

Safe Management of Industrial Gases under pressure

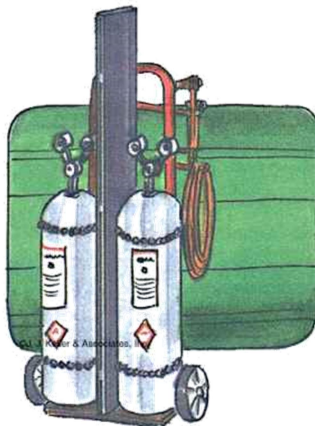
Gases



- 1. Nitrogen**
- 2. Noble gases (argon, helium)**
- 3. Oxygen**
- 4. Propane**
- 5. Liquid Nitrogen (cryogenic)**
- 6. Mixture of Argon-Methane (90-10)**
- 7. Acetylene**
- 8. Carbon Dioxide**

Risk

- 1. Asphyxia**
- 2. Fire**
- 3. Explosion**
- 4. Combustion**
- 5. Overpressure**
- 6. Cramps**
- 7. Faint**



Use of bottles

- 1. Reading SDS**
- 2. Internal transportation**
- 3. Storage**
- 4. Connect-Disconnect**
- 5. Use**
- 6. Collect**



Internal transport specifications

- 1. With a special trolley and always by two people**
- 2. Avoid scrolling**
- 3. We hold the bottle by its lid and body**
- 4. We always wear gloves and safety shoes**
- 5. The bottles must always remain vertical**
- 6. We do not take the lid off.**



Storage specifications

- 1. Protection from weather conditions**
- 2. Far from heat sources $T < 50^{\circ}\text{C}$**
- 3. The bottles must be kept upright with their lid without accessories**
- 4. Fixed with double fireproof belt**
- 5. Not near the exits or the emergency exits**
- 6. Not near flammable materials**
- 7. With adequate ventilation**
- 8. The oxygen must be kept distant from LPG**
- 9. Labelled.**

Placement specifications in the area of use



- 1. Away from heat sources $T < 50^{\circ}\text{C}$**
- 2. Must be kept upright in special cabinets**
- 3. Fixed with double fireproof belt**
- 4. Not near the exits or the emergency exits**
- 5. Not near flammable materials**
- 6. With adequate ventilation**
- 7. The oxygen must be kept distant from LPG**
- 8. With labels at cabinets**

Signage (regulation ELOT- DIN EN 1089 - 3)



Argon

	Old bottle Grey		New bottle Green (dark)
	Grey		Grey (dark green)

Nitrogen

	Old bottle Green (dark)		New bottle Black
	Green (dark)		Grey (dark green, black)

Industrial Oxygen

	Old bottle Blue		New bottle White
	Blue		Grey(blue)

Helion-Balloon gas



Old bottle
Grey

Grey







New bottle
Brown

Grey

Gas mixtures



Gas	Shoulder colours
Inert	 Bright green
Fire intensifier/ oxidizing	 Light blue
Flammable	 Red
Toxic	 Yellow

Signage (regulation ELOT- DIN EN 1089 - 3)

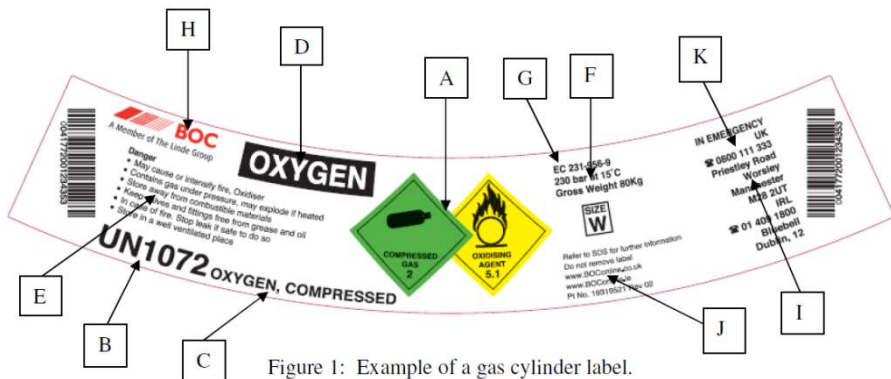


Figure 1: Example of a gas cylinder label.

- A A diamond hazard label, displaying the primary hazard with additional hazard labels displaying any subsidiary hazards. These labels will display the dangerous goods classification number.
- B The UN number, preceded by the letters UN.
- C The proper shipping name.
- D Product name (may be omitted if the proper shipping name is identical).
- E Signal word, hazard and precautionary statements.
- F Package size and pressure.
- G EC number, if applicable.
- H Company name.
- I Address of the gas company.
- J Additional company information.
- K Contact telephone number.

Bottle Connection-Disconnection

- 1. Remove blind nut**
- 2. Gearbox closed-Check for dirt**
- 3. Immediate gear connection**
- 4. Slow opening of the bottle closure**
- 5. No lubricants**
- 6. Leak test with aerosol or soapy water**
- 7. Pressure adjustment**
- 8. If the bottle is not used, it must be immediately closed**
- 9. Never let the bottle fully empty**
- 10. "Flushing" flammable network before connecting a bottle**

Will a checkvalve stop a Flashback?

1. **A flashback is an uncontrolled flame that recesses back into your oxy-fuel gas equipment, upstream of the location where the gas is designed to mix. In order to have a flashback you must have oxygen and fuel mixed together. Pure oxygen won't flash back and pure fuel won't flash back. You need both gases combined in a specific ratio range to have a flashback.**
2. **Check valves are designed to allow gases only to pass in one direction. If your check valves are working properly, you won't have premixed gases upstream of your equipment's designed gas mixing chamber.**
3. **A check valve will not stop a flashback, however, properly functioning check valves will stop back-flow of fuel gas and/or oxygen thus preventing the conditions required for a flashback to occur**

