

ATEX



Take care of yourself and your colleagues!

This leaflet describes the requirements for the handling and storage of flammable liquids and gases.

The objective is to protect yourself from fire and explosion hazards in laboratory work at the University of Southern Denmark.

The conditions for work are drawn up in accordance with the rules of the Danish Emergency Management Agency and the Danish Working Environment Authority about safeguarding workers against a dangerous explosive atmosphere.

The assessment of conditions at SDU has been carried out in collaboration with:

NIRAS

What to do:

Identify the risks of the experiment

Prepare a risk assessment of your experiment. Find inspiration in *Guidelines for laboratory managers*. After this, evaluate whether your experiment is best suited to a Type 1 laboratory or a Type 2 laboratory.

If it is not suited to one of the two types, contact Technical Services to have the laboratory zone classified. This can either result in the work function/plant being assessed and described in the special report or the preparation of separate ATEX documentation for the area.

Basic rules for handling and storing flammable liquids and gases:

- Flammable liquids must only be handled in a fume cupboard.
- The fume cupboard must not be used as a storage space for flammable liquids that are not being used.
- Flammable liquids are to be stored in well-ventilated chemical storage cabinets (zone 2).
- Fixed gas-consuming apparatuses (e.g. gas chromatographs) may only be connected by a gas installation approved by Technical Services.
- Bunsen burners are to be inspected before use.
- Chemical cabinets in laboratories are for chemicals that are to be used in the laboratory. Other storage items are to be placed in the storage room.

Type 1 laboratory

The least dangerous experiments are conducted in Type 1 laboratories.

Conditions for work carried out in Type 1 laboratories

- No more than 1 litre of flammable liquid per experiment may be handled in open areas.
- Maximum size of open containers is 1 litre.
- Flammable gas may only be used by:
Temporary manual bottling of max. 1 litre of gas at 1 atm to the container/balloon in the fume cupboard. The gas must be consumed immediately after bottling, so that the explosive atmosphere is removed as soon as possible. Use of the gas must be done under supervision.
- In case of ventilation failure, the experiment must be stopped and emissions limited (e.g. by putting a lid on the container and closing the fume cupboard doors).
- Experiments can be conducted without supervision — including nights and weekends.

When the conditions for experiments in Type 1 laboratories are followed, there is only a risk of hazardous explosive atmosphere in the chemical cabinets (Zone 2).

If a fume cupboard has been established in accordance with the provisions for Type 2 laboratories, it may be used for decantation of up to 5 litres.

Type 2 laboratory

Higher risk experiments are carried out in Type 2 laboratories.

Conditions for work in Type 2 laboratories

- No more than 5 litres of flammable liquid per experiment may be handled in open areas.
- Maximum size of open containers is 5 litres.
- Flammable gas may only be used by:
Temporary manual bottling of max. 1 litre of gas at 1 atm to the container/balloon in the fume cupboard. The gas must be consumed immediately after bottling, so that the explosive atmosphere is removed as soon as possible. Use of the gas must be done under supervision.
- In the case of ventilation failure, the experiment is to be stopped and emissions limited (e.g. by placing a lid on container and closing the fume cupboard doors).
The power to the fume cupboard's power outlet is to be cut off (manually by emergency switch).
- The experiment manager or a person instructed by the experiment manager must monitor the experiment — including at nights and weekends!

In complying with the conditions for experiments in Type 2 laboratories, there is only a risk of a hazardous explosive atmosphere in the chemical cabinet (zone 2).

Brief guide to working with flammable liquids in the Type 1 lab:

1. Work only in the fume cupboard
2. Use max. 1 litre in open containers
3. Limit handling in open areas
4. Do not connect flammable gas to experiment installations
5. Exercise care when heating substances
6. Remove flammable liquids that are not being used

Brief guide to working with flammable liquids in the Type 2 lab:

1. Work only in the fume cupboard
2. Use max. 5 litres in open containers
3. Limit handling in open areas
4. Do not connect flammable gas to experiment installations
5. Exercise care when heating substances
6. Remove flammable liquids that are not being used

General information about Zone 2 areas

In a zone 2 area, there is rarely and only for short periods of time a dangerous explosive atmosphere. The dangerous atmosphere often arises due to spills, leaks in joints, etc.

The atmosphere, in the form of gas, vapours or mists, is formed due to evaporation or gas emissions.

→ Ignition sources must therefore be removed from zone 2 areas. This is ensured by using electrical equipment that is EX-

marked with II 3 G

→ Entrances to zone 2 areas are marked with



Chemical Storage

Chemicals that are not in use in the laboratories are to be stored in chemical storage rooms. Compressed gas cylinders are stored in special storage rooms (see signage).

Only the chemicals used in the laboratory are to be stored in the chemical cabinets in each laboratory.

Maximum amount of substance

To limit the risk of fire, you must be aware that you may store a maximum of:

- 50 Storage Units (OE) per laboratory.
- 800 OE in total in the fire section of which the laboratory is part.
- Storage rooms located in connection with or within the laboratories are also included in the total amount of 800 OE.

When the conditions for storage of chemicals are followed, there is only a risk of a hazardous explosive atmosphere in the chemical cabinets (zone 2).



Brief guide to storage and pouring of chemicals:

1. Store chemicals in well-ventilated chemical cabinets
2. Decanting or bottling of chemicals must be done in the fume cupboards
3. Decanting of more than one litre may only be done in Type 2 fume cupboards
4. Compressed gas cylinders are stored in the clearly labelled storage rooms
5. The labelling of containers must be checked and updated as required



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