



Controlling exposures to prevent
occupational lung disease in
WELDING

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An Introduction to LEV

Many welders are exposed unnecessarily to welding fume and gases that can damage their health. Welding fume a complex mixture of chemicals, several known to be carcinogens.

In 2017, the International Agency of Research on Cancer reported welding fumes cause lung cancer and positive associations have been observed with cancer of the kidney in workers.



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Exposure to the fumes and gases can also cause other diseases, including:

- an increased susceptibility to pneumonia
- metal fume fever
- chronic obstructive pulmonary disease (COPD), which includes bronchitis and emphysema
- asthma.

One measure that can be used to control the fumes and so minimise the risks to health is local exhaust ventilation – LEV. However, to ensure they are effective:

- the right type of system must be used, matched to the welding process and type of work being carried out
- the systems need to be used correctly, maintained and tested and managed properly.

This fact sheet provides some advice on the design and management of LEV systems to help you control workers' exposure to welding fume and gases.

Selecting an LEV system

There isn't one type of extraction system that will be effective at controlling welding fume and gases in every situation. What is needed will depend on the type of welding being carried out and the type of component or fabrication being welded so care needs to be taken when selecting or designing an LEV system.

Good design of all parts of the system is vital if it is to control the contaminants at source and prevent them dispersing into the working environment. However, the most crucial component from the point of view of contaminant control is the capture hood which is the inlet into the system. If this is poorly designed, then the system as a whole will probably be ineffective, no matter how good the remaining components are.

A number of different hood types are available. Make sure that you select the one that will be the most effective for the particular task.

Types of system

On-torch extraction



On-torch extraction can be fitted on metal inert gas (MIG) welding sets. They extract very close to the source and so can be very effective at controlling the fume. Set up correctly, they can be used without affecting the welding gas needed to ensure the weld integrity.

The advantage of the on-torch system over traditional extraction arm systems, which have to be constantly repositioned, is that the on-torch extract is always close to the weld.

Moveable arms



These are probably the most commonly used type of welding extraction. However, although they can be effective, they are not always the best solution. Other types of systems can be better options for many other welding jobs.

Where they are used, they need to be positioned close to and directly over the source of the fume. So, for larger fabrications, they will need to be frequently repositioned. Welders will need to be instructed to do this and supervisors should ensure that they are being used correctly.

Welding benches



With smaller components, carrying out the work on an extraction work bench will often be the most effective way of controlling the fume.

If used correctly, the fume is drawn away from the welder and the extraction does not need to be moved.

Some extraction benches can be configured to control dust created during grinding operations.

Commissioning LEV systems

Proper commissioning of an LEV system is essential to prove that it has been installed properly and that it controls exposure effectively.

Make sure that your supplier:



- commissions the LEV system thoroughly
- provides a full commissioning report
- includes a comprehensive user manual and log book.

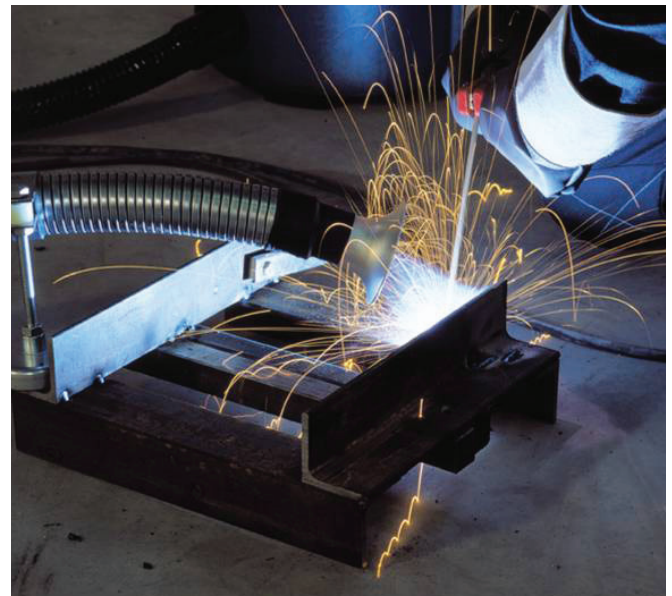
Managing LEV systems

Once they've been installed, LEV systems need to be managed to ensure that they continue to work effectively as follows.

- Ensure all users are trained on how to use the LEV correctly.
- Supervisors should ensure that LEV systems are being properly used.
- Users should check for signs of damage to LEV system before starting work.
- Ensure the systems are well maintained – implement a planned preventative maintenance programme.
- LEV systems require a statutory 'thorough examination and test' (TExT).
- Get a competent person to perform the TExT at least every 14 months.
- Carry out all actions arising from the TExT.
- It is advisable to carry out more frequent basic tests to ensure that the systems are working properly.
- Keep records of all examinations for at least 5 years.

References

- *Health and Safety executive - Clearing the Air. A simple guide to buying and using local exhaust ventilation (LEV)* 
- *Health and Safety Executive - Controlling Airborne Contaminants at Work: A guide to local exhaust ventilation (LEV)* 



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