

Deliberate metal contamination

by Tracey Thompson, Biocote Ltd, Wolverhampton Science Park, Glasher Drive, Wolverhampton, WV10 9RU, UK.

The food industry is all too aware of the rigorous legislation, the ever watchfulness of the food safety authorities and the increase in the threat of civil litigation in relation to the safety of the products the food manufacturers sell. The manufacturers constantly apply every means possible to prevent cross-contamination.

In the good practices they employ and the management systems they use they are trying to ensure that the relevant food safety measures are in place to prevent contaminated products reaching the consumer.

Despite food businesses adopting stringent hygiene, cleaning and hand washing practices, these rely on human factors and it is arguable that alone there is still the potential for contamination outbreaks to occur.

Create a good environment

One possible solution that will complement good hygiene practices and contribute to contamination control systems is to create an environment in which bacteria will not develop or survive.

This can be done by installing fixtures and fittings, furniture and equipment that have antimicrobial protection. The key ingredient in this feature is silver.

Biocote Ltd, a Wolverhampton based technology provider, has developed a patented technology utilising silver, which has the ability to help reduce the risk of cross-contamination, by inhibiting the growth of harmful microbes within the environment.

Silver has natural antimicrobial properties which gives it the power to inhibit the growth of bacteria, mould and fungi. The company has worked with the makers of equipment, furniture and instruments to incorporate silver ions into their products at the time of manufacture, thereby giving them a built-in antimicrobial protection.

The antimicrobial agent works against a wide range of micro-organisms, including those well known threats to the food and catering

industry – E. coli, salmonella, campylobacter and listeria.

Independent tests have proven that over a 24 hour period Biocote protected products have the ability to inhibit the growth of microbes on surfaces by up to 99.9%, in comparison to unprotected surfaces where they can proliferate at drastic rates.

With fewer bacteria growing on surfaces, the potential for cross-contamination decreases, thereby reducing the risks of problems such as food poisoning and spoilage.

An ion is an atom or molecule or small group of atoms that has lost or gained one or more electrons and works at a very small scale. Ions are fundamental to the survival of living cells where sodium, potassium, calcium and other ions play an important role particularly in cell membrane activity.

When silver ions are incorporated into a product at the time of manufacture they are slowly released from an inorganic matrix via an ion exchange mechanism and maintain an effective concentration on or near the surface.

As micro-organisms become present on a surface, the silver ions come into contact with the membrane of the organism. The silver ions bind with its surface and cause disruption in cellular membrane function. Once inside the cell, the silver ions target cellular thiol which is a compound critical to the production of proteins (enzymes) and denature them.

Antimicrobial effect

Many of the enzymes denatured by silver ions are needed in the production of cellular energy and once this energy source is removed, the cell cannot maintain osmotic pressure and necessary substrates will leak out of the cell and the microbe will quickly die.

Due to the nature of silver its antimicrobial effect continues for the normal lifespan of the product. It will not wear off or leach from the surface of a piece of equipment.

Antimicrobial technology can be integrated into a wide range of

materials, from plastics, to textiles and even paper.

Biocote's unique business model works by forming partnerships with companies worldwide who manufacture products that are used in environments where hygiene is a priority, such as food manufacturing plants, washrooms, hospitals and kitchens.

These companies then use the patented technology, market leading brand and the technical and marketing expertise of the Biocote team to give their products a unique advantage.

Application in the food sector

The industrial use of silver technology has its origins in the healthcare industry, with many antimicrobial products being used extensively in hospitals to help prevent superbugs such as MRSA.

However, the technology is already being incorporated into a wide range of products that can be used in the food industry, as organisations begin to realise how it can help reduce cross contamination in hygiene critical environments.

For example, Link Lockers is the only manufacturer of changing room lockers and collection units to apply the Biocote powder coating to give them antimicrobial protection.

One of their biggest markets is the food processing industry, where customers buy the lockers to reduce the risk of workers bringing dangerous bacteria into hygiene critical areas.

Comark, manufacturers of electronic measurement instruments, impregnate silver into their thermometers, data monitors and probes so that their customers' can use their instruments knowing that they are supporting existing hygiene procedures.

Biocote is increasingly seen as a significant contribution to HACCP procedures by providing a preventative control of bacterial contamination via critical contact points.

Such a diligent approach to food safety reduces the risk of cross-contamination.

The coating can be applied to a variety of materials and, therefore, becomes part of a wide range of fixtures, fittings and furniture, such as doors, door handles, curtains and ceilings.

It is, therefore, possible to create an entire antimicrobial environment, where the potential for cross-contamination is reduced to a minimum.

"The food and its supply chain know the devastating consequences of a bacterial outbreak," Matthew Harte, Biocote's managing director, told International Food Hygiene.

"By using products protected with an antimicrobial agent, businesses can help reduce the risk of an outbreak occurring and improve how they address their duty of care to their staff and customers."

The target thresholds of food contamination are being set lower and lower by legislators, enforcers and by retail customers so hygiene standards continue to be of paramount importance.

Whilst Matthew does not claim that their technology is the overall answer to preventing food poisoning, he does feel that it complements hygiene practices, working in between cleaning processes, to give equipment and instruments constant microbial protection 24 hours a day.

Proof of diligence

A food business needing to show a diligent approach to food safety may well find that the use of antimicrobial protected products can be a positive part of its evidence that highlights the preventative measures it has taken to reduce the risk of cross-contamination.

Biocote is currently undergoing a number of environmental trials, where antimicrobial products are being swabbed within an environment and compared to non protected products. The tests aim to show how effective silver is at reducing levels of microbes in a number of different environments, including a food manufacturing plant and hospital ward.

FaxNOW +44 1902 824453
✉ tracey.thompson@biocote.com