LEA
CERAMICHE

Microban®
protezione antibatterica

ALWAYS ACTIVE ANTIMICROBIAL PROTECTION

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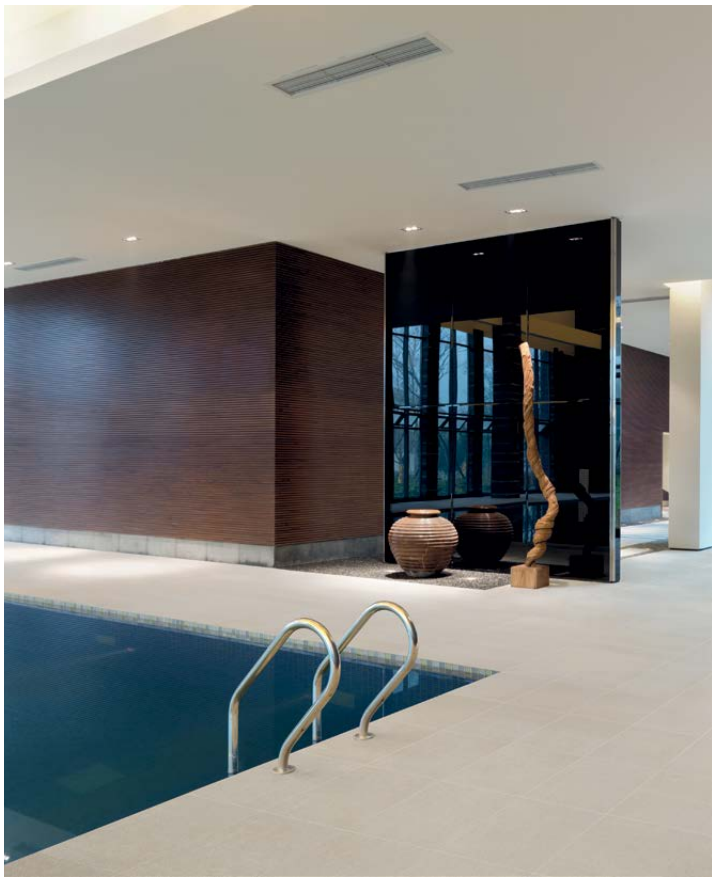
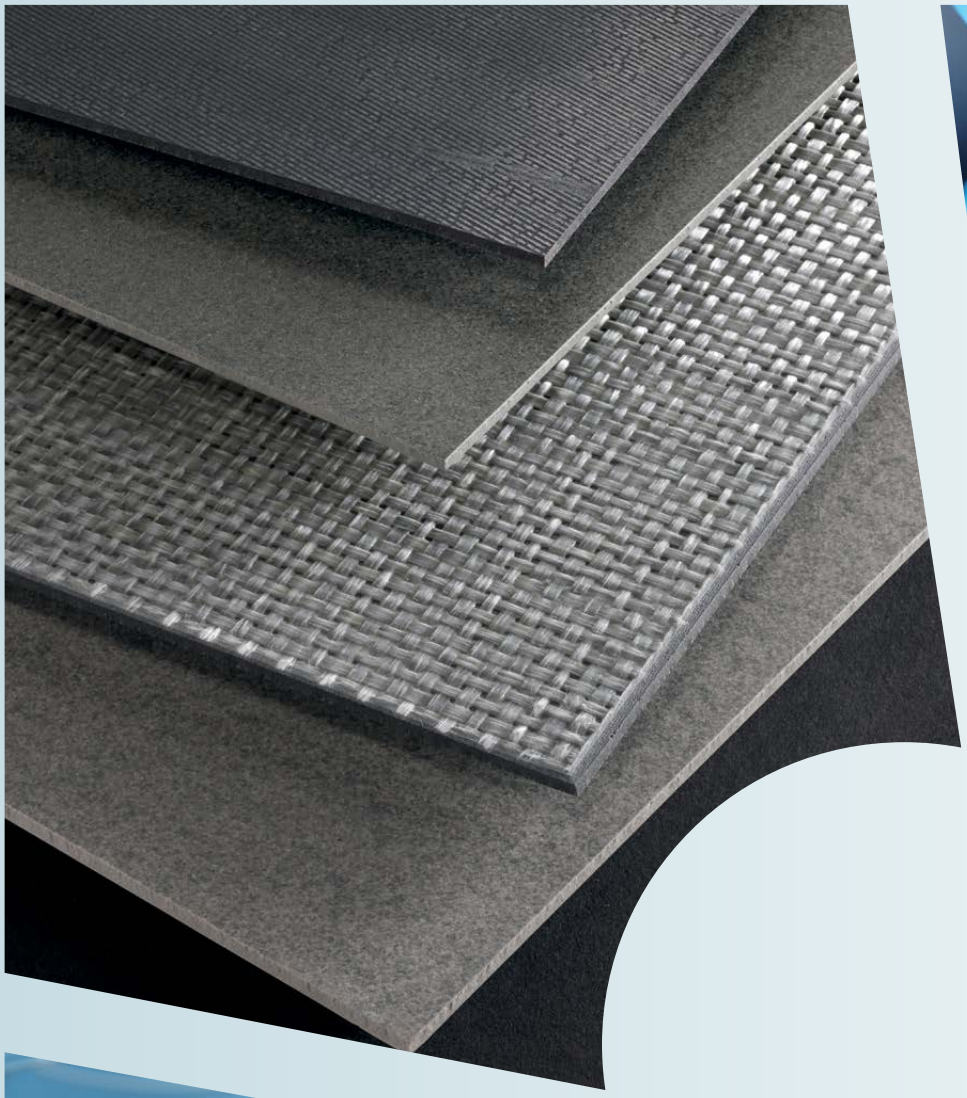
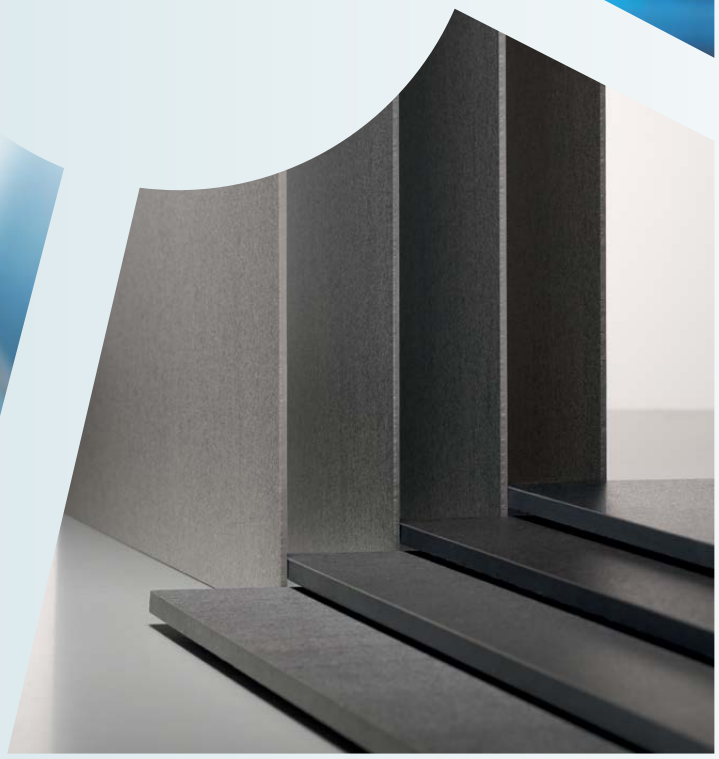






MICROBAN® ANTIMICROBIAL TECHNOLOGY

Microban® and Panariagroup have teamed up to provide antimicrobial protection for ceramic tiles. Panariagroup ceramic tiles are well known for their beauty, durability and performance; the addition of Microban® built-in technology featuring silver provides a continuous level of protection from the growth of common bacteria.

The patented Microban® technology consists of treating the ceramic material with a formulated antimicrobial additive capable to expressing antimicrobial efficacy up to 99.9% kill rate using established international laboratory protocols.

This innovation is available on several collections and colors in both traditional porcelain and laminated porcelain tiles, in a wide range of sizes and in the natural and honed (lappata) surfaces. This provides an amazing tool in the hands of architects and designers looking to develop exceptional environments with high performances when it come to hygiene, cleanliness, safety and ease of maintenance, like for example hotels, restaurants, healthcare, kitchens, bathrooms, wellness centres, spas, gyms, shopping malls, and all public and private space buildings.

Laminated porcelain in particular, provides countless possibilities of application in all residential, public and commercial environments, thanks to its large formats (up to 100 x 300 cm) and their light weight, a direct result of the exceptional 3mm thickness. In addition, laminated tiles can be mounted on top of existing traditional tiles as part of a refurbishing programme therefore avoiding the necessity to remove the old tiles and surfaces and saving costs.

ABOUT MICROBAN®

Microban® International, Ltd. is a global technology company dedicated to enhancing high quality consumer, industrial and medical products with branded built-in protection from microbial growth. Microban® International licenses the Microban® global brand name.

The Microban® brand offers continuous and durable antimicrobial product protection, built-in during manufacture to not wear out for the useful life of the product. Microban® International is headquartered in North Carolina with operations in North America, South America, Europe and Asia.

Worldwide, Microban® has licensed more than 200 companies-including brands such as Whirlpool, Rubbermaid, Johnson & Johnson, DuPont® and many others-which have incorporated Microban® antimicrobial protection into more than 1,000 products, including kitchen and bath products, apparel and home textiles, appliances, building materials, foodservice products, medical products and others.

MAYTAG
WHAT'S INSIDE MATTERS

Kimberly-Clark PROFESSIONAL

Fellowes

DUNLOP

BAL

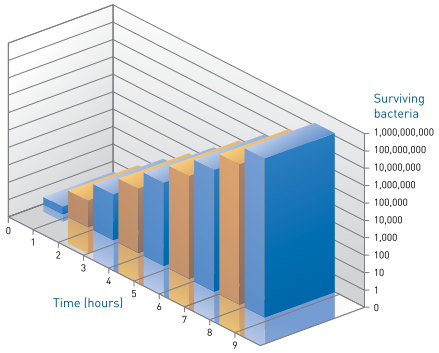
Whirlpool
SENSING THE DIFFERENCE

WHY MICROBAN® PROTECTION?

How clean are your tiles?

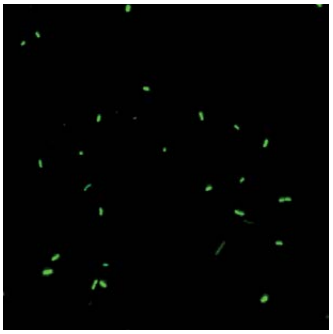
Bacteria and other micro-organisms are a fact of life. They are everywhere, all around us, all the time. However hard we try, there's no getting away from them. Some are good for us, others are neutral, but a few are dangerous. So it makes sense to do what we can to prevent their potentially harmful and undesirable effects.

Under right conditions of warmth, a food source, time and a little humidity, bacteria can grow and divide extremely rapidly, and bacterial populations can double as quickly as every 20 minutes. In addition, bacteria can persist on inert surfaces for a long time. On average, there may be more bacteria on your hand than people on Earth.

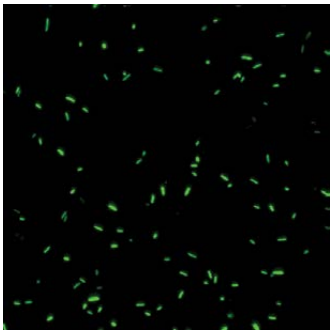


The accompanying table and graph illustrate the proliferation results over a 10-hour period

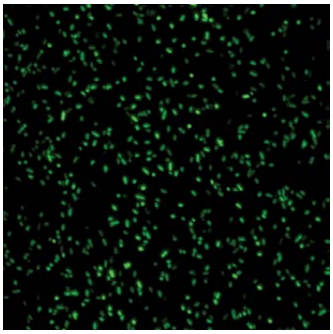
Unprotected



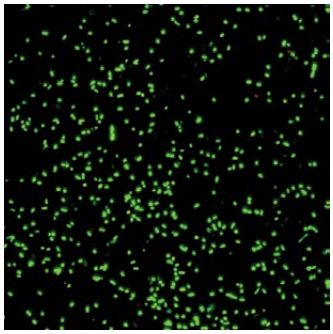
2 hours



16 hours

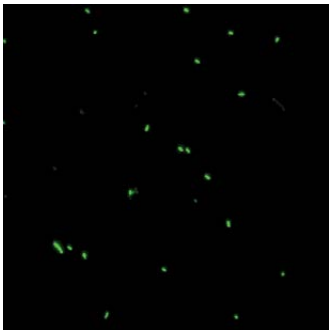


20 hours

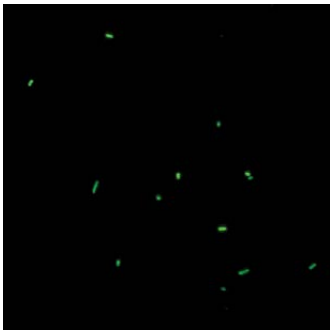


24 hours

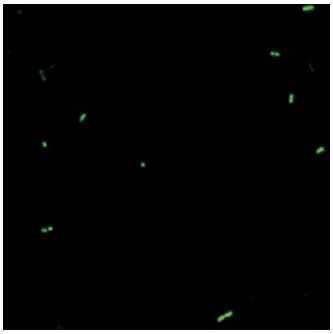
Microban® antimicrobial protection



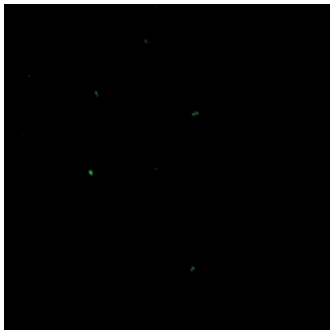
2 hours



16 hours



20 hours



24 hours

WHY MICROBAN® PROTECTION?

Bacteria on floors can be a source of cross-contamination, where bacteria can transfer from one surface to another and from an area to another. This transfer can take place by human contact with the contaminated surface (for example touching with hands or shoes) and can be hazardous for young children who crawl and play on the floor – as dirt and germs are continually being brought into the home through foot traffic from people and also pets!

The goal of such antimicrobial protection, is to minimize the number of bacteria which colonize a surface and therefore reduce the possibility of the bacteria transferring to other surfaces where they may cause potential issues. Looking at bacterial hotspots within the home - the kitchen and bathroom have the potential for the highest number of harmful bacteria which can rapidly spread from one surface to another.

PRESENCE OF BACTERIA IN PUBLIC AREAS

A Survey was carried out in the US on suppliers of foodservice providers and restaurant owners, 85% of respondents* said they were concerned about the growth of bacteria found on flooring in restaurant facilities (*Research fielded all over the US by Decision Analyst, June 2006).

Microban® microbiologists have carried out a swab study in order to investigate the presence of bacteria on ceramic floor tiles in public facilities.

Ten different locations were selected and sampled and included the following; restaurant dining areas, restaurant foyers, restaurant toilet facilities, petrol station toilet facilities and shopping facilities, banking establishments and sport facility changing rooms. For each location five separate Tecra Enviraswabs were utilized on five different tile sections. For each tile, a 7.62 cm^2 area was swabbed.

This allowed for efficient sampling and representation of bacterial bioburden in each location.
The bacteria were enumerated from each swab by plating on TSA and incubated for 48 hours. Results showed that 92 % of the 50 tiles sampled were contaminated with bacteria. Average colony forming units (cfu) were 11 cfu / cm^2 with a minimum of 2 cfu/ cm^2 and a maximum of 513 cfu / cm^2.

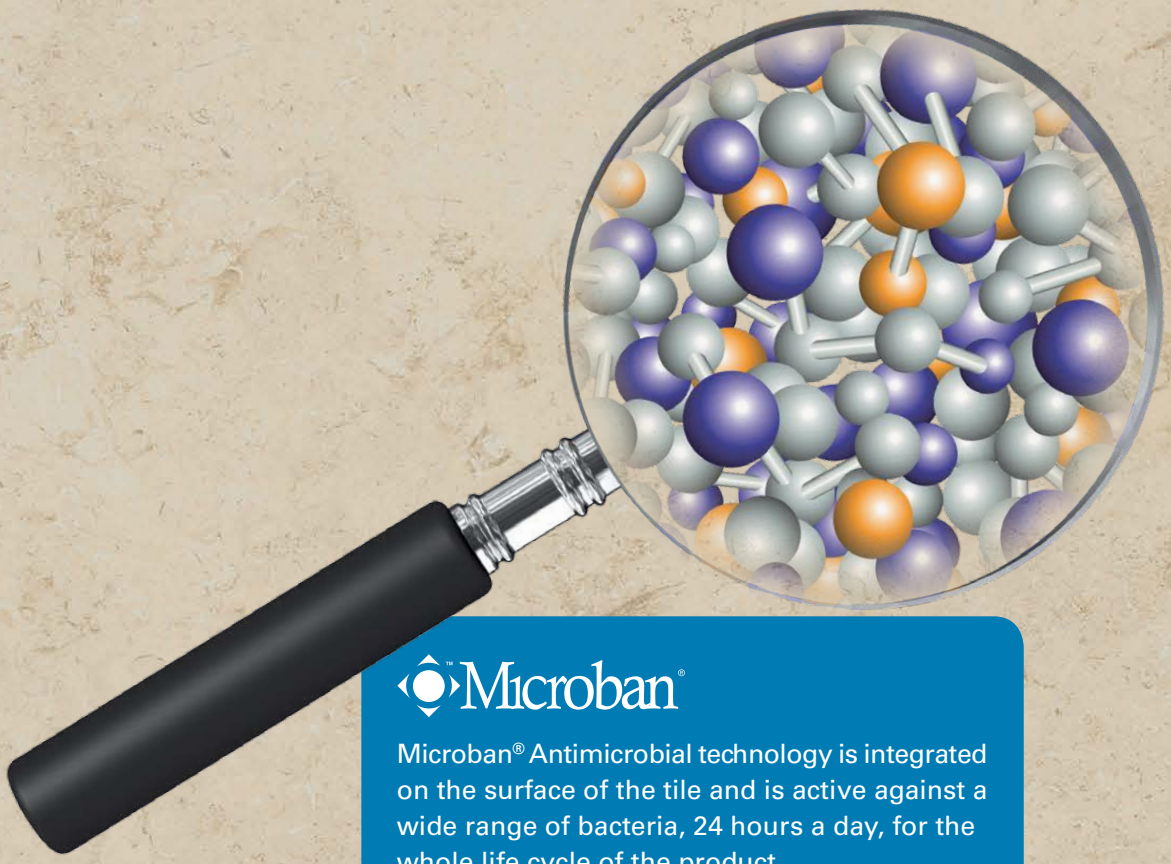
Note: there are no microbiological standards relating to numbers of bacteria and the categorization of contamination, as for some bacteria, such as C. difficle, that are highly infectious, a dirty surface would only consist of a few cfu (possibly 10). For other bacteria, a larger amount would be needed to be categorized as an infectious bacterial load.

ADVANTAGES OF MICROBAN® TECHNOLOGY

On the tile surface, the Microban® antimicrobial technology is effective in reducing bacterial growth up to 99.9%. Efficacy evaluation is carried out by independent laboratories using the International Standard ISO 22196.

The Microban® antimicrobial additive is:

- Permanently Integrated in the tile surface during the firing process at 1200°C, lasting for the lifetime of the product. It is not a surface treatment applied after firing and does not need to be re-applied due to the fact that the additive is a permanent part of the tile structure.
- Uniformly applied in the surface, and is therefore active also in difficult-to-reach flooring areas.
- A continuous protection, 24 h a day, day and night, with and without sunlight, no need of UV lamp activation to display antimicrobial efficacy (unlike other technologies).
- Can to be applied to tiles of any colour. It does not whiten the tile surface where it is applied (unlike other technologies).



Microban®

Microban® Antimicrobial technology is integrated on the surface of the tile and is active against a wide range of bacteria, 24 hours a day, for the whole life cycle of the product.


Microban
Exam Room n.5
Microban Antimicrobial Protection

MICROBAN® TECHNOLOGIES. SAFETY AND REGULATORY COMPLIANCE

The antimicrobial technology featuring silver used in Panariagroup ceramic tiles has a long history of safe use and can be found in a wide range of consumer, industrial and healthcare products. The antimicrobial properties of silver have been known to cultures all around the world for many centuries.

The use and choice of Microban® antimicrobial technologies for Panariagroup laminated porcelain and porcelain tiles is in full compliance with global regulatory bodies which govern the use and claims that can be made. In the United States, the Environmental Protection Agency (EPA) has regulatory jurisdiction and in the EU, the biocidal active components of Microban® antimicrobial additives are notified in accordance with the Biocidal Products Regulation (BPR) No 528/2012 for the relevant product types in accordance with their end use application.

The Microban® additive used in Panariagroup ceramic tile products is also approved for use in direct food contact applications regulated under the Food Contact Materials Framework Regulation (EC) No. 1935/2004. It is also registered with the EPA (Environmental Protection Agency) and FDA (Food and Drug Administration) in the United States of America.

MAIN APPLICATIONS AND USES

Traditional porcelain and the laminated porcelain with Microban® antimicrobial protection provide key benefits in all areas that require high performances in hygiene, cleanliness and easy of maintenance.
All this with combined with high aesthetical qualities, a wide range of colors, formats and finishes (natural and honed), provides an amazing tool in the hands of architects and designers looking to develop an exceptional range of environments, such as:

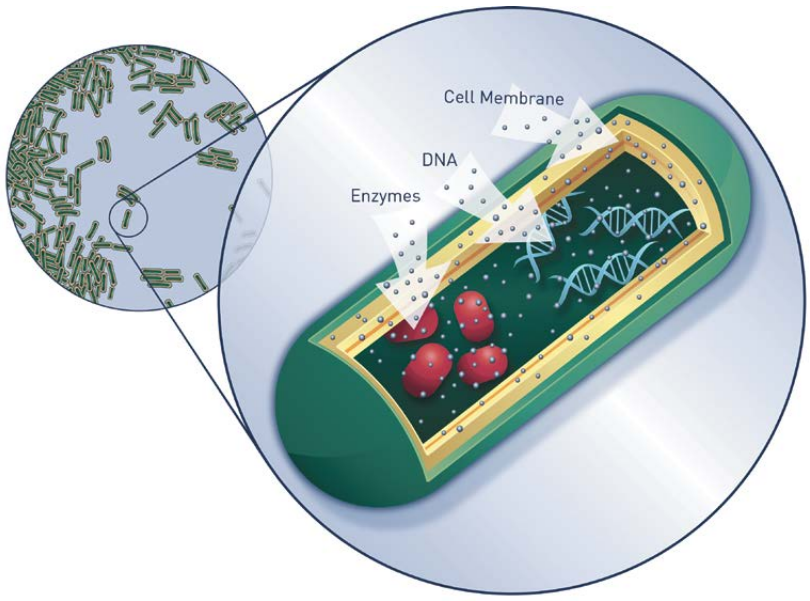
- **Restaurants, canteens, kitchen worktops** - improving hygiene in food contact environments;
- **Healthcare environments, Medical practices** - where patients have a temporarily reduced immunity system and are more vulnerable to infection;
- **Retirement homes** - where guests have a permanently lowered immunity system;
- **Wellness centres, spas, gyms** - improved hygiene is a valued benefit;
- **Shopping malls, airports, schools, colleges, nursery schools, pharmacy, and all such public and private space buildings** - benefit from enhanced hygiene measures;
- **Bathrooms and kitchens** - environments where the proliferation of bacteria is prevalent due to the presence of water and nutrients.

HOW MICROBAN® TECHNOLOGY WORKS?

Antimicrobial & Hygienic technology

Microban® provides round the clock protection against the growth of bacteria.

Microban® technology functions in numerous ways to inhibit bacterial growth. Protein and enzyme activity is blocked and the organism DNA is damaged. The metal ions included in the Microban® additive are able to bind to many targets and stop important cellular functions.



These target sites include:

- Proteins
- Cell membranes
- Enzymes
- DNA

Key proteins for example are denatured and therefore prevent the bacteria from replicating on the surface. With the removal of essential survival proteins, the bacteria will be unable to reproduce causing the death of the organism.

As Microban® antimicrobial technology is incorporated into the tile surface during the manufacturing process, it continuously fights the growth of bacteria for the lifetime of the product. Unlike surface disinfectants which only have a limited residual activity, Microban® protection works continuously eliminating bacteria and keeping the tiled surface more hygienic between cleanings.

Microban® antimicrobial additives have a biocidal action which kills bacteria which colonize and grow on the ceramic tile surface – this action is only on the tiled surface; the antimicrobial action does not create a sterilized environment. Sterilization is defined as a process where 100% of living microorganisms including bacterial spores are killed. For this to be maintained however the surface or product must be kept in a sterile environment in order to remain in that state.

Everyday the surface of the tiles is continually subject to bacterial contamination; the advantage of antimicrobial technology is that it provides a continuously lowered bacterial count. As bacteria come into contact with the tiled surface containing Microban® technology, the elimination cycle commences. It is this ongoing cycle of elimination that supports hygiene measures and helps prevent cross-contamination.

With the Microban® brand you can be sure you're getting continuous, durable and effective antimicrobial protection supported by the Microban® Certification Programme, a quality assurance programme individually tailored to each Microban® partner and product application. Microban® treated tiles, for example, are tested on a regular basis using the International ISO 22196 standard in order to substantiate the biocidal claims.

HOW MICROBAN® TECHNOLOGY WORKS?

Preventing biofilm growth

Biofilms are a community of bacteria that live and thrive on surfaces. These communities can be damaging to the surfaces that they inhabit, such as ceramic tiles. They thrive in wet environments in the presence of nutrient contamination. Upon attachment to a surface and subsequent biofilm formation, these slimy structures can be very hard to clean and cause hygienic and aesthetic problems to the surface (such as discolouration or slime).

Untreated tiles and Microban® treated tiles were examined for the ability to support E. coli biofilm buildup by Scanning Electron Microscopy (SEM). A common biofilm test method, ASTM E 2647 was used for this investigation.

Biofilm formation was allowed to develop for 48 hours and the samples were fixed and visualized by SEM for surface associated communities of bacteria. The Microban® treated surface remained free of micro-organism colonization, as only a minute number of cells were visible.

The ability to stop adherence to the ceramic surface prevents the bacteria from beginning to form a biofilm and thus protects the surface.

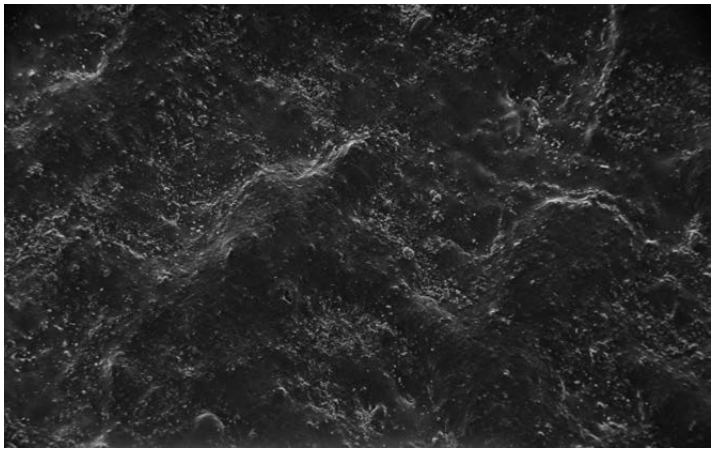
Microban® antimicrobial protection improves product quality in several ways:

- **Visible cleanliness** - product cleanliness can be visibly improved with the Microban® antimicrobial solution.
- **Invisible cleanliness** - microbes are invisible, but they are still there! On textiles, on floors on wall tiles, on kitchen worktops etc. their growth can be significantly controlled.
- **Reduce odour** - microbes can cause unpleasant odours - think about gym equipment. Reducing microbes therefore reduces odours.

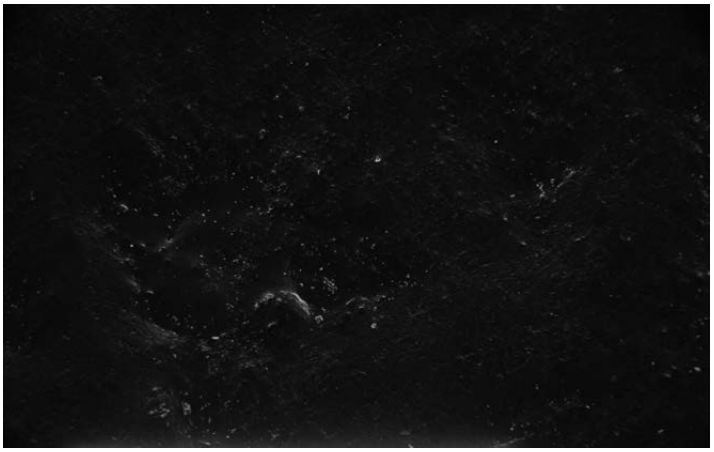
PANARIAgroup
INDUSTRIE CERAMICHE S.P.A.

Microban®

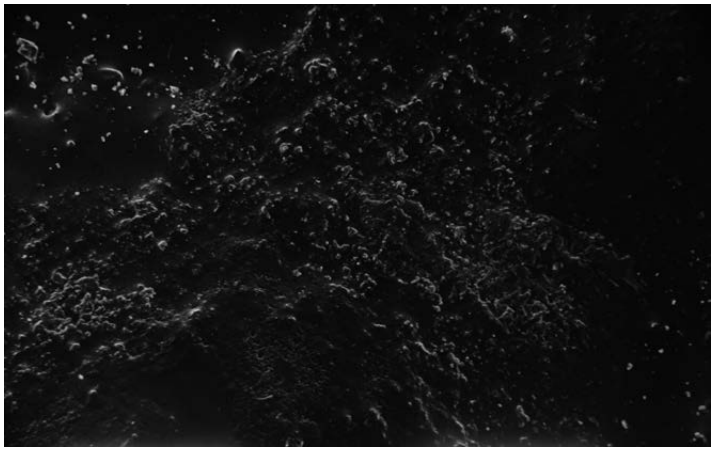
Untreated



Microban® Treated



Untreated

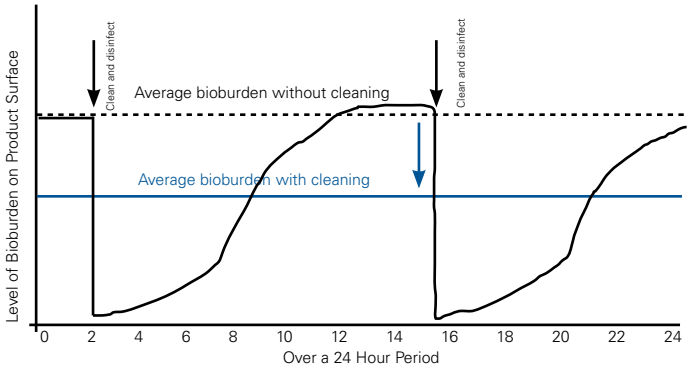


Microban® Treated

HOW MICROBAN® TECHNOLOGY WORKS?

Microban® protection during cleaning

Detergents and disinfectants are a quick but short term solution which provides only a limited residual activity once the disinfected tile surface dries. Bacteria can then very quickly start to colonize the surface and grow and reproduce until the next time the surface is once again disinfected. Microban® antimicrobial additives guarantee long lasting protection, continuously working to prevent the growth and proliferation of bacteria throughout the entire lifecycle of the treated tiles.

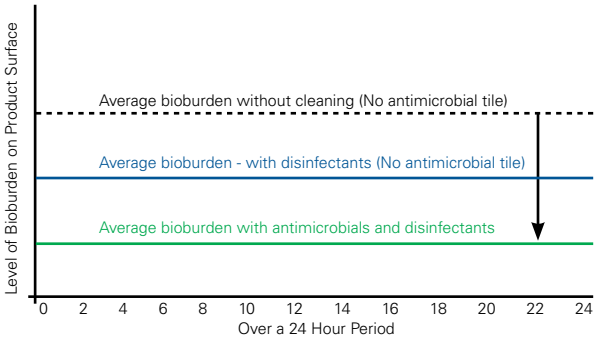


The above graph depicts the level of bacterial contamination on the 'Y' axis and time on the 'X' axis. The level of bacterial contamination on the surface usually is specified as a CFU value (Colony Forming Units). The profile on the graph shows what happens when a surface is cleaned and disinfected with a liquid disinfectant. The surface of the product is not treated with Microban®.

The level of bacterial contamination is rapidly reduced as can be seen at the point of disinfection (2 hours) and then slowly increases over the next hours to a high level. At this point (15 hours), the surface is disinfected again and the bacterial contamination rapidly reduced before slowly increasing as before.

The dotted line represents the averaged value of the bacterial contamination over 24 hours WITHOUT any cleaning or disinfection. The solid blue line represents the averaged bacterial contamination value WITH cleaning and disinfection over a 24 hour period.

Integrated antimicrobial technology does not replace cleaning practices, but rather complements existing routines and adds a level of protection between cleanings, 24 hours a day, for the lifetime of the product (solid green line).



The above graph depicts:

- High levels of contamination (dotted line WITHOUT MICROBAN® AND WITHOUT cleaning or disinfection) average calculated over 24 hours.
- Medium levels of contamination (solid blue line WITHOUT MICROBAN® AND WITH cleaning and disinfection) average calculated over 24 hours.
- Low levels of contamination (solid green line MICROBAN® TREATED sample with cleaning and disinfection) average calculated over 24 hours.

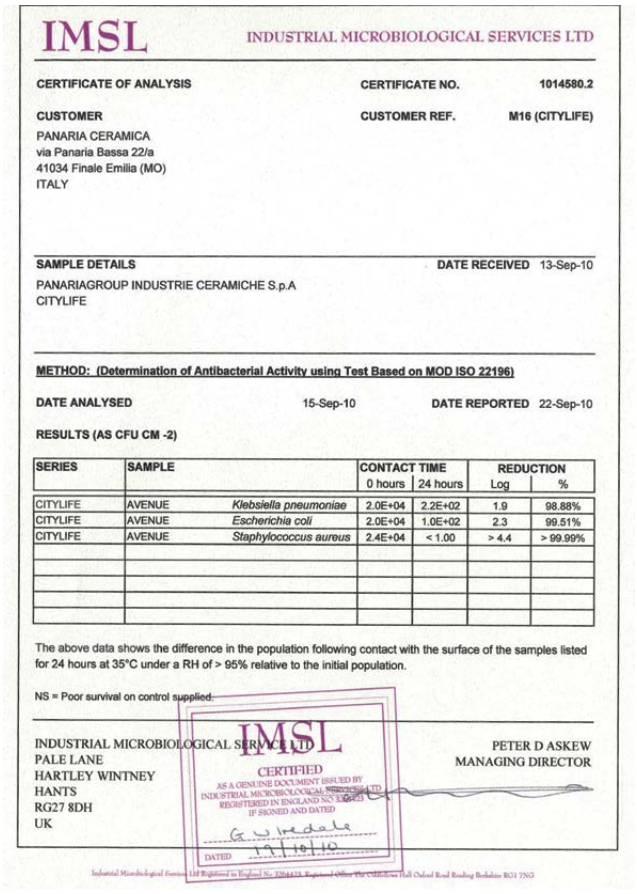
The treated sample with Microban® gives a lower level of contamination on the surface over a 24 hours period compared to non-treated samples, regardless of whether the untreated samples are cleaned and disinfected or not.

THOROUGHLY TESTED APPLICATIONS

To substantiate the antimicrobial claims, Panariagroup and Microban® use both its own expert internal microbiology laboratory for testing as well as external independent laboratories which are highly specialized at carrying out the ISO 22196 test, such as IMSL in the UK and Artest in Italy.
Tested organisms include Staphylococcus aureus, Escherichia coli and Klebsiella pneumonia.

IMSL (Industrial Microbiological Services Limited) is an English testing and consultancy service specializing in the microbiology of industrial processes and products. They provide support for a wide range of industries from paints, adhesives, polymer dispersions to plastics, paper and textiles as well as testing disinfectants. IMSL is capable of carrying out testing and validation of antimicrobial treated articles and disinfectants. In addition they can provide efficacy data to assist in product registrations and specific claims.

ARTEST provides testing and consulting services in the food, environmental and non-food areas. They test the products in laboratories specialized in molecular biology and organoleptic analysis, that aide customers in quality control activities, in the development of new products, packaging and in the monitoring of production processes.
Artest's mission is focused on high quality services and accurate results. The laboratory works in accord with 'General requirements for the competence of testing and calibration laboratories ISO/IEC 17025:2005' (Accredia registration number 0284 – tests list on the website) with Italian and foreign customers.
In particular within the non-food area Artest can test the product's capability of suppressing the growth of bacteria in fixed conditions. The testing methods are applied with plastics, coating materials, ceramics, natural and artificial leather, stainless steel and rubber. Ceramics are tested according to the requirements of ISO 22196:2011 or ISO 27447:2009 - Film adhesion method.



IMSL INDUSTRIAL MICROBIOLOGICAL SERVICES LTD

CERTIFICATE OF ANALYSIS — CERTIFICATE NO. 1014580.2

CUSTOMER — CUSTOMER REF. M16 (CITYLIFE)

PANARIA CERAMICA
via Panaria Bassa 22/a
41034 Finale Emilia (MO)
ITALY

SAMPLE DETAILS — DATE RECEIVED 13-Sep-10

PANARIAGROUP INDUSTRIE CERAMICHE S.p.A
CITYLIFE

METHOD: (Determination of Antibacterial Activity using Test Based on MOD ISO 22196)

DATE ANALYSED 15-Sep-10 — DATE REPORTED 22-Sep-10

RESULTS (AS CFU CM -2)

SERIES	SAMPLE		CONTACT TIME 0 hours	CONTACT TIME 24 hours	REDUCTION Log	REDUCTION %
CITYLIFE	AVENUE	*Klebsiella pneumoniae*	2.0E+04	2.2E+02	1.9	98.88%
CITYLIFE	AVENUE	*Escherichia coli*	2.0E+04	1.0E+02	2.3	99.51%
CITYLIFE	AVENUE	*Staphylococcus aureus*	2.4E+04	< 1.00	> 4.4	> 99.99%

The above data shows the difference in the population following contact with the surface of the samples listed for 24 hours at 35°C under a RH of > 95% relative to the initial population.

NS = Poor survival on control supplied.

INDUSTRIAL MICROBIOLOGICAL SERVICES LTD
PALE LANE
HARTLEY WINTNEY
HANTS
RG27 8DH
UK

IMSL CERTIFIED AS A GENUINE DOCUMENT ISSUED BY INDUSTRIAL MICROBIOLOGICAL SERVICES LTD REGISTERED IN ENGLAND NO 2284423 IF SIGNED AND DATED
DATED 19/10/10

PETER D ASKEW
MANAGING DIRECTOR

1. Escherichia coli
E. coli are Gram-negative rod shaped bacteria.
E. coli are a consistent inhabitant of the human intestinal tract. Pathogenic strains of E. coli are responsible for urinary tract infections, intestinal diseases such as gastroenteritis and neonatal meningitis.
E. coli serve as an indicator of faecal contamination of water and can also be found outside the body in contaminated water environments.

2. Staphylococcus aureus
S. aureus are Gram-positive spherical bacteria which occur in microscopic irregular clusters resembling grapes.
S. aureus mainly colonises the nasal passages but can also be found on the skin, mucous membranes such as in the oral cavity and the gastrointestinal tract. They can also be found in soil.
S. aureus can cause surgical infection and skin infections. They can also cause skin lesions such as boils and styes and more serious infections such as pneumonia and urinary tract infections.

3. Klebsiella pneumoniae
Klebsiella pneumonia are Gram-negative rod shaped bacteria. They belong to the normal intestinal flora of man.
Most frequent Klebsiella pneumoniae infections include lower respiratory tract and catheter-associated urinary tract infections.


1.


2.


3.

INFORMATION FOR DESIGNERS AND BUILDING SUPERVISORS

Data for tender specifications, Panariagroup Microban® porcelain:

Porcelain tiles and slabs with a high "antimicrobial" activity, capable of reducing up to 99.9% of **Escherichia coli, Klebsiella pneumoniae** and **Staphylococcus aureus** bacteria (ISO 22196 standard) thanks to the action of **Microban®** silver-based, integrated technology registered under the European Biocidal Products Regulation (BPR) No 528/2012.

Porcelain tiles and slabs with **antimicrobial properties**
- active day and night, 24/7
- active both in light and dark conditions, with no need to use UV lamps
- active on the surface of the material
- permanent, integrated into the surface during industrial firing at a temperature of 1200 °C (It is not a surface treatment applied after firing),
- active over time, resistant to wear, lasting for the lifetime of the tiles, it is permanent and does not to be retreated over the lifecycle of the product.

Available "antimicrobial" porcelain tiles and slabs
- available on **all colours** of the collection, even the darkest (Microban® technology does not "whiten" dark colours)
- on **Natural** and **honed (lappata)** finishes

"Antimicrobial" porcelain stoneware tiles and slabs, ideal for any environment, especially those that call for a high standard of hygiene and cleanability, such as:
- hotels, restaurants, canteens,
- hospitals, operating theatres,
- wellness centres, spas, swimming pools, gyms, showers,
- retirement homes, schools, nursery schools,
- agricultural and food industries, slaughterhouses,
- public areas and offices,
- public and private kitchens and bathrooms.

LEED Buildings

Microban® tiles manufactured by Panariagroup entitle you to be awarded 1 point for the **ID 1 Innovation in Design** Credit (ref. NC, CI, CS and SCHOOLS LEED Rating Systems).

Antimicrobial grouts

There are antimicrobial grout products available to both the consumer and trade market, to ensure protection on the entire surface.

Information for installation and cleaning

Microban® products are installed in the same manner as other tiles, following the procedures in force in various countries and described in the installation rules and Technical Manuals of Panariagroup laminated porcelain.
For information about cleaning and care of Panariagroup porcelain and laminated porcelain, refer to the instructions given in the general catalogs and instruction manuals.
Since the antimicrobial action of Microban® active principles is exerted on the surface of the tile, it is important to prevent films of any kind from forming on the surface since these may prevent contact between bacteria and the ceramic tile. During cleaning and care activities, do not use detergents containing wax or that create films on the surface, rinse thoroughly and do not apply resin, wax, protective substances, etc.

MICROBAN® FAQs

1. What is Microban® silver antimicrobial technology?
Microban® is an active antimicrobial 'ingredient' that can be added to a wide range of consumer, industrial and medical products to prevent the growth of bacteria on the surface of the item. As it is integrated at the point of manufacture it offers a long-term solution to the prevention of bacterial growth, reducing the risk of cross-contamination.
The technology developed by Microban® and Panariagroup on the porcelain tiles and slabs is silver-based.

2. Is Microban® silver antimicrobial technology for ceramic tiles always active?
Yes - Microban® silver antimicrobial technology developed for ceramic tiles offers continous antimicrobial protection, day and night, 24/7, with or without sunlight and does not require UV light to be effective (unlike other technologies).

3. Can Microban® silver antimicrobial technology be applied to tiles of any color?
Yes - Microban® silver antimicrobial technology does not alter or whiten the original color of the ceramic surface (unlike other technologies), and can therefore be applied onto any colored tiles even the darker ones.

4. Which micro-organisms is Microban® protection effective against?
The Microban® antimicrobial additive developed for ceramic tiles is effective against a range of gram positive and gram negative bacteria such as Escherichia coli, Staphylococcus aureus, Klebsiella pneumonia.

5. Is the action of Microban® antimicrobial technology permanent on the tile surfaces?
Yes - The Microban® protection developed for Panariagroup is not an organic based treatment applied to finished products (such as in the case of waxes or resins), but is permanently integrated onto the tile surface during the industrial firing process. Therefore, it can't be washed away or consumed.

6. Does Microban® protection begin working immediately?
Yes – Microban® protection works continuously, as soon as bacteria and germs come into contact with the surface of the tile, Microban® product protection immediately stops the growth and reproduction cycle. Since they are unable to grow or reproduce - the tile surface stays cleaner for longer.

7. Does Microban® protection wear away over time?
No - Microban® active ingredients are incorporated into the tile surface during the manufacturing process. Evenly distributed throughout the surface Microban® actively protects the entire surface area throughout the entire lifecycle of the product.

8. What is the main advantage provided Microban® antimicrobial protection?
Microban® technology, together with regular cleaning operations, contributes to improved hygiene levels and reduces the risk of cross-contamination, and ensures an additional level of protection in any environment.
Microban® protection displays a continuous action against the growth of bacteria that cause biofilms, odours and cross contamination. Microban® provides targeted protection, focusing where it most benefits consumers.

9. Is Microban® protection safe?
Yes - The antimicrobial technology used in Panariagroup ceramic tiles has a long history of safe use and can be found in a breadth of consumer, industrial and healthcare products – such as toothpaste, water filters, stationery items and more. The Microban® antimicrobial active used in Panariagroup tiles is listed in Europe in the Biocidal Products Regulation (BPR) No 528/2012 and has undergone extensive independent laboratory testing.

10. Are ceramic tiles naturally resistant to bacteria?
No - Even though ceramic tiles consist of a non-porous surface, which provides an important benefit in keeping bacteria from penetrating into the tile, bacteria can still multiply and grow on the surface. As it is built into the tile surface - Microban® antimicrobial technology is designed to help prevent the growth of bacteria on the surface of the ceramic tile, where it is needed most.

11. Do you still need to clean ceramic tiles if they have Microban® protection?
Yes - Microban® protection is not a substitute for a thorough cleaning routine. Microban® silver technology provides an added level of hygiene protection that helps fight the growth of harmful bacteria and prevent cross-contamination.

12. Is it easy to clean Microban®/Panariagroup products?
Yes, cleaning is easy as indicated on the general catalog. As action of the active agents of Microban® happens on the surface of the tile, it is important not to use any cleaning products that create a film that would block the contact between the tile and the bacteria. Therefore it is important while cleaning not to use detergents that contain waxes or coating products, rinse well and do not apply resin, waxes or protective agents.

MICROBAN® FAQs

13. Is it necessary to follow particular precautions when installing products with Microban® protection?
No – Microban® products are installed in the same manner as other tiles, following the procedures in force in various countries and described in the installation rules and Technical Manuals of Panariagroup.

14. How does Microban® antimicrobial protection differ from disinfectants?
Disinfectants and detergents are an instant but short term solution that provides only a limited residual activity once the treated surface dries. Bacteria can then very quickly start to grow and reproduce. On the other hand Microban® antimicrobial additives guarantee long lasting protection, continuously working to prevent the growth of bacteria everyday and throughout the entire lifecycle of the product.

15. Can antimicrobial tiles contribute to generate resistant strains of bacteria?
Dangers from resistant strains of bacteria are primarily related to antibiotic resistance in which bacteria no longer respond to a specific antibiotic. Microban® antimicrobial additives are not antibiotics. They have multiple targets and modes of action on the bacteria (unlike the majority of antibiotics which are target specific). This reduces the risk of potential resistant strain development.

GLOSSARY

Bacterium: single-celled microscopic organisms that lack nuclei and other organized cell structures. "Bacteria" is the plural form of "bacterium." While several bacterial species are pathogenic (capable of causing disease), many are non-infectious.

Microorganism: an individual form of life that is capable of growing, metabolising nutrients, and reproducing. Organisms can be unicellular or multicellular. They are scientifically divided into five different groups that include prokaryotes, protists, fungi, plants, and animals. A microorganism is an organism of microscopic or sub-microscopic size, such as a bacterium.

Cross contamination: transmission of micro-organisms from contaminated materials, surfaces, articles or humans to non-contaminated materials, surfaces etc.

DNA: deoxyreibonucleic acid. A nucleic acid that carries the genetic information in the cell and is capable of self-replication.

Ag Ion (silver ion): a silver ion is a silver atom which has lost one electron and therefore carries a positive charge.

Active substance as defined by the Biocidal Products Directive: a substance or micro-organism including a virus or a fungus having a general or specific action on or against harmful organisms.

Biocidal Product: active substances and preparations containing one or more active substances, put up in the form in which they are supplied to the user, intended to destroy, deter, render harmless, prevent the action of, or otherwise exert a controlling effect on any harmful organism by chemical or biological means.

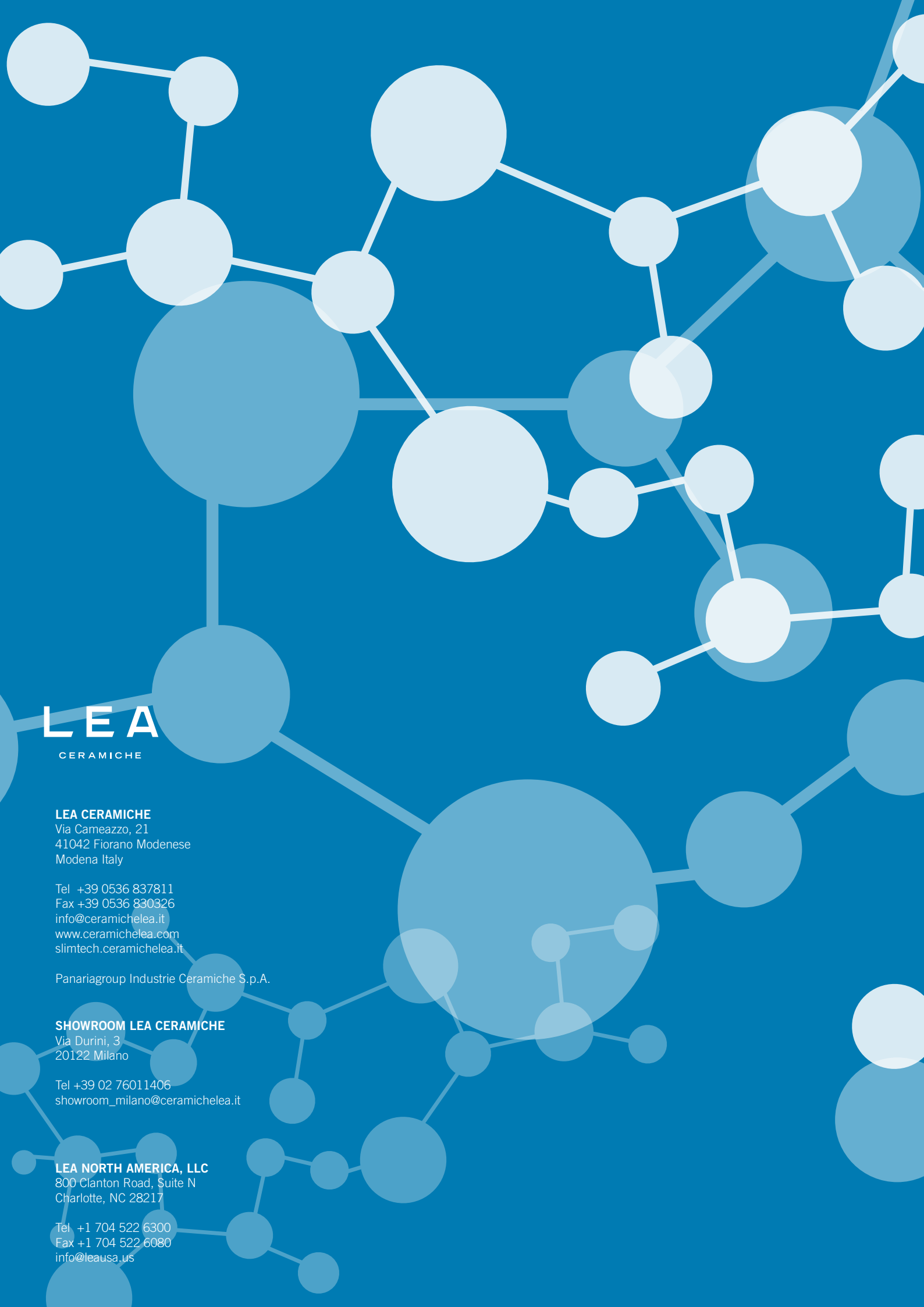
Biocide: this is an active substance or biocidal product as defined by the Biocidal Products Directive.

Biofilm: communities of microorganisms attached to a surface. Microorganisms undergo profound changes during their transition from planktonic (free-swimming) organisms to cells that are part of a complex, surface-attached community.

Gram-positive bacteria: these are able to be stained with a special violet/blue stain and therefore show up under the microscope.

Gram-negative bacteria: these bacteria do not retain the violet / blue stain and need to be stained with a special counter-stain which gives them a pink / red colouration under the microscope.

NOTE



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