aeroseal.

homeseal™ ADVANCE

User Manual

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2 TABLES AND FIGURES

The User Manual for HomeSeal Advance is the property of Aeroseal LLC. This manual cannot be reproduced without the written approval from Aeroseal.

Refer to the manual for diagnostic information, aerosol sealing techniques, troubleshooting, repairs, and maintenance. Specifications subject to change without notice.

3 PRODUCT INTRODUCTION

3.1 PRODUCT OVERVIEW

The Aeroseal duct sealing system is based upon a patented process for injecting sealant particles to seal duct leaks. The patented aerosol injection machine aerosolizes the sealant, evaporates the water in the sealant, and pressurizes the duct system with air that carries the particles to the leaks.

In a properly prepared duct system, the only outlets for the aerosol-laden air are duct leaks. The sealant particles travel to the leaks, attach to the wall at the leaks and then to each other, thereby reducing the size of the duct leaks until they are sealed.

3.1.1 PROPRIETARY INFORMATION

All information in this manual is proprietary and is designed to be used by the Dealer providing duct sealing services. Unauthorized release or use of the Technical Manual constitutes a violation of the sublicense agreement.

3.2 QUICK REFERENCE GUIDE

This Quick Reference Guide quickly identifies the steps to perform a residential seal. Please visit the Aeroseal Support Site for more information.

Quick Reference Guide

New to the work site? Use the Quick Reference Guide to set it up for the first time!

Day of the Job

- **Walk-thru** with homeowner and obtain permission to access all rooms for seal preparation.

Site Prep

- **Perform** a Pre-Sealing Combustion Air Zone Safety Test if necessary.
- **Turn off** HVAC system.
- **Stage** the equipment.
- **Cut** injection point.
- **Isolate** HVAC system.
- **Attach** layflat.

Seal Process

- **Set up** sealing equipment.
- **Connect** the laptop computer.
- **Perform 5Fs**: fog it, find it, feel it, fix it, finish it.

Clean Up and Departure

- **Clean** nozzle.
- **Remove** blocking and isolation materials.

- **Turn on** HVAC system and restore home to working order.

3.3 SAFETY

Table 1. Safety Symbols

	**DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	**WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	**WARNING** indicates a potential Electric hazard
	**NOTICE** indicates important information that if not followed, may cause damage to equipment.
	Personal protective equipment required: Gloves
	Personal protective equipment required: Dust Masks
	Personal protective equipment required: Respirator

3.3.1 HOMEOWNER SAFETY PRECAUTIONS

The Dealer is responsible for assuring the safety and well-being of the homeowner and the contents of their houses on all jobs. The dealer should:

- Keep homeowners away from areas where high sealant concentrations may exist.
- Ensure that pets, pregnant women, and people with breathing difficulties are not at home during the injection process.
- Use the provided scrubber fan to ventilate areas that may be exposed to escaping sealant spray.
- Cover homeowner property that might be exposed to high overspray concentrations like attics or basements.
- Keep homeowners away from work areas near ladders, in attics, or in tight workspaces.
- Prevent accidental sealant spills by using a tarp under equipment. If a spill occurs, clean up immediately using Buckeye cleaner or other equivalent solvent(s).
- Use a liquid-tight tarp under the aerosol injector to prevent liquid sealant spills onto finished floors. The tarp should extend at least 6 feet from the injector under the lay-flat tubing.

- Take care when removing the lay flat tubing from the injector to assure that any potential liquid sealant in the tubing or machine does not spill over to homeowner's floors.
- Maintain the equipment following the maintenance schedule.

3.3.2 TECHNICIAN SAFETY PRECAUTIONS

The safety of technicians while performing the sealing work should be always assured. Aeroseal recommends that proper respiratory protection should be worn at all times when in spaces with high aerosol concentrations (e.g. during the injection process in attics, basements or crawl spaces with significant duct leakage) and that technicians be provided with skin protection (gloves) for use with the solvent, and fiber masks or cartridge respirators with organic/particulate canisters for use in duct zones such as attics or basements. Additional recommended safety precautions include:

- Do not overreach when using tall ladders during the diagnostic or sealing process.
- Use only approved electrical connections for the injector machine, including GFCI pigtails if needed.
- Use scrubber fans to ventilate areas where sealant material may escape from leaky duct sections.
- Place walking boards across ceiling joists to prevent stepping through the ceiling when working in an attic.
- Wear protective glasses when removing register grilles.
- Wear liquid-tight gloves when using solvents.
- Wear respiratory protection when working in areas with sealant particles in the air.
- Sensitive individuals or individuals regularly submitted to high sealant particle concentrations should wear cartridge respirators with organic/particulate canisters.

3.3.3 SAFETY PROCEDURES


CAUTION: ELECTRICAL HAZARD

There are several safety features in the software and hardware to control the sealing process. In case of an emergency the operator should unplug all three power cords into the machine. These safety procedures include:

- The air heaters in the 14-inch diameter heater cylinder are wired through Snap-disk thermostats that cut power to the individual heater circuits if the temperature at the Snap disks reach approximately 93°C.
- The nozzle is fitted with a thermostat that cuts out at approximately 165°C.
- The software provides alarms and warning if the discharge temperature exceeds 65°C.

It is recommended that the operator:

- Do not open any electrical control panel or the heater cylinder while power is applied. Electric shock is possible.
- Use only grounded electrical circuits and cords.
- Use cords with Ground Fault Circuit Interrupters (GFCIs) pigtails.

THE SEALING MACHINE SHOULD NOT BE OPERATED IF THERE IS SEALANT MATERIAL ON THE HEATER-CYLINDER HEATERS OR INSULATORS

4 HARDWARE & SOFTWARE SET UP

4.1 COMPONENTS

4.1.1 FANBOX

The fanbox contains:

- Nozzle assembly
- Wifi antenna
- 25 micron filter
- 1500W heater elements (x2)

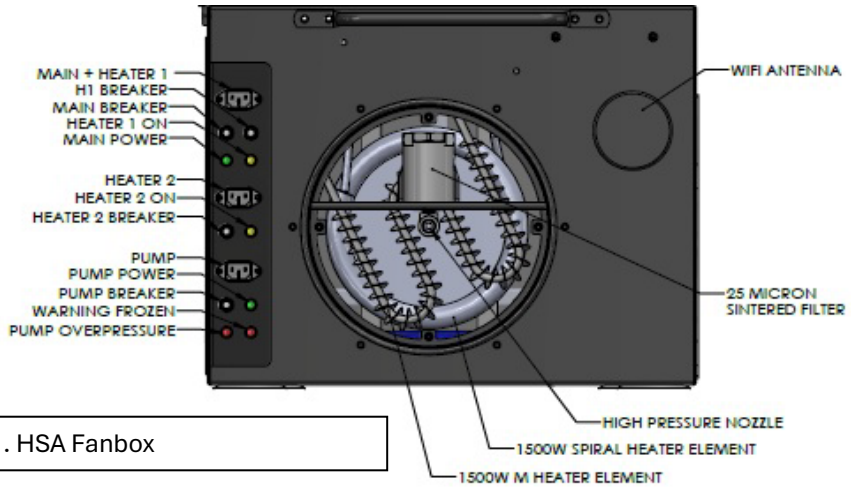

Figure 1. HSA Fanbox

Figure 1. Fanbox Exterior

The front panel includes:

- Main heater 1
  - H1 breaker
  - Main breaker
  - Heater 1 on light
- Main power
- Heater 2
  - H2 on light
  - H2 breaker
- Pump
  - Power
  - Breaker
  - Warning frozen light
  - Overpressure light

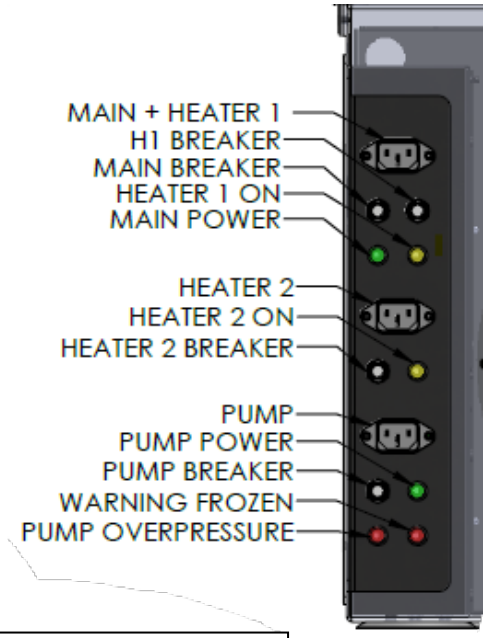

Figure 2. HSA Front Panel

The interior includes:

- Electronics box
- 10” diameter fan
- Heater cylinder
- Sealant reservoir
- Prime assist button
- Drain and seal valve lever
- Reservoir tank thawing heater
- Automatic adjusting gate
- Filter rack

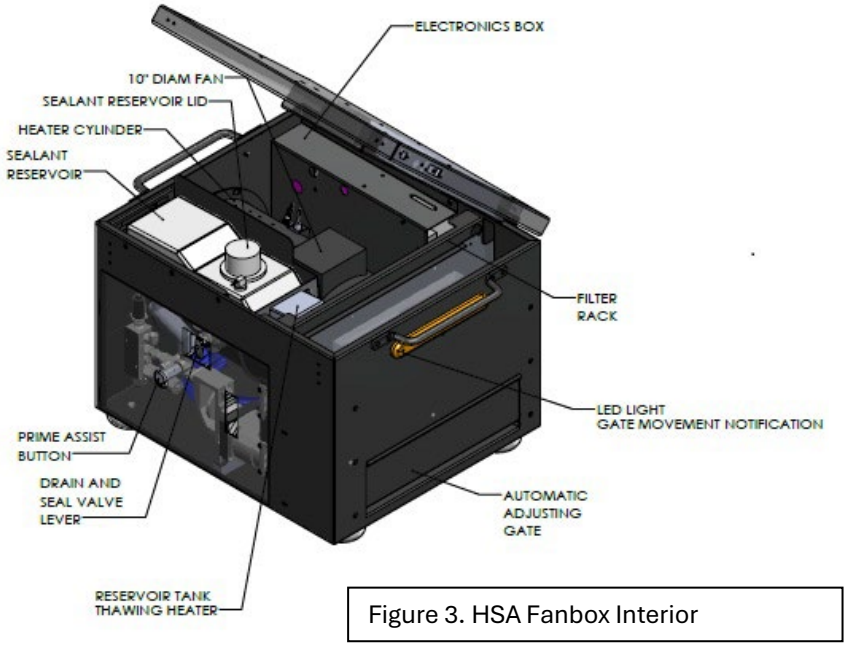

Figure 3. HSA Fanbox Interior

The interior mechanics include:

- Pump pressure transducer
- High pressure outlet line to aerosolizing nozzle
- Pump inlet check valve
- Pump thawing heater
- Pump AC motor
- 4000psi overpressure switch
- Pump outlet check valve
- 3000psi (9000psi burst) hydraulic accumulator hose

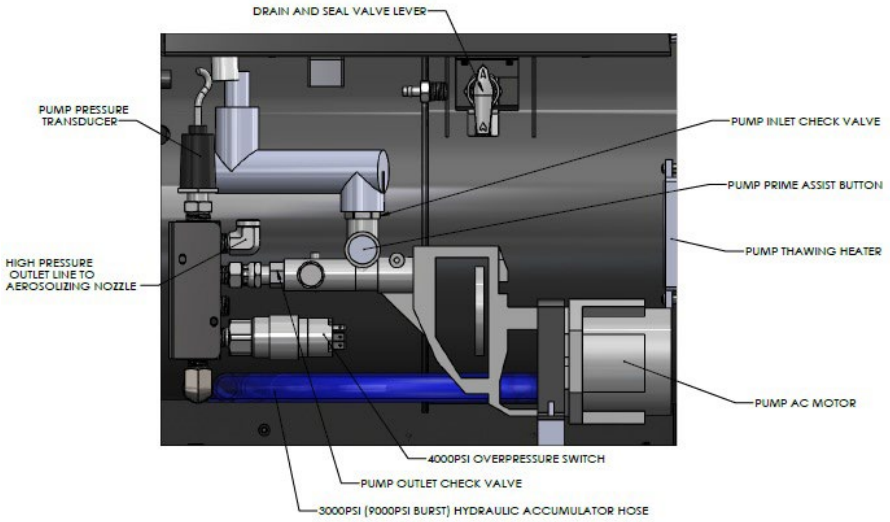

Figure 4. HSA Interior Pump Mechanics

The fanbox lid includes:

- Digiman manometer
- USB-B bulkhead
- Outside reference pressure
- Reference pressure
- Duct pressure
- Negative fanbox pressure
- Temperature sensor
- Power indicator
- Internet status
- MRS board

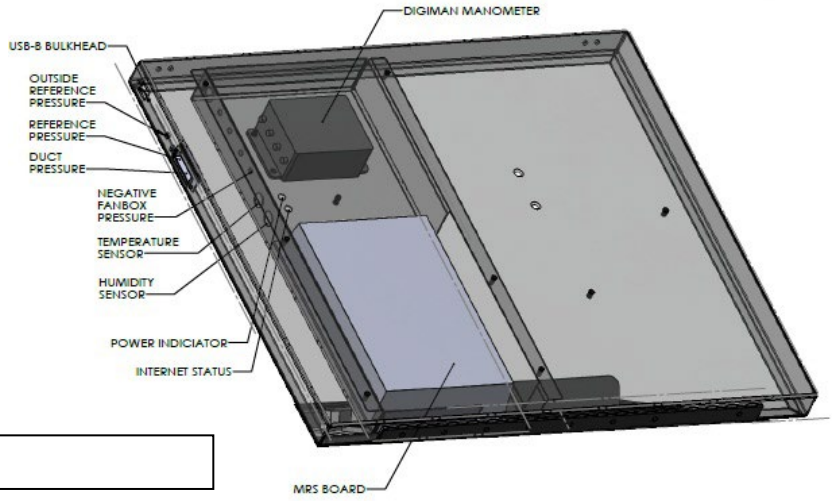

Figure 5. HSA Fanbox lid

4.1.2 LAYFLAT

Layflat is the clear plastic sheeting that runs from the fanbox to the duct system. The layflat is attached to the fanbox using the foam lined clamp.

4.1.3 LT SEALANT

LT duct sealant is a safe, non-toxic, low VOC acrylic polymer. It is heated and aerosolized by the HSA equipment and sprayed into the duct system. The sealant seals gaps up to 5/8" size. Any opening larger than 5/8 should be manually repaired.

Sealant is mold and mildew resistant, warrantied for 10 years and is used in other industries like paint and medical devices. It is advisable to take conservative precautions when in use. For more information see Section 4.4.6.

4.1.4 SCRUBBER

HSA includes a free-standing 1500cfm fan in a box covered with (5) Merv14 filters. The fan is used to "inhale" airborne particles from the air. Place the scrubber fan near the inlet gate of the fanbox if used in areas of heavy overspray and fogging. Ideal places include living spaces or where homeowners keep personal items.

4.1.5 WYE KIT

A Wye Kit is intended to split the flow of aerosolized sealant into two streams to deal with tricky situations. See APPENDIX C: Wye Kit for additional information.

4.1.6 RECOMMENDED TOOLS & MATERIALS

Tools

- (3-4) 50 FT 12/3 extension cords
- Power strip with surge protection
- Step Ladders: 8 ft. & 10 ft. and step ladders
- Sturdy folding table 6 ft.-10 ft.
- (2-3) 25' – 35' tape measures
- (2) Cordless ratcheting screw guns/drivers
- ¼" and 5/16" magnetic driver attachments
- Sheet metal snips: Reds & Greens (right & left-handed)
- (2) Step bit, drill bits
- (2-3) Strong flashlights
- (2-3) Razor utility knives
- Standard set of hand tools
- Shop-vac, broom & dustpan, clean-up materials
- 20" Box fans (optional)
- Malco hole cutter (optional) 2"-20"

Safety Equipment

- Ground Fault circuit interrupters (GFCIs) for all circuits
- Particulate masks (double-strap type)
- Work gloves
- Kevlar Sleeve
- Eye protection

Supplies

- 5/16" Hex head, self-tapping sheet metal screws (at least ¾" in length)
- White-head register/grille/diffuser screws
- (2-3) Rolls of plastic sheeting (.31 mil rolls)
- Sheet metal for injection hole patching (~26 gauge)
- ¼" Zip Screws
- (2-3) Roll-Mastic tape: 3" width (HardCast 1402/1403 recommended)
- Bucket of Duct Mastic -with application brushes
- (2 rolls) 3" Foil HVAC tape (3m cold-weather tape recommended)
- Painter's tape (blue or green)
- Floor runners / canvas drops, shoe covers
- Box of low-lint shop towels (for cleaning nozzle assembly)

4.2 JOB SITE

Worksite

1. Perform a home walk-through:
   - Greet the homeowner and introduce team
   - Explain that a theatrical fog test will be used prior to injecting sealant so that any areas of overspray/damaged ductwork will be identified.
   - Verify number and sizes of registers in the home to be blocked.
     Use shoe covers and/or floor protection. (Look out for pets, infants, people with allergies).
2. Check for combustion appliances inside the home and determine if a Combustion Area Zone (CAZ) test is required.
3. Turn off HVAC. Deenergize the HVAC equipment attached to the duct system being sealed at the disconnect switch or circuit breaker.

4.3 EQUIPMENT SET-UP

Table 1. HSA Basic Package

	Item
1	Duct sealing machine in one box, laptop, laptop case
2	Required Accessories
3	Basic Supplies Kit
4	Sealant (4 gallons)

Table 2. HSA Standard Package

	Item
1	Duct sealing machine in one box, laptop, laptop case
2	Required Accessories
3	Advanced Supplies Kit
4	Sealant (20 gallons)
5	Wye Kit

4.4 PREPARATION

4.4.1 BLOCK DESIGNED OPENINGS

1. With the blade knife, cut the closed-cell foam ½” larger than the boot or space to be blocked. The foam expands and creates a tight seal.
   a. Boots: Insert the foam flush with 100% of the edges touching all four sides
   b. Larger Plenum or Trunk Lines: Add support to avoid bowing or collapsing lines during the seal.
2. Use medium-duty duct mask or roll mastic tape to do the following:
   a. Fully cover hard floor registers
   b. Apply around edges of carpet floor registers. Be sure to tuck in around the openings to create a barrier
   c. Fully cover the entire area around drywall registers. Apply mask over the entire diffuser area.

Note: Reopen dampers when finished.

4.4.2 SUPPLY AND RETURN

For the supply side of the duct system, the aerosol injection point is typically just downstream of the evaporator coil. Return side injection typically occurs just upstream of the fan at the return plenum, or sometimes thru the filter grille opening.

Careful inspection of the return system should be used to determine which end of the system is most appropriate for injecting sealant material. Return systems with multiple grilles are often best sealed by injecting near the plenum, whereas systems with one or two Filter Grilles are often best sealed by injecting at a Filter Grille.

4.4.3 FIND THE BEST LOCATION AND CUT INJECTION POINT

Choose injection technique (flange, wye, direct plenum) and position the HSA nearby. Measure out 36” layflat to connect the fanbox to the chosen injection technique while ensuring an 8 ft straight section is present immediately after the fanbox flange. Options / injection methods include:

- **Flange**: Cut into duct to create an 80 sq in round hole suitable for furnace isolation access. Attach flange to opening. Tape inside of plenum opposite of opening.
- **Wye**: Select two adjacent registers and connect layflat to the Wye kit.
- **Direct plenum**: Strap down or tape layflat to direct plenum access. Select an injection point near the HVAC equipment with the largest flange it can accommodate.

4.4.4 ISOLATE HVAC EQUIPMENT

Isolate HVAC using appropriate blocking material/technique (foam block, corrugated plastic, sheet metal, tape, etc.) to ensure no airborne sealant enters the equipment. Make sure the material makes a tight seal, holds internal pressure, and does not allow sealant to pass.

4.4.5 CONNECT LAYFLAT TO DUCT SYSTEM

Once the Aeroseal equipment is set up near the injection site:

- Attach 36” plastic layflat between the fanbox and injection point(s). Allow a minimum of 8’ straight and level before any turns or connections. This allows for the proper dehydration of the airborne sealant prior to entering the ducts.
- Engage the 10” clamp and insert the retainer pin. Connect the other end of the layflat to the injection point flange.
- Take care with the roll to avoid damaging the material.

Note: To avoid any low temperature or high humidity issues, as well as disturbing the layflat, it is recommended to bring the fanbox inside the home.

4.4.6 SET UP HSA

Table 3. Setup HSA

Item	Action
ELECTRICAL 	Identify and connect extension cords to three separate electrical circuits. The HSA requires three separate electrical circuits, each with the capacity to run 1500 Watts of power. The standard plug size for the three fanbox inputs are NEMA 5-15 (3-prong 120 V outlets). An alternate to using three separate outlets is to use 240/120 adapter plugged into 240 V utility outlet. A generator like a NorthStar c13000s commercial-grade portable generator with electric start with 13,000 surge watts and 10,500 rates watts is a good source of external power.
PRESSURE	Connect the pressure (blue) tube between the fanbox manometer and the furthest register/opening of the system being seal. • Measures and monitors positive duct pressure • Calculates and monitors leakage throughout testing and sealing • Placed into ducts at the furthest point from the injection point • Ensure clear path with no kinks, restrictions or damage to the tubing
SEALANT	Ensure a full gallon of sealant is placed into the fanbox, the sealant tubing is laced through the peristaltic pump in the proper orientation, and the sealant tube tip protrudes just beyond the nozzle tip. DO NOT STORE SEALANT IN FREEZING TEMPERATURES OR EXTREME HEAT. THIS WILL RENDER YOUR SEALANT USELESS. Optimum temperatures are 40°F to 120°F. Duct Seal sealant used in HomeSeal equipment does not require any special mixing. The equipment pumps undiluted sealant through special Master flex tubing. Sealant that has any lumps or coagulation should not be used. The steps are: 1. Inspect the sealant gallon for any signs of coagulation. 2. Replace the bottle cap with the sealant pick-up tube assembly. 3. Place the sealant jug in the HomeSeal box and connect the tubing from the sealant pump to the pick-up tube. Note: the pump tubing should be kept on the “blind” screw inside the HomeSeal box when the sealant container is not in use. Do not place the sealant jug in the HomeSeal Box until you are ready to seal.

4.5 LAPTOP & AEROSUITE

4.5.1 CONNECT LAPTOP TO FANBOX WIFI ROUTER

1. Turn on fanbox.
2. Find available WiFi networks.
3. Select the fanbox ID.
4. Connect to the WiFi.

If the laptop is out-of-range of the WiFi:

- At 20 seconds, the laptop has a clang sound. Regular operation can be resumed if connection is restored within 10 seconds.
- At 30 seconds, the laptop has a boat horn sound. The fanbox enters safe mode: fan on, pump off. Press START to resume operation.
- The laptop has a connection tone when it is back in range.

4.5.2 CONNECTIVITY & SYNC

After connecting to the Wifi network, log into AeroSuite using the Case ID for both username and password.

- Basic information about the system can be found in the **Settings** > **Registry** section of AeroSuite.
- For **Profile**, dealers enter their company information and logo.
- **About** identifies the software version, Aeroseal contact information, and the **Check for Updates** button. It is recommended to check for software updates frequently.
- **Component Checks** can be performed to ensure the equipment is in good operating condition.
- **Sync** is a critical function of AeroSuite. Per the licensing agreement, users must sync their systems every month. AeroSuite will prompt users to sync if more than 30 days has passed since the last sync.

4.5.3 WINDOWS UPDATES

Just like with all computers, Windows occasionally needs to perform updates. When prompted, perform the Windows update when connected to the internet.

5 OPERATIONS

Aeroseal HSA is intended for dealers and technicians trained in the use and maintenance of the sealing equipment.

5.1.1 BEST PRACTICES

During the preparation phase, consider the following best practices:

- Use ground fault protection when using household outlets
- Ensure ducts are thoroughly inspected
- Use a fog machine with high-density liquid to find leaks before sealing
- Take care not to push or pull sealant into the fanbox during sealing.

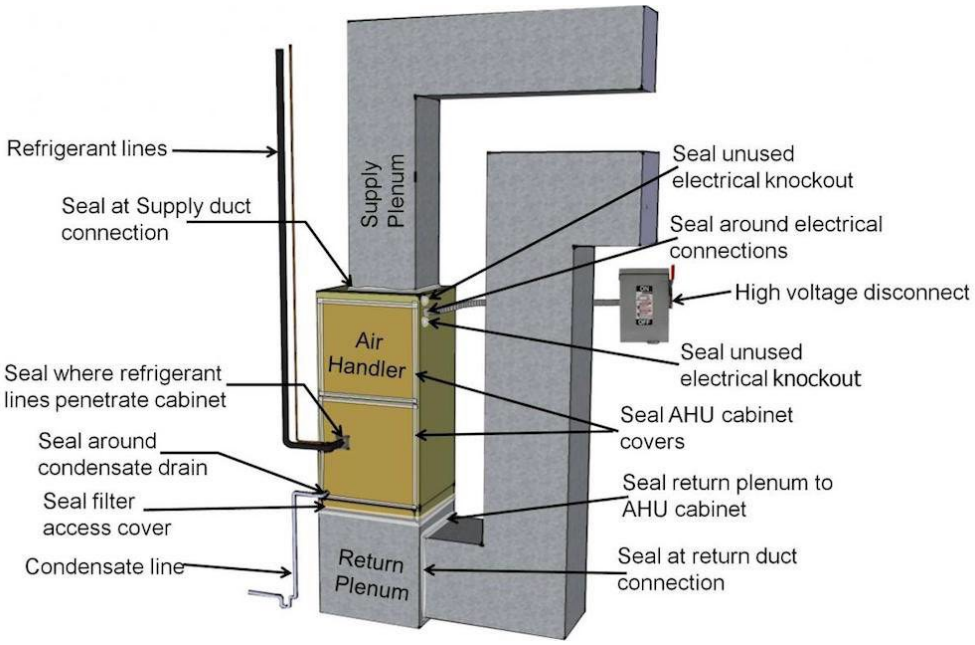

Figure 6. Ductwork System

5.2 AEROSUITE SOFTWARE OPERATION

After the worksite has been thoroughly prepared, the seal event is managed directly from the AeroSuite software.

To start a new job in AeroSuite, follow these steps:

1. Click **New Job**
2. Select the type of job being performed: **Residential Retrofit** or **Residential New Construction** (RNC).

CUSTOMER INFORMATION

3. Complete all the fields in the **Customer** screen.
4. Click **Save**.

ADDITIONAL INFORMATION

5. In the **Additional Info** screen, type notes and upload photos.
6. Click **Save**.
7. Watch the Combustion Area Zone (CAZ) video and check the **Acknowledge** box.

SYSTEM

8. In the **System** screen, type the system and seal event details.
9. Click **Save**. The new job with details displays.
10. Select the seal event and click **Next** to proceed to the PreSeal screen.
11. Follow The 5 F's to prepare the jobsite for a sealing event.

5.3 5 F's

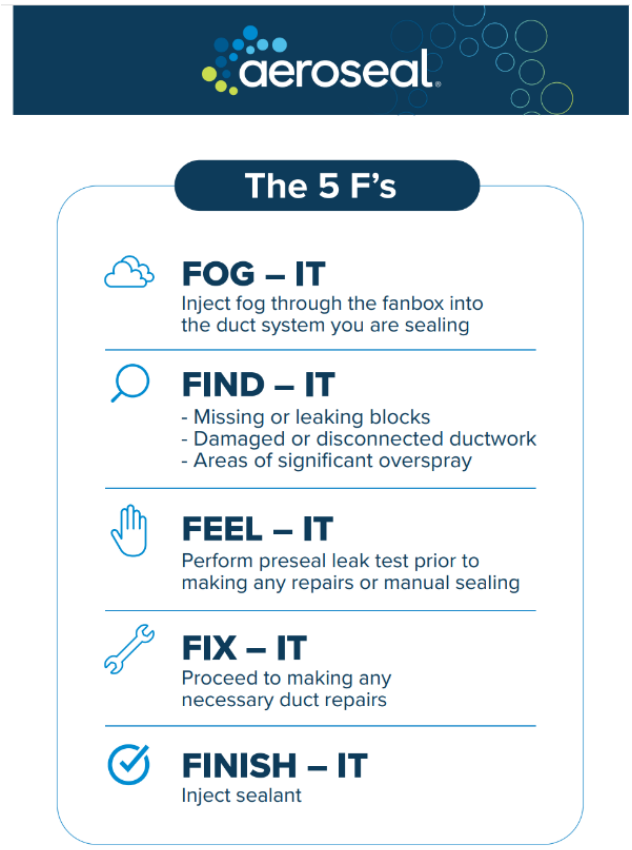

Figure 7. Five Fs

5.3.1 FOG IT: Inflate layflat/Perform fog test

Using the manual fan control knob, increase the fan speed just enough to ensure no twists/disconnects in the layflat are present. Avoid collapsing the layflat more than 50% of its internal diameter.

Using the fog machine, inject fog through the gate in the back of the machine to saturate the duct system to identify missed blocking, large holes, disconnects.

5.3.2 FIND IT: Search for fog in home

Using the fog as an indicator, visually determine where any missed/leaking blocks, duct damage/disconnections larger than 5/8", and/or areas of significant overspray are present. Fix any missed/leaking designed openings and use a scrubber fan as appropriate. (Add definition of defined openings into training materials)

5.3.2.1 SCRUBBER FAN SYSTEM

CAUTION: LIFT HAZARD

To minimize the risk of overspray in occupied spaces, use the provided high-volume, high-efficiency scrubber fan.

NOTE: Always use PLEATED FILTERS SPECIFICALLY DESIGNED TO CAPTURE SMALLER PARTICLES (MERV-14 Ultra Allergen or better).

1. Face the outlet of the scrubber in a direction where it is not blowing away from the homeowner's property or walls to avoid situations where small particles pass through the filters and be blown out of the fan outlet. If the fan outlet discharge is within 15 feet of any items or walls, those items or walls should be covered with a protective tarp to prevent any sealant from sticking to them.
2. Although the high-flow scrubber fan is fitted with small-particle filters should provide an acceptable environment, it is recommended that technicians wear N95 NIOSH approved dust mask when working in areas of high overspray concentration. The sealant is non-toxic and there should be no alarm to the homeowner, but the technician working in the presence of high overspray concentration day in, and day out should take the proper preventive precautions to avoid significant inhalation/ingestion of the Aeroseal sealant.

5.3.3 FEEL IT: PreSeal

NOTE: *The PreSeal leak test is recommended prior to making any manual and/or mechanical repairs or hand sealing. This ensures the seal certificate is as accurate as possible.*

Start the pre-seal leakage test using the software following prompts for gate changes.

1. Start the PreSeal on **Gate 2**. If the software suggests a change, adjust to the recommended gate.
2. Click **Start**. The PreSeal test runs. Be sure not to disturb the layflat or manometer tubing during the test.
3. When the PreSeal test is completed, the seal data displays. The data includes the total CFMs and square inches of leakage.
4. Click **Next** to continue to the Seal screen.

5.3.4 FIX IT: Make Necessary Repairs

The results of the PreSeal test may find openings that were overlooking during prep. Repair areas of leakage and block all missed openings.

5.3.5 SEAL

Start the seal and follow any software prompts to seal the duct system. During the seal, perform frequent safety checks throughout the home, looking for missing/loose blocks, areas of significant overspray. Pause the seal to address any concerns that arise.


CAUTION: DO NOT PUSH OR PULL AEROSOLIZED SEALANT into the fanbox, including electric heaters, bi-metal over-temperature protection switches.


Click **EMERGENCY STOP** at any time to stop the seal event.

1. Begin the Seal on the same gate setting as the PreSeal leak test.
2. During the warm-up, the system tests the nozzle for overheating.
3. If there are no problems, the dialog box states System Spraying.
4. At this time, look through the layflat and check that the spray cone looks good from the nozzle tip.
5. Watch the Leakage graphline to track the sealing progress.
6. When the leakage area is at or below 5 sq. in., the dialog box indicates proceeding with the Flush/Cool Down. **Note**: The seal can stop at 5 sq. in. If additional sealing is necessary, follow the Low Seal Protocols until 3 sq. in. At this time, the seal process must stop.
7. Click **Stop**. The seal event does not stop until Stop is clicked.

5.3.6 MINIMIZE OVERSPRAY

For residences that have a high risk of overspray (panned returns) use a conservative approach and lower the sealant injection rate initially (pausing pump periodically).

5.3.7 FLUSH COOLDOWN

Unplug both heater cords. Replace the sealant jug with the flush jug and proceed to the Flush/Cooldown screen. Open the lid of the fanbox during flush and cooldown. After completion of cooldown, close the fanbox lid.

1. Unplug the H1 and H2 cords from the fanbox.
2. At the **Flushing Time** field, select the numbers of minutes for the flush. The minimum is 2 minutes.
3. Click **Start**.
4. Once both flush and cooldown are complete, ensure the cylinder temperature is below 130 degrees before proceeding.
5. Click **Next** to continue to the PostSeal screen.

5.3.8 FINISH IT: Perform post-seal leakage test

Start post-seal leakage test. Continue to Certificate screen to view, print, and save the certificate.

1. With the gate set at the same setting during the seal, click **Start**. If the software indicates a gate change, adjust the gate to the recommended level.
2. When the PostSeal is completed, a message displays in the dialog box. Additionally, the PostSeal and Improvement data displays.
3. Click **Next** to proceed to the **Certificate** screen.

5.3.9 PRINT CERTIFICATE

From the **Certificate Option** field, select **Basketball**, **Bar Graph**, or **Line Graph** for the homeowner's certificate.

Print the certificate.

All homeowners shall be provided with a printed or electronic copy of the Certificate of Completion generated by or verifying the sealing job. After selecting Certificates in the Aeroseal Software Program on the certificate screen, place a blank sheet of paper into the printer and press print. Be sure to give the printed certificate to homeowner and provide a brief explanation of the results.

Note: Before you print out the homeowner sealing certificate, make sure that all Homeowner details (like name and address) are correct. After printing, all fields get locked, and you will NOT be able to make any further changes to the certificate.

5.3.10 CLEAN UP

Clean nozzle assembly

Remove and clean the nozzle tip assembly using the provided brushes and cleaner per cleaning work instructions.

Remove blocking and isolation/Return equipment to vehicle

Disconnect power from HSA, remove layflat, and pack out equipment to vehicle. Take appropriate steps to remove isolation of HVAC and patch holes as needed.

Restore home to working order

Return power to the HVAC system and ensure proper operation of equipment. Return any smoke alarms/security systems to their original condition and remove all trash.

6 MAINTENANCE

6.1 ROUTINE MAINTENANCE SCHEDULE

Table 4. HSA Maintenance Table

	EVERY SEAL	DAILY	MONTHLY	DURATION
REPLACE NOZZLE ASSEMBLY	X			2 MINS
CHECK AIR FILTERS		X		2 MINS
CLEAN EXTERIOR OF EQUIPMENT WITH BUCKEYE WORKOUT CLEANER			X	5 MINS
CLEAN AND FLUSH INLET CHECK VALVE			X	20 MINS
REPLACE 25 MICRON FILTER AND CLEAN FILTER HOUSING			X	20 MINS
LAPTOP: AEROSUITE SYNC AND UPDATE			X	5 MINS
LAPTOP: COMPLETE WINDOWS UPDATE			X	10 MINS

IMPORTANT:

- The HSA must not be stored in freezing conditions as the pump/reservoir is always filled with fluid. Allowing the pump/reservoir to freeze can crack the pump casting and void the manufacturer's warranty.
- If the HSA is used only once-a-month, drain the sealant before storage. Sealant can dry and clump.

6.2 CLEANING PROCEDURES

Replace Nozzle Assembly

Follow these steps to replace the nozzle:

1. With the nozzle tool included in the parts kit, unscrew the clogged/used nozzle.
2. From the parts kit, select a new nozzle.

3. Using the same tool, screw in the new nozzle. Be sure to tighten both the body and the head.

Clean Valves and Filters

Clean the inlet check ball valve and 25 micron filter housing once a month to prevent sealant from accumulating.

Flush the Reservoir

1. With your hands, pop off the service panel from the HSA fanbox.
2. Inside the fanbox, pinch closed the white clamp on the sealant hose.
3. Loosen the clamp and remove the hose from the barbed fitting.
4. Open the fanbox lid.
5. Unscrew the black reservoir cap.
6. Place a jug under the hose to capture leftover sealant.
7. Flush the reservoir with clean water. Repeat until the reservoir and hose are completely free to sealant.

Disassemble Check/Ball Valve

1. Use an adjustable wrench to remove the inlet barb.
2. Use the four-pronged pickup tool to remove the ball and spring from the valve housing.
3. Thoroughly clean the parts with Buckeye Workout Cleaner. Make sure the parts are washed and rinsed with no sealant debris on the ball, spring or barbed fitting.
4. Flush the valve body thoroughly with clean water. Make sure all sealant is cleaned out.

Re-assemble Check/Ball Valve

1. Place spring into the valve in the upright position.
2. Place ball on spring.
3. Replace barb fitting and tighten with the adjustable wrench.
4. Reconnect hose and clamp.

Flush the Pump

1. Release the white clamp from the hose.
2. Add water to the reservoir.
3. Open AeroSuite. Navigate to Connections and click Pump>Flush/Drain>Start. The pump runs and purges sealant from the pump.
4. Turn the value to the Drain position.
5. Attach flush tube and place a bucket under the tube.
6. Flush pump with clean water until water runs clear. Repeat as needed.

Clean Pre-Filter Nozzle Assembly

1. Loosen the set screw, back out all the way, and lift upwards and forwards from retainer bracket.

2. Remove lid with two wrenches. Do not remove braided tubing from the filter housing.
3. Remove the inner filter and springs from the housing using the adjustable wrench.
4. Replace the filter.
5. Flush the housing thoroughly, removing any sealant buildup. Use brushes and cleaner to remove all sealant chunks. Flush with clean water.
6. Reassemble the filter and spring coils into filter housing and tighten with the adjustable wrench.

6.3 SERVICE & REPAIR PARTS

6.4 Accessories & Spare Parts Kit

6.4.1 HomeSeal Advance Basic Package

- Duct sealing machine in 1 box, laptop, laptop case
- Required Accessories
- Basic Supplies Kit
- Sealant (4 gallons)
- Training at Aeroseal HQ (Technical & Kickstart)

Table 7. Basic Package

ALL PURPOSE CLEANER (12 QUART SPRAY BOTTLES PER CASE)	1
LAYFLAT TUBING 36" 275'/ROLL	1
BLUE DUCT MASK	18
Corrugated Plastic	3
FOAM, CLOSED CELL	8
LIQUID, FOG JUICE	1
FOG MACHINE	1

6.4.2 HomeSeal Advance Standard Package

- Duct sealing machine in 1 box, laptop, laptop case
- Required Accessories
- Advanced Supplies Kit
- Sealant (20 gallons)
- Wye Kit
- Training at Aeroseal HQ (Technical & Kickstart)

Table 8. Standard Package

ALL PURPOSE CLEANER (12 QUART SPRAY BOTTLES PER CASE)	1
LAYFLAT TUBING 36" 275'/ROLL	2
BLUE DUCT MASK	24
Corrugated Plastic	6
FOAM, CLOSED CELL	8
LIQUID, FOG JUICE	1
FOG MACHINE	1

Table 9. Spare Parts Kit

STANLEY SORTMASTER LITE ORGANIZER 17.4"L X 13"W X 3.4" H BLACK YELLOW CLEAR	1
TOOL, WIRE BRUSH KIT	1
TOOL, DENTAL PICK SET	1
DAILY USE NOZZLE, .004" TYPE NFN, HSA, SS - EPDM SEALS	25
TOOL, NOZZLE ASSEMBLY, BLUE	2
JAR, 1 OZ WITH LINED CAP, CLEAR	1
TUBE ASM, NOZZLE FLUSH	2
FILTER ELEMENT, SINTERED, 25u	2
TOOL, 4-PRONG PICKUP	1
SCREW ASM, 10-24 KNURLED THUMB W/ WASHER	2
WRENCH, ADJUSTABLE, 8"	1
TOOL, NUT DRIVER, 3/8" HEX	1
TOOL, 1-1/2" & 7/8", DOUBLE SIDED WRENCH	1
TOOL, TWEEZER, FINE POINT, 3.5 INCH, SS	1
TUBING, 3/16" X 3/8", PEROXIDE CURED SILICONE CLEAR	2
SPRING, COMPRESSION, MAGNUM X5 PUMP	1
CERAMIC BALL, MAGNUM X5 PUMP	1
TUBING, 1/8" X 1/4", 70A SOFT, PU, BLUE	0.7
FITTING, UNION BARB, 1/8" BARB, PLASTIC	2
SCREW, #6 X 2", P, FH, SELF TAP, STEEL, BLACK PHOSPHATE	10
WASHER, SELF-LOCK, #10 X 1.5", SS	10
O-RING, 7/16 ID X 9/16 OD, 70A, EPDM	5
TOOL, 1-3/8" & 11/16", DOUBLE SIDED WRENCH	1
TOOL, NUT DRIVER, 11/32" HEX	1
st for Build	0.3

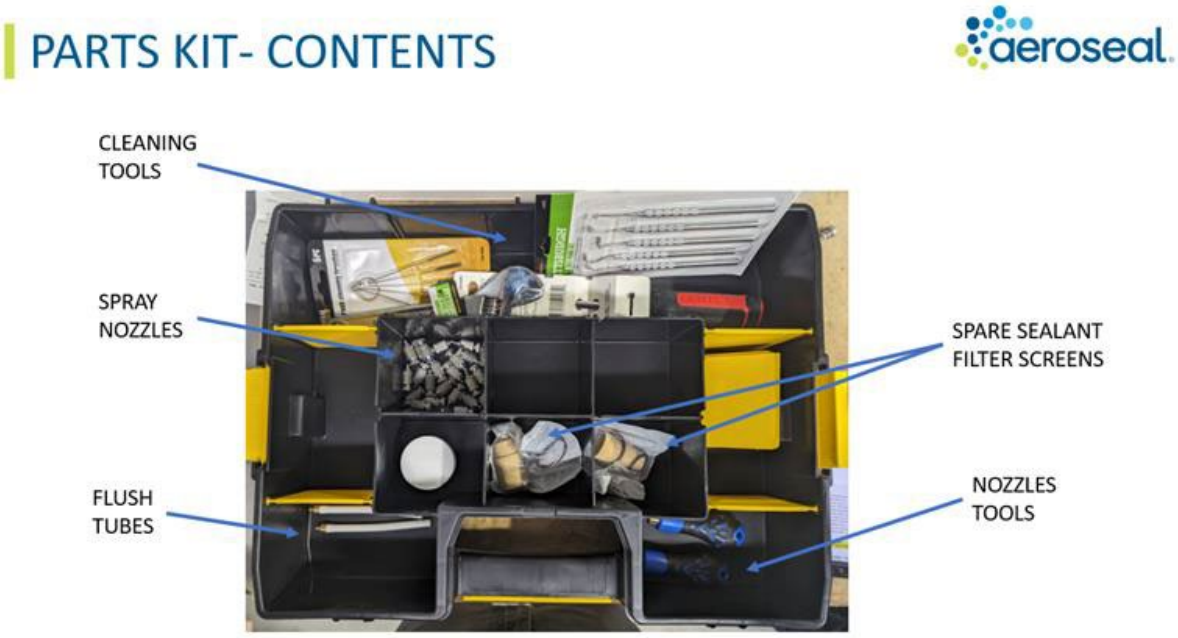

Figure 8. Parts Kit

7 TROUBLESHOOTING & FAQ

Troubleshooting for AeroSuite Software Errors and Alarms

Problem	Blown Seal Alarm
Source	Software detects a sudden change in duct pressure
Solutions	1. **Check blue tube** Ensure blue tube is connected to duct system and to the manometer 2. **Close fanbox lid** Ensure the fanbox lid is properly locked 3. **Look for disconnected ducts** Inspect the duct system for any large breaks or holes

Problem	Low Duct Pressure
Source	Occurs when the system cannot create the minimum of 10 Pa for sealing or 5 Pa for leak testing
Solutions	1. **Check Blue Tube** Make sure the blue tube is not obstructed, pinched, loose, or disconnected at ductwork and/or fanbox 2. **Look for disconnected ducts** Perform fog test. Find any damaged or disconnected ducts. 3. **Check fan and layflat** Make sure the fan is on and layflat is connected to the fanbox. 4. **Check all blocking and isolation materials for failure** 5. **Check for any bypass duct work attached between supply and return** Examples include bypass humidifiers, barometric zone bypass duct/dampers

Problem	Low Fanbox Pressure
Source	Occurs when not enough negative pressure inside the fanbox to calculate leakage
Solutions	If the software does not make a gate change recommendation: 1. **Close fanbox lid** Ensure the fanbox lid is properly locked 2. **Check manometer port** Make sure the manometer port is not clogged in the fanbox

Problem	Low Duct Flow
Source	Not enough air is going through ducts. Also indicates ducts are sealed.
Solutions	1. **Close fanbox lid** Ensure the fanbox lid is properly locked 2. **Check fanbox filter** If the filter needs to be replaced, use only MERV-1 filters 3. **Still high?** Open inlet gate and increase fan speed in manual mode

Troubleshooting Hardware

Problem	Digital manometer and/or control board not found
Solutions	1. **Check AeroSuite software for a pending update** Connect the laptop to the internet. Do not connect using a mobile hotspot. If prompted to update the software, click **Yes**. 2. **Check Blue Tube** Make sure the blue tube is not obstructed, pinched, loose, or disconnected at ductwork and/or fanbox 3. **Check power to fanbox** Unplug the fanbox and wait 30 seconds before plugging in.

Problem	WiFi
Solutions	1. **Power down to restart Wifi connection** Unplug the fanbox and wait 30 seconds before plugging in. 2. **Use the USB cable**

Problem	No Power
Solutions	1. **Check power source(s) with a multimeter** 2. **Use separate circuits for the heaters and fanbox.** The main power for the HSA draws 3 amp, each heater draws 13 amp.

Problem	Don’t Know Log-in
Solutions	1. **A sticker with the username and password is on the top of the laptop.**

Problem	Can’t sync
Solutions	Sync is required every month.

	1. **Connect the laptop to the internet.** Use the internet, not a mobile hotspot, to update the software. 2. **Run Windows updates** 3. **Log into AeroSuite and click Sync to finish the update.**

Problem	**Computer and Software Update/Spinning Update Icon**
Solutions	1. **Power down the laptop, wait 30 seconds and turn it back on.**

8 APPENDIX

8.1 APPENDIX A: Job Checklist

Sealing Supply & Return

Use this checklist when sealing both supply and return.
Estimated Total Time: 4:25 hours. Estimates may vary.

Task	Lead	Helper	Time (Min)
Arrive at the job site / perform a home walk-through	✓	✓	15
Check for combustion appliances	✓		5
Turn off HVAC		✓	
Bring in the equipment	✓	✓	15
SUPPLY: Cut injection point	✓		25
Block all registers		✓	
Isolate HVAC system	✓		25
SUPPLY: Attach layflat		✓	
Set up HSC		✓	
Open AeroSuite		✓	
Inflate layflat/Perform fog test [FOG IT]	✓	✓	5
Search for fog in home [FIND IT]	✓	✓	30
Determine and cut injection point (Return)	✓		
Perform the pre-seal leakage test [FEEL IT]		✓	
Repair major duct damage/ disconnects [FIX IT]		✓	
RETURN: Cut injection point	✓		
Perform the pre-seal leakage test [FEEL IT]		✓	
Repair major duct damage/ disconnects [FIX IT]		✓	

Task	Lead	Helper	Time (Min)
RETURN: Isolate HVAC system	✓		30
RETURN: Attach layflat		✓	
SUPPLY: Seal the duct system		✓	
Perform flush and cooldown	✓	✓	5
Perform post-seal leakage test/ Print certificate [FINISH IT]	✓	✓	5
Inflate layflat/Perform fog test [FOG IT]	✓	✓	5
Search for fog in home [FIND IT]	✓	✓	15
Perform the pre-seal leakage test [FEEL IT]	✓	✓	5
Repair major duct damage/ disconnects [FIX IT]	✓	✓	10
RETURN: Seal the duct system	✓		30
SUPPLY: Remove blocking		✓	
Perform flush and cooldown	✓	✓	5
Perform post-seal leakage test/ Print certificate [FINISH IT]	✓	✓	5
Remove layflat	✓		10
Clean nozzle		✓	
Remove blocking	✓	✓	15
Return equipment to vehicle	✓	✓	
Restore home to working order	✓	✓	5

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8.2 APPENDIX B: SDS

DUCT SEAL LT

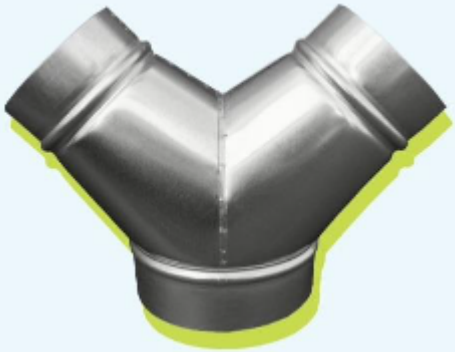
Ductseal LT is a stable, non-toxic, non-flammable water-based emulsion of acrylic polymer.

www.aeroseal.com/sds

8.3 APPENDIX C: WYE KIT

Wye Kit

The Wye Kit is intended to split the flow of aerosolized sealant into two streams to deal with tricky situations



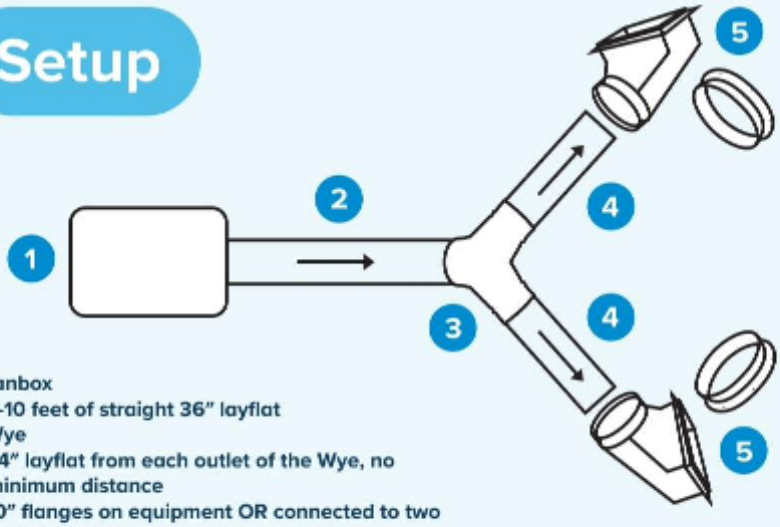
USE 1

Sealing both the supply and return of small HVAC systems at the same time – up to 300 CFM of starting leakage

USE 2

Sealing systems with limited access to the trunk or plenum

Setup



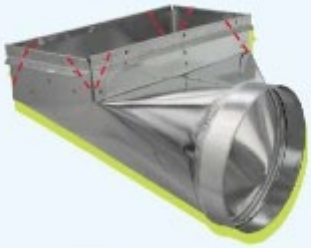
1. Fanbox
2. 8-10 feet of straight 36" layflat
3. Wye
4. 24" layflat from each outlet of the Wye, no minimum distance
5. 10" flanges on equipment OR connected to two registers with reverse boot connections*

*If injecting two different trunks, the Blue Tube "T" must be used to accurately measure pressure from both sides

Reverse Boot Assembly

STEP 1

Find a 90° register boot of the same size as the existing opening, ideally with an 8" or greater duct connection



STEP 2

Cut the boot at the corners to allow it to slip inside the ductwork

STEP 3

Secure with foil tape on both the inside and outside

STEP 4

Use a nylon cable tie to attach 24" layflat to the reverse boot

8.4 APPENDIX E: Technical Data Sheet

Technical Data Sheet
HomeSeal Advance

aeroseal DUCT

SECTION 1: Product Details

Product Name HomeSeal Advance

Description Patented Aeroseal duct sealing system with built in wireless and GSM modules suitable for residential applications. The unitary system includes "Aerosuite" software that controls the machine and provides a user-friendly interface for monitoring sealing process, measuring PreSeal and PostSeal leakages, and printing certificates.

User Interface Laptop with Aerosuite Software

SECTION 2: Product Specifications

Power Requirements	3 X 120V/15A – HSA Core System
Power	3300W (three separate circuits required)
Communication	USB, Wifi, GSM
Wifi range	200 ft. *Wifi range is dependent on ambient weather conditions, home construction materials*
Operating temperature	40 °F to 140 °F
Storage temperature	Above 32 °F
Weight	75 lbs.
Dimensions	21" (l) x 18" (w) x 28" (h) 3.93 ft^3
Frequency	60 Hz

2025-AR-HSADataSheet

225 Byers Road, Miamisburg, OH 45342 aeroseal.com

Sealing range	Up to 1600 CFM_{25} (Pduct > 10 Pa)
Measurement range	15 to 1600 CFM25 (+/- 5% Accuracy)
Fan capacity	600 CFM
Add-on fan capacity	N/A
Fan static (max)	660 Pa
Sealant injection	Dual speed pump (0-48 ccm/58 ccm depending on operating conditions)

SECTION 3: Other Utilities / Accessories Needed for Aeroseal Process

	MINUMUM REQUIREMENTS
Generator (optional)	6500W (for operating machine and accessories)
Air scrubber	> MERV 13 filtration (3 - 10 micron particles) capability 1 x 120V/10A; 1200W power requirements
Oil and moisture filter (recommended)	Regenerative dryer with an oil coalescent filter to deliver clean, oil-free, and dry air

8.5 APPENDIX F: Training Videos

201 Static Pressure Testing - Aeroseal Retro Residential Duct Training

201 IR Camera - Aeroseal Retro Residential Duct Training

201 CAZ Testing - Aeroseal Retro Residential Duct Training

201 Anemometer Testing - Aeroseal Retro Residential Duct Training

101 WYE Kit Use - Aeroseal Retro Residential Duct Training

101 Tools and Materials - Aeroseal Retro Residential Duct Training

101 Toe Kick Supply Registers - Aeroseal Retro Residential Duct Training

101 Sealing Homes with Panned Returns - Aeroseal Retro Residential Duct Training

101 Manometer Blue Tube - Aeroseal Retro Residential Duct Training

101 Fog Testing SOP - Aeroseal Retro Residential Duct Training

101 Fan Flow - Aeroseal Retro Residential Duct Training

101 Blocking and Isolation - Aeroseal Retro Residential Duct Training

AeroSuite Overview Video