CoSec Training

Safety @ EPFL

VPO-SE OHS
Occupational Health and Safety

OHS Vision

Stéphane Karlen
Head of OHS

«Establish a safe, healthy and pleasant work environment in which the community can thrive.»

- ❑ Identified hazards
- ❑ Controlled risks
- ❑ Ergonomic and functional workplaces
- ❑ A healthy environment

OHS @ EPFL

1. OHS Organization
2. OHS Teams
3. OHS team Missions

4. COSEC mission (Why/What?)

5. Occupational Safety – Basics
6. Risk management tools (hazard/exposure)

7. OHS Team supports (missions)
8. OHS IT tools

OHS @ EPFL

1. OHS Organization
2. OHS Teams

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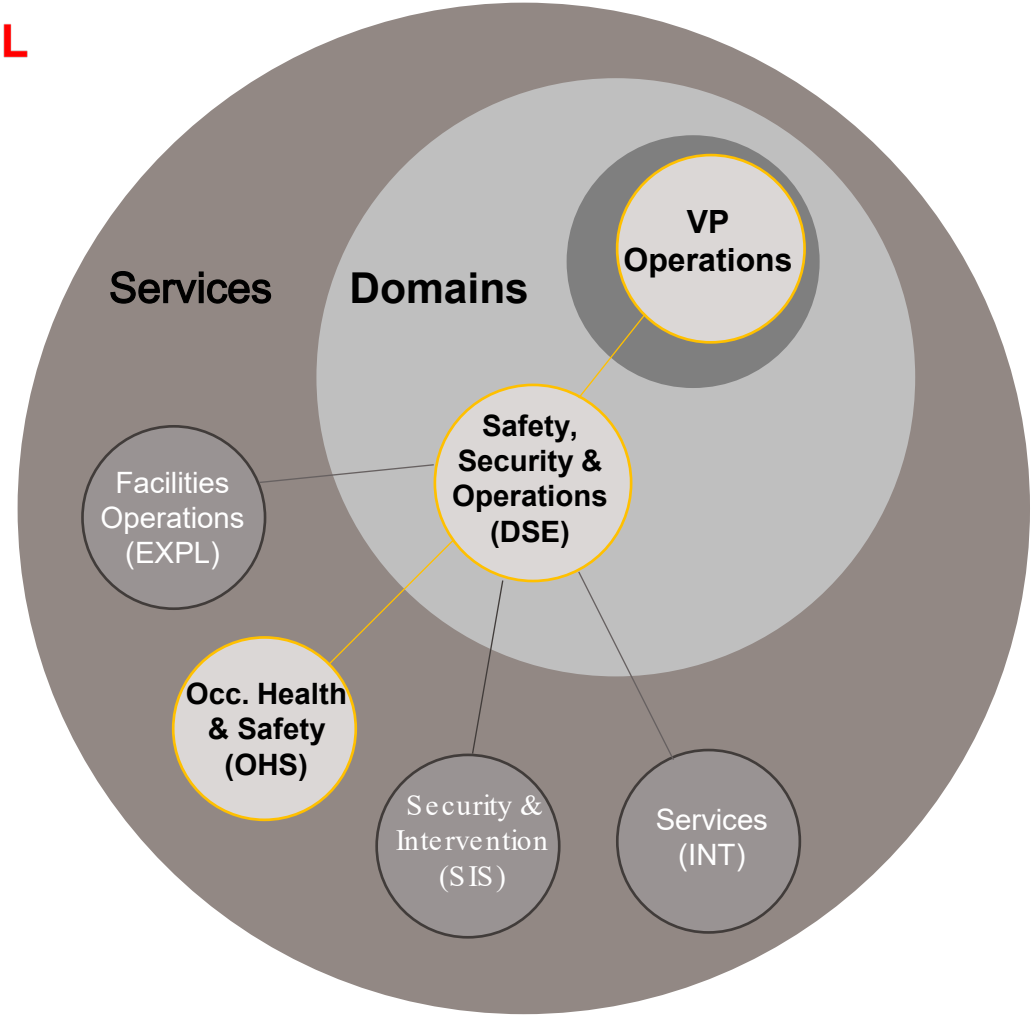
Amela Groso



Two services provide support on **Safety and Security** to EPFL staff

Occ. Health & Safety (OHS)

Security & Intervention (SIS)

OHS @ EPFL

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7. OHS IT tools

EPFL

Workshop : working with chemicals and waste managment

OHS Occupational health and safety

Stéphane Karlen
Head of department

Melissa Mangili
admin.

OHS-ST Health

Thibaut Gaillard
physician

Cesar Jaton
physician

Viviane Depuydt-Linder

Chiyama Mathivatha-nasekaram

Unisanté

Ryan Léo Chesaux
nurse

Sophie Peuble-Bovon
nurse

Mélanie Simon
nurse

OHS-HT Occupational hygiene

Patrick Gerber
hygienist

Anna Maria Novello
hygienist

Helena Palacios
hygienist

Jean-Michel Poffet
hygienist

OHS-PR Risk prevention

Eleonora Simeoni
Head of unit

Biological hazards

Simona Frateschi

Sébastien Gex

Vivianne Padrun

Physical and chemical hazards

Francesca Gaggini
coordinator

Amela Groso

Kirstin Friedrich

Benjamin Uster

Infrastructure-related risks

Astrid Olaya
coordinator

Marc Matthey

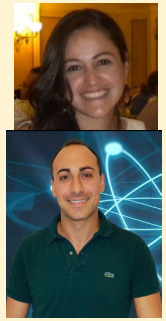
Emanuele Ripiccini

Vincent Virely

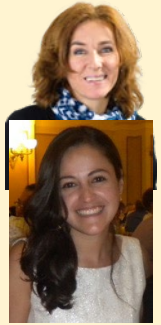
OHS – Prévention des risques: Team in detail

ATEX

Gas

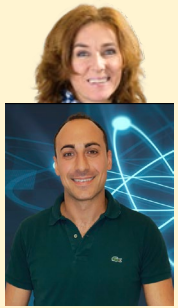


Laser



Nano

Cryo

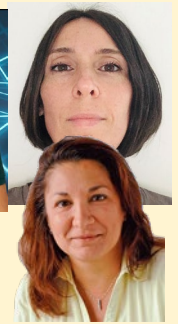


Magnet.

Radioprot.

Electricity

Bio



Chemistry, Storage, manipulation authorization

Roof, machinery safety, Workshop

ADR

Special Waste

Glove box / Mechanical safety

OHS @ EPFL

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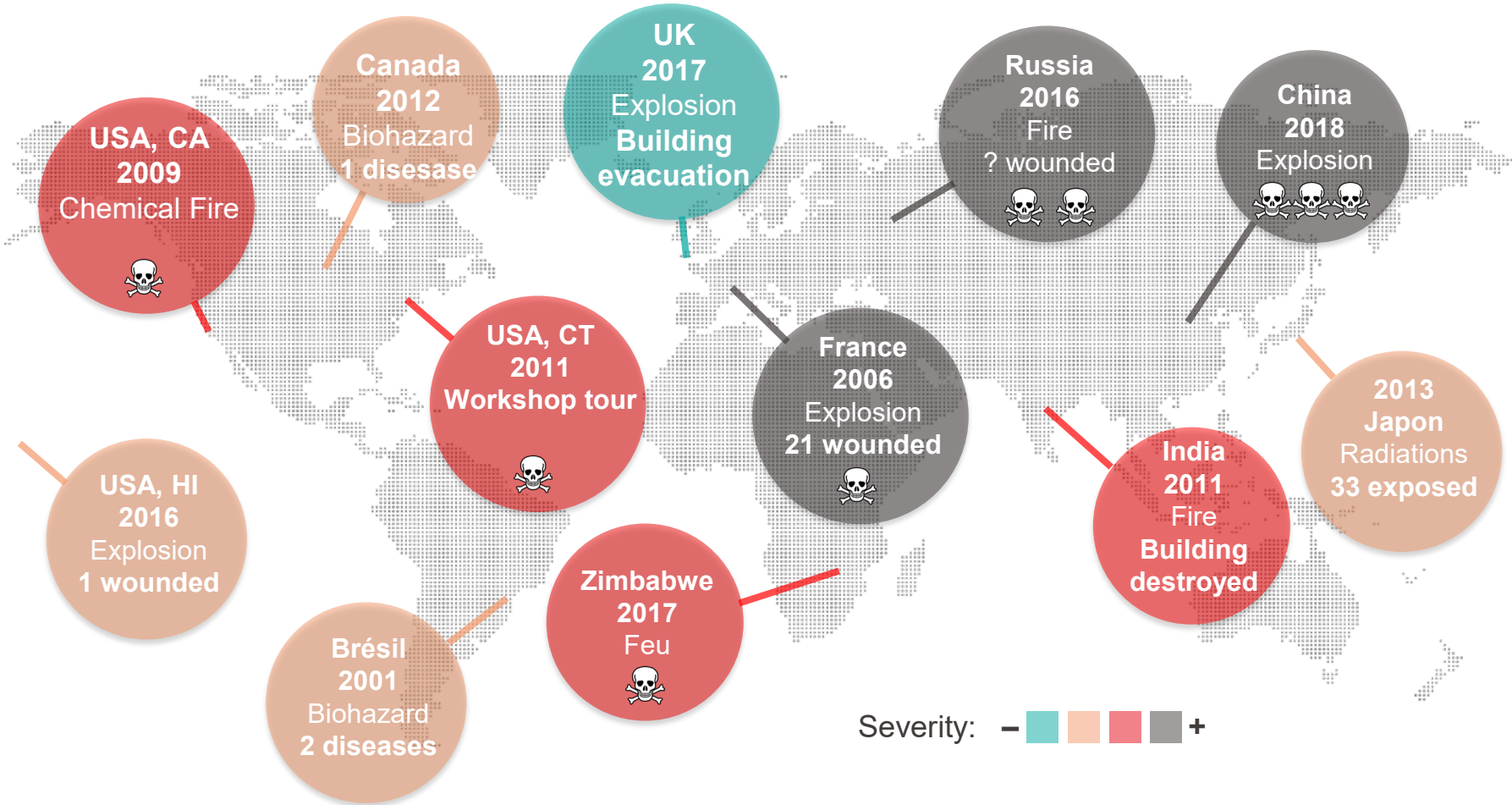
Why did EPFL decided to have CoSecs ?

BSP (Cubotron) – 2006.04.01

Accident also happen in Academia



Examples

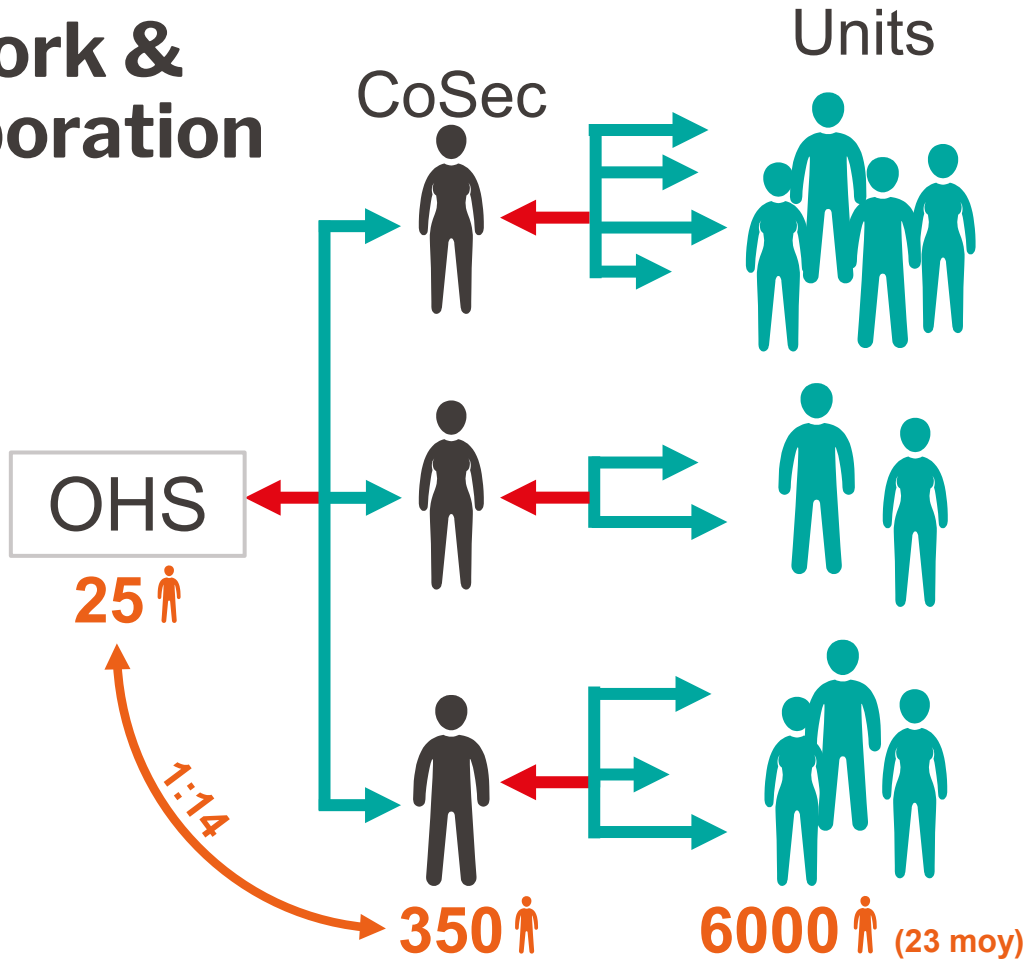
Ge Guo

2018 – Exton, USA, Frontage Laboratories
Died as a result of exposure to potassium cyanide.

Roland Daigle

2008 – Nova Scotia, Canada
Trimethylsilyldiazomethane (TMSD) poisoning. The laboratory fume hood was not working due to work on the roof of the building.

Network & collaboration



Cosec specifications

Cosec Specifications

(cahier des charges)

- Be the **contact person** for OHS.
- Conduct **welcome sessions** regarding OHS rules / work procedure for new comers and guests of the unit.
- Communicate **safety information to unit** personnel.
- Communicate **safety information to OHS**.
- Inform OHS of **safety related problems and incidents**.
- **Be familiar with alarm systems**, building evacuation procedures, and emergency equipment.
- Manage **the door safety sheets** once a year or whenever a change occurs.

LEX 1.5.1 *Directive concerning occupational health and safety of the EPFL*

Cosec Specifications

(cahier des charges)

- Periodically check and update **shared PPE**.
- **Verify** that requested changes in unit safety are implemented.
- Arrange for event announcements and attend **specific meetings and training sessions**.
- Impose emergency measures to **eliminate any imminent danger** of which he/she is aware.
- **Manage procedures about:** cleaning of work areas, storage of chemicals, collection of waste and transfer to faculty stores.
- Assist OHS **safety visits** and **manage the implementation** of corrective actions.

LEX 1.5.1 *Directive concerning occupational health and safety of the EPFL*

OHS @ EPFL

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Occupational Safety - Basics

Risk Management: Understand the risk

Confinement principles

Working environment

Hazard x **Exposure** = **Risk**

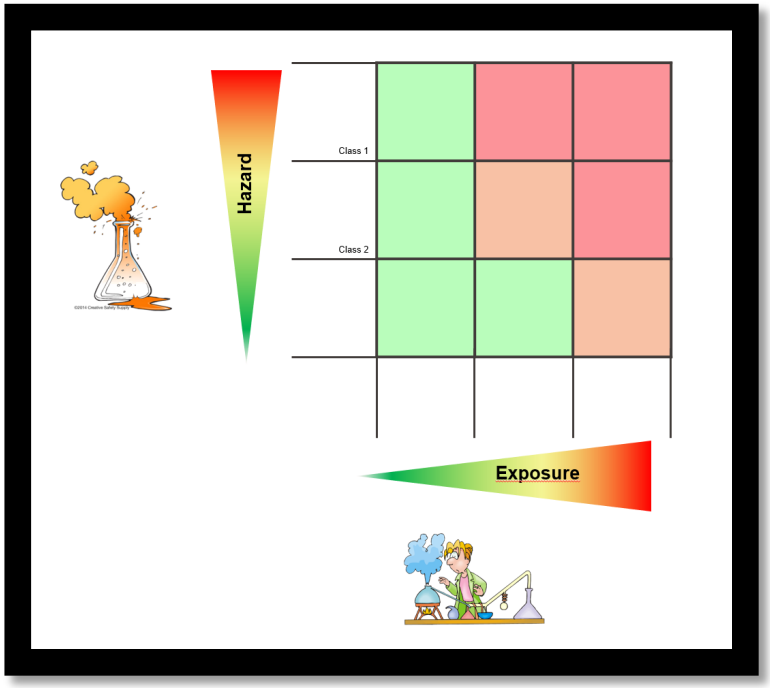
A hazard is something that has the potential to harm you.

Behavior

Rules & procedures

The risk is the likelihood of a hazard causing you harm in case of contact.

Risk Matrix



Hazard identification

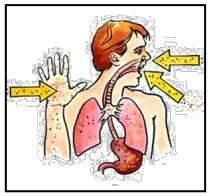
- **What is dangerous?**

Hazard identification

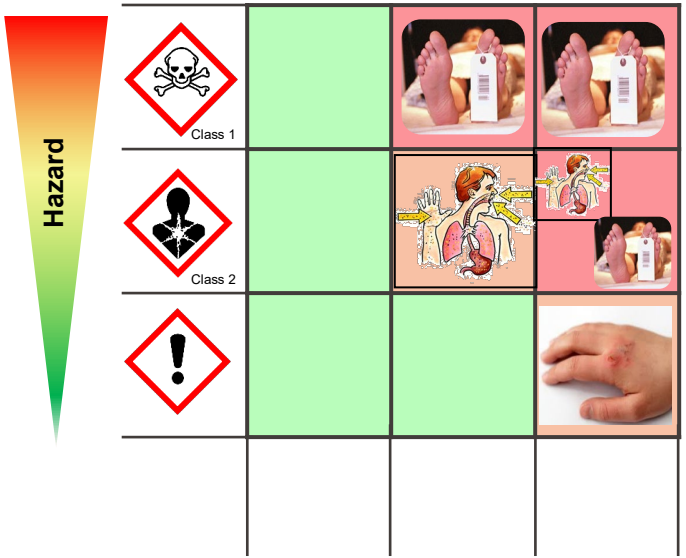
- **Why is dangerous?**

Hazard identification

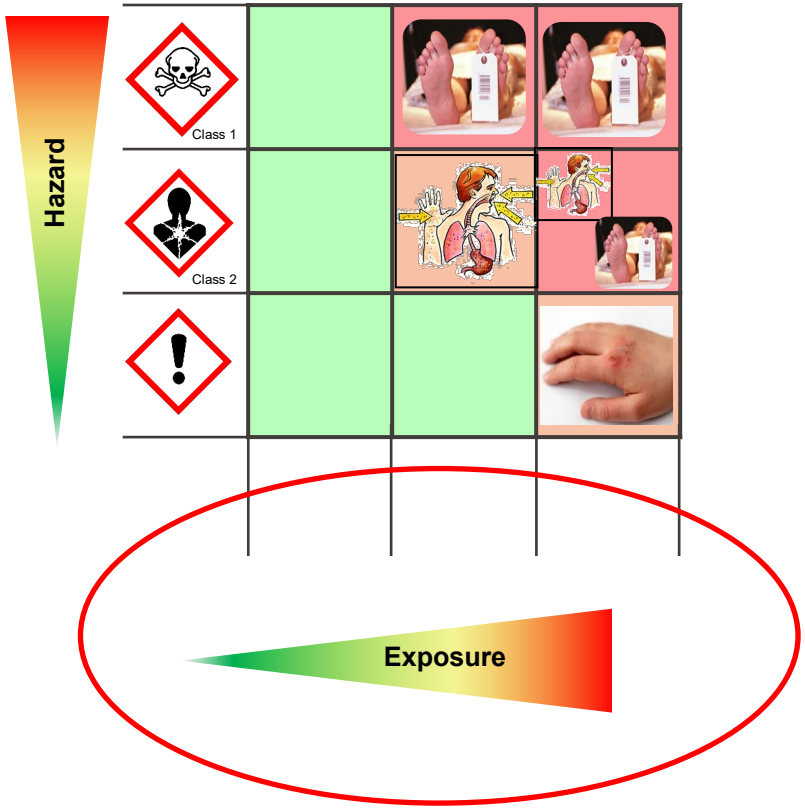
- How much is dangerous?



Risk Matrix



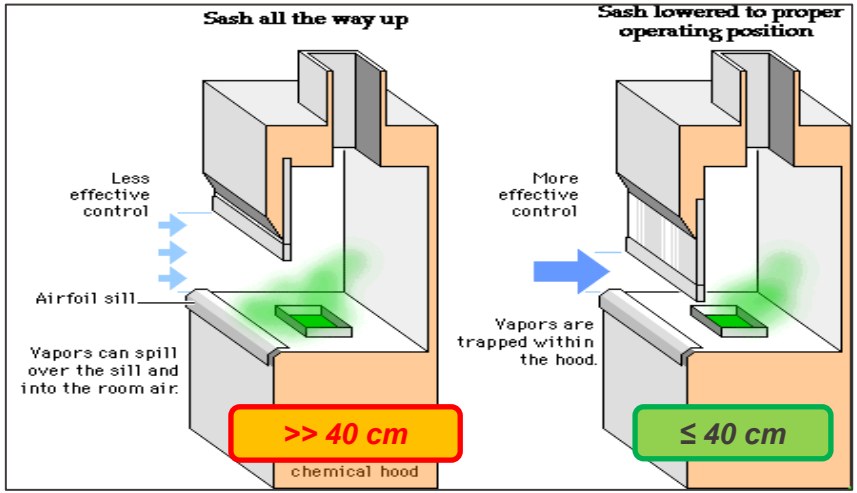
Risk Matrix



Chemical exposure – Fume hood

Confinement reliability issue

Minimum front air issue ...



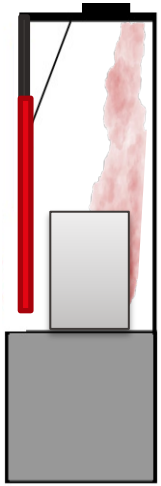
... leading to a weaker confinement

=> Increased probability of exposure

Confinement principle

Suitable usages of fume hood

Sash closed

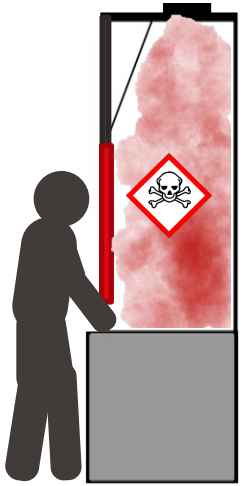


Large equipment
or no manipulation

Sash opening = 50 cm

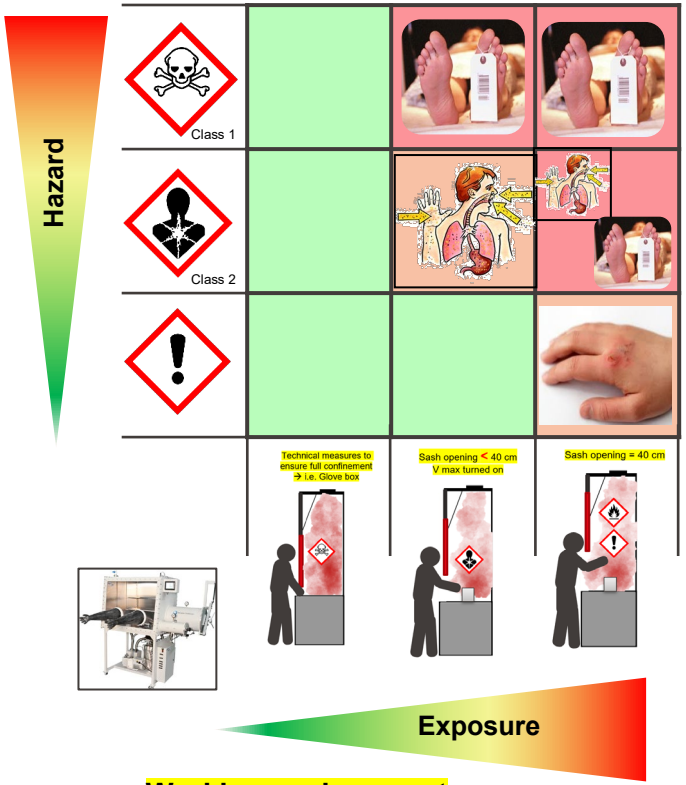
Sash opening < 50 cm
V max turned on

Technical measures to ensure full confinement
→ i.e. Glove box



Risk Matrix

- What is dangerous?
- Why is dangerous?
- How much is dangerous?



- Working environment
- Behavior

Break

OHS @ EPFL

1. OHS Organization
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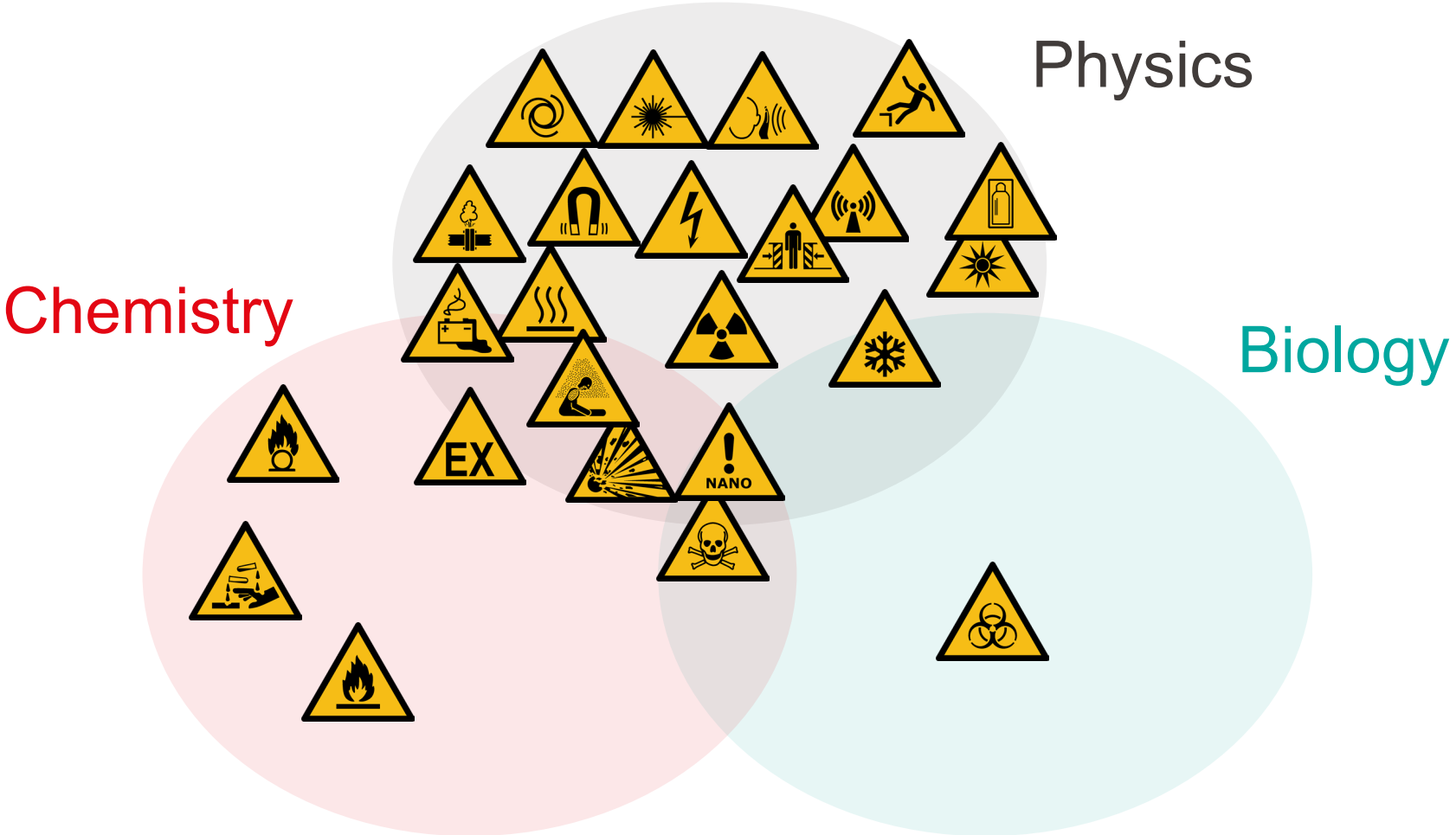
Hazard identification

Types of hazardous material



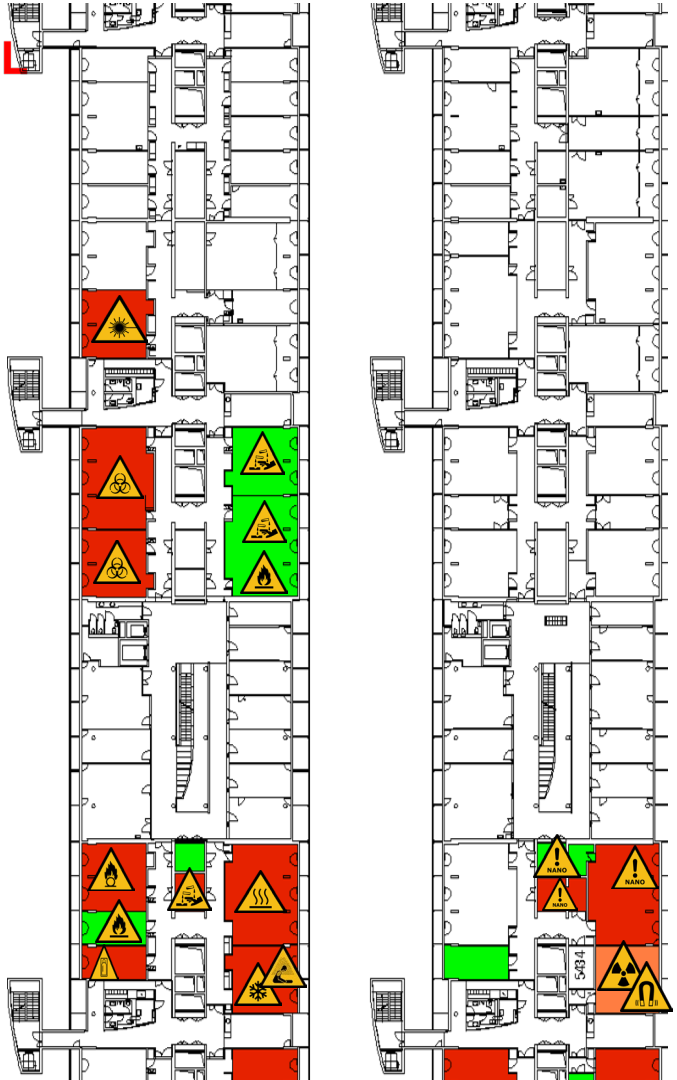
And hazardous conditions

Physics

Chemistry

Biology

Hazards cadaster



Hazards are categorized in three levels

		Hazard			
		Absent	**Low**	**Moderate**	**High**
		No analysis needed	*No analysis needed*	*Analaysis relevance evaluated on a case-by-case basis*	*Analysis validating the existence of sufficient measures*
	Flammable	Absent	V ≤ 15 L	15 L < V ≤ 50 L	V > 50L
	Laser	Absent	Class 1 & 2	Class 3R	Class 3B & 4
	Biological hazard	Absent	NSB 1	NSB 2	NSB 3 & 4
	Cryogenics	Absent	15°C > T > 5°C	5 °C ≥ T > -5 °C	T ≤ -5°C

Marendaz, Safety Science 53 (2013)

Key references to ease the job ☺

Safety data sheet

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	106009
Product name	Methanol for analysis EMSURE® ACS,ISO,Reag. Ph Eur

Flammable liquid, Category 2, H225
Acute toxicity, Category 3, Oral, H301
Acute toxicity, Category 3, Inhalation, H331
Acute toxicity, Category 3, Dermal, H311
Specific target organ toxicity - single exposure, Category 1, Eyes, H370
For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms

Signal word

Danger

Hazard statements

H225 Highly flammable liquid and vapour.
H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled.
H370 Causes damage to organs (Eyes).

Precautionary statements

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240 Ground/bond container and receiving equipment.
P280 Wear protective gloves/ protective clothing.

Response

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P308 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

Storage

5.2.4 Loading the rotor

CAUTION!

Risk of injury due to asymmetric loading of a rotor.

- Load rotors symmetrically with identical tubes or plates and buckets.
- Only load adapters with suitable tubes or plates.
- Always use tubes or plates of the same type (weight, material/density and volume).
- Check that loading is symmetrical by balancing the adapters and tubes or plates used with scales.

CAUTION!

Risk from damaged or overloaded tubes.

- When loading the rotor, observe the safety precautions on dangers as a result of overloaded or damaged tubes (see *Warnings for intended use on p. 43*).

The device automatically detects imbalances during operation and stops the run immediately with an error message and a signal tone.

- Check the load, balance the tubes and restart the run.

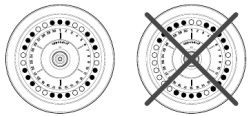
Fixed-angle rotors

Rotor lid!

- Fixed-angle rotors may only be operated with the appropriate rotor lid in each case. This is clearly shown by the identical rotor name labeling on the rotor and on the rotor lid.
- To carry out an aerosol-tight centrifugation, an aerosol-tight rotor must be used in combination with the corresponding rotor lid or cap.

To load the rotor, proceed as follows:

1. Check the maximum load (adapter, tube and contents) per rotor bore.
   The information about this can be found on the rotor and in this operating manual (see *Rotors on p. 13*).
2. Load rotors and adapters only with the tubes intended for them.
3. Insert tubes opposite each other in pairs into the rotor bores. To ensure symmetric loading, tubes that are arranged opposite each other must be of the same type and contain the same filling quantity.



To minimize weight differences between filled sample tubes, we recommend taring with a scale. This will reduce wear on the drive and reduce running noise.

4. Attach and tighten rotor lid.

Safety Data Sheet

The SDS is composed of **16 different chapters**, which give you information about **5 categories**

General information	1. Identification of the substance 3. Composition
Hazards	2. Identification of hazards 9. Chemical and Physical properties 10. Stability and reactivity 11. Toxicological information 12. Ecological information
Emergency	4. First aid 5. Firefighting measures 6. Accidental release measures
Prevention	7. Manipulation and storage 8. Exposure controls/personal protection 15. Regulatory information 16. Other information
Elimination/ Transport	13. Disposal considerations 14. Transport information

Sigma-Aldrich.

www.sigmaaldrich.com

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Version 6.5
Revision Date 24.02.2023
Print Date 10.01.2024
GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Hydrofluoric acid

Product Number : 339261
Brand : SIGALD
REACH No. : This product is a mixture. REACH Registration Number see section 3.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Chemie GmbH
Industriestrasse 25
CH-9471 BUCHS

Telephone : +41 81 755 2511
Fax : +41 81 756 5449
E-mail address : technischerservice@merckgroup.com

1.4 Emergency telephone

Emergency Phone # : +41 43-508-2011 (CHEMTREC)
+41 44-251-5151 (Tox-Zentrum)
145(Tox Info Suisse)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008
Acute toxicity, Oral (Category 2), H300
Acute toxicity, Inhalation (Category 2), H330
Acute toxicity, Dermal (Category 1), H310
Skin corrosion (Sub-category 1A), H314
Serious eye damage (Category 1), H318

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008
Pictogram

HOW TO READ A SAFETY DATA SHEET

OSHA Brief

The Hazard Communication Standard (HCS) (29 CFR 1910.1200(g), revised in 2012, requires that the chemical manufacturer, distributor, or importer provide Safety Data Sheets (SDSs) (formerly MSDSs or Material Safety Data Sheets) for each hazardous chemical to downstream users to communicate information on these hazards. This brief provides guidance to help workers who handle hazardous chemicals to become familiar with the format and understand the contents of the SDSs.

The SDS includes information such as the properties of each chemical; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting the chemical. The information contained in the SDS must be in English (although it may be in other languages as well). In addition, OSHA requires that SDS preparers provide specific minimum information as detailed in Appendix D of 29 CFR 1910.1200. The SDS preparers may also include additional information in various section(s).

Hazard Communications Standard. Safety Data Sheets Sections 1 through 8 contain general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures. This information should be helpful to those that need to get the information quickly. Sections 9 through 11 and 16 contain other technical and scientific information, such as physical and chemical properties, stability and reactivity information, toxicological information, exposure control information, and other information including the date of preparation or last revision. The SDS must also state that no applicable information was found when the preparer does not find relevant information for any required element.

The SDS must also contain Sections 12 through 15, to be consistent with the UN Globally Harmonized System of Classification and Labeling of Chemicals (GHS), but OSHA will not enforce the content of these sections because they concern matters handled by other agencies.

Section 1: Identification

THIS SECTION IDENTIFIES THE CHEMICAL ON THE SDS AS WELL AS THE RECOMMENDED USES. IT ALSO PROVIDES THE ESSENTIAL CONTACT INFORMATION OF THE SUPPLIER.

- Product identifier used on the label and any other common names or synonyms by which the substance is known.
- Name, address, phone number of the manufacturer, importer, or other responsible party, and emergency phone number.
- Recommended use of the chemical (e.g., a brief description of what it actually does, such as flame retardant) and any restrictions on use (including recommendations given by the supplier).

Section 2: Hazard(s) Identification

THIS SECTION IDENTIFIES THE HAZARDS OF THE CHEMICAL PRESENTED ON THE SDS AND THE APPROPRIATE WARNING INFORMATION ASSOCIATED WITH THOSE HAZARDS.

- The hazard classification of the chemical (e.g., flammable liquid, category1).
- Signal word.
- Hazard statement(s).
- Pictograms (the pictograms or hazard symbols may be presented as graphical reproductions of the symbols in black and white or be a description of the name of the symbol (e.g. skull and crossbones, flame).
- Precautionary statement(s).
- Description of any hazards not otherwise classified.
- For a mixture that contains an ingredient(s) with unknown toxicity, a statement describing how much (percentage) of the mixture consists of ingredient(s) with unknown acute toxicity. Please note that this is a total percentage of the mixture and not tied to the individual ingredient(s).

Section 3: Ingredient Information

THIS SECTION IDENTIFIES THE INGREDIENT(S) CONTAINED IN THE PRODUCT INDICATED ON THE SDS, INCLUDING IMPURITIES AND STABILIZING ADDITIVES AND INCLUDES INFORMATION ON SUBSTANCES, MIXTURES, AND ALL CHEMICALS WHERE A TRADE SECRET IS CLAIMED.

Substances
- Chemical name.
- Common name and synonyms.
- Chemical Abstracts Service (CAS) number and other unique identifiers.
- Impurities and stabilizing additives, which are themselves classified and which contribute to the classification of the chemical.

Mixtures
- Same information required for substances.
- The chemical name and concentration (exact percentage) of all ingredients which are classified as health hazards and are:
- Present above their cut-off/concentration limits or
- Present a health risk below the cut-off/ concentration limits.
- The concentration (exact percentages) of each ingredient must be specified except concentration ranges may be used in the following situations:
- A trade secret claim is made,
- There is batch-to-batch variation, or
- The SDS is used for a group of substantially similar mixtures.

Chemicals where a trade secret is claimed
- A statement that the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret is required. A Chemical, as defined in the HCS, is any substance, or mixture of substances.

Section 4: First-Aid Measures

THIS SECTION DESCRIBES THE INITIAL CARE THAT SHOULD BE GIVEN BY UNTRAINED RESPONDERS TO AN INDIVIDUAL WHO HAS BEEN EXPOSED TO THE CHEMICAL.

- Necessary first-aid instructions by relevant routes of exposure (inhalation, skin and eye contact, and ingestion).
- Description of the most important symptoms or effects, and any symptoms that are acute or delayed.
- Recommendations for immediate medical care and special treatment needed, when necessary.

Section 5: Fire-Fighting Measures

THIS SECTION PROVIDES RECOMMENDATIONS FOR FIGHTING A FIRE CAUSED BY THE CHEMICAL.

- Recommendations of suitable extinguishing equipment, and information about extinguishing equipment that is not appropriate for a particular situation.
- Advice on specific hazards that develop from the chemical during the fire, such as any hazardous combustion products created when the chemical burns.
- Recommendations on special protective equipment or precautions for firefighters.

Section 6: Accidental Release Measures

THIS SECTION PROVIDES RECOMMENDATIONS ON THE APPROPRIATE RESPONSE TO SPILLS, LEAKS, OR RELEASES, INCLUDING CONTAINMENT AND CLEANUP PRACTICES TO PREVENT OR MINIMIZE EXPOSURE TO PEOPLE, PROPERTIES, OR THE ENVIRONMENT. IT MAY ALSO INCLUDE RECOMMENDATIONS DISTINGUISHING BETWEEN RESPONSES FOR LARGE AND SMALL SPILLS WHERE THE SPILL VOLUME HAS A SIGNIFICANT IMPACT ON THE HAZARD.

- Use of personal precautions (such as removal of ignition sources or providing sufficient ventilation) and protective equipment to prevent the contamination of skin, eyes, and clothing.
- Emergency procedures, including instructions for evacuations, consulting experts when needed, and appropriate protective clothing.
- Methods and materials used for containment (e.g. covering the drains and capping procedures).
- Cleanup procedures (e.g, appropriate techniques for neutralization, decontamination, cleaning or vacuuming, absorbent materials; and/or equipment required for containment/clean up).

Section 7: Handling and Storage

THIS SECTION PROVIDES GUIDANCE ON THE SAFE HANDLING PRACTICES AND CONDITIONS FOR SAFE STORAGE OF CHEMICALS.

- Precautions for safe handling, including recommendations for handling incompatible chemicals, minimizing the release of the chemical into the environment, and providing advice on general hygiene practices (e.g. eating, drinking, and smoking in work areas is prohibited).
- Recommendations on the conditions for safe storage, including any incompatibilities.
- Provide advice on specific storage requirements (e.g. ventilation requirements).

Section 8: Exposure Controls/Personal Protection

THIS SECTION INDICATES THE EXPOSURE LIMITS, ENGINEERING CONTROLS, AND PERSONAL PROTECTIVE MEASURES THAT CAN BE USED TO MINIMIZE WORKER EXPOSURE.

- OSHA Permissible Exposure Limits (PELs), American Conference of Governmental Industrial Hygienists (ACGIH), Threshold Limit Values (TLVs), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available.
- Appropriate engineering controls (e.g. use local exhaust ventilation, or use only in an enclosed system).
- Recommendations for personal protective measures to prevent illness or injury from exposure to chemicals, such as personal protective equipment (PPE) (e.g. appropriate types of eye, face, skin or respiratory protection needed based on hazards and potential exposure).
- Any special requirements for PPE, protective clothing or respirators (e.g. type of glove material, such as PVC or nitrile rubber gloves; and breakthrough time of the glove material).

Section 9: Physical and Chemical Properties

THIS SECTION IDENTIFIES PHYSICAL AND CHEMICAL PROPERTIES ASSOCIATED WITH THE SUBSTANCE OR MIXTURE.

- Appearance (physical state, color, etc.)
- Odor
- Odor threshold
- pH
- Melting point/freezing point
- Initial boiling point and boiling range
- Flash point
- Evaporation rate
- Flammability (solid, gas)
- Upper/lower flammability or explosive limits
- Vapor pressure
- Vapor density
- Relative density
- Solubility(ies)
- Partition coefficient: n-octanol/water
- Auto-ignition temperature
- Decomposition temperature; and
- Viscosity

The SDS may not contain every item on the above list because information may not be relevant or is not available. When this occurs, a notation to that effect must be made for that chemical property. Manufacturers may also add other relevant properties, such as the dust deflagration index (Kst) for combustible dust, used to evaluate a dust's explosive potential.

Notes _____

Emergency Numbers

Ambulance _____ **Fire Rescue** _____
Hospital _____ **Physicians** _____
OSHA _____ **Hazardous Material** _____

Section 10: Stability and Reactivity

THIS SECTION DESCRIBES THE REACTIVITY HAZARDS OF THE CHEMICAL AND THE CHEMICAL STABILITY INFORMATION.

Reactivity
- Description of the specific test data for the chemical(s). This data can be for a class or family of the chemical if such data adequately represent the anticipated hazard of the chemical(s), where available.

Chemical stability
- Indication of whether the chemical is stable or unstable under normal ambient temperature and conditions while in storage and being handled.
- Description of any stabilizers that may be needed to maintain chemical stability.
- Indication of any safety issues that may arise should the product change in physical appearance.

Other
- Indication of the possibility of hazardous reactions, including a statement whether the chemical will react or polymerize, which could release excess pressure or heat, or create other hazardous conditions. Also, a description of the conditions under which hazardous reactions may occur.
- List of all conditions that should be avoided (e.g. static discharge, shock, vibrations, or environmental conditions that may lead to hazardous conditions).
- List of all classes of incompatible materials (e.g. classes of chemicals or specific substances) with which the chemical could react to produce a hazardous situation.
- List of any known or anticipated hazardous decomposition products that could be produced because of use, storage, or heating.

Section 11: Toxicological Information

THIS SECTION IDENTIFIES TOXICOLOGICAL AND HEALTH EFFECTS INFORMATION OR INDICATES THAT SUCH DATA ARE NOT AVAILABLE.

- Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact). The SDS should indicate if the information is unknown.
- Description of the delayed, immediate, or chronic effects from short-and long-term exposure.
- The numerical measures of toxicity (e.g., acute toxicity estimates such as the LD50 (med an lethal dose) the estimated amount (of a substance) expected to kill 50% of test animals in a single dose.
- Description of the symptoms. This description includes the symptoms associated with exposure to the chemical including symptoms from the lowest to the most severe exposure.
- Indication of whether the chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition) or found to be a potential carcinogen by OSHA.

Section 12: Ecological Information

THIS SECTION PROVIDES INFORMATION TO EVALUATE THE ENVIRONMENTAL IMPACT OF THE CHEMICAL(S) IF IT WERE RELEASED TO THE ENVIRONMENT.

- Data from toxicity tests performed on aquatic and/or terrestrial organisms, where available (e.g. acute or chronic aquatic toxicity data for fish, algae, crustaceans, and other plants; toxicity data on birds, bees, plants).
- Whether there is a potential for the chemical to persist and degrade in the environment either through biodegradation or other processes, such as oxidation or hydrolysis.
- Results of tests of bioaccumulation potential, making reference to the octanol-water partition coefficient (K) and the bioconcentration factor (BCF), where available.ow
- The potential for a substance to move from the soil to the groundwater (indicate results from absorption studies or leaching studies).
- Other adverse effects (e.g. environmental fate, ozone layer depletion potential, photochemical ozone creation potential, endocrine disrupting potential, and/or global warming potential).

Section 13: Disposal Considerations

THIS SECTION PROVIDES GUIDANCE ON PROPER DISPOSAL PRACTICES, RECYCLING OR RECLAMATION OF THE CHEMICAL(S) OR ITS CONTAINER, AND SAFE HANDLING PRACTICES. TO MINIMIZE EXPOSURE, THIS SECTION SHOULD ALSO REFER THE READER TO SECTION 8 OF THE SDS.

- Description of appropriate disposal containers to use.
- Recommendations of appropriate disposal methods to employ.
- Description of the physical and chemical properties that may affect disposal activities.
- Language discouraging sewage disposal.
- Any special precautions for landfills or incineration activities.
- Other adverse effects (e.g., environmental fate, ozone layer depletion potential, photochemical ozone creation potential, endocrine disrupting potential and/or global warming potential).

Section 14: Transport Information

THIS SECTION PROVIDES GUIDANCE ON CLASSIFICATION INFORMATION FOR SHIPPING AND TRANSPORTING OF HAZARDOUS CHEMICAL(S) BY ROAD, AIR, RAIL, OR SEA.

- UN number (i.e. four-figure identification number of the substance) and UN proper shipping name.
- Transport hazard class(es).
- Packing group number, if applicable, based on the degree of hazard.
- Environmental hazards (e.g. identify if it is a marine pollutant according to the International Maritime Dangerous Goods Code (IMDG Code).
- Guidance on transport in bulk (according to Annex II of MARPOL 73/78) and the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (International Bulk Chemical Code [IBC Code]).
- Any special precautions which an employee should be aware of or needs to comply with, in connection with transport or conveyance either within or outside their premises (indicate when information is not available).

Section 15: Regulatory Information

THIS SECTION IDENTIFIES THE SAFETY, HEALTH, AND ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE PRODUCT THAT IS NOT INDICATED ANYWHERE ELSE ON THE SDS.

- Any national and/or regional regulatory information of the chemical or mixtures (including any OSHA, Department of Transportation, Environmental Protection Agency, or Consumer Product Safety Commission regulations).

Section 16: Other Information

THIS SECTION INDICATES WHEN THE SDS WAS PREPARED OR WHEN THE LAST KNOWN REVISION WAS MADE. THE SDS MAY ALSO STATE WHERE THE CHANGES HAVE BEEN MADE TO THE PREVIOUS VERSION. YOU MAY WISH TO CONTACT THE SUPPLIER FOR AN EXPLANATION OF THE CHANGES.

Employer Responsibilities

Employers must ensure that the SDSs are readily accessible to employees for all hazardous chemicals in their workplace. This may be done in many ways. For example, employers may keep the SDSs in a binder or on computers as long as the employees have immediate access to the information without leaving their work area when needed and a back-up is available for rapid access to the SDS in the case of a power outage or other emergency. Furthermore, employers may want to designate a person(s) responsible for obtaining and maintaining the SDSs. If the employer does not have an SDS, the employer or designated person(s) should contact the manufacturer to obtain one.

Operating Manual for MVE Liquid Nitrogen Dewars (SI Version)

M.D.D. Representative: Medical Product Services, Borngasse 20, 35619 Braunsfels, Germany

GENERAL DESCRIPTION

The cryopreservation vessel is a double-wall, vacuum-insulated vessel made of aluminum with a fiberglass composite neck, providing the highest efficiency possible in cryogenic temperature preservation. Use the vessel for liquid nitrogen only. Liquid oxygen is not compatible with this unit and must not be stored inside the vessel.

The MVE Liquid Nitrogen Dewar is designed with consideration for safety, durability and performance. However, mishandling of the equipment, including transport or shipping units in an orientation other than upright vertical, may damage the product. In addition, if a vessel experiences a drop, hit, or blow, it can suffer immediate or premature vacuum failure.

Upon receipt of the product, examine both the vessel and packaging for any evidence of damage during shipping. Contact the carrier with in the carrier's guidelines if there are signs of shipping damage. Some MVE shipping boxes carry the Transit Tested ISTA-3A certification stamp, shown to the right, which is helpful when making a claim against the carrier, should there be damage from shipping. Watch after the first fill for any signs of vacuum loss, such as excessive frost or sweating on the outside jacket. Some frost near the top just after filling is normal.

TRANSIT TESTED

INTERNATIONAL SAFE TRANSIT ASSOCIATION

This high quality vacuum insulated unit is compatible with the divergent temperature extremes and broad applications of cryobiology. The life expectancy of Liquid Nitrogen Dewars is five (5) years. Cryosystems is five (5) years.

CE 0459 Products bearing the CE marking as shown comply with the requirements of Directive 93/42/EEC concerning medical devices in the E...

SAFETY

WARNING: Liquid nitrogen is extremely cold. To avoid injury by frostbite, use extreme care whenever handling liquid nitrogen, liquid nitrogen storage or transfer vessels, or any objects which have come in contact with liquid nitrogen.

- Leave no area of skin exposed.
- Always wear proper safety attire over clothing: face shield, cryogenic gloves, and cryogenic apron.
- Use extreme care to prevent spilling and splashing liquid nitrogen during transfer.
- Always keep vessel in upright position. Do not tilt or lay the vessel on side.
- Immediately remove any clothing or safety attire on which liquid nitrogen has spilled.
- Get immediate medical attention for any frostbite injuries due to liquid nitrogen.

WARNING: The venting of nitrogen vapors may deplete oxygen in the air, possibly leading to asphyxiation or even death. Do not store or use container in areas that are small and enclosed or have poor ventilation.

WARNING: Do not tightly seal liquid nitrogen container or prevent nitrogen gas from escaping. Also, excessive humidity levels or exposure to rain/hail could result in freezing of the cork/cover, and possible explosion.

WARNING: Never use a hollow tube to measure liquid nitrogen level. This could lead to thermal injury.

CAUTION: Handle the cryopreservation vessel with care.

- Never overfill vessels with liquid nitrogen. Liquid nitrogen should always be below the bottom of the neck tube. Overfilling the tank may cause immediate or premature vacuum failure to occur.
- Never ship Liquid Nitrogen Dewar on its side or upside down. This can lead to vacuum failure.
- Remove and insert inventories carefully. Do not scratch neck tube area. Scratches can cause premature vacuum failure.
- Tampering with or removing the vacuum port will destroy vacuum and void warranty.
- Never drop, hit, or blow the unit.
- Never spill liquid nitrogen on or near vacuum port.
- Never leave the vessel in an outdoor condition.
- Keep the bottom of vessel clear and away from chemicals, fertilizers, soil, and moisture.
- Do not use MVE Liquid Nitrogen Dewar for transportation.
- All performance data published for these products is based on static conditions only. Actual performance will vary upon the nature of use. Manipulation of inventories and or accessories along with vibration will decrease the working duration of those products.

OPERATION

CAUTION: Consider the value of stored product when choosing dewar and distribution of samples among storage devices.

CAUTION: Appropriate liquid level monitoring equipment should be utilized if storing human biological material.

CAUTION: Failure to follow Chart's best operating practices as set forth in the manual can result in loss of contents.

ENVIRONMENTAL CONDITIONS

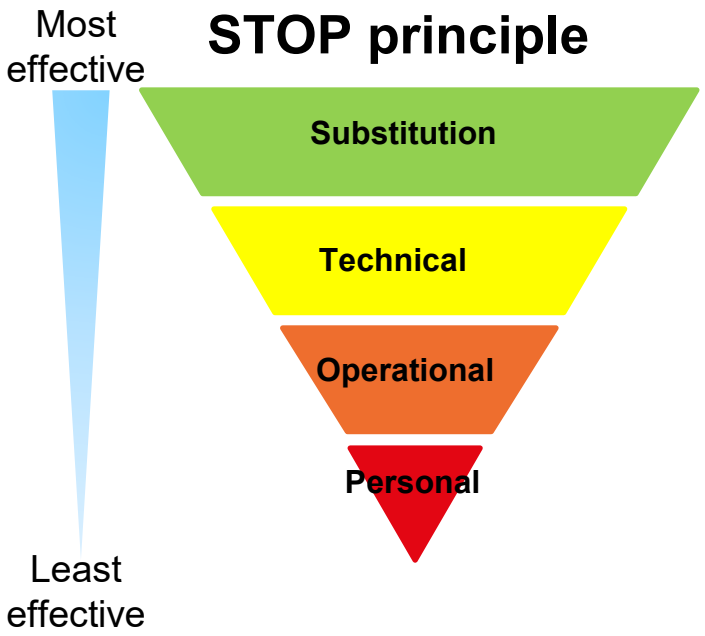
- Indoor (out of elements) use only
- Operating temperature: -28 deg C to +60 deg C.
- Relative humidity: 10% to 95%, non-condensing
- Storage temperature: -25 deg C. to +65 deg C.
- Storage relative humidity: 10% to 65%

Liquid nitrogen is extremely cold. Make sure to wear proper gear before operation. Avoid spilling liquid nitrogen over the vacuum port as this can shrink the seal and allow air to leak into the vacuum space causing premature vacuum failure. To ensure maximum performance from your MVE Liquid Nitrogen Dewar simply follow the listed steps:

1. Open container that Dewar is in, open the lid, and remove cork/cover/accessories. Lift cork/cover straight up (do not twist).
2. Fill unit to desired level. Liquid level should never pass bottom of neck tube.
   a. If you are working with a warm vessel, it is MVE's recommendation to slowly add small amount of liquid to the bottom of unit, and allow it to sit until the liquid nitrogen stops rapidly boiling to cool the unit. Position the vacuum port facing away from the operator or other personnel.
   b. Follow established safety practices and procedures for transferring LN2.
   c. Fill the vessel with a funnel or transfer line when possible. Transfer using LN2 hose with phase separator or pouring container using a funnel.
   d. If you are filling your vessel from a pressurized source, make sure it is a low pressure source (1.5? bar or below).
3. Replace cork/cover and allow unit to cool.
   a. If there is excess ice frost or sweating on the outside vessel after the first few hours, it would indicate either a weak or no vacuum. Examine the unit carefully.
4. Weigh unit and record.
5. Place inventory into unit, wipe water and moisture from outside of cork and inside dewar neck tube, and reinsert cork & cover into dewar.

Safety Corrective actions

How to reduce the risk ?



Substitution

- Can a hazardous product be replaced by a less hazardous one?

Technical (technical isolation of the danger)

- Ventilated laboratory, fume hood, glovebox, etc.

Operational (information on the hazard)

- Read the SDS
- Talk to your co-workers/Prof.
- Check emergency equipment before working
- Learn what to do in case of an emergency
- Contact the Occupational Health and Safety (OHS)
- Prepare waste containers

Personal protective equipment (body protection)

- Lab coat
- Gloves
- Protective glasses
- Apron
- Etc.

OHS @ EPFL

1. OHS Organization
2. OHS Teams

3. COSEC mission (Why/What?)

4. Occupational Safety – Basics
5. Risk management tools (hazard/exposure)

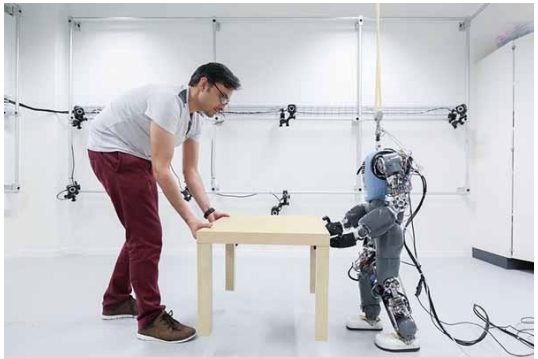
6. OHS Team supports (missions)
7. OHS IT tools

OHS team support

OHS Missions

Training

- Mandatory safety training
  FOBS 1, 2, 3
- Advanced training
  Laser, cryo, radioprotection, etc.
- Specific training
  overhead cranes, etc.
- Student projects related



Support

- Identification of hazards
- Technical control of risks
- Portfolio of hazardous phenomena
- Risk and accident analysis

Compliance

- Audits
- Authorizations
- Directives

Support

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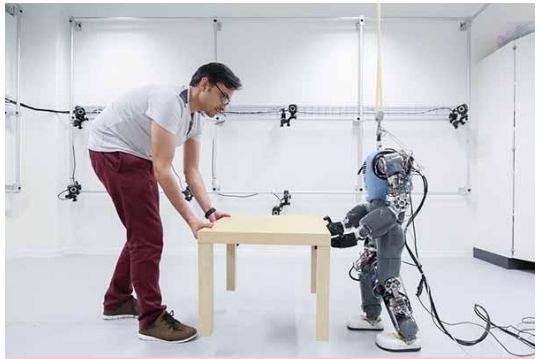

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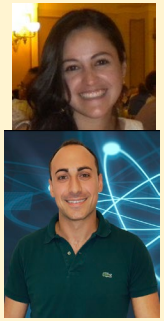
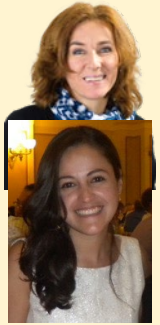
OHS – Prévention des risques: Team in detail

ATEX

Gas

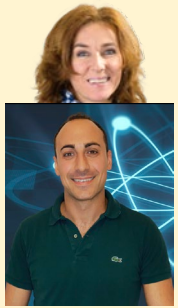


Laser



Nano

Cryo

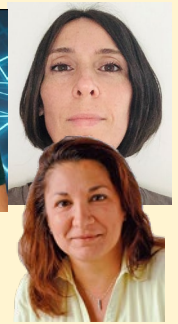


Magnet.

Radioprot.

Electricity

Bio



Chemistry, Storage, manipulation authorization

Roof, machinery safety, Workshop

ADR

Special Waste

Glove box / Mechanical safety

Work equipment: safety starts upon purchase!

Work equipment can present several **hazards** (mechanical, electrical, etc.):

- Ask the manufacturer to provide you with “proof of safety”: **declaration of conformity**. This document states that the work equipment complies with safety standards (e.g., European standards, Swiss standards). Declaration of conformity must be provided for Personal Protective Equipment too.

- Make sure that the **user manual** is provided together with the work equipment. The user manual must be provided in the users' language. In the user manual must find:
  - Instructions regarding the **use of equipment in accordance with its intended purpose**, and **assembly instructions** for partly completed machinery
  - Information about the **Personal Protective Equipment** that must be worn when operating the equipment. Their related **pictograms** must be then displayed on the equipment
  - Information related to the **maintenance** of the equipment
  - Information related to the **specific training** that users should get

- Organize the **specific training** if the equipment requires a specific instruction for the users

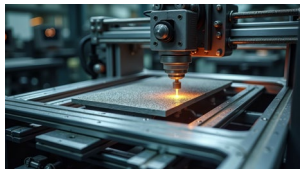
European directive **2006/42/EC**: Safety of machinery
Switzerland: Machinery Safety Ordinance **OMach**

Work equipment

Upon reception:

- Check the equipment and look for **obvious defects**
- Make sure you also got the **declaration of conformity** and the **user manual**
- Identify any **reasonably foreseeable misuse**
- Identify **residual risks** (risk remaining after all possible measures have been taken)
- Identify a **suitable localization** for the equipment:
  - The installation of the work equipment must not create a new hazard
  - For **very heavy equipment** make sure the **load capacity** is respected (e.g. slab can support the weight)
- Make sure that the **safety devices** are in place and work properly (e.g. safety interlock)
- Organize the **maintenance** of the work equipment
- Make sure users got the **training** should the equipment require a specific instruction

Home-made work equipment



When a **work equipment** or **installation** is conceived, constructed / assembled (in case of different machines) and put into service in house, the **employer (group leader)** is automatically considered to be the **manufacturer** of the work equipment.

A **risk assessment** must be carried out to determine the **health and safety requirements** applicable to the machine which must then be designed and built according to the results of the risk assessment. The risk assessment as well as **risk reduction measures** must be recorded (**written documents**).

The **employer (group leader)** is therefore considered the **responsible person** who must make sure that the work equipment complies with the Machinery Safety Ordinance **Omach.**

In the case of “home-made work equipment” the employer must also:

- make the **instruction manual** available. In case of the assembling of different machines into one installation, groping together the different notices instructions is not enough. An **instruction manual** must be prepared and made available for the final installation.
- establish a **declaration of conformity**
- ensure **training and instruction** for the users

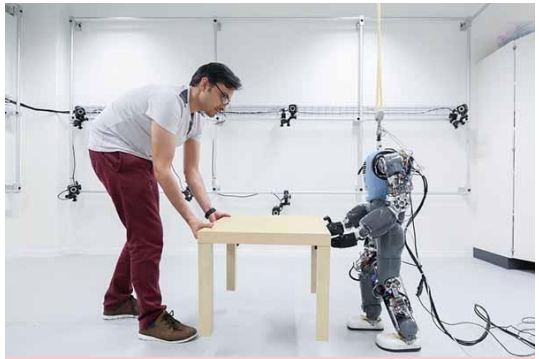
Bases légales et documents:

- Ordonnance sur la prévention des accidents et des maladies professionnelles (**OPA**), RS 832.30
- Loi fédérale sur la sécurité des produits (**LSPro**), RS 930.11
- Ordonnance sur la sécurité des produits (**OSPro**), RS 930.111
- Ordonnance sur la sécurité des machines (ordonnance sur les machines, **OMach**), RS 819.14
- Directive relative aux équipements de travail **CFST 6512**
- Directive européenne **2006/42/CE** relative aux machines
- **SUVA 66084.f** Équipements de travail - La sécurité commence dès l'achat!

Training

Training

- Mandatory safety training
  FOBS 1, 2, 3
- Advanced training
  Laser, cryo, radioprotection, etc.
- Specific training
  overhead cranes, etc.



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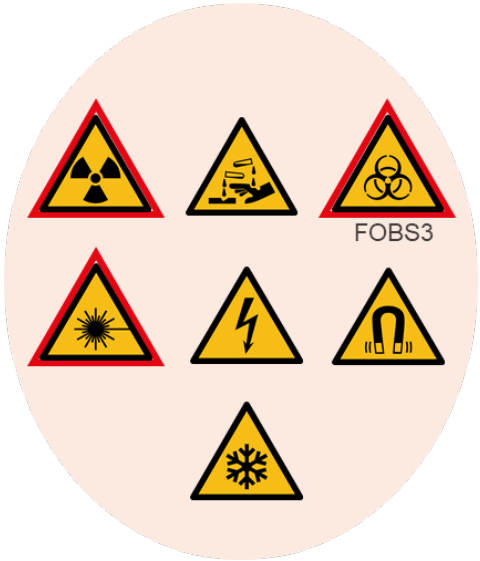
Available safety trainings organized by the OHS

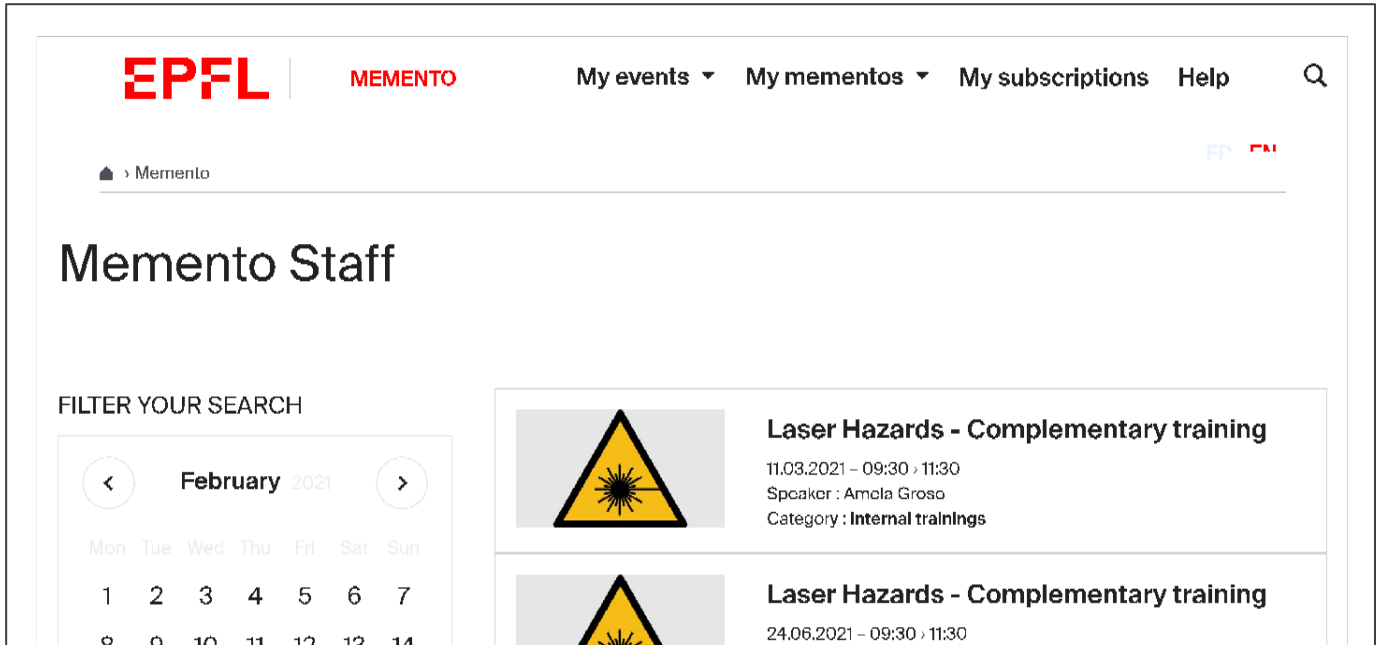
- Biosafety levels 2 and 3 (mandatory)
- Radioprotection (mandatory)
- Laser safety (mandatory if working with lasers of class 3B and 4)
- Management of chemical hazards and risks
- Nanomaterial safety
- Magnetic field hazards
- Cryogenic hazards

https://www.epfl.ch/campus/security-safety/en/trainings/



Where to find the complementary training ?

memento.epfl.ch/ohs



Compliance

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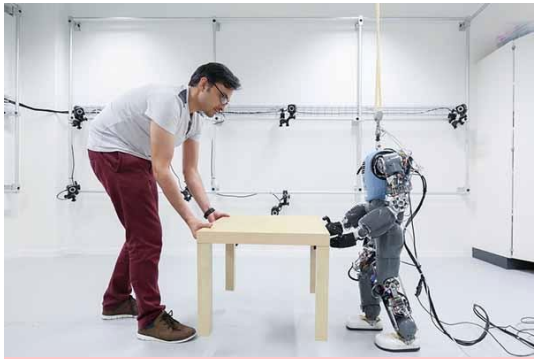

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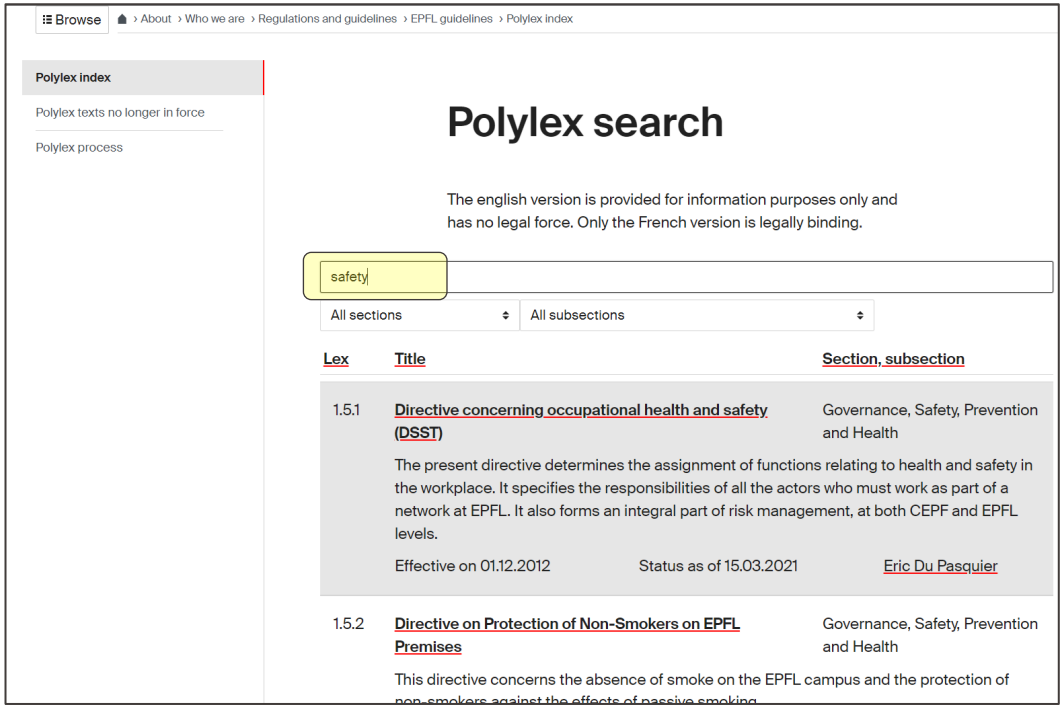
PolyLex



https://www.epfl.ch/about/overview/regulations-and-guidelines/polylex-en/polylex-search/

Compliance

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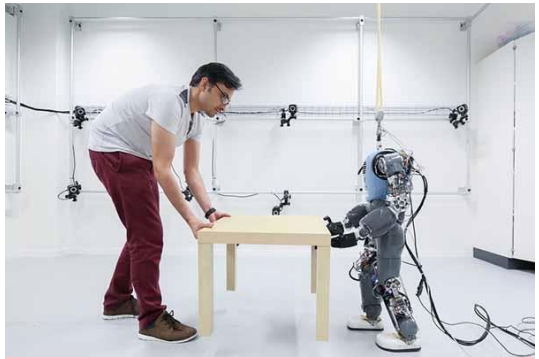

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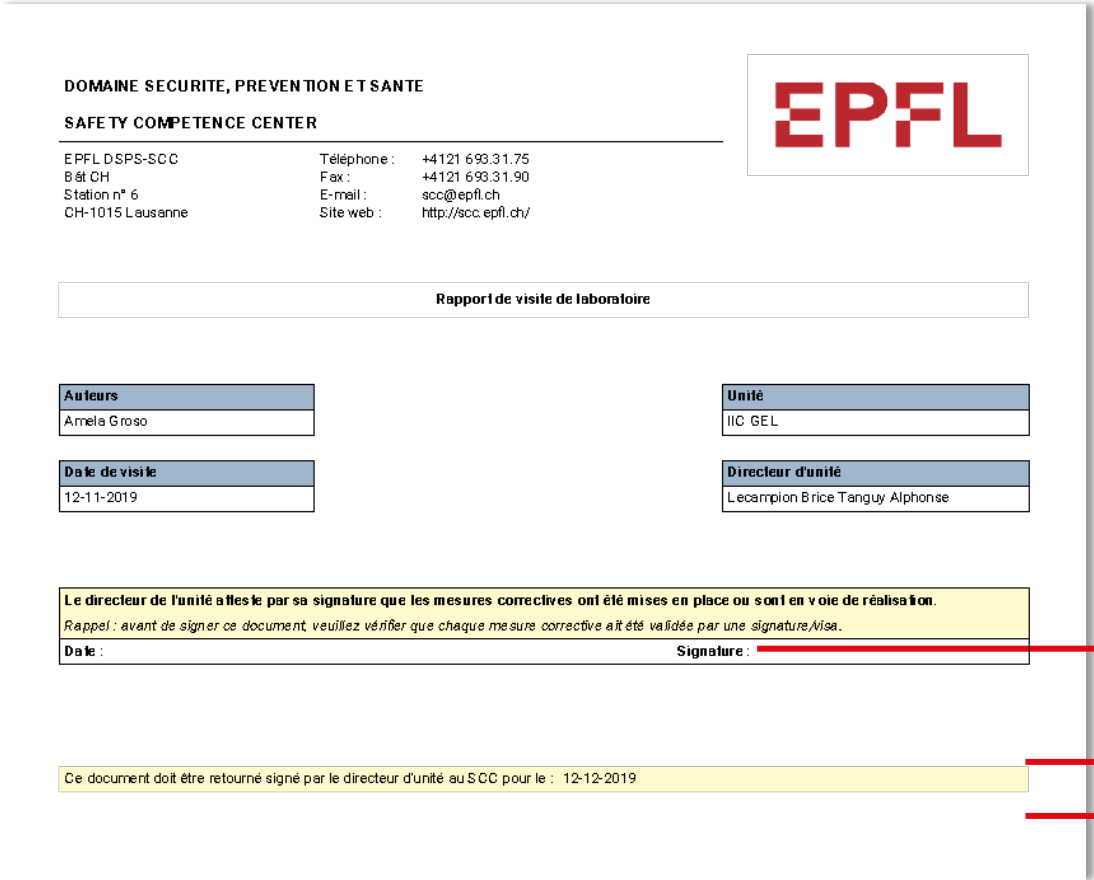
Audit is a mandatory recorded visit

- It has to be formalized and recorded in EPFL system
- Approved by the head of the unit.

Visit report



DOMAINE SECURITE, PREVENTION ET SANTE

SAFETY COMPETENCE CENTER

EPFL DSPS-SCC
Bât CH
Station n° 6
CH-1015 Lausanne

Téléphone : +4121 693.31.75
Fax : +4121 693.31.90
E-mail : scc@epfl.ch
Site web : http://scc.epfl.ch/

Rapport de visite de laboratoire

Auteurs	Unité
Amela Groso	IIC GEL

Date de visite	Directeur d'unité
12-11-2019	Lecampion Brice Tanguy Alphonse

Le directeur de l'unité atteste par sa signature que les mesures correctives ont été mises en place ou sont en voie de réalisation.

Rappel : avant de signer ce document, veuillez vérifier que chaque mesure corrective ait été validée par une signature/visa.

Date : **Signature :**

Ce document doit être retourné signé par le directeur d'unité au SCC pour le : 12-12-2019

Return the **signed report** as soon as corrective measures have been implemented.

Date and signature of the unit responsible

General remarks

Delay to return the report

Visit report

Rapport de visite de laboratoire - SCC

Unité : IIC GEL

Prof. . Lecampion Brice Tanguy Alphonse — Date de la visite . 12-11-2019

Délégué/e (s/es) à la sécurité : Perronnet Gary — Visa SCC : Amelia Grosso

GC B1 402

	Rubrique	Défaut	Mesures correctives	Délai	Visa
2	**Equipements d'urgence/information**				
2.7	Pharmacie	Pas fixée	Merci de fixer la pharmacie et une signalisation d'emplacement au-dessus. Cela peut être fait via une demande de travaux (http://travaux.epfl.ch).	12-12-2019	

Remarques du CoSec

GC G0 484

Rien à signaler

GC G0 494

	Rubrique	Défaut	Mesures correctives	Délai	Visa
6	**Produits chimiques, utilisation**				
6.4	Gants	Pas adaptés	Le latex étant un allergène, merci d'éliminer les gants latex et d'utiliser des gants nitrile ou néoprène.	12-12-2019	

Remarques du CoSec

Visa & delay

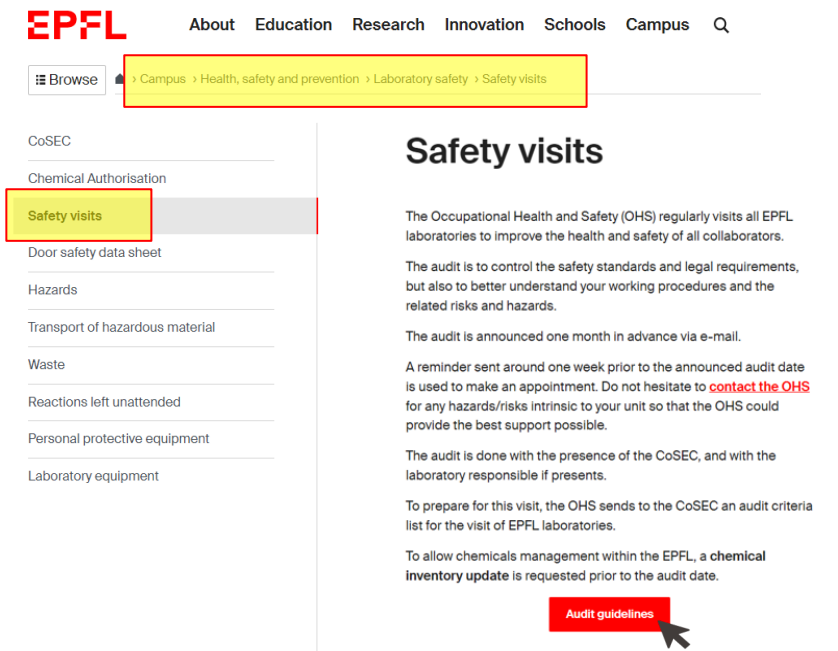
The one responsible for the corrective measure.

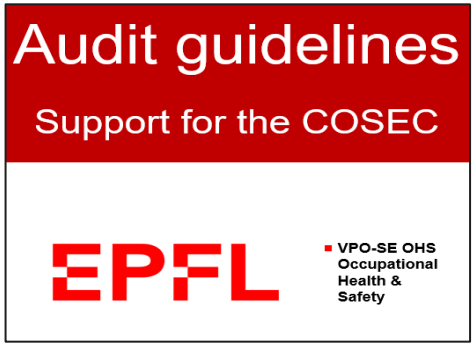
Remarks

Examples

- *Work taken care by the DII.*
- *Order made.*
- *Measure cannot be applied, what should be done ?*

Audit Guideline





https://www.epfl.ch/campus/security-safety/en/audits/

Audit Guideline

Table of content

EPFL
OHS Occupational Health & Safety

https://www.epfl.ch/campus/security-safety/en/audits/

Do not forget routine maintenance

- Safety door sheets
- Eye wash stations
- First-aid kits
- Your chemical authorizations and inventory

Compliance

Training

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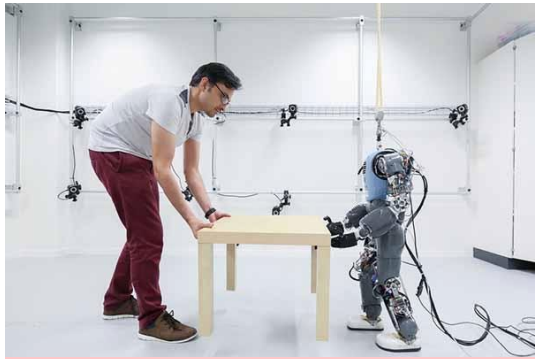

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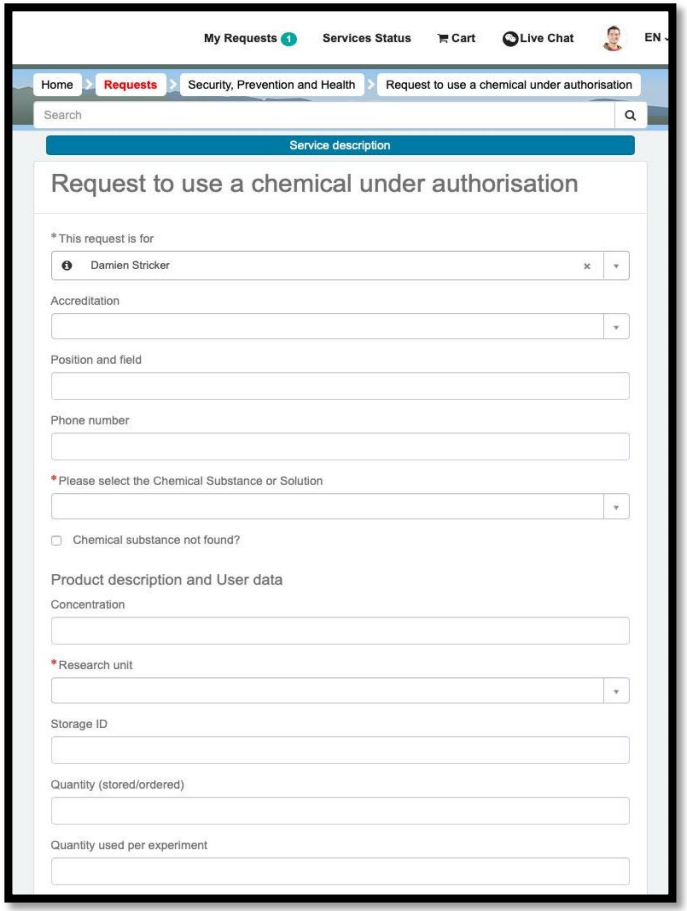
- Authorizations

Chemical Authorizations



Authorizations

Some very hazardous chemicals/substances are under authorization.

The list of these chemicals is subject to change over time.

For all emergencies, 24h/24:

From an EPFL landline: **115**

From a personal mobile phone: **021 693 30 00**

From the EPFL Campus app: **SOS**

Report a laboratory accident: Event manager

For all questions: Support SCC

For chemical authorization requests: Authorisation request

Laboratory Safety

OHS @ EPFL

1. OHS Organization
2. OHS Teams
3. OHS team Missions

4. COSEC mission (Why/What?)

5. Occupational Safety – Basics
6. Risk management tools (hazard/exposure)

7. OHS Team supports (missions)
8. OHS IT tools

Report your accidents and near-accidents!

Event reporting

Swiss law

It is **compulsory** to announce all accidents and near-accidents.

Goal

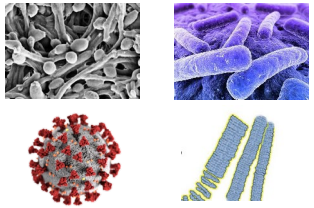
- Understand what happened so it doesn’t happen to someone else.
- Indicators of new risks related to e.g. new technologies.

Organometallic $LiAlH_4$ fire at EPFL 2022

What causes accidents in the workplace?

Chemical hazards:

Biological hazards:



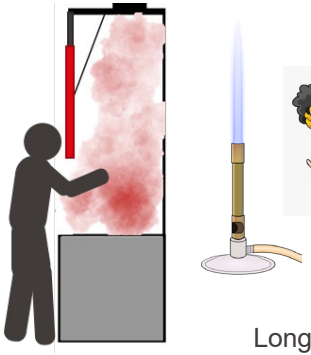
Physical hazards:

Technical failures account for **2%** of all workplace accidents.

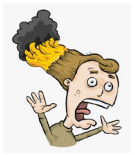
Protective glasses **not used**

Body parts injured in % (2016 - 2023)

At EPFL, **eyes** are the **2nd most** frequently injured part of the body.



Sash fully opened

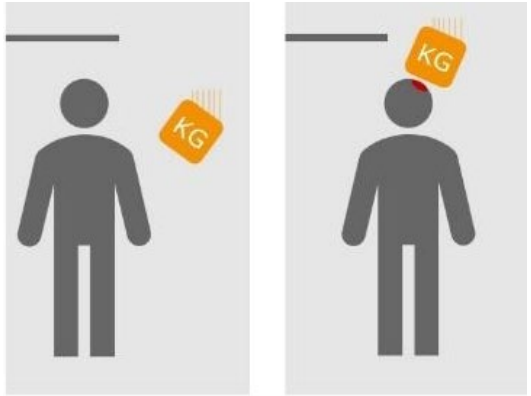


Long hair not tied back

Unsafe behaviors account for **97%** of all workplace accidents

Incident and accident analysis

Near miss **Accident**



A ***near miss*** today could be an ***accident*** tomorrow !

- The aim of the accident analysis is NOT to look for a culprit, but about **lessons to be learned**.
- Accident analysis is carried out **to determine the cause** of an accident aiming **to prevent or reduce the likelihood and gravity** of further accidents of a similar kind.
- The name(s) of the person(s) involved will never be publicly announced.
- **Near miss** and **accidents have to be reported** even if you called 115 !

Report a laboratory accident: Incident Manager

OHS Daily support

Why contact us ?

Not sure of the security aspects?

- New material
- New experience or procedure

Don't hesitate to contact us!

It's easier to get us involved in the design phase.

>>> Safety Ticket ServiceNow

How to contact OHS (occupational health and safety)

For all emergencies, 24h/24:

From an EPFL landline: **115**

From a personal mobile phone: **021 693 30 00**

From the EPFL Campus app: **SOS**

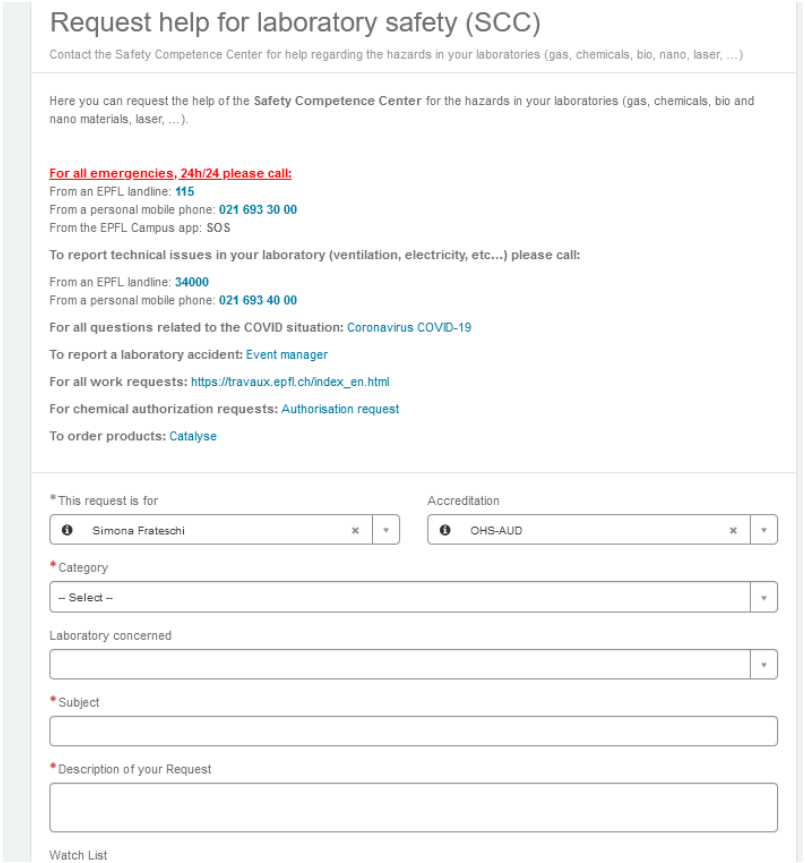
Report a laboratory accident: Event manager

For all questions: Support OHS

For chemical authorization requests: Authorisation request

Click on Support OHS

Fill up the request



Request help for laboratory safety (SCC)

Contact the Safety Competence Center for help regarding the hazards in your laboratories (gas, chemicals, bio, nano, laser, ...)

Here you can request the help of the **Safety Competence Center** for the hazards in your laboratories (gas, chemicals, bio and nano materials, laser, ...).

For all emergencies, 24h/24 please call:
From an EPFL landline: 115
From a personal mobile phone: 021 693 30 00
From the EPFL Campus app: SOS

To report technical issues in your laboratory (ventilation, electricity, etc...) please call:
From an EPFL landline: 34000
From a personal mobile phone: 021 693 40 00

For all questions related to the COVID situation: Coronavirus COVID-19

To report a laboratory accident: Event manager

For all work requests: https://travaux.epfl.ch/index_en.html

For chemical authorization requests: Authorisation request

To order products: Catalyse

*This request is for: Simona Frateschi

Accreditation: OHS-AUD

*Category: -- Select --

Laboratory concerned

*Subject

*Description of your Request

Watch List

We come to you

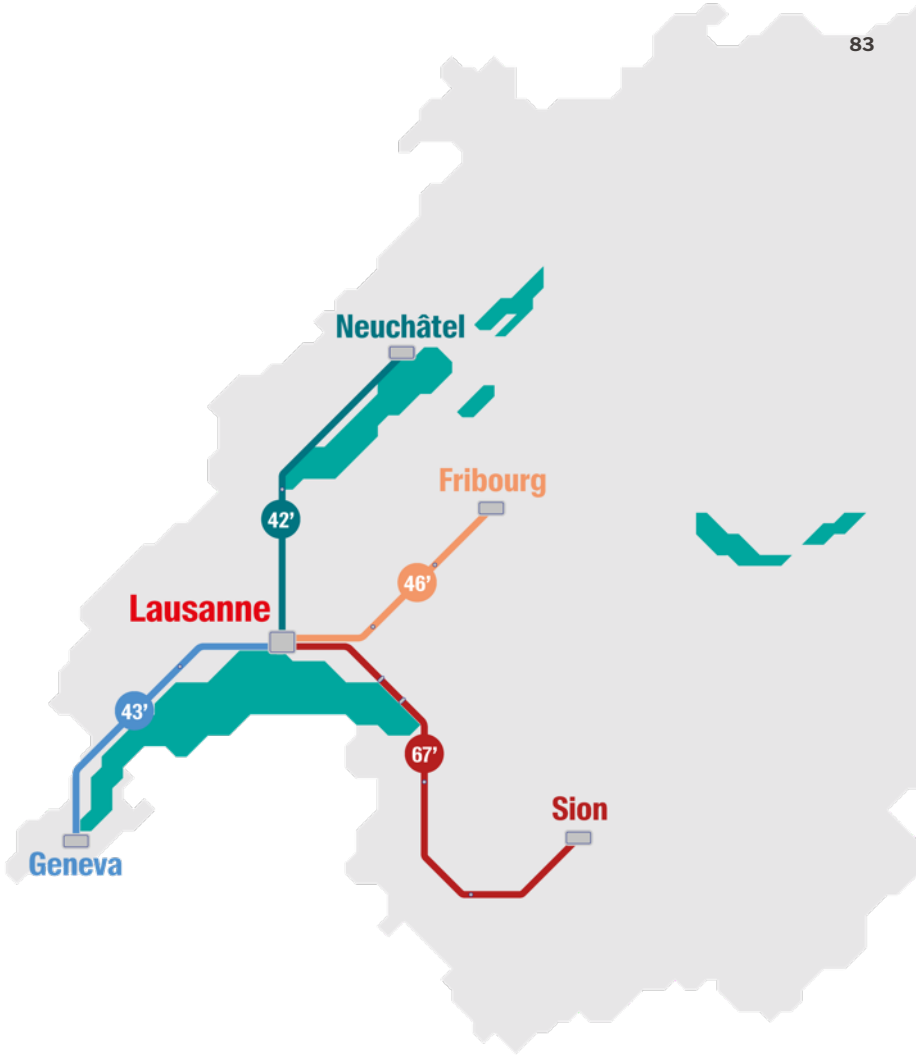
Neuchâtel – Microcity

Fribourg – Smart Living Lab

Lausanne – Campus principal

Sion – Campus Energypolis

Geneva – Campus Biotech



CoSec meetings as a continuous training

- 2 x ½ days per year
- Themes and organization : **you are welcome to help** !


Thank you for your attention!

COSEC Web page

OHS website

- Rescue
- Security
- Health
- **Laboratory safety**
  - Chemical Authorisation
  - Safety visits
  - COSEC
  - Biosafety officer
  - Radio Protection Referent
  - Door safety data sheet
  - Newsletters, pictograms and other useful documents
  - Hazards
  - Special waste
  - Personal protective equipment
  - Work equipment
  - Lone worker
  - Reactions left unattended
  - Transport of hazardous material
- Safety training courses
- EPFL OHS Directives
- Evacuation

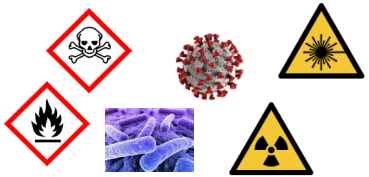
https://www.epfl.ch/campus/security-safety/en/lab-safety/

The members of the OHS (Occupational Health and Safety) service form a **multidisciplinary team** dedicated to:

- Support (ticketing)
- Training (FOBS & al.)
- Inspection (audit)

across EPFL's 2,000 laboratories. Our goal is to **educate and train researchers** to ensure a **safe working environment**.

Comprehensive information on most common hazards encountered in the workplace.



Training on the management of hazardous waste to promote safe, responsible and sustainable research.

.. and much more!

epfl.ch/campus/security-safety/activites-en-labo/cosecs/

RTS HR Perso HR - EPFL Working - EPFL Traduire Google Drive EPFL TREXMO Ticket - ServiceNow Event manager Incident manager |... EPFL - absences2 Tasks board SCC Safety Culture ON Safety Culture EPFL | LHD Travaux sur les toits Suva

EPFL À propos Éducation Recherche Innovation Facultés Campus Campus

Parcourir > Campus › Sécurité, Prévention et Santé › Sécurité en laboratoire › CoSEC

CoSEC
- Page web CoSec
- Autorisations chimiques
- Visites de sécurité
- Fiches de portes
- Dangers
- Déchets
- Équipement de protection individuelle
- Equipements de laboratoire
- Transport de matières dangereuses

CoSEC

Les Correspondants à la sécurité (CoSEC) représentent le premier contact sécuritaire auprès de chaque unité. Ils sont la première ligne officielle du système de santé et sécurité au travail de l'EPFL.

Ils ont force de contrôle, d'annonce, et d'arrêt de toutes activités dangereuses non maîtrisées.

Le concept même de la sécurité dans les laboratoires à l'EPFL s'appuie sur l'excellent travail des Cosec.

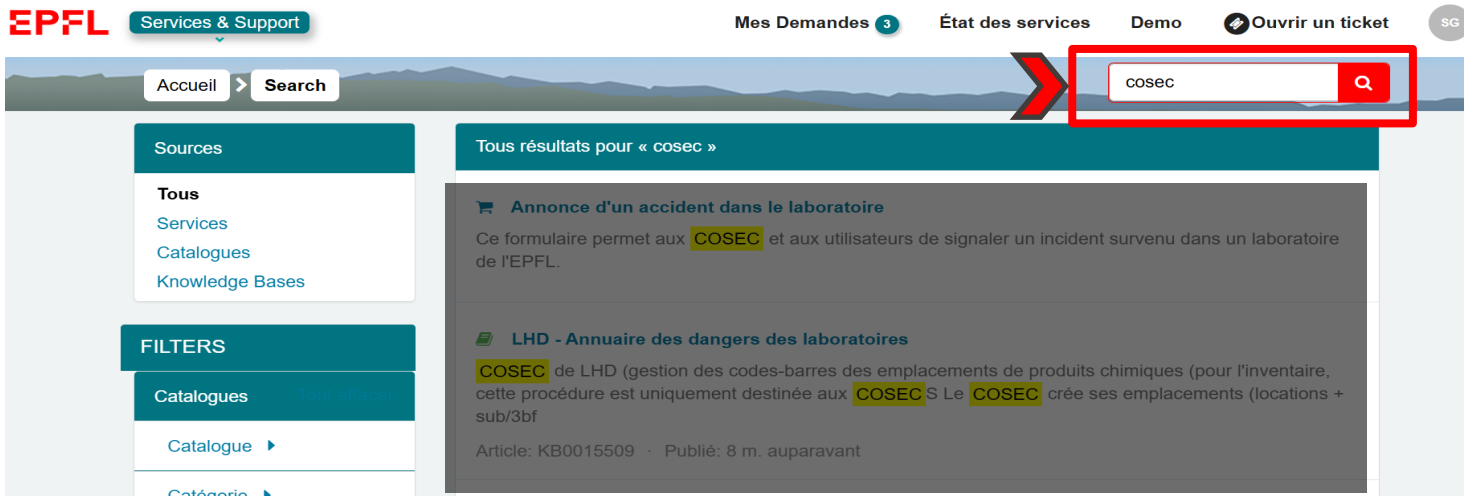
Page web CoSec

New SNOW Process

Step by step

EPFL Access

https://support.epfl.ch/epfl

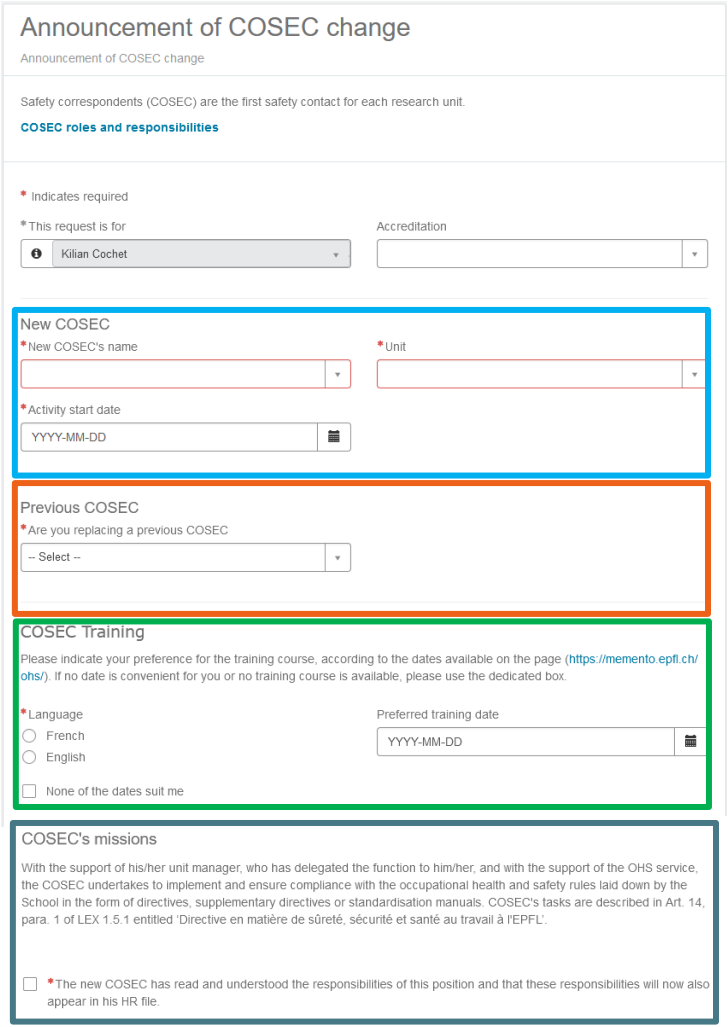


March 1st → https://go.epfl.ch/cosec-change

Form

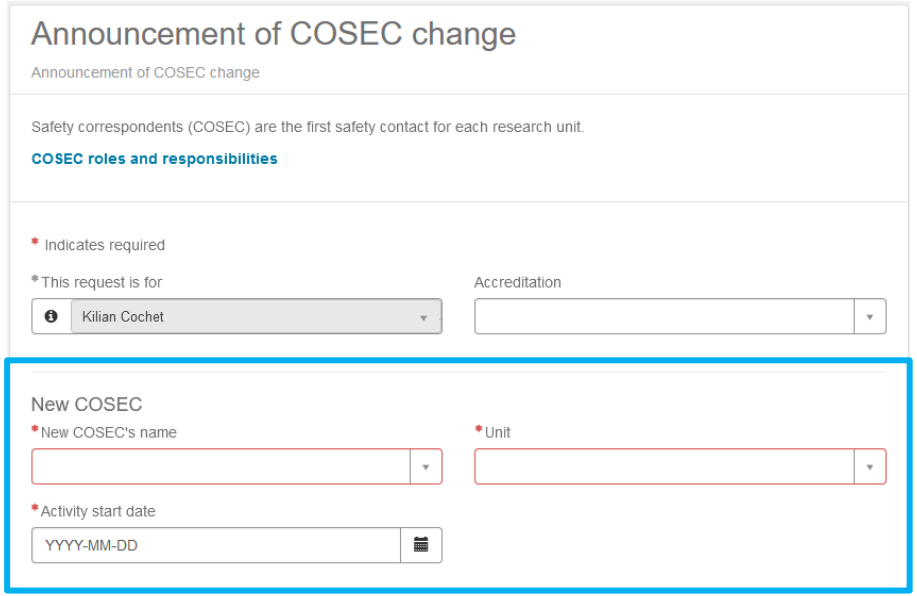
4 steps:

1. New Cosec
2. Previous Cosec
3. Cosec training
4. Signature / mission



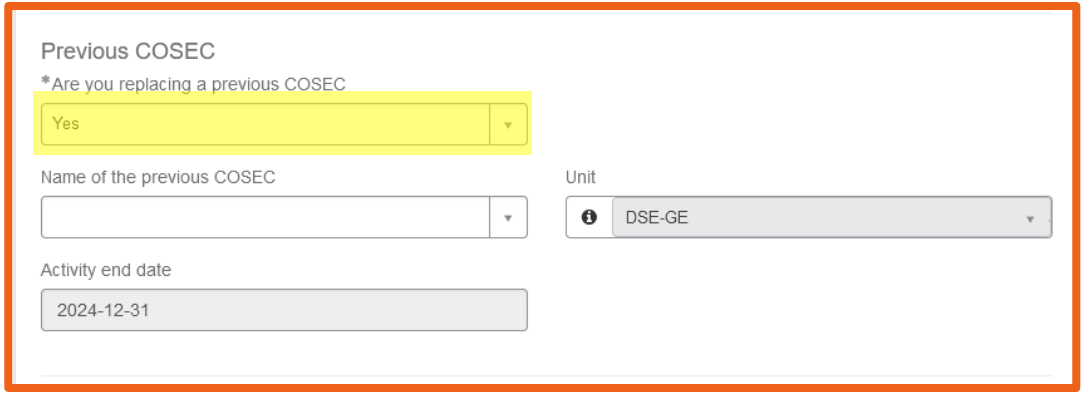
New Cosec

- ✓ Name
- ✓ Unit
- ✓ Activity start date

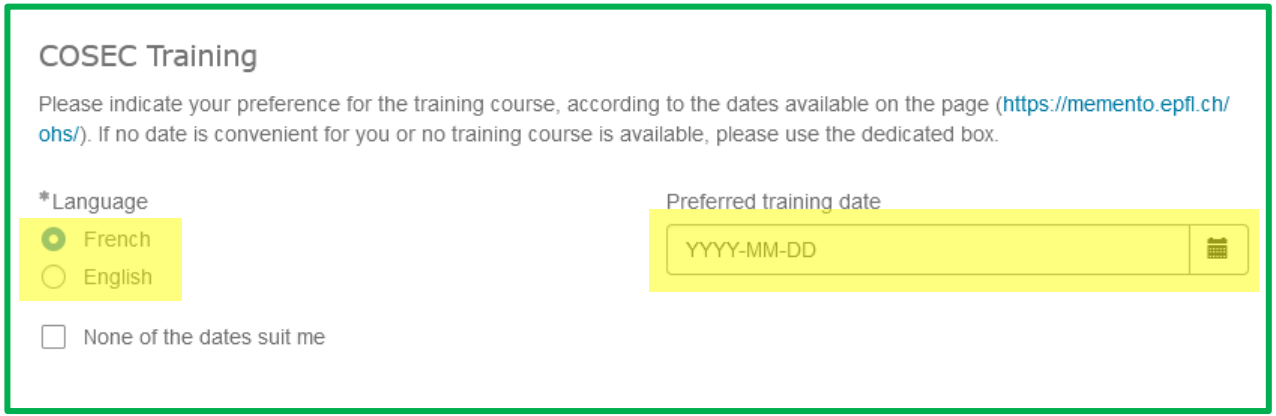


Previous Cosec (if applicable)

- ✓ **Name of previous cosec**
- ✓ **Activity end date**



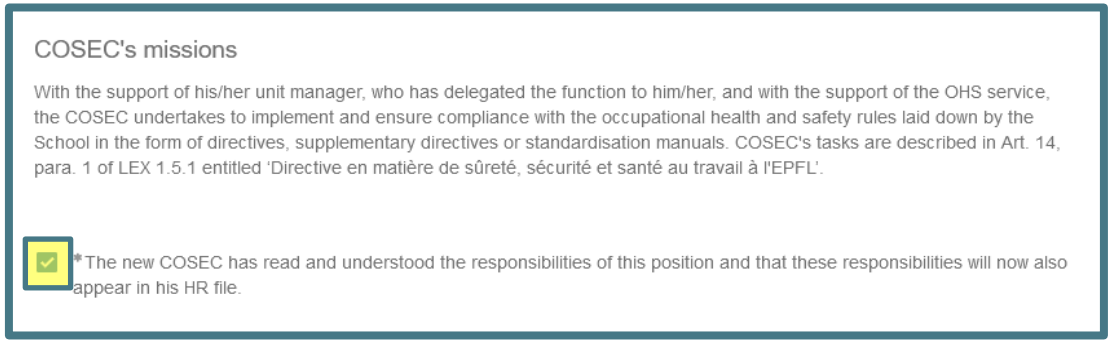
Cosec Training



- ✓ **Language choice**
- ✓ **Preferred training date**

Signature / Mission

✓ **Agreement**



Last step :

- ✓ **End validation by unit manager**
- ✓ **Digital HR document automatically generated**

École
polytechnique
fédérale
de Lausanne