

# MANAGEMENT METHOD: CHEMICAL / BIOLOGICAL WASTE

## Purpose and field of application

Legislative Decree 152 of 3 April 2006 and subsequent amendments regulate all the management phases of hazardous and non-hazardous special waste, from collection to final disposal. The main purpose of the following operating instruction is the correct management of chemical waste from the collection of the waste in the laboratory to the delivery of the waste to the temporary storage.

## References

- Technical regulations for the management of waste from the activities of the University of Padua
- Legislative Decree 3 April 2006 n. 152 and subsequent amendments
- Legislative Decree 81/08 and subsequent amendments
- International regulation on the road transport of dangerous goods ADR and s.m.e.i.
- Legislative Decree 205/10 Sistri and s.m.e.i.
- TULPS
- European Directive 67/548 / EEC
- Regulation 1272 / EC "CLP" - EU Regulation n.453 / 2010

## Terms and definitions

- **waste**: any substance or object that the holder discards or intends or is obliged to discard
- **special refusal**: defined in Article 184 paragraph 3 of Legislative Decree 152/06 as:
  - Waste from agricultural and agro-industrial activities.
  - Waste deriving from demolition and construction activities, as well as waste deriving from excavation activities, without prejudice to the provisions of art. 184 - bis.
  - Waste from industrial processes.
  - Waste from handicraft processing.
  - Commercial waste.
  - Waste from service activities.
  - Waste deriving from the recovery and disposal of waste, sludge produced by drinking water treatment and other water treatments and wastewater purification and smoke abatement.
  - Waste deriving from healthcare activities.

**- dangerous waste:**

defined in Article 184 paragraph 5 of D.lgs. 152/06 and in any case those special waste whose dangerousness depends on the concentration of dangerous substances and/or on the intrinsic characteristics of danger indicated in the relative annexes to part IV of Legislative Decree 152/2006 and subsequent amendments; they are expressly indicated as such with a special asterisk in the EWC code.

**- waste producer:**

the person whose activity produces waste (initial producer) or whoever carries out pre-treatment, mixing or other operations that have changed the nature or composition of said waste.

**- holder:**

the producer of the waste or the natural or legal person who is in possession of it.

**- recovery:**

any operation whose main result is to allow waste to play a useful role.

**- disposal:**

any operation other than recovery even when the operation has as a secondary consequence the recovery of substances or energy.

**- temporary deposit:**

the grouping of waste carried out, before collection, in the place where it is produced provided that certain conditions are met as set out in Article 183, paragraph 1, letter bb, of Legislative Decree no. 152/06. The Temporary Deposit is identified as a Local Unit within our University.

**EWC codes** (C.E.R. in Italian): the catalog is a non-exhaustive list of waste, subject to periodic review, and includes municipal, special hazardous and special non-hazardous waste. Each waste identified in the list is classified with a 6-digit numeric code (CER code):

- a) **the first two digits:** identify the industrial categories or types of activities that generated the waste.
- b) **the second two digits:** identify the individual processes within the industrial categories or activities that generated the waste.
- c) **the last two digits:** identify the single type of waste generated.

In the European Waste Catalog which entered into force on 1 January 2002, hazardous waste is followed by an asterisk \*.

**-ADR:** European agreement on the international road transport of dangerous goods adopted in Geneva on 09/30/1957 and ratified in Italy in 1962 and became mandatory in the European Union on 11/21/1994, with directive 94/55 / EEC. It is updated every two years and on 1 January 2015 update came into effect.

## Responsibility

The main figures involved in the management of waste from university activities are:

**- Legal Representative:** Rector, owner of the management of special waste produced at the University of Padua.

- **Local Unit Manager:** identified as the "producer / holder" of the waste and is responsible for the Local Unit (temporary storage).
- **Operations Delegate:** responsible for the proper execution of the procedures relating to the management of the local unit (temporary storage).
- **Head of the Structure:** Director of the Department, Director of the Experimental Agricultural Company, Directors of the Centers, the Prefect of the Botanical Garden, the General Manager about the Central Administration.
- **Environment and Safety Planning Service:** in charge of:
  - administrative / accounting management of waste disposal.
  - coordination of waste disposal activities.
  - regulatory update.
  - technical support in related procedures.
  - technical support in any remediation operations (excluding asbestos).
- **Laboratory manager:** structured teaching or technical staff, responsible for the laboratory activity or in charge of it. He is responsible for the disposal of waste.

The name of the Head of the Laboratory must be communicated by the Head of the Structure to the Head of the local Unit and to the Environment and Safety Planning Service.

## Operating modes

Each laboratory interested in waste disposal must communicate to the manager of the local unit and to the Environment and Safety Design Service the name of the Head of the laboratory so that the manager of the temporary deposit and the Service can have a reference figure for any communications. Before disposing of the rejects, the Head of the laboratory must fill in the form.

Laboratory waste must only be collected in UN approved containers provided by the staff of the Temporary Repository.

Choose the most appropriate container based on the type of waste:

- 5-10L tanks for liquids; respect the maximum filling limit (a raised line, with two up arrows)
- 50L containers for solids, black bin for medical waste (max. Filling weight 15Kg), yellow bin for chemical waste (max. Filling weight 10Kg).
- rigid plastic containers for needles and other sharp and stinging materials to be stored in the black or yellow bin.

It is recommended that only clean containers in good condition be handed over to the depot. In each container, all the labels provided by Polo Agripolis, bearing the characteristics of the waste, must be evident and filled in where needed:

- **the white label** showing the C.E.R. code, the laboratory of origin, the closing date, the definition of the waste, the weight (weighing is carried out at the deposit). The label must be affixed to the container when the container is closed (see attachments).
- **the black "R" label** on a yellow field (indicates the container as waste to be disposed of).
- **ADR coded labels** (based on the type of waste and on the indication of the Local Unit Manager / Delegate). All scraps that are transferred to the temporary deposit must be accompanied by the "**temporary deposit form for hazardous chemical waste**" (see attachments), completed in all its parts:

- enter the data relating to the relevant Department and the laboratory.
- report the description of the waste and the C.E.R code.

- report the composition of the waste in as much detail as possible.
- report the volume of the containers.
- a form must be completed for each C.E.R. code: waste with the same code must be entered in the same form.
- the form must be legible and must show the name of the head of the laboratory, the composition of the refusal, the closing date and the signature of the person who closes the container.

Please note that refusals will not be accepted at the deposit without the accompanying form duly completed.

Gather the substances to be eliminated as much as possible, respecting the compatibility and the type of C.E.R., keeping the halogenated compounds separate from the non-halogenated ones. For more information, see operating instruction no. 4 containing the list of incompatibilities at the following link: <https://www.unipd.it/rifiuti-pericolosi-non-pericolosi-prevalentemente-origine-chimica>

The delivery of laboratory waste to the Temporary Warehouse must be carried out using compliant carts equipped with containment basin and sides; transport must only be carried out by trained personnel and informed about the dangerousness of waste and the correct use of carts. Before delivering the containers to the depot, it is important to check that they are well closed and not contaminated externally.

## Disposal of Reagentaries

They are considered reagentary and identified with the C.E.R. 16.05.06 \*, all chemical products both solid and liquid in their original packaging. The head of the laboratory agrees with the delegate/manager of the temporary storage the packaging, according to the parameters of safety and compatibility of the substances.

The laboratory involved in the disposal of the reagent must send a list of the material to be disposed of to the Agripolis hub, indicating:

- number of containers
- product name
- c.a.s.
- amount
- phrases H

## Packaging methods

The reagents must be packaged with suitable absorbent material, in the 50L yellow bins, following the criteria established by the Temporary Storage Manager, and in any case divided by state (solid - liquid) and by classes (inorganic, organic, salts, metals ...). The material used to fill the empty spaces inside the bin must be exclusively inorganic, inert (paper, cardboard) and of a nature that does not contribute to chemical - physical reactions between the compounds inside the bins. For each packaged bin, the "identification card of the reagent to be disposed of" must be produced, that is a detailed list that identifies the bin number and the content of the material. The identification card must be produced in duplicate, one of which is applied externally to the container and the other delivered to the warehouse contact person.

### Procedure

- each bin must correspond to only one physical state (solid - liquid).
- follow the separation provisions provided by the deposit contact person.
- number each bin.

- report the same number on the identification card.
- put 1-2 cm of inert material in the bottom of the bin.
- store an adequate number of bottles.
- add inert material to fill the empty spaces so that the containers do not collide with each other.
- arrange other bottles and refill the empty spaces.
- the last bottles must remain at a distance of at least 10 cm from the lid.
- the bin must be filled with inert material.
- close the bin.
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Highly reactive compounds should be kept separate from the common reagentary and packaged in small quantities as indicated by the contact person of the deposit. Between these:

- picric acid, di-nitrophenol, tri-nitrotoluene and in general all explosive materials
- azides
- white, yellow, red phosphorus
- hydrides
- alkali metals (Na, K, Li)
- peroxides
- chlorates / perchlorates

The management of highly reactive materials, and of explosive material, is carried out by the Environment and Safety Design Service which will take care of the safety of the material and its disposal with the authorized companies in accordance with the provisions of current legislation on the subject of explosives.

## Relative requirements

Chemicals unknown before being disposed of as reagents must be identified by chemical analysis; it is not possible to dispose of material whose type and origin are not known. The classification / recognition of the unknown material is the responsibility of the laboratory manager, who can rely on an internal reference structure of the University, agreeing on times and methods of delivery, the material to be identified.

## PPE

All manipulation / handling operations of laboratory waste and waste must be carried out wearing appropriate PPE; these must be chosen based on the type of risk, and in any case according to the Indications reported in the risk assessment. By way of example, a not-exhaustive list is reported of the main PPE:

- disposable gloves made of hypoallergenic material, compatible with the substances handled.
- safety goggles with side splash shields.
- face shields or protective masks.
- laboratory coat (fireproof and antacid).

In the event of accidental spillage, a kit or absorption material for chemical substances must be present; personnel must be trained, informed, and trained to intervene in an emergency.

Annex 1: biological waste sheet

**UNITÁ LOCALE “POLO DI AGRIPOLIS”**

SCHEMA TRASFERIMENTO RIFIUTI BIOLOGICI AL DEPOSITO TEMPORANEO

DIPARTIMENTO: DAFNAE

LABORATORIO:

RESPONSABILE LABORATORIO:

**CER: 18.02.02\* RIFIUTI SANITARI PERICOLOSI**

Rifiuti che devono essere raccolti e smaltiti applicando precauzioni particolari per evitare infezioni

IDENTIFICAZIONE		DESCRIZIONE CONTENITORI			PESO KG
N. LAB.	N. DEP.	CARTONPLAST 60LT	BIDONI NERI 50 LT	NOTE	
<b>TOTALE CONTENITORI</b>				<b>TOTALE KG</b>	

DATA

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FIRMA RESPONSABILE LABORATORIO

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VISTO PER RICEVIMENTO

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## Compilation of biological waste sheet:

Fill in a form for each code, in duplicate:

1. Write the laboratory of origin of the waste.
2. Write the reference teacher.
3. On the card there is already the CER code 180202 and the description.
4. Mark whether cartonplast or black bin.
5. Laboratory No.: progressive number given by the laboratory.
6. The weight (Kg) must be placed after weighing at the deposit.
7. N. Dep.: it is assigned by the warehouse contact person after weighing.
8. Put the total of the containers.
9. Date: Put the date of the day of collection at the depot.
10. Sign the form\*.
11. The visa for receipt is done at the deposit.

\* Send an email to the floor contact, specifying the nature and quantity of the waste produced, to arrange the collection and transport to the warehouse.

Annex 2: chemical waste sheet

**UNITÀ LOCALE “POLO DI AGRIPOLIS”**

SCHEDA TRASFERIMENTO RIFIUTI SPECIALI PERICOLOSI AL DEPOSITO TEMPORANEO

DIPARTIMENTO: DAFNAE

LABORATORIO:

RESPONSABILE LABORATORIO:

CER:    \*

DESCRIZIONE:

INDICAZIONI DI PERICOLO “H”

PERICOLOSO PER L'AMBIENTE (H400-420)

 SI' NO

VALORE pH

IDENTIFICAZIONE		DESCRIZIONE CONTENITORI			PESO KG
N. LAB.	N. DEP.	BIDONI GIALLI 50 LT	TANICHE 10 LT	COMPOSIZIONE	
<b>TOTALE CONTENITORI</b>				<b>TOTALE KG</b>	

DATA

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FIRMA RESPONSABILE LABORATORIO

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VISTO PER RICEVIMENTO

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## Compilation of chemical waste form:

Fill in a form for each code, in duplicate:

1. Write the laboratory of origin of the waste.
2. Write the reference teacher.
3. Write the CER code and description on the card.
4. Indicate whether or not it is dangerous for the environment.
5. Indicate the presumed pH.
6. Mark if tank or bin.
7. In the composition column indicate exactly what is in the tank or bin.
8. Laboratory No.: progressive number given by the laboratory.
9. The weight (Kg) must be placed after weighing at the deposit.
10. N. Dep.: it is assigned by the warehouse contact person after weighing.
11. Put the total of the containers and below.
12. Date: Put the date of the day of collection at the depot.
13. Sign the form\*.

\* Send an email to the floor contact, specifying the nature and quantity of the waste produced, to arrange the collection and transport to the warehouse.

## Annex 3: descriptive label








UNIVERSITÀ DEGLI STUDI DI PADOVA									
UNITÀ LOCALE (Deposito):									
RIFIUTI SPECIALI							DATA / /		
CODICE CER:							PESO (Kg)	VOLUME(L)	
DESCRIZIONE RIFIUTO:									
Rif. SCHEDA N.			NOME LABORATORIO:						
STRUTTURA (Dip.)									
EDIFICIO:				Codici Geotec					
				Edificio:		Piano:		Locale:	
<b>UN</b>									





## Fill in the labels with:

1. Local Unit: write POLO AGRIPOLIS in capital letters.
2. CER: this is the same code written in the card.
3. Date: enter the date of the day of collection.
4. Weight: the weight must be put in the deposit after having weighed it.
5. Volume: put 10 for the cans and 50 for the cans.
6. Description: report the description of the card referring to the code (not the composition).
7. Ref. Card: progressive internal number given by the laboratory.
8. Laboratory Name: where the waste was produced.
9. Structure: name of the department.
10. Building: put batten 2 or batten 1.
11. Geotec Codes: put 1000c for Stecca 2, put 1000b for Stecca1.
12. Floor: 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup>.
13. Room: Geotec number of the laboratory-room where the waste was produced.
14. UN: ADR code obtained from the attached CER codes list.


Annex 4: list of C.E.R. codes in use at Polo Agripolis.

**Chemical waste**






Type of chemical waste Code	Code C.E.R.	Examples	ADR	Labels to apply
Salts and their solutions, containing cyanides	06.03.11*		UN 3276	
Waste containing arsenic	06.04.03*	Solutions containing traces of arsenic	UN 1556	
Waste containing mercury	06.04.04*	Solutions containing mercury compounds (e.g. potassium tetrahydro mercurate)	UN 3289	
Wastes containing other heavy metals	06.04.05*	Acid solutions containing traces of Cr, Pb, Cd, Cu, Zn salts	UN 2922	
Phytosanitary products, wood preservatives and other inorganic biocides	06.13.01*	Diluted solutions containing pesticides, pesticides, fungicides, and biocides	UN 2902	
Aqueous washing solutions and mother liquors	07.07.01*	Aqueous, acidic, or basic solutions with traces of other reagents (e.g., formalin)	UN 1760	
Organic halogenated solvents, washing solutions and mother liquors	07.07.03*	Solutions containing derivatives of alcohols, ketones, aldehydes, and other halogenated organic substances (e.g., chloroform, iodine, etc.)	UN 2810	




Other organic solvents, washing solutions and mother liquors	07.07.04*	Solutions containing ethanol, methanol, petroleum ether, etc.	UN 2929	 
Other filter cakes and spent absorbents	07.07.10*	Polluted disposable material (plastic, paper) and acrylamide / ethidium bromide gel		
Laboratory chemicals containing or consisting of hazardous substances, including mixtures of laboratory chemicals	16.05.06*	Reagents expired or no longer in use in the original packaging, divided by solid / liquid type and accompanied by the transfer form		

**Sanitary waste**

Waste that must be collected and disposed of by applying special precautions to avoid infections	18.02.02*	Disposable materials (paper, gloves, Pasteur pipettes, tips, etc.) contaminated by chemical-vegetable-animal, food, microbial cultures, etc.		
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**Various waste**

Waxes and spent fats	12.01.12*	Solid paraffin for tissue preservation	UN 2811	 
Other engine, gear, and lubrication oils	13.02.08*	Mineral and organic-based lubricating oils	UN 2810	
Other emulsions	13.08.02*	Aqueous emulsions of mineral oils and organic-based lubricants	UN 2810	
Packaging containing residues of dangerous substances or contaminated by such substances	15.01.10*	Glass containers and plastic packaging polluted by chemicals		

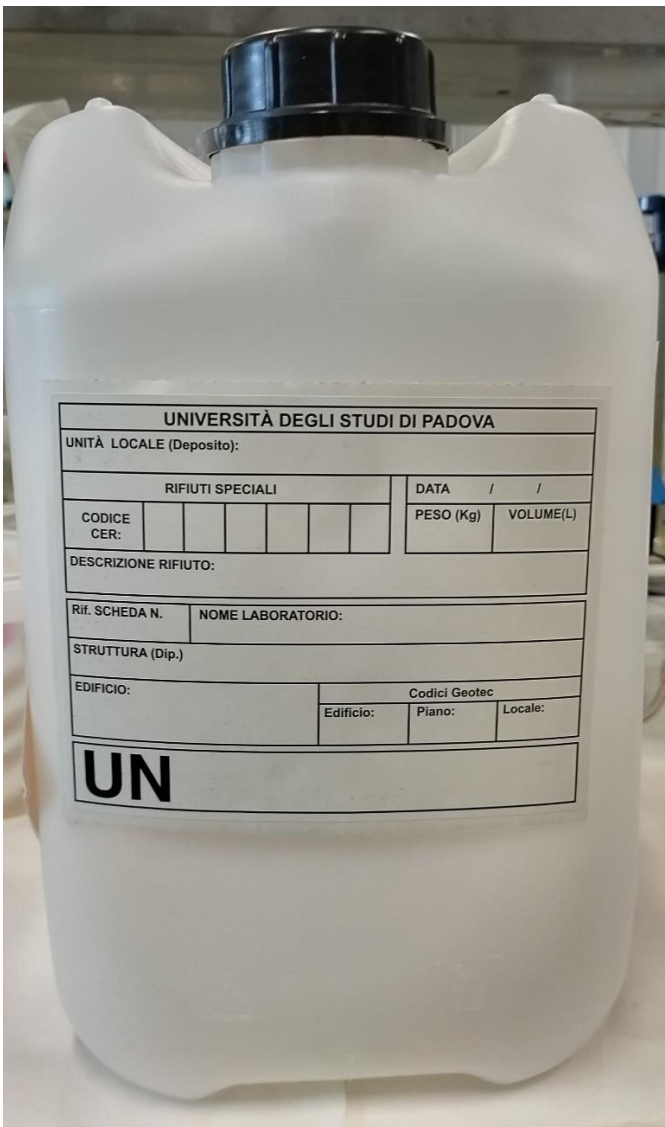
<p>Absorbents, filter materials (including oil filters not otherwise specified), rags and protective clothing, contaminated with dangerous substances</p>	<p>15.02.02*</p>	<p>Filter material used by laboratory hoods, with or without frame</p>		
<p>Activated carbon exhausted</p>	<p>19.09.04</p>	<p>NOT DANGEROUS E.g.: carbon cartridges for deionizers</p>		
<p>Saturated or depleted ion exchange resins</p>	<p>19.09.05</p>	<p>NOT DANGEROUS E.g.: resin cartridges for deionizers</p>		

## Annex 5: bin / canister labels

In which position do you attach the different labels on the tank:

Descriptive label:

On the front



ADR labels:

On the left side



R label:

On the right side





Where do you stick the different labels on the bin:

Yellow bin (chemical waste):

Black bin (biological waste):



# MANAGEMENT METHOD: WEEE WASTE

## Terms and definitions

WEEE is classified into two broad categories, depending on its use in the home or professional, establishing different recovery and disposal routes:

- **WEEE from private households:** WEEE originated from private households and WEEE originated from industrial, commercial, institutional, and other activities that are similar in nature and for quantity, to WEEE originating from private households.
- **Professional WEEE:** WEEE produced by administrative and economic activities, other than those domestic.

WEEE are divided into dangerous and non-dangerous:

### Dangerous WEEE

- CER code **16.02.11** \*: discarded equipment containing chlorofluorocarbons HCFC, HFC (refrigerators, fixed and portable freezers, air conditioners and air conditioners).
- CER code **16.02.13** \*: discarded electrical and electronic equipment containing components other than those referred to in items 16.02.09 \* and 16.02.12 \* (televisions, monitors, personal laptop).
- CER code **16.06.01** \*: lead-acid batteries

### WEEE not dangerous

- CER code **16.02.14**: discarded equipment, other than those referred to in items from 16.02.09 \* a 16.02.13 \* (PC without monitor, keyboards, photocopiers, printers, scanners, telephony, electric heaters, calculators, electrical panels, plotters)
- CER code **16.02.16**: components removed from discarded equipment, other than those referred to in item 16.02.15 (electronic boards, external hard disks, processors, relays).

## Method of conferment

All the facilities of the Agripolis campus and of the farm are "related" to the Temporary Waste Storage of the Agripolis Hub. The currently usable procedure is the following:

The Laboratory Manager / Contact Person:

- ascertains the non-functioning state of the equipment / furniture.
- fill in the WEEE disposal sheet in duplicate (see attachment) specifying:
  - the type of material
  - inventory number
  - quantity
- agrees with the Polo for the delivery of the material and signs the delivery to the warehouse.
- Send the signed form in administration to the person who manages the inventory, currently Mr. Mattia Aresu.

Structure/Department:

- manages the procedures for the decommissioning of materials / equipment / furnishings.

Annex 7: WEEE waste sheet

## UNITA' LOCALE "POLO DI AGRIPOLIS"

SCHEDA TRASFERIMENTO AL DEPOSITO TEMPORANEO per

**RIFIUTI da APPARECCHIATURE ELETTRICHE ed ELETTRONICHE (R.A.E.E.)  
e/o RIFIUTI INGOMBRANTI**

Dip. DAFNAE

Responsabile del laboratorio:

Tipologia di R.A.E.E. consegnato	N° pezzi
Frigo/freezer	
Condizionatori	
Monitor/video	
Pc (fissi e portatili)	
Stampanti*/scanner	
Tastiere/mouse**	
Macchine/attrezzature (specificare) :	
Altro (specificare) :	

Rifiuti ingombranti (specificare tipologia e materiale):

Data _/_/___	Firma _____	Visto per ricevimento _____
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## Compilation of WEEE waste form:

Fill in each form in duplicate (one to be delivered to the administration and one to be left with the deposit contact person):

1. Write the reference teacher.
2. Enter the most detailed description possible in the type of waste: brand, model, inventory number and serial number of the instrumentation.
3. Enter the quantity in number of pieces delivered to the warehouse.
4. Put the date of the delivery day at the warehouse.
5. Sign the form.
6. The visa for receipt is done at the deposit.

\* The toner or color cartridges must be removed from the printer before delivery to the waste depot.

\*\* Batteries must be removed from keyboards and mouse wireless prior to delivery to the waste depot.

\*\*\* The power cable must be removed from all the instruments (PCs, agitators, pH meters, scales, etc.), where possible.