



Laboratory Inspection Program

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Applies To: Employees, Faculty, Students, Others

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1.0 Introduction

The Division of Environmental Health & Safety (EHS) at the University of Connecticut (UConn) seeks to promote and maintain a safe and healthful environment by ensuring the highest level of environmental health and safety services for faculty, staff, students, and visitors. In order to provide a working environment that is free of recognizable hazards, EHS conducts laboratory inspections to help safeguard the quality of UConn's laboratory safety program as well as ensure the overall health and safety of individuals working in laboratories.

2.0 Scope and Applicability

The UConn "Laboratory Inspection Program" applies to faculty, staff, students, and visitors working in laboratories with hazardous chemicals at the Storrs and regional campuses, with the exception of the UConn Health Center. Its primary purpose is to ensure that EHS-trained laboratory personnel follow the guidelines in the University Chemical Hygiene Plan (CHP). The program also seeks to achieve the following three goals:

- Ensure that all laboratory activities are conducted in a way that avoids individual exposure to hazardous chemicals.
- Maintain laboratory facilities and equipment in a safe, code-compliant operating condition.
- Provide a safe and secure working environment for all individuals.

3.0 Program Description & Responsibilities

The following items are addressed by this program:

1. Laboratory inspections will be conducted by EHS to ensure compliance with federal and state laws and regulations, in addition to the University's policies and procedures. Priority will be given to laboratories using highly reactive, toxic or potentially-explosive substances.
2. Each laboratory's principal investigator or supervisor will be contacted by EHS in advance of each inspection.
3. A copy of the inspection report will be sent to the laboratory principal investigator or supervisor within seven business days. The principal investigator or supervisor must take corrective action and respond to EHS within 21 days of receipt of the inspection report.
4. Laboratories identified with unsafe conditions will be re-inspected by EHS. Re-inspections may be either announced or unannounced. If progress is unsatisfactory,

a second inspection report will be sent to the principal investigator or supervisor and the department head.

5. Failure to take appropriate corrective action or otherwise satisfactorily respond to the noted deficiencies shall constitute a violation of the University's [Health and Safety Policy](#) and may result in disciplinary measures in accordance with the University Laws and By-Laws, General Rules of Conduct for All University Employees, applicable collective bargaining agreements, and the University of Connecticut Student Code.

4.0 Laboratory Inspection Documentation

4.1 Chemical Hygiene Plan

- Each laboratory is required to have an up-to-date copy of the CHP in the lab.
- Hard or electronic copies of the document are acceptable. Electronic copies must be kept on a computer that is readily accessible to all researchers.
- The document is available online at <http://www.ehs.uconn.edu/Chemical/chemplan.php>

4.2 Chemical Inventory

- Each lab is required to have an up-to-date chemical inventory that contains the names, locations and approximate quantities of every chemical, including compressed gas cylinders, present in the lab.
- Hard or electronic copies of the inventory are acceptable. Electronic copies must be kept on a computer that is readily accessible to all researchers.
- Inventories should be updated whenever chemicals are brought into or removed from the lab.

4.3 Safety Data Sheets

- Each lab is required to have a safety data sheet for every chemical in the lab.
- Hard copies or electronic documents are acceptable. Electronic safety data sheets must be kept on a computer that is readily accessible to all researchers.
- Links for safety data sheet websites are available under the "Chemical & Laboratory Safety" tab at <http://www.ehs.uconn.edu/information/index.php>

4.4 Workplace Hazard Assessment Form

- Every lab is required to complete a workplace hazard assessment form.
- A copy of the workplace hazard assessment form must be sent to EHS and another copy must be present in the lab.
- The form is required to be updated annually or whenever operations in the lab change or warrant the use of new personal protective equipment.

- The forms can be completed online at <http://www.ehs.uconn.edu/forms/WHA.php>

4.5 Safety Information Cards

- An “UConn Emergency Information” card must be completed and present on the outside door of the lab.
- A “Laboratory Safety Information Card” must be present on the interior of the lab by the entry door.
- Cards must be up-to date with current laboratory personnel and locations of safety-related documentation.
- The cards can be completed online under the “Chemical Health & Safety” tab at <http://www.ehs.uconn.edu/forms/index.php>

4.6 Training

- *Initial Lab Safety & Chemical Waste Management* or online *Lab Safety & Chemical Waste Management Retraining (HuskyCT)* must be completed by all employees working in labs with hazardous chemicals every year.
- Employee training histories can be reviewed on the [EHS website](#).
- Employees that fail to maintain the mandatory annual training requirement are not authorized to work in UConn laboratories.

5.0 Chemical Management

5.1 Chemical Compatibility

- Chemicals must be segregated based on hazard class (i.e., acids, bases, flammables, oxidizers, toxics, etc.).
- Alphabetical storage commonly does not segregate incompatible chemicals.
- Refer to the Chemical Hygiene Plan, safety data sheets and the [Chemical & Laboratory Safety](#) webpage for further information on chemical compatibility and segregation.

5.2 Flammable Storage

- Flammable chemicals should be stored in a rated flammable storage or explosion-proof cabinet or refrigerator when not in use.
- No more than 10 gallons of flammable liquids should be stored outside of a rated flammable storage cabinet.
- Storage areas of flammable material must be labeled with a red flammable diamond sticker or a sign saying “Flammable Storage.”
- Flammables must not be stored near electrical outlets, vacuum pumps or any other potential ignition sources.

- Flammable liquids stored in rated flammable storage cabinets shall not exceed 55 gallons, unless approved by EHS and the UConn Fire Department.
- Flammable liquids must be stored separately from strong oxidizers, corrosives and other incompatible materials.
- More information on the safe use of flammable liquids can be found on the "[Flammable Liquids- Safe Work Practices](#)" fact sheet.

5.3 Corrosive Storage

- Corrosive liquids must be stored below eye level.
- Acids must be stored separately from bases.
- Corrosives should be stored in a corrosive storage cabinet and kept away from incompatible materials.
- Glacial acetic acid, formic acid and other organic, flammable acids must be stored with the flammable chemicals. Protect acetic acid from freezing and store above 17°C (63°F).
- Nitric acid is a strong oxidizer and must never be stored with flammable, organic liquids (e.g. glacial acetic acid) or organic solids (e.g. wood). Ideally nitric acid should be stored in its own designated cabinet. At the very least, it should be stored in a plastic secondary containment bin with other inorganic, compatible acids.
- Perchloric acid should ideally be stored in a separate corrosive storage cabinet away from organic materials. It must not be stored on wooden shelves, or with paper shelf liners. At a minimum, perchloric acid shall be stored in a separate plastic secondary containment bin with other inorganic, compatible acids.

5.4 Peroxide-Forming Chemicals

- Each peroxide-forming chemical must be dated with the date the bottle is received into the lab and the date the bottle was first opened.
- Peroxide-forming chemicals must be tested for peroxides or disposed of after the expiration date. Peroxide test dates must be indicated on the bottle.
- Containers that are being refilled from larger stocks (i.e., from a stockroom supply) must be dated when the container is filled.
- More information on the safe use of peroxide-forming chemicals can be found on the "[Peroxide-Forming Compounds- Safe Work Practices](#)" fact sheet.

5.5 Chemical Storage near Sinks/Floor Drains

- Hazardous chemicals are not allowed to be stored near sinks or floor drains without secondary containment bins.

- Secondary containment bins must be able to contain 110% of the volume of the largest container should a spill or leak occur.

5.6 Chemical Labeling

- Every chemical, whether hazardous or not, is required to have a label.
- The identity of the chemical and appropriate hazard warnings must be shown on the label.
- Labels must be legible, permanently displayed and written in English.
- Boxes containing many small vials must have a label with specific chemical names and hazard warnings on the outside of the box.

5.7 Empty Container Management

- Labels on empty containers must be defaced or removed prior to reuse or disposal.
- Caps on empty chemical containers must be removed prior to being discarded.
- Uncontaminated, empty or broken lab glassware must be discarded into proper, puncture-proof containers.
- Empty bottles containing acutely hazardous wastes (e.g., osmium tetroxide, sodium azide, etc.) must be discarded as hazardous waste through EHS.

6.0 Hazardous Waste

6.1 Hazardous Waste Labeling

- All hazardous chemical wastes must be labeled with the words “**Hazardous Waste**” and full chemical names. Chemical symbols or abbreviations are not allowed on hazardous waste stickers or tags.
- All labels must be legible and prominently displayed on the container.
- Properly labeled hazardous waste stickers or tags must be fastened to each waste container from the moment of the first drop of waste is added.
- Hazardous waste containers with more than one chemical must list chemical contents by percentages. Percentages must equal 100%.
- Biological or radioactive wastes must **not** be labeled with hazardous waste stickers or tags. Refer to “[EHS Regulated Waste Management](#)” webpage for proper disposal of biological and radioactive wastes.

6.2 Hazardous Waste Container Management

- Hazardous waste containers must be in good condition and have tight-fitting caps or lids. Corks, parafilm paper and other non-secure sealants are not allowed.

- Funnels are not allowed to be present in hazardous waste containers unless directly adding or removing waste from the container.
- Every hazardous waste container must contain compatible chemicals. Questions regarding chemical compatibility should be referred to EHS.
- Eco-funnels, or similar equivalents, with closed lids should be used when generating wastes that are being continuously generated (e.g. HPLC wastes). Secondary containment bins that can contain at least 110% of the volume of the largest waste container are required for hazardous wastes that are continuously generated.
- [Chemical waste pick-up request form](#) has been submitted for full containers.

6.3 Hazardous Waste Storage

- Hazardous chemical waste is required to be stored near a green “Satellite Accumulation Area” sign and kept in the same laboratory where it was generated. Storage of hazardous wastes in labs across hallways or in adjacent labs is prohibited.
- Laboratories may only accumulate as much as 55 gallons of hazardous waste or 1 quart of acutely hazardous waste at any one time.
- Incompatible wastes must not be stored next to each other. Multiple storage locations are permissible to separate incompatible wastes.
- Secondary containment bins that can contain at least 110% of the volume of the largest container stored are recommended for the segregation of incompatible waste containers.

7.0 Compressed Gas Cylinders

- Every compressed gas cylinder must be secured to a wall or lab bench with a chain, strap, or cable that can fully support the weight of the cylinder.
- Cylinders must be fastened individually (not ganged) in a well-ventilated area.
- A cylinder cap or regulator valve must be in place at all times.
- Every cylinder must be properly labeled and stored so that the label can be easily read.
- Cylinders valves must be accessible at all times.
- Cylinders must be kept away from ignition sources.
- Incompatible gases must be stored in separate areas of the lab, at least 20 feet apart.
- Oxygen cylinders must be stored at least 20 feet from flammable gas cylinders or separated by a firewall at least 5 feet high with a ½ hour fire rating.
- Empty and full cylinders must be stored in separate areas.

8.0 Fume Hoods

8.1 Fume Hood Function

- Fume hoods are tested annually by EHS.
- Fume hoods should be running between 80-120 feet/minute. Fume hoods running between those parameters receive green stickers.
- Fume hoods running between 51-79 feet/minute or 121-199 feet/minute receive yellow stickers.
- Fume hoods running less than 50 feet/minute or greater than 200 feet/minute receive red stickers.
- EHS initiates work orders through Facilities Operations for all fume hoods that receive yellow or red stickers.

8.2 Fume Hood Storage

- Storage of chemicals or hazardous waste in fume hoods should be limited.
- Only equipment required for experiments should be present in the fume hood.
- Storage of too many chemicals and equipment impedes air flow and reduces the protection factor to researchers.

8.3 Fume Hood Sash Height

- Fume hood sashes must be closed when not in use.
- Fume hood sashes must not be raised more than 18 inches when in use.
- Sliding glass panels on fume hood sashes should be aligned to form a barrier between chemicals and researchers during active experimentation.

9.0 Personal Protective Equipment

- Personal protective equipment, as specified in the lab's [Workplace Hazard Assessment Form](#), must be worn at all times.
- At a minimum, safety glasses and closed-toed footwear are required to be worn by all researchers in labs with hazardous chemicals.
- Flame-resistant lab coats are recommended for work with ignitable chemicals.
- Tight-fitting safety goggles or full-face shields are recommended for work with corrosive liquids.

10.0 Personal Hygiene & Housekeeping

- Eating, drinking, applying cosmetics or smoking is not allowed in active lab areas.
- Refrigerators used for laboratory purposes are not to be used for food storage. Personal food storage areas must be labeled and located outside of active lab areas.
- Microwaves used for laboratory purposes are not to be used to heat food. Microwaves used for personal use must be labeled and located outside of active lab areas.

- Chemicals must be stored in appropriate cabinets or designated storage rooms when not in use.
- Chemicals must be properly labeled and kept in closed containers.
- Cabinets, lab benches, and bench tops must be kept clean, orderly, and in sanitary condition.
- Access to spill kits, first aid kits, and other safety equipment must remain unobstructed.
- Aisles and corridors must be free of tripping hazards.
- Exit access ways must be at least 28 inches wide at all points.
- Unused or defective equipment should be removed from labs.
- Unused, off-specification or expired chemicals should be disposed of properly through EHS.

11.0 Fire Extinguishers and Alarms

- Fire extinguishers and fire alarms must be accessible and unobstructed.
- Fire extinguishers must only be used by properly trained individuals.
- Contact the “UConn Fire Department” for further information on fire safety.

12.0 Safety Shower and Eyewash Stations

- Labs that contain corrosive materials should have a safety shower and eyewash station located within 10 seconds or within 100 feet.
- Eyewash stations should be tested weekly by laboratory personnel.
- No obstructions shall be located within 16 inches from the center of the spray pattern of the emergency shower facility (i.e. a 32-inch clearance zone).

13.0 Electrical Safety

- All electrical equipment must be plugged into dedicated wall outlets.
- Equipment with damaged or defective cords or plugs (i.e. worn, twisted, frayed, abraded, corroded or missing ground prongs) must be taken out of service or repaired by a *qualified person* as defined in the [UConn Electrical Safety Program](#).
- Two-prong outlets are prohibited; all receptacle outlets must have 3 prongs.
- Flammable materials, corrosive chemicals and organic solvents should be stored away from electrical cords and equipment.
- Electrical panels and disconnect switches must remain unobstructed.
- Extension cords are only approved for temporary use. In most cases, a new electrical outlet should be installed by a licensed electrician in lieu of an existing extension cord.
- Extension cords must not run across aisles or corridors where they might be damaged or create a tripping hazard.

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- Extension cords must not run through doors, walls or partitions, under rugs or above dropped ceilings.
 - Relocatable power taps (a.k.a. power strips) should only be used to energize digital and computer equipment. They must not be tied in knots, suspended, draped overhead or attached to walls.
 - Relocatable power taps and extension cords should not be connected to each other. Doing this can overload the circuit creating a potential fire hazard.
 - More information on electrical safety can be found on the “Electrical Safety in the Laboratory” fact sheet.

14.0 Sprinkler System Clearance

- An 18 inch clearance zone is maintained beneath fire sprinkler systems.
- The 18 inch vertical clearance requirement is treated as a horizontal plane throughout the storage area or lab. All materials must be stored below this horizontal plane.
- The clear space between stored materials and the sprinkler deflectors allows discharge from sprinklers to overlap and pre-wet combustibles to effectively contain a fire.

15.0 Additional Criteria

- EHS reserves the right to cite laboratories for unsafe work practices and/or conditions that fall outside of the listed inspection criteria.
- Outside contractors or other groups within EHS may be consulted when further expertise is required to achieve safe working conditions.

Appendices

Appendix A	Laboratory Inspection Checklist
Appendix B	Hazardous Waste Inspection Checklist

APPENDIX A-LABORATORY INSPECTION CHECKLIST

QUESTION	YES	NO	NA
DOCUMENTATION			
Chemical hygiene plan available?			
Chemical inventory present and up-to-date?			
Safety data sheets present and up-to-date?			
Workplace Hazard Assessment form(s) present and up-to-date?			
“UCONN Emergency Information” and “Lab Safety Information” cards present and up-to-date?			
Only authorized individuals trained in Lab Safety & Chemical Waste Management working in lab?			
EMERGENCY EQUIPMENT AND PLANNING			
Fire extinguishers mounted and unobstructed?			
Fire extinguishers inspected within last year?			
Fire alarm pull stations unobstructed?			
Eyewash unit and safety shower within 10 seconds of hazard?			
A 32-inch clearance zone is maintained around all safety showers?			
Spill control materials available and adequate for potential spills?			
PERSONAL PROTECTIVE EQUIPMENT			
Personnel are wearing appropriate eye, hearing, body and face protection?			
Personnel are wearing appropriate gloves?			
Personnel are wearing closed-toed footwear?			
CHEMICAL MANAGEMENT			
Chemicals stored by compatibility and hazard class?			
Flammables stored properly?			
Flammables stored in an approved refrigerator?			
Corrosives stored properly?			
Corrosives stored below eye level (approximately 5ft)?			
Peroxidizable stocks dated upon receipt and when first opened?			
Peroxidizable stocks disposed of before the expiration date?			
All chemical containers, including non-hazardous chemicals, clearly labeled with contents and hazard class?			
Labels on empty chemical containers for reuse/disposal are removed or defaced?			
Chemicals stored away from drains unless secondary containment is provided?			
HAZARDOUS WASTE MANAGEMENT			

QUESTION	YES	NO	NA
Waste containers labeled with the words 'Hazardous Waste'?			
Hazardous waste labeled with full chemical names (no abbreviations)?			
Hazardous waste containers in good condition and kept closed except during use (no funnels)?			
Hazardous waste stored at or near Satellite Accumulation Area?			
Storage limited to <1 quart of acutely hazardous waste?			
Storage limited to <55 gallons of hazardous waste?			
COMPRESSED GAS CYLINDERS & CRYOGENICS			
Gas cylinders stored upright and secured from tipping?			
Gas cylinder valve caps in place when not in use?			
Cylinders stored by hazard class and chemical compatibility?			
Toxic, flammable, corrosive gases used in chemical fume hood?			
Gases and cryogenic liquids dispensed in areas with good ventilation?			
Cryogenic Dewars vented or have pressure relief devices?			
ELECTRICAL HAZARDS			
Flexible cords in good condition?			
Cords are not on surfaces where flammable liquids may pool?			
Cover plates in place for outlets and switches			
Circuit breaker panels are unobstructed?			
Multi-plug adapters have overload protection?			
No extension cords in use?			
Ground fault circuit interrupters (GFCI) used for damp areas?			
FUME HOODS			
Fume hoods working properly?			
Storage in fume hoods is minimized?			
Fume hood sashes closed when not in use?			
Chemicals and equipment are at least 6 inches from the sash?			
PERSONAL HYGIENE & EGRESS			
No evidence of food or drink in active laboratory areas?			
Aisles, passageways and exits are clear and unobstructed?			
Floors dry and free of slip hazards; bench tops (including hoods) reasonably organized and clean?			
Chemical refrigerators and microwaves labeled "No food"?			
Storage at least 18 inches below sprinkler heads?			

**APPENDIX B-
HAZARDOUS WASTE INSPECTION CHECKLIST**

QUESTION	YES	NO	NA
Hazardous waste containers are labeled with the words “Hazardous Waste?”			
Hazardous waste labels are legible and contain full chemical names (i.e. no abbreviations)?			
Hazardous waste labels list the percentages of each chemical constituent in the container and add up to 100%?			
Hazardous waste receptacles contain compatible chemicals?			
Hazardous waste containers have tight-fitting caps or lids (i.e. no funnels, corks, parafilm paper, test tubes, beakers, etc.)?			
Hazardous waste containers are in good condition (i.e. NOT leaking, rusted, corroded, bulging or otherwise in poor condition)?			
Hazardous waste containers are located near a green “Satellite Accumulation Area” sign?			
Hazardous wastes are being stored in a secure location?			
Incompatible hazardous wastes are being stored in separate locations of the lab?			
Secondary containment bins are provided for hazardous wastes that are being continuously generated (e.g. HPLC wastes)?			
Hazardous waste pick-up request form submitted for full containers?			