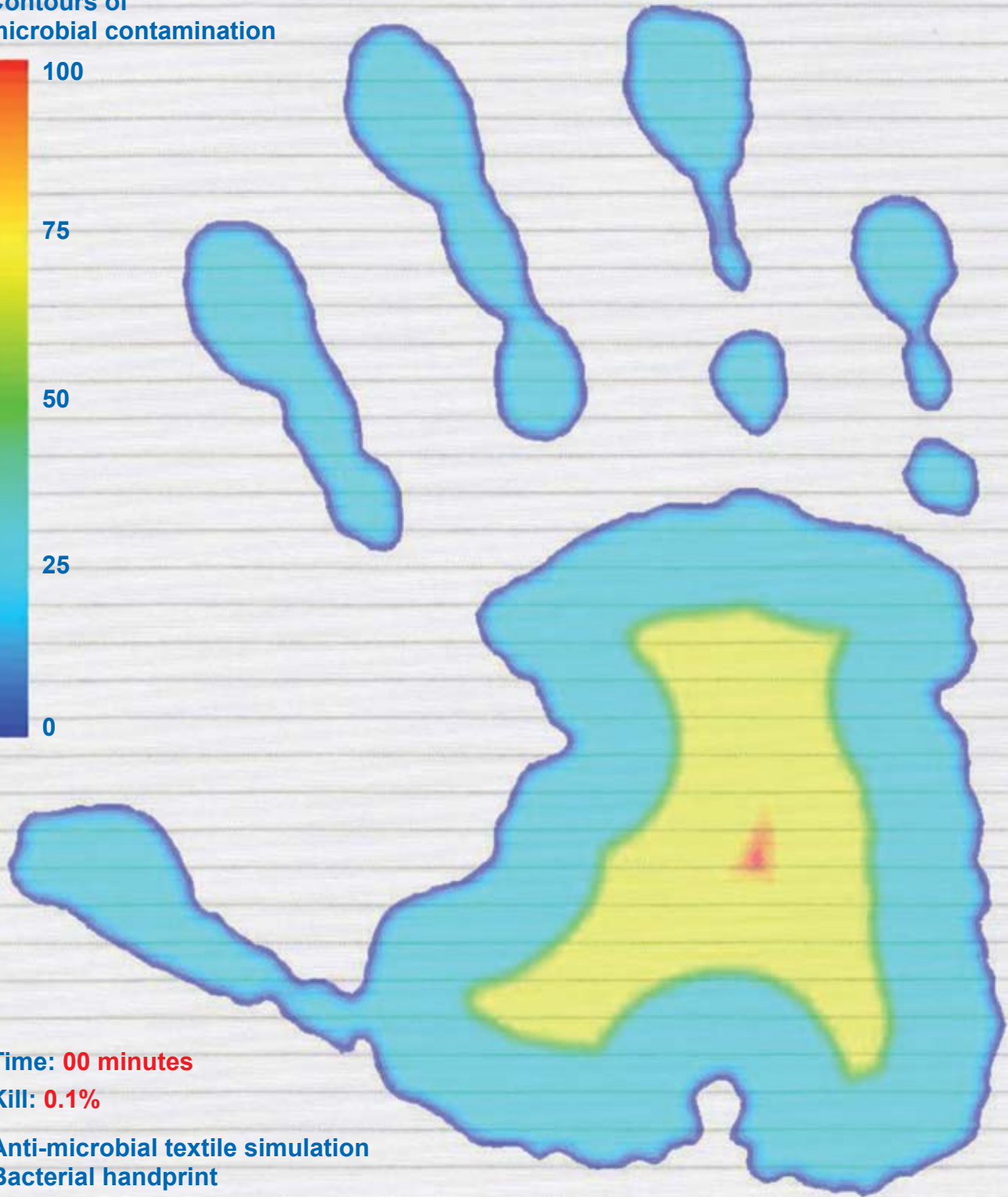


Contours of microbial contamination



Time: 00 minutes

Kill: 0.1%

Anti-microbial textile simulation  
Bacterial handprint

See it SAFE<sup>®</sup> – delivering anti-microbial solutions

**'TORAY'**  
See it S<sub>AFE</sub><sup>®</sup>  
visible protection  

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See it SAFE®, with X-STATIC®  
fibre is a textile product proven  
to eradicate MRSA.

## See it SAFE® textile technology

### See it SAFE® anti-microbial textile produced by Toray Textiles Europe Limited.

See it SAFE® is manufactured with X-STATIC® silver fibre as the active agent carrier. This unique technology has a layer of pure silver permanently bonded to the surface of a textile fibre that is woven into the fabric. This fibre system is used to prevent harmful bacteria from proliferating, mutating or being transmitted from the product. The silver fibre retains traditional textile and tactile characteristics that can be used in woven fabrics. The anti-microbial agent is inherent in the fabrics and active for the life of the product.

An extensive range of technical textiles has been created for a variety of end uses and organisations, including those operating in healthcare, pharmaceuticals, food preparation, catering and retail sectors.

See it SAFE® is specifically designed to defeat the threat of microbial sources. The fabrics within the range are re-useable, technologically advanced and lightweight; providing comfort and protection.

See it SAFE® provides hygiene protection when in contact with the human skin. A self sanitising product that provides the foremost preventative textile barrier against cross-infection from localised environment.

See it SAFE® is the ultimate anti-microbial fabric solution – a fabric system uniquely suited to meet several needs of both consumer and industrial markets.

- Anti-microbial
- Anti-odour
- Anti-fungal
- Anti-static
- Thermo-dynamic

The properties of See it SAFE® fabrics signify a dramatic advancement in anti-microbial textile technology, See it SAFE® is manufactured by Toray Textiles Europe Limited awarded the internationally recognised Oeko-Tex certification.





See it SAFE<sup>®</sup> is interwoven with X-STATIC<sup>®</sup> silver fibre. It is the ultimate anti-microbial fabric solution.

### See it SAFE<sup>®</sup> – the ultimate anti-microbial fabric solution

---

Microbial infestation poses danger to both living and non-living matters. Microbes are the tiniest creatures not seen by the naked eye – including a variety of micro-organism like bacteria, fungi, algae and viruses.

The healing properties of silver are well renowned and See it SAFE<sup>®</sup> combined with X-STATIC<sup>®</sup> silver fibre the active agent carrier, offers all the benefits known to be inherent to pure silver, as a textile fibre to eliminate microbial infections.

See it SAFE<sup>®</sup> is interwoven with X-STATIC<sup>®</sup> silver fibre. It is the best anti-microbial fabric solution on the market, yet it is the fibre system that is uniquely suited to meet several additional demands:

- Anti-microbial
- Anti-odour
- Anti-static
- Anti-fungal
- Anti-linting
- Heat regulating
- Therapeutic





## Why See it SAFE® is so effective

Most anti-microbial fabrics are tested over 24 hours. See it SAFE® eliminates 99.9% of tested bacteria **in less than one hour of exposure.**

### **Catalysts**

The hotter and wetter the environment, the more effective See it SAFE® becomes, as bacteria are more prevalent in these conditions.

### **Anti-odour**

The silver yarn inhibits the growth of odour-producing bacteria. The silver ions also bind with ammonia and denatured proteins, resulting in bacterial odour reduction.

### **Anti-static**

Silver is the most electrically conductive element. The non-conductive materials rubbing together normally create an electrical charge. The pure silver yarn in the product instantly dissipates these and remains static free and helps the end user to remain comfortable.

### **Anti-fungal**

See it SAFE® interferes with the reproductive sequence in fungal spore, which acts on the fabric structure to break down the textiles and reduce the functionality and performance of the fabric.

### **Anti-linting**

Using fibre filament technology, See it SAFE® significantly reduces the linting of the textile product, limiting particle release and reducing the risk of carriage through airborne particles.

### **Thermo-dynamic**

Besides eliminating bacteria and odours, silver is thermally the most conductive and reflective element. Conduction, the primary cause of body heat loss in hot temperatures, is accelerated due to the conductivity of the fibre. See it SAFE® will help regulate temperatures. When used in sheeting, for example, it will help to keep the body cool in warm climates and warm in cool climates.

### **Natural element**

See it SAFE® is made with pure silver, a naturally occurring element.

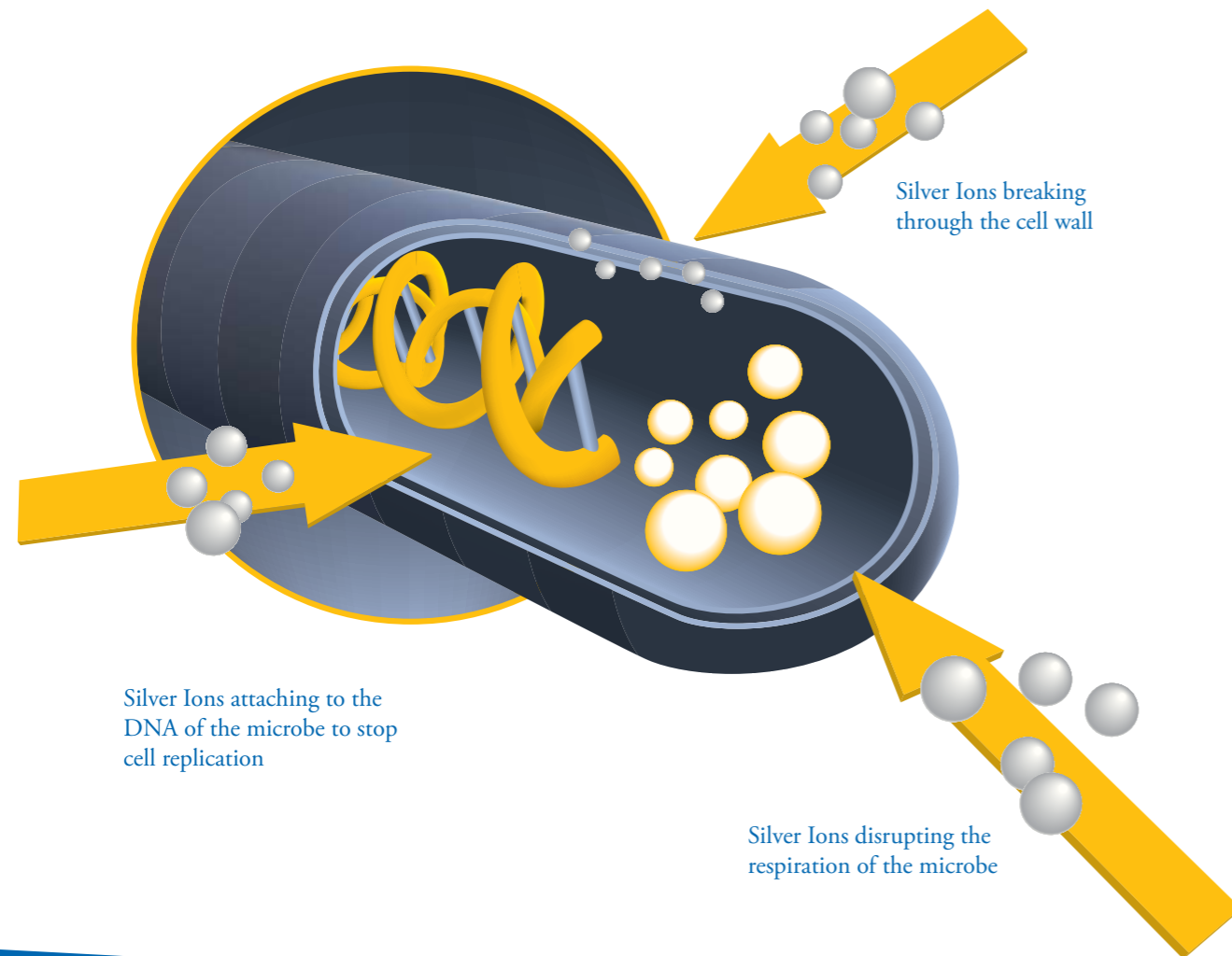
### **Permanent**

See it SAFE® is not a surface treatment. Silver is irreversibly bound to a polymer as a physical part of the fibre. See it SAFE® is permanent and performance does not diminish over time. See it SAFE® has been tested for more than 100 washes with virtually no reduction in anti-microbial performance.

See it SAFE® is made with pure silver,  
a naturally occurring element.



# Anti-microbial activity of ionic silver



Electron release of the silver “works on an intra-cellular level, disrupting the DNA of micro-organisms on the fabric and effectively suffocating microbial activity.”

## Why choose See it SAFE®

See it SAFE® is a licensed product range of anti-microbial fabrics.

See it SAFE® provides visible protection and removes doubt: the silver fibre is clearly visible in the final product making it the only textile product guaranteed to actually have the active ingredient present.

### Best practice

All test data shows that up to a level, the more silver present – the better the results.

### Permanent

See it SAFE® will last as long as the fabric – tested to over a hundred industrial washes.

### Effective

See it SAFE® kills 99.9% of bacteria within one hour, including MRSA.

### Improved performance

In environments that suit bacteria growth, all textile products within the healthcare environment would benefit from the See it SAFE® range.

- Nightwear
- Bed linen
- Patient gowns
- Surgical gowns
- Scrub suits / Clean air suits
- Drapes
- Coats
- Work-wear
- Uniforms
- Footwear

## How See it SAFE® works

### Ionisation

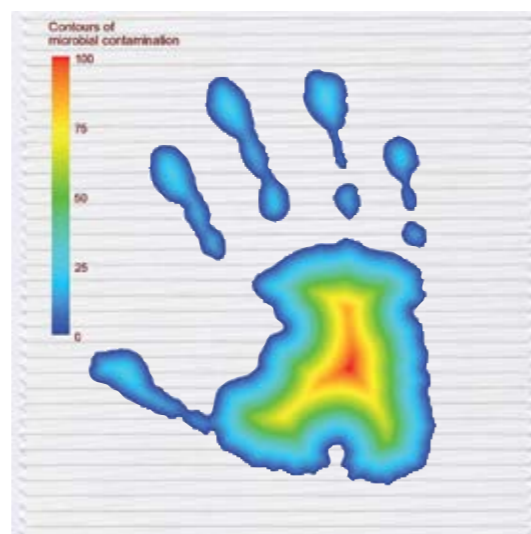
- Electron release of the silver “works on an intra-cellular level, disrupting the DNA of micro-organisms on the fabric and effectively suffocating microbial activity.”

### Mechanical

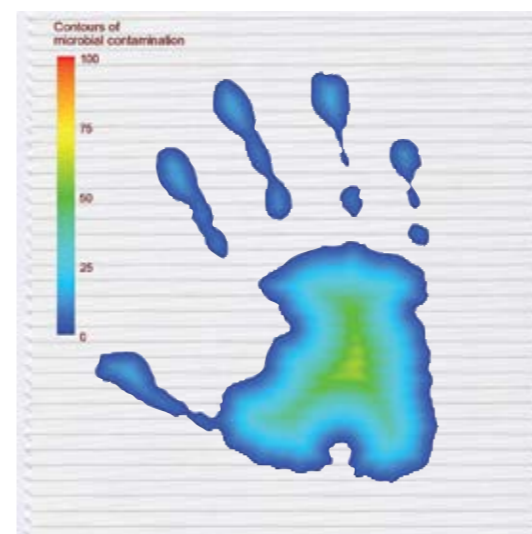
- A non-chemical process, so does not replace one “anti” with another.
- Thermo dynamic – cools when warm, warms when cool.
- Neutralises odour – works in the same way as anti-microbial properties by binding with ammonia, denatured proteins and killing the bacteria that produce odour.
- Non-allergenic – no reported cases in twenty years use of silver fibre.
- Anti-static – dissipates static electricity.



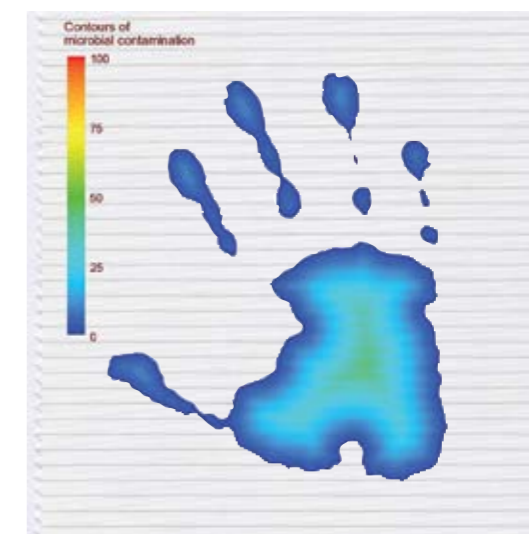
# Visualising the effectiveness of See it SAFE<sup>®</sup> fabric to eradicate MRSA contamination



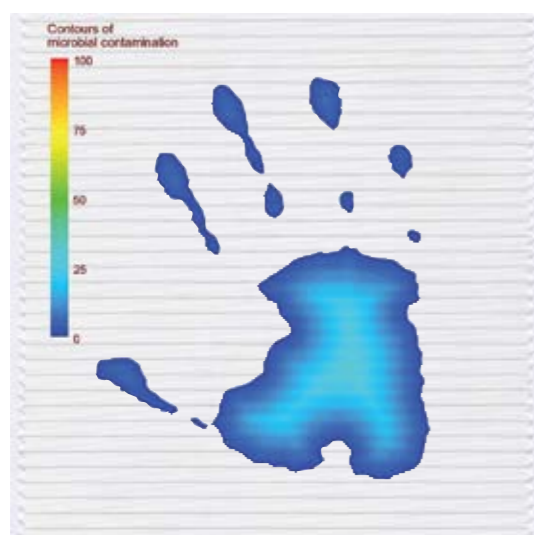
Time: 00 minutes Kill: 0.1%



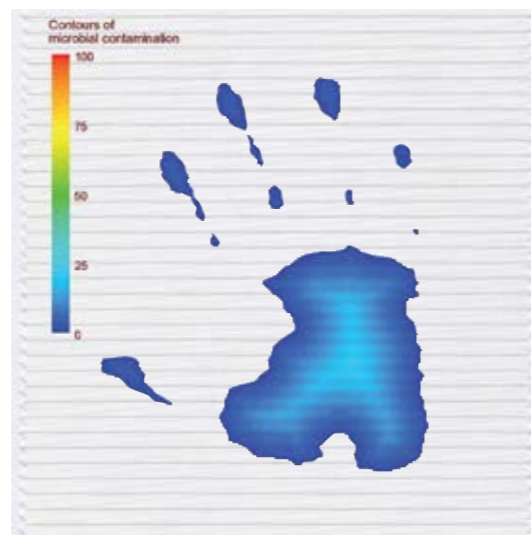
Time: 10 minutes Kill: 45.8%



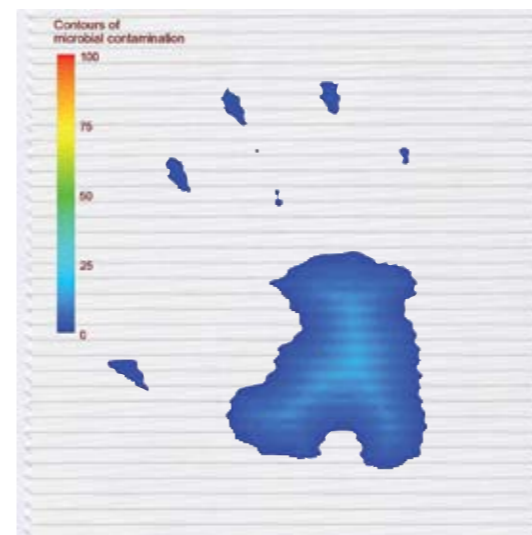
Time: 15 minutes Kill: 60.3%



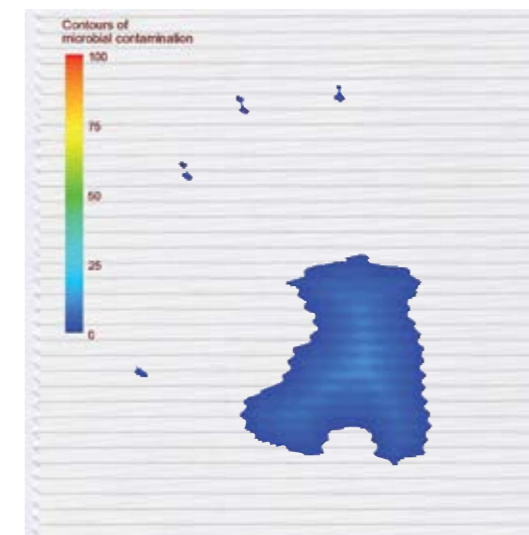
Time: 20 minutes Kill: 70.6%



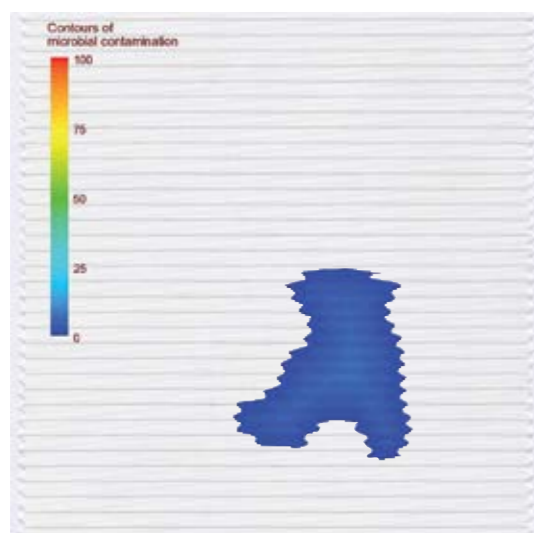
Time: 25 minutes Kill: 78.4%



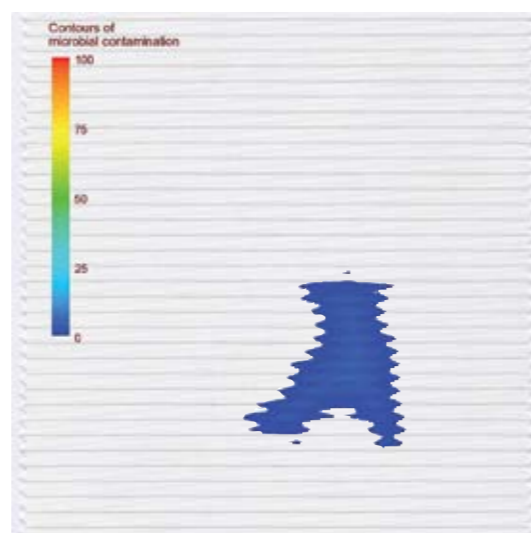
Time: 30 minutes Kill: 84%



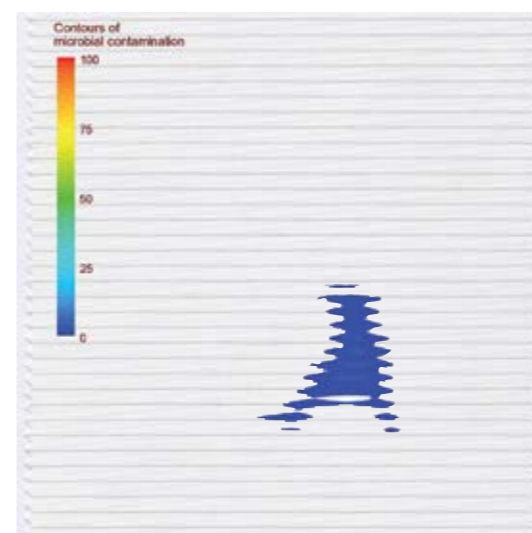
Time: 35 minutes Kill: 88.7%



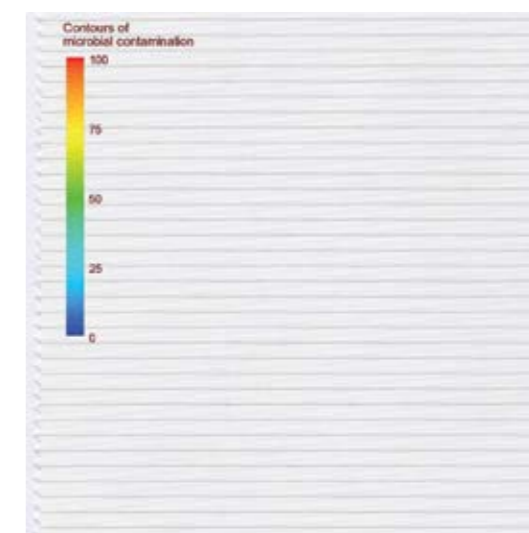
Time: 40 minutes Kill: 91.3%



Time: 45 minutes Kill: 94%



Time: 50 minutes Kill: 98.4%



Time: 59 minutes Kill: 99.9%





The anti-microbial agent in See it SAFE<sup>®</sup> fabrics is present and active for the life of the product.

## A product you can trust

Toray Textiles Europe Limited biocidal and medical fabric range is specifically designed to help defeat the threat of microbial sources. See it SAFE<sup>®</sup> fabrics are re-useable, self-sanitising, technologically advanced, lightweight, comfortable and help reduce the risk of bacterial infection.

The anti-microbial agent in See it SAFE<sup>®</sup> fabrics is present and active for the life of the finished product.

See it SAFE<sup>®</sup> fabrics are 98% continuous filament polyester fibre construction with 2% X-STATIC<sup>®</sup> silver fibre and are lint free – a requirement of EN 13795 for re-usable clothing and drapes i.e. resistant to microbial penetration, efficient wash performance, clean and lint free.

## Standards

### Anti-Microbial Testing

See it SAFE<sup>®</sup> anti-bacterial efficacy tested to standards AATCC100, AATCC147, JIS L1902 and EN ISO 20645, determined by Agar plate diffusion test method for test organisms: Staphylococcus Aureus (Methicillin Resistant SA) ATCC 6538, Escherichia Coli ATCC 11229, Klebsiella Pneumoniae ATCC 4352.

### Wash Performance

These fabrics, in combination with regular appropriate laundering, have been designed to continue to give effective protection. For healthcare requirements, temperatures up to 71°C can be used to achieve thermal disinfection, as per document HSG(95)18.

See it SAFE<sup>®</sup> products do require cleaning and should not be considered either as a replacement or an alternative to good hygiene practices. However, they do provide the optimum level of due diligence currently available against the proliferation of disease-causing bacteria in a wide range of areas where there is a potential for growth.

### Regulation

See it SAFE<sup>®</sup> nightwear and bed linen for consumer and healthcare hygiene protection fall within the scope of the Biocidal Products Directive 98/8/EC.

**Use biocides safely. Always read the label and product information before use.**

See it SAFE<sup>®</sup> medical product range is within the scope of The Medical Device Directive 93/42/EEC.

See it SAFE<sup>®</sup> assists with compliance of the **HEALTH ACT 2006** Code of Practice for the Prevention and Control of Health Care Associated Infections.

### In particular:

- A duty to protect patients from Health Care Acquired Infection.
- A duty to assess risks of acquiring HCAI and to take action to reduce or control such risk.
- A duty to provide and maintain a clean and appropriate environment for healthcare.
- A duty to ensure, so far as reasonably practicable, that health care workers are free of any, and are protected from exposure to, communicable infections during the course of their work, and that all staff are suitably educated in the prevention and control of HCAI.



# Toray has an expansive range of See it SAFE<sup>®</sup> products engineered to combat the spread of Health Care Acquired Infections



## Stay in See it SAFE<sup>®</sup> hands

Super-bugs are on the increase. In the UK alone it is reported that 1 in 9 patients has a Health Care Acquired Infection at any one time. Toray Textiles Europe has an extensive range of See it SAFE<sup>®</sup> technical fabrics engineered for use within the healthcare sector to combat the spread of Health Care Acquired Infections.

See it SAFE<sup>®</sup> kills 99.9% of bacteria within one hour – including MRSA.

### Key Facts †

- It is estimated 12% of hospital in-patients acquire an infection while in hospital.
- There are at least 300,000 HCAs a year.
- Around 5,000 deaths each year can be primarily attributable to HCAs and in a further 15,000 cases it might be a substantial contributor.

† Sources: House of Commons. Committee of Public Accounts. Forty second report: the management and control of hospital acquired infection in acute NHS trusts in England, together with the proceedings of the Committee relating to the report, the minutes of evidence and appendices. Session 1999–2000. London: The Stationery Office, 2000. Chairman: David Davis. (HC 306). The National Audit Office.

Sources of possible contamination in the healthcare environment include:

- Linting of textiles acting as vectors carrying the microbes through the environment. This is prevalent when changing bed sheets and curtains due to the disruption of dust particles through this action.
- It is reported 80% of all nurses' uniforms in the UK are laundered at home.
- Skin shedding of colonized personnel.

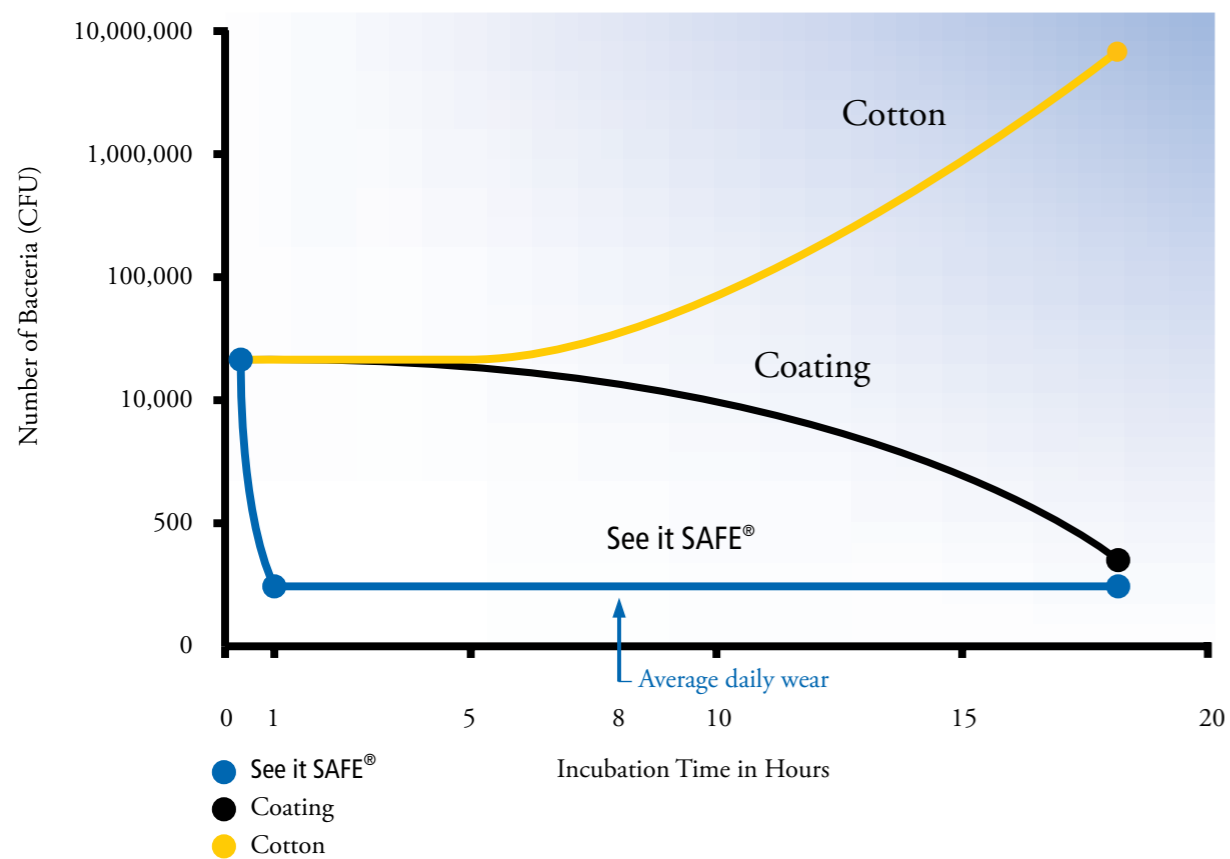
Fact: one human male sheds approximately 4,000 squamae per minute (dead skin cells). Four microbes of MRSA can exist on each squamae and un-impeded can divide every 60 minutes, therefore over time:

- 4,000 x 4 = 16,000
- Hour 1 = 32,000
- Hour 4 = 256,000
- Hour 8 = 4,096,000



# Clinical trials allow us to prove the effectiveness of the See it SAFE<sup>®</sup> anti-microbial range of fabrics

Textile Bacteria Incubation Comparison



## Clinical trials

See it SAFE<sup>®</sup> pyjamas and bedlinen trialled in the UK aim to prove MRSA can be eradicated from the skin, thus protecting vulnerable patients. The result of the clinical trial will be released by December 2007; interim results from the clinical trial are statistically significant.

The skin, as the largest organ of the human body, is a complex mixture of functional and protective cells. When the skin is compromised, a wound is created. Wound protection must include protection against microbiological stresses.

See it SAFE<sup>®</sup> product range transforms the way we tackle certain infections. MRSA is a bacterium that can live completely harmlessly on the skin of healthy people but can lead to serious infection if it enters the bloodstream. Clinical trials allow us to prove the effectiveness of See it SAFE<sup>®</sup> anti-microbial range of fabric.

See it SAFE<sup>®</sup> provides hygiene protection in contact with the human skin. It works by sanitising the skin in close proximity to the fabric and provides the foremost preventative textile barrier against cross-infection from the localised environment. The dual benefit of our anti-microbial fabric means we can tackle infection and prevent cross contamination as the fabric becomes a barrier.





The only significant “self help” preventative measure in the fight against MRSA.

### Assisting in protecting the community and environment

No longer is susceptibility to MRSA infections restricted to hospitalised patients. The entire population is at risk by the increasing presence of MRSA bacteria in the community environment.

It is recommended that patients wear See it SAFE® pyjamas prior to, during and after their visits to hospital to help protect them from MRSA infection. The fibre system woven throughout the garments eliminates 99.9% of germs in less than one hour, which will help combat the effect of MRSA during hospital stays.

### Benefits to the retail sector

The increasing frequency of anti-microbial resistance among infectious organisms is of great concern to both medical providers and the general public. The public needs to be alerted to this potentially devastating threat. MRSA can be picked up just about anywhere, from hospitals, schools and workplaces to your own kitchen or bathroom. Any open wound, even a scraped knee or a minor cut, is susceptible to infection. Children playing sports are at greater risk because they share equipment and have skin contact, which are both common causes of infection.

See it SAFE® anti-microbial range of nightwear and bed-linen is available to the public and private domain to reduce the risk of bacterial infection and protect the wearer from contamination from the surrounding environment. See it SAFE® is the only significant “self help” preventative measure to protect oneself against the potential of contracting MRSA.

See it SAFE® reduces the risk of the wearer being contaminated from the environment but also reduces the risk of the environment getting contaminated from the wearer – 1 in 3 people are known staphylococcus carriers. See it SAFE® can help prevent infection from the environment, prevent infection of open wounds and speed up the healing process.

The healing properties of silver are well renowned and See it SAFE®, combined with X-STATIC® silver fibre, offers all the benefits known to be inherent to pure silver as a textile fabric to eliminate microbial infections.



The hotter and wetter the environment, the more effective See it SAFE<sup>®</sup> becomes.

### Benefits to food preparation industry and catering sector

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In the food preparation industry and catering sector, all food handlers should wear clean protective clothing. Protective work-wear is worn to protect the food from risk of contamination as most people carry some type of bacteria organism at one time or another. The dual benefit of wearing See it SAFE<sup>®</sup> anti-microbial work-wear reduces the risk of cross contamination of bacteria.

See it SAFE<sup>®</sup> can reduce the risk of spread of unwanted bacteria and also protect the wearer from microbial infestation.

See it SAFE<sup>®</sup> products are comfortable and thermo-dynamic and available in “bespoke uniform” and work-wear, chef jackets, chef trousers and butchers apron.



The anti-microbial effect of See it SAFE<sup>®</sup> with X-STATIC<sup>®</sup> comes from ionic silver. It is virtually impossible for relevant bacteria to develop resistance to it.

## Benefits

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See it SAFE<sup>®</sup> anti-microbial products:  
“A silver lining in preventing infections.”

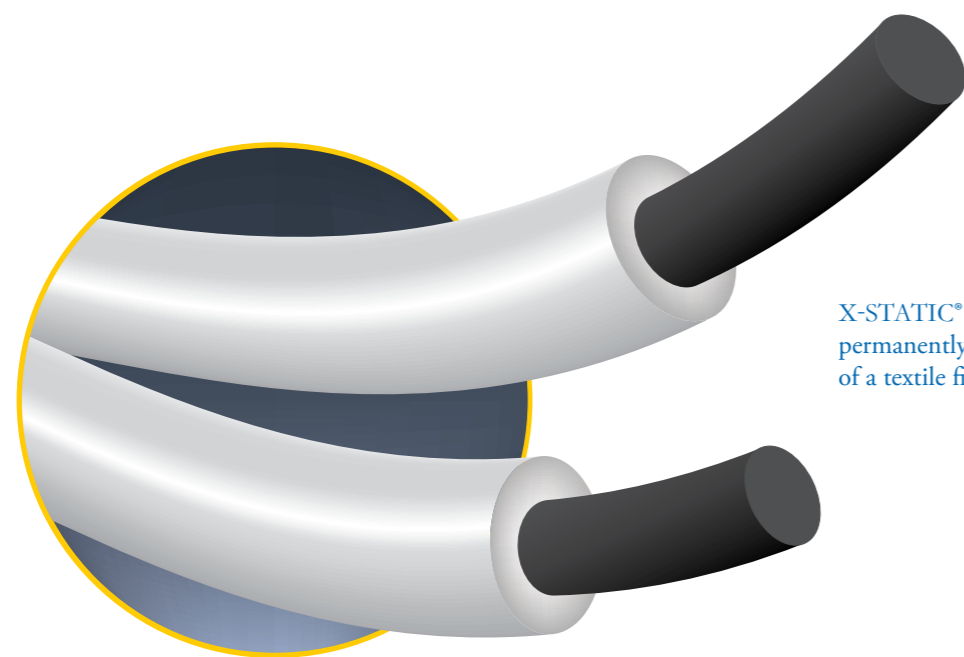
Infection control is at its very best when it prevents infection from occurring, consequently the benefits of See it SAFE<sup>®</sup> technology are both preventing and treating infection.

The anti-microbial production in See it SAFE<sup>®</sup> with X-STATIC<sup>®</sup> comes from ionic silver. It is virtually impossible for relevant bacteria to develop resistance to it.

In addition to the healthcare benefits, the financial benefits of See it SAFE<sup>®</sup> are derived from a reduction in product and nursing costs, reduced risk of systemic infection and associated costs and reduced use of antibiotics, therefore by removing the need for antibiotics means antibiotic resistance is not a threat.

See it SAFE<sup>®</sup> presence in the healthcare sector can provide added protection for patients, staff and visitors. Preventing infection can save significant costs and address hospital bottlenecks by speeding up the patient process by eradicating infection. Shorter stays and reduced treatment time typically mean lower costs.





X-STATIC® has a layer of pure silver permanently bonded to the surface of a textile fibre.

The unique and proprietary manufacturing process metallises a silver layer to the substrate fibre while maintaining the supple textile hand.



All of the inherent benefits of silver are made available in a new format – See it SAFE® fabrics manufactured with X-STATIC® silver fibres.

### The power of silver

The use of silver for medical and therapeutic benefits dates back thousands of years. Hippocrates (the “father of medicine”) taught that silver healed wounds and controlled disease. Romans were the first to publish and document the “magical healing” powers of silver when used to cover wounds to speed up the healing process. The King of Persia would only let his troops go to war if they carried water in silver vessels – something he knew would keep the water supply clean and safe.

Modern Western medicine reflects what the Romans believed and recognises silver as the most effective anti-microbial agent, natural or otherwise.

Today, silver is used for its broad-spectrum anti-microbial properties in healthcare products ranging from bandages to burn care treatment – almost any product where infection control is critical.

### Noble Biomaterials, Inc. – Makers of X-STATIC®

- Gear with X-STATIC® has been touted by NASA astronauts and U.S. Special Forces.
- Products featuring X-STATIC® technology deliver unmatched performance and protection.
- Researched and tested for more than 10 years by leading institutions around the world and widely accepted in the medical, defence and high-tech industries.
- X-STATIC® silver technology is used in many FDA approved products.
- X-STATIC® is registered as an anti-microbial by the Environmental Protection Agency (USA).
- In addition to its superior anti-microbial properties, silver technology is heat reductive and heat reflective, making X-STATIC® materials cooler in the summer and warmer in the winter.

X-STATIC® has a layer of pure silver permanently bonded to the surface of a textile fibre.

The unique and proprietary manufacturing process metallises a silver layer to the substrate fibre while maintaining the supple textile hand. All of the inherent benefits of silver are made available in a new format – See it SAFE® fabrics, manufactured with X-STATIC® silver fibre.



Toray, delivering tomorrow's solutions, today.

## Toray Textiles Europe Limited Together: delivering tomorrow's solutions, today.

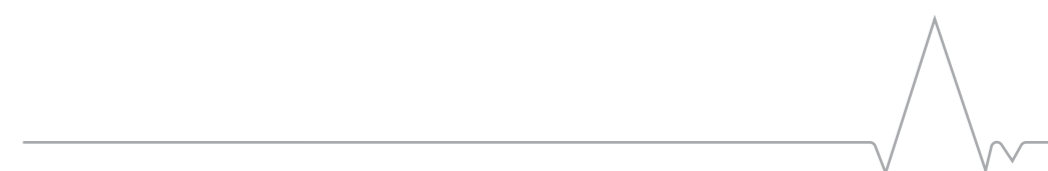
Toray Textiles Europe Limited based in Mansfield, Nottingham UK, is a wholly owned subsidiary of Toray Industries Inc., and is the largest manufacturer of woven polyester and nylon fabrics in Europe. We are renowned for our high levels of customer service, innovation, technical expertise and product quality.

Toray Textiles Europe Limited is committed to fulfilling the global requirements of customers, employees and shareholders, by adding value and excellence through innovation, quality and service in textile related products, whilst upholding our social responsibility to health, safety and the environment.

## Working Together in Partnership

Toray See it SAFE® is a branded licensed anti-microbial product range. Toray Textiles Europe Limited works in exclusive partnership with Noble Biomaterials, Inc. – Makers of X-STATIC® – to produce this type of product range, ensuring our substantial investment in developing these products will not be copied by others.

We choose our partners carefully. Only those companies with the vision and commitment to share our passion for the potential benefits of the See it SAFE® product range will be offered a license to purchase See it SAFE® fabrics for the manufacture and market of healthcare, pharmaceuticals, food preparation, catering and retail end use.



## Contours of microbial contamination



**Time: 59 minutes**

**Kill: 99.9%**

**Anti microbial textile simulation  
Bacterial handprint**

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[www.ttel.co.uk](http://www.ttel.co.uk)

**'TORAY'**  
See it **S**AFE®  
visible protection 

