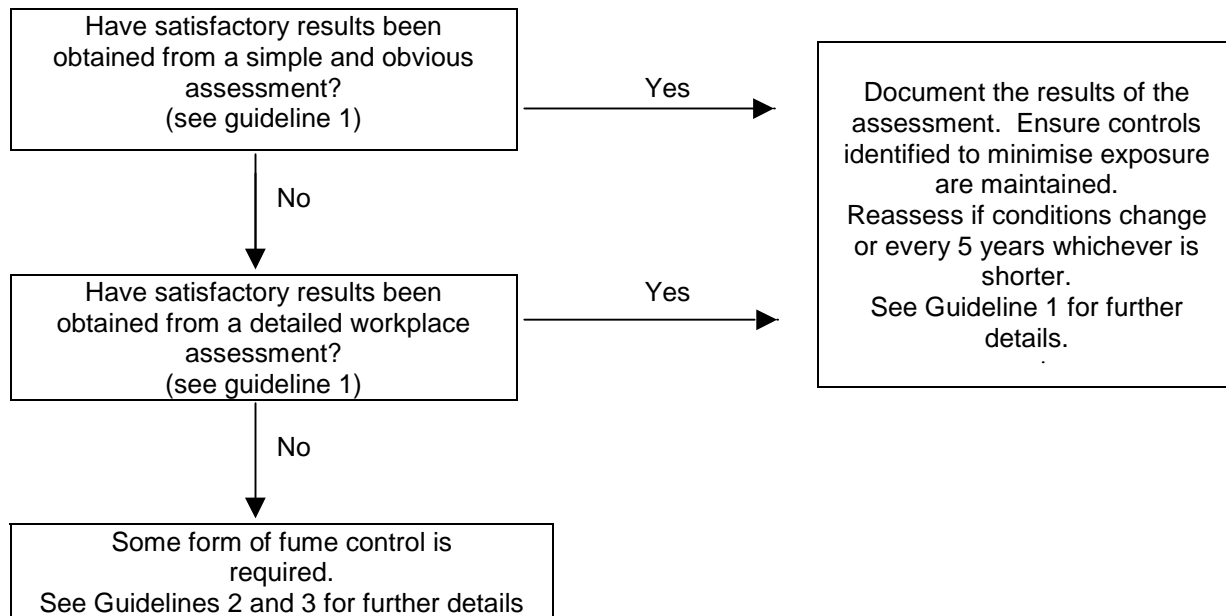


FUME MINIMISATION GUIDELINES

GUIDELINE 4:

MANUAL METAL ARC WELDING (MMAW)

An employer has a duty to ensure that a suitable and sufficient assessment is made where there is potential for exposure to hazardous substances. It should be noted that in tests conducted under still air conditions, breathing zone fume from MMAW usually exceeds the recommended levels (see Figure 1). No special measures may be necessary to protect the operator provided clean air movement is greater than 0.5 m/s across the welders breathing zone (see Figure 2). Accumulation of fumes in the workshop must be prevented by general ventilation.



Steps To Reduce The Effect Of Fumes And Gases

- **Process Alternatives**

- 1) Consider using GMAW, FCAW, SAW or GTAW as these processes may be mechanised and/or on gun fume extraction is available. Higher capital costs are often offset by higher productivity.

- **Process Modifications**

- 1) Arrange welding to reduce welders exposure as shown in Figure 3. This also reduces fatigue and back problems.

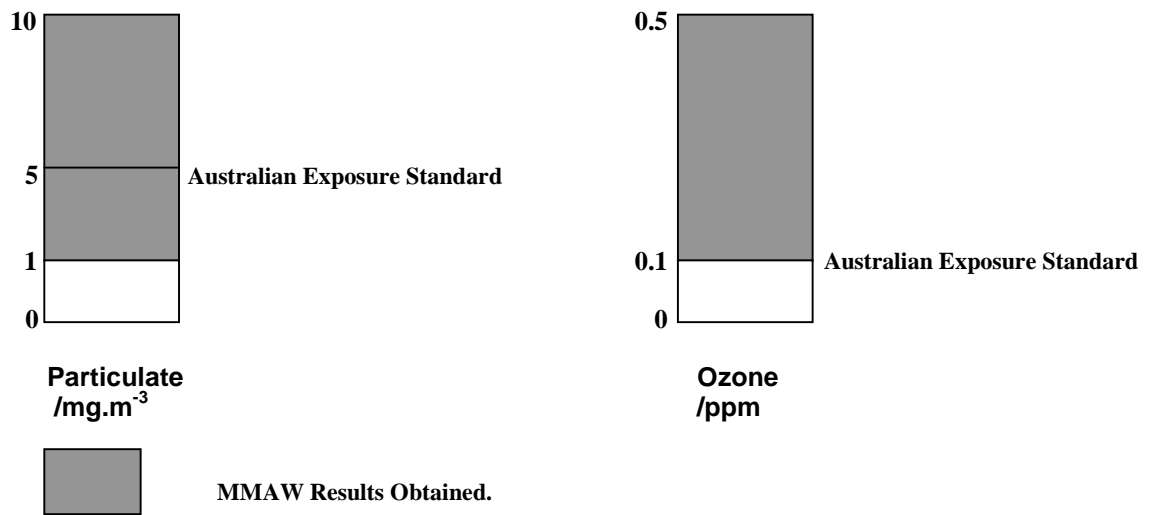


Figure 1. MMAW fume production at the breathing zone under still air conditions compared to the regulations (not to scale).

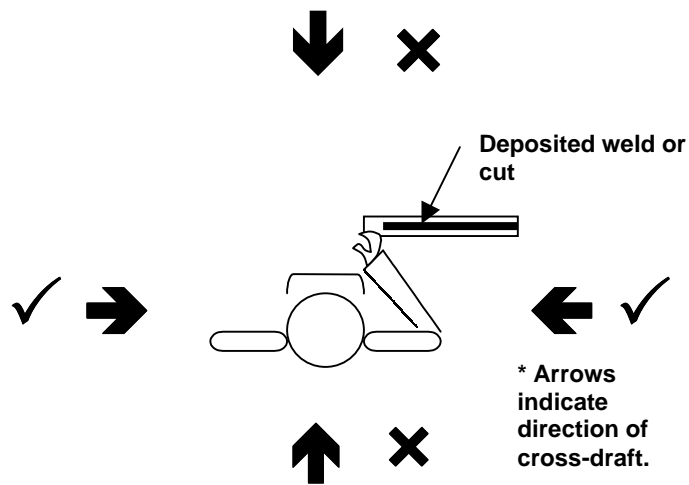


Figure 2. Preferred and non – preferred direction of cross draft for breathing zone ventilation.

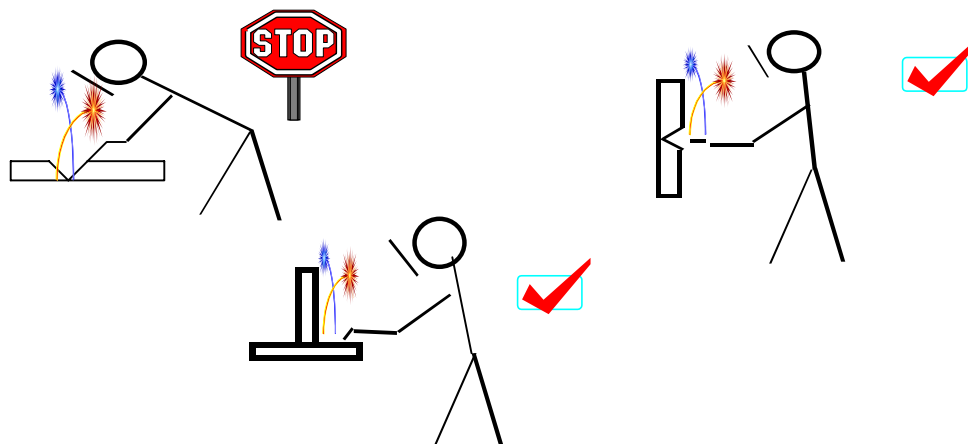


Figure 3. The welder's head should not enter the visible fume plume.