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Compressed Gas Cylinder Procedure

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1.0 PURPOSE

The storage and use of compressed gas cylinders exist in many operations and maintenance activities throughout different Sectors. These activities, where workers store and/or use compressed gases, have inherent hazards regarding the storage, transportation, and usage of gas bottles/cylinders. Therefore, it is good practice for Entities, and/or their facility management contractors, to implement a procedure giving direction to mitigate hazards associated with such gas bottles/cylinders.

2.0 SCOPE

The scope of this procedure is to provide means to the user to create a custom procedure outlining and detailing gas bottle/cylinder safety, and the requirements and responsibilities of the Entities and/or facilities or operations and maintenance activity contractors. This procedure applies throughout the Kingdom of Saudi Arabia to Operations and Maintenance functions and activities on government owned facilities and projects where transportation, storage, and use of compressed gases exist (e.g., medical gases, gases used for burning, welding, breathing air, fire protection, etc.).

3.0 DEFINITIONS

Definitions	Description
Flashback Arrestor	Is a special gas safety device most commonly used in oxy-fuel welding and cutting to stop the flame or reverse flow of gas back up into the equipment or supply line

4.0 REFERENCES

- SASO-ISO-2503
- OSHA 29 CFR 1910 Subpart H Hazardous Material
- OSHA 29 CFR 1926.350 Welding and Cutting
- EOM-KSS-PR-000004 Fire Prevention and Protection Procedure
- EOM-KSH-PR-000007 Control of Hazardous Materials Procedure
- EOM-KSS-PR-000001 A&FM General Safe Work Requirements Procedure
- Saudi Civil Defense Ministerial Resolution No. 10/K/2/DF Dated: 24/4/1410

5.0 RESPONSIBILITIES

5.1 Facility Manager

- Overall responsibility for this procedure and for supporting this process and verifying personnel actively participate.
- Providing the personnel, facilities, and other resources necessary to effectively accomplish this procedure.

5.2 Supervisor

- Providing the resources to implement the requirements of this procedure.
- Communicating with management concerning Health, Safety, and Environment HSE expectations concerning compressed gas cylinder requirements.
- Providing leadership regarding HSE requirements and expectations for Managers, Project Supervisors, Superintendents and other leadership.

5.3 HSE Representative

- Auditing this procedure.
- Confirming that this procedure meets the government requirements and regulations.

5.4 Personnel

- Knowing, understanding, and complying with the HSE requirements of this procedure that apply to the work they perform.
- Requesting additional information and further clarification before starting work if personnel receive assignments they do not understand.

6.0 GENERAL

The following general requirements pertain to the use/handling, and storage of compressed gas cylinders of all sizes.

6.1 Handling/Use and Storage

- Any damaged cylinder or any cylinder's contents that are not satisfactorily identified should not be used. The cylinder should be tagged, the deficiency clearly stated, and then reported to the Supervisor and Vendor.
- Defective valves or safety relief devices on cylinders should not be tampered with and repair should not be attempted. Such cylinders should be identified and arrangements made for returning them to the vendor immediately.
    - These cylinders shall be tagged with "DANGER - DO NOT USE" tags in both languages English and Arabic
- Cylinders must be stored in the upright position and be properly secured by means of a substantial chain, cable, or equivalent method.
- Oxygen cylinders will not be stored within 6.1 meters of combustible gas cylinders or near any other substance where an accelerated fire could result, unless protected by a wall at least 1.5 meters high having a fire-resistance rating of at least one hour.
- Gas cylinders will be protected against shock, especially falling, or high temperature extremes.
- Gas cylinders handled by cranes or a hoist must be in suitable cages and must never be lifted by rope, chain slings, or magnets.
- Cylinders will not be dragged or slid. The user shall use a suitable hand truck, fork truck, roll platform, or similar device with the cylinder secured for transporting in the upright position.
- Cylinders shall not be dropped when being unloaded or loaded off or onto a truck or dock. Elevator tailgates on trucks will be utilized for unloading or loading cylinders safely.
- Gas cylinders shall never be used as rollers, supports, or for any purpose other than to contain the contents as received.
- When using individual oxygen cylinders, the pressure regulator should be located directly on the cylinder (Figure 2).
    - DO NOT use oil, grease, or pipe compound on any component associated with oxygen.
- Cylinders are uniquely threaded (by cylinder type) to minimize contamination. The use of adapters or systems that compromise this safeguard is prohibited.
- Cylinder-to-cylinder connections are prohibited for gas transfer. Manifold or multiple cylinder systems designed for this purpose are an exception.

Figure 1: Right Way to Store

Figure 2: Use Pressure Regulator

- To prevent flashbacks, flashback arrestors must be installed on the outlets of both regulators, and torch inlets.
- Cylinders will not be placed where they might form part of an electrical circuit or a grounding path.
- Cracking (quickly opening and closing the cylinder valve) is required prior to connecting components to clear debris, dust, and water and to prevent plugging of the hoses, torches, regulator, or other systems.
- Cylinders are not to be stored in un-vented enclosures.
- Smoking, naked flames and other sources of ignition are prohibited nearby storage areas. Proper warning/prohibition signs must be placed in dual languages Arabic and English
- Gas cylinders' contents must be labeled in Arabic and English
- Empty and full cylinders of the same gas should be segregated.
- Compressed gasses shall not be used for cleaning or blowing materials or debris, and shall never be directed toward clothing or exposed skin.
- Fuel-gas hoses (Red) and oxygen hoses (Green) will be easily distinguishable and will have different connector threads that are not interchangeable.
- Hose assemblies Shall be inspected annually by authorized vendor (third party) recorded and tagged. and every 6 months shall be visual inspection by a Competent Person
    - Hoses and torches will be inspected before each use, and defective hoses or torches will be removed from service and tagged.
- Cylinders should be secured to prevent potential vandalism and tampering as well as accidental damage
    - Cylinders should not be stored within 1m of a perimeter fence.
- Store cylinders with consideration for the SDS requirements of the chemical it contains.
- Cylinders must be labelled in accordance with local regulations stipulated by the Saudi Civil Defense.

Refer to: SASO-ISO-2503 standard for further details.

6.2 Cylinders Designed with Caps

Many cylinders are provided with a removable protective cap that screws over the valve on the end or top of the cylinder to protect the valve and associated components from damage when the cylinder is not in use. For cylinders designed with such caps:

- A cap will be kept on the cylinder always, except when a cylinder is in service to the extent of being connected to a line or hose.
    - The cap should be hand tight.
- The protective cap should never be used for lifting or handling the cylinder.
- Anytime a cylinder is moved by any means from one location to another, the cap will be on the cylinder. The one exception to this is when a cylinder is properly secured on a hand truck/cylinder cart.
- Manifold systems on wheeled carts must have the wheels chocked and secured to prevent motion when not being repositioned.

6.3 Signage

Signs will be in accordance with Saudi Civil Defence requirements and are to be placed in appropriate locations to provide information to those entering the area or who use the substances and for emergency response. Signage shall also conform to Dangerous Goods codes as applicable to storage volumes (Figure 3 and 4).

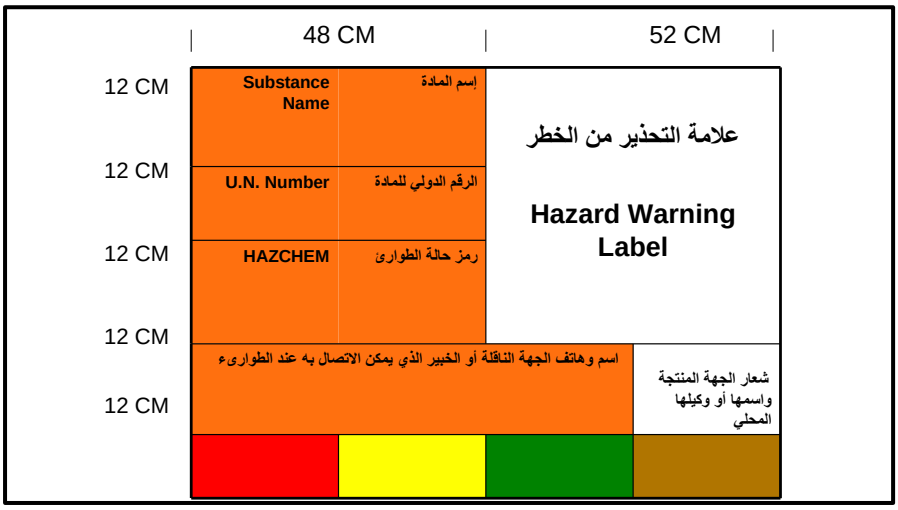

Figure 3: Hazard Waning Panel Specifications

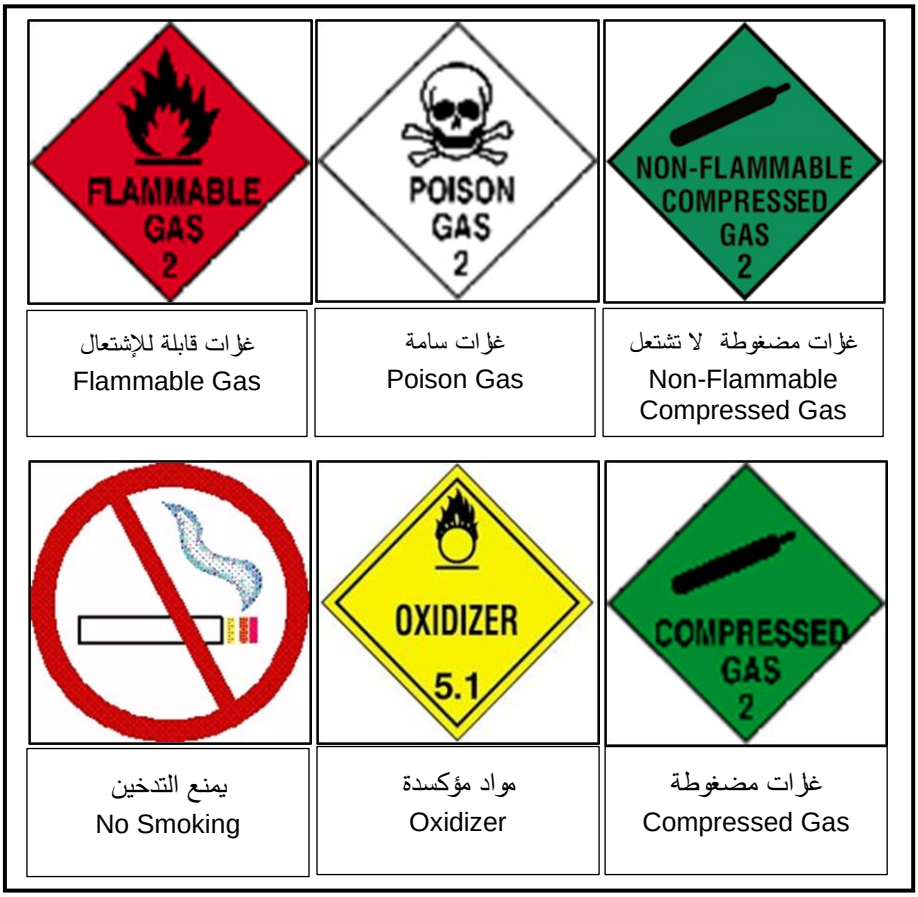

Figure 4: Hazard Warning Labels Classifications

6.4 Housekeeping

A high level of housekeeping must be maintained around storage areas where there are Compressed Gas Cylinders. Access and egress to the area is to be setup is to be maintained to avoid unwanted personnel entering the area. Signage is also to be erected in accordance with Saudi Civil Defense requirements.

6.5 Smoking

There is to be no smoking near Compressed Gas Cylinder Storage Areas. A warning sign shall be erected in accordance Saudi Civil Defense requirements.