



Controlling exposures to prevent
occupational lung disease in
MANUFACTURING

Welding Selector Tool  Control Sheet

Respiratory Protective Equipment (RPE)

© TWI

RPE at a glance



Respiratory protection may be suitable for one-off welding jobs or when there is only one worker in the room. Respiratory protection can only protect the welder from breathing in the fume, not other people.

RPE is needed for supplementary control for some welding operations. The Breathe Freely campaign has a preferred type of RPE, which will provide the highest protection for the wearer; this is the powered respirator.

Effectiveness rating



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

Controlling exposures to prevent occupational lung disease in MANUFACTURING

**Welding Selector Tool  Control Sheet
Respiratory Protective Equipment (RPE)**

Respiratory Protective Equipment (RPE)

Respiratory Protective Equipment (RPE) may need to be used where other control solutions are not practicable or in combination with other controls.

The best type of RPE is usually a welding helmet with an integrated powered respirator. This has a fan, filter and battery pack secured by a waist belt on the welder's lower back. The fan blows filtered air into the visor to prevent welding fumes from leaking into the RPE and being breathed in by the welder. The integral welding visor also protects the skin and eyes from UV radiation.

Powered respirators used for welding should have a particulate filter. TH3 filters will provide the highest level of protection, although TH2 filters can also be used.

Good general (room) ventilation is always needed to ensure the welding fume is diluted and, when the RPE is removed the welder does not breathe in any fume remaining in the air.

Respiratory protective equipment only reduces the exposure of the welder, and other people may be at risk from inhaling the fumes released into the room.

Top tips How to use the LEV effectively

Some types of powered respirators have a double visor – an outer one with a UV filter and an inner clear one. On completion of welding, the outer visor can flip up to allow the welder to view the weld, while the inner visor remains in place and so protects the welder from the fume being released.

Without this type of device, the welder must wait until all the visible fume has disappeared before lifting their visor.

Limitations

RPE is the last resort in any control strategy.

- It only protects the wearer.
- It does not remove or reduce the fume at source.
- The generated fume can linger in the air.
- Disposable masks rely on making a good seal with the face; sweat and movement can change the effectiveness of the protection.
- A particulate filter gives no protection against gases generated from welding.
- Disposable RPE and welding helmets with a powered respirator are not suitable if there is a risk of oxygen deficiency in the air; a lack of oxygen to breathe can result in death.



© 3M

Controlling exposures to prevent occupational lung disease in MANUFACTURING

**Welding Selector Tool  Control Sheet
Respiratory Protective Equipment (RPE)**

Other considerations

Good room ventilation is needed in addition to RPE to ensure the welding fume is suitably dispersed and diluted to minimise the risk to the welder when the RPE is removed and to others in the area. A face fit test is not required for RPE with loose fitting head tops, such as a welding helmet with integrated welding visor.

There must be an RPE Programme in place to include the following 3 points:

1. Information, instruction and training

The RPE wearers should be trained on:

- The hazardous substances present and their health hazards.
- How RPE works.
- How to fit and use their specific RPE.
- Maintenance procedures, including cleaning and fault/problem reporting.

2. Maintenance and test

Provision should be in place for pre-use checks, routine preventative maintenance as well as reporting of faults and ordering of spare parts and consumables. Records should be made and retained for 5 years of the checks carried out on RPE.

For powered RPE, test to ensure that the battery and blower unit are in good order and it delivers the correct flow rate. Flow testers are provided with the RPE

If you are using a supplied air system, as required in a confined space, the air must be of breathable quality and must be periodically tested in accordance with British Standards.

3. Storage

Provision of storage for the RPE to ensure that it remains free from contaminants and moisture ingress so that it is kept in good working order until it is next inspected and used.

Alternative control solutions

Well designed local exhaust ventilation (LEV) will be more effective at controlling exposure to welding fume than RPE. Use the welding fume control selector tool to help you decide what type of LEV is most suitable for the task.

RPE can be used to supplement other control solutions to protect the health of the welder.



© 3M

Date of publication: October 2018