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# Understanding and managing chemical hand hazards in the workplace

With the latest statistics from the Health and Safety Executive revealing an estimated 20,000 people in the last 12 months suffered from skin problems which they believed to be work related and news that Unilever had to pay fines and costs totalling £28,770 after workers at its Port Sunlight site on Merseyside suffered irritant dermatitis due to exposure to hazardous chemicals – protecting the hands of workers against irritants and chemicals in the workplace remains a real issue for businesses across the UK.

Undoubtedly, protecting the hands of workers against chemicals remains one of the biggest health and safety challenges. With up to 10,000 commercial chemicals classified as being hazardous, those with the responsibility for worker safety are often understandably hard pressed to ensure they are providing their staff with the right level of protection.

Clearly, removing contact between hazard and worker is the ultimate step in the safety process but the reality is that in many circumstances this is neither practical nor possible.



So attention must be firmly focused on understanding the hazards associated with the substances that workers will be coming into contact with, how they will come into contact with them and which glove material will provide the best level of protection for them.

Safety Management talks to hand protection expert Marigold Industrial Ltd – who have launched a new chemical permeation chart – to see how health and safety managers can best get to grips with protecting the hands against chemical hazards.

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“The case of Unilever is a classic example of the dangers associated with working with chemicals. Between September 2005 and February 2007, 25 employees and Remploy agency workers contracted the skin condition while cleaning and maintaining production lines.

“The HSE found that Unilever had failed to assess the risks from and prevent exposure to hazardous substances and to provide employees exposed to irritant substances with adequate health surveillance,” said John Williams, UK Sales Manager, Marigold Industrial Ltd.

“And this is one of the key issues in managing hand protection when it comes to chemicals – just because something doesn’t create immediate harm when the skin is exposed to it, doesn’t mean it is not harmful. If you have people working with a substance like sulphuric acid, the vast majority of people would understand that this poses a serious and instant risk to health should there be any skin exposure.

“But, as we have seen with the case of Unilever, it is often the subtler substances, such as cleaning detergents, that whilst not posing an immediate danger, will from the very first moment of contact with the skin, start to attack it, breaking down its natural defences, and causing problems in the longer term.

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“Clearly, no-one would ever knowingly dip their hands into a vat of chemicals, yet the reality is that millions of people work with water, cleaning fluids, oils, greases and fats as part of their working day – all of which are chemicals that strip the skin of its natural protective oils, but many of which are ‘perceived’ as low risk or part and parcel of their job by workers,” added John.

#### Examples of Common Chemical Hazards include:

- **Engineering** – Metalworking fluids, neat oils
- **Automotive manufacture and aftercare** – New and used engine oils, paint solvents, degreasers, battery acid and adhesives
- **Construction** – Cement, epoxy resins
- **Food** – synthetic flavourings, cleaning agents
- **Printing** – Processing chemicals, inks, plate cleaning
- **Agriculture** – Pesticides, silage additives, degreasers
- **Janitorial** – bleaches, floor cleaning chemicals
- **Hairdressing** – bleaches, dyes, detergents



Chemical safety data sheets are an essential tool in identifying chemical make up and hazard levels to the unprotected worker. As well as a vital source of information, they must be held by the employer under COSHH.

Once the make up of a chemical has been understood, Marigold Industrial says safety managers must consider the work being undertaken by staff and the type of contact they have with the chemical they are working with before being able to determine which glove material will provide the right levels of protection.

The three steps to selecting the right glove for the job says Marigold Industrial are:

- Understand the chemical
- Understand how staff work with the chemical and for how long
- Identify the glove material and glove design that will provide the right level of protection

These steps are absolutely critical in ensuring worker safety – especially when staff are coming into contact with substances that are particularly hazardous to health, as is the case with Fertin Pharma, one of the World’s leading manufacturers of medical chewing gum.

With around 200 people working in its production plant in Denmark, many of whom come into direct contact with potentially lethal substances such as liquid nicotine, ensuring staff have the right levels of protection for the job is absolutely essential.

According to Fertin Pharma’s safety officer Litta Lauth, with staff handling a range of extremely hazardous substances, there is absolutely no room for error where hand protection is concerned.

“Whilst the finished products are used to help people improve their health by increasing levels of fluoride or helping them give up smoking, many of the raw ingredients that we work with are in their pure form and extremely hazardous. In some cases, such as liquid nicotine, it can be lethal if the skin comes into contact with it.

“Other tasks carried out on site will see staff having to handle the gum in its more liquid form before it is baked and cut, or work on the product packaging, which has cut hazards.

“So it is essential that we provide a safe barrier between the workers and the substances and materials they are handling and understand key issues such as break through times for every chemical,” said Litta.

When determining which glove material will provide the right levels of protection, Marigold Industrial believes health and safety managers should not hesitate to use the knowledge of leading glove manufacturers who provide a range of support materials such as glove performance data in the shape of Chemical Permeation Chart’s, which will be a critical tool to help in the decision making process.

“As we have seen with Fertin Pharma, prevention is the key and there really is no room for error and chemical hand protection has to be based on accurate and authoritative data – whether the risk is an immediate one or one that, as with dermatitis, builds up over time. Without this, the glove selection process is potentially and seriously flawed, which is why information tools such as our Chemical Permeation Chart are essential.

“The new chart effectively spells out clearly and simply not only how long you can safely use our gloves with a particular chemical but which gloves provide the highest levels of protection,” said John Williams.

But just what is chemical permeation?

“Permeation is the process by which a chemical can pass through a protective barrier – ie a glove – without going through visible openings. Molecules of a specific chemical enter the glove material and effectively wriggle through the compound – with the glove material often appearing unchanged to the human eye despite the fact its protection has been compromised.

“The objective therefore is to provide a glove that is robust enough to provide a barrier that stands firm against the threat of permeation – even when people are working with that chemical for several hours,” said John.

To help this process, Marigold Industrial’s chemical permeation chart adopts a number rating from 0 to 6 to highlight specific glove permeation performance against the 100 of the most common workplace chemicals listed. A glove with a score of 6 provides permeation protection of over 8 hours whilst a glove with a score of 0 provides protection of less than 10 minutes and is therefore inappropriate for use with a particular chemical. Users can also cross-reference official chemical names with their common alternative names.

“Selecting the right gloves to protect against chemicals is an extremely difficult process to get right as there are a lot of issues to consider. But with support materials such as chemical data sheets and Chemical Permeation Charts, the decision making process becomes a lot easier,” said Mr Williams.

## Conclusion

Chemicals are one of the main UK workplace hazards, yet one of the most widely used substances. Only by investing time and using all the information available can the right hand protection solution be selected.

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