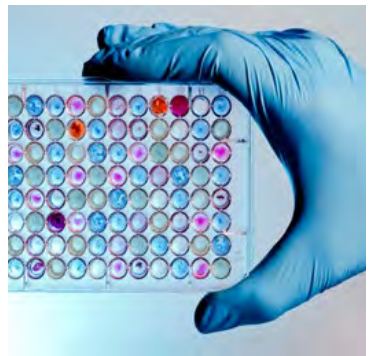
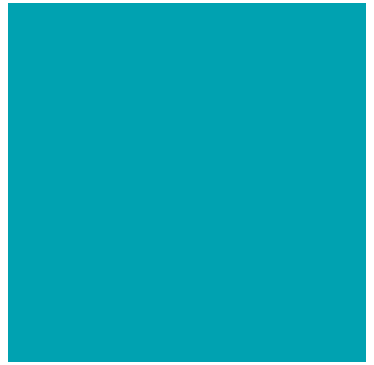




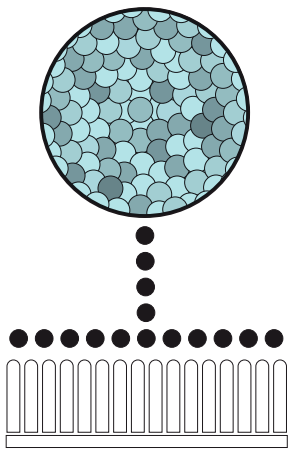
Advanced Antimicrobial Technology



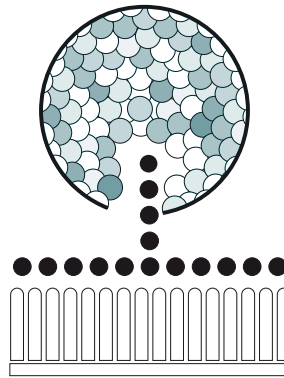
What is BI-OME®

BI-OME® is an antimicrobial treatment that is applied to our carpets. The concept of the BI-OME® technology is based on 'intelligent' or functional microbial protection that reaches personalised performance built around freshness, comfort, hygiene or in other words well being.

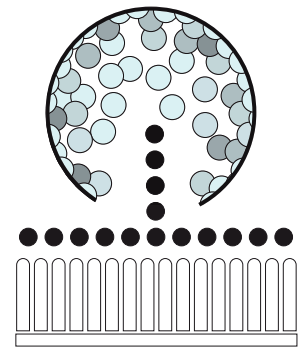
BI-OME® is a revolutionary technology that guarantees optimum active freshness and active hygiene for textiles, even after intensive use and frequent washings. BI-OME® technology is based on the fixation of a non-migrating permanent coating on the fibres. The coating is specially designed to destroy micro-organisms.



1
The micro-organisms are attracted by the coating.



2
Once they come in contact with the coating, the cell membrane is punctured, as if by a sword.

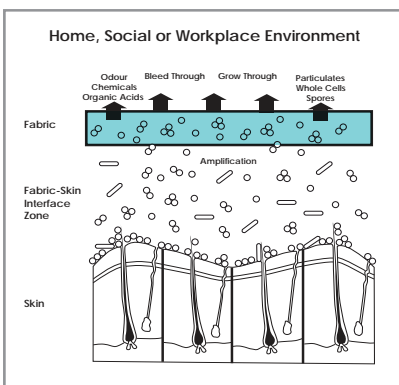


3
This way the micro-organisms cell membrane is compromised and physically destabilised.

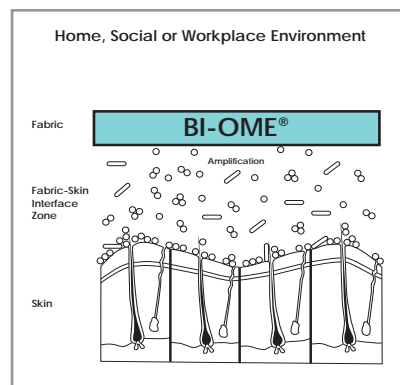
Non-migrating versus migrating treatments

BI-OME® is a non-migrating coating that means it is non-leaching. Regular migrating antimicrobials migrate out of the carpet and chemically kill the micro-organisms. This migration will cause the antimicrobial to be used up over time, leading to a loss of power over prolonged use and washing. Migrating treatments can also cause bacterial resistance over time.

Environmental and consumer groups have concerns with migrating coatings because they may migrate to the skin and the environment causing well known problems.



1



2

BI-OME®, being a non-migrating antimicrobial stays fixed to the carpet and destabilises the micro-organisms on direct contact. It does not lose strength over time, and it does not create the conditions in which micro-organisms can adapt to its presence.

- 1** The effects of microbial growth in the skin, fabric and environment.
- 2** The effects of microbial growth in the skin, fabric and environment with BI-OME® technology.

Why you need BI-OME[®]

Exceptional protection
against infectious
bugs and disease.

Reasons to use BI-OME[®] protection



The increased use of carpets in hospitals, schools and other institutions demonstrates the need for an additional property in carpeting: the prevention of bacterial and fungal growth. The need is obvious in hospitals, where the greatest concern about carpeting

is the possibility of infectious hazards. However, the need for a safe antimicrobial treatment is not limited to hospitals. Inhibiting bacteria and fungi is equally important in carpeted areas of playrooms, care homes, clinics, doctor's surgeries and hotels. All of these areas may serve as a reservoir for potentially harmful bacteria and fungi. In addition there is the problem of odour and deterioration caused by the presence of micro-organisms and their breakdown products. Extension of this need to the home is obvious as we consider the use of carpeting in bathrooms, kitchens, recreation and family rooms, as well as other areas where pets and babies roam. The need for hygienic freshness is a reality in the consumer's mind.

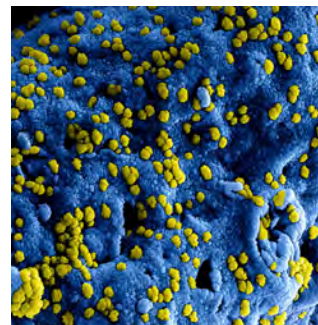
Why is antimicrobial protection in carpets so important?

The press reminds us almost daily that e.coli, staph, strep and stachybotrys atra threaten our well-being and there is a general growing awareness of the health and odour problems microbes can cause in the environments we live and work in. Antibacterial and antimicrobial products are selling at record levels and retailers across many sectors are responding to consumer demand for anything antimicrobial. Where carpets are protected by BI-OME[®], existing disease and odour causing microbes are destroyed and new contamination prevented - usually for the life of the carpet.

Microbe growth in carpets if left unprotected can lead to a variety of problems including: aggravation of skin complaints, dust mites which can lead to asthma, the spread of bacteria which causes MRSA and other infections. BI-OME[®] protection will eliminate 99.99% of the microbes which can lead to these problems.

Micro-organisms are part of our everyday lives and include many diverse organisms. They include bacteria, fungi, yeast and algae that are found wherever moisture, temperature and food sources allow. Some of these organisms are beneficial and a natural part of our environment. Others can cause serious problems including deterioration, defacement, rotting, surface degradation, staining, and health problems ranging from simple discomfort to physical irritation, allergic sensitisation, toxic responses and infection. Additionally, carpets require the need to control microscopic arthropods such as mites. Mites are associated with dirt and dust and their presence in carpeting has been linked to allergenic responses in humans.

The ability to make surfaces and carpeting resistant to microbial contamination has advantages and values in many applications and market segments where carpeting is used.



Why you need BI-OME[®]

Exceptional protection
against infectious
bugs and disease.

Why BI-OME[®] does NOT cause bacterial resistance



BI-OME[®] is designed with a mechanism of action that is fundamentally different from the way traditional antimicrobial agents (such as silver nanoparticles) work. Traditional antimicrobials typically use chemicals that kill or inhibit the growth of

bacteria through a single mode of action (e.g. inhibiting enzymes). Over time, bacteria can evolve and develop resistance to these chemicals through mutation and selection pressure.

However, BI-OME[®] technology works by employing non-toxic, physical mechanisms to prevent the growth and reproduction of bacteria, rather than killing them directly. Here's how:

1. BI-OME[®]'s Mode of Action:

- **Surface Modification:** BI-OME[®] creates a protective layer on the flooring surface that interferes with the ability of microbes to adhere, grow, and proliferate. This prevents microbial growth in a passive way.
- **Physical Interaction:** The technology does not release toxic chemicals into the environment but instead relies on mechanical disruption of microbial attachment to the surface. This process is generally not something that microbes can evolve resistance to, since it is based on the physical properties of the surface itself rather than on chemical agents.

2. No Selection Pressure:

- Unlike antibiotics or other chemical antimicrobials that exert strong selective pressure on microbes, BI-OME[®] does not provide a mechanism that encourages mutations that confer resistance. Because BI-OME[®] doesn't kill or actively interfere with the microbial cell's processes, bacteria cannot "learn" to resist it in the same way they can develop resistance to traditional chemical agents.

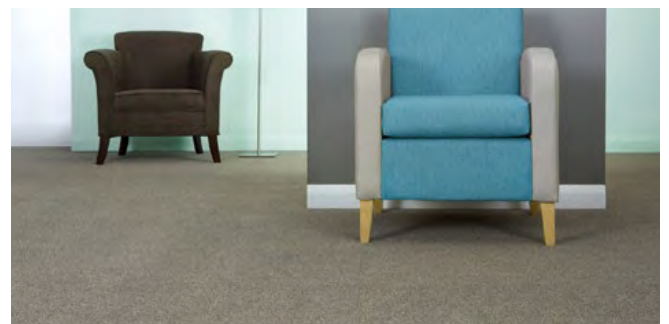
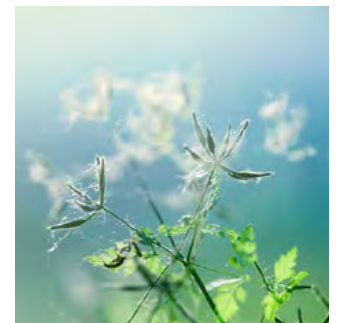
3. Safe for Environment & Humans:

- One of the key benefits of BI-OME[®] technology is that it is non-toxic to humans and animals, which further reduces the risk of any harmful side effects or resistance development. It is designed to avoid environmental impact, unlike traditional antimicrobial agents that can accumulate in the environment and contribute to resistance problems.

4. Proven Efficacy Without Resistance:

- In studies and real-world applications, BI-OME[®] has been shown to provide long-lasting protection against microbial growth without causing resistance. Because it doesn't rely on antimicrobial toxins that target specific bacterial functions, the technology remains effective over time.

Traditional antimicrobial technologies and silver-based antimicrobial agents, have been linked to the development of antibiotic resistance in bacteria. This is because these chemicals actively kill bacteria, creating an environment where only resistant strains survive and proliferate.



Why you need BI-OME®

Exceptional protection
against infectious
bugs and disease.

Why choose BI-OME® protection?



BI-OME® is important for anyone needing to either eliminate odours or increase health protection. It is ideal for sectors where carpeting is used near or around food and drink, such as in the

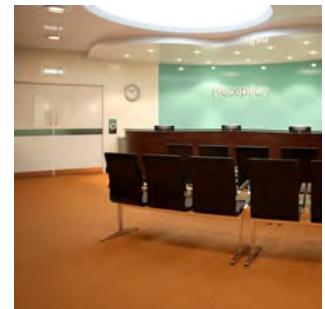
hospitality sector, where direct contact with the skin occurs such as babies and children crawling in childcare settings or in the health care sector; hospitals, nursing or care homes. There are also many benefits to using BI-OME® protection for carpeting in domestic housing where carpets are increasingly being used in bathrooms and kitchens.

BI-OME® benefits include:

- Stops bacterial and fungal growth the major cause of most fabric odour problems
- Reduces the risk of cross contamination
- Controls or eliminates microbial staining and deterioration
- Contains no heavy metal or polychlorinated Phenols
- Will not leach into the environment or transfer to other articles
- Maintains carpet freshness
- Durable for the life of the carpet
- Unmatched safety profile

Unrivalled Quality & Protection

The BI-OME® certification stands for over 30 years of superior technical performance in medical goods, consumer products and indoor environments where safety and performance are paramount. Universally recognised as the best antimicrobial of choice for a variety of uses, it has been tested by the L'Institute Pasteur de Lille and is accepted by regulatory bodies globally. Most importantly, it has been embraced by consumers who have purchased BI-OME® protected products from retailers all over the world. A carpet protected with BI-OME® shows consumers that, not only are you using an antimicrobial, but that you are using the most advanced antimicrobial on the market today.



The Fight Against MRSA

Shown in the chart below are the results of a test to show the protection given by BI-OME® against the bacteria which cause MRSA. You can see that the textile treated with BI-OME® showed a 99.99% reduction in the MRSA causing bacteria.

Microbiological Analysis			
	Initial Concentration	Final Concentration	Percentage Reduction
Untreated Sample	1.52 x 10 ⁵ /ml	1.6x 10 ⁵ /ml	0%
Treated Sample	1.52 x 10 ⁵ /ml	<1.0 x 10 ⁵ /ml	>99.99%
Inoculum Control	1.52 x 10 ⁵ /ml	1.55 x 10 ⁵ /ml	0%

Protected by BI-OME[®]

Developed to combat the widespread problem of Superbugs such as MRSA and C. Difficile.

Below you will find a list of bacteria, fungi, yeast and algae which can be controlled by using BI-OME[®] protection on danfloor carpets.

Bacteria

Acinetobacter calcoaceticus
Bacillus cereus
Bacillus subtilis
Brucella abortus
Brucella cania
Brucella suis
Citrobacter diversus
Clostridium difficile
Clostridium perfringens
Corynebacterium bovis
Enterobacter agglomerans
Escherichia coli ATCC 25922
Escherichia coli ATCC 23266
Haemophilus influenzae
Haemophilus suis
Klebsiella pneumoniae ATCC 4352
Lactobacillus casei
Leuconostoc lactis
Listeria monocytogenes
Methicillin-resistant Staphylococcus aureus (MRSA)
Micrococcus sp.
Mycobacterium smegmatis
Mycobacterium tuberculosis
Propionibacterium acnes
Proteus mirabilis
Proteus vulgaris
Pseudomonas aeruginosa
Pseudomonas aeruginosa PDR-10
Pseudomonas cepacia
Pseudomonas fluorescens
Salmonella choleraesuis
Salmonella typhosa
Staphylococcus aureus ATCC 6538 (non-pigmented & pigmented)
Staphylococcus epidermidis
Streptococcus faecalis
Streptococcus mutans
Vancomycin Resistant Enterococcus
Xanthomonas campestris

Fungi

Aerobasidium pullulans
Aspergillus flavus
Aspergillus fumigatus
Aspergillus niger
Aspergillus repens
Aspergillus terreus

Aspergillus versicolor
Chaetomium globosum
Cladosporium herbarum
Fusarium nigrum
Fusarium solani
Gliocladium roseum
Mucor sp.
Oospora lactis
Penicillium albicans
Penicillium chrysogenum
Penicillium citrinum
Penicillium elegans
Penicillium funiculosum
Penicillium humicola
Penicillium notatum
Penicillium variable
Rhizopus nigricans
Stachybotrys atra
Trichoderma flavus
Tricophyton interdigitalis
Tricophyton mentagrophytes

Yeast

Candida albicans
Saccharomyces cerevisiae

Algae

Anabaena cylindrica B-1446-1C
Chlorella vulgaris
Gonium sp. LB 9c
Oscillatoria borneti LB143
Pleurococcus sp. LB 11
Schedesmus quadricauda
Selenastrum gracile B-325
Volvox sp. LB 9



Who uses BI-OME®

Advanced protection for hospitals and healthcare environments.

Medical and Healthcare

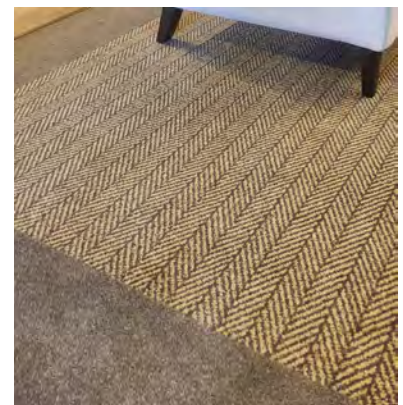
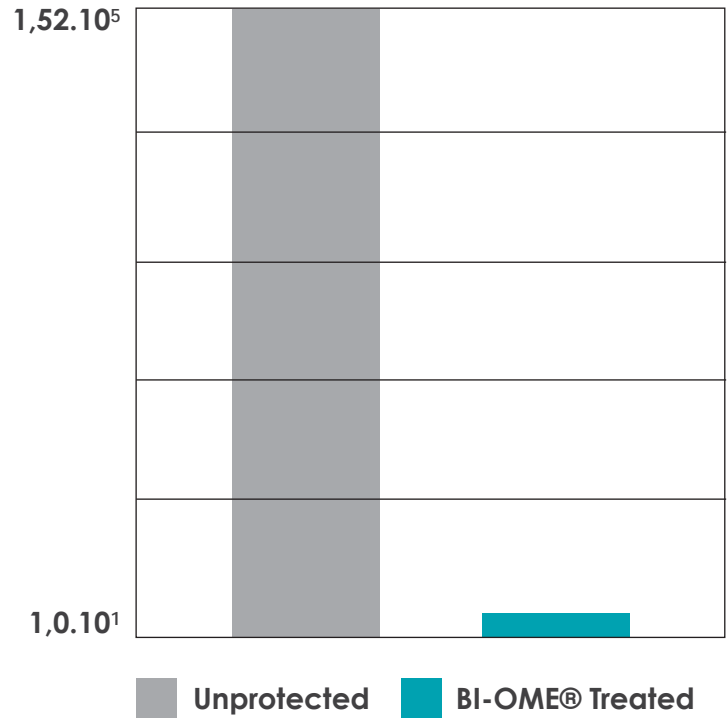
The medical industry is challenged by the presence of micro-organisms and the negative effects they cause. Cross contamination, deterioration, defacement and odours are all dramatic effects which occur from microbial contamination.

Carpets can act as a microbial 'harbour' as most offer ideal environments for the proliferation of micro-organisms that are harmful to humans. Nosocomial infections are a serious issue for healthcare facilities.

In hospitals and healthcare environments preventative measures are used to protect patients and staff from nosocomial infections. However, across Europe more than 3 million patients develop this kind of infection. The use of carpets treated with BI-OME® can help to eliminate the microbes which cause these infections.

For example, the results performed by different universities and independent laboratories in medical environments have shown that BI-OME® is a unique technology in controlling microbial growth, even MRSA. The chart below shows the results which prove that BI-OME® leads to a 99% reduction in MRSA causing bacteria.

MRSA Results
(99.99% reduction in BI-OME® Treated)



Who uses BI-OME®

Advanced protection
for schools, childcare,
care homes
commercial and
domestic buildings.

Education and Childcare

BI-OME® is a non-leaching microbial which makes it ideal for use when carpeting an environment to be used by children.

Children in schools, nurseries and at home tend to have regular direct contact with carpeting through play or crawling and sitting. BI-OME® is non-toxic to children as it bonds on to the surface of the carpet and will not transfer to skin on contact and it cannot be ingested making it very safe.

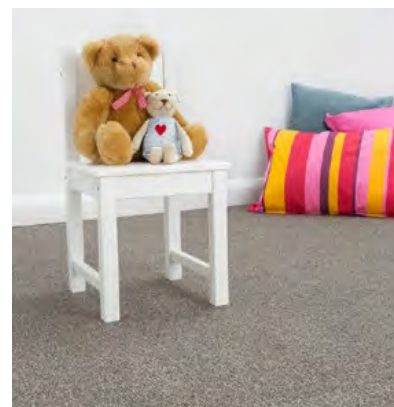
Carpets treated with BI-OME® will help to reduce the irritation of skin complaints and many problems associated with dust mites such as allergies and asthma. BI-OME® also prevents the development and spread of bacteria caused by spillages or accidents which can occur frequently in environments used by children and younger people.

BI-OME® protection also protects older children and young adults in university or college accommodation where bacteria tend to spread and breed quickly where large numbers of people are working and living in close proximity to one another.

Domestic and Commercial Buildings

Consumer and commercial operators are challenged by the presence of micro-organisms and the negative effects they cause. Antimicrobial treatments for bacterial, fungal and mite control are proving to be popular amongst consumers, manufacturers and building operators. These treatments not only provide protection from micro-organisms they also add aesthetic and emotive values to a full range of products. Deterioration, defacement, odours and 'harbouring' medically significant micro-organisms, are all dramatic effects we see in buildings and products where microbial contamination is present. The ability to make surfaces and carpeting resistant to microbial contamination has many advantages.

There has been an increased popularity in the carpeting of bathrooms and kitchens where bacteria can breed and corporate users are experiencing increases in 'sick building syndrome'. BI-OME® will help to eliminate some of these problems.



Who uses BI-OME®

Advanced protection
for the hospitality and
leisure industries.

Hospitality and Leisure

In the hospitality trade BI-OME® protected carpets can be a real benefit in providing extra customer satisfaction as well as prolonging the life and quality of your carpets.

Consumers frequently demand the right to control and select their environment with respect to colours, textures, temperature, humidity, odours, light and sound. Carpet constitutes a major environmental surface in commercial establishments such as hotels, clubs, bars, restaurants, gymnasiums and theatres.

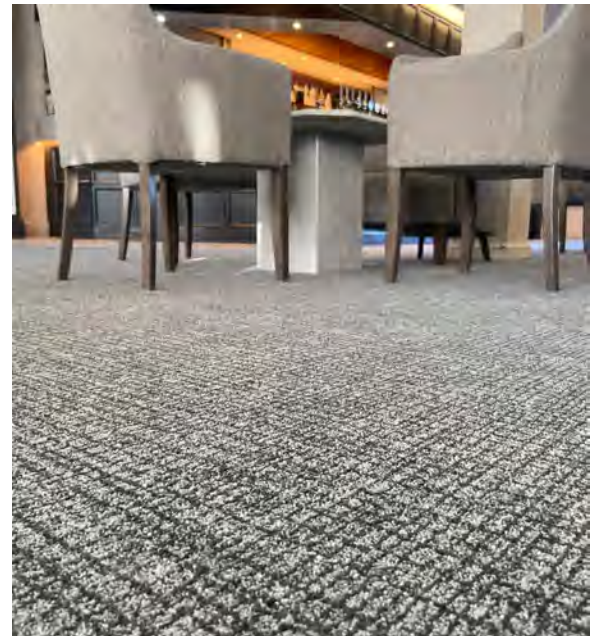
Carpeting by its construction and use provides a habitat for a large variety of micro-organisms, some of which not only produce putrid and mildew odours but also contribute to unsightly defacement and deterioration of carpet components. The use of BI-OME® protection will not only prolong the quality and life of your carpets, saving the need to replace, but will also reduce unpleasant odours which will improve the quality experienced by your customers.

In the hospitality trade, where there is exposure to food, drink and spillages there is an increased exposure to the possibility of bacteria growth and odours forming. The spread of bacteria in environments where food and drinks are prepared or served can lead to outbreaks of illness which pose a health & safety risk to your customers. BI-OME® acts to prevent the development and spread of these harmful bacteria.



Right:

Health & leisure clubs and gymnasiums can be breeding grounds for harmful bacteria which lead to odours and infections. BI-OME® helps keep carpets fresh and bacteria free.



Above:

BI-OME® helps to protect the spread of unwanted bacteria, including those that can cause serious food poisoning.

BI-OME[®]

How it works

Protection against bacteria, fungi, yeast and algae.

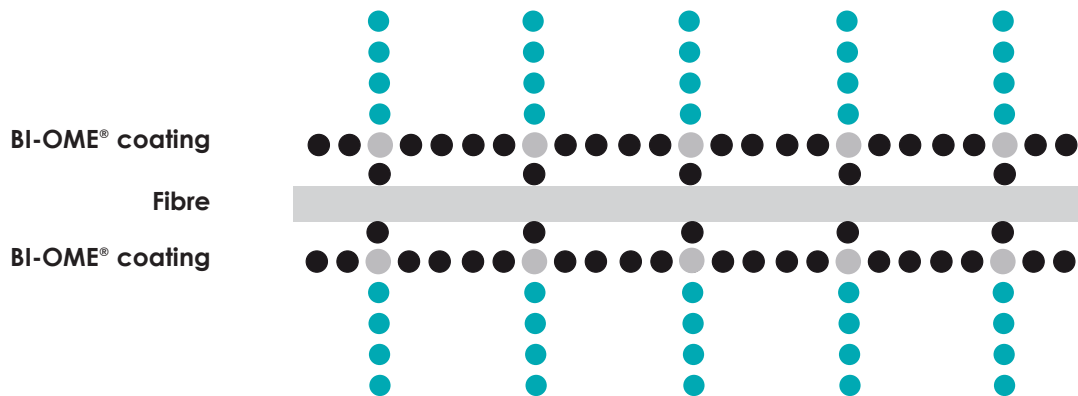
Protecting your carpet. Freshness, Hygiene and Comfort.

Freshness, hygiene and comfort are essential considerations when carpeting any environment. Micro-organisms thrive best in environments with moisture, food and warm temperatures. Unfortunately carpets are an ideal surface for micro-organisms to develop and reproduce. The problems they cause include odours, deterioration, stains, allergies and in some cases even diseases.

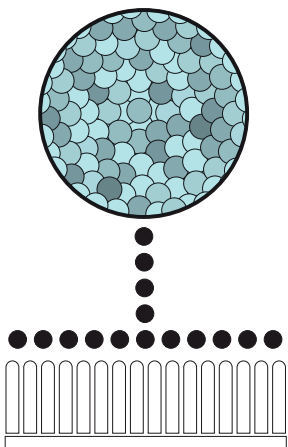
A World First

The BI-OME[®] technology is the world's first odourless, colourless, non-migrating, durable technology with a broad spectrum of activity against microbes (bacteria, fungi, yeast and algae).

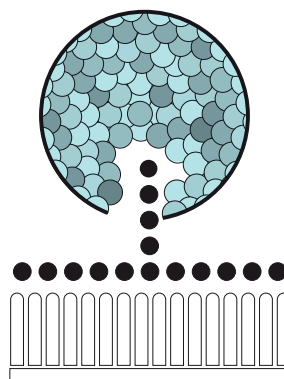
The BI-OME[®] protection treatment is produced in an ISO 9002 certified plant and has been tested by L'Institut Pasteur de Lille.



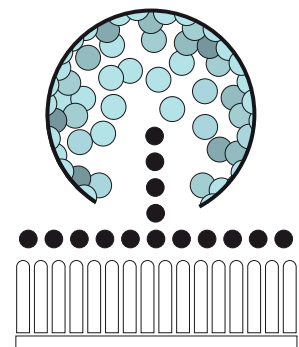
The BI-OME[®] technology is based on the fixation of a non-migrating, bonded permanent coating on the carpet fibres. This special coating is designed to deactivate micro-organisms.



1
The micro-organisms are attracted by the coating.



2
Once they come in contact with the coating, the cell membrane is punctured, as if by a sword.



3
This way the micro-organisms cell membrane is compromised and physically destabilised.

BI-OME®

How it works

Protection against
bacteria, fungi,
yeast and algae.

Safe and Durable

Because the coating is permanently fixed to the fibres of the carpet, the BI-OME® treatment is prevented from migrating to the environment. In this way antimicrobial protection is guaranteed even with frequent washing, cleaning and shampooing of the carpet.

The strength of BI-OME® is not used up or diminished when it acts, allowing it to remain functional for the life of the carpet. Conventional antimicrobials are absorbed and chemically interrupt the cell by poisoning, disrupting a life process, or causing lethal mutation. Over time the effectiveness of conventional antimicrobials diminishes.



BI-OME® becomes a permanent part of the carpet's surface and will continue to be fully effective as long as the surface remains intact.

Quality Control and Assurance

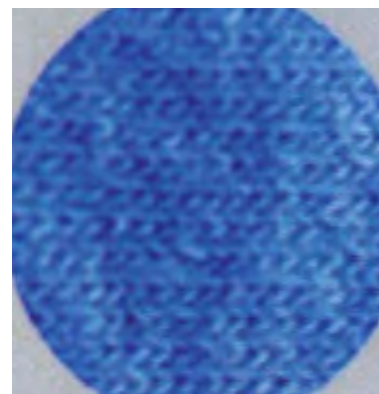
High Standards are the key to the continued success and reputation of the BI-OME® brand. The BI-OME® quality standards consist of prequalification and ongoing quality control which are of real added value for you and your consumers.

How do i know my carpet is protected?

The Bromophenol Blue Test Method is a wonderful feature of the BI-OME® technology to build confidence in the treatment. This test takes just a few minutes and a little water to verify the proper application of the invisible BI-OME® technology on your carpet. This blue staining test can be performed during every step of the production process and at any place in the supply chain.



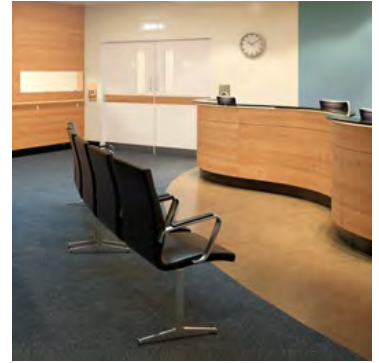
Unprotected



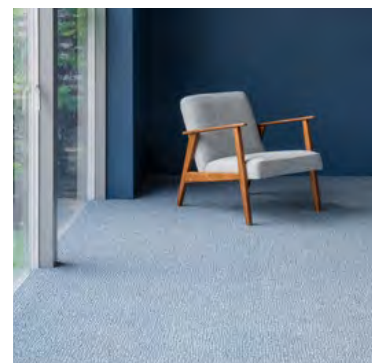
Protected with BI-OME®

Left:

Traces of BI-OME® will show as blue upon testing. The test proves that BI-OME® provides a durable long lasting all encompassing protective bond.



Innovative Carpet Solutions



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