

Safety Advice.

17 – Handling leaking compressed gas cylinders.



Preliminary note

Before handling leaking compressed gas cylinders, find out which gas is escaping! Labels indicating contents, hazardous substance class, hazard symbols according to hazardous substance regulations and cylinder colours may provide information. If the type of gas cannot be identified beyond doubt, always assume that there is a high risk, e.g. that it is an asphyxiant, oxidizing or toxic gas. Furthermore, remember that a gas can have properties belonging to various groups, e.g. flammable and toxic.



Hazard warning

Staff should not be subjected to danger unnecessarily. If in any doubt, call the fire brigade as the fire brigade is prepared for work with self-contained breathing apparatus.

1. Leakage of inert gases (e.g. nitrogen or CO₂)

1.1. In rooms

- Close off the room and ventilate it thoroughly. (Open doors and windows.) Enter the room only if it is absolutely certain that the concentration of the inert gas is not dangerous.
- If in doubt that the oxygen concentration

has dropped below 17%, only enter the room wearing self-contained breathing apparatus.

- If possible, close the cylinder valve.
- If the cylinder valve cannot be closed, move the cylinder out into the open or close off the room again and ventilate it thoroughly.

1.2. In the open

- If possible, close the cylinder valve.
- If the cylinder valve cannot be closed, cordon off the area if necessary and allow the gas to blow off.

2. Leakage of oxidizing gases (e.g. oxygen or laughing gas)

2.1. In rooms

- Close off the room and ventilate it thoroughly. (Open doors and windows.) Beware of the increased risk of fire.
- Enter the room only if it is absolutely certain that the concentration of the gas is not dangerous.
- If possible, close the cylinder valve.
- If the cylinder valve cannot be closed, continue to ventilate the room thoroughly or move the cylinder into the open and allow the gas to blow off in a safe, cordon off area.
- Keep open fire away.
- Vent clothing thoroughly after handling the cylinder.

2.2. In the open

- If possible, close the cylinder valve.
- If the cylinder valve cannot be closed, cordon off the area if necessary and allow the gas to blow off.
- Vent clothing thoroughly after handling the cylinder.

3. Leakage of flammable gases (e.g. hydrogen or propane)

3.1. In rooms

3.1.1. Without combustion

- Close off the room and ventilate it thoroughly (open doors and windows) in order to inhibit the existence or formation of an explosive gas / air mixture (risk of explosion in the room).
- Remove sources of ignition (open light, fire, cigarettes, etc.) and do not use electrical switches or equipment.
- Do not move near or touch the area around the cylinder valve outlet as the possibility of ignition cannot be excluded with certainty.
- In the case of hydrogen a flame may not be visible. Therefore check (e.g. with a broom) whether gas is leaking without combustion.
- To discharge a possible electrostatic charge, earth the cylinder by making a conductive connection to the lower part of the cylinder. In an emergency it is sufficient to touch the lower part of the cylinder with your hand if you are wearing conductive safety shoes.
- If possible, close the cylinder valve.
- If the cylinder valve cannot be closed, move the cylinder into the open and allow the gas to blow off in a safe, closed off area or continue to ventilate the room (and nearby area if necessary) thoroughly and close it off.

3.1.2. With combustion

- Cordon off the room.
- If possible, close the cylinder valve.
- If the cylinder valve cannot be closed, prevent danger to the surroundings, e.g. heating of other cylinders.
- Extinguish the flame only if this is

absolutely necessary and only if, by thorough ventilation of the room, the formation of an explosive gas / air mixture can be excluded with certainty (risk of explosion in the room). Also check whether channels or other depressions are present in which the gas (e.g. propane) could "flow out".

- After extinguishing the flame, move the cylinder into the open if possible and allow the gas to blow off in a safe, closed off area or continue to ventilate the room (and nearby area if necessary) thoroughly and close it off.

3.2. In the open

3.2.1. Without combustion

- Close off area and access.
- Do not move near the area around the cylinder outlet as the possibility of ignition cannot be excluded with certainty. In the case of hydrogen a flame may not be visible. Therefore, check (e.g. with a broom) whether gas is leaking without combustion.
- To discharge a possible electrostatic charge, earth the cylinder by making a conductive connection to the lower cylinder valve. In an emergency it is sufficient to touch the lower part of the cylinder with your hand if you are wearing conductive safety shoes.
- If possible, close the cylinder valve.
- If the cylinder valve cannot be closed, allow the gas to blow off. Beware of danger to the surroundings.

3.2.2. With combustion

- Close off area and access.
- If possible, close the cylinder valve.
- If the cylinder valve cannot be closed, prevent danger to the surroundings, e.g. heating of other cylinders.
- Extinguish the flame only if this is absolutely essential. Also check whether channels or other depressions are present in which the gas (e.g. propane) could "flow out".

4. Leakage of toxic or caustic gases (e.g. ammonia)

4.1. In rooms

- Close off room and access.
- Consult safety data sheet and tremcards for advice on any special risks.
- Only enter room wearing self-contained breathing apparatus.
- Depending on the type of gas, wear protective overalls (information e.g. in the safety data sheet).
- If possible, close the cylinder valve.
- If the cylinder valve cannot be closed, ventilate the room and continue to keep room or area closed off.
- Immediately after action, remove protective clothing and take a shower.

4.2. In the open

- Close off the nearby area and clear in particular the leeward area behind the cylinders and protect it.

- Consult safety data sheet and tremcards for advice on any special risks.
- Only approach the cylinder using suitable breathing apparatus. If in doubt, wear self-contained breathing apparatus. Small apparatus designed for escape and rescue and approved for minor handling procedures can be used.



Caution: Danger of asphyxiation

- Depending on the type of gas, wear protective overalls if necessary (e.g. if caustic gas is leaking).
- If possible, close the cylinder valve.
- If the cylinder valve cannot be closed, continue to keep access to the area closed and allow the gas to blow off.
- Immediately after action, remove protective clothing and take a shower.

Linde AG

Linde Gas Division, Linde Gas Germany, Seitnerstraße 70, 82049 Pullach
Phone 018 03.85 000-0*, Fax 018 03.85 000-1, www.linde-gas.com