KAM-rule 03 Hazardous substances

Contents

Changes compared to the previous version **2**
Introduction **3**
Legal framework and permits **4**
General control measures in laboratory and production areas **4**
Specific control measures in laboratory and production areas **5**
Workspace requirements **6**
Source extraction and fume cupboards **8**
Personal protective equipment **8**
Storage **10**
Fire safety cabinets **11**
Coolers and freezers **12**
Registration of and information about hazardous substances **12**
Labelling **13**
Disposal **14**
Risk declaration **14**
RI&E and exposure assessment **14**
Accidents and incidents **15**
Information and instruction **15**
Abbreviations and terms **17**
Appendices and references **18**

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Changes compared to the previous version

The 2016 update from the RIVM (National Institute for Public Health and the Environment) was implemented in this KAM-rule and comments from organisations on the site processed. For users of this KAM-rule, the following changes have been made as compared to revision 1 of the Stichting AL-terrein:

- The chapter format has been changed;
- It's a more user-friendly document with a clickable table of contents and inserted hyperlinks;
- Included in the overview with relevant legislation and regulations are: Wabo, CLP (EU-GHS) and REACH;
- Environmental regulations that come under the supervision of the Stichting AL-terrein (whether or not combined with occupational health and safety topics) have been placed in text boxes. Occupational health and other safety issues that are not covered by the Stichting AL-terrein, have not been included in the text boxes. This requires the organisations at the USPB to further update the topics themselves.
- Changes with respect to the Working Conditions Decree up to and including 1 July 2017, published in the Official Gazette of the Kingdom of the Netherlands, Volume 2017, No. 255;
- Added:
    - Registration-requirements for WVMC (Abuse of Chemical Substances (Prevention) Act) category 1 substances;
    - Category NAR, and category PSY differently defined;
    - Clarification of criteria for the use of fume cupboards or source extraction or use of personal protective equipment;
    - Labelling rules for home-made and/or repackaged hazardous substances;
    - More specific elaboration of the legal obligations with regard to CMR-substances.
    - References to legislation around working conditions.
- Removed:
    - Specific control measures for working under increased or reduced pressure. This is not specifically related to hazardous substances.
- Appendix 2 'EU-GHS Classification of CMR-substances has expired;
- Appendix 3 'SZW lists of CMR-substances' has been removed. A reference to the current SZW (The Ministry of Social Affairs and Employment) list has been added instead;
- Appendix 6 'Example registration form for CMR-substances' has expired;
- Information on the old pictograms from the Environmental Management Act has been removed from the other appendices. Because a number of appendices have expired, those remaining have been renumbered as follows:
    - Appendix 1 Classification of hazardous substances according to Wm, EU-GHS and ADR (appendix number unchanged)
    - Appendix 2 Storage of hazardous substances (was Appendix 4)
    - Appendix 3 Requirements and secondary conditions for fire cabinets in accordance with NEN-EN- 14470-1 (was Appendix 5)
    - Appendix 4 Determination of hazard indication and safety measures for working with nanomaterials (was Appendix 7)
- A new Appendix 5 'Code of conduct in laboratories and production areas' has been added. Specific conduct rules from the KAM-rule have been moved to this appendix.
- A new Appendix 6 'Standards for laboratory gloves' has been added. The overview containing the standards has been moved from the KAM-rule to this appendix.
- A new Appendix 7 'Explosive atmospheres' has been added. Included in this are articles 3.5 a to f from the Working Conditions Decree.

Introduction

This KAM-rule describes how hazardous substances are responsibly handled at the Utrecht Science Park Bilthoven (USPB). The KAM-rule is intended for all organisations at the USPB, including external (maintenance) companies, and applies to all areas where hazardous substances are stored and/or worked with.

Purpose

The purpose of this KAM-rule is:

- to minimise the health risks and the risk of fire when working with and storing hazardous substances (preventive);
- to minimise damage to health, material and the environment as much as possible following an accident or unwanted exposure (repression).

Delineation of KAM-rule

Under hazardous substances in this KAM-rule is understood: all chemical compounds that can have an undesirable effect on humans or the environment. Chemical substances can be synthetic, but also natural substances.
This KAM-rule is focussed on the following topics:

- Prevention and/or minimisation of exposure to hazardous substances;
- Taking measures to prevent unwanted events;
- Taking technical and organisational measures to limit the consequences of unintended events.

The supplementary rules in KAM-rule 09 Gas bottles in workplaces apply when working with gas cylinders. In addition, further rules may apply per organisation for specific hazardous substances (e.g. cryogenic substances, cyanides, opiates and cannabis) or measures (such as the use of personal protective equipment).

The following topics are outside of the scope of this rule:

- Occupational health-related research, files and registration.
- Biological agents and genetically modified organisms (GGO's). See KAM-rule 13 Biological Safety.
- Radioactive substances. See, if applicable, your own organisation's Nuclear Energy Act license and radiation control.
- Measures and regulations arising from organisation-specific permits or exemptions.
- Transport of hazardous substances on public roads.

Responsibilities

- The Stichting AL-terrein oversees users o the USPB in terms of compliance with relevant provisions of the permits held by the Stichting AL-terrein, and the related protocols. Also see https://stichting-alt.nl/ .
- All organisations at the USPB are responsible for maintaining a current overview of hazardous substances.
- Line management is responsible for all other mandatory registrations, such as CMR substances.
- Line management is responsible for information, instruction, supervision and enforcement with regard to this KAM-rule.
- Every employee who works with or is in contact with hazardous substances is responsible for following the provisions as set out in the KAM-rule.

Legal framework and permits

This KAM-rule is based on the following laws and regulations:

- Working Conditions Act, –decree and –regulation (Occupational Health and Safety Act, Working Conditions Decree, Occupational Health and Safety scheme)*;
- General Provisions Environmental Law (Wabo);
- Convention for the International Carriage of Dangerous Goods by Road (ADR);
- Chemical Weapons Convention Implementation Act (UVCW);
- Abuse of Chemical Substances (Prevention) Act (WVMC);
- Opium Act;
- Regulation (EG) No. 1272/2008 (EU-GHS);
- Regulation (EG) No. 1907/2006 (REACH).

The following license applies to all organisations at USPB:

- Flexible license (VOH). Managed by Stichting AL-terrein.

Rules relating to this license are set out in this KAM-rule. The Stichting AL-terrein oversees compliance by the organisations at the USPB.

Permits or exemptions may apply per organisation, to which regulations and measures are linked. These permits and exemptions come under the management and supervision of the relevant organisation (s) at the USPB.

*See chapter appendices and references (page. 18).

General control measures in laboratory and production areas

When taking control measures to limit exposure to hazardous substances follow the **occupational hygiene strategy** where possible. This means that the following (statutory) order of priority must be observed:

a) **Replacement** of hazardous substances by less hazardous substances;
b) Use of substances in a **closed system**;
c) Discharge of polluted air through **ventilation**: source extraction (work in fume cupboards, point extraction) or room ventilation;
d) **Separation of man and source** by shielding source or employee;
e) Use of **personal protective equipment**. Personal protective equipment may only be used if the above control measures do not adequately control the risks. Once measures a) to d) become feasible, the use of personal protective equipment must be replaced by those measures. When using personal protective equipment, it is important that use thereof is limited to what is strictly necessary.

Key controls are described in various sections in this KAM-rule. In addition, rules of conduct in laboratories and production areas are described in Appendix 5 of this KAM-rule.

Specific control measures in laboratory and production areas

Additional rules apply to a number of topics. These are described below.

Carcinogenic, mutagenic and reprotoxic substances (CMR substances)

Introduction CMR-substances:

Special forms of hazardous substances are **CMR-substances**:

- Carcinogenic substances and processes, that can cause cancer in humans as a result of exposure or promote the cancer process.
- Mutagenic substances that can change (mutate) the generic material of body cells.
- Toxic substances that can have an effect on reproduction. These are effects on the reproductive potential of both men and women, as well as damage that can be caused to the unborn child (teratogenic substances) or to the infant (breastfeeding).

The Ministry of Social Affairs and Employment (SZW) keeps up-to-date lists of CMR-substances (for example carcinogenic substances and processes).

One of these substances on the list is ethanol. **It has been agreed at the USPB that specific occupational health and safety measures for CMR-substances described below do not apply to ethanol, provided this is substantiated in the RI&E.**

Workspace:

Reserve one area specifically for working with CMR-substances. If incidental work is performed with CMR substances, limit the working area/workplace for this and keep the working area/workplace as separate as possible from other working areas/workplaces. This can be done by concentrating the work in a glove box (or fume cupboard) reserved for CMR substances for example. No other work may be performed in this cupboard when working with CMR substances.

Shielding source:

Work with CMR substances should, where possible be implemented in a closed apparatus such as a glove box. If this is not possible, carry out operations with CMR substances in a well-functioning fume cupboard (see section Source extraction and fume cupboards (page 8)).

Prevent contamination:

Avoid contamination of surfaces and products that are not immediately required for the experiment.

Control measures to prevent contamination of the workplace:

- Working in drip trays;
- Working on a layer of absorbent paper (filter paper);
- Applying the clean & dirty hand method.

Storage:

See the storage section (page 10).

Waste:

Solid waste of CMR substances (gloves, tissues and the like) is collected in leak-proof, lockable buckets. Liquid waste is collected in 5-liter waste drums. The solid and liquid waste may only leave the department if these buckets and drums are placed in waste drums approved by the waste disposal company (blue 60 litre drum with yellow lid). Buckets and drums are available via PSP-Self-service. The organisation, the department, the building and the room will be listed on the drums.

Special groups of employees:
For employees who are pregnant or breastfeeding and work with CMR substances, special guidelines apply. To this end follow your own organisation's policy.

Sensitizing substances (SENS-substances)
Shielding source:
Where possible perform work using SENS-substances under source extraction; preferably in a well-functioning fume cupboard (see section Source extraction and fume cupboards (page 8))

Gloves:
Always wear gloves when working with SENS-materials. For the selection of suitable gloves, see the section Personal Protective Equipment (page 8) and Appendix 6 'Standards for laboratory gloves' for this KAM-rule.

Prevention of fire and explosion

- Be aware of explosive combinations and special risks of hazardous substances, as described in the KAM-rule 07 Hazardous waste appendices.
- Work with (light) flammable solvents in the fume cupboards (or if not possible in well ventilated areas);
- Work with (very) (light) flammable substances after extinguishing 'open fires' such as pilot lights, Bunsen burners and the like;
- Keep flammable substances, solvents and explosive vapour/air mixtures away from hot surfaces, such as hot plates, ovens, pipes etc.;
- Do not allow solvents to escape into the work area: Close containers and bottles immediately after use, avoid spillage, work neatly. Remember that most vapours from organic solvents are heavier than air and can 'creep' over the work table and collect at lower locations.

Transport

- Transport hazardous substances over long distances in sealable and break-free transport containers, in which the packaging cannot fall over, catching any spilled substances.

Workspace requirements

Access to laboratory and production areas
Each access door to a (cluster of) space (s) in which hazardous substances are used, or where hazardous substances are stored, is marked with a green square, yellow triangle or red circle according to KAM-rule 20 Access to lab and production areas. Line management is responsible for the accuracy of the sign. The sign indicates which instructions apply for access to the risk-associated areas. These instructions are described in Appendix 3 of the KAM-rule 20.

Safety and health signs
Every area in which hazardous substances are used, or where hazardous substances are stored, is provided with the required health and safety signs in accordance with the Working Conditions Act article 8.4; that is, prohibition signs, warning signs, mandatory signs, rescue signs and signs relating to fire-fighting equipment.

Requirements for laboratory and production facilities

An area where work is carried out with hazardous substances must meet requirements and guidelines arising from:

- the Building Decree,
- the Occupational Health and safety Legislation,
- Flexible license (VOH) (managed by Stichting AL-terrein),
- Model fire protection regulation,
- General rules for escape and rescue (AROR),
- Occupational health and safety sheets (in particular AI-sheet 18 Laboratories),
- Stichting AL-terrein KAM-rules and any additional regulations within your own organisation.
- Any additional requirements within your own organisation.

Standard requirements at the USPB are:

- There must be at least two escape routes in a laboratory or production area where there is heightened risk such as an increased risk of fire. Otherwise the nature of the work or the size of the space may be the reason for the presence of two or more escape routes.
- There must be a stockpile of absorbent materials (possibly as part of a spill-kit) present in a laboratory or production area for hazardous substances.

Standard guidelines at the USPB are:

- Ideally a small 2 kg extinguishing agent should be situated next to the entrance door in a laboratory area. In addition, there should also be a 6 kg extinguishing agent in the corridor, located near the firehose reel and the manually operated call point. See company emergency plan for location of the fire extinguishers.
- In a laboratory area and if possible in a production area the stock pile of absorbent material will absorb the regularly used types of chemicals and volumes.
- For areas in which hazardous substances are worked with, there is a necessity for an *eyewash facility in the room* (within reach of the working area) as well as an *emergency shower in or in the (immediate) vicinity of the room*. It is important that the eyewash facility and the emergency shower are clearly indicated and easily accessible at all times. The eyewash facility should ideally be connected to the watermains. The emergency shower is connected to the watermains and has a capacity of at least 80 litres per minute. Also see KAM-rule 34 'Fire hose reels, emergency and eyewash showers and decontamination shower systems'.

Additional measures for explosive atmospheres

If an explosive atmosphere cannot be prevented, the following measures will be taken in the following order:

- The ignition of explosive atmospheres is prevented in accordance with the ATEX directive and the use of explosion-proof equipment. In doing so consideration is given to electrostatic discharges which may emanate from the employee or the place of work as charge carrier or charge producer.
- The harmful effects of an explosion will be confined.

Also see Appendix 7 of this KAM-rule in which articles 3.5a to 3.5f from the Working Conditions Decree on Explosive Atmospheres are included.

Source extraction and fume cupboards

Definition of source extraction

In the first instance, source extraction is understood to mean: fume cupboards and other cupboards, specifically designed for the extraction of chemicals (e.g. a weighing cabinet). If it's not possible to work in one of these cabinets, other local (point) extraction systems can be chosen as an alternative.

Source extraction for hazardous substances AND biological agents

When working with source extraction is mandatory or recommended, while at **the same time working with biological agents**, a minimum requirement is that a 'biological safety cabinet Class II' is used for the 'source extraction'. It is then important that the extracted air (filtered) is immediately passed outside.

Use of source extraction

Types of substances where working with source extraction is **mandatory**, is described in Appendix 5 of this KAM-rule.

Working under source extraction is **recommended** independently of the substances referred to above when working with all solid and volatile hazardous substances.

The safe use of fume cupboards

The operation of the fume cupboard is influenced by the way in which the work is carried out. What to watch for in the safe use of fume cupboards is described in Appendix 5 of this KAM-rule.

Requirements for (the maintenance of) fume cupboards

- New fume cupboards comply with the NEN-EN 14175 standard. Among other things this standard describes the presence of an airflow indicator, which features an auditory and a visual alarm.
- For older fume cupboards without an airflow indicator (and as such without an auditory and a visual alarm), the proper functioning of the fume cupboard must be periodically checked by the organisation itself.

Personal protective equipment

Protective clothing (lab coats for example)

- According to your own organisation's policy and regulations.
- It is compulsory for everyone to wear protective clothing (a lab coat for example) in every work place where hazardous substances are used;
- If you work with CMR substances, the following rules apply:
  - ✓ Protective clothing (such as lab coats) in areas where CMR-substances are used, is intended only for use in the area in question;
  - ✓ Hang protective clothing (such as lab coats) on a designated coat rack, where there is no other clothing.
  - ✓ Clean non-disposable protective clothing regularly (weekly), if not (potentially) contaminated with CMR-substances, or after evaporation of any spilled liquid CMR substances.
  - ✓ Dispose of contaminated protective clothing (also non-disposable) as carcinogenic waste.

Gloves

Compulsory use and standards:

Work involving compulsory wear of suitable chemically resistant, heat resistant or cold resistant gloves is described in Appendix 5 of this KAM-rule.

An overview of the most common standards for gloves in laboratory situations is included in Appendix 6 of this KAM-rule.

Safety of gloves:
When using gloves as personal protective equipment, two important rules apply:

- Preferably **no latex-gloves**;
- If latex really is the required material of the gloves, then **do not use powdered latex gloves**.

Reasons for this are that:

- Latex can lead to skin and inhalation allergies. When using powdered latex gloves both types of allergies occur much quicker than with unpowdered latex gloves;
- If work is (also) being carried out using biological agents: as a material, latex is less effective as protection against biological agents than a number of other readily available and affordable glove materials.

Chemical safety
When gloves are needed to protect the skin from contact with chemical substances, it is important that selection is based on how long the glove in question provides protection (breakthrough time or permeation time) **PER SUBSTANCE**. Many substances can penetrate through the glove material (permeation). Ensure that the gloves comply with 'NEN-EN 374-3: 2003'. These have the following symbol on the package:

Your organisation may have an overview of breakthrough times or permeation times of different types of gloves for different types of chemical substances. Other sources of information include:

- (Material) safety datasheets (MSDS) from the supplier of the hazardous substance;
- Tables with breakthrough times or permeation times of glove manufacturers or suppliers;
- Expert on hazardous (chemical) substances within your organisation (e.g. occupational hygienist/ safety expert).

Biological safety
If gloves are (also) required as protection against skin contact from **bacteria or fungus**, then they must (also) at the very least comply with AQL-class 2 from NEN-EN 374-2:2015. This is indicated by the following symbol on the packaging:

If protection is (also) required against skin contact from **viruses**, the suitability of the glove can be identified by the following symbol on the packaging:

When working with biological agents it is recommended to choose gloves with a **long cuff.**

Safety glasses and/or face shields:
Work involving compulsory use of a face shield or safety goggles is described in appendix 5 of this KAM-rule. It also describes the circumstances under which wearing of safety goggles is recommended.

Storage

The general guidelines for the (environmentally) safe storage of hazardous substances are described in PGS 15:2016 'Storage of packaged hazardous substances' (http://content.publicatiereeksgevaarlijkestoffen.nl/documents/PGS15/PGS_15_2016_versie_1_0_sept_2016_definitief.pdf).
The contexts below offer customisation to meet the requirements in the PGS 15:2016.

Storage rules

- The **supply** of stored hazardous substances in laboratory and production rooms and chemical warehouses to be kept to an absolute minimum**;**
- In **work spaces** where dangerous substances are used, a **stockpile** of up to one, strictly necessary hazardous substance is permitted. The stockpile is defined in the section Abbreviations and terms (page 17).
- The **stockpile** of hazardous substances to be stored in drip trays, where one drip tray is considered to be one compartment. Also see the Compartmentalisation requirements below.
- Storage of **all hazardous substances that are not part of the stockpile** and that come under the following **classes**, takes place in **separate compartments** and in a **dedicated storage facility**, such as a fire safety cabinet:
  - ✓ CMR-substances
  - ✓ Hazardous substances that come under the following ADR classes:
    - Class 3 (Flammable liquids);
    - Class 4 (Combustible solids, substances liable to spontaneous combustion and substances which, on contact with water, emit flammable gasses);
    - Class 5 (Oxidising substances and/or organic peroxides);
    - Class 6.1 (Toxic substances);
    - Class 8 (Corrosive substances such as acids and bases);
    - Class 9 (Various hazardous substances and objects; the environmentally hazardous substances).
- **Toxic substances and CMR-substances** are stored:
  - ✓ in a **sealable (fire proof and suction filtered) cabinet**.
  - ✓ in well-sealed bottles or jars, which have been placed in a **drip tray**.
- Other **related substances** without ADR class may also be kept in a **storage facility containing hazardous substances.** These related substances may also be stored in ordinary cabinets.

Compartmentalisation requirements

- It is **forbidden** to jointly store in one compartment:
  - acids and bases;
  - acids and chlorite or hypochlorite solutions;
  - sulfuric acid or nitric acid with formic acid, acetic acid or formaldehyde solutions;
  - acids with cyanides;
  - acids with sulphides;
  - oxidising substances such as HNO^3 or $HClO^4$ for flammable organic substances (explosion hazard)
  - interacting substances, in which hazardous gases or vapours can be released or dangerous situations such as explosions or heat generation can occur.

  For an overview, see Appendix 2 of this KAM-rule.
- **Acids and bases** re-stored in separate drip trays that are corrosion resistant (plastic), in a (ventilated) fire safety cabinet.
- **Oxidizing** substances are stored in fire protection cabinets, which are preferably corrosion resistant (provided with a plastic inner wall).

Chemicals warehouse

- The **ventilation rate** (number of times per hour that all air in the room is refreshed) in chemical warehouses is at least five times per hour.
- A chemicals warehouse is **not accessible to unauthorized persons**.
- All access doors to areas in which flammable and/or volatile solvents are stored or used, are marked with the heading **'open fire and smoking is prohibited'** or have a standardized safety sign attached.
- If the chemicals warehouse is itself the fire-resistant facility: The door of the chemicals warehouse must feature **hazard symbols** that indicate which categories of hazardous substances are present in the warehouse (see Appendix 1 of this KAM-rule). At most it concerns hazard symbols for (very) highly flammable substances, (very) toxic substances and corrosive substances.

Fire safety cabinets

Fire safety cabinets are cabinets with high levels of fire resistance and (self-closing) doors for the storage of hazardous substances.

The following rules apply when using fire safety cabinets:

- When compartmentalising in cupboards, a separate drip tray is required for each substance to be compartmentalised according to Appendix 2 of this KAM-rule.
- If for (very) (highly) flammable liquids, this drip tray can collect the entire contents.
- Other substances in the same fire safety cabinet have a drip tray with a capacity of at least 110% of the largest packaging. However, if 10% of the total content of the packaging is more than 110% of the largest packaging, then the drip tray must have a content equal to 10% of the total official content of all packaging combined.
- The collection facility (drip tray) must be sufficiently resistant to the stored liquids.
- The front (outside) of the fire safety cabinets are fitted with **hazard symbols** that indicate which hazard categories of chemicals are present in the cabinet (see Appendix 1 of this KAM-rule). It concerns the hazard symbols for (very) highly flammable substances, (very) toxic substances and corrosive substances.
- Fire safety cabinets are periodically inspected and approved. A validity sticker is visible on the cupboard.

For information purposes, the requirements and conditions of use for fire protection cabinets in accordance with the NEN-EN-14470-1 standard have been included in Appendix 3 of this KAM-rule. For more information when purchasing new cabinets, contact the expert in the field of hazardous (chemical) substances within your organisation (e.g. occupational hygienist / safety expert).

Coolers and freezers

If (very) (light) flammable substances or explosive substances are stored in a refrigerator or freezer, the requirement is that they are **explosion-proof**. This means that all spark-releasing components have been removed. An 'explosion proof' sign must be affixed to the door.

Registration of and information about hazardous substances

Information

Every organisation at the USPB has information available per hazardous substance for each employee working with it, on the risk aspects of that substance and the minimum management measures to be taken in:

- Fire and explosion prevention (storage, sparks and open fire);
- Prevention of damage to health (extraction and personal protective equipment);
- Prevention of environmental damage (waste disposal).

This information is (among others) available through an organisation-specific register (and overview) with hazardous substances and via MSDS and/VIBs. If insufficient information is available, or if information is required, this can be requested from the expert in the field of hazardous substances (e.g. occupational hygienist or safety expert) within the organisation.

Registration

Every organization at the USPB has an overview of all hazardous substances that are present.

This is subject to overall requirements for registration, additional registration requirements for CMR-substances, WVMC1-substances and NAR- and PSY-substances.

General registration requirements:
Minimum registered per hazardous substance:

- what it relates to (chemical name/names and CAS-number(s));
- how many packaging units there are and of what size (as a whole);
- in which area(s) this packaging is usually located;
- which hazard aspects apply, through the hazard indications by EU-GHS/CLP and H- and P-phrases for example. See MSDS/VIB of the substance;
- or one or more of the classifications apply:
  - CMR for carcinogenic, mutagenic and/or reprotoxic substances
  - R for reprotoxic substances that are not also carcinogenic and/or mutagenic
  - SENS for sensitizing substances (skin and/or respiratory system)
  - WVMC1 for substances from the Abuse of Chemical Substances (Prevention) Act (WVMC), class1
  - WVMC2 for substances from the Abuse of Chemical Substances (Prevention) Act (WVMC), class 2
  - WVMC3 for substances from the Abuse of Chemical Substances (Prevention) Act (WVMC), class 3
  - NAR for substances (opiates) from the Opium Act
  - PSY specifically for the opiate cannabis

Additional registration requirements for CM-substances:
Also registered per CM-substance (does not apply to R-substances):

- the weight in terms of percentages of the CM-components in the product or mixture;
- the hazard categories according to EU-GHS (H-phrases, P-phrases, pictograms and signal words);
- the department(s) in which the CM-substance in question is worked with;
- the reason for using the CM-substance and why replacement is technically not feasible;
- the type of work that is carried out with the substance;
- whether the substance is processed in open or closed systems;
- the quantity of the CM-substance that is produced, used or is present annually;
- the number of employees who are or may be exposed to the substance;
- the manner and extent to which the exposure takes place or can take place with a risk assessment. A list of employees who perform work using CM-substances is maintained and registered within each organisation.

Additional registration requirements WVMC1-substances:

- current accurate supply in grams per substance on 1 January and 31 December of every calendar year, (initial and final stock);
- mutations per substance in that year: accurate quantity in grams that has been purchased, used or disposed of.

Additional registration requirements NAR- and PSY-substances:
If applicable, each organisation will have a procedure with registration requirements.

Labelling

Clear (hazard) labelling of all home-made and repackaged (solutions and mixtures of) hazardous substances is necessary, in order that mistakes can be prevented when used and users can determine which specific control measures are necessary for safe use. A group of packaging with similar (sorts of) substances may be provided with one group label.

General rules

- Labels must be clearly legible and remain so;
- Labels must be in Dutch or English;
- The hazard symbols used must comply with the EU-GHS.

Rules relating to hazardous substances which are kept for up to one day
At minimum, the label must state:

- Date of creation;
- Name of producer;
- Chemical name of the hazardous ingredients that determine the ADR-class and/or CMR-substance.

Additional rules for hazardous substances that are kept for longer than one day
The label must also, at the very least state:

- Required hazard symbols according to the EU-GHS.

Information about the required hazard symbols can be found in your organisation's register of hazardous substances, or in the ECHA-database.

Disposal

- Hazardous substances or waste contaminated with hazardous substances must be disposed of (environmentally) safely according to KAM-rule 07 Hazardous waste. The classification of waste materials in waste categories is described on the waste category map in Appendix 1 of KAM-rule 07. It is **prohibited** to deposit (waste contaminated with) hazardous substances in sinks or bins.
- Directives for the disposal of empty packaging of chemicals are described in KAM-rule 07 Hazardous waste.
- The discharge requirements are described in KAM-rule 35 Discharge requirements for hazardous substances into the sewerage system.
- The disposal of CMR waste is described in the section Specific control measures in laboratory and production areas (page 5).
- Furthermore:
  - ✓ Fill waste containers in a well-ventilated place, preferably in a fume cupboard;
  - ✓ Always seal waste containers, taking into account any pressure build-up;
  - ✓ Store full waste containers with flammable and volatile solvents in a fire safety cabinet until they are collected.

Risk declaration

On occasions work must be carried out in or on a room, installation or device that contains (or has contained) a hazardous substance. It is important for the person performing the work to know whether these activities have specific risks associated to them as a result of (residual) hazardous substances, and if so, to identify and control these risks. KAM-rule 16 Risk declaration states that repair and maintenance work (both by third parties and by own personnel) on installations, tools or in areas where hazardous substances are stored or used, may only be carried out if a risk declaration has been issued.

RI&E and exposure assessment

Risk Inventory and Evaluation (RI&E)

When working with hazardous materials, the occupational health and safety administration requires, as set out in the RI&E the 'safe handling of hazardous substances' to be addressed. This can be done by drawing up a theme-oriented in-depth RI&E for example, in addition to the general RI&E. If this is the case, it is usually indicated in the general RI&E and/or in the assessment of the RI&E by the core expert (registered occupational hygienist, senior safety expert, labour and organisation expert and / or occupational physician).

Exposure assessment

For activities where exposure to hazardous substances is possible, an in-depth RI&E 'Exposure assessment' will apply. It is advisable to involve a (registered) occupational hygienist in the exposure assessment. They will be able to provide specific advice to further minimise or control the exposure to hazardous substances. Line management is responsible for decision making about these recommendations and, in conjunction with the employees for the implementation thereof.

Accidents and incidents

An accident or incident involving hazardous substances is an unintended event that can lead to additional exposure to hazardous substances, directly or in the long term, and/or to the dissemination of hazardous substances in the environment. If an accident or incident involving hazardous substances occurs, the following agreements and rules apply:

- Immediate handling of an accident or incident in accordance with the incident regulation of your own organisation, which avoids further spreading and exposure where possible (by using available absorbent methods for example);
- If a person is exposed to a hazardous substance, and this exposure lasted longer, the concentration was higher or the amount was greater compared to a normal situation, it is important that this is reported to the line management and to the company doctor. Should you have any questions relating to this, you can contact the expert in the field of hazardous (chemical) substances within your own organisation;
- Report (near) accidents and incidents, including those relating to the environment, in accordance with the internal regulations of your own organisation.
- Report any event that could cause the (potential) spread of hazardous substances in the environment (air, water and/or soil) according to KAM-rule 15m Reporting of (near) environmental incidents to the Stichting AL-terrein.

Information and instruction

General information and instruction

- Every employee, guest employee, student, trainee, etc., who will be working either independently or under supervision with hazardous substances, will receive demonstrable information, work instruction and training prior to commencing work. It is important that the employee is and continues to be well informed about the dangers of the substances with which he/she works.
- Information provision and instruction will be repeated as and when there is reason to do so. This may be as a result of (repeated) questions from employees, (near-) incidents, internal audits or inspections, etc.
- At the very least, information and instruction will include:
  - ✓ the potential risks associated with this work (see RI&E, exposure assessment, and health and safety information about hazardous substances);
  - ✓ the mandatory measures required in this work in order to prevent or limit these risks (or the consequences thereof) (see RI&E, this KAM-rule, organisation- specific procedures);
  - ✓ if one of the measures is to wear personal protective equipment: the purpose, the operation and method of use, and that the employer makes the personal protective equipment available;
  - ✓ the rules for safe storage of hazardous substances;
  - ✓ the rules for labelling of hazardous substances (the meaning of pictograms, H- and P-phrases, self-labelling);
  - ✓ the rules for safe disposal of hazardous substances;
  - ✓ measures that need to be taken when a (sudden) unintended event with a hazardous substance occurs;
  - ✓ the general control measures in laboratory and production areas;
  - ✓ the way in which compliance with instructions and regulations is monitored.

Specific information and instruction

It is recommended, if applicable, that specific information and instruction is provided periodically:

- Carcinogenic, mutagenic and reprotoxic substances (CMR-substances).
  See paragraph Specific control measures in laboratory and production areas (page 5).
- Sensitizing substances (SENS-substances). See paragraph Specific control measures in laboratory and production areas (page 5).
- Synthetic nanomaterials. See Appendix 4 of this KAM-rule.
- Cryogenic substances, of which liquid nitrogen is a common example.
- Cyanides (prussic acid).
- Opiates. If applicable, see the exemption from your organisation for working with opiates and/or cannabis and/or contact the appointed administrator of this exemption within your organisation.
- Gas bottles. See KAM-rule 09 Gas cylinders in work area's.
- Substances from the Abuse of Chemical Substances (Prevention) Act (WVMC, law on drug precursors). See registration requirements for WVMC1- and WVMC2-substances in section: Registration of and information about hazardous substances. (Page 12).
- Substances from the Chemical Weapons Convention (UVCW). If applicable see the exemption decision on behalf of your organisation and/or contact the relevant administrator within your organisation with regard to this exemption decision.
- Prevention of fire and explosion.

Abbreviations and terms

Abbreviations	
ADR	Accord européen relatif au transport international des marchandises Dangereuses par Route
CLP	Classification, Labelling and Packaging
CMR	Carcinogenic and/or Mutagenic and/or Reprotoxic
ECHA	European Chemicals Agency
EU-GHS	The European introduction of the Globally Harmonized System; revision 6 is implemented in the CLP Regulation (EC).
H-phrases	Hazard phrases. See Appendices and references (page 18).
KAM / QHSE	Quality, Health, Safety and Environment
MSDS	Material Safety Data Sheet (= VIB)
PGS	Publication Series Hazardous Substances
PSP	Poonawalla Science Park
P-phrases	Precaution-phrases. See Appendices and references (page 18).
REACH	Registration, Evaluation, Authorisation and Restriction of Chemical substances
RI&E	Risk, Inventory and Evaluation
SENS	Sensitizing (may cause sensitization)
USPB	Utrecht Science Park Bilthoven
UVCW	Chemical Weapons Convention (implementation) Act
VIB	Safety Information Sheet (= MSDS)
Wabo	General Provisions Environmental Law
WVMC	Abuse of Chemical Substances (Prevention) Act (law on drug precursors)

Terms	
Carcinogenic substance	Carcinogenic substances and processes can cause cancer in humans or promote the cancer process. Specifically: 1. A hazardous substance that meets the criteria to be classified as a carcinogen in category 1A or 1B as referred to in appendix I of the CLP Regulation (EG) on classification, labelling and packaging of substances and mixtures; or 2. A hazardous substance or process as referred to in appendix I of aforementioned Regulation (EG), as well as a hazardous substance released by a process referred to in that appendix.
CLP Regulation (EG)	The regulation for classification, labelling and packaging of substances and mixtures.
Hazardous substances	Substances or mixtures to which employees are or may be exposed to when working which, because of the properties or conditions under which those substances or mixtures occur, may constitute a safety or health hazard. Hazardous substances can be recognized by a hazard symbol on the label. See Appendix 1 of this KAM-rule (EU-GHS) for an overview of the hazard categories according to the European classification rules (EU-GHS) and the rules for the transport of hazardous substances (ADR).
Line management	Responsible manager of the organisation who wants the (technical) work performed and/or wants to transfer/dismantle a space, installation or device.
Mixture	Mixture or solution consisting of two or more substances.
Mutagenic substance	Mutagenic substances can change (mutate) the genetic material of body cells. This is a hazardous substance that meets the criteria to be classified as germ cell mutation in Category 1A or 1B as referred to in Appendix 1 of the CLP Regulation (EC) on classification, labelling and packaging of substances and mixtures.
REACH	European Regulation on the production and trade of chemical substances.

Reprotoxic substance	Reproductive toxic (reprotoxic) substances have an effect on reproduction. These effects could impact the reproductive potential of men and/or women and cause damage to the unborn child (teratogenic substances) or to the infant (breastfeeding). This is a hazardous substance that meets the criteria for one or more of the following hazardous statements as referred to in the CLP Regulation (EG) concerning the classification, labelling and packaging of substances and mixtures: H-phrases 360, 360F, 360D, 360FD, 360Fd, 360Df, 361, 361f, 361d, 361fd, 362.
Sensitizing substance	A hazardous substance that meets the criteria for one or more of the following hazard statements as referred to in the CLP Regulation (EG): H-phrases 317, H334.
Stockpile	The stockpile of hazardous substances that have been prepared for the purpose of operations/production in a workspace/production area or near a process installation or a filling installation. The stockpile must be strictly necessary. The size of the workspace must be aligned to a day's consumption or of one batch. Hazardous substances that are awaiting storage or disposal do not fall within the definition of stockpile.

Appendices and references

Appendix 1	Classify hazardous substances according to Wm, EU-GHS and ADR *(appendix number unchanged)*
Appendix 2	Storage of hazardous substances *(formerly: Appendix 4)*
Appendix 3	Requirements and preconditions for fire protection cabinets in accordance with NEN-EN-14470-1 *(formerly: Appendix 5)*
Appendix 4	Determine hazard indication and safety measures for working with nanomaterials *(formerly:* Appendix 7)
Appendix 5	Code of conduct in laboratories and production areas *(new appendix)*
Appendix 6	Standards for laboratory gloves *(new appendix)*
Appendix 7	Explosive atmospheres *(new appendix)*

SZW-lists with CMR-substances, search on the **'** Arboportaal' (https://www.arboportaal.nl/) for carcinogenic, mutagenic or reprotoxic substances (for example carcinogenic substances and processes).

List with H- and P-phrases: http://ec.europa.eu/taxation_customs/dds2/SAMANCTA/NL/Safety/HP_NL.htm

CLP Regulation (EG) No. 1272/2008: http://eur-lex.europa.eu/eli/reg/2008/1272/oj/nld

Occupational health and safety legislation:

The basis for the policy on hazardous substances is the general duty of care as stated in article 3 of the Working Conditions Act. Additionally, in the context of this KAM-rule the following articles from the Working Conditions Act are important:

- Art. 5: makes the RI&E mandatory.
- Art. 6: the prevention of serious accidents involving hazardous substances.
- Art. 8: information and education.
- Art. 10: the prevention of risks to third parties.
- Art. 16: further inventory obligations for hazardous substances (and biological agents).

Furthermore Chapter 4 of the Working Conditions Decree has been entirely devoted to hazardous substances (and biological agents).

PGS 15 'Storage of packaged hazardous substances; Storage and temporary storage directive with regard to fire safety, occupational safety and environmental safety'':

- Website with publications: http://www.publicatiereeksgevaarlijkestoffen.nl/publicaties/PGS15.html
- Publication of PGS 15:2016, valid for the USPB: http://content.publicatiereeksgevaarlijkestoffen.nl/documents/PGS15/PGS_15_2016_versie_1_0_sept_2016_definitief.pdf