

Leaflet: Disposal of Laboratory Chemicals

Disposal plants: Biebesheim Waste Centre, HIM Frankfurt, HIM Stuttgart, HIM Kassel

The purpose of this leaflet is to describe the delivery and sorting criteria for the disposal of laboratory chemicals and chemical residues, as well as acids, alkalis and other concentrates in standard laboratory containers from industrial companies.

The disposal of large monobatches of chemicals, plant protection products and pesticides is not covered by this leaflet. There are separate leaflets available for this purpose.

Delivery shall be performed to the Biebesheim waste centre, HIM Frankfurt, HIM Kassel or HIM Stuttgart, depending on the allocations in the waste disposal certificates.

Disposition:	Biebesheim:	0049	6258	8092900	dispo@him.de
	Frankfurt:	0049	69	794215532	dispoffm@him.de
	Stuttgart:	0049	711	79322412	dispostuttgart@him.de
	Kassel:	0049	561	5706510	waage.kassel@him.de

The delivery form is laid out in a binding manner in the offer or certificate of disposal/notification and is oriented by the properties, composition and quantity of waste, as well as the technical capabilities of the plant. It is thus imperative that it be complied with.

The waste must correspond in its entirety to the information provided to us (safety data sheets, descriptions, photos, analyses, etc.). Deviations may be invoiced with costs. Further rights remain reserved

If deviations from the delivery form are unavoidable, please urgently get in touch with your sales contact before delivery. For all other questions on waste disposal, our sales contacts are also available to you.

In addition, our General terms and conditions (version of: 01.06.2022) and the leaflets in the version valid on the date of delivery apply (the documents can be found on our website www.indaver.de under "Service"). If necessary, you can always request documents to be sent.

Table of contents

1	Scope	3
1.1	Definition	3
1.2	Waste code and description	3
1.3	Limitations and exclusions	3
2	General conditions and requirements	4
2.1	Notification and implementation of waste disposal	4
2.2	Classification of laboratory chemicals and handling of unknown substances	4
2.3	Proof of a complete list of laboratory chemicals	4
2.4	Packaging and binders	5
2.5	Requirements for transport containers/packaging	5
2.6	Labelling of transport containers	5
2.7	Delivery on pallets	5
3	Sorting and packaging - acceptance conditions	6
3.1	HIM - collection in Frankfurt/Kassel/Stuttgart	6
3.2	Disposal plant and waste centre Biebesheim	7
4	Annexes	11
4.1	Annex 1 - Laboratory chemical list form	11
4.2	Annex 2 - List of mercury trivial names	12

1. Scope

1.1 Definition

Laboratory chemicals in this leaflet include all inorganic and organic laboratory chemicals, chemical residues and acids, alkalis and other concentrates in standard laboratory containers. The maximum quantity per package (barrel) is listed within the respective sorting groups.

1.2 Waste code and description:

According to the European Waste List, laboratory chemicals have the following codes:

16 05 06*: *Laboratory chemicals consisting of or containing hazardous substances, including mixtures of laboratory chemicals.*

16 05 07*: *used inorganic chemicals consisting of or containing hazardous substances*

16 05 08*: *used organic chemicals consisting of or containing hazardous substances*

Separation and sorting is done according to the sorting groups in mentioned in item 3.

1.3 Limitations and exclusions

For the following waste, which is often produced in the laboratories special acceptance conditions and separate disposal certificates apply, due to safety regulations and the kind of disposal.

Type of waste	Disposal
Laboratory waste contaminated with infectious agents	➡ see leaflet for the disposal of waste from human medicine facilities M 1
Gas cylinders	➡ Individual arrangements with your sales team
Compressed gas packs (spray cans)	➡ See spray cans leaflet

The disposal of unspecified particularities and special waste must be coordinated with your sales team in individual cases.

2. General conditions and requirements

2.1 Notification and implementation of waste disposal

For information on how to register and dispose of waste, see our leaflet A.

2.2 Classification of laboratory chemicals

Only waste that can be clearly classified will be accepted. The composition of the waste must be known before it is packed into the corresponding transport containers. This also applies to products and preparations which are only marked with company, brand, trade, trivial or experimental names.

- ➔ **According to the plant permits, the acceptance of unknown substances and compounds is generally excluded!**

2.3 Proof of a complete list of laboratory chemicals

- A complete list of quantities and types of laboratory chemicals packed in each drum must be drawn up (copy template see Annex 4).
The list must include the chem. nomenclature and the corresponding box labelling. Company, brand, trade, trivial and experimental names or abbreviations in the list of chemicals alone are not sufficient. This list of chemicals is submitted to the Disposition team of the intended waste centre or disposal plant. After inspection, a number is issued with which a delivery date can be agreed.
- A copy of the list shall be placed in a shipping bag on the outside of the barrel or in a protective case directly under the lid.
- A copy of the lists shall be carried along with the accompanying documents.
- Care must be taken that the drums with laboratory chemicals, the lists of which were jointly submitted to the HIM for release, are completely delivered in one load. Deviations from this requirement shall be agreed with the respective Disposition team.

2.4 Packaging and binders

The laboratory chemicals must be filled into the transport packaging in layers with binding agent. Only granulated, dust-free inorganic binder suitable for the material to be packed must be used as a binder. Loose or unstable closures and ground stoppers or plug closures must be fixed (adhesive tape or new closures if required).

Fragile, defective or leaky containers must be individually placed in stable containers. These must be clearly labelled and also marked with hazard warning symbols in accordance with the Hazardous Materials Ordinance.

2.5 Requirements for transport containers/packaging

Please use only stable and externally clean plastic, cardboard or steel packaging, which is approved for the transport of the respective substance according to ADR./GGVSEB, as specified in item 3. In individual cases, approved transport boxes can also be used after consultation (if this is required as a type of packaging or is absolutely necessary according to the transport regulations).

2.6 Identification of transport containers

- **Adhesive labels for barrels**

For delivery to HIM, all transport containers must be provided with a weatherproof barrel sticker.

The barrel stickers shall be labelled **completely and legibly and must be weatherproof** giving at least the following information:

- Waste owner (name, address)
- Waste name, EWC
- Number of the notification
- Number of the shipping document
- Classification according to GGVSEB/ADR
- CLP / GHS classification and labelling
- Name (in block letters) and signature of the sorting personnel

- **Identification according to hazardous goods law**

The transport containers must be marked with the appropriate hazard label according to ADR or GGAV.

All incorrect hazard labels and markings (identification) must be removed or made illegible.

2.7 Delivery on pallets

All barrels, canisters, containers or transport boxes shall be delivered upright and in a single layer, bound, on commercially available, intact and stable pallets. The straps shall be installed such that the containers can be transported and unloaded in a stable manner and cannot slip or drop from the pallet.

It must be ensured that the locking ring closures and all markings and identification notes face outwards, i.e. are legible at all times.

Only waste listed in one notification is collected on the same pallet.

3. Sorting and packaging / acceptance conditions

3.1 HIM disposal plant, collection points in Frankfurt/Kassel/Stuttgart

Arsenic, arsenic salts and arsenic plant protection products >2 kg

Arsenic trioxide, arsenic salts, inorganic arsenic preparations, copper lime arsenic, arsenide, arsenate, etc.

Packaging: If possible, original containers in one layer in approved transport boxes, with intermediate spaces completely filled with inorganic binder.

Mercury (Hg), elemental and Hg relays (free of other liquids) (accepted at HIM Frankfurt only)

Packaging: Max. 1 l plastic container with max. 10 kg Hg, single layer in transport box. Glass bottles or glass bottles with ground stoppers are also acceptable if waste is produced in this way (glass bottles and ground glass stoppers must be secured).

Mercury thermometers, broken glass with mercury (accepted at HIM Frankfurt only)

Packaging: Wide-necked bottle, in transport box, transport box completely filled with inorganic binding agent as breakage protection.

Delivery of larger devices (e.g. pressure gauges/thermometers) only upon consultation with your contact person.

Mercury salts and solutions (laboratory chemicals) (accepted at HIM Frankfurt only)

Packaging: Original container up to max. 5 kg or l, single layer in transport crate, intermediate spaces filled with inorg. binder - see appendix for list

Mercury-contaminated absorbent and packaging materials (accepted at HIM Frankfurt only)

Mercury-contaminated sorbents, waste, cleaning cloth, empty Hg-contaminated containers with plastic, cardboard and metal packaging materials

Packaging: 30 - 120 l plastic barrel

3.2 Disposal plant and waste centre Biebesheim

For all sorting groups, the following material-related quantities in compounds per container must not be exceeded:

(in the case of solutions and compounds, the percentage may be extrapolated)

▪ Chlorine	max. 20 kg/barrel
▪ Fluorine	max. 3 kg/barrel
▪ Bromine, iodine	max. 2 kg/barrel
▪ Chlorosilanes and organosilicon compounds	max. 20 kg/barrel
▪ Sulphur	max. 15 kg/barrel
▪ Zinc ¹	max. 15 kg/barrel
▪ Cadmium and thallium	max. 10 kg/barrel
▪ Chromium, nickel, copper and lead	max. 15 kg/barrel
▪ Sodium, lithium, magnesium, potassium, barium in total	max. 30 kg/barrel
▪ Vanadium, tin, manganese (each)	max. 20 kg/barrel
▪ Inorg. nitrates and nitrites	max. 20 kg/barrel
▪ Arsenic, arsenic salts, arsenic chemicals, antimony, molybdenum, selenium	max. 2.5 kg/barrel
▪ Highly flammable solvents of explosion group II b (e.g. diethyl ether, tetrahydrofuran) or substances of class 3 Packaging group I ADR./GGVSEB	max. 10 l/barrel

Note: Pure metals see particularities

Laboratory chemicals, organic

Organic laboratory chemicals of all kinds

Packaging: Laboratory-standard containers in 60 l of PE barrels with clamping ring covers, positioned in layers and completely filled with inorganic binder.

Note: Chemicals which can cause hazardous reactions amongst each other must be packed separately.

Attention, separate sorting groups for:

Cyanide waste

Reactive and self-igniting chemicals

Wastes containing mercury

Inorganic chemicals

Inorganic chemicals of all kinds

Packaging: Laboratory-standard containers in 60 l of PE barrels with clamping ring covers, positioned in layers and completely filled with inorganic binder.

Note: Chemicals which can cause hazardous reactions amongst each other must be packed separately.

Attention, separate sorting groups for:

Cyanide waste

Reactive and self-igniting chemicals

Mercury and wastes containing mercury

Laboratory chemicals containing cyanide

Packaging: Laboratory-standard containers in 60 l of PE barrels with clamping ring covers, positioned in layers and completely filled with inorganic binder

up to 10 kg of cyanide compounds / barrel

Liquid cyanide-containing wastes may only be delivered at a pH > 12.

Particularities

Laboratory chemicals, products and preparations which are self-igniting, have a highly reactive or highly oxidizing effect, cause strong reactions with water or cannot be assigned to any of the waste groups listed above for operational reasons and are subject to specific quantitative restrictions.

Packaging: Delivery must be performed separately in approved 30 l - 60 l barrels with clamping ring covers made of plastic at least according to the following groups.

Particularities	Quantity per barrel
Acrolein	5x1 l/barrel
Azides (e.g. sodium azide)	max. 20 kg/barrel
Ammonium dichromate , desensitized (0.5 - 3% H ₂ O)	max. 0.5 kg/barrel
Ammonium nitrate without organic impurities	max. 10 kg/barrel
Ammonium nitrate-containing products and preparations < 28% N in the solid or < 90% ammonium nitrate in the liquid	max. 20 kg/barrel
Ammonium persulfate	max. 5 kg/barrel
Alkali and alkaline earth metals and their silicides, amides	max. 5 kg/barrel
Chlorates and perchlorates, ammonium perchlorate with at least 10% water	max. 5 kg/barrel
Carbides , pure compounds such as calcium, aluminium and magnesium carbide	max. 5 kg/barrel
Hydride-containing compounds (e.g. LiH, CaH ₂ , SrH ₂ , BaH ₂)	max. 5 kg/barrel
Hypochlorite, solid (e.g. chlorinating agent, bleaching agent)	max. 20 kg/barrel
Potassium dichromate	max. 20 kg/barrel
Organometallic compounds	max. 5 kg/barrel
Sodium and potassium chlorite	max. 20 kg/barrel
Sodium sulphide (Na ₂ S) anhydrous	max. 5 kg/barrel
Sodium sulphide (Na ₂ S) containing water	max. 10 kg/barrel
Nitriles (e.g. acrylonitrile, acetonitrile, benzonitrile, adiponitrile)	30 kg/barrel
Peroxides with a SADT > 50°C	10 kg
Peroxides with a SADT < 50°C or classified as explosive	excluded
Permanganate compounds	max. 10 kg/barrel
Phosphorus, red and phosphorus oxide	max. 5 kg/barrel
Phosphorus, white , inert with water	max. 5 kg/barrel
Phosphides , alkali metal and alkaline earth metal phosphides and aluminium, magnesium and zinc phosphides	max. 5 kg/barrel
Picric acid with at least 30% water	max. 1 kg/barrel
Pyrophoric (very finely dispersed) metals , such as e.g. Raney nickel, aluminium powder, magnesium powder	max. 5 kg/barrel
Pyrophoric substances and compounds , such as e.g. Thermit®, mixture of Al powder with iron oxide, chromium oxide or manganese oxide, butyllithium, hexyllithium	max. 2.5 kg/barrel
Carbon disulphide	max. 1 kg/barrel
Substances which are self-igniting at >77°C , in each case in separate packaging, in a form which excludes self-ignition (inertisation must be indicated)	max. 5 kg/barrel

The list is not exhaustive - reactive connections that are not specified, as well as the maximum capacity must be agreed with your sales team before delivery.

Note: Inertisation

Inertisation (stabilisation) of particularly reactive chemicals with suitable inert substances must be ensured (e.g. covering metallic sodium with petroleum).

Hazardous goods regulations

The packaging regulations according to the Ordinance on Hazardous Goods must be observed; if necessary, several transport packages are required for different waste from one group.

Special labelling

Barrels containing ingredients of hazard classes 4.2, 4.3 and 5.2 and barrels containing ammonium nitrate or ethidium bromide **must be marked in colour (yellow spray marking of the clamping ring or the cover). These 24 h waste shall be grouped together on a pallet.**

4 Annexes



SAZ Biebesheim
 saz@him.de

Freigabenummer HIM:

 Datum, Unterschrift

Laborchemikalienliste

Seite ____ von ____

Fass-Nr. _____	Gefahrgut: _____
Paletten-Nr. _____	Verpackung: <input type="radio"/> 30 l Fass
EN / SEN - Nr. _____	<input type="radio"/> 60 l Fass
Sortiergruppe/ Abfallbezeichnung _____	<input type="radio"/> Transportkiste
Abfallerzeuger: _____	<input type="radio"/> _____
Abfallherkunft: _____	

Lfd. Nr.	Chemische Bezeichnung	Menge [kg]	Konsistenz	
			fest	flüssig

Firma: _____ **Verantwortliches Fachpersonal:** _____
 Name, Datum und Unterschrift

4.2 List of mercury-containing chemicals - trivial names

Mayer's reagent	Solution of HgCl_2 and KJ in water
Eder's solution	Aqueous solution of a double compound of mercury(II) chloride and ammonium oxalate
Caspan	Methylmercury chloride
Ceresan or agallol	(2-methoxyethyl)mercury chloride, fungicide, according to Plant Protection Application Ordinance, a complete ban on use is in force in Germany.
Chlormerodrine	Radiodiagnostic [3-(chlormercurio-197Hg)-2-methoxypropyl]-urea
CSB analysis waste and CSB test (Dr. Lange)	In addition to potassium dichromate (oxidizing agent), contains silver sulphate (catalyst) and mercury sulphate (masking of the chloride ions) in an acidic solution.
Hayem's solution	Fixing dilution liquid for counting erythrocytes from sodium sulphate, sodium chloride and mercury chloride
Calomel	Mercury (I) chloride (Hg_2Cl_2)
Sublimate	Mercury (II) chloride (HgCl_2)
Calomel electrode	Calomel half-cell: A half cell consisting of a mercury electrode containing a potassium chloride solution. A specific consistency is in contact which is in turn saturated with mercury(I) chloride (calomel, Hg_2Cl_2).
Mercury fulminate	Mercury (II) fulminate
Preservatives	Often containing Hg for technical purposes
Livingstonite	HgSb_4S_8 or $\text{HgS} \cdot \text{Sb}_2\text{S}_3$, grey-black mercury mineral, leafy or spherical masses, coarse, whether or not fibrous, monoclinic crystals translucent red at the edges
Neßler's reagent	Reagent (alkal. K_2HgI_4 solution) of 11 g (66 mmol) of KI and 15 g (33 mmol) of HgI_2 in 100 ml of water, mixed with the same volume of 6n NaOH.
Merbromine	Mercurochrome (antiseptic)

Mergal	Phenylmercury solution; assortment of fungicidal and bactericidal active substance preparations for protection against microbial attack on e.g. glues, wood protection and paints, sealing compounds, plastics, textiles and papers.
Millon's reagent	Detection reaction for tyrosine-containing proteins, solution of mercury nitrate with nitrous acid
PCMB	4-(Chlormercuri)-benzoic acid
Seyferth reagents	Organomercury compounds
Thoulet's solution	Aqueous solution of potassium tetraiodomercurate(II) from 1 part mercury (II) iodide and 1.24 parts potassium iodide. Extremely poisonous!
Thiomersal	<p>Thiomersal is the sodium salt of an organic mercury compound and is used as a preservative in cosmetic and pharmaceutical products to protect them from microbial spoilage. It is already effective in very low concentrations. Wikipedia</p> <p>Formula: C₉H₉HgNaO₂S IUPAC number: Ethyl(2-mercaptobenzoato-(2-)-O,S) mercurate(1-) sodium</p>
Thimerosal Bioextra Vermilion	is the US version of Thiomersal (cinnabarite, tin barite). HgS
Freckle-bleaching agents	<p>Oxidising agents such as sodium perborate, magnesium peroxide and H₂O₂ have been used to bleach freckles (ephelides) since time immemorial, which are a pigmentation that results from increased concentrations of melanin in the skin.</p> <p>Further examples are mercury preparations such as Hg(NH₂)Cl (white precipitate) or mercuric oil [from the same part BiO(NO₃), Hg(NH₂)Cl, glycerol and so on. vegetable oil], which are no longer used in modern cosmetics because of their toxicity.</p> <p>The mercury and bismuth salts inactivate ... various skin enzymes which normally have a melanin-forming effect.</p>
Zenker solution	As a fixing agent for zoological preparations of suitable solution of 5 g of mercury(II) chloride, 2,5 g of potassium dichromate and 1 g of sodium sulphate in 100 ml of water acidified with 5 ml of acetic acid.
Dimaval	Mercury poisoning antidote
Mercurisorb® Roth	Quick absorbent containing silver salts