FlexPak Leak Detectors

MAINTENANCE & INSTRUCTION MANUAL

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www.flexpakinc.com

FlexPak Leak Detectors

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Uncrating The Leak Detector

TOOLS REQUIRED:

1. DRILL WITH ¼" NUT DRIVER BIT
2. PRY BAR
3. HAMMER

CAUTION: THE MAIN COMPONENT OF THE LEAK DETECTOR (THE VACUUM CHAMBER) IS BUILT WITH ACYLIC PANELS. STRIKING OR IMPACTING THE VACUUM CHAMBER COULD CAUSE DAMAGE. USE CAUTION WHEN OPENING THE CRATE.

Step 1: Remove Top of Crate

Remove the top of the crate by backing out the ¼" Hex Head Screws.

Step 2: Remove Front Panel of Crate

The front panel of the crate is mounted with ¼" hex head screws, the other 3 sides are secured with nails.

Remove the front panel of the crate by backing out the screws.

Step 3: Remove Remaining Panels

The remaining wall panels are secured with nails.

Starting with the back panel (Opposite to the front panel) carefully remove the remaining wall panels with a pry-bar.

Step 4: Moving the Leak Detector

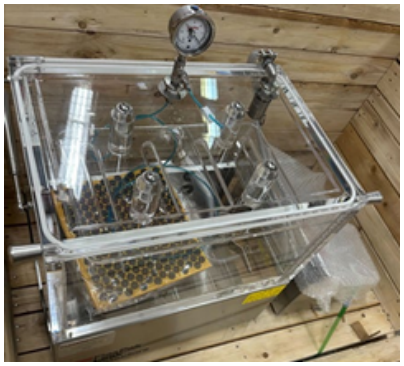
If relocating the Leak Detector, use a pallet jack to lift the crate to move to the desired location, keeping the Leak Detector strapped to the crate while moving.

Once in the desired setup location, remove the strapping securing the Leak Detector to the crate.

Step 5: Final Position of Leak Detector

Finally, lift the Leak Detector into the final position.

Note: When lifting the Leak Detector, it's recommended to use a minimum of 2 people. Larger models may require more personnel or machinery.



NOTE: Tabletop Models with Controllers

Control packages for tabletop units are loose from the main Leak Detector's frame. The equipment is shipped with Vacuum Supply hose connected (located at back of the Control package, Top Right outlet) between the Leak Detector and Control Package.

It's recommended to disconnect the Control Package prior lifting and moving the equipment to a workbench. A ¼" nut driver is required to loosen the Hose Clamp on the Vacuum Supply hose. Using a Heat Gun on the Vacuum Supply hose will make removal and installation easier.

Leak Detector Model Numbers

Use this to Navigate the Manual for Your Specific Model

Model Identification:

- Locate the Model Number on your unit - see image located on the right side of the page.
- If your Leak Detector includes add-ons, they will appear in the model number ID. The following add-ons are commonly available:

Compressed Air Models (BaseModel)

- These models rely on a venturi vacuum generator powered by compressed air to create a vacuum.

FP242015

Electric Vacuum Pump (BaseModel - EVP)

- Equipped with an electric vacuum pump, these models are ideal for environments without compressed air systems.

FP242015-EVP

Controller Models (BaseModel - FPSA/FPFA)

- Controller models feature integrated automation with PLC systems, enabling advanced test cycles, altitude simulations, and data logging.
- **FPSA (Semi-Automatic Controller):**
  - Enables automated testing of 2 different tests (pressure/duration) atthe push of a button.
- **FPFA (Fully-Automatic Controller):**
  - Enables programming of up to 24 unique test parameters, along with data logging.

FP242015-FPSA-T

FP242015-FPSA-EVP

FP242015-FPFA-T

FP242015-FPFA-EVP

VAC Attachment (BaseModel -VAC)

- Enables testing for low-headspace or vacuum-sealed packages by injecting air into the package during a vacuum cycle.

FP242015-VAC

FPIPA (BaseModel -FPIPA)

- Special model type with additional features. See separate manual for detailed instructions if you own an FPIPA system.

FP242015-FPIPA

Safety Warnings

Please review these warnings before installation or use

Warnings

LBS - Table Top Weight Warning

MODEL	FILL WEIGHT (LBS)	WEIGHT (KG)
FP110808	60	27
FP181210	145	66
FP201413	225	102

The FlexPak Leak Detector is a heavy piece of equipment, even in the table top form factors. The three base model sizes listed in the table above detail the full weight of the Leak Detector when f illed with water.

WTR - Water Filling Warning

Do not use water above room temperature. Even +10 °F over ambient can cause thermal expansion resulting in damage of the Acrylic Vacuum Chamber which will void warranty.

NDL - Sharp Needle Warning

VAC and FPIPA add-ons use medical grade needles to puncture packages. Always use caution and keep protective covers on needles when not in use.

LID - Lid Operation Warning

Warning Notice:

Releasing the lid while it is in motion can cause the lid to slam closed with significant force, posing a serious injury risk.

Safe Use Notice:

Ensure that your hands and body parts remain clear of the testing chamber opening at all times while controlling the lid. Always maintain a firm grip and actively control the lid during both opening and closing; do not release it mid-motion. Releasing mid-motion could cause bodily harm and/or damage to the equipment.

Overview & Install Steps

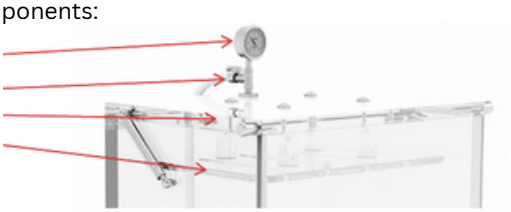
Compressed Air Vacuum Generator Models

Overview of Compressed Air Leak Detectors

Lid Assembly

The Lid Assembly of the Leak Detector houses the following Components:

- The Vacuum Gauge
- Vacuum Inlet Port
- Lid
- Hold-Down Plate

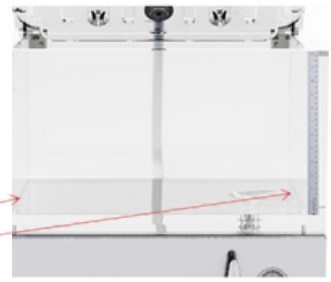


Vacuum Chamber

The Vacuum Chamber is the testing chamber in which packages will be placed during testing.

The Vacuum Chamber contains the following components

- Vacuum Chamber
- Ruler

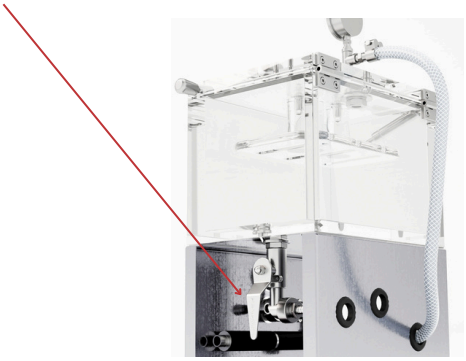


Drain Valve

The Drain valve is located at the bottom of the Vacuum Chamber, accessible through the Stainless Steel Base.

Table Top models have the Drain Valve accessible on the right hand side of the equipment. Floor Stand models have the drain accessible from the left hand side.

- Drain Valve (Table Top Open Position)



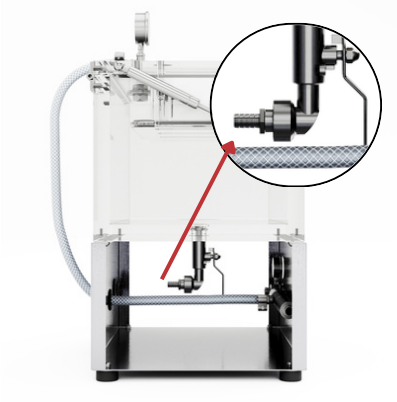
Installation Steps

Step 1: Hook Up Compressed Air Supply

- Clean, dry air at a minimum of 70 psig (4.8 bar) @ 13 SCFM (6.1 L/s) is required. It's recommended to provide at least a ½" air supply hose to ensure adequate air flow through the venturi.
- Air supply inlet on the Leak Detector is a ¼" NPT fitting (G-fitting adapters provided outside of North America) .

Step 2: Vacuum Gauge Equalization

- Open the Blue Push pin on the Vacuum Gauge to equalize the gauge case to Atmospheric pressure.

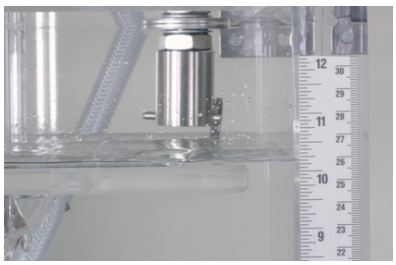


Step 3: Attach Hose to Drain Port

- The Leak Detector is fitted with a ½" hose barb drain port.
- Route your hose either into a bucket or into a floor drain.

Compressed Air Vacuum Generator Models

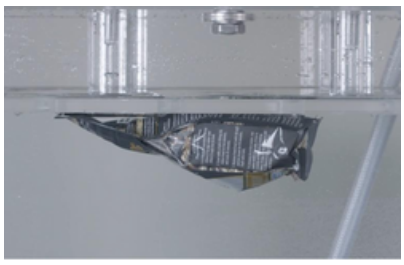
Operation Instructions



Step 1: Fill Leak Detector with Water

NOTE: Skip step 1 if performing dry chamber testing

- **Close Drain Valve:** Ensure the drain valve is closed before filling the Vacuum Chamber with water.
- **Fill With Water:** Fill with room temperature water only via flexible hose or a bucket.
- **Water Level:** The water level should be set to fully submerge the Hold-Down Plate when a package/test sample is submerged.



Step 2: Load Test Sample

- **Load Sample:** Place sample into the Vacuum Chamber for testing.
- **Note:** For MAP/Rigid trays, it is recommended to orient the package so the film faces upwards.

Step 3: Turn on Vacuum System

NOTE: If performing stat-up or commissioning of the Leak Detector, adjust the Regulator so that the Regulator Pressure Gauge is set to zero prior to turning on the Vacuum System.

- **Open Control Valve:** Adjust the Control Valve to the ON (horizontal Position)
- **What To Expect:** Air will travel through the Venturi and exhaust out the Ventur's exhaust port. It is normal for Venturi exhaust air to travel out the left-hand side of the equipment.

Step 4: Adjust Vacuum Setpoint

- **Note:** If the equipment is setup to perform testing at a specific setpoint, no adjustment is required.
- **How To Adjust:**
  - Pull the Regulator Knob out.
  - **Increase Pressure:** Turn clockwise.
  - **Decrease Pressure:** Turn counter-clockwise.
  - **Monitor Pressure:** Use the Vacuum Gauge mounted on the Lid to adjust the Vacuum level to the desired Vacuum Setpoint.
  - **Set Pressure:** Push the Regulator Knob inward when Vacuum Setpoint at the desired level to "lock" the Setpoint.

Step 5: Monitor Sample for Leaks

- **Look For Bubbles!** Watch the Package in the Leak Detector for Leaks. If a steady stream of air bubbles is made from the sample (for bubble emission tests) that would indicate a Leak and seal/package failure.
- **Dry Chamber - Look for Liquid:** Dry Chamber tests will have liquid contents leak out of the sample.

Step 6: Turn off Vacuum System & Complete Test

- **Finish The Test:**
  - Close the Control Valve (Vertical Position)
  - Wait for the Vacuum Level to return to zero
  - Lift the Lid
  - Remove the Sample for further inspection.

Overview & Install Steps

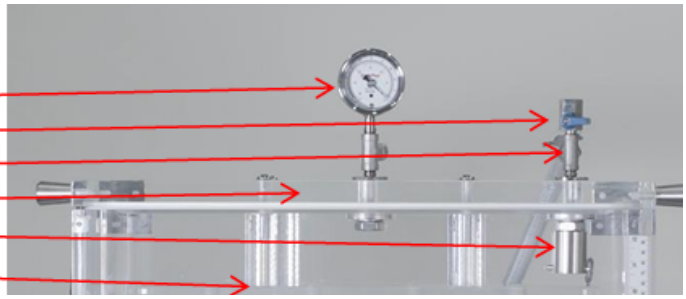
Electric *Vacuum Pump Models*

Overview of Electric Vacuum Pump Leak Detectors

Lid Assembly

The Lid Assembly has the following components:

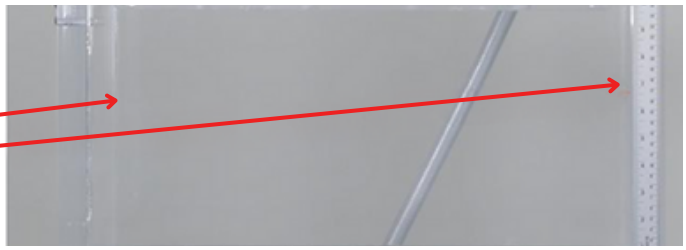
- The Vacuum Gauge
- Vacuum Relief Valve
- Vacuum Inlet Port
- Lid
- Water overfill Check-Valve
- Hold-Down Plate



Vacuum Chamber

The Vacuum Chamber contains the following components

- Vacuum Chamber
- Ruler



Drain Valve

The Drain valve is located at the bottom of the Vacuum Chamber, accessible through the Stainless Steel Base.

Installation Steps

Step 1: Connect EVP to Power

- *A power supply outlet is required to energize the pump.*
- *A Standard electric plug will be sufficient.*
- **Power Requirements:** 120V/1P/3.3A - OR - 230V/1P/1.65A

Step 2: Vacuum Gauge Equalization

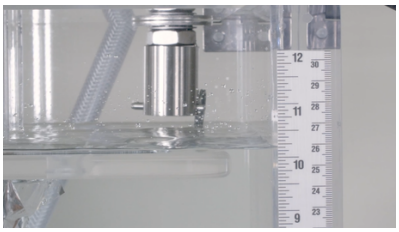
- Open the Blue Push pin on the Vacuum Gauge to equalize the gauge case to Atmospheric pressure.

Step 3: Attach Hose to Drain Port

- The Leak Detector is fitted with a ½" hose barb drain port.
- Route your hose either into a bucket or into a floor drain.

Electric Vacuum Pump Models

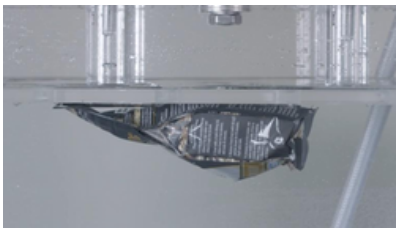
Operation Instructions



Step 1: Prepare Testing Chamber

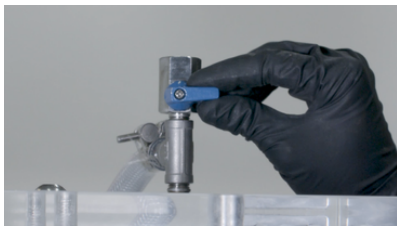
- Before filling the Vacuum Chamber, ensure the drain valve is closed.
- Fill with room temperature water by lifting the lid and using a flexible hose or bucket.
- Water level should fully submerge the Hold-Down Plate when a sample is added.

⚠ **Warning:** Keep water below the overfill check-valve to prevent water from entering the vacuum pump.



Step 2: Place product in the Vacuum Chamber

- Lower the product into the Vacuum Chamber for testing.
- Close the lid to submerge the package under water.



Step 3: Close Vacuum Relief Valve

- Turn the blue handle horizontal to seal the Vacuum Chamber.

Step 4: Turn the Vacuum Pump on

- Turn on the switch on the Vacuum Pump.
- The Vacuum Pump will start drawing a vacuum.
- Depending on where the EVP Control Valve was last set the Vacuum Pump will draw the Vacuum chamber to that level (see Step 5).

Step 5: Adjust Vacuum Level

- If necessary, adjust the Vacuum Setpoint using the EVP Control Valve:
  - **Increase Pressure:** Turn clockwise
  - **Decrease Pressure:** Turn counterclockwise
  - **Monitor Pressure:** Use the Vacuum Gauge on the lid to monitor levels.

Step 6: Monitor Package for Leaks

- Watch the Package in the Leak Detector for leaks. If a steady stream of air bubbles is made from the sample (for bubble emission tests) that would indicate a leak and seal/package failure.
- Dry Chamber tests will have liquid contents leak out of the sample.

Step 7: Relieve Vacuum

- Once your test is complete, turn the Blue Handle on the Vacuum Relief Valve to the vertical position.

⚠ **WARNING:** Failure to Relieve Vacuum prior to turning off the EVP will cause air to back cycle through the Vacuum Pump. This can cause damage to the Vacuum Pump.

Step 8: Turn off EVP

- Use the EVP Power switch to turn of the pump.

Step 9: Remove Package for Inspection

- Lift the Chamber Lid and remove the Package from the Vacuum Chamber for further inspection.

Maintenance

How to Keep Your FlexPak Leak Detector in Tip-Top Shape

Annual Calibration

- **Why Calibrate Your Equipment?**
  - Annual calibration ensures your FlexPak Leak Detectors continue to deliver accurate results, helping you maintain high-quality standards and avoid costly errors and product recalls. Calibration involves the replacement of the following two parts:

- **Lid Gasket:** The Lid Gasket is crucial to maintaining an airtight seal with the chamber, and it has a lot of wear and tear over time as operators lift and close the lid.

- **Pressure Gauge:** The Gauge we provide is certified to be calibrated for one year, and given your clients purchased in 2020, we'd highly recommend replacing the gauge to ensure the readings are accurate (they likely are, but it's good practice to replace).

Water Clean Out

- **Frequency:** Daily, or after sample burst/leakage into chamber.

- **Method:**
  - Wash the Vacuum Chamber with water and mild soap such as dish soap or an Acrylic compatible cleaning chemical. Always use room temperature, not hot, water.
  - Ask our FlexPak team for more resources on Acrylic Compatible cleaning chemicals.
  - Never use chlorine, bleach or any Alcohol based in the water as this can permanently damage the Acrylic Vacuum Chamber

Acrylic Polishing

- **Frequency:** Yearly, or as needed.

- **Method:**
  - Plastic polish manufactured by Novus can be used to re-polish the finish on the plastic tank www.novuspolish.com
  - Polish 3, 2 and 1 will be required to remove heavy scratches

Degassing of Water

- **Frequency** After every water change.

- **Why?** Water has oxygen in it, so if you don't degas before testing, you will see many bubbles (which can result in false-positives).

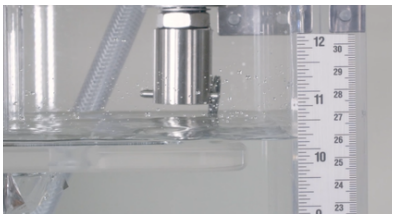
- **Method:**
  - Draw Vacuum System to a high Vacuum (minimum 24 inHg)
  - Run system for 3 minutes, air bubbles will rise and collect on Chamber walls
  - Turn off Vacuum System
  - Use a cloth or squeegee to remove air bubbles from chamber walls (under water)

Lid Gasket Replacement

Frequency of Replacement:
The Lid Gasket will need placing if:

- Vacuum Chamber fails gasket inspection test
- 18,000 Vacuum Cycles have been performed.

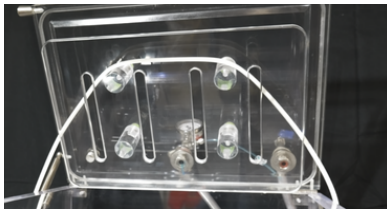
Gasket Inspection Test:



Fill Chamber:
Fill the chamber with water to the underside of the Hold-Down Plate

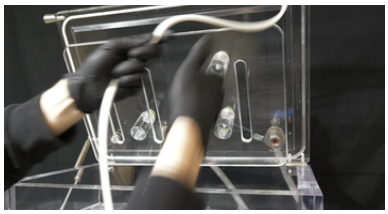
Maximum Vacuum Test:
Increase vacuum level to Maximum:

- Compressed Air – 27 inHg
- Electric Vacuum Pump – 25 inHg

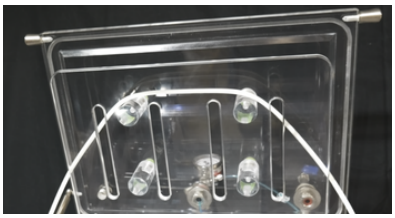


Confirm Maximum Level:
If the vacuum level is below the maximum rating, the Lid Gasket needs to be replaced.

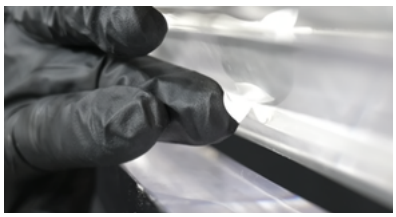
Lid Gasket Replacement Steps



Step 1 - Remove Existing Gasket
Behind the Vacuum Gauge, the 2 Lid Gasket ends are pressed together to form a joint. Grab one end and remove the gasket.

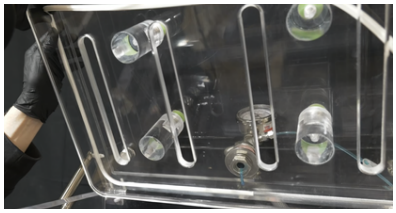


Step 2 - Prepare New Gasket
Set the new lid gasket across the Hold-Down Plate, ensuring equal lengths hang to each side

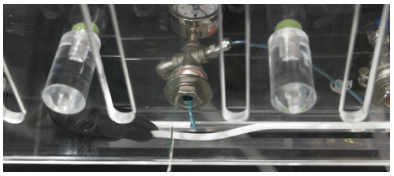


Step 3 - Start Installation
Press 1 end of the Lid Gasket to the center of the lid (behind the Gauge Port). Ensure the gasket profile is arrange correctly:

- Lap Edge external in groove, free end pointed towards exterior of Chamber



Step 4: Install Gasket
Press the gasket into the Groove working clockwise. Ensure the gasket is slightly compressed during installation and not stretched. If the Gasket "Wrinkles" it's over-compressed.



Step 5: Mark & Cut Joint (If Required)
Replacement Gaskets are shipped with a 2" of tolerance for compression. At the Butt Joint, after adequatly installed, there should be a 1/2" overlap of the 2 ends. Cut to size if needed. If overlap is greater than 4 inches, re-install with more compression.

Step 6: Press Joint - Complete Install
Press the two ends together to create the Butt Joint. Massage out the gasket material into the groove to even out the compression across the gasket.

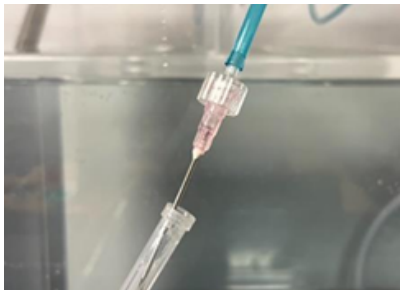
FlexPak Leak Detectors

VAC Attachment Instructions

THE FOLLOWING SECTION INCLUDES A STEP-BY-STEP PROCEDURE ON HOW TO USE YOUR VAC ATTACHMENT.

#1: Ensure that the white clamp attached to tubing (top of tank's lid) is closed (depressing tube).

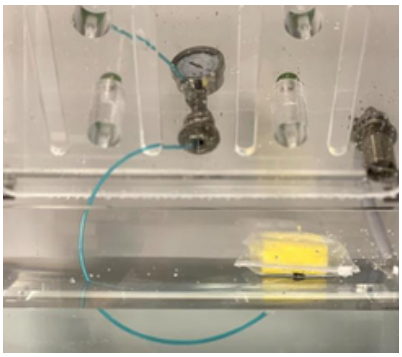
#2: Place septum on package to be tested



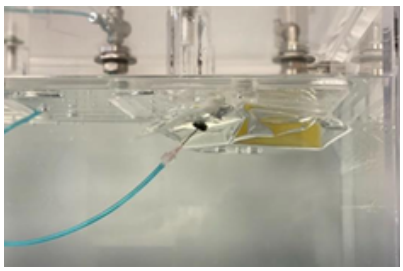
#3: Remove cover from needle.

PLEASE NOTE: While the cover is over the needle, turning clockwise will tighten the needle in the tubing adapter fitting. Twisting the cover counterclockwise will loosen the needle. Ensure the needle is secure in the fitting.

#4: Carefully insert needle into septum. Ensure the needle does not puncture the opposite side of the package or into product.



#5: Open lid and place package into water within the tank.

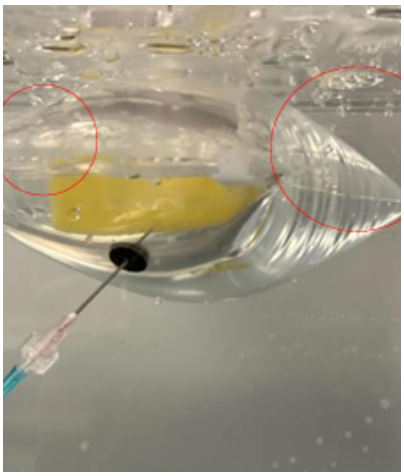


#6: Close lid so that package is submerged in water and held under the hold-down plate.

#7: Engage the Vacuum generation (either by Compressed Air ball Valve, Electric Vacuum Pump switch or Control Package)

#8: Adjust Vacuum Level till Vacuum Gauge (on top of the Lid) reaches the desired test level.

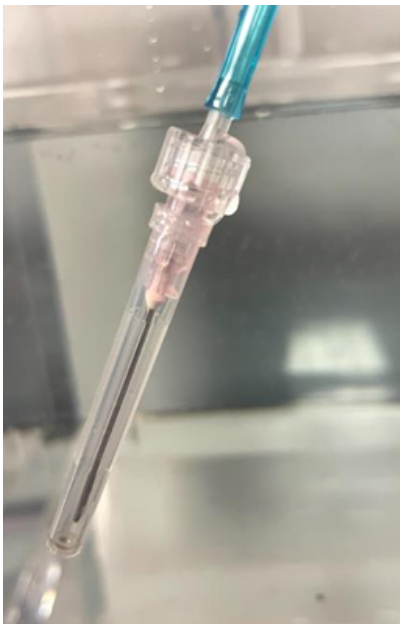
#9: Open the White Valve on the Blue Air hose of the Vacuum Package Attachment (at the top of the lid) to add headspace to the package. Close the White Valve once the package has inflated to an adequate level. The package should inflate, but not "balloon" or stretch to a point of bursting.
For low volume and thin film packages, it is recommended to inflate the package at a lower setpoint—such as 5 inHg (20 kPa)—to prevent rupturing or overexpansion of the sample. Once properly inflated, you can then increase the vacuum level to your desired setpoint.



#10: Look for bubbles emitting in the water bath, indicated package failure.

#11: Note exact area for bubble emission. Correct sealing machinery as required.

#12: Turn of the Vacuum generation, remove the package from the tank and carefully remove the needle. At this time proceed back to step 1 for the next package.



#13: When testing is complete, ensure the needle cover is reinstalled on the needle.

FlexPak Leak Detectors

Ordering Spare Parts

Ordering Spare Parts

- Visit https://flexpakinc.com/support/
- If you are unsure which part you need, contact **orders@flexpakinc.com** for assistance.
  - **Email Subject Line: Company Name – SPARE PARTS**
  - Include Equipment Model Number and Serial Number

Part Number	Description	Spare Parts / Consumables
FP4007	Lid Gasket	Spare Part
FP8062	Vacuum Gauge (0-30 inHg/0-100 kPa)	Spare Part
FP8062-NIST	NIST Certified Vacuum Gauge (0-30 inHg/0-100 kPa)	Consumable
FP8093B	Gas Spring – Model FP110808	Spare Part
FP8090B	Gas Spring – Model FP201413/FP242015/FP181210	Spare Part
FP8008	Gas Spring – Model FP302015/FP322620/FP392219	Spare Part
FP8014-A	Pressure Regulator (Manual Compressed Air Units Only	Spare Part
FP8016-A	Main Control Valve (Manual Compressed Air Units Only)	Spare Part
FP8015	Vacuum Generator (Manual Compressed Air Units Only)	Spare Part
FP8200	Electric Vacuum Pump (EVP Units Only)	Spare Part
Varies	Hold-Down Plate (Available For All Tank Models)	Spare Part
Varies	Lid (Available For All Tank Models)	Spare Part
SEPTA	Septa (Various Quantities)	Consumable
FP8055-A	Vac Attachment Needle Kit	Consumable
FP8029-A	Drain Valve Assembly (Table-Top Models)	Spare Part
FP8116-A	Drain Valve Assembly (Floor Stand Models)	Spare Part
FP8015	Vacuum Generator (Manual Compressed Air Units Only)	Spare Part
FP8082	Digital Vacuum Sensor	Spare Part
FP8088	NO Solenoid Valve	Spare Part
FP8083	NC Solenoid Valve	Spare Part
FP8099	FPSA-T/EVP PLC Controller	Spare Part
FP8130	FPFA-T/EVP PLC Controller	Spare Part
FP8139	FPLA-T/EVP PLC Controller	Spare Part

Testing Examples

Pouch Production Testing

- Seal the pouch with a sponge of specific dimensions inside the pouch in order to control
- the amount of air that is being sealed in the pouch
- Test the pouch under 15 inches Hg vacuum; if no leak, the pouch is acceptable
- Bring the pouch under vacuum up to 25 inches in order to determine burst level
- Document and trend burst level throughout the production run.
- If burst level occurs below 18 inches Hg, adjust pouch machine to correct seal.

Food Packaging Testing

- Suitable for any package that has a gas inside of it.
- Place the sealed package in the tank and test to 15 inHg or your desired Vacuum Setpoint. If the package leaks, package is a failure.

Note: *Various companies will have many different standards, i.e. Different vacuum levels for determining an acceptable product. It is up to the individual company to determine what standard is suitable for their own industry.*

Dry Chamber Testing

Samples containing liquids, with some head space can be tested in Dry Chambers.

- place product in the dry chamber on a paper towel
- close lid and start vacuum
- increase vacuum to expand package and put pressure on seals
- when test is completed, examine the paper towel for evidence of moisture

Note: *The VAC Attachment can also be used for testing packages containing liquid to add headspace to the sample.*

Empty Bag Testing

To achieve more consistent results when testing empty bags for seal integrity, we advise that a specific size block of foam (a sponge) is sealed in the bag for volume and operator consistency.

Rigid Tray with Lidding, Tub or Cup Testing

To achieve more consistent results when testing empty bags for seal integrity, we advise that a specific size block of foam (a sponge) is sealed in the bag for volume and operator consistency.

Setting of Quality Control Testing Standards

Every application will have a different “acceptable” vacuum level that will be used for consistent quality control testing of packages. Determining of this level will change from company to company and application to application. For a particular package, consistent water level, vacuum level, and time of test are necessary for consistent quality control of the production process.
With consistent testing, package consistency is easily tracked, trended and controlled. Visual knowledge of where the leak is physically located will allow the machine operator to exactly pinpoint where the operator must make an adjustment on the seal bars. This kind of physical testing can indicate an uneven seal bar, inadequate dwell time, inadequate seal pressure or temperature.
Please reference ASTM 3078-02 for Bubble Emission Testing and ASTM 6653 for Altitude Testing. These standards give good information as to the accuracy and repeatability of these test methods.

Absolute Vacuum vs Gauge Pressure

Vacuum indicated on vacuum gauge of tank is the “gauge pressure”. Absolute vacuum of the Chamber is equal to the atmospheric pressure of your location minus the gauge pressure indicated on the vacuum gauge.
Please see the following image below. Pvac is represented by the actual indicated gauge pressure of the vacuum gauge on the Leak Detector. Therefore Pabs=Patm-Pvac: