JIMCO®

UV-C & OZONE
Technology

DISINFECTION
FLO-D TECHNOLOGY

DISINFECTION

INNOVATION AND DRIVE

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.

AUTOMATIC DISINFECTION OF SURFACES

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.

WHY CHOOSE AUTOMATIC DISINFECTION OF SURFACES?

- ✓ 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.

PRACTICAL USE

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 at the front edge.
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.

VERY POSITIVE RESULTS – OF TESTS AS WELL AS PRACTICAL USE

Prior to the introduction of our solutions for UV-C & Ozone-based desinfection, 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.

SOME FACTS ON OZONE AND IT'S USE

1.

Ozone is a potent antimicrobial agent, which can effectively kill viruses, bacteria, fungi and parasites, including those causing food spoilage or human diseases.

2.

The efficiency of ozone depends on the target microorganism and the treatment condition.

3.

Ozone destroys microorganisms by reacting with particular oxidizeable cellular components, the end reactions of which result in cell damage and death of microorganisms.

4.

Ozone as opposed to other chemical treatments destroys microorganisms instantly and effectively, without leaving harmful residues in treated food or surfaces, hence is safer and environmentally friendlier than most other antimicrobials.

5.

The production and use of ozone in food processing is safe, provided that its concentration is controlled and monitored. The permissible level of exposure to ozone is 0.1 ppm in workplace and food processing environments for 8 hours.

FIND OUT HOW MUCH YOU CAN SAVE

It is easy to calculate the amount of savings that your company will be able to gain in terms of manpower, water, heat, electricity and chemicals, simply by shifting to an automatic, environmentally friendly disinfection.

Solutions for UV-C & Ozone-based disinfection can be rented at Jimco A/S.

AUTOMATIC DISINFECTION OF COLD STORAGE

Disinfect effectively - without manual processes, chemicals or water

Production manager Morten Tønder from Danfrugt A/S. says: -The results demonstrate that UV-C produced ozone is beneficial to the production environment. In practice, this means that we can keep our exotic fruits fresh for two weeks longer. Danfrugt is one of Denmark's leading fruit growers and one of Jimco's customers, who has installed, tested and purchased Jimco's new technology.

Mixing apples and pears

In addition to the minimization of mould and yeast growth, the system has other benefits. It also reduces ethylene in the air, normally secreted by apples. This enables the possibility of mixing different fruit types. Normally, apples cannot be stored in the same cold storage rooms as a number of other fruits. However, the concentration of ethylene, which causes e.g. pears to rot faster, is minimized with the FLO-D technology. Thus, new opportunities are offered for storage of different fruits in the same cold storage rooms. It is an advantage, because we can then close down a few cold storage rooms and gather various fruits together in the same room when the high season is coming to an end, says Morten Tønder.

HYGIENE ON LEVEL WITH OR BETTER 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.

COLD STORAGE

KILL MOULD, YEAST AND ETHYLENE

- No need to use so many resources to effectively clean your cold store.
- Avoid premature wastage of your precious fruits.

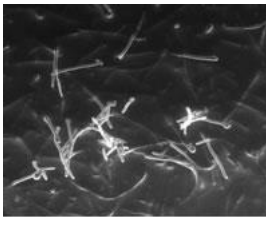
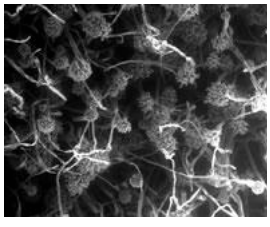
JIMCO A/S has performed tests and analysis, depicting significantly lower concentration of both mould and yeast when using the FLO-D.

SAVE MONEY

The shelf life of food has always played an important role. For example, ethylene, mould and yeast shorten the time in which the food stays fresh. In the fruit industry, among other places, mould and yeast growth is a tough opponent affecting product lifespan. FLO-D (photolysis oxidation disinfection) will help revolutionize the way fruit is stored. The FLO-D uses UV-C-Technology to kill the bacteria, mould and yeast in the cold storage, hence optimizing the lifespan of fruits.

Cleans within a few hours
One FLO-D unit is capable of cleaning a cold storage room of up to 1,500m3 within a few hours.

TREATMENT WITH & WITHOUT UV-C PRODUCED OZONE

With ozone		Without ozone
	Grapes	
	Strawberries	
	Oranges	
	Tomatoes	

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: 3x400/460/480V + N + 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 MINI

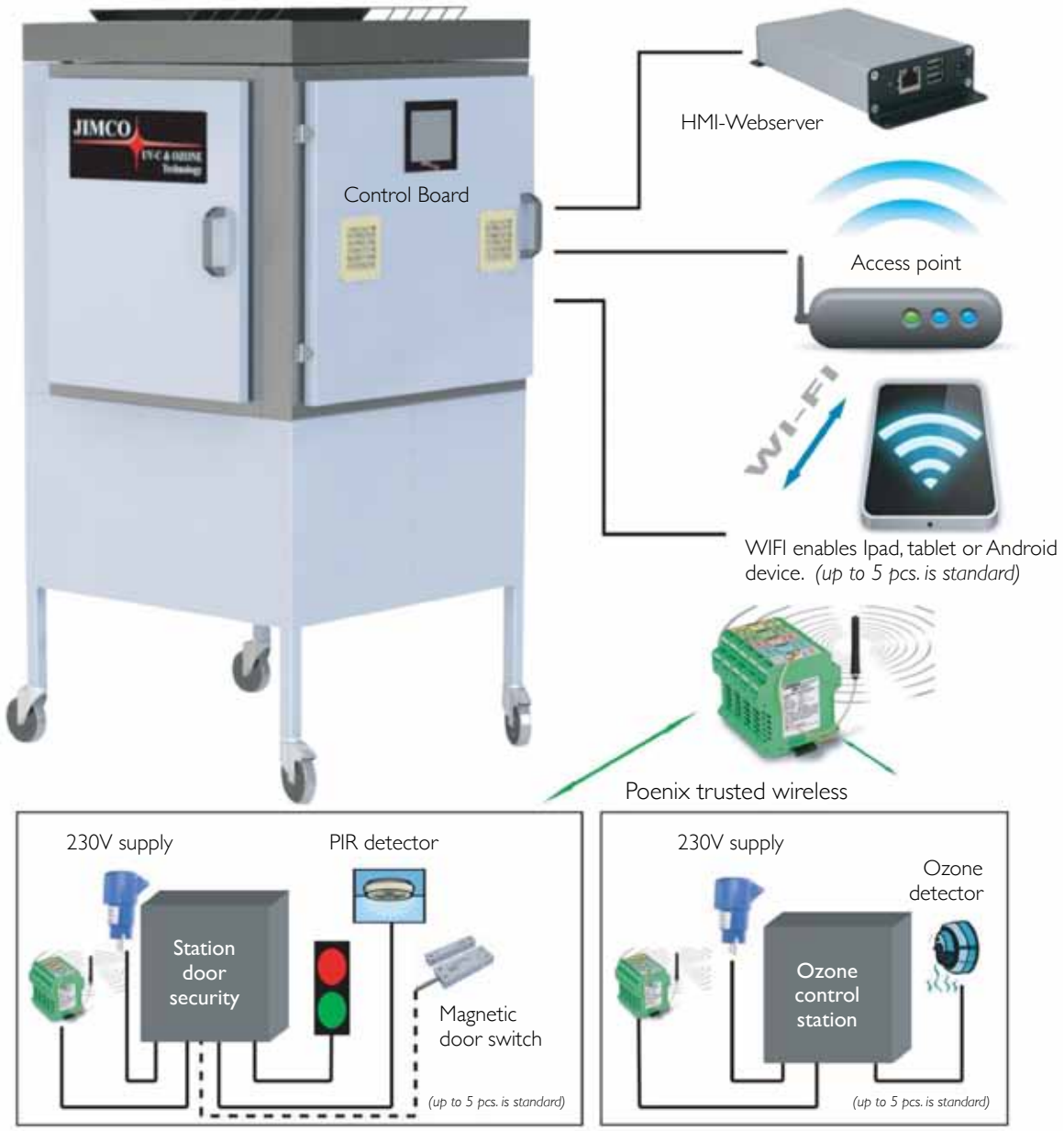
TECHNICAL DESCRIPTION

FLO-D MINI

UV-lamps: 4 pcs. 89 watt
Quartz sleeve: 4 pcs. (in cold storage)
Power supply: 1x230V + PE 50/60Hz, 10A
Consumption: 600 watt
Display: Proface PLC, color panel
Room-volume: Up at 800 m3 for odour treatment
Disinfection up to 200 m3 in 3 hours

Mesurements:
Height: 1,500mm
Width: 600 mm
Depth: 600 mm
Weight: 42 Kg

FLO-D TECHNOLOGY



- 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 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.

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 prossing 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 for time point.

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.

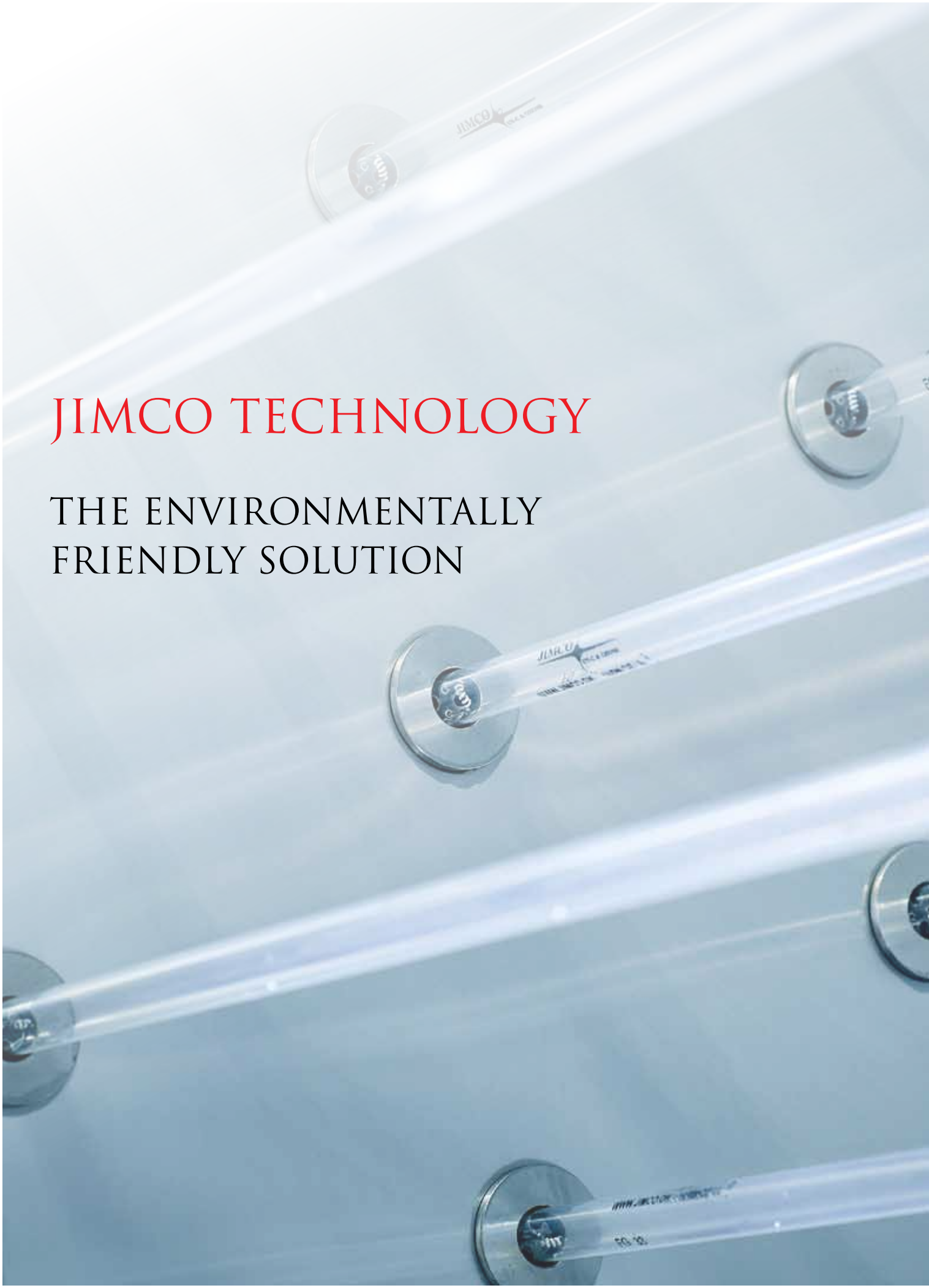
Conclusion

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 og bacteria wad distinctively decreased. Futhermore, 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 exceed the level of what would be representative of well-cleaned food production facilities, which is the premise for the application of the device.

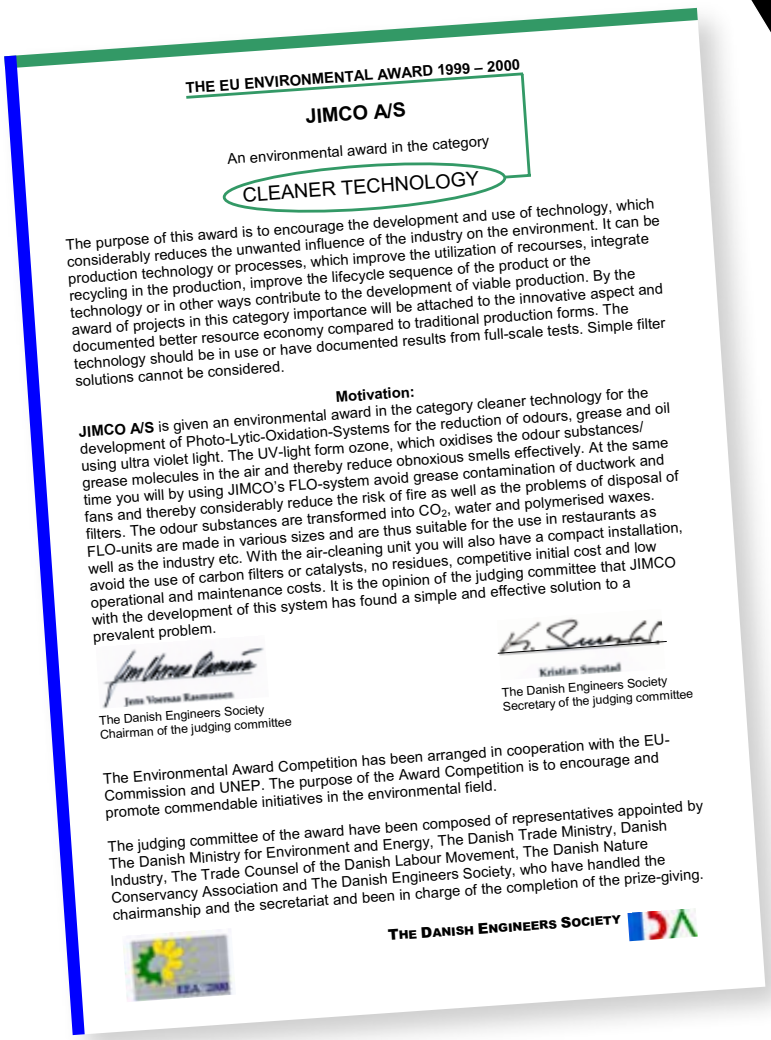
Exposure time	Ozone concentration	Loaded	Control	Ozone	Reduction
		CFU/cm²	CFU/cm²	CFU/cm²	
2 hour	10 ppm	2,40E+03 (2400)	4,00E+00 (4)	0,00E+00 (0)	
		3,30E+03 (3300)	8,00E+00 (8)	0,00E+00 (0)	
		3,00E+03 (3000)	7,00E+00 (7)	0,00E+00 (0)	
			1,60E+01 (16)	0,00E+00 (0)	
	Average	2,90E+03 (2900)	8,75E+00 (8,75)	0,00E+00 (0)	100,00%
2 hour	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 hour	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 hour	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%



JIMCO TECHNOLOGY

THE ENVIRONMENTALLY FRIENDLY SOLUTION

AWARDS AND PATENTS



THE EU ENVIRONMENTAL AWARD 1999 – 2000

JIMCO A/S

An environmental award in the category

CLEANER TECHNOLOGY

The purpose of this award is to encourage the development and use of technology, which considerably reduces the unwanted influence of the industry on the environment. It can be production technology or processes, which improve the utilization of recourses, integrate recycling in the production, improve the lifecycle sequence of the product or the technology or in other ways contribute to the development of viable production. By the award of projects in this category importance will be attached to the innovative aspect and documented better resource economy compared to traditional production forms. The technology should be in use or have documented results from full-scale tests. Simple filter solutions cannot be considered.

Motivation:

JIMCO A/S is given an environmental award in the category cleaner technology for the development of Photo-Lytic-Oxidation-Systems for the reduction of odours, grease and oil using ultra violet light. The UV-light form ozone, which oxidises the odour substances/ grease molecules in the air and thereby reduce obnoxious smells effectively. At the same time you will by using JIMCO's FLO-system avoid grease contamination of ductwork and fans and thereby considerably reduce the risk of fire as well as the problems of disposal of filters. The odour substances are transformed into CO_2, water and polymerised waxes. FLO-units are made in various sizes and are thus suitable for the use in restaurants as well as the industry etc. With the air-cleaning unit you will also have a compact installation, avoid the use of carbon filters or catalysts, no residues, competitive initial cost and low operational and maintenance costs. It is the opinion of the judging committee that JIMCO with the development of this system has found a simple and effective solution to a prevalent problem.

Jens Vaernæs Rasmussen
The Danish Engineers Society
Chairman of the judging committee

Kristian Snorstad
The Danish Engineers Society
Secretary of the judging committee

The Environmental Award Competition has been arranged in cooperation with the EU-Commission and UNEP. The purpose of the Award Competition is to encourage and promote commendable initiatives in the environmental field.

The judging committee of the award have been composed of representatives appointed by The Danish Ministry for Environment and Energy, The Danish Trade Ministry, Danish Industry, The Trade Counsel of the Danish Labour Movement, The Danish Nature Conservancy Association and The Danish Engineers Society, who have handled the chairmanship and the secretariat and been in charge of the completion of the prize-giving.

THE DANISH ENGINEERS SOCIETY

The EU Environmental Award for Cleaner Technology.

Worldwide patents of Jimco Technology.

JIMCO®
UV-C & OZONE
Technology

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

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KPC SOLUTIONS

INDUSTRY SOLUTIONS

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