

## Purpose

This document provides general instructions on the use of chemical fume hoods to protect lab personnel against exposure to hazardous materials.

## Scope

All users of fume hoods within the Advanced Analysis Centre should be familiar with the procedures outlined below.

Fume hoods are an engineering control strategy to restrict exposure to potentially hazardous materials when performing activities or experiments that may create hazardous aerosols, with the exception of biological agents. For biological materials, a biological safety cabinet should be used.

## Definitions/Acronyms

**Hazardous chemicals** – drugs, chemicals, natural and synthetic products which present a significant, immediate or long-term health risk to persons or their offspring exposed to them.

## Requirements/Policies/Regulations

- Occupational Health and Safety Act R.S.O. 1990, c. O.1
- R.R.O. 1990, Reg. 833: Control of Exposure to Biological or Chemical Agents
- R.R.O. 1990, Reg. 851: Industrial Establishments
- University of Guelph Safety Policy [851.07.01](#) Equipment Standards, Authorization and Use (June 2017)

## Training

### Training and competency:

- WHMIS, Lab Safety training

All operators must receive training on the safe use of the fume hood prior to using the equipment. Training may be delegated to a qualified individual, but it remains the responsibility of the supervisor to ensure that their personnel are adequately trained.

**Certification:**

[EHS Safety Services](#) shall coordinate a program for annual inspection, calibration and testing of fume hood air flow alarms by a third-party contractor.

**Postings:**

Certification tags are posted on the equipment.

**Maintenance**

Physical Resources is responsible for the preventative maintenance of fume hood exhaust fans. This includes inspection of pulleys, belts, alignment, flexible connections, dampers, operation and lubrication of fans and motor bearings. If a problem arises with fume hood ventilation, contact Work Order Desk in Physical Resources at ext 53854.

**Safety Precautions**

- ⚠ Keep the sash fully closed when not in use. Fume hoods exhaust a large amount of air which require large amounts of energy for heating or cooling replacement air. By closing the sash when not in use energy consumption is reduced drastically.
- ⚠ Ensure work area is unobstructed. If materials must be stored in the hood (e.g. in use waste containers) place items adjacent to the side wall. To ensure proper function, the baffles at the lower rear of the hood and the airflow through the front opening must not be obstructed.
- ⚠ Always work at least 6" (15cm) in from the front lip of the hood.
- ⚠ Perchloric acid at concentrations >70% must not be used in standard fume hoods. Heated or concentrated perchloric acid must be handled in specially designed hoods with wash down features to prevent the formation of explosive perchlorate salt deposits.

**Description of the Task****Preparation:**

- Ensure the hood certification is up to date. If a hood certification has expired, do not use the hood – call EHS (x53282) and request recertification.
- If this is your first time working with a material, or if you are unfamiliar with the hazards, review the applicable SDS.
- Plan your work so that you know what items and chemicals you need in the hood and the order which materials are to be dispensed and mixed.
- All hazardous materials decanted from their original container must be labeled with a product identifier. If the decanted hazardous material will be

moved out of the lab it also requires directions for safe handling, and a reference to the SDS.

- If an experiment will be left unattended inside a hood, post a sign indicating what the experiment is and whom to contact.
- Ensure the fume hood is on and that the air flow is adequate. Visually check the flow alarm in case the audible tone has been muted.
- Don required personal protective equipment (PPE); lab coat, gloves, and eye/face protection.
- Ensure you have the supplies you need for collecting waste and for dealing with spills.
- Retrieve chemicals and required items and place in the hood.

### **Procedure:**

1. Lower sash to a reasonable working height to minimize the size of the working aperture and act as a safety screen from potential splashes or flying debris, and to keep aerosols out of your breathing space.
2. Uncap/open containers one at a time and dispense required amounts.
  - When possible use pipetting devices to avoid the need to pour liquids.
  - When diluting, always add acids or base to water, to avoid splashes of concentrated hazardous materials.
  - If heating is required to dissolve a hazardous material, all heating must be done inside the hood in an uncapped container. Heating a sealed container may cause an explosion. Do not heat solutions which contain flammable solvents as diluents.
3. Recap all containers and return chemicals to appropriate storage location.
4. Close sash completely.

### **Contingency Plan and Reporting**

- ⚠ If odours accumulate in the lab, all personnel are to evacuate the lab until ventilation is restored.
- ⚠ If a hazardous leak of chemical vapor or biohazardous aerosols has resulted, activate the evacuation alarm and evacuate building.

### **Alarm Activation:**

Fume hoods on campus are equipped with an alarm which activates if the airflow is below a prescribed threshold. If the alarm activates:

1. Close the sash fully.
2. Reset the alarm if possible
3. If the alarm or warning light resumes after resetting do not use the fume hood
4. Post a sign indicating the hood is out of service.
5. Report the problem to Physical Resources at ext 53854 (Work Order Desk)

If the fume hood alarm activates after hours:

- IF the sash was open and there are open chemicals in the hood, LEAVE the lab because noxious fumes could have accumulated in the hood or could have escaped into the lab. Immediately notify Emergency Services at x52000
- IF the sash was closed, follow the steps above to reset the alarm.

**Note:** Each fume hood has a blue label indicating the proper procedure if the fume hood alarm activates.

### **Power Outage:**

In the event of a power outage all fume hoods must be closed. There may not be sufficient airflow to ventilate the fume hood and provide operator protection.

### **Equipment Malfunction:**

If a fume hood is malfunctioning:

- Immediately stop all work.
- Close all open containers and any gas ports within the hood.
- Close the sash fully.
- Post a sign indicating the hood is out of service.
- Report the problem to Physical Resources at ext 53854 (Work Order Desk)
- Do not attempt to reuse the fume hood until the problem is fully resolved.

### **Incident Response:**

Complete the [Incident Report Form](#) and submit to your supervisor and EHS.

If the fume hood is equipped with a sink, do not allow chemicals to enter the drain. Spills that reach a fume hood sink must be reported to the area supervisor and EHS immediately, as municipal authorities and Ministry of Environment may require notification.

### **Spill Cleanup:**

If a spill occurs within the fume hood:

- Lower the sash and take appropriate safety precautions for cleanup and disposal as described in the SDS for that chemical
- Attempt to contain the spill at the source and if required use the appropriate spill kit to neutralize.
- Assess the situation and evacuate the lab if necessary.
- Refer to the [Spill Response Poster](#) or AAC Chemical Spill SOP for further details.

## **Waste Management and Environmental Responsibility**

- Place segregated waste in closed, labelled, and leak-proof containers.

- Label container appropriately with hazardous waste disposal tag and complete the hazardous waste disposal form.
- Discard sharps in a CSA-approved sharps collector (leak-proof, rigid, puncture resistant, and fitted with a lid). Do not bend, break or remove needles from the syringes or overfill sharps container. Once the container is  $\frac{3}{4}$  full, complete the “Surplus Chemical and Sharps Disposal Request” and tag with University of Guelph’s hazardous chemical waste yellow tags.

## References/Material/Resources

- Canadian Biosafety Standards 2nd edition (2015) – Sections 3.7, 4.6, and 5.1
- Canadian Biosafety Handbook 2nd edition (2016) – Chapter 11 BSC
- Safety Data Sheets
- EHS Lab Safety Manual (2018) section 13
- AAC Chemical Spill SOP

## Distribution of Copies

Document accessible on [AAC website](#).

## SOP History

16-Jan-2008	Fume Hood SOP	A. Doane
10-Dec-2018	CBS-SOP-016-18 Fume Hood	A. Holliss
22-Apr-2019	AAC Fume Hood SOP	A. Holliss

## Reason for Changes:

- Adaptation for AAC

## Review Frequency:

All AAC SOP’s are to be reviewed every two years or as changes in legislation or procedures necessitate.