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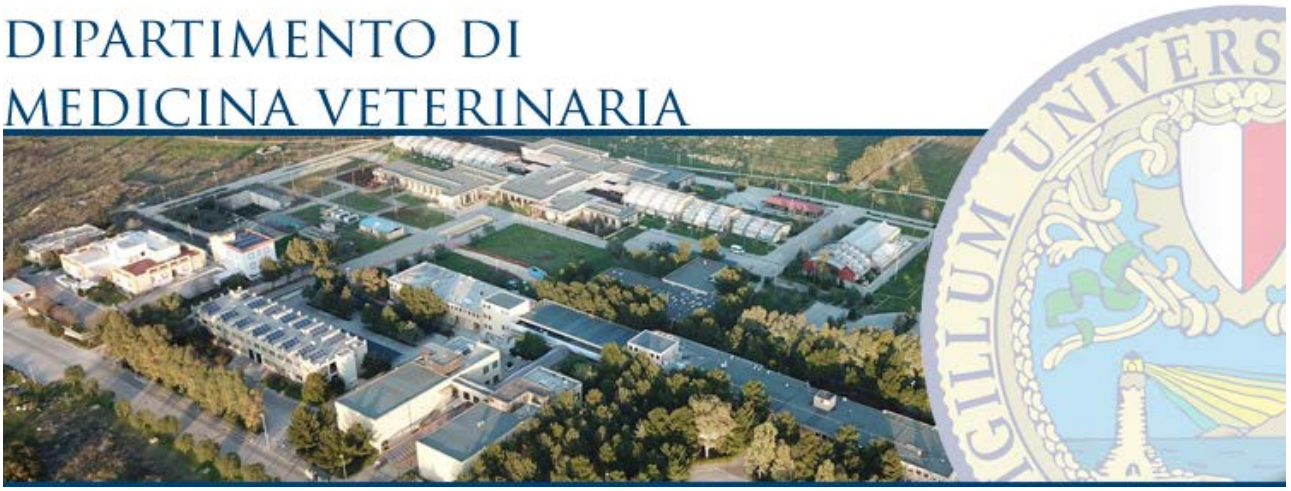

FOOD SAFETY UNIT

BIOSECURITY MANUAL
FOOD CHEMISTRY LABORATORY

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Premise

This Manual has been drawn up by all the Managers of Research and Teaching of the Department of Veterinary Medicine (DIMeV) who carry out activities at the Food Chemistry Laboratory.
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This document is addressed to all structured personnel (teachers and researchers, technical personnel) and non-structured personnel (teaching support personnel such as scholarship holders, doctoral students and research fellows, students, undergraduates, trainees, undergraduate students, occasional visitors, etc.) of the DiMeV who, in approaching their work and training path, must know the possible risks associated with the practical teaching and research activities carried out in the Food Chemistry Laboratory.
In relation to the specificity of the activities envisaged, the peculiarity of individual skills and the subdivision of the distinct tasks and operations, it is necessary to define the specific risks associated with the activities carried out, the operating procedures to be adopted to minimize and prevent them and the measures, intended as correct practices, to be implemented and followed to manage these risks

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1. INTRODUCTION

The term safety in the common sense indicates a characteristic of what does not present dangers or is well defended.
Safety is also a feature of the various activities carried out, linked to:
• to what you have or come into contact with in carrying out the activities, such as buildings, premises, systems, equipment, materials, or other,
• the way of operating.

Safety means safeguarding the physical and mental integrity of those who work.
Physical integrity involves:
• absence of accidents causing injuries (accidents),
• absence of situations that could damage workers' health.
This is why sometimes a distinction is made between safety, when referring to the prevention of accidents (accident prevention: the damage is due to an accident, considered an event that begins and ends, more or less violently, in a time very short) and health when referring to the state of physical and mental well-being of the human body, which is generally influenced by situations that continue over time.
Safety and health are everyone's right, which imposes duties on everyone in order to be guaranteed.
The duties pertain, to the extent pertinent, to all members of the organizational line, involved in any way, directly or indirectly, in the exercise of the activity. This line is made up of an Employer, Manager, Supervisor, Worker (Operator, Student who works in the laboratory, Technical Attaché, Administrative Attaché).
In laboratories, whether for research, analysis, or teaching, safety is a fundamental aspect of the way the activity is carried out.
It is up to not only the Director of the Facility, but also the persons in charge of the activities, the persons in charge, and the workers understood as specified above, each according to their own competences, to work to ensure the creation and maintenance of safety conditions.
For each new activity, from the very first planning stages, the definition of the safety conditions of the entire work process and the way to achieve it must be foreseen (among them, for example, the disposal of the raw materials resulting in excess at the end of the labour, by-products and products that are not used in any way).
The types of risks in laboratories are linked to a series of factors, among which are mentioned, for example:
• dangers presented by the materials used: dangerous substances (toxic, harmful, corrosive, carcinogenic, capable of causing irreversible effects, capable of exploding, flammable, etc.),
• dangerous biological agents, radioactive materials, etc. ;

• dangers presented by the equipment: electrical equipment, centrifuges, agitators and moving mechanical parts in general, pressure and vacuum systems, at high or low temperatures, etc. ;
• dangers presented by structures, rooms, systems, furnishings (scarcity or bad use of spaces, crowding, unsafe gas distribution, unsuitable worktops and hoods, etc.);
• not always adequate training of operators (including unstructured personnel, students, trainees, doctoral students, scholarship holders, guests for various reasons).

The levels (or entity) of risk can be different, in relation to the specific situations present and are essentially linked to the entity of the possible damage and to the probability that the harmful event will occur.
The level of risk can be reduced through information and training, which lead to awareness of everything connected with the work activity and to operate correctly, with a sense of responsibility and prudence, in order to reduce the possibility /probability of the occurrence of an event or that its occurrence may cause damage, or even limiting its extent should this occur in any case.
There are rules issued in order to reduce the risks and their entities; the main ones are described in the national and community regulations and, as such, are accompanied by sanctions for those who fail to fulfill their respective obligations.
This guide contains general rules of conduct in the laboratories of the Department of Veterinary Medicine of the "Aldo Moro" University of Bari where chemical substances are used; takes into account current regulations, such as those concerning the improvement of safety and health in the workplace, fire prevention, classification and labeling of dangerous substances, waste disposal.
These standards represent minimum measures to be followed. Detailed rules are contained in the operating procedures dedicated to the various specific topics, the availability of which will be notified from time to time through notices in the laboratories, subject to appropriate training; a copy of the regulations will be made available for consultation in each laboratory or group of laboratories.

2. MAIN BIOSECURITY STANDARDS

2.1. Generality

All activities, including those that take place in research, analysis or teaching laboratories, are subject to laws and regulations that must be taken into consideration right from the planning stage of the activities themselves. Each operator is required to comply with the minimum safety measures indicated in the manual.

2.2. General rules of conduct

1. Carefully read the labels on the containers in advance, with particular reference to the danger symbols, the risk phrases ("R phrases" or "H phrases") and the safety advice ("S phrases" or "P phrases") reported on them.
2. Beforehand, carefully read the safety data sheets (SDS) of the chemical products you intend to use. These sheets, which must be provided by the seller of the products, must be available to the user in the laboratory or near it.
3. Always and correctly label all containers, so as to be able to recognize the content and its danger at any time.
4. If you intend to reuse a container previously used with products other than those you intend to introduce, clean it carefully, completely remove the label relating to the old product, and apply that of the new one.
5. Always keep all containers with chemical products perfectly closed.
6. Do not leave unidentifiable material in work areas.
7. Always adopt the criterion of replacing what is dangerous with what is not or is less dangerous.
8. Always use collective protection devices (hoods, localized aspirations, screens, etc.).
9. Work on worktops (benches and hoods) of suitable materials.
10. Always use personal protective equipment (PPE) appropriate for each type of risk (overalls, gloves suitable for the agent to be handled, safety goggles, visors, masks suitable for the agent from which they must protect, footwear, etc.) which must be used correctly and always kept in good state of maintenance, notifying any deficiencies to their manager.
11. Communicate with the other people present in the laboratory to warn of the processing being carried out in the event that it presents any dangers.
12. Maintain order and cleanliness in the laboratory. Avoid excessive presence of appliances, tools and materials on worktops. Promptly remove glassware and equipment when no longer needed. Avoid storing unnecessary chemicals.

13. Do not introduce materials and objects unrelated to the work activity into the laboratory.
14. Refrain from eating, drinking, and keeping food or drink in the laboratory.
15. Don't smoke.
16. Always promptly report unsafe conditions or any accidents to the Laboratory Manager, even if they have had no consequences.
17. Do not work alone, in the area, in risky situations (dangerous substances or equipment or reactions, high pressure boxes, cold cells, etc.)
18. Always check whether particular work processes require the application of specific operating procedures (e.g. operations in cold rooms, or operations with equipment under pressure, or at very high temperatures, etc.).
19. Do not leave chemical reactions in progress unsupervised: they must be stopped in the absence of personnel, unless appropriate structures and procedures are in place. Adopt specific procedures or follow the general ones.
20. Do not pipette by mouth, but use the appropriate equipment.
21. Do not touch doorknobs and other laboratory objects with gloves with which you handled chemicals or radioactive isotopes. It is absolutely forbidden to keep gloves on outside the laboratories.
22. Do not keep scissors, glass test tubes or other sharp or blunt material in your pockets.
23. Avoid the use of contact lenses as they can cause an accumulation of harmful substances, or in the presence of certain substances they can weld themselves to the cornea; in the event of an accident,they can worsen the consequences or jeopardize first aid operations.
24. Avoid wearing high heels and open toe shoes. Long hair must be tied back. Jewellery, especially if dangling, (earrings, bracelets, etc.) could represent risk factors.
25. Do not obstruct the electrical panels and the panels containing the fluid shut-off and regulation devices (cylinder gas, methane, water).
26. Do not obstruct fire and rescue equipment. Do not obstruct or block emergency exits.
27. Prohibit unauthorized persons from accessing risk areas.

2.3. Crowding in the laboratories

1. Avoid crowding of operators or other people in the laboratories as much as possible.

2. In exceptional cases of particular crowding, coordinate your movements with those of other performers. Avoid interference. The space behind the operator's shoulders must also be adequate.

2.4. Information and training

1. The laboratory manager has the obligation to adequately instruct the personnel belonging to the laboratory of competence, including students, trainees, scholarship holders, guests and other unstructured personnel; these subjects are required to follow the information and training actions. The instruction must be in relation to the activities that will be carried out, and the objective is that everyone is informed and trained on:
• risks related to the workplace and duties;
• possible damage deriving from the use of dangerous equipment or substances without due precautions;
• prevention and protection measures to be implemented in each specific situation;
• fire prevention measures and escape routes; contingency plan.
2. The Manager is required to provide every tool in order to achieve these purposes, including the delivery of this manual to every person who has to work in the laboratory.
3. All personnel, structured and unstructured, belonging to the laboratory must:

• refer constantly to one's Manager;
• observe the operational safety standards in force and submit to all the provisions that are given for the purposes of collective and individual protection;
• immediately report any malfunctioning of the prevention and protection devices to the Manager.
4. In particular, the unstructured personnel belonging to the laboratory must:
• actively collaborate with the structured personnel in order to keep the prepared safety system efficient;
• participate in all courses aimed at safety and health organized by the structure;
• read these regulations before entering the laboratories.

2.5. Responsibility towards third parties

Legislative Decree 81/2008 imposes prevention rules for employees of contractors or self-employed workers, for which, among other things, each laboratory manager must implement prevention and protection measures against risks that may derive from the work activity , even towards third parties.

In particular, as regards the liability towards the employees of the cleaning company, during the time intervals in which cleaning is carried out in the laboratories, dangerous substances, biological or radioactive materials must not be present in situations such as constitute danger.

Suitable measures must also be taken for the intervention of personnel of civil, mechanical, electrical maintenance companies, or those in charge of furnishings and equipment (for example and in particular, during maintenance on hoods, their extraction systems - pipes, fans and any filters).

3. HANDLING OF HAZARDOUS SUBSTANCES

3.1. Fundamental standards

1. Ensure that all chemical containers are labeled with the exact chemical name of the contents and with the danger symbols, as well as with the risk phrases and precautionary statements ("R or H and S or P phrases" respectively, plus listed below).
2. Make your own the contents of the safety data sheets (SDS) of the chemical products you intend to use. For additional and more extensive information, also keep in mind the possibility of consulting paper or computerized databases.
3. Keep very limited quantities of flammable substances in the laboratory, sufficient for a few days' work, leaving the larger quantities in the appropriate storage rooms outside the laboratory.
4. Keep dangerous substances in special safety cabinets suitable for the type of danger (for flammable products or for products otherwise dangerous to health and possibly equipped with suction also in relation to type and quantity), on the outside of which must be reported the danger symbols specific to the content.
5. Whenever possible, replace dangerous products with others that are not dangerous or less dangerous.
6. Keep incompatible products (which could react with each other) adequately separated.
7. Keep an up-to-date inventory of all chemicals, especially carcinogenic ones (R 45 or H 350 and R 49 or H 350i).
8. Flammable substances should not be stored in domestic refrigerators and other environments where there are possible sources of ignition such as sparks or hot spots. Like cabinets, refrigerators too must be marked on the outside with the danger symbols of the products they contain.
9. For the handling and storage of self-flammable substances or substances which, in contact with atmospheric humidity, emit highly flammable gases, follow the instructions in the safety data sheets. Bear in mind the need to operate in the absence of air, replacing it with inert gases.
10. Explosive materials, for sensitivity to shocks or for particular reactivity, must be handled delicately and used only after having made a detailed and punctual risk assessment, resorting to shields of adequate resistance, to a safe allocation. Use extreme caution when using and storing peroxidable products.
11. Bear in mind that inert gases can be very dangerous if the quantities leaked (or evaporated) cause the oxygen concentration in the air to drop below 17%, with risks for survival.

12. Keep in mind that oxygen can be very dangerous with risk of fire if the quantity released causes a concentration in the air equal to or greater than 25%.
13. All operations and processes with dangerous materials (in relation to their chemical-physical properties or their danger to health, such as toxic, harmful, etc., or suspected as such) must be carried out under a chemical laboratory hood (of which suction efficiency must be certain following periodic checks) by keeping the front sliding panel down as much as possible.
14. The weighing of the powders of dangerous substances must be carried out under a hood, or by preparing the materials to be weighed under a hood by subsequently transferring them to an external scale, or, if indispensable, in a dedicated room used for the use of scales in calm conditions. 'air; it is recommended to protect the operating area with paper, in order to collect any residues to be eliminated in the due manner.
15. No chemicals should be disposed of via the sewage system. For their collection and disposal, refer to the specific procedure for laboratory waste.
16. Clean up spills immediately; if the quantity and/or the nature of the spilled product require it, promptly resort to the appropriate absorbent materials with which the laboratory must be equipped.
17. Transport hazardous chemicals and materials properly. The transport of dangerous chemical substances, especially if contained in glass containers, must be carried out with caution, using baskets or trolleys equipped with containment containers, capable of receiving any material spills.

3.2. Behaviors to adopt in the event of an accident

In the event of an accident involving chemicals, as with any type of accident, always and immediately follow the rules contained in the emergency plan, which all personnel must have read before entering the laboratory.
If the accident is minor (and in any case) as a first aid action, act promptly, taking care of:
1. remove contaminated clothing and any PPE, using the necessary precautions;
2. decontaminate any contaminated skin using running water, using the provided showers; if the eyes have been affected, use eye fountains, eye washes or other predisposed systems;
3. if necessary, use the medication kit;
4. do not disperse contaminating substances in the environment, collect them with the protection of the PPE required by the situation; in the case of liquids, use the appropriate absorbent products; clean the affected surfaces well. If there are gases,

vapors or airborne dust, create maximum ventilation in the room by opening the windows and using all available means of mechanical ventilation (hoods, wall fans, etc.).
5. comply with the Emergency Plan also to give rise to the information provided therein.

3.3. Carcinogens

In this lab no carcinogenic substances are used. However, national law provides the following:
with specific reference to Title IX Chapter II of Legislative Decree 81/2008 and subsequent amendments, concerning work activities in which workers may be exposed to carcinogens or mutagens, it is necessary to comply with the following:
1. All work involving the use of substances or preparations bearing the statement "R45 or H350 May cause cancer", "R49 or H350i May cause cancer by inhalation", "R40 or H351 Possibility of a carcinogenic effect - insufficient evidence ” or “R46 or H340 May cause hereditary genetic alterations”, must be avoided by replacing, if possible, these products with others less harmful to health. The same must be done for substances bearing the words "R61 or H360D - May harm the unborn child".
2. If the use of other materials is not possible, the processes involved must absolutely be carried out
separately from the others, so as not to involve people unrelated to the process in question, in a closed system, or under a laboratory hood or equivalent systems, using personal protective equipment (gloves, goggles, masks, etc...).
3. The quantity of product present in the laboratory must be strictly necessary.
4. The number of exposed workers must be limited to what is strictly necessary.
5. The operator must ensure, after use, the systematic cleaning of equipment, environments, etc.
6. Particular care must be taken in cleaning PPE and clothing.
7. For waste, in applying the general laboratory waste procedure, it is necessary to ensure that the collection pending disposal takes place under safe conditions, using hermetic containers labeled in a clear, complete, clearly visible way.
8. In the event of unforeseeable exposure, it is recommended to leave the affected area immediately and notify the Manager.
9. It is forbidden to use these products in laboratories where suitable hoods or equivalent systems are not installed.

Even products already classified R45 or H350 and R49 or H350i or by EC Directives not yet implemented by the State, must be treated in the same manner indicated above. Products suspected of being carcinogenic should also be treated in the same manner.

3.4. Incompatible chemicals

Many chemicals, commonly used in the laboratory, react dangerously if they come into contact with each other. Some of these incompatible substances are listed in Annex 2.

4. SYMBOLS AND DANGER INDICATIONS

Annex 3 lists the danger symbols and wordings of the danger indications relating to the labelling of dangerous substances and preparations, with the indication of the class to which the products are assigned.

The symbols are printed in black on a yellow-orange background.

The descriptions of the individual dangers and of the main precautions, shown next to the symbol and under the danger designation, are indicative and not exhaustive, as the precise knowledge of the specific risks occurs through reading the R or H phrases on the label, and the awareness of the precautions occurs through reading, always on the label, the S or P phrases, listed in Annexes 4 and 5.

5. USE OF DANGEROUS EQUIPMENT

1. Before use, consult the instructions with which each equipment must be accompanied and which must be readily available at all times.
2. When purchasing new equipment, always consider all their characteristics involving safety aspects and make sure that they are fully satisfactory from this point of view as well.
3. If possible, adequately shield glass equipment used under vacuum, under pressure or with moving parts, and always use protective goggles, after making sure before use that the glassware is perfectly intact.
4. For the use of glass equipment under pressure, ensure that you do not exceed the pressure values foreseen by the manufacturer, inserting safety valves or other devices such as hydraulic guards, also ensuring the compatibility of the products used. The use of equipment under pressure is subject to specific procedures.
5. Whenever possible, use electric heaters (preferably oil circulating) rather than open flames. If open flames are used, these must be equipped with a safety device.
6. Use compliant electrical equipment and instruments.
7. Use centrifuges only if equipped with the safety device, envisaged by the standards, designed to prevent operation with the lid open; only use rotors approved by the manufacturer.
8. Do not use flying electric cables, extension cords, multiple sockets.
9. For powers exceeding 1 kW, it is necessary to use sockets equipped with an omnipolar switch.
10. Normally the cylinders must be placed outside, connected to the points of use by means of fixed pipes. In exceptional cases (short time of use and presence, very small dimensions) it is allowed to operate after assessing the risks, identifying the least risky positions in the laboratory, always ensuring good anchoring to fixed structures; however, keep the cylinders in the laboratory for as little time as possible, avoiding their presence when they are not sed and avoiding the presence of stocks (to be kept in the external warehouse).
11. Autoclaves (intended both as reactors and as sterilizers), in relation to the mode of operation and their volume, like all gas or steam pressure appliances and steam generators, are subject to the legislation for pressure equipment . However, both for autoclaves subject to the regulation and for those excluded on the basis of their characteristics, it is essential to carry out the checks and periodic maintenance indicated by the manufacturer.

12. The autoclaves should only be used by suitably trained expert personnel who observe all the specific usage and safety standards set up by the manufacturer and which must be available near the appliance.

6. PERSONAL PROTECTIVE EQUIPMENT (PPE).

By personal protective equipment (PPE) we mean any equipment intended to be worn and held by the worker in order to protect him against one or more risks likely to threaten his safety or health during work, as well as any complement or accessory intended for this purpose .
PPE is specific to the various types of risk and must be CE marked. They constitute personal equipment, with the exception of the more complex ones and of exceptional use (e.g. self-contained breathing apparatus).
They must be kept in the laboratory in a special cabinet, close at hand for prompt and convenient use when needed.
The worker is obliged to use these devices correctly, to take care of them and not to make any changes, reporting any defects or inconveniences that he may encounter.
For the use of some PPE it is mandatory to undergo education and training programs.
Provision of PPE for personnel working in the laboratory with chemical products

1. Eye Protection:
• glasses with temples with side shields;
• airtight goggles (mask).

2. Face protection:
• visors (face shields).

3. Respiratory protection:
• dust masks;
• respirators (with non-interchangeable filter, to be chosen according to the substances to be protected from);
• half masks (or half face masks) with interchangeable filters, to be chosen according to the substances to be protected from;
• masks (or full face masks), with interchangeable filters to be chosen according to the substances to be protected from.
N.B. Mask filters, even if not used, have a limited life and the expiration date should always be checked before use. Before use, remember to remove the filter cap.

4. Upper limb protection:
• gloves for chemical risks, in material suitable for the specific substances (consult the appropriate manufacturers' tables or similar);
• gloves against the cold (eg for the use of cryogenic gases);
• cotton undergloves can be useful in case of allergies.

5. Lower limb protection:

• typical laboratory activity may rarely require protection of the lower limbs, which may instead be required by ancillary activities such as handling cylinders, transferring significant quantities of acids, solvents, liquefied cryogenic gases, frequenting slippery places (for these cases , and others, there are specific types of shoes).

6. Body protection: gloves for heat protection (for using ovens, mittens,

• gowns (it is important that they are made of cotton and not synthetic materials for safe doffing in the event of an accident in contact with a flame);

• aprons (anti-acid, against splashes of cryogenic liquids, etc.).

7. ACCIDENTAL SPILLS AND CONTAMINATIONS WITH CHEMICALS

In the event of an accident involving chemicals, observe the following emergency rules.

First aid actions:

• Remove contaminated clothing and any PPE, using the necessary precautions;
• Decontaminate any affected skin using the prepared emergency showers; if the eyes have been affected, use eye fountains, eye wash liquids or other predisposed systems;
• Clean up spills immediately; if the quantity and/or nature of the product poured permits it, making use of the appropriate absorbent materials with which the laboratory is equipped;
• If there are gases, vapors or airborne dust, ensure maximum ventilation of the room by opening the windows and using all available means of mechanical ventilation (hoods, wall fans, etc.);
• In the event of unforeseeable exposure to dangerous chemical agents, leave the affected area immediately, isolating it until decontamination has been completed by the emergency management personnel;
• Immediately notify the Section Manager giving all the information necessary to manage the emergency (dynamics of events, information on the compound poured, etc.).

Every laboratory that uses chemicals must have access to a spill control kit (SPILL KIT) placed strategically near work areas so that it is easily accessible in case of an emergency. The procedures relating to the spillage of specific chemicals are given in Annex 6.
This SPILL KIT must contain the Personal Protective Equipment (PPE) indicated below and adsorbent materials suitably chosen to manage the spillage of 1 liter of liquid or 1 kg of dry chemical products.
PPE:
• goggles and protective visor;
• heavy neoprene or nitrile gloves;
• disposable apron for corrosive substances;
• vinyl/plastic boots/overshoes;
• FFP3 dust mask to be used in case of spreading of solid substances in powder or granules.

ABSORBENT MATERIALS:

• universal inert absorbents for spreading solvents: Trivorex, sawdust, sodium bicarbonate, and sand, clay.
• neutralizer for spilling acidic substances: sodium bicarbonate, sodium carbonate or calcium carbonate.
• neutralizer for spreading basic substances: sodium bisulphate.
• bromine neutraliser: 5% solution of sodium thiosulfate and absorbent inert.
• hydrofluoric acid spill neutraliser: calcium gluconate.

MATERIAL FOR THE CLEAN UP:

• disposable broom, dustpan and spatula for waste collection and, if necessary, tongs for glass collection;
• absorbent cloths or gauze;
• waste collection container: plastic bags, a plastic bucket (5-litre polyethylene) with lid.

GENERAL PROCEDURE TO BE CARRIED OUT IN THE EVENT OF SPILLING LIQUID PRODUCTS

• always consult the safety data sheet of the product involved;

• evacuate the area by making people leave;

• close the doors and ventilate by opening the windows;

• wear the appropriate personal protective equipment present in the kit;

• pour the absorbent substance starting from the periphery of the spill to arrive inside;

• wait for the powder to solidify;

• remove the absorbed product with a scoop and spatula;

• in the case of glass fragments, collect them with the special shovel and/or pliers;

• possibly wash with water or other liquid if indicated by the safety data sheet;

• dry and check that the surfaces do not have any residual slipperiness;

• properly store and dispose of used products in the waste container

GENERAL PROCEDURE IN THE EVENT OF SPREADING PRODUCTS IN POWDER OR GRANULES

• always consult the safety data sheet of the product involved;

• evacuate the area by making people leave;

• close doors and windows avoiding creating draughts;

• avoid operations that may develop or raise dust;

• wear the appropriate personal protective equipment present in the kit;

• limit the spill in order to avoid environmental contamination;

• if required by the safety data sheet, moisten the powders;

• collect dust with damp cloths,

• remove the absorbed product with a scoop and spatula;

• in the case of glass fragments, collect them with the special shovel and/or pliers;

• possibly wash with water or other liquid if indicated by the safety data sheet;

• dry and check that the surfaces do not have any residual slipperiness;

• properly store and dispose of used products in the waste container

Annex 1

LIST OF INCOMPATIBLE CHEMICAL SUBSTANCES

Acetylene with copper (piping), halogens, silver, fluorine, mercury and their compounds
Acetone with concentrated mixtures of sulfuric and nitric acids and peroxides
Acetic acid with chromic acid, nitric acid, hydroxyl-containing compounds, ethylene glycol, perchloric acid, peroxides and permanganates
Hydrocyanic acid with nitric acid, alkalis (caustics)
Chromic acid and chromium trioxide with acetic acid, naphthalene, camphor, alcohol, camphor, glycerol, benzene, turpentine and other flammable liquids
Nitric acid (concentrated) with acetic, chromic and cyanogen acids, aniline, carbon, acetone, hydrogen sulphide. Hydrogen sulfide, fluids, gases and substances which are readily nitrated. Alcohol, flammable liquids and gases
Oxalic acid with silver, mercury and their salts
Perchloric acid with acetic acid, acetic anhydride, bismuth and its alloys, alcohol, paper, wood, fats and other organic substances
Hydrogen sulphide with nitric acid, other acids and oxidants
Sulfuric acid with chlorates, perchlorates, permanganates, peroxides and water
Alcohols and polyalcohols with nitric, perchloric, chromic acid
Anhydrous ammonia with mercury, halogens, calcium hypochlorite, iodine, bromine and hydrogen fluoride
Ammonium nitrate with acids, metal powders, sulphur, chlorates, nitrates, finely ground organic compounds, combustible, flammable liquids
Acetic anhydride with alcohols (ethanol phenol etc.), perchloric acid and ethylene glycol
Aniline with nitric acid and hydrogen peroxide
Silver and salts with acetylene, oxalic acid, tartaric acid, fulminic acid (produced in nitric acid-ethanol mixtures) and ammonium compounds
Arsenic (materials containing it) with any reducing agent
Azides with water and acids
Chlorine dioxide with ammonia, methane, phosphine, hydrogen sulphide
Bromine with ammonia, acetylene, butadiene, butane, other petroleum derivatives (methane, propane, ethane), benzene, hydrogen, sodium carbide, turpentine and finely ground metals
Activated carbon with all oxidizing agents, calcium hypochlorite
Cyanides with acids and alkalis
Chlorates with ammonium salts, acids, metal powders, sulphur, finely ground organic compounds, flammable substances and carbon
Chlorine with ammonia, acetylene, butadiene, butane, benzene, gasoline and other petroleum derivatives (methane, propane, ethane), hydrogen, sodium carbide, turpentine and finely ground metals

Chloroform with sodium and potassium
Potassium chloride with ammonium salts, acids, metal powders, sulphur, finely pulverized organic substances, combustible
Sodium chloride sulfur in large quantities
Chlorides with sulfuric acid
Dichloromethane (Methyl chloride) with sodium and potassium
Chlorine dioxide with ammonia, methane, phosphine hydrogen sulphide
Fluorine with all other chemicals
Hydrogen fluoride ammonia (anhydrous or aqueous solution)
Phosphorus (white) with air, oxygen, alkali, reducing agents
Hydrazine with hydrogen peroxide, nitric acid and hydrogen sulphide
Hydrocarbons with fluorine, chlorine, bromine, formic acid, chromic acid, sodium peroxide, peroxides, benzene, butane, propane, gasoline, turpentine
Hydrogen sulphide with nitric acid vapors and oxidizing gases
Iodine with acetylene and ammonia (anhydrous or in aqueous solution), other strong bases
Hypochlorites with acids, activated carbon
Flammable liquids with ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide and halogens
Mercury with acetylene, fulminic acid (produced in nitric acid mixtures), hydrogen, ammonia and other strong bases
Alkali metals (calcium, potassium and sodium) with water, carbon dioxide, carbon tetrachloride and other chlorinated hydrocarbons (including trichlorethylene, tetrachloroethane, methyl chloride), carbon dioxide
Ammonium nitrate with acids, metal powders, flammable liquids, chlorates, nitrates, sulfur and finely pulverized organic substances or flammable compounds
Nitrites and Nitrates with acids
Nitrocellulose with phosphorus and metals
Nitroparaffin with inorganic bases, amines, metals
Calcium oxide with water
Oxygen with oils, fats, hydrogen, propane and other flammable liquids, solids and flammable gases
Phosphorus pentoxide with water, alcohols, strong bases
Potassium perchlorate with sulfuric acid and other acids, acetic anhydride, bismuth and its derivatives, alcohol, paper, wood, organic fats and oils
Potassium permanganate with glycerol, ethylene glycol, benzaldehyde, and sulfuric acid
Organic peroxides with acids (organic or mineral), most metals and fuels (avoid rubbing and high temperatures)
Hydrogen peroxide with chromium, copper, iron, most other metals and their salts, flammable liquids and other combustible products, aniline, nitromethane, some strong acids such as sulfuric acid
Sodium peroxide with any oxidizable substance such as ethanol, methanol, acetic acid, acetic anhydride, benzaldehyde, carbon disulfide, glycerol, ethylene glycol, ethyl acetate, methyl acetate, furfural
Potassium with carbon tetrachloride, carbon dioxide, water, chloroform, dichloromethane
Copper with acetylene, azide and hydrogen peroxide

Sodium with chlorinated hydrocarbons (including carbon tetrachloride, chloroform, trichlorethylene, tetrachloroethane, dichloromethane, methyl chloride), carbon dioxide, water and aqueous solutions
Sodium azide with lead, copper and other metals. This compound is commonly used as a preservative, but forms unstable and explosive compounds with metals. If eliminated through sink drains, traps and pipes could explode when a plumber is working on them
Sodium nitrite with ammonium nitrite and other ammonium salts
Selenium and selenium fluorides with reducing agents
Sulphides with acids
Tellurium and tellurium fluorides with reducing agents
Carbon tetrachloride with sodium and potassium

Annex 2

SYMBOLS AND PICTOGRAMS

Symbol and denomination	Meaning (definition and precautions)	Examples
C  **CORROSIVE**	Classification: These chemicals cause destruction of living tissue and/or inert materials. Precautions: do not inhale and avoid contact with skin, eyes and clothes.	• Hydrochloric acid • Hydrofluoric acid
E  **EXPLOSIVE**	Classification: substances or preparations which may explode from a spark or which are very sensitive to shock or friction. Precautions: Avoid hitting, shaking, rubbing, flames or heat sources.	• Nitrogen trichloride • Nitroglycerin
O  **OXIDISING**	Classification: substances which act as oxidants with respect to most other substances or which easily release atomic or molecular oxygen, and which therefore facilitate the burning of combustible substances. Precautions: Avoid contact with combustible materials.	• Oxygen • Potassium nitrate • Hydrogen peroxide
F  **FLAMMABLE**	Classification: Substances or preparations: • which can overheat and subsequently ignite on contact with air at a normal temperature without the use of energy • solids which can ignite easily due to a brief action of a source of flame and which continue to burn • liquids that have a burning point below 21°C	• Benzene • Ethanol • Acetone

	• flammable gases in contact with air at ambient pressure • gases which, in contact with water or humid air, create easily flammable gases in dangerous quantities. Precautions: avoid contact with igniting materials (such as air and water).	
F+  **EXTREMELY FLAMMABLE**	Classification: liquid substances or preparations whose burning point is between 21 ºC and 55 ºC. Precautions: avoid contact with igniting materials (such as air and water).	• Hydrogen • Acetylene • Ethyl ether
T  **TOXIC**	Classification: substances or preparations which, if they are inhaled or ingested or if they penetrate the skin, may involve serious, acute or chronic health risks and even death. Precautions: contact with the body should be avoided.	• Barium chloride • Carbon monoxide • Methanol
T+  **EXTREMELY TOXIC**	. Classification: substances or preparations which, by inhalation, digestion or absorption through the skin, cause extremely serious, acute or chronic health risks, and easily death. Precautions: contact with the body, inhalation and ingestion must be avoided, as well as continuous or repetitive exposure even to low concentrations of the substance or preparation	• Cyanide • Nicotine
Xi  **IRRITANT**		• Calcium chloride • Sodium carbonate

Xn  **HARMFUL**	Classification: substances or preparations which, by inhalation, ingestion or skin absorption, may involve health risks of limited gravity, and rarely death. Precautions: Vapors must not be inhaled and contact with skin must be avoided.	• Laudanum • Dichloromethane • Cysteine
N  **DANGEROUS IN THE ENVIRONMENT**	Classification: the contact of the environment with these substances or preparations can cause damage to the ecosystem in the short or long term. Precautions: the substances must not be dispersed in the environment.	• Phosphorus • Potassium cyanide

NEW PICTOGRAMS

	Explosive		Corrosive
	Flammable		Harmful Irritating
	Combustive		Toxic
	Gases under pressure		Harmful in the long run Carcinogenic Mutagenic Toxic to reproduction
	Harmful		

Annex 3

LIST OF RISK PHRASES

R-phrases

R 1 : Dry explosive.
R 2 : Risk of explosion by shock, friction, presence of fire or other sources of ignition.
R 3 : Great risk of explosion by shock, friction, in the presence of fire or other sources of ignition.
R 4 : Forms highly sensitive explosive metallic compounds.
R 5 : Risk of explosion in the presence of heat.
R 6 : Risk of explosion with or without contact with air.
R 7 : May cause fire.
R 8 : Promotes the inflammation of combustible substances.
R 9 : May explode when composing with combustible substances.
R10 : Flammable
R 11 : Very flammable.
R 12 : Extremely flammable.
R 13 : Extremely flammable liquefied gas.
R 14 : Reacts violently in contact with water.
R 15 : In contact with water emits highly flammable gases.
R 16 : May explode when composing with oxidising substances.
R 17 : Spontaneously flammable in the presence of air.
R 18 : With use, possible formation of flammable vapor / air mixture / explosives.
R 19 : May form explosive peroxides.
R 20 : Harmful by inhalation.
R 21 : Harmful in contact with skin.
R 22 : Harmful if swallowed.
R 23 : Toxic by inhalation.
R 24 : Toxic in contact with skin.
R 25 : Toxic if swallowed.
R 26 : Very toxic by inhalation.
R 27 : Very toxic in contact with skin.
R 28 : Very toxic if swallowed.
R 29 : In contact with water emits toxic gases.
R 30 : May become highly flammable in operation.
R 31 : Contact with acid emits toxic gas.
R 32 : Contact with acid emits very toxic gas.
R 33 : Danger of cumulative effects.
R 34 : Causes burns.
R 35 : Causes severe burns.
R 36 : Irritating to eyes.
R 37 : Irritating to the respiratory system.
R 38 : Irritating to skin.
R 39 : Danger of very serious irreversible effects.
R 40 : Possibility of a carcinogenic effect - Insufficient evidence.

R 41 : Risk of serious damage to eyes.
R 42 : May cause sensitization by inhalation.
R 43 : May cause sensitization by skin contact.
R 44 : Risk of explosion if heated in closed areas.
R 45 : May cause cancer.
R 46 : May cause heritable genetic damage.
R 47 : May cause birth defects.
R 48 : Risk of serious effects on health in case of prolonged exposure.
R 49 : May cause cancer by inhalation.
R 50 : Very toxic to aquatic organisms.
R 51 : Toxic to aquatic organisms.
R 52 : Harmful to aquatic organisms.
R 53 : May cause long-term adverse effects in the aquatic environment.
R 54 : Toxic for flora.
R 55 : Toxic for wildlife.
R 56 : Toxic to soil organisms.
R 57 : Toxic to bees.
R 58 : May cause long-term adverse effects for the environment.
R 59 : Dangerous for the ozone layer.
R 60 : May impair fertility.
R 61 : May harm the unborn child.
R 62 : Possible risk of impaired fertility.
R 63 : Possible risk of harm to the unborn child.
R 64 : Possible risk to breastfed babies.
R 65 : Harmful: may cause lung damage if swallowed.
R 66 : Exposure to vapors may cause skin dryness and cracking.
R 67 : Inhalation of vapors may cause drowsiness and dizziness.
R 68 : Possibility of irreversible effects.

Sentence combinations

R 14/15 Reacts violently with water, liberating flammable gases.
R 15/29 In contact with water releases toxic and easily flammable gases.
R 20/21 Harmful by inhalation and in contact with skin.
R 21/22 Harmful in contact with skin and if swallowed.
R 20/22 Harmful by inhalation and if swallowed.
R 20/21/22 Harmful by inhalation, if swallowed and in contact with skin.
R 23/24 Toxic by inhalation and in contact with skin.
R 24/25 Toxic in contact with skin and if swallowed.
R 23/25 Toxic by inhalation and if swallowed.
R 23/24/25 Toxic by inhalation, if swallowed and in contact with skin.
R 26/27 Very toxic by inhalation and in contact with skin.
R 26/28 Very toxic by inhalation and if swallowed.
R 27/28 Very toxic in contact with skin and if swallowed.
R 26/27/28 Very toxic by ingestion, inhalation and in contact with skin.
R 36/37 Irritating to eyes and respiratory system.
R 37/38 Irritating to respiratory system and skin.
R 36/38 Irritating to eyes and skin.
R 36/37/38 Irritating to eyes, respiratory system and skin.
R 39/23 Toxic: danger of very serious irreversible effects through inhalation.
R 39/24 Toxic: danger of very serious irreversible effects in contact with skin.
R 39/25 Toxic: danger of very serious irreversible effects if swallowed.
R 39/23/24 Toxic: danger of very serious irreversible effects through inhalation and in contact with skin.
R 39/23/25 Toxic: danger of very serious irreversible effects through inhalation and if swallowed.
R 39/24/25 Toxic: danger of very serious irreversible effects in contact with skin and if swallowed.
R 39/23/24/25 Toxic: danger of very serious irreversible effects through inhalation.
R 39/26 Very toxic: danger of very serious irreversible effects through inhalation.
R 39/27 Very toxic: danger of very serious irreversible effects in contact with skin.
R 39/28 Very toxic: danger of very serious irreversible effects if swallowed.
R 39/26/27 Very toxic: danger of very serious irreversible effects through inhalation and in contact with skin.
R 39/26/28 Very toxic: danger of very irreversible effects through inhalation and if swallowed.
R 39/26/27/28 Very toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
R 42/43 May cause sensitization by inhalation and in contact with skin.
R 48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.
R 48/21 Harmful: danger of serious damage to health by prolonged exposure in contact with skin.
R 48/22 Harmful: danger of serious damage to health in case of prolonged exposure if swallowed.
R 48/20/21 Harmful: danger of serious damage to health by prolonged exposure through inhalation and in contact with skin.
R 48/20/22 Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
R 48/21/22 Harmful: danger of serious damage to health by prolonged exposure in contact with skin and if swallowed.
R 48/20/21/22 Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.

R 48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation.
R 48/24 Toxic: danger of serious damage to health by prolonged exposure in contact with skin.
R 48/25 Toxic: danger of serious damage to health in case of prolonged exposure if swallowed.
R 48/23/24 Toxic: danger of serious damage to health by prolonged exposure through inhalation and in contact with skin.
R 48/23/25 Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
R 48/24/25 Toxic: danger of serious damage to health in case of prolonged exposure in contact with skin and if swallowed.
R 48/23/24/25 Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R 68/20 Harmful: possibility of irreversible effects through inhalation.
R 68/21 Harmful: possibility of irreversible effects in contact with skin.
R 68/22 Harmful: possibility of irreversible effects if swallowed.
R 68/20/21 Harmful: possibility of irreversible effects through inhalation and in contact with skin.
R 68/20/22 Harmful: possibility of irreversible effects through inhalation and if swallowed.
R 68/21/22 Harmful: possibility of irreversible effects in contact with skin and if swallowed.
R 68/20/21/22 Harmful: possibility of irreversible effects through inhalation, in contact with skin and if swallowed

H sentences

REGULATION (EC) No. 1272/2008
Warning notices

Physical Hazards

• H200 – Unstable explosive.
• H201 – Explosive; danger of mass explosion.
• H202 – Explosive; serious projection hazard.
• H203 – Explosive; fire, blast, or projection hazard.
• H204 – Fire or projection hazard.
• H205 - May mass explode in fire.
• H220 – Extremely flammable gas.
• H221 – Flammable gas.
• H222 – Extremely flammable aerosol.
• H223 – Flammable aerosol.
• H224 – Extremely flammable liquid and vapour.
• H225 – Highly flammable liquid and vapour.
• H226 – Flammable liquid and vapour.
• H228 – Flammable solid.
• H240 – Risk of explosion on heating.
• H241 – Risk of fire or explosion if heated.
• H242 – Risk of fire from heating.
• H250 - Spontaneously flammable in air.
• H251 – Self-heating; it can catch fire.
• H252 – Self-heating in large quantities; it can catch fire.
• H260 – Contact with water releases flammable gases which may ignite spontaneously.
• H261 – In contact with water releases flammable gases.
• H270 – May cause or intensify fire; oxidizing.
• H271 – May cause fire or explosion; very oxidizing.
• H272 – May aggravate fire; oxidizing.
• H280 – Contains gas under pressure; may explode if heated.
• H281 – Contains refrigerated gas; may cause cryogenic burns or injury.
• H290 – May be corrosive to metals.

Health Hazards

• H300 – Fatal if swallowed.
• H301 - Toxic if swallowed.
• H302 – Harmful if swallowed.
• H304 – May be fatal if swallowed and enters airways.
• H310 - Fatal in contact with skin.
• H311 – Toxic in contact with skin.

• H312 – Harmful in contact with skin.
• H314 - Causes severe skin burns and eye damage.
• H315 – Causes skin irritation.
• H317 – May cause an allergic skin reaction.
• H318 - Causes serious eye damage.
• H319 - Causes serious eye irritation.
• H330 – Fatal if inhaled.
• H331 – Toxic if inhaled.
• H332 – Harmful if inhaled.
• H334 – May cause allergy or asthma symptoms or breathing difficulties if inhaled.
• H335 – May cause respiratory irritation.
• H336 – May cause drowsiness or dizziness.
• H340 - May cause genetic defects.
• H341 - Suspected of causing genetic defects.
• H350 – May cause cancer.
• H351 - Suspected of causing cancer.
• H360 – May damage fertility or the unborn child.
• H361 – Suspected of damaging fertility or the unborn child.
• H362 - May cause harm to breast-fed infants.
• H370 - Causes damage to organs.
• H371 – May cause damage to organs.
• H372 - Causes damage to organs through prolonged exposure or repeated exposure causes the same hazard.
• H373 - May cause damage to organs through prolonged or repeated exposure exposure causes the same hazard>.
• H400 - Very toxic to aquatic life.

Dangers to the environment

• H410 - Very toxic to aquatic life with long lasting effects.
• H411 - Toxic to aquatic life with long lasting effects.
• H412 – Harmful to aquatic life with long lasting effects.
• H413 – May be harmful to aquatic life with long lasting effects.

Additional hazard information

Physical properties

• EUH 001 – Dry explosive.
• EUH 208 – Contains. May cause an allergic reaction.
• EUH 209 – Can become highly flammable during use.
• EUH 209A – May become flammable in use.
• EUH 210 – Safety data sheet available on request.

• EUH 401 – To avoid risks to human health and the environment, follow the instructions for use.
• EUH 006 – Explosive in contact or without contact with air.
• EUH 014 – Reacts violently with water.
• EUH 018 – In use may form flammable/explosive vapour-air mixture.
• EUH 019 – May form explosive peroxides.
• EUH 044 – Risk of explosion if heated in a confined space.

Properties hazardous to health

• EUH 029 – Contact with water releases toxic gas.
• EUH 031 – Contact with acids releases toxic gases.
• EUH 032 – Contact with acids releases very toxic gases.
• EUH 066 – Repeated exposure may cause skin dryness or cracking.
• EUH 070 – Toxic by eye contact.
• EUH 071 – Corrosive to the respiratory tract.

Environmentally hazardous properties

• EUH 059 – Dangerous for the ozone layer.

Label elements and supplemental information for certain substances and mixtures

• EUH 201 – Contains lead. Do not use on items that can be chewed or sucked by children.
• EUH 201A – Warning! Contains lead.
• EUH 202 – Cyanoacrylate. Danger. Bonds skin and eyes in seconds. Keep out of reach of children.
• EUH 203 – Contains chromium (VI). May cause an allergic reaction.
• EUH 204 – Contains isocyanates. May cause an allergic reaction.
• EUH 205 – Contains epoxy components. May cause an allergic reaction.
• EUH 206 – Warning! Do not use in combination with other products. Dangerous gases (chlorine) can be released.
• EUH 207 – Attention! Contains cadmium or. Dangerous fumes are released during use. Read the information provided by the manufacturer. Comply with the safety regulations.
• EUH 208 – Contains. May cause an allergic reaction.
• EUH 209 – Can become highly flammable during use.
• EUH 209A – May become flammable in use.
• EUH 210 – Safety data sheet available on request.
• EUH 401 – To avoid risks to human health and the environment, follow the instructions for use

Annex 4

LIST OF SAFETY ADVICE

Phrases S

S 1 : Keep locked up.
S 2 : Keep out of the reach of minors.
S 3 : Keep in a cool place.
S 4 : Keep away from all inhabited premises.
S 5 : Store in ... (suitable liquid recommended by the manufacturer).
S 6 : Keep in ... (inert gas recommended by the manufacturer).
S 7 : Keep container tightly closed.
S 8 : Keep container dry.
S 9 : Keep container in a well-ventilated place.
S 12 : Do not close the container hermetically.
S 13 : Keep away from food and drink, including those for animals.
S 14 : Keep away from ... (incompatible substances specified by the manufacturer).
S 15 : Keep away from sources of heat.
S 16 : Keep away from all sources of inflammation. Not smoking.
S 17 : Keep away from combustible substances.
S 18 : Handle and open container with care.
S 20 : Do not eat and drink when using.
S 21 : Do not smoke when using.
S 22 : Do not breathe dust.
S 23 : Do not breathe its gases and vapours, fumes, aerosols (suitable terms specified by the manufacturer).
S 24 : Avoid contact with skin.
S 25 : Avoid contact with eyes.
S 26 : In case of contact with eyes, rinse immediately with plenty of water and consult a specialist.
S 27 : Take off immediately any soiled or splashed clothing.
S 28 : After contact with skin, wash immediately and abundantly with ... (appropriate product specified by the manufacturer).
S 29 : Do not empty into sewers.
S 30 : Never pour water into this product.
S 33 : Avoid the accumulation of electrostatic charges.
S 34 : Avoid shock and friction movements.
S 35 : Do not throw away the product and the container without having taken all the indispensable precautions.
S 36 : Wear suitable protective clothing.
S 37 : Wear suitable gloves.
S 38 : In case of insufficient ventilation, wear suitable respiratory equipment.
S 39 : Wear eye and face protection equipment.

S 40: To clean the floor or objects soiled by the product, use ... (product specified by the manufacturer).
S 41 : In case of fire and/or explosion do not breathe fumes.
S 42 : In case of liquid or gaseous irrigation wear suitable respiratory equipment (indications to be provided by the manufacturer).
S 43 : In case of fire, use ... (fire extinguishers specified by the manufacturer. If the risk increases in the presence of water add: "Never use water").
S 44 : In case of illness, consult a doctor (possibly bearing the label).
S 45 : In case of accident or if you feel unwell, seek medical advice immediately (preferably carry the label with you).
S 46 : If swallowed, seek medical advice immediately, taking the packaging or label with you.
S 47 : Keep at a temperature not exceeding ... °C (to be specified by the manufacturer).
S 48 : Keep in a humid place with ... (suitable product to be specified by the manufacturer).
S 49 : Keep only in the original container.
S 50 : Do not mix with ... (to be specified by the manufacturer).
S 51 : Use only in well ventilated areas.
S 52 : Do not use on large surfaces in inhabited premises.
S 53 : Avoid exposure, obtain special instructions before using.
S 54 : Obtain the consent of pollution control authorities before discharging to sewage treatment plants.
S 55 : Use the best available treatment techniques before discharge to drains or the aquatic environment.
S 56 : Do not discharge into drains or into the environment; dispose of the residues at an authorized waste collection point.
S 57 : Use suitable containers to avoid environmental pollution.
S 58 : Dispose of as hazardous waste.
S 59 : Request information from the manufacturer/supplier for recovery/recycling.
S 60 : This material and/or its container must be disposed of as hazardous waste.
S 61 : Do not release into the environment. Refer to special instructions/safety data sheets.
S 62 : If swallowed, do not induce vomiting: seek medical advice immediately.
S 63 : In case of ingestion by inhalation, remove the injured person from the contaminated area and keep him at rest.
: If swallowed, rinse mouth with water (only if the person is conscious).

P sentences

REGULATION (EC) No. 1272/2008
Cautionary advice

General precautionary statements

• P101 – If medical advice is needed, have product container or label at hand.
• P102 - Keep out of reach of children.
• P103 – Read label before use.

Precautionary statements – Prevention

• P201 – Obtain special instructions before use.
• P202 - Do not handle until all warnings have been read and understood.
• P210 - Keep away from heat / sparks / open flames / hot surfaces. Not smoking.
• P211 - Do not spray on an open flame or other ignition source.
• P220 – Keep/Store away from clothing / ... / combustible materials.
• P221 - Take all precautions to avoid mixing with combustible substances.
• P222 - Avoid contact with air.
• P223 - Avoid all contact with water: danger of violent reaction and spontaneous ignition.
• P230 – Keep moist with...
• P231 - Handle under an inert gas atmosphere.
• P232 - Protect from moisture.
• P233 - Keep container tightly closed.
• P234 - Keep only in the original container.
• P235 - Keep in a cool place.
• P240 - Ground / bond container and receiving equipment.
• P241 – Use electrical / ventilation / lighting / ... / explosion-proof equipment.
• P242 – Use only non-sparking tools.
• P243 - Take precautions against static discharge.
• P244 - Keep reducing valves free from grease and oil.
• P250 – Avoid abrasion / impact / ... / friction.
• P251 – Pressurized container: Do not pierce or burn, even after use.
• P260 - Do not breathe dust / fume / gas / mist / vapors / spray.
• P261 - Avoid breathing dust / fume / gas / mist / vapors / spray.
• P262 - Avoid contact with eyes, skin, or clothing.
• P263 - Avoid contact when pregnant / nursing.
• P264 – Wash thoroughly after handling.
• P270 - Do not eat, drink or smoke when using this product.

• P271 – Use only outdoors or in a well-ventilated area.
• P272 - Contaminated work clothing should not be allowed out of the workplace.
• P273 – Avoid release to the environment.
• P280 - Wear protective gloves / protective clothing / eye protection / face protection.
• P281 – Use required personal protective equipment.
• P282 - Use heat gloves / face shield / eye protection.
• P283 - Wear clothing that is completely flame retardant or flame retardant.
• P284 - Wear respiratory protection.
• P285 – In case of insufficient ventilation wear respiratory equipment.
• P231 + P232 - Handle under an inert gas atmosphere. Keep away from moisture.
• P235 + P410 - Keep cool. Protect from sunlight.

Precautionary Statements – Reaction

• P301 – IF SWALLOWED:
• P302 – IF ON SKIN:
• P303 – IF ON SKIN (OR HAIR):
• P304 - IF INHALED:
• P305 – IF IN EYES:
• P306 – IF ON CLOTHING:
• P307 - IF EXPOSED:
• P308 - IF EXPOSED OR THROUGH EXPOSURE:
• P309 - IF EXPOSURED OR FELL ILL:
• P310 - Call a poison control center or doctor immediately.
• P311 - Call a poison control center or doctor.
• P312 – Call a poison control center or doctor if you feel unwell.
• P313 - Get medical attention.
• P314 – Get medical attention if you feel unwell.
• P315 - Get medical attention immediately.
• P320 - Specific treatment urgent (see... on this label).
• P321 – Specific treatment (see… on this label).
• P322 – Specific measures (see… on this label).
• P330 - Rinse mouth.
• P331 - DO NOT induce vomiting.
• P332 – IF SKIN IRRITATION OCCURS:
• P333 - IF YOU HAVE SKIN IRRITATION OR RASH:
• P334 - Immerse in cold water / wrap in wet bandage.
• P335 - Remove particles from skin.
• P336 - Thaw frozen parts using warm water. Do not rub the affected part.
• P337 - IF EYE IRRITATION PERSISTS:
• P338 - Remove any contact lenses if it is easy to do so. Continue rinsing.

• P340 - Remove victim to fresh air and keep at rest in a position comfortable for breathing.
• P341 - If breathing is difficult, remove person to fresh air and keep at rest in a position comfortable for breathing.
• P342 – IF YOU HAVE RESPIRATORY SYMPTOMS:
• P350 – Wash gently with plenty of soap and water.
• P351 - Rinse thoroughly for several minutes.
• P352 - Wash with plenty of soap and water.
• P353 - Rinse skin / take a shower.
• P360 - Immediately rinse contaminated clothing and skin with plenty of water before removing clothing.
• P361 - Take off immediately all contaminated clothing.
• P362 - Take off and wash contaminated clothing before reuse.
• P363 - Wash contaminated clothing before reuse.
• P370 – IN THE EVENT OF FIRE:
• P371 – IN THE EVENT OF A MAJOR FIRE AND SIGNIFICANT QUANTITIES:
• P372 - Explosion hazard in case of fire.
• P373 - DO NOT use extinguishing media if fire reaches explosive materials.
• P374 – Use extinguishing media with usual precautions from a reasonable distance.
• P375 - Risk of explosion. Use extinguishing media at a great distance.
• P376 – Stop leak if safe to do so.
• P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
• P378 – Extinguish with...
• P380 - Evacuate area.
• P381 - Eliminate all ignition sources if safe to do so.
• P390 – Absorb spillage to prevent property damage.
• P391 - Collect spillage.
• P301 + P310 – If swallowed: Immediately call a poison control center or doctor/physician.
• P301 + P312 – If swallowed with discomfort: Call a poison control center or doctor/physician.
• P301 + P330 + P331 – If swallowed: rinse mouth. DO NOT induce vomiting.
• P302 + P334 – IF ON SKIN: Immerse in cold water / wrap in a wet bandage.
• P302 + P350 – In case of skin contact: Wash gently with plenty of soap and water.
• P302 + P352 – IF ON SKIN: Wash with plenty of soap and water.
• P303 + P361 + P353 – In case of contact with skin (or hair): Take off immediately all contaminated clothing. Rinse skin / take a shower.
• P304 + P340 - If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

• P304 + P341 - If inhaled: If breathing is difficult, remove person to fresh air and keep at rest in a position comfortable for breathing.
• P305 + P351 + P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove any contact lenses if it is easy to do so. Continue rinsing.
• P306 + P360 – IF ON CLOTHING: Rinse contaminated clothing and skin immediately with plenty of water before taking off clothes.
• P307 + P311 - If exposed, call a poison control center or doctor/physician.
• P308 + P313 - If exposed or concerned, get medical advice/attention.
• P309 + P311 – Call a poison control center or doctor/physician if exposed or if you feel unwell.
• P332 + P313 – If skin irritation occurs: Get medical attention.
• P333 + P313 – If skin irritation or rash occurs: Get medical advice/attention.
• P335 + P334 - Remove particles from skin. Immerse in cold water / wrap in a wet bandage.
• P337 + P313 – If eye irritation persists, get medical attention.
• P342 + P311 – If experiencing respiratory symptoms: Call a poison control center or doctor/physician.
• P370 + P376 - In case of fire: Stop leak if safe to do so.
• P370 + P378 – In case of fire: Extinguish with...
• P370 + P380 - Evacuate area if there is a fire.
• P370 + P380 + P375 - In case of fire: Evacuate area. Risk of explosion. Use extinguishing media at a great distance.
• P371 + P380 + P375 - In case of major fire and large quantities: Evacuate area. Risk of explosion. Use extinguishing media at a great distance.

Precautionary statements – Conservation

• P401 – Keep...
• P402 - Keep dry.
• P403 - Store in a well-ventilated place.
• P404 - Store in a closed container.
• P405 - Store locked up.
• P406 - Store in a corrosive resistant / resistant liner container.
• P407 - Maintain clearance between racks / pallets.
• P410 - Protect from sunlight.
• P411 – Do not store above ...°C / ...°F.
• P412 - Do not expose to temperatures exceeding 50°C / 122°F.
• P413 – Store bulk goods weighing more than ...kg / ...lb at temperatures not exceeding ...°C / ...°F.
• P420 - Keep away from other materials.
• P422 – Store under...

• P402 + P404 - Store in a dry place and in a closed container.
• P403 + P233 - Keep container tightly closed and in a well-ventilated place.
• P403 + P235 - Keep in a cool, well-ventilated place.
• P410 + P403 - Protect from sunlight. Keep in a well-ventilated place.
• P410 + P412 - Protect from sunlight. Do not expose to temperatures exceeding 50°C / 122°F.
• P411 + P235 – Store in a cool place at temperatures not exceeding ...°C / ...°F.

Precautionary statements – Disposal

P501 – Dispose of contents / container to..

Annex 5

SPECIFIC PROCEDURES TO BE IMPLEMENTED IN THE EVENT OF ACCIDENTAL SPILLS AND CONTAMINATIONS WITH CHEMICAL SUBSTANCES

Chemical substance	***Clean up procedure***
Organic acids	Apply baking soda. Absorb spillage with absorbent paper or absorbent powder (Trivorex or other absorbent material).
Inorganic acids	Apply sodium bicarbonate/calcium oxide or sodium carbonate/calcium oxide. Absorb spillage with absorbent paper or absorbent powder (Trivorex or other absorbent material). NOTE: Hydrofluoric acid is an exception to general practice.
Hydrochloric acid	Do not use water. Absorb with sand or sodium bicarbonate.
Hydrofluoric acid	Absorb with calcium carbonate (limestone) or lime (calcium oxide) rather than baking soda. (Sodium bicarbonate leads to the formation of sodium fluoride, which is considerably more toxic than calcium fluoride.) Be careful when using absorbent materials, some may contain silicates, which are incompatible with hydrofluoric acid.
Oxidizing agents	Apply sodium bisulfite.
Aldehydes	Absorb spillage with absorbent paper or absorbent powder (Trivorex or other absorbent material).
Halides, organic or inorganic	Apply sodium bicarbonate.
Aliphatic amines	Apply sodium bisulfite. Absorb spillage with absorbent paper or absorbent powder (Trivorex or other absorbent material).
Aromatic amines	Absorb spillage with absorbent paper or vermiculite. Avoid contact with skin or inhalation.
Halogenated aromatic amines	Absorb spillage with paper or other absorbent material. Avoid contact with skin or inhalation.
Azides	Absorb spillage with paper or other absorbent material. Neutralize with 10% ammonium nitrate solution.
Bases	Neutralize with acid, citric acid, or commercial chemical neutralizers. Absorb spillage with absorbent paper or absorbent powder (Trivorex or other absorbent material).
cyanides	over with a lightly moistened paper towel and pat dry, or use a vacuum cleaner with a HEPA filter. Absorb spillage with absorbent paper or absorbent powder (Trivorex or other absorbent material).

Carbon disulfide	Absorb spillage with absorbent paper or absorbent powder (Trivorex or other absorbent material).
Derivatives of chlorine	Absorb spillage with paper or other absorbent material. Avoid contact with skin or inhalation
Phosphates, organic and related	Absorb spillage with absorbent paper or absorbent powder (Trivorex or other absorbent material)
Halogenated hydrocarbons	Absorb spillage with paper or other absorbent material.
Hydrazine	Avoid organic material. Apply hydroxide of ". Absorb spillage with absorbent paper.
Inorganic saline solutions	Apply soda.
Mercaptans/organic sulphides	Neutralize with calcium hypochlorite solution. Absorb spillage with absorbent paper or absorbent powder (Trivorex or other absorbent material).
Nitriles	Collect solids. Absorb liquids with absorbent paper or absorbent powder (Trivorex or other absorbent material).
Nano-particles	Collect particles vacuum system using HEPA or ULPA filters.
Organic nitriles	Absorb spillage with absorbent paper or absorbent powder (Trivorex or other absorbent material). Avoid contact with skin or inhalation.
Peroxides	Absorb spillage with absorbent paper or absorbent powder (Trivorex).
Inorganic saline solutions	Apply soda.
Reducing substances	Apply soda or sodium bicarbonate.

Useful numbers

STRUCTURE MANAGER:

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Head of Section: Prof. Angela Di Pinto, phone 0805443878 – Internal 3887

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Competent Doctor: Prof. Piero Lovreglio, phone 0805478201 – Internal 6201

FIRE FIGHTERS:	**115**
EMERGENCY SERVICE (emergency)	**118**