

Guideline on Chemical Fume Hood Usage

Overview

A properly functioning chemical fume hood is an important safety device in a laboratory. The chemical hood protects users from inhalation hazards by constantly pulling air into the hood and exhausting it out of the building. Chemical hoods can also provide some protection in the event of an explosion or fire. This form provides guidance on the usage of chemical fume hoods at Ferris State University (FSU).

Applicability

This procedure applies to:

- All laboratory personnel who use chemical fume hoods.
- Facilities Management (FM) and External Contractors who are working with or repairing FSU chemical fume hoods.

Responsibilities

Safety, Health, Environmental and Risk Management (SHERM) advises laboratory personnel of proper hood procedures, ensures that chemical hoods are surveyed annually, reports hood malfunctions to laboratory personnel and Facilities Management (FM) immediately, and performs follow-up airflow surveys promptly after hood repairs are completed.

Principal Investigators and Laboratory Managers establish policies and procedures in their laboratories to ensure compliance with regulatory and institutional requirements and ensure that their personnel is trained and use chemical hoods safely and responsibly. Reports malfunctions to facilities management immediately.

Laboratory Personnel use hoods according to recommended guidelines for safe use and coordinate modifications, maintenance, repair, and new equipment needs with SHERM and/or FM. Reports malfunctions to facilities management immediately.

Facilities Management (FM) performs preventive maintenance on fans, ductwork, and hoods, make repairs or maintenance as identified by annual surveys or by users, notifies SHERM, and coordinates with laboratory personnel when hoods must be turned off for repair and maintenance or other operations. FM will notify SHERM to certify a hood that has been repaired.

Procedure

All chemical hoods operate at an average minimum face velocity of 80 to 120 feet per minute (fpm).

A chemical hood should be used when:

- Handling chemicals with significant inhalation hazards such as toxic gases, toxic chemical vapors, volatile radioactive material, and respirable toxic powders
- Carrying out experimental procedures with strong exothermic reactions
- Handling chemicals with significant vapor pressure
- Chemical vapors could cause a fire hazard
- Working with compounds that have an offensive odor (e.g., beta-mercaptoethanol).

RATING CLASSIFICATIONS

All chemical hood surveys are conducted at a sash height of 18”.

- PASS - average face velocity between 80 and 150 fpm. The optimum range for face velocity is 80 to 120 fpm.
- RESTRICTED USE ONLY - average face velocity between 151 and 180 fpm. Laboratories should not use acutely toxic, highly hazardous, or carcinogenic chemicals.
- FAIL - average face velocity less than 80 fpm or greater than 180 fpm.

USER GUIDELINES (STANDARD OPERATING PROCEDURES)

- Position the hood sash to a maximum opening of 18 inches or indicated sash height markings to ensure proper airflow velocities. Adjust the sash lower to shield from splashes, flying objects, and incidents in the hood. The best practice is to work with the sash as low as possible while conducting work.
- Keep hood storage to an absolute minimum. Do not take up hood space and block ventilation by storing unused equipment or chemicals in hoods. If large items must be kept in the hood, contact SHERM for evaluation, certification, and a smoke test.
- Keep all work at least six inches inside the hood. The capture ability of a hood may not be 100% at the front of the hood.
- Avoid cross drafts. Someone walking rapidly past the work opening can create a cross draft that may disturb airflow direction and cause turbulence.
- Keep the hood clean. Remove old experimental glassware and clutter. Wipe up spilled chemicals or residues. Ensure the glass sash remains clear for good visibility.
- Do not heat perchloric acid in standard chemical hoods. Perchloric vapors may create explosive perchlorates in the ductwork. Contact SHERM if you are performing perchloric acid digestions.

- Confirm that the chemical hood is operational. Check the airflow gauge or flow monitor if so equipped. Check a telltale (or piece of paper attached to the bottom of the sash). The telltale should be noticeably pulled toward the back of the hood.
- Avoid opening and closing the hood sash rapidly and avoid swift arm movements in front or inside the hood. These actions may cause turbulence and reduce the effectiveness of hood containment.
- Use extreme caution with ignition sources inside a hood. Ignition sources such as electrical connections and equipment, hot plates, controllers, and open flame can ignite flammable vapors or explosive particles from materials being used in the hood.
- Never put your head inside a hood while operations are in progress.
- Report airflow problems and problems with the physical structure of the chemical hood to Facilities Management before using (231-591-2920). If a hood fails while working with highly hazardous materials, immediately close the sash, leave the area, and contact Facilities Management and SHERM (231-591-2147) for assistance.
- Close or lower the sash to a 2" opening when the hood is not used.

CHEMICAL HOOD SURVEYS AND MAINTENANCE

SHERM surveys all chemical hoods annually to verify that the air velocity at the opening is within an acceptable range. The Chemical Hood Test Record label is affixed to the external surface of the hood and will indicate the inspection date, the average face velocity measurement at 18" sash height, and the rating classification (e.g., Pass, Restrict, or Fail).

RESTRICTED USE: SHERM will conduct a hazard assessment of the operations conducted in the hood, inform laboratory staff and post a sign on the hood indicating which materials and specific uses are acceptable until it is repaired and re-certified.

FAIL TEST: SHERM will post a sign on the hood informing laboratory staff not to use the hood until it is repaired and re-certified.

REPAIRS: SHERM will submit a work order to FM to repair all non-passing hoods and post a sign on the chemical hood to notify laboratory personnel. FM conducts repairs to chemical hoods and flow monitors and notifies SHERM when repairs are completed. SHERM will re-survey the hood to verify the airflow is at passing levels and communicate the results to the laboratory.

SHUTDOWN NOTIFICATION

- Minor shutdowns affecting only a few hoods: notifications will be placed directly on each hood affected.

- Large shutdowns affecting large areas (e.g., an entire building): notifications will be posted in elevators and other public areas

DUCTLESS CHEMICAL HOODS

Laboratories who plan to purchase ductless chemical fume hoods must inform SHERM to schedule an evaluation of the authorized uses and materials for each specific hood and filter models, capabilities, and change out schedules. For additional information, consult the Chemical Hygiene Plan.

REFERENCES

[OSHA Laboratory Standard 29CFR 1910.1450](#)

[FSU Chemical Hygiene Plan](#)

Adapted with permission from: Weill Cornell Medicine – Chemical Hood Guideline (2022)