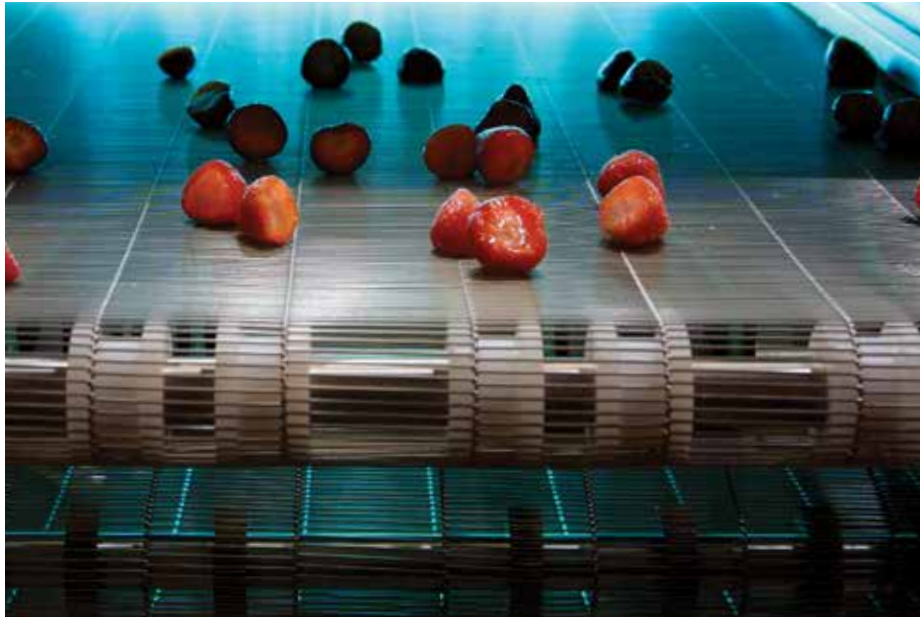


# UV Technology

Specialists in Decontamination Technologies

The Leading Provider of UV-C Decontamination Solutions...



Improved product quality  
Extended product shelf life  
Reduced customer complaints

...Delivering competitive advantage to the Food Industry



www.uvtechnology.co.uk

**UV - C Disc**



mJ/cm²  
230-280nm



**UV Technology**

Manufactured by UV Technology, Tuckwell, Kent, UK





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## About UV Technology Limited

UV Technology Limited is the leading provider of UV-C disinfection solutions. Specialising in all aspects of UV-C disinfection, we can provide a complete package of solutions to the food industry.

UV-C disinfection systems are used successfully around the world and are recognised as one of the most effective forms of disinfection available.

UV Technology's food disinfection solutions are effective in reducing mould and bacterial contamination in food production and storage facilities, enhancing product quality and extending shelf life.

Our disinfection systems are also used in industry, hospitals, laboratories, institutions, offices and schools to provide a safer and cleaner environment, energy savings and reduced HVAC maintenance costs.



Untreated (pack + 5 days)



Treated (pack + 5 days)



Untreated (pack + 8 days)



Treated (pack + 8 days)

- **UV Technology Limited manufacture a range of UV-C disinfection systems for use in the food processing sector. We also provide 'best of breed' products from the world's leading UV-C solutions companies.**
- **UV Technology's UV-C disinfection systems can reduce the proportion of micro-organisms by up to 99.99%+. All our systems are fully encapsulated and unlike other systems no thermal or chemical treatment is necessary.**
- **We focus on providing high quality, high performance, cost effective and environmentally friendly products.**
- **We manage projects from initial consultation through commissioning and beyond.**
- **Our 'in-house' expertise coupled with our strategic partnership approach ensures that we provide our clients with unparalleled service, solutions and aftercare.**



Specialists in Decontamination Technologies

## "Bringing the power of sunlight indoors"

### THE UV SPECTRUM

UV-A, UV-B, and UV-C are all part of the ultraviolet light spectrum.

UV-A results in skin tanning and is used in medicine to treat certain skin disorders.

UV-B has a very high penetrating ability and results in sunburn. Prolonged exposure is responsible for some types of skin disease, skin ageing and cataracts.

UV-C has an extremely low penetrating ability and is nearly completely absorbed by the outer surface.

UV Technology Limited makes use of the bactericidal effect of UV-C light in the form of UV-C disinfection.

**Ultraviolet light in the C spectrum (UV-C) is energy-rich light with a wavelength of 200 – 400 nanometres (nm).**

UV-C light is very versatile and can be used for disinfecting water, destroying harmful micro-organisms in other liquids, on surfaces, on food products and in 'air'.

With UV-C technology it is possible to destroy more than 99.99% of all pathogens within seconds, without addition of chemicals, without harmful side effects, inexpensively, highly efficiently and absolutely reliably.

### HOW IT WORKS

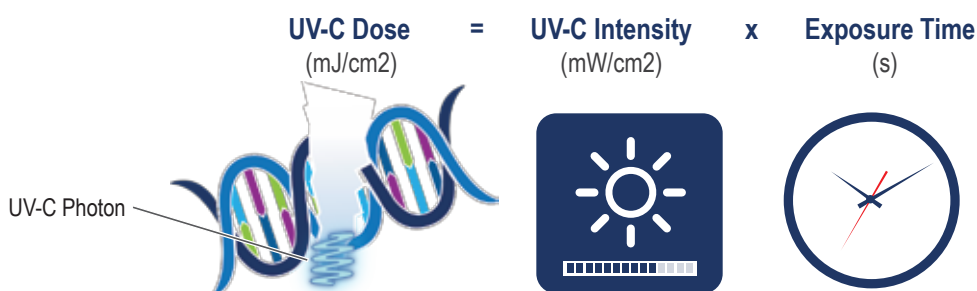
Micro-organisms are microscopically small. They are everywhere and have an extremely high metabolism. For example, in hot and humid weather the number of moulds and bacteria increases exponentially.

Furthermore, micro-organisms produce mucus substances that are deposited on surfaces and can contaminate food and cause microbial decay of the products.

The cell nucleus of micro-organisms contains thymine, a chemical element of the DNA / RNA. This element absorbs UV-C light at a specific wavelength of 253.7 nm and changes to such an extent (formation of thymine dimers) that the cell is no longer capable of multiplying and surviving.

### THE PROCESS:

- UV-C light at an optimal wavelength of 253.7nm penetrates the cell wall of the micro-organism.
- The high energy photons of the UV-C light are absorbed by the cell proteins and DNA / RNA.
- UV-C damages the protein structure causing metabolic disruption.
- DNA is chemically altered so organisms can no longer replicate.
- Organisms are unable to metabolise and replicate. They cannot cause disease or spoilage.



**This process has a lethal effect on all micro-organisms such as bacteria, fungi, moulds, yeasts and viruses.**





**UV Technology Limited collaborate with numerous academic partners including Campden BRI & The National Centre For Food Manufacturing – University of Lincoln.**



**Science, technology and information for the food, drink and allied industries worldwide**

Campden BRI provide practical scientific, technical, legislative and information support to the food, drink and allied industries. Membership based, they work closely with industry to ensure the industrial relevance of everything they do. This includes a wide range of analysis and testing services and operational support underpinned by a vigorous programme of research and innovation and promoted through extensive knowledge management activities. Many of their activities are independently accredited and can be tailored to specific needs.

#### **TECHNICAL STRENGTHS:**

- Manufacturing technologies - food processing (heating, chilling, freezing), aseptic technology, microwave heating, malting and brewing, milling, baking and extrusion, process control and instrumentation, and packaging technology.
- Safety assurance - including hygiene and sanitation, microbiology and preservation, processing technologies, analysis and testing (microbiological, chemical), and quality and safety management systems.
- Product development, product quality, consumer studies, market insights, sensory science, authenticity testing, shelf-life evaluation, labelling and legislation.
- Agri-food production, ingredients and raw material technologies.
- Training courses and events delivered by world-class experts.

#### **FACILITIES INCLUDE:**

- 3,000 sq m of laboratories for microbiology, hygiene, chemistry, biochemistry, molecular biology, brewing and cereal science, sensory and consumer studies, and packaging technology.
- 3,500 sq m of food process hall and pilot plant facilities including malting and brewing, retorting, chilling, milling, baking, hygiene and packaging. This includes an 'in-house' UV-C trial system.
- Leading industry guidance on best practice and legislation.



Holbeach is the University of Lincoln's specialist campus for the food manufacturing sector, and home to the National Centre for Food Manufacturing. Strategically situated in Holbeach, South Lincolnshire, the campus serves the UK's largest concentration of food manufacturing businesses. The facility is fitted with state-of-the-art food manufacturing equipment.



**The above facilities are available to our clients to conduct efficacy testing challenge trials and organoleptic assessment etc.. Please call us to discuss.**



## The food industry faces many challenges, these include:

- The demands for increased freshness and longer shelf life of produce.
- Reduction in microbiological contamination, these include health threats from Salmonella, E coli, Campylobacter, Listeria etc.
- Improved product quality and reduced customer complaints.
- Improved production and logistical efficiencies.
- HACCP compliance.
- Reduced wastage.
- Carbon reduction programmes.

As leaders in the field of product, air, surface and liquid disinfection, UVT manufacture and promote a range of products that address such challenges in food production, storage and transportation.

UVT's UV-C disinfection systems can reduce the proportion of micro-organisms by up to 99.99%+.

This can form a decisive, competitive advantage for many food producers, processors and retailers. UVT's products and expertise in this area can be one of the keys to that competitive advantage.



Fruit



Bread & Bakery



Meat



Salads



Flowers



Herbs



Drinks



Packaging



Dairy Products



Vegetables



Poultry



Sea Food

## OUR SOLUTIONS INCLUDE:

- Product Decontamination Tunnels.
- Low Risk / High Risk Transfer.
- Air Disinfection.
- Surface Disinfection.
- Liquid Disinfection.
- Packaging - Films, Trays and Lids.
- Coil Cleaning - Energy Reduction Programmes.



Salad drying line incorporating UV-C decontamination.



# Product Decontamination Tunnels

UV Technology Limited are at the forefront of the development of bespoke UV-C decontamination tunnels.

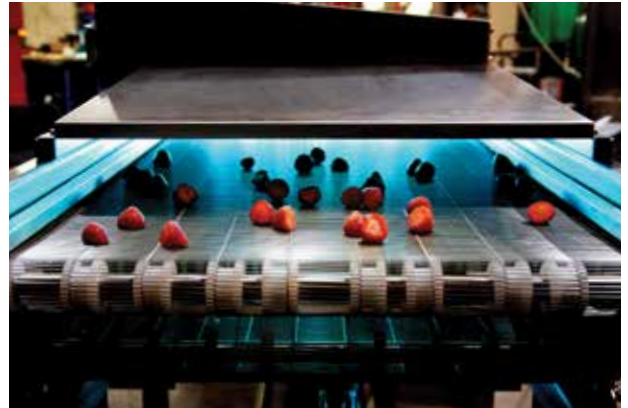
Driven by the growing demand for ever higher quality standards, food processors can now benefit from UV-C disinfection technology, helping them realise higher standards with reduced dependence on other processes.

UV-C decontamination tunnels typically treat the product prior to packaging to ensure minimal risk of re-contamination.

The introduction of UV decontamination tunnels has allowed a broad range of food manufacturers from bakeries to fruit processors to enjoy the benefits of our technology.

## **BENEFITS INCLUDE:**

- Extended product shelf life.
- Reduced spoilage and wastage.
- Improved product quality & reduced cross contamination.
- Reduced customer complaints.
- Improved production and logistical efficiencies.
- Products retain weight, freshness and colour for longer.
- Enables a reduction in the use of chemicals, process water, gasses, heat treatment, etc.



**UV-C product decontamination technology is approved by the Food Standards Agency (UK), The Food and Drug Administration (USA), The Soil Association (Organic Lobby).**

Furthermore there are no specific labelling requirements with respect to UV-C product decontamination.

Our range of 'Product Decontamination' tunnels are manufactured in the UK to the highest standards.

These tunnels are built to individual customer specifications, thus assuring the optimal solution.



## Low Risk / High Risk Transfer

UVT manufacture a range of 'Low Risk – High Risk' transfer solutions to eliminate the risk of transferring bacteria between low and high care areas when transferring products and equipment.

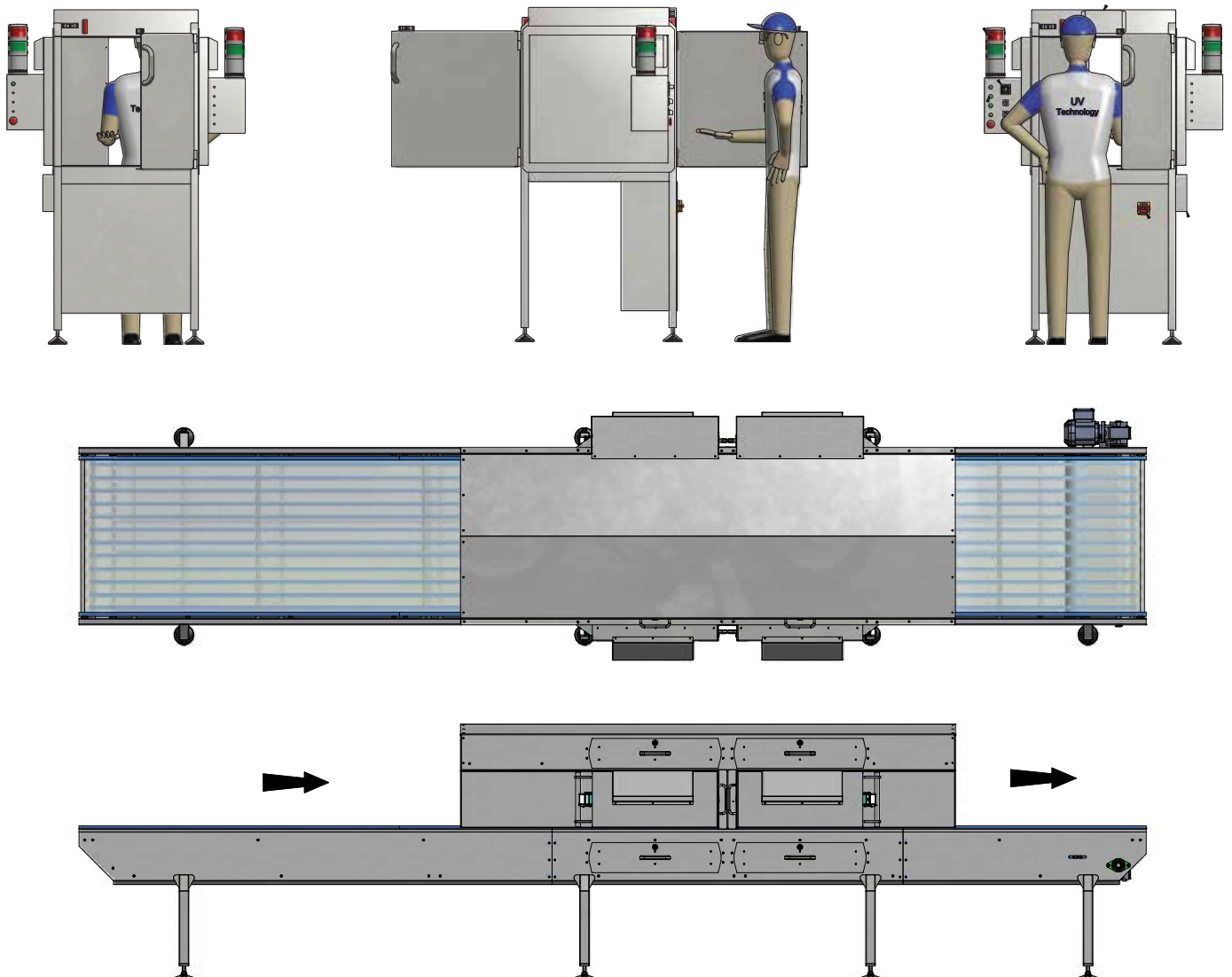
### EXAMPLES OF THIS INCLUDE:

- The decontamination of inbound raw materials into the facility - ingredients, packaging etc.
- The decontamination of finished goods prior to despatch.
- Product rework where packaging is incorrectly applied or printed etc.
- Disinfection of engineers tools & equipment.

Solutions are typically bespoke and are designed around factors including product nature, size and throughput volume.

### BENEFITS INCLUDE:

- Reduced wastage.
- Non chemical / thermal process.
- HACCP compliance.





Air disinfection systems are deployed where there is a risk of contamination by airborne micro-organisms. These air handling systems typically provide an ideal breeding ground for micro-organisms and can present a range of issues to food processors.

## THESE INCLUDE:

- Premature spoilage of products.
- Cross contamination.
- Reduced shelf life.
- Consumer health risk.
- Increased customer complaints.

## TYPICAL AREAS OF DEPLOYMENT INCLUDE:

- Processing and packaging facilities.
- Product cooling.
- Storage and ripening rooms.
- Maturation and cutting rooms.
- Coil cleaning (evaporator coolers and air handling systems).

**UVT's Air Disinfection solutions can alleviate these issues.**

## BENEFITS INCLUDE:

- Extended product shelf life.
- Reduced cross contamination and a reduction in wastage.
- Product quality as a whole is increased.
- Products retain constant weight and colour for longer.
- Hygiene standards are safeguarded (HACCP compliance).
- Reduce harmful odours associated with mould and bacterial growth.
- Improved general IAQ for better productivity / reduced absenteeism.
- Lower HVAC operational costs – energy & maintenance savings.



# Close Coupled Field Technology / Molecular Disruptive Technology

CCFT/MDT is a revolutionary technology utilizing 'non-ionizing electron field' created through the use of alternating current at very low power.

It is an entirely new form of active air treatment that utilizes Patent applied for technology to destroy all airborne bacteria, viruses and volatile organic compounds (VOC's) that are passed through its disruptive electron field.

## HOW IT WORKS:

CCFT/MDT uses elementary physics to change the chemistry of air:

- Air enters the device and is passed through an 'electron avalanche' inside a non-ionizing disruptive electron field.
- Viruses are destroyed immediately by breaking down the bonding charges that bond the individual chemical bases together within the Virus. (99.99999999% effectiveness).
- Bacteria, moulds and their spores are killed immediately when the electron avalanche destroys the envelope of lipids that surround each cell and their cellular walls (99.9999% effectiveness).
- VOC's are disassembled by CCFT/MDT into their constituent atomic components and rendered inert (99.94% effectiveness).
- Each disassembled and inert particle is then given an electric charge by the field and expelled through an electro-static High Air Flow (HAF) Media.
- Any debris or remaining matter bonds to the HAF Media and is completely safe to handle.
- Chemically pure air then exits the device, post treatment.

## CCFT / MDT FEATURES:

- CCFT/MDT completely destroys such dangerous viruses and compounds as SARS, Swine Flu, TB, MRSA, Influenza and Anthrax.
- It has been extensively tested by Independent Professional International Laboratories including the HSL in the UK and the DTI in Denmark and in Universities across Europe.
- CCFT/MDT has the added benefit of removing smoke and odours.
- The dielectric components (electrically insulating material) of the CCFT/MDT modules are unaffected by moisture or temperature, meaning that they can operate in the harshest environments (up to 1,000° F).
- CCFT generators draw 40W, MDT emitters draw 5 Watts, making them one of the greenest technologies in the world today.



## Plasma development timeline

Thermal	1900's	Dangerous, High Energy Costs. Ionizing, Ozone Producing
Cold Plasma	1920's	High Energy Costs. Ionizing, Ozone Producing
Non Thermal Plasma	1920's	Medium Energy Costs. Ionizing, Ozone Producing
Close Coupled Field Technology	2009	Low Energy Costs. Ionizing, Low level Ozone Producing
Molecular Disruptive Technology	2013	Ultra Low Energy Costs, Non Ionizing, None Ozone Producing





# Surface Disinfection Systems

Surface disinfection systems are deployed in the food industry in order to disinfect equipment.

## EXAMPLES OF THIS INCLUDE:

- Conveyor and deboning belts, dough rising surfaces and other food preparation surfaces etc.
- Machine housings – filling, slicing etc.
- Cutting blades, knives, workwear.
- Packaging including food trays, foil, films and plastic lids.
- Equipment storage - medical, dental or veterinary instruments, the disinfection of fragile objects etc.

## BENEFITS INCLUDE:

- Reduced wastage.
- Non chemical / thermal process.
- HACCP compliance.
- Reduced cross contamination.



Infection through contact with surfaces is one of the most common causes of the contamination of foodstuffs with bacteria and mould.

The existence of micro-organisms on equipment is usually an unavoidable fact, and when they come into contact with foodstuffs this can often greatly reduce the shelf life of the products. In addition to this, micro-organisms can present a health risk such as E Coli, Salmonella, Campylobacter etc..

Equipment surfaces are treated with high intensity UV-C and depending on the dosage up to 99.99%+ of micro-organisms can be destroyed.





# Packaging Disinfection

Contaminated packaging is one of the primary causes of the contamination of foodstuffs with bacteria and mould.

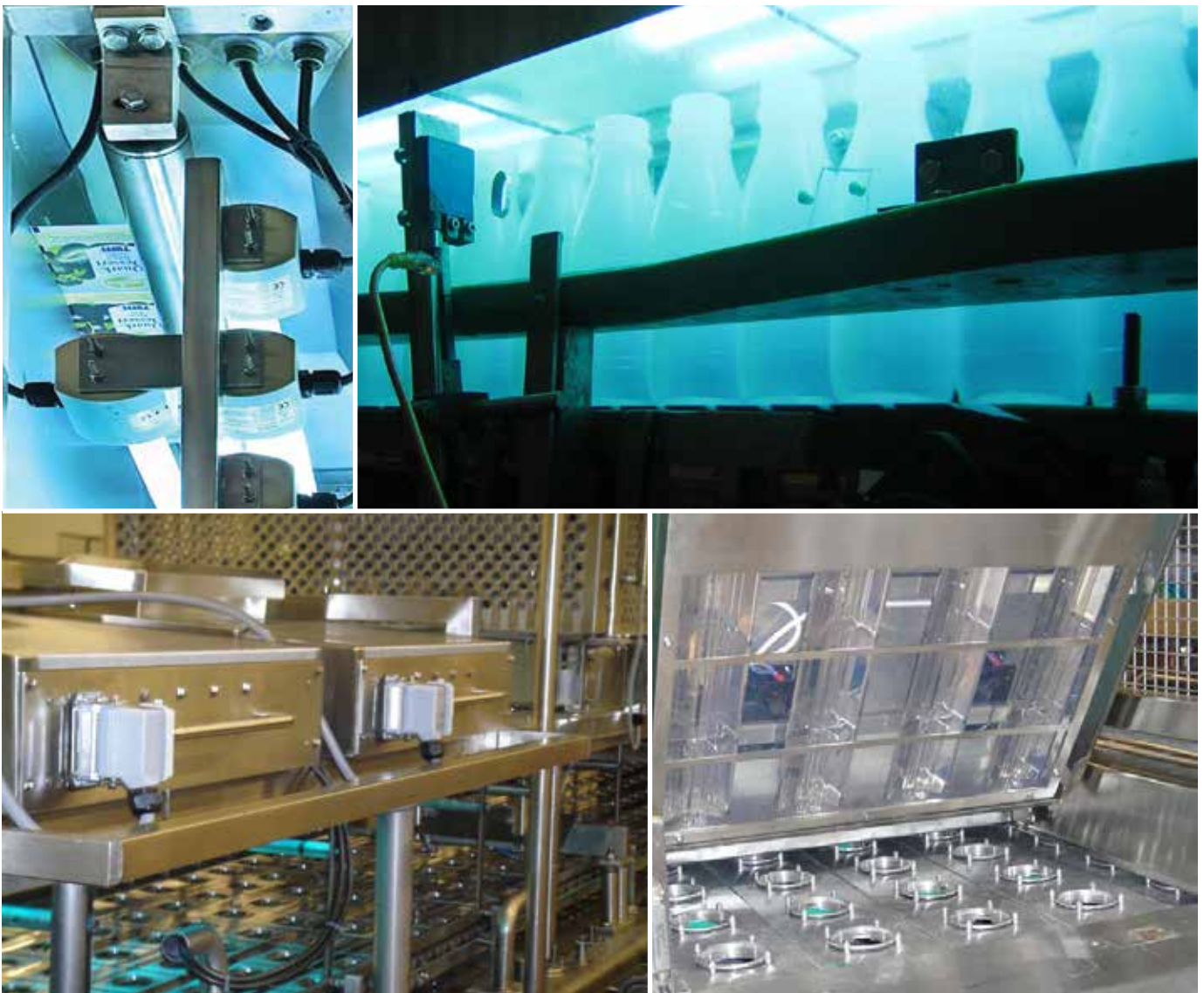
The existence of micro-organisms on packaging can often greatly reduce the shelf life of products, result in expensive product recalls and in extreme cases cause food borne outbreaks.

Packaging disinfection solutions are deployed in the food industry in order to disinfect various types of packaging.

## EXAMPLES OF THIS INCLUDE:

- Food trays & pails.
- Foils and films.
- Lids, caps and closures.
- Finished product packs.

Packaging surfaces are treated with high intensity UV-C and depending on the dosage up to 99.99%+ of micro-organisms can be destroyed.



# Liquid Disinfection

The disinfection of liquids utilising UV-C is common place throughout the world.

The deployment of chlorine, chlorine dioxide, hypochlorite and other chemical substances to disinfect liquids can result in effects which are detrimental to health and the environment.

UV-C technology is the better alternative to chlorine disinfection. The intensively researched and technologically mature disinfection method with ultraviolet light is adapted from the natural action of sunlight.

The light necessary for UV-C disinfection is generated in special UV-C lamps. A watertight tube made of quartz glass which allows the UV-C light to pass through surrounds each lamp. The liquid to be disinfected runs past the quartz tubing, being treated by the UV-C light. The number of UV-C lamps employed vary according to amount, flow rate and transmittance of the medium.

UV Technology's systems are suited for the disinfection of drinking water, process water, waste water, salt water, ultra-pure water and other translucent fluids, e.g. sugar syrup. Other uses of water disinfection include the treatment of wet equipment parts such as dehumidifiers and rotary spray humidifiers in air conditioning equipment.

The rate of disinfection is up to 99.99%+, depending on the UV-C dosage.

U V Technology's UV-C systems provide non-chemical disinfection for process, product water and other liquids in a wide range of applications.

## INDUSTRIES BENEFITING FROM UV TECHNOLOGY:

- Meat and poultry processors.
- Dairy.
- Water & soft drink processors & bottlers.
- Breweries & wineries.
- Processed & pre-packaged foods.
- And many more...



## APPLICATIONS INCLUDE:

- Pre-treatment disinfection.
- Cooling media (Brine chillers etc).
- Direct contact fluids and ingredients.
- CIP, bottle rinse or wash waters.
- Tank headspace and venting.
- Grey water systems.





## Services, Consumables & Other Products

UV Technology Limited is your source for a comprehensive range of 'best of breed' UV consumables and replacement parts, including:

### Replacement Emitters & Ballasts:

#### MANUFACTURERS INCLUDE:

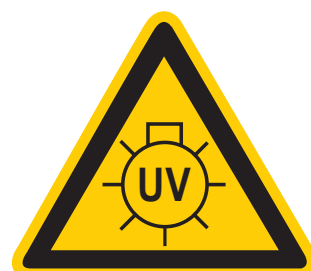
- Philips Electrical.
- Osram.
- Baro.
- Xylem (Wedeco).
- Steril-Aire.
- Sanuvox.
- Light Tech.
- Ushio.
- GE Lighting.
- First Light.

#### OUR OTHER PRODUCTS INCLUDE:

- Emitter coating service (Food Safe).
- UV Measurement devices.
- UV Knife disinfection cabinets.
- UV Personal Protection Equipment (PPE) – eyewear, face protection...
- UV Fly killers.
- UV Hazard warning signage & labels.
- Hand wash training kits.
- Drug use prevention equipment.

#### SERVICES:

- Consultancy.
- Site assessment.
- Project management.
- Laboratory testing.
- Challenge trials.
- Machine refurbishment.
- Third party maintenance.



## Food Industry UV-C Efficacy Trial Data



The use of ultraviolet light (UV) is now well established within the food processing sector as an alternative to traditional thermal processing and chemical wash systems.

Areas of application include direct product decontamination, treatment of food contact surfaces, air disinfection and liquid treatment.

We possess a range of efficacy trial data confirming the effectiveness of UV-C decontamination on common foodborne pathogens for a variety of food products, packaging materials, food contact surfaces and air.

Please contact us to discuss your specific area of interest and we can provide data accordingly and where available.

Please see the facing page as an example of typical efficacy trial data.

For further information regarding the deployment of UV-C decontamination solutions please visit the Technical Centre on our website [www.uvtechnology.co](http://www.uvtechnology.co) or call us on +44 (0) 161 408 0060.

# Effect of UV-C on Inoculated Packaging Material & Food Contact Surfaces

Log reduction cfu/cm<sup>2</sup>



Trial Conducted by The Institute of Food & Health and Centre for Food Safety, University College Dublin.



Trial Funded by the European Commission



**UV Technology**

Trial conducted using  
UV Technology Ltd equipment

## Notes

**C. Jejuni** - Reduction (log<sub>10</sub> cfu/cm<sup>2</sup>) of C. Jejuni inoculated onto packaging & surface materials. UV-C exposure for 8 - 16 seconds @ 6.5 cm from the light source. - Average starting population = 3.5 log<sub>10</sub> cfu/cm<sup>2</sup>

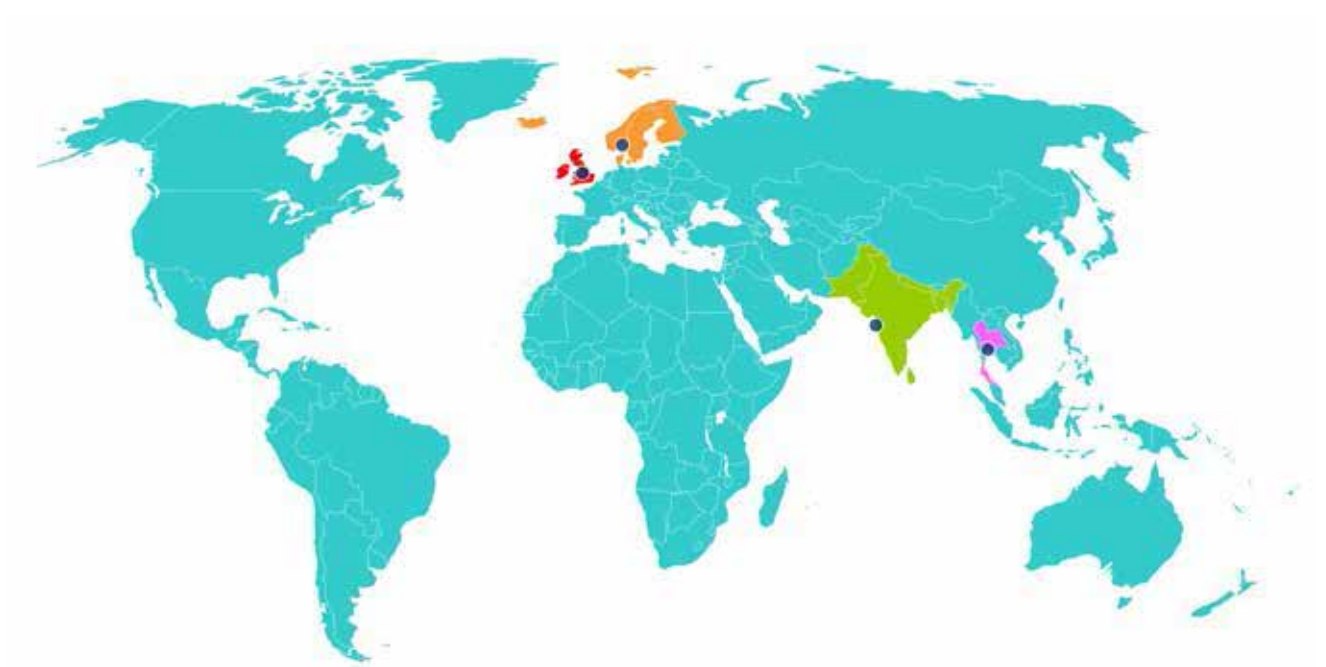
**E. Coli** - Reduction (log<sub>10</sub> cfu/cm<sup>2</sup>) of E. Coli inoculated onto packaging & surface materials. UV-C exposure for 8 - 16 seconds @ 6.5 cm from the light source. - Average starting population = 4.5 log<sub>10</sub> cfu/cm<sup>2</sup>

**S. Enteritidis** - Reduction (log<sub>10</sub> cfu/cm<sup>2</sup>) of S. Enteritidis inoculated onto packaging & surface materials. UV-C exposure for 8 - 16 seconds @ 6.5 cm from the light source. - Average starting population = 4 log<sub>10</sub> cfu/cm<sup>2</sup>

Packaging Medium	Bacterium	8s Exposure	16s Exposure
Black Polypropylene	C. Jejuni	3.16	3.16
	E. Coli	3.75	3.75
	S. Enteritidis	3.93	3.93
Blue Polypropylene	C. Jejuni	3.44	3.44
	E. Coli	2.21	2.36
	S. Enteritidis	2.26	2.68
Aluminium	C. Jejuni	3.40	3.40
	E. Coli	4.12	4.12
	S. Enteritidis	4.18	4.18
Polyolefin	C. Jejuni	3.78	3.78
	E. Coli	4.28	4.28
	S. Enteritidis	4.07	4.07
Polyvinyl Chloride	C. Jejuni	3.77	3.77
	E. Coli	4.50	4.50
	S. Enteritidis	4.16	4.16
White Polypropylene	C. Jejuni	3.97	3.97
	E. Coli	3.94	3.94
	S. Enteritidis	3.69	3.69
Polyethylene - Polypropylene	C. Jejuni	3.92	3.92
	E. Coli	2.58	2.65
	S. Enteritidis	3.08	3.35
Stainless Steel	C. Jejuni	2.92	2.92
	E. Coli	3.98	3.98
	S. Enteritidis	4.20	4.20
Polyethylene Cutting Board	C. Jejuni	3.36	3.36
	E. Coli	3.39	3.39
	S. Enteritidis	3.55	3.55

If you would like to receive a full copy of this trial report please contact us directly.





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