VV 23 SAFETY INSTRUCTIONS **Use and storage of hazardous substances**	nyrstar Balen/Pelt

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1 PURPOSE

This regulation describes the requirements associated with the (temporary) use and (temporary) storage of hazardous substances during the performance of work.

2 SCOPE

The requirements of this safety regulation apply on Nyrstar Belgium's premises.

3 DEFINITIONS

Hazardous substances: the substances and mixtures for which the criteria for physical, health hazards or environmental hazards are met according to the CLP Regulation.

The CLP Regulation introduces the Globally Harmonised System (GHS) in the European Union. CLP stands for "classification, labelling and packaging". This Regulation No 1272/2008 deals with the classification, labelling and packaging of substances and mixtures.

SDS: Safety Data Sheet.

Carcinogen: A **carcinogen** is a substance that can cause cancer or increase the frequency of cancer in a population that has been exposed to this substance.

Reprotoxic: **Reprotoxic** substances are chemical substances that can have a detrimental effect on the fertility and reproductive structure of workers.

Mutagens: A **mutagen** (combination of mutation and genesis) is a chemical substance that damages DNA and can cause hereditary changes.

Repository (cf. VLII): the premises or places in buildings, underground or in the open air, in which the dangerous products or flammable liquids are stored in fixed containers, in movable containers or unpackaged in a quantity exceeding the daily consumption per 24 hours.

a) "fixed containers" means containers that are filled or refilled at the place of use;
b) Movable container: the containers that are filled or refilled in a place other than the place of use.

Transport vehicles and devices in which the hazardous substance is present to undergo processing (e.g. production) do not count as storage sites.

Open storage area: storage space in the open air or in a room that is closed to a maximum of 3/4 of the perimeter.

Closed warehouse: storage place in a closed room or in a room that is closed for more than three quarters of the perimeter of the storage area.

4 PRESCRIPTION

4.1 Requirements for the use of hazardous substances

- The use of dangerous substances should be avoided as much as possible.
- The use of dangerous substances is only permitted if:

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- the Safety Data Sheet is available;
- the substances are labelled with the hazard statements;
- The people who have to work with the substance are aware of the risks and they observe the recommended precautions.

- In the event that hazardous substances are used in a confined space, a risk analysis must be drawn up in which the hazards and precautions to prevent fire/explosion or poisoning or other injuries are specifically mentioned.

- In a closed warehouse:
  - heating may be carried out only by means of appliances whose installation and use offer sufficient guarantees to prevent the risk of fire or explosion;
  - no work may be carried out which requires the use of an appliance with an open flame or which is likely to generate sparks;
  - it is forbidden to smoke, light fire or store flammable substances within the boundaries of a zoned zone – this prohibition is indicated by pictograms;
  - the chimneys and discharge ducts of the aspirated fumes and fumes are made of non-combustible or self-extinguishing materials.

- The use of substances classified as (very) toxic and/or hazardous to health is only permitted after explicit approval by Nyrstar's Medical Deparment.
  These include substances known to be **carcinogenic, mutagenic or reprotoxic**.
  In order to obtain this approval, it will have to be demonstrated that there are no alternatives.

- The use of **HF (hydrogen fluoride),** for example as a passivation liquid or paste, is not permitted.

- Acetylene/oxygen cylinders on welding carts must always be driven to a safe location after work has been completed, due to the risks to emergency responders in emergency situations.

- Only the daily supply of the dangerous substance may be present at the workplace. Other stock must be stored as described below.

- The 'points of attention for use' mentioned in the table below must be observed.

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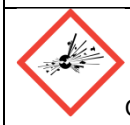
Hazard label		**Point of attention when using**
CLP marking		
 GHS01	Explosion Explosive	
 GHS02	Fire hazard Flammable	In combination with fire-hazardous work: MEDIUM-HIGH **RISK ZONE** for both this work and adjacent works.
 GHS03	Oxidizing Fire-promoting	In combination with fire-hazardous work: MEDIUM-HIGH **RISK ZONE** for both this work and adjacent works.
 GHS04	Gases under pressure	
 GHS05	Corrosive Corrosive	**Keep BUMB** available .
 GHS06	Poisonous	Only with explicit permission from **Nyrstar MEDICAL Department.**
 GHS07	Irritating	
 GHS08	Dangerous to health (carcinogenic, reprotoxic, mutagenic)	Only with explicit permission from **Nyrstar MEDICAL Department.**
 GHS09	Environmentally hazardous	Take precautions against spills.

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4.2 Storage of Hazardous Solids in Bulk

Bulk solids, which contain leachable substances, are stored on a liquid-tight surface, equipped with a collection system.

4.3 Storage of hazardous liquids

4.3.1 Storage Requirements Fixed/Movable Overhead Holders

Fixed containers for the storage of hazardous liquids must be constructed in accordance with a code of good practice (cf. VLII annex 5.17.2) – with a "declaration of conformity of the holder" signed by the manufacturer.

Movable/fixed containers containing hazardous liquids must be placed in a sump that meets the following conditions:

- the sump is impermeable to liquids and resistant to the effects of the stored liquids;
- the sump is strong enough to withstand the mass of liquid that may escape from the largest container placed in the sump in the event of a breakage;
- Ducting pipes through the sump is only permitted if the tightness of the containment remains ensured;
- the floor is laid in such a way that the spread of leaking fluids is kept to a minimum and can be easily removed;
- measures are taken to remove rainwater from a containment on a regular basis; this takes into account the avoidance of soil, groundwater or surface water pollution;
- The capacity of the sump depends on many factors such as the location of the containers, the hazard class of the hazardous liquid, the equipment of the container, etc.
    - As a general rule, it is assumed that the sump should have at least a capacity of at least one of the water capacity of the largest container, increased by 25% of the total capacity of the containers placed in it;
    - Always consult the environmental department for a correct capacity determination of the containment for a specific situation!

Movable/fixed containers with a capacity > 220 litres:

- A minimum distance equal to half the height of the container shall be maintained between the container and the inner bottom of the walls of the sump.
- A passage of at least 1 meter wide between the holders and the walls of the sump must be left completely free.

Fixed containers with a capacity > 10,000L: the containment and foundation are built according to code of good practice under the supervision of a (civil (structural) architect, or industrial engineer.

Permanent containers with a capacity > 50,000 L: stability study should be carried out.

Fixed containers are equipped with an overfill protection and a level measurement.

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Single-walled fixed holders are placed within a sump.

Double-walled fixed holders do not need to be placed inside a sump, but are equipped with a permanent leak detection system.

Fixed containers are always equipped with a marking plate – the following indications are placed at the filling opening: the number of the holder; the name of the stored liquid, the hazard pictograms and the water capacity of the container.

If leaks or defects are found on a container, all possible measures are taken to limit soil and groundwater contamination as much as possible.

The contents of a leaking container are immediately pumped or transferred to another suitable container.

Any spilled liquids are immediately immobilized with intervention equipment (such as absorption and neutralization material, oversized drums, protective equipment,...) and placed in a specially designated container.

In the case of repair of a container which is part of a group of containers installed in the same containment, the container must be surrounded by a liquid-tight wall throughout the repair period, the height of which is equal to that of the raised edge and/or walls surrounding the entire group.

After a container has been professionally repaired, it may only be put back into use after inspection by a recognised environmental expert who effectively certifies this inspection.

4.3.2 Distance rules

Precautions are taken to prevent products from coming into contact with each other and causing dangerous chemical reactions.

Products, marked with different hazard pictograms, shall be stored in the same warehouse in different compartments taking into account distance rules set out in VLII – Annex 5.17.1. or consult the environmental department.

4.3.3 Filling of fixed above-ground containers

With regard to the filling of the fixed containers and tankers, the following rules apply:

- measures are taken to prevent spillage of liquids and contamination of soil, groundwater and surface water;
- the flexible hose, which is used for supplying, is connected to the opening of the holder or duct by a screw-fitting device or equivalent;
- any filling operation is carried out under the supervision of the operator or his appointee; this monitoring shall be organised in such a way that the filling operation can be monitored and immediate action can be taken in the event of an incident;
- it is forbidden to fill the container with any liquid other than that for which the container is designed;
- The location of the tanker, the areas where the filling nozzles of the filling pipes are grouped and the filling zones at the distribution system are always located on the site of the installation and are:
    - sufficiently load-bearing and impermeable to liquids;
    - equipped with the necessary ramps and possibly raised edges, so that all spilled liquids drain into a collection system;
    - The liquids collected shall be disposed of in accordance with the provisions of the regulations, in particular those relating to the disposal of the waste. Under no

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circumstances may there be a connection to a public sewer system, a surface water, a canal or a groundwater layer.

4.3.4 Inspection obligation

Before installing the fixed above-ground container > 10,000L, a certified environmental expert must check whether the holder / foundations are compliant.
This control is attested by an unambiguous report.

After installation, but before the fixed above-ground container is put into service, it must be checked that the holder, the pipes and accessories, the overfill warning or protection system, the containment and fire-fighting equipment and, where applicable, the leak detection system and the existing vapour recovery facilities are adequate.
This control must be carried out by an approved body that certifies this control with an unambiguous report.

After commissioning, all certificates and reports are submitted to the Reliability Department – statutory inspections, which draws up the necessary PO plans to guarantee, among other things, the external periodic 3 – annual examinations and the internal 20 – annual general examinations.

4.3.5 Flammable liquids

Storages for flammable liquids must be tub-shaped and constructed of non-combustible material. The doors must open outwards and must be closed automatically in the event of a fire.

The storage area must be adequately ventilated. This can be done through both natural ventilation and artificial ventilation.

Flammable liquids should be stored in closed containers and protected from all adverse effects of radiation from heat sources.

Storage of flammable products is not permitted at basement level.

Flammable liquids and solids, marked with the hazard pictogram GHS02, must NOT be stored in a place where the temperature may exceed 40°C due to technological origin.

4.4 Storage of gases in fixed / movable containers

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4.4.1 Storage Requirements Fixed/Movable Overhead Holders

The gases must not be stored outside the designated storage area, taking into account that no chemical reactions occur. A storage area must be provided for the empty movable containers.

The electrical installations / lighting fixtures comply with the requirements of the CODEX Well-being at Work and the AREI inspection certificates are made available to the certified environmental expert.

The floor of the storage area offers sufficient resistance, is impermeable and is laid out in such a way as to ensure the stability of the movable containers.
The floor must not be lower than the adjacent property / must not contain any openings, cavities or trenches / must not be set up in a basement.

Closed warehouses must be built entirely of non-combustible materials, the doors must open outwards, the windows must have fixed windows with reinforced glass, and must be adequately ventilated.

In storage facilities of group 1 gases:

- Measures are taken against electrostatic charges;
- Heating is only allowed if there are sufficient safeguards to avoid the risk of fire and explosion – the temperature must not exceed 40°C;
- Is it forbidden to make open fires, to work with appliances that generate sparks, to smoke – these prohibitions are indicated by means of pictograms;
- Is it forbidden to enter with motor vehicles;
- The storage of flammable substances within 5 m is prohibited;
- Are the chimneys / discharge ducts made of non-flammable material and is there no connections with sewers;
- Is the roof built of non-combustible material that has max. 20% consists of translucent self-extinguishing material.

Only authorised persons have access to the storage facility – the prohibition of access to unauthorised persons is indicated by means of pictograms.

The construction of the fixed container, whether vacuum or not, is adapted to the gas they contain according to a code of good practice.

The fixed container undergoes a water pressure test in the presence of a certified environmental expert and is equipped with an identification plate.

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4.4.2 Distance rules

For open and closed storage sites, gases from different groups must be stored in a separate compartment; these compartments are indicated by walls, safety screens, markings on the ground, chains or fixed demarcations at a height of 1 m) taking into account the distance rules included in VLII – Annex 5.17.1. or consult the environmental department.

Below are some distance rules for the most commonly used gases in movable containers with a storage capacity of up to 1,000L. Consult the environmental department for the determination of distance rules for the storage of hazardous liquids and solids or distances from limits of property, storage tanks,...

	Group 1 gas	**Group 2 Gas**	**Group 3 Gas**	**Group 4 Gas**
Group 1 gas Acetyleen Butane LPG Propane Hydrogen	0 m	5 m (acuut tox. cat. 1)	2 m (open storage) 5 m (closed storage area)	0 m
Group 2 Gas Arsine Sulphur dioxide	5 m (acuut tox. cat. 1)	0 m	0 m	0 m
Group 3 Gas Oxygen Lachgas (stikstofmonoxide)	2 m (open storage) 5 m (closed storage area)	0 m	0 m	0 m
Group 4 Gas Argon Carbon dioxide Nitrogen Helium	0 m	0 m	0 m	0 m

4.4.3 Filling of fixed above-ground containers

For each filling operation, a precise and written instruction is drawn up describing the various operations to be performed.

An appointee continuously and attentively supervises the effective filling operation.

The percentage of the fixed container to be filled depends on the density of the gas and the volume of the above-ground container (see VLII art. 5.17.3.3.9).

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It is forbidden to fill non-cooled, non-vacuum insulated containers with a liquid whose vapour pressure is higher than the maximum service pressure for which the container was purchased.

Hoses used for filling may only be used in the open air.

4.4.4 Inspection obligation

An accredited environmental expert checks the documents provided by the manufacturer, the detailed statement of the checks, the inspections, the surveys and the tests carried out by him.
This control is attested by an unambiguous report.

After commissioning, all certificates and reports are submitted to the Reliability department – statutory inspections that draw up the necessary PO plans to guarantee, among other things, the periodic examinations and the general internal examinations, carried out by a recognized environmental expert.

Vacuum – insulated containers should be checked at least 2 – annually by a recognized environmental expert – the safety valves should be adjusted 10 – annually.

Non-return valves on the filling line between the container and the filling point of an LPG station must be inspected at least 5 times a year by a certified environmental expert.