FUME HOOD OPERATIONS, MAINTENANCE, AND INSTALLATION MANUAL

ONEPOINTE SOLUTIONS

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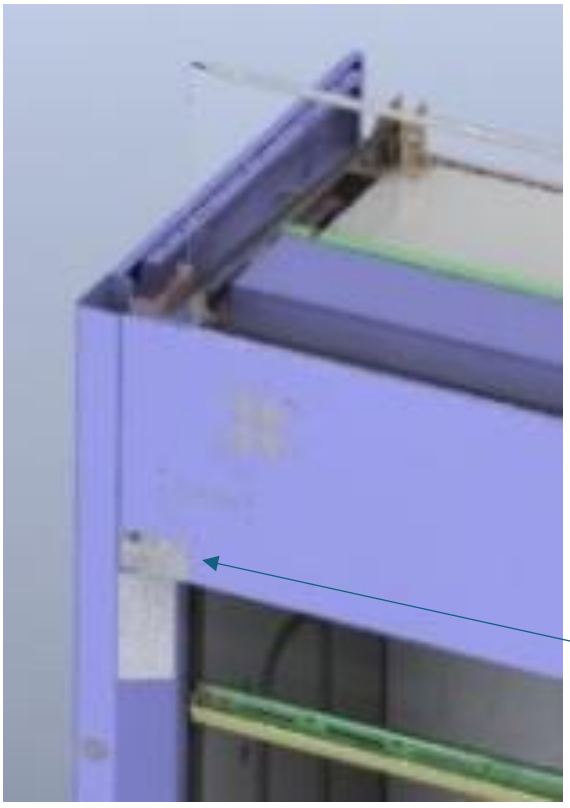
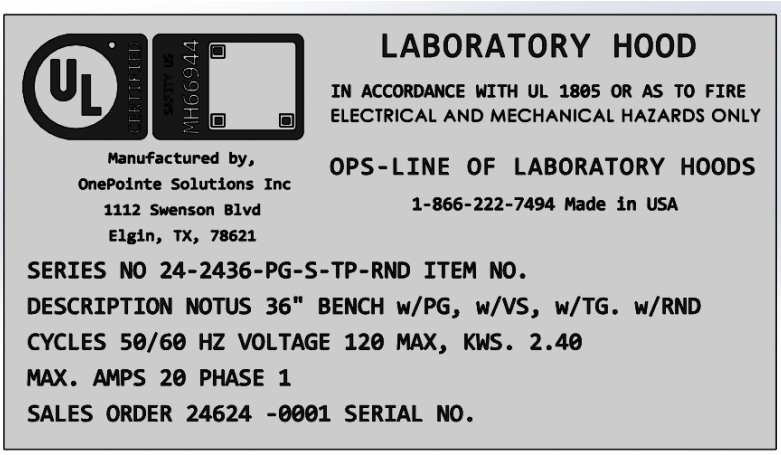
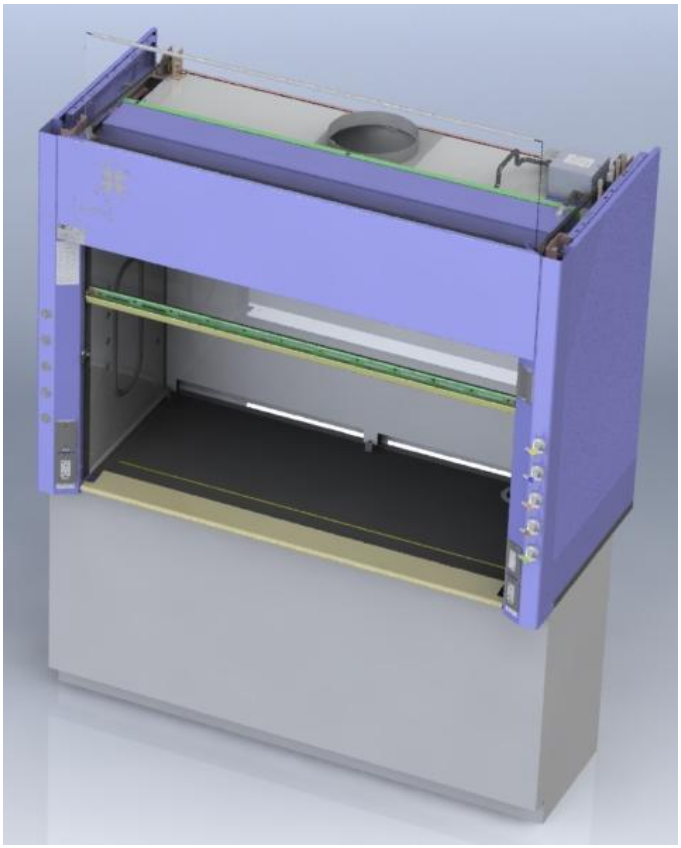
OnePointe Solutions is committed to providing safe, reliable, sustainable, and serviceable laboratory furniture and equipment. We are proud to have had the privilege of furnishing your chemical fume hood. Fume hoods represent a significant investment in the laboratory workspace, and this equipment is designed and built to withstand the rigors of the laboratory environment and still provide years of reliable and safe service, providing you give it reasonable care and use.

For additional information regarding this fume hood, please scan the QR code located next to the UL label located above the operations label located on the left vertical fascia.





GENERAL



Fume hoods are devices designed to protect laboratory workers from unnecessary exposures to potentially hazardous or noxious vapors or fumes. These devices are exposed to elevated working temperatures in the interiors, chemical fumes, and worksurface abuse. Regular care will prolong service.

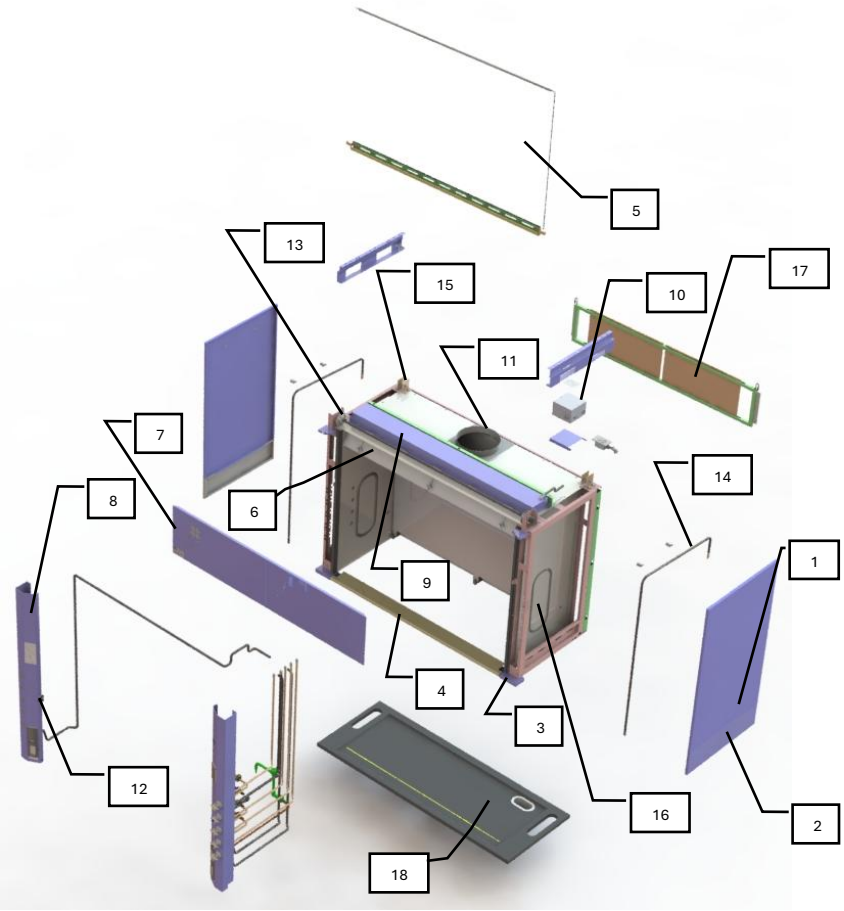
The exhaust system and blower of a fume hood must be maintained regularly to ensure appropriate levels of air flow through the fume hood for proper containment. Maintenance personnel should service the exhaust system components regularly. Accumulated deposits should be removed from the impeller blade and housing on a regular basis.

A simple test with lighted match or smoke will determine if air is being drawn into hood. More accurate checks of air velocity should be made with appropriate air measurement instruments such as a thermal anemometer on a regular schedule.

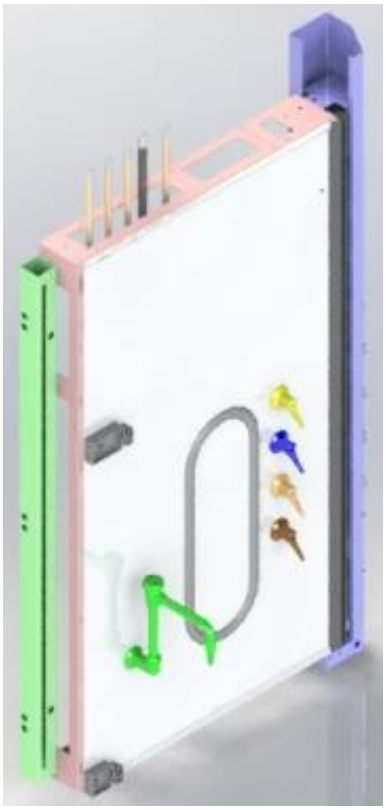
Always place equipment and apparatus as far back into the fume hood as possible since this provides greater assurance of proper fume collection and removal. Large, bulky apparatus or equipment should be placed in the fume hood to permit air flow around it, and never placed to interfere with the operation of the baffle system. Raise large items an inch or two above the worksurface. Spilled liquids, acids, or corrosive materials should be immediately wiped up and the surface neutralized with water or the proper neutralizing agent to prevent damage to the worksurface and the hood interior or to apparatus and equipment installed in the hood.

BASIC HOOD COMPONENTS

1. REMOVABLE SIDE PANEL
2. 7” HIGH FIXED SIDE PANEL
3. LOWER SPILL TROUGH
4. LOWER FLIP UP TROUGH COVER
5. VERTICAL SASH
6. ADJUSTABLE BYPASS
7. UPPER AIRFOIL
8. VERTICAL FASCIA
9. LIGHT BOX
10. ELECTRICAL JUNCTION BOX
11. DUCT COLLAR
12. DEFEATABLE SASH STOP
13. FRONT DRIVE AXLE
14. #35 ROLLER CHAIN
15. REAR IDLER PULLEY
16. GASKETED ACCESS PANEL
17. SASH WEIGHT
18. WORKSURFACE



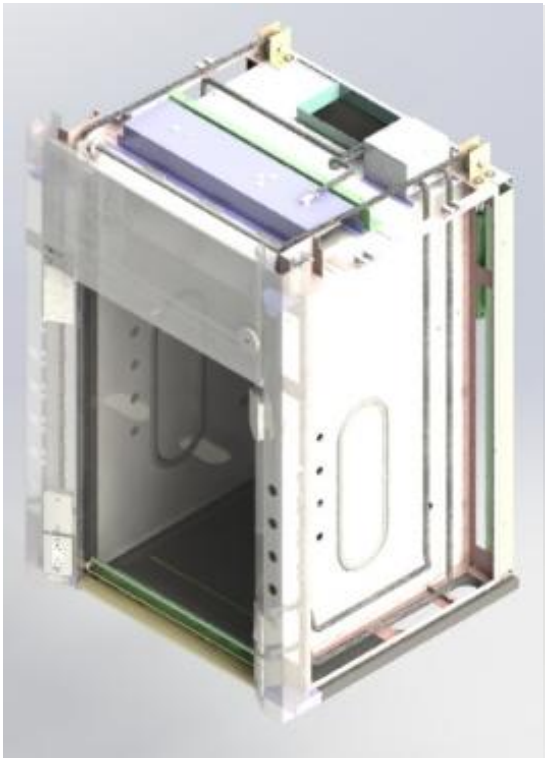
TYPICAL PLUMBING DIAGRAM

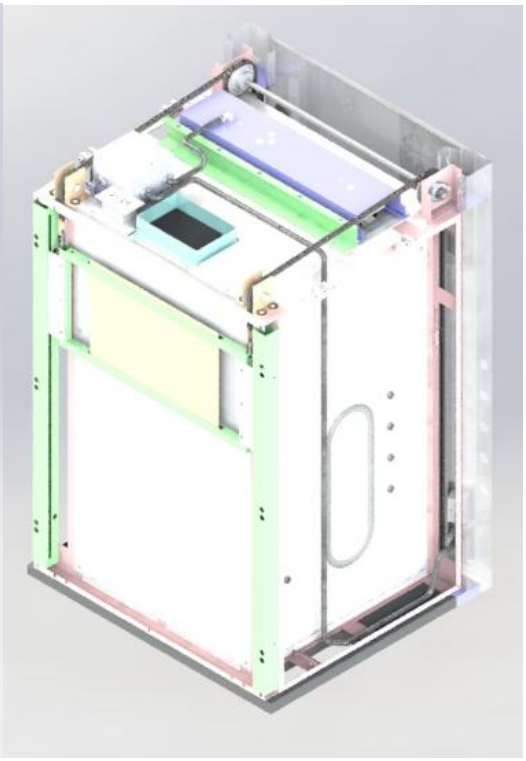


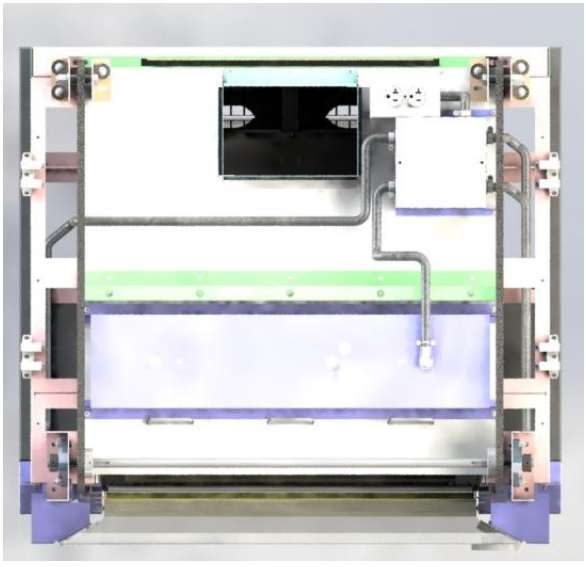
TYPICAL HOOD PRE-PIPED UP

TYPICAL WIRING DIAGRAM

Note: models below shown with optional rectangular duct collar.







INSTALLATION

The OPS line of fume hoods is shipped from the factory fully assembled. Unless requested by the customer to be shipped knocked down. To install the fume hood into the laboratory space, follow the instructions below,

1. Place the fume hood pallet near the location it will be installed.
2. Remove carton and all packing materials.
3. Remove upper side panels on both sides of fume hood. The side is attached with a push in magnet. Push the center of the side panel in towards the top to engage magnetic catch.
4. Remove screws that secure the fume hood to the pallet. The lower fixed side panel can be removed to make access to the pallet screws easier. There is one screw located towards the back of the panel that needs to be removed before removing the panel.
5. Remove the four screws that are securing the counterweight channel to the back of the fume hood. Do not discard these screws, you will use them later to secure the fume hood to the worksurface.
6. Place clamps on weights to secure the counterweight to the rear end frames. This will prevent the counterweight from moving while the hood is being lifted in place.
7. While the fume hood is still on the pallet, remove any items, such as velocity alarm manual, etc., that have been secured to the top of the fume hood.
8. Before lifting fume hood onto the worksurface, take note of any caution labels affixed to the fume hood.
9. Using a mechanical lift, place fume hood on worksurface. Be careful not to scratch the dished surface of the worksurface. Most worksurface materials, especially epoxy, scratches easily. Center fume hood on worksurface so dished area is center left to right inside the fume hood interior.
10. When pushing the fume hood back towards wall, the vertical weight track tubing will bottom out at the wall. This will hold the proper distance of 2” between the back of the fume hood end frame and the wall.
11. Check the operation of the sash. Making sure the sash does not bind in its travel for closed to full open, 28”.
12. Once fume hood is secured in place, drill two holes in worksurface where the pallet screws were. Secure fume hood to work surface with screws saved from weight channel.
13. Run a bead of RTV or silicone around the inside perimeter of the fume hood to provide a seal between the fume hood and the worksurface. Also, run a bead where the lower trough meets the front of the worksurface. This area can be accessed by rotating the lower airfoil cover towards the front of the fume hood.
14. Replace the lower fixed side panels remembering to secure the rear screw after the panel has been affixed.
15. Replace the upper side panel, making sure the magnetic catch is engaged so the panel lays flat.

OPERATING INSTRUCTIONS

A chemical fume hood is a safety device and is intended to be used with chemicals and substances that may be harmful or can cause injury to laboratory workers if used improperly. Care must be taken by any person using a chemical fume hood to follow appropriate safety protocols as defined by laboratory management and Environmental, Health and Safety,

WARNING: Although OnePointe Solutions line for fume hoods are designed to minimize the exposure to certain harmful chemicals, the performance of the fume hood, and therefore the level of protection provided by the fume hood, is dependent upon several external factors.

General Recommendations:

1. The exhaust system that the fume hood connects to must be working properly and maintained in good working order. Static pressure requirements at the duct collar of the fume hood must be field verified.
2. The airflow monitors and alarms have been properly installed, calibrated, and verified.
3. The challenge to the fume hood from cross drafts and HVAC supply registers has been minimized.
4. The individuals using the fume hood have been trained in proper chemical usage, including the proper use of all personal protective devices required.

Failure to follow these general operating instructions could result in physical injury or illness. Consult the Owner's Industrial Hygienist or EHS representative prior to using the fume hood.

CAUTION: This fume hood is not intended for the use of Perchloric Acids or Radioisotopes.

OPERATING GUIDELINES

1. Do not use fume hood without proper training from EHS or safety personnel.
2. This fume hood is not intended to be used with all chemical processes. Confirm with EHS or safety personnel to determine whether the fume hood is appropriate for said processes.
3. Confirm hood is operation and proper airflow is present. It is recommended the fume hood be equipped with an airflow monitor.
4. Minimize foot traffic near and around fume hood.
5. Lower sash to the proper working height.
6. Setup work at least six inches behind sash.
7. Never place your head inside fume hood.
8. Do not obstruct the baffle opening or place large bulky items directly on the work surface where they could obstruct proper airflow through the fume hood.
9. Elevate equipment above work surface.
10. Avoid storing containers of corrosive or volatile liquids in the fume hood.
11. Clean spills immediately.
12. Do not use fume hood exhaust as a waste disposal mechanism (i.e., for evaporation of chemicals)
13. If fumes or odors are present, the ventilation system malfunctions or airflow alarm indicates unsafe conditions, call for help.
14. It is recommended this fume hood be tested and certified annually per applicable industry and government standards.

MAINTAINENCE and ADJUSTMENTS

OnePointe Solutions line of fume hoods is designed to be as maintenance free as possible. However, as with any mechanical drive, some periodic maintenance is required to ensure trouble-free operations. It is recommended that the following items be inspected and/or serviced at regular intervals,

- Inspect the interior of the hood for cleanliness and the liner and baffles for signs of damage or wear.
- Verify the airflow monitor is working properly and is calibrated (as required).
- Inspect the service fittings for signs of wear.
- Inspect the sash drive mechanism for signs of wear.

Annual Inspection Procedures

Good laboratory practice and general safety considerations require that a schedule of inspection and documentation be setup for every laboratory fume hood at least annually,

An inspection record should be maintained, either in the form of a label attached to the fume hood, or an inspection log held by the laboratory manager of the Owners' Environmental Health and Safety office.

Inspection procedures should include using calibrated airflow measurement instruments to verify fume velocity and a determination of proper usage by observation and interview. These procedures should also consist of a physical examination of liner condition and cleanliness, baffle and sash operation and condition, counterbalance mechanisms, and light operation and condition, and service fixture function.

Inspection results should be recorded and reported to the proper authority for any required action.

Options, such as low airflow detectors, when installed, should be inspected at least annually. Where extreme hazardous or corrosive conditions exist or when filters are present in the system, the inspection frequency should be increased appropriately. Velocity and pressure sensing detectors should be tested at each inspection. Low-flow of no-alarms of the visible (lights) or audible (horns or bells) type should be tested for correct operation at least at each inspection. Signal transmission for alarms designed to activate signals at more than one location should be verified at each location during each inspection.

Cleaning of Interior

Periodically wash-down with mild detergent and warm water will ensure long life for the liner and baffle materials. Most chemical or salt stains may be removed with a weak (5%) acid solution or an appropriate cleaning solvent. It is important to ***NEVER USE ACETONE*** on the interior liner surface or sash tracks.

The use of organic chemicals or materials in a specialized Perchloric Acid fume hood with a stainless-steel interior should be avoided.

Access Panel Gasket Removal

Insert screwdriver and wedge out panel and gasket assembly. Gently pull the exposed gasket and panel to remove it from the side wall.

Access Panel Gasket Installation

Twist the corners of the gasket toward the cutout before inserting the panel. Replace the panel and work the entire perimeter of the gasket to ensure the gasket is completely snapped into position. The gasket should be smooth and tight when properly seated.

Needle valve fixtures are used within the fume hoods. If fixtures are worn, stainless steel cone and seat replacement kits can be ordered from your sales representative.

When rod driven valves are used, it is necessary to remove the rod from the valve before removing the valve mechanism. This can be done by removing the access panel exposing the inside wall chase.

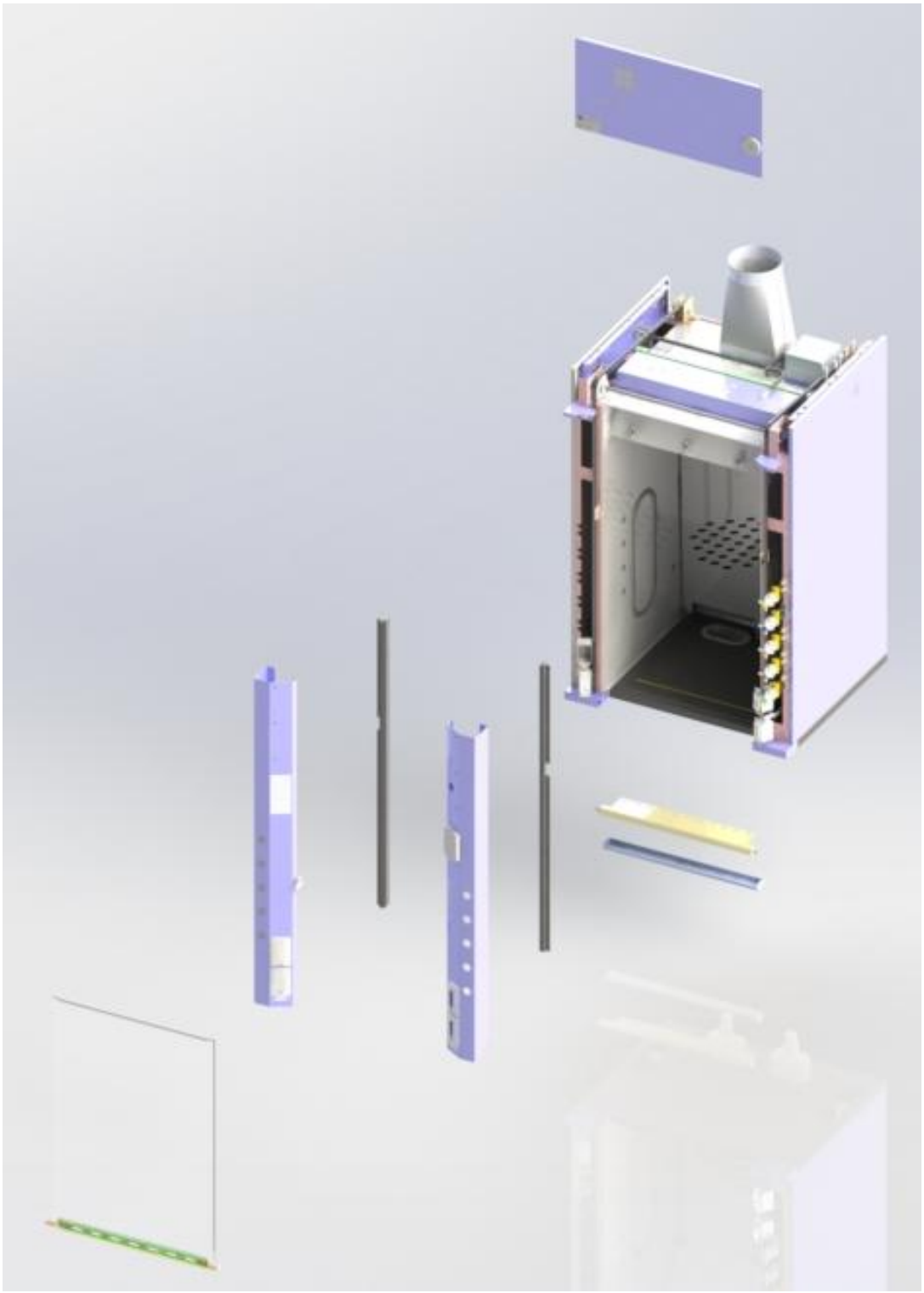
Access to the valves by removing the exterior side panel provides ample space. If the side panel is completely exposed, this is the preferred method of access to the valves.

Front mounted valves come standard with OnePointe Solutions line of fume hoods. Cones and seats are accessed from the front of the fume hood. Unlike a rod driven valve, there is no need to access the wall chase.

For fume hoods that do not have interior access panels, such as Perchloric Acid fume hoods, the valves should be accessed by removing the exterior side panel.

Frameless Sash Glass Replacement

Note: model below shown with optional rectangular duct collar and transition to round.



CAUTION: Before removing panels, be sure power to the fume hood has been turned off!

It is recommended that gloves be used before sash glass replacement.

1. Remove upper airfoil panel by slightly raising panel toward ceiling. This will disengage the panel from the keyway post.
2. Rotate the lower airfoil cover, using a 5/32" Allen wrench, remove both button fastener located on each side of cover.
3. With the lower trough exposed, use a 5/32" Allen wrench to remove all four screws, two on each side.
4. Remove left-hand vertical fascia by first removing the plastic electrical cover plates.
5. Remove the four truss head screws holding the lower electrical box in place. Pull electrical box through cutout, then, rotate box and feed through cutout.
6. If the electrical box located above the GFCI is empty, there is no need to remove the box.
7. Remove two upper screws securing the vertical fascia to the bracket located behind the fascia.
8. Remove five screws from the inside the side wall chase. Remove upper exterior side panel to access screws.
9. If the exterior side panel is inaccessible, screws can be accessed through interior gasketed access panel.
10. Repeat this same process, 4. – 9. for the right-hand vertical fascia.
11. With vertical fascia's removed, inspect chain. If chain is damaged, it *MUST* be replaced to avoid personal injury or damage to the fume hood.
12. Move sash into a position where the sash handle chain catch can be easily accessed.
13. For these next steps, it is a good idea for another person to assist.
14. Using a pair of vice grip style pliers, clamp the chain to the front face of the end frame. Do this for both chains. With the clamps engaged, lift the sash handle to make sure the clamps will hold the chain in place.
15. Wearing gloves, with one person on each side of the hood, have one person hold the top of the glass to prevent it from coming out of the sash track.
16. The other person on the opposite side can now remove the countersunk screws from the sash track and slide it down towards the floor.
17. Repeat this same process, 14. – 15. for the opposite sash track.
18. With one person holding the top of the sash glass from tipping, the person can remove the chain master link from each end of the sash handle chain catch.
19. Remove the sash handle with the damaged glass and lay the assembly on a flat table.
20. Remove the top sash glass gasket and set aside.
21. Remove the sash handle from the glass by pulling it away. If the handle is too tight to pull away from glass, take a dead blow hammer and gently tap the top of the sash handle chain catch to remove.
22. Inspect glass gasket that was used to secure glass to handle.
23. If there are numerous rips in gasket, then use a new piece. A new piece of gasket was included with your owner's manual.

24. Take the top sash gasket and press on top of glass. Place gasket material on the bottom of the new sash glass. Align with the bottom frame member and press into place. Use blue painters' tape to hold gasket in place.
25. Place a piece of cardboard on the floor. Place the top gasket edge on top of cardboard.
26. Center handle over sash handle gasket. Be sure to measure the distance on each side so glass is centered in sash handle.
27. Use a rubber mallet to tap the bottom of handle to seat the glass.
28. Attach chain catch to handle, replace sash tracks. Remove clamps from chain, move sash up and down to verify smooth travel. Replace vertical fascia, all cover plates and interior and or exterior panels.

FUME HOOD TESTING

Fume Hood Evaluation in the Field

It is recommended that the user make provisions and have the following tests performed on all laboratory fume hoods. These tests should be performed by qualified personnel to verify proper operation of the fume hood before they are used. Fume hood testing should be performed after the installation is complete, the building ventilation system has been balanced, and all connections made. Any unsafe conditions disclosed by these tests should be corrected before using the fume hood.

Test Procedures

Test Conditions

Verify that the building make-up air system is in operation, the doors and windows are in normal operating position, and that all fume hood and exhaust devices are operating at designed conditions.

Room Conditions

Check room conditions in front of the fume hood using a thermal anemometer and smoke source to verify that the velocity of cross drafts does not exceed 20% of the specified average fume hood face velocity. Any cross drafts that exceed these values shall be eliminated before proceeding with the fume hood test.

Equipment List

- a properly calibrated hot-wire thermal anemometer.
- A supply of ½ minute smoke bombs.
- A bottle of titanium tetrachloride and a supply of cotton swabs or other recognized devices for producing smoke.

CAUTION

Titanium tetrachloride fumes are toxic and corrosive. Use sparingly, avoid inhalation and exposure to body, clothing, and equipment.

It must be recognized that no fume hood can operate properly if excessive cross drafts are present.

Airflow

Face Velocity

Determine specified average face velocity for the fume hood being tested. Perform the following tests to determine if the fume hood face velocities conform to the specifications. With the sash in the normal operating position, turn ON the exhaust blower. The face velocity shall be determined by averaging the velocity of six readings taken at the fume hood face. Readings shall be taken at the centers of a grid made up of three sections of equal area across the top half of the fume hood face and three sections of equal area across the bottom half of the fume hood face.

If not in accordance with specified face velocity, refer to Troubleshooting section on page 21, for aid in determining the cause of variation in airflow. If face velocity cannot be corrected to that which is specified, reclassify fume hood to conform to actual face velocity.

Sash Operation

Check operation of the sash be moving it through its full travel. The sash operation shall be smooth and easy. Vertical rising sashes shall hold at any height without creeping up or down.

Airflow

Fume Hoods

Turn fume hood exhaust blower on. With sash in open position, check airflow into the fume hood using a cotton swab dipped in titanium tetrachloride or other smoke source. A complete traverse of the fume hood face should verify that airflow is into the fume hood over the entire face area. A reverse flow of air indicated unsafe fume hood operation. Consult the Troubleshooting section on page 21, for possible causes and take corrective action. Move a lighted smoke bomb throughout the fume hood work area directing smoke across the worksurface and baffle. Smoke should be contained within the fume hood and be rapidly exhausted.

Low Airflow Monitor

On fume hoods with low flow warnings devices, verify that monitor functions properly and indicate unsafe condition.

ANSI/ASHRAE 110

The performance of a laboratory fume hood in providing protection for the worker at the face of the fume hood is strongly influenced by the laboratory room ventilation, and by other features of the laboratory in which it is installed. Therefore, the need arises for a performance test which can be used to establish an “As Manufactured” and an “As Used” performance rating, including the influences of the laboratory arrangement and its ventilating system.

The test presumes a conditioned environment. No test can be devised which, regardless of frequency, reflects the results obtained in a non-conditional laboratory with various conditions of windows, wind velocity, etc.

This procedure is a performance test method.

It remains for the user, the hygienist, or the applications engineer to specify what level of fume hood performance is desired or required. It should be noted that the performance test does not give a direct correlation between testing with a tracer gas and operator exposures. The physical properties of the material, the rate and mode of evolution, the amount of time the worker spends at the face of the fume hood, and several other factors must be integrated by a trained observer into a complete evaluation of worker exposure. The performance test does, however, give a relative and quantitative determination of the efficiency of fume hood capture under a set of strict, although arbitrary, conditions. The same test can be used to evaluate fume hoods in the manufacturer’s facilities under (presumably) ideal conditions, or under some specified condition of room air supply.

The test may be used as part of a specification once the appropriate release rate and required control level are determined. If so used, an “AM” (as manufactured) specification places a responsibility on the fume hood manufacturer, and an “AU” (as used) specification places responsibilities on others, such as, the designer of the room air supply, the designer of the room layout, etc.

It is recommended that the ASHRAE 110 test procedure be subjected to this fume hood under “AU” (as used) conditions.

Refer to the ASHRAE Standard 110 or contact your sales representative for further information.

If the above test cannot be performed at the job site, use of the SEFA-1 test procedure as minimal proof of proper fume hood performance is suggested.

This test consists of a face velocity grid test and a smoke test procedure.

Information and copies of ASHRAE-110 testing are available from OnePointe Solutions.

Semi-annual verification that this above criterion is subjected to and met by all fume hoods at your facility is recommended.

Field Evaluation of Laboratory Fume Hoods

	1	2	3	4	
	Equal	**Equal**	**Equal**	**Equal**	
A					**Height Dim.**
B					
	Width Dim.				

Project Name: _____ Location: _____

Sales Order #: _____ Room #: _____ Item #: _____

Fume Hood Description: _____

Sash Style: _____ Baffle Operation: _____

Conclusions and Comments: _____

_____

_____

Alarm Condition _____ Functional _____ Non-Functional

Smoke Test _____ Positive _____ Negative

Face Velocity Test

Sq. Ft. of fume hood opening _____ + Bypass _____ = Total _____

1A _____ + 1B _____ + 2A _____ + 2B _____ + 3A _____ + 3B _____ +

4A _____ + 4B _____ = Total divided by 8 = _____ Average Face Velocity

Total Cubic Feet Per Minute (CFM) = Average Face Velocity (AFV) x Total Sq. Ft. (TSF)

AFV _____ x TSF _____ = _____ CFM

TROUBLESHOOTING

When fume hood test procedures detect improper function, the cause is typically due to,

a) Insufficient quantity of air flowing through the hood.
b) Room cross drafts blowing into the face of the fume hood.
c) A combination of both (a) and (b).

The following are suggestions to troubleshoot the problem.

Room Cross Drafts

Air moving through an open door located adjacent to the fume hood can cause cross drafts. An open window or a room air supply located to one side or across for the fume hood can also cause disturbing cross drafts.

High velocity air from ceiling mounted diffusers can cause a flow of air down and into the top half of the fume hood face that can cause reverse floes or air out of the bottom half of the face.

Insufficient Airflow

One or more of the following conditions may exist; each condition should be checked and eliminated, if possible, to determine what conditions may exist,

a) Inaccurate face velocity readings. Check airflow velocity meter type. Is the instrument recommended for low air velocities in the 50 to 100 feet per minute ranges? When was it calibrated last?
b) Verify readings with another air velocity meter or by checking air volume using a pitot tube traverse or exhaust duct.

Before contacting a service representative to assist with troubleshooting, answering the following questions will help identify where the problems have originated.

Who stated that the unit did not operate properly?

- What is their position?
- Who are they employed with?

What tests were performed?

- Instrument used?
- When was it calibrated?
- What were the results?

What is the fume hood type?

- What is the series?
- What is the size?

Is the location of fume hood acceptable?

Are cross drafts present?

- Is there traffic past the fume hood?

Is adequate free or make-up air available?

Are cross currents present?

- Is it always available?
- What is the supply source?
- Can it be altered or cut off?

Did the fume hood ever function properly?

- Have authorized modifications been made?

Have recent changes been made to the laboratory heating/cooling system?

- Describe.