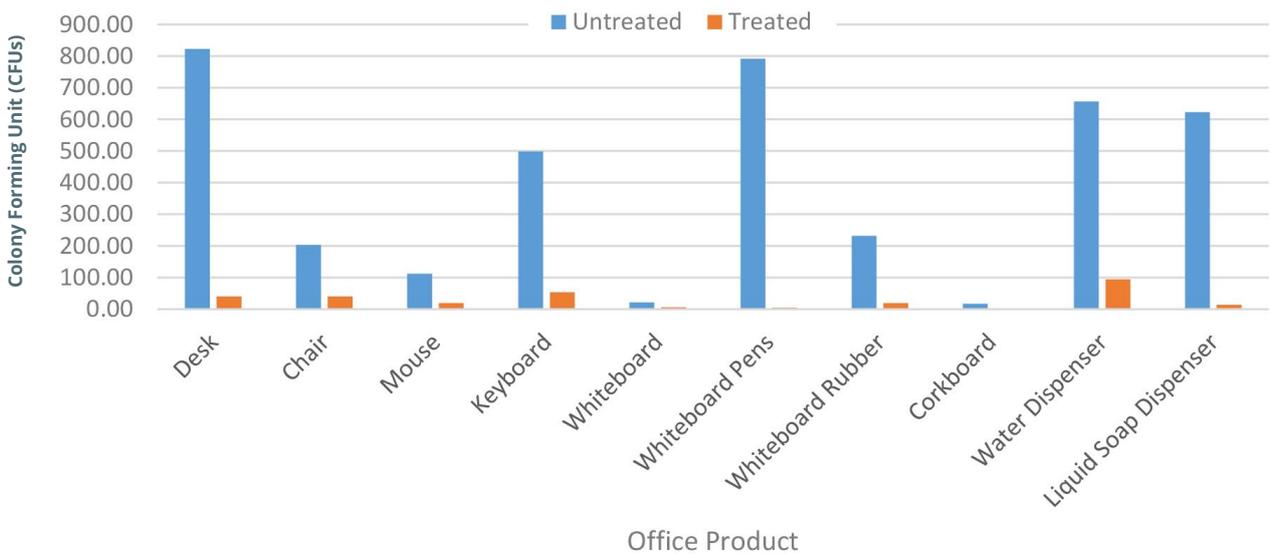
**FIGURE 1:** Difference between the average colony counts for the untreated (non-antimicrobial) and treated (contains BioCote®) office products



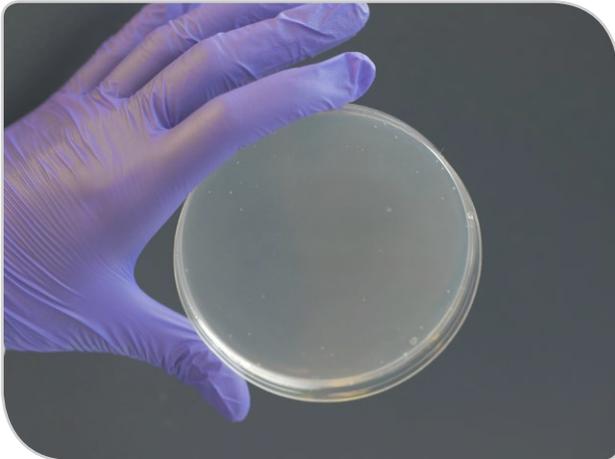
**TABLE 1:** This table shows the total reductions seen in each product

Product	% Reduction
Desk	95.14%
Chair	80.23%
Computer Mouse	83.21%
Computer Keyboard	89.34%
Whiteboard	73.44%
Whiteboard Pens	99.49%
Whiteboard Rubber	91.80%
Corkboard	84.47%
Water Dispenser	85.63%
Liquid Soap Dispenser	97.86%

**FIGURE 2:** Graph showing the difference between treated and untreated office products



**IMAGE 1:** An example of a swab plate for a BioCote® treated product from the office used in the study



**IMAGE 2:** An example of a swab plate for an untreated product from the office used in the study



## DISCUSSION

The above study represents a demonstration of the antimicrobial activity of BioCote® silver based additives incorporated into products used in a real-life environment. The products for this study were chosen for their suitability in an office environment, and due to their comparable similarities and frequency of use being the same for both the treated and untreated products.

Based on the results of the study it is obvious that there is a clear reduction in the total number of bacteria present on surfaces and products treated with BioCote®. All products were contained in the same environment, cleaned and maintained in the same way and used by the same people. The only difference between the functionality of the two sets of products is the presence of BioCote® antimicrobial technology. On this basis it is reasonable to conclude that the reduced counts of bacteria on the silver based antimicrobial containing products, compared to the control untreated products, is a direct result of those products' continued antimicrobial performance. Before being released to market, BioCote® protected products are subjected to an appropriate laboratory

based test to measure and demonstrate their antimicrobial performance. With this in mind, it is reasonable therefore to expect reduced counts of bacteria on the treated, antimicrobial products, in comparison to untreated products subjected to similar use and conditions.

BioCote® antimicrobial technology is not intended to replace cleaning, however, in this study we have clearly demonstrated a significant reduction in the bacteria present on products treated with silver based antimicrobial technology versus near identical, untreated, counter parts. This finding constitutes a compelling argument for the necessity for antimicrobial products to be introduced into office spaces on a larger scale to improve hygiene levels in the working environment. A comprehensive cleaning regime, and increased hand hygiene, together with the introduction of antimicrobial protection to common touch surfaces would significantly reduce the microbial load on surfaces and provide a scientifically credible and hugely important step towards creating a more healthy, hygienic and productive work environment.

**BioCote® would like to say a massive thank you to the following partners for donating products for use in this study.**

