Inelligent Food Grade Paints

Hygiene in the Food Industry

Innovation, Prevention and Safety

Toxi-infections: Biofilm, fungi, bacteria - Organoleptic variations - Toxic Migrations - Safety in workplace

For Direct Contact with Foods and Drinks

Inhibitors of Biofilm, Bacteria, Mould, Yeast...

www.pinturaalimentaria.es
FAKOLITH IN THE FOOD INDUSTRY

Fakolith has been present on the international foodstuffs market for 50 years and, during this time, direct contact with the problems of this market, has oriented our official R&D&i programmes towards the resolution of the real day-to-day problems that we have come up against in the food industry.

In the present brochure we place practical and innovative solutions, at the disposal of the food industry as a whole, based on years of experience in this market, experience that is backed by advanced technologies, such as combined cyclical oligodynamics and nano-technology, and with the firm commitment to strictly meet the full range of European regulations and international standards. The Fakolith proposal benefits and is directed at all sectors of the food processing industry and agriculture in general:

- Meat Industry
- Fishing Industry
- Milk and Cheese Industry...
- Bread, Pastries and Cake Making
- Fruit and vegetables

- Wines, Beers, and Alcoholic Drinks
- Soft drinks
- Sugar, Cocoa, Chocolate...
- Aquaculture
- Canning Industry

- Alimentary Pastas
- Flours, Cereals, milled Products
- Animal Feeds
- Food Additives
- Etc...

STRict Compliance With Regulations

It must be taken into account that European health legislation stipulates that businessmen/women are directly responsible for compliance with the applicable regulations concerning the paints and coatings that are used. That is they are responsible for compliance with the standards applicable to the paints and coatings that they choose to be in direct contact, and also to ensure that their installations comply, not only with part of, but with all of the applicable regulations in force at any given time.


At Fakolith we apply HACCP in collaboration with the CNTA (Spanish National Centre for Technology and Food Safety), and we are also a partner in various official R&D&I projects within the sector that, along with the historical know-how of the Fakolith GROUP, have been fundamental in the development of BioFilmStop and FoodGrade technologies.

Avoid Risks

To make sure, in a single document, that a paint meets all of the applicable regulations, requires an obligatory declaration of conformity, with details of the manufacturer's sanitary registry, plus the date of the most recent record of inspection, accompanied by a list of all of the standards that it must comply with, plus the official tests that verify it. This is the only document that ties the manufacturer to compliance with the applicable regulations.
RISK 1: BIOFILM

The biggest risk in the food processing industry are biofilms, which can form on all kinds of surfaces: plastics, glass, wood, metal, iron or stainless steel, as well as on the food itself. Biofilms are the cause of final product contamination and can lead to product rejection, economic losses and an evident risk for the health of the consumer.

In nature only a small proportion of bacteria exist in an individual or planktonic form, insofar as most bacteria live in colonies forming biofilms. A biofilm is a complex community of micro-organisms embedded with an extracellular polymeric substance that they themselves excrete. This matrix favours the adhesion of the biofilms to all kinds of surfaces, allowing for their adaption to an adverse medium, providing water and nutrients, and protecting them from disinfectants so that they can grow, colonise and infect other surfaces.

The process starts with adhesion to the surfaces that the bacteria want to colonise. In this process there are two aspects that need to be stressed:

a) The reversible Phase. This is the first phase, in which the bacteria approach the surface and forces of electrostatic repulsion come into play, to resist them mechanisms are started up in order to counteract them. In this phase they are sensitive to methods of cleaning, scrubbing and disinfectants.

b) The Irreversible Phase. Having overcome this initial phase, adhesion becomes definitive and the bacteria obtain their maximum power of contamination and max. resistance to cleaning, to the extent that in order to destroy them, 2-stage actions needs to be taken:

- Destruction of the extracellular protection matrix
- Disinfection.

In view of the above, it is evident just how important prevention is when it comes to avoiding biofilm, bacteria, fungi and micro-organisms settling on surfaces in the food industry, as well as on the foods themselves.

RISK 2: ORGANOLEPTIC VARIATIONS

The disagreeable smells and tastes of mould, cork, stables, metallic tastes, abnormal colourations, decay... Defects such as these, can result in a significant reduction in the quality of the product and the image of the company, which can lead to rejection of a full batch, loss of prestige and important economic losses.

The responsible micro-organisms can be divided into 3 types: moulds, yeasts and bacteria, in short also biofilm.

The presence of these micro-organisms is already there in the raw materials, themselves, utensils, consumables, and also in typical food industry environments. Once in the interior they start to colonise and multiply, spreading on floors, walls, ceilings and other exposed surfaces. Before penetrating, in a second phase, into production areas. The food industry micro-climate normally with high humidity, a lack of ventilation, adequate organic material, the right temperatures, etc., Providing the ideal habitat in which the micro-organisms responsible for causing the above-indicated defects, can reproduce.

Fungi, yeasts, algae... Do so individually, while bacteria together with the above form biofilms.
There are 3 types: Bacteria, Mould and Yeast

Most relevant bacteria:

- **Listeria monocytogenes.** Is widespread, even proliferating in cold refrigerator environments, with a great capacity to adhere to inert or organic surfaces. One of the targets of food safety.

- **Salmonella spp.** Can form biofilms on different kinds of surfaces in food processing plants, including plastic, cement, and steel. According to the EFSA, salmonellosis, is the first cause of outbreaks of food-based toxic-infection in the European Union.

- **Escherichia coli.** Has the ability to easily adhere to surfaces and its nutritious needs are simple. Toxic-infection occurs as a result of entry into the intestine on foods, although it can also affect other human organs, in both cases it can cause serious symptoms and is one of the most serious public health risks.

- **Pseudomonas spp.** Is found in food processing, drains, on floors, in vegetables, on the surface of meats and even in some weak acids. It produces large quantities of polysaccharides and is even capable of adhering to stainless steel.

- **Campylobacter jejuni.** The WHO classifies this pathogen as one of the main cause of foodstuff toxic-infections worldwide. While the EFSA, also coincide in identifying it as a major cause, in recent years, of cases in the European Union.

- **Bacillus spp.** Its danger is aggravated by the fact that it is resistant to heat and can survive for hours in processes in which heat is used. Accumulates by forming biofilms, particularly in pipes and joints.

- **Staphylococcus aureus.** Is an important food pathogen because of its ubiquity, in a wide range of environments. It is the most common cause of gastroenteritis worldwide and can be found in raw food, manipulators and equipment.

- **Legionella spp.** Is responsible for the illness known as legionnaires disease. Thriving in stagnant waters in a wide range of temperatures. Growth is favoured by the presence of organic materials. The main source of contagion is through water and refrigeration systems in large industrial buildings: humidifiers, spraying machines...

- Along with a number of others, such as: **Shigella, Streptococcus, Clostridium botulinium...**

Moreover, different species of moulds and yeasts, Aspergillus, Penicillium, Cladosporium. Brettanomyces, Candida also produce changes in the colour, smell and texture of foods. While the micro-toxins produced in their metabolisms can also cause a serious threat to health.
FAKOLITH VALUE PROPOSITION: BioFilmStop

We assume that attacking micro-organisms when their resistance is greater than the disinfectants, and when they have the greatest power of contamination, is to make life even more difficult when it comes to ensuring their destruction, as well as presenting a greater health risk. BioFilmStop technology can help us to resolve both of these problems.

Fakolith BioFilmStop technology inhibits, and delays biofilm development, making growth difficult in the initial phase on surfaces that have been treated and, in all cases, making cleaning and disinfection easier and safer, using present day means. BioFilmStop is not exclusive, but rather acts as a complement to other current disinfection systems.

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

BioFilmStop technology is applied as a paint, mainly onto exposed industrial surfaces; such as walls, ceilings, floors and other paintable surfaces. Its inhibitor effect notably reduces the above indicated risks of infection by pathogenic micro-organisms: Aspergillus, Penicillium, Cladosporium, Algae, Escherichia, Listeria, Bacillus, Pseudomonas, Staphylococcus, Legionella, Etc.

Its design brings the ability to inhibit micro-organisms, along with its aesthetic effect, while providing a durability that is approximately 5 times greater than that of conventional paints on the market. Due to the notable technological improvement of its mechanical and biochemical resistances, so much so that, solely by taking into account the maintenance costs of painted surfaces in the industry, over a period of 5 years, it is evident that it is more profitable to paint with Fakolith’s BioFilmStop than any of the conventional market paints, by prolonging the intervals between renovation from 1 to 5 years. If, moreover, we also take into account the additional values provided by BioFilmStop, there will be an even greater reduction in maintenance costs.

ADITIONAL VALUES

a) Once the paint has been applied, its inhibiting effect will begin to operate in a dry environment. there is no contamination by aerosols or the splashing of other areas, or the environment.

b) Currently, the imperfections of surfaces, fissures, cracks, protuberances, etc., are important reservoirs of micro-organisms, and surfaces conveniently painted with BioFilmStop also maintain their inhibiting effect here.

c) BioFilmStop also brings to the production process an important reduction in cross-contamination, as a result of surfaces that have been exposed to the environment.

d) The technology is highly suitable for inhibiting and reducing microbial contamination, moulds and bacteria in general, particularly in critical areas, such as processing rooms and areas of difficult access for conventional disinfection, sprinkling or spraying... Unlike sprinkling or spraying systems paints that contain BioFilmStop do not contaminate other surfaces (tanks, consumables, installations, surfaces...)

e) Reducing and complementing, without energy costs or waiting times, the use of chemicals, water and labour costs for cleaning and disinfection.

f) Helping to reduce contamination by micro-organism pathogens on extensive surfaces, which contributes to the lowering of the quantity of foods that have to be rejected withdrawn and avoiding economic losses.

g) Improving both personal safety and health and safety in the workplace.

h) Generating important savings in costs given that the inhibition of contaminants is static, without any need for action to be taken.
RISK 3: TOXICS MIGRATIONS IN DIRECT CONTACT

At the present time European legislation is already very strict.

All tank and container surfaces, along with all others that are in direct contact with foods and drinks including those that may occasionally be in contact, such as condensation drips from ceilings and other surfaces must be coated with a paint, the components of which are permitted to be in direct contact with foods and for which, overall and specific migrations are not in excess of the established limits, in order to avoid any food safety risk or public health problems.

To this end the coating paint must comply with a whole series of sweeping regulations. Likewise, the manufacturing company must also comply with the requirements of clean room food GMP (Good Manufacturing Practices), implement their HACCP, obtain sanitary registration, notify the sanitary administration with regard to each paint, and have them inspected and authorised for commercialisation.

Because food safety is important to us, Fakolith FCS have developed their FOODGRADE technology range, with the first paints that comply, not only with migration testing but also, in an accredited way, with all of the demandable requirements (EC mark, EC Declaration of Conformity, 852/2004, EC 1935/2004, EU 10/2011, EU 1282/2011, SPANISH RD 847/2011, EC 1895/2005, EC 2023/2006...). FK-45 is suitable for direct contact with almost any kind of food or drink. Fakolith have the obligatory RGSEAA (General Sanitary Registry for the Food Business and Foodstuffs) registration ES-39.005259/T, and applies an HACCP in their production plant. Moreover, in our official R&D&I projects we always bear in mind the regulatory tendencies that are going to appear in the future and dispose of new and state-of-the-art products such as epoxy FK 45 Hygienic and Disperlith FOODGRADE water-based dispersion paint that brings together BioFilmStop and FOODGRADE technology and that, moreover, are also formulated and certified as being free of Bisphenol A.

RISK 4: OCCUPATIONAL SAFETY - HEALTHY ENVIRONMENTS

a) We create healthier environments. The existence of moulds on surfaces and in the workplace environment could be the silent cause of a range of different types of mycosis that can cause asthma and respiratory problems, ocular and nasal irritations, muscular pains, tiredness, allergies.... BioFilmStop Technology inhibits the growth of moulds and bacteria, without releasing biocides into the air/environment, Procuring healthier environments and, as a result, notably improving the workplace environment and reducing the risks of job-related illnesses.

b) More ecological products. In our R&D&I Plans, and thanks to oligodynamics and nanotechnology, which provide high levels of efficiency but with a drastic reduction in toxic emissions into the environment, increasing safety for the applier, procuring products, from low VOC or event zero-zero VOC, with European Ecolabel certification.
At Fakolith we understand that in order to be effective industry solutions have to be suitably introduced into the production process. Through the Total Solution Program, each food sector, when so required, is provided with all of the professional services that they may require to ensure an adequate application of these technologies:

- **Painter and maintenance hand training**
- **Declarations of conformity, trials and certificates**
- **Official food industry R&D&I Projects**
- **Analysis, reports and technical prescription**
- **Per system application guides**
- **Price quotation calculations**

### MAIN INTELLIGENT FOOD INDUSTRY PAINTS

**With BioFilmStop Technology**, high resistance to humidity, biofilm, bacteria, mould...

**DISPERLITH Industry**
- Water-based dispersion paint, for walls and ceilings in general in production and storage areas.

**DISPERLITH Hygienic**
- Water-based ecological-ecolabel dispersion paint, for walls and ceilings in production areas.

**With FoodGrade Technology**, for direct contact with foods and drinks

**FAKOLITH FK-45**
- High performance epoxy for the interiors of tanks, silos, on walls, ceilings, floors, facilities, installations...

**With FoodGrade and BioFilmStop Technology, and also Bisphenol A free**

**FK-45 Hygienic**
- Special version of FK-45, but formulated without Bisphenol A, and with improved performance in general

**DISPERLITH FoodGrade**
- Water-based dispersion, free of Bisphenol A, The first water-based single-comp.paint, apt for contact.

Production areas, clean rooms, tanks, silos, walls, floors, ceilings, sandwich pannels, fridges, installations, objects...

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**TOTAL SOLUTION SUPPORT**

**FAKOLITH**

We Know How!

FoodGrade paint in a FoodGrade bucket

**Analysis, reports and technical prescription**
- Per system application guides
- Price quotation calculations

**Painter and maintenance hand training**
- Declarations of conformity, trials and certificates
- Official food industry R&D&I Projects
OFFICIAL R&D&i PROJECTS

TECNOCAI PROJECT. “Efficient and Intelligent Technologies oriented to Health and Comfort in Indoor Environments”, Official R&D&I basic investigation project, expedient CEN-20091010, with an overall budget of EUR 19,859,841.00, with EUR 684,140.00 specifically provided by FCS, partially funded by the CDTI (Spanish Centre for Technological Industrial Development), Within the CENIT-E Program of the Spanish Ministry of Science and Innovation, in accordance with the resolution of 25th June 2009 (B.O.E. of 7th July 2009).


LIFE MINOX-STREET PROJECT. “Monitoring and Modelling NOx Removal Efficiency of Photocatalytic Materials: A Strategy for urban air quality management” approved at the LIFE 2012 Meeting, Expedient LIFE12 ENV/ES/000280. This project was approved in July 2013, and is set to last for 4 years. The budget is for EUR 1,982,619.00, of which the European Union has funded 46.23% (€ 916,913.00). FCS Is a partner in the project with their range of photocatalytic products.

FOODTECH&COATINGS PROJECT. “Development of Alternative, Safe and Sustainable Preservatives for Application in Water-Based Coatings for the Food Industry”, Official R&D&I technological innovation project, with expedient RTC-2014-2020-5, The overall budget for which was EUR 491,101.60, with EUR 182,335.64 specifically provided by FCS, and which was partially funded by the Spanish Ministry of the Economy and Competitivity, As part of the challenges-collaboration sub-program, of the Spanish State Program of Scientific Research, Development and Innovation oriented to the challenges facing society. Within the framework of the Spanish National Plan for Scientific Research and Innovation technique2013-2016, In accordance with the Resolution of 13th December 2013 (B.O.E of 19th December 2013).

Fakolith Chemical Systems (FCS) is a Fakolith (FK) Group company, based in Spain. Our premises in Tortosa include a production plant and buffer warehouse, specialised technical services, a training centre and our own R&D&I Department.

At FCS our goal is to ensure the satisfaction of our customers, assisting them to win new business opportunities and to achieve excellence through technological innovation and the optimisation of the application in order to ensure the complete satisfaction of the end user.

Our experienced technical team, along with our network of official Distributors, will be delighted to provide you with complete information and assessment about our technologies, products and systems.

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www.foodindustrypaint.com
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