

JIMCO[®]

UV-C & OZONE
Technology

DISINFECTION
WITH FLO-D[®]
TECHNOLOGY

DANISH DESIGN & TECHNOLOGY - FOR THE FUTURE

INNOVATION AND DRIVE

Technology for the future - designed and developed in Denmark

JIMCO A/S is the company behind some of the world's most unique air and waste-water purification and sterilisation solutions.

Since designing its very first air-cleaning unit in 1993, JIMCO A/S has not looked back. Today, the company supplies its products to a large number of industries and institutions worldwide.

Its customer base comprising factories within the food industry, commercial kitchens, waste-water treatment plants, schools and nursing homes. In brief, JIMCO A/S undertakes all types of projects – large and small.

JIMCO A/S combines common sense with innovative thinking as the basis of the company's unique products. It is no coincidence that JIMCO A/S supplies air-treatment units to some of the biggest chains in the world – including McDonald's, Scandic Hotels, McCain, Danish Crown etc.



WHY CHOOSE JIMCO DISINFECTION TECHNOLOGY?

- ✓ Avoid time-consuming manual disinfection with water and chemicals.
- ✓ Save litres of water by the tons as well as energy for heating and drying.
- ✓ Disinfect more efficiently in corners, chinks and ventilation ducts, cooling coils and surfaces.
- ✓ Avoid strong chemicals, which have an impact on the environment and work environment.
- ✓ Avoid an environmentally harmful release of chlorinated waste-water.

Efficient disinfection – without manual procedures, chemicals or water

With the introduction of the UV-C-based disinfection of surfaces, we now add yet another field of application to our patented UV-C technology, which has been awarded the EU Environmental award and which since 1993 has been used in air cleaning – systems which i.a. are used for removing obnoxious smells, improving the indoor climate as well as reducing the danger of fire and infection.

The fact that it is now possible to disinfect surfaces, which would normally require a manual treatment, involves a large number of advantages for the operating economy, the environment as well as the work environment.

SURFACE DISINFECTION AND ODOUR REMOVAL

Food Industry · Refrigerated Containers · Limited Areas · Health Sector

It can be expensive

A food production factory can be exposed to bacteria and mould even if a high standard of hygiene is in place. Manual surface disinfection of work surfaces, machinery and freezers etc. can often allow an unusually high number of bacteria to remain.

Unpleasant odours can also cause inconvenience. In these cases, money may be lost through complaints, resulting in bad publicity, and spoilt products.

It is easy to be ahead

By simple use of the mobile FLO-D® air cleaners, you will quickly and effectively disinfect and remove unpleasant odours from the air in a confined production space.

The daily cleaning of production areas is the most important function, in order to maintain a high standard of hygiene and by using the FLO-D® you will also prevent mould, fungus or any other type of micro-organisms from forming on equipment, walls or ceilings.



REPEATEDLY DELIVERING POSITIVE RESULTS

Prior to the introduction of our solutions for UV-C & Ozone-based disinfection, we have for some time conducted full-scale tests in various companies in cooperation with DTU (*Technical University of Denmark*) and The National Institute for Aquatic Resources. The results were impressive.

Furthermore, various tests carried out in cooperation with The South Danish University have shown that concentrations of for instance listeria and salmonella bacteria can be almost completely destroyed by means of our technology and within only two hours.



HYGIENE ON A HIGHER LEVEL THAN TRADITIONAL DISINFECTION

At the fish factory Vega Salmon A/S in Esbjerg, Jimco's system for UV-C & Ozone-based disinfection has been installed in the production. Tests from the factory show that the total bacterial concentration after a UV-C & Ozone-based disinfection is better/lower than after a traditional disinfection.

At the same time, the concentration of fungal spores is reduced. This goes to prove that saving tons of water and chemicals has no hygienic consequences.

TEST OF JIMCO FLO-D[®] DISINFECTION EQUIPMENT BASED ON UV-C/OZONE



UNIVERSITY OF SOUTHERN DENMARK

Aim of project

To investigate the bactericidal effect of UV-C produced ozone on chosen bacteria strains that are regarded as relevant contaminants in the food processing industry. Furthermore, it was desirable to determine a setting for the ozone concentration and the time of exposure, in achieving the desired effect.

Experimental setup

The test was performed in a special designed ozone chamber, where the ozone concentration and the temperature were measured during the experiments. 10 µl of bacteria culture was applied on stainless steel plants and spread to an area of 1 cm². The bacteria culture was diluted in sterile milliQ H₂O to a concentration of 10⁵-10⁷ cells/ml. The steel plates were incubated at room temperature for one hour until the applied culture had dried out. The plants were then placed in the ozone chamber and exposed to various ozone concentrations.

Bacteria survival was measured by washing the applied area on the steel plates with 2x50 µl 0.9 % NaCl, which was obtained and spread on agar plates for CFU determination by overnight incubation at 37°C.

As a reference, the CFU of bacteria applied on stainless steel that were not exposed to ozone, was also performed. The experiments were performed at room temperatures that did not exceed 23°C during the experiments.

Conclusion

In these experiments, the largest effect was observed after two hours of exposure at 10 ppm. When the time exposure was reduced to one hour, or the concentration of ozone was lowered to 5 ppm, the reduction of bacteria was distinctively decreased. Furthermore, the effect of ozone was limited by the amount of bacteria applied on the steel plates.

When the level of bacteria exceeded 10⁵ bacteria per cm², the effect of ozone also decreased after two hours of exposure at 10 ppm.

However, with a reduction that is within the accepted range. Also, this amount of bacteria exceeded the level of what would be representative of well-cleaned food production facilities, which is the premise for the application of the device.

Exposure time	Ozone concentration	Loaded	Control	Ozone	Reduction
		CFU/cm ²	CFU/cm ²	CFU/cm ²	
2 hours	10 ppm	2,40E+03 (2400)	4,00E+00 (4)	0,00E+00 (0)	
		3,30E+03 (3300)	8,00E+00 (8)	0,00E+00 (0)	
		3,00E+03 (3000)	7,00E+00 (7)	0,00E+00 (0)	
			1,60E+01 (16)	0,00E+00 (0)	
	Average	2,90E+03 (2900)	8,75E+00 (8,75)	0,00E+00 (0)	100,00%
2 hours	10 ppm	2,00E+04 (20.000)	3,00E+00 (3)	0,00E+00 (0)	
		2,00E+04 (20.000)	1,40E+01 (14)	0,00E+00 (0)	
		2,00E+04 (20.000)	2,80E+01 (28)	0,00E+00 (0)	
	Average	2,00E+04 (20.000)	1,50E+01 (15)	0,00E+00 (0)	100,00%
2 hours	10 ppm	3,60E+04 (36.000)	3,00E+01 (30)	0,00E+00 (0)	
		2,20E+04 (22.000)	1,13E+02 (113)	0,00E+00 (0)	
		2,60E+04 (26.000)	3,40E+01 (34)	0,00E+00 (0)	
	Average	2,80E+04 (28.000)	5,90E+01 (59)	0,00E+00 (0)	100,00%
2 hours	10 ppm	3,60E+05 (360.000)	3,98E+02 (398)	0,00E+00 (0)	
		2,20E+05 (220.000)	2,85E+02 (285)	1,00E+00 (1)	
		2,60E+05 (260.000)	2,97E+02 (297)	0,00E+00 (0)	
	Average	2,80E+05 (280.000)	3,27E+02 (327)	3,33E-01 (0,33)	99,90%

From O^2 to O^3 to O^2

Anyone working in the production of fish is faced with the listeria bacteria which is common in fish. Always and in the whole process.

After several years of disinfesting with chlorine, related products, a lot of water and a significant time investment, Axel Verberckmoes from Levenstond Seafood went looking for a better solution.

He ended up with the ozone solutions from JIMCO.

*Safe processing
with the ozone solution from JIMCO*



Article from MEAT & CO
Holland February 2017

JIMCO

JIMCO sells various air cleaning systems with UVC and ozone technology and is thus specialised in the elimination of micro-organisms and scents. JIMCO supplied and installed three FLO-D® units at Levenstond Seafood.

The machine works as follows: by means of light, oxygen is converted into ozone, a process which, in this case, is reversible.

That means that neutral air is emitted again.

This technology is applicable in the complete food industry.

Levenstond Seafood was established in 2007 when founder Axel Verberkmoes had the intention to process salmon for Delhaize with about 10 employees. In 2017, the Belgian company processes 5,000 tonnes of fish per year into 30,000 consumer packages per day, in two production departments, four cash&carries and two sourcing platforms, one of which is in Vietnam. The family company serves almost the whole retail sector in Belgium, including Delhaize, Colruyt, Spar, Carrefour, Lidl and Aldi.

Automation for the industry

Besides Levenstond Seafood, the group of family companies consists of Vandermaesen which was taken over in 2012 and LSF Services, which was created out of necessity.

Axel: "Nowadays, as a food company, you can no longer do without IT. It has become a huge expense for companies. The work is often outsourced as the companies themselves do not have enough know-how. It is expensive and the result is often insufficient. We are talking about links, control, ERP software and so on.

As a food company, you have a huge amount of obligations. You must be able to pass on information to your customers. Retailers are demanding because the market requires them to be. To this end, we have established LSF Services, which focuses on domotics for the food plant."

Ozone based cleaning

Axel: "When you process fish, every day again you introduce listeria to the production process. That is inherent to the product. At the start, we have set up a system to disinfect with chemicals. First cleaning, then disinfecting with a disinfectant product, such as chlorine. That works, but that only cleans the surface and machines require more. They have holes and gaps. After several years, it has emerged from testing that it is becoming more and more difficult to obtain good results. That is why we actively went in search of a better solution. We got into contact with the people from JIMCO, who presented us with a device based on ozone, which ensures that, in fact, the whole area, each hole, and even the air is sterilised. We now have three of these devices. A fantastic investment."

From O³ to O²

When working with ozone, the air in the room is changed into O³. Axel: "You must ensure that at that moment, nobody can enter; that the cleaning is timed and measured and that you can report afterwards. So, the device by itself, which is a standalone device, is a part of the solution. Because we have LSF Services, we started talking with Jimmy Larsen to turn the standalone solution into a complete concept, which makes the system user-friendly. The devices from JIMCO are amazing. We gain a lot of time in the cleaning process, use half of the water, do not use chemicals and thus work more environmentally friendly and business safer. In addition, the results are available online and always very good. Above 7 ppm we know we have cleaned well, but we are always above it. You also note from the results that the cleaning gets better and faster. While initially, it took seven to eight hours to achieve a good result, now it is done in two to three hours." Axel adds: "It is important to note that the process of converting to ozone, to O³, is reversible. After a few hours, we emit neutral air again."

Proactive with FAVV

"The Belgian FAVV and the Dutch NVWA are often approached with suspicion", Axel believes.

"But when you approach them proactively and talk with them, the contact is often fine. That is what we did when we started cleaning with the JIMCO FLO-D. We also brought our test results straight away. The FAVV is very positive about our company and the results. Which are simply wonderful. This investment pays back within one year."

FLO-D®



TECHNICAL DESCRIPTION

FLO-D®

UV-lamps: 30 pcs. 89 watt

Quartz sleeve: 30 pcs. (in cold storage)

Power supply EU: 3x400V + PE 50/60Hz, 16A

Power supply US: 3x480V + PE 50/60Hz, 16A

Consumption: 9 kW

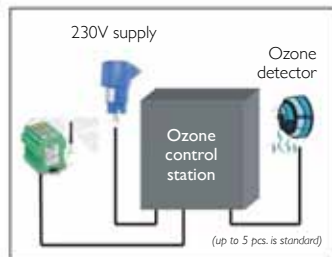
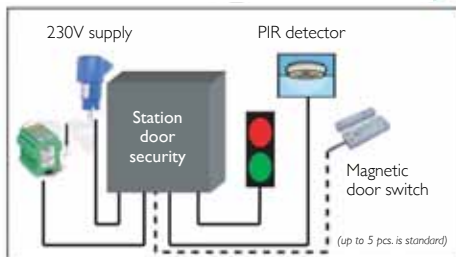
Display: Siemens PLC, Proface color panel

Treatment capacity: Roomsize up to 1,500 m³

Mesurements:

Height 2,100mm Width: 1,200 mm Depth: 1,200 mm Weight: 175 Kg

FLO-D[®] TECHNOLOGY



- Disinfect all places where air are in touch
- All valued data is logged for later analytic use
- Access point for wireless connection by smartphone/tablet

- Each entrance is monitored by a PIR sensor or magnetic door switch.
- There are warning lamps at each input. Status of ozone levels can be read via FLO-D's website outside the room with a handheld Web browser (tablet, Iphone etc.).

- All signals from the doors and ozone sensor are handled wirelessly. However, all stations must have a 230V supply.
- Single-station and measuring stations come with up to 5 pcs. per installation by default, but it is possible to connect more.

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Technology

UV-C AND OZONE SOLUTIONS FOR THE FUTURE.
EUROPE · SOUTH AMERICA · USA · ASIA · MIDDLE EAST · AFRICA

JIMCO TECHNOLOGY USERS

KPC SOLUTIONS



INDUSTRY SOLUTIONS



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