



شركة العين للتوزيع  
Al Ain Distribution Company

Health, Safety and Environment  
Management System  
Procedure

Standard Operating Procedure  
Handling & Changing of Chlorine  
Cylinders  
SOP.HSEMS.19

Effective Date 10 / 01 / 2019

Procedure #: SOP.HSEMS.19

Issue : 1

Revision : 0

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Approved by:

Managing Director



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Al Ain Distribution Company

Standard Operating Procedure  
Handling & Changing of Chlorine Cylinders

Prepared by:

  
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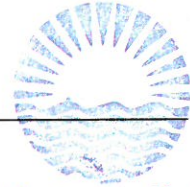
  
Health, Safety and Environment Department Manager

Approved by:

  
Managing Director

Issued by:

  
HSE Management System Representative



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### 1. INTENT

- 1.1 This Standard Operating Procedure (SOP) defines the general rules and good practices required for handling and changing of chlorine gas cylinders.
- 1.2 This SOP is a supplement to the AADC JSAs.
- 1.3 This activity is regarded as a high risk activity and should only be undertaken when adhering to this SOP.
- 1.4 This procedure has been developed in line with the OSHAD CoP 1.0 Hazardous Materials Version 3.0 July 2016 and is applicable to all AADC staff and contractor workers.

### 2. PRINCIPLES

- 2.1 Chlorine is a very hazardous material.
- 2.2 Chlorine gas has greenish-yellow colour and has a pungent smell, like liquid bleach that one uses at home.
- 2.3 It is very toxic when breathed in and severe exposure to chlorine may lead to death.
- 2.4 It irritates the eyes, the respiratory system and the skin.
- 2.5 Chlorine gas is 2.5 times heavier than air and accumulates at ground and underground levels.
- 2.6 Chlorine gas is very reactive with other materials / gasses and whilst it is not flammable it will support combustion.

### 3. DEFINITIONS

Term	Definition
JSA	Job Safety Analysis
SCBA	Self-Contained Breath Apparatus

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**4. RESPONSIBILITES**

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

Role	Handling & Changing of Chlorine Cylinders
Supervisor	<ul style="list-style-type: none"> <li>Conduct the onsite risk assessment</li> <li>Develops a rescue plan in accordance with the risk assessment</li> <li>Ensures that operators are trained to handle and change chlorine cylinders</li> <li>Observes this activity from time to time to ensure compliance to the procedure</li> </ul>
Operators	<ul style="list-style-type: none"> <li>Ensures they are aware of the risks of handling and changing chlorine cylinders</li> <li>Work in accordance to this procedure</li> <li>Work in accordance with the supervisor's instruction and guidance</li> </ul>

**5. PROCEDURE**

**Offloading / Loading and Storage of Chlorine Gas Cylinders**

**Required PPE**

Safety shoes

Overalls

Safety helmet

5.1.1 The Offloading / Loading and Storage of Chlorine Cylinders JSA shall be reviewed and specific site and working conditions shall be considered, assessed and included when required.

5.1.2 Vehicles offloading chlorine cylinders are to park as close as possible to the chlorine storage facility as possible.

5.1.3 Chlorine cylinders are to be offloaded in a safe manner.

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**Safety during Cylinder Movement**

Cylinders shall not be dropped from the lorry onto the ground – they should be lifted and lowered using lifting devices / machines whenever possible

Cylinders being lowered from the lorry shall be placed on a rubber mat prior to being moved

Moving of cylinders shall be done using a cylinder trolley and always with the protective hood in place

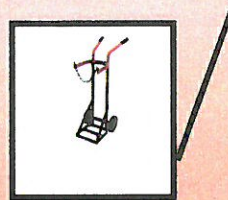
**Do not:**

Drop cylinders

Drag cylinders

Roll cylinders

Allow cylinders to strike each other



5.1.4 Full cylinders must be moved in the upright position.

5.1.5 Full cylinders must be placed and secured in the upright position.

5.1.6 Empty containers shall also be placed and secured in the upright position.

5.1.7 Empty and full containers must be identified / labelled indicating "Empty" or "Full".

5.1.8 Empty cylinders shall be moved to the vehicle using the cylinder trolley.

5.1.9 The placing of cylinders on the vehicle shall be done using lifting devices / machines whenever possible.

5.1.10 Cylinders shall be placed upright and secured on the vehicle.

**5.2.1 Changing Chlorine Cylinders**

**Required PPE (normal operations)**

Safety shoes

Overalls

Safety helmet

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**Required PPE (emergency operation)**

Safety shoes

Overalls

Safety helmet

Rubber Gloves

Self-Contained Breathing Apparatus (SCBA)

5.2.1 Only trained operators to change chlorine cylinders.

5.2.2 Close the main chlorine container valve on the cylinder.

5.2.3 Allow the system to purge itself of chlorine gas - ensure that the float drops to the bottom of the feed-rate indicator (rotameter).

5.2.4 Verify that there is a high vacuum.

5.2.5 Loosen the chlorinator feed pipe from the cylinder valve, whilst checking for leaks - using the ammonia squeegee / test bottle release ammonia vapour.

5.2.6 If no chlorine leaks are detected remove the pipe completely.

5.2.7 Replace the valve end cap and safety hood.

5.2.8 Move empty cylinder using a cylinder trolley to the empty container storage location as described in 5.1 above.

5.2.9 Secure the empty cylinder in place.



5.2.10 Move a full chlorine cylinder to dosing location using a cylinder trolley.

5.2.11 Remove the protective hood from the new cylinder.

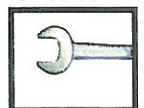
5.2.12 Ensure that there is no chlorine leaking from the packing gland - using ammonia squeegee bottle.

5.2.13 Ensure that the cylinder valve is closed. **Do not open the valve yet.**

5.2.14 Ensure there is no chlorine leak from valve assembly using the ammonia test bottle – if no leak, remove end cap.

5.2.15 Check that the cylinder outlet valve face is clean and smooth.

5.2.16 Using a new washer (lead), connect the vacuum regulator pipe / yoke assembly to the cylinder outlet valve - using only the correct wrench which is supplied.



**Note: Never use oil-based material or water to clean the mating surfaces – use a rag if required.**

- 5.2.17 Crack-open the chlorine cylinder valve and then quickly close it again - this will let enough chlorine into the line to charge it.
- 5.2.18 The valve should open with no more than a sharp rap from the heel of your hand - **never use a “helper” wrench or a larger wrench than the one supplied.**
- 5.2.19 If the valve will not open, report the situation to the supervisor and the cylinder should be returned to the supplier and another one should be used.
- 5.2.20 Check all the connections you have made to ensure there are no leaks - use the vapour from the ammonia test bottle.
- 5.2.21 If a leak is detected ensure that the required PPE as identified in (PPE Required (emergency operations)) is used and check that all connections are securely tightened and that no damage has occurred to the pipe or fittings – once again follow step 5.2.20 and re-check.
- 5.2.22 When no leaks are detected, open the chlorine cylinder valve no more than half a turn and leave the cylinder wrench on the valve spindle.
- 5.2.23 Open any additional system valves and test for leaks using the ammonia test bottle.
- 5.2.24 Ensure that the alarm system is functioning and leave the room.



### 5.3 Leak Detection and Emergencies

#### Required PPE (emergency operation)

Safety shoes  
Overalls  
Safety helmet  
Rubber Gloves  
Self-Contained Breathing Apparatus (SCBA)

- 5.3.1 Enter the room using the required PPE.
- 5.3.2 Immediately close the main cylinder valve.
- 5.3.3 Leave the room and allow time for the chlorine to be vented.
- 5.3.4 Enter the room and check the main cylinder valve to see if any leak is still present.
- 5.3.5 If no leak, remove the vacuum regulator pipe from the cylinder valve and refit it using a new lead washer.

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- 5.3.6 If a leak is still present, make a third and final attempt to get a good seal using a new lead washer.
- 5.3.7 If the leak cannot be corrected after three attempts, remove the cylinder from service and contact the supplier.
- 5.3.8 Ensure that there is no leak from this cylinder with the main valve closed, end cap attached and hood in place - a different cylinder must be connected to the chlorination system.
- 5.3.9 Leave the chlorine room and remain nearby to restrict access to the room or provide other assistance, as directed, until the chlorine alarm has automatically shut off.
- 5.3.10 Emergency response plan(s) for major chlorine leak is available in adherence to *Emergency Response Plan (OP.HS.12)*.

**6. REFERENCES**

- 6.1 OSHAD SF CoP 1.0 Hazardous Materials – Version 3.0, July 2016
- 6.2 OSHAD SF Element 2 – Risk Management – Version 3.0, March
- 6.3 AADC Core Procedures Emergency Response Plan – OP.HS.12
- 6.4 AADC Emergency Response Plan (OP.HS.12)

**7. RECORDS (when required)**

- 7.1 Incident Report
- 7.2 Training Records
- 7.3 Permit to Work

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