

Safety Tips for Oxygen and Acetylene Cutting and Welding**Introduction**

This information sheet briefly outlines the fire dangers and precautions of not only welding, but also cutting metals. As welding (and cutting) involves very high temperatures (up to 5500 degrees C), there is always the risk of fire, especially when combustible materials are around. These fires cause millions of dollars damage each year and the loss of life. It is important to recognise and understand the dangers and risks involved when welding, and to implement safe practices to reduce these risks.

Most workshops have some type of equipment for welding and cutting metals. Acetylene is the most commonly used fuel gas. Acetylene is very flammable and hazardous and can ignite at a wide range of concentrations. Oxygen won't burn or explode, but it helps other objects burn at greater rates. In Papua New Guinea gases are stored in cylinders at pressures of around 15,000kPa and they can rupture if not handled correctly. A cylinder containing compressed gas can shoot through the air like a rocket if its valve is damaged or broken.

Storage and Handling of Gas Cylinders

- Keep cylinders away from physical damage, heat, and tampering.
- Securely chain equipment to prevent falling.
- Store away from flammable and combustible materials.
- Store extra gas and oxygen cylinders separately.
- Store in an upright position.
- Close cylinder valves before moving.
- Protective caps or regulators should be kept in place.
- Roll cylinders on bottom edges to move--Do not drag.
- Allow very little movement when transporting.

General Gas Welding Safety Tips

- Inspect equipment for leaks at all connections using approved leak-test solution.
- Inspect hoses for leaks and worn places.
- Replace bad hoses.
- Protect hoses and cylinders from sparks, flames and hot metal.
- Use a flint lighter to ignite the flame.
- Stand to the side (away from the regulators) when opening cylinder valves.
- Open cylinder valves very slowly to keep sudden high pressures from exploding the regulators.
- Only open the acetylene cylinder valve 1/4 - 3/4 turn; leave wrench in place so the cylinder can be quickly closed in an emergency.
- Open and light acetylene first, then open and adjust oxygen to a neutral flame.
- Close the acetylene torch valve first when shutting off the torch (a "pop" might occur as the oxygen "blows out" the flame, but this eliminates the possibility of the flame burning up the acetylene line).
- When finished, close cylinder valves, bleed the lines to take pressure off regulators, neatly coil hoses and replace equipment.
- Have a fire extinguisher easily accessible at the welding site.

Personal Protective Equipment:

- Infrared radiation is a cause of retinal burning and cataracts. Protect your eyes with safety glasses.
- Protect your body from welding spatter and arc flash with protective clothing. Such as:
 - ✓ Woolen clothing
 - ✓ Flame-proof apron

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- ✓ Gloves
- ✓ Properly fitted clothing that is not frayed or worn.
- ✓ Shirts should have long sleeves.
- ✓ Trousers should be straight-legged and covering shoes when arc welding.
- ✓ Fire resistant cape or shoulder covers are needed for overhead work.
- ✓ Check protective clothing equipment before each use to make sure it is in good condition.
- ✓ Keep clothes free of grease and oil.

The Welding Environment

Ideally, cutting and welding should be carried out in specially designated areas of a workshop. To reduce any fire hazard, these areas should have:

- Concrete floors .
- Fire extinguishers
- Arc filter screens .
- Protective drapes or curtains
- Adequate ventilation

Also, whenever any welding/cutting operation is carried out, the area should be free from any combustible material that may fuel a fire. When the work cannot be done in a specially designed workshop, other precautions must be taken to minimise the fire risk. If the floors or roofs are combustible, they should be wet down with damp sand and/or covered with metal shields or fire-resistant tarps. The walls should also be protected if they are combustible. Also, any openings in the walls or floor should be covered with non-combustible shields to prevent hot metal travelling through these openings. If this is not possible, for example when the opening is too large, and the opening exposes flammable material in nearby areas, then the opening should be guarded by firewatchers. Sometimes it is necessary to suspend fire-resistant tarps beneath the work area to catch any hot/molten metal that may fall through. This is especially important when the work is being conducted above an area which contains combustible materials.

In summary, remember the following key points

- Proper personal protective equipment is important.
- Acetylene is very flammable.
- Inspect all equipment before welding.
- If ventilation is not sufficient, then the welding area should be equipped with mechanical ventilating equipment.
- Always have a fire extinguisher ready for immediate use.

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