



شركة العين للتوزيع
Al Ain Distribution Company

**Health, Safety and Environment
Management System
Procedure**

**Standard Operating Procedure
Hot Works
SOP.HSEMS.01**

Effective Date 10/ 01 / 2019

Procedure #: SOP.HSEMS.01

Issue : 1

Revision : 0

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Approved by:

Managing Director



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**Standard Operating Procedure
Hot Works**

Prepared by:

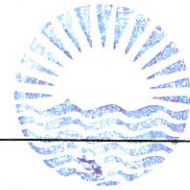
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Managing Director



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Al Ain Distribution Company

Issued by:

HSE Management System Representative

Effective Date: 10 / 01 / 2019

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1.0 Intent

- 1.1 This Standard Operating Procedure (SOP) defines the general rules and good practices required for hot works such as handling and using of both arc and gas welding.
- 1.2 All welding and cutting operations must be carried out in accordance with this SOP.
- 1.3 This procedure has been developed in line with the OSHAD CoP 28.0 Hot Work Operations Welding and Cutting, OSHAD CoP 49.0 Compressed Gases and AADC System Safety Rules.
- 1.4 This SOP is applicable to all AADC staff and contractor workers.

2.0 Principles

- 2.1 Many welding operations cause fire and produce toxic fumes and gases. It is extremely important that the health hazards of the materials worked on are known and that the appropriate precautions are taken.
- 2.2 These are some of the hazards when conducting hot works:
 - Electric shock;
 - Fire;
 - Fumes;
 - Radiation burns to eyes or body;
 - Body burns due to hot or molten materials;
 - Flying sparks, abrasions and entanglement;
- 2.3 Persons performing hot works shall be competent and aware of associated potential risks.

3.0 Definitions

For the purposes of this document the following definition applies:

Term	Definition
AP	Authorized Person
CP	Competent Person
Hot Works	It is a term used for welding, grinding and thermal cutting



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	tasks resulted in extreme temperature, fire and explosion.
Radiation	Hot work, like welding, often involves exposure to harmful ultraviolet and infrared light. This can cause severe damage to worker's eyes and skin
SOP	Standard Operating Procedure

4.0 Responsibilities

The respective Section Manager is responsible to distribute this procedure to all involved parties and monitor the implementation. Added responsibilities:

Role	Hot works
Authorized Person / Supervisor	<ul style="list-style-type: none"> • Conducts onsite risk assessment for hot works. • Coordinates, plan and frequently observes the hot works activity. • Ensures that only competent persons shall perform hot works appropriate facilities such as designated work areas, PPE, fire prevention and protection system shall be provided. • Issues safety document as required
Competent Person	<ul style="list-style-type: none"> • Conduct the onsite tool box talk / safety briefings when required • Checking and testing of all to ensure that all is in good operating condition and free of defects • Received safety document when required • Work shall be in accordance with this SOP and APs instructions and guidance. • Appropriate PPE and safety equipment shall be used and worn.

5.0 Procedure

5.1 Planning and Assessment

5.1.1 Risk assessment shall be conducted as and when required.





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- 5.1.2 Work shall be carried out in the designated areas only and other activities shall be limited in these designated areas.
- 5.1.3 CP shall conduct onsite tool box talk / safety briefing as described in section 5.2.1. If any high risk is revealed during the safety briefing, then this must be made known to the AP.
- 5.1.4 Ensure that all equipment are checked and tested as required prior to use.
- 5.1.5 Hot works shall only be undertaken by persons trained and competent to operate the equipment.
- 5.1.6 Only CP shall perform work that holds a valid competency certificate for hot works.
- 5.1.7 Medical surveillance program shall be in place and implemented for persons performing hot works.
- 5.1.8 Appropriate PPE shall be used and worn accordingly.

5.2 Tool box talk / Safety Briefing

- 5.2.1 Tool box talk shall be undertaken to review the risks at worksite.

Tool box talk / safety briefing topics
Ensuring safe access and egress available?
Ensuring there is adequate ventilation (when required), space and illumination?
Is task being carried out by CP?
Has the equipment been checked and tested and in a good condition?
Is designated work area for specific task?
Is an effective fire protection system been provided and maintained?
Are required PPE worn as per Appendix - 7.3?
Are required first aid and Fire extinguisher equipment available?

5.3 PPE Requirements

5.3.1 Required minimum PPE

- Welding apron
- Welding Helmet (filtered lens)
- Welder Gloves
- Half Face Mask (Heat Works)
- Ear plug

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- Safety Shoes
 - Leather spats
- 5.3.2 When performing welding activities, suitable face / eye protection shall be worn in order to ensure for the filtering of harmful radiation.
- 5.3.3 When welding, a welding helmet should always be worn with cover plates protecting the lenses.
- 5.3.4 Head protection (leather hood) must be worn when performing overhead welding or cutting.
- 5.3.5 Nylon or other synthetic materials shall not be worn during hot works as they can easily melt when contacted by sparks and thereby cause injury.
- 5.3.6 It is preferred that high cut shoes / boots are used in order to prevent sparks from falling inside shoes.
- 5.3.7 Leather gloves and aprons shall be worn during welding and cutting operations.
- 5.4 **Designated Work Areas**
- 5.4.1 Hot works whenever possible shall only be performed in a designated work area such as the workshop
- 5.4.2 To perform hot work operations outside of a designated area, a Safety Document in the form of a Limited Access Permit (LAP) must be obtained from authorized person.
- 5.4.3 When welding indoors, consider the use of an extraction and / or ventilation system.
- 5.5 **Fire Precautions**

When hot work is performed outside of a designated area, suitable fire precautions shall be considered and this should be in the form of a least a suitable fire extinguisher being at hand. Hot works should be carried as far as possible away from combustible materials. Consider the use of fire resistant materials to cover flammable materials when hot works is being performed near them

- 5.5.1 Penetration holes in the floors should be plugged to prevent sparks from falling through.
- 5.5.2 When performing hot works near a penetration, a fire watchman should be considered to keep check on lower floor or room next door.
- 5.5.3 A fire extinguisher shall be at hand to be used as and when required. Persons



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are to be trained in the safe operation of fire extinguisher.

- 5.5.4 The area where hot works has taken place should be checked for at least an hour after the welding operation has ceased to verify that there is no chance of fire. Welding fires can occur long after welding has ceased.

Do not weld any closed vessel that has contained or is suspected to have contained flammable or toxic materials until it has been tested, thoroughly cleaned, vented and purged.

- 5.6
- 5.6.1 The frame of welding transformer must be earthed with system earthing at all times.
- 5.6.2 Conduct a thorough inspection of the welding equipment, this shall include:
- Check the length of the welding cables for exposed conductors, damaged insulation or cuts. Any damaged cable shall be replaced prior to using the equipment **Do not repair cables with insulation tape.**
 - Condition of the plug
 - Condition of electrode holder
 - Condition of earth clamp
- 5.6.3 Electrode holder shall be made of insulated material. Check electrode holder for loose or exposed connections to reduce shock hazard.
- 5.6.4 Do not loop welding cables around your body.
- 5.6.5 Do not change the polarity switch whilst the machine is under load. The arcing due to the high current can burn the switch contact surfaces or cause serious burns.
- 5.6.6 Ensure that the welding machine is equipped with a power disconnection switch, which should be used in case of an emergency.
- 5.6.7 Electrode holders should be kept away from electrical power sources and compressed gas cylinders.
- 5.6.8 Never strike an arc on a compressed gas cylinder.
- 5.6.9 When welding is completed, all electrodes must be removed from the holders and the equipment must be disconnected from the power source.

5.7 Gas Welding and Cutting

5.7.1 Oxygen and Acetylene Cylinders

- All cylinders must be stored in a well-ventilated, dry location and as far as possible from combustible materials.



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- Valve protection caps must be in place when the cylinder is not in use.
- Oxygen cylinders must be stored separate from other flammable gases cylinders.
- All cylinders must be marked identifying their contents.
- Cylinders in use must be chained or otherwise secured to prevent falling preferably on a suitable trolley. Keep cylinders away from any sources of heat or ignition. If this is not possible, heat and fire-resistant shields or covers must be provided.
- Ensure that flash-back arrestors and non-return valves are fitted to the equipment.
- Never face a gauge while opening a cylinder. Stand to the side in case of a malfunctioning valve.
- Do not use oxygen to blow out any rubbish or to dust off workplace or clothing.
- Acetylene cylinders must be kept and used in an upright position and must not be used at a pressure exceeding 15 psi.
- Always keep the wrench or key for the acetylene cylinder on the cylinder while in use. Never open the cylinder more than one full turn so that it may be quickly shut off in case of emergency. Make sure that valves are closed when returning empty acetylene cylinders, so as to prevent the evaporation of the acetone solvent.
- Use only approved bronze brass fittings. Do not use grease or any other readily oxidizable substance on any regulator or torch. Do not handle this equipment with oily rags or gloves.

5.7.2 Hoses

- Hoses showing signs of burns, cracks or leaks must be immediately replaced.
- Hoses should be color coded to avoid accidental mixing.
- Check hose connections for correct threading. Standard hose connections are threaded right hand for oxygen and left hand for acetylene or other fuel gases. This helps to prevent an accidental switch off oxygen and flammable fuel gases.
- Do not repair hoses with insulation tape. Test for leaks using soapy solution. If leaks exist, have them replaced or repaired.

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5.7.3 Lighting of gas welding torch.

- Open acetylene cylinder $\frac{3}{4}$ of a turn
- Open torch valve $\frac{1}{4}$ of a turn
- Adjust acetylene working pressure with gas regulator screw
- Slowly open oxygen cylinder all the way
- Open oxygen torch valve .50 of a turn
- Adjust oxygen to working pressure with the gas regulator screw
- Close valves on acetylene and oxygen cylinders
- Reopen the acetylene torch valve $\frac{1}{4}$ turn and light gas with friction lighter. Never use matches.
- Open the oxygen valve $\frac{1}{4}$ of a turn and adjust flame.

5.7.4 Shutting off gas welding torch

- Always close the acetylene torch valve first, then the oxygen.
- Close the cylinder valves, acetylene first
- Open both torch valves to release the pressure
- Shut off the regulator adjusting handle until you no longer feel any spring tension.
- Close the torch valves.

5.8 Emergency Planning and Rescue

5.8.1 Response plan shall be available prior to work starting of the following:

- Electric shock and flash
- Fire and explosions
- Fumes and Radiation

5.8.2 CP and accompanying Person shall be trained as First Aider.

6.0 References

- 6.1 OSHAD SF CoP 28 Hot work operations-welding and cutting – Version 3.0, July 2016
- 6.2 OSHAD SF CoP 49.0 compressed gases– Version 3.0, July 2016
- 6.3 OSHAD SF Element 2 – Risk Management – Version 3.0, March 2016
- 6.4 AADC Emergency Management and Response Procedure



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6.5 ANSI - Enforcement Guidance for Personal Protective Equipment in Hot works industry

7.0 Appendices

- 7.1 Appendix - Lenses for Arc welding
- 7.2 Appendix - Lenses for Gas welding and Cutting
- 7.3 Appendix - Approved PPE List for Hot works

7.1 Appendix - Lenses for Arc Welding

Operations	Arc Current (Amp)	ANSI Shade Number
Shielded Metal Arc Welding	Less than 60	-
	60-160	10
	160-250	12
	250-550	14

7.2 Appendix - Lenses for Gas Welding and Cutting

Operations	Plate Thickness (mm)	ANSI Shade Number
Gas Welding	Under 3.2	5
	3.2 -12.7	6
	Over 12.7	8
Oxygen Cutting	Under 25	4
	25 - 150	5
	Over 150	6

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7.3 Appendix - Approved PPE List for Hot works

Sr. No	Personal Protective Equipment	Standard and Specification
1	Welding Helmet (filtered lens)	EN 175
2	Welder Gloves	EN 388, EN 407, BS EN 12477.
3	Welding apron	EN 470-1
4	Half Face Mask (Heat Works)	EN149
5	Ear plug	EN 352
6	Safety Shoes	EN ISO 20345
7	Leather spats	EN 470-1

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