Ductless Enclosures Committee Web Meeting

Monday, March 2, 2026 11:00AM - 12:00PM - NY Time (EST)

Co-Chairs - Luke Savage and Kevin McGough

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MEETING AGENDA

- **Vote to approve SEFA 9 Standard**

Scientific Equipment and Furniture Association

Minutes of the Ductless Committee Meeting
Friday, November 7, 2025 – 9:00 AM
Trump National Doral – Majestic Ballroom

P R E S E N T :

Co-Chairs:	Kevin McGough	AirClean Systems
	Luke Savage	LABCONCO
Attendees:	Myoung Oh	GT Scien
	Sangun Lee	Jeio Tech
	Kevin Gilkison	LABCONCO
	Horace Ng	Mocha Lighting
	Palaksha Karibasappa	Mocha Lighting
	Nathan Waud	Mott Manufacturing
	John Peters	NuAire
	Drew Pippin	NuAire
	Lloyd Fisk	RFD
Guests:	Mark Basak	Mission Bell

The Meeting was called to order at 9:00 AM. The first item on the Agenda was the election of Co-Chairs. Kevin McGough and Luke Savage agreed to continue to lead the Ductless Committee for the next two years and the Committee voted unanimously in favor of this.

Luke Savage reviewed the work undertaken by the Committee over the past few years which culminated in the updated draft which had been circulated to the Committee for comment with a deadline of October 30, 2025.

Luke reported that comments had been received from Abbie Gregg. Several of Abbie's comments were grammatical in nature and had been incorporated in the draft the currently before the Committee. One of the comments concerned silica dust applications. Luke indicated there are other filtered exposure control devices designed specifically for particulates and dust that might also be considered, especially if there are no gases or vapors involved. These other products often have higher volumetric rates to maintain transport velocities. But this could be a good subject for future dialogue within the committee on expanding guidance to particulates.

Another comment concerned field testing and providing better documentation which Luke indicated he was in agreement with was hopeful that the ASHRAE 110 committee would deliver a ductless fume hood test methodology and appropriate tracer gas in their upcoming publication. This would be reviewed in further by the SEFA 9 Committee after approval of this document.

Following the review of the edits Luke made a motion to sending the current edited document on the SEFA's editor for updating. The motion was unanimously approved and there being no further business before the Committee the Meeting was adjourned.

A Scientific Equipment & Furniture Association Standard

SEFA 9–2025
Ductless Fume Hoods and Enclosures

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SEFA SPELLS SAFE

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1. Foreword

1.1. ABOUT SEFA

The Scientific Equipment and Furniture Association (SEFA) is an international trade association comprising manufacturers of laboratory furniture, casework, and fume hoods, as well as members of the design and installation professions. SEFA exists to promote this industry and improve the quality, safety, and timeliness of the construction of laboratory facilities in accordance with customer requirements.

1.2. SEFA STANDARDS

SEFA and its committees develop and promote SEFA standards, which have domestic and international applications. Development of these standards considers the work of other standards organizations and information provided by government agencies.

SEFA standards are developed in and for the public interest. They are designed to promote a better understanding among designers, architects, manufacturers, purchasers, and end users and to assist purchasers in selecting the proper product to meet the user's specific needs.

The SEFA committee, which is co-chaired by Luke Savage (Labconco Corporation) and Kevin McGough (AirClean Systems), updates these standards periodically through biannual public meetings. SEFA welcomes input from all relevant organizations at these meetings. For comments or questions, please contact SEFA at info@sefalabs.com.

NOTE

To reference SEFA 9 for project specification purposes, we suggest the following: "Ductless fume hoods and ductless enclosures, as well as the application approval process, shall be in full conformance to SEFA 9."

1.3. GLOSSARY

SEFA-defined terms are frequently used in contracts and other documents that define the products to be furnished or the work involved. To provide uniformity for users of these terms, the association has developed a glossary (SEFA 4 – 2025). Bolded terms in SEFA standard text are included in SEFA 4, as well as at the end of each individual standard (see SEFA 9, Appendix A). The definitions shall be used to help resolve disputes or incorporated into relevant contracts and related documents.

Where a specific standard contains a definition that differs from the one in the glossary, the definition in the standard should be used. SEFA encourages interested parties to submit additional terms or suggest changes to terms already defined by the association.

1.4. DISCLAIMER

SEFA uses its best efforts to promulgate standards for public benefit based on available information and accepted industry practices. SEFA does not guarantee, certify, or assure the safety or performance of any products, components, or systems tested, installed, or operated in accordance with SEFA standards, or that any tests conducted under its standards will be non-hazardous or free from risk. SEFA encourages the use of third-party independent testing.

NOTE

SEFA encourages testing as described in this document to be performed and documented by a SEFA-approved third-party testing facility. For a current list of SEFA-approved test labs, visit sefalabs.com.

2. An Introduction to Ductless Fume Hoods and Enclosures

2.1. STANDARD SCOPE AND PURPOSE

This standard provides a comprehensive first source of information pertaining to laboratory ductless fume hoods and enclosures. Because these are recirculating filtration devices that are not integral to the laboratory ventilation system, this standard primarily addresses filtration, product usage, feasibility, safety, limitations, manufacturer usage recommendations, and manufacturer responsibilities.

This standard is intended to ensure the correct use and application of ductless fume hoods and enclosures by establishing manufacturer requirements for the general design and testing of ductless fume hoods and enclosures along with guidelines and procedures for their proper specification, use, maintenance, and testing. These requirements, guidelines, and procedures apply to ductless fume hoods and enclosures that protect personnel from harmful exposure to contaminants generated within the device. Operators must follow individual manufacturer recommendations for each specific application and usage.

2.2. DEFINITIONS

Ductless fume hoods and **ductless enclosures** are **exposure control devices (ECDs)** designed to carry undesirable effluents generated within them during a laboratory procedure away from laboratory personnel. They are not typically interconnected to an external exhaust system. Instead, they use an independent ventilation system that forces contaminated air through a filter before recirculating it into the room. Ductless fume hoods, being more specific than ductless enclosures, require more stringent components and filtration systems.

Ductless fume hoods and enclosures have a more limited scope of application than standard **laboratory fume hoods**, biological safety cabinets, or potent compound hoods. They are only suitable for identified, manufacturer-approved applications.

The following terms distinguish ductless fume hoods and enclosures from related devices:

- **Laboratory Fume Hood** – An ECD designed to carry undesirable effluents generated within the hood during a laboratory procedure away from laboratory personnel and out of the building. Conforms to SEFA 1-2025, Section 3.0–Section 3.1.10.
- **Ventilated Enclosure** – An ECD designed to carry undesirable effluents generated within the enclosure during a laboratory procedure away from laboratory personnel and out of the building. Does *not* conform to SEFA 1-2025, Section 3.0–Section 3.1.10.
- **Ductless Fume Hood** – A laboratory fume hood with a DH III filtration system (see Section 2.3) that returns exhaust to the laboratory work area. Conforms to SEFA 1-2025, Section 3.0–Section 3.1.3 and Section 3.1.5–Section 3.1.10.
- **Ductless Enclosure** – A ventilated enclosure with a ductless filtering system that does not comply with the requirements or definition of a laboratory fume hood or ductless fume hood. Does *not* conform to all of SEFA 1-2025, Section 3.0–Section 3.1.3 and Section 3.1.5–Section 3.1.10.

NOTE

Ductless enclosures are occasionally incorrectly referred to as ductless fume hoods. These light-duty enclosures, however, have limited applications and do not offer the same capabilities, capacities, and safety features as ductless fume hoods. Ductless enclosures must be reviewed and approved for each application prior to their specification or use (Ref. NFPA 45).

2.3. DUCTLESS FILTRATION CATEGORIES

Ductless fume hoods and ductless enclosures are limited by the capabilities of their filtration system. There are three designated filtration categories, each specified by a "DH" (ductless hood) prefix. Ductless enclosures may use any filtration type, but ductless hoods must use DH III filtration.

- **DH I** – Designed to control nontoxic chemicals, nuisance odors, and particulates.
- **DH II** – Designed to filter manufacturer-approved toxic contaminants up to **filter breakthrough** only. Not designed to provide **secondary containment** beyond **primary filter** breakthrough.
- **DH III** – Designed to filter manufacturer-approved toxic contaminants beyond primary filter breakthrough by providing secondary protection. After detecting primary filter breakthrough, a DH III system shall be designed to provide a period of time to conclude an ongoing experiment using its **secondary filter**. The secondary filter must be of the same media, efficacy, and capacity as the primary filter.

3. Ductless Fume Hoods and Enclosures – As Manufactured

3.1. PERFORMANCE AND MONITORING REQUIREMENTS

3.1.1. MANUFACTURER'S PERFORMANCE INFORMATION

For each DH II and DH III application for a ductless fume hood or enclosure, manufacturers must supply performance information that clearly outlines approved applications and usage limitations. This information must include at a minimum:

- A definition of DH categories identical to the one outlined in Section 2.3.
- A copy of SEFA 9 test results for the **"As Manufactured"** performance test for both filtration and containment as outlined in Section 3.2, validated by a known, independent third party, showing retention capacities in grams or ounces for each compatible filter type.

3.1.2. FILTER SATURATION DETECTION

DH III ductless fume hoods and DH II and DH III ductless enclosures require constant monitoring of **filter breakthrough** due to saturation. These devices must be designed with a continuous, automatic, audible and visible saturation-detection monitoring device capable of detecting all manufacturer-approved toxic contaminant(s).

The efficacy of the device should be such that when breakthrough occurs, test measurements taken downstream from the filter do not exceed:

- 50% of the **threshold limit value (TLV)** of manufacturer-approved toxic contaminant(s) for DH II ductless enclosures and
- 1% of the TLV of the manufacturer-approved toxic contaminant(s) for DH III ductless fume hoods and enclosures.

Manufacturers must provide the means to ensure the proper functioning and manual verification of the automatic filter saturation detection device. The manufacturer shall recommend verification frequency, but the Environmental Health & Safety (EHS) officer shall be responsible for ensuring verification occurs.

3.1.3. FACE VELOCITY MONITORING

All DH III ductless fume hoods and enclosures and DH II ductless enclosures should incorporate a permanent **face velocity** monitoring device. The device should be calibrated by a face velocity traverse as recommended in ASHRAE 110, using the average as the set point. To ensure proper performance as recommended by the manufacturer, testing should be performed at least annually.

3.2. BENCHMARK TESTING

DH I systems, which are used for nuisance and nontoxic odors only, do not require testing. For DH II and DH III systems that require multiple filter media types to meet the benchmark test, testing should be performed using the appropriate filter media type, with the type used clearly documented. Manufacturers' benchmark testing as described below shall be validated by a known independent third party. Manufacturers should include a copy of the third-party testing in their technical manual.

3.2.1. TESTING EQUIPMENT CALIBRATION

Refer to ASHRAE 110 for testing equipment calibration guidelines.

3.2.2. FACE VELOCITY GRID TEST

This test is needed for each model of ductless fume hood or enclosure and for all filter combinations used in benchmark testing. To prepare, set up the ductless fume hood or enclosure per the manufacturer's recommendations in a location with an average cross draft of less than 30 FPM (0.15 m/s) when measured 18 in. (46 cm) from the face of the hood at the left and right side of the sash opening.

Cross draft and airflow velocity measurements should be made using a calibrated hot-wire anemometer. Establish a grid pattern by equally dividing the length and width of the opening. Take velocity readings at each grid point, record readings each second for a period of 30 seconds, and average the results.[1]

3.2.3. FLOW VISUALIZATION (SMOKE) TEST

Discharge smoke from a smoke stick along the walls and work surface of the fume hood 6 in. (15 cm) back from the front of the unit. Smoke shall be carried to the back or top of the fume hood or enclosure and be exhausted with little reverse movement. Particular attention shall be given to the corners. Filter seals and other areas of the fume hood or enclosure where contaminant could escape shall be under negative pressure.

At no time shall smoke escape out of the fume hood or enclosure, except through the filtered exhaust. If smoke does escape out of the front of the fume hood or enclosure, the unit fails the test.

3.2.4. TRACER GAS CONTAINMENT TEST

To prepare for the **tracer gas containment test**, place an exhaust duct with a canopy-style connection from an exhaust system with variable control over the exhaust port of the ductless fume hood. The exhaust system shall be set to exhaust a greater CFM than the ductless fume hood requires, preventing contaminant from the exhaust from leaking into the test room.

Once the external exhaust system is operating, retake face velocity readings. They shall match those previously taken with the external exhaust system off. If the face velocities have changed, reduce the exhaust system CFM until there is no effect on the face velocities. The exhaust on the system must be strong enough to keep the exhaust plenum area negative without affecting hood face velocities.

Position the manikin in a sitting position in front of the fume hood or enclosure with the sampling probe 1.5 in. (3.8 cm) above and 3 in. (7.6 cm) out from the bottom sash edge. Place the sash in the "designed sash position." Run the tracer gas test with the ejector placed per ASHRAE 110 methodology. Using a leak meter or other continuous-reading instrument specific for ASHRAE 110 tracer gas with 0.01 ppm detection capability or better, determine tracer gas concentration.

Remove the manikin and scan the perimeter of the sash and airfoil of the fume hood or enclosure using the leak meter probe, holding the probe approximately 1 in. (2.5 cm) from the fume hood or enclosure opening. Leakage of tracer gas shall be no greater than an average of 0.05 ppm in any position.[2]

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[1] Refer to SEFA 1 – Section 4.3 and/or ANSI/ASHRAE 110 – Section 6.2 Face Velocity Measurements
[2] Refer to ASHRAE 110 for instrumentation, ejector construction, and method details.

3.2.5. FILTER EFFICIENCY AND ADSORPTION CAPACITY TESTS

Set up the ductless fume hood or enclosure per manufacturer recommendations and install the appropriate filter(s) for the test. Turn the system on and allow the fume hood to stabilize per manufacturer instructions. Record relative humidity and temperature of the laboratory before and after the test. The temperature should be 18°C–22°C and the relative humidity should be 40%–60%.

Evaporate one of the chemicals in the following table at the indicated rate. **Recommended exposure limits** (RELs) must be in accordance with current NIOSH-listed thresholds.

Chemical Family	NIOSH REL	Evaporation Rate
HCl	5 ppm	100 ppm
Diethylamine	10 ppm	50 ppm
Isopropyl Alcohol	400 ppm	500 ppm
Toluene	100 ppm	150 ppm

Acceptable evaporation methods are free surface evaporation without heat, heating the chemical in a container on a hot plate, or adding the chemical into a metal or ceramic cup heated by a hot plate using a peristaltic or other high-precision positive displacement pump set to the required mass flow rate. When using a pumping device to pump the chemical into a heated container, the flow rate into the container determines the evaporation rate. When using a hot plate for evaporation, maintain the temperature below the chemical's flash point to prevent a fire, explosion, or chemical degradation. Control evaporation temperature to where degradation of the chemical does not occur (e.g., evaporation temperature for toluene would be 140°C).

NOTE

Do not use open flame to heat the containers.

Determine evaporation rate by weighing the container(s) before and after evaporation with an appropriate precision balance or scale, noting weight change per unit of time. The evaporation rate required is determined by calculating the mass rate of chemical needed to mix with the hood airflow (CFM) during the test to create the indicated flow rates.

If additional chemicals are tested and sufficient mass cannot be evaporated to reach a challenge level of REL or greater, a lower challenge level may be permitted if it is the maximum level that can be reasonably obtained and the test conditions are recorded.

Monitor the test chemical concentration in the room, in the fume hood or enclosure, before the filter, and in the exhaust stream past the filter(s) being tested using a gas chromatograph, mass spectrometer, FTIR analyzer, or PID detector. When hydrochloric acid (HCl) is tested, an ion chromatograph or FTIR is recommended; colorimetric detection tubes lack the necessary resolution to accurately determine the concentration of the chemicals and shall only be used for the determination of HCl if neither FTIR nor an ion chromatograph is available. For HCl sampling using colorimetric tubes, begin sampling two hours before the test end point is achieved.

Sample exhaust air from the fume hood or enclosure at 15-minute intervals. Continue evaporation and exhaust sampling until chemical concentration equals the inlet concentration or the REL, whichever is lower. The instrumentation used shall have a minimum detection level of 1% of REL or less.

The manufacturer must determine sampling points. Complete mixing at the sampling point must be validated. The exhaust sampling point must be located in an area that represents the actual concentration of the exhaust. For fume hoods or enclosures with secondary filter systems, sample only the exhaust of the primary filter bed, not the exhaust of the unit itself.

For each data point, record or calculate the mass of chemical evaporated and chemical concentration levels in the sampled air streams. Sample and record room concentrations at a sampling point 1 ft. (0.3 m) from the center point of the sash.

For acid detection, continuous sampling of the exhaust can be performed using a small pump to pull the exhaust sample through a general acid colorimetric tube at approximately 1.5 L/min. When the general acid colorimetric tube begins to turn pink, begin sampling exhaust with an HCl 1–10 ppm colorimetric tube following manufacturer sampling recommendations to determine exhaust concentration.

If testing duration extends beyond eight hours, turn off the fume hood or enclosure and leave in a stagnant mode until the next testing period. During the stagnant period, disconnect the fume hood or enclosure from any active exhaust systems to prevent airflow through the filters. Seal chemical containers to prevent evaporation. At the beginning of the next test period, record and graph all data.

The test output shall be a table or graph plotting the mass of the test chemical evaporated on the x-axis and the concentration in ppm of the chemical found in the fume hood or enclosure exhaust on the y-axis.

Provide test conditions on the graph or in a separate list. Conditions should include temperature and humidity of the test room, CFM and face velocity, evaporation rate, grade and concentration of the chemical, current listed REL, test start and stop time, amount and type of filter media, evaporation method, inlet concentration, and total test time. The report should also include the name and model number of the unit tested.

3.3. MINIMUM MARKING REQUIREMENTS

Ductless fume hoods and enclosures should be clearly identified with the words “DUCTLESS FUME HOOD” or “DUCTLESS ENCLOSURE” respectively, prominently displayed in large letters on the front of the product to differentiate it from a conventional ducted fume hood or enclosure.

The DH rating (see Section 2.3) should also be prominently displayed in large letters on the front of the product, along with a reference to SEFA 9 (see Section 1.2).

- A DH I label should contain a message noting the system’s inability to provide protection for anything other than nuisance odorous compounds.
- A DH II label should contain a message requiring immediate suspension of usage upon saturation detection.

An area should be provided in plain view on the ductless fume hood or enclosure for the placement of **SEFA Form 9-A** (see Section 5.3). If the form is removed, the following words shall be displayed: “NOT RECOMMENDED FOR USE WITHOUT CURRENT APPROVED SEFA FORM 9-A IN PLACE.”

A sticker stating the recommended sash/door position should be placed on the ductless fume hood or enclosure. The label should also indicate if the unit can only achieve SEFA 9 containment compliance in a specific position. The filtration device type and name should appear in plain view and be easily identifiable by the operator.

4. Ductless Fume Hoods and Enclosures – As Installed

4.1. TEST PROTOCOL

Manufacturers must provide a test protocol for DH III ductless fume hoods and DH II and DH III ductless enclosures to verify that units function according to manufacturer's specifications. The "**As Installed**" test protocol must be sufficient to validate manufacturer claims for face velocity, base containment, filter sealing, and instantaneous filtration, as well as verify the display of face velocity and emissions monitoring systems.

The test protocol must include:

- **Face Velocity Verification** – A test procedure for verifying hood face velocity, including requirements for testing recommended face velocity settings if the control system provides face velocity adjustment. Face velocity monitors may be verified simultaneously with this test.
- **Base Containment Verification** – A test procedure for verifying base containment using a smoke stick or other form of flow visualization.
- **Filter Seal and Instantaneous Removal Verification** – A test procedure for verifying filter seals and instantaneous removal of contaminant by the primary filter pack for DH II and DH III ductless enclosures and by the secondary filter pack for DH III ductless fume hoods and enclosures.
    - If a surrogate chemical challenge is specified, the recommended chemical must have low toxicity and be readily available (e.g., isopropyl alcohol or similar). The chemical surrogate should be from the same chemical family as the chemical for which the hood was specified, if possible.
    - The test should not require a large amount of chemical to be adsorbed, to avoid shortening filter life.
- **Monitoring Systems Operation Verification** – The test procedure should contain provisions for verifying alarm functions.

To enable users or third-party certifiers to carry out test protocols in the field, manufacturers may make testing kits and instruction manuals available for sale or loan.

4.2. TESTING FREQUENCY

The manufacturer should specify the events that trigger the need for testing. At a minimum, tests should be conducted:

- After initial installation but before first use
- After major repair or refurbishment of the hood or enclosure
- After relocation of the hood or enclosure

The user's facility EHS officer is responsible for establishing test plans to verify proper function throughout the life of the unit.

5. Ductless Fume Hoods and Enclosures – As Used

5.1. SAFE WORK PRACTICES

Operators should understand the limitations and capabilities of the ductless fume hood or enclosure prior to use and should always use them in accordance with their organization's safety guidelines. Always refer to completed SEFA Form 9-A prior to usage, and refer to Section 5 of SEFA 1-2025 for applicable general safe usage recommendations.

5.2. RECOMMENDED USAGE PRECAUTIONS

Ductless fume hoods and enclosures are generally not recommended for usage with unknown chemicals or reactions. Usage should be limited to manufacturer-approved applications (see Section 5.3).

5.2.1. DH I

DH I ductless enclosures should:

- only be recommended for use with applications that would normally be performed on the open bench without protection.
- not be used with toxic contaminants.

5.2.2. DH II

DH II ductless enclosures should:

- not be recommended for use unless their application has been preapproved by the manufacturer/supplier using SEFA Form 9-A, which should be posted on the ductless enclosure at all times in accordance with Section 3.3.
- not be recommended for use with toxic contaminants that do not have a reported TLV/REL value.
- only be recommended for use with applications where continuous monitoring and filter breakthrough detection is available. Since DH II ductless enclosures only provide protection up to filter breakthrough, use must be suspended immediately upon filter breakthrough detection (see Section 3.1.2).

5.2.3. DH III

DH III ductless fume hoods and enclosures should:

- not be recommended for use unless their application has been preapproved by the manufacturer/supplier using SEFA Form 9-A in accordance with Section 5.3.
- only be recommended for use with applications where permanent monitoring and filter breakthrough detection is available (see Section 3.1.2).

5.3. MANUFACTURER/SUPPLIER APPLICATION APPROVAL

Operators of a ductless fume hood or enclosure must submit a written description of all intended applications to the manufacturer/supplier for approval prior to use. The Application Questionnaire section of SEFA Form 9-A (see Appendix B) collects all necessary information about intended usage for submission to the manufacturer/supplier. The manufacturer/supplier must approve all applications before use, and operators must limit usage to approved applications only.

Information to be provided by the user on Form 9-A includes:

- Company name, address, and contact information
- Date
- Description of intended application and equipment to be used inside the hood
- Chemical identification (CAS#, EN#, etc.) for each material to be used
- Amount and concentration (e.g., full strength, dilute, percentage) of each material
- Frequency and duration of the application
- Material temperature
- Container type (covered/open)
- Evaporation rate
- Maximum potential spill volume
- Statement certifying truthfulness and accuracy

Ductless fume hood and enclosure manufacturers/suppliers shall integrate within their organization the means to scientifically approve each potential application. A qualified specialist or department within the manufacturer/supplier organization must review the submitted Form 9-A to determine the compatibility of each application with the ductless fume hood or enclosure. For approved applications, the manufacturer/supplier shall complete the Manufacturer's Response section of Form 9-A, which must include:

- Manufacturer name and contact information
- Application approval reference number
- Device model and serial number
- Approved filter category and type
- Filtration system date of first use and estimated date of replacement
- Estimated filter life
- Approved application and toxic substances list
- Approval date
- Automatic filter saturation detection system information
- Warning dedicating the ductless fume hood or enclosure to the approved application only
- For DH II ductless enclosures, a warning to stop procedures immediately upon filter saturation detection

The completed Manufacturer's Response portion of Form 9-A represents an agreed-upon understanding of correct dedicated use and should be posted in the space provided on the ductless hood or enclosure at all times (see Section 3.3).

A change of application is equivalent to a new usage qualification. Operators shall obtain prior written re-approval from the manufacturer every time an application varies in any way from the initial approved usage. Each time an application changes, a current Form 9-A must replace the previous form.

5.4. CONTAMINATED FILTER HANDLING PROCEDURES

The waste disposal method for contaminated filters depends on the type of toxic contaminant(s) introduced into the filter by the ductless fume hood or enclosure operator. The operator should contact the individual or department within the organization responsible for controlling hazardous waste disposal. The filters should be removed in accordance with local ordinances.

6. Reference Organizations

6.1. APPLICATION REFERENCES

- **U.S. –** NFPA 45
- **U.S. –** ANSI/ASSP Z9.5
- **U.S. –** NIOSH Pocket Guide to Chemical Hazards
- **U.S. –** OSHA 29 CFR 1910.1450
- **Canada –** CSA Z316.5
- **France –** AFNOR NF X 15-211
- **Australia –** AS 2243.9

6.2. CONTAINMENT

- **U.S. –** ASHRAE 110
- **France –** AFNOR NF X 15-210

APPENDIX A
Glossary

adsorption capacity – The amount of a specific chemical a filter can retain before reaching saturation or breakthrough. *See also* filter breakthrough (saturation).

as installed – Testing conducted after a unit has been set up in a facility but prior to first use to verify its functions according to specifications.

as manufactured – Performance testing and results validated by an independent third party at the manufacturer's facility.

DH I – Filtration designed to control only particulates, nuisance odors, and nontoxic chemicals.

DH II – Filtration designed to filter manufacturer-approved toxic contaminants up to the point of filter breakthrough only. Does not provide secondary containment.

DH III – Filtration designed to provide secondary protection for toxic contaminants beyond primary filter breakthrough.

ductless enclosure – A ventilated enclosure with a ductless filtering system that does not comply with the requirements or definitions of a laboratory fume hood or ductless fume hood. Does *not* conform to all of SEFA 1-2025, Section 3.0–Section 3.1.3 and Section 3.1.5–Section 3.1.10.

ductless fume hood – A laboratory fume hood with a DH III filtration system that returns filtered exhaust air back into the laboratory work area. Conforms to SEFA 1-2025, Section 3.0–Section 3.1.3 and Section 3.1.5–Section 3.1.10.

exposure control device (ECD) – A category of equipment designed to carry undesirable effluents away from personnel during a laboratory procedure.

face velocity – The speed of air moving through the front opening of the hood. Typically measured in feet per minute (FPM).

filter breakthrough (saturation) – The point at which a filter can no longer effectively remove contaminants from the airflow, allowing chemicals to escape into the exhaust stream.

laboratory fume hood – An ECD designed to carry undesirable effluents generated within the hood away from personnel and out of the building. Conforms to SEFA 1-2025, Section 3.0–Section 3.1.10.

primary filter – The filtration stage in a DH III filtration system that encounters and removes contaminants first.

recommended exposure limit (REL): The airborne concentration of a substance to which NIOSH believes most workers may be exposed over a working lifetime without adverse health effects.

secondary filter – The backup filter in a DH III filtration system that provides protection and containment after the primary filter has reached saturation.

SEFA Form 9-A – An operating certificate, consisting of a user questionnaire and a manufacturer's response, that must be completed and permanently displayed on all ductless fume hoods or ductless enclosures.

threshold limit value (TLV) – The maximum concentration of a hazardous substance to which a worker can be exposed daily for a working lifetime without adverse effects.

tracer gas containment test – A test using a specific gas, a manikin, and a leak meter to detect and measure gas escaping from a hood.

ventilated enclosure – An ECD designed to carry undesirable effluents generated within the enclosure away from personnel and out of the building. Does *not* conform to SEFA 1-2025, Section 3.0–Section 3.1.10.

APPENDIX B
SEFA Form 9-A

SEFA FORM 9-A - Application Questionnaire

(See SEFA 9-2010 §4.2.2)

Customer :		
Address:		
Contact:	**Phone:**	**Date:**

Description of Application: ***(Customer to** describe the process to be performed inside the hood including all equipment to be used inside hood)*

Completed by Customer								**Completed by Manufacturer**			
Chemical ID (ie., CAS#, EN#, etc.)	**Amount**	**Concen-tration**	**Frequency/ Duration**	**Tempera-ture**	**Container Type—Covered/ Open**	**Evapora-tion Rate**	**Maxi-mum Potential Spill Volume**	**Exp Reference**	**Exp Limit**	**Limit Type**	**MSDS**

I, _____ , in my capacity as _____ of _____, certify to the best
(Print Name) (Title/Position) (Customer Company)

of my knowledge that all data and information submitted in this Application/SEFA Form 9-A, is truthful and accurate and that no material fact has been omit-ted.

(Signature) (Date)

SEFA FORM 9-A—Manufacturer's Response

(See SEFA 9-2010 § 5.3.1)

Manufacturer's Name:_____

Address:_____

_____

Phone:_____

Approval Reference No.: _____

Model and Serial No._____

Manufacturer's Approved Filtration Category: ☐DH I ☐DH II ☐DH III

Filtration System Date of First Use _____ Estimated Replacement Date _____

Approved Filter Type_____ Estimated Filter Life

Approved Application: *(Manufacturer to provide information regarding the automatic filter saturation detection system as well as the list of approved toxic substances)*

Application: ☐ **Approved**

☐ **Disapproved**

Print Name: _____

Signature: _____ **Date:** _____

— WARNINGS —

- DUCTLESS HOOD OPERATORS SHALL LIMIT THEIR USAGE TO MANUFACTURER APPROVED APPLICATIONS AS SHOWN ON THIS SEFA FORM 9A.

- OPERATORS SHALL OBTAIN PRIOR WRITTEN RE-APPROVAL FROM THE MANUFACTURER EVERY TIME AN APPLICATION VARIES IN ANY WAY FROM THE INITIAL APPROVED USAGE. THERE IS NO DIFFERENCE BETWEEN A CHANGE OF APPLICATION AND A NEW USAGE QUALIFICATION.

- CATEGORY II DUCTLESS HOODS MUST STOP PROCEDURE IMMEDIATELY FOLLOWING FILTER SATURATION DETECTION.