

Portershoek Quarry	SAFETY HEALTH - MANAGEMENT SYSTEM (Doc No.7.5.1.19)	Effective Date:15 May 2021 Revision No. ISO 45001 Date Reviewed: Page: 1 of 5
--------------------	---	--

Gas, Cutting & Welding

1. Purpose

To establish a safe and correct procedure that will ensure competent operational practice and regular inspection and maintenance are achieved with respect to oxy-acetylene cutting torches, including rigid observation under the Mine Health and Safety Act and Regulations.

2. Scope

This procedure applies to competent persons who have been charged with the duties to perform gas cutting and welding operations at the site, including contractors and their sub-contractors.

3. Reference Documents

Mine Health and Safety Act, Act 29 of 1996.

Manufacturer specifications (Afrox)

SABS 0238 : 1991 Section 10 and a section on Fire Fighting.

ISO 45001:2018(E)

4. Terms and Definitions

5. Procedure

5.1 SAFETY

5.1.1 Inspect flashback arrestors (at both bottle and torch ends), regulators, nozzles, oxy-acetylene hoses and fire extinguishers before use.

5.1.2 Goggles with lenses of approved colour and shade must be worn.

5.1.3 Leather or asbestos gloves, spats, aprons and other protective clothing must be worn as protection against burns.

5.1.4 Clothing of flammable material never to be worn.

5.1.5 When cutting in confined spaces always keep the cylinders outside. Personnel who are familiar with the operation of the equipment must be stationed at the cylinders. Ensure that adequate ventilation is present and that life lines are worn by all persons inside the confined space.

5.1.6 Always light the torch before passing into the confined space. Bring the torch out whenever work is stopped.

5.1.7 Dirty nozzles can also cause a flashback.

Portershoek Quarry	SAFETY HEALTH - MANAGEMENT SYSTEM (Doc No.7.5.1.19)	Effective Date:15 May 2021 Revision No. ISO 45001 Date Reviewed: Page: 2 of 5
--------------------	---	--

5.1.8 Oxy-acetylene cylinders must always have safety covers over the cylinder valve.

5.2 Safety Precautions

5.2.1 If a torch backfires on lighting, it is because:

- a) The regulators are not set to the correct pressure, or
- b) A light has been applied before the flow of gas is properly established.

5.2.2 If the flame snaps out when the torch is in use, it is because:

- a) The regulator pressure and/or gas flows are incorrect.
- b) The nozzle is blocked.
- c) The nozzle has been held too close to the work.
- d) The nozzle has become overheated.

5.3 Malfunction Descriptions

5.3.1 Backfire

Flame enters into nozzle or torch with a violent popping sound. Flame either extinguishes or re-ignites at the nozzle.

5.3.2 Sustained Backfire

Flame enters into nozzle or torch and continues burning inside with a hissing or whistling noise.

5.3.3 Flashback

Flame enters into torch and travels back into supply system. The speed of such a flashback is more than twice the speed of sound.

5.3.4 Backflow

Gas with higher pressure flows back through the torch into hose with lower pressure. Caused if nozzle exit becomes blocked or by some internal obstruction.

Portershoek Quarry	SAFETY HEALTH - MANAGEMENT SYSTEM (Doc No.7.5.1.19)	Effective Date:15 May 2021 Revision No. ISO 45001 Date Reviewed: Page: 3 of 5
--------------------	---	--

5.4 Operating Procedure

5.4.1 To Light the Torch

- a) Open the cylinder valves very slowly by means of the cylinder key. Do not open suddenly, or the regulator may be seriously damaged. Open the acetylene cylinder valve half a turn, but not more and leave the key in the cylinder valve. Open the oxygen cylinder valve one full turn, but no more.
- b) Maximum operating pressures are 100kPa for oxygen and 20kPa for acetylene respectively.
- c) Open the acetylene valve on cutting torch slowly, pause for two seconds then light the gas by means of lighter only. (No other open light or sparks from welding machine). Reduce or increase the acetylene supply until the flame just ceases to smoke. If the flame moves away from the cutting tip the acetylene pressure is too high. Reduce pressure on regulator until flame burns close to tip.

5.5 On Completion of the Work

- 5.5.1 Close the acetylene control valve first, after the flame goes out, re-open acetylene control valve to ensure no flame is burning in the system, close the control valve.
- 5.5.2 Close the oxygen control valve.
- 5.5.3 Close the cylinder valve and remove the key.
- 5.6 No person shall use oxy-acetylene equipment unless such a person has been trained and found competent to do so. Has been examined and issued with a certificate to use such equipment. This certificate will be re-issued annually after examination.
- 5.7 Each set of equipment will be equipped with a fire extinguisher, flashback arresters on the pressure regulators and the flashback arresters on the torch.
- 5.8 All regulators, hoses, fire extinguishers and safety equipment must confirm to SABS 0238 Specifications.
- 5.9 Cylinders must always be fully secured in an upright position.
- 5.10 Cylinders should never be allowed to drop or come into violent contact with one another.
- 5.11 Always keep equipment clean and in a good condition so that it is safe to use.
- 5.12 Keep all connection threads on cylinders, regulators and hoses free from oil, grease and dirt.

Portershoek Quarry	SAFETY HEALTH - MANAGEMENT SYSTEM (Doc No.7.5.1.19)	Effective Date: 15 May 2021 Revision No. ISO 45001 Date Reviewed: Page: 4 of 5
--------------------	---	---

- 5.13 Inspect hoses regularly for cuts, cracks, burns or worn surfaces. (Copper tubing must **not** be used to join hoses: Brass only to be used)
- 5.14 The two inlets and the nozzle of the torch must be protected with short pieces of hose when not in use.
- 5.15 Open cylinder valves momentary, prior to connection of regulators, in order to dislodge any dirt or obstruction in cylinder connections.
- 5.16 Only use standard hose lengths where applicable (18m).
- 5.17 Use only recommended nozzle sizes and working pressures for the various metal thicknesses.
- 5.18 Keep cylinders away from electrical apparatus or live wires, sparks, open flames, welding or any abnormal heat.
- 5.19 Remove the cutting tip for cleaning purposes.
- 5.20 Do not attempt to open cylinders, or connect equipment with anything else, but the appropriate tools.
- 5.21 Always make use of protective equipment.
- 5.22 Only use proper hose clamps for hose attachments. (Do not use wire).
- 5.23 Flame cutting, welding, heating or arc welding may not be performed closer than four metres from any gas cylinder.
- 5.24 Uncoil hoses completely before use.
- 5.25 While working, the key must remain in the acetylene cylinder valve.
- 5.26 At any sign or defect to equipment usage must immediately discontinued.
- 5.27 The cylinder valve key must be removed from unattended cylinders.
- 5.28 Do not tamper with gas equipment, do not attempt to repair faulty pressure regulating valves, alter nozzle hole sizes or perform any modifications whatsoever.
- 5.29 Mark equipment suspect of being damaged, but with no apparent defect, clearly for information of anybody else.
- 5.30 Residual pressure must be released from hoses after use.
- 5.31 All oxy-acetylene equipment must be checked fortnightly by the appointed Gas Cutting and Welding inspector. The results must be entered in the register provided for the purpose.

Portershoek Quarry	SAFETY HEALTH - MANAGEMENT SYSTEM (Doc No.7.5.1.19)	Effective Date:15 May 2021 Revision No. ISO 45001 Date Reviewed: Page: 5 of 5
--------------------	---	--

5.32 Only plastic quick release clamps or Insulok cable ties T30R (size: 140 x 3,6mm) to hold the oxygen and acetylene hoses together are to be used. Hoses must not be tied together with wire etc.

5.33 Coiling of oxygen and acetylene hoses around gas cylinders are prohibited.

6. Responsibility

Persons in charge of charge gas cutting and welding operations.

Supervisors and inspectors.

Manager for arranging of training and appointments.

7. Recording

Gas cutting and welding equipment, inspection registers.



Mine Manager



Date