

Safe Use of Oxy-Acetylene Gas Welding & Cutting Equipment

Standard Operating Procedure (SOP)

1. Purpose

To prevent fire, explosion, flashback, burns, and asphyxiation when using oxy-acetylene equipment for welding, brazing, heating, or flame cutting.

2. Scope

Applies to all portable and fixed oxy-acetylene sets in the workplace (cylinders, regulators, hoses, flashback arrestors, torches, trolleys).

3. Responsibilities

Operator: Must be trained and follow this SOP at all times.

Supervisor/PCBU: Ensure cylinders are in test, flashback arrestors are fitted and in date, and only authorised persons use the equipment.

4. Mandatory Personal Protective Equipment (PPE)

- Shade 4–5 welding lens or flip-up goggles (AS/NZS 1338.1)
- Flame-resistant welding jacket or leather apron
- Welding gloves (leather, gauntlet type)
- Steel-cap safety boots
- Hearing protection if cutting thick plate
- P2 respirator when cutting galvanised or painted metal

5. Pre-Use Checks

- Cylinders within 5-year hydrostatic test date and 12-month visual inspection
- Flashback arrestors fitted at regulator end (and preferably torch end) – in date
- Regulators correct for gas (oxygen green, acetylene red) and undamaged
- Hoses red (fuel) and blue/black (oxygen) – no cracks, cuts, or tape repairs
- Torch valves close fully and no leaks
- Trolley secure, chains fitted, cylinders capped when moving
- Fire extinguisher (minimum 9 kg ABE dry chemical) within 5 m and in test
- Area clear of flammables for 8 m radius

6. Safe Operating Procedure

Set-Up

- Secure cylinders upright on trolley or chain to wall
- Crack cylinder valves before connecting regulators
- Connect regulators with correct spanner – hand-tight plus $\frac{1}{4}$ turn only
- Fit flashback arrestors
- Blow out hoses briefly before connecting torch
- Leak-test all connections with approved leak-detection fluid (never a flame)

Lighting Up

- Light acetylene first – open torch acetylene valve $\frac{1}{4}$ – $\frac{1}{2}$ turn, ignite immediately
- Adjust to clean feather (slightly carburising)
- Open oxygen slowly until neutral flame achieved
- Never leave a lit torch unattended

Cutting

- Use correct tip size and pressures (refer manufacturer chart)
- Keep cylinder valves within arm's reach
- Cut away from cylinders and hoses

Shut-Down

- Turn off torch acetylene valve first → flame goes out
- Turn off torch oxygen valve
- Close both cylinder valves fully
- Open torch valves to bleed lines (acetylene first, then oxygen)
- Back off regulator pressure screws (anti-clockwise until loose)
- Close torch valves

7. Absolutely Prohibited Actions (Zero Tolerance)

- Using oil or grease on oxygen fittings
- Using matches or cigarette lighters to light torch
- Leaving cylinders or torch unattended while pressurised
- Rolling cylinders horizontally
- Using copper fittings on acetylene side
- Cutting or welding on drums/tanks that contained flammables without hot-work permit
- Exchanging regulators or hoses between oxy-acetylene and oxy-LPG sets

8. Emergency Procedures

- Flashback or sustained backfire: close oxygen valve first, then acetylene
- Cylinder fire: close valve if safe, otherwise evacuate and call 111
- Leaking acetylene cylinder (smell of garlic/ether): evacuate, call 111, do not operate switches
- Burns: cool with running water 20 minutes, seek medical help

9. Storage & Transport

- Cylinders stored upright, capped, in well-ventilated cage
- Oxygen and acetylene separated by 3 m or 30-minute fire wall when not in use
- No cylinders inside vehicles unless windows open and vehicle ventilated

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