

Università degli Studi di Firenze

Centro di Risonanze Magnetiche - CERM
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Health and safety manual

Standards of practice for the safety and risk prevention in the workplace of CERM

(Updated October 2020)

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1. Identification of accident prevention and security measures

1.1 Access and use of Cerm facilities.

Access to Cerm buildings is allowed every day by means of a badge. The use of badge is strictly for personal use, in case this indication is not observed the badge will be withdrawn.

The CERM alarm systems (volumetric and entrance doors) are inserted automatically at 22.00 and switch off at 7.00 am from Monday to Friday; Saturday, Sunday and public holidays the systems are always inserted.

To access CERM when the alarm is on you will need to show up at the guard post or communicate the security service operator (Tel 3818 from internal phones or 346 6973395 from cell phones) the need to come in, so that the alarm can be switched off. It is also necessary to communicate to the guard post when you leave.

If you need to open a window on the ground floor or a security door in 24h you need to communicate in advance to the guard post (Tel 3818).

People who are not an institutional member of CERM (students, scholarship holders, doctoral candidates, ecc.) are allowed to access to CERM building only if authorized and under the responsibility of the scientific or laboratory responsible person. In any case they have to be covered by personal accident insurance.

Representatives from commercial partners, students, visitors are not allowed to access to the Cerm building if not accompanied by authorized personnel. New users must undergo a presentation about general and specific safety rules with the scientific responsible person and with the responsible person in charge of the facilities where the activity will be carried out.

1.2 Safety and conduct rules.

The users of Cerm facilities have to adhere to the following rules and they will sign a declaration of understanding of the rules. Likewise will have to do non-staff users who will be operating under direct control of the lab scientific responsible persons. New users will have to familiarize with the location of safety equipment and be instructed on their use.

1.2.1 Safety equipment

- Emergency exits
- Showers
- Fire extinguishers
- First-aid kits
- Eye-washing stations
- Alarm signals
- Personal and collective protection equipment
- Forced aspiration with activation by oxygen sensor and/or manual in the NMR laboratories

1.2.2 Safety rules

The following collective security rules are handled by the employer, but it is also the responsibility of the user to report any failures or deficiencies:

- All safety equipment must be signaled by Polo offices and must be easily accessible
- First-aid kits must be always fully equipped and placed in visible locations
- Danger areas must be well sign-posted
- All environments must be well ventilated
- It is forbidden to work on electrical wiring and electrical machines
- All materials and equipment used in the laboratories must be purchased in accordance with the law and kept in perfect functionality. The user guide must be kept in the vicinity of the equipment.

Malfunction of equipment must be reported promptly to the Director or the responsible person. Defective equipment must be repaired by specialized companies.

- Users must be informed about the emergency evacuation procedures of the laboratories and places where they work.
- The numbers of users who work in the laboratories at any time must be suited to the laboratory capacity.
- On the door of every laboratory must be indicated the responsible person's name.
- In case of long absence, the responsible person must indicate a substitute so that activities, which are controlled by him, will not be interrupted.

1.2.3 Conduct rules in chemistry and biotechnology laboratories

In all laboratories the following conduct rules must be respected:

- Access to laboratories is forbidden to non authorized people
- Never work alone in the laboratory
- It is necessary to wear suitable clothing and always a protective lab coat (it must be in cotton or non-flammable material) and protective goggles.
- It's forbidden wear shoes that leave feet uncovered (sandals, slippers, etc)
- Long hair must be tied behind the head
- Stay in the laboratories and corridors only when required for the work activity. Backpacks, bags, coats, raincoats, umbrellas, etc. must be stored in the office rooms.
- Do not smoke, run, eat or drink in the laboratories
- Do not use laboratory containers as food containers (even out of the laboratory)
- Keep the work environment clean and tidy. In case of spilling liquids or solids, broken glass etc., clean immediately observing safety rules.
- Avoid misplacement of common materials in the laboratories (glass, pincers, scissors, etc...)
- Avoid to move acids, bases and dangerous substances keeping containers to eye level.
- Protect eyes with appropriated goggles when using UV lamps. Protect also other body parts exposed (hands, legs, etc...).
- Do not watch through the opening of a container containing a reaction mixture
- Always use protective gloves specific for the work being undertaken.
- For the handling of dry ice, liquid nitrogen and liquid helium, use goggles, shields and suitable protective gloves. Protect hands with appropriated gloves in case of use of the fridge at -80 °C; the same is valid for the use of autoclave.
- Always protect hands while working tubes or glass rods.
- Wear protecting clothes appropriated for the access to cold room. Do not leave the container containing liquid nitrogen inside the cold room.
- The suction of liquids in the pipettes must be done by appropriated aspirators and never by mouth.
- Take reagents extremely carefully, working under extractor hood when using volatile, toxic or smelly substances.
- Use containers of solvents and flammable, toxic and harmful substances only for the time required to weigh and pour them. Store the containers in the appropriated safety wardrobe immediately after use.
- Before doing any risky operation inform the nearby colleague.
- Never heat up flammable solvents on a naked flame and always do it with extreme caution. Do not use laboratory burners near flammable substances.
- Be careful when using centrifuges. Set up all parameters correctly.
- As far as possible do not leave experiments in progress or equipment in function unattended.
- Do not leave equipment and instrumentation working unnecessarily
- Do not throw liquids or materials into the washbasins, unless they are diluted aqueous solutions, not toxic or harmful. In that case flush with water.
- Never lay containers or heavy objects on the edges of the tables

- Never put in tagged containers any substance different from what indicated in the label
- Ensure that gas taps are closed before leaving the laboratories

1.2.4 Pay attention to waste

- Chemical wastes of any kind (solid or liquid) must always be put in the appropriate and dedicated containers for later disposal
- In case of broken glass, put the glass pieces in the appropriate containers, separating contaminated from non contaminated glass.

1.2.5 Pat attention to fire!

- Solvents stocked in laboratories must be minimized
- In case of fire inform immediately the responsible person and prepare to evacuate in an orderly fashion, turning off naked flames and electrical equipment.

1.3 Identification of appointees

Ordinarily, the scientific responsible and the people responsible for the laboratories where they work, i.e. the professors and the researchers, are responsible for the adherence and the application of the rules mentioned above. This is also applicable in relation to the reception capacity of the lab.

The assignment of non structured people to their appointees takes place with the communication to the Director and authorization of the beginning of their activity in Cerm. Authorized people receive from the secretariat the identification card and a copy of these safety instructions that must be signed for receipt and acceptance.

The names of the appointees shall be indicated on the doors of all laboratories where research activities take place. Should laboratories be used by more people the responsibility can be shared.

Technical staff, appointed by Director with decision of the CERM Scientific Council, shall also be put in charge of the application and respect of behavior and safety rules in laboratories, they are: Marco Allegrozzi, Rebecca Del Conte, Leonardo Gonnelli, or anyone who, although without legal investiture, in the specific moment exercise similar functions (in charge de facto).

1.4. Attributes of the appointees

- Inform people who work in Cerm and whom they have responsibility for, about these rules and regulation. Users will sign as acceptance. These documents will be stored in the secretariat.
- Evaluate risks related to planned operations.
- Inform the operators about the above risks and safety measures to be taken.
- Verify efficiency of safety equipment and laboratory equipment and notify malfunctions or deficiencies to the Director who shall act as required.
- Verify that safety data sheets of chemical products required for their own and their colleagues activity are available.
- Ensure that legal requirements are adhered to in case of an incident to a colleague, as per the regulations.

- In case of great or incumbent risk, they shall adopt emergency measures, including the interruption of equipment or processes.
- Look out for the execution of procedural rules, regulatory rules, guidelines, work order, and operating procedures within their own area of expertise.
- Inform promptly and formally to the Director about risks that cannot be removed by their own initiative or reduced to acceptable levels.
- Inform formally the Director about professional misconducts of their colleagues.
- Inform to the Director about pregnancy of workers belonging to laboratory they are responsible for (D.Lgs. 151/2001).

1.5. Materials

1.5.1 Chemical safety data sheets

All users handling chemical reagents must read the labels carefully, paying particular attention to the chemical pictograms and the H and P captions. The safety data sheets for the chemical substances are available in paper format near the reagents cabinet, or in electronic format in each computer present in the lab. The safety data sheets can also be found on the internet on the manufacturer's web site. For any queries, please refer to the laboratory manager.

1.5.2 Carcinogenic substances

Substances labeled with the following captions should not be handled and should be replaced with other less harmful.

H350 – carcinogenic H351 – Is suspected of causing cancer (H350 and H351 replace the GHS – Global Harmonized System – R45: Can cause cancer R49: can cause cancer if inhaled). If replacement is not possible, all operations must be carried out under extractor hoods, using appropriate safety equipment (masks, gowns, security glasses and gloves). Laboratories where extractor hoods have not been installed do not comply to safety and security regulations: it is therefore forbidden to handle the above mentioned substances there.

In the CERM Laboratories, the only carcinogenic substance currently used is Acrylamide solution.

An updated list of H350 and H351 (or R45 and R49) carcinogenic substances can be found the Security Office of the "Polo".

For completeness, find the following extract of the acrylamide security tab:



H302-H315-H317-H319-H330-H334-H340-H350-H361f-H372
P201-P260-P280-P284-P305 + P351 + P338-P310

- IDENTIFICATION OF HAZARDS

2.1 Substances and mixtures classification according to regulation (CE) n.1272/2008 [EU-GHS/CLP]

Acute toxicity, Ingestion (Category 4)

Acute toxicity, Inhalation (Category 2)

Skin irritation (Category 2)

Eyes irritation (Category 2)

Sensitization in the respiratory system (category 1)

Skin sensitisation (category 1)

germ-cells mutagen (category 1B)

Carcinogenic (category 1B)

Reproductive toxicity (Category 2)

Specific target organ toxicity – repeated exposure (category 1)

Substances and mixtures classification to EU 67/548/CEE or 1999/45/CE guidelines :

Toxic by ingestion. Can cause serious health damage in case of prolonged exposure (inhalation, skin contact, ingestion).

Can cause cancer. **Can cause genetic hereditary alteration.** Harmful for inhalation and contact with the skin Can cause sensitization by contact with the skin. Can cause decreasing of fertility

Eyes and skin irritation

2.2 Label elements

Labeling according to regulation (CE) n. 1272/2008 [CLP]

Pictogram

Warning Danger

Indication of danger

H302 Harmful if swallowed

H315 Causes skin irritation

H317 Can cause skin allergy

H319 Causes serious eyes irritation

H330 Lethal by inhalation

H334 Can cause allergic or asthmatic symptoms or breathing difficulty if inhaled

H340 Can cause genetic alteration

H350 Can cause cancer

H361f Suspected of causing infertility

H372 Can cause serious health damage in case of prolonged and repeated exposure

Warnings advise

P201 Obtain special instructions before use

P260 Do not breathe dust/fumes/ gas/ fog/ vapours / aerosol

P280 Wear gloves

P284 Use respiratory equipment

P305+P351+P338 In case of eye contact: rinse thoroughly for several minutes. If it is possible remove any contact lenses. Continue rinsing.

P310 Call immediately poison control center or a doctor.

1.5.3 Biological agents

Definitions:

- a) Biological agent: all micro-organisms, including those genetically modified, cell cultures and human endoparasites, which may cause infection, allergy or toxicity;
- b) Microorganism: any microbiological entity, cellular or not, capable of replication or transferring genetic material;
- c) Cell culture: the in-vitro growth of cells derived from multi-cellular organisms.

Classification of biological agents

The biological agents are divided in four groups according the risk of infection:

- a) Group 1 biological agent: an agent that is unlikely to cause human disease;
- b) Group 2 biological agent: an agent that can cause human disease and might be a hazard to workers; it is unlikely to spread to the community; there are usually effective prophylaxis or treatments available;
- c) Group 3 biological agents: an agent that can cause severe human disease and present a serious hazard to workers; it may present a risk of spreading to the community, but there is usually effective prophylaxis or treatment available;
- d) Group 4 biological agent: an agent that causes severe human disease and is a serious hazard to workers; it may present a high risk of spreading to the community; there is usually no effective prophylaxis or treatment available.

- *Authorization use of biological agents*

Only group 1 biological agents can be handled at the CERM. The use of agent of higher classed needs

authorization from USL or Department of Health.

- *Technical, organizational and procedural measures*

All activities that present health risks must be subject to technical, organizational and procedural measures, to avoid exposure to biological agents:

- a) Avoid the use of a harmful biological agent, if the nature of the activity so permits,
- b) Minimize exposure or potential exposure of workers to the risk of biological agents.
- c) Plan suitably working processes
- d) Adopt collective protection measures or, where exposure cannot be avoided by other means, individual protection
- e) Adopt hygiene measures to prevent or reduce the accidental propagation of a biological agent outside the workplace.

For Group 1 biological agents use following devices:

- Sterilize bottles and tools in autoclaves at 15 psi for a minimum of 15 minutes at 121°C
 - Use sodium hypochlorite solution at 10% to clean laboratory benches before and after the use of microbes or nucleic acids (DNA/RNA)
 - Decontaminate work areas at least once per day and after every loss of material.
- Nucleic acids, enzymes, microorganisms and chemical substances shall not be kept in the fridge with food and beverages.

For Group 2, 3 and 4 biological agents, appropriate prevention measures and protection devices will be communicated once the authorization to use the agents is granted.

- f) Use the biohazard sign and other relevant warning signs
- g) Develop appropriate procedures for collecting, handling and processing samples of human or animal origin
- h) Provide means for safe collection, storage and disposal of waste including the use of secure and identifiable containers, after suitable treatment of the waste where applicable
- i) Agree the procedures for the safe handling and transport of biological agents within the workplace.

- *Information*

Users of biological agents must have available information and instructions, in particular with regard to:

- a) Risks to health from biological agents
- b) Precautions to be taken to prevent exposure
- c) Hygiene measures that must be observed
- d) Function of work and protective clothing, safety equipment and their correct use.
- e) Procedures that must be followed for proper handling of group 4 biological agents.
- f) How to prevent accidents from occurring and measures to adopt to reduce consequences

1.5.4 Cryogenic liquids

Users of cryogenic liquids, liquid helium and liquid nitrogen, must protect eyes, face and skin against liquid splashes by wearing safety goggles, protective shield, cryogenics gloves and must wear lab coat and closed shoes. They shall also work in conditions of adequate ventilation.

1.6 Instrumentation

1.6.1 Ultrasound equipment

The ultrasound equipment (ultrasound bath or high power ultrasonic processor) shall be placed in an appropriated and sound proof room. Users shall remain in the room only for the time needed to start the equipment.

1.6.2 Magnetic Resonance

In the rooms where NMR and EPR equipment is present, there are magnetic fields of different intensities. In accordance to D.M. 2/08/91 about diagnostic equipment at magnetic resonance, wherever there are static magnetic fields, the following are identified:

Areas where access is normally forbidden to the population and to workers at risk: the areas where the stray field of magnetic induction exceeds the Action Values (VA) ie, it is equal or greater than 0.5 mT (5 Gauss)

Areas where the Exposure Limit Values (VLE) are respected for workers: ie in normal working conditions, areas are affected by external magnetic induced field values up to 2T (20000 Gauss) and up to 8T (80000 Gauss) for localized exposure of the limbs or under controlled working conditions.

All areas where the electromagnetic field levels exceed the VA set for the population are properly marked and delimited.

Areas with electromagnetic field equal or larger than the VA of 0.5mT (5Gauss) can be access only by staff duly authorized by the Director of CERM and, anyway, these areas will be off- limits to people for whom there are contraindications to exposure to high frequency electromagnetic fields as, for example: carriers of electrical implants (peacemaker, defibrillator, metallic prosthesis), people with deep alterations to organs and tissues considered target of non-ionizing radiation (nervous system, gonads), pregnant and breast feeding women, children under the age of 18 and people with sickle cell disease.

Appropriate permanent signs shall be displayed at the entrance of the controlled areas and of the room where equipment is present. Work and study stations or activities which involve long time presence cannot be established in the controlled admission area. It is allowed to stay in the vicinity of the magnets only for the time needed for the work activity (insertion of samples, tuning of parameters).

It is advised not to introduce magnetic cards, watches or cell phones in these rooms, as they could be damaged, and ferromagnetic objects which could be accidentally charged or be attracted by the magnetic field.

The reference levels for the exposure of workers to static magnetic field according to VLE and VA indicated in the D.Lg 159/2017 and ICNIRP (International Commission for the protection from non-ionizing radiation) where:

Exposure	VLE for static magnetic induction (mT)
normal working conditions	2000
localized exposure of the limbs	8000
controlled working conditions	8000

Exposure	VA for static magnetic induction (mT)
Interference with active implantable devices, eg. cardiac stimulants	0.5
Risk of attraction and propulsion in the peripheral field of high intensity sources	3

In case of a magnet quench the forced suction system, available in the laboratory where the instrument is, will start automatically but it is good practice to leave the laboratory as quickly as possible. Further and detailed information is available in the risk assessment documentation of CERM.

1.6.3 Centrifuges

The centrifuges have to be used correctly and following carefully the instruction manuals. It is necessary to check the balance of the centrifuges. Do not stand unnecessarily near the centrifuges during their operation.

1.6.4 Autoclaves

The autoclaves have to be used correctly and following carefully the instruction manuals. Pay attention to uncovered parts of the body (wear goggles, gloves, etc.). Do not stand unnecessarily near the autoclaves during their operation.

1.6.5 Ultraviolet devices

The ultraviolet devices have to be switched on for the shortest possible duration.

UV transilluminators: Always use fixed protective screens and special protective goggles for UV for the use of UV equipment. It is advisable to wear the protective visor, available near the transilluminator, to protect the face.

Antiseptic lamps (biological hoods and portable lamps): Use only for the time needed for the sterilization of concerned surface. The time of operation of an antiseptic lamp in biological hood shall not exceed 30 minutes. Portable lamps cannot be switched on for more than 10 minutes. UV radiations can get through the screens of biological hoods. Do not stand near biological hoods when UV lamp is switched on.

1.6.6 Ultrafreezer (-80°C)

Wear appropriated gloves for low temperatures. Open the fridge only for the time needed for stocking / collection of materials. Check the correct closure of the freezer. In case ice is present on the freezer doors it is necessary to remove it. Verify that near the freezer there is no water on the floor. If this is present it is necessary mop it up to avoid slips.

1.6.7 Cold room

Enter the cold room and stand in for the minimum time needed. It is good practice to wear a jacket to protect from the cold. The cold room is an acoustically and thermally isolated environment. In order to allow prompt assistance in case of sickness inside the cold room it is necessary to inform somebody (lab colleagues, etc...) about the access to room.

1.6.8 Transport of cultures and chemical agents

The containers (flasks, centrifuge tubes, etc...) for handling of cultures of E.Coli, and any other glass or plastic containers containing chemical agents (in particular glass containers for the collection of solvents, acids and chemical agents in general) must be always transported inside plastic buckets with a handle.

- Trolleys shall be used when the transported load exceeds a certain weight

- Compressed gas cylinders must be equipped, during the transportation, with protective cap and the must be transported on trolleys fitted with fixing chain. Cylinders containing incompatible gases such as: oxygen/hydrogen, oxygen/ammonia, chlorine/ hydrogen, chlorine/ammonia shall never be stored in the same room. Cylinders must be securely fastened to the wall with chain provided.

1.6.9 Transport of cryogenics gas

The handling of cryogenic gases must be carried out with the aid of insulated containers, suitable and

approved (Dewar). Trolleys shall be used if containers are heavy. Always wear special goggles and gloves for protection from low temperatures and closed shoes.

1.7 Management of chemical and biological waste in the CERM

1.7.1 Collection and disposal of chemical waste

The subject will be defined in a specific regulation that will concern the entire « University Pole ».

It is the responsibility of the Director designates a representative of the Centre, both for chemical waste for biological ones: Marco Allegrozzi for CERM and Leonardo Gonnelli for the laboratories at the Department of Chemistry.

General guidelines:

The reference regulations refer to the D.Lgs 22/97 and its following modifications. Within the CERM labs, dedicated tanks have been installed for the collection of liquid and dry waste as well as for solid waste to be recycled. All these substances, derived from laboratory activities are to be considered as specially hazardous waste.

It is strictly forbidden to dispose of any waste in the environment or through the sewage system.

When handling hazardous waste, single users or groups must take the appropriate precautions, i.e. wear lab gowns, protective gloves, masks and security glasses.

In the following table are listed the main categories of waste substances that are produced in the CERM laboratories:

CER waste code	Description	ONU number	Transport rank RID/ADR	Hazard rank	Contents
180103*	Infected or potentially infected waste (liquid biologic waste)	3291	6.2	H09	Micro-organisms growth substrates, all liquids that have been in contact with micro-organisms, proteins or DNA
180103*	Infected or potentially infected waste (plates and tubes) (solid)	3291	6.2	H09	Petri dishes, test tubes or any non powdery solids that have been in contact with micro-organisms, proteins or DNA
160506*	Lab chemicals (liquid)	3287	6.1	H04; H05; H06; H3B	Solutions containing acids, bases, salts, distaining solutions, acryl-amide gel etc
160506*	Lab chemicals (solid)	3288	6.1	H04; H05	Acryl-amide gel, agar gel
150202*	Absorbent and filtrating materials, cloths and security garments	3077	9	H04; H05	Used paper, filter paper, rubber, gloves, chromatography residues
150110*	Glass, plastic and metal containers having contained hazardous substances	-	3 – 6.1	H05	Reagents bottles, pipette Pasteur, syringes, glass shards, plastic bottles, metal containers
160211*	Refrigerators	NO ADR	-	H14	

					Refrigerators containing CFC, HCFC, HFC
160213*	Video	NO ADR	-	H05	Video sets
160214*	Out of order equipment				Computers, printers

For any other typology of waste product please refer to the reference standard (i.e. organic Cl and non Cl compounds, expired reagents, toners etc.).

1.7.2. Disposal

Waste must be collected in the dedicated containers according to the different typologies. Each container must be labelled with its category, code and source laboratory. The label must be placed on the container prior to its usage. All labels, plastic bags and containers are available from room n.61 in the LAP. IN CASE OF ANY DOUBT IT IS NECESSARY TO CONTACT THE HEAD OF LABORATORY.

Waste must be collected in the dedicated containers according to the different typologies. Each container must be labelled with its category, code (**as per above table**) and source laboratory. The label must be placed on the container prior to its usage. All labels, plastic bags and containers are available from room n.62 in the LAP.

In case of any doubt it is necessary to contact the head of laboratory.

-Make sure all labels are filled in correctly and clearly. **It is in the Head of Lab responsibilities to make sure the contents in the disposal containers correspond to the CER code on the label.**

-Hazardous waste must not be kept in the laboratory longer than necessary.

-It is good practice to dispose of different chemicals according to their compatibility, in order to use a minimum number of containers. It is necessary to know properties and compatibilities of all chemicals used during lab experiences; for all information on chemicals incompatibility refer to the security tabs present in the laboratory premises or available on-line on the website of the manufacturers.

-It is forbidden to dispose of chemicals using containers which contents are unknown. It is also forbidden to leave behind or use containers which are not labelled.

-In case of having to dispose of organic solvents, it is necessary to keep halogenated (halogens content >0.5%) and non-halogenated waste separated.

-Chemical and biological waste must be stored away from heat sources, direct sun and electrical boards.

-We suggest to store liquid waste containers in a storage basin which volume should not be inferior to the maximum container capacity and to keep absorbent materials in case of spilling.

1.7.3 Transport

Once containers are full, they must be transported to rooms n. 62 and n. 58, appointed as temporarily storage in the LAP. During transport, the following rules must be strictly respected:

- Make sure containers are properly closed before they are moved.

-Always use protective individuals measures for each handling.

-Use four wheels caddies, equipped with security basins in case of spilling of liquid waste. The volume of the basins must not be inferior to the maximum capacity of all containers.

-Never transport chemical waste on your own.

1.7.4 Temporary storage

- Storage is only authorized within rooms appointed as temporary waste storage. The access to these rooms is restricted.
- All charge and discharge operation are entered in the Log by the appointed operator, as well as the delivery to the authorized transport company.
- Containers which do not abide safety rules or that are not labelled will not be accepted in the temporary storage and will not be disposed of.
- Waste containers must be weighed and separated between the storage rooms according to their typology and following the instructions on wall signs.

ROOM 62 LAP

- Clean plastic containers, stored in plastic bags
- Clean metal containers, stored in plastic bags
- Clean glass containers, stored in plastic bags or in dedicated containers
- Contaminated glassware: reagents bottles, Pasteur's, syringes, broken glass etc.
- Absorbent material: used paper, filter paper, rubber, gloves, residues from chromatography
- Contaminated dishes and contaminated biological material
- Liquid biological waste
- Empty toner
- Expired liquid reagents
- Expired solid reagents

ROOM 58 LAP

- Mixed solvents
- Mixed halogenated solvents (halogens content >0.5%)
- Used oil: residues from void pumps and other equipment
- Acid solutions
- Basic solutions
- Liquid reaction residues
- Solid reaction residues

1.7.4 Disposal

All containers in the temporary storage must be properly closed and weighed. The weight will be written on the label together with the content description , the CER code and the laboratory of origin. The appointed operator will provide all information concerning the disposal to the Technical Office of the University or to the designated chemical waste disposal company. The appointee will also take care of all administration procedures (filling the charge and discharge log, USB key procedures for the SISTRI) and of the collection of the waste from the designated company.

2. Application of security and prevention measures

2.1 Security and prevention instructions

- In case of an accident, immediately perform first aid and, if necessary, call for medical help.
- Do not touch any wounds or medications without protective gloves
- Do not administer beverages to an unconscious person. In case your eyes get in contact with any chemical, rinse abundantly under water (min 15 minutes)
- In case of small burns or in case of accidental contact of the skin with any chemical reagent, wash abundantly with water.
- In case of accidental ingestion of any chemical reagents, call immediately for medical help.

The wounded employee, after having received the appropriate care, must refer to his/her employer presenting a written declaration describing the circumstances of the accident and attaching all medical documentation. The affiliation office when the accident has been notified will contact the representative of Polo (Mr. Orlando Baroncelli), and he will send him/her the complete file. For any accident causing at least one day of absence from work, the representative will ask to the prevention and protection service the number of accident register. For any accident causing more than 3 days of absence from work the representative will make (within 48 hrs or within 24 hrs in case of death) a complaint to the INAIL and appropriate Public Safety, completing the appropriate forms with attachments.

2.2 Behaviour in case of emergency

An emergency plan has been prepared for CERM by the University of Florence and is available at the Reception or online, on the CERM website (www.cerm.unifi.it).

In the plan are listed the names of all people in charge of controlling and supervising the application of emergency procedures. The supervisors will meet twice per year to update on the security systems and to form any new attendant of CERM.

During the above mentioned meetings evacuation drills will also take place.

In case of emergency or danger, Reception must immediately be warned: intern n. 4252 from 7:30 to 19:30.

Outside these hours, surveillance must be warned by calling the 3818 (346 6973395 from cell phones).

In case of a fire, emergency medical service or rapid deployment forces (police or carabinieri) are needed, call immediately the following numbers.

Unique number for emergencies 112 (from internal phones 0112)

2.3 Special emergency measures:

2.3.1 Spilling of dangerous liquids

Immediately intervene with the available absorbing material

2.3.2 Fire emergency and protection measures

Trained staff has the task of addressing situations of average risk in the event of fire and give first aid in case of injury. The **EMERGENCY PERSONNEL** is recognizable by the orange vest. Currently are part of it Marco Allegrozi, Rebecca Del Conte, Leonardo Gonnelli and Cristina Mescalchin.

In the case of a small fire:

- If you see smoke, if you smell a burning odor, or if you notice a small fire immediately call the 4252 and wait for instructions;
- If there is no response to the 4252 activate the fire alarm;

- In the event that there is no immediate danger, remain online to provide more information and stay in the area to help the EMERGENCY PERSONNEL in locating the fire. Otherwise leave the building closing the doors (but unlocked) proceeding along the shortest evacuation routes (indicated by green signs), reaching the gathering point outside the building.

In the case of a large fire:

- Warn other people;
- Vacate the premises and possibly close the doors (but unlocked);
- Activate the fire alarm;
- Leave the building proceeding along the shortest evacuation routes (indicated by green signs) reaching the gathering point outside the building and wait for the instructions of EMERGENCY PERSONNEL

In case of alarm for general evacuation

- Leave the building immediately close the doors (but unlocked), proceeding along the shortest evacuation routes (indicated by green signs)
- Reach the gathering point outside the building;
- Wait as your EMERGENCY PERSONNEL until all-clear to enter the building

In any case:

- Promptly leave the area, do not delay;
- Stay calm, do not run, do not push, do not scream, do not panic;
- Do not use the elevators;
- Warn the other people around and help those who are in trouble, protecting themselves; if it is impossible to help them, warn the PERSONAL EMERGENCY providing data on the presence and location of people still inside the building. Tell the PERSONNEL EMERGENCY if you remain trapped.
- Do not stand along escape routes.

Only if you can:

- Secure equipment and devices
- Close all water taps, tanks, turn off electrical tools the laboratory (equipment for chromatography, pressure tanks, agitators, etc.).

IMPORTANT: DO NOT TOUCH THE NMR INSTRUMENTS

In case of injury

- Call 4252, remain waiting for instructions and stay with the injured person;
- If there is no response to the 4252 or if the injury is serious, call 112 (0112 from any phone extension), clearly indicating the address of the building, the location, the phone number and condition of the injured person;
- Call again 4252 to warn that the emergency call to 112 was performed.

To extinguish a fire it is necessary to intervene on one of three factors causing combustion. Such factors can be eliminated through extinguishing agents, each with a specific mechanism of action:

On the fuel: the action is the separation of the substance in the combustion remainder not yet involved in the event.

On the combustion air: this is to prevent the contact of the combustion air (oxygen) with the material in the combustion: this is obtained by interposing a means by moving air for combustible or with an inert gas

On the temperature: cooling the fuel material up to bring its temperature below the relative "ignition

temperature" (heat dissipation).

Effect type of extinguishing agents

- On the combustible: separate the burning substance from its intact parts
- On the combustive agent: avoid further contact between oxygen and the combustible. This can be done by interposing fireproof material between the two or by ventilating with an inert gas.
- On temperature: bring the temperature of the burning material below combustion temperature

Effect of extinguishing agents:

Water	cooling
Sand	smothering
Foam	smothering
CO2	cooling + smothering
Dust	cooling + smothering
Halon	negative catalysis*

* it consists in the capture of free radicals in the combustion and the consequent blocking of flame propagation.

2.4 Safety equipment

2.4.1 Material supplied always available and ready for use

Fire extinguishers: scattered around CERM and always indicated by appropriate signs

Glasses: available at the office of laboratory technicians

Gloves: available in all laboratories

First-aid kits: are indicated by specific signs and in particular are located at the toilets

2.4.2 Material commonly found in the corridors of the laboratories of the CERM at the entrance of Via E. Detti.

A red cabinet A:

- 1) 1 frame "EC" visor avenger
- 2) 1 polycarbonate screen "EC"
- 3) 1 pair of gloves for cryogenic gases
- 4) 2 packages of gloves back crust
- 5) 1 package 10 pcs gloves Ultranitril 492
- 6) 1 Tyvek suit termos.c / cap.dup-XL

A red cabinet B:

- 1) 1 frame "EC" visor avenger
- 2) 1 polycarbonate screen "EC"
- 3) 1 pair of gloves for cryogenic gases
- 4) 1 packages of gloves back crust
- 5) 2 pack 10 pcs gloves Ultranitril 492
- 6) 1 Tyvek suit termos.c / cap.dup-XL

**Health and safety manual
Risk assessment document**

**Centro di Risonanze Magnetiche - CERM
Universita degli Studi di Firenze**

**The undersigned, born in,
country....., on....., declares to have read and understood the
booklet on Safety and Risk Assessment Document**

Signature

In the presence of the Scientific Supervisor _____

The director of CERM _____

Sesto Fiorentino, _____

**Health and safety manual
Risk assessment document**

**Centro di Risonanze Magnetiche - CERM
Universita degli Studi di Firenze**

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