



University of New Haven

POLICIES AND PROCEDURES

Policy Title:

Chemical Fume Hood Policy

Policy No.: 8210

Effective Date: June 2012

Last Revision: January 2025

Responsible Office: Department of Public Safety

Responsible Official: Associate VP of Public Safety & Administrative Services

Table of Contents

1.0	Introduction	4
1.1	Purpose	4
1.2	Scope	4
1.3	Review	4
2.0	Roles and Responsibilities	5
2.1	Associate Vice President of Facilities	5
2.2	Associate Vice President of Public Safety and Administrative Services	5
2.3	Environmental Health and Safety	5
2.4	Laboratory Managers	5
2.5	Director of Facilities or Designee.....	5
2.6	Laboratory Personnel and Students	6
3.0	Definitions	6
4.0	Laboratory Chemical Fume Hoods	6
4.1	Location	7
4.2	Ductless Fume Hoods.....	7
5.0	Safe Work Practices	7
5.1	Before Use.....	7
5.2	During Use	8
5.3	After Use.....	8
6.0	Scheduled Maintenance	9
6.1	Filter Replacements	10
7.0	Procedures for Testing and Recertification	10
7.1	Certification Rating Interpretation	10
7.2	Face Velocity	10

7.3	Flow Monitoring Devices	11
8.0	Fume Hood Failure Procedures	11
8.1	Removing from Service	12
9.0	Roof Work.....	12
10.0	Training.....	12
11.0	References	12
	Appendix A: Face Velocity Measurement Procedure.....	14
	Appendix B: "Out of Service" Signage.....	15
	Appendix C: Chemical Fume Hood Inventory	16

1.0 Introduction

The University of New Haven is committed to providing a safe and healthy work environment for employees and students. Chemical fume hoods are one of the primary safety devices in a laboratory. When properly installed, maintained, and tested, a chemical fume hood can offer a substantial degree of protection to the user, provided that it is used appropriately, and its limitations are understood.

This policy outlines the maintenance and performance of chemical fume hoods at the University of New Haven. For further information on the proper use of a chemical fume hood, including basic guidelines for operation, please reference the University Chemical Hygiene Plan.

All the elements of this policy are considered University of New Haven policy and may be enforced as such. The failure on the part of the employees to follow the policies and elements of this Plan may result in disciplinary action.

1.1 Purpose

To establish a protocol for the safe use of chemical fume hoods. This includes performance testing, reporting and responding to equipment failures, scheduled maintenance, appropriate steps necessary to safeguard workers who perform repairs and the responsibility for implementation of this policy.

1.2 Scope

This policy covers all chemical fume hoods at the University of New Haven found in Echlin Hall, One Care Lane, Canal Dock, Dodds Hall, Buckman Hall and Charger Plaza.

1.3 Review

The Associate Vice President of Public Safety & Administrative Services will review and update this policy whenever necessary or at least annually.

2.0 Roles and Responsibilities

2.1 Associate Vice President of Facilities

- Ensure the Director of Facilities and facility staff responds to all correspondence of non-working chemical fume hoods in a timely manner.
- Maintain an accurate inventory of all chemical fume hoods, including their location, recertification dates, and annual inspection results.

2.2 Associate Vice President of Public Safety and Administrative Services

- Update chemical fume hood policy at least annually.
- Ensure that chemical fume hoods are being certified annually.
- Maintain an accurate inventory of chemical fume hoods at the University.

2.3 Environmental Health and Safety

- Conduct quarterly inspections of fume hoods to ensure all hoods are certified, functioning, and properly maintained and used.

2.4 Laboratory Managers

- Inform all laboratory personnel if a hood is not working.
- Place a “Do Not Use” sticker on the hood if it is not working properly.
- Contact Facilities for repair or air flow adjustment.

2.5 Director of Facilities or Designee

- Repair and adjust adequate flow rate of the chemical fume hoods.
- Provide adequate preventive maintenance to all of the chemical fume hoods and maintain records of maintenance performed.
- Ensure personnel safety when repairing chemical fume hoods.
- Schedule certification of all the chemical fume hoods annually.

2.6 Laboratory Personnel and Students

- Use all fume hoods properly and in accordance with this Policy as well as the Chemical Hygiene Plan.
- Immediately alert the laboratory manager if a fume hood is malfunctioning or in inadequate condition.

3.0 Definitions

Term	Definition
Capture velocity	Air velocity at any point in front of the hood is necessary to overcome opposing air currents and to capture the contaminated air into the exhaust hood.
Face velocity	Average linear air velocity into the exhaust system (i.e. fume hood) measured at the opening of the hood.
Maximum face velocity	The maximum acceptable velocity at any point on the operating opening.
Minimum face velocity	The minimum acceptable velocity at any point on the operating opening.

4.0 Laboratory Chemical Fume Hoods

The first line of defense against workplace hazards is engineering controls, which remove the hazard from the workers' environment. Local exhaust ventilation (i.e. chemical fume hoods) act as an engineering control by removing gases, chemical vapors, and aerosols from the air to prevent exposure. There are two basic categories of laboratory hoods: chemical fume hoods and biological safety cabinets. Chemical fume hoods may not be used in place of biological safety cabinets, and vice versa. This policy outlines the procedures for the use, design face velocity requirements, and testing for chemical fume hoods only. Information on biological safety cabinets may be found in the University of New Haven Biosafety Manual.

NOTE: The use of perchloric acid in chemical fume hoods is prohibited at the University of New Haven. Please contact the Associate Director of Public Safety & Administrative Services at 203.932.7147 with any questions.

4.1 Location

Fume hoods shall be located within a lab in such a way that their performance is not adversely affected by cross drafts. Cross currents, drafts and air currents from open windows, doorways and personnel traffic flow may directly influence hood containment ability.

4.2 Ductless Fume Hoods

Due to the potential for misuse creating an unsafe condition, ductless fume hoods are prohibited from installation or use at the University of New Haven. Ductless fume hoods, unlike traditional hoods, do not fully remove hazardous contaminants from the workspace. Instead, they are designed to filter specific contaminants, limiting their effectiveness to substances that the filters can adequately capture. The safety of ductless hoods is heavily reliant on the type of filters used and the frequency of maintenance. Without proper upkeep, the risk of user exposure increases significantly due to filter saturation or improper chemical handling.

5.0 Safe Work Practices

Lab personnel shall employ proper work practices that minimize/eliminate their exposures when working with hazardous materials in fume hoods.

5.1 Before Use

- Always check the certification sticker prior to use to ensure the fume hood is in working condition.

- Do not use if the certification expiration date has expired, or if there is a sign indicating the fume hood is not functioning.
- When setting up equipment, ensure any hazardous materials are always placed at least 6 inches away from the sash to ensure proper containment of chemical vapors.
 - Equipment that could be sources of emission (including in case of breakage) should also be placed $\geq 6''$ inside the hood.
- Equipment should be placed in a manner to not block air flow through slots in the baffle.
- Ensure the fume hood is turned on prior to starting work.

5.2 During Use

- Lab personnel should not place their upper body in the fume hood at any time during use, except during initial setup of equipment inside the hood prior to any hazardous materials being placed inside the hood.
- The hood sash or panels should be lowered to the lowest (comfortable) working height, usually 12", and no higher than the height indicated by the arrow sticker located on the side. Fully opening the sash lowers the face velocity to the point of ineffectiveness.
- The hood sash or panels shall not be removed except for initial experimental setup and before hazardous chemicals are placed in the hood.
- Utilize proper personal protective equipment (PPE), including safety goggles and gloves. A chemical fume hood must not be used as a substitute for PPE.

5.3 After Use

- Remove all hazardous materials and relocate them back to their proper storage area. Hoods should not be used for permanent storage of hazardous materials.
- Clean and decontaminate any spills of hazardous materials. Do not leave spills for the next person.
- Once finished, turn off the fume hood and lower the sash to conserve energy.

6.0 Scheduled Maintenance

Facilities shall provide advance notification to relevant laboratory staff/laboratory managers of any planned interruption of fume hood service. Fume hood service interruption notices shall include:

- Date/time of shutdown;
- Fan Motor # to be shut down;
- Reactivation date/time; and
- Number to call for further information.

No procedures shall be conducted inside the affected fume hoods during maintenance. If procedures cannot be interrupted or relocated to another fume hood during this time, the laboratory staff shall inform the Facilities department of this conflict and schedule a mutually convenient time for preventive maintenance to be conducted.

During maintenance:

- Laboratory staff shall make necessary arrangements to conduct procedures requiring local exhaust ventilation elsewhere or suspend these activities until service is restored.
- All hazardous materials inside the hoods must be removed by laboratory personnel (not facilities personnel).
- Facilities shall lockout and tagout affected hoods so that they cannot be used during this time.
- Facilities shall place a "Do Not Use" sign on the affected fume hoods.
- Once Facilities has completed the maintenance on the fume hood, the lockout device(s) may be removed only by the persons who installed it, and the appropriate laboratory manager will be notified.

6.1 Filter Replacements

Filters should be replaced when they reach the service life as recommended by the manufacturer, or when needed as indicated by annual testing. Filter replacements shall be conducted by a third-party vendor.

7.0 Procedures for Testing and Recertification

The University of New Haven uses a third-party contractor to perform chemical fume hood testing and certification annually. The tester will place a certification sticker on the front of the hood, indicating the test date, the certification expiration date, face velocity at a 12" sash height, and the tester's initials. The sash height at which the average face velocity is 100 fpm is also indicated.

7.1 Certification Rating Interpretation

Fume hood certification is characterized as follows:

- **Certified:** A hood is considered certified when the average face velocity at 12" working sash height is between 80 – 120 fpm.
- **Not Certified:** If the face velocity at 12" working sash height is below 80 fpm or above 120 fpm the hood is considered not certified. A "Do Not Use" sign is placed on the sash and the laboratory manager is advised not to use the hood until required repairs and certification is made.

7.2 Face Velocity

Measurement of hood face velocity is important for quantitatively determining the effectiveness of a chemical fume hood in capturing and removing materials emitted within. The average face velocity (V , in ft/min or fpm) is the volumetric flow rate of the hood (Q , in ft³/minute or cfm) divided by the area of the hood face (A , in ft²). Adequate face velocity ranges from 80-120 linear fpm. Fume hood minimum face velocity should not be less than 95 percent of the as-designed average face velocity. Maximum face velocity

should not be greater than 120 fpm to prevent creation of turbulent air currents within the fume hood.

Average face velocity is determined by measuring velocity at evenly distributed points in the plane of the hood face in the following manner:

- The sash is placed at the lowest working height, usually twelve inches.
- The plane of the hood face is divided into (at least) three equals in area sections. Face velocity is measured at the center of each section. The hood face velocity is the average velocity of these measurements.

See Appendix A for more information on the procedures for measuring face velocity.

7.3 Flow Monitoring Devices

New and reconditioned hoods should be equipped with an airflow-monitoring device that provides an indication of the face velocity. These devices should also be equipped with a safety alarm that will alert users if the hood is operating at an unsafe velocity. The device should be checked and recalibrated by a third-party contractor annually at the time of recertification. For any damaged devices Facilities should be contacted for repair or replacement.

8.0 Fume Hood Failure Procedures

If it is suspected that a fume hood is not working properly:

1. Stop working inside the hood immediately. Close or cover any opened or exposed chemical containers and remove them if feasible.
2. Notify others in the area that the fume hood is not operating and cannot be used.
3. Notify the laboratory manager as soon as possible so that a “Do Not Use” sign may be placed on the hood, and the University of New Haven Facilities Department may be contacted.
 - The laboratory manager may either contact Facilities at 203-0932-7087, or by submitting a work order through the University work order system.

Although rare, hood repair may require extended downtime if major parts (e.g. fan motor) need replacement. Procedures that must be conducted within a hood must be relocated to another working hood during this time.

8.1 Removal from Service

When a chemical fume hood is removed from service, the laboratory manager must ensure that all hazardous materials have been removed, and the hood has been properly decontaminated. After decontamination and final survey, clearance for removal will be given.

9.0 Roof Work

Fume hood exhaust ducts terminate just above the roofline in many cases. Working near these outlets could potentially expose workers to hazardous chemicals, albeit in extremely diluted concentrations. If maintenance/repair work must be done on the roof of any building containing hood exhaust(s), Facilities must first notify the appropriate laboratory manager of the work to be performed. If needed, the laboratory manager shall provide to facility and/or contractor staff information regarding chemicals used in their fume hoods. It may be necessary to cease work in fume hoods until roof work is complete.

10.0 Training

No laboratory personnel or students may use a chemical fume hood or engage in procedures that require a chemical fume hood, without up-to-date Lab Safety training. Faculty is required to take these training refreshers annually, while students must take these each semester prior to the start of any lab work.

11.0 References

- ANSI/ AIHA Z9.5-2003, American National Standard for Laboratory Ventilation.
- ACGIH's Industrial Ventilation: A Manual for Recommended Practice.

- RCNY Chapter 10, Chemical Laboratories, 1992
- ANSI/ASHRAE 110-2016 Method of Testing Performance of Laboratory Fume Hoods.

Appendix A: Face Velocity Measurement Procedure

Average face velocity will be determined by measuring air velocity at evenly distributed points in the plane of the hood face in the following manner:

1. The sash is placed at the lowest working height, usually twelve inches. The plane of the hood face is divided into (at least) three sections equal in area. Face velocity is measured at the center of each section. The hood face velocity is the average velocity of these measurements.
2. The tester will place a certification sticker on the front of the hood, recording the test date, face velocity at a 12" sash height and initials the sticker. The sash height at which the average face velocity is 100 fpm is also indicated.
3. If fume hood is not working according to the specifications, the laboratory managers have been instructed to clear the fume hood so that Facilities or a contractor may repair or make proper adjustments to the fume hood.
4. Upon adjustment or repair, and notification by Facilities, the laboratory manager will contact a 3rd party contractor to verify the fume hood velocity is appropriate (minimum average 100 fpm @12 inches) and provide certification.

Appendix B: "Out of Service" Signage

This signage is required to be placed on chemical fume hood when not working as designed:

DANGER

HOOD IS NOT WORKING

DO NOT USE

FOR QUESTIONS CALL FACILITIES AT 203.932.7087

Appendix C: Chemical Fume Hood Inventory

Chemistry

Location	Number of Fume Hoods
Buckman 301	10
Buckman 304	5
Buckman 306	1
Buckman 307	10
Buckman 310A	2
Buckman 310B	2
Buckman 310C	3
Buckman 311	3
Buckman 313	3
Buckman 314	4
Buckman 332	5
Buckman 331A	3
Buckman 311B	2
Total # of Hoods	54

Biology

Location	Number of Fume Hoods
Canal Dock 2 nd floor	2
Charger Plaza 5	1
Charger Plaza 6	2
Charger Plaza 14	2
Dodds 103	3
Dodds 302	1
Dodds 305	4
Dodds 306	1
Dodds 308	1
Dodds 309	0
Dodds 311	1
Total # of Hoods	18

Forensics

Location	Number of Fume Hoods
Dodds 408	2

Dodds 411	3
Dodds 412	2
Dodds 413B	2
Dodds 414A	1
Dodds 415	4
Charger Plaza 108/110	2
Total # of Hoods	16

Fire Science

Location	Number of Fume Hoods
Echlin Hall 11	3
Total # of Hoods	3

Health Sciences

Location	Number of Fume Hoods
One Care Lane 116	1
Total # of Hoods	1