



Safety instruction.

Handling of gas cylinders in hazardous situations.



Gas cylinders in a fire

All cylinders can explode if exposed to fire. The danger can be caused by:

- flying cylinder pieces
- emissions of flammable or toxic gases
- hot gases
- pressure shocks

An exploding cylinder can fly very far from the explosion site. When you arrive at the scene of an accident, the following precautions are important to prevent cylinder explosions or reduce the consequences of a possible explosion:

- Alert staff and evacuate the area.
- Ask for information on the location, contents, and number of cylinders at risk and the point of origin of the fire.
- If possible, close open cylinder valves and move all cylinders that are not on fire away from the danger area **if they can be handled with bare hands**.
- Start cooling hot and warm cylinders **immediately** if they cannot be removed from the area. Cooling must be carried out from a protected place by spraying the entire surface of the cylinder with water until the fire is extinguished.
- The cooling of the cylinders must be continued if the surface of the cylinder dries out quickly or if water vapour rises from the surface of the cylinder. Cooling is continued until the surface of the cylinders remains moist when the water spray is interrupted for 10 minutes.

Acetylene cylinders may be undergoing acetylene decomposition. In this case, the cylinder may heat up again after several minutes, requiring additional cooling and special measures.

- Handle all cylinders that cannot be identified as if they were acetylene cylinders.
- Do not approach or move unidentified cylinders or cylinders containing acetylene until you have checked their temperature with an evaporation test.

How to handle flammable gases or cylinders containing liquefied petroleum gas, and cylinders with a fire in the valve

Remove all undamaged cylinders from the danger area

- Cool all heated cylinders from a safe place to reduce the pressure
- Close the cylinder valves, if possible

If the valve cannot be closed, **allow the gas to burn and cool the cylinder** and surroundings with water, as the gas released from the cylinder can cause an explosion in the room when it mixes with the air and ignites.

A burning flame in a cylinder valve should therefore only be extinguished if it poses a particular danger and if:

- valve can be closed quickly
- the leakage is very minimal and the cylinder can be quickly transferred from the dangerous area

Propane cylinders must always be handled and stored in an upright position.

When cooling propane cylinders with a water jet, be careful not to spill the cylinders. If possible, lift any fallen cylinders, as the liquid gas escaping from the safety valve will come in liquid form and the safety valve will not have enough capacity to prevent the cylinder from exploding.



Handling cylinders containing toxic or corrosive gases

- Remove all undamaged cylinders from the danger area.
- Cool the heated cylinders with a water spray.
- Please note that cylinder valves may start to leak when they become very hot. **Always wear protective equipment.** (Protective suit, compressed air breathing apparatus).
- Ventilate the area or move the cylinders outdoors. Notify your gas supplier.
- Check the tightness of the cylinder with a soapy water solution.
- Make sure that the area where the cylinders are stored is isolated, and that the necessary warnings are given.

Clearly mark all cylinders that have been damaged or exposed to heat. Notify the gas supplier before handling or transporting cylinders.

Keep unrelated people out of danger-area.

Acetylene cylinders in a fire

Cylinders of acetylene exposed to heat may explode. The danger can then be caused by:

- Flexible cylinder pieces
- pressure shocks
- flames or hot gas

An exploding acetylene cylinder can fly very far from the explosion site (up to 300 m).

The acetylene in the cylinder may disperse if the cylinder gets hot. During the dispersion process, pressure builds up in the cylinder and its temperature rises. This process can lead to the cylinder exploding after only a few minutes or even after 24 hours.

For this reason, acetylene cylinders that have been exposed to heat or fire must be handled in a special way.

- Warn personnel and evacuate the danger area.
- Ask for information on the number and location of acetylene cylinders in the fire.
- Close open cylinder valves if possible and move all cylinders in the vicinity of the danger zone to a safe place, but **only if the cylinders can be handled with bare hands.**
- Start cooling hot cylinders immediately by spraying them with water from a protected place. If there is no protection, use a fixed water cannon. Continue cooling the cylinders until the fire is extinguished. **However, cool the cylinders for at least one hour!**
- If the cylinders dry out quickly or water vapour rises from the surface of the cylinder, continue to cool the cylinders and monitor the temperature of the cylinders every half hour until the surface of the cylinder remains moist when the water injection is stopped for 10 minutes. Let the cylinders cool for another hour before checking their temperature by testing the surface with your bare hands. Avoid knocking cylinders.
- When the cylinders remain moist and cool, even if water spraying on the surface of the cylinders is interrupted, move the cylinders away from the danger area. If possible, immerse them in water for at least 24 hours. If immersion is not possible, move them to a safe place and arrange for the cylinders to be kept under guard for 24 hours, during which time their temperature should be monitored by spraying them with water every 1-2 hours.
- If the cylinders are connected to actuators (e.g. pressure regulators or gas centres), make sure that the cylinder valves are closed before disconnecting the cylinders from the actuators.

Never approach or move acetylene cylinders that have been in a fire or that have become hot until they have been cooled and kept cool.



Decomposition of acetylene

In an acetylene cylinder, a situation can arise where acetylene gas starts to disperse for various reasons.

Dispersion may start for reasons such as:

- setback
- local heating of the cylinder
- a sharp blow to the cylinder's shell

Normally, the dispersion stops in the mass of the cylinder by itself, without the user noticing anything unusual. However, if the dispersion continues, the flask will start to heat up. Normally, the first sign of heating is the shoulder of the cylinder.

Acetylene cylinders that are undergoing internal dispersion are treated as acetylene cylinders in a fire.

In a cylinder valve, the burning fire is normally allowed to burn out, cooling the cylinder and its surroundings. Gas escaping from an unburnt cylinder forms a highly flammable mixture with air and may cause an explosion in the room.

The flame should not be extinguished unless there are particularly compelling reasons to do so, or unless the cylinder is outside or otherwise in a well-ventilated area. Even in this case, care must be taken to isolate all ignition sources.

Handling of the acetylene package

Acetylene cylinders that are in the process of disintegrating or are on fire should be handled in the same way as loose cylinders, with the aim that water cools all cylinders in the cylinder.

Never approach or unpack acetylene packages if there is a possibility that the package is undergoing dispersion in one or more cylinders.

Clearly mark all acetylene packages that have been exposed to heat and inform the gas supplier before handling the package.