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AEROBARRIER-SELECT OPERATIONS MANUAL

aeroseal® ENVELOPE

2024

AEROBARRIER SELECT ENVELOPE SEALING OPERATIONS MANUAL

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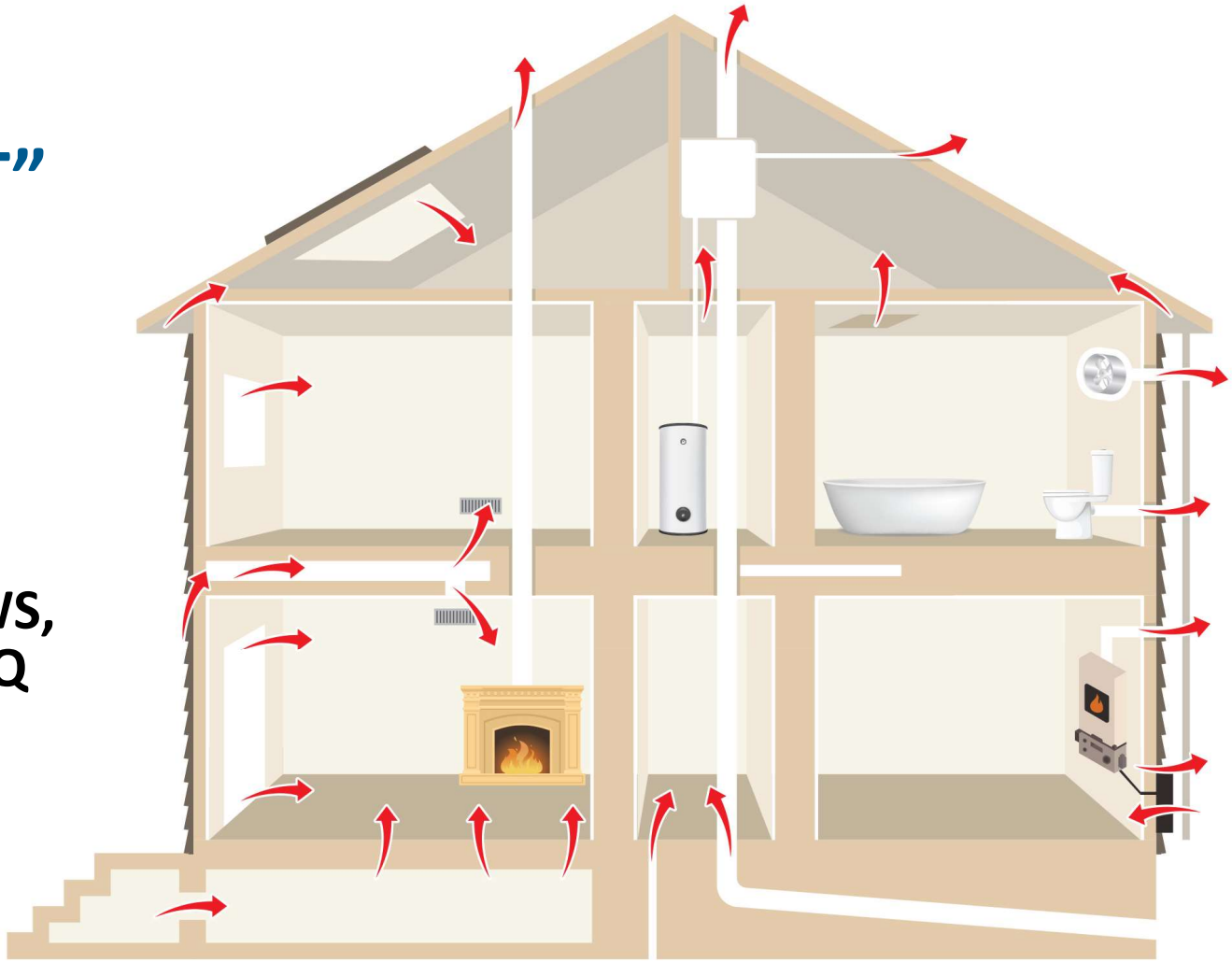
“MAKE IT TIGHT VENTILATE RIGHT”

HOMES LEAK AIR

- INFILTRATION
- EXFILTRATION

UNCONTROLLED AIR FLOWS, DEFEAT COMFORT AND IAQ



Air Sealing Trouble Spots

1. Air Barrier and Thermal Barrier Alignment
2. Attic Air Sealing
3. Attic Kneewalls
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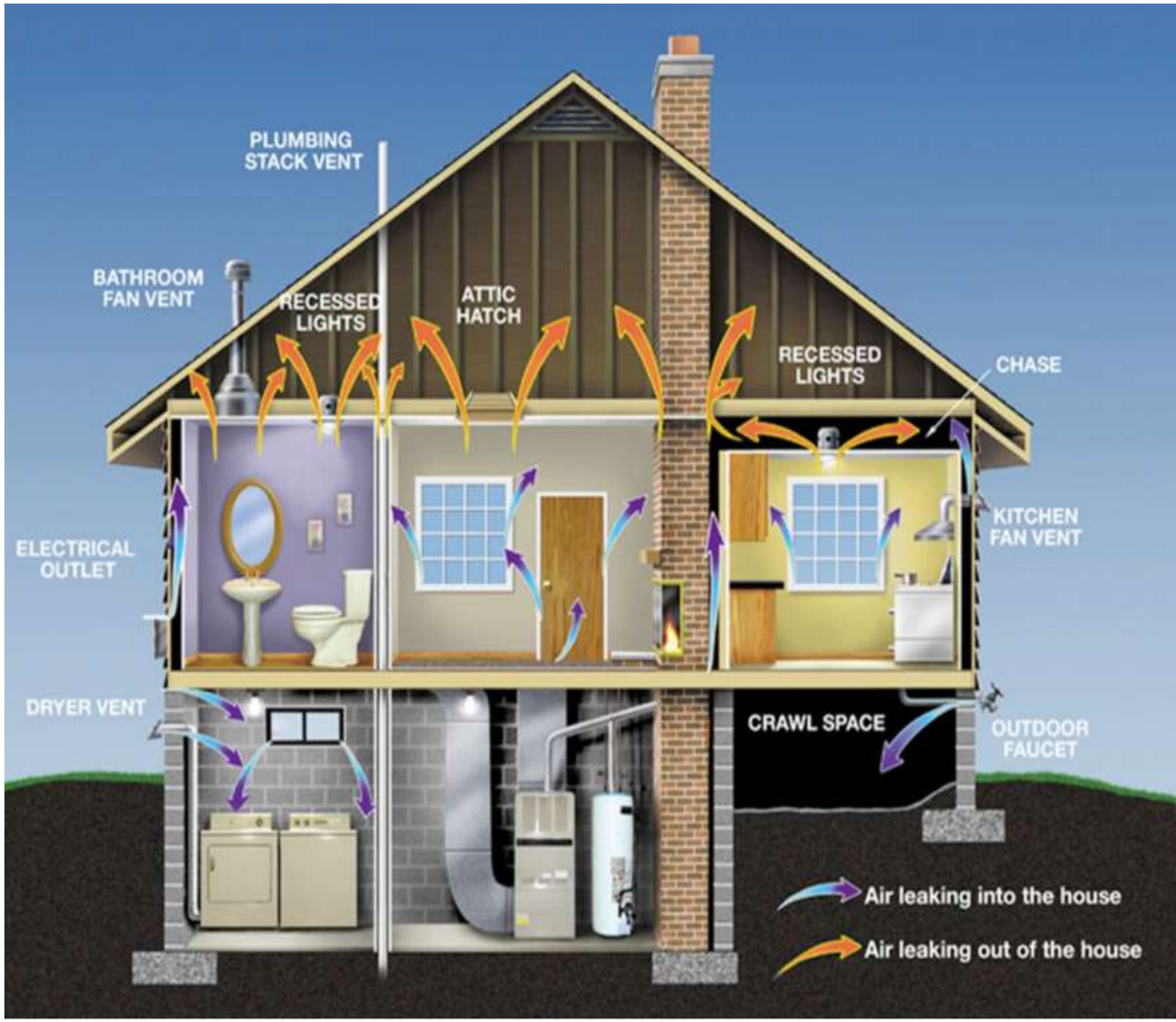
"MAKE IT TIGHT VENTILATE RIGHT"

HOMES LEAK AIR

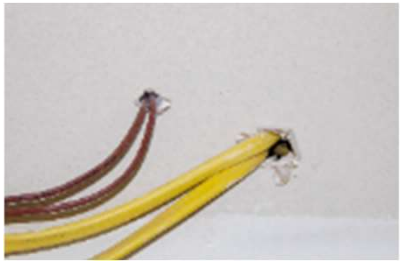
- INFILTRATION
- EXFILTRATION

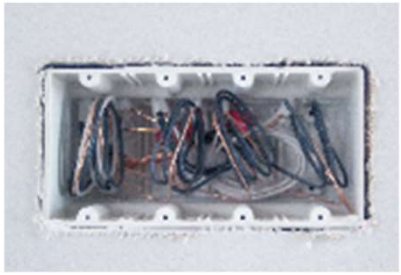
UNCONTROLLED AIR FLOWS, DEFEAT COMFORT AND IAQ



Types of Leakage in a Building Envelope

- Top & Bottom Plates
- Drywall leaks
- Stud leakage
- Boot leakage





Top & Bottom Plates

- These leaks are found as gaps between the drywall and ceiling/subflooring

Video of this process

Stud Penetrations

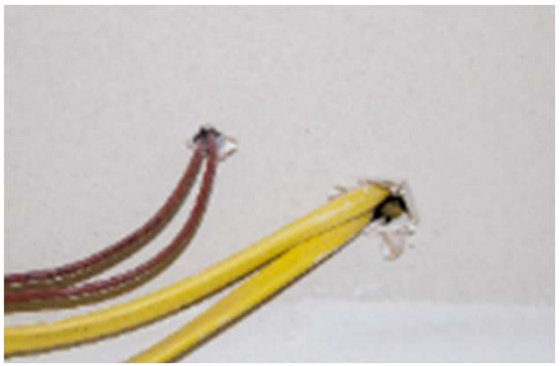
- Behind the drywall, these gaps are sealed by the sealing process

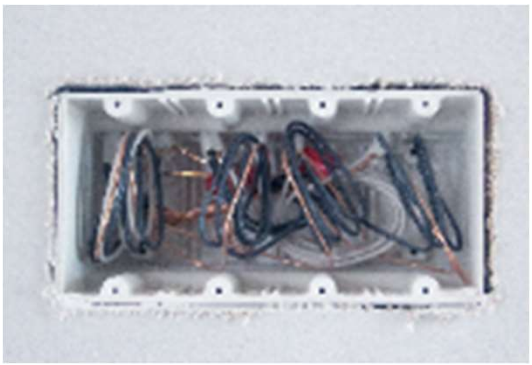
Drywall Penetrations to be sealed

The gaps in the drywall around:

- Electrical Wires
- Lighting fixtures
- Outlets
- Plumbing
- Dryer vent
- Windows and Doors
- Bathroom / Kitchen Exhaust
- Audio equipment/speakers

*Sealant can travel past the interior gaps and seal leaks beyond





Efficiency Demands Are Higher

Air-sealing requirements for new construction is becoming increasingly more difficult. Many states throughout the US have already adopted the 2018 International Energy Conservation Code (IECC) requirement of 3 ACH_{50} and more states and municipalities will follow. **You need to prepare now.**

Air sealing with the Aeroseal Envelope process can help you meet or exceed the 2018 IECC requirements every time, guaranteed. AeroBarrier reduces outside air infiltration up to 70%

2009 IECC Requirements = 7 ACH_{50}
Equivalent to 15” x 15”hole in home

Energy Star 3.0 = 5 ACH_{50}
Equivalent to 13” x 13” hole in the home

2018 IECC Requirements = 3 ACH_{50}
Equivalent to 10” x 10” hole in the home

What is Aeroseal Envelope ?

- It is a proprietary technology that takes the guesswork out of air sealing and allows you to achieve consistent air sealing results.
- Can be applied at any time after rough-in and prior to occupancy, if the space can be pressurized
- Offers guaranteed measured results
- Can seal leaks up to ½ inch

How Envelope Sealing Works

SINGLE-FAMILY

MULTI-FAMILY

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Terminology-Building Terms /Metrics

- **Air Barrier** - systems of materials designed and constructed to control airflow between a conditioned space and an unconditioned space. The air barrier system is the primary air enclosure boundary that separates indoor (conditioned) air and outdoor (unconditioned) air. AeroBarrier is **not** a primary air barrier.
- **Building Envelope-** The conditioned space of a building that is enclosed by the Air Barrier
- **Pascals (Pa) -** the standard unit of pressure or stress in the International System of Units (SI), equal to one newton per square meter. (example: 6,894pa = 1psi)
- **ACH50 -** air changes per hour at 50 pascals (Pa) pressure differential. It is the number of times the air volume in a building changes per hour at 50 Pa of pressure.
- **CFM50 -** the airflow (measured in cubic feet per minute) from the blower door fan needed to create a change in building pressure of 50 pascals.
- **Building Volume**- The total amount of the air enclosed inside of a building. It is measured in Cubic Feet(ft^3)

Basic Building Science Terminology

Terminology -Calculations

- **Calculating Building Volume**-When calculating building volume, you multiply the Square footage of the house by the average ceiling height(ft^2 x avg H)
- **Calculating ACH50 using CFM50**-To Calculate ACH50 using a CFM50 leakage, you multiply the CFM50 leakage by 60 and divide it by the building volume. (cfm50 x 60/ ft^3)
- **Calculating CFM50 using ACH 50**-To calculate CFM50 using an ACH50 leakage, you multiply the ACH50 by the building volume and divide it by 60. (ACH50 x ft^3/ 60)

Terminology -Devices

- **Main Control Unit (MCU)** – The main machine in the Aerobarrier System. Contains the electrical outlets and Wi-Fi router
- **Sealing Stations** – The supplementary machines that distribute sealant in the envelope
- **Manometer**-Device used to measure the pressures of the envelope and blower door fan (AB connect uses a Retrotec monometer)
- **Envelope Pressure-** Blue tube **The positive pressure** of the envelope. It is measured in pascals. It requires **10 Pascals** or higher to calculate leakage
- **Fan Pressure Tube**- RED tube It measures the amount of **negative pressure** the fan is pulling. It is measured in pascals. It requires **–10** Pascals or **Below** to calculate leakage. **Note:** On program's Pre-Seal/Post-Seal and sealing screens, this **(-10)** shows as a **(10)**
- **Blower Door** - a machine used to measure the airtightness of buildings. It can also be used to measure airflow between building zones, to test ductwork airtightness and to help physically locate air leakage sites in the building envelope.
- **Fan Inlet Ring** – Is an orifice used to restrict the amount of air going into the fan - tighter ring = less outgoing air

The Sealant

AeroBarrier X1: An inert sealant based on permeable waterborne acrylic

- Green Guard Gold Certified
- National Green Built Standard Certified Product
- Ultra-Low VOC (Volatile Organic Compounds) / No Off-Gassing

Meets:

- ASTM 2178 - Air Sealing Material
- UL 263 (Fire Resistance)
- CAN-ULC-S101 (Fire Resistance, Canada)
- CAN-ULC-S102 (Flame Spread and Smoke, Canada)
- UL 2818 (Green Guard Gold Certificate)
- ASTM C719 - Sealant Durability
- ASTM D543 - Chemical Compatibility
- ASTM E2357 – Air Leakage in wall assemblies

Safety

- Operation of this equipment can be hazardous due to mechanical and electrical components. Only trained / Certified Aeroseal Technicians, should operate and service this equipment.

- When working on this equipment, observe precautions in the Operations Manual, on tag, and on labels attached to or shipped with the equipment. Follow all safety instructions.

- Follow all local and national codes.

Section 2

Scope of Work

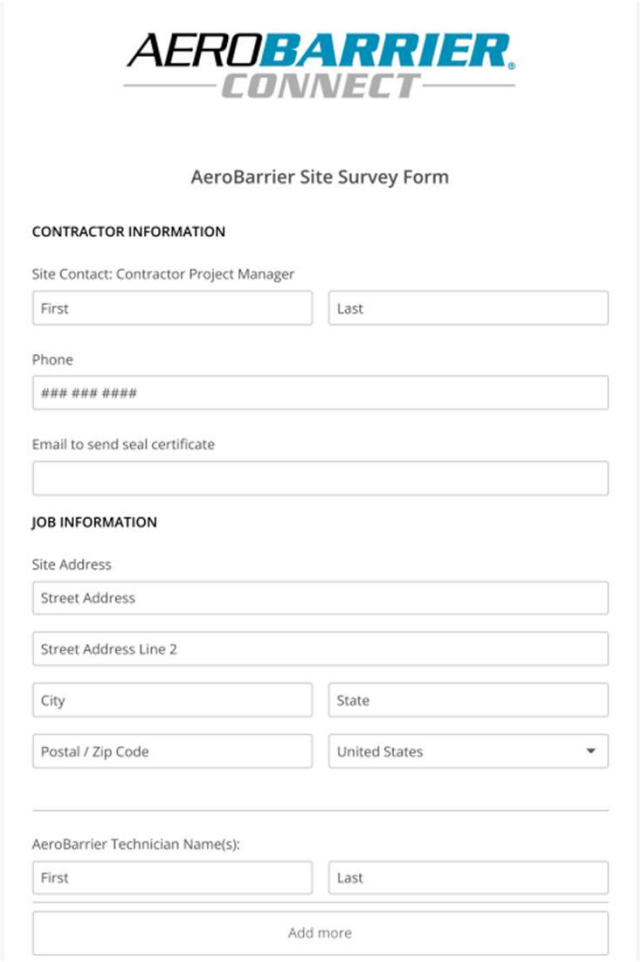
Communicate to Builder

- Ensure the builder has the envelope ready for the seal
- Make sure the builder has parking space for the trailer within 100ft of the injection point.
- In cold weather, (below 50 degrees F) ensure builder has the structure heated
- Obtain the Structural Volume (from the plans) of the envelope to be sealed
- Avoid other subcontractors working on structure during the sealing process.

Necessary Items to know Prior to Seal

- Square footage and building volume
- ACH50/CFM50 requirements
- Number of items needing to be prepped (windows, doors, etc.)
- Stage of construction of the structure to be sealed.

Aerobarrier Site Survey Form


AEROBARRIER CONNECT

AeroBarrier Site Survey Form

CONTRACTOR INFORMATION

Site Contact: Contractor Project Manager

First | Last

Phone

####

Email to send seal certificate

JOB INFORMATION

Site Address

Street Address

Street Address Line 2

City | State

Postal / Zip Code | United States

AeroBarrier Technician Name(s):

First | Last

Add more

The Aeroseal Envelope Process

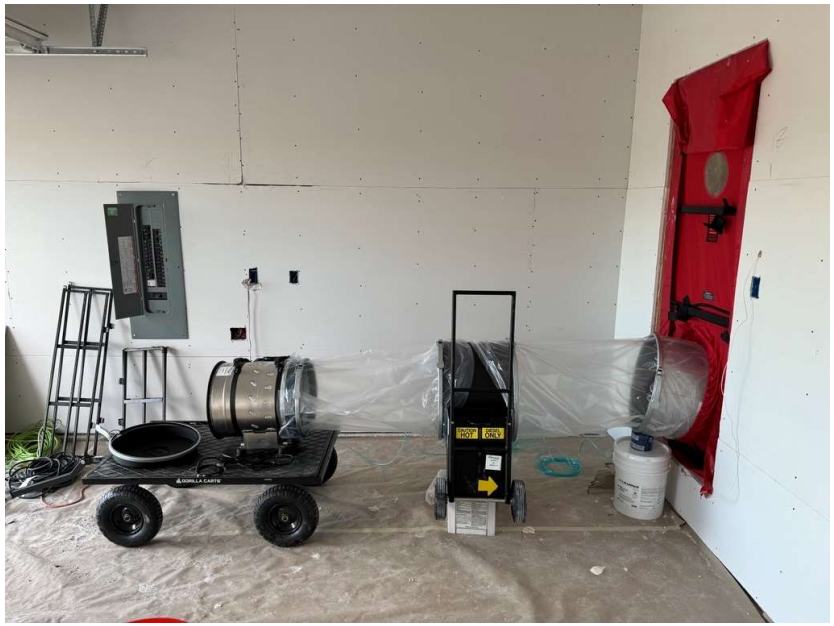
STEP 1:

Prepare house for sealing. Cover all large DESIGNED openings (drains, bathroom vents, etc.) and horizonal surfaces, set up sealing equipment, and pressurize home.

The Aeroseal Envelope Process

STEP 2:

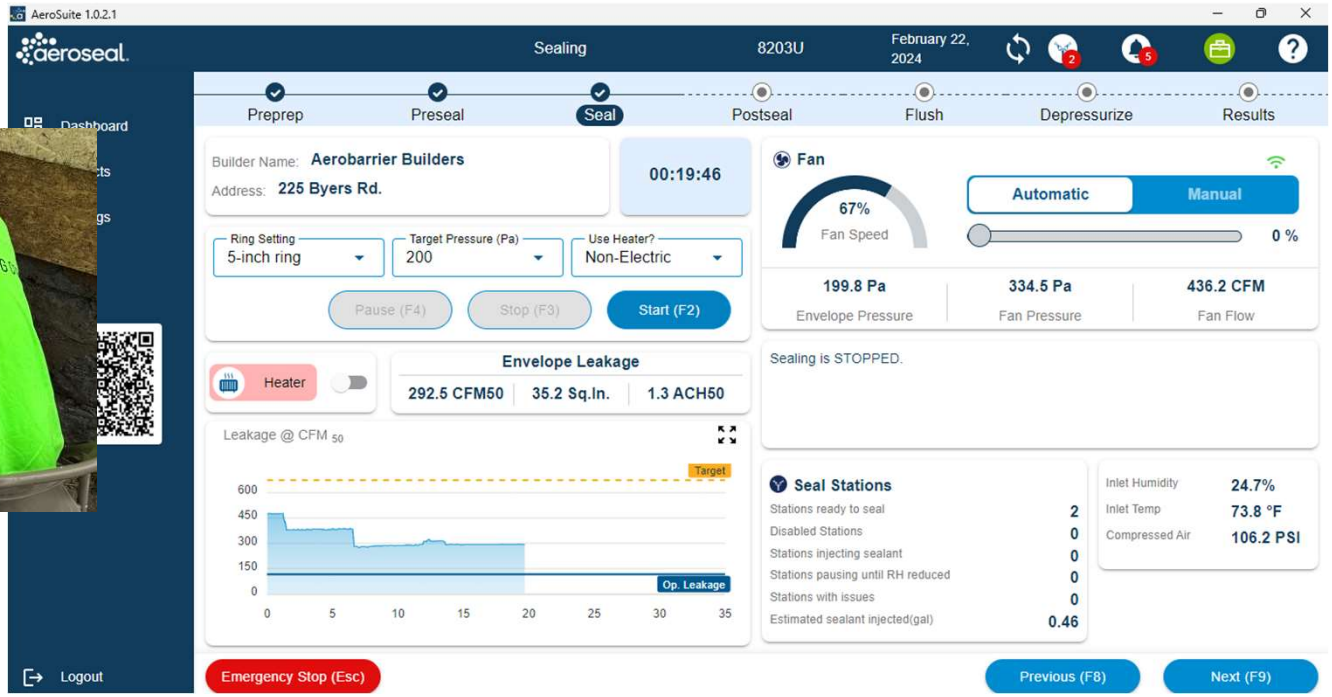
After baseline leakage is determined, pressurize the space and the sealing stations begin the sealing process



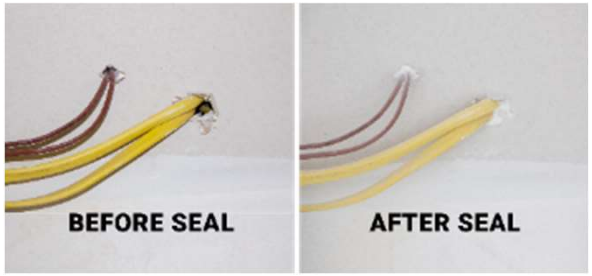
The Aeroseal Envelope Process

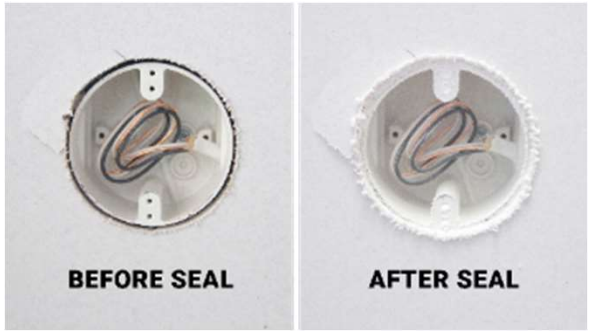
STEP 3:

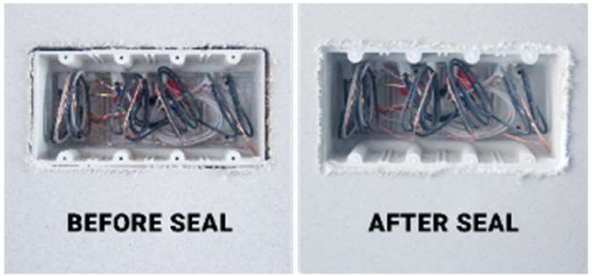
The software regulates the entire process; controlling all parameters, monitoring the sealing, recording all data, and verifying air-tightness target is achieved.



Types of Leakage Sealed







Section 3

SET UP & SEALING

STANDARD OPERATINING PROCEDURE

Arriving at the jobsite

- If possible, position equipment in an area away from wind and rain. (i.e. garage)
- Make sure other trades are out of the envelope during sealant injection
- Determine blower door/fan injection point, seal station location and quantity of seal stations.
- Locate big openings and entry / exit points.
- Walk through envelope to scope amount of prep-work and look for any unforeseen prep work(i.e. missing windows, chase walls etc.).

Prepping the Envelope for Seal

Preparation of the envelope is the most time-consuming part of the job

The Goal:

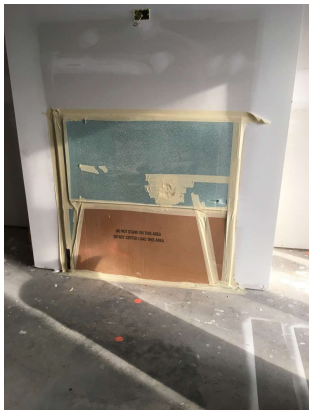
Prep the house to ensure:

- Minimal clean up
- Protection of designed opening and other components within the space that you don't want to be sealed
- Maximum seal efficiency

Understand why we prep

Understand the implications of prep work

1 - Scoping out the Jobsite for Prep



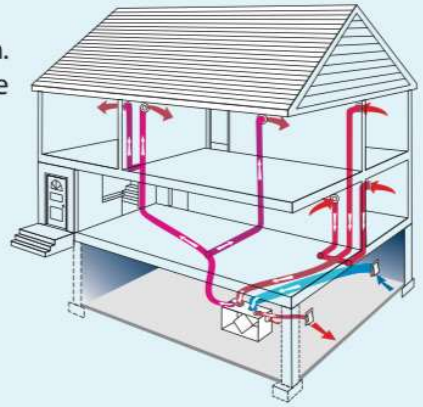
Prep Work Outline

What to look for:	How to Prep:
Big Holes	Manually block (with foam or duct mask) or seal with caulk/can foam
Vents	Use duct mask on all HVAC supply and returns (ensure the gap between the duct boot and drywall is left open so it can be sealed). All exhausts grills, bathroom vents, and kitchen vents should be temporarily covered.
Designed Openings	Cover and protect any designed opening in the space to ensure they don't get sealed
Windows	Check windows to make sure that they are all closed tightly and LOCKED
Doors	Tape top of doors and cover and finished surfaces (i.e. sliding door tracks)
Finished Horizonal Surfaces	Any finished horizonal surfaces in the house should be protected for easy clean up
Plumbing	Check for plumbing penetrations and block or seal any holes larger than ½"
Electrical	Remove any switch and outlets plates. Tape/protect main electrical panel and low voltage/data panel
HVAC Equipment	Cover up and protect any mechanical equipment
ERV	Tape or cover the outer shell of the ERV. Look for the piping between HVAC and ERV and block the holes
Light Fixtures and Fans	Cover and protect any light fixtures or fans with plastic
Fireplace	Cover fireplace completely, including vent holes. Look for any other ventilation in the drywall or framing into the fireplace

(See Envelope prep Checklist in Appendix section for more details)

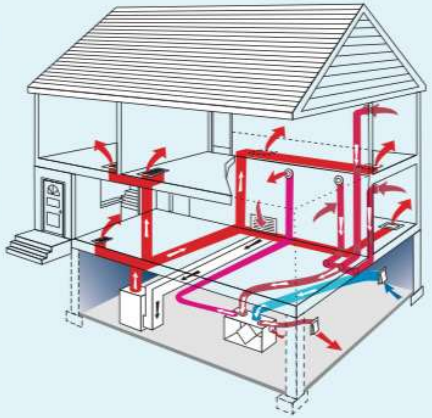
Fully Ducted System

The most desirable configuration. Highly recommended to get the best results in all climate types.



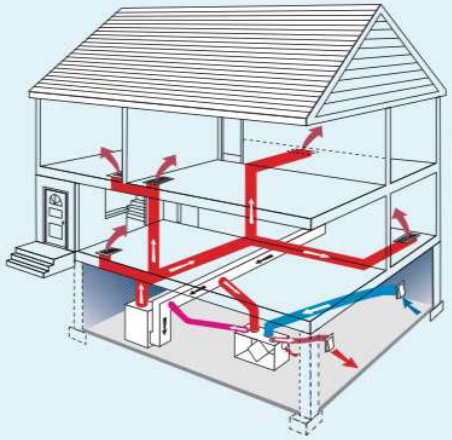
Dedicated Exhaust Points with Distribution of Fresh Supply Air through the Central H/AC System

A hybrid approach that allows the system to be an effective exhaust fan, while taking advantage of the central H/AC duct system to distribute fresh air. Maintaining unit balance is often challenging.



Exhaust from H/AC Return and Distribution of Fresh Air through H/AC System

The least desirable solution because it is difficult to assure balanced airflow and can cause moisture problems in duct during warm, humid seasons. Requires knowledgeable installer.



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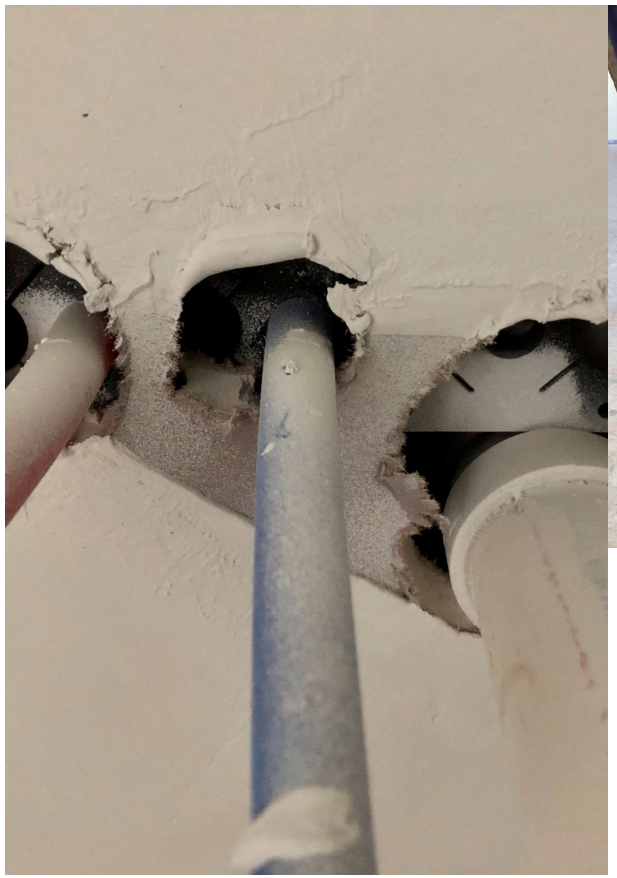
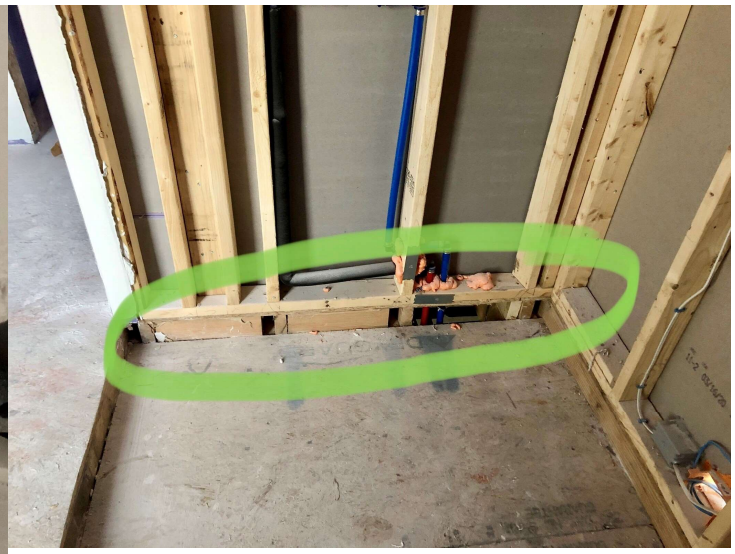
Common Manual Sealing Points

- For holes larger than ½”, manually seal with sprayfoam/caulk

Manual Sealing in Aeroseal Envelope





Windows and Doors

Window and Door Prep

How to prep a door

How to prep a window

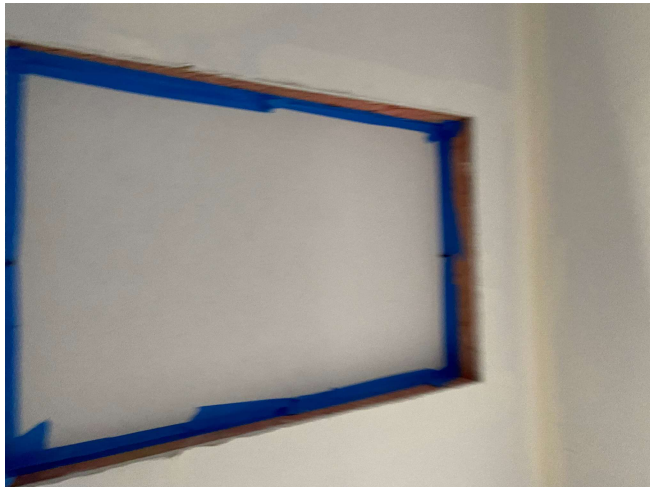
HVAC/Bath/Range Hood Vents

Boot Leakage in Envelope Sealing

Ensure gap between drywall and HVAC register (boot leakage)/Bath fan frame are either manually sealed with caulk/sprayfoam if >1/2” or left open for Aerobarrier to seal if <1/2”

Prep of the Exhaust and HVAC Ducts

Attic/Crawlspace Accesses

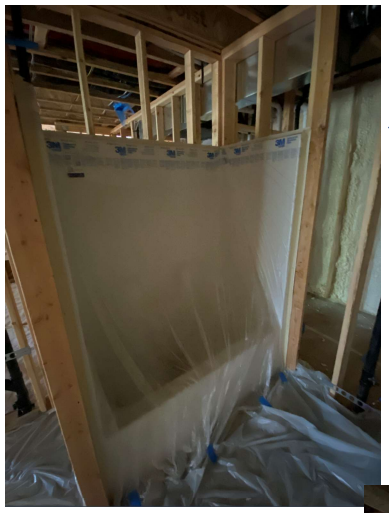


For attic and crawlspaces, we need to tape off the perimeter of the access doors to seal it off.

If the temporary hatch or door is missing, we will have to use a barrier material such as plastic sheets or plywood to block them off.

Covering missing door

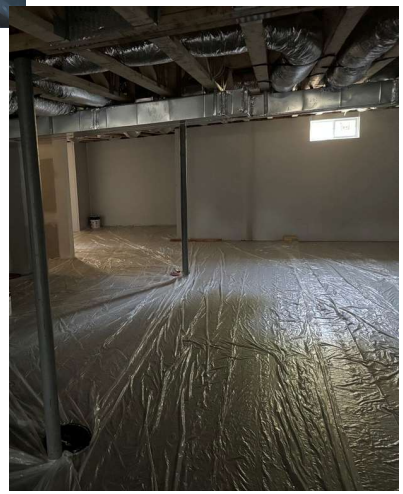
Finished Horizontal Surfaces



Tub prep is simple, just make sure the drain, spout and breather port are taped off.

Cover **any** finished surfaces, including floors exposed to sealant.

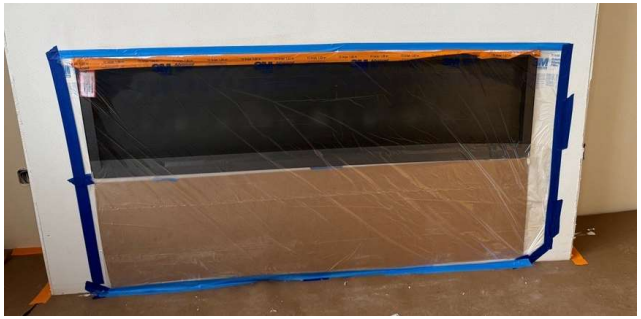
Prep of Finished Surfaces & Spec App



COVER WINDOW FRAME "WEEP-HOLES" FROM SEALANT DEPOSITION

HVAC Equipment & Fireplace Prep

Prep of the Fireplace and HVAC



Blower Door

- The Blower Door is a Frame with a nylon canvas that has an opening for a fan
- This blower door frame is what allows the envelope to be pressurized for sealing

Link to Setting up a blower door video

Pre-Prep (Baseline) Leakage Test

- To prevent any unforeseen issue (High leakage, failed blowerdoor tests, Etc.) Set up MCU & AB Fan and do a **pre-prep** test without any prep to get a feel for how much window/door leakage there is in the house.
- Once prep is done, do the **pre-seal** to see what the leakage is without the window/door leakage.
- Use that delta between pre prep blower door test and post seal blower door test to determine what ACH/CFM to seal down to

(Note: This step is **required** to prevent any failed blower door tests)

Pre-Prep Test with AeroSuite

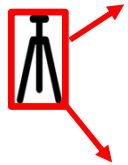
Seal Station Layout

- Identify amount of seal stations to use(**Generally 1 Seal Station per 500-700 sqft. floor area/layout of the envelope)**
- Orient nozzles away from walls
- For very small rooms –
  - locate station in the corridor
  - Use each nozzle for adjacent rooms
- Locate Blower door in a garage/ accessible place where MCU can be located
- Identify additional entry/exit door in case you need to enter the house being sealed during the job.

➢See subsequent slides of example layouts

Link to-Sealing station/nozzle positioning in Aeroseal Envelope video

Legend for floorplan examples in next pages

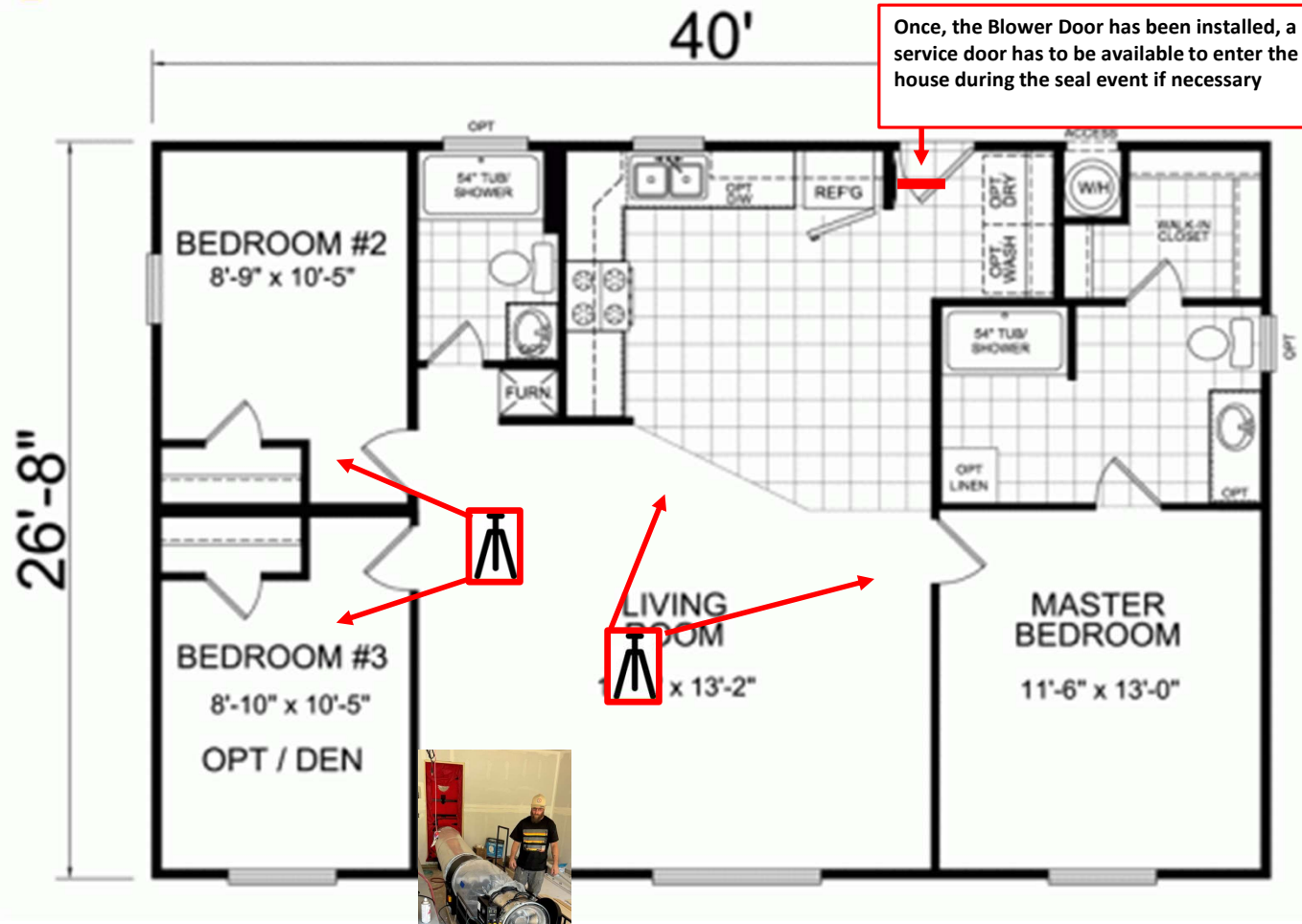


Seal Station location and Nozzle direction

Blower door location

Where to move seal stations

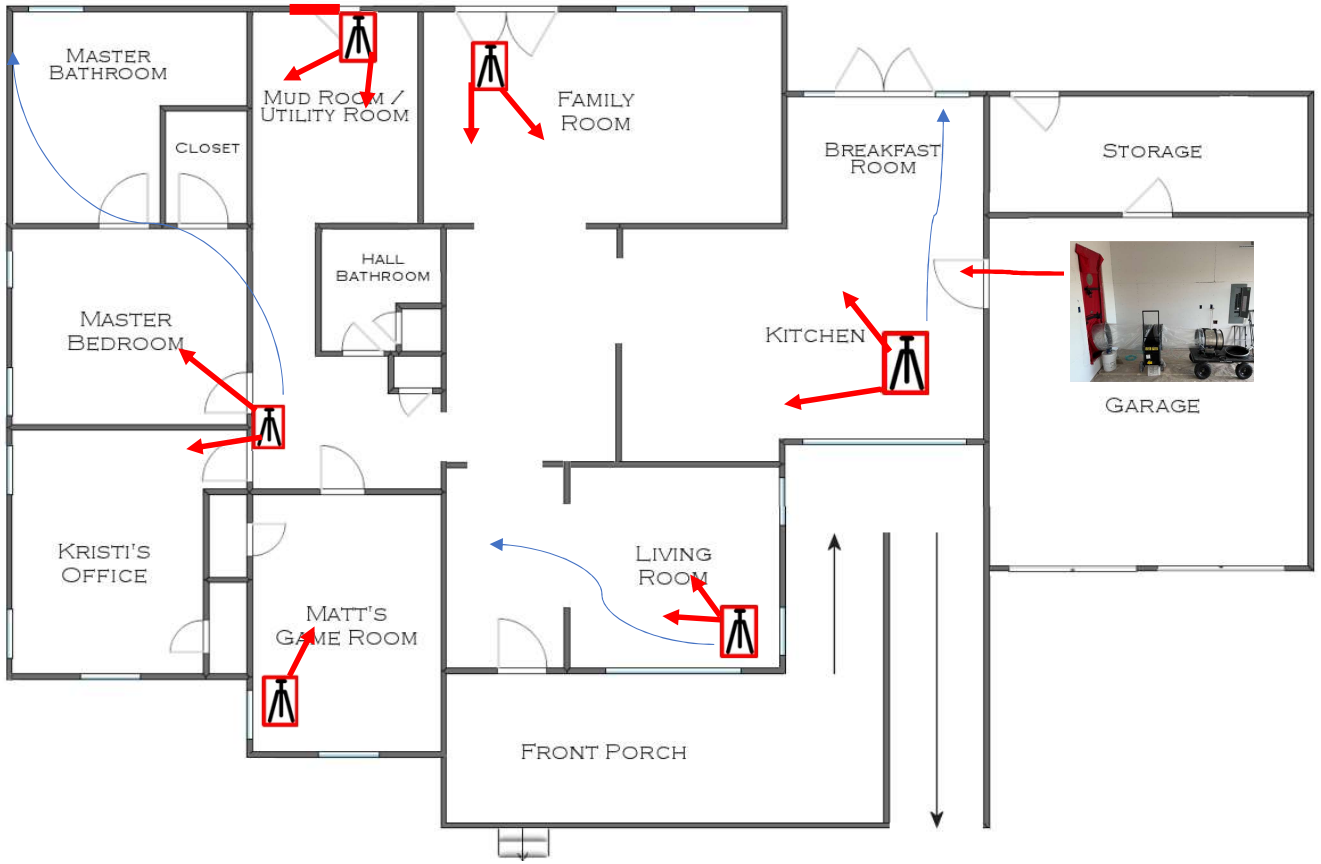
Layout 1: Sealing Station and Blowerdoor Layout



RECOMMENDATION: You may start with one additional sealant station than is required based on the 500 /sqft rule of thumb. Use additional sealant station to "fog"/seal the unit/home at the beginning and take it off line (disable) after "x" minutes, in order to speed up the beginning seal. You may find the seal could flat line after you take additional seal station off line, and may need to start back up to assist others due to excessive leaks in the building/home/unit. This gives you flexibility, especially on a repetitive unit/house style project which you are trying to determine the right number of sealant stations based on size and starting ACH/CFM.

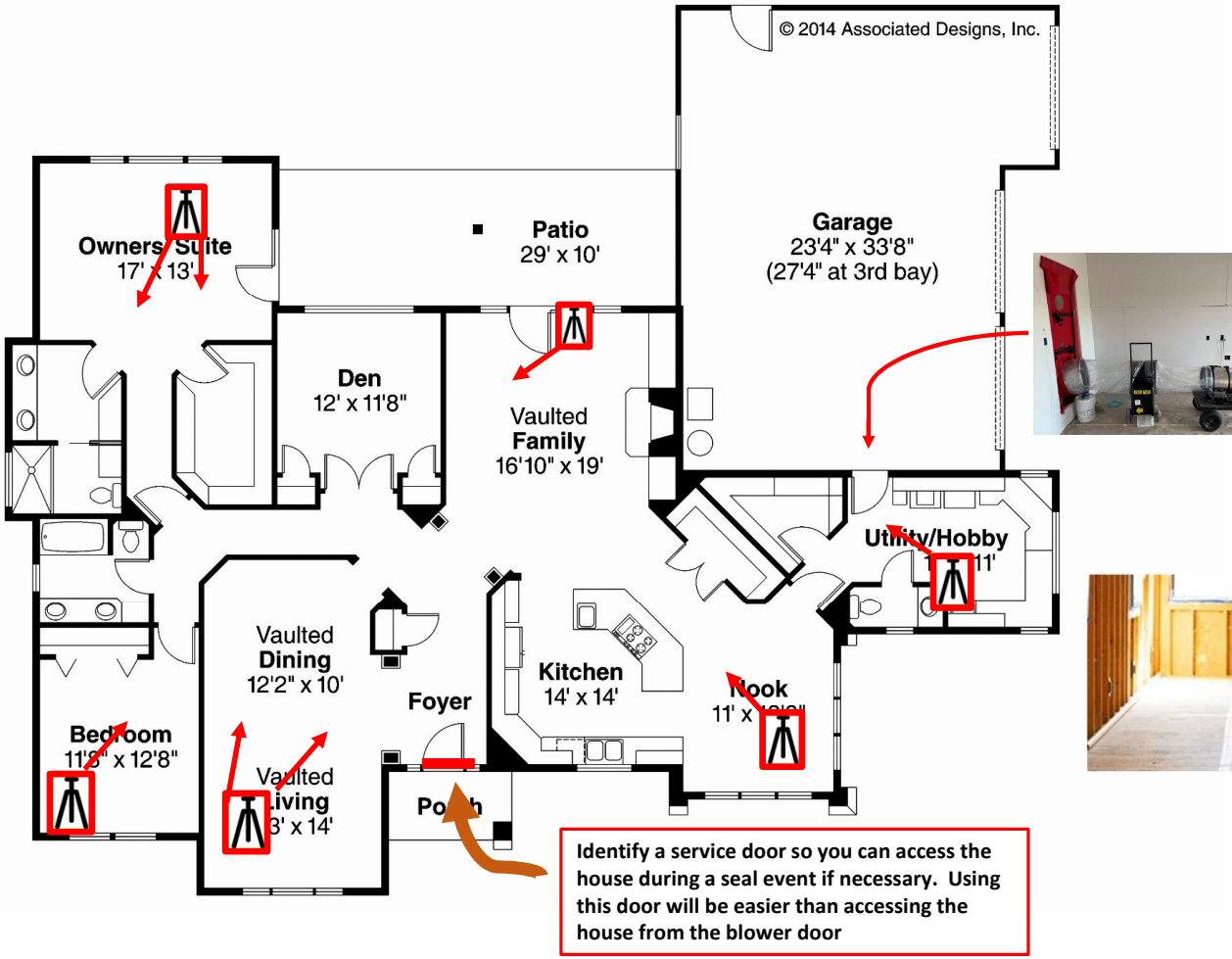
Layout 2:Sealing Stations and Blowerdoor Layout

Once, the Blower Door has been installed, a service door has to be available to enter the house during the seal event if necessary



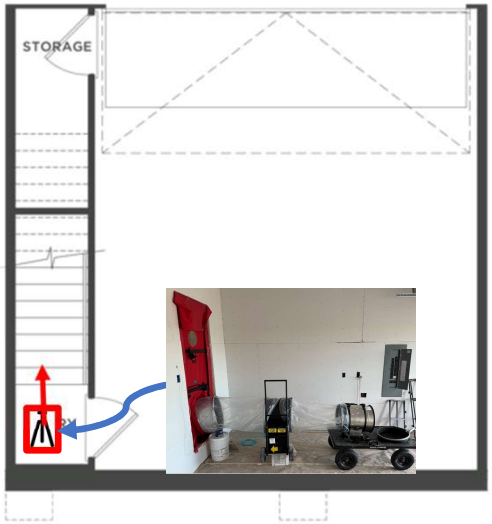
This layout shows a 6 nozzle setup. With all the small rooms it makes it difficult for the nozzles to get ample coverage. This setup shows the blower door centrally located to cover the majority of the home.

Layout 3: Sealing Stations & Blowerdoor Layout



This example shows a blower door setup in the garage pressurizing the home. This setup allows the equipment to be stored inside the garage and is ideal for cold weather applications

Layout 4:Sealing Station & Blower door Layout



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Section 4

AEROBARRIER SELECT EQUIPMENT

AeroBarrier Select System

- Main Control Unit (MCU)
- Sealing Stations
- 120V Fan
- Non-Electric Heat (NEH)

Practice seal set-up video

Main Control Unit

Sealing Stations

120V Fan

Heater System

Important Accessories

Air Manifold

30 ft Air Hose

Sealant Transfer Pump

Link to Aerobarrier accessories video

Charging Station

NOTE: WHEN CHARGING, SET FOR "LITHIUM BATTERY"

Component Assembly

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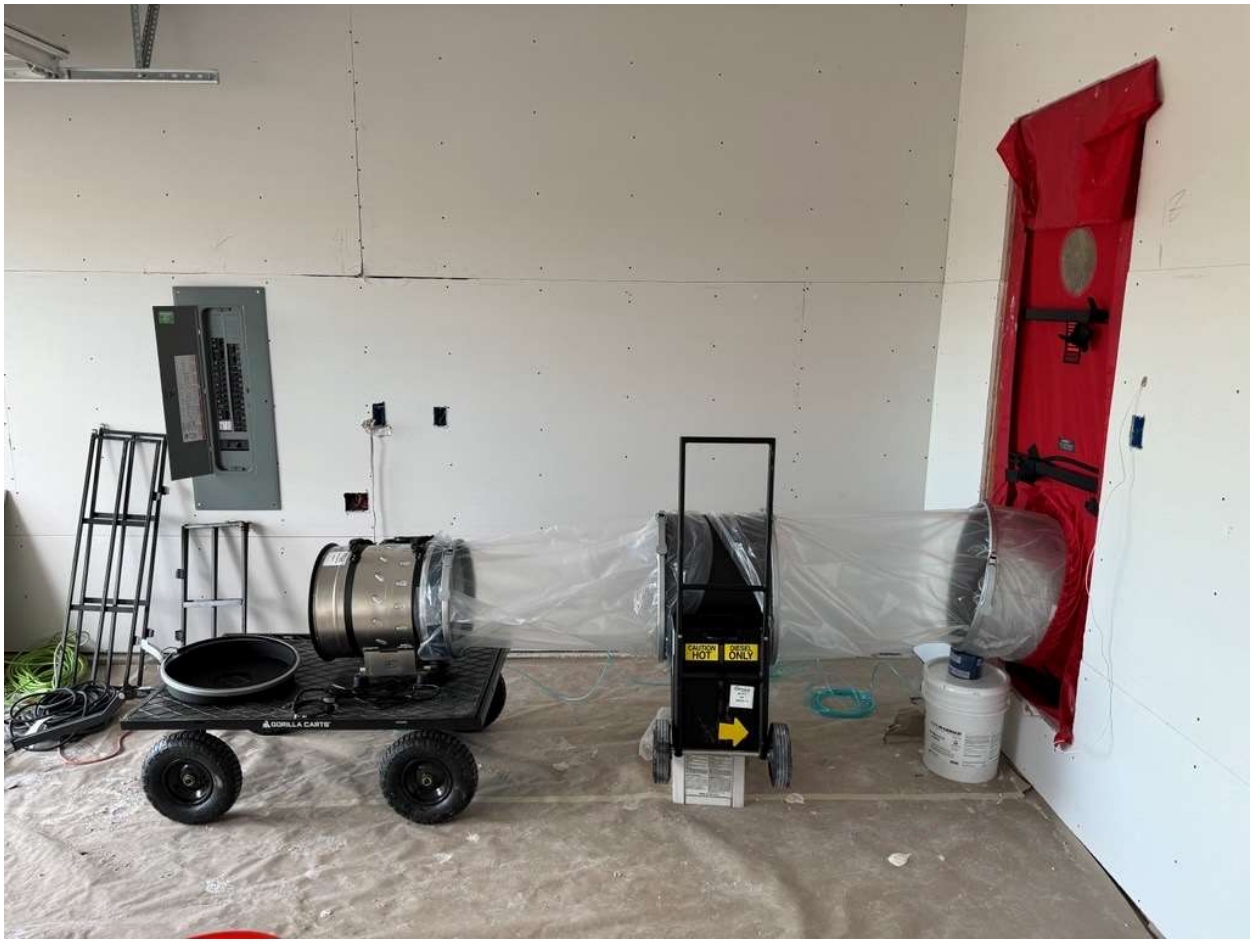
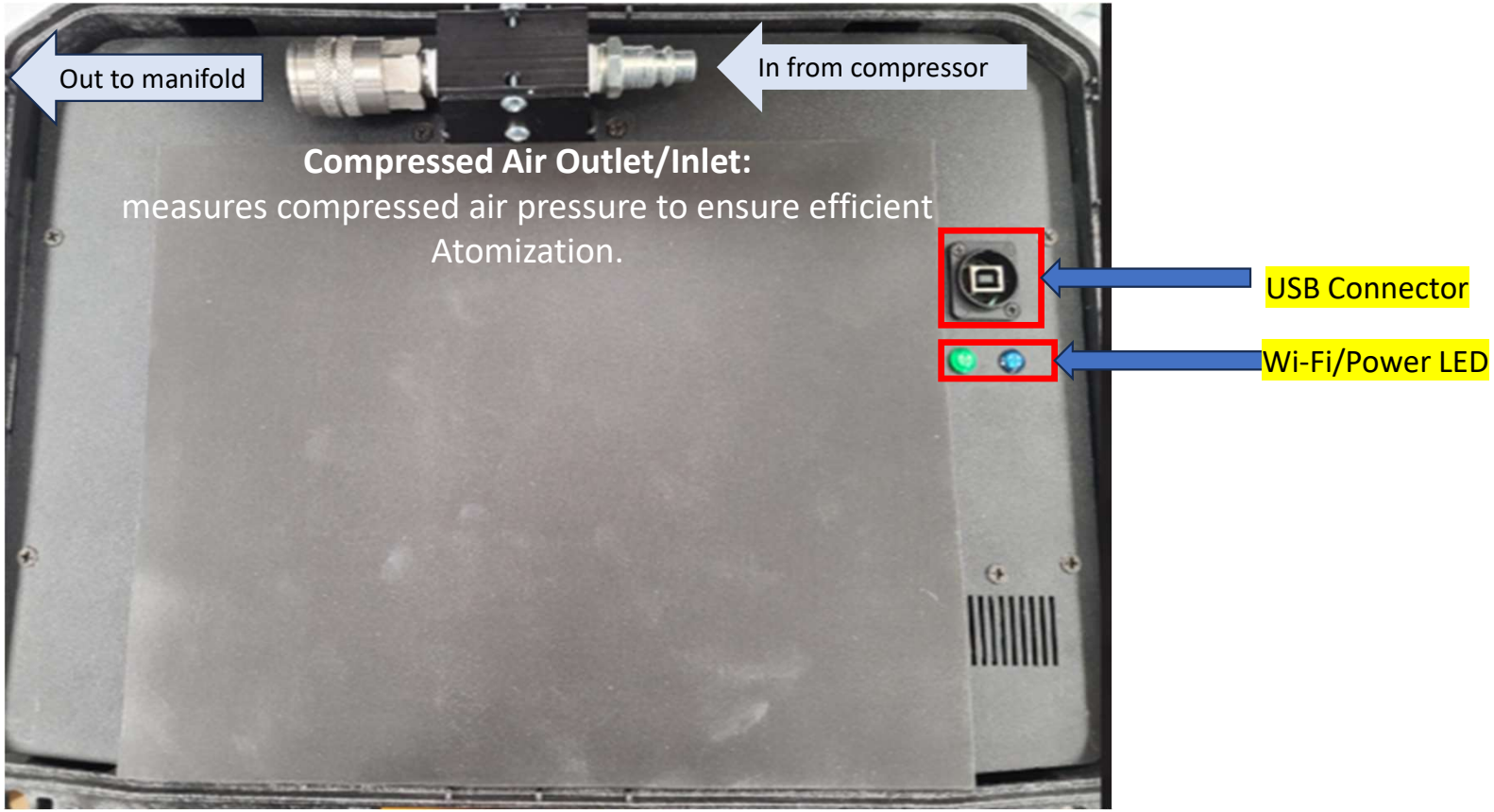


AeroBarrier Select Main Control Unit (MCU)

- The “Brains” of the AeroBarrier Process.
- Contains the laptop and all components that measure and control the process.
- Has a Wi-Fi router which the smart sealing stations automatically connect to.
- Contains a set of sensors that measure ambient conditions
- Connects to the software via Wi-Fi or USB

Power input -Required Input power to MCU is 110V, 15A Single Phase

MCU Panel

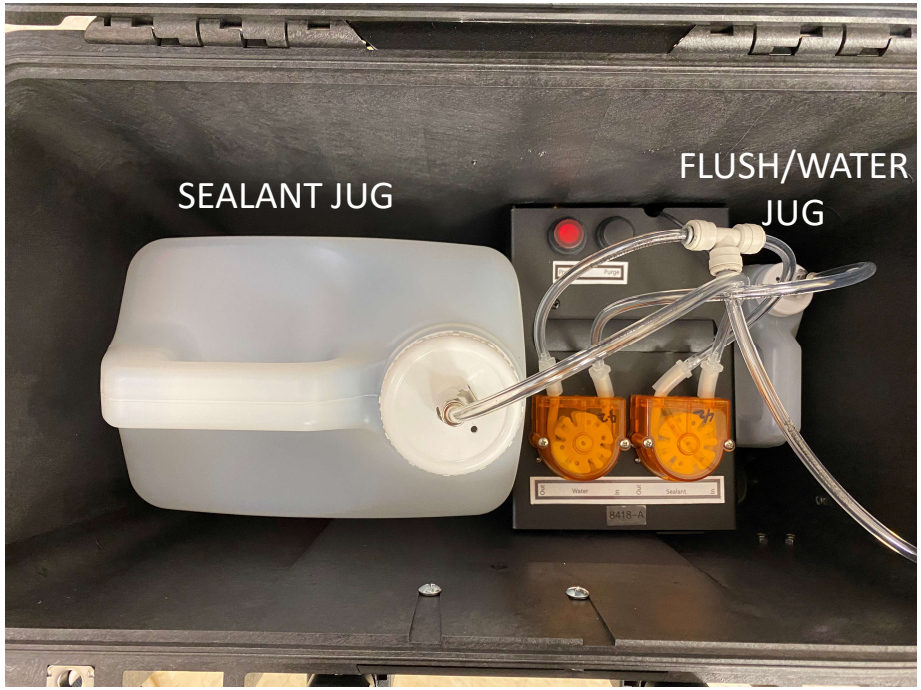

Out to manifold
In from compressor
Compressed Air Outlet/Inlet:
measures compressed air pressure to ensure efficient Atomization.
USB Connector
Wi-Fi/Power LED

Smart Sealing Stations

Link to Aerobarrier
Sealing stations video

Inside Seal Station

- Each sealing station is powered by lead acid sealed battery
- Has sealant & flush pumps
  - to push sealant to nozzle
  - To flush lines with water
- Has self contained sealant & water jugs

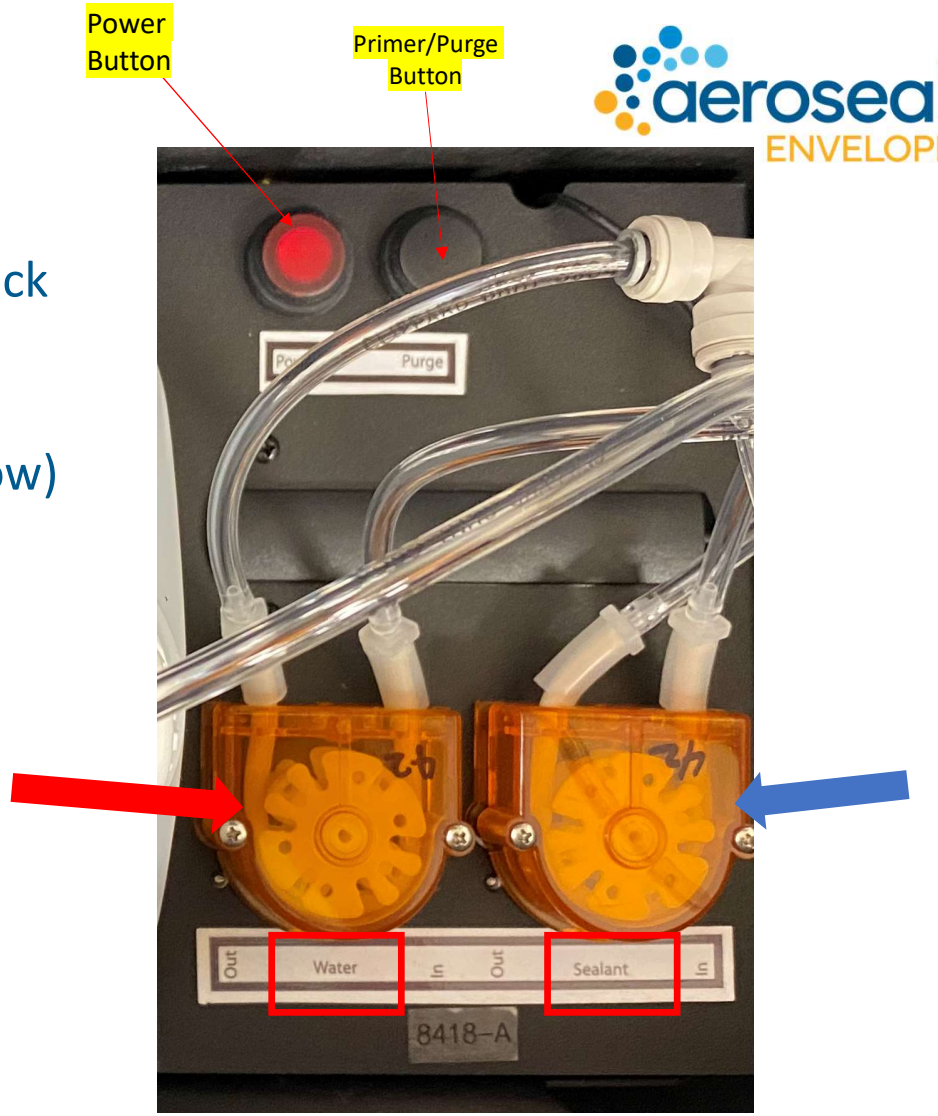


Stir sealant prior to filling sealant stations

Inside Seal Station (Cont'd)

- The sealing station has two buttons. The red button is to power on the seal station. The black button is the primer/purge button
- The pump labelled Sealant(Blue Arrow) will pump sealant while the other pump (Red Arrow) will pump flush water.

1. Stir the sealant in 5gal bucket completely
2. Fill the sealant jug in the spray station with sealant
3. To Prime, press the black purge button and sealant travels through tubing to the nozzles



Sensor Guard

- Takes zone temperature/RH readings at each smart sealing station.
- If RH goes higher than 90%, seal station will automatically stop injecting sealant. Will resume /reset at 70%
- Note: Temperature/Humidity limits for sealing are as follows:

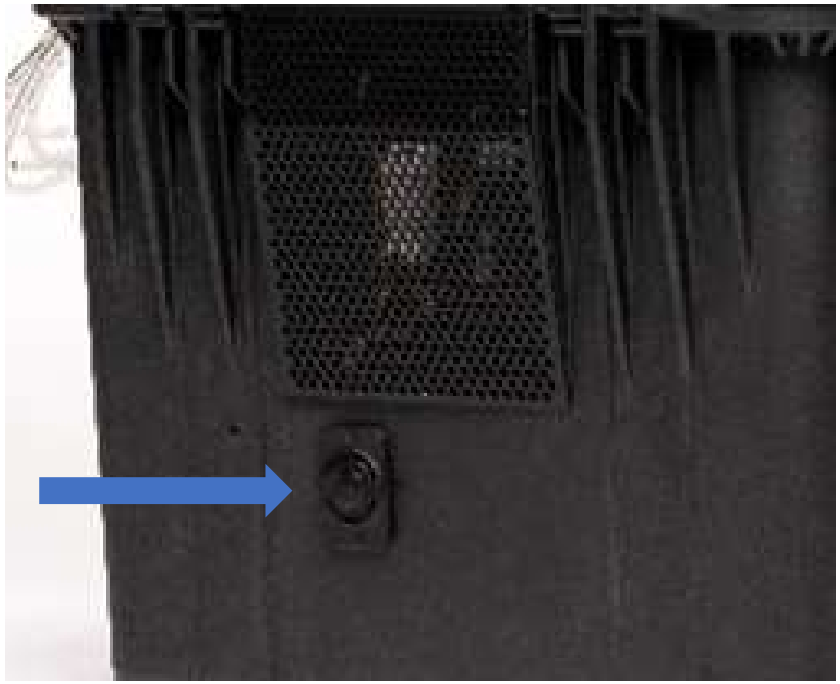
  -Temp: Min 40˚F - Max 120˚F

  -RH: No Min - Max 90%

- Note: the position and orientation of the sensors is critical.

Charging Port

- Used to charge the battery in the seal station
- Requires a 12V/DC charger (provided)
- After 10 hours of run time, it is important to charge the sealing stations
- Note: Set charger to “Lithium Battery” when charging stations



120V Fan

FRONT VIEW

Aerobarrier Select 120v fan video

Back of Fan

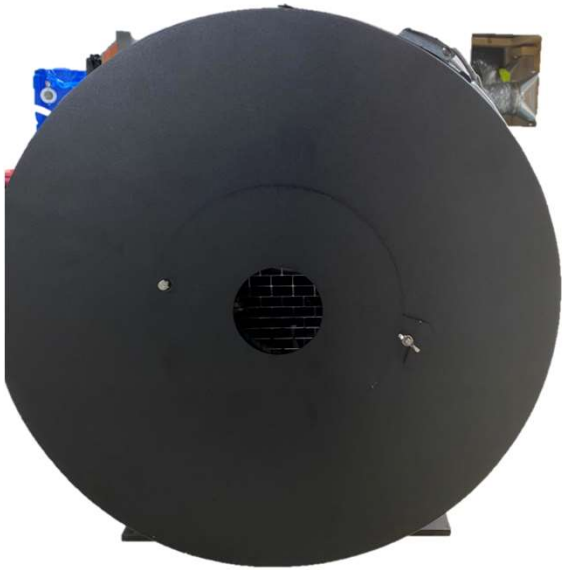
Ring assembly consisting of 3 ring setups

-No Ring (Highest Flow)

-5” Ring (Middle Range Flow)

-2.5” Ring (Lowest Flow)

•Fan Pressure connection point (brass bulkhead) where the red tube is connected.



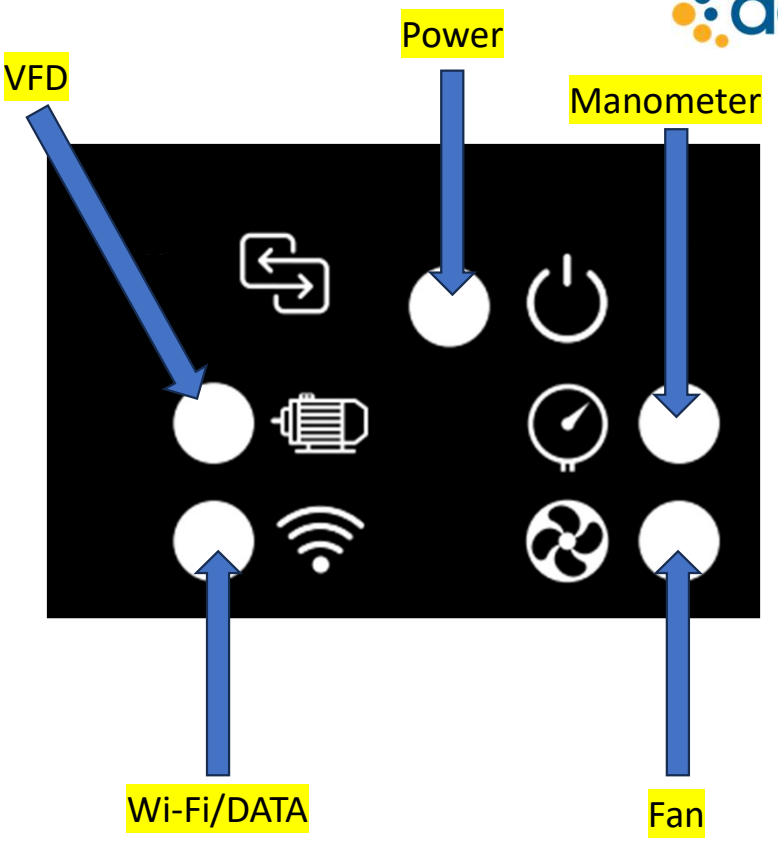
The Ring openings are calibrated orifices and care needs to be taken to avoid any damage – else you risk incorrect leakage readings

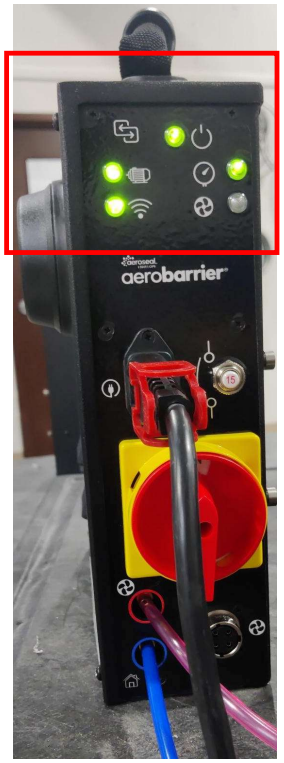
Fan Control Box

Fan Control Box Panel

LED Status

- Power – This indicator lights up when the control box is powered on.
- VFD – This indicator shows green when the motor drive is operating correctly.
- Manometer – this indicator shows green within 1 minute of power on when the manometer is operating correctly.
- Data – This indicator turns green when connection with MCU has established and it blinks Red when data is received from the MCU.
- Fan – Only lights up when fan is running





Pressure Connections

- The fan control also incorporates a calibrated manometer, signal interface boards to communicate with the laptop.
- The pressure signals from the fan inlet (red tubing) and the envelope pressure (blue tubing) are connected to fan control box as shown
- The software uses the Fan Pressure and the ring settings on the fan to calculate air flow supplied into the building envelope.
- The brass bulkhead ports on the **back** of control box are atmospheric pressure **reference ports** for the manometer. Each is used as a reference for envelope or fan pressures.

FRONT PANEL

REAR PANEL

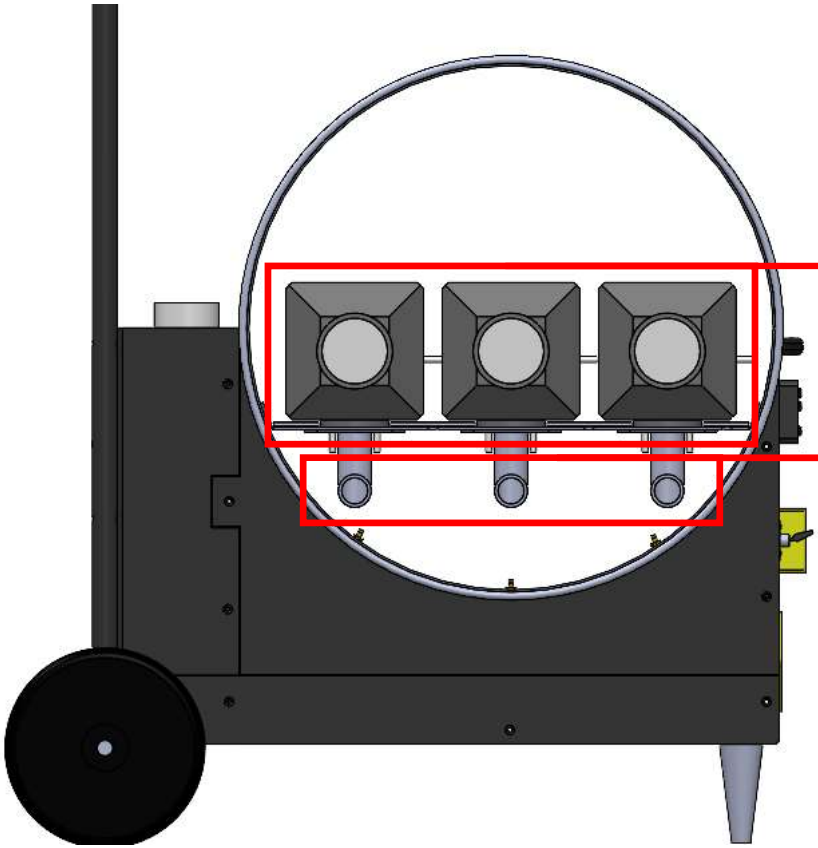
Good Pressure readings is key to correct Leakage (or ACH) numbers. Ensure the tubes are connected securely

Non-Electric Heater System

Aerobarrier Select heater system Video

aeroseal ENVELOPE

Heaters



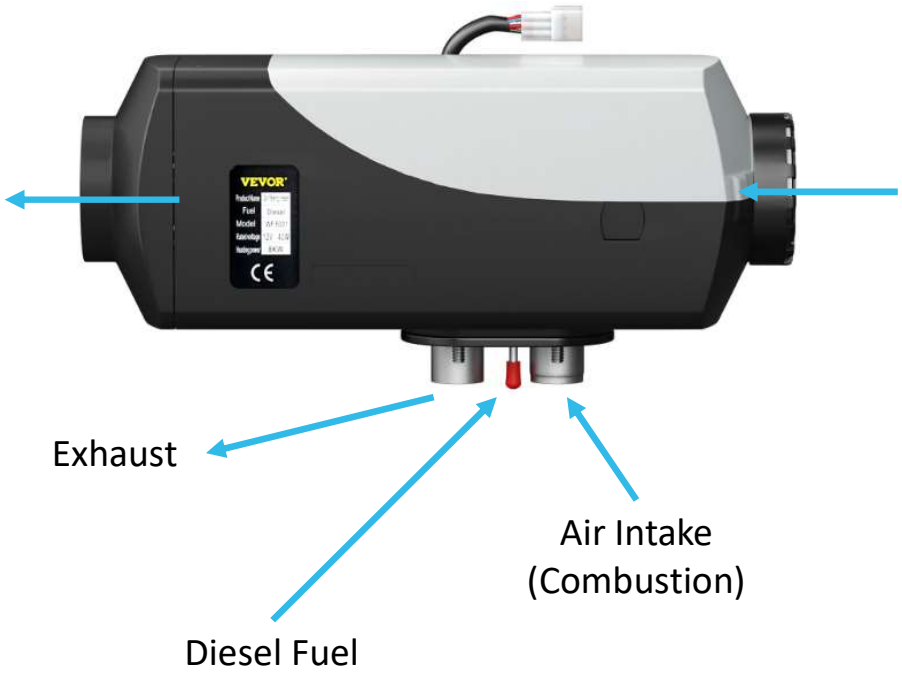
Heaters

- Diesel combustion heaters
- 11kw total

Intake/Exhaust

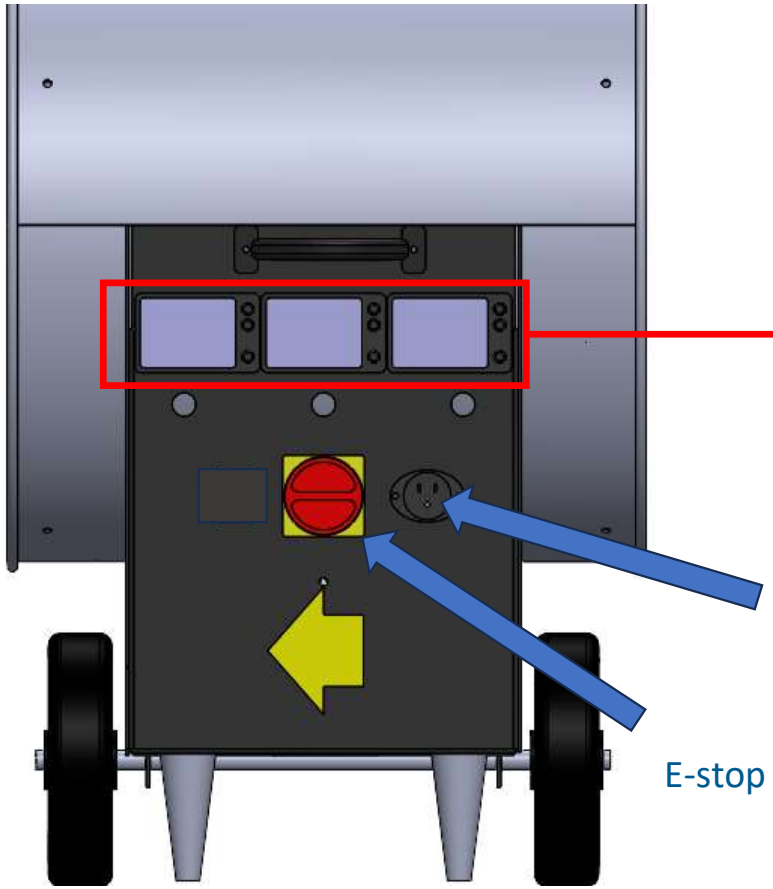
- Takes air from flow to feed combustion
- Puts heat into air flow (goes into house)

Diesel Heater



- Three Heaters within cylinder
- Full DIESEL fuel tank will last roughly 3 hours of runtime

Control Panel



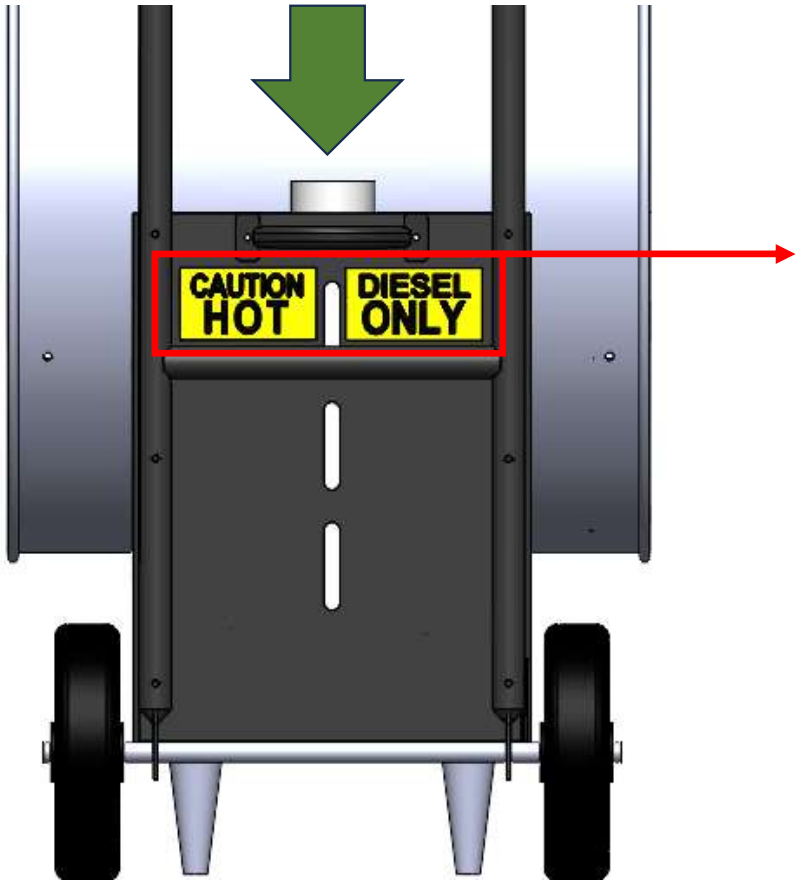
LCD Screens

- Each one is used to control a heater
- Always use this to shut down- Unless emergency
- Always use all three heaters

Power Input

E-stop

Fuel Tank

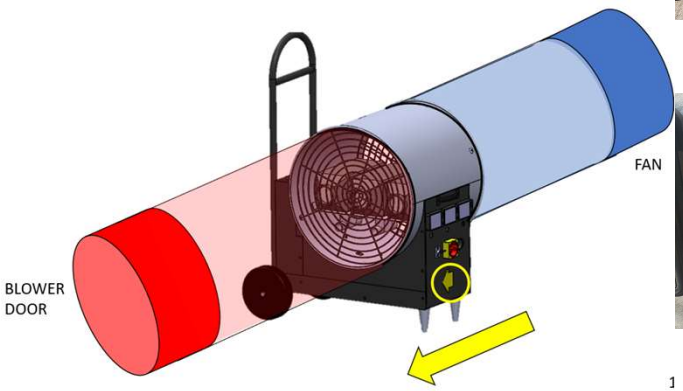


Caution label

- Reminder that surfaces may be hot
- Reminder to only use diesel with these heaters.

Heater Setup

- **ONLY RUN THE HEATER DURING THE SEAL**
- The heater will go in between the fan and the blower door
- 3ft of layflat fan-heater & at least 6ft of layflat heater-blower door
- When seal is up and running, press and hold the power button on each LCD to turn the heater on
- Click the “UP” button until it gets to H6 (3 times)



On Power-Up

After Pressing Power

After Turning Up Heat

Cool Down

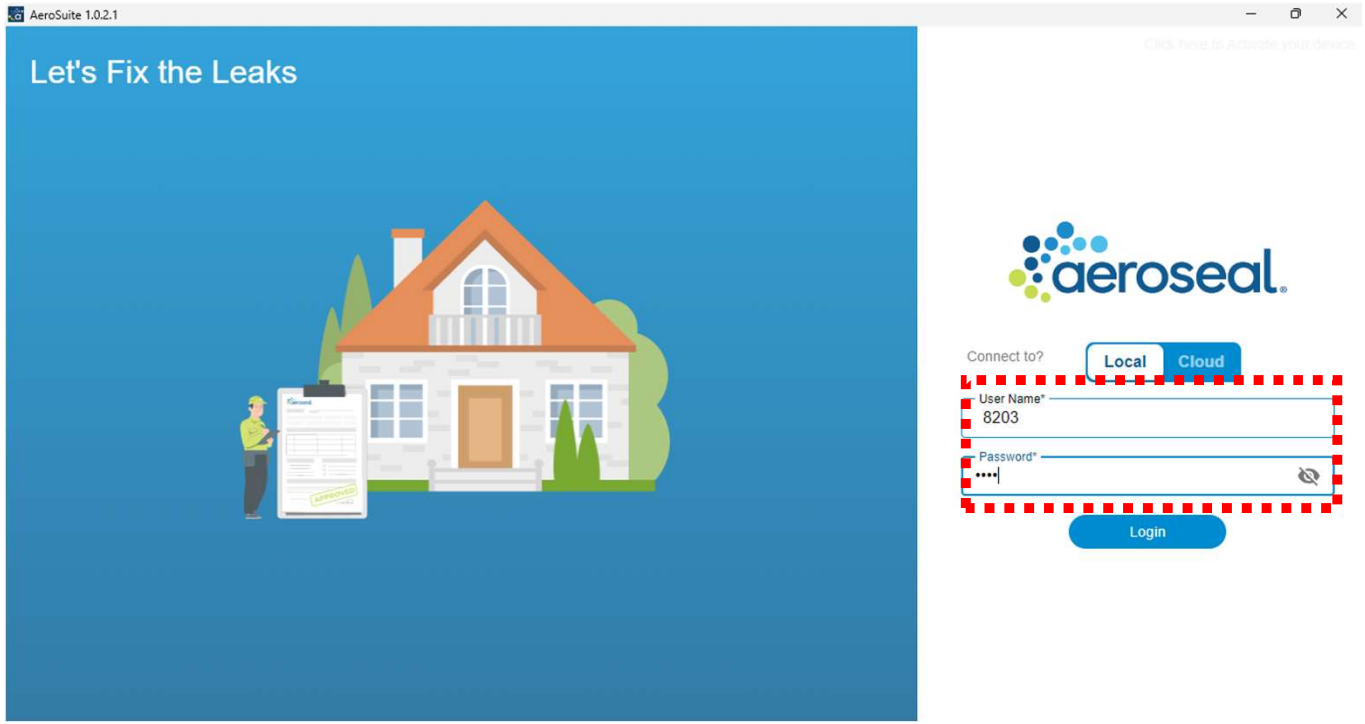
- Press and hold power button – heater will start proper shut down process
- Fan running during post-seal and house de-fogging will help cool down heater
- NOTE: Good handling to never get used to touching the grate – always use handles
- Grate takes roughly 1.5 minutes to cool down to handling temperature

Initial Start Up of AeroSuite

Section 5

AEROSUITE SOFTWARE

Starting the Aerosuite Software



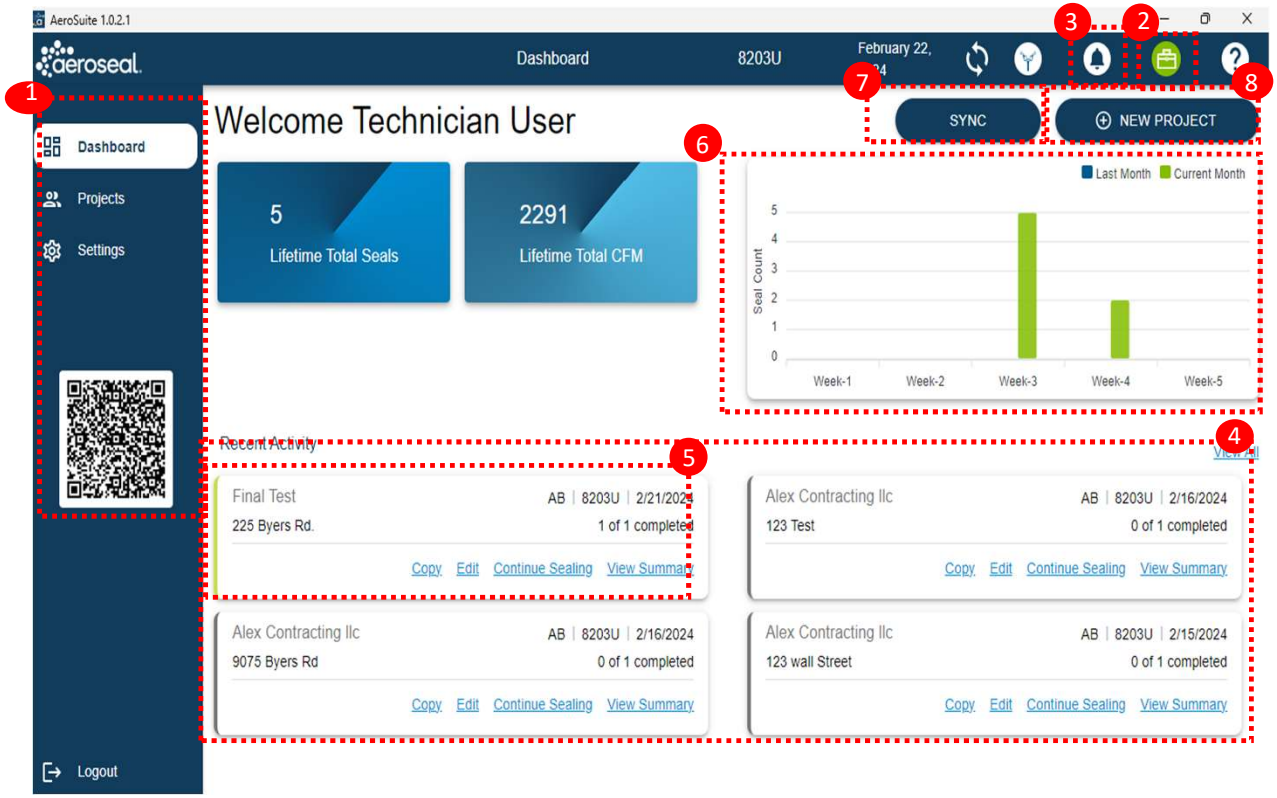
Link to-Sealing with the Aerosuite software video

Enter username and password to Login
Username: CASE ID
Password: CASE ID

PRO-TIP

Make sure that you do not have any pending Windows Updates on your laptop

Dashboard



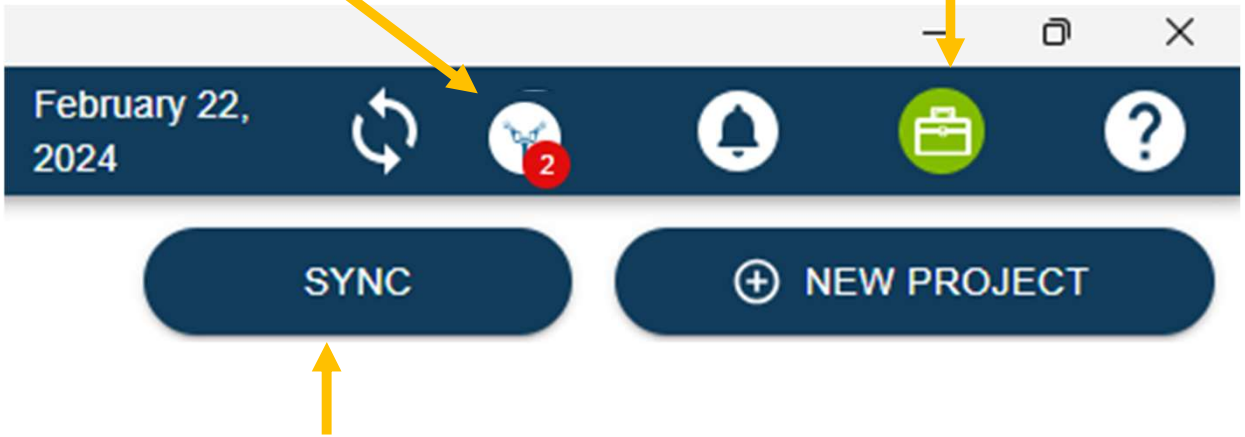
1. Main Menu
2. MCU connection status (Green=connected/Red=disconnected)
3. Notification Bell.
4. Recent seal layout.
5. Project cards with color indication of the job status and seal preview.
6. Weekly count of seals
7. Upload/Sync data to Aeroseal
8. New Project button

Project cards: All seals completed| All seals not completed | No seals started

WiFi – Connection Status

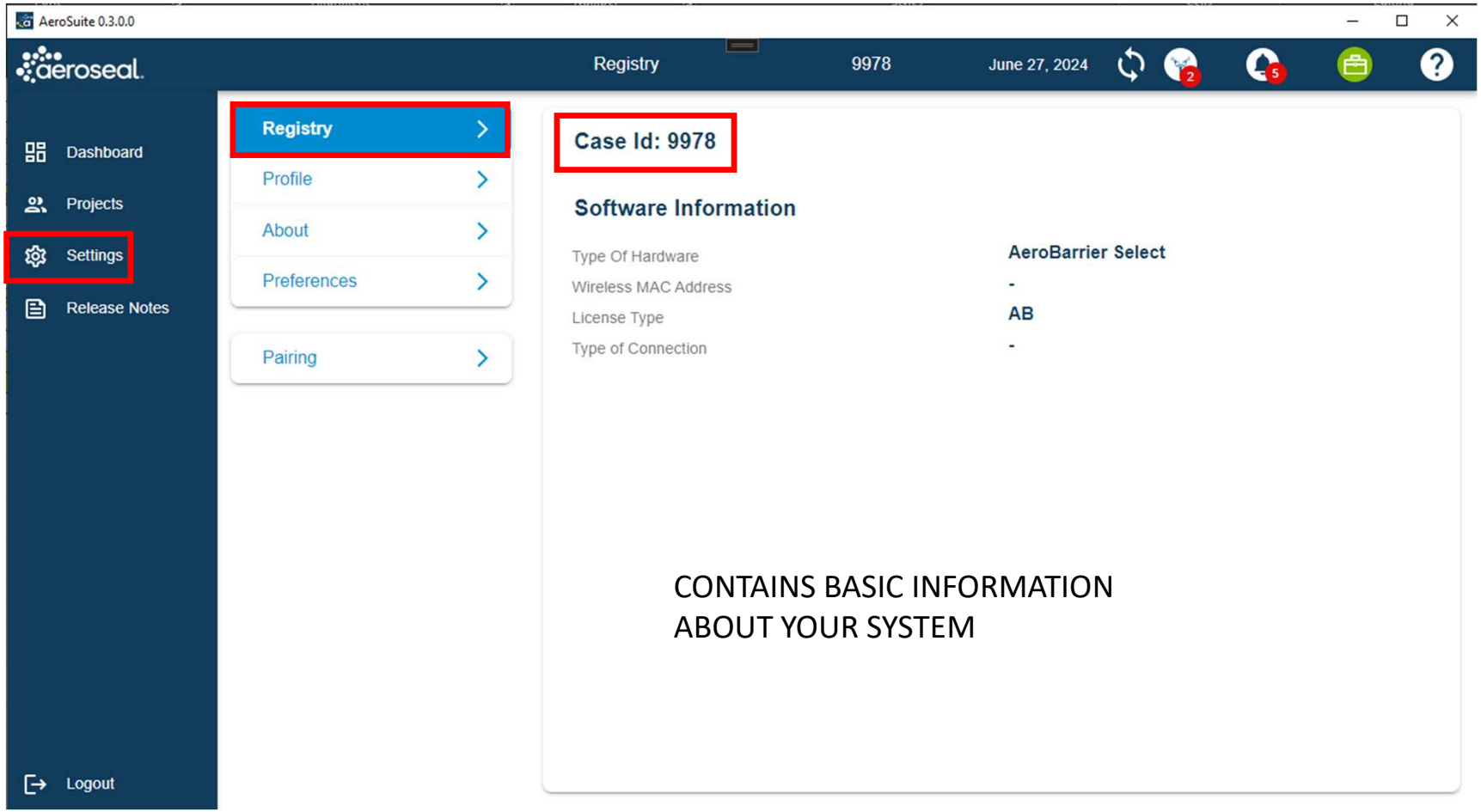
Sprayer Icon Will show how many Sealing stations are connected.

Ensure the Briefcase is green. If not connect to the MCU WiFi



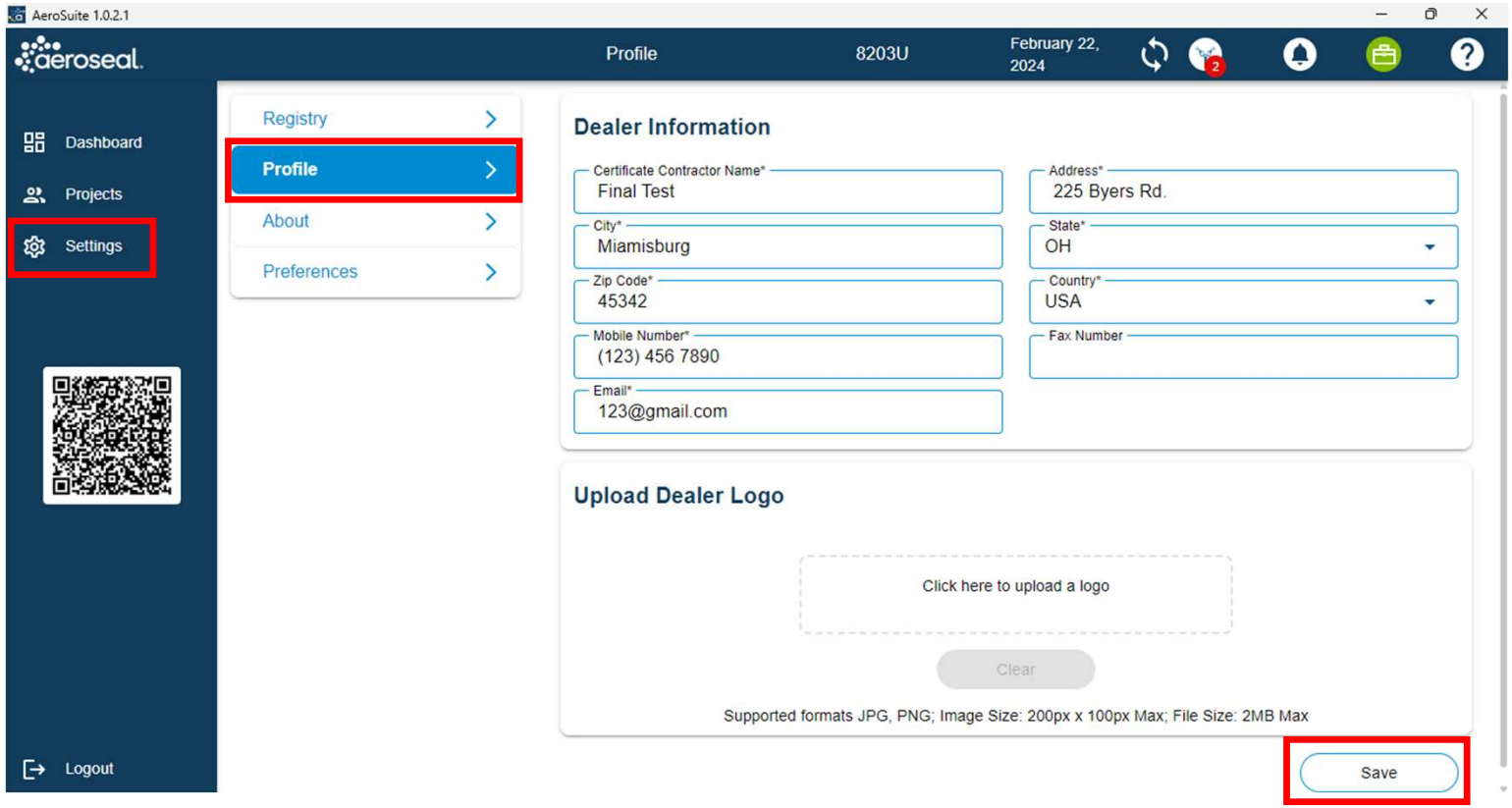
Sync your software with Aeroseal at least once per month

SETTINGS – REGISTRY

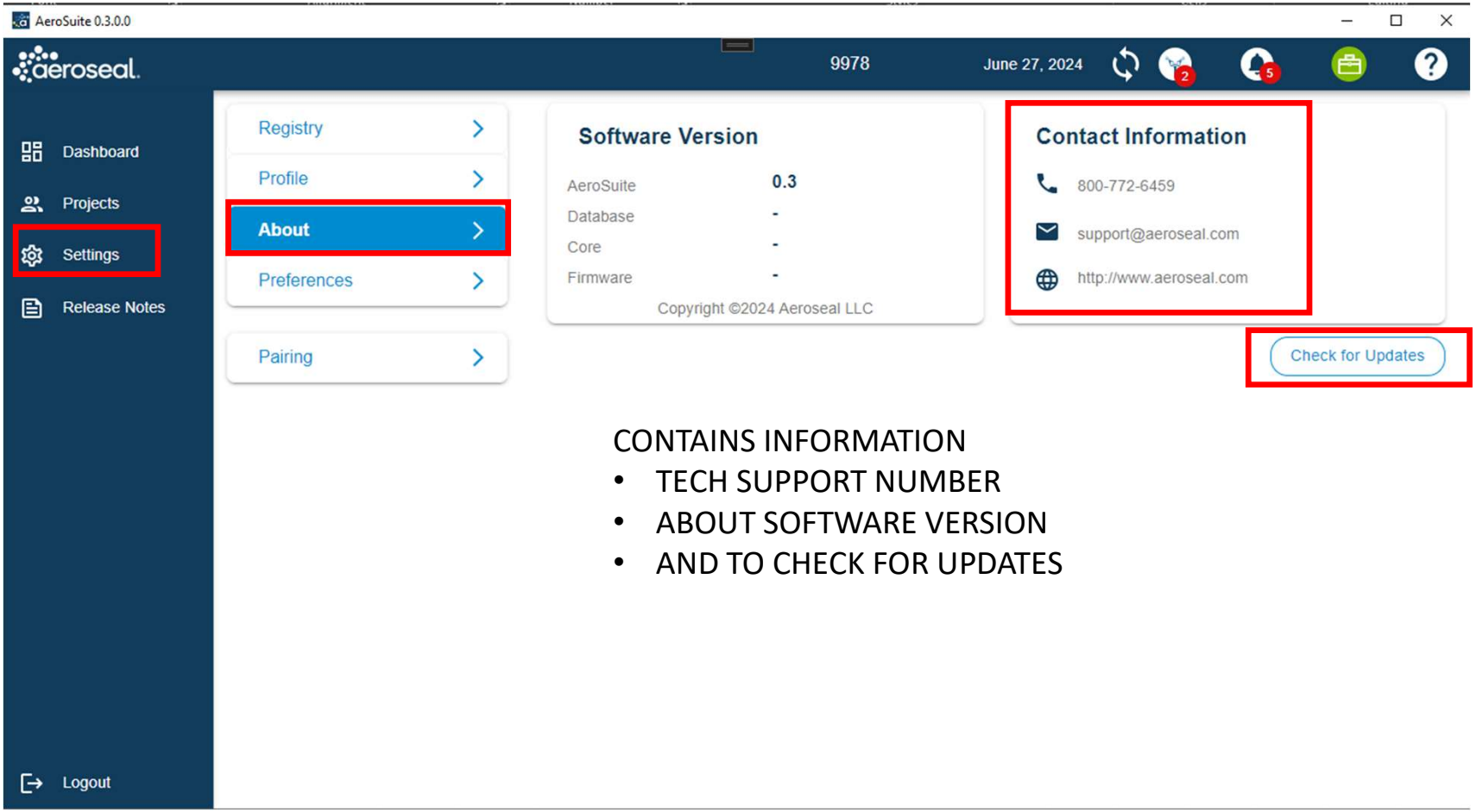


CONTAINS BASIC INFORMATION
ABOUT YOUR SYSTEM

PROFILE -Enter Your Company Information



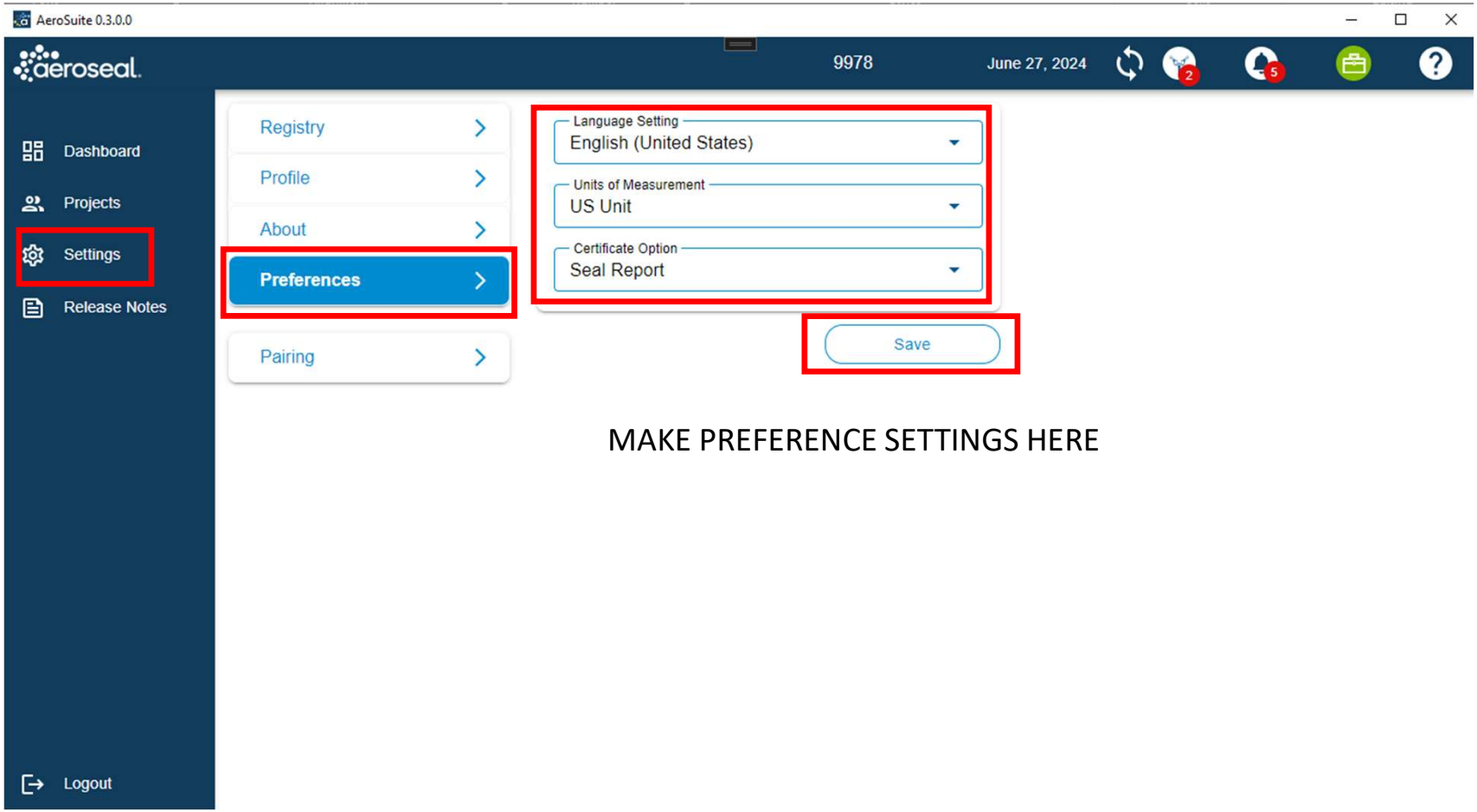
SETTINGS – ABOUT



CONTAINS INFORMATION

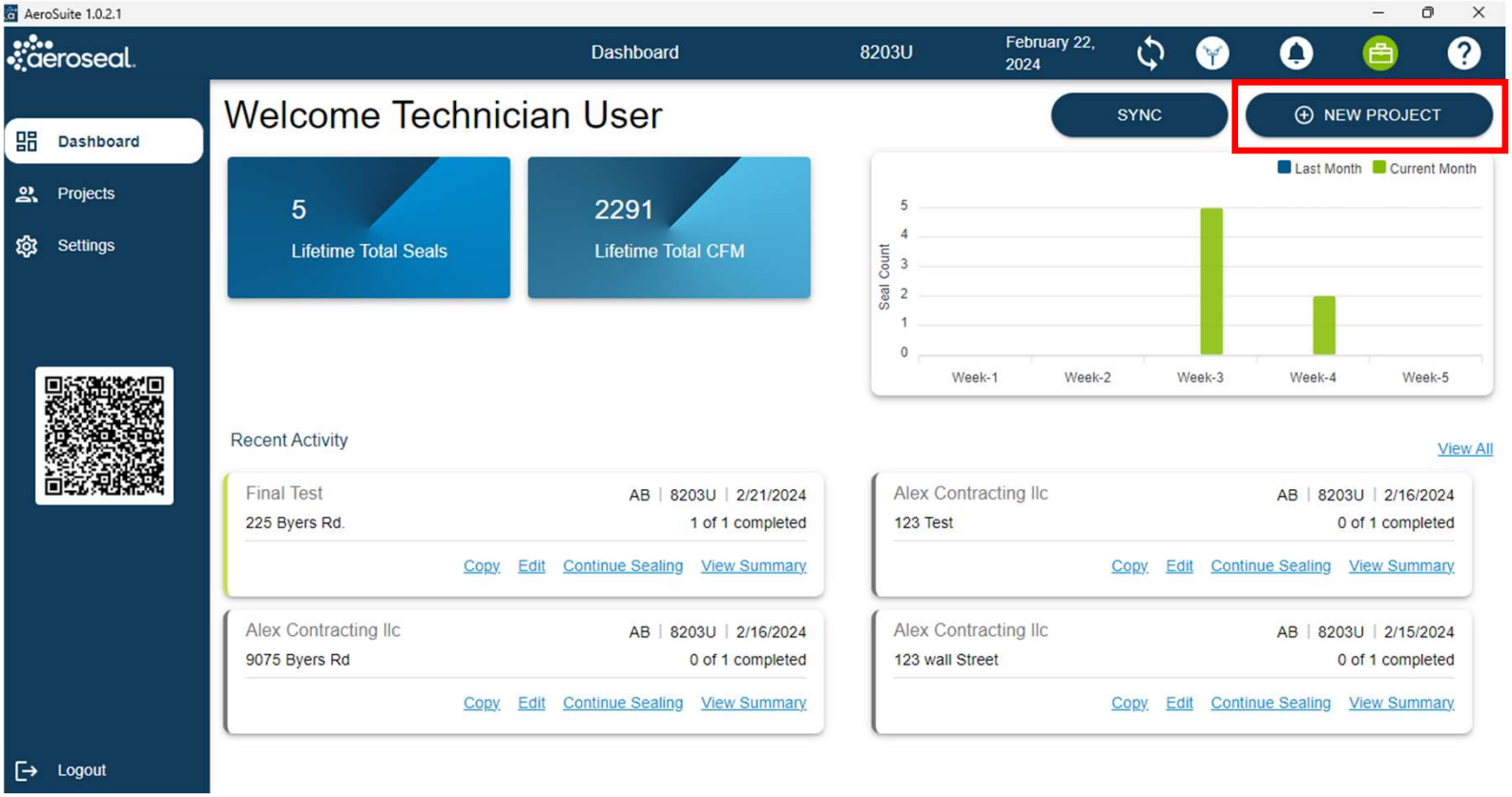
- TECH SUPPORT NUMBER
- ABOUT SOFTWARE VERSION
- AND TO CHECK FOR UPDATES

SETTINGS – PREFERENCES

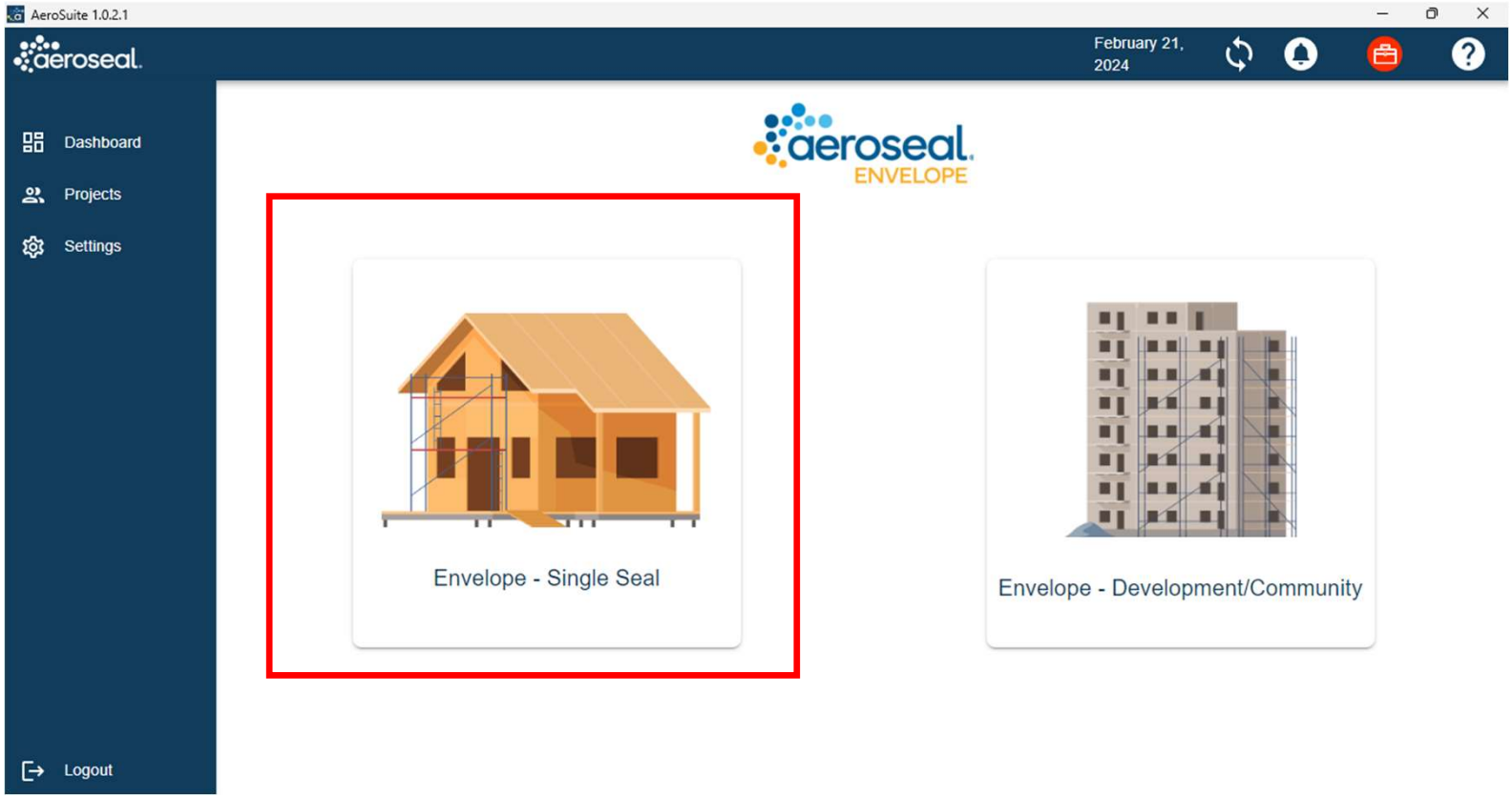


MAKE PREFERENCE SETTINGS HERE

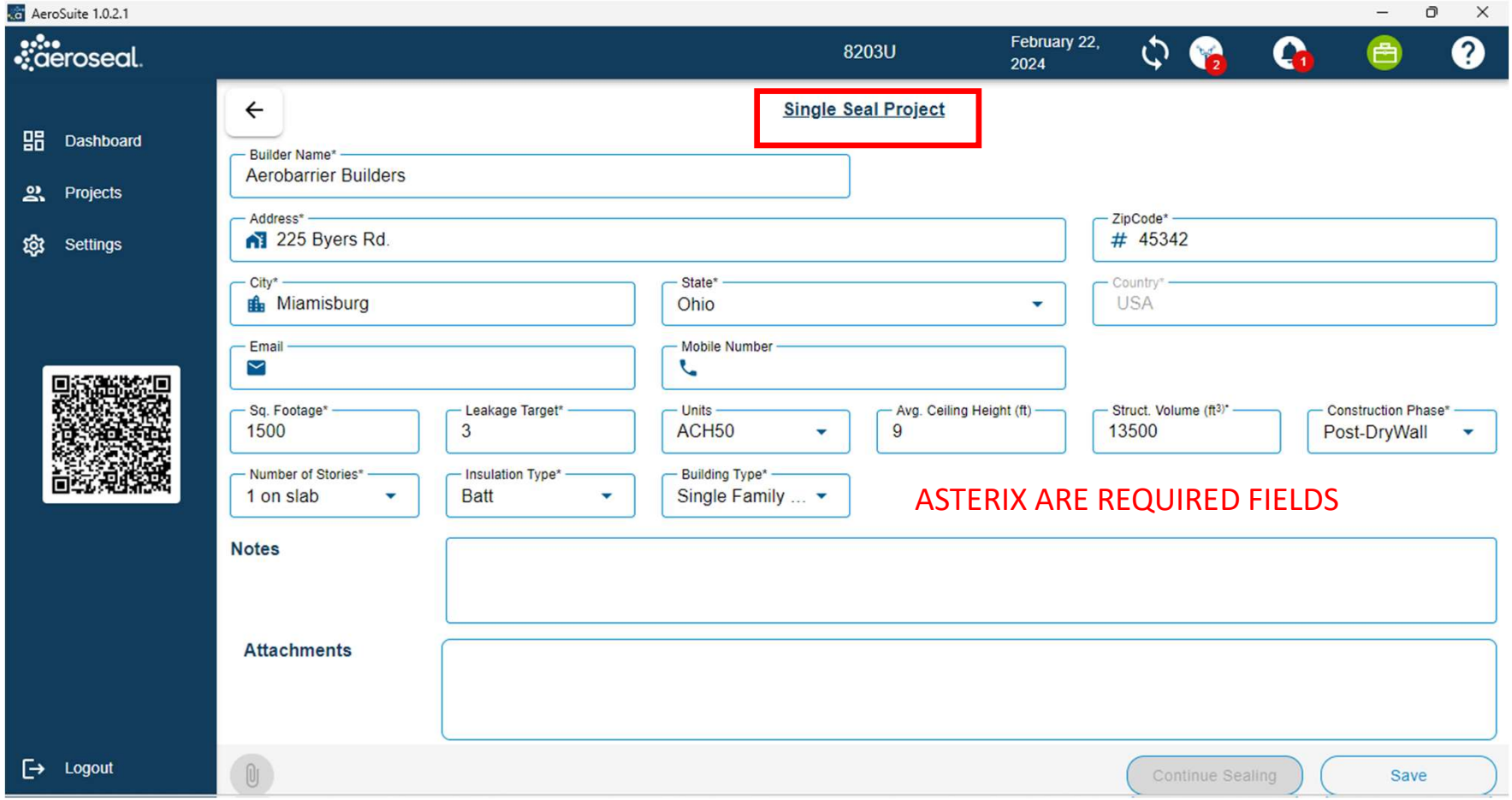
New Project


AeroSuite 1.0.2.1
aeroseal
Dashboard
8203U
February 22, 2024
Dashboard
Projects
Settings
Logout
Welcome Technician User
SYNC
NEW PROJECT
5
Lifetime Total Seals
2291
Lifetime Total CFM
Last Month
Current Month
Seal Count
Week-1
Week-2
Week-3
Week-4
Week-5
Recent Activity
View All
Final Test
AB | 8203U | 2/21/2024
225 Byers Rd.
1 of 1 completed
Copy Edit Continue Sealing View Summary
Alex Contracting llc
AB | 8203U | 2/16/2024
123 Test
0 of 1 completed
Copy Edit Continue Sealing View Summary
Alex Contracting llc
AB | 8203U | 2/16/2024
9075 Byers Rd
0 of 1 completed
Copy Edit Continue Sealing View Summary
Alex Contracting llc
AB | 8203U | 2/15/2024
123 wall Street
0 of 1 completed
Copy Edit Continue Sealing View Summary

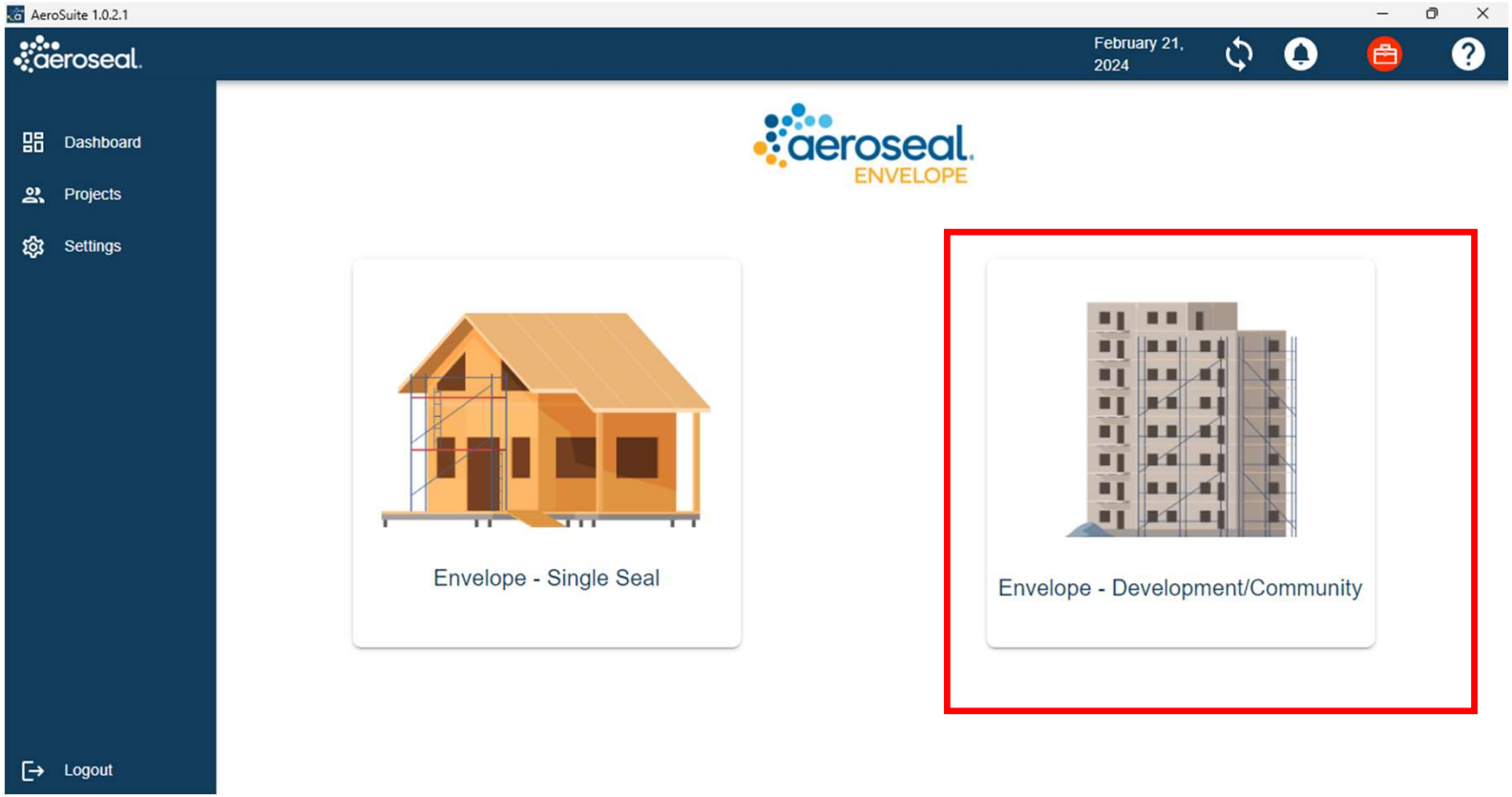
Select Job Type



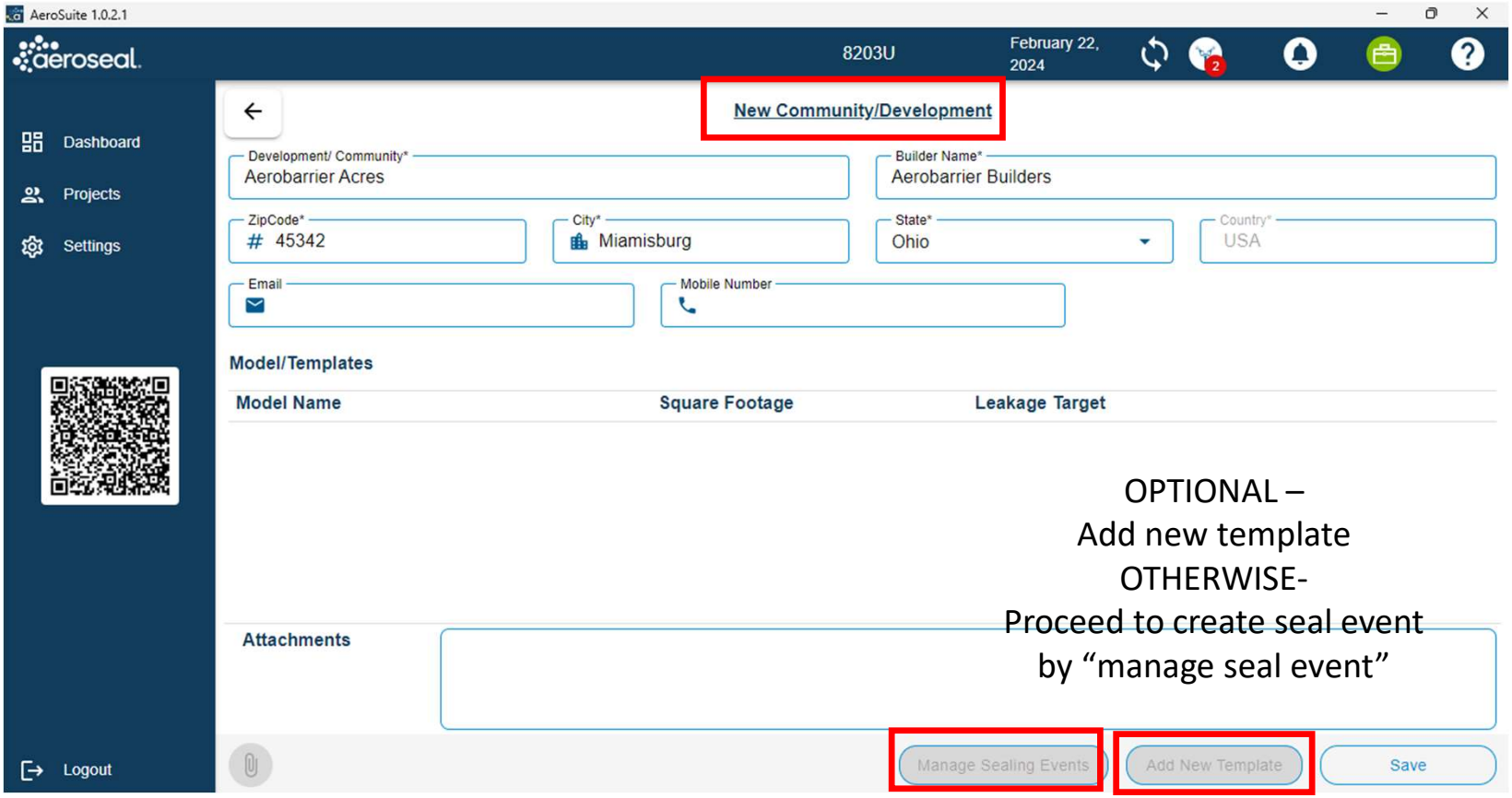
Single Seal Option



Select Job Type

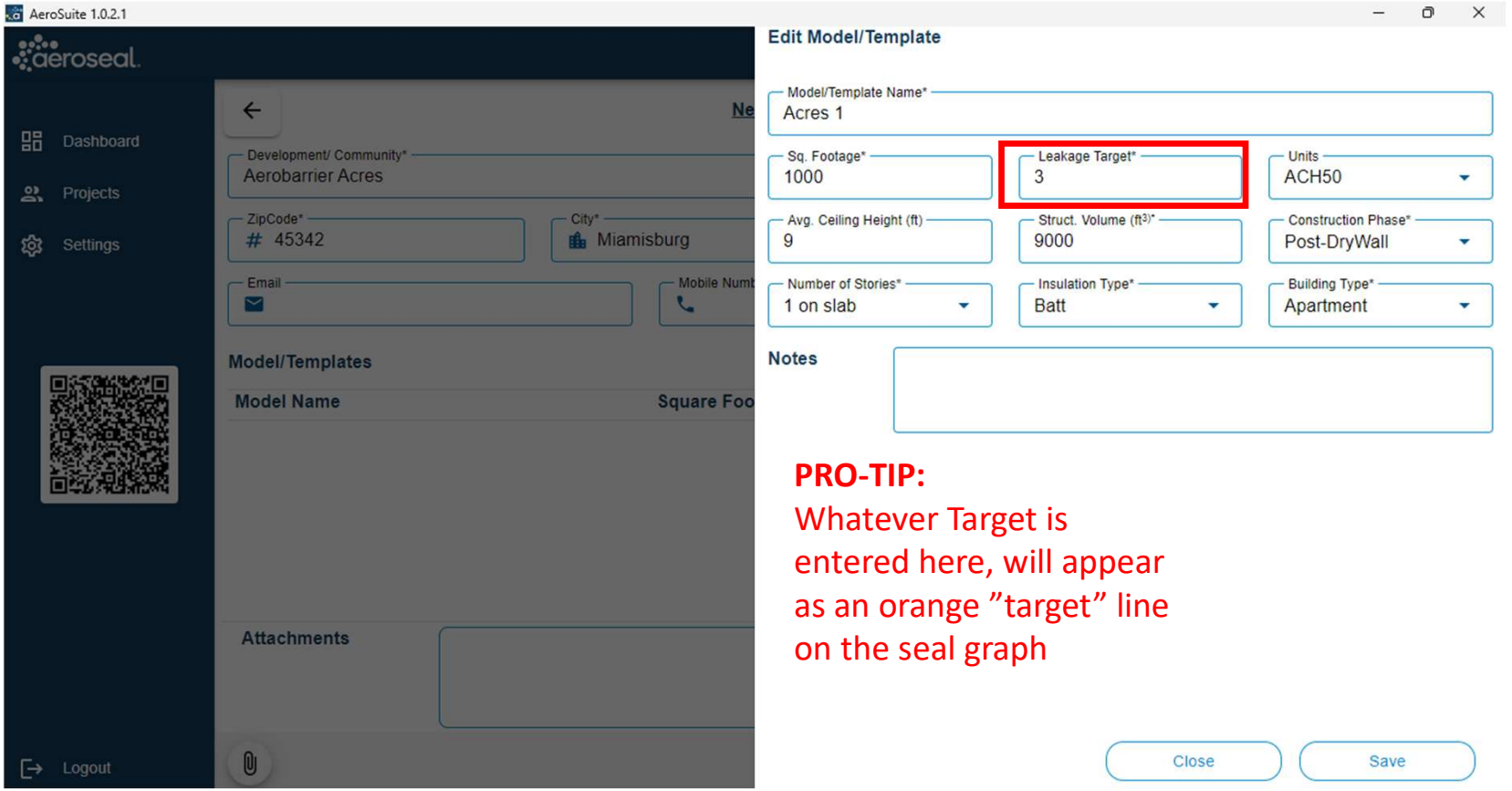


Development Option



OPTIONAL –
Add new template
OTHERWISE-
Proceed to create seal event
by “manage seal event”

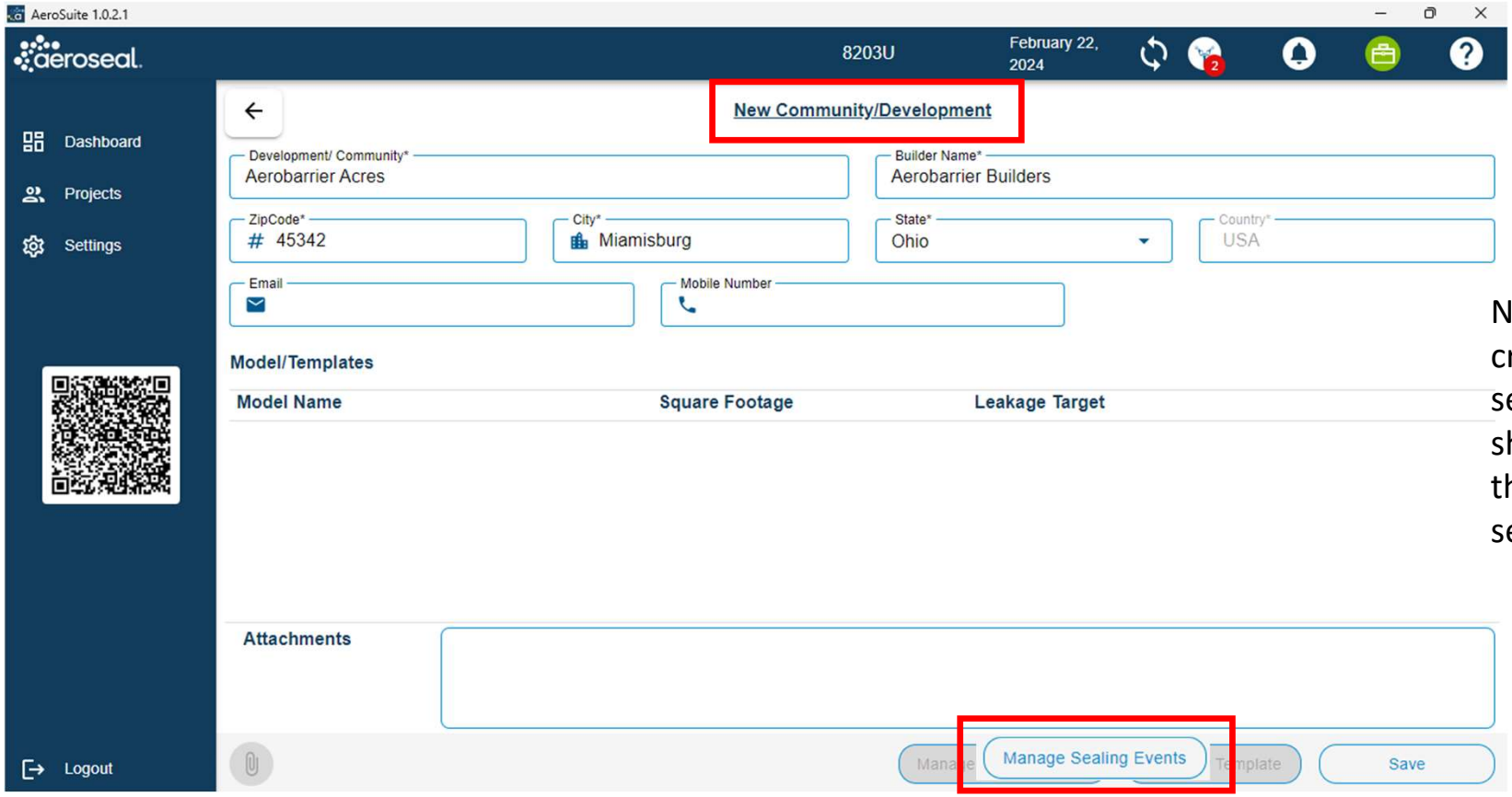
New Development Template



PRO-TIP:
Whatever Target is entered here, will appear as an orange ”target” line on the seal graph

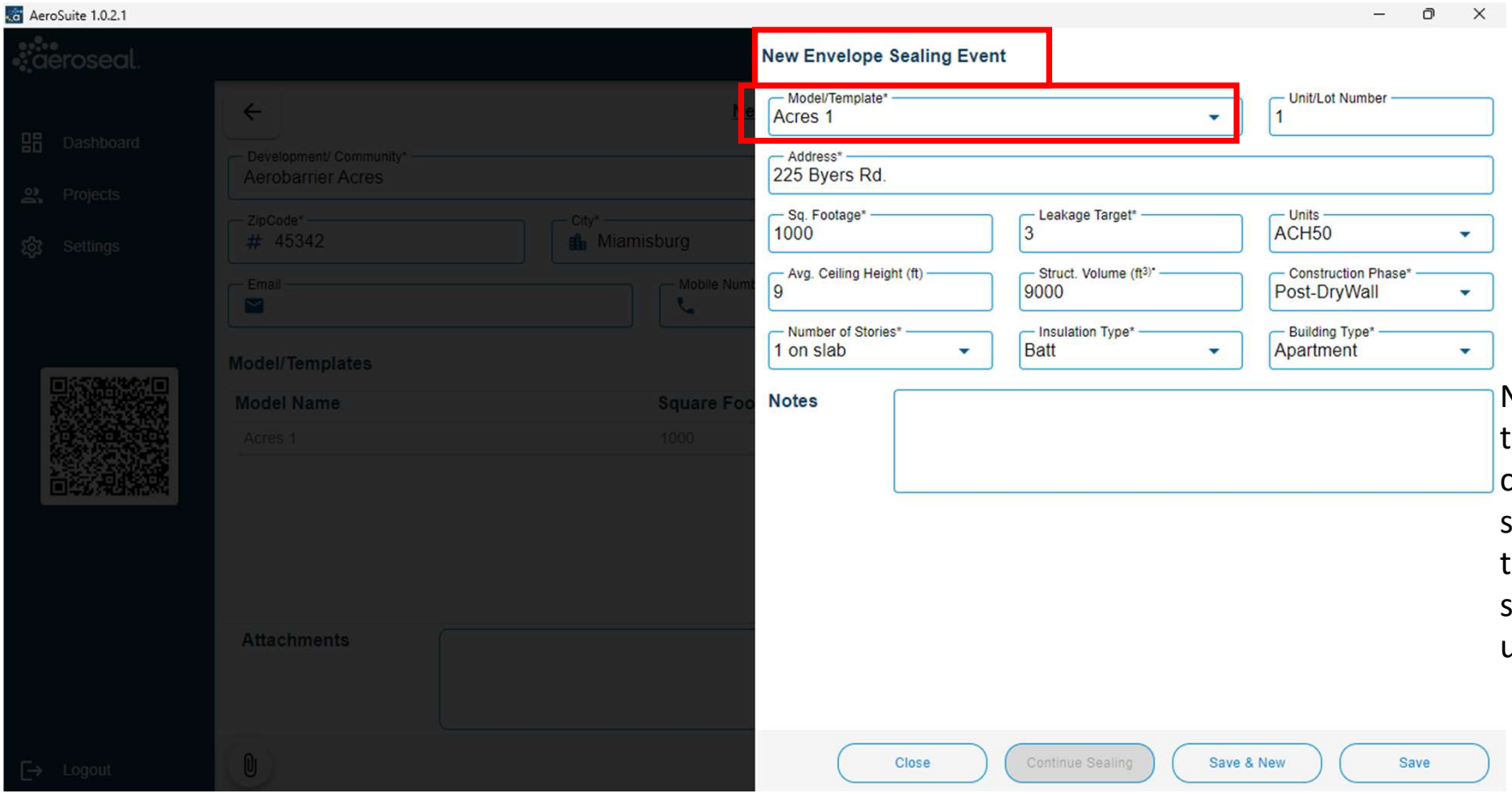
In Aerosuite, you are able to create multiple templates for the development you are sealing.
To create a template, input the details of one of the floorplans then click save.

Creating a Seal Event



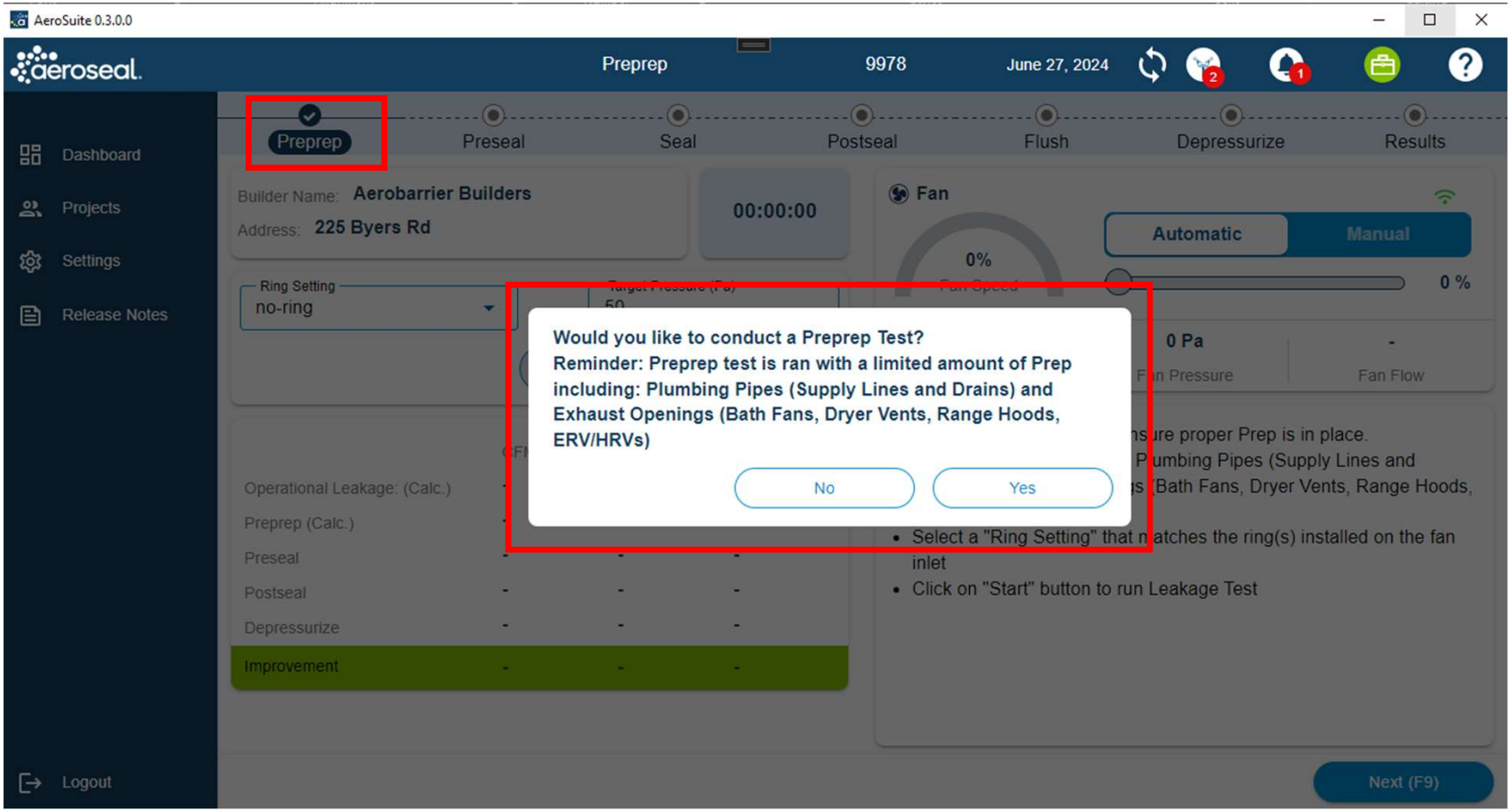
Now that a template is created, the “manage sealing events” button should highlight. Click on that button to create a sealing event.

Create Seal Event



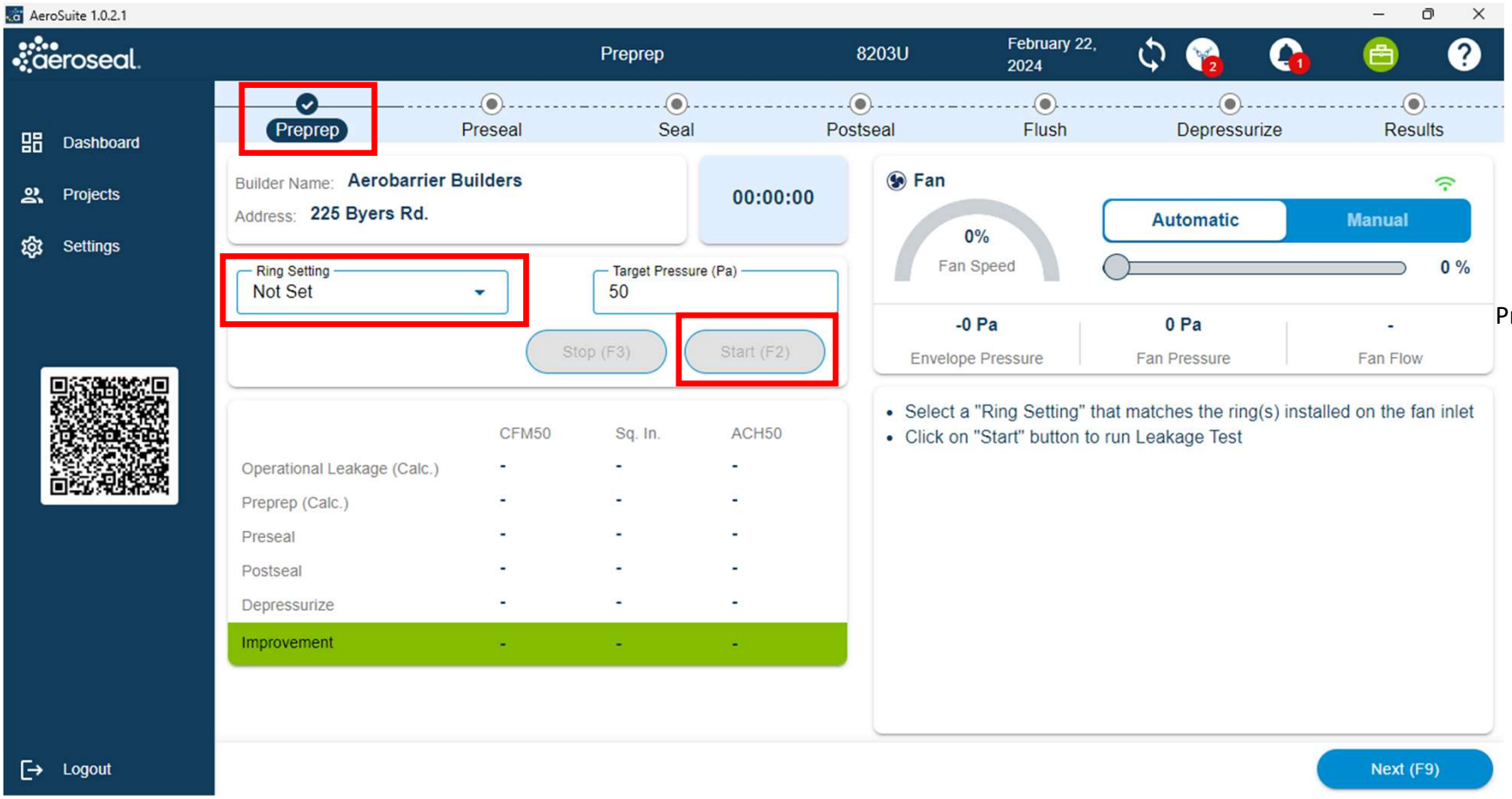
Now that the templates are created, you can select the template to pre fill and the seal event will be set up information wise

Pre-Prep Test



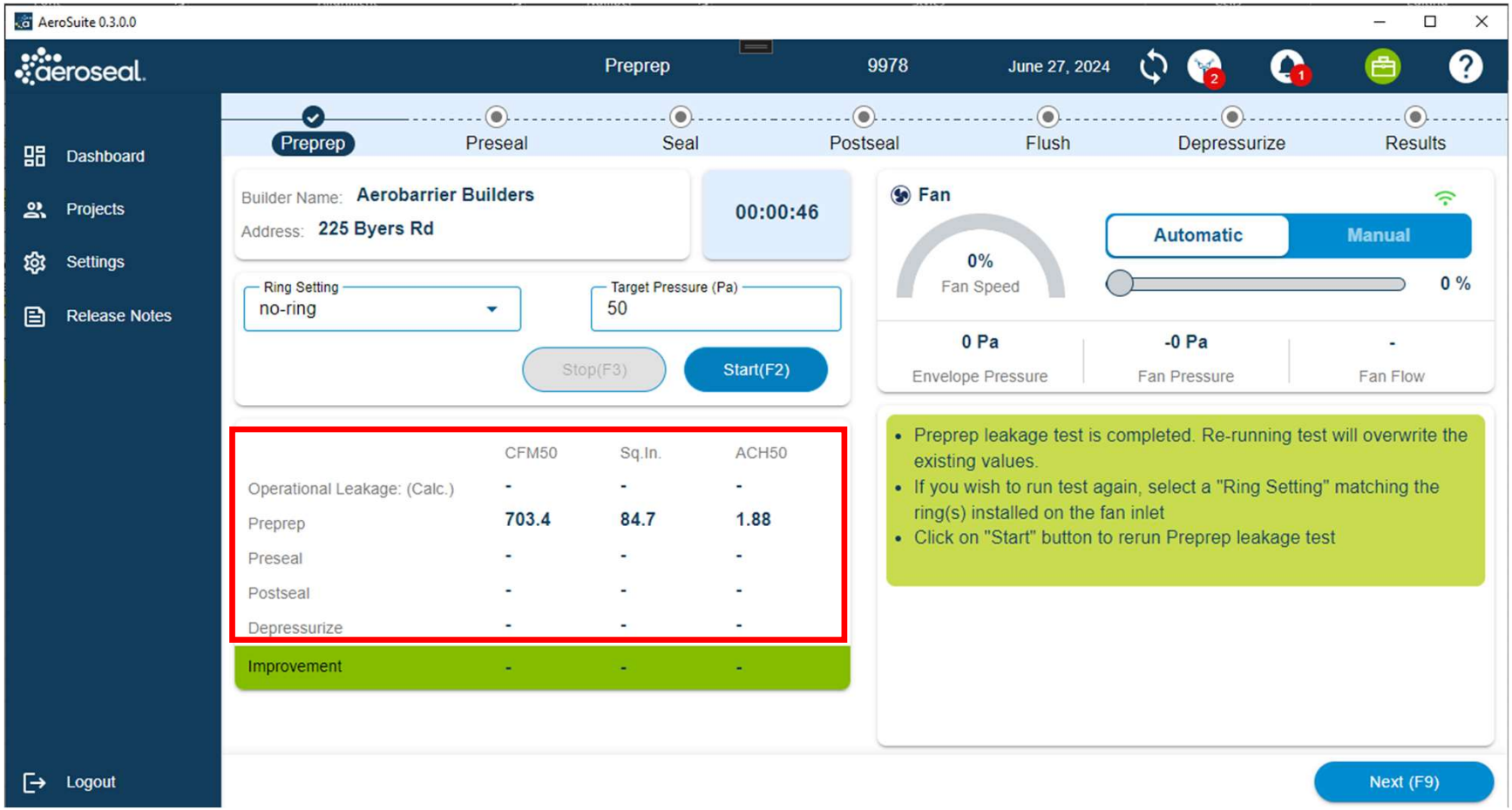
Pre-Prep Test with AeroSuite

Pre-Prep Test

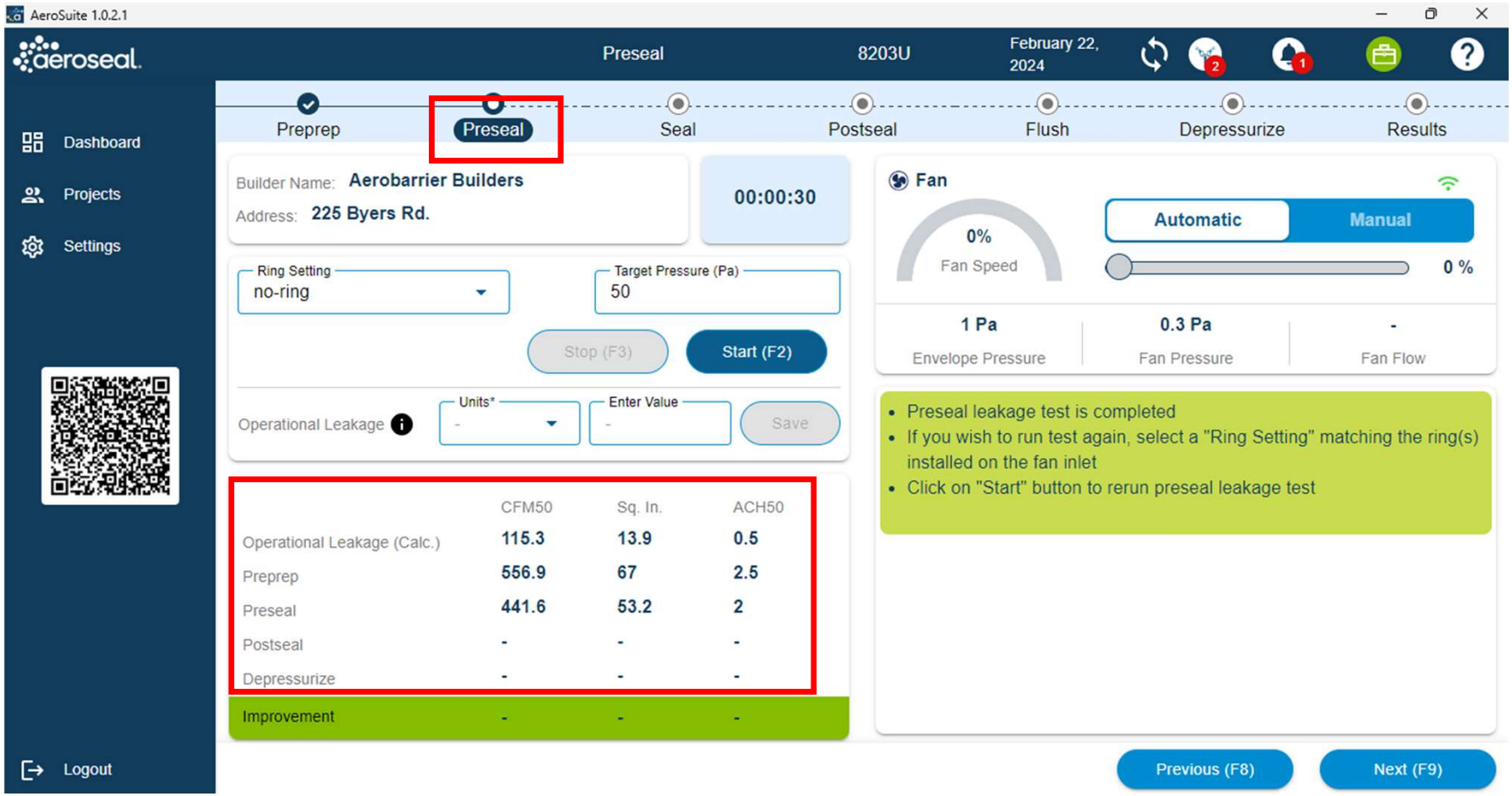


Pre-Prep Test with AeroSuite

Pre-Prep Test - RESULTS

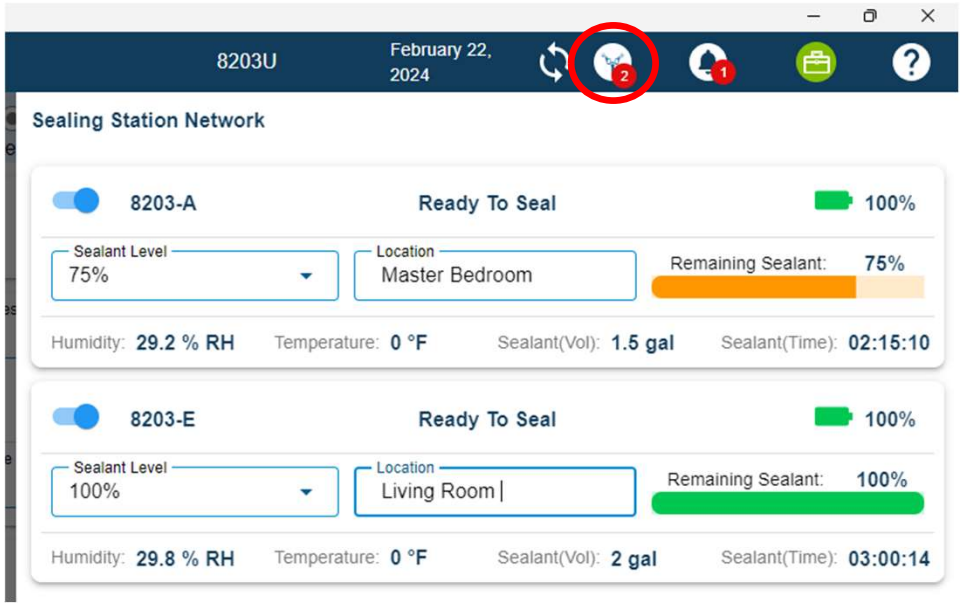


PreSeal Test – Operational leakage Results (Calc)



Once house is fully Prepped, Perform the Preseal test to calculate the operational leakage of the envelope

Sealing Station Setup



After the Pre-seal test, set up the sealing stations in the software.

- Select the sprayer Icon in the top right of the screen and ensure you have your sealing stations on and connected.
- Select the sealant level and enter the location for each

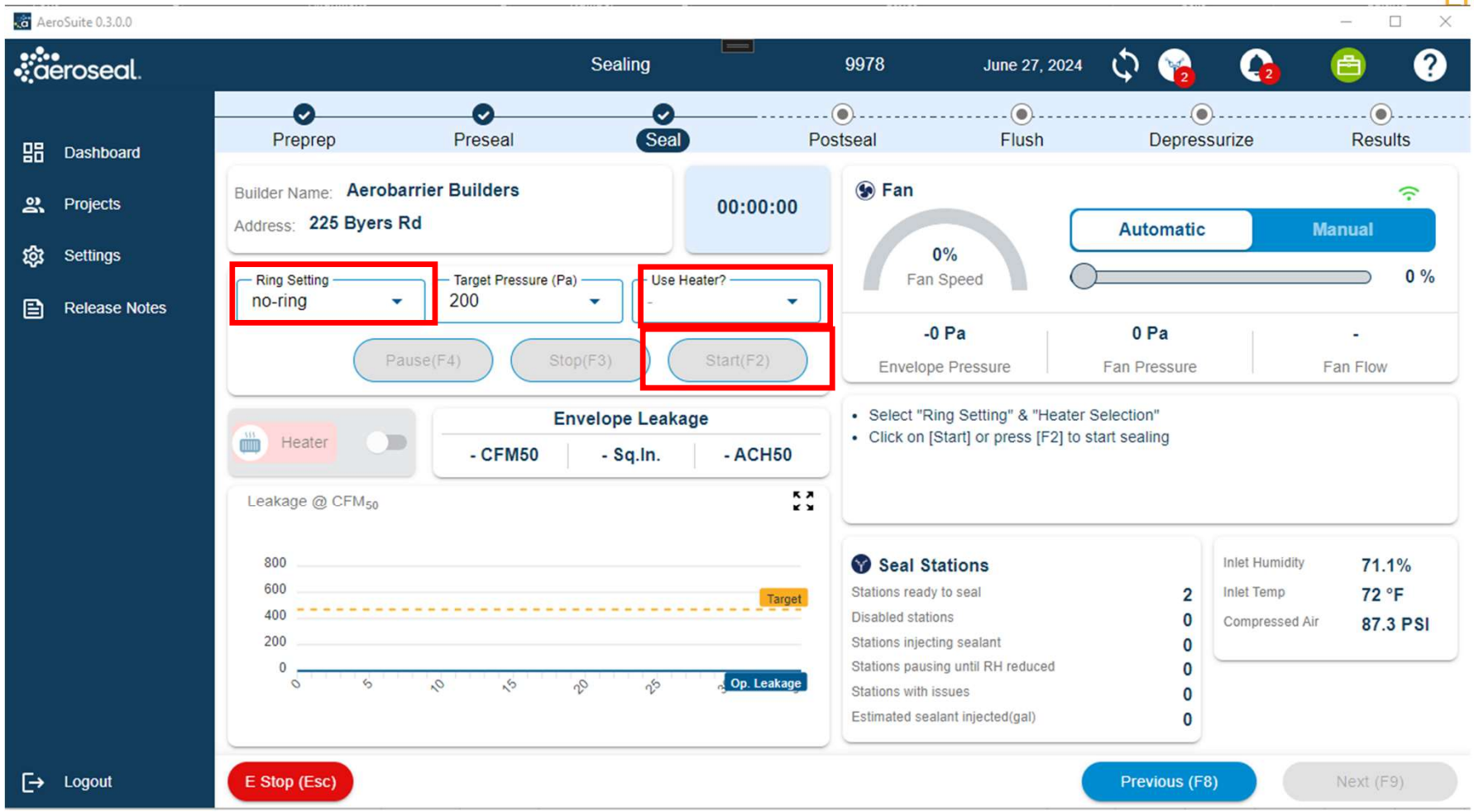
PRO-TIP

TROUBLESHOOTING:

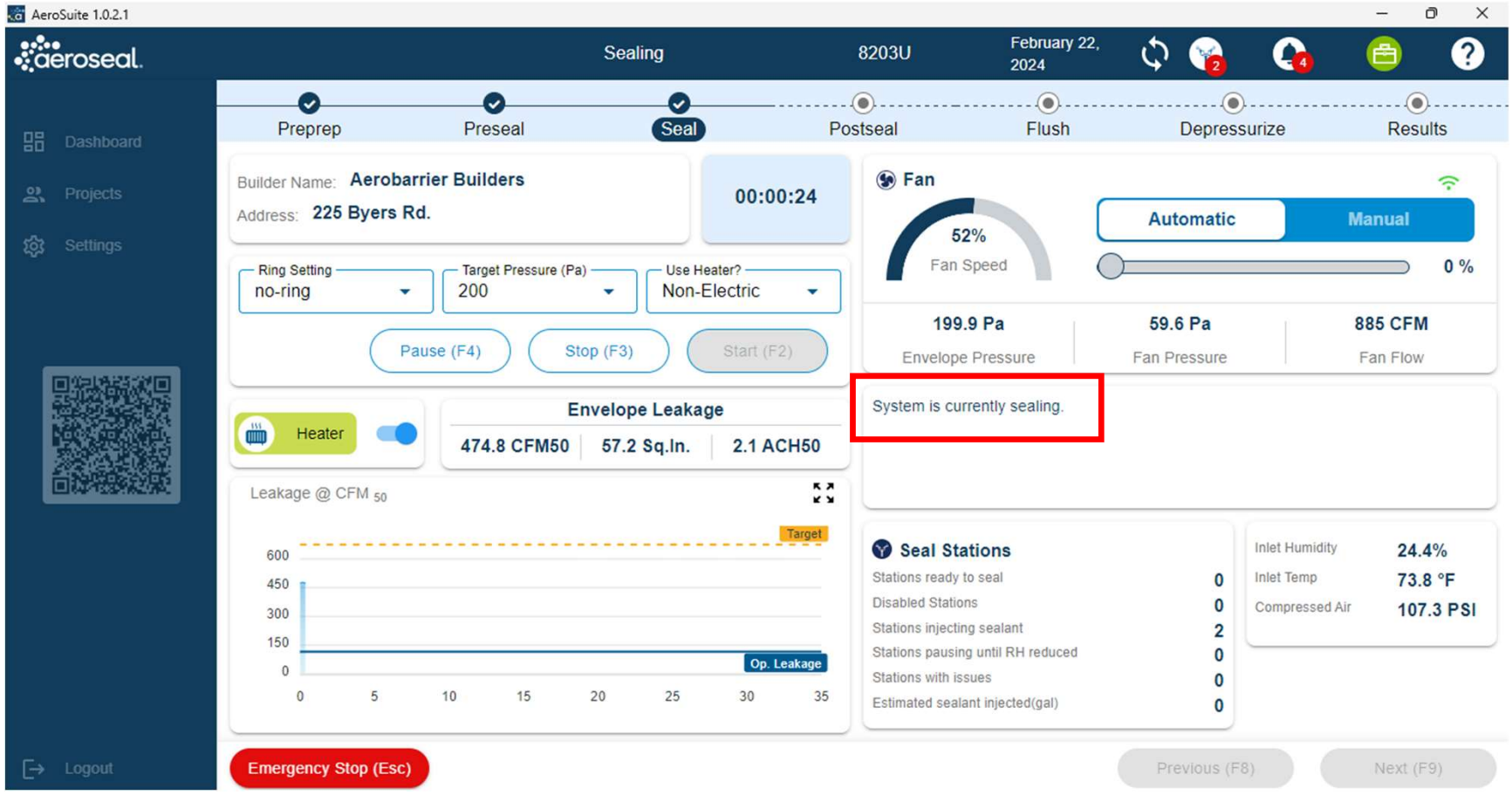
- Check Temps (Above 40F)
- Humidity (Below 90%RH)

See application Note: Cold Weather Operation in Appendix section

Sealing Screen



Starting the Seal



During the Seal

The Seal Graph can be enlarged if desired

Sealing –TROUBLESHOOTING

The sealing cannot commence until compressed air pressure is at least 90PSI at the MCU. Make sure the trailer gauge is set to at minimum **100PSI** to achieve 90PSI at the MCU and manifold. If you do not get pressure, then it is either due to:

- Air leaks
- Water in compressor tank
- Leaks in incoming air hose or compressed air dryer assembly

- If the graph starts to Flat-line, it could mean:
  - you are out of sealant
  - you have large penetrations that cannot be sealed
  - your sealant is not flowing out of the nozzles

Sealing-TROUBLESHOOTING

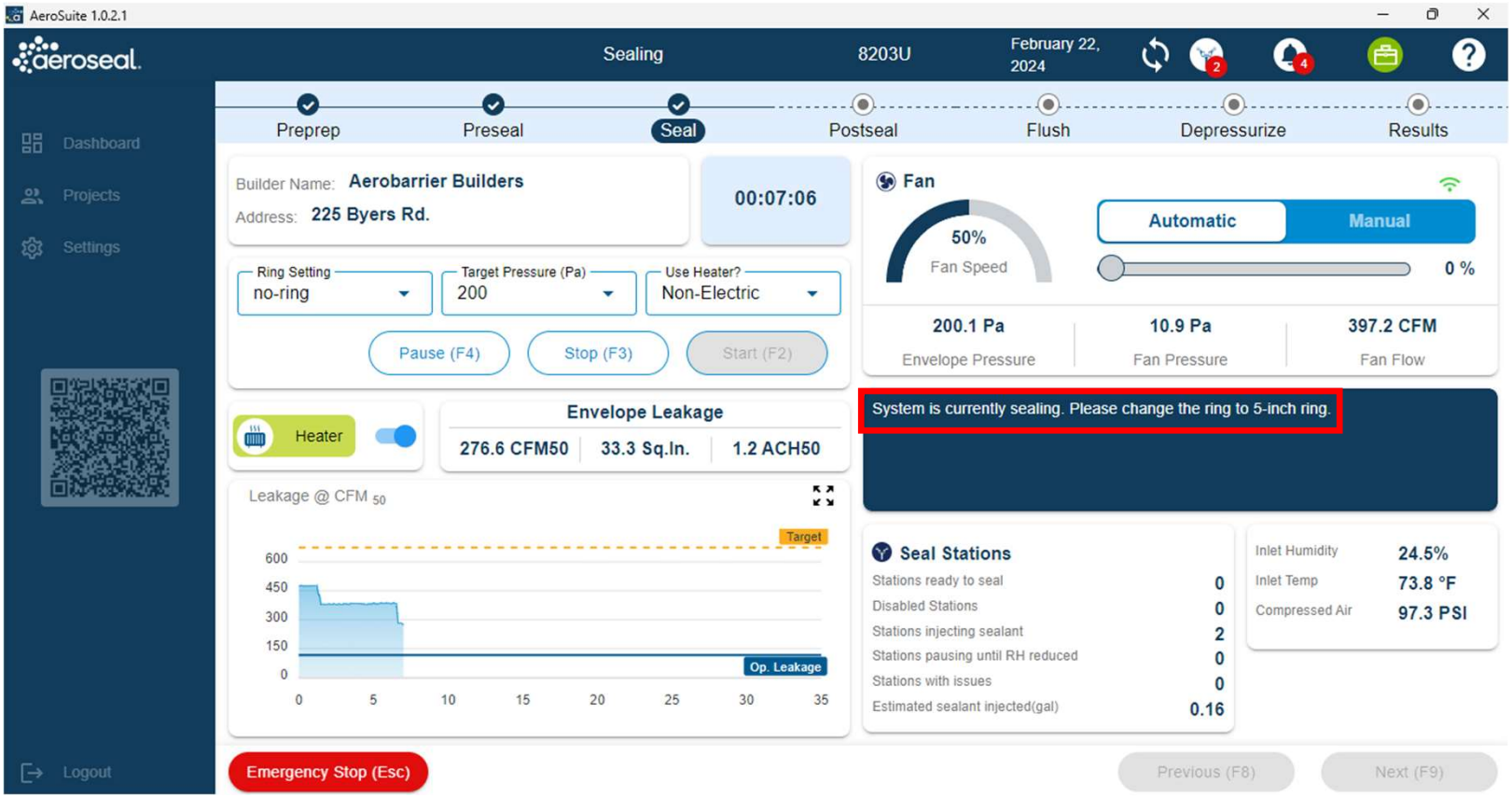
Sealing also cannot commence if the envelope pressure is below **10pa.** If you are unable to build 10pa of pressure on the envelope it could be due to:

- Ring setting too low
- Blue tube disconnected
- Huge leaks in the envelope

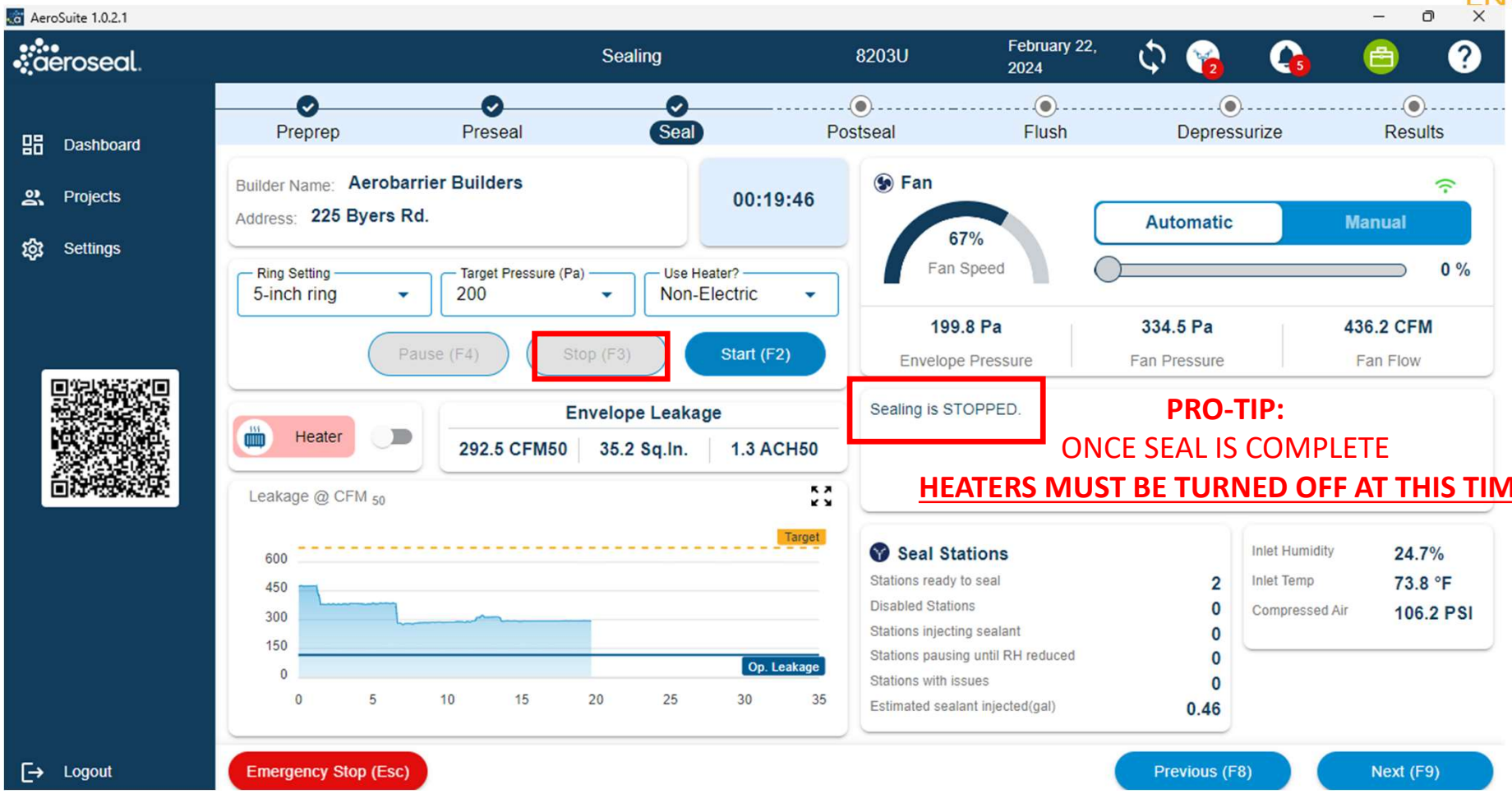
Be sure you know where to seal down to based on the operational leakage

Also check the notifications bell for any alarms/issues

Changing Rings



Stopping the Seal

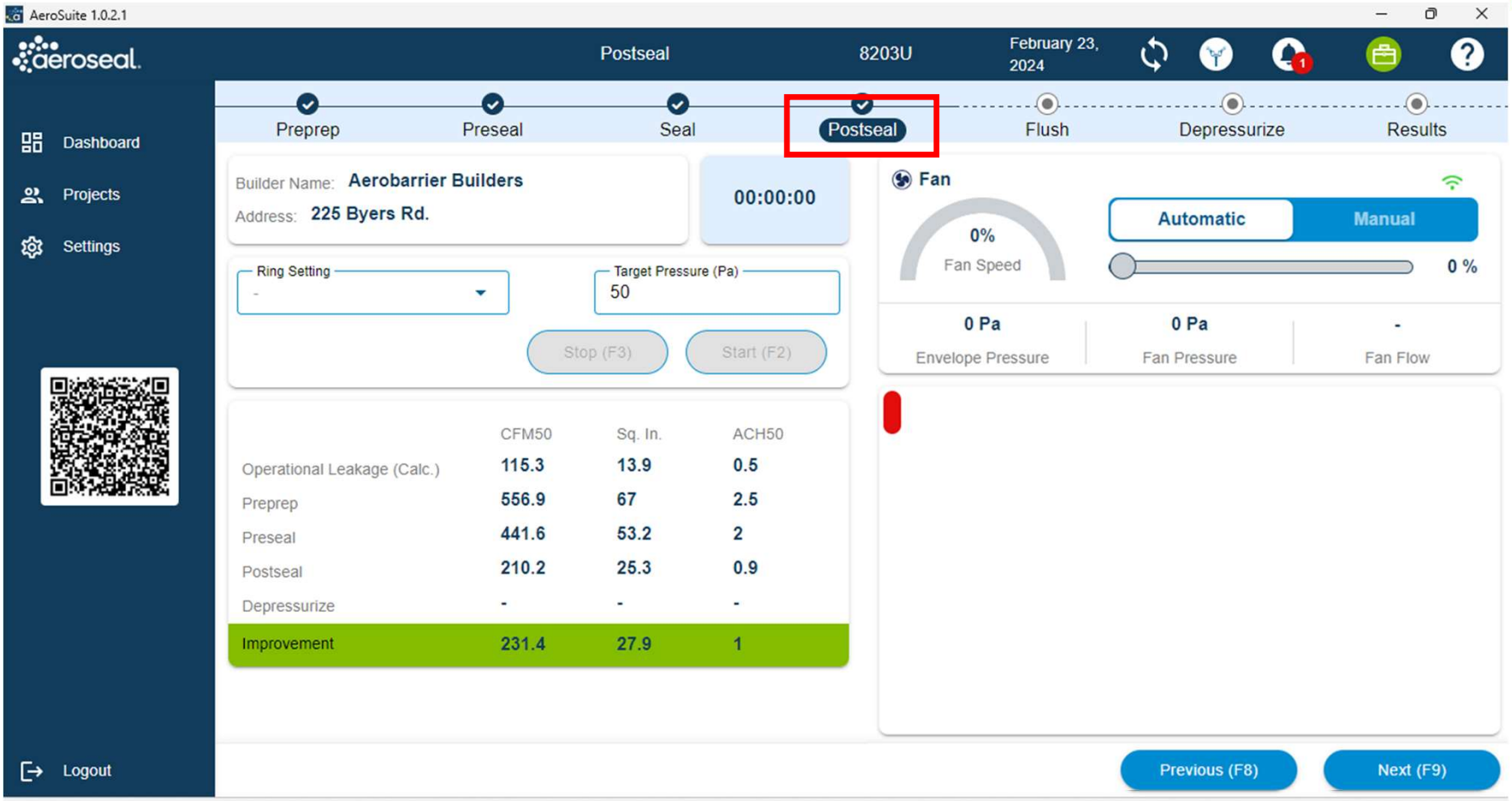


PRO-TIP:

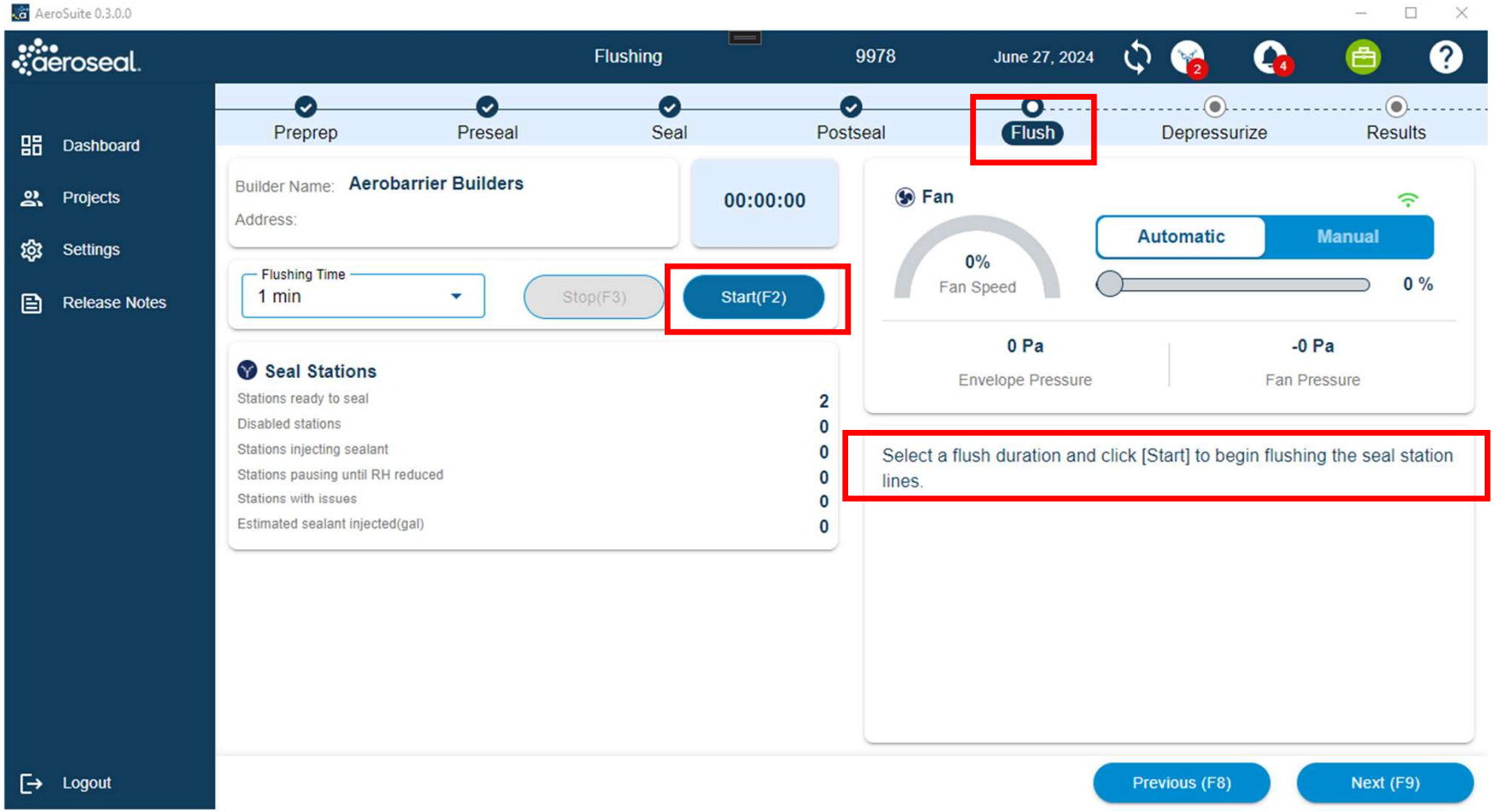
ONCE SEAL IS COMPLETE

HEATERS MUST BE TURNED OFF AT THIS TIME

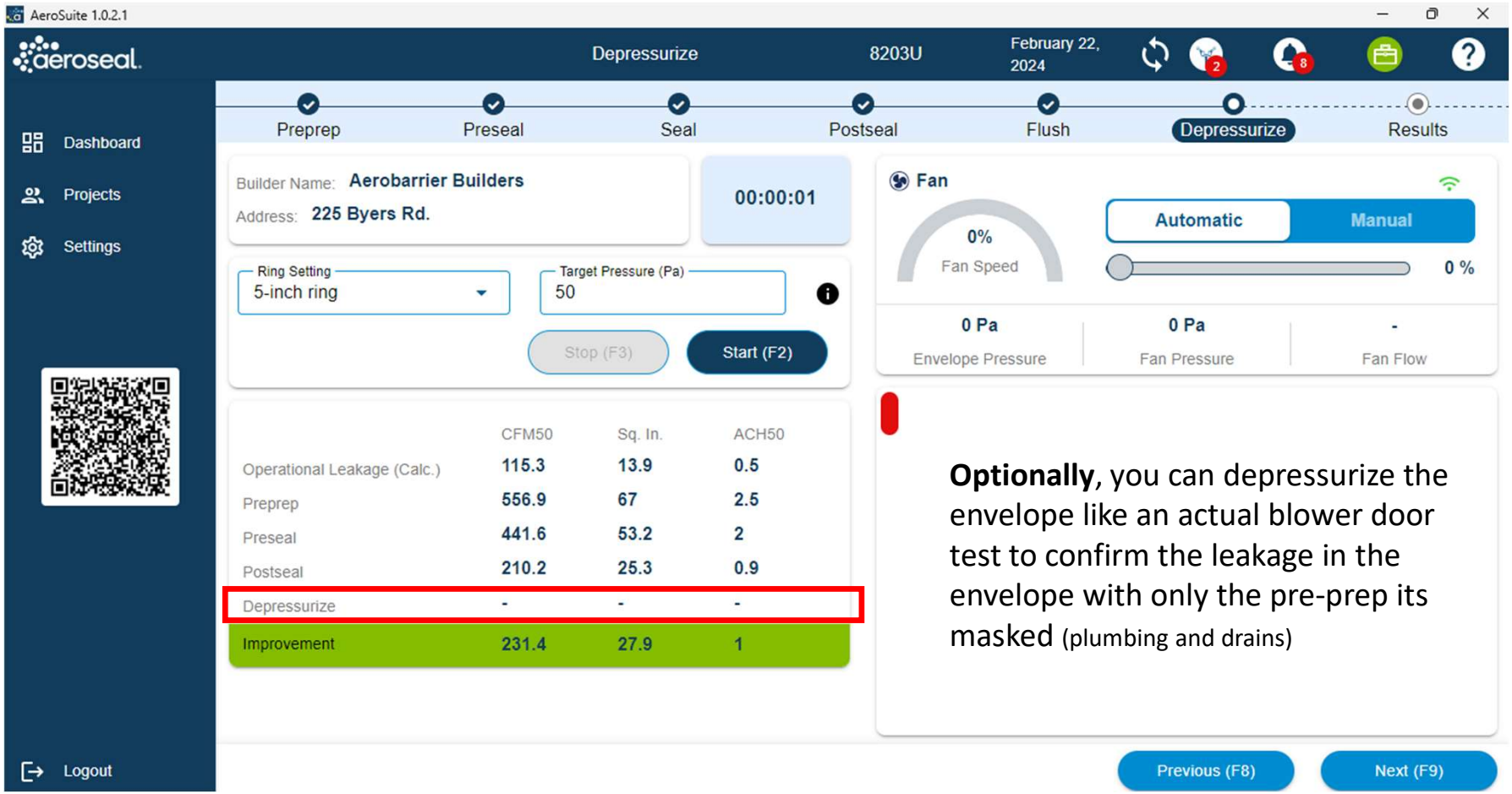
Post Seal


AeroSuite 1.0.2.1
aeroseal
Postseal
8203U
February 23, 2024
Dashboard
Projects
Settings
Logout
Preprep
Preseal
Seal
Postseal
Flush
Depressurize
Results
Builder Name: Aerobarrier Builders
Address: 225 Byers Rd.
00:00:00
Ring Setting
Target Pressure (Pa)
50
Stop (F3)
Start (F2)
Fan
0%
Fan Speed
Automatic
Manual
0 %
0 Pa
Envelope Pressure
0 Pa
Fan Pressure
-
Fan Flow
CFM50
Sq. In.
ACH50
Operational Leakage (Calc.) 115.3 13.9 0.5
Preprep 556.9 67 2.5
Preseal 441.6 53.2 2
Postseal 210.2 25.3 0.9
Depressurize - - -
Improvement 231.4 27.9 1
Previous (F8)
Next (F9)

Flush


AeroSuite 0.3.0.0
aeroseal
Flushing
9978
June 27, 2024
Dashboard
Projects
Settings
Release Notes
Logout
Preprep
Preseal
Seal
Postseal
Flush
Depressurize
Results
Builder Name: Aerobarrier Builders
Address:
00:00:00
Flushing Time
1 min
Stop(F3)
Start(F2)
Seal Stations
Stations ready to seal 2
Disabled stations 0
Stations injecting sealant 0
Stations pausing until RH reduced 0
Stations with issues 0
Estimated sealant injected(gal) 0
Fan
0%
Fan Speed
Automatic
Manual
0 %
0 Pa
Envelope Pressure
-0 Pa
Fan Pressure
Select a flush duration and click [Start] to begin flushing the seal station lines.
Previous (F8)
Next (F9)

Depressurize

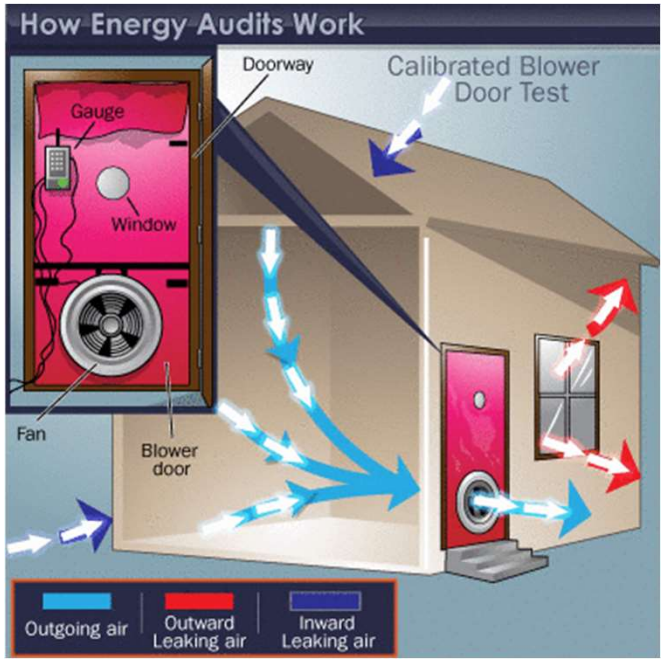


Optionally, you can depressurize the envelope like an actual blower door test to confirm the leakage in the envelope with only the pre-prep its masked (plumbing and drains)

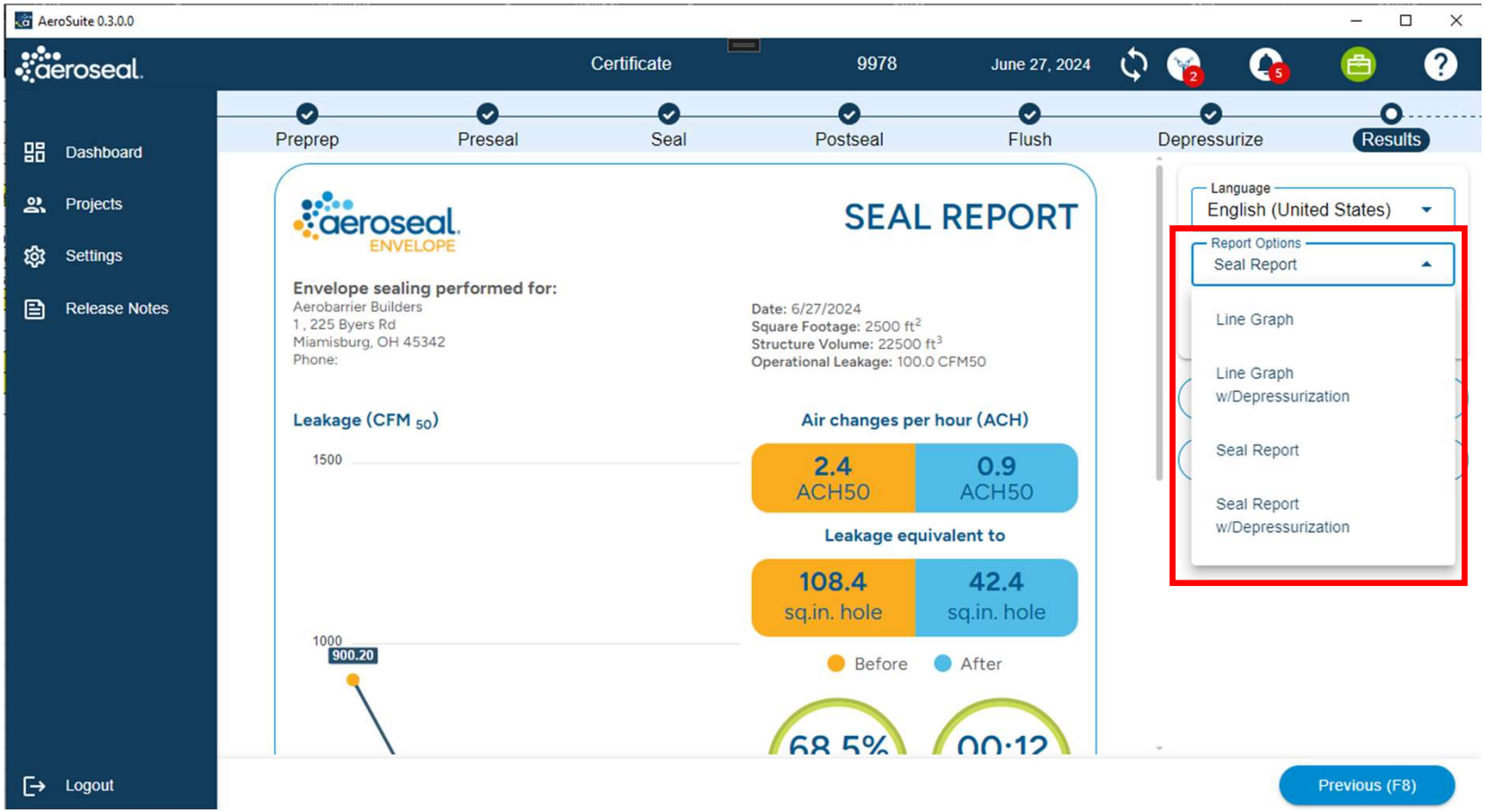
Depressurization Test Out

This is the most accurate representation of what a 3rd party Rater/Verifier is going to test.

1. Move the Fan and MCU inside – blowing out
2. Move blue tube to the outside
3. Remove all prep, except for plumbing fittings
4. Run the depressurized post-seal test



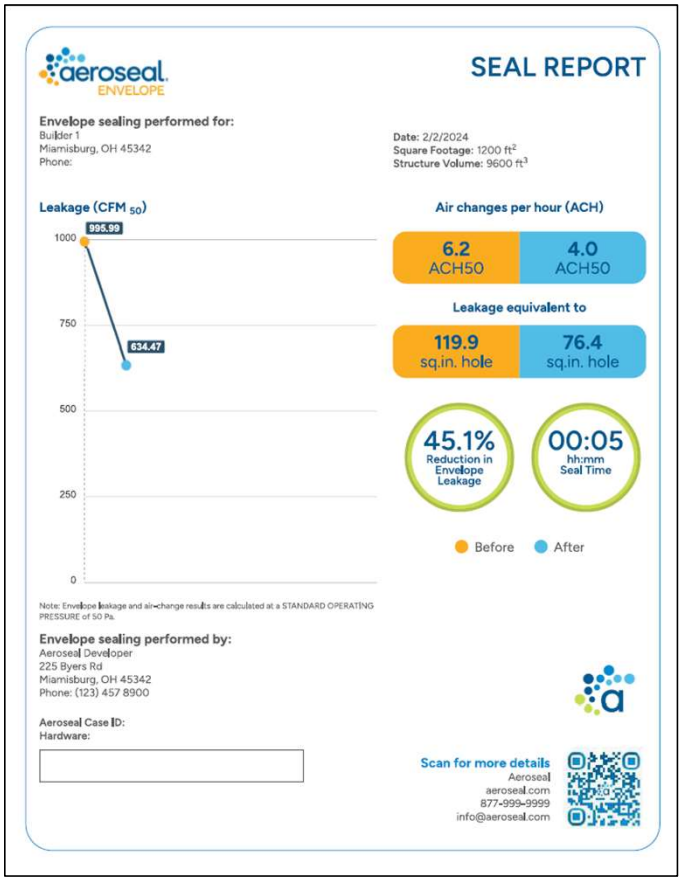
Seal Report



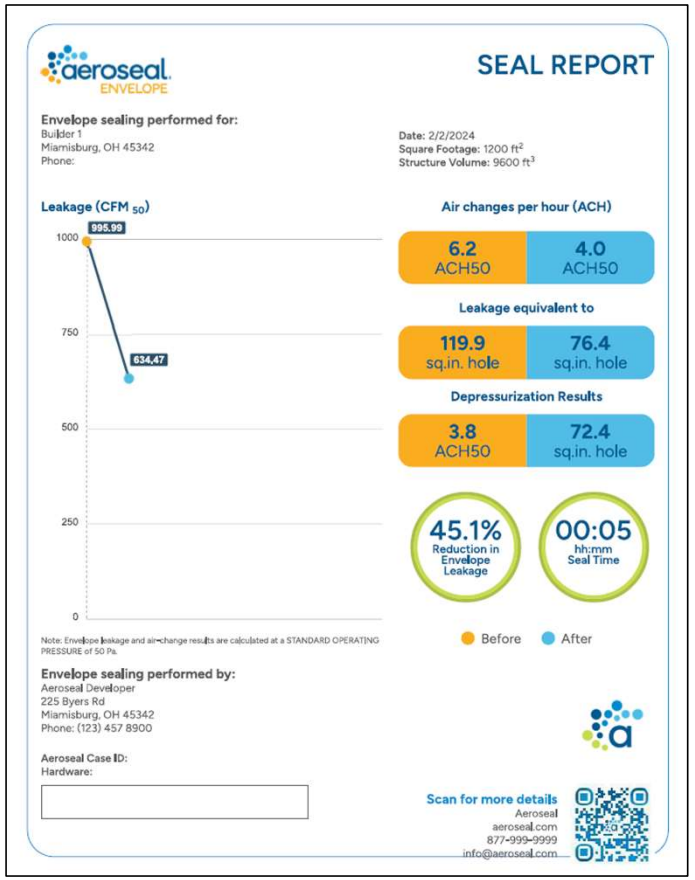
Select Report Option of choice

PRO-TIP:
Once you "Print certificate" **you will not be able** to go back and do more sealing

Seal Report



Seal Report with Depressurization



Section 6

MAINTENANCE

General Maintenance

Part	How often to clean	How to clean	Tips
Nozzles	Every seal	Flush with water – use warm water if available	Whenever there is sealant build-up on the nozzles, soak in Buckeye cleaner. Disassemble as needed to clean sealant build-up.
Tubing	Every seal	Flush with water – use warm water if available	Remember to clear lines of water with compressed air after flushing
Connectors	Whenever build-up is observed	Connectors will not require cleaning as long as CLEAN tubing is inserted. Also, be sure to insert tubing all the way into the connector so it is fully seated.	Make sure tubing is clean every time you insert into connectors. This reduces the chance for leakage and air bubbles in the system.

Link to-Compressed Air system Maintenance video

Link to-Nozzle cleaning Video

Link to-Sealing station Maintenance Video

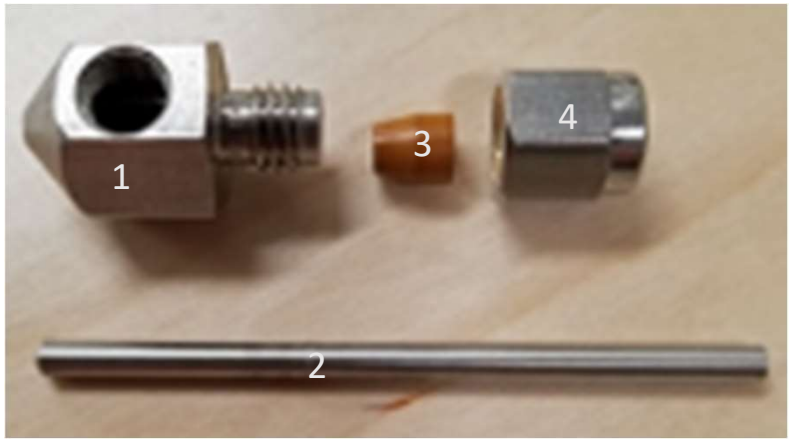
Flushing the System

One of the key steps after you do the sealing job is to make sure that your liquid lines are free of sealant

- ALWAYS flush the system with CLEAN water. Use the purge switch and warm water if available.
- Make sure all tubing ends are clean before storage and before use.
- During cleanup, it is critical to do a manual flush to clear the sealant line

Nozzle Cleaning

- When Cleaning the nozzle, it is recommended that the nozzles be soaked overnight in buckeye workout cleaner.
- The Nozzle contains 4 parts
  1. Nozzle head
  2. Liquid tube
  3. Ferrrule
  4. Compression fitting

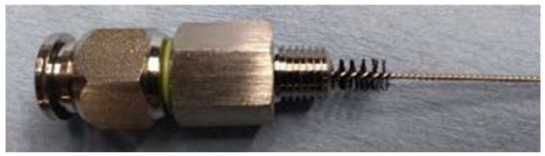


Nozzle Cleaning Cont'd

- Make sure both the nozzle and liquid tube are completely clear of sealant.
- The compression fitting and ferrule just need to be dried.
- Check the air inserts for any sealant. Give the PTCs a quick cleaning

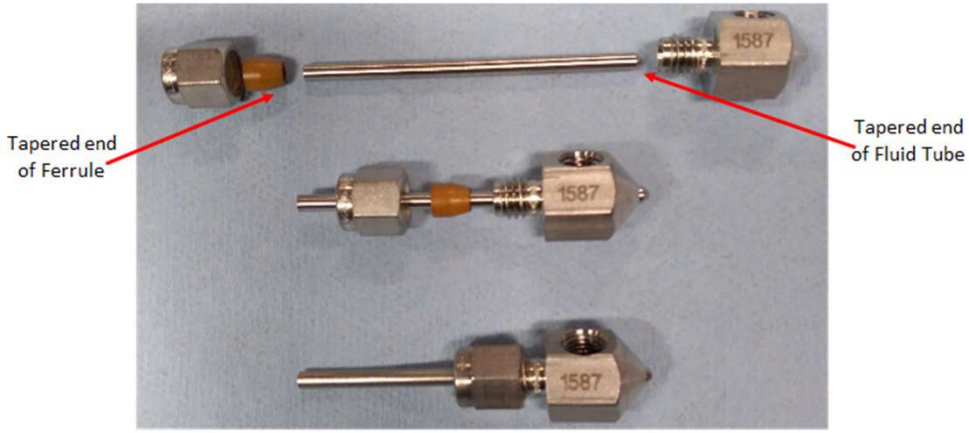
Brush inside the nozzle bore (both ends), female thread, and inside the central cavity

Ram rod for the interior of the insert



Nozzle Reassembly

- To reassemble the nozzle, first put the ferrule **Curved side up** into the compression fitting
- Attach the compression fitting to the nozzle head and run the liquid tube (**Tapered end)** through
- Tighten with a wrench to ensure ferrule creates an airtight seal around the liquid tube
- **Important note: Ensure that the tapered end of the liquid tube is flush with the nozzle head to ensure efficient aerosolization.**



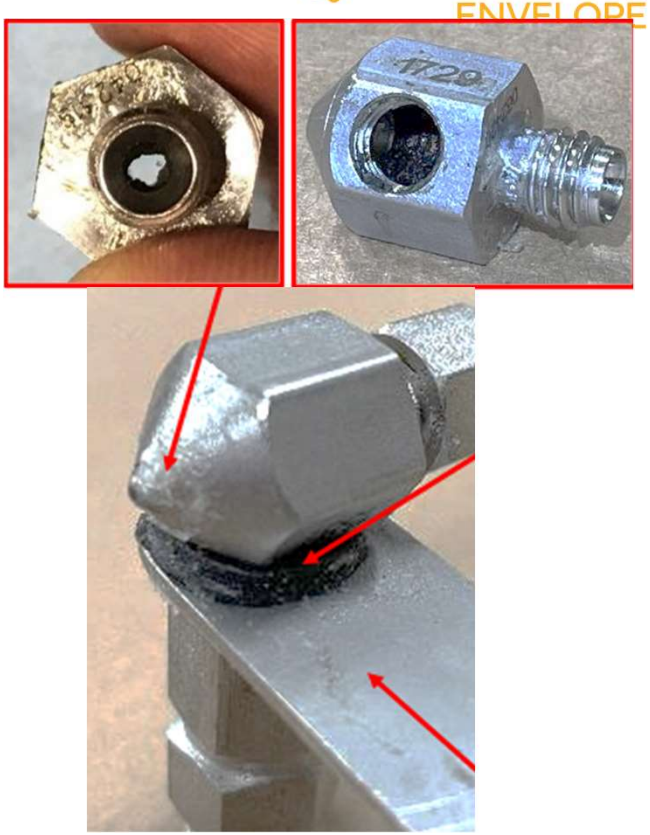
Maintenance: Nozzle Cleaning Tip

- It is imperative that the nozzles are cleaned at the end of each day. Failure to clean the nozzles can lead to:

-Sealant not fully aerosolizing, leading to the sealant falling to the floor in liquid form

-No saturation of sealant in the envelope, causing longer seal times

-Low compressed air flow, leading to no aerosolization in the sealant



Section 7

APPENDIX

APPENDIX

GENERAL INFORMATION:

- TECHNICAL SUPPORT INFO PAGE
- ENVELOPE SEAL JOB CHECKLIST
- HOUSE PREP CHECKLIST
- ABS – S.O.P. CHECKLIST
- PRACTICE SEAL CHECKLIST

APPLICATION NOTES:

- 001 – COLD WEATHER OPERATIONS
- 002 – POOLING SEALANT
- 003 – NOZZLE CLEANING DETAIL & LEAK TESTING

ADDITIONAL DOCUMENTS:

- TRAILER –FULLY OUTFITTED
- OPTIONAL ACCESSORY PACKAGES

VIDEO LIBRARY:

- QR CODE LINKS TO SHORT-SUBJECT TUTORIAL VIDEOS

Aeroseal Envelope Contact Information

Tech Support: *(800)-772-6459 or (937)-428-9300 ext.308*

(If calling past 5pm est, leave a voicemail for the on-call tech to reach you)

Orders: *(937)-428-9300 ext. 406*

John Parkinson Cell*:937-307-6228*

aeroseal ENVELOPE

ENVELOPE SEAL JOB CHECKLIST

JOB NAME:_____

DATE:_____

- [ ] 1. ARRIVE AT JOBSITE – COMPLETE WALK-THRU TO DETERMINE PREP NECESSARY
- [ ] 2. SET UP: BLOWER DOOR / EQUIPMENT @ INJECTION POINT
- [ ] 3. AEROSUITE SOFTWARE – DATA ENTRY; JOB INFORMATION
- [ ] 4. PERFORM PRE-PREP OF HOUSE – AND PRE-PREP LEAKAGE TEST
- [ ] 5. FULL PREP OF HOUSE – AND PRE-SEAL LEAKAGE TEST
- [ ] 6. DETERMINE NUMBER AND LOCATION OF SEAL STATIONS – IDENTIFY AND CONNECT IN THE SOFTWARE
- [ ] 7. STIR SEALANT AND FILL SEAL STATIONS – SEALANT JUG AND WATER/FLUSH JUG
- [ ] 8. ENSURE (NEH) NON-ELECTRIC HEATER STATION HAS FUEL AND IS STARTED
- [ ] 9. BEGIN SEAL – TROUBLESHOOT DURING, FOR ANY CONDITIONS THAT NEED ATTENTION
- [ ] 10. AS SOON AS THE SEAL IS STOPPED – TURN OFF HEATER
- [ ] 11. PERFORM POST-SEAL LEAKAGE TEST
- [ ] 12. PERFORM FLUSH OF SEAL STATIONS
- [ ] 13. * OPTIONAL – DEPRESSURIZATION TEST
- [ ] 14. VIEW/PRINT/SAVE SEAL REPORT
- [ ] 15. EQUIPMENT AND NOZZLE MAINTENANCE

PLEASE ALSO REFER TO THE "OPERATIONS MANUAL" FOR DETAILS

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Prep work to be done in Building Envelope (before sealing step)

The main objective of prep work is to ensure there are no holes larger than 1/2" size and to protect any finished surfaces fixtures and gadgets in the home. Use painters tape, duct mask, foam guns and plastic sheets for this purpose. **Ensure pre prep blower door test is complete before prepping**

Address / Apartment# _____

	Look for	***How to Prep?***
☐	Big holes	Manually block, use foam spray or use Duct Mask to temporarily seal Check for plumbing penetrations (bathroom/kitchen sink/kitchen) Block or spray foam any holes larger than 1/2" - plumbing holes, bottom sill plate etc.
☐	Vents	Duct mask tape or foams blocks on HVAC registers **Leave Boot Leakage Exposed** Duct Mask tape over range hood and dryer vents Duct mask tape on bath fans *Let AB sealing process address the boot leakage (if any)* Optionally use caulk to seal the boot leakage
☐	Windows	Check windows (close tightly) and inspect vent holes (tape them) Cover the whole window using tape & drape plastic and painters tape Cover window weep holes
☐	Doors	Exposed penetrations to be taped (painters tape or duct mask) Be careful of sliding doors/ tracks (cover with painters tape) Protect horizontal surfaces , handles, knobs Use painters tape to tape the seams between door and door frame
☐	Finished surfaces	Plastic sheets on counter tops/ bathroom ceramic fittings (all horizontal surfaces) Cover plumbing fixtures - faucets, tubs, tiles Kitchen cabinets-Tape the doors/drawers handles (using painters tape). Leave doors open. Protect any finished flooring
☐	Electrical	Tape electrical outlet face (if installed). Tape up main electrical panel (Do not let sealant go onto high voltage terminals) Break drywall mud off of the outlet boxes
☐	HVAC equipment	Cover up the HVAC unit Ensure all cabinet penetrations are covered
☐	ERVs	Duct Mask over the outer shell of the ERVs Look for piping between HVAC and ERV and block the holes
☐	Light fittings & Fans	Preferably remove the fixtures to expose holes on wall/ ceiling Cover up any wall mounted light fixtures. Cover fans using plastic sheets (expose the mounting bracket/ ceiling for sealing) Canned Lights - no additional prep; if you see sealant deposits then escalate to builder
☐	Fireplace	Cover fireplace completely (including vent holes) and tape up with Duct-Mask *Be careful of paint Look for any other ventilation in the drywall framing into the fireplace
☐	Fire Suppression heads	Use the sprinkler cover plate to prep fire suppression heads

Tip: A good way to make sure no major gaps are left or hidden would be to use a smoke puffer

1) Install the Blower door and fan during Preseal
2) Ramp up the fan manually and pressurize the room (ensure you are inside the room)
3) Use smoke puffer to see the direction where smoke travels (smoke will exit out towards holes/ leaks)
   Common locations - near cabinet edges, plumbing entries, electrical fixtures and panels

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Standard Operating Procedure for Aerobarrier Select System

Pre Prep Blower Door Test and Envelope Preparation

☐ Set up the Machine for Pre Prep Test

- ___ Before Pulling Equipment, Ensure all exterior doors/windows are closed and locked
- ___ Get MCU, Fan Assembly, And Blower Door and place at injection point
- ___ Set up Blower Door Frame by attaching the four frame pieces together
- ___ Size Blower Door frame into injection point door(either front door or garage door)
- ___ Take Blower Door frame out of injection point and attach blower door canvas
- ___ Put Blower Door back in place, attach crossbars and lock cam levers into place
- ___ Connect Fan Pressure Tube (red) to fan+control Box
- ___ Connect Envelope Pressure Tube (blue) to Fan assembly and run tube through Blower Door to the middle of the Envelope
- ___ Connect Layflat tubing to Fan assembly+21" injection collar
- ___ Place 21" Injection Collar to Blower door and attach Velcro on crossbar to rubber band on 21" injection Collar
- ___ Run 2 120v power legs and plug it into MCU+fan control box
- ___ Turn on Generator
- ___ Ensure Blue LED on MCU and Green Fan LED's light up when power is added
- ___ Open up Aerosuite software and Run the pre prep Blower Door test (see Aerosuite checklist)
- ___ Once test is complete, shut off generator

☐ Prep House and plan equipment layout

- ___ Prep the Envelope for Sealing (See Prep Checklist)
- ___ Determine work space location outside of Envelope (I.e. in Garage, outside main door)
- ___ Determine access door for entry during the seal (back door, front door, or blower door)
- ___ Run 100ft Compressed Air hose from trailer to MCU

☐ Sealing Station Layout

Typically Use one seal station per 500 sqft

☐ Prep Sealant by mixing it with a paint mixer until solids at the bottom are mixed in.

Standard Operating Procedure for Aerobarrier Select System

Setting up Seal Stations, nozzles and compressed air manifold

☐ Set up Seal Stations

- ___ Place Seal Stations in areas you have designated for the seal
- ___ Attach monopod to seal station
- ___ Attach Nozzle Bracket to monopod
- ___ Point nozzles away from walls and windows (allow 8ft of open space for the nozzles to spray)
- ___ Connect liquid Tube to seal station connector on the right side of seal station

Repeat the steps for each seal station

☐ Priming the Seal Stations

- ___ Fill the two Gallon Jug with sealant and the Half Gallon jug with water
- ___ Connect the water pump to the water Jug
- ___ Connect the sealant pump to the sealant jug
- ___ Power on Seal Station by pressing the red button (button should light up when on)
- ___ Ensure all liquid tubes are connected to the seal station
- ___ Hold down the black button to start the Priming process (let go of silver button when pumps start)
- ___ Observe sealant from inside the sealing station until it gets to the "Y" Piece on the nozzle bracket.

☐ Hook up all Compressed Air hoses

- ___ Connect 30ft Compressed Air Hose to MCU+Compressed air manifold
- ___ Place Compressed Air Manifold in a central part of the house where it reaches all seal Stations

Ensure unused ports are blocked using either jumper tubes or blocker pieces (both found in Spare Parts Kit). Recommend to cover up the manifold after properly hooking up all tube to avoid any clean effort needed after the job.

- ___ Connect Dual Bonded Tubing to the manifold

Ensure dual bonded tubes are firmly connected to the manifold (feel for the sharkbite)

- ___ Run dual bonded tubes to seal stations and connect to nozzle brackets (bottom part of bracket)

Ensure dual bonded tubes are firmly connected to the nozzles (feel for the sharkbite)

Sealing Event

☐ Final Walkthrough before start of the seal

- ___ Check Prep of the envelope to ensure areas needing protection are prepped
- ___ Ensure all sealing stations are powered on and primed
- ___ Ensure Sealing stations, manifold and hose reels are covered with protective materials
- ___ Ensure Envelope pressure tube (blue tube) is centrally located in the envelope

☐ Setting Up Blower Door for Seal

- ___ Cut a piece of grid foam the width and length of the injection door frame
- ___ In the foam, cut a 1in canal to allow for clearance of the 30' compressed air hose to run under Blower Door
- ___ Put Blower Door back into injection point, adjusting as necessary and lock cam levers into place
- ___ Place 21" sleeve back into the blower door, and reattach Velcro to rubber band

☐ Starting the Seal

- ___ Start the Generator
- ___ Do the pre seal test (see Aerosuite Checklist)
- ___ Start the compressor on the trailer (ensure it has at least 100PSI on the trailer gauge)
- ___ Power on the NEH (If Using)
- ___ Put Fan Switch in the "ON" position
- ___ Click 'Start' button in Smartseal software to start the sealing step (see Smartseal software Checklist)
- ___ Ensure all LED's light up
- ___ Ensure fan spools up to the set target pressure

Standard Operating Procedure for Aerobarrier Select System

☐ Monitoring the seal

___ Watch the computer to ensure seal is going as planned (See Aerosuite Checklist)
___ Do a walk around on the outside of the envelope to look for sealant overspray (if applicable)
Sealant overspray appears as thin white cloud
Ensure Areas prepped are holding in place
___ 15-20 minutes into the seal, enter envelope through access door
Pause the seal (See Aerosuite checklist)
Check "the fog" to ensure sealant is spraying properly
Ensure compressed air is at 90psi on manifold gauge
Fix any issues with the equipment (loose compressed air connections, liquid connections)
Ensure prep is holding up and fix any missed prep
Exit the envelope and continue the seal
___ Every 30 minutes after initial entry, enter envelope through access door
Pause the seal (See Aerosuite checklist)
Check "the fog" and move sealing stations as needed
Do manual sealing as needed (using sprayfoam/caulk)
Exit the envelope and continue the seal
___ Continue the seal until desired leakage is reached
Ensure you take into account your pre prep Blower Door Leakage

☐ Ending the Seal

___ Stop the seal and do the post test (see Aerosuite Checklist)
___ Once flush is complete, shut off compressor and drain compressed air tank
___ Flush the Seal Stations (see Aerosuite checklist)
___ Create your seal report (see Aerosuite checklist)

Equipment Clean Up

☐ Envelope Purge

___ Enter Envelope through access door
___ Open 2-3 Windows in the envelope
___ Exit the Envelope
___ The envelope will purge for 15-20 minutes

☐ Seal Station Tear Down

___ Disconnect monopod and nozzle bracket from Seal Station
___ Disconnect nozzles from nozzle bracket and place nozzles in cleaning solution
___ Disconnect sealant line from Sealant Jug and connect the same tube to the water jug
___ Purge the sealant line by using the purge button on sealing station
___ Continue purging until line is free and clear of sealant
___ Disconnect sealant line and Purge the Seal Station Lines with air using the purge button
___ Place any leftover sealant back into the 5 gallon buckets

☐ Cleanup and demobilization

___ Ensure all prep is down
___ Clean any overspray of sealant
___ Place equipment back in trailer
___ For maintenance - follow Maintenance checklist

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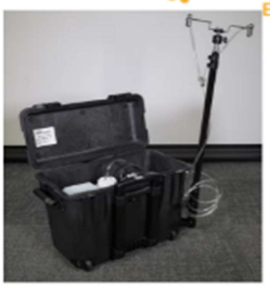
Setting up for a Practice Seal



Setting the Machine up for a Practice Seal

☐ Set up the Machine

___ Get MCU, Fan Assembly, And Seal Stations
___ On the fan assembly, attach 36" layflat tubing and tie off the other end
___ On the layflat tubing, cut a small slit for the blue tube and a 4"x4" hole to simulate leakage
___ Connect Fan Pressure Tube (red) to fan+control box
___ Connect Envelope Pressure Tube (blue) to the slit in the layflat
___ Plug the Fan into 120v power
___ Run two 120v power cords from the generator to the MCU+Fan Assembly
___ Turn on the generator
___ Ensure Blue LED on MCU and Green Fan LED's on control box light up when power is added
___ Open up Aerosuite software and Run the pre-seal test (see Aerosuite checklist)

Setting up Seal Stations, nozzles and compressed air manifold

☐ Set up Seal Stations

___ Place Seal Stations near the MCU
___ Attach monopod to seal station
___ Attach Nozzle Bracket to monopod
___ Connect liquid Tube to seal station connector on the right side of seal station

Repeat the steps for each seal station

☐ Hook up all Compressed Air hoses

___ Connect 30ft Compressed Air Hose to MCU+Compressed air manifold
___ Place Compressed Air Manifold in a central part of the house where it reaches all seal Stations

Ensure unused ports are blocked using either jumper tubes or blocker pieces (both found in Spare Parts Kit). Recommend to cover up the manifold after properly hooking up all tube to avoid any clean effort needed after the job.

___ Connect Dual Bonded Tubing to the manifold

Ensure dual bonded tubes are firmly connected to the manifold (feel for the sharkbite)

___ Run dual bonded tubes to seal stations and connect to nozzle brackets (bottom part of bracket)

Ensure dual bonded tubes are firmly connected to the nozzles (feel for the sharkbite)

Setting up for a Practice Seal

Sealing Event

☐ Starting the practice Seal

___ Start the Generator
___ Do the pre seal test and start the seal (see Aerosuite Checklist)
___ Start the compressor on the trailer (ensure it has at least 100PSI on the trailer gauge)
___ Plug in the Cylinder Heaters to the 120v outlets on the MCU
___ Put Fan Switch in the "ON" position
___ Click 'Start' button in Smartseal software to start the sealing step (see Smartseal software Checklist)
___ Ensure all LED's light up on the control box
___ Ensure fan spools up to the target pressure you set

☐ Ending the Seal

___ Stop the seal and go to the post test (see Aerosuite checklist)
___ Do the Post Seal test (see Smartseal checklist)
___ Do the flush of the seal stations and drain compressor once complete
___ Create your seal report (see Aerosuite checklist)

Equipment Clean Up

☐ Seal Station Tear Down

___ Disconnect monopod and nozzle bracket from Seal Station
___ Disconnect sealant line from Sealant Jug and connect the same tube to the water jug

☐ Cleanup and demobilization

___ Place equipment back in trailer

Cold Weather

- If Envelope is not heated, heaters will be needed to warm the structure. (*see cold weather application note*)

AeroBarrier Cold Weather Operation

How to use seal and use optional equipment during cold weather

Purpose:
This document describes the AeroBarrier seal process during cold weather. This information will cover how to handle the sealant and other equipment during seals in cold weather.

Sealant:

- ALWAYS store sealant above 40˚F (4˚C) as the sealant is water- based and will freeze if stored in cold conditions.
- Best Practice is to store sealant in a temperature-controlled warehouse and take only the required # of buckets to the job site. Any partial containers to be put back into the warehouse at the end of the day. If sealant does freeze, do not use and contact Aeroseal for further instructions.
- Mix sealant every hour during a seal operation to avoid any change in viscosity.

Pre-Heating the Space to be Sealed:

For sealing in very cold situations, ensure that the space being sealed is at least 40F with the temperature increasing.

- Existing heat source (furnace, other installed heat source that do not add moisture or combustion exhaust to the envelope). Sites that have installed heating systems should leave their system on the night before the seal operation.
- Space heaters inside the envelope (electric or indirect propane with exhaust going outside the envelope)
  * Heaters must be removed before the seal operation begins.
- Pre-heat with indirect propane heaters outside using duct to force air into the envelope
- Pre heat with the AeroBarrier system
  - Set-up the blower door and fan/heater equipment before prep. Power will be needed for the fan, and separate power will be needed for the heaters as there will be no power control from the MCU (Main Control Unit) before the seal operation is in progress. All of these will be running at 100% when plugged directly into 110V 20A power. Four outlets will be needed (3 heaters, 1 fan).
  - First, turn the fan on (plug-in). The fan must be in operation before power is applied to the heaters. The fan must remain on the entire time the heaters are energized and for five minutes after the heaters have been de-energized. Plug the heaters into the local power or generator. Once the fan/heater assembly is supplying heated air to the envelope, let it run while prep is completed.

Prep the Space:

In cold conditions, tape adhesion may be reduced. You may need to clean some surfaces and remove dust/dirt to make sure tape stays in place during the seal operation.

Pre-Heating Air During the Sealing Operation:

An indirect heater can be used to warm the air going into the blower door fan with the following directions:

- The exhaust from the heater must be routed outside the seal/work area. Direct fire propane heaters should not be used due to the moisture that will be added to the air.
- Air flow from the heater should not point directly into the blower door fan. This may cause incorrect CFM readings.

Post Seal:

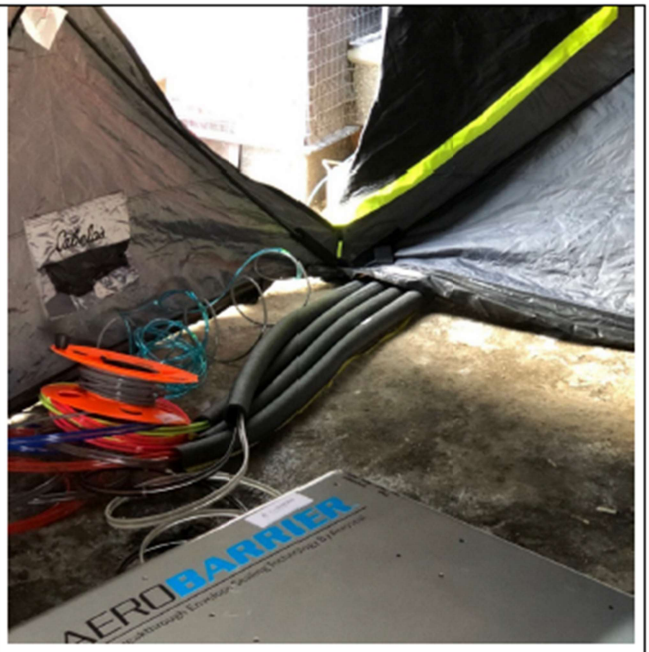
Remove condensation from the compressed air system

- drain the compressor
- close the valve
- restart the compressor
- blow out the air line to purge any condensation (Keep air hose from freezing by purging the air lines after use)
- drain the compressor
- If you do find hoses/tubing that have some frozen water, thaw that equipment inside a heated building. Use a hot air gun on low or a hair dryer and slowly thaw the frozen section of the hose or tubing.
- **ALWAYS** ensure that the hose reels and machine are free of water before storing away after the job.
- After the Flush step of your Aerobarrier process (when you pump water through the liquid lines and nozzle), remember to blow the hose reels out using the compressed air. Removing moisture from the lines will eliminate any wait time for the equipment to thaw out before your next job.

The best option: store the equipment and hose reels in conditioned environment above 40 degrees F

Tips:

- Be aware of uninsulated walls - as cold walls will cause condensation on the inside and will not retain heat.
- Plan on seal rates (pump injection rates) being slower than in summer months.
- If a long section of hose reels is outside & exposed to elements, then consider routing them through insulated sleeves.

Using a tent for shelter. A larger tent can be used for to pre-heat air going into the blower door where the building design allows. Otherwise, use the garage area to pre-heat air and create a wrm area to work. Always remember to keep exhaust outside and leave an opening for air flow for the blower door.	

	Indirect heater example

Sealant Pooling Prevention and Resolution

Component Setup and Cleaning

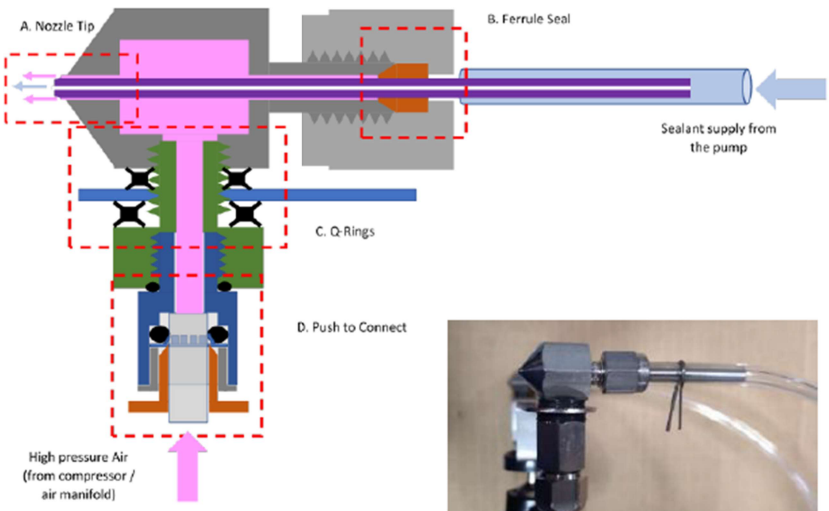
Sealant puddling in front of the sealing stations can be caused by two different factors, insufficient compressed air supply at the nozzle or the fluid tube position within the nozzle. Both can cause undesirable sealant droplet sizes, causing them to fall to the ground and create puddles of sealant. The following list provides guidance on what causes, and how to prevent, sealant puddles from forming

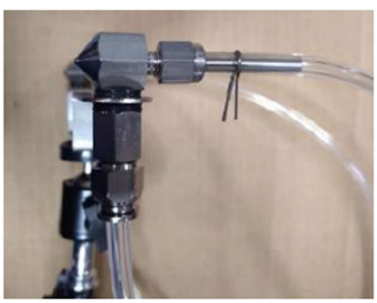
Potential causes of sealant puddling (in order of likelihood):

1. **Air Leaks:** Nozzle Assembly and Compressed Air Manifold
   - Leaks in the compressed air system (anywhere from compressor to nozzle body) reduce the pressure and air flow from the nozzle tip, where it's needed to create sealant droplets that can be suspended in air. Lower pressure and air flow at the nozzle tip will create larger droplets or even drips that fall out of the surrounding air and create puddles on the floor.
   - Critical Areas for a Correctly Functioning Nozzle (pg 2) provides more detail surrounding the nozzle.
   - Leaks at the compressed air manifold have the same effect as leaks at the nozzle assembly. Although less common than nozzle leaks, care must be taken to ensure the compressed air generated at the compressor reaches the nozzle tip where it is needed
   - Manifold Disassembly and Cleaning (pg 19) covers this component.
2. **Contamination:** Dirty Nozzle Bore and Tip
   - Dirt particles and other build-up in the compressed air gap at the tip of the nozzle (between the nozzle bore and fluid tube) restrict the opening for the compressed air. Restrictions of any type, especially in this area, will also create larger sealant droplets that will puddle on the floor.
   - Nozzle Disassembly and Cleaning (pg 8) and Nozzle Reassembly and Inspection (pg 15) provide more detail on this issue.
3. **Setup:** Air pressure setting at compressor (100 psi recommended)
   - Increasing the compressor setting to 100 psi will help ensure the pressure and air flow seen at the nozzle tip is sufficient for proper sealant droplet creation (even if very small leaks are present in the compressed air lines)
4. **Setup:** Fluid Tube Position within the Nozzle
   - Correctly positioning the fluid tube within the nozzle tip helps create an ideal direction / path for the air flow to interact with the sealant stream. Visually aligning the parts during nozzle reassembly works well if you understand how the air is flowing and key features that need to align. Critical Areas for a Correctly Functioning Nozzle (pg 2) and Nozzle Reassembly and Inspection (pg 15) cover fluid tube alignment needs.
5. **Air Leaks:** Other locations.
   - While the nozzle assembly and compressed air manifold are more common leak points, other fittings and even a cut air hose will cause air leaks. If leaks are suspected, the system can be tested with a spray bottle and soap water (pg 24)

Critical Areas for a Properly Functioning Nozzle Assembly:

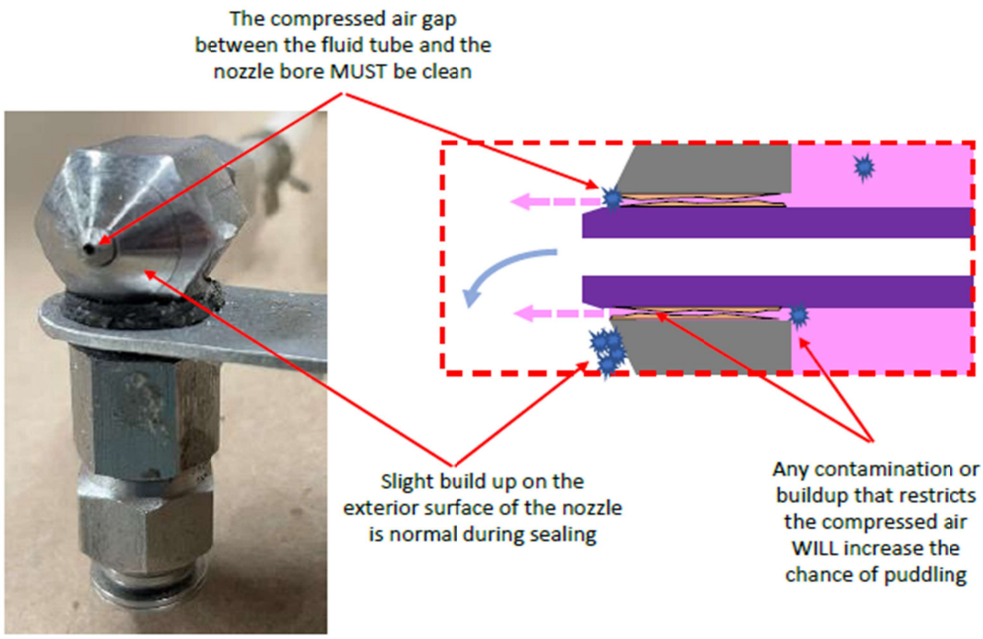
A. Nozzle Tip
B. Ferrule Seal
C. Q-Rings
D. Push to Connect Fittings





Side view of clean mounted nozzle

A - Nozzle Tip: Sealant build-up reduces air flow

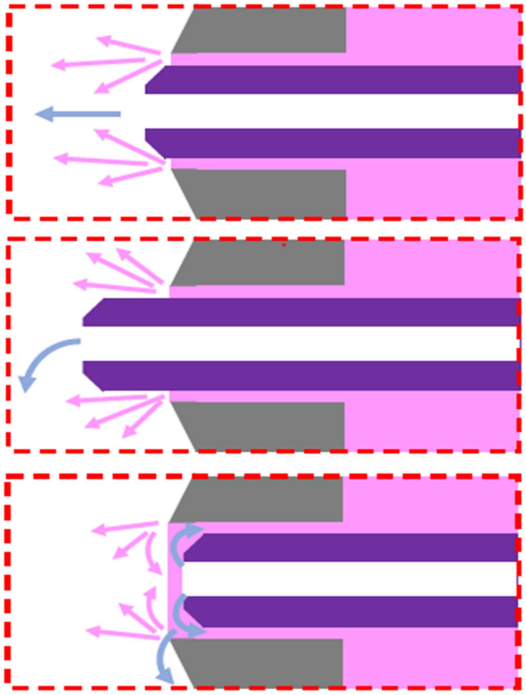


Functioning nozzle after a sealing

Nozzle Tip: Clean Surfaces

- A small amount of sealant buildup on the nozzle is normal and expected during a sealing job.
- This build up is typically on the outside of the nozzle, away from the compressed air flow path
- IF sealant or other contaminants get into the gap between the outside of the fluid tube and the inside bore of the nozzle, it **WILL** restrict airflow and increase the chance of sealant puddling in front of the nozzle

A - Nozzle Tip: Fluid tube alignment sets the direction of the air flow



Correct Position – the transition point of the fluid tube is aligned with the tip of the nozzle

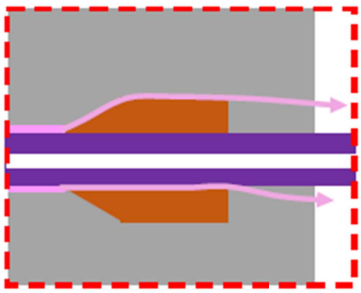
Fluid tube proud of the nozzle tip – compressed air is forced away from the fluid stream and the sealant will drip from the nozzle

Fluid tube recessed into the nozzle tip – Compressed air will force sealant back into the nozzle, creating blockage

Nozzle Tip: Fluid Tube Alignment

- The fluid tube must be positioned so the transition point of the angled tip aligns with the end of the nozzle body
- IF the tube sticks out too far, the compressed air will blow away from the sealant stream – this will not break the stream into small droplets and the sealant will puddle
- IF the tube is recessed, the compressed air will force sealant back into the nozzle and create blockage. This blockage will build and restrict air flow.

B. Ferrule Seal:



Functional Ferrule: smooth surfaces, clean edges

Leaking Ferrule: pitted and chipped surfaces (cleaned with harsh chemicals)

Leaking Ferrule: Installed and tightened backward in the nozzle body

Leaking Ferrule: Sharp ridge at end of tapered surface, chipped leading edge (excessive compression from seal nut)

Ferrule Seal:

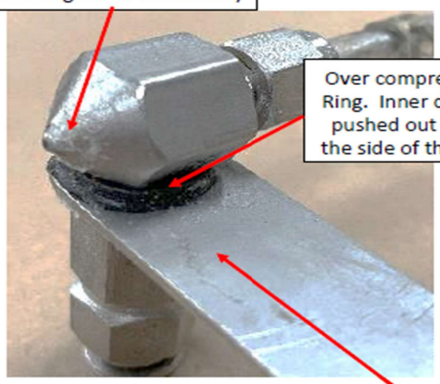
- The ferrule seals the rear of the nozzle to the fluid tube
- Damage from over-tightening, chipped edges, or other surface damage can cause compressed air leaks (stealing air from the nozzle tip)

C. Q-Rings

Functional Q-Ring (round, clean, all surfaces intact)

Damaged Q-Ring (Cut by twisting nozzle after assembly)

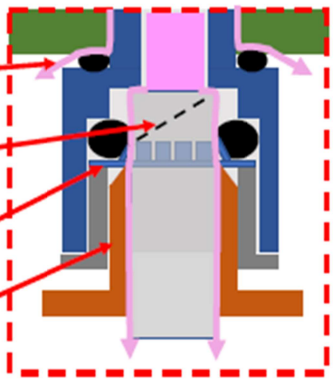
Damaged Q-Ring (distortion from over-compression and debris from incomplete cleaning)



Q-Rings:

- Q-Rings are used to seal the PTC adapter and nozzle to the nozzle bracket
- The cross section of the Q-Ring has 4 round lobes (making concentric circles). The inner surface creates most of the seal.
- Cuts and debris on surfaces will create air leaks
- Overtightening the nozzle to the bracket will squeeze the Q-Ring out of position where the seal cannot be maintained causing air to leak around it.

E. Push to Connect Fittings



PTC must be tight to the threaded adapter

Angled end cuts on air tubing can create leaks past the internal O-ring

Damaged or bent teeth may prevent the tube from being fully installed or allow it to come loose during use

Dirty or scarred tubing surfaces will create a leak

Damaged retention teeth

Gouged surfaces on the flexible tube (area inserted into the PTC)

Angled cut on tube end

D. Push to Connect: Nozzle assembly and compressed air manifold

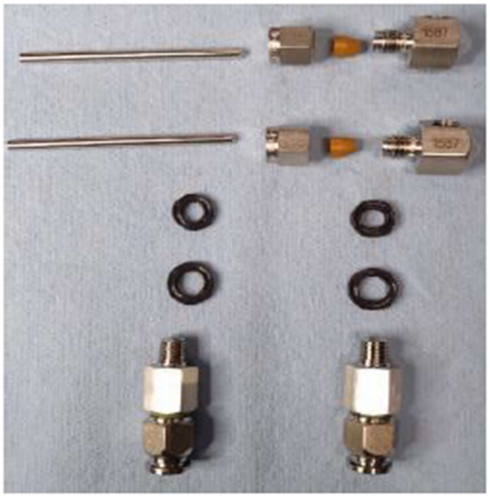
- The push to connect (PTC) both secures and seals the flexible compressed air tube to the bottom of the nozzle assembly
- There are 2 sealing surfaces on the part – both need to be clean and undamaged to prevent leaks:
  - O-ring on the exterior that seals to the threaded adapter
  - O-ring inside the PTC that seals to the flexible tube
- The PTC also has internal "teeth" that hold the flexible tube in position when its installed. The outer collar must be fully compressed to release the teeth before disassembly
  - The flexible tube end condition (last 3/4") is also critical to creating a seal.
  - The tube surface must be clean and free from scratches
  - The cut end of the tube must be perpendicular to the length and free of any burrs
  - The tube must be fully installed past the teeth and O-ring

Nozzle Cleaning - Detailed Instructions

Remove Flexible Tubing:

1. Slide clamps back and remove fluid tubing
2. Remove compressed air tubing from PTC

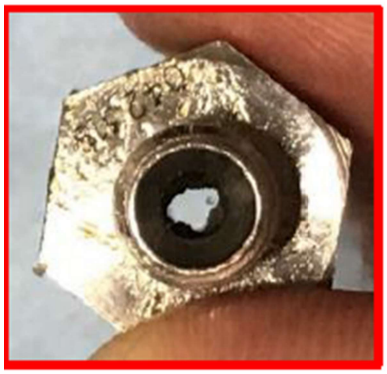
Disassemble Nozzle:



1. Unthread the PTC / Threaded adapter from the bottom of the bracket (hold the nozzle body stationary)
2. Remove the Q-Rings
3. Fully remove the seal nut
4. Separate the fluid tube, ferrule, and nozzle body

Inspect the Parts:

- Inspect for build-up and debris in nozzle ID and inside the body. This must be removed during cleaning.
- Inspect for damage on the Q-Rings. Replace the ring(s) if damaged.



Note: This is a severe case of buildup inside the nozzle, but ANY restriction in the inner diameter of the nozzle must be removed.

If any nicks, cuts, abrasions, or deformation are found on either Q-Ring, there WILL be a leak that impacts nozzle performance. Replace the ring with a new one (match the size) from the spare parts kit.

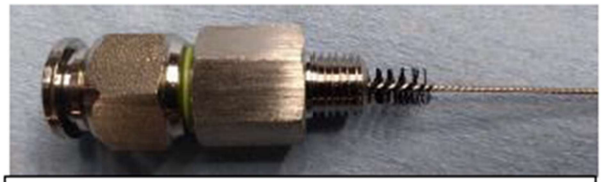
Cleaning Soak:

- Soak all metal pieces in Buckeye Workout cleaner for a minimum of 5 minutes, do not dilute (agitate during soak).
- **WARNING:** Buckeye solvent has the potential for damaging the rubber seals if soaked for extended periods of time (i.e. overnight soaking). Soaking for 5 minutes is effective without the risk of damaging the parts.

Cleaning Scrub:

- Clean ALL interior surfaces with small spiral brushes
- USING BRUSHES REDUCES THE CHANCE OF LEAVING DEBRIS / LINT INSIDE THE NOZZLE COMPONENTS
- Twisting the brush clockwise during insertion into the part can help pull debris to the outside edges where it can be more easily cleaned
- A dental pick is also useful for removing debris from the interior of parts
- Use the ram rod for reaming the ID of the fluid tube
- Wipe the exterior surfaces with shop towels

Brush inside the nozzle bore (both ends), female thread, and inside the central cavity of the part



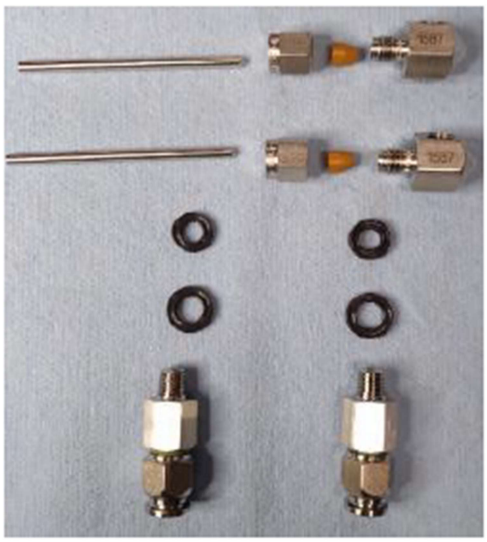
Brush the interior of the air inlet fittings (both ends)

Ram rod for the interior of the insert tube

Rinse:

2-minute rinse in hot water (agitate during soak)

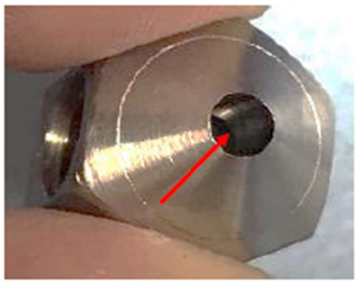
Dry Parts:

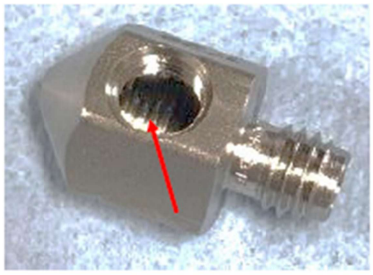


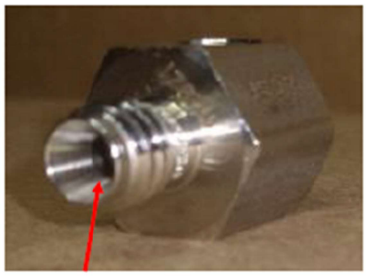
- Blow dry (inside and outside) with filtered compressed air
- **IF ANY SURFACE IS STILL TACKY OR HAS SMEARED SEALANT, REPEAT THE CLEANING PROCESS WITH FRESH SOLVENT AND WATER RINSE**

Inspect Nozzle Body

- The ID bore at the tip must be bright steel. Any build-up or film can restrict compressed air flow.
- The internal cavity must be clean and free of any contamination that can break free and block the compressed air gap from the inside of the nozzle.
- The ferrule mating surface must also be clean and free of contamination

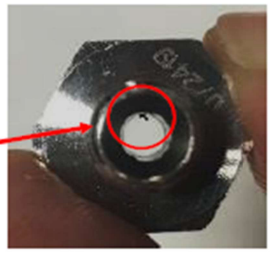






Nozzle Tip: No build-up or debris in the tip ID, central cavity, or taper at the back of the part

NOTE: Even small particles can restrict airflow enough to cause issues



Inspect Nozzle Body

- Fluid Tube – no debris, sealant build-up / film, or damage. The first 1/2" from the tapered end is critical (mates with the nozzle bore to create the compressed air path)

Fluid Tube: No debris on the ID, outside is bright steel – no build-up (if a fingernail catches on the surface, repeat cleaning) especially in the first 1/2" from the tapered end

Inspect Ferrule

- The surface of the ferrule must be clean and smooth.
- Pitting, ridges, or scratches will cause air leaks

Functional Ferrule: smooth surfaces, clean edges

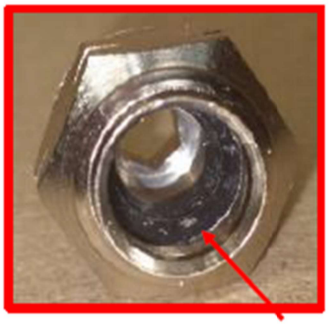
Leaking Ferrule: pitted and chipped surfaces (cleaned with harsh chemicals)

Leaking Ferrule: Installed and tightened backward in the nozzle body

Leaking Ferrule: Sharp ridge at end of tapered surface, chipped leading edge (excessive compression from seal nut)

Inspect the Push to Connect Fittings

- The center bore must be free of debris
- The release collar must move freely with respect to the body (must fully compress to release the retention teeth)
- After cleaning with brushes and Buckeye Workout, it may still be difficult to determine if the internal parts of the PTC have residue on them. One suggestion is to use a clean piece of 1/4" tubing – install and remove the tubing and feel for any resistance on the tube (sticking to the internal O-ring or dragging on the retention teeth)



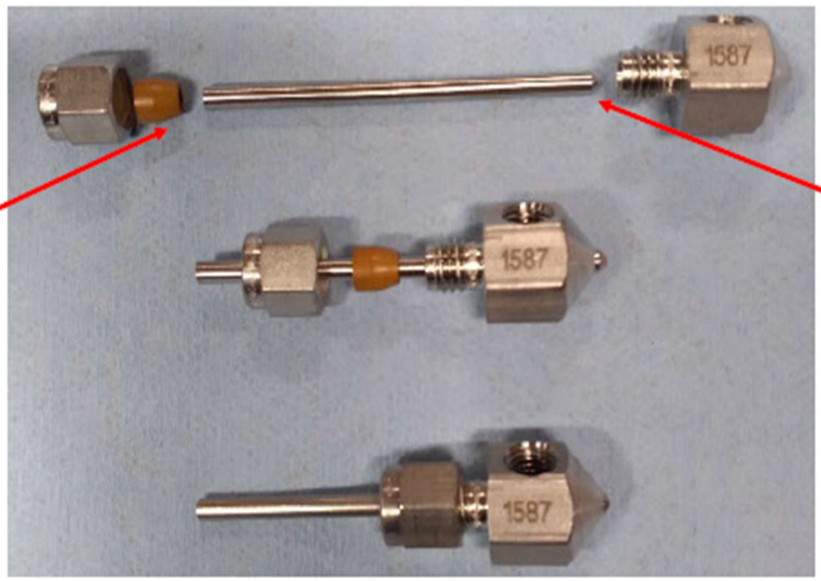
PTC Contamination on the O-ring

PTC Missing Retention Teeth (Tube pulled out without fully compressing collar)

Release collar must move freely (Fully press in and return on its own)

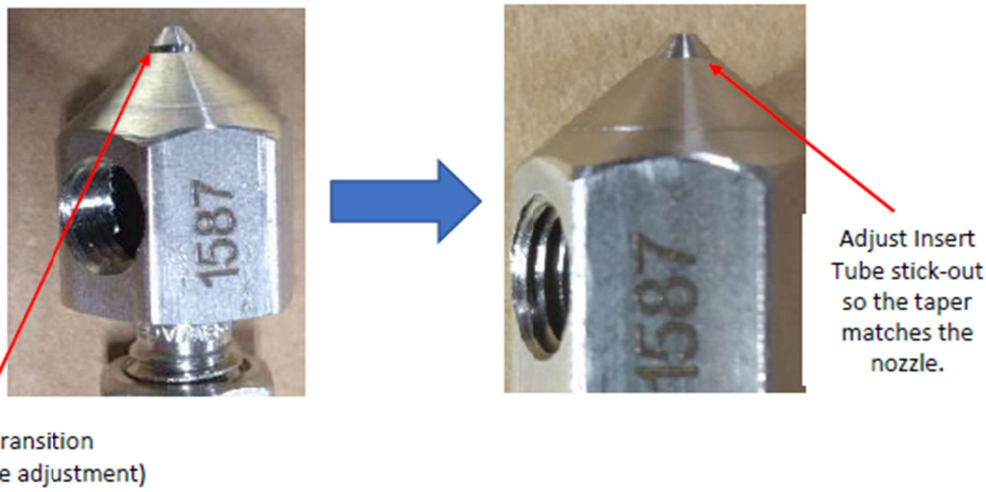
Assemble Nozzle

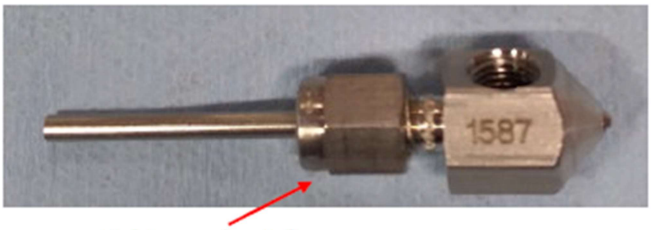
- Loosely assemble the nozzle body, fluid tube, ferrule, and seal nut
- ENSURE THE TAPERED END OF THE FERRULE MATES WITH THE BACK OF THE NOZZLE BODY
- ENSURE THE TAPERED END OF THE FLUID TUBE IS INSERTED INTO THE NOZZLE BODY



Adjust the Fluid Tube Position

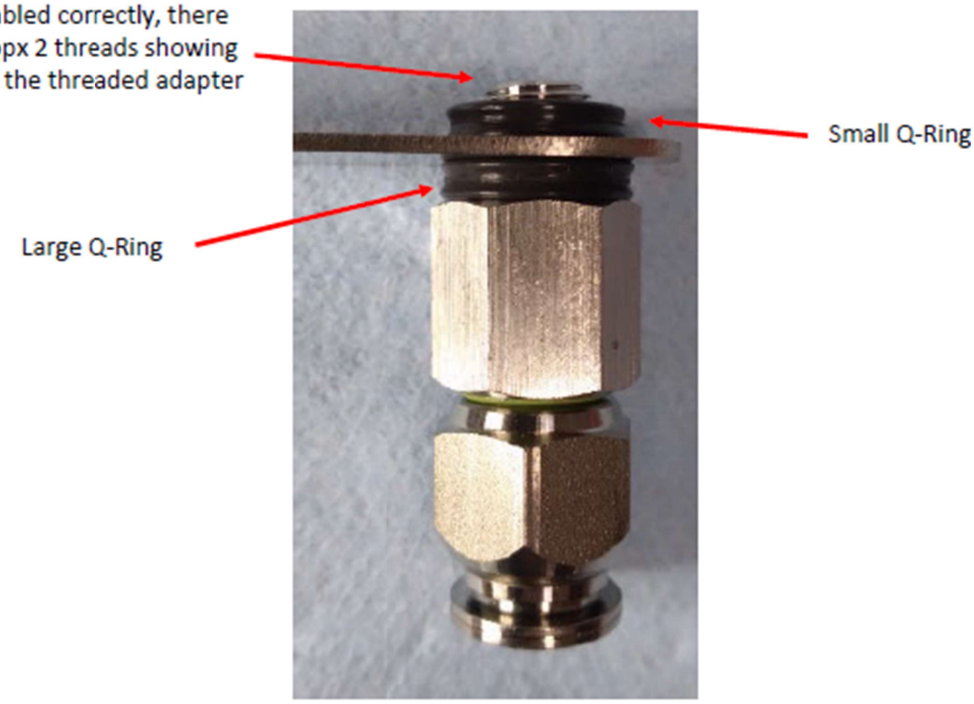
- The transition point between the tapered end and the full body diameter of the fluid tube must align with the tip of the nozzle body
- Secure the fluid tube position by tightening the seal nut (finger tight + 1/4 turn MAX)
- Verify the fluid tube remained in position after tightening the seal nut





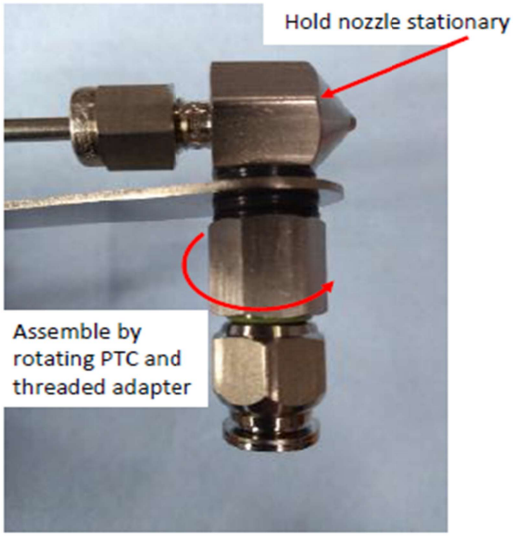
Assemble the Push to Connect and Q-Rings

- Install the large Q-Ring fully onto the threaded adapter (push flush to the shoulder on the fitting)
- The small Q-Ring on top of the nozzle bracket (push flush to the bracket)

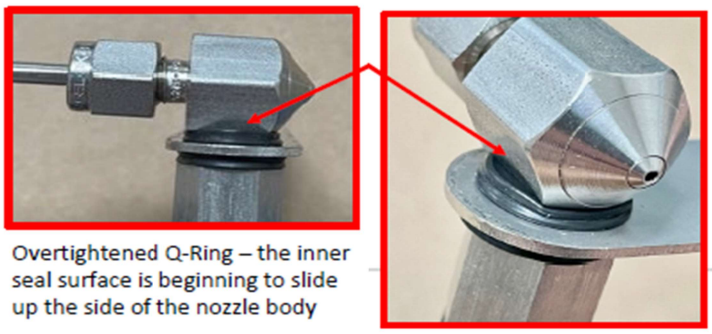


Assemble Nozzle Body

- Hold the nozzle stationery and thread the PTC 2 full turns into it (turn the PTC, NOT the nozzle during assembly)
- There is a thin edge at the bottom of the nozzle that can cut the Q-Ring if the nozzle is twisted
- **The nozzle assembly may not feel fully "tight" when correctly assembled. It should not rattle on the bracket, but over compressing the Q-Rings (3rd turn on the inlet elbow) will create leaks and cause issues with droplet formation**
- NOTE: if the nozzle direction needs to be adjusted for setup on the job, loosen the PTC slightly prior to turning the nozzle body.



Properly tightened Q-Ring – Slight compression, inner seal surface of the Q-Ring is in contact with the bottom face of the



Overtightened Q-Ring – the inner seal surface is beginning to slide up the side of the nozzle body

Leak Testing

The entire compressed air path can be leak tested using a spray bottle of soap water. Bubbles will form at any leak (threaded fittings, tube ends, push to connects, etc.)

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AeroBarrier Select Basic Equipment Package

1 120V Fan
1 Lo-Pro Main Control Unit
1 Laptop Computer
1 Non-Electric Heat
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5 Sealing Stations
+ Required Accessories

+

Modular Air and Power Package
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1 Honda Gasoline Generator

If Needed Add

AeroBarrier Select Extra Capacity Add-On Package

+2 Sealing Stations
+1 Wheelbarrow Gasoline Compressor

or

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AeroBarrier Select Basic Equipment Package

1 120V Fan
1 Lo-Pro Main Control Unit
1 Laptop Computer
1 Non-Electric Heat
1 Blower Door
8 Sealing Stations
+ Required Accessories
+ Your choice of trailer option with air & power package below

+

Trailer Option with Air & Power Package

(Must Select One)

Standard Trailer Option
1 Trailer with Build Out

Modular Air and Power Package
2 Wheelbarrow Gasoline Compressors
1 Honda Gasoline Generator

or

Diesel Trailer Option
1 Trailer with Build Out

Diesel Air and Power Package
1 Diesel Compressor/Generator

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ADDITIONAL TROUBLESHOOTING VIDEO TUTORIALS

Checking the Seal Station Battery

Why is One Nozzle Spraying?

Basic Building Science Terminology