

## Workplace Health and Safety Queensland

*Information guide – Rural industry***9. Cutting and welding****Use protective clothing and equipment**

When choosing appropriate protective clothing, you should take into account protection of body parts from electric shock and burns from radiation or hot metal parts and splashes. Welders should wear:

- fire resistant gauntlet leather gloves with internal seams to prevent stitches burning or trapping hot particles
- wool or fire-resistant canvas protective clothing that covers arms, legs and neck that also provide UV protection
- a leather apron
- leather steel-capped safety boots with leather spats
- a felt skull-cap or beret.

Eye and face protection should:

- be non-flammable and have anti-glare sides
- ensure adequate visibility
- be equipped with a shade filter appropriate to the cutting and welding process.

For gas welding and cutting, select a shade filter number between three and seven. For arc welding and cutting, the shade filter number should be between seven and fifteen. If visibility remains poor after choosing a suitable filter for the welding process, improve the lighting conditions.

Workers who wear contact lenses need to avoid dust, metallic particles and other foreign matter getting into their eyes. These workers should wear full eye protection because of the potential for severe discomfort and increased risk of serious eye damage.

Where possible, wear full helmet equipment to protect the head from falling objects, impact from protruding objects, hot or flying metal particles. Helmets should:

- allow adequate breathing and ventilation

- be light and durable
- be constructed from non-flammable and non-conducting materials
- have a non-reflective surface.

To ensure its longevity and protection, all protective clothing and equipment should be kept clean and in working order.

**Training**

The dangers involved in welding should never be underestimated. All persons who cut or weld metal should be properly trained.

**Dangers**

The dangers associated with welding include:

- The arc temperature can reach 6000°C. The intense ultraviolet and infra-red rays can be harmful to both the welder and people nearby. It is not unusual for welders who are not wearing overalls to suffer symptoms similar to extreme sunburn.
- Fumes - depending on the item being welded fumes may be hazardous to health and precautions should be taken, particularly in confined spaces. If it is not possible to ensure good ventilation, a suitable respirator should be worn.
- Combination of heat and gas - fatalities have resulted where drums and other containers have exploded as a result of welding or cutting work. The nature of the previous contents should be established to ensure that any heating does not liberate toxic fumes or cause an explosion.
- Electrical circuit is perhaps the greatest hazard to the welder. There is a high risk of electrical shock. Welders should note the following points:
  - never attempt to connect or change welding cables before switching off the power at the mains first

- always install the welding machine as near as possible to the power point
  - always keep the welding machine terminals and cable connections clean and tight - only use welding cables that are fully insulated throughout their entire length
  - get a qualified electrician to do any electrical repairs
  - work on a well insulated floor wherever possible and wear rubber insulated shoes
  - always wear dry gloves when handling equipment that is live, e.g. when placing an electrode in a holder
  - do not attempt to use gas pipes or water pipes as part of the welding circuit, as explosions or shocks to other workers may result.
- low pressure gauge. The gauge needle creeps beyond the pressure set for actual welding or cutting.
- Excess pressure or the presence of a different gas in a regulator can cause fire and explosion in varying degrees of severity, resulting in damaged equipment and operator injury.
  - Operators should never use equipment fitted with a regulator in which a creep condition is known to exist.
  - Use the correct colour and type of hoses and fittings recommended by the manufacturers. Copper must never be used on acetylene lines as substances which may spontaneously detonate are formed.
  - Flashback arresters should be fitted to all oxy-acetylene equipment to overcome the danger of flashback.
  - Oxy-acetylene equipment should not be left near hot equipment or metals which could burn the leads. Gas leaks can be tested by using soap and water.
  - Proper attention to maintenance of equipment is necessary to prevent accidents.
  - Don't smoke when welding or near welding and don't keep your lighter in your pocket - it could explode.
  - Cutting and welding can be extremely dangerous. Follow appropriate practices and ensure the health and safety of yourself and others.
  - It is important to:
    - be properly trained in the use of cutting and welding equipment as well as in welding practices
    - be equipped with the appropriate protective clothing and equipment
    - be aware of the danger signs, such as creep and other gas regulator failures.

The finished work will be very hot.

### Gas welding

- Gas leakage is perhaps one of the greatest risks involved with gas welding. Leaking fuel gas is usually recognised by odour. Oxygen leaks are potentially more dangerous as they are not usually recognised easily.
- Leaking oxygen leads to an oxygen enriched atmosphere where normal events such as naked flames, cigarettes, sparks and electrical faults become more dangerous situations. Oil and grease may spontaneously ignite in the presence of pure oxygen.
- Under no circumstances should any fittings of oxy-acetylene equipment be allowed to be contaminated with grease or oil.
- Regulators can fail in two ways - by the controlled forward flow of gas, known as regulator creep, or by the reverse flow of another gas in the gas lines. Regular maintenance should avoid these situations.
- Either of these failures can be recognised by a higher than expected reading on the operational or

### More information

Further information is available from [www.worksafe.qld.gov.au](http://www.worksafe.qld.gov.au) or by calling the WHS Infoline on 1300 369 915.