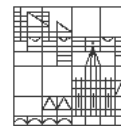


Guide to storing hazardous substances



1. General responsibilities and protective measures

Risk assessment

Supervisors are required to complete a risk assessment which accounts for the risks stored hazardous substances pose to staff members. They must also ensure the implementation of all necessary protective measures.

Safety data sheets

Supervisors must ensure that current safety data sheets are available for all hazardous substances stored in their respective areas.

The safety data sheets can also be kept electronically.

Instructions

Supervisors are responsible for including information about correct and safe storage in the instructions for handling hazardous substances. This is especially important for particularly dangerous substances (e.g. those that are highly toxic, explosive, etc.).

Training

Supervisors are responsible for ensuring that staff members and anyone else working in the laboratory receive training on correct and safe storage as part of their training on how to handle hazardous substances.

University-wide database of hazardous substances (DaMaRIS)

Supervisors ensure that records are kept of the hazardous substances stored in their respective areas.

This inventory of hazardous substances must be kept up-to-date at all times.

Newly purchased hazardous substances must be entered into the DaMaRIS database right away. Substances that have been used up and will not be replenished must be deleted from the database right away.

Entries for hazardous substances that the hazardous waste team ("Sonderabfalllager") is responsible for disposing of must be copied (not moved!) into the "virtueller Sonderabfallraum" (virtual hazardous waste room). These entries can only be deleted from the research team's inventory in DaMaRIS after the hazardous substances have been physically delivered to the "Sonderabfalllager". The hazardous waste team will delete the entries for the "virtueller Sonderabfallraum" in DaMaRIS.

More information about the DaMaRIS database of hazardous substances at the university is available on the occupational safety website:

<https://www.uni-konstanz.de/en/occupational-safety-health-and-environmental-protection/occupational-safety/hazardous-and-biological-substances/damaris-hazardous-materials-register/>

Stock of hazardous substances

Please take care not to have or order more stock of hazardous substances than absolutely necessary.

Before ordering new stock, please check the DaMaRIS materials exchange to see if the substance is already available at the university.

Wherever possible, replace particularly dangerous goods with less dangerous ones (substitution requirement as per Hazardous Substances Ordinance (GefStoffV)).

Complete an inventory of all hazardous substances at least once a year. Hazardous substances that are no longer needed or are out of date must be disposed of properly (contact the hazardous waste team).

Storage locations

Hazardous substances must be stored in the prescribed locations.

Suitable storage areas include e.g., safety cabinets/refrigerators/rooms for storing chemicals, toxic/acidic/basic substances.

Hazardous substances cannot be stored in public areas (hallways, stairs, passages, emergency escape/access routes) or break rooms – not even in cabinets.

Hazardous substances are to be kept either locked or stored so that only persons who have been instructed on and have knowledge of how to use these substances can access them. This is especially important for hazardous substances that can pose a high danger (e.g. acutely toxic, CMR and explosive substances) (see section 2 below).

Keep the amount of hazardous substances available for use at workplaces to an absolute minimum.

Containers

Hazardous substances must be stored in containers that seal completely (exception: substances that release gasses).

They should be kept in the original packaging provided by the manufacturers.

Containers must be replaced if they are damaged or outdated. Please note the maximum period of use printed/stamped on plastic containers (usually 5 years).

If hazardous substances need to be refilled or put into another container, please do the following:

- Use containers that cannot be mistaken for food containers and label them clearly.
- Choose a container made of a suitable material for storing the respective hazardous substance. For example, do not store hydrofluoric acid in glass containers or picric acid in metal containers. Storage information is usually provided in section 10 of the respective safety data sheets.
- Please also take care to use suitable lids. For example, do not use a glass plug for a container with picric acid.

Labels

Labels on containers with hazardous substances must always be in plain sight and legible and must include all the required information.

Labels that no longer fulfil these criteria must be replaced. DaMaRIS can be used to print labels that contain the following required elements:

- Name of substance (or components of compound)
- GHS pictogram
- Signal word
- Hazard sentences and EU hazard sentences (if applicable)

Original containers with old labels (orange hazard symbols) usually do not need to be relabelled, unless the new GHS class requires providing additional safety information.

Substances and compounds created in the lab must be classified and labelled by the users themselves.

Storing substances together

Hazardous substances in different storage classes can only be stored together if they pose no additional danger as a result. Otherwise they must be stored in separate locations, e.g. in different storage sections of the respective building where a fire would need at least 90 minutes to burn through. Type F90 cabinets are considered a separate storage section.

The regulations for storing substances together are available in the table in section 7 of the Technical Rules for Hazardous Substances "TRGS 510: Lagerung von ortsbeweglichen Behältern" (storage of transportable containers).

Under the following conditions, exceptions are possible:

- The total amount of hazardous substances per storage section is ≤ 400 kg and
- The amount of hazardous substances for each class of substance and storage section is ≤ 200 kg and
- Storing substances together poses no additional danger as a result.

Since the last condition depends on the substance, please refer to the corresponding information provided in the respective safety data sheets.

2. Protective measures for specific groups of hazardous substances

Group (including hazard labels)	Storage location and access	Other measures
liquid and viscous ^(*) hazardous substances ^(*) e.g. oils	– use drip pans	—
flammable liquids H224, H225, H226	– safety cabinets for flammable substances threshold amounts ⁽¹⁾ : H224 → 10 kg or more H225 → 20 kg or more H226 → 100 kg or more – use drip pans	– max. permitted container size outside storage areas: breakable containers → 2.5 L non-breakable containers → 10 L
acids + base solutions	– cabinets for acids/base solutions – use drip pans	– store acids and base solutions separately
acutely toxic substances (categories 1-3) H300, H310, H330 H301, H311, H331	– keep in a locked area (e.g. in a cabinet for toxic substances) – restrict access to persons who have been instructed on and know how to use these substances	<u>for acutely toxic substances (category 1):</u> – enter the actual amount of the substance and not the container size in DaMaRIS – document the amount you have used – check existing amount of substance at least every 3 months ⁽²⁾ ; if you suspect theft/misuse, please inform the

		<p>respective supervisor immediately</p> <ul style="list-style-type: none"> – a list of acutely toxic substances in category 1 is available on the occupational safety website ⁽³⁾.
<p>CMR substances (categories 1A + 1B) H340, H350, (H360)</p>	<ul style="list-style-type: none"> – keep in a locked area (e.g. in a cabinet for toxic substances) – restrict access to persons who have been instructed on and know how to use these substances <p><u>Note:</u> not required for substances with reproductive toxicity (H360), but recommended</p>	—
<p>category 1 substances with specific target organ toxicity (STOT) H370, H372</p>	<ul style="list-style-type: none"> – keep in a locked area (e.g. in a cabinet for toxic substances) – restrict access to persons who have been instructed on and know how to use these substances 	—
<p>explosive substances ⁽⁴⁾</p>	<ul style="list-style-type: none"> – store in a safety cabinet or storage room for chemicals – keep in a locked area (to prevent unauthorized use) – choose a storage location where the the substance is protected from: <ul style="list-style-type: none"> shock impact falling heat 	<ul style="list-style-type: none"> – if possible, please store substances in the original packaging ⁽⁵⁾ – enter the actual amount of the substance and not the container size in DaMaRIS – document the amount you have used – check existing amount of substance at least every 3 months ⁽²⁾; if you suspect theft/misuse, please inform the occupational safety team immediately – explosive substances that are sold pre-moistened should be checked at least every 3 months ⁽²⁾ and the moisturizing agent should be refilled if necessary (see label and safety data sheet)
<p>desensitized explosives ⁽⁴⁾</p>	<ul style="list-style-type: none"> – store in a safety cabinet or storage room for chemicals – keep in a locked area (to prevent unauthorized use) 	<ul style="list-style-type: none"> – enter the actual amount of the substance and not the container size in DaMaRIS – document the amount you have used – check existing amount of substance at least every 3 months ⁽²⁾; if you suspect theft/misuse, please inform the

		<p>occupational safety team immediately</p> <ul style="list-style-type: none"> – please check the desensitizing agent at least every 3 months ⁽²⁾ and refill it if necessary (see label and safety data sheet)
<p>non-explosive peroxides H242</p>	<ul style="list-style-type: none"> – store in a safety cabinet or storage room for chemicals – if peroxides are stored in a temperature-controlled environment, please note the maximum storage temperature listed by the manufacturer 	<ul style="list-style-type: none"> – if possible, please store substances in the original packaging ⁽⁵⁾ – please note the recommended shelf life if the manufacturer gives one (tip: date the container when you receive it) – organic peroxides must not be stored together with activators such as heavy metal compounds, amines and amine compounds as well as polymerizable substances (monomers like styrol, methyl methacrylate, etc.)
<p>oxidizing substances (category 1) H271</p>	<ul style="list-style-type: none"> – keep in storage rooms for chemicals threshold amount ⁽¹⁾: 1 kg – access only for specially trained staff 	—
<p>gasses</p>	<ul style="list-style-type: none"> – safety cabinet for gas canisters (type G90) threshold amount ⁽¹⁾: 2.5 L or more 	<ul style="list-style-type: none"> – put warning label W029 (warning: gas canisters) on the door to the room – note the dates when the canisters need to be checked (see test label or date imprinted on canister)
<p>compressed gas canisters + aerosol containers H220, H221, H222, H223</p>	<ul style="list-style-type: none"> – small amounts (under 20kg) should be stored in a safety cabinet – larger amounts (20kg or more) should be stored in a safety cabinet for gas canisters 	—
<p>hazardous waste with flammable liquids e.g. solvent waste</p>	<ul style="list-style-type: none"> – store in safety cabinet 	<ul style="list-style-type: none"> – dispose of waste regularly to avoid accumulating larger amounts

⁽¹⁾ The threshold amounts correspond to the total net amounts per fire compartment of the respective building.

⁽²⁾ Tip: Add an additional label to these substances to help you remember when the 3-month period ends (e.g. coloured dots).

- (3) A list of acutely toxic substances in category 1 is available on <https://www.uni-konstanz.de/agu/arbeitssicherheit/gefahrstoffe-und-biostoffe/gefahrstoffmanagement/>.
- (4) Research teams with explosive or desensitized explosive substances will be contacted directly by the dangerous goods representative.
- (5) It is generally not possible to store older stock in the original packaging, but please take care to do so with any new stock you order.

This guide does not claim to be exhaustive.

Please also follow the legal requirements for handling chemicals as well as the current safety data sheets from the applicable manufacturers and the most current versions of the respective Technical Rules for Hazardous Substances (TRGS, e.g. 510 and 526) available online at <https://www.umwelt-online.de/regelwerk/index.htm>.