

Hygienic air and surfaces

Cold fogging minimises product losses, increases quality and prevents diseases

Undesired microorganisms pose a high quality risk in meat processing facilities. Apart from other measures aimed at eliminating this risk, cold fogging can be employed to decontaminate both room air and surfaces in the production facility.

By Ralph Bittner

Microorganisms are ubiquitously present in the air and in general are not dangerous to human health. However, under certain circumstances or in higher amounts they can become a problem. In the food industry, moulds and other microbial loads are a latent danger putting product safety at risk. This is why the absence of microorganisms and with this the hygienic condi-

tion in a facility is generally an issue in the food processing industry. In the light of constantly increasing hygiene requirements, the elimination of microorganisms is gaining more and more importance.

Despite the fact that hygiene aspects in the meat industry have been given more consideration than in many medical fields, there are two directly linked and often neglected areas: There are air conditioning installations and evaporators that do not provide easy access and are thus difficult to clean and disinfect. The hygienic condition of these units has a decisive effect on the room air because the air is treated in these units before it is introduced into the building. This means that the condition of the room air immediately reflects the hygienic condition of the air condi-



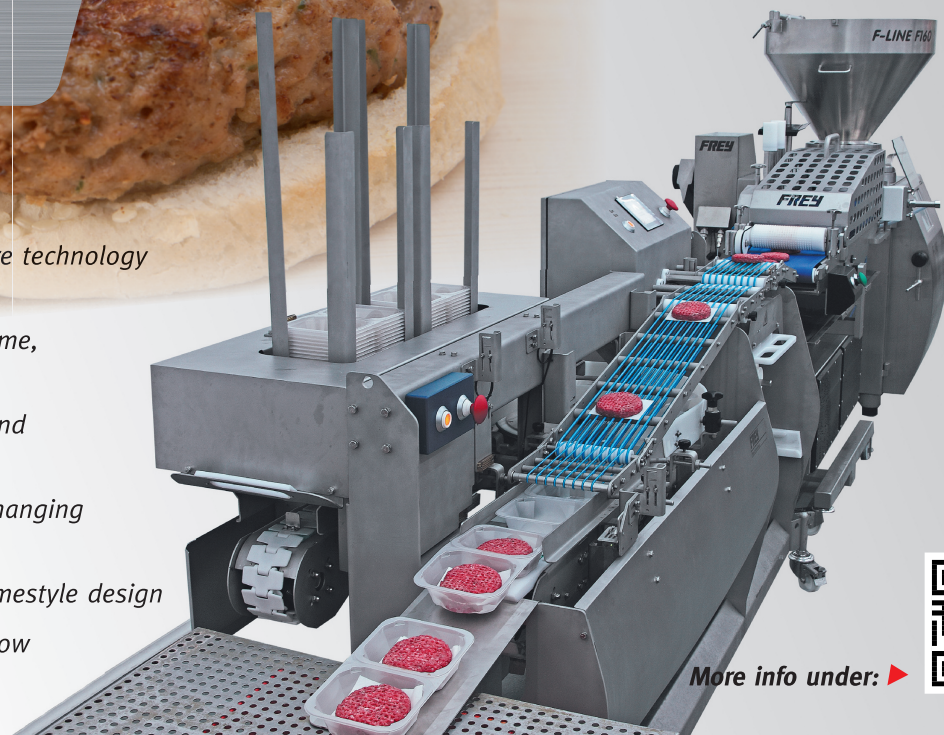
Cold fogging is an effective precautionary method.

tioning units. In practice it can often be observed that within the scope of cleaning efficiency tests, microbial contamination on surfaces is detected despite proper

cleaning measures. In all cases, room air was found to be the source of this contamination. Cold fogging is one way to solve this problem.

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Reducing the microbial load through cold fogging

One possible measure, which can also be used for odour neutralisation, is a cold fogging process with ValloFog offered by Vallovapor GmbH, Berlin, Germany. It is a biocidal product classified as harmless. Microorganisms do not develop resistance to this product. The active agent is introduced into the room in the form of an aerosol produced in a specific fogging unit. The droplets in the fine mist are so small that no wetness or moisture will occur. The mist penetrates the entire room and comes into contact with all surfaces and coats ceilings, walls, equipment, air ducts, air conditioning units and heat exchangers with a thin layer. The polymer is airborne in the mist which transports the active ingredient uniformly into all areas, even the ones that are usually hard to reach, thereby closing the disinfection gap. In practice, this method can completely treat an entire area because the mist floats in the room for a certain length of time before precipitating. This means that there are definitely no untreated spots left which may otherwise occur due to hard-to-access areas, constructional restrictions or human errors. The fogging time is adapted to the individual requirements in the facility taking for example the time between production runs into consideration. The exposure time of the active agent in the room is one to two hours. If the cold fogging is not possible during the day, the treatment can also be carried out at the weekend. The method is harmless and has long-lasting efficiency due to the catalyser effect.

Often the product is used only once for immediately remedying a pressing problem, but more and more companies, ranging from small craft businesses to large industrial plants, are seeking the support of their disinfection measures with the Vallovapor system. In practice this is done by designing a tailor-made solution in cooperation with the company taking all individual requirements including current conditions, production times, possible treatment periods, validation of active ingredients and technology into account. This solution is then integrated into the hygiene schedule; the disinfection

will take place at defined intervals as a precautionary measure. After the treatment, a very thin, invisible layer is present on the surfaces. This layer remains in place and is effective until it is removed by wear. Microorganisms upon contact with the intact active ingredient layer will be killed thus giving the active agent a long-lasting effect. Practical experience gained under various conditions in food producing facilities shows that in most cases one treatment is sufficient to achieve the desired low airborne counts over a prolonged period. Increases in the airborne count that are observed some time after the treatment indicate that the next cold fogging is due. Using an uncomplicated air sampling technology, the time for the next air treatment can be easily determined thus guaranteeing lasting elimination of airborne microorganisms and with that effective mould control.

The cationic polymer is non-toxic to humans and animals; it has been registered in Germany with the Federal Institute for Occupational Safety and Health (BAuA) and the Federal Institute for Risk Assessment (BfR).

When not properly maintained, central air conditioning units as commonly used in food production facilities contribute rather quickly to the microbial contamination of air. This can affect the entire company because the air is fed from the central air conditioning unit into all rooms. Microorganisms transported in this way can be the reason for expensive faulty batches or even recall actions which massively undermine the trust of customers and consumers. To exclude these risks, an increasing number of businesses are decontaminating process air as well as room air and surfaces with the cold fogging technology.

Odour neutralisation

Apart from disinfection and mould control, the industry is increasingly using this active ingredient for odour neutralisation. The product is able to neutralise the room air without just masking the odorous substances to be eliminated. It is therefore interesting for a number of possible applications; for example, in strong smelling grease sep-

arator areas. In the reconstruction business, it can be used for the elimination of smells for the keeping of animals. When used for other reasons than for disinfection purposes, it could be that several treatments may be necessary depending on the odour intensity because the product needs a prolonged time to be effective. Odour molecules are complex chemical compounds which, other than viable microorganisms, do not have cell division processes where the active agent can start its attack. This means that the amount of active agent to be used for odour neutralisation is directly related to the amount of aromatic molecules to be degraded. Depending on the complexity of the aromatic compounds to be eliminated, the reactions and resulting break-down of the intermediate products simply need a certain amount of time.

Properties

The active agent present in ValloFog is a new member of the cationic family of polymeric substances with an antimicrobial effect. It is produced in a specific patented and highly sophisticated polymerisation process from various low-molecular monomers. This production process guarantees that the product is free from harmful substances. The positively charged active ingredient belongs to a category of compounds known for their high binding affinity to negatively charged cell walls and cell membranes in bacteria and moulds. The active agent impairs the membrane functions which results in lower membrane fluidity, loss of osmo-regulatory and physiological functions, development of hydrophilic pores in the phospholipid membrane and finally to the cell lysis. The product has a broad in vitro activity against bacteria and moulds.

Due to its specific properties, the active ingredient can be applied via cold fogging which has a number of benefits:

- The treated room or equipment can be used again after a one to two hour exposure period.
- The method is user-friendly because no objects have to be removed from the room.
- The product has long-lasting efficiency due to its catalyser effect.

- The product has a bland odour, is non-oxidative and non-corrosive which means that it does not cause any bleaching or discolorations.

- It is non-allergenic.
- If used in amounts as recommended, it is safe for humans and animals.
- It does not promote the development of bacterial resistance.

In Germany, ValloFog is approved for use in the following fields:

- Disinfection agent for medical equipment
- Biocide for residential or industrial properties
- Air conditioning units
- Hygiene in veterinary offices
- Disinfection agent for food and feed areas

The product does not need to be classified according to Art. 8-15 of the Regulation on Chemicals (ChemV).

Pilot project to assist in decision making

Within the field of prevention, Vallovapor offers pilot projects for industrial customers so that they can experience the effectiveness of this method themselves. In cooperation with certified laboratories, possible hazards and production problems will be analysed, critical points identified and documented. Based on these evaluations, solutions with long-term effects will be developed. The analysis covers all production areas (manufacture and processing), storage, transport and food expenditures. Subsequently, the company will either provide the service itself or train the industrial customer in using this method.



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