



A02 Handling of gas cylinders

General information

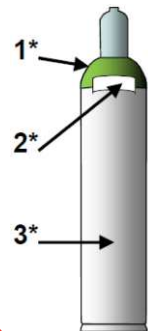
This IGS safety recommendation contains supplemental information to the general applicable laws, regulations, guidelines and standards on the practical application and storage of gas cylinders.

Labelling, cylinder valves and cylinder inspection

Labelling

The colour code of the cylinder shoulder (**1***) in accordance with SN-EN 1089-3 acts solely as a distinguishing mark of a gas cylinder, the clear identification is provided by the labels (**2***) with product labelling, danger and safety information as well as the ADR / GHS symbols. This label contains the binding information on the contents of the gas cylinder.

The body colour (**3***) of the pressure gas container generally does not hold any significance, only medical gases (RAL 9010 – pure white) have defined cylinder colours.



ADR symbols (danger labels)



GHS symbol

Cylinder valves

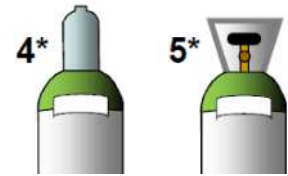
In order to avoid confusing pressure gas containers, they are all equipped with different valve connections dependent on the type of gas and the gas mixture composition and pressure. Due to the danger of confusing containers, do not use any "adapters ". Adapt your installations and fittings to the respective gas type and application. Your gas supplier also provides pressure regulators with the suitable connections.

Cylinder inspection

The adherence to the legal inspection dates is monitored by the gas supplier. Gas may continue to be extracted from pressure gas containers for which the inspection date has expired. This is quite harmless from a safety perspective. The use of gases from cylinders yet to be inspected is in most cases possible without a loss of quality. The transport of pressure gas containers whose inspection date has expired on public roads is however only permitted when they are being brought to inspection (road transportation to an external workplace is for example not permitted).

Transport

Cylinder caps (4*), protective collars (5*) or special valve mountings are used to protect the valves. Connected pressure regulators or hoses must in any case be removed before transport and the valve must be suitably protected. If the valves of the pressure gas containers are equipped with fastening nuts, these must be additionally screwed on during the transport of the container.



In-house transport

The in-house transport of pressure gas containers should only be carried out with cylinder carts or, for small containers, with suitable carriers.

Transport on public roads

Pressure gas containers are generally classified as hazardous goods. They are therefore obliged to strictly comply with the requirements of the Swiss Agreement concerning the Carriage of Dangerous Goods by Road (SDR) and with the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).

Storage of gases

The storage location of non-connected gas cylinders is generally classified as a depot. The provision for transport, the “daily requirement” (number of cylinders that are required for the continual operation during one day) or a provided spare cylinder at the respective workplace are not classified as a depot. The following points must be observed regarding the storage of gases (not exhaustive):

- The establishment of a gas depot is subject to official approval
- Protection from mechanical damage (impact protection)
- Protection against unauthorised access
- Good accessibility with suitable transport routes (keep escape routes clear)
- Securing against falling and rolling away
- Storage only with protective cap or equivalent valve protection
- Protection against exposure to heat (normal sunlight is not considered to be heat exposure)
- Protection from weather influences and significant contamination is recommended
- Explosion protection (for flammable gases)
- Prohibition of combined storage with flammable substances (e.g. fireworks, solvents etc.)
- Store full and empty gas cylinders separately
- Divide the depot in accordance with gas type and properties (flammable, oxidising etc.)
- Constructive fire protection and fire extinguishing units
- Sufficient natural or artificial ventilation (prevent the accumulation of gases)
- Labelling (required prohibitive, mandatory and warning signs according to gas type)



Prohibition signs



Mandatory sign



Warning signs

Safe handling

Pressure gas containers may be handled by trained personnel only. For the training, safety information, safety data sheets (SDS) and product information may also be used. The following points are to be observed for a safe handling (not exhaustive):

- Secure gas cylinders against falling over.
- Observe the correct position for gas extraction (e.g. for gases that are liquefied under pressure, gas can unintentionally escape out in liquid form from a cylinder lying down).
- The intended liquid extraction may only be carried out with the suitable devices.
- For safety reasons, the pressure gas container should not be decanted yourself.
- The filling of disposable, rented or borrowed cylinders is prohibited.
- Before pressure gas containers are connected, it must be ensured that a backflow from the pipeline system into the cylinders is not possible.
- After removing the cylinder cap or the valve protection, immediately attach a pressure regulator in order to prevent contaminants in the valve connection.
- Before opening the cylinder valve, the adjusting screw of the pressure regulator must be completely screwed out (pressure regulator closed).
- Fully open cylinder valves slowly and without jerks.
- Do not oil or grease cylinder valves.
- Never open the cylinder valves with tools using excessive force.
- The tightness of the connection should be checked using the appropriate methods (leak spray).
- Slowly turn in the adjusting screw of the pressure regulator until the desired backpressure is achieved.
- In case of a longer interruption in the gas extraction, close the cylinder valve.
- Return pressure gas containers with low overpressure. This ensures among other things that no foreign substances can get into the pressure gas container.
- Pressure gas containers with obvious defects must be sent back to the gas suppliers clearly marked.
- Do not throw pressure containers or expose them to excessive mechanical forces.

Gas leakage / in the event of fire

(see also IGS safety recommendation A03 “Gas cylinders in emergencies“)

Gas leakage

In case of a larger gas leakage the fire department must be notified.

- In case of a leak, close the cylinder valve immediately
- Ventilate the affected areas well
- If the leaked gases are flammable, keep away ignition sources (widely cordon off)

Fire

In case of fire ⇒ alert ⇒ rescue ⇒ extinguish

- Alert the fire department
- Interrupt gas feed, close valves
- If possible, remove the pressure gas container from the areas at risk of fire
- Make the fire department aware of pressure gas containers located in the object on fire
- Intensively cool the heated cylinders with water
- Cool acetylene cylinders with a closed valve for a minimum of 24 hours (water bath)

Attention: Cylinders with non-flammable gases may also explode from excessive heat in a fire due to the resulting excess pressure in the cylinder.

Concluding remark

The safety data sheets (SDS) provide information on the safety-relevant properties of the gases. For further queries regarding the handling of pressure gas containers, the gas suppliers are available to provide you with assistance.

The safe operation of pressure gas containers is only possible if the specific properties of the gases are taken into consideration and the safe handling of the pressure gas containers is ensured.

Scope / Demarcation

This document replaces the existing IGS safety recommendations "Safety in the handling of gas cylinder IGS-TS-006/03" and "Handling of pressure gas containers IGS-TS-004/03".

The applicability of this safety recommendation encompasses pressure gas containers (gas cylinders) and pressure gas cans that are used as transportation and storage containers for gases. This documentation cannot be applied to gas tanks or cryogenic containers (vessels for cryogenic liquefied gases).

Further documentation (not exhaustive, available in German, French and Italian languages)

- SUVA publication "Gas cylinders. Depots, ramps, gas distribution systems" No. 66122.d
- SUVA data sheet "Explosion protection principles, minimum requirements, zones" No. 2153.d
- EKAS (Federal Commission for Occupational Safety FCOS) guideline "Storage and handling of ammonia" No. 6507.d
- EKAS guideline "Liquid gas, part 1" No. 1941.d
- EKAS guideline "Liquid gas, part 2" No. 1942.d
- VKF (Association of Cantonal Fire Insurers) "fire protection guidelines"
- Umweltfachstellen der Kantone „Lagerung gefährlicher Stoffe – Leitfaden für die Praxis“

Do you have any questions?
We hold further documents ready for you.

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