Chemical Fume Hood

Category:	**QUALITY MANAGEMENT**		
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1.0 PURPOSE

One of the primary safety devices in a laboratory is a chemical fume hood. Chemical fume hoods should be used for all activities/experiments that may create hazardous airborne contaminants, except for biological agents. A secondary purpose is to limit the effects of a spill by partially enclosing the work area and drawing air into the enclosure by means of an exhaust fan, as well as providing some protection from splashes and minor explosions.

2.0 SCOPE

The Occupational Health and Safety Procedures at the institution hosting the biobank will have procedures that should form the basis of safety precautions for chemical handling and disposal. However, this procedure covers basic steps that should be followed to ensure that personnel are adequately informed to avoid contamination, damage to the environment and personal injury. These procedures in this standard operating procedure (SOP) apply Chemical Fume Hood

3.0 ROLES AND RESPONSIBILITIES

Explaining the responsibilities of each personnel and defining their roles in accordance with the SOP

Biobank Personnel	Responsibility
Laboratory management	Ensure compliance with all safety policies and procedures. Non-compliance should be reported to the lab director, head of quality and safety and provide training, monitoring and follow up.

4.0 MATERIALS, EQUIPMENT, AND FORMS

Listing of the materials, equipment, and forms being used to achieve the goals of the SOP, this list will mainly contain necessary materials and, or recommendations that may be substituted by alternative or equivalent materials more suitable at the time of testing.

Material to be used	Site
Fume Hood	1.604

5.0 POTENTIAL HAZARDS

In this part of the SOP, we explain the potential hazards from chemicals and methodologies used in this procedure. It will also contain information on how to handle these chemicals and the level of biosafety

Material	Safety and handling

6.0 PROCEDURES

The following procedures will be followed when performing maintenance and/or repairs inside of a fume hood or inside the fume hood exhaust system and when shutting down a fume hood for scheduled or unscheduled maintenance and/or repairs.

Periodic preventive maintenance should be performed following the manufacturer's instructions every 6 months. At a minimum, the following tests should be performed:

- Face Velocity Test
- Air Volume Test
- Airflow Smoke Pattern Test
- Site Installation Assessment Tests
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Daily, weekly and monthly maintenance will be conducted on CFHs, **(Appendix A).**

All operators must receive training on the safe operation 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 their personnel are adequately trained.

6.1 SAFETY PRECAUTIONS

6.1.1. Use appropriate Personal Protective equipment.
6.1.2. Never use fume hood to control exposure to hazardous substances without first verifying that it is operating properly.
6.1.3. Know the hazards of the chemical you are working with; refer to the chemical's Safety Data Sheet.
6.1.4. Extend only hands and arms into the fume hood and avoid leaning against it.
6.1.5. Provide catch basins for containers that could break or spill, to minimize the spread of spilled liquids.

6.2 SAFETY PERCAUTIONS

6.2.1 The hood user should never remove sliding sashes. Removal of sashes may reduce the face velocity below acceptable levels.
6.2.2 Sash hoods are designed with no more than half the face open.
6.2.3 Keep the hood sash clean and clear.
6.2.4 Keep sashes fully closed when not in use.
6.2.5 Mark a line with tape 4-6 inches behind the sash and keep all chemicals and equipment behind that line. This will help to keep materials from escaping the hood when disturbances like air currents from people walking past the hood, etc., interfere with airflow at the face of the hood.
6.2.6 Do not block slots or baffles. If large equipment must be placed in the hood, put it on blocks to raise it approximately 2 inches above the surface so that air may pass beneath it.
6.2.7 Place large or bulky equipment near the rear of the CFH. Large items near the face of the hood may cause excessive air turbulence and variations in face velocity.
6.2.8 Do not use the fume hood as a storage device.
6.2.9 CFH should not be used for waste disposal.
6.2.1 Do not leave uncapped bottles of reagents in a hood.
6.2.2 Check area around the hood for sources of cross drafts, such as open windows, supply air grilles, fans and doors. Cross drafts may cause turbulence that can allow leaks from the hood into the lab.
6.2.3 Clean all chemical residues from the hood chamber after each use.

6.2.4 All electrical devices should be connected outside the hood to avoid electrical arcing that can ignite a flammable or reactive chemical.

6.2.5 DO NOT USE A HOOD FOR ANY FUNCTION FOR WHICH IT WAS NOT INTENDED. Certain chemicals or reactions require specially constructed hoods. Examples are perchloric acid or high pressure reactions.

6.2.6 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 diluent

6.2.7 Recap all containers and return chemicals to appropriate storage locations.

6.3 COMMON MISUSES AND LIMITATIONS

6.3.1 Particulates: A fume hood is not designed to contain high velocity releases of particulate contaminants unless the sash is fully closed.

6.3.2 Explosions: The hood is not capable of containing explosions, even when the sash is fully closed. If an explosion hazard exists, the user should provide anchored barriers, shields or enclosures of sufficient strength to deflect or contain it.

6.3.3 Air Foil Sills: Sills should not be removed or modified by the hood user. Objects should never be placed on these sills.

6.3.4 Microorganisms: Work involving harmful microorganisms should be done in a biosafety cabinet, rather than a chemical fume hood.

6.3.5 Tubing for Exhaust: Tubing is frequently used to channel exhaust to the hood from equipment located some distance away. This is not an effective control method.

6.3.6 Highly Hazardous Substances: When working with highly dangerous substances needing more containment than a fume hood offers, consider using a glove box.

6.4 MECHANISMS OF FUMES AND VAPORS MONITORING

6.4.1 Visually inspect the baffles: For optimum performance, adjust the baffles when working with high temperature equipment and/or heavy gases or vapors.

6.4.2 To open the baffle slot, simply loosen the baffle adjustment knobs and push the lower section of the baffle inward you using the adjustment knobs**.**

6.4.3 To lessen or fully close the baffle slot, you would again loosen the adjustment knobs and pull the lower baffle section back toward you using the adjustment knobs.

6.4.4 Pressurized systems: Gases or vapors escaping from pressurized systems may move at sufficient velocity to escape from the fume hood.

6.4.5 Perchloric Acid: A standard fume hood must not be used for perchloric acid. Perchloric acid vapors can settle on ductwork, resulting in the deposition of perchlorate crystals. Perchlorates can accumulate on surfaces, causing serious injury to personnel.

6.4.6 Pollution Control: An unfiltered fume hood is not a pollution control device. All contaminants that are removed by the ventilating system are released directly into the atmosphere.

7.0 REFERENCES

7.1 Refer to 3-110203-860(4) policy of king Abdullah bin Abdulaziz hospital university

7.2 Occupational Safety and Health Administration (OSHA) Laboratory Standard.

7.3 HEMCO –Operation Manual Uniflow Perchloric Acid Laboratory Fume Hood.

7.4 CLSI. Laboratory Instrument Implementation, Verification, and maintenance; Approved Guideline. CLSI document GP31-A. Wayne, PA: Clinical and Laboratory Institute; 2009.

7.5 Laboratory Chemical Hygiene an AIHA Protocol Guide, American Industrial Hygiene Association, Fairfax, VA 1995.

7.6 Occupational Exposure to Hazardous Chemicals in Laboratories, U. S. Occupational Safety and Health Standards for General Industry, 29 CFR 1910.1450, U. S. Government Printing Office, Washington, DC.

7.7 Prudent Practices in the Laboratory Handling and Disposal of Chemicals, National Research Council, National Academy Press, Washington, DC 1995.

8.0 REVISION HISTORY

SOP No.	Date Revised	Author	Summary

9.0 APPENDICES

Appendix A: Fume Hood Maintenance Log Sheet

Appendix B: Composition of Chemical Fume Hood.

Appendix C: Work area inside chemical fume hood.

Appendix D: Placement of Large Equipment.

Appendix E: Suggested Baffles and Slot Position.