Northeastern University
Planning, Real Estate, and Facilities

# Northeastern University
# Hazard Communication Program

Planning, Real Estate & Facilities (PREF)

Environmental Compliance & Occupational Safety (ECOS)

Office of Academic Research & Safety (OARS)

Risk Management


## Statement of Need

Northeastern University has implemented a Hazard Communication Program:

A. To assist in achieving a safer working environment for employees and students.
B. To comply with the Federal Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR § 1910.1200).

## Anticipated Benefits

A. Overall improvement of Northeastern University's safety program and safety climate.
B. Prevention of chemical-related injuries and illnesses.
C. Improvement of employer-employee and faculty-staff-student relations by establishing regular lines of communication about safety hazards through collaborative efforts, training and consultation.
D. Maintain full compliance with federal law.
E. Avoidance of OSHA citations and related compliance costs.

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# Definitions

## Article

Article means a manufactured item:

1. Which is formed to a specific shape or design during manufacture.
2. Which has end use function(s) dependent in whole or in part upon its shape or design during end use.
3. Which does not release, or otherwise result in exposure to, a hazardous chemical, under normal conditions of use.

## Chemical

Chemical means any element, chemical, compound, or mixture of elements and/or compounds.

## Chemical Manufacturer

Chemical manufacturer means an employer with a workplace where chemical(s) are produced for use or distribution.

## Chemical Name

Chemical name means the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS) rules of nomenclature, or a name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

## Classification

Classification means to identify the relevant data regarding the hazards of a chemical; review those data to ascertain the hazards associated with the chemical; and decide whether the chemical will be classified as hazardous according to the definition of hazardous chemical in this section. In addition, classification for health and physical hazards includes the determination of the degree of hazard, where appropriate, by comparing the data with the criteria for health and physical hazards.

## Combustible Liquid

Combustible liquid means any liquid having a flashpoint at or above 100 F (37.8 C), but below 200 F (93.3 C), except any mixture having components with flashpoints of 200 F (93.3 C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

## Common Name

Common name means any designation or identification such as code name, code number, trade name, brand name or generic name used to identify a chemical other than by its chemical name.

## Compressed Gas

Compressed gas means:

1. A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70 F (21.1 C); or
2. A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 F (54.4 C) regardless of the pressure at 70 F (21.1 C); or
3. A liquid having a vapor pressure exceeding 40 psi at 100 F (37.8 C) as determined by ASTM D-323-72.

## Container

Container means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.

## Designated Representative

Designated representative means any individual or organization to whom an employee gives written authorization to exercise such employee's rights under this section. A recognized or certified collective bargaining agent shall be treated automatically as a designated representative without regard to written employee authorization.

## Distributor

Distributor means a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to employers.

## Employee

Employee means a worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies. Workers such as office workers or bank tellers who encounter hazardous chemicals only in non-routine, isolated instances are not covered.

## Employer

Employer means a person engaged in a business where chemicals are either used, distributed, or are produced for use or distribution, including a contractor or subcontractor.

## Explosive

Explosive means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

## Exposure or Exposed

Exposure or exposed means that an employee is subjected to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.), and includes potential (e.g. accidental or possible) exposure.

## Flammable

Flammable means a chemical that falls into one of the following categories:

1. **Aerosol**, flammable means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening.
2. **Gas, flammable** means:
   i. A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of thirteen (13) percent by volume or less.
   ii. A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than twelve (12) percent by volume, regardless of the lower limit.
   iii. Liquid, flammable means any liquid having a flashpoint below 100 F (37.8 C), except any mixture having components with flashpoints of 100 F (37.8 C) or higher, the total of which make up 99 percent or more of the total volume of the mixture.
   iv. Solid, flammable means a solid, other than a blasting agent or explosive as defined in § 190.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

## Flashpoint

Flashpoint means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

1. *Tagliabue Closed Tester* (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79)) for liquids with a viscosity of less than 45 Saybolt University Seconds (SUS) at 100 F (37.8 C), that do not contain suspended solids and do not tend to form a surface film under test; or

2. *Pensky-Martens Closed Tester* (See American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79)) for liquids with a viscosity equal to or greater than 45 SUS at 100 F (37.8 C), or that contain suspended solids, or that tend to form a surface film under test; or

3. *Setaflash Closed Tester* (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTMD 3278-78)). Organic peroxides, which undergo auto accelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

## Foreseeable Emergency

Foreseeable emergency means any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.

## Hazard Category

Hazard category means the division of criteria within each hazard class, e.g., oral acute toxicity and flammable liquids include four hazard categories. These categories compare hazard severity within a hazard class and should not be taken as a comparison of hazard categories more generally.

## Hazard class

Hazard class means the nature of the physical or health hazards, e.g., flammable solid, carcinogen, oral acute toxicity.

## Hazard statement

Hazard statement means a statement assigned to a hazard class and category that describes the nature of the hazard(s) of a chemical, including, where appropriate, the degree of hazard.

## Hazardous Chemical

Hazardous chemical means any chemical which is a physical hazard or a health hazard.

## Hazard Warning

Hazard warning means any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which convey the hazard(s) of the chemical(s) in the container(s).

## Health Hazard

Health hazard means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term health hazard includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendix A, to 29 CFR 1910.1200 provides further definitions and explanations of the scope of health hazards covered by this section, and Appendix B, 29 CFR 1910.1200 describes the criteria to be used to determine whether or not a chemical is to be considered hazardous for purposes of this standard practice instruction.

## Identity

Identify means any chemical or common name which is indicated on the material safety data sheet (MSDS) for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label and the MSDS.

## Label

Label means any written, printed, or graphic material, displayed on or affixed to containers of hazardous chemicals.

## Safety data sheet (SDS)

Safety data sheet means written or printed material concerning a hazardous chemical which is prepared in accordance with 29 CFR 1910.1200, paragraph (g). SDS's are developed by the manufacturer of a particular chemical that includes information on all the hazards associated with said chemical. It also

provides guidance based off these hazards as to how to best protect yourself, along with emergency information/procedures to be followed in the event of an accident.

## Mixture

Mixture means any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.

## Oxidizer

Oxidizer means a chemical other than a blasting agent or explosive as defined in 29 CFR 1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

## Physical hazard

Physical hazard means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

## Pictogram

Pictogram means a composition that may include a symbol plus other graphic elements, such as a border, background pattern, or color, that is intended to convey specific information about the hazards of a chemical. Eight pictograms are designated under this standard for application to a hazard category.

## Precautionary Statement

Precautionary statement means a phrase that describes recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to a hazardous chemical, or improper storage or handling.

## Produce

Produce means to manufacture, process, formulate, or repackage.

## Responsible Party

Responsible party means someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

## Specific Chemical Identity

Specific chemical identity means the chemical name, Chemical Abstracts Service (CAS) Registry Number, or any other information that reveals the precise chemical designation of the substance.

## Unstable (Reactive)

Unstable (reactive) means a chemical which in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature.

## Use

Use means to package, handle, react, or transfer.

### Water-Reactive
Water-reactive means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard. Often when the water is heated it goes into a gaseous state allowing oxygen to be released which can help feed a fire.

### Work Area
Work area means a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

### Workplace
Workplace means an establishment, job site, or project, at one geographical location containing one or more work areas.

## Background
In November of 1983 the Occupational Safety and Health Administration (OSHA) published the Hazard Communication Standard to reduce the incidence of chemical-related occupational illness and injury. The standard was developed to ensure employers provide employees with important safety information regarding hazardous materials used in their workplace. The Hazard Communication standard was updated on March 26, 2012 to align with the third revision of the Global Harmonization System (GHS) to provide a common and coherent approach to classifying chemicals and communicating hazard information. This program applies to all members of the Northeastern University community. Northeastern University's written program includes provisions for container labeling, accessing Safety Data Sheets (SDS), employee information, training and the NFPA Hazard Assessment Inventory Program.

## Purpose
The purpose of the Northeastern University Hazard Communication Program is to ensure that all potential exposures to hazardous materials on campus are evaluated, and that information concerning physical and health hazards is effectively communicated to the campus community. It is the dual objective of Northeastern University to fully comply with 29 CFR § 1910.1200 and to improve the overall safety and health management systems, education, and training of the University Community.

### Campus Community – Labs, Shops, Studios
The Northeastern University Hazard Communication Training course through the Learning Management System, Scischield, is assigned to personnel who may be exposed to hazardous materials in shops, design labs and studios.

### Campus Community – Planning, Real Estate and Facilities (PREF)
For employees within the PREF division, the Hazard Communication Training course and associated courses such as Global Harmonization Systems, Laboratory Safety, and Safety Data Sheet education will be assigned to personnel who may be exposed to hazardous materials as a normal function of their job through the training platform Safety Skills.

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## Authority

This Hazard Communication Program is required by the Occupational Safety & Health Administration, (OSHA), pursuant to 29 CFR § 1910.1200. Northeastern University's Office of Environmental Compliance and Occupational Safety (ECOS), Office of Academic and Research Safety (OARS), and Risk Management Group, shall have the authority and responsibility to assure compliance with all regulations governing hazardous materials and waste management. In the event of noncompliance, immediate corrective action is to be taken while a plan for permanent correction is developed and implemented. ECOS and OARS will establish hazardous materials policies and procedures. The written procedures are located on the ECOS and OARS websites.

## Safety Data Sheets (SDS)

Access to Safety Data Sheets (SDS) is the keystone to a successful Hazard Communication Program. Members of the Northeastern University community have full access to SDSs which include instructions for safe use and the potential hazards associated with hazardous materials. In addition, SDSs provide safe handling instructions, storage requirements, personal protective equipment (PPE) recommendations, and emergency information. SDSs should be reviewed prior to starting work with all hazardous materials.

### Sections of SDS

Employees are required to be familiar with the different sections of the SDS, which is achieved through applicable safety training. Sections of the SDS include the following:

1. Section I- Identification
2. Section II- Hazard(s) Identification
3. Section III- Composition/information on ingredients
4. Section IV- First-aid measures
5. Section V- Fire-fighting measures
6. Section VI- Accidental release measures
7. Section VII- Handling and storage
8. Section VIII- Exposure controls/personal protection
9. Section IX- Physical and chemical properties
10. Section X- Stability and reactivity
11. Section XI- Toxicology information
12. Section XII- Ecological information
13. Section XIII- Disposal considerations
14. Section XIV- Transport information
15. Section XV- Regulatory information
16. Section XVI- Other information

### Accessing SDS

Safety Data Sheet (SDS) information is critical as it includes instructions for safe use and details potential hazards associated with a chemical. You have the right per OSHA to review SDS for each chemical in your workplace. In the event of a workplace chemical related incident (i.e. injury, spill, release to the

environment etc.), SDS must be provided to emergency response personnel in a timely manner to properly conduct first-aid and subsequent medical actions.

The Office of Academic and Research Safety (OARS) maintains a LMS, SciShield, for all SDS information associated with laboratories and research facilities on campus. SciShield includes a search function on the user's home page. Every member of the NU community with a NU username and password has access to this system.

The Environmental Compliance and Occupational Safety department (ECOS) maintains the full chemical inventory for chemicals associated with members of the PREF division at Northeastern. SDS information associated with these chemicals is stored in paper copies within the trades shops or mechanical spaces where the chemicals are located. Electronic versions are available through the ECOS maintained compliance system, which can be accessed through the ECOS website.

Please refer to the follow steps for accessing an SDS:

1. Obtain the following information regarding the chemical you're working with to the best of your ability:
    a. Chemical Name
    b. Manufacturer
    c. Physical State (Solid, Liquid, Gas)
2. Dependent on the location of the chemical, utilize either SciShield or the ECOS compliance tracking system to search for the associated SDS form. Paper copies should always be stored nearby the physical chemical location. Contact a member of ECOS or OARS for assistance if the SDS is not able to be located.
3. Chemical manufacturers supplying Northeastern University with products are required to make available upon request SDS for each product shipped. If SDS sheets are not sent with your order, a written request can be made to receive one. An up to date SDS must be maintained either onsite or online, and be accessible to appropriate personnel 24/7.

## National Fire Prevention Association (NFPA) Hazard Assessment Program

Employees must understand the information presented in the NFPA signs on all doors where hazards are present. These signs were developed to aid firefighters in recognizing hazards behind a door, but they are also very important for everyone on campus who is entering the room. They also provide a hazard assessment inventory for all areas where hazardous materials are stored or used. Further guidance on understanding NFPA is covered in employee training.

The following image displays an example of a NFPA Door sign that can be found at Northeastern University:

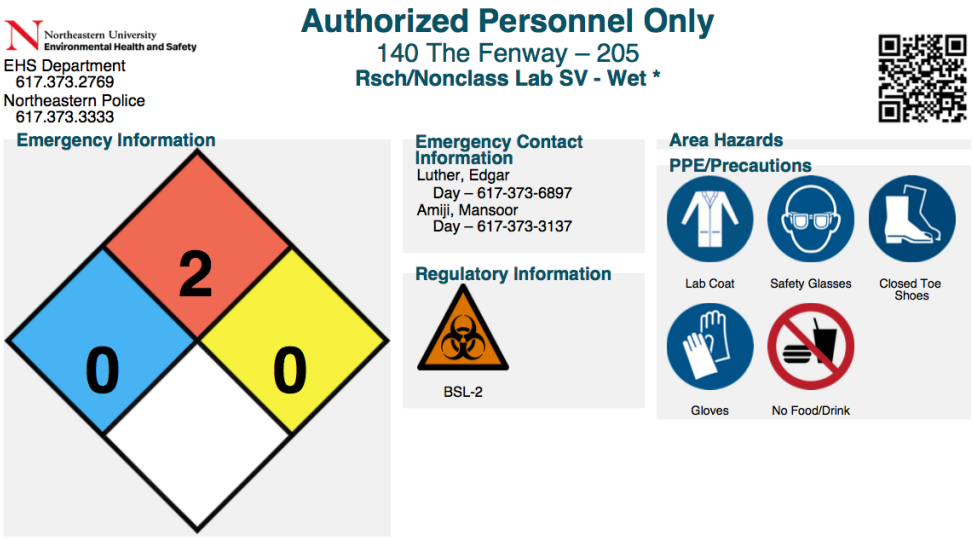


*Figure 1: Door Sign Example*

**NFPA door signs are divided into three groups of represented information:**

1. The NFPA Diamond - This diamond is divided into 4 sections:

    **a.** Blue = Health
    **b.** Red = Flammability
    **c.** Yellow = Reactivity
    **d.** White = Special information

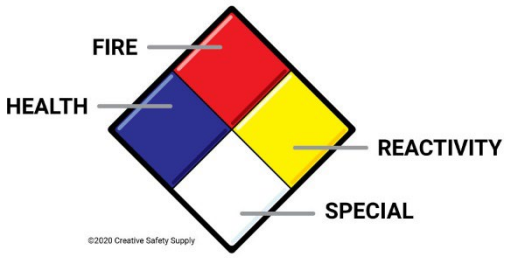


*Figure 2: NFPA Diamond*

    Within each of the three colored sections of the diamond there will be numbers representing the hazard rating. The numbers range from 0-4. 0 being minimal, 1 being slight, 2 being moderate, 3 being serious, and 4 being extreme. Within the white section there may be many combinations of the following symbols, or there may be nothing at all:

    - OXY- Oxidizer
    - W- Water Reactives
    - G- Compressed Gas
    - LN2- Liquid Nitrogen
    - LHe- Liquid Helium

2. Contact Information - This section provides emergency contact information. There must be two contact people listed along with the associated room and phone numbers.

3. Other Information - Various identifiers may represent specific hazards, including the following:

- High Voltage
- Biohazard Rating
- Radiation Hazard
- Magnetic Field
- Radioactive Material

## A Global Harmonization System (GHS)

GHS is a framework or guidance for classifying and labeling hazardous chemicals on a global scale. The purpose of classification under the GHS is to provide harmonized information to users of chemicals with the goal of enhancing protection of human health and the environment. ***All hazardous materials on campus are required to be properly labeled with a clear indication of the full chemical name, hazardous properties of the chemical, a GHS pictogram and emergency response information.*** Further guidance on GHS and adequate hazardous material labeling is covered in employee training.

The following image displays nine different pictograms that may be included in a hazardous material label under GHS:


*Figure 3: GHS Pictogram*

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# Spill Response

In the event of a hazardous material spill, NUPD and Facilities Customer Service should be contacted immediately, followed by a supervisor or member of ECOS. Minor spills should be assessed for cleanup by employees if it is safe to do so. In the event of a major spill, the area should be evacuated, secured, all drains and access to water or the environment protected if possible, and an outside contractor should be contacted immediately for assistance in cleanup.

## Oil/Fuel Spill Response Guidance

1. Assess safety of situation.
2. Protect storm drains/water ways.
3. Contain spill using spill response materials (Speedy dry, Pads, Booms, Socks).
4. Document timeframe, volume, location, & source.
5. Contact appropriate personnel:
   NUPD: (617) 373-3333
   FCS: (617) 373-2754

## Chemical Spill Response Guidance

1. Assess safety of situation & **notify supervisor/NUPD immediately.**
2. Identify material spilled and approximate volume if possible.
3. Isolate the area and ensure all storm and sewer drains are protected.
4. Locate SDS, review proper spill response.
5. If small spill, cleanup per guidelines on SDS if properly trained.
6. If large or hazardous spill, contact outside personnel to respond and place sign on ALL entry points to the contaminated area stating **DO NOT ENTER** with date and time listed.

# Contractor Work

- Contractors are responsible for supplying all SDSs for hazardous materials they bring on site and ensuring adequate labeling.
- If a contractor is working in an area on campus with hazardous material present, they must be notified to the potential hazards and risks present. Project Managers should inform contractors of the Hazard Communication Program.
- Contractors must notify occupants of a space where they are storing or using hazardous materials.
- Project Managers must ensure adequate management, storage, usage, and disposal of hazardous materials brought on campus by a contractor. A member of ECOS can assist with this if necessary.
- In the event of a spill, the contractor must understand Northeastern's Spill Response Protocols and have the adequate information provided by the Project Manager to contact the respective parties within ECOS or Facilities.

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# Employee Training

The Hazard Communication Standard training is required and assigned to every member of the NU community who has the potential of being exposed to hazardous chemicals.

> ***Note:*** *If you are working in a wet research laboratory setting then you are covered under the OSHA Laboratory Standard (1910.1450) and your training is covered under NU's flagship laboratory safety courses (e.g. Fundamentals of Laboratory Safety, as of 2021).*

## Training for Laboratories, Shops, Studios and Makerspaces

NU Faculty/staff/students in engineering labs, design shops and studios are meeting the Hazard Communication training requirement through the 2021 version of their Hazard Communication Training program, which is geared towards shops, studios, design labs and makerspaces. As of 2021, this course is hosted on the OARS LMS platform, SciShield, which is accessible to everyone on campus. Groups with regular members will need a group profile in BioRAFT which supports the tracking and monitoring of training compliance for that group.

New faculty, staff, and students with potential exposures to hazardous materials are required to complete the Hazard Communication training course. In addition, department supervisors must provide on-the-job training to understand standard operating procedures related to newly introduced chemicals as they are introduced.

This Hazard Communication training program covers the following information:

1. Overview of the Hazard Communication Standard
2. How to interpret SDS and product labels
3. How to access hazard information and SDS
4. The location of the written hazard communication program
5. Interpretation of the NFPA door sign; hazards in their work area
6. How to read and properly label containers
7. Proper chemical storage locations
8. Proper recognition and handling of hazardous chemicals
9. Proper use and location of safety & personal protective equipment
10. Methods and/or observations to detect the presence of hazardous materials
11. Emergency response and evacuation procedures

## Training for Planning, Real Estate, and Facilities (PREF)

For employees within the PREF division, the Hazard Communication Training course and associated courses such as Global Harmonization Systems, Laboratory Safety, and Safety Data Sheet education will be assigned to personnel who may be exposed to hazardous materials as a normal function of their job through the training platform Safety Skills.

All PREF employees will be signed up for an account by a member of ECOS during the onboarding process, and associated courses will be reviewed during new hire safety orientation. Depending on the

nature of the employees job, applicable courses will be assigned to based on the types of hazards they may be exposed to.

The Hazard Communication and associated training on Safety Skills covers the following information:

1. Introduction and overview of the Hazard Communication Standard
2. Review the purpose and requirements associated with the Hazard Communication Program
3. Identification of chemical hazards and hazard controls in the workplace
4. Identification of sources of information for workplace chemical hazards
5. Identification of OSHA requirements for medical recordkeeping
6. Identification of key elements of the Global Harmonization System
7. Recognition of GHS labels
8. How to interpret SDS and understand key components of the different sections
9. The location of the written hazard communication program
10. Interpretation of NFPA door signs
11. Proper chemical storage practices
12. Emergency response and evacuation procedures

## Chemical Inventory and Storage

Maintaining active inventories helps to maintain a safer campus and supports our goal of preventing any hazard-related injuries or accidents. Northeastern University maintains a Chemical Hygiene Plan and Waste Minimization Plan with more details on Chemical Inventory and Storage Practices.

For Research Laboratory Space, Principal investigators are responsible for keeping track of all chemicals stored in their workspace, regardless of whether or not they are currently being used for research. Chemicals associated with these spaces should be accurately accounted for via SciSchield.

For PREF employees, the individual trades groups are responsible for keeping track of all chemicals stored in their shops or associated mechanical spaces on campus.