**Technical Manual**

# AEROBARRIER SELECT

## Contents

## Scope

### 1.0) Ownership and Use of Manual

This Aerobarrier Technical Manual is the property of Aeroseal LLC (hereinafter referred to as “Aeroseal”). Dealers, Installers and service providers (hereinafter referred to as “Dealers”) who are using the AeroBarrier system and components to provide envelope sealing service are urged to consult this manual for system information, aerosol sealing techniques, troubleshooting, repairs, and maintenance.

Instructions for proper use, storage and maintenance of 3rd party accessories like generators, compressors, hand-tools, and supplies are not included in this document. Dealers are encouraged to refer to the respective manufacturer manuals for details.

### 2.0) Confidential Information

All information in this Technical Manual is confidential and meant only for direct use by the dealer and their current employees who are engaged in providing building envelope sealing services. All information in the Technical Manual is proprietary and unauthorized release or use constitutes a violation of the sublicense agreement.

### 3.0)Safety Information

This manual contains very important information on SAFETY and how to PREVENT EQUIPMENT PROBLEMS. The following will help in understanding this information:

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.

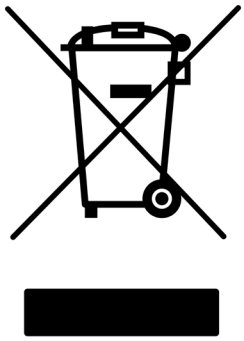
Personal protective equipment required: Gloves

Personal protective equipment required: Dust Masks

Personal protective equipment required: Respirator

***Read associated manuals for this product carefully. Be thoroughly familiar with the controls and the proper use of the equipment.***

**4.0)WEEE Label for Electronic Equipment Disposal**



**5.0)Job Site Safety Information**

The Dealer is responsible for assuring the safety and well-being of the occupants in the vicinity of the home or apartment being sealed. The dealer should:

a) Keep customers and 3rd party trade technicians away from areas where high sealant overspray concentrations may exist without use of proper protective equipment.
b) Incorporate into own work and safety practices, the relevant elements of OSHA Safety regulations (or applicable local laws) that are intended for safety of personnel at the construction site.
c) Consider and plan to put in place measures to avert fall, slip and trip hazards especially when it involves visitors to the application site.
d) Assure that pets, pregnant women, and people with breathing difficulties are not in the building during the injection process.
e) Ventilate using a scrubber fan and, if possible, box fans in areas that may be exposed to escaping sealant overspray.
f) Keep handy a copy of the safety data sheet for AeroBarrier X1 sealant on the job site.
g) Ensure compliance with local / state/ country specific construction site safety ordinances.

**6.0) Technician Safety Information**

The safety of technicians performing the sealing work should be assured at all times. The dealer should comply with OSHA (or local) rules & regulations to ensure technician safety on the job site. Aeroseal recommends that proper respiratory protection should be worn at all times when technician is in spaces with high aerosol concentrations (e.g. during the injection process in confined spaces) 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 confined spaces. Additional recommended safety precautions include:

a) Not overextending reaches if using tall ladders during the diagnostic or sealing process.

b) Using only certified properly sized electrical cables for operating your machine and accessories.

c) d) Wear appropriate gloves when handling cleaners, gasoline, diesel, spray foam cans or the AeroBarrier X1 sealant.

e) Wearing appropriate NIOSH approved P100 cartridge respirators with organic/particulate canisters when working in confined areas with sealant particles in the air.

f) NIOSH approved N95 masks or respirators be available for use at the job site in the vicinity (30ft of the home or apartment) of the jobsite.

**7.0) Property Damage**

The dealer is responsible for ensuring safekeeping of homeowner's property and for the contents therein. These precautions / measures to include -

a) Cover finished surfaces and customer property that might be exposed to high sealant concentrations.
b) Prevent accidental spillage onto finished surfaces by using a tarp under equipment setup and performing any sealant transfer activities outside of the building. If accidental spillage occurs, clean up immediately using provided cleaners or other solvent(s).
c) Use a liquid-tight tarp under the aerosol injectors to prevent spillage of liquid sealant onto finished floors. The tarp should extend at least 2 feet in the direction of the injector.
d) Keep the sealing equipment clean and free of liquid sealant for storage.
e) Ensure that heaters are clear of any sealant deposition and any maintenance or burn off of sealant on heater is done offsite.

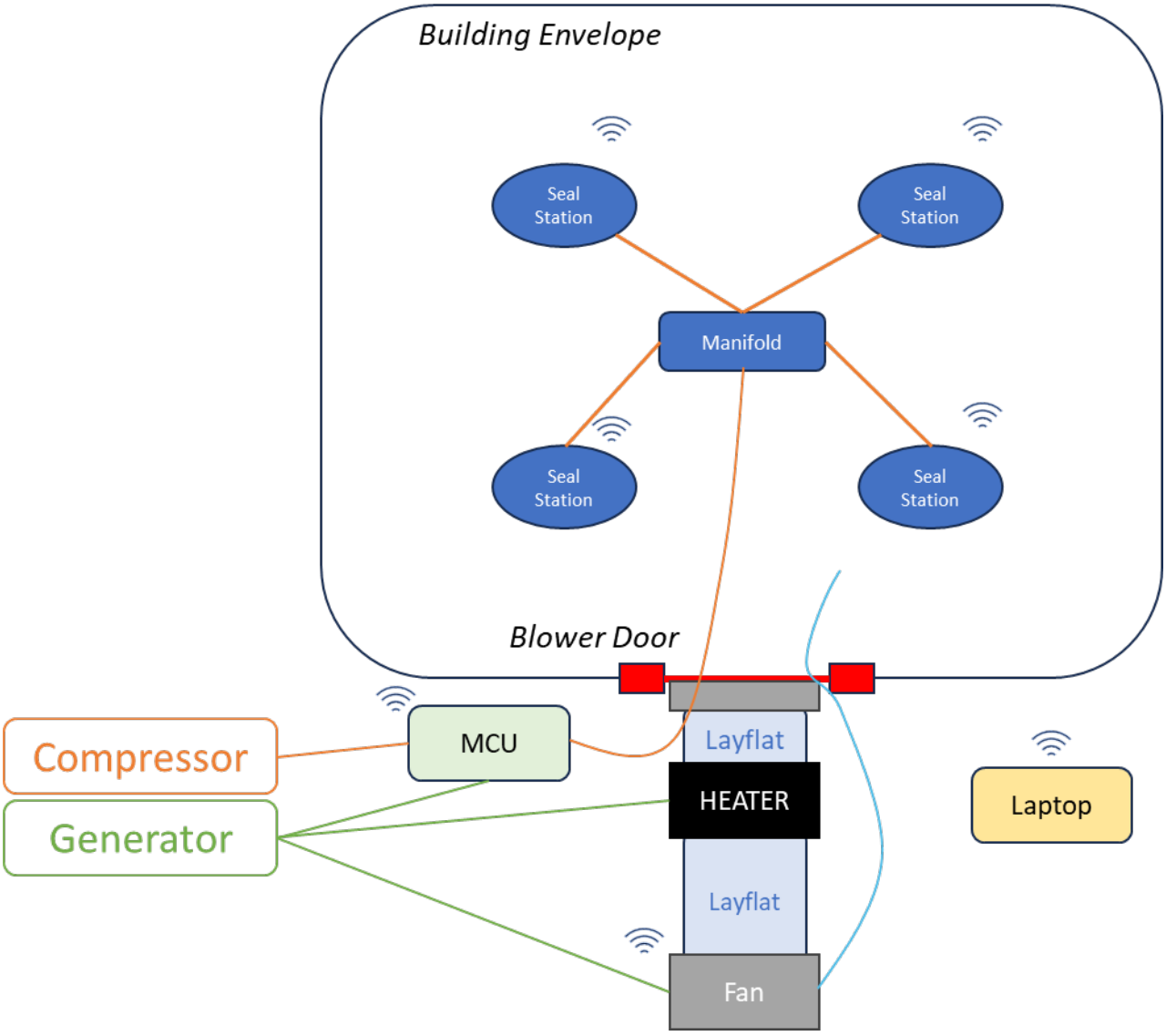
**8.0) Sealant Material Specifications**

The aerosolized sealant is called Aerobarrier X1 and is a waterborne acrylic sealant. The datasheet along with Safety Data Sheets (SDS) can be found in the Appendix to this Manual along with SDS sheet for the standard cleaner provided with the Aerobarrier start-up kit

Dealer shall ensure that all SDS sheets are available to access on all job sites, including during diagnostics/sales.

**AeroBarrier System Information**

AeroBarrier™ process is a patented, cutting-edge envelope sealing system that allows you to reach any level of air tightness in any building enclosure. A typical set up of Aerobarrier components, generator and compressor in a typical home is shown in the below pictorial along with interconnecting cables, hoses and pressure tubes.




During normal operation, the overall system monitors, measures critical parameters in the envelope and report out the leakage level dynamically. The main parts of the machine are the Main Control Unit (MCU), Sealing Stations (ST) with Nozzle tripod assemblies, the Fan Assembly, and the Heater Assembly. The machine is controlled by the proprietary AeroSuite software pre-loaded onto a laptop which acts as a user interface.

## Main components of an AeroBarrier System

This section covers the use and operation of the following main components needed for performing an AeroBarrier install.

1.0) Main Control Unit
2.0) Smart Sealing Stations
3.0) Nozzle Assemblies with compressed air lines
4.0) Fan Assembly
5.0) Heater Assembly
6.0) Blower Door Assembly
7.0) Laptop with proprietary Aeroseal software and license that controls the machine and the process
8.0) Power, Compressed Air, Sealant, and water

Needed utilities like power and compressed air are provided by accessories that can be packaged in a trailer or mobilized separately.

### 9.0) Main Control Unit (MCU)

The MCU is the hub of the system and is responsible for signal communication between the sealing stations placed inside the house, the Fan, and the AeroSuite software that is controlling the process and providing real time information to the technician. It controls the sealing stations that inject sealant and the fan that pressurizes the home being sealed. The unit also has LED indicators which indicate the status of the machine. For additional information regarding the MCU, please see the component specific Operations Manual.

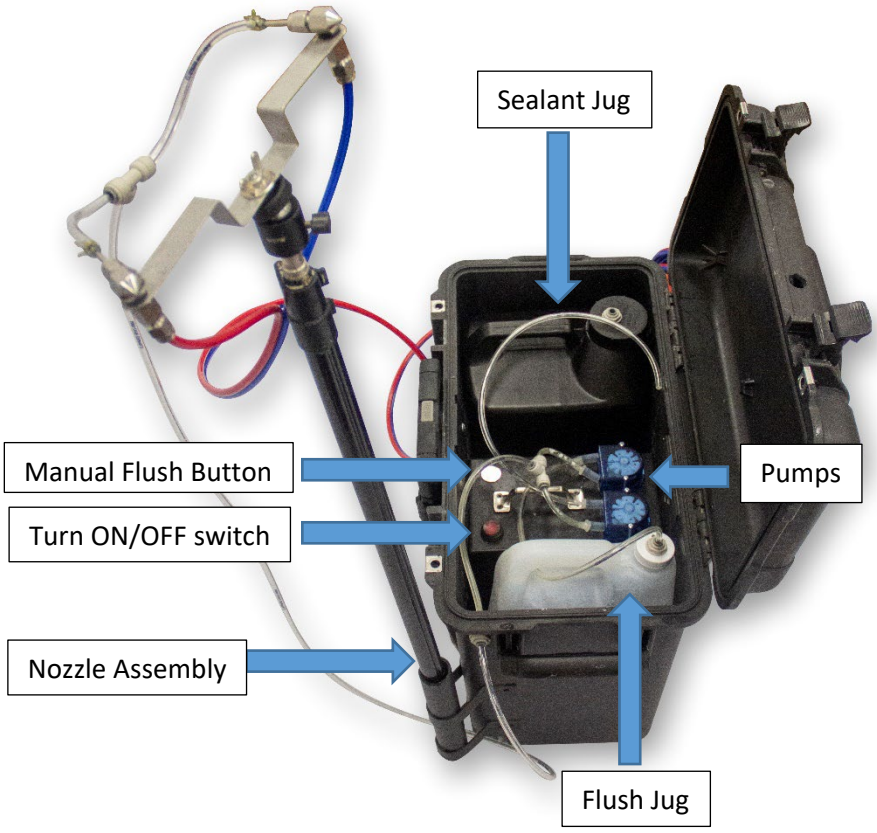
### 10.0) Smart Sealing Stations

Each sealing station is responsible for monitoring the conditions of the enclosure and for managing sealant dispensing through the nozzles. Sealing Station consists of –

a. Pump 1 – Used in sealing mode
b. Pump 2 – Used in flushing mode
c. Sealant and flush (Water) Jug
d. Antenna
e. Sensors
f. Battery
g. Nozzle Assembly (covered in the next section)

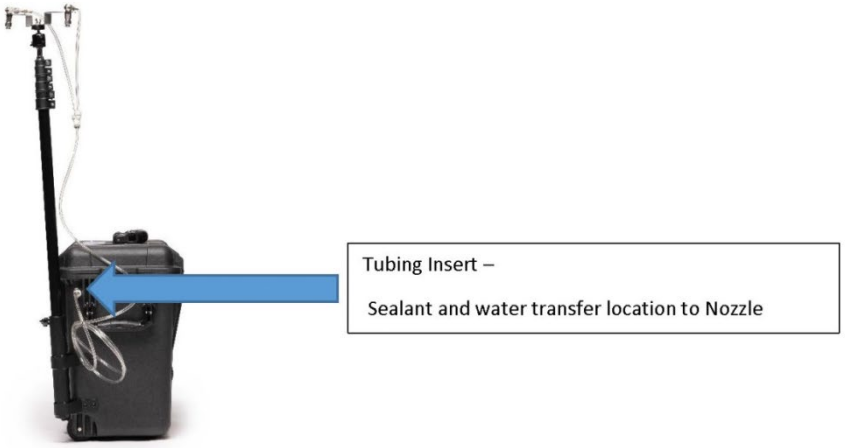
All the pump and electronics are powered by a 12V rechargeable Lead acid maintenance free batteries that is rated for an 8-hour run time when fully charged. Refer to the maintenance section of the manual for proper usage and storage. Built in electronics board controls the pumps, monitors battery voltage, and communicates with the laptop via the MCU. Communication is established by a MESH network established by a XBee built into the electronics board and antenna.

Each station is individually programmed with set parameters that will allow the pump to turn ON/OFF" without any manual intervention as long as they are communicating with the MCU. Also, the stations are programmed with fail safe mechanisms to stop spraying if communication with MCU is lost for any reason.




Note that there are two pumps installed – One for pumping sealant (during the sealing process) and the second for flushing the sealant lines and nozzle with water. The water flushing process is initiated as a part of the

Aerobarrier sealing process. You do not need to disassemble the pumps for cleaning as long as you flush them with water at the end of the job. At the end of your day, you will need to use the manual flush button to make sure that the residual sealant left in the liquid lines is also flushed with water completely. Drain the water in the lines before storage.





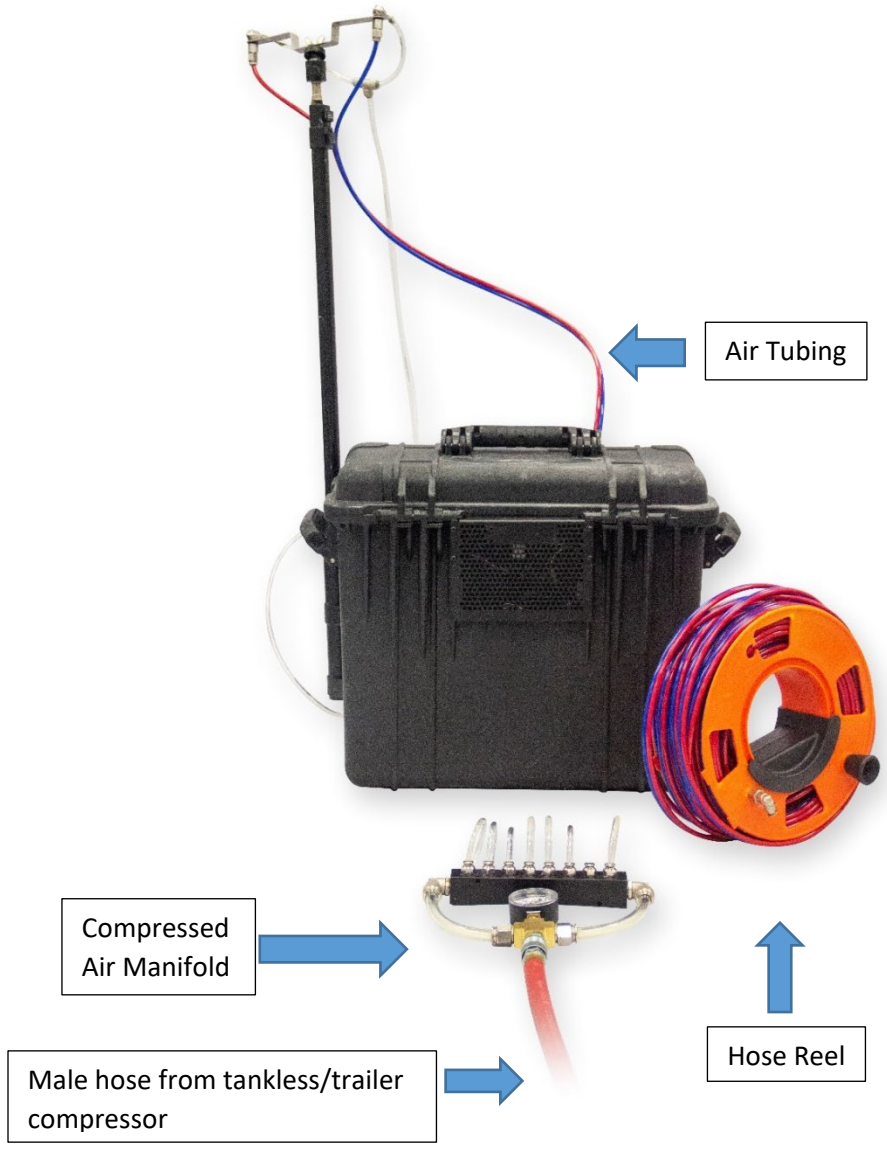
Just like the MCU, each sealing station has temperature and humidity sensors which are protected by the sensor guards. The side panel of the MCU has a push to connect which is used for dispensing sealant (or water) to the Nozzles mounted on the tripod stand. Unless overridden by the MCU/ software, the sealing stations will run until the ambient space around the sealing stations reaches around 90% Rh.

A battery charge port is located below the sensor guard (rear side of the station). A 120V/12V battery changer (not shown in the picture) can be used to charge the batteries before commencing the job. During the sealing process, battery charge level for each station can be viewed on software so you can plan to deploy alternate sealing stations.

## 11.0) Nozzle Assembly with Air tube Reels and Compressed air manifold

Each nozzle assembly is fitted with two special nozzles that are mounted on a U-Bracket/ tripod stand onto the sealing stations. The nozzles atomize sealant being pumped into a fine mist using compressed air from the manifold.

The dual bonded tubes on the hose reels are used for running compressed air from the air manifold to the nozzles mounted on the tripod stand. The sealant tube (liquid tube) is routed to the two nozzles from the push to connect on the side of the sealing station via a 3-way connector.




Make sure that the air and liquid connections are pressed tight to eliminate any air leaks and loss of nozzle pressure which might cause spills on the floor and excessive nozzle clogging. This impacts spray particle size and drives your seal time and sealant consumption.

## 12.0) Fan and Heater Assembly

The Heater Assembly is a diesel-fueled heating solution that is composed of three independent heaters packaged into a single assembly that should be placed in-line with the air flow to allow for full realization of the heat produced. The heater is powered off of a single 120V Plug that draws less than 500W. The intent of the heaters is to add sealant capacity to the air inside the envelope. Additional capacity allows for additional sealant which ultimately drives down seal times. The heater can be attached using 21" Quick Fit Clamps. Layflat should run between the Fan and Heater as well as between the Heater and the Blower Door. A minimum of 6' between the Heater and Blower Door is recommended to minimize back flow of sealant into the unit. For additional details on the heater please refer to the component specific Operations Manual.

### Fan Assembly

The Fan assembly comprises a single phase motor capable of producing 3200CFM of Air. This is controlled by a variable frequency drive mounted in the control box of the fan. The Fan can be powered off of a single 120V outlet and pulls a maximum of 1800W which is compatible with 120V/20A circuits. For additional information on the fan assembly please see the component specific Operations Manual.

## 13.0) Blower Door Assembly

The blower door frame assembly is mounted at the main door entrance of the house or apartment that is being sealed. This is typically installed after all the in-house prep work is completed and hoses laid out and connected to the machine.

The fan-Heater Assembly or the empty 12" heater cylinder flow ring sits inside the round opening at the bottom of the blower door. The built-in elastic band grips the cylinder and seals tightly around the assembly to minimize air leaks when the envelope is pressurized.

## 14.0) Utilities required for running the AeroBarrier process

The necessary utilities for running the Aerobarrier process are electric power, compressed air, sealant, and water.

a. Electric Power: 120V/20A to run the MCU, Fan Assembly, and Heater Assembly.

b. Compressed Air: The compressed air system needs to deliver clean, dry air to the Aerobarrier system. The amount of compressed air needed depends on the number of sealing stations you intend to use. This depends on how large of an enclosure you are trying to seal. In order to aerosolize adequately, each Seal Station needs a minimum of 4 CFM @ 100psi. Do note that when operating at high altitudes, you will have to de-rate the compressor capacity. It is worth noting that oil and rust produced from the compressor can clog up the nozzles and impact the job. If this issue occurs, it is recommended to use a dryer and filter attachment to the compressor.

c. Sealant: AeroBarrier X1 sealant is provided in 5 gal buckets. Onsite, the technician will need to thoroughly mix the sealant with the provided paint stirrer and cordless drill. Be careful to start the mixer at low speed to avoid any spills. Also during the sealing process repeat the mixing process periodically (every 2 hours) so that the sealant mixture is consistent. It is important to note that the sealant is stored between 40F and 120F only. Hence do NOT leave it on the job site or inside the trailer. Two paint stirrers (mixers) are provided in your start-up kit. One can be used for the 5gal pail, and the other is used for the 2gal bottles inside the sealing stations. Make sure that the stirrer can reach the bottom of the container to ensure that the entire content can get mixed. Use the battery-operated

pump to transfer sealant from the pail to the individual bottles. If you have already transferred sealant to the 2gal jugs, then be sure to use the appropriate mixer (that reaches the bottom of the jug) to thoroughly mix the sealant. This is key to running an efficient job without your nozzles / sealant lines getting clogged by unmixed sealant mixture.

d. Water: Water is needed for flushing the sealant lines with water. It is recommended to conduct a flush after every job so that the nozzles, and tubes do not gum up. You will need water for routine cleaning of equipment and for use in a spray bottle to check for any compressed air leaks.

## Process Checklist for using AeroBarrier Connect system and software

☐ **Prep House and Set up equipment**

Prep the house / apartment for sealing (please refer to separate checklist)

Determine where you will locate the fan, heater and the MCU. (It can be inside the trailer or near the main door)

Determine # of Sealing stations needed to seal the apartment or house.

Locate a power supply source. This can be building power (cutout) or your Trailer Generator

*Compressed Air*

Locate the air compressor in a suitable place on the job site. If using the Wheelbarrow Gas Compressor(s), they **MUST** be moved outside the trailer and 3' from any other equipment.

Run compressed air hose into the Main Control Unit (MCU)

Run another hose from the MCU to the manifold placed in a central place inside the house.

Locate the sealing stations in the house.

☐ **Setting up the Sealing station, Manifold and Nozzles**

☐ Lay Air lines from Manifold to Sealing stations

Run the dual bonded tubing from the centrally located manifold to each of the sealing stations

Connect both the tubes to the nozzles mounted on the tripod.

Plug the unused ports on the manifold (using ¼" PTC Plugs or 4" tube pigtails kept in the Spare parts kit box)

☐ Checks on Sealing stations

Ensure Sealant jug and water jugs are filled with fluids.

Using a mixer - thoroughly mix the sealant so that the mixture is consistent (like "milk").

Check if all tubes from pump to nozzles are connected (just a quick finger tightness check)

Turn on the switch. Red LED should light up

Confirm that each sealing station is communicating with the software via MCU. (On the software, Look for MCU icon pulsing indicating a heartbeat).

Name each station on the software (E.g. Living room, Basement -east side). This will aid you in trouble shooting if needed

Plug in sealant jug levels into the software and check battery levels

☐ Checks for Leaks and spray pattern at each station

Start Compressor (after hooking up all air connections). Make sure that the manifold gauge shows at least 85PSI pressure.

Check for air leaks at all Nozzle stations. (Spray soap water onto Nozzle to identify leaks)

If no leaks, then press the 'purge' button at each sealing station. You should see sealant spraying out. Look for a fine mist spray.

Adjust the Nozzle orientation so it does not spray on Walls. (Make sure there is no obstruction for 6ft from Nozzle tip).

Important: Make sure that both Nozzles are active. [Sealant is being pumped from both sides of the Y-connector]

☐ Install Blower door

Install the blower door. The blue tube and the compressed air hose need to be routed through the door. The air hose should connect to the MCU while the blue tube should connect to the Fan.

Connect a 36" layflat from the fan -Heater cylinder to the cylinder mounted on the blower door frame.

Make sure there are no kinks in the layflat. (Will be easier to slightly ramp up the fan and adjust layflat using clamps)
At this stage you can pressurize the house by Manually ramping up the fan using the control found in AeroSuite.

☐ Run Envelope and Fan pressure tubes

Run the blue tube coming from inside the house to the Fan
(Ideally the tube should be at the center of the home. but be sure that it is at least 5 feet into the room and not directly in the air stream of the fan)
Ensure that the red tube is connected on the Fan Assembly from the Fan to the Control Box.

**Operating the machine with AeroBarrier software**

☐ **Power up the software**

Ensure that the laptop is started and is connected to the machine (either via USB or through Wi-Fi)
Start Envelope sealing software
open /view hardware and check to make sure all sensor readings are ok & you are able to control the fan

☐ **Input all project information**

Key in all the input fields for the home or apartment that is being sealed.

☐ **PrePrep Leakage measurement**

Ensure that the room pressure tube is connected to the blue port on the machine and the fan pressure tube to the hose barb on the machine.
Set Fan's ring selection in the software to match the actual ring that's on the fan. (Start with 6" Ring and adjust per software)
Start PrePrep test
Software will ramp up the fan to get room pressure to 50Pa
If there is not enough fan pressure or room pressure, the software will advise you change the gate (The recommended setting will be displayed in the upper right corner in the message body)
When measurement readings are stable, software will calculate the CFM@50Pa pre seal leakage number.
Alternatively, you can use manual control of the fan or even adjust the Target pressure
Proceed to the sealing screen using F9 or click on the "Next" button.

☐ **PreSeal leakage measurement**

Start Pre-Seal test
Software will ramp up the fan to get room pressure to 50Pa
If there is not enough fan pressure or room pressure, the software will advise you change the gate (The recommended setting will be displayed in the upper right corner in the message body)
When measurement readings are stable, software will calculate the CFM@50Pa pre seal leakage number.
Alternatively, you can use manual control of the fan or even adjust the Target pressure
Proceed to the sealing screen using F9 or click on the "Next" button.

☐ **Sealing Process [Sealing screen]**

Select the actual Fan ring being used on the fan in the software setting.
Ensure Seal Stations are enabled and connected
Select whether Heater is to be used
Press - Start sealing
Software prompts you to verify the sealant levels. You need to ensure that the correct level is plugged in for each station.

fan will slowly spin up to reach the target pressure, the appropriate # of heaters will turn ON. If you need to change to a larger ring to reach 100pa. Use the pause function before changing rings.
After spin-up, if envelope pressure is > 60Pa the system goes into "pressure seeking" mode to attempt to reach the target pressure
If the envelope pressure reaches the target pressure, the system goes into sealing mode.
If the fan is at 100% speed, and the pressure levels off at a pressure above 10 Pa, the system will go into sealing mode.
While in sealing mode, the system will continuously adjust the fan speed to reach and/or stay at the target pressure.
While in sealing mode, the system will monitor conditions and appropriately turn off / on the stations

The graph will provide CFM@50 leakage readings / plotted every ten seconds

You can monitor Room rH & Sealing station parameters during the process

You can monitor status by clicking on the MCU (Orange) Icon on the software

As sealing occurs, air flow reduces, the software may prompt you to change the fan ring setting.

Important: Always press 'Pause' button. Change the ring (on the fan and on the software). Press 'Start'

Important: The fan will slowly adjust to get envelope back to 100 Pa. It might take 3-4min to stabilize

Keep a watch on the graph - If you do not see a drop in CFM, then it indicates that sealing activity has stopped. This can be because of various reasons - No sealant, or nozzles are clogged, a large hole or no fan flow.

During sealing you can enter into the house to check up on nozzles and for sealing up big holes.

Wear respiratory protection before going into confined spaces with sealant mist.

When you reach the desired leakage target CFM@50 or ACH, press the STOP button to stop sealing

☐ **Post Seal Testing**

The fan will run continuously to prevent backflow and puts fresh air into the room.

ENSURE that compressed air is OFF (Important as this will affect the post seal readings)

Ensure that the gate settings on software are matching actual fan ring setting and press Start Post seal button

when measurement readings are stable, software will provide a CFM@50 reading as your post-seal result.

If you are satisfied with the result, then press the 'next' button, else go back and do more sealing

☐ **Flush**

Flush is an optional step that may be completed after every job, but must be completed at the end of the work day to ensure nozzle tubing stays clear.

Use the software to flush the seal stations. One minute is the minimum time.

☐ **Fresh air purge (of enclosed space)**

Wear respiratory protection - at least P95/ P100 dust masks. and then remove the heater assembly and the blower door to enter into the envelope

Open Doors and windows to expedite fresh air into the room - and getting it ready for Depressurization

During this time, the fog will settle down (give at least 5 minutes for room get clear of the fog)

**Depressurization**

- [ ] The Depressurize test is used to get an approximate equivalent test to the final Blower Door test of the envelope
  Before conducting the test, the fan and MCU should be placed within the unit.
  The Blue Tube should be run from the Fan to the Outside of the unit
  It is important to let all sealant evacuate from the space before conducting the test to ensure the fan does not become full of it.
  Select the ring size and select Start to run the Depressurize test.

- [ ] **Print results**
  Press next button to see the sealing certificate.
  You can print out the certificate or save the certificate or exit out of the software.

- [ ] **Demobilize**
  Disconnect compressed air lines at the sealing stations.
  - [ ] Final Flushing of the sealing stations
    Get all the sealing stations to near the trailer
    Clean and remove all Nozzle tripod stands. Make sure that the nozzles are in cleaning solvent so they can be cleaned for the next job. You can clean the nozzles at the end of day, so they are ready for the next job. (Follow maintenance list)
    Flush the small section of sealant tube (from bottle to the T-connector) with water Using the water bottle and the purge switch
    Important: You do NOT need to remove the black tube from the pump head.
  - [ ] Turn Off sealing stations (to save on battery drain)
  - [ ] Top up sealant in the jugs (for the next job). - Helps prevent any skinning/ drying of sealant during storage
  - [ ] Ensure that all sealing stations are stored at room temperature (DO NOT STORE IN TRAILER)
  - [ ] Roll back the tubes into hose reels. (Use a rag - so the outside of the tubes gets cleaned as you roll it)
  - [ ] Drain water from the compressor tank
  - [ ] Remove all the temporary blocks and prep work in the house
  - [ ] Remove all plastic sheets on the floor (Do not walk without your booties - else your shoe soles will get sticky, and you may track glue to other unintended places). Be careful if you notice liquid Spills. Soak it up with rags before removing the protective sheets.
  - [ ] Clean up all surfaces of the machine (if sealant got deposited) so that the equipment is ready for the next job

*It should be noted that the process defined is the primary option recommended for dealers. For additional methods of operation, please refer to the software help.

# APPENDIX

## APPENDIX 1 : AeroBarrier X1 Sealant Datasheet and Standards

AEROBARRIER.
Breakthrough Envelope Sealing Technology

# AEROBARRIER X1

**AEROSOL-APPLIED, WATERBORNE ACRYLIC SEALANT**

### Product Description

AeroBarrier X1 is a stable, non-toxic, aerosol-applied, waterborne acrylic sealant. AeroBarrier is a patented air sealing system that uses a computerized process to pressurize the building and install AeroBarrier X1 to seal leaks in the building enclosure from the inside. The particles deposit only at the leak sites and build to form a complete and tight seal, remaining firmly in place for years while staying completely pliable and flexible. By reducing air leaks through the building envelope, it is possible to reduce energy loss, help mitigate moisture damage, and enhance overall comfort and health of the building.

### Features and Benefits

- Seals leak up to ½" and as small as a human hair.
- Most economical to install at rough in or drywall stage of construction but can be applied to unoccupied, finished spaces.
- In multi-family applications, a tighter building envelope offers reduction in noise transmission, mitigates odor transfer, reduces pest migration and enhances climate control.
- Sealant does not stick to vertical surfaces like walls, windows, or doors.
- AeroBarrier is UL GreenGuard Gold certified and is safe to use in any type of building.
- Ultra-Low VOC and has no off-gassing.

### Applicable Standards

AeroBarrier X1 has been tested to the following industry standards:

- GreenGuard Gold Certification
- ASTM E84: Surface Burning Characteristics of Building Materials
- ASTM C719 Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement
- ASTM D543 Chemical compatibility

### Limitations

- AeroBarrier is intended for use on the interior surfaces of residential and commercial building envelopes.
- Do not apply to damp, contaminated or frost-covered surfaces.
- Not to be used as a permanently exposed surface.
- When applying in cold weather conditions, follow cold weather applications/protocols as defined by manufacturer.
- Keep product from freezing.

### Storage

Store AeroBarrier X1 in original, undamaged packages in a clean, dry, protected location with temperatures from 40 to 100 °F (5 to 37 °C).

### Shelf Life

1 year when stored in accordance with storage instructions.

| Sealant Information | |
|---|---|
| **Property** | **Description** |
| Part Number | AERO-128 |
| Packaging | 5-gal (19-L) pails |
| Weight | 45 lbs (20.41 kg) |
| Storage Temperature | 40 to 100 °F (5 to 37 °C)<br>*Do Not Freeze* |
| Shelf Life | 1 year |
| Application Temperature | Above 40 °F (5 °C) and rising. If installing below 40 °F (5 °C), please refer to Cold Weather Air Barrier Installation Technical Bulletin or contact AeroBarrier Technical Service |

| Technical Data | |
|---|---|
| **Property** | **Description** |
| Sealant Base | Acrylic |
| Color | White |
| Dispersion | Water |
| Application | Aerosol |
| Solids | 18.5 to 21.5% |
| VOC | 12 g/l |

ZERO ENERGY READY HOME PARTNER | GREENGUARD GOLD | Home Innovation NGBS GREEN PARTNER | U.S. GREEN BUILDING COUNCIL MEMBER

7989 South Suburban Road | Centerville, OH 45458 | Phone: (937) 428-9300 | Email: info@aerobarrier.net

AEROBARRIER.NET

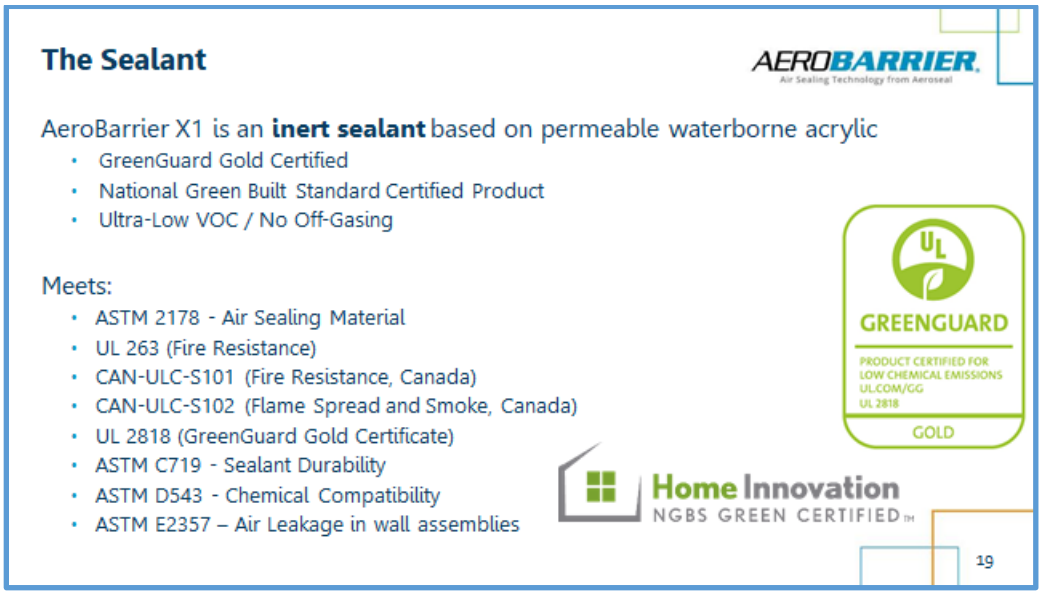
**APPENDIX 2 : AeroBarrier X1 Safety Datasheet (SDS)**

AeroBarrier X1 sealant is a waterborne acrylic sealant. It is a stable emulsion, non-toxic and not flammable.

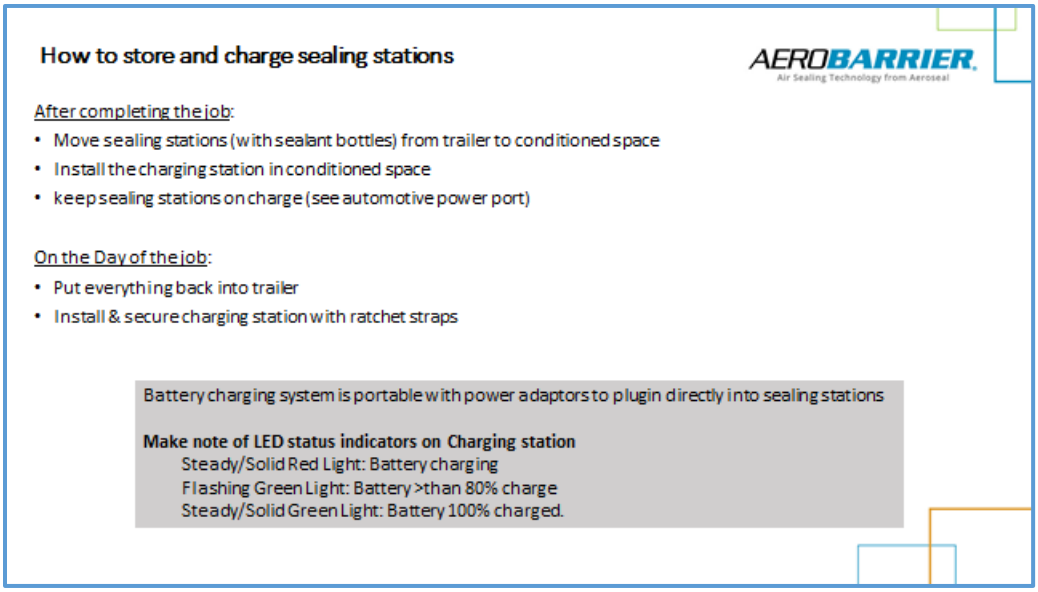
The latest copy of the Data sheet and the Safety data sheet can be downloaded from the below link:

https://aeroseal.com/wp-content/uploads/2021/03/AeroBarrier-X1-Datasheet-and-SDS.pdf

Key summary characteristics for Aerobarrier X1 is shown in below figure.



## APPENDIX 3 : How to Store Sealing stations and AeroBarrier X1 Sealant




The above picture shows the recommended steps for storing your sealing stations and sealant. In most cases this might be the most efficient arrangement you want to follow.

However the modular nature of the equipment gives you some flexibility depending on specific circumstances. One such example is described here – In moderate climates, it might be efficient to leave the sealing stations and the charger inside the trailer and run a 120V extension cord into the trailer. This will avoid handling, but please ensure that the sealant is not subjected to extreme temperatures. Some contractors choose to keep the trailer in conditioned space.

The sealant is water based and needs to be between **40$^0$F and 100$^0$F** or (4$^0$C and 38$^0$C)

Sealant tends to settle at the bottom of the jug when stored. It is important to mix the sealant using the provided stirrers. On the job site, thoroughly mix with provided stirrer and every 2hours thereafter

**APPENDIX 4 : Transferring sealant from 5Gl Pail to sealing stations at Job site or the shop?**

**Sealant Management**

AEROBARRIER
Air Sealing Technology from Aeroseal

**On the Job Site**

- **Always** flush sealing station with water **and**
- **Use compressed air** to dry (winterize) at end of job
- At end of job, top off sealant in each station
  - Use the provided battery-operated pump
  - Flush the pump with water after use

**At the shop**

- Store sealing stations in conditioned space (stations are filled with sealant)
- Put all sealing stations on charge
  - Move the charging station from the trailer into conditioned space
  - Alternatively, backup trailer into conditioned warehouse
- Put everything back into trailer before going to job

**The above set up will reduce bottle handling, sealant contamination, drying up (skinning), and any inadvertent running out of sealant during a job**

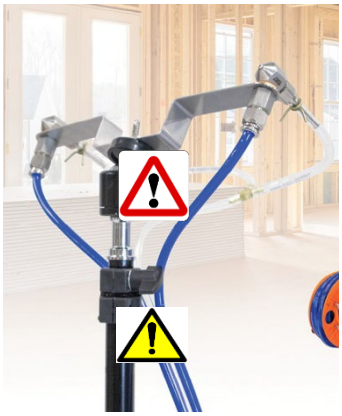
*Caution: Overnight parking - Do not store sealant & sealing stations inside trailer (especially in sub-zero conditions)*

Use the provided pump or lid to transfer and top up sealant into the sealing station jugs.

Another technique that technicians follow is to first consolidate all sealant into 5Gallon Pails after the job and then clean up all the sealant Jugs with warm water. This might be the way to go especially if you do not have jobs scheduled daily. It is important that you have clean jugs to avoid dry particles (skinning) being sent into the nozzle and clogging the nozzles.

**APPENDIX 5 : Typical set ups for Sealing stations**

One of the key decision points that a technician has to make before he reaches the job site is to determine how many sealing stations to use on a particular job. A good starting rule of thumb would be one sealing station per 500 sqft floor area (minimum two). Many a times the room layout, wall restrictions, ceiling heights would determine fewer or more stations.



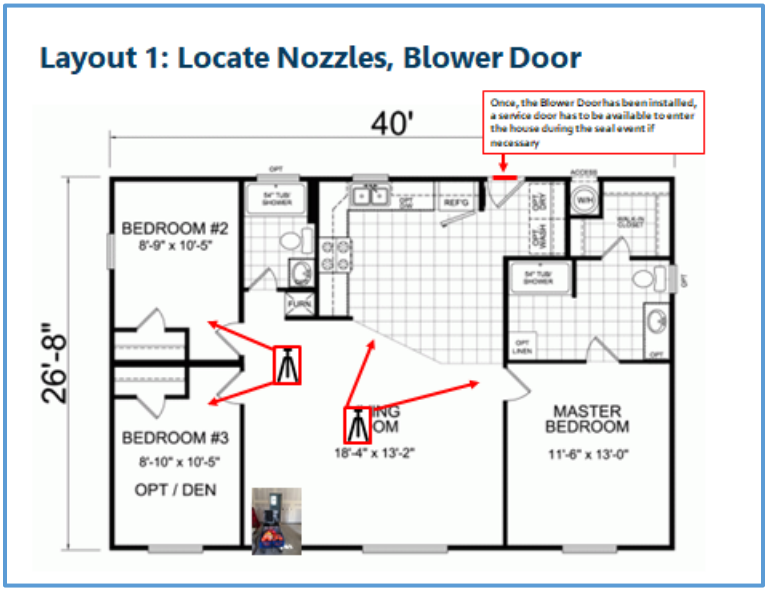
Keep Nozzles pointed away from the walls.

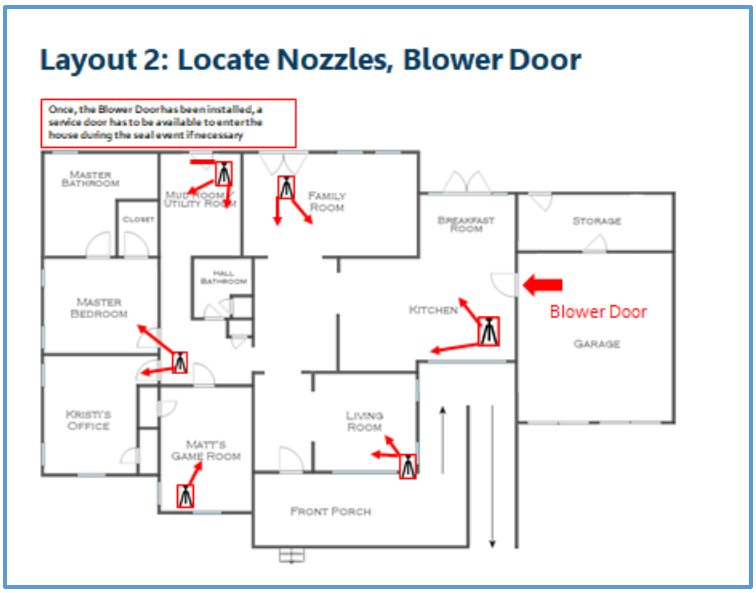
Do NOT manually block one nozzle as it might not result in good Aerosol particles (high risk of floors wetting)

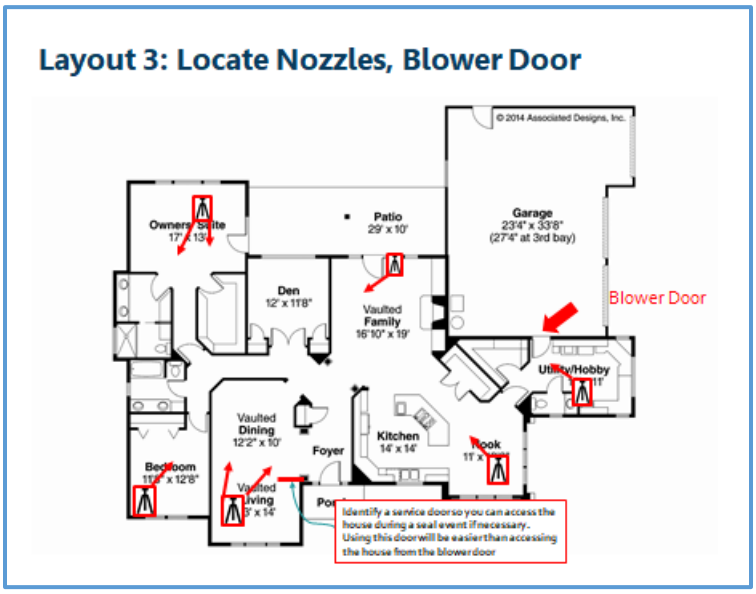
Identify an access door that you can use to go inside the room during the sealing event

Wear a respirator if entering confined space with Aerosol mist

The below three sketches will help you get oriented on how one can place Nozzle stations in an apartment or home






Note for Sealing stations (for back-to-back sealing events)

When preparing for a subsequent seal to be done immediately after, do not turn on the seal stations in the following unit until the previous seal is finished and those units are turned off. Turning on seal stations during a seal will cause the system to think that they are in use and connected to air. This will cause spraying of fluid. If the units from the first seal are not turned off prior to starting the second seal, the amount of fluid used will carry over from the first job and be added to the amount used for the second job.

**APPENDIX 6 : Typical Cold weather set up**

## Purpose:

This appendix 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 quantity 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 clogging due to settling of adhesive by gravity.

## 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 inside sealing space must be removed (or turned off and covered up) 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 few 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 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.

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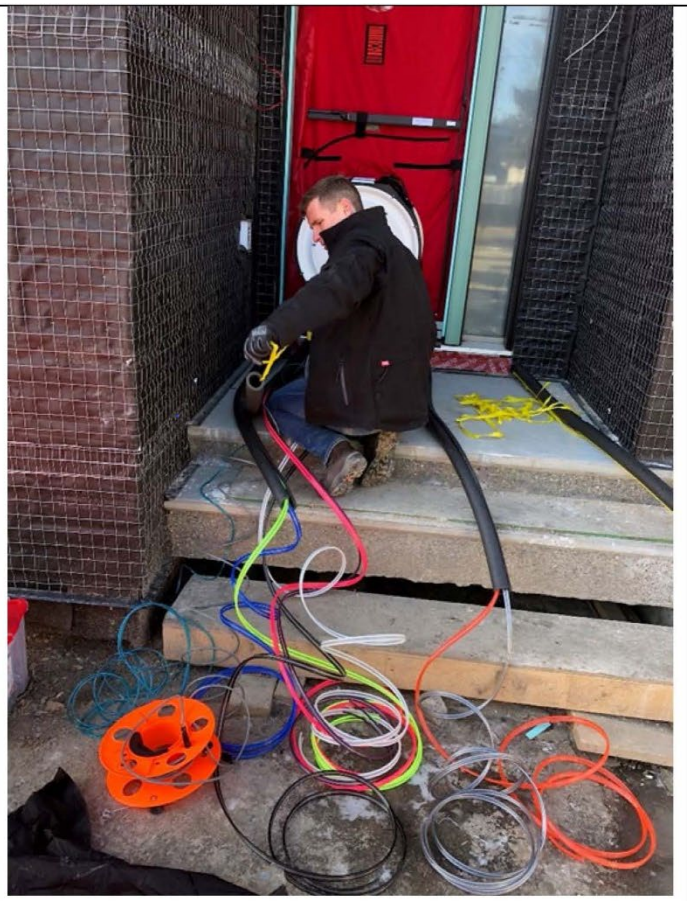
| Consider using insulation to protect tubing in cold conditions |  |

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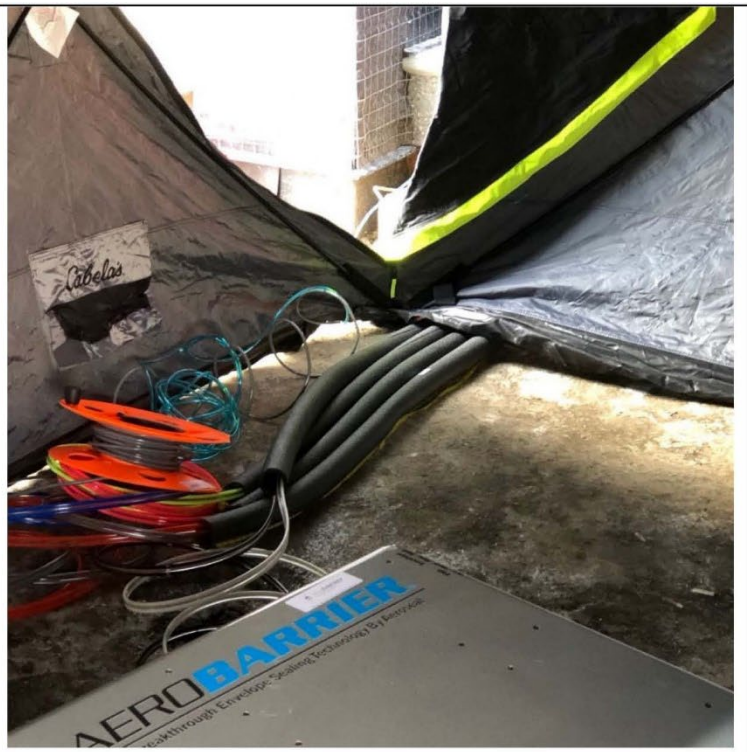
| Using a tent for shelter. A larger tent can be used for to pre-heat air going into the blower door where the building design allows. Otherwise, use the garage area to pre-heat air and create a wrm area to work. Always remember to keep exhaust outside and leave an opening for air flow for the blower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

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|   | Indirect heater example |

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|  | Indirect heater supplying heat to the second floor |

**APPENDIX 7 : Maintenance Schedule for AeroBarrier Select**

The below table lays out a recommended schedule for maintenance and routine checks that would be needed for the main components of the AeroBarrier Connect system including for key accessories.

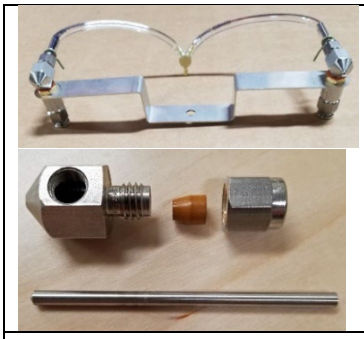
| TASK | EVERY SEAL | DAILY | MONTHLY | DURATION |
|---|---|---|---|---|
| CLEAN NOZZLE ASSEMBLIES | ✓ | ✓ | ✓ | 30 MINS |
| INSPECT/CLEAN U-BRACKET ASSEMBLIES | ✓ | ✓ | ✓ | 10 MINS |
| CHARGE SEALING STATIONS | ✓ | ✓ | ✓ | 5 MINS |
| INSPECT SEALANT CONDITION | ✓ | ✓ | ✓ | 1 MIN |
| DRAIN COMPRESSOR AIR TANKS | ✓ | ✓ | ✓ | 2 MINS |
| INSPECT/CLEAN COMPRESSED AIR MANIFOLD | ✓ | ✓ | ✓ | 5 MINS |
| INSPECT/CLEAN SEAL STATION TUBING | ✓ | ✓ | ✓ | 2 MINS |
| INSPECT/CLEAN SEAL STATION CONNECTORS | ✓ | ✓ | ✓ | 5 MINS |
| INSPECT SEAL STATION PUMP & ROLLERS | | ✓ | ✓ | 5 MINS |
| CLEAN/INSPECT SEALANT BUILDUP ON SEAL STATION | | | ✓ | 2 MINS |
| LAPTOP: AeroSuite UPLOAD | | | ✓ | 2 MINS |
| LAPTOP: AeroSuite UPDATES | | | ✓ | 2 MINS |
| LAPTOP: WINDOWS 10 UPDATES | | | ✓ | 20 MINS |

**APPENDIX 8a : Cleaning tips for AeroBarrier Select sealant delivery system**

Please follow the cleaning procedures described below for optimal performance of the system:

- Once the sealing operation is complete, ALWAYS flush the system with CLEAN water. Use warm water if it is available.
- Make sure all tubing ends are clean before storage and before use (inserting them into connectors- PTCs). Push the release flange of the PTC back while fully seating the tubing.

**Components of the sealant delivery system**

| | | | |
|---|---|---|---|
|  |  |  |  |
| **Nozzles** | **Nozzle Clean out tool** | **Pump Head** | **Liquid and Air Tube** |

**Maintenance tips for each component**

| 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 & Manifolds | 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. |

**Detailed instructions**

Nozzles

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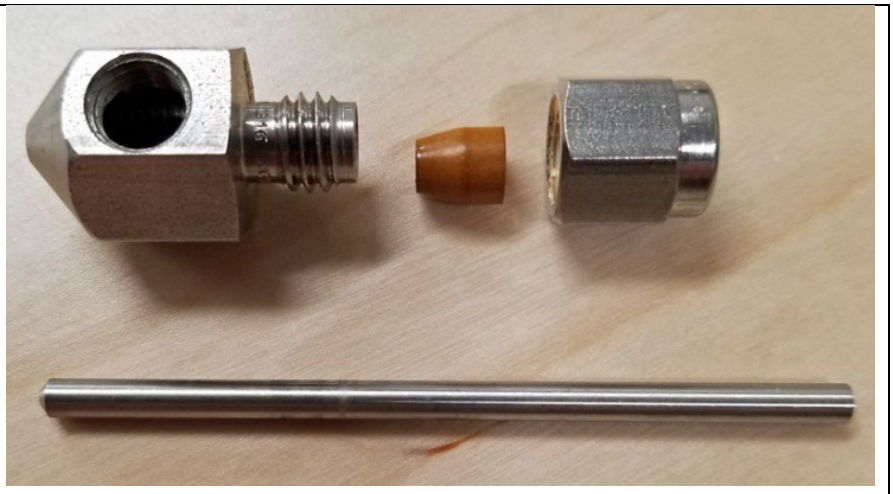
|  |  |
| Nozzles should be cleaned after each use. If there are minor sealant deposits, the nozzle assembly can be soaked in Buckeye cleaner, then purged with an air hose and/or the nozzle clean-out tool. | Nozzles that have heavy deposits and/or air flow restrictions should be disassembled for soaking in Buckeye cleaner.<br><br>Once the nozzle parts are clean, reassemble the nozzle parts. Make sure the liquid tube is adjusted about 1mm from the front of the nozzle, the nozzle alignment template can help with this process. |

Refer to the next Appendix section for more detailed explanation of why and how to do maintenance

**APPENDIX 8b : Detailed maintenance procedure for components handling compressed air**

Proper maintenance of all components handling compressed air is needed for correct spray atomization at the nozzle thereby avoiding sealant puddling and wet floors. Puddling is the result of improper interaction between the fluid stream and surrounding compressed air supply (air flow and air pressure) at the nozzle. When sealant droplets become too large, they fall from the surrounding air and create puddles on the floor.

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 at the nozzle assembly (Q-ring, ferrule, push to connect)**
    - 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.
    - Applying the Pipetite-Stik to the threads before assembly will help reduce air leaks.
    - Critical Areas for a Correctly Functioning Nozzle (pg3) provides more detail surrounding the nozzle.
2. **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 9) and Nozzle Reassembly and Inspection (pg16) provide more detail on this issue.
3. **Air leaks at the compressed air manifold**
    - 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 20) covers this component.
4. **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)
5. **Fluid tube position in 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. Using the Nozzle assembly template helps remove the guesswork out of alignment and creates a consistent position every time.

- Critical Areas for a Correctly Functioning Nozzle (pg3) and Nozzle Reassembly and Inspection (pg 16) cover fluid tube alignment needs.

6. **Air leaks at any other place**
   - 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 25)

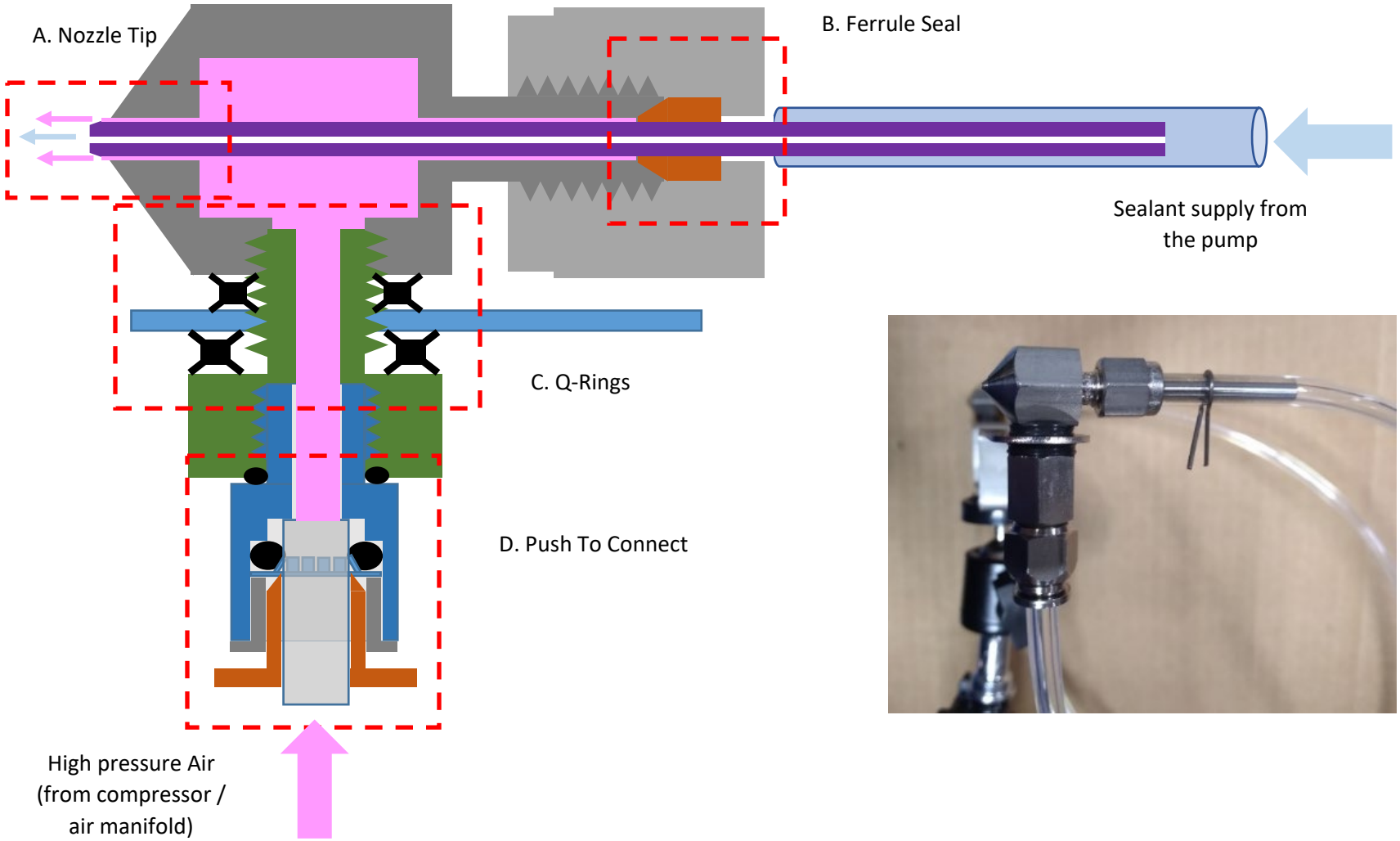
| **What You Will Need:** | Soap water (for leak detection) |
|---|---|
| 82AS1773 - Air Nozzle cleaning brushes | Disposable Shop Towels |
| 82AS1923 - Dental Picks | Nitrile Gloves |
| 82AS1726 - Fluid Tube Ram Rod | (2) Plastic Cups |
| AERO-005 - Buckeye Workout (cleaner) | Hot (Tap) Water |
| 82AS2073 – Pipetite-Stik | 82AS2072 – Nozzle Alignment Template |




Additional Buckeye Workout cleaner is available from the Aeroseal Store

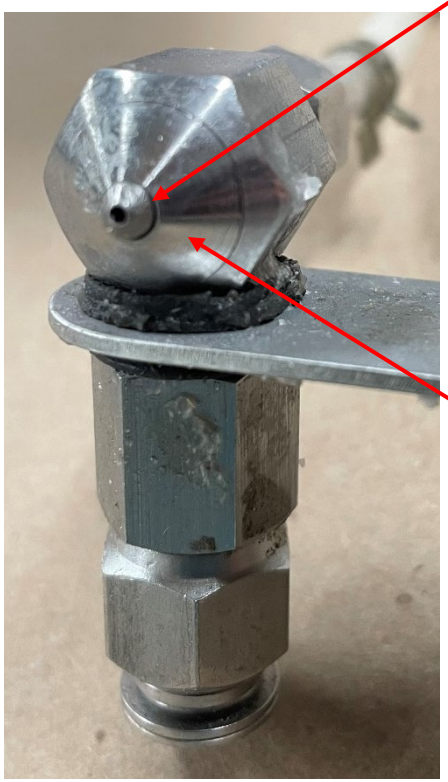

Brushes, picks, the fluid tube ram rod, Pipetite-Stik and Assembly Template are included in the Spare Parts Kit, or can be ordered from the Aeroseal Store

➢ **Critical areas to focus on for a correctly functioning nozzle assembly**

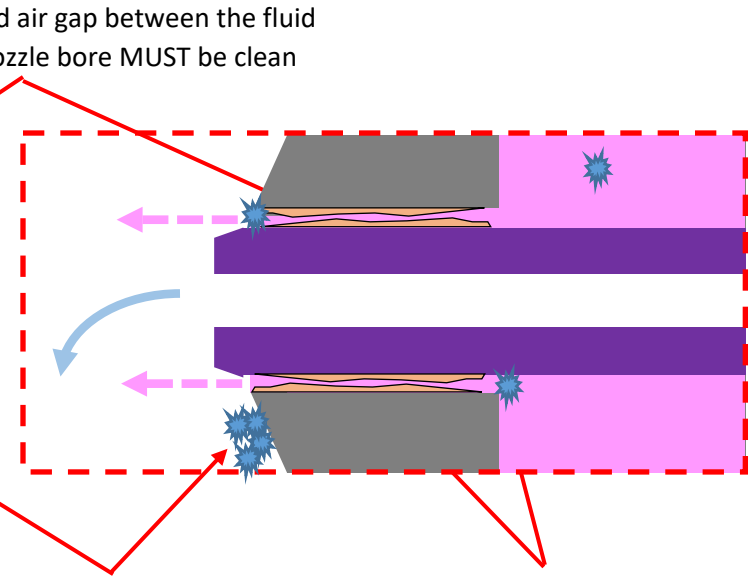


**A. Nozzle Tip – (Build-up Reduces Air Flow)**

- A small amount of sealant build up 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 contamination 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 puddling

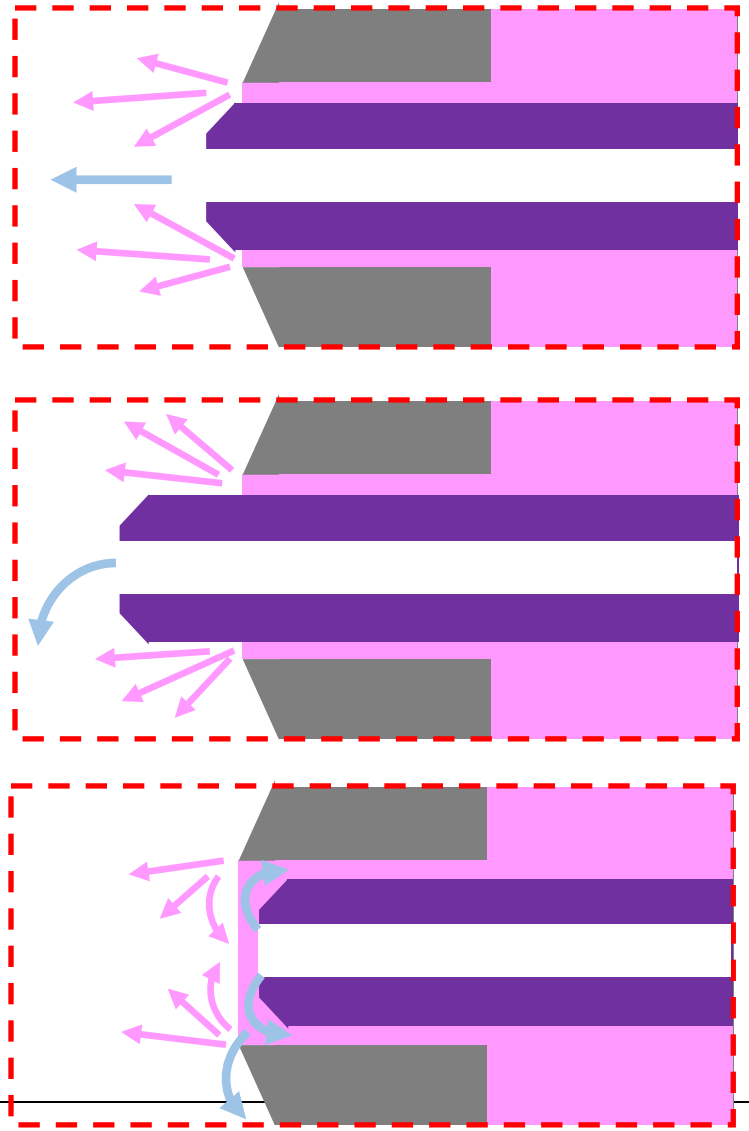


Functioning nozzle after a sealing job.



**A. Nozzle Tip – (Fluid Tube Alignment Sets the Direction of Air Flow)**

- 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.
- Using the nozzle alignment template will help insure that the fluid tube is in the correct position



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

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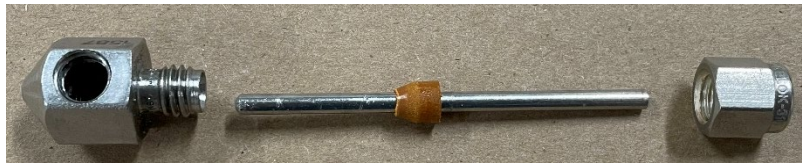
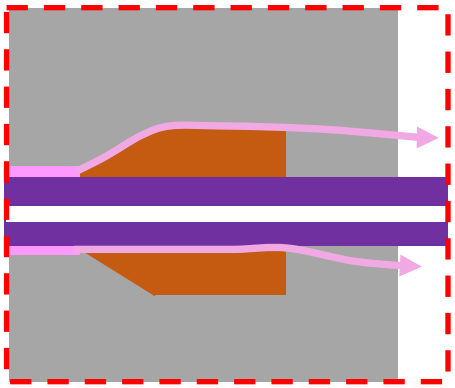
**B. Ferrule Seal – (Leaks Steal Air Pressure and Flow from the Nozzle Tip)**

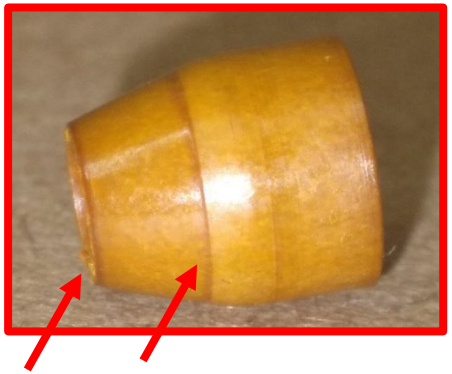
- The ferrule seals the rear of the nozzle to the fluid tube
- Damage from over-tightening, edge chips, or other surface damage can cause compressed air leaks (stealing air from the nozzle tip)





Functional Ferrule – smooth surfaces, clean edges

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



Leaking Ferrule – sharp ridge at end of tapered surface, chipped leading edge – beginning to crack (excessive compression from seal nut)

Leaking Ferrule – Installed and tightened backward in the nozzle body

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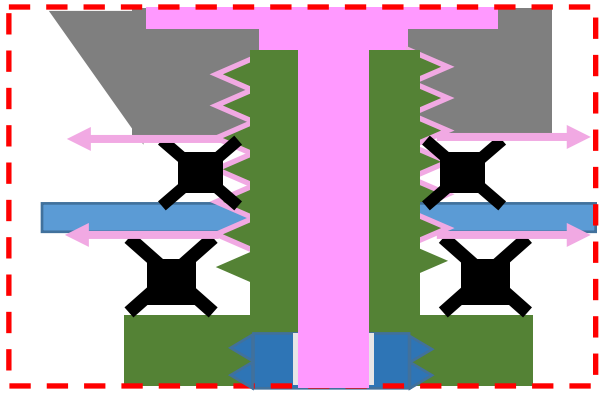
**C. Q-Rings – (Leaks Steal Air Pressure and Flow from the Nozzle Tip)**

- 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 the majority 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.

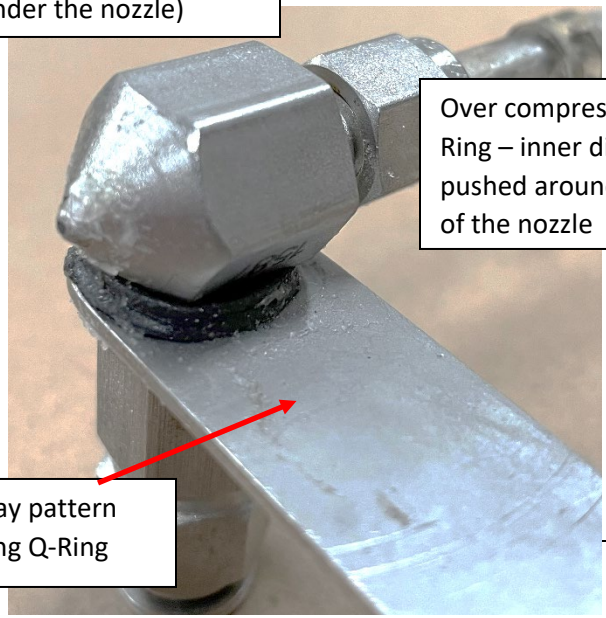
Functional Q-Ring (round, clean, all surfaces intact)

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

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



Leak caused sealant build up across the compressed air gap at the nozzle tip (puddling under the nozzle)



Over compressed Q-Ring – inner diameter pushed around the side of the nozzle

Visible spray pattern from leaking Q-Ring

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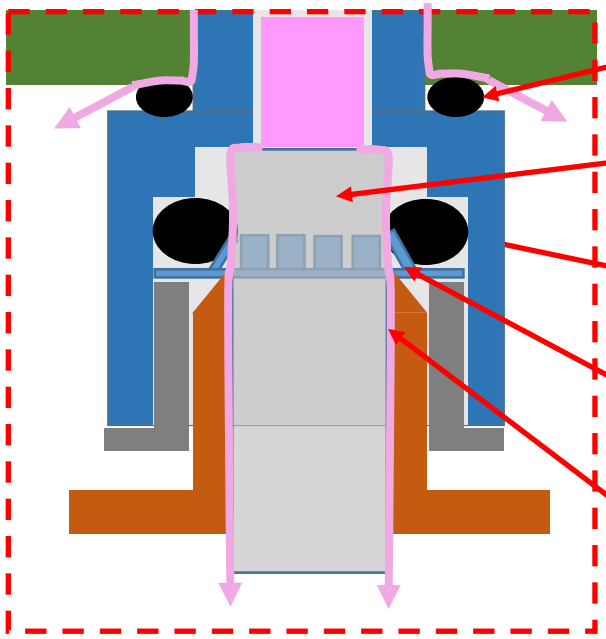
**D. Push To Connect – (Leaks Steal Air from the Nozzle Tip)**

- 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



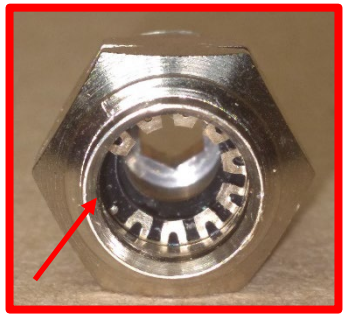
PTC must be tight to the threaded adapter

Angled end cuts can create leaks past the internal o-ring

Contamination on 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 tube surfaces will create a leak path



Damaged retention teeth

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

Angled tube end cut

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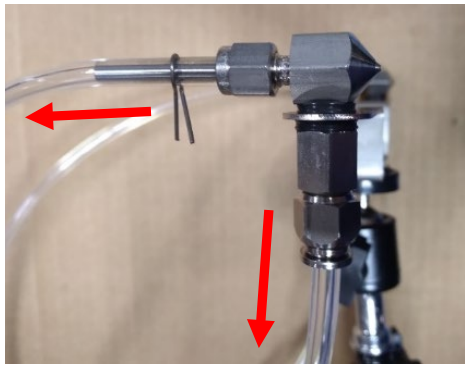
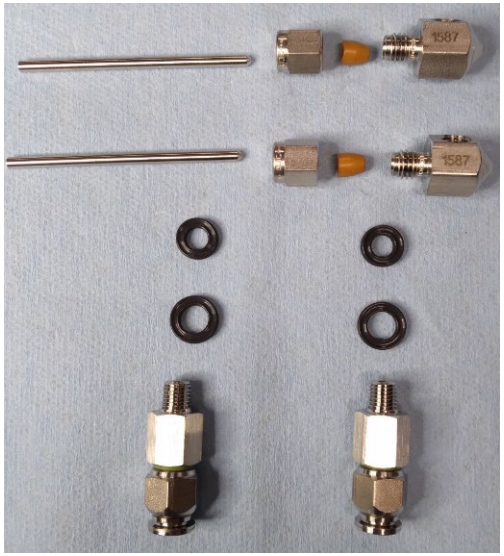
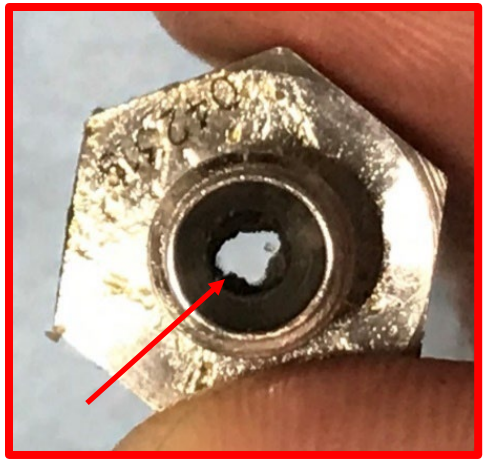
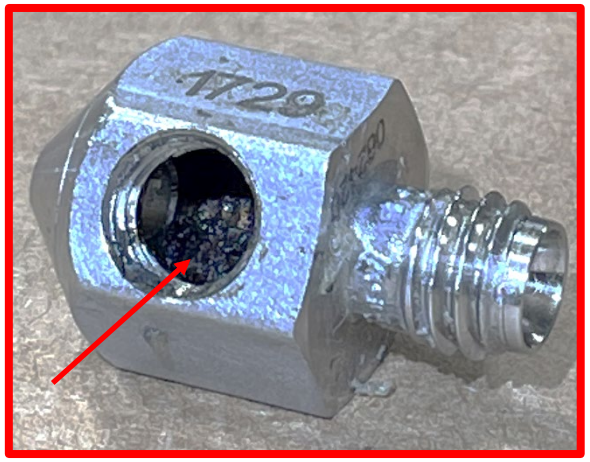
|---|---|
| ○ The tube must be fully installed past the teeth and o-ring. | |
| ➢ **Nozzle maintenance : Disassembly and cleaning** | |
| **Remove Flexible Tubing**<br>• Slide clamps back and remove fluid tubing<br>• Remove compressed air tubing from PTC<br>• Remove insert tubes |  |
| **Disassemble Nozzle**<br>• Unthread the PTC / Threaded adapter from the bottom of the bracket (hold the nozzle body stationary)<br>• Remove the Q-Rings<br>• Fully remove the seal nut<br>• Separate the fluid tube, ferrule, and nozzle body |  |

**Inspect 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.

| | |
|---|---|
| **Buckeye Workout Soak**<br>• 5-minute soak in Buckeye Workout cleaner, Do not dilute (agitate during soak)<br>  |  <br>  |

**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



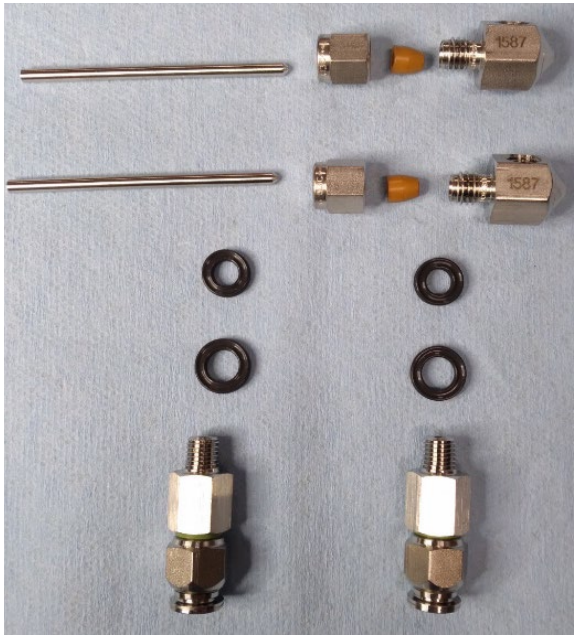

Brush inside the nozzle bore (both ends), female thread, and inside the central cavity of the part

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

Brush the Exterior of the air inlet fittings

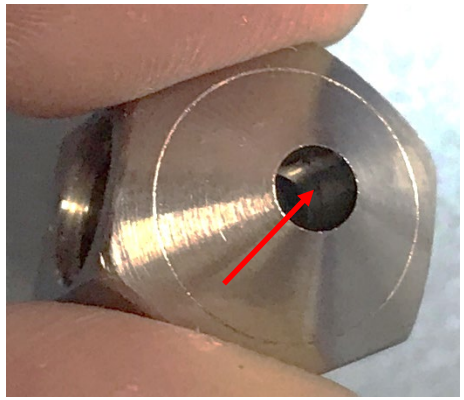
Ram rod for the interior of the insert tube

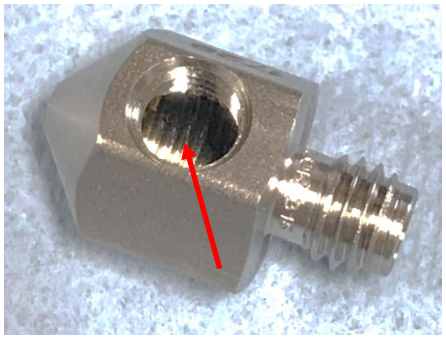
| | |
|---|---|
| **Rinse**<br>• 2 minute rinse in hot water (agitate during soak) |  |

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

**Inspect Nozzle Body**

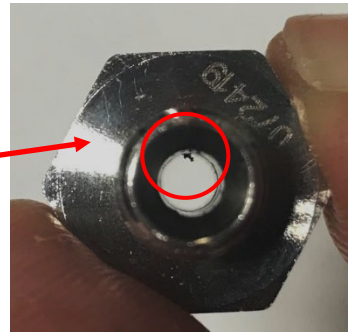
- The ID bore at the tip must be bright steel. Any build-up or film can restrict compressed air flow.
- The internal cavity must be clean and free of any contamination that can break free and block the compressed air gap from the inside of the nozzle.
- The ferrule mating surface must also be clean and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



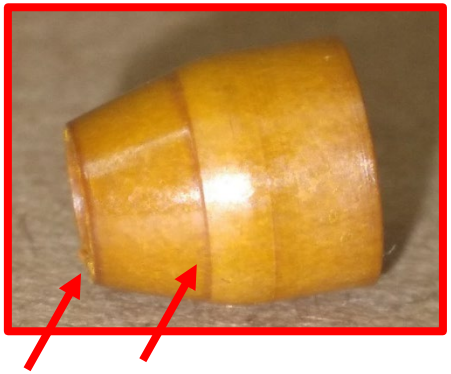
| | |
|---|---|
| **Inspect Fluid Tube**<br>• Fluid Tube – no debris, sealant build-up / film, or damage. The first 1/2” from the tapered end is critical (mates with the nozzle bore to create the compressed air path) |  <br>Fluid Tube: No debris on the ID, outside is bright steel – no build-up (if a 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)

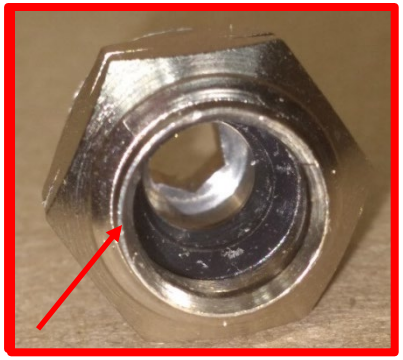


Leaking Ferrule – sharp ridge at end of tapered surface, chipped leading edge – beginning to crack (excessive compression from seal nut)

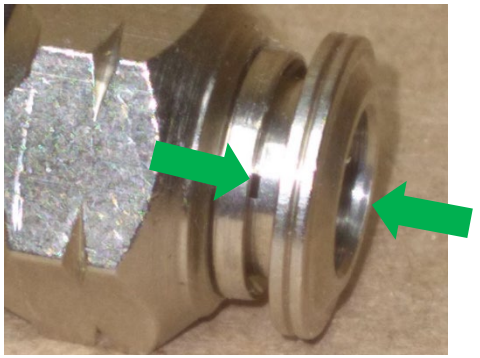
Leaking Ferrule – Installed and tightened backward in the nozzle body

**Inspect the Push To Connect**

- 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 suggesting a piece of remove any resistance on the tube (sticking to the internal o-ring or dragging on the retention teeth)
- 



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



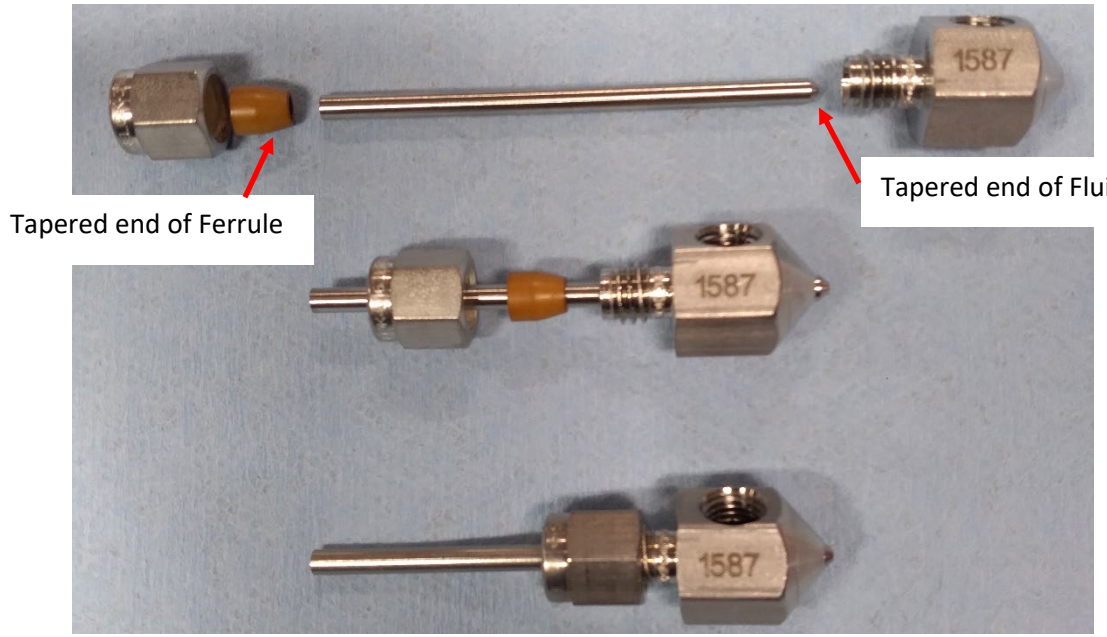
PTC Contamination on the o-ring

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

## ➢ Nozzle maintenance: Assembly

**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



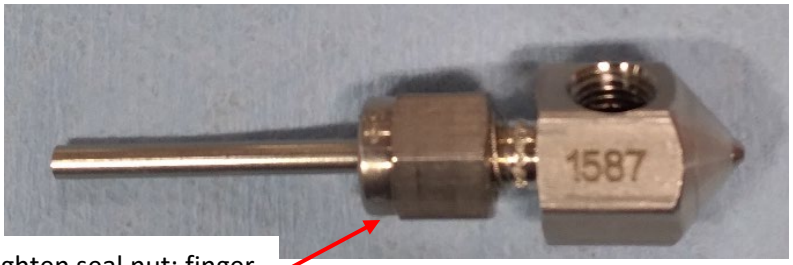
**Adjust the Fluid Tube Position**

- 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

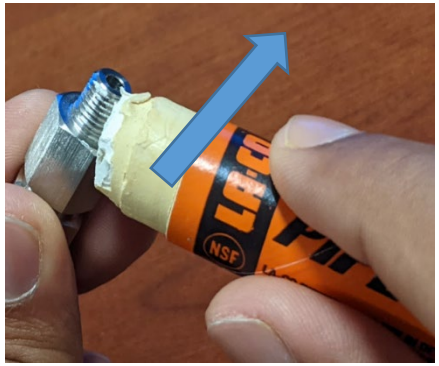
It might be easier to use the Nozzle alignment tool in your spare parts kit (and is described in the next section).


Fluid Tube Transition Point (before adjustment)


Adjust Insert Tube stick-out so the taper matches the nozzle.



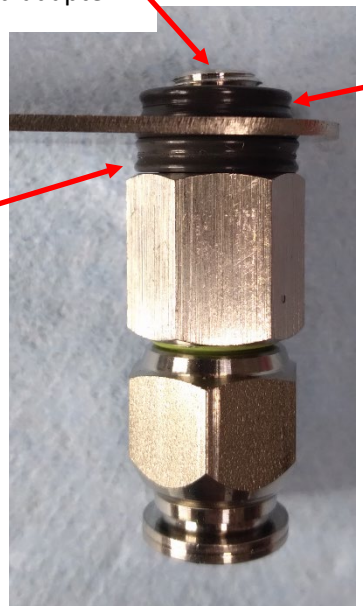

Tighten seal nut: finger tight + 1/4 turn MAX

| | |
|---|---|
| **Apply Pipetite to threaded adapter**<br>• Strike upwards on the threads of the adapter making sure to have a light amount of Pipetite covering most of the threads |    |

**Assemble PTC 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)

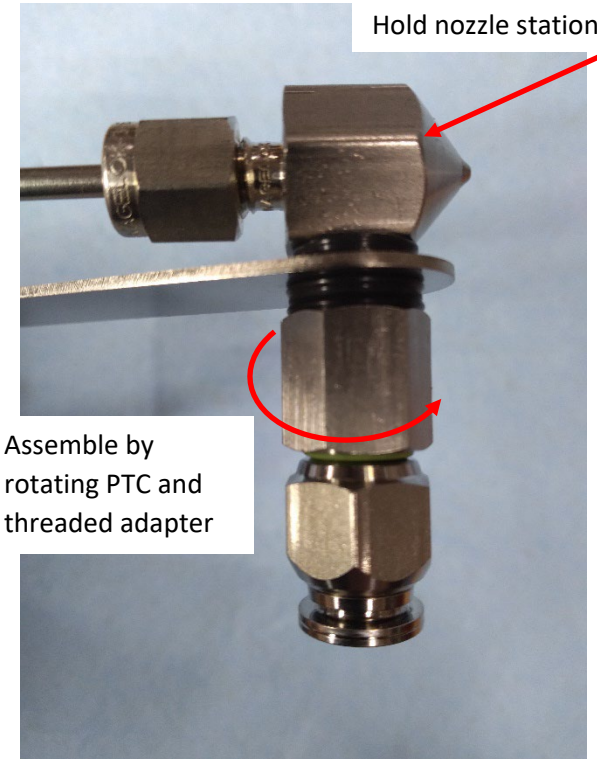
When assembled correctly, there should be appx 2 threads showing at the top of the threaded adapter



**Assemble Nozzle Body**

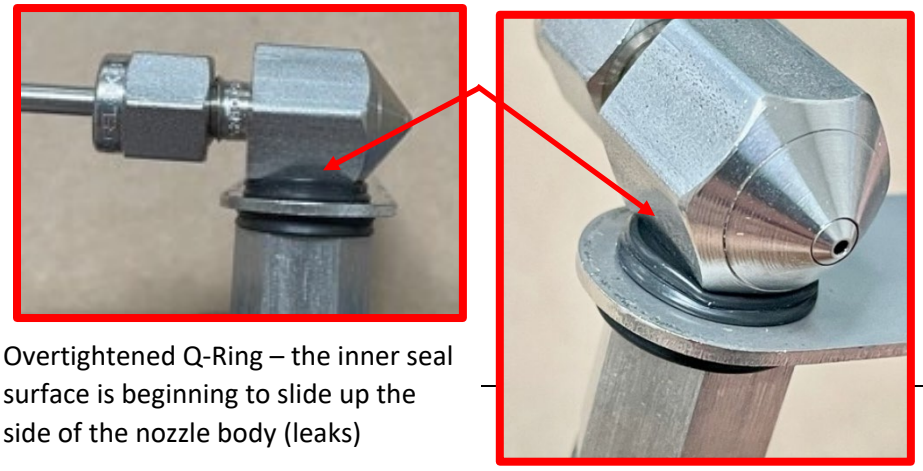
- Hold the nozzle stationary and thread the PTC 2 full turns into it (turn the PTC, NOT the nozzle during assembly)
- There is a thin edge at the bottom of the nozzle that can cut the Q-Ring if the nozzle is twisted
- **The nozzle assembly may not feel fully "tight" when correctly assembled. It should 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.




Assemble by rotating PTC and threaded adapter

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



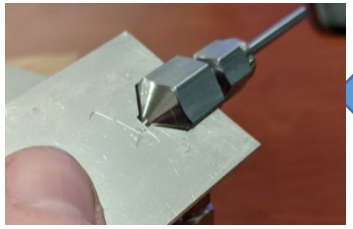
Overtightened Q-Ring – the inner seal surface is beginning to slide up the side of the nozzle body (leaks)

| | |
|---|---|
| | |

**Align fluid tube using Nozzle Assembly template**

- Pull back the fluid tube and align the template with the nozzle body
- Push the fluid tube forward into the template and tighten the back by hand
- The fluid tube should be at the end of the nozzle assembly template with little no gap between the nozzle body and template
- Use the assembly template to tighten it an extra quarter of a turn

Pull back the fluid tube and align the template with the nozzle body



Push the fluid tube forward into the template and tighten the back by hand

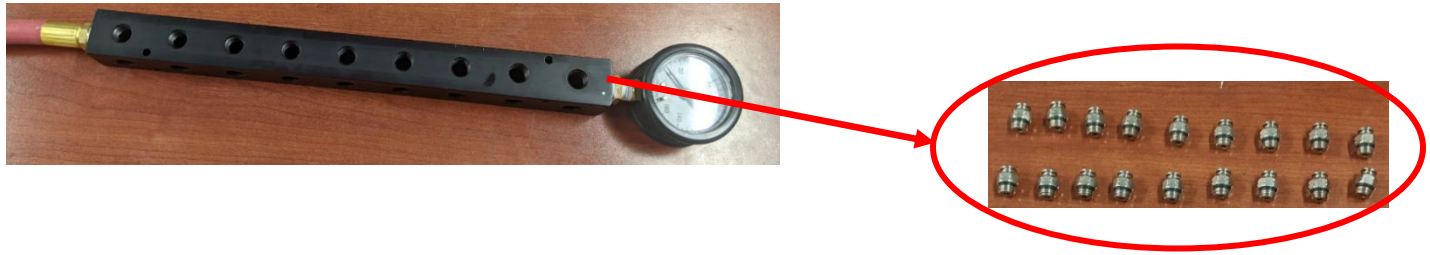
The fluid tube should be at the end of the nozzle assembly template with little no gap between the nozzle body and template

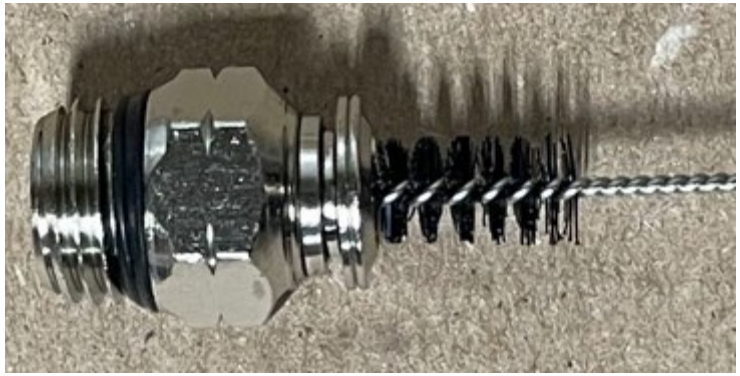
Use the assembly template to tighten it an extra quarter of a turn

## ➢ Compressed Air Manifold Cleaning

**Wipe Exterior Surfaces**

- Wipe the exterior surfaces of the manifold body, large tubes and fittings, and gauge prior to disassembly (this will help keep contamination out of the internal surfaces)
- Contamination inside of the manifold body may work its way out through the air lines and block nozzles from the inside.

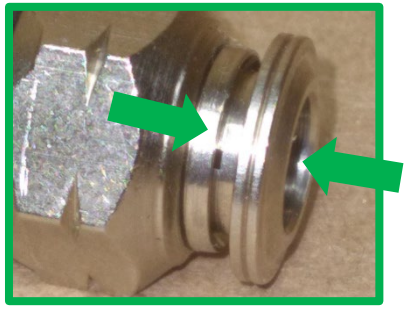
| | |
|---|---|
| **Remove PTC from Manifold Body**<br>• Remove all 16 of the PTC fittings (1/4" NPT) from the manifold body |  |
| **Buckeye Workout Soak**<br>• 5-minute soak in Buckeye Workout cleaner, Do not dilute (agitate during soak)<br>  |  <br>  |

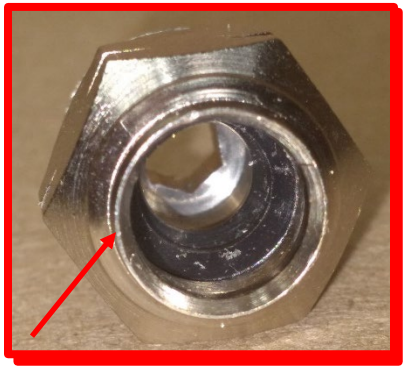
| | |
|---|---|
| **Scrub**<br>• Clean ALL interior surfaces with small spiral brushes<br>• USING BRUSHES REDUCES THE CHANCE OF LEAVING DEBRIS / LINT INSIDE THE NOZZLE COMPONENTS<br>• Twisting the brush clockwise during insertion into the part can help pull debris to the outside edges where it can be more easily cleaned<br>• **DO NOT USE DENTAL PICKS INSIDE THE PTC OR ON THE EXTERNAL O-RING SEAL**<br>• Wipe the exterior surfaces with shop towels |   |
| **Rinse**<br>• 2 minute rinse in hot water (agitate during soak)<br>• Multiple rinse cycles may be needed |  |

**Inspect**

- Inspect the interior and exterior of the push to connect.
- There should be no damage or contamination on the O-ring seals, retention teeth, or other surfaces that can cause an air leak.
- The retention collar must move freely (able to fully compress and will return to extended position)

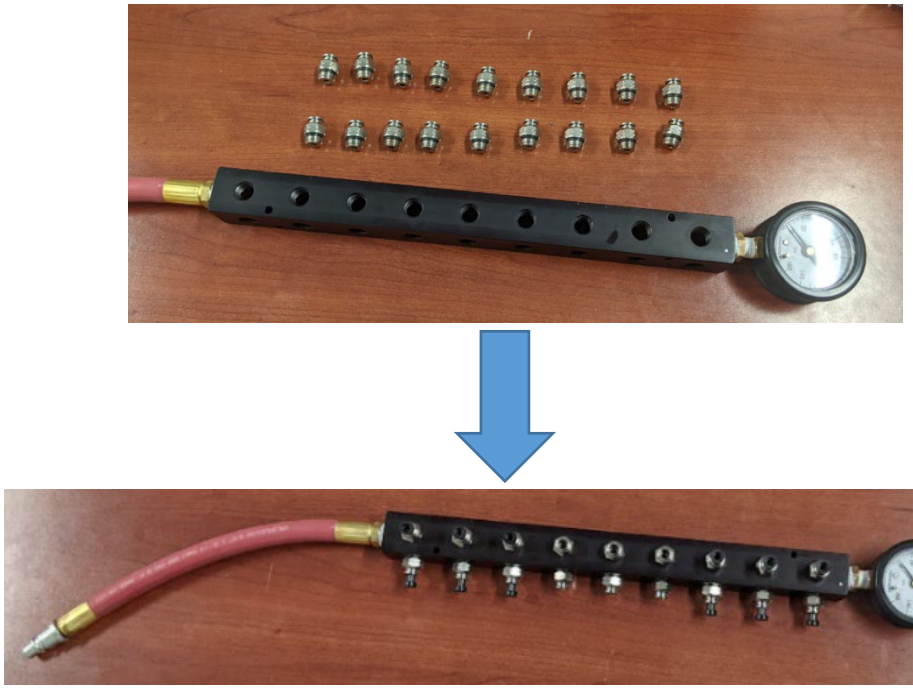
Clean, Functional PTC – no damage and release collar moves freely





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

Cut or Damaged O-Rings (internal and external)

| | |
|---|---|
| **Reassemble**<br>• Reassemble the PTC fittings into the manifold body. |  |

**PREVENTION IS KEY**

- It is difficult to fully clean PTC fittings – preventing contamination is easier and more effective
- Covering the compressed air manifold during a job (plastic bag, pillowcase, etc.) will keep sealant from settling on the components and make clean up and maintenance much easier.

Example of a working compressed air manifold. This was used in approx 70 sealing jobs and was placed inside a pillowcase during sealing

Example of a non-functioning compressed air manifold. This was used in approx 100 sealing jobs without being covered.

| | |
|---|---|
| ➢ **Test for Leaks** | |
| **Leak Testing**<br>• 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.) |  |

 Use Gloves when mixing sealant, and when using cleaners

**APPENDIX 9 : Troubleshooting chart for AeroBarrier Connect**

## I. Common problems or questions

| Problem | Source of the problem | Verify source of the problem | Solution |
|---|---|---|---|
| Seal graph is flatlining or sealing slowly | Sealant | Sealant jug empty | Add more sealant |
| | | Is there a restriction in sealant pick-up line | Check lines & connections |
| | Big hole in enclosure | Verify prep work & check overspray areas | Correct any problem areas |
| | Pressure reading tubes (Red & Blue) | Are they dirty or restricted | Clean or replace tubes |
| | Sealant turns to liquid around enclosure leak point | Ambient temperature much lower than enclosure | Add heat at fan inlet |
| Insufficient envelope pressure | Prep work | Are all major holes covered | Check windows; doors; attic access; |
| | Pressure reading tube (blue tube) | Check tube and connections to MCU | Replace tube; unkink; splitter bad |
| | | | Reseat and tighten tube in bulkheads of MCU & fan |
| | Ring setting | Does ring setting match on software & on the fan | Change setting; is it on the correct size |
| Spike in graph | Pressure tube suddenly measuring more leakage | Envelope pressure tube came loose or restricted | Fix bad connection; clean tube; ensure nothing is on tube pinching it |
| | | Prep work blew apart | Fix prep work |
| | | Ring on fan and software settings mismatch | Adjust rings or software ring setting |

| | | | |
|---|---|---|---|
| | | Fan outdoors on windy day (affects fan flow) | Adjust fan so no wind blows in the back |

## II. Component Malfunction

### 1. MCU and Sealing Stations power

| Problem | Source of the problem | Verify source of the problem | Solution |
|---|---|---|---|
| MCU dead | Incoming power | Power plug loose or not connected | Insert and lock plug into receptacle on MCU |
| | | Main power LED ON at MCU? | LED OFF means no power into MCU, check power source or power cable |
| | | 12V Blue LED on? | Check ribbon cable's connection to the black computer box |
| Sealing station not powering on | Battery not supplying power | Battery level must be 10 to 13 vdc at station's charging port | Charge battery |
| | | Battery level after charging overnight is less than 10 vdc | Check battery charger; are connections and setting correct; will a known good battery charge properly on charger? |
| | | | Check for loose wires on station charging port or on battery |
| | | | Replace battery |

## 3. Sealant Not Pumping

| Problem | Source of the problem | Verify source of problem | Solution |
|---|---|---|---|
| Sealant not moving from sealant jug to tripod | User skipped priming the lines | Air bubbles through out liquid lines | Prime liquid lines |
| | Sealant pick-up lines | Dirty or clogged | Clean or Replace tubes |
| | | Breather hole in lid blocked | Clean out breather hole |
| | Pump doesn't turn | Envelope humidity 90% or above, software stops pump | Add heat to enclosure to lower humidity |
| | | Power to pump | Run pump with purge switch (direct power to pump) |
| | | Pump doesn't run by purge switch | Check station voltage, must be above 11 v to run |
| | | Station has charge but pump doesn't run by purge switch | Bad Purge Switch, Pump motor is bad; station needs service |
| | | Humidity at station is too high, approaching 90% | Wait till humidity drops or add heat to enclosure to dry it out |
| | Liquid tubes | Liquid lines clogged | Blow out with air, pump warm water and Buckeye cleaner through lines |
| | Leaks in push-to-connect fittings or fitting clogging | connections are allowing air in (visible air bubbles in line) or blocking flow | Reseat or tighten liquid line connections, clean PTC, replace PTC |
| | Y fitting at tripod | Liquid getting through lines but not to nozzle | Remove and clean Y fitting |

## 4. Sealant Not Spraying Properly

| Problem | Source of the problem | Verify source of problem | Solutions |
|---|---|---|---|
| Sealant not spraying (atomizing) or dripping from nozzle | Nozzle tips and connections | Inspect nozzles | Clean nozzles |
| | | | Use nozzle alignment template to align nozzle |
| | | Nozzle and tripod mounting bracket | Tighten the nozzles down snug against the rubber seal rings. |
| | Steel air tubes in nozzle | tubes missing | Replace if needed |
| | | | |
| | | Tubes assembled incorrectly | Properly align air tube to end of nozzle |
| | Low compressed air pressure | Compressor | Is compressor still running? |
| | | Regulator in trailer set below 100 psi | Adjust regulator |
| | | Compressed air pressure at MCU is below 90 psi | Check for leaks or restrictions in hose. Check fitting from trailer to MCU for leaks |
| | | Compressed air pressure at manifold is below 85 psi | Check for leaks or restrictions in hose. Check fitting from MCU to manifold |
| | | Compressed air pressure at nozzle is below 65 psi | Check for leaks or restrictions in tubing. Check nozzles properly seated against the rubber seal rings |

## 6. Sealing Stations Not Connecting to MCU

| Problem | Source of the problem | Verify source of the problem | Solution |
|---|---|---|---|
| Station not showing up in software | Station battery low | Check station voltage, must be above 11 v to run | Charge battery |
| | | Battery level after charging overnight is less than 10 vdc | Check battery charger; are connections and setting correct; will a known good battery charge properly on charger? |
| | | | Check for loose wires on station charging port or on battery |
| | | | Replace battery |
| | Xbee board not communicating | Battery good but station not showing up in software | Move station close to MCU and wait for connection |
| | | | Possible bad board, antenna issue, loose wiring. Send in for repairs |

FOR COMPONENT LEVEL TROUBLESHOOTING PLEASE SEE COMPONENT SPECIFIC OPERATIONS MANUAL

**SUBLICENSEE DEALER CLAIM FORM – SEALING APPLICATION WARRANTY**

_____ a Certified Aeroseal Sublicensee warrants that the sealing application at the below address was completed by an Aeroseal, LLC Certified Technician and complies with Aeroseal, LLC's application procedures and standards.

Dealers: Submit this claim form to Aeroseal Warranty Support, 225 Byers Rd., Miamisburg, Ohio 45342, or to: WarrantySupport@Aeroseal.com. Aeroseal will respond after receiving the claim. Please call Customer Service (877) FIX-DUCT with any questions.

**Date of Original Application** _____ **Date of Failure** _____

**Description of Failure** _____

**Name of Customer** _____

**Address of Customer** _____

**Quantity of Sealant Required to Reseal** _____

**Direct Labor Hours to Reseal** _____ **Direct Labor Hour Rate** _____

**Name of Certified Technician** _____ **Case ID Number** _____

**Dealer Signature** _____

**SUBLICENSEE DEALER CLAIM FORM – EQUIPMENT WARRANTY**

_____ a Certified Aeroseal Sublicensee warrants that the machine is operated and maintained by the Aeroseal LLC trained technician and used as per Aeroseal, LLC's procedures and standards.

Dealers: Submit this claim form to Aeroseal Warranty Support, 225 Byers Rd., Miamisburg, Ohio 45342, or to: WarrantySupport@Aeroseal.com. Aeroseal will respond after receiving the claim. Please call Customer Service (877) FIX-DUCT with any questions.

**Description of Defect** _____

**Component and Serial Number** _____

**Registered Case ID Number** _____

**Name and Number of Dealer** _____

**Certified Technician** _____

**Signature** _____