

# Fume Hoods

## When Is a Fume Hood Necessary?

In general, laboratory fume hoods are required when using hazardous chemicals that are:

- Acutely toxic, carcinogenic, or have reproductive hazards
- Highly reactive
- Volatile (e.g., solvents) or easily dispersible in air
- Substances with uncharacterized hazards
- Nanoparticles
- Stench chemicals or that have a low odor threshold

## Before Starting Work in Fume Hoods

- Verify the hood is working by checking the flow monitor (if present) and/or using a tissue/Kimwipe to demonstrate flow into the hood.
- Ensure that the hood has a current certification sticker (dated within the last year). If the sticker is missing or out of date, request certification by contacting HSRM at (612) 626-6002.
- Never use a fume hood that is not functioning properly. To request repairs, contact Facilities Management.

## Proper Use of Fume Hoods

- **Allow for proper air flow around large equipment.** Raise large equipment on blocks or a jack so it is approximately 2" above the surface and air may pass beneath it.
- **Do not use the hood for storage of equipment, chemicals, or hazardous waste.** Keep only the materials necessary for the experiment inside of the hood. Dispose of hazardous waste frequently.
- **Work with the hood sash at 18".** This ensures the most effective flow. Only raise sash completely for setup or takedown and when there are no hazardous materials present.
- **Work 6" into the fume hood.** Place chemicals and equipment at least 6" into the fume hood to avoid disturbances, such as air currents due to movement in the lab, which interfere with airflow at the face of the hood. Larger equipment should be set up in the rear of the fume hood to minimize air turbulence.

## Best Practices

- Do not place spark or flame sources inside the hood when flammable liquids or gases are present.
- If no spill lip is present, use secondary containment to minimize the spread of spilled material.
- Work behind horizontal sliding sash (if one is present) to protect from splashes, mild eruptions, etc.
- Close the sash completely when hood is unattended. This also helps reduce energy consumption.
- When running unattended reactions, place a sign on the fume hood alerting lab users to the details and safety information of the reaction taking place. Include emergency contact information.

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# Fume Hoods (cont.)

## Fume Hood Limitations

- **Explosions and Pressurized Reactions:** A laboratory fume hood is not rated to contain explosions. If an explosion hazard exists, weighted barriers or shields must be used. Note that such barriers will affect the airflow in the hood. Vent pressurized systems in a slow, controlled manner. Gases or vapors released from pressurized vessels may disrupt fume hood flow and cause a containment breach.
- **Highly Reactive Substances:** Efficiency of a fume hood can vary with age and use. When working with highly toxic or air and moisture reactive chemicals, consider using a glove box.
- **Perchloric Acid:** A conventional fume hood must not be used when heating or using large quantities of concentrated perchloric acid. Perchlorate crystals may accumulate on surfaces and can detonate upon contact. Perchloric acid hoods, equipped with a wash-down system, must be used. See the Perchloric Acid Fact Sheet for more information.
- **Radioisotopes:** Hoods used with volatile radioactive materials must be authorized by Radiation Safety.

## Common Misuses

- **Do not remove hood components:** Removal of hood components, such as horizontal sliding sashes, air foils, and utility panels, may create undesired air currents in the hood and reduce face velocity.
- **Evaporation and Waste Disposal:** A fume hood should never be used for evaporation or waste disposal as they are vented directly into the atmosphere. Use condensers, traps and scrubbers to prevent chemical release. It is a fineable offense to intentionally evaporate material in the fume hood.
- **Microorganisms:** Work involving harmful microorganisms should be done in a biosafety cabinet as fume hoods are not HEPA filtered. See the Biosafety Manual for more information.

## Ductless Fume Hoods

Use of a ductless fume cabinet does not provide adequate protection for researchers using hazardous substances. This type of equipment is not allowed at the University of Minnesota for the following reasons:

- The filters require a high degree of attention and maintenance.
- Users must be thoroughly trained and diligent about properly using and maintaining such as system.
- If not properly maintained, hazardous chemicals exhaust back into the room.
- Chemicals with poor warning properties will provide no indication if the filters become overloaded or leak.
- Long-term ducting to the outside is less expensive and more effective than changing filters.

## References

For diagrams regarding the proper use of a fume hood, please see [Kewaunee's Recommended Work Practices manual](#).

*If you have any questions about the use and integrity of a particular hood, contact HSRM (612) 626-6002.*