A REAL-LIFE CASE STUDY: EDUCATION

96% REDUCTION IN BACTERIA

IN A SCHOOL ENVIRONMENT

School classrooms present the classic factors important for the efficient spread of microbes; close contact of people for prolonged periods, numerous commonly touched, communal surfaces and isolated cleaning. Hygiene in these environments is, therefore, important in order to reduce the risk and consequences of microbial cross contamination.

Inevitably, good hygiene guidance for education providers from government[1] includes regular, thorough environmental cleaning. However, developments in antimicrobial technology now offer the ability to create indoor environments composed of materials that act continuously by reducing the presence of microbes contaminating them.

The rationale for hygienic classrooms is obvious. Does the application of antimicrobial technology to a classroom have a beneficial impact?

Aim

To measure and compare the numbers of bacteria in two classrooms in the same primary school after antimicrobial technology has been extensively applied to one whilst the second is unchanged.

Method

In the autumn of 2014, a medium-sized UK primary school was selected as suitable for the purposes of this environmental study. A classroom was refurbished with computer desks, chairs, door handles, light switches, liquid soap dispensers, cable trunking, sockets, tables, storage trays, bookcases, storage units, castors, carpet, radiator covers, window handles, wall and ceiling paint, PVC wall cladding and a drinking water dispenser all treated with BioCote® antimicrobial technology. Products were donated for the purpose of this study by BioCote Ltd Partners.

A second classroom was included in this study to serve as a control environment. The demographics of both classrooms was suitably comparable. Both classrooms were used and cleaned as normal. Typical daily cleaning of school classroom involves the wiping of desks, sinks and draining board, sweeping the hard floor and vacuuming carpet. In addition, a weekly clean involved dusting of computers, shelves and worktops and mopping of non-absorbent floors.

A weekly collection of swab samples began in November and extended for three weeks. Antimicrobial products were swabbed from the antimicrobial classroom whilst corresponding, untreated products and surfaces in the control classroom were swabbed at the same time.

Swabs were collected before and after the school day and processed appropriately in the microbiology laboratory to isolate, count and where possible, identify bacteria (data not shown here) recovered from the study classrooms.

BioCote Ltd

Unit 3, Oak Court,
Pilgrim's Walk,
Prologis Park,
Coventry CV6 4QH

t +44 (0) 2477 712489
f +44 (0) 2476 338081
biocote@biocote.com
www.biocote.com

Results

Total environment: A comparison of the average number of bacteria recovered from all BioCote treated products with all corresponding products in the control classroom revealed almost **96% less** bacterial contamination in the antimicrobial classroom.

Figure 1: The difference in total bacterial counts between the classrooms: 95.68%.

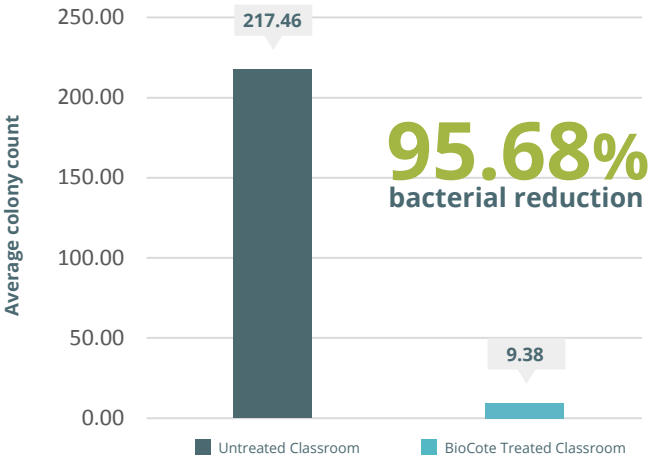
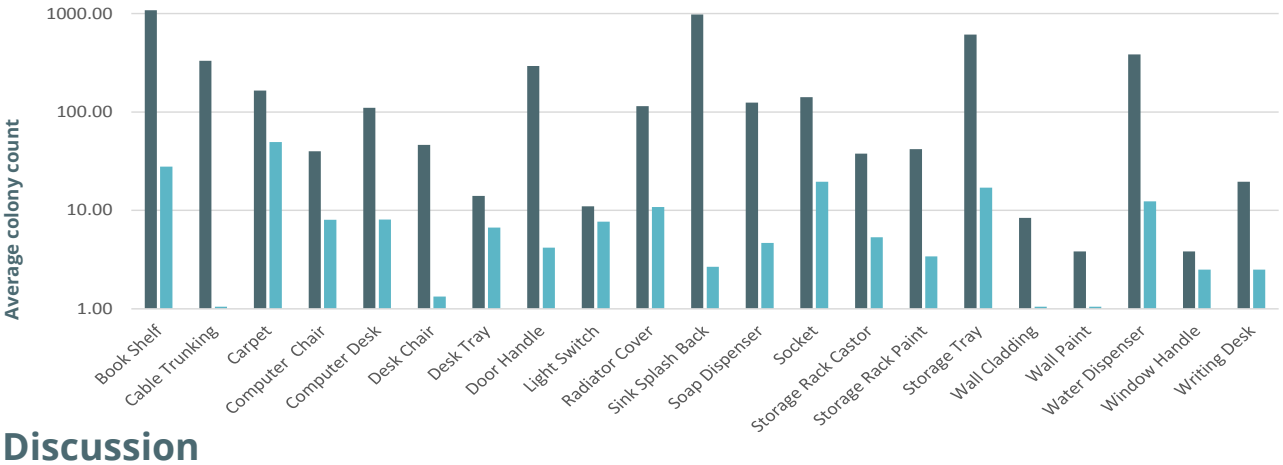


Table 1: % reduction in average colony counts per product in the BioCote® treated vs Untreated classroom

Product	% Reduction
Book shelf	97.43%
Cable trunking	99.90%
Carpet	70.09%
Computer chair	79.90%
Computer desk	92.65%
Desk chair	97.12%
Desk tray	52.38%
Door handle	98.58%
Light switch	30.30%
Radiator cover	90.54%
Sink splash back	99.73%
Soap dispenser	96.26%
Socket	86.24%
Storage rack castor	85.84%
Storage rack	91.90%
Storage tray	97.22%
Wall cladding	>99.99%
Wall paint	91.30%
Water dispenser	96.79%
Window handle	34.78%
Writing desk	87.73%

Figure 2: Differences in average colony counts per product in the Untreated classroom vs BioCote® treated classroom



Discussion

The two classrooms studied were chosen due to their similarities in use, location and demographics. From this basis, the difference between the two classrooms was the presence of antimicrobial technology. It is reasonable to view the reduced counts of bacteria on the antimicrobial products, compared to the control classroom's counterparts, is a direct result of those products' continued antimicrobial performance.

Before release into the market, products treated with BioCote® technology are validated for acceptably high antimicrobial efficacy. In theory, then, reduced counts of bacteria contaminating BioCote treated products deployed in working environments, compared to equivalent but untreated products should be expected. Previous environmental studies measuring bacterial counts on antimicrobial surfaces also reported them to be less contaminated than untreated counterparts[2,3].

Antimicrobial technology should not be viewed as a replacement to cleaning. However, the repeated observation of considerably fewer bacteria present on antimicrobial products, regardless of product type and when the observation was made, compared to those counts made from the control classroom, presents a compelling case for the application of antimicrobial technology to hygiene-critical environments.

BioCote Ltd

Unit 3, Oak Court,
Pilgrim's Walk,
Prologis Park,
Coventry CV6 4QH

t +44 (0) 2477 712489
f +44 (0) 2476 338081
biocote@biocote.com
www.biocote.com

[1] Gov.uk. (2014). *Guidance on infection control in schools and other childcare settings.* Available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/353953/Guidance_on_infection_control_in_schools_11_Sept.pdf. Last accessed 19th Feb 2015.
[2] Taylor, L., Phillips, P., Hastings, R. (2009) Reduction of bacterial contamination in a healthcare environment by silver antimicrobial technology. *Journal of Infection Prevention*. 10 (1): 6-12.
[3] Taylor, L., Phillips, P., Hastings, R. (2009) Silver ion antimicrobial technology: decontamination in a nursing home. *British Journal of Community Nursing*. 14 (5): 51-53.