

SMART SANITARY PAINTS

# HYGIENE IN HOSPITALS AND CLINICS

Innovation, Prevention, and Safety



STOP NOSOCOMIALS



**BioFilmStop**

**FAKOLITH**

**Technology**

Stop moho & bacterias

The most innovative barrier



# FAKOLITH IN THE HEALTHCARE SECTOR

Fakolith has been present in the international market for over 50 years and has direct contact with the problems faced by the healthcare, pharmaceutical, and food sectors. This has guided our official R&D&I programmes, enabling us to solve the real problems encountered daily in these critical sectors. We are supported by advanced and innovative technologies that add highly relevant features to the main function of paints as decorative and functional elements, such as physical resistance and chemical resistance, very low odor, moisture resistance, and microbiological resistance and activity.



PYME INNOVADORA

Válido hasta el 15 de noviembre de 2021



## MAIN PROBLEM: Nosocomial Infections - IRAS

According to the OMS these are infections acquired by patients during their stay in a hospital and are not the reason for their admission. Known as HAIs (healthcare-associated infections), they are a huge public health problem and one of the greatest challenges facing healthcare facilities world-wide due to the health issues they cause for patients, healthcare personnel, family members, and visitors. We would particularly like to highlight the global issue of microorganisms that have acquired resistance to multiple antibiotics (MMR), which lead to longer hospital stays, increased mortality and associated costs. It is estimated that the MMRs cost to the Spanish National Health System (SNS) is around 800€ million per year.

In Spain, the EPINE-2015 report (Study of the Prevalence of Nosocomial Infections in Spain) indicates that the prevalence of HAIs in the case of hospital admissions is 5.6%. Other studies estimate that around 56.6% of all HAIs are preventable, with 20% of these being of environmental origin. This includes contamination from surfaces and hospital rooms, and there is scope for improvement in at least 40% of cases.

A recent analysis published in the "Journal of Hospital Infection" to determine the risk to patients of acquiring a pathogen associated with the previous occupant of a room revealed that:

- a) If the previous occupant did not have a BMR, 3.2% of subsequent occupants contracted one.
- b) However, if the room had previously been occupied by a patient with a BMR, 6.2% of subsequent occupants acquired a BMR of the same species. In other words, the risk doubled.

The authors of the study concluded that current cleaning and disinfection practices do not reduce the risk and they suggest combining manual cleaning with the use of new technologies that complement surface cleaning and disinfection.



## The role of surfaces in the transmission of nosocomial diseases

Hospital surfaces are reservoirs of pathogens that must be neutralised.

In 2013, the Rudolf Schuelke Foundation published a European consensus study in the RKI Commission's journal 'GMS Hygiene and Infection Control'. The study, entitled 'Hygiene Requirements for Cleaning and Disinfecting Surfaces', demonstrated how infections are transmitted from surfaces to patients, healthcare workers, visitors and so on. (For more details, read the report on nosocomial infections, which is available in the healthcare sector section on our website: [www.fakolith.es](http://www.fakolith.es)).

Various scientific studies have estimated that the average cost of nosocomial infections represents between 2% and 3% of the annual budget of each hospital. The significant margin for improvement is no less than 40% in the environmental aspect, which includes surfaces, hospital rooms and pipes. This is due to the fact that cleaning and disinfection have only been carried out manually, with little complementary innovation.

# Synergies between new technologies and traditional media

Adequate synergy between manual cleaning and disinfection methods and technological innovations can drastically improve hospital hygiene, leading to significant social and economic savings and reducing sick leave.

The primary function of our paints is obvious: to create a functional and decorative paint films (see technical data sheets). In addition, we have equipped our paints have important secondary functions, such as low odour and VOC content, physical and chemical resistance, moisture resistance, washability, ecology, durability and microbiological resistance. In this brochure, we will highlight the effectiveness and advantages of BioFilmStop Technology, particularly in the healthcare sector.



## Innovation: Prevention Barrier with BioFilmStop Technology

It is smarter to try to prevent and inhibit infection or contamination than to wait for it to occur and then disinfect. In the healthcare sector, BioFilmStop technology offers a radical change in the fight against biofilm, bacteria, mould, yeast and other microorganisms, as it forms a pathogen-inhibiting barrier on surfaces, rather than allowing microorganisms to establish themselves, strengthen and become more infectious.

Open surfaces in hospitals account for over 90% of the total surface area. BioFilmStop is applied to walls, ceilings, floors, pipes and other paintable surfaces in the form of treated paint (BPR Art. 3 treated articles), transforming these potential contamination vectors into active infection-inhibiting surfaces. The effectiveness BioFilmStop Technology-treated paints has been tested under ISO 22196:2007 and ISO 22196:2011 standards on the main indicator microorganisms:

-*E. Coli*  
-*Legionella pneumophila*

-*Listeria monocytogenes*  
-*Aspergillus brasiliensis*

-*Salmonella enteritidis*  
-*Candida albicans*

-*Pseudomonas aeruginosa*  
-*Staphylococcus aureus...*

-*Coronavirus*



### The advantages of the BioFilmStop Barrier are definitive:

- 1- Prevention: The static barrier inhibits the growth of biofilms, bacteria, mould and yeast, virus, without releasing biocides into the environment.
- 2- Inhibition is active on 100% of painted surfaces, 24 hours a day.
- 3- It is effective and harmless to personnel, and non-corrosive to machinery, equipment and facilities.
- 4- Its application complies with industry requirements including short renewal times, low odour, low-temperature application where applicable and strict compliance with all European and national regulations.
- 5- It improves the efficiency and effectiveness of traditional L+D systems and reduces waiting times. Unlike traditional systems, it does not generate cross-contamination from aerosols or splashes to other areas or the environment.
- 6- It compensates for the risk of traditional disinfectants being ineffective due to incompatibility between the wet phase (kill time), since the kill time of BioFilmStop technology occurs in the dry phase.
- 8- It does not produce additional waste from cleaning and disinfection methods, nor does it consume water or chemicals, making it a sustainable solution.
- 9- It creates healthier environments, improves the perceived quality of hospitals, and reduces the risk of toxic infections and staff absences.
- 10- It is economically viable because, in addition to its pathogen-inhibiting effect, it has the aesthetic effect of paint and is highly durable.



# MAIN FOCUS OF NOSOCOMIAL ON SURFACES:

## Biofilm

It is one of the greatest health risks in hospitals and is directly related to nosocomial infections. Biofilms can be formed on all types of surfaces, including plastic, glass, wood, metal, iron and stainless steel.

A biofilm is a complex community mainly composed of bacteria, but also containing protozoa, fungi and yeasts. It is covered with an extracellular polysaccharide produced by the organisms themselves. This polymeric matrix enables them to adhere to surfaces, adapt to adverse environments, obtain water and nutrients, and protect themselves from disinfectants. This allows them to grow, colonise and infect other surfaces.

The process begins with the bacteria adhering to the surfaces they want to colonise. This process has two phases:

- a) Reversible phase. This is the initial stage of the bacteria's interactions with the surface, in which electrostatic repulsion forces are at play. To overcome these forces, the bacteria activate various mechanisms to counteract them. During this phase, the biofilm is more susceptible to cleaning methods, minor friction and disinfectants.
- b) Irreversible phase. Once complete, adhesion becomes permanent and the bacteria achieve maximum contamination and resistance to cleaning and disinfection. This is such that two phases are required to destroy them:
  - Destruction of the protective extracellular matrix.
  - Disinfection.

It is clear from the above that prevention is extremely important in order to stop biofilms, bacteria, fungi and microorganisms nesting on surfaces such as ceilings, walls, floors and in installations.

## Fungi

For example, we highlight some strains of *Aspergillus*, which grow and develop at human body temperature. Their small spores are transported through the air, facilitating their inhalation. Infection can also occur through direct contact during surgery.

The danger lies in its ease of spread through spores and inhalation, as well as its high mortality rates, particularly in cases of pneumonia. Spores can be originated from damp surfaces, ventilation systems contaminated by dust, but above all, construction activities in or near the hospital involving exposure to reservoirs of the fungus. We highlight the fungal strains that cause systemic and opportunistic mycoses, particularly in immunocompromised individuals, due to their ability to cause infection.

### Biofilm Problem

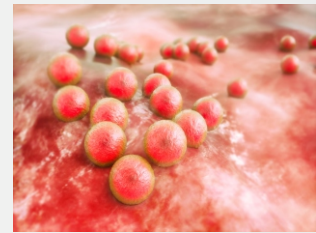


### BioFilmStop Solution



# Superbugs that are multi-resistant to antibiotics, and others:

-*Staphylococcus aureus*. It is favoured by the fact that these species inhabit both the mucous membranes and the skin of humans. This means they can enter in the patient's bloodstream through surgical wounds, via direct or indirect contact with healthcare personnel, contaminated objects, or even other patients. The most dangerous species is methicillin-resistant *Staphylococcus aureus* (MRSA). This microorganism is clinically significant because it hinders the treatment of the infections it causes, requiring a series of control measures to be put in place in hospitals.



*Staphylococcus aureus*.

-*Pseudomonas aeruginosa*. It can infect lungs, the respiratory and urinary tracts and tissues (wounds), and can also cause sepsis (generalised infections in the body). It is one of the most frequently isolated microorganisms in many studies.



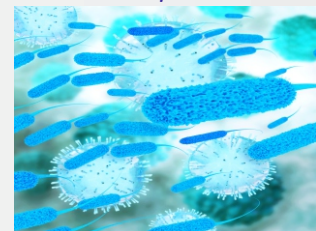
*Pseudomonas aeruginosa*

-*Klebsiella pneumoniae*. It is the causative agent of urinary tract infections, pneumonia, sepsis, soft tissue infections, and surgical wound infections. Patients admitted to intensive care units, newborn babies, and patients with COPD, diabetes mellitus, or alcoholism are particularly susceptible.



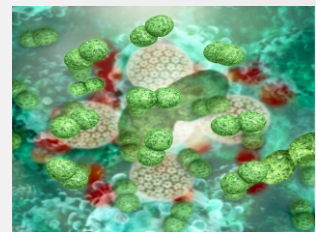
*Klebsiella pneumoniae*

-*Escherichia coli\_T0157:H7*. While most strains are harmless and inhabit the intestines of healthy humans and animals, this strain produces a potent toxin that can cause serious illnesses such as haemolytic uraemic syndrome. The risk group includes virtually everyone, regardless of immunocompetence.



*Escherichia coli*

-*VRE Vancomycin-resistant enterococci*. They cause hospital-acquired infections, including urinary tract infections and bacterial endocarditis. They are also associated with healthcare-associated infections and MRSA.



*VRE Enterococcos*

## Critical areas:

Particularly critical areas include surgical wards, sterilisation centres, dialysis units, parenteral therapy units, intensive care units, emergency rooms and hospital wards, food services, mortuaries, oncology wards, accommodation, common areas...

## Pathogen reservoirs:

### 1.- Animated reservoirs:

This includes asymptomatic colonised patients, infected individuals or patients, and colonised healthcare personnel.

### 2.- The inanimate reservoirs:

While large surfaces such as walls, ceilings, floors and installations were traditionally not considered reservoirs of pathogens, it has now been demonstrated that they play a significant role in infections as they constitute the environment of patients and healthcare personnel. These surfaces provide the environmental conditions necessary for pathogens to nest and grow: temperature, humidity, organic matter and dirt.



# WORKPLACE SAFETY - HEALTHY ENVIRONMENTS

a) **We create healthier environments.** Long-term exposure to bacteria and mould in hospital facilities can lead to various toxic and fungal infections, ranging from mild allergies to severe health issues. In addition, asymptomatic healthcare personnel can act as vectors of infection for patients. BioFilmStop technology inhibits the growth of mould and bacteria without releasing biocides into the environment. This ensures a healthy environments and thus significantly improving the working conditions and reducing the risk of occupational diseases and sick leave.

b) **Environmentally friendly and odourless products.** Fakolith, in its official R&D&I projects and thanks to the combined use of cyclic oligodynamics and nanotechnology, provides high efficiency with a drastic reduction in toxic emissions into the environment. We prioritise the safety of our customers by providing products ranging from Low VOC to even ZeroZero VOC all of which are certified by the European Ecolabel and compliant with BPA.

c) **Water tanks.** European and FDA legislation is already very strict in this area.

All surfaces of water tanks and containers that come into direct contact with food and beverages, as well as surfaces that may occasionally come into contact with them, such as condensation droplets from ceilings and other surfaces, must be coated with a paint whose components are permitted for direct food contact, and whose overall and specific migrations rates do not exceed the established limits. This is in order to avoid food safety risks and public health problems.

To this end, the coating paint must comply with a whole host of extensive regulations. Similarly, the manufacturing company must comply with the requirements of good manufacturing practices (GMP) in clean rooms, implement its HACCP, obtain health registration, notify each paint to the Health Administration, and be inspected and authorised for marketing.

At Fakolith FCS, food and health safety is our top priority. That's why we have developed the FOODGRADE Technology range - the first line of paints to comply with migration tests and meets all the required standards (CE marking, Declaration of Conformity, EC 852/2004, EC 1935/2004, EU 10/2011, EU 1282/2011, RD 847/2011, EC 1895/2005, EC 2023/2006 and so on).

FK-100 FoodGrade is suitable for direct contact with almost all types of food and beverages. Fakolith holds the mandatory RGSEAA ES-39.005259/T Health Registration and applies HACCP in its production plant. In addition, we always take future regulatory trends into account, in our official R&D&I projects, and we already have new and cutting-edge products such as in the project Safe ED Coatings explained on next page and our website.

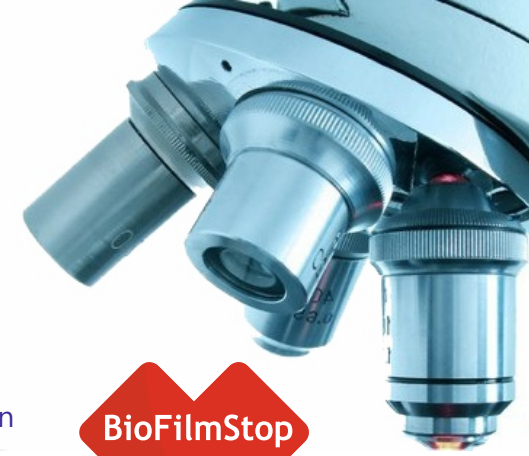


# VALUE PROPOSITION: The BioFilmStop Barrier

Prevention Barrier is the new concept in the fight against biofilm, bacteria, yeasts and fungi!

BioFilmStop Technology draws on more than four official R&D&I projects and FAKOLITH's 60 years of experience. This gives us the **combined cyclic oligodynamics** as a result., which has enabled the synergistic compatibility of inorganic nanotechnological metallic active ingredients with the free and microencapsulated organic ones, as well as with natural food preservatives and photocatalytic pigments. These ingredients combine over time to prevent the development of bacterial, moulds and microorganisms resistance, extending their long-term effectiveness and efficacy. All this is done in order to treat in accordance with BPR Art. 3 high-performance paints and surface treatments as their primary function that have been manufactured in a GMP environment using high purity, quality and efficient raw materials.

In addition to its primary aesthetic and functional value, the design of the paint provides a secondary barrier that inhibits microorganisms, with a greater durability than conventional paints on the market, due to the significant technological improvement in its mechanical and biochemical resistance. In fact, if we consider only the maintenance costs of painting surfaces over a period of three years, it is clear that the Fakolith option is more cost-effective than using conventional paints on the market, as repainting intervals are also extended. If it is also taken into account the additional contribution of the inhibitory value of BiofilmStop, maintenance costs are reduced even further. For further information, please refer to the question and answer report available at [www.foodgradepaint.com](http://www.foodgradepaint.com).



## RELATED OFFICIAL R+D+I PROJECTS

**Safe ED Coatings PROJECTS.** 'High-performance safe coatings to eliminate, encapsulate and/or reduce exposure to and contamination by endocrine disruptors'. Official R&D&I project CPP2022-009628, with a total budget of 683.63,00€, partially funded by the Ministry of Science, Innovation and Universities and the State Research Agency, under the Public-Private Partnership call for proposals. Ongoing until the end of 2026.

**BioTech Coatings PROJECT.** "Development of coatings using safe and environmentally friendly preservatives", official R&D&I project RTC-2017-5947-5 with a total budget of 507.323€, partially funded by the Ministry of Economy and Competitiveness, within the 2017 Retos-Colaboración sub-programme. Successfully completed..

**FoodTech&Coatings PROJECT.** 'Development of safe and sustainable alternative preservatives for use in aqueous coatings for the food industry', official R&D&I project for Technological Innovation, file number RTC-2014-2020-5, with a total budget of 491.101,60€, partially funded by the Ministry of Economy and Competitiveness, within the Retos-Colaboración sub-programme.

**APLICONs PROJECT.** "Nanotechnology-based antimicrobial paints", official R&D&I project of Technological Innovation, with file number IPT-2011-1499-900000 and a total budget of 1.001.439,15€, partially funded by the Ministry of Science and Innovation, within the INNFACTO sub-programme, part of the 2008-2011 National Plan for Scientific Research, Development and Technological Innovation. Successfully completed.



**INNOVATIVE SME**

Valid until Jan 22nd 2028



# MAIN HYGIENIC PAINTS



## DISPERLITH Elastic

Aqueous dispersion, BioFilmStop, certified for clean rooms, mainly for use on walls and ceilings with high cleaning and disinfection requirements, operating theatres, ICUs, rooms, common areas... The all-rounder in hospitals.

## FK-100 FoodGrade

Ultra high-solid epoxy paint with high physical and chemical resistance, featuring BioFilmStop and FoodGrade technologies, mainly used for flooring and other surfaces in technical areas and water tanks.

## Others

For special cases and requirements we have a long catalogue of solutions

- Low-VOC and zero-VOC paints, very low odour, easy to apply and maintain
- Resistant to cleaning and disinfection
- Technical specifications, application guidelines, budget calculations
- Training for applicators and maintenance technicians
- Declarations of conformity, tests and certificates



*We Know How!*

## Our mission is your satisfaction

Fakolith Chemical Systems (FCS) is a company belonging to the Fakolith (FK) group in Spain. Its facilities in Tortosa include a compact production plant, a buffer warehouse, a specialised technical service, a training centre and its own R&D&I department.

FCS's mission is to achieve customer satisfaction by helping them secure new business opportunities and strive for excellence through technological innovation and application optimisation, thereby ensuring total end-customer satisfaction.

Our experienced technical team, as well as our official distributors and professional application companies, will be delighted to provide you with comprehensive information and advice about our technologies, products and systems.

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