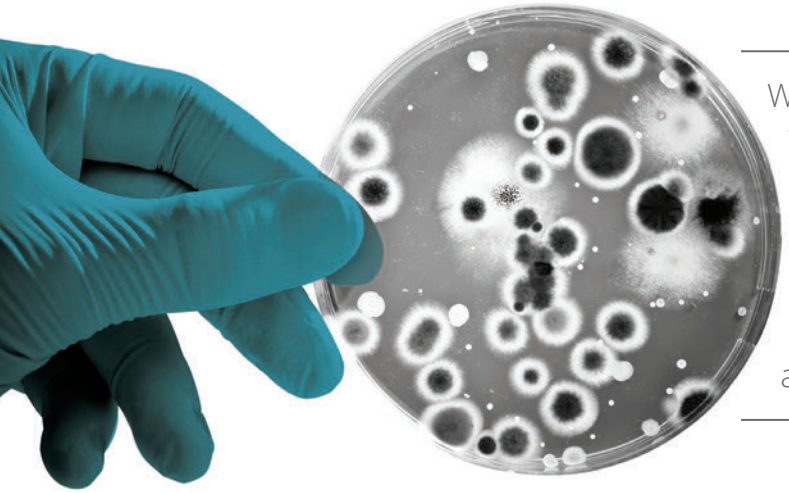
MOULD



Whilst many antimicrobial products focus on their powerful performance against bacteria, it is important to remember that the term 'antimicrobial' refers to a product's combined antimould and anti-bacterial capability. BioCote antimicrobial products have a proven record against mould, fungi and yeast as well as an extensive list of bacteria.

Not only are fungi and mould unsightly, their spores can have a detrimental effect on our health and wellbeing in environments in which they are found, including our home or workplace.

Fungi are well known to be able to grow and flourish on plastics, resulting in the degradation of material and the transmission of the fungi to the wider environment.

If the fungi in question are capable of causing human disease then a material that resists their growth is desirable due to its ability to interrupt the transmission of disease-causing microbes.

Aim

This study aimed to demonstrate the antifungal component of BioCote antimicrobial technology. To that end, BioCote protected materials were directly compared to identical but unprotected materials with respect to their ability to support or resist the growth of fungi.

Test Method

BioCote protected and identical unprotected polymers were assessed for their ability to resist the growth of mould using the universally accepted test method: ATSM G21 - a standard method designed to measure the resistance of synthetic polymers to fungi.

Fungi

The fungi used in this study were Aspergillus niger and Penicillium sp. Each was grown separately on malt extract agar at room temperature for long enough prior to the study commencing to allow the cultures to produce spores.

Test materials

This study examined the following polymer types: ABS (acrylonitrile butadiene styrene), PP (polypropylene) and LDPE (low-density polyethylene). Flat surface samples were cut to size before testing began.

Laboratory procedure

Samples were positioned on agar plates and inoculated with the fungal spores as per the ASTM G21 method. Inoculated samples were incubated at 27-29°C for 40 days at a relative humidity of >85%, and observed on a weekly basis for the appearance of fungi on the polymer materials.

BioCote House Oak Court Pilgrim's Walk Prologis Park Coventry CV6 4QH United Kingdom
T: +44 (0) 2477 712489 **F:** +44 (0) 2476 338081 **E:** biocote@biocote.com **www.biocote.com**

Results

The test materials were examined by eye (macroscopic) and using a low power dissecting microscope (microscopic) for evidence of fungal growth on their surface during their inc ubation and at the 40 day test end point.

ABS

Unprotected ABS material supported the growth of Aspergillus niger but not Penicillium sp. The BioCote protected ABS material showed no evidence of fungal growth from either test fungi.

PP

Unprotected PP supported growth of both test fungi after just 7 days and the abundance of mould growth increased with extended incubation The BioCote protected PP material showed no evidence of fungal growth from either test fungi.

LDPE

After 40 days of incubation, the unprotected LDPE supported the growth of Aspergillus niger, but not Penicillium sp., upon microscopic examination. The BioCote protected LDPE material showed no evidence of fungal growth from either test fungi.

Conclusion

Aspergillus niger was shown to be capable of growing on unprotected ABS, PP and LDPE to at least a microscopic level after 40 days incubation. Aspergillus fungus was, therefore, able to breakdown these polymers and extract nutrients from them as a source of energy. Microbial (fungal) degradation of materials like polymers is a well-recognised occurrence and will lead to the failure of susceptible products. This study aimed to compare the ability of BioCote protected polymers to resist the growth of mould under ASTM G21 test conditions with that of unprotected polymers. The study's results showed no evidence of growth of Aspergillus niger or Penicillium sp. on the BioCote protected polymers, ABS, PP and LDPE.

As all parameters of testing were identical between the BioCote protected and unprotected polymers except for the presence of BioCote antimicrobial technology in the protected polymers, the study can conclude that the antifungal property of the BioCote technology was responsible for resisting the growth of the test fungi on the protected polymers. This study demonstrated that BioCote antimicrobial technology successfully inhibited fungal growth on the surface of the test materials into which it had been incorporated during its manufacture, as well as demonstrating that common plastics can provide an environment for fungus to thrive and survive.

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