



# BREATHE FREELY



The Chartered Society for  
Worker Health Protection

Controlling exposures to prevent  
occupational lung disease in  
**MANUFACTURING**

Do you  
breathe freely?

[www.breathefreely.org.uk](http://www.breathefreely.org.uk)

# 99% health

Approx 13,000 died from work related diseases



# 1% safety

144 workers died in accidents at work

# Treat health like safety and breathe freely

Every year in the UK, about 13,000 people die from diseases which were caused by the work that they do, or used to do. In 2015/16, precisely 144 people died from accidents at work. In other words, 99% of deaths caused by work can be attributed to ill health, and 1% to poor safety.

Just as surprising, though, is that we can protect workers' health and actually prevent most of these deaths *through good occupational hygiene practice*. Or to put it simply, by recognising the hazards, evaluating the risks, and controlling exposures.

People at work - *that means everyone*, employers and employees - need to recognise what the greatest hazards in the workplace actually are and properly understand the real risks these pose to workers' health. Then they need to control their exposures to them.

It's time to start treating health like safety in our UK workplaces.

BOHS is the Chartered Society for Worker Health Protection; we're the professional society representing qualified occupational hygienists in the UK, and we understand the scale of the problem. We also know that it can change, and we know how to help make that change happen.

That's where our  
**Breathe Freely**  
campaign  
comes in.



## **Breathe Freely**

### A collaborative approach

Breathe Freely for the manufacturing sector is a campaign which launched in May 2017, led by BOHS in partnership with EEF, the manufacturers' organisation, HSE, TWI, TUC, JCB, Toyota and BAE Systems.

Through this campaign, we aim to effect improvements in respiratory health protection for workers in the manufacturing industry, focusing in particular on the key area of welding.

## **Breathe Freely**

### Controlling exposures to prevent occupational lung disease in manufacturing

The process of welding generates fumes, gases and dusts which, if inhaled, can cause serious lung conditions.

In fact, welding is one of the top ten causes of work-related cancer, causing an estimated 150 deaths a year in the UK. In addition, welding is associated with numerous other serious health conditions, such as asthma, COPD (chronic obstructive pulmonary disease), metal fume fever and effects on the nervous system as well as short-term irritation of the throat and lungs, and reduced lung function.

The good news is there's a solution, and all the cases of ill health caused by welding are in fact preventable. Welders can be protected from the hazardous fumes and gases - by recognising the hazards, evaluating the risks and controlling exposures (i.e. good occupational hygiene practice).

Unfortunately, workers are still being exposed to fumes and gases because in some workplaces, either there are no controls in place, inappropriate controls are being used, or the controls provided are not being used properly.

Make sure you're getting this right - use our resources to check that you have the right controls, and they are being used properly.

At BOHS, we understand the scale of the impact of occupational ill health in manufacturing. But we also know how important it is to generate better awareness of its causes as well as how to do something about it so that everyone can *breathe freely*.

# Recognise, evaluate, control and breathe freely

## 1. Recognise the hazards and *breathe freely*

Welding is one of the most common activities carried out in the UK. It is estimated that there are 190,000 workers in the UK who weld, comprising of around 73,000 professional, skilled welders and many other unskilled or semi-skilled welders who carry out welding as part of their job.

**There are a number of health hazards associated with welding in particular:**

- Fume
- Gases, including ozone and, with MIG and TIG welding, inert gases that can present a problem when working in confined spaces
- UV radiation from the welding arc. This can affect the eyes ("Arc eye") and skin and is also responsible for the generation of ozone from atmospheric oxygen.

The main health hazard with many welding operations - particularly MMA (stick) and MIG welding – is the welding fume. This consists of very fine particles of metal oxides, mainly arising from the welding rod or wire.

The composition varies depending on the metal being welded. With mild steel the fume will mainly consist of iron oxide, but there is also likely to be a small percentage of manganese, which is used in welding rods.

Stainless steel welding is particularly hazardous as the fume contains nickel and chromium VI oxides, which are highly toxic if inhaled - both are carcinogens and can also cause occupational asthma. Repeated exposure to low concentrations of manganese have been shown to affect the nervous system, and there are proposals to significantly reduce the Workplace Exposure Limit for manganese in 2018.

As well as the fume (particulate), Arc welders will also be exposed to gases. Ozone is produced by the action of the UV from the Arc on oxygen in the air. It is highly irritant to the eyes and respiratory system. In some cases, particularly with thicker plate, atmospheric nitrogen can be converted to highly irritant nitrogen oxides. With MIG and TIG welding the inert gas used to stop the weld oxidising will be released into the working environment. This should not present a risk when welding outdoors or in a well ventilated area, but can present a serious risk of asphyxiation in a confined space.

## 2. Evaluate the risks and *breathe freely*

For some welding processes, the fume concentration in the immediate vicinity of the weld can be above the substance specific exposure limit. The amount of fume generated in each case is determined by a number of different factors. This includes the type of welding process, the material being welded as well as the welding position, location and type of workplace. The duration of exposure also has to be taken into account.

Welders using the same process may be exposed to varying levels of fume and therefore each job should be assessed individually, and then suitable controls applied according to the level of risk.

## 3. Control exposure and *breathe freely*

Control measures for welding fume are available, and it's important to make sure the right controls are used - there is not one solution that will be effective in all cases.

Local extraction with moveable arms are frequently used, but to be effective they need to be positioned close to, and directly over the source of the fume. Other types of extraction such as welding benches and on-gun extraction for MIG welding are also readily available, and depending on the type of job, these are better options for many types of work.

Respiratory protection should always be the last resort, but it will be the most appropriate control for some types of work, particularly very large fabrications where the use of local extraction is impracticable. Powered devices which are built into the welding visor are likely to be most effective.



The invisible nature of many of the toxic substances that workers breathe in



The long latency of their ill effects



Controls are often frequently ignored

# Consult the experts and breathe freely

At BOHS, we believe that manufacturing employers - managers and supervisors - have a key role to play in minimising health risks. **YOU** can protect your employees by making sure hazards are recognised, risks are evaluated and exposures are effectively controlled.

And we can help you do that by providing the information, resources and signposting to the advice and expertise that we know you sometimes need.



## Web-based information hub

*A centre of excellence on exposure control.*

All our campaign materials are available on

[www.breathefreely.org.uk](http://www.breathefreely.org.uk) with new ones being added over time to reflect the growing reach of the initiative.



## Welder task sheets

We have a series of task sheets which show the controls which need to be in place to protect welders, according to the type of welding, the materials being welded and the nature of the environment where the welding is being carried out.



## Welding fume slidepack

There is a slidepack and information sheet for H S & E Managers to use when communicating with their employees about the dangers associated with welding fume.



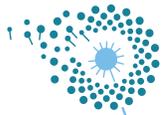
## Guidance materials

We have guidance on LEV, RPE and the hierarchy of control. Over time we will develop a bank of case studies as well as other guidance materials.



## External links

Links take you to more detailed guidance and regulations, other sources of relevant information, and to the **BOHS Directory of Occupational Hygiene Services**, which is the definitive list of UK companies able to provide qualified and experienced occupational hygienists, and specialist occupational hygiene support services.



# BREATHE FREELY



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Worker Health Protection

## Controlling exposures to prevent occupational lung disease in MANUFACTURING

### Breathe Freely - helping you take control

Occupational hygiene is about recognising, evaluating and controlling risks to health in the workplace.  
Occupational hygienists have the knowledge and skills to help you protect your employees.

Join us and be part of the solution

Sign up as a supporter now at  
[www.breathefreely.org.uk](http://www.breathefreely.org.uk)

Then begin to *breathe freely*.

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