



Department of Environmental Health and Safety

Subject: Laboratory Fume Hoods

Date: September 2014

Revision: 4

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SUMMARY: Employees using laboratory fume hoods shall observe all applicable standards and guidelines to minimize exposure of chemicals.

SCOPE: This Guideline applies to personnel using laboratory fume hoods.

REFERENCE

REGULATIONS: [OSHA 29 CFR 1910.1450 Occupational Exposure to Hazardous Chemicals in Laboratories](#)
[MIOSHA PART 431 Hazardous Work in Laboratories](#)

RESPONSIBILITY: Environmental Health and Safety (EHS)

Review and revise the Laboratory Fume Hoods Guidelines.

Provide technical assistance.

Conduct annual certification of all laboratory fume hoods.

Employees

Comply with this Guideline and any further safety recommendations initialized by the principal investigator/superior.

Conduct their assigned tasks in a safe manner, wear appropriate personal protective equipment, and only use equipment for which they have been formally trained.

Inform supervisor of faulty equipment, alarms, or other problems noted with fume hoods in the lab.

Consult with your supervisor when there are questions regarding health and safety.

Report any job related injuries or illnesses, questions on health and safety, or any unsafe or unhealthy working conditions to your supervisor.

Contact EHS to evaluate potentially unsafe conditions.

Principle Investigators/Supervisors

Implement procedures in accordance with this Guideline.



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Assure that staff are aware of this Guideline, instructed on the details of implementation, and provided with equipment and controls. Maintain documentation as required.

Report all problems with fume hoods to the Facilities Management Department.

Do not allow employees to use fume hoods that are posted out of service, broken, or in alarm.

Report all workplace accidents or injuries (<http://www.umd.umich.edu/694753/>)

Provide training to laboratory fume hood users.

PROCEDURES:

Training

All personnel using laboratory fume hoods should be fully trained in their proper operation. This includes knowledge of the controller operation, monitoring devices, and designed sash height to contain chemicals and protect users. Training on the operation of the specific hoods in the lab shall be provided by the principle investigator or supervisor.

Proper Use of Fume Hood Sash

Certification labels and arrows are placed on the face of the fume hood by EHS. These indicate a specific sash height that the hood should be operated at to provide containment of chemicals and protection of employees. Work in the fume hood should not be conducted with a sash height any higher than that marked by the sticker and arrow.

Whenever possible, lower the sash to the lowest position when working in the hood to provide a safety shield for the face and upper body. Avoid placing one's head in the hood.

Fully close the sash when the hood is not in use. This will improve safety and may reduce energy consumption.

Proper Use of Fume Hood

Always confirm the hood is operating by checking alarms and monitors and observing nose and air movement that would indicate proper operation.



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All experimental materials and equipment should be placed at least six inches back from the face. For proper air circulation, keep rear baffle openings clear. Large objects should be placed two to three inches above the work surface to insure proper air flow.

Keep nearby windows and doors shut and pedestrian traffic to a minimum, when working in the hood. While performing any ongoing procedures or reactive experiments, monitor as appropriate.

Laboratory fume hoods are not to be used as permanent storage for chemicals or equipment. Chemical containers should be capped or covered when not in use and should be properly labeled as to the contents.

No other types of exhaust can be connected to the hood exhaust system without proper engineering consultation from Facilities Management or Facilities Planning. For additional information contact the Facilities Management Department.

Periodically and/or after a spill, clean the interior and exterior surfaces and the sash with deionized water and then a soap solution. Wear appropriate personal protective equipment (PPE) to protect from chemicals used in the hood.

Keep papers, paper towels, work surface diapers, vials, or any other small objects from being drawn into the hoods ventilation system.

Alarms or Monitors

Laboratory fume hood alarms or monitors should never be turned off. If the alarm sounds or the monitor lights indicate low flow, work should be stopped, equipment turned off, and the sash lowered. Lab personnel should leave the area if highly toxic or volatile chemicals are being used. If the hood is not functioning, call Facilities Management.

Manual Controllers

Laboratory fume hoods with manual controllers should be set to minimum and the sash closed when not in use. Be sure to turn the controller to maximum or the 100 fpm position before using the hood.



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Perchloric Acid

Use of perchloric acid requires a special hood approved for use by EHS. Contact EHS for more information on special handling.

Radioactive Materials

Use of radioactive materials must be authorized by OSEH-Ann Arbor.

Certification

EHS conducts annual certification of face velocity and monitor operation. If an inspection is needed, notify EHS. Face velocity certification criteria is between 80 and 120 linear feet per minute (LFM). The certification criteria for high performance fume hoods, which are design to contain at lower face velocities, is 70 to 120 LFM. This certification is documented on a sticker placed on the front of the hood. Hood failing the certification will be posted out of service. Any chemical fume hood tagged out of service should not be used

Maintenance

Hoods posted out of service by EHS are immediately reported to Facilities Management. Questions on maintenance of hoods can be referred to the Facilities Management Department.

Ductless Fume Hoods

Ductless fume hoods are not acceptable in place of a traditional ventilated hood. NFPA 45 states "Ductless chemical fume hoods that pass air from the hood interior through an absorption filter and then discharge the air into the laboratory are only applicable for use with nuisance vapors and dusts that do not present a fire or toxicity hazard." Purchases of these types of hoods are subject to health and safety review by EHS before purchase approval is granted.

EHS does not recommend the use of ductless hoods for the following reasons:

1. The filtered air is returned into the lab space and there are not guarantees that the filtration system will adequately remove the chemical contaminants.
2. Ductless filtration fume hoods often do not meet face velocity or ASHRAE test criteria requirements for containment of chemicals.



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3. The determination of the type of filter used in each hood is dependent upon the type of chemicals used in the fume hood. In a University setting, this determination is often difficult as researchers and projects change frequently.
4. Filter saturation is generally determined using only one chemical. In a University setting, fume hoods are frequently used for many chemicals and mixtures. Therefore, estimating a filter's saturation point and establishing a regular maintenance schedule is very difficult.
5. Filters saturated with flammable chemicals can be a fire hazard. Filters saturated with other chemicals may also be a potential source of chemical exposure.
6. EHS in conjunction with OSEH Radiation Safety Service and Biological & Laboratory Safety must evaluate each laboratory's experimental procedures and radioisotope usage to determine if the ductless filtration fume hood would be adequate for their experiments.
7. The filters for ductless fume hoods must be disposed of as hazardous waste. The disposal of these filters is very expensive to the University and individual departments. EHS recommends changing the filters on these units a minimum of every six (6) months. Replacement filters for most units cost approximately \$600 to \$1200.
8. Periodic exposure monitoring on people utilizing ductless fume hoods may be necessary to assess chemical exposure.

The select few applications that EHS and OSEH would approve the use of these hoods involve specific types, limited numbers, and minimal volumes of chemicals. The following procedures should be followed when purchasing a ductless fume hood:

1. Contact EHS to review information about the intended use.
2. Write Standard Operating Procedures (SOP) for proper use, training, and maintenance.
3. Departments are required to maintain the hood with manufacturer's recommendations including change out of filter media. Filter media shall be turned over to EHS as a hazardous waste.
4. Use only small quantities of chemicals in the hood.
5. Do not conduct reactions involving pressure and heat in the hood.
6. Do not store chemicals in the hood.



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7. Keep all chemical containers capped or covered while in the hood..
8. Document all filter changes and keep a log of use.

RELATED

DOCUMENT:

ANSI/AIHA Z9.5-2012

ANSI/ASHRAE 110-1995

UM Fume Hood and Laboratory Ventilation Standards

UM Biological Safety Cabinet/Fume Hood Helpful Hints pamphlet

TECHNICAL

SUPPORT:

Contact EHS if there are any questions regarding laboratory fume hoods.