Fume Hood Policy

Bryant University

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Bryant University

1.0 Purpose

To establish a protocol for the safe use of chemical fume hoods. This includes performance testing, reporting, and responding to equipment failure, scheduled maintenance, appropriate steps necessary to safeguard workers who perform repairs, and the responsibility for implementation of this policy.

2.0 Scope

This policy covers all chemical fume hoods in the Bryant University Science & Technology area in the Unistructure building.

3.0 Definitions

Face Velocity: Average linear air velocity into the exhaust system (i.e., fume hood) measured at the opening into the hood.

Capture Velocity: Air velocity at any point in front of the hood necessary to overcome opposing air currents and to capture the contaminated air into the exhaust hood.

4.0 Responsibilities

4.1 Risk Management & Safety

- Schedule certification of all the chemical fume hoods annually.
- Issue clearance before chemical fume hood repairs.
- Schedule re-certification of the chemical fume hood after repairs or adjustment.
- Assists in the communication between Facilities and laboratory staff on status of hood inspection or repair.
- Provides necessary clearance to Facilities for repair.
- Will schedule with third party contractor the recertification of fume hood when repair is complete.

- Gives clearance for use after retesting/recertification.

4.2 Facilities

- Repair and adjust adequate flow rate of the chemical fume hoods.
- Provide adequate preventive maintenance of all the chemical fume hoods.
- Ensure personnel safety when repairing chemical fume hoods.
- Contact RMS to schedule re-certification after repair or adjustment of the chemical fume hoods.
- Lockout and tagout individual hoods prior to conducting investigations. Ensure that all non-Bryant contractors follow fume hood lockout/tagout procedures.
- Investigates hood failure through a review of the entire system (e.g., motor, belts, fan unit and electrical connections).
- Notifies laboratory staff of the affected lab and RMS of the hood problem and gives an estimated time necessary for repair. Posts affected hood with "Do Not Use" sign (if not already posted by RMS).
- Removes lockout of hoods when the hood is returned to service and informs relevant individuals.

4.3 Bryant Laboratory Staff

- Inform all lab personnel if hood is not working.
- Place a “Do Not Use” sticker on the hood if it is not working properly.
- Contact Facilities for repair or air flow adjustment.

5.0 Procedures

5.1 Laboratory Chemical Fume Hoods

Engineering controls are the first line of defense against workplace hazards, removing the hazard from the worker’s environment. This includes local exhaust ventilation (i.e., chemical fume hoods) to prevent exposure to gases, chemical vapors, and aerosols. There are two basic categories of laboratory hoods: chemical fume hoods and biological safety cabinets. This policy outlines the design face velocity requirements and test procedures for chemical fume hoods.

NOTE: The use of perchloric acid is prohibited at Bryant University. Please contact RMS at RMS@bryant.edu with any questions.

5.2 Location

Fume hoods shall be located within a lab in such a way that their performance is not adversely affected by cross drafts. Cross currents, drafts and air currents from open windows, doorways and personnel traffic flow directly influence hood containment ability.

5.3 Face Velocity

The measurement of hood face velocity is important for quantitatively determining the effectiveness of a chemical fume hood in capturing and removing materials emitted within it. The average face velocity (V, in ft/min or fpm) is the volumetric flow rate of the hood (Q, in ft3/minute or cfm) divided by the area of the hood face (A, in ft2). Adequate face velocity ranges from 80-120 linear fpm. Minimum face velocity is the minimum acceptable velocity at any point on the operating opening, for example 80 fpm. This should not be less than 95 percent of the as-designed average face velocity. Maximum face velocity is the maximum acceptable velocity at any point of the operating opening. Maximum face velocity should not be greater than 120 fpm to prevent creation of turbulent air currents within the fume hood.

6.0 Fume Hood Testing

The Bryant Risk Management and Safety (RMS) department manages chemical fume hood testing and certification annually. This is completed by an outside vendor. Average face velocity is determined by measuring velocity at evenly distributed points in the plane of the hood face in the following manner:

- The sash is placed at the lowest working height, usually twelve inches. The plane of the hood face is divided into (at least) three equal in area sections. Face velocity is measured at the center of each section. The hood face velocity is the average velocity of these measurements.
- The tester will place a certification sticker on the front of the hood, recording the test date, face velocity at a 12” sash height, and initials the sticker. The sash height at which the average face velocity is 100 fpm is also indicated.
- Fume hood testing information is recorded in the database maintained by RMS. It should include department, building, room number, hood ID #, date, velocity (fpm) and tester initials.

6.1 Fume Hood Certification Ratings Interpretation

Fume hood certification is characterized as follows:

- **Certified:** A hood is considered certified when the average face velocity at 12" working sash height is between 80 – 120 fpm.
- **Not Certified**: If the face velocity at 12" working sash height is below 80 fpm or above 120 fpm the hood is considered not certified. A DO NOT USE sticker is placed on the sash and the PI is advised not to use the hood.

6.2 Fume Hood Failure

6.2.1 User Responsibility

If it is suspected that a fume hood is not working properly, work inside the hood must stop immediately and the problem reported to:

Facilities Department at Bryant University 401-232-6052

RMS at Bryant University 401-232-6006; RMS@bryant.edu

Notify others in the area that the fume hood is not operating and cannot be used and post a "Do Not Use" sign on the hood. **The lab manager must strictly enforce this.**

Close/cover any opened/exposed chemical containers. It may be necessary to remove all chemicals and equipment from a hood to allow access for repair.

Although rare, hood repair may require extended downtime if major parts (e.g., fan motor) needs replacement. Procedures that must be conducted within a hood must be relocated to another working hood during this time.

When repair is completed, the hood will be recertified for use by a third-party contractor. RMS will schedule this recertification.

7.0 Fume Hood Scheduled Maintenance

Facilities shall provide advance notification to relevant laboratory staff and RMS of the planned interruption of fume hood service and tag the affected fume hoods with “Do Not Use” signs. During this time, no procedures shall be conducted inside the affected fume hoods. If procedures cannot be interrupted or relocated to another fume hood during this time, the laboratory staff shall inform the Facilities department of this conflict and schedule a mutually convenient time for preventive maintenance to be conducted.

- Fume hood service interruption notices shall include:
    - Date/time of shutdown
    - Fan Motor # to be shutdown
    - Reactivation date/time
    - Number to call for further information
- Once scheduled, the laboratory staff shall make necessary arrangements to conduct procedures requiring local exhaust ventilation elsewhere or suspend these activities until service is restored.
- Facilities shall lockout and tagout affected hoods so that they cannot be used during this time. All hazardous materials inside the hoods must be in closed containers or removed.
- Once Facilities has completed the maintenance on the fume hood, the lockout device(s) shall be removed, and RMS notified.
- RMS shall reevaluate such hoods and give clearance for use when maintenance is complete.

8.0 Roof Work

Fume hood exhaust ducts terminate just above the roofline in many cases. Working near these outlets could potentially expose workers to hazardous chemicals, albeit in extremely dilute concentrations. If maintenance/repair work must be done on the roof of any building containing hood exhaust(s), Facilities must first notify the laboratory staff and RMS to provide them with information regarding chemicals used in their fume hoods.

9.0 Fume Hood Flow Monitoring Devices

New and reconditioned hoods should be equipped with an airflow-monitoring device that provides an indication of the face velocity. For uniformity the selection must be reviewed by RMS. The device should be checked and recalibrated by a third-party contractor annually at the time of re-certification which will be scheduled by RMS. For any damaged devices Facilities should be contacted for repair or replacement.

10.0 Fume Hood Safe Work Practices

Lab personnel shall employ proper work practices that minimize/eliminate their exposures when working with hazardous materials in fume hoods:

- Lab personnel should not place their upper body in the fume hood except during initial setup of equipment inside the hood before any hazardous materials have been placed inside the hood.
- Hazardous materials should be placed > 6” inside the hood for proper containment of chemical vapors.
- Hoods should not be used for permanent storage of hazardous materials.
- Equipment inside the hood should be placed so as to not block airflow through slots in the baffle.
- Equipment that could be sources of emission (including in case of breakage) should be placed > 6” inside the hood.
- The hood sash or panels should be lowered to the lowest (comfortable) working height, usually 12”. Fully opening the sash lowers the face velocity to the point of ineffectiveness.
- The hood sash or panels shall not be removed except for initial experimental setup and before hazardous chemicals are placed in the hood.
- Each hood shall be posted with a sticker showing the date of last certification. If the hood failed the performance test, it shall be taken out of service until repaired, or posted with a restricted use notice.

10.1 Removing Hoods from Service

When a chemical fume hood is to be removed from service, the laboratory staff must ensure that all hazardous materials have been removed and the hood has been properly decontaminated. After decontamination and final survey, clearance for removal is given by RMS.

Appendix A: Emergency Contact Information

Contact Type/Name	Contact Info
Department of Public Safety	Office (401) 232-6001 Emergency (401) 232-6911
Risk Management & Safety Bill Thomas (Risk Manager)	RMS@bryant.edu BThomas12@bryant.edu (401) 232-6006
Andy DeMelia Assistant Vice President of Facilities Robert Dunning Assistant Director of Facilities	ademelia@bryant.edu (401) 232-6082 rdunning@bryant.edu (401) 232-6912
Town of Smithfield Fire Department	911
Town of Smithfield Police Department	911

Appendix B: Fume Hood Inventory

Type	Location	Quantity
Fume Hood	384	1
Fume Hood	371	2
Fume Hood	380	1
Fume Hood	381	1
Fume Hood	377	1
Fume Hood	375/374	1
Fume Hood	370	1
AirClean Systems Workstation (Ductless)	376	1
BSC	384	1
AirClean Systems Workstation (Ductless)	374/375	1
Glove Box	384	1
Glove Box	374/375	1
Canopy Hood	373	1