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Fume Hood Safety Series

Bench Top Chemical Fume Hoods

Mott Manufacturing Limited
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Introduction

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Purpose of Fume Hood

- The fume hood is a safety device that is designed to capture, contain and evacuate fumes, vapors and light dust.
- The fume hood protects the user by pulling air into and through the hood opening. This inward airflow prevents vapor and gasses from entering our breathing zone. This speed of this air is known as the “Face Velocity”
- Air from the fume hood is exhausted by fans and discharged into the outside atmosphere.
There are two types of sliding doors (sashes) on the front of fume hoods in common use:

The Vertical Sash is the most common and moves vertically only.

The Combination Sash consists of horizontally sliding panels in a vertically rising frame.

Operation of each type of hood sash is slightly different.
Sash Use

Acceptable sash use.

Sash is set at the working height.

Safe working height may vary from hood to hood. Check the fume hood for labels indicating the safe working height.

Operator’s face is protected by safety glass.
Sash Use

Never raise the sash fully during active work.

Never insert you head or face inside the sash opening. Keep nose at least 3” outside plane of sash.

Wide open sash may result in unacceptably low face velocities and vapors may escape from the hood into the laboratory.

Insertion of the face inside the sash will result in exposure to fumes and vapors from experiments.
Sash Use

Always fully close the sash when the hood is unattended.

Open sash on unattended hoods may expose passers by.

Active experiments may go awry – closed sash will help contain hazardous materials even if the hood is unattended.
Combination Sash Use

Acceptable combination sash use.

Sash frame is in the down position.

Operator inserts arms only through small opening at center. Left and right openings are also acceptable.

This position does not provide effective face protection from flying debris.
Combination Sash Use

Acceptable combination sash use.

Horizontal panels are closed and sash frame is raised to a maximum of 50% open. Face velocity must remain above 80 feet per minute.

Operator’s face is protected by safety glass doors.

Never raise the sash vertically without closing the horizontal panels first.
Combination Sash Use

Ideal combination sash use.

Sash frame is in the down position. Horizontally sliding panels are positioned in front of the worker.

Operator inserts arms through small opening on the left and right of the glass.

Face and upper body protected from possible flying debris, gasses and vapors.
Combination Sash Use

Never insert head or face inside the sash opening. Keep nose at least 3” outside plane of sash.

Insertion of the face inside the sash will result in exposure to fumes and vapors from experiments.
Apparatus Location

Always locate apparatus at least 6 inches behind the sash plane.

If this is not done, vapors and gasses released near the hood face may not be captured and contained.
Apparatus Location

Always support large object on blocks.

Airspace beneath large objects reduces airflow disruption and vapor buildup in front of the object.
Fume Hood Lighting

Always turn the light on when using the hood.

In the event that lamps need to be replaced, contact facilities immediately since poor lighting can cause accidents.
Materials in Fume Hood

Hood must be kept clean and uncluttered. Only small quantities of materials should be stored in the hood.

Large objects in the fume hood needlessly disrupt proper airflow and reduce the protection provided.

With poor and unsafe housekeeping, severity of a fire increases since greater quantity and variety of materials become involved.
Perchloric Acid

Standard chemical exhaust fume hoods must not be used for Perchloric acid applications.

Impact sensitive crystals can be formed that cause violent explosions. These crystals also form in the ductwork and will persist for the life of the building.

Workers today and in the future will be at risk.

Special design fume hoods and exhaust systems are available for perchloric acid work.
Heat in Hood

Avoid the generation of large amounts of heat in the hood.

High heat loads within low volume or variable volume type fume hoods can overcome the negative pressure that the fume hood requires to provide containment.

Special fume hood configurations are available for high heat loads. Low flow fume hoods are not suitable for applications that produce high heat loads.
Baffles

Keep opening around the baffles in the rear and top of the fume hood clear of obstructions such as laboratory wipes.

Do not adjust the baffles in any way. Only qualified airflow personal should adjust baffle or duct dampers.

Airflow may be affected and workers could be exposed if baffles are improperly adjusted.
Fume Hood Use

Always walk by fume hoods slowly at least three feet behind the operator at the hood.

Air currents produced by a rapidly walking person can draw vapors and gasses out of the fume hood and expose the operator.
Fume Hood Use

Never walk by fume hoods rapidly or too closely behind the worker at the hood.
Fume Hood Use

When removing objects and arms from fume hood, always move slowly in a direction parallel with airflow.

Airflow will help to clean fumes and gasses off of arms and objects when arms are parallel with airflow direction.
Fume Hood Use

When removing objects and arm from fume hood, never use a scooping or side-to-side motion.

Movement across the fume hood will defeat the inward airflow and may cause fumes and vapors to be drawn out.
Fume Hood Use

Keep doors and windows closed.

Open windows and laboratory doors that are propped open cause disruptive air currents that can compromise fume hood performance and place operators at risk.

Heating, cooling and ventilation systems are designed to operate with laboratory doors and windows closed.
Escape Routes

In the event that the lab needs to be evacuated due to an event in the fume hood, plan the escape route in advance.

Do not cross in front of a fume hood.

b) Escape routes should not cross a hazard area

a) Escape routes should not cross a hazard area where there is no alternative escape route
Alarms

Verify the operation of the fume hood alarm daily.

Temporarily blocking the fume hood alarm sensor tube on the outside or the inside of the hood will trigger an alarm and verify that the unit is functioning.

If the alarm fails to function after 30 seconds, close the hood sash and contact maintenance personal

Alarm units differ from make to make. Contact alarm manufacturer if unsure how to verify operation.

Never insert any object into the sensor hole.

Never operate the fume hood when the alarm is not functional.
Alarms

Do not defeat the alarm function in any way.

Do not tamper with the alarm settings or calibration.

When alarm sounds, lower the sash and step away from the hood. If the alarm does not reset, evacuate the area and contact maintenance personal. There may be a malfunction in the exhaust system.
Experiment Setup

During setup and teardown only, the sash may be raised beyond the established working position.

During this time, there must be no hazardous vapors or gasses present in the hood since the fume hood will provide NO PROTECTION.

Wait at least two minutes after all hazard generating activity has ceased before opening the sash above working position.

During setup and teardown of experiments, the fume hood alarm will most likely sound due to insufficient airflow. During this time only, it is acceptable to mute the alarm by pressing the “Test” or “Enter” button. Alarms vary by manufacturer, contact them if in doubt.
Electrical Safety

Never tamper with cords or use ungrounded electrical items.

Electrical **SHOCK** may result

Never use electrical items when flammable gasses or vapors are present in the hood.

**FIRE** or **EXPLOSION** may result
References


Feedback

Questions, Comments or Suggestions?

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