

# FUME HOOD GUIDELINES & SAFE USAGE

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**Research Safety**  
*Office of Research*  
**UNIVERSITY OF GEORGIA**

## I. Purpose & Scope

This document provides an overview of the University's requirements for laboratory engineering controls that provide ventilation for laboratory spaces. These include chemical fume hoods, exhaust hoses, canopy hoods, and ventilated cabinets. Included are design specifications and best practices for utilizing these devices in order to maximize efficiency and effectiveness.

## II. When to Use a Fume Hood

Fume hoods should be used with open containers of flammable solvents, corrosive materials, irritating vapors or dusts, asphyxiating gases or combustible concentrations of vapors, gases, or dusts.

Keep in mind that some hoods are inappropriate for certain types of operations. Specialized hoods should be used for hot acid digestions, procedures involving perchloric acid, or work with radioisotopes. See section III for additional information regarding fume hood types.

## III. Fume Hood Types

### A. General Purpose

General purpose chemical fume hoods provide adequate protection for the user from the buildup of toxic or flammable fumes, vapors, or particulates during the course of routine laboratory work. These hoods can be either high performance (low flow) or standard bypass hoods either at constant air volume (CAV) or variable air volume (VAV).

Perchloric acid, radioisotopes, and unstable explosive materials are excluded from use in these types of hoods. Perchloric acid use in these hoods can lead to the buildup of potentially explosive metal perchlorates in hood ductwork. It is also not appropriate to perform acid digestions in these types of hoods.

Name plates are recommended for general purpose hoods that state, "Do not use perchloric acid within hood."

**B. Perchloric Acid Hoods**

A perchloric acid hood contains a canopy wash-down system and a stainless steel work surface. It is used for laboratory experiments with perchloric acid compounds. These hoods shall not be used for work with sulfuric acid, acetic acid, organic solvents, or any combustible or water-reactive materials. Reactions involving organic material may not be performed in these hoods as they may react violently with perchloric acid if the system is not routinely washed down.

Name plates are required for perchloric acid hoods reading: "Only reactions with perchloric acid are permitted in this fume hood."

Perchloric acid hoods shall be equipped with an explosion-proof lamp fixture.

**C. Radioisotope Hoods**

Radioisotope hoods are similar to general purpose hoods but they have dedicated exhaust ducts and some may require HEPA filters to ensure that any discharges do not exceed legal release limits. These hoods are also marked with radioactivity symbols. For more information, please contact the Radiation Safety Office.

**IV. Prior to Working in a Fume Hood**

- A.** Check the blue certification placard to verify that the hood has been tested within the last 12 months and has met university standards. Most often, these placards are located above the sash of the fume hood. Please contact the Office of Research Safety to schedule testing if needed.
- B.** Know the hazard(s) of the materials used and processes being performed within the hood. Verify that the hood you are using is appropriate for the types of material you are intending to use.
- C.** Make note of the location of the nearest fire extinguishers, eyewashes, and safety showers. Be sure that pathways to this emergency equipment are unobstructed.
- D.** Verify that all doors to the laboratory from exterior hallways are closed. Fume hood operation can be compromised if doors to exterior hallways are left open.
- E.** Check that the fume hood is operating properly by monitoring the hood flow indicator. Depending on the type of hood present in your lab, this may be done in one of the following ways:
  - Check the flow indicator light or the digital readout
  - Compare the magnehelic gauge reading to a marked set-point. Most often for these gauges, the black needle is meant to fall between two red needles or within a small red circle on the gauge.
  - For hoods without a flow indicator, digital readout, or magnehelic gauge reading, holding a tissue (e.g., kimwipe) or paper towel at the face of the hood is a good way to visualize that the hood is still drawing properly.

## **V. Working in the Fume Hood**

- A.** When possible, elevate large pieces of equipment within the hood to allow air to flow underneath the equipment. Rubber stoppers and metal racks work well for most pieces of routine laboratory equipment.
- B.** Don appropriate personal protective equipment (PPE) such as gloves, safety glasses, and a lab coat. A fume hood supplements but does not replace PPE. PPE should still be worn when using a fume hood.
- C.** Reduce foot traffic in front of the hood to decrease turbulence.
- D.** Ensure that all work is done at least 6" inside the hood.
- E.** Keep the hood sash closed as much as possible. For vertical sashes, the sash should not be raised higher than 18" while work is being performed in the hood. For horizontal sashes, at least one pane of the sash should be between the user and the experiment at all times particularly if there is a risk of splashing, splattering, or explosion.
- F.** Never cross the plane of the hood sash with your head or face.
- G.** Clean the work surface of the hood after each use and wipe down walls, baffles, and sashes at least monthly. Cleaning minimizes the buildup of stains and residue within the hood that can be detrimental to performance and may create compatibility hazards with future uses.
- H.** If the hood's low airflow alarm sounds, immediately cease all work in the hood and close any open containers if possible. Lower the sash and exit the area if the situation presents an immediate threat to life and health. As soon as practical, a work order should be submitted to correct the problem.
- I.** Alarms should never be silenced. Doing so is a safety deficiency that will be noted during a lab safety assessment.

## **VI. Additional Fume Hood Guidelines & Best Practices**

- A.** Fume hoods should never be used for long-term storage. Doing so can compromise the air flow of the hood, and cause the unit to provide inadequate protection for users. Chemicals not in use should be stored in appropriate safety cabinets either under the hood or elsewhere in the lab.
- B.** If the hood is equipped with a corrosive storage cabinet, liquid acids should be stored in those cabinets. These cabinets are vented through the hood, limiting the chance of corrosive vapor buildup. Flammable cabinets located under fume hoods are usually not ventilated so the storage of acids in these cabinets can lead to premature corrosion within these cabinets.
- C.** Sashes should be kept closed when the hoods are not in use and dual horizontal and vertical sashes should not be used simultaneously. Users should determine which

sash would be best to use for each process.

- D. Do not place sources of electrical power (power strips or extension cords) or other ignition sources inside the hood. Additionally, electrical cords should not be placed in such a way that they do not allow for the full closure of the sash. When closed the sash should always come into full contact with the airfoil.

## **VII. Annual Testing**

- A. UGA performs preventative maintenance and checks of all chemical fume hoods (general purpose, radioisotope, and perchloric acid) in use by suitable quantitative and qualitative testing in the as used condition. Annual tests verify that the hood is operating within university standards.
- B. UGA provides full testing to the ASHRAE 110 standard every five years.
- C. If a hood does not meet the appropriate standards for use, a visible notice will be placed on the sash describing the limitations on hood use and the reason(s) why the hood does not meet the required standards.

## **VIII. Specialty Uses**

Questions concerning ventilated storage cabinets, canopy hoods, and snorkels should be directed to the Environmental Safety Division. Approved ventilated storage cabinets can be obtained from CRS.

## **IX. Contacts**

Office of Research Safety: 706-542-5288  
Environmental Safety Division: 706-542-5801  
Radiation Safety: 706-542-0107

## **X. References**

Design Criteria for Laboratories, 5<sup>th</sup> Ed., Board of Regents of the University System of Georgia, 2019

Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards, National Research Council, 2011