

Disinfecting surfaces safely

Dry cold fogging ensures hygienic air and aseptic surfaces in the meat industry

Both mould and general microbial contamination can pose a significant quality risk in the industry. Although they are a natural part of the air, these microorganisms can present a significant problem under certain circumstances or in a high concentration. Especially in the food industry both moulds and microbes are a latent threat and represent a risk for the safety of products, reflecting rising hygiene standards eliminating microorganisms such as bacteria, fungi and viruses in the food industry.

By Martin Urbanek

With cold fogging, an effective sterilisation of both the air and surfaces in the production area is possible – even where there is no or insufficient access (cable carrier, scoring, undersides of machinery etc.) for mechanical cleaning procedures. Cold fogging minimises product losses, increases quality, protects against diseases and can be used throughout the whole production process. This is ideal for the industrial plants as well as for packing plants, slaughterhouses, warehouses etc.

Anyone who has ever tried to fight mould knows how persistent it is. In order to prevent spores from even gaining foothold, several methods are available. Basically, mould grows on all surfaces. Work surfaces are hardly affected by this problem, since they are cleaned daily and hardly provide a

An effective sterilisation of both the air and the surfaces in the production operation is possible using cold fogging.



suitable habitat for microorganisms. Ceilings, walls, joints, areas that are difficult to reach behind equipment and machinery or hiding places such as cooling units offer significantly better living conditions. These surfaces are usually not cleaned daily and are difficult to clean completely, so that mould can grow unnoticed and unhindered.

Preventive measures

As so often the best protection is prevention. Structural measures can be used to create a climate in which mould can not grow. Those microorganisms always need water or moisture to live. If this element is missing, so is mould. Unfortunately, it can often be difficult to create a dry climate. In many areas of the food industry, condensation or water accumulation are a natural part of the production process. In such cases, even optimal structural conditions cannot

prevent mould growth. This means that the microorganisms must be fought actively.

Active measures

Chemical methods

Chemical methods can be used quickly and are relatively inexpensive. However, most chemical methods must constantly be repeated in order to permanently prevent mould growth. This causes regular costs. Disadvantages of these methods are the often long exposure times that have to be observed. Rooms cannot be used during treatment and machines have to remain inactive. In addition chemical methods are not uncontroversial due to the health risks they may create.

Mould-prevention paints

If only walls and ceilings are infested by mould, mould-prevention paints offer temporary protection. Classical mould-prevention

paints incorporate fungicides, but over time, these biocides wash out so that the surfaces must often be repainted. In addition, some paints contain nanoscale silver. Results have shown, however, that the silver is also degrading over time and stops working at some point.

Epatherm board

Another method for coating walls is the use of so-called “epatherm” sheets. Made of calcium silicate, these sheets absorb a lot of moisture and prevent water films from developing on surfaces. A standard sheet absorbs about 28 l of moisture per square meter and dissipates it slowly into the ambient air again.

Coating

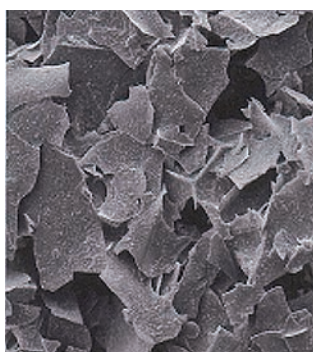
The same effect is also achieved by BioRid coating, which is employed for example by Vallovapor GmbH to fight mould in industrial, medical, dining and living areas. They can bind moisture as well and dissipate it again slowly, which ensures that moisture does not accumulate in the first place and which keeps the moisture level of the room low. Surfaces remain dry and there is no more breeding environment for microorganisms. The effect is the same as with epatherm sheets, but the kind of coating is much less expensive. Optically, the coating is more unobtrusive than the sheets. Both procedures are able to physically change the room climate in order to prevent mould. In contrast to



During the cold fogging, all furnishings remain in the premises.



The process is safe for electronic devices as well.



The BioRid-coating can be used, amongst others, in the industry and gastronomy sector. It can bind a lot of moisture, which is gradually released again.

structural measures that must be considered during planning or renovation, wall sheets or coatings can be added at a later date. The advantage of these coatings is their sustainability. In addition, they function on a purely physical level due to the perlite mineral in them; nothing oxidises into the ambient air. Substances can neither leach out nor be changed through water absorption or dissipation.

Cold dry-fogging

Another active measure to combat fungi and microbes, which is also successfully applied by Vallovapor, is cold dry-fogging using a biocide that has been classified as non-hazardous. It is applied with a special atomiser. This

Vallovapor GmbH is a service provider in the field of decontamination and disinfection of closed spaces by cold fogging. Activities include sustainable mould elimination, generation of sterile air and sterile surfaces and odour removal or neutralisation. The Vallovapor GmbH and its certified partner companies carry out their services throughout Germany. The methods used work quickly, are safe and sustainable. Orders are carried out for the housing industry, the food industry and for healthcare. The application sizes range from individual car interiors to production facilities including the ventilation systems.

way very fine droplets of ValloFog are being sprayed into the air, which assures that neither moisture nor humidity occur, but a fine aerosol mist. The mist covers all surfaces such as floors, walls and equipment, ventilation pipes, air ducts, air conditioning systems and heat exchangers. Using this method almost everything in a room will be covered, as the fog remains in the room for an hour or two. Afterwards the premises can be used normally again. The nebulisation takes between 15 minutes to half an hour.

Operation

The disinfectant ValloFog applies a very thin, invisible film adhering to surfaces. This effect is desirable, since the film produces a

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sterile surface. Fungal spores, bacteria, viruses and other microorganisms that come in contact with the film die. This leads to a sustained effect. ValloFog has a positively charged surface, which blocks the ion channels on the surface of the microorganisms and leads to the death of the organisms. The MOA (mode of action) is therefore a physical process: the active ingredient docks as a cationic polymer to the anionic charged cell walls and cell membranes and destroys them, so that the cell is no longer viable. ValloFog is a developed cationic polymer that binds strongly to the cell walls and membranes, due to its positive charge. Subsequently, the membrane function is disturbed – at the membrane the negatively charged part is opened leading to the cell being penetrated. The effect is a loss of osmosis regulatory and physiological functions. Hydrophilic pores develop and the protein function is disturbed, which ultimately leads to lysis. The cationic polymer is



With the disinfectant ValloFog, a very thin, invisible film adheres to the surfaces and makes it free from germs.

non-toxic to humans and animals and is registered with the Federal Institute for Occupational Safety and Health (BAuA) and the Federal Institute for Risk Assessment (BfR) in Germany. For the cold fogging to achieve the desired effect, the room geometry and size have to be noted, devices have to be adjusted. The drug delivery can be dosed individually. Thus experienced experts are needed. Vallovapor GmbH operates throughout Germany with specially trained personnel. The application areas in the industry range from the disinfection of transport vehicles or refrigerated vehicles up to complete production facilities including ventilation systems.

Results

Experience shows that with fogging the results last for months. As long as the surfaces on which the mist has deposited are not wiped, they will stay disinfected. As in most food production companies the quality assurance performs bacteriological control checks, regular air sampling measurements and contact samples, which help to easily determine the time for a total cleaning and thus ensure durable mould control and germ removal. The common circulation technology which nowadays is mostly used in production systems, can easily cause microbial contamination of the air, which quickly leads to costly failed batches or even recalls. To avoid these risks, more and more companies choose to sterilise their process air or room air and surfaces by cold fogging. In addition to the sterilisation of the air, there are also individual processing steps (e.g. conveyor

belts from cutting machines) and packaging processes (conveyors, packaging film, etc.) in which a sterilisation leads to an improvement of the hygiene standard levels.

Summary

The process of cold fogging is highly effective, and completed in a short disinfection time. During the cold fogging, all furnishings remain in the premises. Even for electronic devices, the process is safe because no oxidation is taking place and the protective film does not lead to a short circuit. Additionally on these surfaces an antibacterial preventive layer is established due to a depot effect. After the contact, when the mist has settled, the rooms are ready for use again. This is an advantage over the conventional decontamination measures. Due to the highly toxic chemicals used, usually the access to the treated areas is impossible for several days or even weeks. They do not provide long-term protection and often have significant side effects. Other cold fogging processes work with agents, such as hydrogen peroxide or hydrogen with nano-silver ions or per-acetic acid. These drugs, however, have major disadvantages as they tend to cause severe corrosion and odours. In addition, heavy metals should not be released into the environment.



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