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UMEÅ UNIVERSITET

Safety regulations for employees and First aid

1 Content

2 Introduction

Before you start working at the department you must read and understand the information found in this document, sign the document together with your supervisor and return the signed paper to the staff administrator.

This document describes the general protection and safety routines that apply when working at the Department of Ecology and Environmental Science at Umeå University. In the text you will find references to people functions, which people that is connected to each function is collected in Appendix 1, Important Functions.

The head of the department have the main responsibility for work environment and safety at EMG. The department head have delegated the responsibility for this to the assistant head of the department, as well as to heads of research groups (or equal).

Within each group (or equal) there must be detailed routines for the existing work. The assistant head of the department, heads of research groups (or equal) shall clearly inform what you as employee have as responsibility/working task. Examples of this can be responsible for a laboratory, instrument or chemicals.

In each laboratory it must be clear of whom has the responsibility for the room and rules that apply, and have the responsibility for the equipment in the room.

The EMG's Work Environment/Environment Plan state how the delegation authority in the department looks and what tasks that can be delegated and persons in charge of each room. See further **Link 1 Appendix 1**.

The department has a work environment and infrastructure group that oversees work environment issues and questions that apply for adapting the department's environmental work according to the University's work environment and environmental policies.

2.1 Basic rules

At the university the head master have an overseeing work environment responsibility. Employees, guest researchers, students and PH:d students must show a personal responsibility for the work environment by following instructions, rules and routines and be aware of and report incidents, risks and threats against a good working environment.

At the university, we have to follow the Working Environment Act (AML 1977: 1160) which has an objective to prevent illness and accidents at work and further to work towards a good work environment. This law apply to all occupations in which an employee do labor for an employer, and this is complemented by the Work Environment Ordinance (SFS 1977: 1166). The systematic work environment act has regulations (AFS 2001: 1) to facilitate the work.

At EMG we have come up with this document to facilitate and to secure a safe work environment and to minimize the existing risks. There is each and every ones responsibility to understand and to follow these rules.

2.2 Common rules

The general thought in laboratories is that it shall be tidy, clean and neat. Storage on floors shall be avoided. Longtime storage of samples in laboratories is not allowed. Liquid solutions shall be labeled with content and suitable pictogram for hazardous substances (see further below). Samples/solutions must also be labelled with name and date.

Note that it is not allowed to use fume hoods for storage, either for samples, solutions or other chemicals.

Chemicals shall be kept in ventilated chemical storage cupboards. Flammable liquids shall be kept in ventilated fire-proof cabinets (see further below). Hazardous chemical handling shall be done in the “Chemical storage/working area” on floor 3 in the H-building.

Corridors and escape routes must not be blocked and must not be used as storage areas. It is the person responsible for the corridor that shall see to that this is followed. The escape route must be at least 1.2 meters wide.

On laboratories all form of consumption is forbidden, which also includes coffee! Snus cannot be taken and cosmetic not be applied, which also includes hand moister and lip cerate. When doing laboratory work a lab coat should be worn. With higher risks also protective gloves/safety googles/respiratory protection should be used. Protective gloves have different properties, and choice of material shall be made from the risk involved. Protective gloves also have a penetration time, depending on substance, which is found in the safety data sheet for the chemical. All this should be found in the risk assessment (see further below).

3 Risks

A risk can be many things. First of all it is the health perspective that is considered. Work with a risk is here mainly those that is found at the laboratory, but special risks is also occurring during field work (see below).

At Umeå University there are rules and guide lines for work at laboratories that can be found under **Link 2 Appendix 1**

3.1 Risk assessment

The goal with a risk assessment is to identify risks and to minimize these. A risk assessment shall be made for all laboratory and field work. Before any laboratory work start, or if changes are made, a risk assessment shall be made, especially when hazardous chemicals, biological contaminants, GMM, radioactive sources or flammable substances are used, but also when machines or tools (e.g. syringes) are used. Special care should be taken when exposure can lead to injury via inhalation, skin contact, splashes (to eyes) or if the substances are flammable, chemically reactive or destructive in contact with material.

The risk assessment shall include the whole work activity, and not only the risk with a chemical, and it shall include risks at unusual/unforeseen events as, e.g., a power shortage, ventilation stop or if the building needs to be emptied, and what then is needed to be done.

A risk assessment is made in the form *Risk assessment for laboratory work*. See **Link 3 Appendix 1.**

3.2 Working with chemicals and hazardous substances

Since 2009 all chemical products are classified according to the CLP-decree (Classification, Labelling and Packaging). Hazardous chemical products always have a danger symbol (pictogram) when it is purchased. The risk with a chemical product can change if, e.g., a solution is made, and therefore which pictogram that should be used. A risk assessment, on which pictogram to use, can be made via Prevents web-page. In the link in the Appendix 1 you can access information for more than 2 million chemicals, **Link 4 Appendix 1.**

More information about the pictograms can be found at the European Chemicals Agency (ECHA), **Link 5 Appendix** 1.

For work including flammable chemicals/solutions see further below.

Work with chemicals always includes a risk, it can be small or extremely high. Work with a high risk shall be made in the Chemical Storage/Working Area on floor 3 in the H-building (Fysiologihuset). There you can find a fume hood, a draw bench and a fume extractor. There is also Vermiculite for sanitizing chemical spill. Work with ha hazardous chemicals shall be made with special care to ventilation choice.

Corrosive substances

Special care should be taken when working with strong acids, alkaline substances or other corrosive chemicals. A bottle with concentrated acid as, e.g., sulphuric acid, nitric acid, hydrochloric acid etc. is only opened in a fume hood. To get a strong alkaline in your eye involve a greater risk for eye damage than if you get a strong acid in the eye due to that it is harder to wash away. Strong solutions should not be kept in beakers or measuring flasks. Strong acids must not be kept above eye height. Perchloric acid is not allowed to be handled at the department without contacting the department head. Handling of this carry a higher risk and special constructed fume hoods is required.

AIW-rule

Many acids and alkaline liquids have a higher density than water and thus sinks to the bottom when poured in to water. This physical entity is used when acids and alkaline liquids are diluted. A solution with higher concentration is poured in to a solution with lower concentration according to this rule. Doing the reverse may incur a violent reaction and the solution may start 'boiling', if the concentration difference is large enough.

3.2.1 CMR-substances

There are a variety of chemicals that are carcinogenic, mutagenic and toxic to reproduction. These are collectively called CMR substances and handling of these are under special rules. These are subject to National regulations (AFS 2011: 19, §§ 38-44), **Link 6 Appendix 1**.

At the Department you have to report (the head of department) if such product will be used, and a

routine for this must be established and documented in accordance with the Work Environment Authority. It is your responsibility to find out if the substance belongs to this group.

3.2.2 Allergenic substances

Chrome, nickel, cobalt, mercury and salts from these, formaldehyde, and certain types of plastics; especially isocyanates, epoxy, colors and film may cause allergies, that mostly is expressed as eczema or asthma. Take precautions and use good hand hygiene. Always handle these type of substances at well ventilated work stations. Allergenic substances having restriction limits are marked with an S in the protocol ASF 2011:18. In ASF 2011:19 Chemical work environment risks, the so called B-list with substances requiring an allowance (you have to apply for this) to use is found. In this list a number of allergenic substances are listed.

3.2.3 GMO, GMM and biological substances

For work with genetically modified organisms (GMOs) genetically modified microorganisms (GMM) and biological substances, there are special rules with need for reporting or authorization requirements for certain use. See AV's regulations AFS 2012: 7 Microbiological safety risks. Link to a page with contact information for the university biosafety information, **Link 7 Appendix 1**.

3.2.4 Radioactive substances

Work with radioactive substances is permitted only if you have participated in the Umeå university course in basic work with radioactive substances and that you have had a briefing with the radiation protection representative person at the department. All laboratory work with beta-emitters (and gamma emitters) will take place in the Isotope laboratory on the 3rd floor in the H-building (Fysiologihuset). It is not allowed to let the students handle radioactive substances even if you have completed the course.

The radiation protection officer at the University, and the rules for the handling of radioactive materials can be found under **Link 8 Appendix 1**.

3.3 Handling of chemicals

3.3.1 Buying chemicals and registering in Chemkeeper

All chemicals with a hazardous pictogram shall be registered in the university's computer system – Chemkeeper. The system can also be used as storage system and it is thus possible to search the system for chemicals in the whole university. If you only need small amounts you then can ask a college instead of buying the chemical. Inform the person responsible for Chemkeeper where you intend to keep the chemical. When you buy a chemical you must also see to that a safety data sheet (MSDS) exist, both in Swedish and English. You can find these at resellers as, e.g., Sigma-Aldrich. Person responsible for Chemkeeper must every year make an inventory of the chemicals at the department.

3.3.2 Transport of chemicals

Transport of chemicals must be made in a safe way. Use transport trolleys with rubber wheels and a frame as a safeguard during transport. Large bottles may for example be transported standing in a bucket etc. Avoid going in an elevator together with liquid chemicals.

3.3.3 Storage of chemicals

Check rules of co-storage of chemicals, se the safety data sheet and/or the link to “Kemiska ämnen” found at Prevent. Chemicals shall be stored in ventilated cabinets or in chemical storage areas.

Note the special labelling for flammable and poisonous chemicals.

- Poisonous chemicals, which is not flammable, must not be stored with flammable substances.
- Chemicals that are both poisonous and flammable shall be stored with flammable substances.

Chemical storage areas and ventilated cabinets with flammable and poisonous substances shall be marked with pictograms. Acids must be stored in ventilated acid resistant cabinets. Acids and alkaline solutions must not be stored in the same cabinet. Packages with acids and alkaline solutions should be kept in plastic containers that will take the volume of the package.

Ethers shall every year be controlled for peroxide content. High content of peroxides may cause explosion.

3.4 Working with ventilation needs

Both the environment and your own work is influenced by how you perform your work in fume hoods and on draw benches. It is easy to disturb the function of fume hoods and draw benches by an incorrect work procedure, with a lower level of safety as a result. Note that the ventilation has two purposes;

- Protect workers and the environment from hazardous substances.
- Dilute the flammable vapors / gases so that an explosive atmosphere cannot be formed.

Both draw benches and fume hoods should have alarms indicating when the air flow is too low. See to that you know how the alarm and control units work. Working according to the instructions below ensure that it can be done under more secure conditions, with reduced risk of leakage, harmful exposure and fire/explosion risk.

- Doors near a fume hood / fume benches shall be kept closed during work in the cabinet and on the bench
- Avoid that people pass by.
- Lab coat and coat sleeves should be properly worn.
- Work should be made with slow arm movements.
- Acute toxic substances must not be handled in a hood without a functioning audible / visual alarm.
- Perchloric acid must not be handled in conventional fume hood / fume benches.
- In case of electrical shortage and/or ventilation stop, all packages of flammable chemicals and fume hood should be closed and shutter pulled down.

3.4.1 Fume hood

- Work with the gap in the safety position, i.e. normally up to 30 cm's door opening.
- Work as far into the hood as possible.
- Do not store chemicals or other things that are not required for the work in the fume hood.
- Fume hood shutter must be closed when work is not going on in the fume hood.
- The air velocity in the shutter opening should be at least 0.5 m / s.

- The fume hood shutter is not suitable for protection with work when an explosive hazard may exist. Instead, use special screens, for example, shatterproof plastic.
- Shelves in a fume hood is not permitted because it impairs their function.

3.4.2 Draw bench

- 2/3 of the perforated surface should be free. Contamination should be placed at least 10 cm inside the perforated area.
- The draw bench can be fitted with a fume extractor, which increases protection.
- If a fume extractor is not installed samples should not be placed higher than 15-20 cm above the work surface. With a fume extractor installed you get increased clearance height and larger portion of the perforated surface can be used as a work surface.
- It is very important that the perforated surface is kept clean and free from dirt and chemical residues as such can provide reduced air flow and therefore reduced protection.
- Close forced ventilation when finished if it does not shut down automatically.

3.4.3 Fume extractor

- Place extraction point so close to the source as possible. The hose diameter determines how far from the source it can be placed.

3.4.4 LAF benches, sterile benches

Open LAF benches are used for sterile work and closed LAF benches for product and personnel protection. Where harmful substances is to be used the LAF bench should be connected to the exhaust system.

Note, if only personal protection is needed the fume hood or draw bench always gives the best protection.

3.5 Flammable goods and explosive substances and handling of gas

3.5.1 Flammable- and explosive substances

Information on the use of flammable liquids in the laboratory is described by the Swedish Civil Contingencies Agency, MSB, which is found under **Link 9 Appendix 1**.

The use of these substances should be minimized. A general rule is that each laboratory / storage location should keep as little as possible. The amount of flammable liquid kept on laboratory benches should be below 2.5 L, and the maximum amount that may be handled at the same time is 10 L. Total amount within a fire compartment shall be at maximum 50 L if stored in ventilated steel cabinets. Larger quantities must be kept in classified and ventilated fire cabinets. Plastic containers, above 2 L, that is used for storage must be approved for the flammable liquid.

There is a volume limit for the storage of hydrogen peroxide, because of its reaction force.

- Hydrogen peroxide with a concentration of ≥ 80%, a maximum of 1 L stored in cabinets.
- If the concentration is between 60-80%, a maximum of 5 L stored.
- If the concentration is between 20-60%, a maximum of 50 L stored

Permits are required for all handling of hydrogen peroxide with a concentration ≥ 60% regardless of volume.

Taking into account the ignition and explosion risk all work with flammable substances should be dealt with great caution and always in a fume hood or other equipment with adequate ventilation. Classification plans that apply to the current lab has to be observed. Work with flammable substances may not be performed at an open lab bench without special ventilation device (thus includes ethanol).

When working with flammable products safe electrical sockets should be used for electrical equipment that is placed inside the fume hood or beneath the hood shutter. This is because a ventilation loss cuts the power and eliminates an ignition source for potentially explosive mixture in air.

No flammable substances may be stored in a standard refrigerator or freezer. Evolving vapors or explosive mixtures can be ignited by sparks from the lighting switch or thermostat. Use approved refrigerators and freezers for the storage of flammable products.

Drying cabinets may not be used where flammable hazardous vapors of harmful substances can be emitted. Explosion hazard may also exist.

3.5.2 Handling of gas

The central supply of several different gases, such as oxygen, nitrogen and hydrogen in KBC and H (Fysiologihuset) is handled by the Chemistry store. Take advantage of these as far as possible and minimize the use of free cylinders. For detailed information about gas management read: "Security level for gas plant and gas management at Umeå University." More concise information can be found in the documentation "User instruction for handling of gases and gas cylinders" and "Checklist cylinders" located on the university intranet Aurora, **Link 10 Appendix 1**.

Free gas cylinders must be transported in designated trolleys. They should be treated with care and must not be subjected to shock or impact. They must not be placed so that they are exposed to heat and not so that they can be knocked over. Never ride in an elevator with gas cylinders or containers filled with liquid liquefied gas, such as nitrogen or helium! If the elevator is stuck between two floors while the bottle or vessel leak, there is a risk of suffocation. Keep in mind that - one liter of liquid nitrogen yields about 800 liters of nitrogen and a 10 L gas cylinder with 50 bar emits about 500 L of gas at normal pressure. Use the sign: "Transport of liquid nitrogen! Do not enter the elevator during transport."

Cylinders with corrosive or respiratory paralyzing substances should be obtained in small bottles that can be placed in a fume hood when handling and would otherwise be placed in ventilated cabinets. The gas cylinders should be clearly marked with the pictogram "skull and crossbones". Poison gas may not be stored with flammable gas.

If approved storage of gas bottle is missing in your lab, gas cylinders can be kept at the Chemistry store. They can also lend you trolleys for gas cylinders.

3.5.3 Classification Plans – flammable goods and electrical safety

Handling of flammable gases and liquids hold the risk that an ignitable gas / air mixture is produced. As part of the overall risk assessment Classification Plans for handling these should therefore exist. Classification Plans has as its primary function to identify areas (zones) where flammable gas mixture can occur and where the ignition source by electrical equipment, etc. therefore should be avoided. If electrical equipment exists in classified areas they shall normally be explosion-proof.

The zones indicate the following:
Zone 0: Area in which an explosive gas mixture is present continuously or for long periods.

Zone 1 Area in which an explosive mixture is likely to occur in normal operation.

Zone 2 Risk area in which an explosive gas mixture is not expected to occur during normal handling, and if this should occur, then only rarely and briefly.

Ventilation
A decisive factor for the extent of the classification is how the ventilation is made in the proximity to the handling. For the ventilation to be classified as good, and thus reduce the classification specification, a separate ventilation with back-up power and ventilation is normally needed. If these specifications is not met electrical safe sockets can be used, meaning that electricity is cut if ventilation becomes too low. Laboratory spaces within Umeå University have a ventilation with high reliability but there is no backup power or backup ventilation. Therefore, electrical safe power outlets should always be used in the area where the zone 0, 1 or 2 can occur if the ventilation function decreases or ceases. If electrical safe sockets is missing in the zone then only equipment with the correct Atex-classification (certification of explosion-proof electrical equipment) should be used. As a support to the risk assessment there are general classification plans that apply to laboratories with normal handling of flammable materials. For laboratories handling flammable materials with higher risk there are specific classification plans developed.

General classification plans
Three general classification plans have been developed. These show the zone that develops when the ventilation is not adequate for handling flammable gas or solvents such as methanol or ethanol. The general classification plans are posted by the entrance to laboratories.

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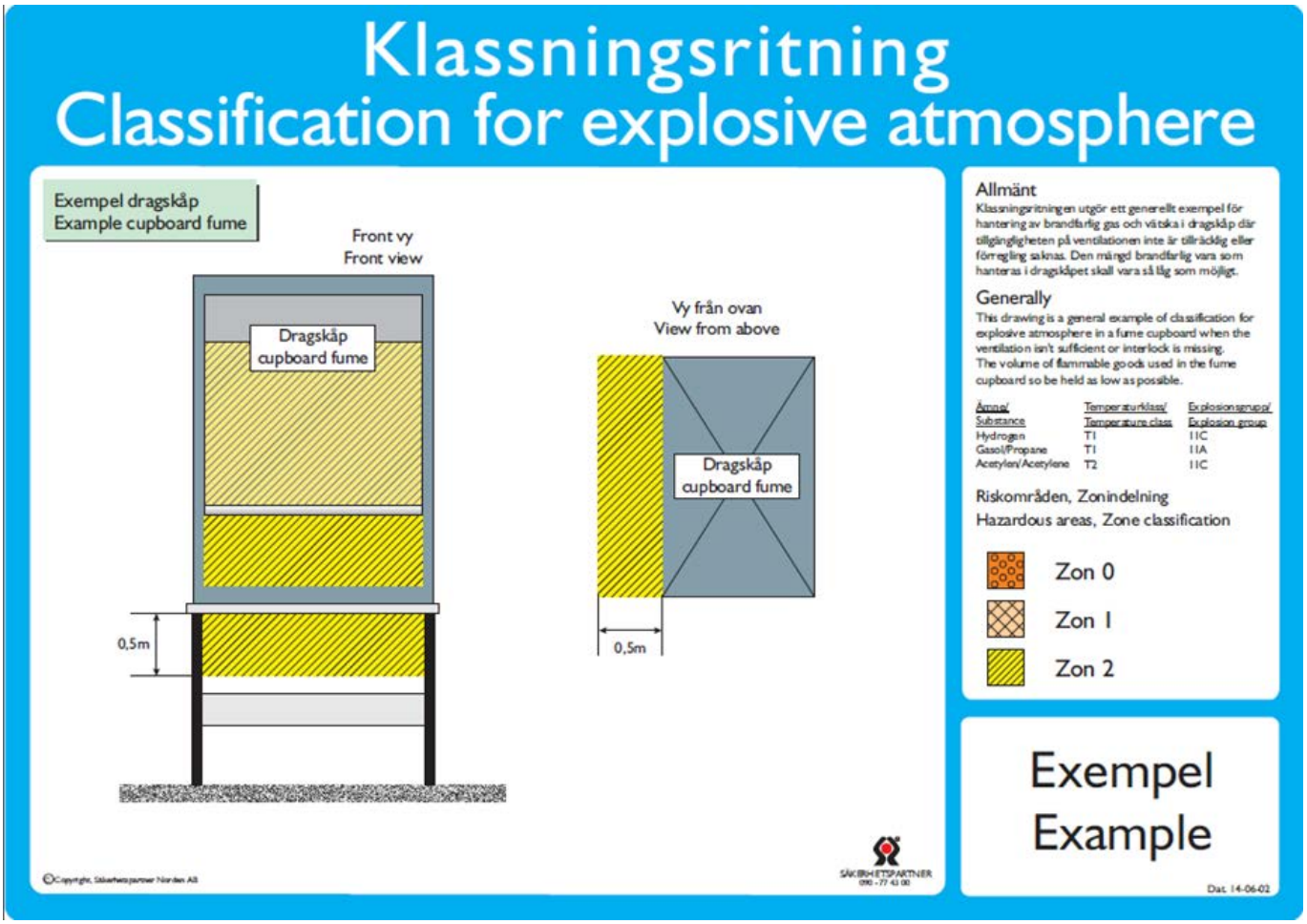
Fume hood



Within the fume hood and 0.5 m outside and below opening, zone 2 applies.

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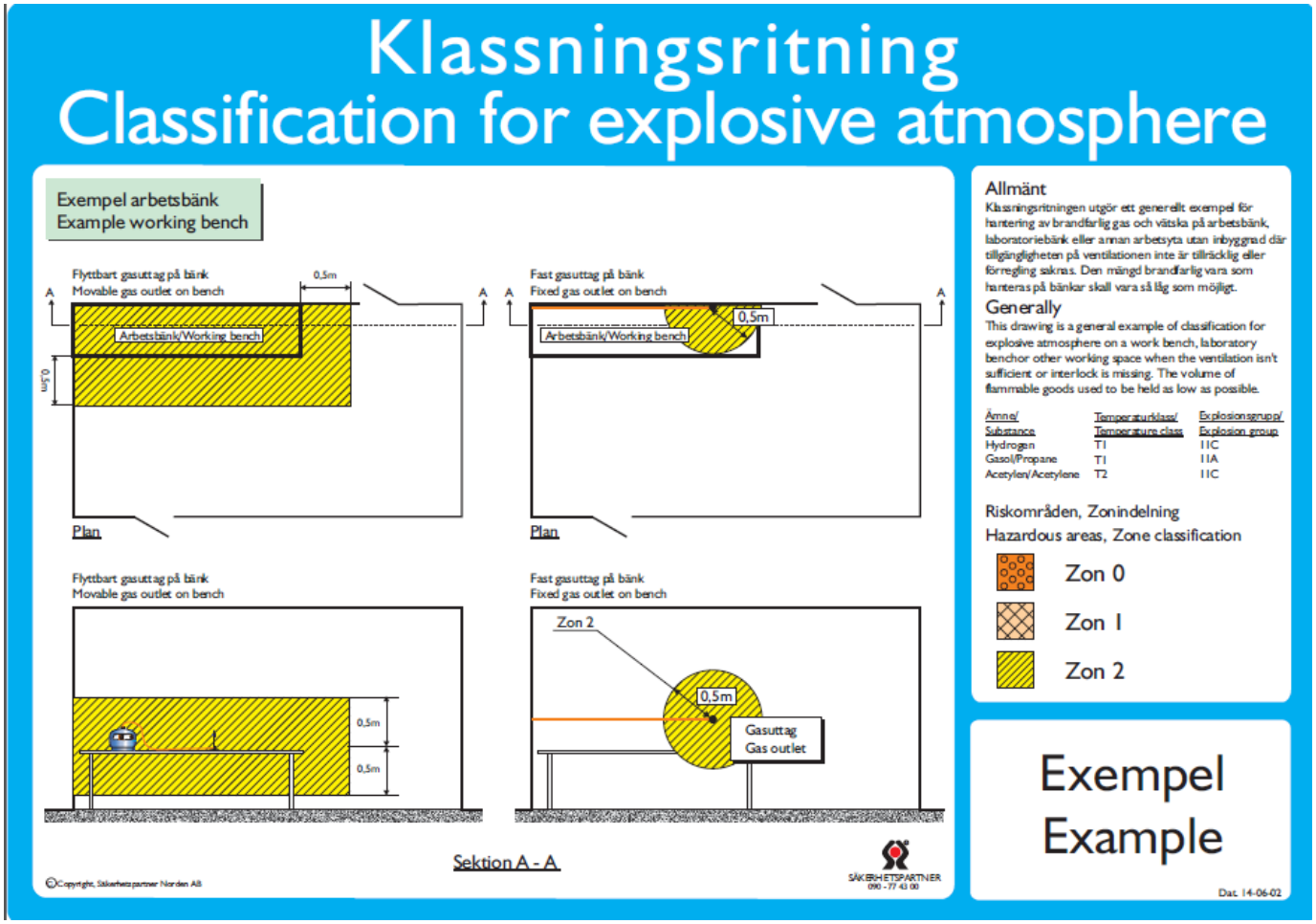
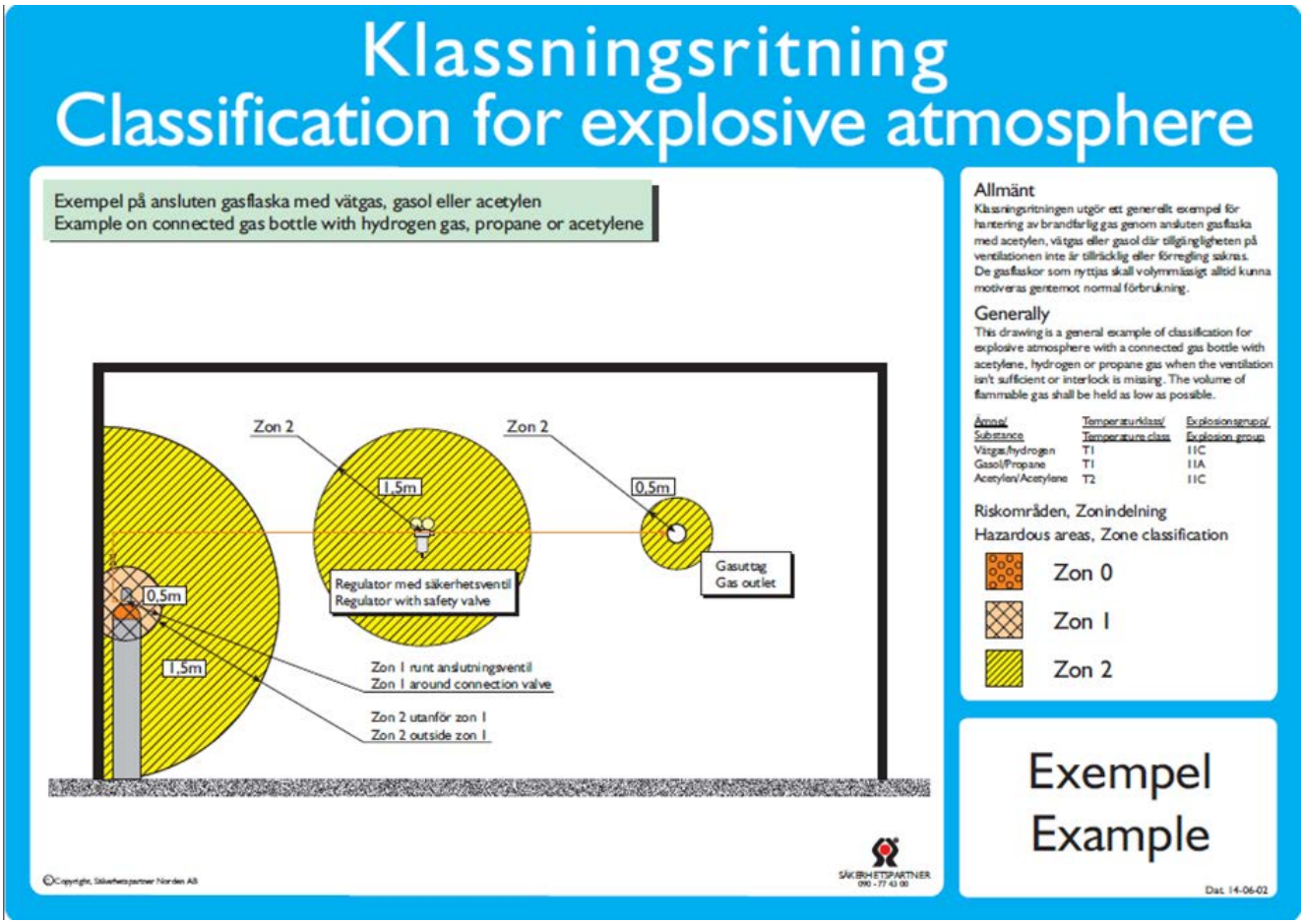
Work bench, laboratory bench or other work area without containment



In general zone 2 applies within a distance of 0.5 m on the side above and below the bench surface when handling free gas bottles. At a fixed outlet, zone 2 applies within a radius of 0.5 m around the outlet.

Gas bottle with hydrogen, liquefied petroleum gas or acetylene



Zone 1 applies with a radius of 0.5 m around the connection valve and Zone 2 in a radius of 1.5 m outside Zone 1. Around a regulator with safety valve for Zone 2 applies with a radius of 1.5 m. For outlets Zone 2 applies within a sphere with a radius of 0.5 m around the outlet mouth.

Storage of flammable goods
Cabinets used for storage of flammable liquids shall be ventilated at least 10 times/h. Inside cabinets Zone 2 applies.

3.6 Waste disposal

The person who produces waste is also responsible for packaging it correctly and placing it in the waste

- combustible waste (container)
- clean wood (container)
- metal / foil
- cartridges
- battery
- non-colored packaging glass (NOTE: NOT laboratory glassware)
- colored packaging glass (NOTE: NOT laboratory glassware)
- plastic (only plastic from packaging such as ketchup bottles, detergent bottles, plastic containers, etc.)

- soft plastics (packaging)
- cardboard
- paper recycling
- fluorescent lamps
- bulbs
- electronics scrap (must not contain environmentally hazardous waste and radioactive sources)
- scrap metal (container)

Glass, plastic and metal packages shall be cleaned before disposal!

For more information about waste disposal and sorting, contact KBC Service center.

Note that containers and packages from chemicals must be cleaned before they are disposed as normal waste. Also take care of residues from chemicals properly.

3.6.1 Hazardous waste (cutting/piercing, bilogical and infectious)

This includes contaminated broken glass and glass waste from laboratories. This is placed in the recycling room which is used for "Riskavfall" close to the KBC Service center. OBS! Syringe needles cannot be discarded in the fraction for incineration. Canisters for syringe needles shall be found close to work spaces. These canisters must be discarded in a box marked "Riskavfall" for glass etc (red one – not the yellow one). These you can buy in the Chemical store. Biological contaminants shall be kept in fridges/freezers at the department and discarded in a yellow box marked "Riskavfall" and left in the recycling room for "Riskavfall". A link to information about Biosafety and rules for GMM waste etc can be found under **Link 11 Appendix 1**.

Important to note

The box for "riskavfall" can be bought in the Chemistry store.
The plastic bag inside must be carefully closed using e.g. tape.
The box should be closed carefully also using tape.

3.6.2 Chemical waste

All chemical waste should temporally be kept in the laboratories or preferably in the Chemical Storage/Working Area on floor 3 in the H-building (Fysiologihuset). Waste should be kept in bottles/containers and brought to the Hazardous waste building for further handling/destruction. The Hazardous waste building is opened on Fridays between 08:00-10:00. Fill the form "declaration of hazardous chemical waste" and leave this with the waste. A link to the form can be found under **Link 12 Appendix 1**.

Oil (petroleum): Collect and leave to the Hazardous waste building

Vegetable oil: Collect into container for non-chlorinated solvents and leave to the Hazardous waste building

Ethers: Collect and leave to the Hazardous waste building

Other solvents: Chlorinated and non-chlorinated solvents are collected separately and left to the Hazardous waste building. Deposited waste shall be registered in a folder in the Hazardous waste

building with amount and type of waste. Non-chlorinated solvents are collected in a zinc container. Chlorinated solvents are collected in barrels. Solvents must not contain water.

Organic acids and bases: On condition that required knowledge in chemistry is acquired, these can be neutralized and flushed in the drain.

Non environmental- and hazardous substances and liquids as, e.g., KCl, MgSO4: Can be flushed in the drain.

Other environmental hazardous substances and solutions: Collect and leave to the Hazardous waste building.

All chemical waste that has been left to the Hazardous waste building must be documented and archived at the department to be shown on an official inspection of authority.

3.7 Field work

3.7.1 General guidelines

Being equipped with suitable clothes and shoes/boots minimizes the risk of frostbite, slipping, blisters etc. If you need to walk long distances, you should have something to eat and drink. You must have a fully charged mobile phone with you and if possible, a GPS and/or a map and compass. You must have a complete first aid kit with you when doing field work.

If you take medicine or are very allergic to something, make sure you have extra medicine with you and inform someone in your vicinity about it. If you yourself are responsible for a group doing field work, you must ask the group members if they have the necessary medication with them.

3.7.2 Vehicle transport

The greatest safety hazard when doing field work or when on excursions is transport. Do not drive a car or bus for long periods since this can cause fatigue and backache. Stop regularly and take turns at driving if possible. In winter, you must remember that roads may be slippery. You must follow traffic regulations and the vehicle must be driven sensibly and carefully. It is always good to have a mobile phone and additional warm clothing with you, especially in winter since there may be a holdup or your car/bus may break down. If the weather is extremely bad, postpone the trip until the storm is over.

If you need to rent a bus, check the insurance policy conditions.

Helicopter transport

When travelling by helicopter, check with the helicopter pilot what safety regulations apply. Be very careful when getting in and out of the helicopter.

Wildlife folds/grazing grounds

Never go into a field with loose bulls/animals. Be very careful when passing electric wires. Always assume an electric wire is switched on.

Walking over agricultural ground

Do not walk on growing crops. Try to walk along the edges by ditches or forest. Wear clothes/shoes that give you good protection from insects, ticks and snakes.

Crossing watercourses

If it seems risky to wade across a watercourse, you must go round it. Do not wade across flowing water that goes higher than your knee. Use a stick as support. Do not wade barefoot. Use boots or some other kind of non-slippery shoe.

Transport by boat
Always wear a life jacket when in a boat or on a raft. Do not overload it. Do not go out in a boat in bad weather. You must always have a safety rope with you.

3.7.3 Hazardous work activities
Certain circumstances during fieldwork requires special attention.

Working with high-tension power and water
When working with electric current and water, you must always wear sturdy rubber boots and rubber gloves with long sleeves. If you are doing electric fishing, you must not use an aluminum boat. When working with aquariums, remember that all cables must be earthed and that there must be a residual-current device. Never work alone, always be two people working together.

Working on ice
Check that the ice is sufficiently thick. You must have ice-prods and, if possible an ice-stick with you. If you are going to be working for a long time, you must have warm windproof clothes and shoes/boots that will prevent frostbite.

Working at height
For example, working up trees, on ladders etc. Try to avoid working in strong winds. Secure your ladder firmly to the ground and to the tree. Use a climbing harness.

Avoid working alone at a high height.

Working with sharp tools
There is a risk of injury when working with sharp tools, for instance, drilling tool, motor saw, axe, ice drill. Equip yourself with good protective clothing. Use the equipment's protection devices when transporting it. Learn how to use the equipment correctly before you go out into the field. If possible, ask someone who has used the equipment before to help you if you are unsure. Take a first aid kit with you in case you need it.

Risky terrain
Avoid stony and steep terrain. Walk around it. Use sturdy, non-slippery shoes.

Field work during the hunting season
If possible, find out whether there is any hunting going on in the area where you will be working. If possible, contact the hunt supervisor in the area. Try to plan your work so that it does not coincide with hunting. Tell people that you are there; leave a piece of paper in your car/bus saying who you are etc.

Field work in conjunction with forest felling
If you are doing field work where forest is being felled, tell the machine driver that you are there and stay well away from the forest machines and falling trees.

Field work in strong winds
Try to avoid working in the forest when there is a strong wind. If you must work, look out for old, dead trees and branches or falling trees.

3.7.4 Working alone

Avoid taking samples alone. Always have a fully charged mobile phone with you and, if possible, a GPS. Take something to eat and drink and a first aid kit with you.

Inform somebody that you are going out, where you are going and when you think you will be back. Remember to let them know when you have returned. If you take medicine, it is essential that you take your medicine with you and ideally some extra in case you are out longer than you planned to be.

3.7.5 Work with heavy lifting

Plan your work so that you avoid very heavy lifting and twisting movements. Lift correctly. If there are lifting aids, use them. If you have other people with you, distribute the work tasks between you. Do stretching exercises after finishing work to stretch out your muscles.

3.7.6 Other guidelines

Plan your field work so it can be done during the day. You should not work at dusk or in the dark. It is good to inform the landowner, or any people on the land where you will be working, who you are so as to avoid misunderstandings. If you park your car/bus, leave a piece of paper in it, saying who you are and what you are doing there.

3.7.7 Looking after field equipment

Clean field equipment thoroughly after use.

4 Preparedness for accidents and fire

4.1 Work injuries and incidents

The University homepage with information about occupational injuries and incidents are available under **Link 13 Appendix 1**.

4.1.1 Reporting incidents

If something happens in the lab, in the field or on the way to or from work that does not develop into accident with personal injury it should be reported as an incident to the Assistant Head of Department. This is done on a form "incidents" available on the university website, see above, but also with the assistant head of department. The incident is then reported to the University's environmental coordinator whom compiles all the incidents during the year. This is for the university to get an idea about the incidents that could develop into accidents involving personal injury and thus be able to take preventive measures.

4.1.2 Application for compensation through personal injury insurance

If an accident has occurred, and a personal injury or property damage has happened, you can apply for reimbursement of the expenses from the AFA or PSA as it is known. It is advised to fill in the forms directly on the website. See the following links:

Link 14 Appendix 1

4.1.3 Reporting and occupational injury, AFA

At Umeå University's home page there are routines for reporting a work injury, see the link above. Here the deputy head of department can help. Several forms and certificates must be sent along with the declaration. The declaration is sent in by the head of the department.

4.2 Crisis

If something occurs that becomes problematic to define as an accident or an incident, but rather takes the form of a crisis, seek the heads of department. They have an overall responsibility within crisis management. Furthermore, they have a reporting responsibility to the head of security relating to crisis-related issues and crisis events. They can go ahead and ask help from the university if you believe that you cannot do it yourself. The university's crisis management is described on the website, and is found under **Link 15 Appendix 1**.

There is an internal emergency number that can be used in emergencies and you quickly need to make contact, see further Appendix 1 for contact details.

4.3 In case of an accident

In the event of an accident or sudden illness you should know:

- Where the first aid kits are/what do they contain.
- Where are the emergency showers, including eye showers and how these are used.
- Where are fire extinguish equipment and how is it used.

- How do I alarm the fire brigade and ambulance.
- Where is the assembly point in case of fire.

In a serious situation such as a heart attack, cardiac arrest, road accident, fire, suffocation or drowning accidents, it is usually obvious that one must call 112 for help. It is important to call for help as soon as possible since it can take a while before an ambulance, or in certain cases, the sea, air or mountain rescue services will get to the place. If you know first aid, you can prevent and alleviate serious injuries and even save lives. In such cases, life-saving First Aid consists of checking if the injured or ill person has any signs of life, i.e. normal breathing, movements or coughing. Placing a person in the recovery position which keeps airways clear and prevents suffocation, mouth to mouth resuscitation, cardiopulmonary resuscitation, and stopping bleeding are examples of measures that can be taken on the spot.

Mouth to mouth resuscitation
A person who has been saved from drowning or from another accident may be unconscious. If you cannot make any contact with the injured person, you must immediately check to see if the person is breathing.

A person who is unconscious has completely limp muscles. If lying on their back, the tongue can fall back into the throat and block the airways. After only a few minutes without oxygen, the brain will be seriously damaged. Therefore it is important that breathing assistance is given immediately.

If there is anyone else on the spot, call 112 immediately.

If you are alone and cannot see any signs of life after checking for consciousness, breathing and pulse for maximum 30 seconds, you must call for help and then start cardiopulmonary resuscitation.

Check – take action
Check in this order

- Consciousness
- Breathing
- Pulse

Is the person conscious?
Shake the person's shoulders carefully and call-out "How are you?"

- Yes, the person reacts, stay – the person may get worse.
- No, the person is unconscious. Check breathing.

Is the person breathing?
Free the airways by placing one of your palms on the person's forehead. Support the chin with the other hand and carefully bend the head backwards. Look to see if his/her chest rises. Listen for sounds of breathing. Can you feel any breath against your cheek? Check for breathing for maximum 10 seconds.

- Yes, the person is breathing. Place him/her in the recovery position.
- No, the person is not breathing. Check his/her pulse

Does the person have a pulse?

Place your fingers in the groove at the side of the larynx and check for pulse for a maximum of 10 seconds.

- No, no pulse. Start cardiopulmonary resuscitation (CPR)

4.3.1 Cardiopulmonary resuscitation (CPR)

- Make sure the person is lying on his/her back, preferably on something hard.
- CPR must be given continuously.
- Do not pause to check for breathing or pulse.
- If possible, take turns with someone else to compress the chest, swapping over every other minute.
- Only stop giving CPR when the person begins to breathe normally.

This is what to do

1. Put your hands on the unconscious person's chest.
2. Press quickly and firmly 30 times, faster than one compression per second.
3. Keeping your arms straight, press the chest down four or five centimeters every time.
4. Allow the chest to rise after each compression.
5. After 30 compressions, blow air into the person's lungs twice. See mouth-to- mouth resuscitation below.
6. Continue to do 30 compressions and blow air in twice until the person begins to breathe and has a pulse or as long as you are able to while waiting for medical staff.

Mouth-to-mouth resuscitation

1. Open the person's mouth and check there are no loose objects in the mouth.
2. Free the unconscious person's airways by placing your hand on the forehead and bending the head backwards. At the same time, close the person's nose by pinching it with your thumb and forefinger. Raise the chin using two fingers.
3. Breathe in normally. Let your own mouth cover the unconscious person's mouth and carefully blow in air until you can see the person's chest rising. This should take about one second.
4. Lift up your head and take a new breath while the injured person breathes out and his/her chest goes down.
5. Continue giving artificial respiration at the rate of normal breathing, i.e. 10-12 breaths per minute. If the person starts to breathe again, place him/her in the recovery position.

Recovery position

1. Put the person on his/her back.
2. Kneel beside the person.
3. Stretch the arm closest to you straight out and bend it upwards.
4. Put the person's other arm over the chest.
5. Bend the leg that is furthest away from you.
6. Grab hold of the person's shoulder and press down on the knee of the bent leg. The person will then roll over so that the bent leg almost forms a right angle.
7. Place the person's hand under his/her cheek and make sure he/she is lying steadily.
8. Make sure the airways are clear.
9. Keep the injured person warm.

First Aid and burn injuries
Cool the burnt area down with cool water for at least fifteen minutes.

Poisoning
Call the Swedish Poisons Information Centre (*Giftinformationscentralen*) 08-331 231. In an emergency, call 112.

Splashes in the eye
Rinse the eye with water for a few minutes. Rinse for at least 20 minutes if splashed with a corrosive substance and call 112.

Inhalation of dangerous substances
Take the injured person out into fresh air, loosen his/her clothes and call the Swedish Poisons Information Centre (*Giftinformationscentralen*) 08-331 231. In an emergency, call 112.

Hypothermia
Take off wet clothing and warm the person up slowly. If possible wrap the person's arms, legs and trunk separately. Body heat from another person is the best source of heat.

Stop bleeding
Slight, oozing bleeding is seldom dangerous and often stops by itself after a while when the blood coagulates. Heavy bleeding is an indication that a larger blood vessel has been damaged. If a large blood vessel is bleeding, it can rapidly lead to the injured person losing a lot of blood and then losing consciousness. It is therefore essential to stop the bleeding quickly.

Spurting, pulsating or heavy bleeding

- Hold the sides of the wound together while applying steady pressure inwards.
- Make a pressure bandage and place it over the wound. Finish off by wrapping a bandage or by pressing around the wound in order to maintain the pressure. If the wound is on the throat, hold the sides of the wound together and press down onto the wound.
- Raise the part of the body that is bleeding since that helps to stop the pressure of the blood.

Call 112 for an ambulance or go to the hospital.

Slow-flowing bleeding

- Clean the wound with soap and water
- Apply a pressure bandage
- Raise the part of the body that is bleeding

Slight, oozing bleeding

- Clean the wound with soap and water
- Let the wound dry in the air

Shock – poor supply of blood to the brain. Can be caused by:

- Serious accidents
- Heavy bleeding
- Extensive burns
- Severe pain
- Electric shocks
- Heart failure
- Mental strain

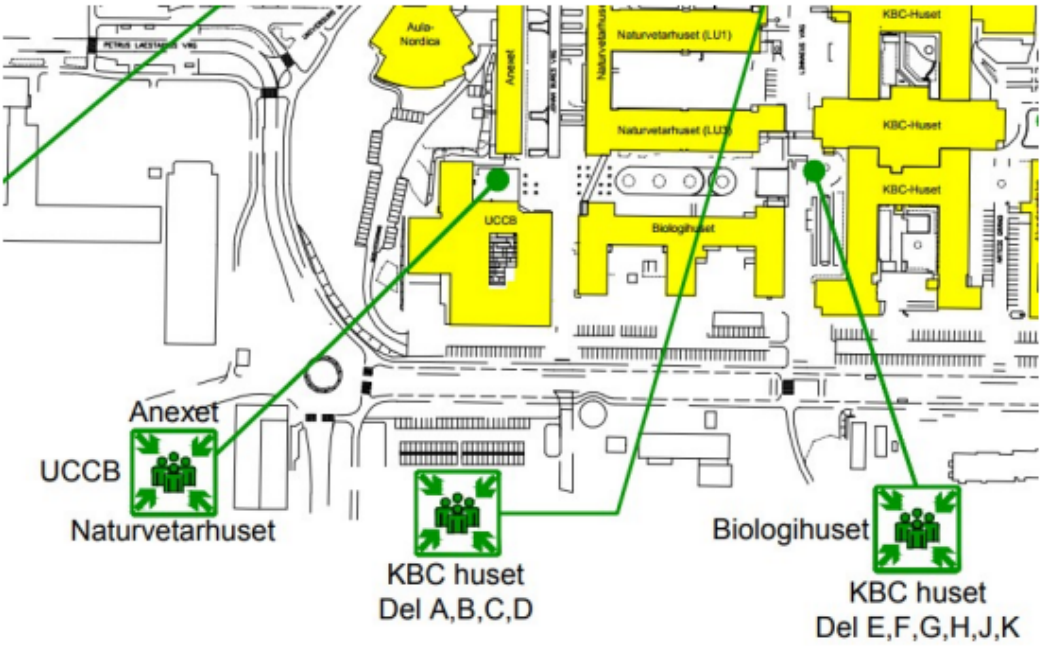
1. Place the person in a horizontal position with the head lower than the feet.
2. Keep the person as still as possible.
3. If possible, cover the person with a blanket or piece of clothing
4. When transporting the person in cold weather, cover him/her with blankets or clothing so as to retain heat
5. Give the person something to drink if he/she is fully conscious. NB! It is absolutely forbidden to give an unconscious person something to drink. The liquid can cause choking.

4.4 In case of fire

Rescue, alarm and extinguish, this is the order you do it!

Rescue

If the fire alarm goes off, EVERYONE must IMMEDIATELY leave the room, use the stairs and go out of the building to the assembly point. The teacher leaves the room as last person. The assembly point for the Physiology building and KBC is Biologitorget. The assembly point for the Natural Sciences building is Oxeltorget. At the assembly point, a check is made that everyone is outside by counting all the people it is believed were inside the building.



Alarm
Call 112 if a fire starts. The person making the call meet up with the rescue services and give them information about where the fire is etc.

Extinguish
If someone's clothes catch fire, you must help the person to go to the closest emergency shower or you must put the person on the floor and put out the fire with a fire blanket or a lab coat. Start covering the person from the head and work down the body so that smoke and flames do not flare up at the person's face. Make sure that the fire blanket is wrapped tight so that the fire is smothered. Then shower the person with water until absolutely sure the fire has been put out and a supervisor from EMG or ambulance staff are at site. Do not remove clothes since some synthetic materials can melt and stick to the skin.

All burn injuries must be reported to the work environment representative at EMG.

If there are extensive burns on the body or face, a doctor must be contacted.

Fires in containers (beakers, saucepans etc.) are put out by smothering the fire with some kind of lid. Close the fume cupboard ventilation so as to reduce the supply of oxygen. Large fires are put out by using the extinguishers placed in the laboratory or in the stairway. Fire extinguishers must not be used on burning people, primarily because this can cause injuries that are at least as dangerous as burns. If the fire cannot be contained, close all windows and doors, if possible, in order to stop oxygen from getting at the fire. If possible, remove flammable materials.

4.5 Routines in case of theft, sabotage, threat, fire and accidents etc

People below are the department management group in case of an acute situation. In contact with one of them also contact Alarm Center at 112 if this is needed. The contacted person in the management group organizes and leads until professional rescue service is at site.

KBC-huset Jon Moen, 786 96 47 Kerstin Abbing, 786 76 05 Christian Bigler, 786 97 29
Naturvetarhuset Mariana Sjöström, 786 51 07

Routines in case of theft and sabotage

• To prevent theft, sabotage and unauthorized entry, personnel shall lock the door in the locality when leaving, and if the lock is not functioning to immediate report this to Akademiska hus AB. http://akademiskahus.se

• In case of theft, sabotage or demonstrations within the localities of the department a report to the police is made immediately by the person noticing the incident.

• Don not move on things before the police have made a technical investigation, unless there is a risk of further damage or if the room has to be sanitized.

• The person discovering the damage also report this to one of the persons in the department management group

• The management group informs the University's safety manager Jörgen Sandström on phone number. 090-786 65 55 or at jorgen.sandstrom@adm.umu.se

• Follow-up and measures to prevent any similar incidents shall be made.

Routines in case of violence and threat

• If you as an employee or student have been affected – inform someone in the management group. If there is risk of life and health, you -or colleges being at hand, shall immediately contact the police, call 112.

• The management group shall support the person being affected to make a report to the police.

• The management group shall inform the University's safety manager Jörgen Sandström phone number.78665 55, or at jorgen.sandstrom@adm.umu.se. The management group is responsible for creating a safe environment and to give support during the acute event, and that those affected is given an opportunity to speak about the occurred event.

• The management group is responsible to see too that someone follow the person/s affected to the hospital or to home if needed, and to see to that family member is contacted.

• In more serious accidents or when someone has been seriously injured the University's safety manager Jörgen Sandström phone number 786 65 55 is responsible for that the Swedish Work Environment Authority immediately is contacted.

• The head of the department should have a follow-up dialog with the person/s affected within a week to find out if there is need for any further measures to be taken, e.g. counseling dialog.

4.6 What is an acute rescue situation?

With common sense you often can decide whether you should call 112 or not. But to make clear of what an acute rescue situation is one can say that this include risk of lives, property or environment and where you are in need of acute help from ambulance, rescue service, police, air-, sea- or mountain rescue, minister on call or toxic information.

Some examples of situations when you should call 112

You see car crashes
You see a boat with people about to sink
You see smoke and/or flames coming out of window
You encounter an unconscious person
You see people violently fighting
You encounter a person with heavy bleeding and seem to be confused