

PRO TEC TING WORKERS

against the threat of chemical
hazards in food and drink
manufacturing environments

FOOD AND DRINK MANUFACTURING

The UK's food and drink manufacturing sector has become the single largest manufacturing sector in the UK, with a turnover of £95.4bn ⁽¹⁾

Food and drink manufacturing is a truly diverse sector, taking place in everything from small units with few workers to large factories which may be part of multi-site organisations employing thousands.

The food and drink manufacturing industry actually comprises over 30 different sectors. The largest of these is the bakery sector followed by meat processing, drinks industries, dairies, animal feed and fish processing.

AS WELL AS BEING DIVERSE, IT IS ALSO ONE OF THE MOST HAZARDOUS

According to the Health and Safety Executive every year, in food and drink manufacture, around 19,000 workers (nearly 5% of the workforce) suffer from ill health caused or made worse by work.

The risk of suffering occupational ill health is around twice that of sustaining an injury reportable to HSE⁽²⁾.

Among the main injury hazards in the food and drink manufacturing sector, (which continue to be manual handling and slips and

trips), is exposure to hazardous substances⁽³⁾.

A range of chemical solutions – from pesticides and organophosphates to antibacterial cleaning solutions and industrial disinfectants – are used across the food and drink manufacturing chain daily.

It has been estimated that there are more than 15,000 different chemicals in use in more than 60,000 products within industries including food and drink manufacturing.

Many chemicals used to counter the threat of contamination by micro-organisms are classified as hazardous and pose potentially serious health risks for those people working with them.

Although often selected to remove the threat of bacteria and ultimately conserve the health of the consumer, in industrial and manufacturing settings many of them can affect the skin, eyes or respiratory system and can be extremely harmful if ingested or direct skin contact is experienced in sufficient quantity.

WHERE'S THE HARM IN THAT?

Exposure to these chemicals can result in immediate injuries – such as burns and respiratory damage. They can also be the cause of cumulative injuries where the damage of unprotected exposure can build over time until a tipping point is reached where continual exposure becomes too much for the body to protect against naturally and permanent injury or disease results (such as dermatitis).

According to the HSE, there are **13,000 deaths each year** in the UK as a whole estimated to be linked to past exposures at work, primarily to chemicals or dusts⁽⁴⁾.

Key chemical hazards in the UK food and drink manufacturing chain include:

Surface active agents (surfactants)

These can include are detergents, some of which will include biocides such as amphoteric (based on amyl alkyl glycines), the cationics (quaternary ammonium compounds - known as QACs or quats) and biguanides/diguanides. Many of the amphoteric and cationics are classified as skin, eye and respiratory irritants.

Alcohols

These are used as skin cleaners as well as a transport medium for other active ingredients, but nevertheless are irritant to eyes, nose and throat at high airborne concentrations and can be a fire risk.

Aldehydes

Glutaraldehyde is classified as a skin and respiratory sensitizer. Formaldehyde is a strong respiratory irritant and is also classified as a category 3 carcinogen.

Peracetic acid

A powerful oxidising agent used in the food and drink industries and is also extremely corrosive.

Hypochlorite and organic chlorine

Releasing compounds are corrosive in their concentrated form and are classified as eye and skin irritants in their diluted form (5<10%).

SENSITISORS

Human contact with flavourings, ingredients and disinfectants known to contain chemicals that are toxic by inhalation or to the skin, are classified as **sensitisors**, and contact with them should be avoided. Where working practices require human interaction however, strict safety measures to control exposure should be adopted.

HAZARD, EXPOSURE AND INTERACTION



It is vital that the right level of Personal Protective Equipment (PPE) is provided including chemical protective clothing, chemical resistant gloves, safety footwear and where there is an inhalation threat, respiratory protection.

What level of PPE is required will be determined by the hazardous substances being used, how they are used, what exposure is likely to take place and how workers will interact with them.

It is likely that a combination of PPE solutions may well be required.

Whilst there has been much discussion, campaigning and promotion about the need for common PPE measures such as respiratory protection and hand protection when workers are in contact with chemicals, much less has been written about the importance of chemical clothing.



Perhaps it is felt the dangers are not as immediate because by using general coveralls it is felt these represent a safe 'barrier' against chemicals encountered – especially where exposure does not include immersion or splash.

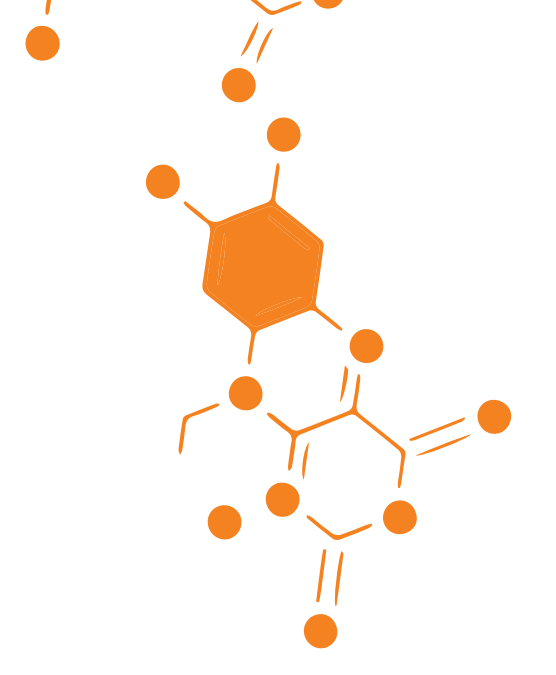
How important is chemical clothing when working with chemicals? Could I just supply waterproof clothing?

Whenever anyone is working with chemicals there is a danger that just providing basic waterproof barriers will not provide the right levels of protection against the chemicals being used and leave the worker exposed to danger and the threat of injury.

Whilst thinking that providing basic waterproof clothing is adequate, the reality is that proper chemical protection must be provided where workers are likely to be exposed – whether for a short or long time.



IS THERE REALLY AN ISSUE I NEED TO THINK ABOUT?



Contact with chemicals can cause immediate and severe injuries such as burns, breathing problems and respiratory damage, but they can also attack clothing surfaces in other ways, including:



Degradation

When a chemical comes into contact with a material, it can break down the integrity and weaken its properties causing leakage and weakness.



Penetration

The flow of chemicals and micro-organisms through porous material, seams, small holes or other small defects in materials caused by degradation. Where workers are exposed to chemicals it is important to ensure that clothing can prevent penetration through design and manufacturing features.



Permeation

The process where a chemical passes through a material on a molecular level, because the chemical's molecules are able to penetrate through the outer material and into the inside of the material.



Despite the clear dangers of working with chemicals, **EXPOSURE TO THESE TYPES OF HAZARDOUS SUBSTANCES CONTINUES TO RANK IN THE TOP 10 CAUSES OF INJURY IN THE UK.**

CONTROLLING THE RISK

So what are the key steps to managing and controlling exposure to chemical hazards when working in the food and drink sectors in particular?

COSHH Assessment

According to the HSE, the Control of Substances Hazardous to Health Regulations 2002 (COSHH) requires employers to prevent or control exposure to hazardous substances. Where exposure cannot be prevented, employers are required to assess the risk to health, and provide adequate control measures.

This assessment should include a list of all chemicals to be used, their hazards and measures provided to control operator exposure (covering safe storage, chemical compatibility, working concentrations/safe dilution procedures and application procedures and equipment).

Knowing the hazards of disinfectants

Disinfectant suppliers should provide a material safety data sheet (MSDS) to set out the hazardous properties of each product. This provides information about the health hazards, physical and chemical characteristics, first aid and how to use the chemical safely.

COMMON EXPOSURES TO CHEMICALS:

Mist and foam spraying

This generates a contaminant likely to affect the whole body to exposure from disinfectants. A greater risk is presented by pressure mist spraying where higher levels of contaminant will be generated.

Suitable PPE and Respiratory Protective Equipment (RPE) should be provided. Such RPE will range in type from disposable masks, used to protect against liquid aerosols (particle filters marked SL), to airline breathing apparatus, depending on the toxic nature of the disinfectant and personal and work-related factors. PPE may include chemical suit, boots, gloves/ gauntlets and eye/face protection.

For example, spraying aldehyde or peracetic acid formulations is likely to require the provision of airline breathing apparatus with full face mask or visor, in addition to full chemical protective clothing, boots and gloves or gauntlets.

Fogging

This employs similar disinfectants and concentrations to those used in mist and foam applications. However, fogging presents a particular risk to the respiratory system as it produces smaller droplets than spraying. These can remain suspended in the air for 45-60 minutes or longer, depending upon the droplet size.

This method requires a risk assessment for each type of agent used and strict management procedures to prevent early re-entry of people into fumigated

areas, particularly where the more hazardous disinfectants are used (eg aldehydes or peracetic acid).

Anyone working with hazardous chemicals in this manner needs to wear appropriate PPE including respiratory protection and chemical protective clothing including chemical suits.

Soak tanks and manual disinfection

These present a risk of skin and eye exposure (the latter from splashes) which, in many cases, will require the use of an impermeable apron, overalls, gloves/gauntlets and safety spectacles/visor for protection. In addition, where volatile chemicals or respiratory irritants/sensitisors are used (eg: alcohols, formaldehyde, glutaraldehyde), there may be a requirement for respiratory protection, particularly when disinfecting in enclosed spaces.

Disinfectant penetration and contamination of PPE

It is important to ensure that certified chemical clothing, glove and boot selection have the ability to resist penetration by the disinfectant concerned. Manufacturers and suppliers have duties to supply this information. However, it should be born in mind that although some types of PPE provide very high levels of protection, breakthrough will eventually occur. Also, skin exposure may occur when removing used PPE, so seek advice and information for operators is necessary to ensure that the PPE provides the protection needed.

SOLUTION

I have identified a need for workers to use chemical protective suits - **What do I need to look for when selecting the right solutions?**

Key features to look out for are:

+ CHEMICAL PROTECTION + FLEXIBILITY + COMFORT

THESE FEATURES MUST BE CORE TO THE SELECTION PROCESS.

An example of new industry solutions includes Chemsol HG Lite from worker safety specialist Alpha Solway.

The new range of lightweight, flexible clothing provides long lasting chemical protection, thanks to its specially-formulated material, combined with an anti-bacterial coating which avoids mould build up.



chemsol HG Lite

...has been specifically developed for sectors where chemical hazards exist such as the food and drink industries through to agricultural, heavy industry, shipping and oil and gas, offering enhanced resistance to animal fats, food oils and certain chemicals.

KEY FEATURES

- + Fully liquid proof
- + Anti-bacterial coating
- + Lightweight fabric - 305gm²
- + Greater flexibility due to the unique PVC/PU blend
- + Soft and durable
- + Stitched and high frequency welded seams for enhanced waterproof protection
- + Offering enhanced protection against animal fats and food oils
- + Certified to EN14605:2005 + A1 2009 Type PD (4)
- + Various styles available

COLOUR



SIZES

S-XL - Special sizes to order upon request

Hope that helps!

If you would like some obligation-free advice on protecting workers against chemical contact, speak to the team at **Alpha Solway** on **+44 (0)1461 202 452** or email **sales@alphasolway.com**

REFERENCES

1) - <https://www.bdo.co.uk/en-gb/insights/industries/manufacturing/the-food-and-drink-report-2016>. 2) <http://www.hse.gov.uk/food/healthtopics.htm>. 3) - <http://www.hse.gov.uk/food/nonfatalchart.htm>. 4) - <http://www.hse.gov.uk/statistics/overall/hssh1516.pdf?pdf=hssh1516>

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