

Trains & Public Transport

Protect Your Business Against The Rise of "Superbugs"

Unique molecular bonding technology to protect against bacteria, viruses and infection outbreaks.



Goldshield® Technology

Introduction - for a safer customer environment

Goldshield®'s unique antimicrobial barrier technology provides unrivalled cleaning and disinfection armoury in the fight against infection and potential outbreaks.

Goldshield® Trains & Public Transport

In a world where we are fighting a losing battle against more resistant bacteria and viruses, the need for new technology to clean and disinfect our public transport environments has never been greater.

Public transport, which includes trains, buses and coaches transport millions of customers each day. Public transport environments need to be kept clean but can also become highly contaminated from potentially harmful microbes because of the sheer numbers of passengers in a relatively small environment. This means that microbes can easily be transferred through touch points such as grab rails for those standing, seating and the proximity to a number of frequently touched surfaces. The potential risk for the transmission of harmful microbes is therefore of concern from surfaces.

Although public transport vehicles need to be kept as clean as possible for aesthetic reasons the requirement for the environment to be as safe as possible from harmful microbes and potential global pandemics is paramount.

“Cleaning alone does not kill potentially harmful microorganisms such as Norovirus the “winter vomiting” virus, which can strike at any time”

Most normal cleaning products do not contain any form of biocide relying on physical removal of soils and microorganisms as cleanliness is the main objective. Even if they do contain some form of biocide, none can compete with the long-lasting effect of using Goldshield® known as our long-lasting “residual protection”.

Any surface in public transport that is in contact with passengers especially hands becomes a potential source of cross-infection. Surfaces can also become contaminated from passengers shedding microbes or those originating from respiratory infections. This contamination then poses a risk to other passengers and staff responsible for both driving and provide services to those passengers.

Goldshield®'s advanced technology contains a range of liquid products that can both clean and disinfect. Our products leave an invisible layer which is completely safe to passengers and staff but carries on killing harmful microbes for potentially days after a single application.

Using Goldshield® will provide your passengers and staff with “peace of mind” that your environment is not just visibly clean but microbiologically clean as well thereby providing a safer environment for your passenger.



How Goldshield® works

Goldshield®'s persistent residual antimicrobial barrier protection technology

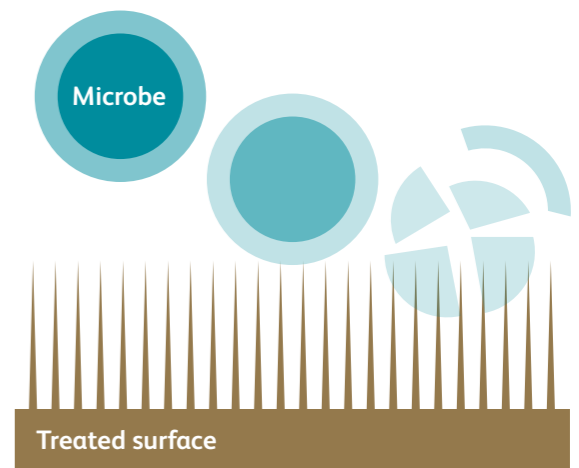
- The microbe lands on the treated surface
- The microbe is then pulled onto the molecule by strong electrostatic forces
- The microbe is then pierced and killed
- The analogy is “a bed of molecular nails”

Goldshield®'s technology forms a covalent bond which allows it to remain affixed to any hard or soft surface including textiles. The surface is positively charged generated by a nitrogen molecule, which pulls in negatively charged microbes. Through a long carbon chain, this unique assembly penetrates the cytoplasmic membrane physically stabbing the cell releasing ions, denaturing proteins and causing cytoplasm to leak so the cell is then destroyed. This renders the microbe dead and incapable of any adaption.

Goldshield® uses a technology that not only cleans and disinfects any surface but also protects it from microbes that land on the treated surface once it is dry.

Extensive clinical trials have shown the product will remain active for at least 24 hours and for up to 7 days with a single application, depending on the product chosen and the type of surface treated.

For many years cleaning and disinfection has relied upon old technologies that have failed to evolve and keep pace with microorganisms that are becoming ever more difficult to treat.



The need for new products that are safe to use, sustainable and are as environmentally friendly as possible has never been greater, Goldshield® fits this need.

Goldshield® is an innovative solution to reduce the risk of cross-infection, providing a more effective solution that can be easily implemented without causing any business interruption whatsoever.

Why use Goldshield®?

Goldshield® is a silicone based polymer that for many years was used in the treatment of textiles to provide both hydrophobic and antimicrobial properties. Our R&D team were able to adapt this technology to provide a water based solution and a molecule capable of forming a covalent bond with hard and soft surfaces. This meant that we now had a biocidal product capable of being used on hard and soft surfaces that provides a durable antimicrobial mono-molecular layer protecting the surface for extended periods.

Goldshield® is a product that:

- Provides an anti-microbial surface once dry
- Is a broad spectrum biocide
- Is Water based
- Covalently bonds to any surface making it difficult to remove
- Microbiologically protects surfaces over long periods of time
- Is safe and simple to use
- The analogy is “a bed of molecular nails”

Why is this of benefit?

Disinfectants of which there are many, are important to control pathogenic or harmful microorganisms as if there are any on a surface potentially capable of causing infection, removing them by cleaning and killing them by disinfection minimises that risk. Many products contain both detergent and disinfectant and are termed sanitisers. Products containing powerful agents such as chlorine or more recently chlorine

dioxide, have excellent microbicidal properties but can be damaging to surfaces and can have health & safety issues depending on their concentration.

When these products are applied they remove the pathogen but only at that point in time and if the source of the pathogen remains the surface will re-contaminate after approximately 2 hours and with other potentially harmful (and non-harmful) microorganisms. Goldshield® is not only microbicidal at point of use but also carries on protecting the surface to a level that minimises the risk of cross-contamination. Other disinfectants cannot provide this extended antimicrobial activity.

Goldshield® and routine cleaning processes

Goldshield® does not replace cleaning as this remains an important part of the process and as an acknowledgement of this we have a sanitiser in our range that both cleans and disinfects. A surface has to be thoroughly clean before the application of Goldshield®. The reason cleaning is important is that during the course of the day surfaces become “dirty” and need to be cleaned to remove this soil and for aesthetic reasons. Moreover, if surfaces were not cleaned regularly even with microfiber and normal detergent soils such as body fat (the “smudge” we see on glass) will build up and both protect and provide nutrients for microorganisms held within.

Goldshield®’s covalent bonding means that it remains active even if the treated surface is cleaned by physical and even chemical action.

Goldshield® has a product that:

- Is not removed by routine cleaning
- Enhances cleaning
- Provides a surface that is microbiologically clean in excess of 24 hours



Industry Sectors

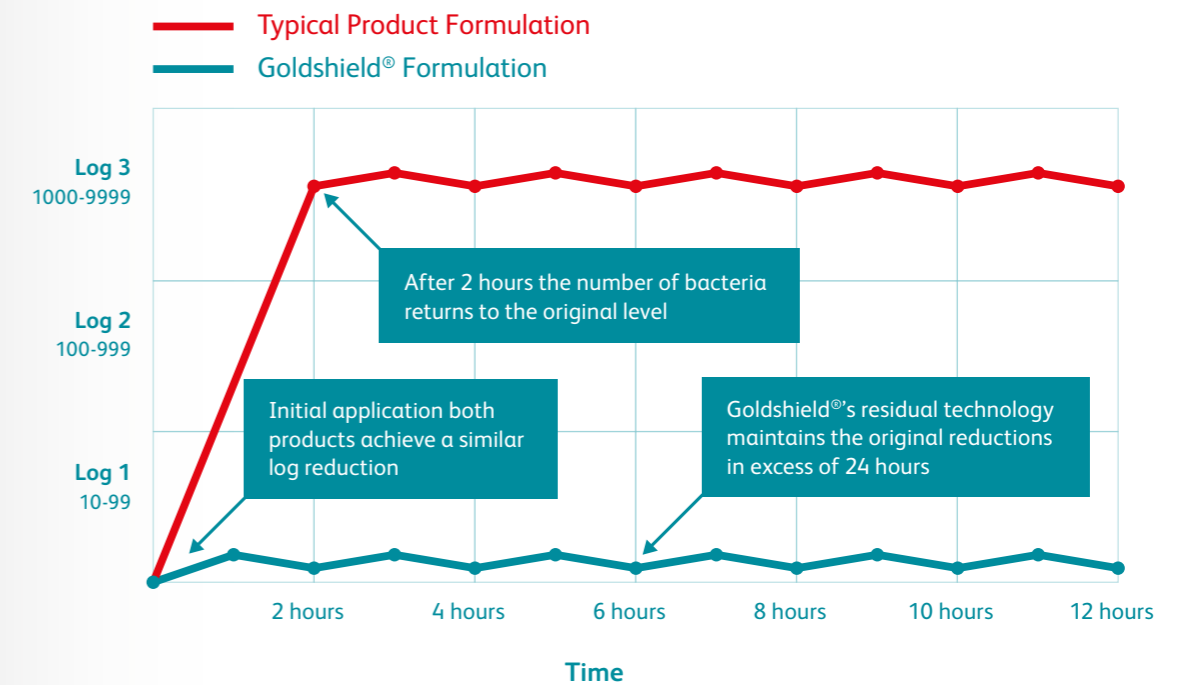
Protecting health, welfare and environments
and redefining new standards for infection control

- Transport & Logistics
- Hotel, Catering & Leisure
- Healthcare
- Veterinary
- Laundry & Textiles
- Agriculture & Horticulture
- Workplace & Education
- Care Homes
- Domestic Household



Formulation

Goldshield® compared to non-residual sanitisers



Goldshield®'s unique technology differs to other similar technologies in that it not only kills microorganisms but also leaves a residual layer on any surface once dry. Most other formulations contain quaternary ammonium compounds only (QAC) as the main biocidal active, which is not capable of leaving an antimicrobial barrier once dry.

In the environment, residual activity is important because even though after disinfection, the levels of environmental bacteria are reduced, they soon recover as the surface is re-seeded from the air, people and animals shedding microorganisms and touching surfaces and other sources.

Goldshield® provides a protective layer that has been shown in a number of tests to remain for periods in excess of 24 hours. Also because Goldshield® has a unique covalent bond, it is able to remain on the surface even if it is subsequently cleaned with normal detergents

after application as cleaning is important to remove soils such as dirt and body fat. This is represented on the graph above, which is a visual representation to show the principle. The numbers of bacteria and levels of kill will vary depending on the environment.

Goldshield®'s ability to create this protective layer after cleaning and disinfection, reduces the potential for cross-contamination/infection of potentially harmful pathogens in all areas of application in our industry sectors. This will create a safer environment in a world where we are seeing more and more antibiotic resistant strains of bacteria and viral pandemics. Goldshield®'s technology therefore provides a safer environment by providing a protective shield, wherever it is applied giving confidence that surfaces remain hygienic for hours or even days after application.

Goldshield® Products

Goldshield® offers a range of products in various forms



Alcohol-free Hand Sanitiser & Skin protector

- Long lasting protection
- Effective for up to 24 hours
- Moisturises skin
- Unique water based technology
- Kills 99.999 % of microbes



Key Areas Of Use

Varying sizes and formats for use for use by staff to protect their hands from harmful microbes.

Just one application offers up to 24 hours protection.

This product has been tested and is effective against virtually all commonly occurring bacteria, yeast and viruses that are know to be highly transmittable and can result in infection and illnesses. It is perfect for use where the highest standards of hand hygiene are required and is suitable for use in healthcare and food processing environments.

Disinfectant with Residual Anti-Microbial Barrier

- Unique molecular bonding technology
- Long lasting continual protection
- Minimizes cross-contamination
- Alcohol-Free & Non-Corrosive
- Kills 99.999 % microbes



Key Areas Of Use

To be used after basic cleaning to disinfect all hard floors and all surfaces. e.g. passenger environment, hand rails, fabrics and driver's cabins.

Just one application offers 14 days continual protection.

Unlike most disinfectant cleaners which commonly use chlorine as their active ingredient, Goldshield uses a water-stabilised organosilane formula. Typical disinfectants or inhibitors used in hospitals generally provide no more than ten minutes to two hours of residual protection.

Cleaner and Disinfectant with Residual Anti-Microbial Barrier

- Unique non-leach molecular bonding technology
- Long lasting 24 hour continual protection
- Minimises cross-contamination
- Kills 99.999 % of microbes
- Alcohol free & non-corrosive



Key Areas Of Use

Two in one product to clean and disinfect all hard floors and all surfaces. e.g. passenger environment, hand rails, fabrics and driver's cabins.

Just one application will provide continuous protection

This product is highly effective as a cleaner and disinfectant against bacteria, mycobacteria fungi, viruses and spores and has excellent cleaning properties. It is designed to be used a deep cleaner prior to the application of GS75.

Food Grade Surface Cleaner and Disinfectant

- Unique non-leach molecular bonding technology
- Long lasting continual protection (up to 24 hours)
- Minimises cross-contamination
- Kills 99.999 % of microbes
- Alcohol free & non-corrosive



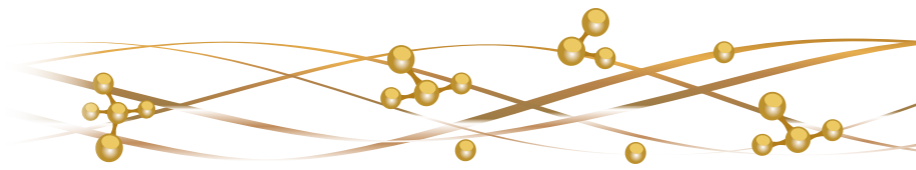
Key Areas Of Use

For cleaning and disinfection on-board catering facilities.
Just one application will provide up to 24 hours of protection.

This product is specifically designed for use within the food processing /handling facilities. It is non-leaching, has no fragrance and has no migration risk.



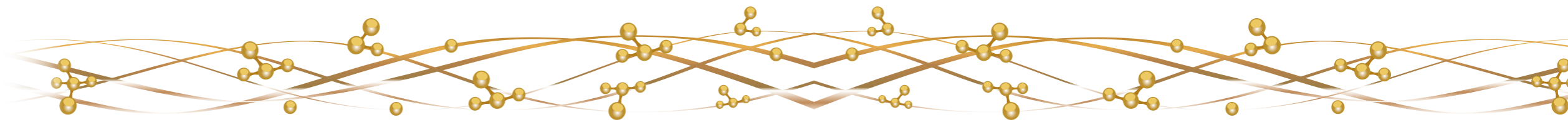
Goldshield®'s advanced product range is incredibly versatile and provides long-term "residual" protection that cannot be achieved using typical cleaning and disinfection products.



Organisms Tested Against Goldshield®

| Bacteria | Fungi | Viruses |
|---|--------------------------|-------------|
| Acinetobacter spp | Yeast | Avian Flu |
| Bacillus cereus | Candida albicans | HIV B |
| Burkholderia cepacia, | Saccharomyces cerevisiae | Influenza A |
| Clostridium difficile | | Norovirus |
| Enterobacter spp | | SARS |
| Enterococcus spp | | |
| Escherichia coli | | |
| Klebsiella pneumoniae | | |
| Listeria monocytogenes | | |
| Mycobacterium tuberculosis | | |
| Pseudomonas aeruginosa | | |
| Salmonella typhosa | | |
| Staphylococcus epidermidis ¹ | | |
| Streptococcus faecalis | | |





Sales & Enquiries

Goldshield® Technologies LTD
Top Floor
Waterloo Chambers
Fir Vale Road
Bournemouth
BH1 2JL
+44 (0) 800 98 78 050

Distribution & Delivery Enquiries

Goldshield® Technologies LTD
Unit C
Lincoln Lodge Farm
MK19 7HJ
+44 (0) 1908 745 539

Goldshieldtech.co.uk