



Sterling Chemical Malta Ltd


OPERATIVE INSTRUCTION INSTRUCTIONS FOR EQUIPMENT AND MACHINERIES MAINTENANCE

REVISION HISTORY

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1. PURPOSE

This document is intended to define the guidelines to properly carry out maintenance operations within the Sterling Chemical Malta Ltd.

2. FIELD OF APPLICATION

This procedure applies to all maintenance operations that take place within the production building.

3. PROCEDURES

1) Use of chemicals

It is necessary to follow the steps below in order to totally comprehend the situation:

1. Identify the substance and its hazard class (risk phrase) analysing the product safety data sheet;
2. Check its concentration;
3. Check the substance quantity (in order to assess the risk of exposure to the operator)
4. Check in which internal conditions it is used (pressure, temperature, etc...)
5. Check in which external condition it is used (presence of ventilation, presence of ignition sources, room temperature, etc.);
6. Establish the conditions of use (pouring, transport, dilution, spraying, mixing);

Depending on data gathered, identify the preventive and protective measures to be taken.


Here are some general protective indications:

- Wear gloves: neoprene-made gloves when using acids and bases, protective gloves when using harmful or irritants substances;
- Wear protective glasses: in case of corrosive substances use a protection for your face;
- Wear a mask or a gas mask whenever the use of the substance results in gases, aerosols or vapours by checking all requirements of the product safety data sheet;
- Do not smoke or use an open flame: this general validity rule becomes essential in case you use flammable substances.

Remember that in case of diluted concentrations, the chemical aggressiveness decreases proportionally to the dilution factor.

In case you need to use two or more different chemicals in succession, ensure that the chemicals used are not incompatible and that the area of use, or the relative containers, has been adequately cleaned.

Remember that all informations necessary for a safe use of chemicals and compounds are given in the product safety data sheet, which also contains all necessary information for first-aid operations in case of an accident.

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If case of doubt (if you do not know the product characteristics) please refer to the supervisor or to Safety Manager.

It is important to identify at which temperature the substance is used, especially in case of flammable substances with different flash points (this information is reported in safety data sheets) which represent the temperatures at which the substance emits vapours that can ignite in the presence of ignition sources.

It is important to consider also the pressure at which the substance is used for the risk of spurts on the operator.

Conditions of the areas of use, such as the ventilation, considerably affect the risks to the operator and the protective measures to be taken.

The lack of adequate air changes can increase the chances for vapours to reach such a high concentration to be dangerous. Furthermore, the difficulty of movement due to operations carried out in closed or narrow places can cause an operator's late reaction and complicate the first-aid operations in case of an accident.

It is important to always respect the following rules:


1. Do not use hazardous chemicals in narrow spaces without the PPE required and the presence of another operator who can provide help and assistance in case of an accident.
2. Before entering a room where chemicals are stored, open the door and wait for a time lapse enough to let some "fresh" air in and to realize any possible abnormal situations. Do not close immediately the door. This rule has to be applied to all places where gas cylinders are stored or where there is a real possibility of leaks (e.g. refrigerating rooms)

If it is necessary to transport the substance from one place to another, all precautions in order to avoid the operator contamination and/or possible spillages have to be taken.

It is necessary to:

- Use a suitable leak-proof container;
- Containers designed for waste storage have to meet all hold requirements depending on the physical-chemical properties and characteristics of the content;
 - Make sure the container used does not contain residues of other substances (in this case it has to be cleaned and certified by an external laboratory before being used again);
 - Keep an emergency kit available for any possible spills (when it is necessary);
- If you need to decant a chemical, the container have to be labelled so that it reports the same indications of the original container that are readable even within a long time;
- All containers of chemicals have to be carefully labelled. Labels have to report all the informations required by law (substance name, pictograms, R risk phrases, S safety advices, information concerning the supplier and the mass or volume of the content);

2) Physical risk

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The main risk of these operations is related to the capture and dragging of hands or limbs from moving parts of the machine subject to the maintenance activities (such as protective casing or any other protective systems temporarily removed)

For a safe operation please follow the rules below:

1. Machinery and equipment maintenance operations have to be carried out when the machine is off. If the operation can not be performed by stopping the machinery/equipment, it can only be carried out by authorized personnel in accordance with operating procedures properly prepared or under the supervision of a direct manager/supervisor. Remember that once the operation is completed, you have to immediately restore all safety conditions required by the manufacturer of the machine/equipment for final users safety;
2. During the execution of these operations make sure that the machine can not be accidentally restarted by other operators using the mechanical locks (when possible) or special warning signs;

If it is impossible to stop the machine to perform maintenance activities, in addition to rules before mentioned workers have to:

1. Make sure there is the emergency button and that it is reachable by the same operator or by a colleague ready to intervene in case of need;
2. Wear cloths suitable to minimize the risk of capture and dragging, paying attention to the coverall, pendants and hairnet.

3) High temperature

The presence of high-temperature parts is an added risk to operations performed on machinery.


In order to avoid burns:

1. Look for possible pictograms/signals (stickers or yellow signals) which warn you against the danger. If the above-mentioned signs are not present and if you are not sure about the surface temperature of the object/machinery to touch, please act carefully during the first contact;
2. If possible, before starting with the operation, wait for the surfaces to cool down.

4) Activities at a certain height

Operations at a certain height entail two types of risk; one to the operator who stands in high (risk of falling from above), the other to those who stand below (danger of being hit by material falling from above). Operations at a certain height have to be performed only by properly trained personnel.

1. Before carrying out work activities, check the suitability and the presence of fixed guards in plants/authorized areas;

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2. If you choose to build an access platform or a part of a scaffold, remember that this safety measure (collective protective equipment) have to be installed in compliance with the installation, use and maintenance handbook. For example, the work plan have to be complete with toe-board, a halfway toe rail, an upper toe rail (1 meter high protections) and safely reachable (within the toe-board). If available, use stabilizers or brakes on wheels and a suitable harness to be used in the final part of the toe-board.
3. If you use a ladder, it has to be placed always on a clean floor and in a stable way. Make sure it has anti-slid materials on its feet. Make sure the ladder is used with a suitable tilt (tilt = $\frac{1}{4}$ of its length). Remember that the ladder must have a suitable length as it always has to go approximately 1 meter beyond the arrival/work floor.
4. These operations with the ladder have to be always carried out with the help /assistance of a second operator. He helps the worker who performs maintenance activities by securing the ladder to his foot. The assistant has to always wear a safety helmet;
5. In the absence of fixed safety equipment (footpath platforms along the machine, toe-boards or scaffolds) together with the ladder, the operator in charge of maintenance operations has to always use the safety belt with double locking beaks to be fixed to stable parts of the machine;
6. Keep the work plan free and clean in order to avoid slipping or tripping over misplaced tools.

If the maintenance operation is carried out close to an area where at the same time other operators are working at height:


1. Do not stand directly below the work area;
2. Always wear a safety helmet.

5) Confined areas

Operations in confined areas (inside of reactors) are prohibited for Sterling S.p.A. operators.

If it is necessary to carry out operations in confined areas, these have to be provided only by companies or self-employed persons who meet the following requirements:

- Full implementation of the regulation in force on risk assessment, health surveillance and emergency management measures;
- In case of self-employed operators or family businesses, they have to comply with clause 2, art. 21 of Legislative Decree no. 81/08 on training and health surveillance;
- Labour force has to be not less than 30% with at least three years working experience in suspected polluted or confined areas, hired as employees with an open-ended contract or with other types of contracts on condition that they are certified in accordance with Title VIII, Chapter I, of Legislative Decree no. 276/03. **It is necessary for workers performing the position of supervisors to have this experience;**
- A training course of all staff, including the employer if involved in activities within suspected polluted or confined areas, on risk factors arising from such activities, in accordance with Art. 34 and 37 of Legislative Decree no. 81/08.

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- Workers have to be in possession of personal protective equipment and work tools suitable to prevent risks related to their activity and they have to be trained on the proper use of such devices and equipment in accordance with the provisions of art. 66 and 121 and Annex IV paragraph 3 of Legislative Decree no. 81/08.
- All staff employed in working activities within suspected polluted or confined areas, including the employer, has to be trained on the implementation of safety procedures according to provisions of art. 66 and 121 and Annex IV paragraph 3 of Legislative Decree no. 81/08.
- regulations in force regarding the DURC certification (or tax compliance certificate) have to be respect when possible;
- Total implementation of the economic and regulatory part of the sectoral collective agreement, including the payment of taxes to the bilateral body of reference, when the professional service is kind of day rate, with reference to contracts and sectoral collective agreements signed by employers and employees most representative organizations on the national level.

As far as working activities in suspected polluted or confined areas, subcontracts are not allowed unless expressly authorized by the client company employer and certified by the Title VIII, Chapter I of the Legislative Decree of 10 September 2003 n. 276 and subsequent amendments and additions. Provisions of this procedure apply also for businesses and self-employed worker to whom the work is subcontracted.

Before entering into workplaces, all contract company employees, including the employer himself if involved in the same activities, have to be informed in detail by the client company employer on the characteristics of the places in which they are called to work, on all the risks including those resulting from previous uses of the workplace and on emergency and prevention procedures taken. Such training course has to be carried out in a sufficient and adequate time not less than one day.

Client company employer have to identify a representative, with appropriate skills regarding health and safety and aware of the risks in workplaces. The representative has to supervise and coordinate the activities performed by the contract company employees in order to minimize the risk generated by interference between activities conducted simultaneously in the same workplace.


When working in suspected polluted or confined areas a work procedure has to be adopted and effectively implemented in order to eliminate or, if not possible, to minimize all risks generated by activities in confined areas. The procedure has to include rescue operations in cooperation with the emergency system of the National Health Service and Firemen.

If the above mentioned regulations are not observed, the qualification required to operate will not be released.

6) Areas with wet floors or ice

In order to avoid slipping:

1. Wear the appropriate PPE (non-slip and cold-proof soles);
2. Move carefully, by paying attention to the icy floor and to any work equipment which can be used during the working activities;

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3. Be particularly careful in case of electrical working activities;
4. Make sure the transported material is secured even in case the operator loses him balance.

7) Operations on pressurized parts

The risk related to this type of activities is due to the ejection of possible objects or high pressure fluids. It is necessary to take pressure off the work area, and if it is not possible:

1. Wear face protection, gloves, appropriate clothing (apron or coverall) making sure that the operations to be carried out are compatible with the fluid contained in the machine or with the material that could spurt out the operator.
2. Choose the appropriate PPE according to the type of risk by taking into account that:
 - The circuit contains fluid or air at a very high temperature;
 - The circuit contains chemicals;
 - The major risk is due to the ejection of possible objects.

8) Welding activities

Every time you carry out a welding activity it is necessary to:


1. Wear the long-sleeved and heat-resistant clothing provided, gloves, and a protective mask;
2. Use the face shields supplied suitable to prevent eyes damages
3. Always weld in open and ventilated areas whether it is possible. If it is not possible, use the table portable hood which allows you to suck welding fumes, or use the gas mask to perform small welding activities that do not require the involvement of other operators;

Remember that even the operator who assists and/or collaborates in the welding process, has to wear the same PPE since he is subjected to the same dangers.

If welding is done with acetylene:

1. Acetylene cylinders have to be guarded against heat sources and radiation in order to prevent explosive reactions;
2. Do not hang welding torches or their hoses to the cylinders;
3. Make sure hoses are not damaged and, if case of doubt, replace them;
4. When acetylene cylinders are not in use, close their valves;
5. Let the air in the acetylene hoses out before turning on a welding torch by draining acetylene in the torch for a few seconds.

Do not perform welding operations by using welding torch or electricity in the following conditions:

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1. On closed containers or pipes;
2. On open containers or pipes containing substances that due to the heat action can lead to dangerous reactions;
3. On containers or pipes (also open) which contained substances that could have generated explosive mixtures;
4. Furthermore it is forbidden to perform welding operations in areas that are not naturally or forcedly ventilated;
5. In order to carry out welding activities in potentially explosive areas (production area, storages, etc.) the working permit is required.

9) Activities with electrical equipment

Before using any electrical equipment make sure cables and plugs are kept intact and in good conditions.


Remember that in potentially explosive areas of the plant (distilling zone, fractional distillation area, mother liquors storage) it is not permitted to use electrical equipment that can generate sparks or other ignition sources unless upon authorization through the working Permit.

10) Activities which require a mechanical handling

In case you need to handle loads with the help of a forklift, it has to be used only by authorized and trained personnel.

Please remember that:

1. in normal working conditions it is forbidden to use the forklift to lift and transport workers within the plant area;
2. If it is necessary to use the forklift for workers lifting, make sure that:
 - it is an exceptional situation, that is the operations to be performed can not be differently programmed;
 - the equipment used is approved for the purpose (work platform man baskets equipped with effective safety devices);
 - appropriate safety measures are taken by implementing especially developed safety procedures;
3. It is forbidden to use the forklift to push or pull material, or to lift it in a way that is not considered by the manufacturer. The manufacturer specify that the forklift can only be used to lift pallets, containers, etc. through forks by respecting the load limit established;

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4. Pay attention to respect the load limits in terms of residual capacity by checking it on the plates placed on the vehicle which consider the weight, the load focal point and the equipment.
5. Before using the forklift, the operator has to know the content of the load chart provided by the manufacturer. This chart can be different from one forklift to another;
6. Internal traffic paths indicated by appropriate signals and markings have to be respected;
7. The use of the forklift is reserved only for staff adequately trained and informed about the risks arising from its use and from the workplace in which it is used. Remember that such work equipment entail the following risks to workers:
 - a reversal due to excessive speed (speed >15-20 km/h);
 - keep the load down when moving it (lower the focal point of the vehicle);
 - always park the forklift with handbrake and lowered forks;
 - fasten seat belts;
 - doors or bodyguards always kept closed.

11) Electrical risk


Electrical activities divide into two main categories: **"Operations on isolated machinery"** and **"Operations on live machinery"**

Operations on isolated machinery

Before carrying out any "operation on isolated machinery" on the BT electrical system it is necessary to:

1. Unequivocally identify the part of the machine on which the operation has to be performed and dissect the end and the beginning of all possible power sources.
2. Place the sign WORK IN PROGRESS DO NOT USE on each power switch
3. Where possible, block the BT switches which are not visible by the operator or the supervisor by using padlocks or other effective methods.
4. Cordon off the working area
5. Always check the real absence of electricity before starting with the maintenance operations
6. In case of doubt about the identification of all possible power sources, it will be necessary to short-circuit and ground the part of the machinery to be maintained before proceeding;
7. If within the working area there are other powered parts, which do not required any maintenance operation, they must be isolated and made safe

The above described operations have to be carried out by an adequately trained operator.

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Operations on live machinery

Before carrying out any "operation on live machinery" wait for the supervisor to check that all safety measures to guarantee workers health are taken.

It is always forbidden to carry out operations under the rain, snow or hail, in wet areas and where there are fire and explosion risks.

Before giving permission to start the operations, supervisor has to check that:

1. The operations will be performed according to the requirements laid down in the regulation EN 1127 and EN 50110-1 for which a dedicated training course for employees was carried out.
2. There is no voltage in foreign masses,
3. Powered parts are contained in a 50 x 50 maintenance area. Apart from this area, make sure there is not any other powered/not-isolated zone.
4. Before and during the operations, make sure workers accurately use PPE (specified below) and the equipment provided. Constantly monitor the operations until the end.

Operations on live machinery of the BT electrical system have to be performed only on conditions that:


1. Powered parts on which you have to work within the maintenance area are placed in front of the operator
2. Parts with different potential (phases, neutral, masses) on which you have to work are mutually separated by insulating partitions, already present or put on purpose, or that they are far enough so that you can not accidentally cause a short-circuit or ground connections with the naked part of the tools or materials that will be used during the operation,
3. When working, wear the insulating helmet, visor and gloves, wear also insulating clothing that does not leave any body part uncovered and unprotected.

Operations above described have to be performed only by trained operators who have the specific knowledge and experience to avoid the dangers caused by electricity as a result of an accidental contact. The person who will perform these activities must be an "Expert" who attended specific courses.

12) Maintenance operations in potentially explosive areas (ATEX or EXAT)

Working and maintenance activities carried out in certain areas or production plants can be an additional danger to workers safety because of the possibility of certain atmospheres to become explosive under specific conditions.

In fact, an explosive atmosphere refers to an atmosphere which develops in an explosive way due to changes in the surrounding environment or as a result of the activities carried out within it. An explosive atmosphere consists of air and combustible materials such as gas, vapours, sprays or dusts, in which the explosion spreads after the ignition.

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Within the plant there are workplaces that, depending on the state of the same places (including malfunctions/accidents) and the working activities performed in these areas can entail a risk of explosion.

Workplaces partition

As far as the risk of explosion, the ATEX (or EXAT) regulation provides the division of workplaces into three zones.

Zone 0: Constant danger. Area with a constant presence of explosive gases or combustible dust.

Zone 1: Potential danger. Area with a possible presence of explosive gases or combustible dust during the normal activity.

Zone 2: Minor danger. Area with an uncertain presence of explosive gases or combustible dust, or just for a short time lapse.

Specific measures to be taken

Before carrying out work activities in areas classified as Zone 1 and Zone 2, you need the specific approval by the company Safety Office (working permit). Later you can do all planned operations.

13) Maintenance operations in areas with asbestos (building A)

As far as the risks related to the presence of asbestos within an area and business buildings, it is necessary for you to know that this material entails specific risks to workers health since the inhalation of asbestos fibres can cause asbestosis (lung cancer).

There is an internal cement asbestos covering within the building A. It is important to specify that, in addition to the simple directions provided below regarding maintenance activities close to MCA (material containing asbestos); such material can not be altered, moved or removed by unskilled workers. MCA can be removed only by expert and authorized personnel upon delivery of a "working plan" to the local health authority.


Preventive activities

Before starting working activities, you have to be authorized through a working permit issued by the Safety office.

14) Maintenance operations in areas with a potential biological risk

Maintenance activities on machinery serving these areas (e.g. air conditioning system) have to be carried out using standard precautions such as the use of masks and gloves.

For maintenance operations on air conditioning systems to be carried out in the production areas during the working activity, please see the operative instruction "Replacing of air conditioning systems filters in the production area" IO_4.4.6-I2

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4. RESPONSIBILITIES

Maintenance operators have the responsibility to follow the instructions provided by this operative instruction. The supervisor has to make sure that operators observe all regulations provided in the operative instruction.

5. APPENDIX

Nil