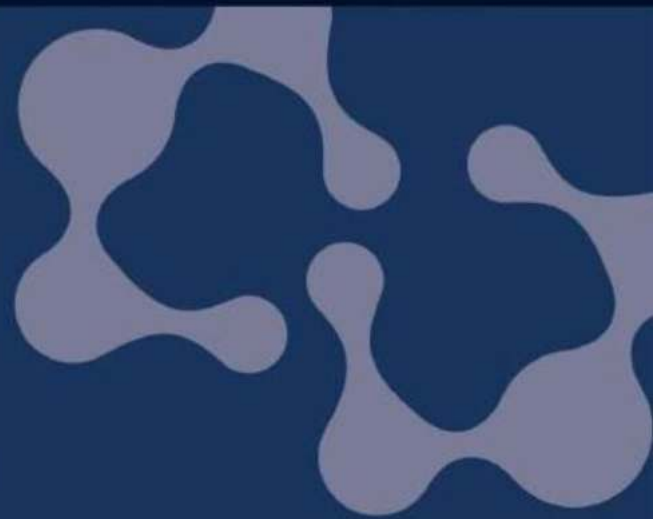


Ask the experts

The benefits of
silver ion technology:
separating fact from fiction



Ask the experts: the benefits silver ion technology



Introduction

Addmaster is the leading supplier of technically innovative additives for the plastics, paper, textile, paints and coatings industries.

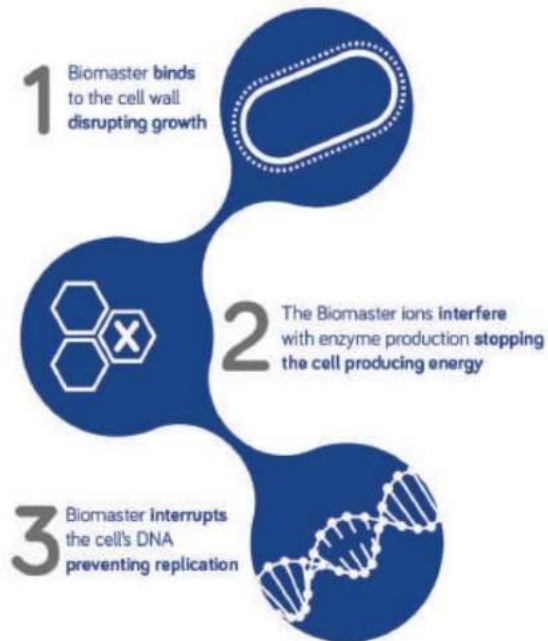
We pioneered the development of durable antimicrobial product protection with Biomaster silver ion technology and today Biomaster is the acknowledged leader in antimicrobial technology and the trusted partner of global brands.

As market leaders, we are always open to challenges about the claims we make for the efficacy of silver ion technology and we are happy to justify those claims.

In this paper we provide answers to the most frequently answered questions about silver ion technology. We also address some of the most common myths and misconceptions about the technology that we have encountered.

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How does silver ion technology work?



When silver ions are built into a substrate they bind to and damage the bacteria cell wall preventing growth.

The bacteria no longer produce energy and the DNA is interrupted, preventing replication. If a bacteria cell cannot grow, produce energy or replicate, it dies.

Unlike a chemical agent such as a disinfectant, silver ions don't 'kill' microbes. They inhibit the growth of microbes so they cannot survive on a given surface.

How effective is silver ion technology?

The technology has been rigorously tested at independent laboratories to prove efficacy and is proven to inhibit the growth of bacteria by up to 99.99%.

It also destroys many other types of harmful microorganisms such as viruses, fungi and moulds.

How long is it effective for?

It is effective for the intended lifetime of the product that it is added to. It becomes an integral part of the finished item and does not wear off or leaches out.

Is silver ion technology as fast-acting as a disinfectant?

While not as quick as cleaning chemicals, silver ion technology will achieve significant reductions in microbial load just 15 minutes and up to 99% in just two hours.

Disinfectants act much more rapidly, but their efficacy is short-lived - up to two hours at most.

Does silver ion technology affect a product in any way?

No, apart from imparting antimicrobial properties, silver ion technology does not change product appearance or mechanical properties in any way. You can't see, smell or taste it.

Is it completely safe?

The antimicrobial properties of silver have been known for centuries with no harmful effects. Silver is not toxic to humans. Silver ion technology is used in thousands of applications around the world including, medical, food and water applications.

Is there a difference between antimicrobial and antibacterial?

An antimicrobial inhibits the growth of, or acts to destroy all types of harmful microorganisms such as bacteria, fungi and moulds.

An antibacterial specifically prevents the growth of bacteria so antibacterial is a subset of antimicrobial.

In some applications it is also effective against viruses.

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Is it effective against antibiotic-resistant bacteria?

Silver ion technology has been proven effective against antibiotic-resistant bacteria such as Staphylococcus aureus (MRSA) and Vancomycin-resistant Enterococcus (VRE).

Is there any definitive data to support the efficacy of silver ion technology in reducing healthcare acquired infections?

It is widely accepted that silver ion technology could play a major part in the fight against Hospital Acquired Infections such as MRSA, however there are so many parameters to consider in a hospital environment which impact HAI's that the Department of Health has said it is impossible to produce definitive data.

For example, you could not measure the reduction of HAI's with the addition of an antimicrobial door handle because there are so many variables to consider, such as patient health in the ward, location in the hospital (intensive care or canteen?), hand-washing and frequency of use, etc.

However we have worked with the NHS to produce data with them on bacterial levels on actual products, with and without silver ion technology.

In extended trials silver ion technology showed a significant reduction in bacterial load on surfaces that were treated. This report (above, right) is available on request.

There are also several independent white papers available proving the association between surface bioburden and frequently touched sites.



Is silver-ion technology similar to nano-silver technology?

Silver nano-particles (AgNPs) are well known for their excellent antibacterial ability. However they consist of very small particles which can be easily transfer into the environment.

All nano particles are considered toxic to humans. Because of their small size they can pass through skin cells. Many countries have banned nano technology due to on-going safety concerns about the use of such small particles.

By comparison, the very smallest silver ion particle is more than twenty times bigger than the largest nano particle and does not pose any threat to humans or the environment.

Addmaster does not use any form of nanotechnology in its antimicrobial additives because of these safety concerns.

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Does silver ion technology encourage antibiotic resistance and pose a risk to human health?

Antibiotics can encourage antimicrobial resistance through overuse. However there is no evidence that silver ion technology can create antibiotic resistant strains of bacteria.

The Royal Society for Public Health has also published a report (below) exposing the myth that targeted hygiene, for example through the use of silver ion technology, is somehow also responsible for antibiotic resistance.

Addmaster has also sponsored education programmes at Aston University and showed clinicians how using silver ion technology in critical touch points can reduce the likelihood of cross contamination which could require unnecessary antibiotic use.



Does silver ion technology damage the environment?

No. Multiple migratory studies have been carried out

on products containing Biomaster and it demonstrates that silver ion technology is non-leaching and this is why it passes the strict WRAS drinking water approval and food contact testing.

Is it dangerous to rely on biocides?

It is dangerous to rely solely on biocides and the claims we make fully support this point. The best way to protect yourself from any microbe is to wash your hands and disinfect surfaces.

Biocides should never be used in place of good hygiene, but they are the perfect partner to enhance good hygiene. Cleaning will always be the most important step to protect a surface, but silver ion technology gives added protection for extra security.

Is it true that some materials are already naturally antimicrobial?

Yes, although the effects are typically unreliable and short-lived. The BPR regulations also state that for a product to be marketed as 'antimicrobial' it has to contain an additive designed for that purpose. This includes materials with naturally occurring properties.

What are the BPR regulations and what do they say about silver?

It was decided at the end of the 1990's that all biocides in Europe needed to be regulated. The result was the Biocidal Products Directive (98/8/EC) which also included the application of silver as a biocide within its scope. From 1 September 2015 a biocidal product cannot be sold if the active substances contained in the product is not included in the list. The silver ion additives used by Addmaster are also on the list of approved technologies

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Are the regulations for using silver ion technology the same worldwide?

The legislation varies regionally. Addmaster also has EPA licensed additives that can be used in the USA in conjunction with applications highlighted on the specific EPA label. The sale of treated products is allowed as long as the claims made fall within those acceptable under the treated article exemption for FIFRA.* These claims are about protecting the product itself and do not make any health claims.

Addmaster works closely with customers to ensure regional compliance.

Is silver ion technology effective against viruses?

It is highly effective against the growth and proliferation of enveloped viruses on specific substrates.

It has also been successfully tested for efficacy against non enveloped virus such as Norovirus on porous surfaces including textiles.

Is silver ion technology effective against Coronavirus?

We have very recently been able to test against the specific virus that causes Covid-19, namely SARS-CoV-2.

Initial testing is positive on porous surfaces and we are expanding the testing on other porous and non porous substrates with Biomaster.

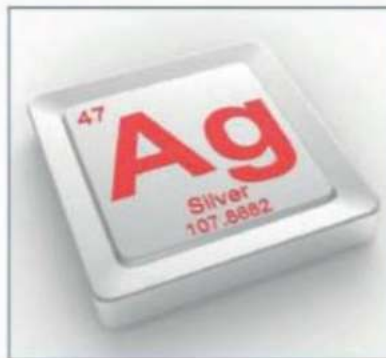
How does silver compare with zinc and copper-based antimicrobial additives?

Zinc-based antimicrobial additives are unsuitable for food and drink contact. Zinc is also incompatible with certain chemicals and can cause a reaction. Zinc is only stable up to 240°C and is only suitable for use in opaque substrates.

Copper is a pure metal additive and because of its high toxicity can only be used in a very limited

number of applications. Copper is also relatively expensive, although it has no better efficacy rate than other antimicrobial additives.

Silver is very cost effective and is a good all-round antimicrobial. It can be added to any substrate and is stable to 1000°C.



Summary

Silver has been used for thousands of years to prevent the growth of bacteria without the high toxicity associated with other metals.

Silver ion technology is also very inexpensive. Even with very low addition rates it offers incredibly durable, long lasting and highly active antimicrobial protection.

If you would like to know more about silver ion technology or the potential benefits of antimicrobial protection for your product, please contact our technical department.

* The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) is a US system of pesticide regulation.