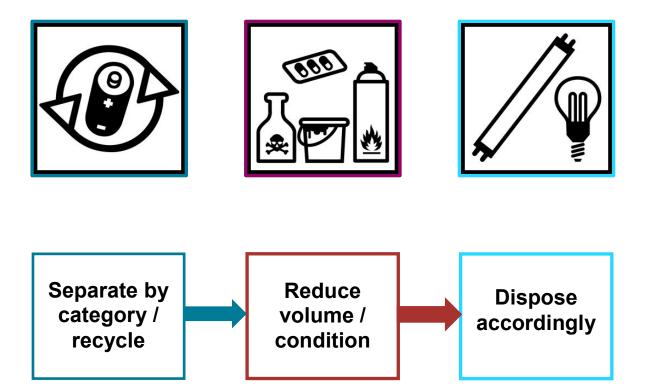
# ETHzürich

# **Disposal Guideline**

# **Avoid waste**



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# 1 Introduction

The present guideline shall apply to all work areas at ETH exclusively – excluding all external catering businesses or external companies at ETH sites. It regulates the flow of substances and the responsibilities of those entrusted with waste disposal process.

The disposal or depositing of private waste at ETH Zurich (incl. the hazardous waste disposal facilities) is prohibited. Furthermore, it is forbidden to remove deposited waste of any kind from consolidated containers, collection facilities or hazardous waste disposal facilities.

# 1.1 Definition of waste

According to the Environmental Protection Act waste refers to movable material which its owner wants to dispose of or whose disposal is in the interests of the public. Four main categories of waste can be distinguished:

- Residential waste is combustible and separately collected waste from households. Besides, it comprises
  waste from companies with fewer than 250 full-time employees, given its composition in terms of content
  and proportions is comparable to that of households. Residential waste does not include waste whose
  composition in terms of content and proportions is not comparable to that of households (e.g. waste
  generated by companies during production processes) or any waste that stems from companies with 250
  or more full-time employees.
- Hazardous waste is any kind of waste requiring special technical and organizational measures to dispose
  of it in an environmentally compatible manner. Reasons for specific requirements might be its composition, its chemical-physical or biological properties. Included in this category are, for example, batteries,
  car batteries, paints, lacquers, adhesives, acids, bases, solvents, medications, mercury, mercury thermometers, chemicals, spray cans, pressurised gas cartridges, mineral oils, pesticides, wood preservatives and insecticides, etc. Hazardous waste must be collected and disposed of separately. Disposal in a
  dumpster or in the residential waste is prohibited.
- "Other waste subject to regulatory controls" (short: other controlled waste) is waste requiring partly special technical and organizational measures for national transport and disposal in an environmentally compatible matter. Reasons for partly special requirements might be its composition, its chemical-physical or biological properties. Included in this category are, for example, used tyres, old cables, waste wood, end-of-life vehicles, electronic waste, construction waste, scrap metal, excavation and used cooking oil.
- Construction waste is any kind of waste generated during construction, renovation or dismantling of fixed facilities. It may be incinerated, recycled or dumped. Dismantling materials may occur during construction or dismantling and can be recycled according to their properties and compositions (e.g. mineral dismantling materials or metals).

Hazardous waste and other controlled waste must not be disposed of via the residential waste or the sewage system. They must be handed in at specialised collection points or waste management companies.

# 2 Responsibilities

The «polluter pays principle» essentially applies at ETH Zurich for the disposal of other controlled waste and hazardous waste. The person producing other controlled waste or hazardous waste remains responsible until its final disposal. The duty of supervisors (at ETH Zurich, more specifically every professor, workshop head, institute head, department head, etc.) is to either avoid waste in the first place or condition or process it in such a way that it can be disposed of. All supervisors are responsible for the correct handling of waste in their area of responsibility. They have to take all measures that are necessary to guarantee a safe and healthy work environment for their employees, provide written instructions, and ensure that conducted work burdens the environment as little as possible. Whenever other controlled waste and hazardous waste is produced, the supervisors bear responsibilities, such as:

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- Inform staff and students of the present guideline
- Adhere to and comply with the present guideline
- Ensure proper handling, collecting, storing and labelling of such waste at the work place
- Ensure proper transportation to one of ETH's hazardous waste disposal facilities

For ensuring proper disposal of chemical, radioactive as well as biological waste, the supervisor must nominate employees having the respective knowledge.

# 3 General principles

**Avoiding waste** takes priority over professional waste disposal. Both moderate use of materials and reusing materials help to achieve that aim. Please be economical with resources. Before producing hazardous waste, check whether alternative materials and methods are available which generate a lower and less problematic waste volume.

Waste materials are raw materials and sources of energy. Managing materials and material flows purposefully and employing established and new technologies allows to recycle resulting waste in terms of materials and energy. Combustible waste is incinerated at state-of-the-art facilities with virtually no environmental pollution and energy thus produced is used as heat or electricity. Many types of waste and so-called dismantling materials are collected separately. Thus, material recycling allows recovering valuable raw and reusable materials.

#### 3.1 General information on disposal

Facility Management is responsible for the proper management of building collection points meant for the collection and temporary storage of general waste. The collection points are run by the respective building section. In addition to the containers for operational waste, user-specific collection and separation containers are available on specific floors.

SSHE is responsible for the proper management of hazardous waste facilities and covers the costs incurred. Disposal of hazardous waste at ETH is essentially organised based on the «delivery principle». Suitable containers are available free of charge at the hazardous waste disposal facilities. A deviating procedure is possible in exceptional cases.

#### 3.2 Transporting waste

Waste of any kind must always be taken to the nearest collection point or hazardous waste disposal facility. Long transportation routes must be avoided. To transport hazardous goods, suitable packaging must be ensured to prevent any contamination in transit.

Generally, it is not allowed to transport hazardous waste in a private vehicle. ADR/SDR (European Agreement concerning the International Carriage of Dangerous Goods by Road) regulations apply for the transport of hazardous goods in a vehicle. If hazardous materials are to be transported via vehicle, ETH Services must be commissioned with the transport and ETH Zurich's Authorized Dangerous Goods Advisor must be contacted in advance: sgu-gefahrgut@ethz.ch.

#### 3.3 Dealing with hazardous waste

Avoiding hazardous waste as well as disposing of it properly is important in terms of environmental protection, economic efficiency, and safety – both your personal safety and that of third parties (e.g. cleaning staff, visitors, facility management staff members or their contractors).

Disposal of hazardous substances or their transformation into a less hazardous substance suitable for disposal must be conducted at their point of origin (polluter pays principle). Disposal of hazardous substances can be achieved by destroying them, detox them or converting them into less harmful substances. Laboratory waste differs greatly in its nature, physical properties, hazardousness, reactivity and especially its accruing amount. Hence, appropriate disposal and recycling methods accounting for the particular characteristics of the respective waste are vital.

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Contaminated labware or externally contaminated containers (glasses, bins, canisters, etc.) must be decontaminated before disposal. When a decontamination effort proves unsuccessful, such labware or containers have to be disposed of as hazardous waste.

Comply with the following basic principles when handling hazardous waste and disposing of it:

- Avoiding waste takes priority over waste recycling and waste disposal.
- Order only the amount of chemicals necessary.
- Very often, chemicals required for preliminary tests or experiments are already available; check with other work groups.
- It is forbidden to dispose of hazardous waste via residential waste or the sewage system.
- Use only approved containers to collect hazardous waste.
- Any accumulated hazardous waste must be labelled with at least the following information: name and signature of the person handing in the waste, date, contents.
- Individual types of hazardous waste must be collected separately.
- Containers for disposal must be kept clean on the outside and free from contaminants.
- Containers for disposal must be closed tightly.
- Containers for the storage of hazardous waste must be appropriately stored (e.g. safety cabinets; shielded from heat and direct sunlight).
- Hazardous waste containers must be inspected regularly. Damaged or outdated containers must be replaced.
- Fill only completely reacted mixtures into containers for the collection of hazardous waste.
- Dispose of hazardous waste regularly, e.g. weekly, at least monthly.

Before disposing of scientific instruments, any hazardous materials (e.g. Beryllium-windows, vials containing internal standards) must be removed properly. The person producing the waste is responsible for its proper decontamination. Contaminated scientific instruments cannot be handed over to ETH's hazardous waste facilities but have to be transferred to a licensed disposal business by the user at his own cost.

**Important:** The disposal of hazardous substances via waste water o(including via chemical waste water) or directly into the sewage system is prohibited. Chemicals or antibiotics entering the waste water may impair the waste water treatment plant for longer periods or even lead to a breakdown of the biological treatment stage.

#### 3.4 Hazardous waste disposal facilities

Attended hazardous waste disposal facilities are situated in the Zentrum, building CNB, and at Hönggerberg, buildings HCI and HPL.

At other ETH locations, e.g. Lindau/Eschikon, AgroVet Strickhof, Schwerzenbach, and Technopark, the collection of hazardous waste must be registered in advance via **sgu-sonderabfall@ethz.ch.** or via online form **«Inquiry Hazardous Waste Disposal»**.

Opening times of ETH's hazardous waste facilities are available on the website of SSHE and via the added QRcode.

# 4 Types of waste

List of abbreviations: VeVA: Verordnung über den Verkehr mit Abfällen; FM: Facility Management; MSWI: municipal solid waste incineration plant; HWDF: hazardous waste disposal facility

Types of waste	Waste materials	Responsibility	Contact for queries	Hazardous waste according to VeVA	Internal disposal possibility/ Disposal facility	Disposal
Residential waste	Residential waste	FM	Building area	No	Waste bins at workplaces	MSWI
Biologically con- taminated waste	Biologically contaminated waste	User	HWDF	Yes	Inactivation on site, e.g. in the lab → . Classify the inacti- vated waste according to used / still contained chemi- cals	Depending on classifi- cation of inactivated waste (MSWI or HWDF)
Construction materials	Construction materials	Real Estate Management	Real estate management	No	Site containers / skips	Landfill / dump
Reusable materi- als	Paper/cardboard	FM	Building area	No	Paper collection bin at work- places	Recycling
(recyclable ma- terials)	Wood	FM	Building area	No	Central collection points of the building areas	Recycling/MSWI
	Glass (normal glass waste, e.g. drink- ing bottles; emptied and cleaned or decontaminated original packaging)	User/FM	Building area	No	Central collection points of the building areas	Recycling
	Contaminated glass: chemical con- tainers containing /having contained highly toxic substances (Hazard state- ments: 300, 310, 330). Chemical containers containing resi- dues of hazardous chemical that can- not be cleaned in a simple and safe way.	User/SSHE	HWDF	Yes	HWDF	Landfill / dump

Types of waste	Waste materials	Responsibility	Contact for queries	Hazardous waste according to VeVA	Internal disposal possibility/ Disposal facility	Disposal
	Metals incl. cables (e.g. aluminium, copper, steel)	FM	Building area	No	Central collection points of building areas	Recycling
	Organic waste	FM	Building area	No	organic waste bin	Energy generation
	Green waste	FM	Building area	No	Decentralised collection con- tainers	Recycling
	PET, polystyrene	FM	Building area	No	Decentralised PET collection containers	Recycling
	Household batteries (alkaline, alkali- manganese)	FM	Building area	Yes	Central collection points of building areas	Recycling
	Other batteries and accumulators (e.g. lithium)	SSHE	HWDF	Yes	HWDF	Recycling
	Fluorescent tubes	FM	Building area	Yes	Central collection points of building areas	Recycling
	Electrical and scientific equipment (decontaminated), PCs, office equipment, etc.	FM	Building area	No	Central collection points of building areas	Scrap material trade, supplier, producer, SWICO, recycling
	Toner, ink cartridges	Services	Logistic center ONA	No	Return to logistic center ONA	Recycling by suppli- ers
	Aluminium coffee capsules (Nes- presso)	Services	Logistic center ONA	No	Return to logistic center ONA	Recycling by suppli- ers
	Coffee cream in PE bottle, 500 mL	Services	Logistic center ONA	No	Return to logistic center ONA	Recycling by suppli- ers
Sludges	Sludge and separator residue	FM	HWDF	Yes	Specialised waste disposal companies	According to the ac- tual concentration of noxious substances
Fats	Fats from grease separators	FM	Building area	Yes	Specialised waste disposal companies	ERZ
Gas cylinders	Rented cylinders (large bottles) and lecture bottles	User	Supplier	Yes	Return to supplier	Cylinder recycling

Types of waste	Waste materials	Responsibility	Contact for queries	Hazardous waste according to VeVA	Internal disposal possibility/ Disposal facility	Disposal
Chemicals	<b>Examples:</b> Waste oil and emulsions; solvents ( <i>halogenated/non-halogenated</i> ); phar- maceuticals; acids / bases; photo- chemicals; organic / inorganic sub- stances; laboratory chemicals; spray cans	SSHE	HWDF	Yes	HWDF	Special companies with corresponding permit
Animal waste, carcasses	Livestock, non-contaminated labora- tory animals, properly inactivated ani- mals and animal waste	User	HWDF	No	Public carcass collection point	TMF extraction facility (Bazenheid)
	Radioactively, chemically, biologically or prion-contaminated, non-inacti- vated laboratory animals (incl. genet- ically modified animals) and animal waste	SSHE	HWDF	Yes	HWDF	TMF incineration plant (Bazenheid)

# 5 Disposal at ETH Zurich

Detailed information on proper disposal for individual laboratory chemicals is available **online**. A brief description of the correct way to dispose of common types of waste is provided below.

# 5.1 Waste oil

Waste oil is the collective term for used mineral and cooking oil. Mineral oils predominantly originate from engines and gearboxes, cooking oils from deep fryers. Waste oil is hazardous waste and must be handed in at the hazardous waste disposal facilities in suitable containers (200 L barrels, 10 L canisters). Disposing of waste oil via the sewage or in the residential waste is not permitted.

# 5.2 Batteries

Rechargeable and non-rechargeable batteries contain substances that are harmful to the environment and must be disposed of as hazardous waste. Rechargeable batteries (power packs) and Li-batteries must be handed in at the hazardous waste disposal facilities; for disposable batteries use the collection containers.

# 5.3 Biologically contaminated waste

Waste contaminated with pathogenic or genetically modified organisms or prions must be collected separately and **inactivated prior to disposal**. Suitable inactivation techniques are steam sterilisation (autoclaving), chemical inactivation and (dry) heat sterilisation. Depending on the contained chemicals, the waste needs to be classified and disposed of accordingly. Properly inactivated waste needs to be classified corresponding to used / still contained chemicals and disposed of accordingly.

When disposing of biologically contaminated waste, the interfaces with other safety and disposal concepts are regulated as follows:

- **Radioactivity**: Biological waste of safety level 1 or above which is radioactive must first be inactivated completely using sufficient disinfectant, then they can be disposed of as corresponding radioactive waste.
- **Chemicals**: Biological waste of safety level 1 or above which contains toxic, corrosive or carcinogenic chemicals must first be inactivated completely using sufficient disinfectant, then they can be disposed of as corresponding hazardous waste. This kind of waste must not be autoclaved.
- **Antibiotics:** Biological waste of safety level 1 or above which contains antibiotics may be inactivated thermally or chemically. Depending on used / still contained chemicals, the waste needs to be classified and disposed of accordingly. If the antibiotics are not destroyed during inactivation, the inactivated waste must always be disposed of as hazardous waste.

# 5.4 Chemicals

Chemical waste (e.g. mercury, solutions containing heavy metals, acids, bases, photo chemicals, pharmaceuticals, etc.) is hazardous waste and subject to the *«Verordnung über den Verkehr mit Abfällen»*. According to the *«*Chemicals Act» and the *«*Environmental Protection Act», the owner is responsible for rendering the toxins harmless. If this is not possible, the chemical waste must be correctly packed – in original containers or containers provided – labelled and handed in to the hazardous waste disposal facilities. Chemicals must not be disposed of via residential waste.

# 5.5 Chemically contaminated materials

Materials such as wipes, gloves etc. and empty original containers to which chemicals adhere – no matter if they are harmless, water-soluble, a highly volatile, harmless chemicals or a highly toxic substances (hazard statements: 300, 310, 330) – must be collected separately and handed in at the hazardous waste disposal facilities.

## 5.6 Gas cylinders

Rented gas cylinders and lecture bottles must be disposed of via the vending company (please, arrange this while placing the order with the suppliers; other disposal options are limited and extremely expensive.) The suppliers have an obligation to accept returned goods, even if the container date has expired. If gas bottles are defective, immediately notify the Emergency Desk (internal: 888).

### 5.7 Glass

Normal glass waste (drinking bottles etc. without caps) must be disposed of in glass collecting containers.

Chemical containers which contain / have contained highly toxic substances (hazard statements: 300, 310, 330) are considered hazardous waste and must be handed in at the hazardous waste facilities.

Glass goods that contain hazardous chemical residues which cannot be cleaned in a safe and simple way are considered hazardous waste and must be handed in at the hazardous waste disposal facility.

#### Otherwise the following applies:

Chemical containers for water-soluble substances must be rinsed with water, then disposed of in a glass collecting container. The rinsing solution must be classified and disposed of in accordance with its contents.

Chemical containers for non-water-soluble substances must be rinsed with a suitable solvent (see respective safety factsheet), then disposed of in a glass collecting container. The rinsing solution must be classified and disposed of in accordance with its contents.

#### 5.8 Fluorescent tubes

Discharge lamps (fluorescent lamps, luminescent tubes, neon tubes, fluorescent tubes, energy-saving lamps, mercury/sodium vapour lamps, LED lights) are hazardous waste and may be disposed of at ETH Zurich via facility management or the hazardous waste disposal facilities.

Note: Hand in this type of lamps unbroken.

While the disposal of discharge lamps in the residential waste carries a penalty, conventional light bulbs belong in there.

#### 5.9 Solvent waste

Halogenated and non-halogenated solvent waste is collected separately in UN containers (5 L). The canisters (incl. labels) can be obtained from the hazardous waste disposal facilities free of charge.

The canisters, filled to a maximum of 90%, can be handed in at the hazardous waste disposal facilities. They must be firmly closed and transported in a suitable collecting container (e.g. chemicals cart with a collection tray).

#### 5.10 Medication

Medication must be disposed of as hazardous waste. In particular, liquids that contain antibiotics must be collected and disposed of as hazardous waste. They must not be disposed of via the sewage system.

#### 5.11 Radioactive waste

Waste which is contaminated radioactively must be collected separately in suitable containers. It must be separated by isotopes; diluting it or mixing it with different isotopes is not permitted.

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Only fully labelled containers will be accepted at the hazardous waste disposal facilities: name, nuclide, activity, date of receipt and decay date. Moreover, radioactive waste must be shielded in a safe and nuclide-specific manner for transport.

# 5.12 Sharps

Glass breakages, syringe needles, scalpels and sharp objects must be collected in special transparent containers (available at ETH Zurich e.g. in the HCI Shop). If sharps were exposed to infectious material, they must be inactivated before disposal.

The containers, which may only be filled to a maximum of three quarters, must be handed in at the hazardous waste facilities. Sharps must not be disposed of in the residential waste.

### 5.13 Explosives

ETH Zurich does not have **a licence to accept explosives** of any kind (e.g. TNT, DNT, nitrocellulose, etc.). Explosive waste must not be taken to the hazardous waste disposal facilities. For such cases, please contact **sgu-sonderabfall@ethz.ch** immediately.

#### 5.14 Animal waste, carcasses

Non-contaminated and properly inactivated animal carcasses may be taken to the communal carcass collection facility.

Secondary animal products, i.e. animal carcasses, whole or in pieces, must be disposed of in accordance with the legal requirements (*Tierseuchengesetz/Tierseuchenverordnung*; *Verordnung über die Entsorgung von tierischen Nebenprodukten*) and using state-of-the-art technology (animal carcass collection facilities, GZM Extraktionswerk AG in Lyss, on-site pickup service for whole large animal carcasses of 200 kg and over, TMF Extraktionswerk AG in Bazenheid). Disposal via carcass collection facilities with subsequent incineration is allowed only if the carcasses are not mixed with foreign matter such as e.g. plastic packaging material or metal.

Carcasses which were contaminated in the course of research activities or treatment (e.g. with chemical or radioactive substances, pathogens or genetically modified organisms) respectively, cannot be inactivated, but must be disposed of as hazardous waste and taken to the hazardous waste disposal facilities.

For disposal and transportation in accordance with animal epidemic legislation, dead, contaminated animals or their parts must be labelled clearly. The person handing in the waste must indicate their contamination and/or contagion risk on the packages.

**Please note:** If in doubt, carcasses must be considered contaminated and disposed of as hazardous waste. Please inform **sgu-sonderabfall@ethz.ch** in advance.

# 6 Legal foundations

The present guideline is based mainly on the following legislation in Switzerland:

- Chemikaliengesetz (ChemG; "Chemicals Act")
- Gewässerschutzgesetz (GSchG; "Waters Protection Act")
- Umweltschutzgesetz (USG; "Environmental Protection Act")
- Chemikalien-Risikoreduktions-Verordnung (ChemRRV; "Chemical Risk Reduction Ordinance")
- Einschliessungs-Verordnung (ESV; "Containment Ordinance")
- Luftreinhalteverordnung (LRV; "Ordinance on Air Pollution Control")
- Strahlenschutzverordnung (StSV; "Radiological Protection Ordinance")
- Verordnung über den Verkehr mit Abfällen (VeVA)
- Verordnung über die Beförderung gefährlicher Güter auf der Strasse (ADR/SDR)
- Verordnung über den Verkehr mit Abfällen, tierischen Nebenprodukten (VTNP)
- Verordnung über die Sammlung und Anlieferung radioaktiver Abfälle (VRAA)
- Verordnung über die Vermeidung und die Entsorgung von Abfällen (VVEA)



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