

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

Welding Selector Tool  **Control Sheet**

**Fume Extraction:  
Local Exhaust Ventilation (LEV)  
On-torch Extraction**

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On-torch Extraction at a glance



Effectiveness rating



Appropriate workpiece size

- ✓ Small (up to 1.0m x 0.5m)
- ✓ Medium (up to 2.0m x 1.0m)
- ✓ Large (up to 2.0m x 4.0m)
- ✓ Extra large (> 2.0m x 4.0m)

Purchase price and other costs

Supply and installation	from £1500 + VAT per system excluding cost of torch
Other costs	Thorough examination and test every 14 months – cost will depend on number of systems to be tested
Filters	£1600 - £2500 filters every 2 years

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## On-torch Extraction

**LEV is needed for adequate control of MIG welding fume generated.**

On-torch extraction can be fitted on metal inert gas (MIG) and metal active gas (MAG) welding sets. The extract is very close to the source, and so can be very effective at controlling the fume. When set up correctly, it can be used without compromising weld integrity or shielding gas.

The advantage of the on-torch system is that the extract will normally be at the optimum position, unlike flexible extraction arm systems, which have to be constantly repositioned.

### Top tips

#### How to use the LEV effectively

The right type of system used must be suitable for the specific welding process.

Welding fumes rise vertically; so make sure you keep the extract nozzles above the weld point, where possible, to maximise fume capture.

It is important to maintain the volume flow rate to achieve good control. Select an extract unit with an airflow indicator and check the flow regularly.

Address any reduction in volume flow rate immediately. A common reason for loss of flow are blocked filters that require cleaning or changing.

Gaps in the torch hose, such as for cooling fluid lines, allow air to leak in, reducing volume flow. Air cooled torches will perform better; thus they are a more preferable choice, where practical.

To ensure they are effective, the systems need to be used correctly, maintained and tested.

## Limitations

On-torch extraction is only suitable for MIG and MAG welding torches. The extraction unit needs to be located close to the welding area. Hence, it is not always practical to use when welding is carried out overhead.

Research has shown that on-torch is more effective when welding on a flat surface, either parallel to the ground or vertical, than when welding in a fillet or junction between two surfaces.

Even when used correctly, the system is unlikely to capture all the fume, so the work area must also have good general (room) ventilation. Supplementary respiratory protection may be required, if the nature of the task means the fume is not fully captured or if the fume is particularly hazardous, e.g. steels with high chromium or nickel content. [See RPE control sheet](#) 

## Other considerations

If other workers are in close proximity, ensure they are also protected from the fume.

An airflow indicator should be fitted in order to allow the welder to check there is sufficient airflow through the system.

The extraction needs to be maintained and tested regularly. [See LEV, Installation, Commissioning, Maintenance and Testing management sheet](#) 

Health surveillance may also be needed for workers who regularly carry out welding and may be at risk of lung disease. [See Health Surveillance management sheet](#) 

Welders should be trained on the correct use of the on-torch extraction.

## Alternative control solutions

An extracted table can be used for small and medium components. A flexible extraction arm can be used, but is not likely to be as effective or consistent.

For stainless steel or exotic metals, respiratory protection will also be required to supplement the on-torch extraction.

For occasional short duration tasks, it may be acceptable to use respiratory protection in combination with good general (room) ventilation, e.g. for non-routine maintenance tasks. However, respiratory protection should be your last resort and all alternative options should be explored.

Pictures are courtesy of: HSE, TWI, Plymovent, Kemper, and 3M.