



## Routine for handling gases at MSE

MSE safety group, June 14, 2024, MSE Brinellvägen 23

### Training

All users of gas must receive suitable training. As a minimum, this must be training given by (or given by another person nominated by) the lab manager **before** any gas is purchased or used. Additional training may be required in certain cases.

### Purpose

We want to avoid accidents associated with gas handling. Specifically, gas in this routine refers to the gases supplied in – typically – 50L steel containers from one of the suppliers with whom we have a “framework agreement” (supply contract). This routine does not provide guidance on how flammable gases must be handled to meet the requirements of the law on flammable and explosive goods (LBE, 2010:1011) and associated provisions. **Safety precautions to protect against flammable (and other physiochemical) properties of gases must be taken in addition to the guidelines specified in this document.**

The risk of gas handling is essentially threefold:

1. The hazardous properties of the gas itself, typically if it is toxic, flammable, or asphyxiant.
2. Pressure release can cause injury to personnel or damage property, for instance, if cylinder topples or falls, by application of heat due to fire (risk of explosion).
3. The containers are heavy and can damage limbs and other body parts if they are knocked over or dropped.

### Purchase

Purchase of gas must be done by the lab manager where the gas is to be used, following standard MSE purchasing procedures. Before placing the order, the delivery must be planned and agreed with the supplier so that there is a person receiving the gas. Gas bottles should not be left standing around the building or the area outside the building.

### Ownership

From delivery onwards, gas cylinders must be marked with the name of the person responsible for them, that person’s email address, a contact telephone number and the date of delivery. This label

must be on the cylinder until the cylinder is returned to the supplier. **Any cylinder that is lacking such information may be disposed of without warning.**

## Storage

When not in use, gas cylinders must be stored in dedicated and approved locations. They may only be stored in the 'cages' outside the rear of the department (Figure 1), the gas cupboards outside the rear of the department (Figure 2, Figure 3) or in approved specialized fire-resistant gas cabinets that are adapted for the purpose (e.g. Figure 4). The locations of the two gas containers and the two gas cages are shown in Fig. 7. For example, they must not be stored in the special acetylene compartment (L041C). This room is meant for the 'welding cart', which is covered by specific regulations, as well as small amounts of calibration gases. When not in the cage, gas cylinders must always be attached securely to a solid object, such as a wall or pillar.



*Figure 1: The gas cage North.*

## Transport

Gas cylinders must be transported with specially designed bottle carts. It is desirable that this is done by two people, especially if they are small or inexperienced people. Safety footwear should be worn when handling gas cylinders. In case of lift transport, gas cylinders must be fastened with an appropriate chain/tether inside the lift, so it does not fall during travel, and no people are permitted in the lift. Suitable tethers are provided in the lifts at MSE. Regulators **must** be removed from all bottles before and during transport.

## Location where used

When in use, gas cylinders may only be placed in the gas containers or gas cabinets. Non-flammable, non-toxic gases may be **temporarily** stored indoors out of a gas cabinet **with the approval of the fire safety supervisor and lab manager**. We should be very restrictive with 'elsewhere' placement. Cylinders must under no circumstances be stored out of approved containers when not being actively used for an experiment.



*Figure 2: The gas container North.*



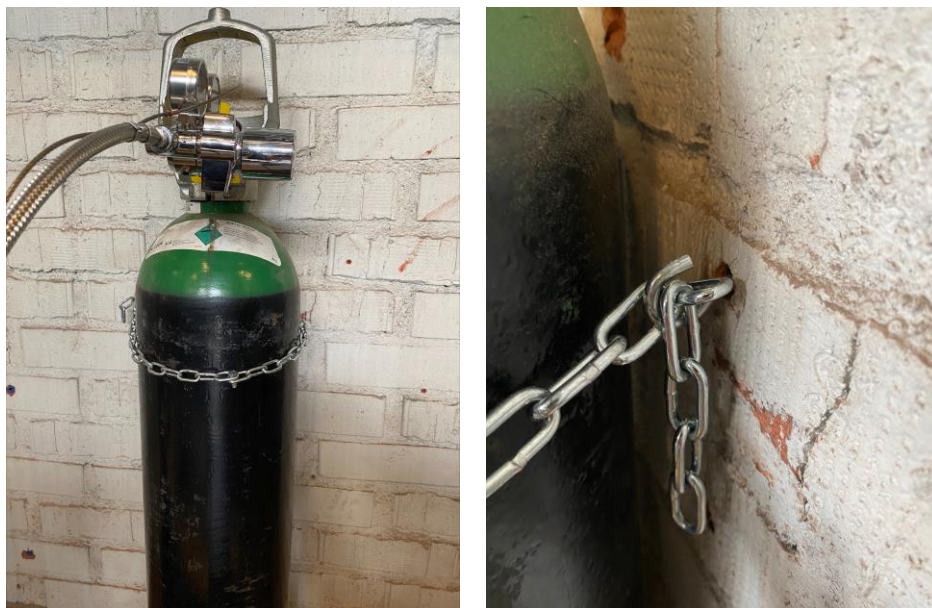
*Figure 3: Inside the gas container North.*



*Figure 4: Example of an approved, fire-resistant gas cylinder cabinet required for flammable gases (EN 14470-2 standard).*

## Usage

It is up to the **lab manager** (this is likely to be someone other than your supervisor) that the use meets all safety requirements. This includes correct installation, that you have completed a risk assessment and had it signed and approved by all necessary persons. The gas cylinders must always be attached securely to a solid object, such as a wall or pillar (see, for example Figure 5).



*Figure 5: A gas cylinder attached securely to the wall.*

## Disposal of empty or unused bottles

Bottles that are empty or not used must be returned to the supplier. The lab manager must do this. We must pay rent each day for each cylinder while we have it and empty bottles unnecessarily take up valuable space. To dispose of a gas cylinder, contact the supplier and mark the cylinder with a label.

## Location of gas containers and gas cages at MSE

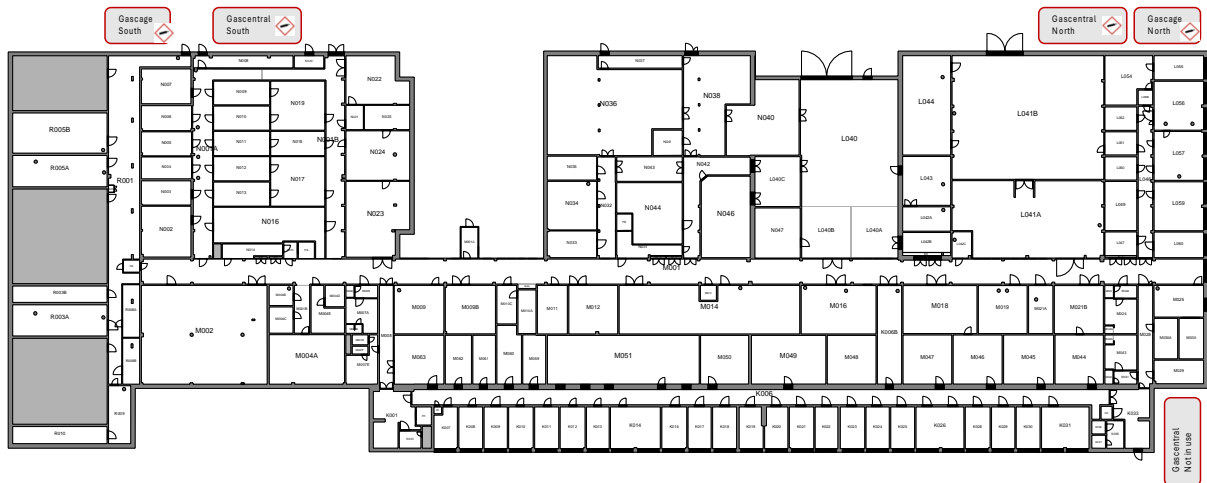


Figure 6: Location of gas containers (gas central) and gas cages.