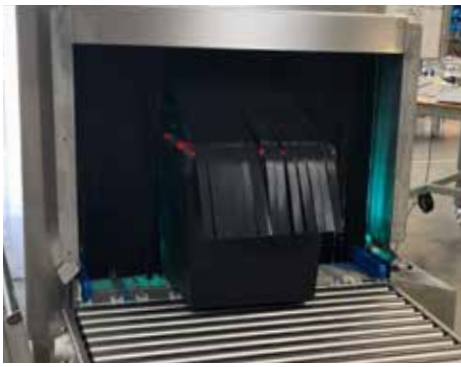
UV Technology Global

Specialists in Decontamination Technologies

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



MADE IN BRITAIN

Low Risk to High Risk Transfer

The Challenges of 'Low-risk to High-risk' Transfer

The transfer of foodstuffs, equipment, packaging and personnel from 'low risk to high-risk' areas within a food factory has always represented a challenge for food producers. Strict procedures to meet the required standards for the transfer of personnel have long been in place. However, the transfer of foodstuffs, equipment and packaging still poses a significant problem and threat to bio safety.

The definition of a high-risk area is "A physically segregated area, designed to high standards of hygiene, where practices relating to personnel, ingredients, equipment, packaging and environment aim to prevent product contamination by pathogenic micro-organisms".

There are several methods for conducting the transfer of components into a 'high-risk' area, however some of the more commonly used methods also pose a number of challenges.

According to 'Tesco`s Food Manufacturing Standard', there are several options available to food producers when it comes to 'low-risk / high-risk' transfer.

The two main options are to utilise either a thermal treatment or a non-thermal treatment. For some products and food components the thermal treatment methods are the most obvious option.

However, the majority of the food produced in the UK cannot be heat-treated. Trying to bring a bag of frozen produce into the high-risk area, for example, can for obvious reasons not be handled in this way.

Included under the non-thermal category, there are several options available.

These include:

- **The use of disinfectant in troughs, tanks and spray tunnels.**
  In the majority of cases this will entail using water mixed with a chlorine-based solution.
- **The transfer of packaging using double bagging.**
  This is an incredibly time consuming and slow process and does not address the cross-contamination issues. Furthermore, it does not comply with retailers and processors 'Plastic Reduction' programmes.
- **Pumping ingredients through large sealed containers.**
  This typically applies to the more liquid type components of the production process.
- **The use of Ultraviolet light (UV-C) or Ozone.**
  The use of Ozone must be managed very carefully due to its potentially severe and adverse health effects.
- **UV-C has been proven to deliver significant benefits for this non-thermal category.**

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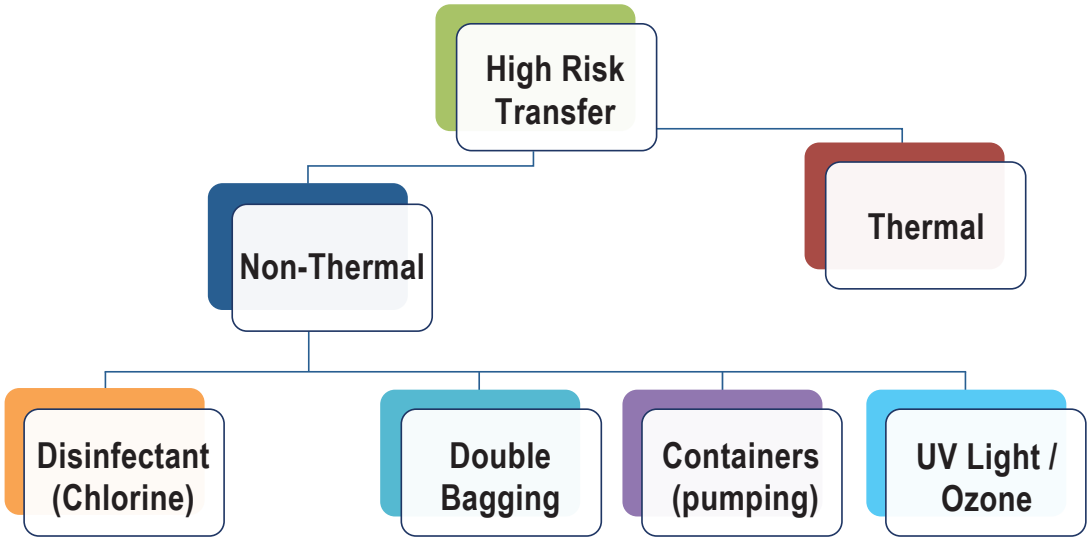

The most commonly used practice globally for 'low risk / high-risk' transfer is the use of Chlorine based disinfectants mixed with water. These solutions are applied to the product or component through troughs, tanks and spray tunnels. Although a widely utilised practice, this procedure poses several issues food producers should be concerned about:

1. Governments and associated legislation are forcing more and more restrictions on the use of Chlorine and other chemicals in food production, particularly in the EU. This is also a major issue for foreign companies exploring the potential of exporting foods to countries within the EU.

2. Washing or spaying using a chlorinated solution not only uses large amounts of expensive water and chemicals, it also requires the waste water to be treated before it can leave the factory. There has been many an environmental scandal relating to the emission of untreated waste water from food production facilities, and it is the food producer's legal and ethical responsibility to ensure this issue is properly addressed.

3. Not all components can be treated with chemicals and water. As the above-mentioned example, a bag of frozen produce can often burst when water is applied to it, leading to both spoilage of ingredients and potential bio contamination.

4. All water introduced into food factories is a potential breeding ground for bacteria. Whenever possible, food producers should strive to utilise as many dry production methods as possible to avoid the potential growth of pathogens.

5. Although chlorinated systems have been successfully used for a number of years now, in reality they deliver a rather low log reduction of unwanted micro-organisms, typically less than Log 1

An alternative to the common use of chemicals is that of UV-C 'Low-risk / High-risk' transfer tunnels.

Successfully applied in multiple industries, a UV-C transfer tunnel delivers several benefits in comparison to a water and chemical based solution.

The Benefits of ‘Low-risk to High-risk’ Transfer Tunnels

- Significantly higher Log reduction. UV-C can achieve up to Log 4 reduction in micro-organisms.
- The removal of water also means significant costs savings both directly in terms of water and chemical usage, but also in terms of the necessary treatment of waste water.
- There are no restrictions relating to the application of UV-C tunnels in food production, as well as no labelling requirements.
- As a dry decontamination procedure, UV-C tunnels have also been shown to extend product shelf life and increase the operational efficiency in a variety of food production facilities.
- Perhaps one of the most important factors for food processing companies to consider is that the reduced use of chemicals and water and the environmental impact of production are increasingly important criteria for the large multiple retailers, including M & S, Tesco, Sainsbury, etc. and for consumers.

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

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

Trial Funded by the European Commission

UV Technology Global

Trial conducted using UV Technology Global equipment

Notes

C. Jejuni - Reduction (log10 cfu/cm2) 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 log10 cfu/cm2

E. Coli - Reduction (log10 cfu/cm2) 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 log10 cfu/cm2

S. Enteritidis - Reduction (log10 cfu/cm2) 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 log10 cfu/cm2

Log reduction cfu/cm2

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

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

Examples of our ‘Low Risk / High Risk’ solutions

‘Low Risk / High Risk’ solution for ‘Ready to Eat’ fresh produce prior to packing.

‘Low Risk / High Risk’ solution for bulk ingredients (ready meals).

Static, multipurpose ‘Low Risk / High Risk’ solution.

‘Low Risk / High Risk’ solution for crates and boxes

UV Technology Limited offer a range of standard decontamination tunnels and bespoke solutions which can be tailored to your specific production environment and requirements.

To see our latest ‘Machine Image Brochure’ follow this link

If you believe your production facility could benefit from a UV-C solution for your ‘Low Risk / High Risk’ transfer points please do not hesitate to get in touch with us.

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