



**IN EACH BUILDING THE DEPARTMENT COUNCIL SHALL APPOINT A WASTE DISPOSAL MANAGER, WHO IS IN CHARGE OF PROVIDING SUPPORT IN CASE OF DOUBTS ON THE PROCEDURES REGARDING THE DISPOSAL OF SPECIAL WASTE. IF THERE ARE CHANGES IN THE WASTE MANAGEMENT PROCEDURE, THE LABORATORY MANAGERS WILL BE PROMPTLY INFORMED AND THEY, IN TURN, WILL NOTIFY THE LAB USERS**

### **General information and regulatory references**

The purpose of the guidelines is to provide simple theoretical-practical notions for the management, temporary storage and disposal of the various types of special waste coming from research and teaching laboratories and from the different work sites (including offices when dealing with non-urban waste). The procedures that must be adopted to ensure the protection of users and the environment are defined in full compliance with the law in force (D.L. No. 152 of 3 April 2006 G.U. No. 88 of 14 April 2006 ordinary supplement No. 96 in implementation of Law No. 308 of 15 December 2004 part 4).

More information on waste legislation can be found at the following University's website: <https://www.ateneosostenibile.unifi.it/vp-144-rifiuti.html>.

All the Department staff (i.e., Professors, researchers, technical-administrative staff, students, trainees, PhD students, scholarship holders, graduate students, associates and collaborators, visiting professors, visiting lecturers) attending and using laboratories, workshops, stables, external field activities but also offices (toner, cartridges, hardware, bulky waste) and any other work sites,

**is required to comply with these guidelines, as waste produced in these areas is considered to all intents and purposes SPECIAL WASTE.**

The management of waste is regulated by the law in force in all its stages and there are strict procedures for the disposal of hazardous and non-hazardous waste in each phase.

The heavy fines in case of errors require us to both attribute specific responsibilities towards the producers of the waste and towards those who are responsible for its subsequent treatment and to operate in full compliance with the law during all stages of waste treatment: collection, storage, record keeping and delivery to the company authorized for disposal. It is absolutely forbidden by law, as well as by common sense, to dispose of waste, including chemical or biological waste, through the sewerage system, and to introduce and abandon it in the environment. According to the Decree in force, waste must be recovered or disposed of without endangering human health and without using procedures or methods that could harm the environment:

- without endangering water, air, soil and fauna and flora;
- without causing inconvenience through noise or odours;
- without adversely affecting the landscape and sites of special interest.

Uncontrolled waste storage leads to severe fines, in some cases even arrest.

Waste is classified *according to its origin* into **urban and special waste** and *according to its characteristics* into **hazardous and non-hazardous waste**.

Waste is identified by an **EWC code** (European Waste Code). In case of a **hazardous** waste, it is a necessary to mark its EWC with an asterisk (mirror codes for non-hazardous waste). The code consists of 6 digits separated with spaces or dots. The first two digits identify the chapters ranging from 01 to 20 for each sector or production process from which the waste is generated. The sub-chapters within the chapters identify the production activity, while the second pair of digits and the last pair of numbers identify the specific type of waste.

The EWC codes can be found online and on the CEE website. According to the characteristics of the activities in the labs and in the various sections of DAGRI, the EWC codes have been indicated for the types of waste most commonly disposed of by the DAGRI department itself to make their search easier (**SEE ANNEX**).

The University of Florence, as a producer of **hazardous and non-hazardous special waste**, which not includes domestic (urban) waste, has the obligation to keep a **loading and unloading register** (art. 190, paragraph 1) and to identify an employee for each building with the task of keeping the register and managing waste correctly. The list of the persons in charge and their substitutes can be found on the DAGRI website. Any waste produced within the University must be registered and disposed of with the appropriate procedure with the exception of office products (such as waste paper) which can be considered equivalent to **urban waste** and, as such, disposed of by the municipal waste company. The disposal procedure between the University, the person in charge of the management and the transport and disposal company is regulated by law. Any non-compliance is punishable under criminal law. The responsibility for the correct disposal of waste falls firstly to the person in charge of the procedures and then to the person who committed the misconduct.

### **MANAGEMENT OF SPECIAL WASTE**

Waste management is divided into several phases (Legislative Decree No 22 of 5 February 1997) which will be explained in detail.

- 1- production and transfer to a temporary storage
- 2- storage in a temporary storage
- 3- transport and disposal by an authorized company.

### **SPECIAL WASTE PRODUCTION AND TRANSFER TO A TEMPORARY STORAGE**

The waste produced must be collected according to its typology (EWC codes) in the appropriate and approved **collection containers** provided by the company that is authorized to collect and transport the waste. IT IS STRICTLY FORBIDDEN TO STORE WASTE MATERIALS IN THE LABORATORY

AND IN THE OTHER WORK SITES WHERE THEY ARE PRODUCED WITHOUT CLEARLY INDICATING IN THE CONTAINER THE EWC CODE AND THE DESCRIPTION OF THE CONTENTS.

**The following containers are available:**

- **For liquids, canisters of 5 l, 10 l and 15 l:** the containers must not be filled completely, but only up to the arrow indicating the maximum level. The canisters can be stored for filling under the hood or in the soil in the appropriate anti-skid tanks, but only for a short time.
- **For solids, yellow or black plastic canisters without any silk-screen printing:** the containers can be used for absorbent material/gloves (EWC 15.02.02), solid residues (EWC 16.05.06); glass/plastic/metal (EWC 15.01.10) and, if appropriately identified, for the infected biological material (EWC 18.01.03).
- **Waste bins made of cardboard or black plastic with appropriate silk-screen printing for infectious health care materials** (EWC 18.01.03). Cardboard containers are supplied with an inner plastic bag that can be resealed with a special band.
- **Waste bins for not-infected needles and scalpels** (EWC 18.01.01)
- **Waste bins for toners**
- **Waste bins for exhausted batteries**

Inquiries about the location of the containers must be asked to the person in charge of special waste disposal. Each container must clearly indicate its EWC code, with an adhesive label or with an inscription done with an indelible marker, the description and the laboratory of origin. This information is an integral part of the documentation for the management of special waste. If something is missing, disposal cannot be performed.

**It is the person in charge of waste disposal who HAS THE RESPONSIBILITY to check the contents of the waste bins; since any mistake can have criminal consequences, waste disposal must be organized in such a way that the person responsible of it can personally check the contents.**

For this purpose, the user (i.e., producer of the waste) must:

1. *Know the EWC codes and consult the chemical incompatibility tables so that waste can be placed in the correct bins and canisters.*
2. *In case of doubts on the correct bin/canister to be used for the specific waste, the user must never take any hazardous action, but on the contrary must consult the person in charge of waste disposal.*
3. *Always check the presence of the label on the waste bins. The label must be placed on the front side of the waste bin and NOT on the lid. The label must indicate the code of the waste to be disposed of, its description, the laboratory, and the date.*
4. *When the bins are full, the contents must be checked by the person in charge of special waste who signs the check on the label. The bins are designed in such a way that once closed they cannot be reopened. For this reason, they must NOT be closed before the inspection by the person in charge of special waste.*
5. *Close the bins and weigh them on the appropriate scales. Add their weight on the label and place the waste bin in the appropriate storage site. Place the containers in the appropriate spaces and not outside.*

Liquid chemical waste, stored in the appropriate canisters and waiting to be delivered to the temporary storage, must be kept in a collection tank with a volume not less than the maximum capacity of the container. They must be stored closed, under hoods or in suctioned cabinets and away from heat, solar radiation, and electrical panels. Moreover, they must not be placed at the top or in precarious equilibrium. Adequate collective and individual protection measures must be used at all stages of waste handling, e.g. overalls, gloves, masks, goggles. If you are unsure of the category of waste, ask the person responsible for waste disposal and do not proceed with hazardous action.

### **Each user has the responsibility to**

Carefully select the correct container according to the waste to be disposed of.

### **It is the responsibility of the person in charge of waste disposal (or, on his behalf, the person in charge of the laboratory)**

To ensure that the contents of the collection containers for solid waste correspond to the description of the EWC code on the label.

### **It is forbidden**

To mix chemically incompatible substances. Mixing incompatible substances can trigger reactions that can lead to the formation of hazardous vapours or explosions. In each laboratory there are safety data sheets from which all indications can be derived. As a non-exhaustive list, it is also possible to consult the printout attached to this Regulation (SEE ANNEX) which gives some examples of incompatibility of chemicals.

### **It is forbidden**

To mix hazardous waste with different EWCs and hazardous and non-hazardous waste, and it is forbidden to deliver municipal waste in the special waste containers.

### **It is forbidden**

To leave or keep in use not labelled containers, and to add substances in a container whose contents are unknown. In this respect, it is **ABSOLUTELY FORBIDDEN** to mix containers whose contents are unknown.

## **CATEGORIES TO BE TREATED WITH SPECIAL CARE**

### **EWC 15.02.02\* Absorbents, filter materials, wiping cloths, protective clothing contaminated by dangerous substances**

This category includes most laboratory-produced waste: absorbents, sawdust (when used for absorbing oils), contaminated paper, filters, filtering materials (including oil filters not otherwise specified), wiping cloths, safety masks, protective clothing contaminated by dangerous substances, also GLOVES of every kind. Protective gloves are made from polymers that can't be disposed of as plastic waste and must not be placed in bins labeled with the 15.01.01\* code.

### **CER 15 01 10\* Packaging containing residues of or contaminated by dangerous substances**

This category includes contaminated glassware, plasticware, metal containers, pipettes and pipette tips; also synthetic and mineral oil containers. Doesn't include gloves (see above), needles or scalpels (EWC 18.01.01).

### **EWC 14.06.02\* Other halogenated solvents and solvent mixtures**

Includes mixtures of non-halogenated solvents that contain at least 5% halogens (chloroform, chloroform/methanol mixture, methylene chloride, carbon tetrachloride). In particular:

- Residues from Folch/Bligh and Dyer methods (lipid extraction with chloroform and methanol);
- Residues from nucleic acids extraction with a phenol-chloroform-isoamyl alcohol mixture.

NEVER place acetone leftovers (for example, acetone used for cleaning/drying glassware) in bins containing chloroform, due to chemical incompatibility.

### **EWC 14.06.03\* Non-halogenated solvents and solvent mixtures**

Includes acetone, hexane, cyclohexane, ethyl ether, petroleum ether, toluene, ethanol, methanol, isopropanol.

### **EWC 18.01.03\* Wastes whose collection and disposal is subject to special requirements in order to prevent infection**

Includes microbiological laboratory special waste (see D.P.R. 254, July 15, 2003): residues of cultures and stocks, culture plates, contaminated (or potentially contaminated) disposable materials.

To be placed in special cardboard containers (with plastic bags inside), labeled as "*rifiuti sanitari pericolosi a rischio infettivo*", with the biological hazard symbol and the 18.01.03\* code. Black plastic bins (properly labeled) can also be used, especially in presence of contaminated pipettes, glassware, etc.

Solid media cultures (especially when the amount is significant) must be autoclaved at least once, to minimize the proliferation of cultures and/or moulds or bacteria. Culture plates must be put in autoclavable bags carefully stored in a vertical position and closed, to minimize leakage.

Sharps (needles, scalpels) must be placed in small plastic bins used for non-contaminated sharps (i.e. Contenitori porta aghi e bisturi (non infetti), code 18.01.01); the bins must then be placed in the 18.01.03\* containers.

Glassware and plasticware (tubes, etc.) should be carefully emptied before placing them in bins or containers, to prevent any kind of leakage. The resulting liquid waste must be stored separately as described below.

Avoid putting too much material (in terms of weight and/or volume) into waste containers, especially cardboard ones. The lids must close perfectly and there should be no risk of ruptures or

deformation. The handles of cardboard containers can't bear an excessive weight; the plastic bag inside should be filled for two thirds only.

Liquid media cultures (or any other biologically contaminated liquid substance) must be autoclaved, then poured into specific 10-liter plastic cans labeled with the 18.01.03\* code.

In case of non-autoclavable liquids the plastic cans must be disinfected (when still empty) using sodium hypochlorite (0.5% of final volume), to guarantee decontamination and safe handling and prevent the release of smells and contaminants in the workplace.

Microbiological waste should be handled using the appropriate DPI (=PPE). Gloves used for handling contaminated waste must be placed in the appropriate container immediately afterwards, avoiding any contact with equipment of communal use.

### **EWC 16.05.06\* Laboratory chemicals, consisting of or containing dangerous substances, including mixtures of laboratory chemicals**

Includes every kind of laboratory chemical, liquid or solid, in their original packaging. Should be placed in a plastic bin, keeping the original packaging and filling the empty spaces with inert, inorganic materials (vermiculite, clay pellets) to avoid collisions and reactions between the different chemical compounds.

Strongly reactive and incompatible chemicals must be kept separately and stored in small quantities. Typical examples are: picric acid, dinitrophenol, trinitrotoluene, every kind of explosive chemical, azides, hydrides, alkali metals (Na, K, Li), peroxides, chlorates and perchlorates. It is necessary to draw up a complete list of the reagents to be disposed of and the relative quantities inserted in each bin, this list must be communicated to the waste disposal company before the request for disposal on the web application. The company will provide specific guidance on how to handle the different reagents.

### **Catalogued furniture and equipment**

Includes furniture, laboratory equipment, computers, printers, etc. that have been catalogued in the official inventory. The respective entries must be canceled before disposing of these objects. Contact the person in charge of inventory entries (see website) and send the inventory label accompanied by a description of the object.

When in doubt, ask your supervisor or contact the administrative office.

(See "Chi fa cosa").

### **TEMPORARY STORAGE**

Due to safety reasons, dangerous waste must never be left in the laboratories. The waste must be transferred in the temporary storage site as soon as possible. In the case of small amounts, partially filled containers can also be stored.

The bins/containers/cans should be put inside appropriate tanks (to prevent leakage), transported on 4-wheeled carriers and stored in containment tanks, ordered by EWC if possible.

NEVER leave containers outside the storage site.

Cardboard containers for EWC 18.01.03\* waste must be placed in a weatherproof area, protected from humidity and any potentially damaging agents.

Damaged, inappropriate or not properly labeled containers must NEVER be placed inside the storage site, as they can't be correctly disposed of.

**DISPOSAL**

The person in charge of waste disposal (or his substitute) fills in the register log and hands over the waste to the transport company. This will be scheduled according to the amount of waste present in the storage site and not on a timeline basis.

The person in charge will fix an appointment for the collection and transport of the waste by the authorized company.

WHEN IN DOUBT ALWAYS ASK THE PERSON IN CHARGE OF WASTE DISPOSAL, THE LABORATORY SUPERVISOR OR YOUR PERSONAL SUPERVISOR.

IF THEY AREN'T AVAILABLE, SUSPEND EVERY LABORATORY PROCEDURE AND WAIT UNTIL NEXT DAY.

LOOK UP THE RECOMMENDED WEBSITES AND ALWAYS PUT FIRST PERSONAL AND ENVIRONMENTAL SAFETY.

Date.....

Signature.....

Supervisor's signature.....