BREATHE FREELY

BOHS
The Chartered Society for Worker Health Protection

Controlling exposures to prevent occupational lung disease in
MANUFACTURING

Welding Selector Tool **Control Sheet**

Fume Extraction: Local Exhaust Ventilation (LEV)

Flexible Extraction Arm

Flexible Extraction Arm 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	£1500 + VAT for single arm mobile unit For multi-hood systems the cost will depend on the specific design
Other costs	Thorough examination and test every 14 months – cost will depend on number of systems to be tested

Flexible Extraction Arm

These systems have a round or oval inlet on the end of a flexible arm which can be moved over the welding position.

The purpose of the system is to draw the welding fume into the capture hood. To achieve this, the capture hood needs to be positioned as close as possible to the source of the welding fume. The careful positioning and repositioning of the capture hood is essential to maintain the optimal effectiveness of these types of systems.

The system is particularly suitable for welding to smaller or medium scaled objects, where there are not too many welding points. When the extraction nozzle needs to be moved frequently, effective control may not be achieved.

When positioned correctly, they can be used without compromising weld integrity or shielding gas. Ideally, the capture velocity (a measurement of the air velocity at the point where the fume is released) would be 0.5 m/s.

The extracted air should be vented outdoors. Where this is not possible, suitable filters should be fitted to units, which recirculate the filtered air back into the workplace.

An airflow indicator should be fitted so that the welder can check there is sufficient airflow through the system.

Top tips
How to use the LEV effectively

Ensure the LEV visibly captures all the fume, so it doesn't pass through the worker's breathing zone.

Also make sure the welding is within the capture zone of the hood at all times. To achieve this:

- The hood normally needs to be positioned at a distance of 1 to 2 hood diameters from the welding point.
- Place the capture hoods above the welding point to ensure an upward movement of the fume.
- Never position the welder between the capture hood and the welding point.
- As the welder changes position, the hood will need to be repositioned to ensure efficient capture of fume.

Fixed arm system

Standard Wheeled Mobile LEV

Potable Fume Extraction System

Limitations

The flexible extraction arm needs to be used correctly by the welder or it will not effectively capture and remove the fume.

Although this type of LEV can provide effective fume control when used correctly, it is likely that, in practice, the control will be inconsistent, due to the need for the welder to reposition the hood to ensure fume capture for each weld.

When the extraction nozzle needs to be moved frequently, effective control may not be achieved.

Even when used correctly, the system is unlikely to capture all the fume; so the work area must also have good general (room) ventilation.

Other considerations

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

The extraction needs to be maintained and tested. *See LEV, Installation, Commissioning, Maintenance and Testing management sheet*

Supplementary respiratory protection may be required, if the fume is particularly hazardous, e.g. steels with high chromium or nickel content. *See RPE control sheet*

Fume exposure measurements might be needed to confirm effectiveness of the flexible extraction arm in controlling the fume. *See Air Monitoring 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 flexible extraction arm.

Alternative control solutions

For small and medium size components, an extracted bench is likely to provide control more consistently.

With MIG welding, on-torch extraction can also be used. 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 solely use respiratory protection, e.g. non-routine maintenance tasks.

However, respiratory protection should be your last resort and all alternative options should be explored.

Good general ventilation will also be needed.

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

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