

ENVIRONMENTAL HEALTH & RADIATION SAFETY POLICY

Local Exhaust Ventilation: Commissioning

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Purpose

This policy establishes mandatory procedures for the Commissioning of newly installed or relocated ducted fume hoods to ensure:

- Safe operation for laboratory personnel
- Compliance with ANSI/ASHRAE standards, including ASHRAE 110 and ANSI/AIHA Z9.5
- Proper function according to manufacturer instructions and design criteria
- Identification and correction of installation or performance Deficiencies prior to laboratory use

No fume hood may be used for hazardous material operations until Commissioning is complete and EHRS approval is issued.

Scope

This policy applies to:

- All ducted fume hoods, including Specialty Fume Hoods (e.g., perchloric acid fume hoods)

This policy excludes:

- Non-ducted fume hoods or local exhaust devices not intended for hazardous chemical containment, including biological safety cabinets

References

- ANSI/AIHA Z9.5 Laboratory Ventilation (latest edition)
- ANSI/ASHRAE 110 “Methods of Testing Performance of Laboratory Fume Hoods” (latest edition)
- EHRS Policy OCC012.01 Local Exhaust Ventilation – Fume Hoods
- Manufacturer-specific commissioning instructions

Definitions

- **Acceptance Criteria:** The performance standards established in Section 7 that a fume hood must meet to be approved for laboratory use.
- **Commissioning:** Full verification that a fume hood meets design, manufacturer, and ASHRAE 110 performance criteria, including Operational Checks and Fume Hood Performance Monitor calibration.
- **Commissioning Report:** The written documentation of all testing, calibration, and performance verification activities required under this policy.
- **Commissioning Vendor:** A qualified third-party individual or firm engaged to perform testing, balancing, and performance verification in accordance with ANSI/ASHRAE 110 and this policy.
- **Deficiency:** Any condition where the fume hood or monitoring system does not meet design or safety criteria.
- **Face Velocity:** Air velocity measured at the fume hood sash opening.
- **Flowrate:** Exhaust volume over time (cubic feet per minute (cfm)).
- **Fume Hood Performance Monitor:** Device providing visual and/or audible feedback on fume hood performance.
- **Operational Check:** Testing conducted by EHRS to verify that the fume hood achieves specified Face Velocity at the designed sash opening, separate from ANSI/ASHRAE 110 Commissioning.
- **Qualified Personnel:** Individuals possessing documented training and demonstrated experience in laboratory ventilation testing and ANSI/ASHRAE 110 performance evaluation.
- **Responsible Project Unit:** The organizational unit directing the installation or relocation of a fume hood. This may be PDG or O&M, depending on project scope and ownership.
- **Specialty Fume Hood:** Fume hood requiring additional or unique Commissioning procedures due to chemical compatibility or hazard type.

Roles & Responsibilities

Environmental Health & Radiation Safety (EHRS)

- Develop and maintain this policy
- Conduct Operational Checks
- Approve fume hoods for laboratory use only after successful Commissioning and Operational Check
- Notify PIs, Supervisors, Department Heads, or Designees once a fume hood is approved
- Maintain a centralized fume hood database with associated Commissioning and approval records

Project Delivery Group (PDG)

- When serving as the Responsible Project Unit, verify installations comply with manufacturer instructions and design criteria
- When serving as the Responsible Project Unit, arrange Commissioning with qualified vendors
- Provide all Commissioning documentation to EHRS
- Notify EHRS when Commissioning is complete

Operations & Maintenance (O&M)

- Maintain construction and design documentation for projects under O&M direction
- Calibrate and maintain Fume Hood Performance Monitors after initial Commissioning
- When serving as the Responsible Project Unit for relocation or modification, assume all Commissioning coordination responsibilities assigned to PDG under this policy

Supervisors, PIs, Department Heads, Managers, Designees

- Ensure fume hoods are not used until EHRS approval is received
- Verify Commissioning and Operational Checks are complete
- Assist with Commissioning coordination as requested

Users

- Will not operate a fume hood until approved by EHRS
- Report any observed Deficiencies immediately

Procedure

Commissioning includes the following five phases:

1. Installation Verification
2. Initial Testing and Balancing
3. Performance Testing (including ANSI/ASHRAE 110)
4. Fume Hood Performance Monitor calibration
5. Final Operational Check by EHRS

Final approval for laboratory use is contingent upon successful completion of all phases listed above.

Installation Verification

The Responsible Project Unit shall verify and document compliance with installation requirements prior to proceeding to performance testing.

The following shall be confirmed:

- Fume hoods are installed in accordance with manufacturer instructions and project design specifications
- Exhaust connections, ductwork, and associated fans are correctly installed and operational
- Controls and operating equipment (including Fume Hood Performance Monitors) function within design parameters
- Fume hoods are labeled with exhaust fan number/location
- Manufacturer operating and maintenance instructions are provided to the laboratory

Any Deficiencies identified during installation verification shall be corrected prior to performance testing.

Initial Testing and Balancing

The Responsible Project Unit shall arrange for testing and balancing to be performed by a

Commissioning Vendor.

Each fume hood shall be tested and balanced to achieve the specified design exhaust airflow. Commissioning shall include:

- Measurement and adjustment of exhaust Flowrate (CFM)
- Verification of static pressure readings
- Adjustment of sash settings as necessary to meet design airflow
- Documentation of exhaust fan serving the fume hood

If relocation or system modification occurs that may affect performance, the Responsible Project Unit shall coordinate full recommissioning.

Performance Testing and Certification

All newly installed or relocated fume hoods shall undergo performance testing conducted by Qualified Personnel arranged by the Responsible Project Unit.

Face Velocity Testing

- Average Face Velocity (fpm) measured at the specified sash height (18 inches unless otherwise designed)
- Individual traverse readings recorded with calculated averages
- Sash height documented at time of testing
- Verification that Face Velocity meets the defined performance standard

ANSI/ASHRAE 110 Testing

- Certification testing conducted in accordance with ANSI/ASHRAE 110 using the "As Installed" method
- Smoke visualization performed to qualitatively assess containment performance

Air Monitoring and Control Verification

Initial calibration of Fume Hood Performance Monitors during Commissioning shall be

performed by the Commissioning Vendor.

Ongoing calibration and maintenance shall be the responsibility of O&M.

- Confirmation that Fume Hood Performance Monitors are field calibrated per manufacturer specifications
- Alarm setpoints established and verified to activate outside design range
- Confirmation that all controls and operating components perform within specifications

Upon completion of performance testing, EHRS shall conduct the final Operational Check and issue approval prior to laboratory use.

Acceptance Criteria

The Commissioning Report shall clearly state the performance standard used for evaluation, such as:

- 80–120 fpm average Face Velocity at 18-inch sash height, unless otherwise specified by project design

If alternate criteria apply (e.g., high-performance or low-flow fume hood designs), the report must include the documented design specifications.

Corrective Action and Retesting

If a fume hood fails to meet established Acceptance Criteria listed in Section 7:

- The Commissioning Vendor shall ensure the fume hood is labeled “Out of Service – Do Not Use” immediately upon determination of failure
- The fume hood shall not be used for hazardous material work until Deficiencies are corrected
- After corrective action, the Responsible Project Unit shall arrange full retesting in accordance with this policy

Commissioning shall be repeated whenever relocation or system modification that may affect performance occurs.

Commissioning Report Requirements

Upon completion of Commissioning, a written Commissioning Report shall be prepared by the Commissioning Vendor and submitted to EHRS by the Responsible Project Unit.

At minimum, the report shall include:

- Building name, room number, fume hood ID number, and fume hood type
- Manufacturer, model, and installation date (if new)
- Date(s) of testing and name(s) of Qualified Personnel
- Average Face Velocity and individual traverse readings
- Sash height during testing
- Exhaust Flowrate (CFM) and static pressure readings
- Smoke visualization results
- Alarm setpoints and verification results (if applicable)
- Confirmation of Fume Hood Performance Monitor calibration
- Deficiencies identified during testing

Distribution and Record Retention

- Commissioning Reports shall be submitted to EHRS
- EHRS shall maintain a centralized electronic database of all Commissioning documentation for at least five (5) years

Training & Authorization

- Laboratory personnel may only operate fume hoods after they have been Commissioned and approved by EHRS
- EHRS shall provide guidance on proper fume hood use, sash operation, and performance monitor interpretation during laboratory safety audits
- Supervisors, PIs, and Department Heads shall ensure all users are informed of fume hood approval status and understand how to identify operational Deficiencies

Program Review

EHRS shall review this policy annually to ensure effectiveness and regulatory compliance.