



## **CONGRATULATIONS!**

You have purchased the world's first and only intelligent freeze dryer. The freeze dryer is smart; it knows how to perfectly freeze and dry your material/food. Once it is set up, you can just put in your product and press start. The process is entirely automatic. When your batch of product is dry, the freeze dryer will beep to let you know it is finished.

Please do not bypass the freezing cycle of your freeze dryer. Doing this will void the warranty on your vacuum pump. Let the freeze dryer do its job; your end product will turn out better and your vacuum pump will last longer.

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# UNPACKING

## UNPACKING YOUR FREEZE DRYER

You should have taken the box off the freeze dryer and inspected for damage at the time you received your unit, before you signed the Shipper's Bill. Do not accept a damaged unit.

You should have received the following items:

- Harvest Right Freeze Dryer
- Vacuum Pump
- Power Cord
- Vacuum Hose
- Vacuum Pump Oil (not included with oil-free pump)
- Shelving Unit
- Trays
- Owner's Manual
- Insulator Door Pad
- Oil Filter (not included with oil-free pump)
- Other materials, not listed here, may have been included

1. Remove Harvest Right Freeze Dryer, vacuum pump, vacuum hose, and power cord from packaging.
2. Inspect all items.
3. Remove the vacuum pump from its packaging and place it beside or behind the freeze dryer.
4. If there is a problem, call Harvest Right Customer Support at **1-800-865-5584**.

**▲ CAUTION:** Do not lift the freeze dryer from the bottom of the door. Doing this may cause misalignment and inability to achieve proper vacuum, and voids the warranty. Always lift the freeze dryer from the base.

# GENERAL INFORMATION

## MAJOR COMPONENTS

### Harvest Right Freeze Dryer

**Power Switch:** Located on the back of the freeze dryer (“0” is off, “1” is on).

**Vacuum Chamber:** This circular chamber includes a shelving unit for the trays. The orange heating pads on the shelving unit should face down.

**Trays:** These hold the material to be freeze dried. Do not overload trays or batch times will be extra long.

**Power and Display:** The freeze dryer is powered by plugging the power cord into the back of the freeze dryer (one receptacle is for the power cord and one is for powering the vacuum pump) and a functioning 110 volt power outlet. A dedicated 20 amp circuit is required for large freeze dryers.

**Vacuum Pump:** Connect the vacuum hose to the connection on the side of the freeze dryer and to the appropriate fitting on the vacuum pump. The vacuum hose should be tight. Be sure to hand tighten both ends of the vacuum hose to properly connect the freeze dryer to the vacuum pump. Plug the vacuum pump power cord into the receptacle on the back panel of the freeze dryer. Make sure to add the right amount of oil to the vacuum pump as specified in the manufacturer’s instructions (See image on Page 5, Figure 1). Make sure the vacuum pump “on/off” switch is set to the “ON” position (“0” is off, “1” is on). It will not receive power until the freeze dryer completes the circuit at the appropriate time in the freeze drying process.

**Oil Demister:** The black cylinder attached to the top of the vacuum pump.

**Drain Line:** This is a clear tube, located on the side, toward the bottom-back of the freeze dryer. This tube should be un-coiled and the open end placed in a drain or a 5-gallon bucket (or similar container) to collect the water removed during freeze drying (collects as ice on the sides of the vacuum chamber). Don’t open the drain valve with the open end of the clear hose in water or the water will be sucked into the freeze dryer.

Before you start a freeze drying cycle make sure the valve on the drain tube is closed. The small handle on the valve should be perpendicular to the tube (See Figure 3, page 6).

# IMPORTANT SAFEGUARDS

## SAFETY INFORMATION

Read all instructions carefully before using your Harvest Right Freeze Dryer. Following these instructions will help prevent injuries, damage to the freeze dryer, and will ensure that you have the best possible experience with your freeze dryer. Save these instructions.

When using this appliance always exercise basic safety precautions, including the following:

- Use this product only for its intended purpose as instructed in this Owner's Manual.

- ⚠ **WARNING** Do not use an extension cord when plugging your freeze dryer into your power source. Most extension cords cannot handle a sufficient draw of power and may melt or deform causing a fire or other damage.
- Do not use surge protectors or plug your freeze dryer into a GFI outlet. These sources are very sensitive and may cause your freeze dryer to unnecessarily trip the power breaker.
- Do not allow children to climb, stand on the freeze dryer, or hang on the door or shelves. They could damage the freeze dryer and injure themselves.
- After your freeze dryer is in operation, do not touch the cold surfaces during the freezing cycle, particularly when hands are damp or wet. Skin may adhere to these extremely cold surfaces.
- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of the freeze dryer.
- Keep fingers out of "pinch point areas". Clearances between the doors and closing mechanism are necessarily small. Be careful closing doors when children are in the area.
- Unplug your freeze dryer before cleaning or making repairs. We strongly advise that service be done by a qualified individual.
- Refrigerants: All refrigeration products contain refrigerants, which under federal law must be removed prior to product disposal. If you choose to dispose of an old refrigeration product, check with the company handling the disposal about what to do.
- This appliance is not intended for use by small children or infirm persons without capable, adult supervision. Children should be supervised when using the appliance.

- Do not use a wet or damp cloth when cleaning the plug at the end of the power cord. Remove any dust or foreign matter from the power plug pins. A dirty power plug can increase the risk of fire.
- Do not block vent air holes. If the air holes are blocked, the freeze dryer could overheat. Keep vents clean.
- Never unplug your freeze dryer by pulling on the power cord. Always grip the power plug firmly and pull straight out from the outlet. Pulling on the power cord could cause a fire and/or electric shock. A damaged power cord must be replaced by the manufacturer, a certified service agent or qualified certified service personnel.
- Use caution when putting your hands under the appliance. Any sharp edges may cause personal injury.
- Do not insert the power plug with wet hands. It may cause electric shock. In general, power consumption will average between 9-11 amps of power and spike near 16 amps. Usage of a dedicated 20 amp circuit will prevent power outages and allow for proper freeze drying.
- Do not defrost your freeze dryer with a blow dryer or other heating device. There is a thermal cutoff that protects the machine and the material inside the chamber from overheating. If the thermal cutoff gets too hot, it will eliminate all power to your shelf heaters and will need to be replaced with appropriate parts.

### **NEVER OPERATE THE FREEZE DRYER IF IT APPEARS DAMAGED**

If it is dropped or damaged in any way, call Harvest Right Customer Support immediately at 1.800.865.5584 for examination, repair, electrical or mechanical adjustment, or possible replacement of parts.

### **BE CAREFUL ABOUT WHAT YOU PUT IN YOUR FREEZE DRYER**

The freeze dryer is designed to freeze dry materials or products that contain water. Freeze drying other materials may void the warranty and could damage the freeze dryer.

### **VACUUM PUMP RUNS HOT**

Use caution when running your freeze dryer as the external vacuum pump can reach 160°F during operation. Keep your vacuum pump out of the reach of children as it may cause injury if touched. Your vacuum pump is built to run hot. Use care and caution in order to prevent injury.

### **RECOMMENDED OPERATING TEMPERATURES**

Your Harvest Right Freeze Dryer is designed to work in a wide variety of environmental temperatures, but extreme heat and cold will affect performance. The recommended temperature range for operation is 35-90°F. The most efficient temperature range is between 45-75°F. Although safe, operating your freeze dryer

in temperatures above 90°F will increase batch times and may have an adverse effect on the condensing unit (freezer). As the temperature rises where your freeze dryer operates, so does the length of time it takes to finish. This happens because with hotter operating temperatures it is harder to reach the extreme cold required for freeze drying. When running your freeze dryer in temperatures higher than 90°F, place a small fan in a location where it can blow air on the vacuum pump. This will help the pump run more efficiently and may increase the life of the vacuum pump.

For example: a batch that normally takes 24 hours to finish in a 75°F environment could take over 40 hours to complete in hot temperatures.

# FREEZE DRYER ASSEMBLY

## ASSEMBLY INSTRUCTIONS

*Wait 24 hours before running your freeze dryer in order to facilitate proper settling of the refrigerant within the condensing unit.*

1. Once unpacked, place the freeze dryer on a level, stable surface. The ideal location for operating your freeze dryer is a cool, dry, clean location. Dirty air will clog the cooling fins in the condensing coil and reduce the life and efficiency of the refrigeration system. Ensure that the freeze dryer side vents are unobstructed to allow proper air flow during use.
2. Check rubber door gasket to make sure it is clean.
3. Make sure the inside of acrylic door is clean. Use only dry cotton cloth and warm water, no cleaners.
4. Put oil in your vacuum pump by removing the red cap. (If you have one of our bright green Premier oil pumps, you need to unscrew the black oil demister on top of the pump). Fill your vacuum pump to the center of the sight glass and replace the cap (See Figure 1).
5. Connect the hose to the freeze dryer (See Figure 2) and to the vacuum pump and tighten. Hand tightening is generally adequate, but you may **gently** use pliers or vice grips, as required. Do not over-tighten. Do not add any additional Teflon tape, or any type of adhesive, when installing the vacuum hose. Doing this usually creates a vacuum leak because it interferes with the O-ring in the hose. Instructions for connecting the oil-free pump are on page 17.



FIGURE 1



FIGURE 2

6. Connect the freeze dryer power cord to the receptacle on the rear panel of the freeze dryer and to a 110 outlet. A dedicated 20 amp circuit is required for large freeze dryers.
7. Connect the vacuum pump power cord to the receptacle on the rear panel of the freeze dryer.
8. Make sure the power switch on the vacuum pump is in the “ON” position. (“O” is off, “I” is on). The power button is located on the back of the oil vacuum pump.
9. Insert the black insulator door pad into the door opening, past the rubber gasket, to plug the gap between the shelving unit and the back edge of the gasket. Make sure your shelving unit is pulled forward close to the rubber door gasket so the insulator door pad will snugly fit between the door and the shelf. Do not allow the door pad to get caught between the door and the rubber gasket.
10. Secure the door latch to create a good seal. The door latch is a two-staged handle. Stage 1 latches the door and stage 2 compresses the door to the rubber gasket. Turn the handle as far to the right as possible. Do not apply too much force. Don’t break the door latch.
11. Make sure to close the drain valve on the freeze dryer, located on the side, toward the bottom-back of your freeze dryer. When in the closed position, the small handle on the valve should be perpendicular to the direction of the drain tube (See Figure 3). If the drain valve is not closed, there will be a vacuum leak which could damage your vacuum pump and void the vacuum pump warranty. Be sure to place the open end in a 5-gallon bucket, drain, or similar container, to collect the water that is removed during the freeze drying defrost process. Be sure to keep the hose out of the water, as it will suck water into the chamber.

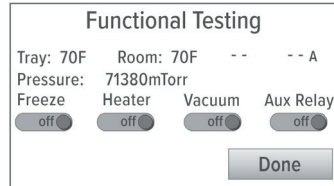


FIGURE 3

12. Ensure that the acrylic door makes contact with the rubber gasket by examining the door in the fully closed position. You will see a thin line in the middle of the gasket (that goes partially around the gasket) as it presses up against the door. When the pump turns on, make sure the door fully seals against the gasket.
13. As described in previous steps, it is your responsibility to make sure the door is closed properly, the drain valve is closed, and the hose connecting the vacuum pump to the freeze dryer is connected. The successful functioning of the vacuum pump depends on these steps being performed properly.
14. Turn on the freeze dryer by pressing the switch to the “ON” position (“O” is off, “I” is on). The On/Off switch is located on the back of the freeze dryer. Next, in order to perform a quick test and ensure that your freeze dryer is set up properly, complete the following steps. To accomplish this task, your freeze dryer chamber must be free of any damp or wet material such as water or condensation. It needs to be completely dry.



15. Press the circle leaf logo in the upper left corner. This will take you to a “Functional Testing” screen. Toggle “on” the “Freeze” switch by pressing the “off/on” button icon. You should hear the refrigeration condenser turn on. Close the door and the drain valve. Let it freeze for 30 minutes or more. Then toggle the Vacuum to “on” by pressing the “on/off” button icon. You should hear the vacuum pump turn on. Within 20-30 minutes the Pressure reading will decrease until it is below 500 mTorr. When this occurs, this test is successful. Press “DONE” to exit this screen. (Pressing “DONE” will automatically toggle the Freeze and the Vacuum to “off”.)



16. You can now open the drain valve, this will release the pressure and allow the door to be opened. If 500 mTorr or lower is not reached, check for air leaks and repeat the test.
1. Door must be properly closed.
  2. Hose connecting the vacuum pump to the freeze dryer should be securely tightened on both ends.
  3. Drain valve must be closed.
- If you are unable to successfully complete this test because the vacuum pressure won't go below 500 mTorr, please call Customer Support: 800-865-5584.

17. You are now ready to start your first batch.

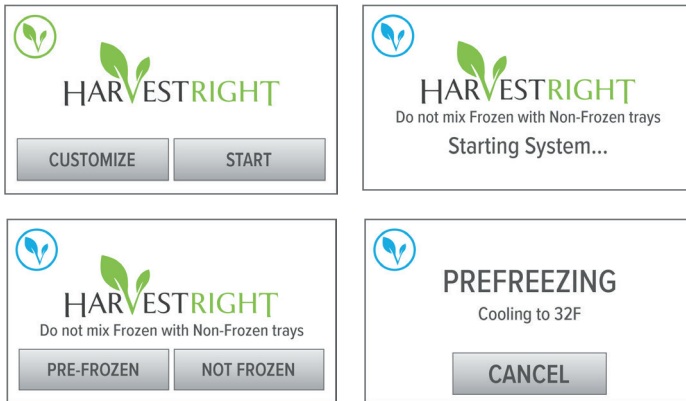
### **IMPORTANT INFORMATION ABOUT YOUR FIRST BATCH:**

Throughout the freeze drying process, the system will monitor the cooling, vacuum, and heating functions. If it detects a problem, it will provide information to help you resolve the issue. While waiting for you to respond to the error message, the system will attempt to resolve the issue itself. If it is successful, it will delete the error message and continue processing the batch.

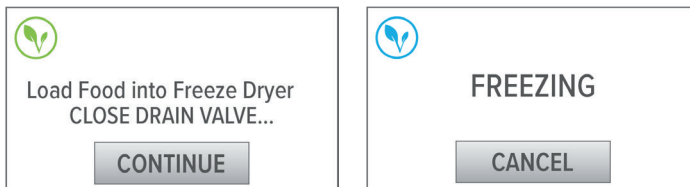
New freeze dryers need to have a one batch burn in period. That means, you should fill the freeze dryer with moist bread slices and freeze dry it. After the bread is finished, test it for dryness and throw it away. This way you can make sure your freeze dryer is working properly and it will help remove any manufacturing “new car” type smell.

18. Then prepare the material that you want to freeze dry and place it on the trays. It should only be one layer and should not be higher the top of the trays.
19. From the home screen, press “START”. You will see a screen that says “Starting System”. At this time, a few diagnostic tests are running. Please be patient. After a few seconds, you will see a screen with “PRE-FROZEN” and

“NOT FROZEN”. Material that is pre-frozen should be placed in a cold vacuum chamber to prevent the product from defrosting in a warm chamber. To accomplish this, select the “PRE-FROZEN” cycle. The chamber of the freeze dryer will then cool to 32°F. This “pre-cooling” process takes about 30 minutes; but will vary.



**20.** Once cooled, the screen will prompt you to load the trays into the freeze dryer and close the drain valve (see Figure 3, page 6). Place the trays in the shelving unit inside the freeze dryer; insert the insulator pad; close the acrylic door and turn the door latch clockwise as far as it will go, compressing the door against the rubber gasket. Visually check to make sure the door is sealed properly to the gasket. If the door is not latched tight, there will be a vacuum leak. Press “CONTINUE.” The unit will continue “FREEZING”.

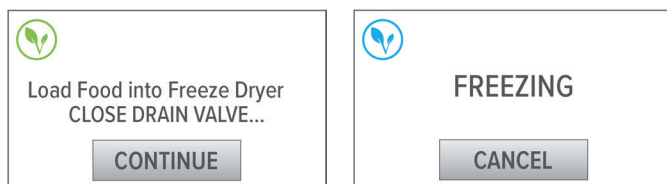


If your material is not pre-frozen, after pressing “START”, you will see a screen that says “Starting System”. After a few seconds, you will see a screen with “PRE-FROZEN” and “NOT FROZEN”, press “NOT FROZEN”.

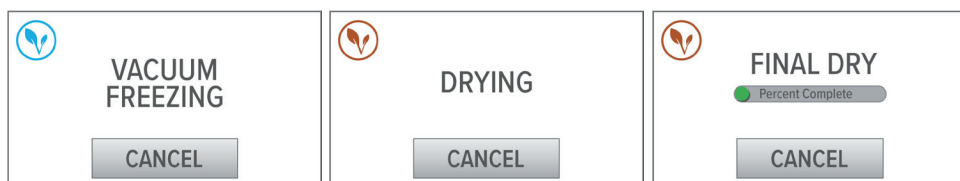


**21.** You will then be prompted to load the trays into the unit and close the drain valve (see Figure 3, page 6). Place trays in the shelving unit inside the freeze dryer; insert insulator pad; close the acrylic door and turn the door latch clockwise as far as it will go, compressing the door against the rubber gasket.

Visually check to make sure the door is sealed properly to the gasket. If the door is not latched tight, there will be a vacuum leak. Press “CONTINUE”. The unit will start “Freezing”.

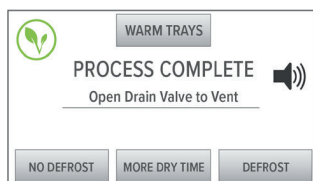


- 22. From then on, everything is automatic. Unless you get an error screen during the freeze drying process, it is safe to assume that the freeze dryer is working properly and operating as normal.
- 23. The first process is Freezing. The next processes are VACUUM FREEZING, DRYING, and FINAL DRY.
- 24. The final dry process is also automatic. The times may vary considerably but should be between 2-15 hours.



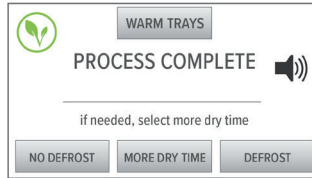
- 25. The freeze dryer will beep to notify you that the process is complete. You will then be prompted to “Open drain valve to vent”. Before doing so, pull the drain hose out of the bucket and/ or check to ensure bucket is completely empty of any water. If you open the drain valve while the hose is in water, it will suck the water into the chamber and ruin the material that was freeze dried.

Opening the drain valve vents the vacuum and allows air to enter the chamber. Then the door may be opened, the insulator door pad removed, and the trays removed.



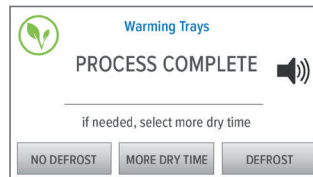
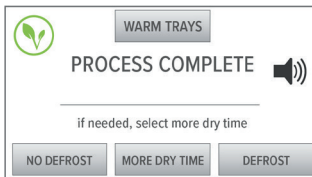
- 26. Check the material thoroughly to make sure it is completely dry. (If just a few pieces are not dry, when you package the food, they will spoil the whole batch; everything in the bag will turn soft.)

27. If you find that there is still moisture in the material, simply press “MORE DRY TIME” and allow the freeze dryer to finish drying. Otherwise, you can remove the trays, ensure drain hose is properly placed for draining, close the door, and press “DEFROST”.



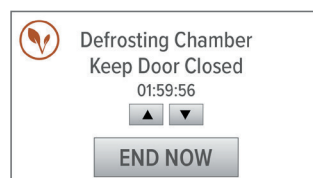
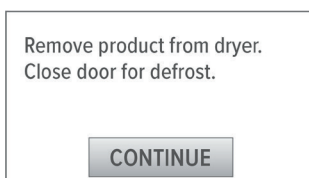
28. Immediately package your freeze dried material so that it doesn't rehydrate from the natural humidity in the air. When packaging food, you can use cans, Mylar bags, and glass jars. Always use an appropriate oxygen absorber.
29. Make sure all of the ice and water are removed from the vacuum chamber before starting a new batch.

**WARM TRAYS:** The freeze-drying process includes warming the trays. Trays will be warm immediately after the batch ends. If you are unable to remove trays immediately after a batch ends, the unit will cool and freeze the material that was freeze dried. This safely preserves your food until you are ready to remove it. The extremely cold trays can be uncomfortable to remove with bare hands. To avoid this, you may use gloves, hot pads, or simply warm the trays. Push the “WARM TRAYS” option on the screen and wait 5-10 minutes before unloading.



**NO DEFROST** button: Allows ambient air to melt the ice over time. You may choose to leave the door open during this time.

**DEFROST** button: Turns on the heaters in the shelving unit and accelerates melting the ice.



## USING THE “CUSTOMIZE” SETTINGS

### To adjust dry temperature settings:

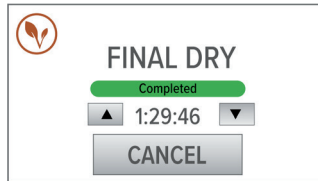
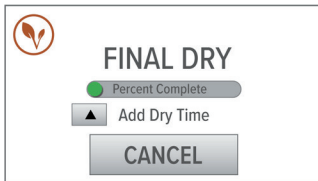
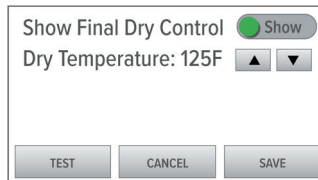
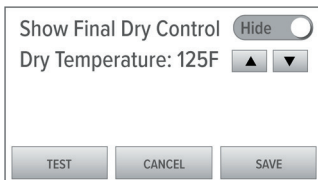
Press “CUSTOMIZE” on the touch screen. This screen allows you to adjust the temperature of the warming elements inside your freeze dryer. The factory setting is 125°F. Most items can be dried at this temperature; however, you can increase or decrease the temperature in 5° increments by using the arrow buttons. Press “SAVE” to keep your setting and be returned to the home screen.



### Show Final Dry Control:

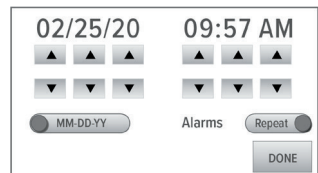
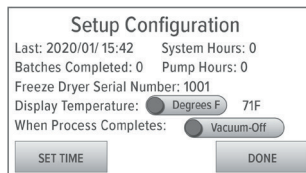
If you select ‘Show’ on Show Final Dry Control, it makes it possible for you to add time to the FINAL DRY process. (Arrows will appear to add or subtract time from FINAL DRY.)

The freeze dryer is intelligent. It will properly dry the material with little to no user interaction. However, some users like to add additional time to FINAL DRY in order to coordinate a finish time that works with their schedule. This gives you the option to do that. When the screen shows the progress status bar on FINAL DRY as “Completed”, the system believes your food is dry and ready to be taken out.



### To set the date and time:

Power on your freeze dryer and press the ‘HarvestRight’ logo. This will take you to the “Setup Configuration” screen. From here you can use the arrows to set the date and/or time. Press “DONE” once set.



# A CLOSED SYSTEM

## WHAT IS A CLOSED SYSTEM

In order to freeze dry items, your machine will use a vacuum pump that removes the air and creates a vacuum environment. In order to achieve adequate vacuum pressure, it is VERY IMPORTANT to ensure that all valves are closed tightly. If there is a leak somewhere in the system, the freeze drying process will not occur.

**! WARNING:** You may think there is not an air leak in your machine because the door will not open (a sign that you are pulling a vacuum). However, it is possible to achieve less than suitable vacuum pressure, yet have enough vacuum to hold the door closed. Within 10-15 minutes you should see that the pressure noted on the screen has decreased significantly. Drying can occur when the vacuum pressure descends to 500 mTorr (also displayed). If after 30 minutes, 500 mTorr has not been reached, checking for leaks is a logical next step. Make sure the drain valve is closed and the door gasket is sealing properly (clean gasket with warm water, let dry, and reinstall—do not wipe dry because lint may prevent a good seal).

While every precaution has been made to ensure that there are no leak points in your vacuum system, a situation could arise where there is a leak point. It is important to check the following possible leak spots in order to achieve optimal freeze drying.

## POSSIBLE LEAK POINTS ON THE VACUUM PUMP

- Vacuum pump hose connections
- Vacuum pump oil is contaminated
- Vacuum pump oil level is too low
- Gaskets in the vacuum hose are damaged

For additional information about your vacuum pump, review the instruction manual that came with your vacuum pump.

## POSSIBLE LEAK POINTS ON THE FREEZE DRYER

- Drain valve is open
- Vacuum pump hose not connected properly or tightly
- Door not properly shut (2 stages of closing, latch and compression against gasket)
- Door gasket not clean inside and out
- Door needs adjustment

# CARE AND CLEANING

## OIL VACUUM PUMP MAINTENANCE

We recommend you change and filter your oil every 4-5 batches (or sooner if the oil is cloudy) in order to ensure high vacuum performance and to increase the life of your vacuum pump.

For optimum performance of your vacuum pump do not bypass the the freezing cycle of your freeze dryer. For shorter freezing cycles you may pre-freeze the products until they are frozen solid before placing them in the freeze dryer but still do not bypass the freezing cycle. The unit is intelligent. It will only freeze to the temperature it needs in order to adequately dry a batch. Freeze drying products that have even a little non-solid moisture in them will reduce the performance and the life of the vacuum pump

DO NOT overload the trays in the freeze dryer. Too much product will produce too much evaporated moisture which may exceed the ice capacity inside the vacuum chamber and cause the vacuum pump to suck in the excess moisture. This may affect the performance and shorten the life of the vacuum pump.

### Oil Change

1. Turn off vacuum pump.
2. Locate the drain valve for the oil reservoir located at the bottom, front of the pump. (See Figure 4). Make sure it extends past the edge of the table or cart.
3. Place your oil filter beneath the drain valve to collect the oil.
4. Open the valve.
5. Drain the oil from the vacuum pump into your filter.
6. Elevate the back of the pump and drain the remaining oil from the drain valve. Once all the oil is drained, close the drain valve.
7. Using new or filtered oil, refill the oil reservoir to the appropriate level. (See image on page 5, Figure 1).
8. Turn the vacuum pump switch back on.



FIGURE 4

### Oil Filtration

1. Approximately every 4-5 batches (preferably when the oil is still warm), place the oil filter below the oil reservoir drain valve.

2. Open the oil reservoir drain valve and allow oil to drain into your oil filter. Assure all of the oil comes out by lifting the rear of the vacuum pump slightly.
3. Wait for the oil to filter through your filtration system (this could take a couple of hours).
4. Remove the water from the oil by pouring off the oil and discarding the water. Do not pour the water back into the vacuum pump.
5. Pour the filtered (or new) oil into your vacuum pump.
6. Start your freeze dryer.

### **How do I know that my filtered oil is clean for use?**

The best indications for cleanliness are as follows:

- Oil has clarity (color may be yellow or amber and still be clear)
- Your vacuum pump achieves a pressure (mTorr) suitable for freeze drying

### **How do I know when I need to replace my oil filter?**

- Oil won't drain through filter (happens over time as debris builds up)
- Oil isn't cleaning well

### **How do I replace my oil filter?**

Replace the paper filter (coffee filter) and batting inside the filter, or, purchase a new filter from Harvest Right. The filter material inside the oil filter can be replaced after every 20 to 30 batches (or sooner if the filter looks really dirty).

The bottom of the filter material is a common coffee filter that may be purchased in any grocery store. The material above the coffee filter is quilt batting and can be purchased in most hobby stores and department stores (Walmart, Target, etc.). The quilt batting should be packed tightly into the filter jar.

## **CLEANING THE INTERIOR AND EXTERIOR OF YOUR FREEZE DRYER**

Interior: First unplug your freeze dryer from the wall. Clean the vacuum chamber and shelves with a mild detergent and then wipe dry with a soft cloth. Remove shelves for a thorough cleaning. In order to remove the shelves, you will need to take off the black rubber gasket that the door seals against. Gently pull out the shelf. Then disconnect the cable. Once the red tab is unlocked, press the black tab down and pull the two pieces apart. When finished cleaning, ensure that the shelves and chamber are dry. Next, reconnect the power line to the shelving unit.

It is important to clean the chamber and the shelf on a regular basis. It is necessary to do this by hand. You can put the shelf in a large sink and wash it with dish soap, brushes and rags; however, a dishwasher can get so hot that it will melt the glue and cause the heating pads to loosen and fall off.



Using a dishwasher to wash shelves will void the freeze dryer warranty.

Exterior: The outer door, handle, and cabinet surfaces should be cleaned with warm water and a mild detergent and then wiped dry with a soft cloth.

## CLEANING CAUTIONS

Do not use stiff bristled brushes or abrasive cloths/pads to clean the freeze dryer, interior or exterior, as this will dull or scratch the surface.

Do not use Benzene, Thinner, or Clorox for cleaning. They may damage the surface of the appliance and may even cause fires.

## MOVING OR LONG ABSENCES

If you have a long vacation planned, empty the freeze dryer and keep it turned off. Wipe any moisture from the inside and leave the chamber door open to keep odor and mold from developing. Drain the pump and fill with fresh oil.

# TROUBLESHOOTING

## FREQUENTLY ASKED QUESTIONS

**Why has the freeze dryer been running for over 46 hours and the process is not complete?**

There are a number of factors that can contribute to longer cycle times. Some of which may be a combination of the following:

1. Some items are more challenging to freeze dry than others. Because of their cellular structure, sugar, and moisture content, oranges, pineapple, strawberries, blueberries, and other foods/meals with high amounts of sugary liquid may take longer to freeze dry. The freeze dryer is measuring the removal and moisture and knows when the process is complete.
2. There is so much water in the material being dried that the condensed ice on walls of chamber has begun to encroach on the trays. While rare, if this occurs, the freeze dryer cannot recognize that the process is complete because it will sublimate the ice that is coming onto the trays. If this happens, remove the trays and put them in the freezer, defrost the ice in the freeze dryer, put the trays back in the freeze dryer, and allow it to finish the process.
3. The vacuum pump oil should be changed and filtered every 4-5 batches (sooner if the oil is cloudy). As the oil in your pump gets older, the cycle time for food may increase.
4. The freeze dryer is working properly if during the drying portion of the freeze dry cycle, the vacuum is reading between 100-900 mTorr.

**After my freeze dry cycle finished and I released the drain valve, water came rushing into my vacuum chamber. What happened?**

Make sure to empty the container that your freeze dryer drains into. If the drain hose is sitting in water when the vacuum is released by opening the drain valve, water will suck through the drain hose and into the freeze dryer vacuum chamber like a giant straw.

### **We had oil spray out of our vacuum pump, what is happening?**

1. It is likely that air is leaking into your freeze dryer chamber (or the vacuum pump is over-filled). This can happen if the drain valve is accidentally left open, the door isn't clean/aligned properly, the door seal isn't clean, or the vacuum hose is not completely tight on both ends. It can also occur if all of the caps/fittings on the pump aren't tight. These are the most common reasons for an oil spray.
2. The oil level is too high. It may have been over-filled or because of water vapor coming through the vacuum hose and condensing as liquid into the oil (it is important to drain this water out of your vacuum pump and discard it so that you can preserve the life of your oil as well as prevent an oil spray).

### **When the process is complete, sometimes the shelves are warm and sometimes they are cold. Why?**

The last step of the freeze dry process is Final Dry. When Final Dry is finished, the shelf heaters and the vacuum pump turn off. The refrigeration unit will continue freezing until you stop the process or press "Defrost".

If you remove the food/material immediately after the process finishes, the trays will be warm. If you wait for an hour or longer, they will be very cold. Hot pads or gloves should be worn to remove these cold trays.

Test that the product is completely dry by breaking the thickest piece to check for ice. If it is cold or wet in the middle, there may be a bit of moisture remaining. If this is the case, add "More Dry Time".

### **I packaged my food and it was very dry when it came out, but now it is not dry. Why?**

1. Properly packaging the freeze-dried material is vital. It is important to promptly package your freeze-dried product. When packaging food, you can use Mylar bags (in order to seal thoroughly, we recommend you seal the bags twice to be safe), #10 cans, or mason jars. Always use the appropriate oxygen absorber. To ensure long shelf life, store in a cool, dry location.
2. Occasionally, all of the product will be perfectly freeze dried with the exception of a couple of pieces. This can happen if you cut a few pieces of your product much thicker than the rest. If packaged, one wet piece will rehydrate and ruin the whole batch. When a batch is complete, it is a good idea to break the thickest piece on your trays in half and test it in order to be sure that the product has completed the drying process. If you find that the

material is not completely dry, simply put it back in the freeze dryer and press “More Dry Time” to get right back into the vacuum pump/drying portion of the freeze dry cycle. The freeze dryer will then finish the pieces that weren’t quite complete.

### **PUMP ISN'T TURNING ON DURING THE DRY CYCLE:**

Make sure your pump is plugged into the back of the freeze dryer and is switched to the “ON” position. The freeze dryer controls the pump turning on and off, but it cannot do so unless the pump is switched on (switch is located on the back of the pump) and plugged into the freeze dryer.

## **OIL-FREE PUMP**

### **OIL-FREE VACUUM PUMP SET UP**

1. Connect the vacuum hose to the vacuum pump and to the freeze dryer, and tighten (See Figure 5). Do not add any additional Teflon tape, or any type of adhesive, when installing the vacuum hose. Doing this almost always creates a vacuum leak.
2. Plug the vacuum pump power cord into the receptacle on the back of the freeze dryer.
3. Make sure the power switch on the vacuum pump is switched on.

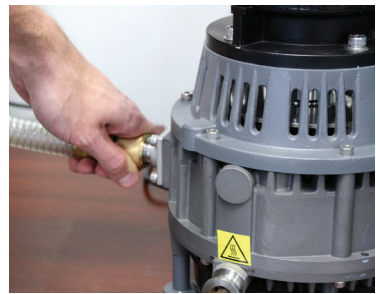


FIGURE 5

For optimum performance of your vacuum pump, do not bypass the the freezing cycle of your freeze dryer. For shorter freezing cycles, you may pre-freeze the products until they are frozen solid before placing them in the freeze dryer but still do not bypass the freezing cycle. Freeze drying products that have even a little non-solid moisture in them will reduce the performance and the life of the vacuum pump.

DO NOT overload the trays in the freeze dryer. Too much product will produce too much evaporated moisture which may exceed the ice capacity inside the vacuum chamber and cause the vacuum pump to suck in the excess moisture. This may affect the performance and shorten the life of the vacuum pump.

## **LOADING AND PACKAGING FOOD**

### **GUIDELINES FOR LOADING THE TRAYS OF YOUR FREEZE DRYER.**

- Fruits such as apples, bananas, peaches, pineapple, strawberries, and raspberries should be placed in one layer across the trays. The fruit slices may

be placed close together, but should only be one layer deep.

- Fruit should be sliced and the skin side (if it is kept on) should be placed down on the tray with the cut side up. Pieces may be thickly sliced; however, if they are thick, they will take longer to dry. For instance, some people just cut strawberries and apricots in half and place them skin side down on the trays.
- Liquids are a little tricky to get in the freeze dryer. When freeze drying runny liquids such as raw scrambled eggs, milk, soup and so on, it is best to place the empty trays in the freeze dryer and then while partly pulled out, pour the liquid onto the trays. Once filled, gently slide the trays into the freeze dryer.
- Again, the thicker something is, the longer it will take to dry.
- Things like blueberries and grapes need to be cut so that the water can escape through the skin.
- Casseroles and pastas (such as beef stroganoff, mac and cheese) may be spread thickly across the trays. In general, foods should not be higher than the sides of the tray.

## PACKAGING FREEZE-DRIED MATERIAL: INSTRUCTIONS

- Fill the Mylar bags
- Add an oxygen absorber
- Seal immediately on the highest setting (8) of your Harvest Right sealer

### **The following are things to consider:**

- When you open a pouch of oxygen absorbers, they need to be used immediately. Therefore, you should not open your oxygen absorbers until your freeze-dried material is in the bags and is ready to be sealed.
- Immediately reseal your bag of oxygen absorbers. And, immediately seal your bags that have the absorbers in them. The setting for sealing the bags of oxygen absorbers is less than for the Mylar bags. To seal bags of oxygen absorbers use setting 5 on your Harvest Right sealer.
- A chemical reaction takes place when the oxygen absorber is in the open air. During this process, the oxygen absorber package will get hot. This is normal. However, if you leave the oxygen absorbers in the open air too long they will get hot before you seal them in Mylar bags and they may not work.
- When you are sealing your bags, try to press all the air out of them before you seal them.
- There should be no folds in the seal of your bags. If you seal a fold, it likely will allow air in and spoil the food in the package.

# WARRANTY INFORMATION

## 3-YEAR LIMITED WARRANTY

All sales of Harvest Right Freeze Dryers after February 1, 2019, are covered by this warranty.

### **Full One-Year Warranty (only includes the U.S. continental 48 states)**

Warranty Period: For one year from original ship date.

Exclusion: Oil vacuum pump has 6 months warranty.

Harvest Right will be responsible for: Repair or, at our option, replace any part of this freeze dryer which proves to be defective in workmanship or material.

Consumer will be responsible for: Costs of service calls. Consumer may also be responsible for replacement parts caused by consumer misuse and neglect of product. See Normal Responsibilities of the Consumer below.

### **Limited 3-Year Warranty**

Warranty Period: For the second and third year from the original ship date.

Harvest Right will be responsible for: Repair or, at our option, replace any part of the sealed refrigeration system (compressor, condenser, evaporator, tubing) which fails because of defective workmanship or material.

Consumer will be responsible for: Diagnostic charges for determining defects, and any costs for transportation and delivery of the appliance required because of service.

### **Limited Warranty (Alaska, Hawaii, Canada and Puerto Rico)**

Time periods listed above.

Exclusion: Oil vacuum pump has 6 months warranty.

Harvest Right will be responsible for: All provisions of this limited warranty are the same as listed above except that service will be provided by the customer or a qualified local service provider that is approved by Harvest Right.

Consumer will be responsible for: Cost of transportation of the product to the shop or the travel cost of the technician to the consumer's location.

### **Limited International Warranty (includes all countries not described above)**

Warranty Period: For one year from original ship date.

Exclusion: Oil vacuum pump has 6 months warranty.

Harvest Right will provide: Support through telephone and e-mail only. At our option, all parts deemed necessary will be provided by Harvest Right.

Consumer will be responsible for: Costs of local service and cost of parts for consumer misuse and neglect of product. Costs for transportation and delivery of all parts, for any reason, from Harvest Right to Consumer.

### **Normal Responsibilities of the Consumer:**

This warranty applies only to freeze dryers used in clean environments and when operated in accordance with Harvest Right instructions. The consumer is responsible for the following items:

1. Proper use of the appliance in accordance with the instructions provided with the product.
2. Proper installation in accordance with the instructions provided with the appliance and in accordance with all local electrical codes.
3. Proper connection to a grounded power supply of sufficient voltage, replacement of blown fuses, repair of loose connections or defects in house wiring.
4. The appliance must be operated in a clean open area that has plenty of airflow and is not above 95°F (35°C) or below 35°F (2°C).
5. Damages to the appliance during or after installation. Do not lift the unit by holding onto the door.
6. Properly maintaining and operating the freeze dryer and vacuum pump.
7. Ensuring freeze-dried food, or other freeze-dried material, are completely dry prior to packaging.
8. Ensuring proper, durable containers are used. Containers, once sealed, must not allow water or air to penetrate them.
9. Ensuring sufficient/proper, fresh oxygen absorbers are included in the sealed container with the freeze dried material. They must not have expired or been exposed to the air prematurely for too long of a time.

*Harvest Right accepts no responsibility for the quality of freeze-dried food or freeze-dried materials; nor does it accept responsibility for the packaging of the food or other freeze-dried material.*

### **Exclusions:**

1. Any modifications or add-on after-market accessories will void the warranty in its entirety.
2. Consequential or incidental damages such as, but not limited to, property damage and incidental expenses resulting from any breach of this written or any implied warranty.
3. Service calls which do not involve malfunction or defects in workmanship or material.
4. Damages caused by services performed by persons other than authorized by Harvest Right.
5. Parts other than Harvest Right repair parts or parts obtained from suppliers other than Harvest Right personnel.

6. External causes such as abuse, misuse, inadequate power supply, or acts of God.
7. Products with original serial numbers that have been removed or altered and cannot be readily determined.
8. Using an extension cord instead of direct line connection to available power supply.
9. Claims for personal injuries, incidental or consequential damages, or economic loss (profit or revenue), however caused.
10. If you are not the original owner of the freeze dryer, the warranty no longer applies.

**Service:**

Since it is the responsibility of the consumer to establish the warranty period by verifying the original purchase date, keep your delivery slip or purchase receipt or some other appropriate payment record. This written warranty gives you specific legal rights. You may have other rights that vary from state to state. Service under this warranty must be obtained by contacting Harvest Right directly:

Harvest Right  
95 North Foxboro Drive, Ste. 100  
North Salt Lake, UT 84054  
USA  
1-800-865-5584

**Returns**

Within 30 days of ship date, customers may return their freeze dryers for a refund less shipping costs and less a restocking fee of 15%.

## SAFE USE OF FREEZE DRYERS & PUMPS

1. Harvest Right oil-sealed vacuum pumps and oil-free pumps are only to be used with foods and organic materials that are not harmful when swallowed or when vapors coming from those materials are also not harmful when inhaled.
  - a. Harvest Right expressly warns users of its freeze dryers and vacuum pumps to not use them for any purposes other than freeze drying food or other healthy, non toxic materials. Harvest Right accepts no responsibility for such acts whether intentional or not.
  - b. If someone uses the pump for freeze drying anything with harmful chemicals in it, the freeze dryer and vacuum pump warranties are breached and no longer valid. Harvest Right accepts no liability for

these acts and it is understood by both the customer and Harvest Right the customer knowingly performs these acts at the risk of their own health and wellbeing; and that the customer accepts responsibility for all such acts.

2. Harvest Right freeze dryers, in conjunction with their vacuum pumps, must be used in well ventilated rooms. When using an oil pump, vaporization of oil is not expected at ambient temperatures. The oil is not expected to cause inhalation-related disorders under anticipated conditions of use.
3. Harvest Right freeze dryers and vacuum pumps must be operated correctly as described in Harvest Right's instruction documents and user manuals. When in use, drain valves must be closed, doors latched securely (with no obstructions between the doors and the door gaskets), hoses connecting pumps to freeze dryer must be connected properly. The users of the freeze dryers have the responsibility of ensuring that there are no leaks in the system whatsoever.
4. All Harvest Right instructions for operating the freeze dryer are to be explicitly followed by the user/customer. Harvest Right accepts no responsibility for acts that breach its instructions.
  - a. If there are leaks in the system, the freeze dryer(s) will report that there is a vacuum error. Users of Harvest Right freeze dryers understand that they should respond quickly and responsibly to these messages.
5. When draining oil from vacuum pumps that use oil, the user must not tilt the vacuum pump so far forward that oil pours into and/or fills the oil demister/ filter. Doing this can cause some oil to be in the demister that could then cause oil vapor to come out of the filter while operating. It should be noted that the oil demister used on Harvest Right's Premier Oil Pump has a drain in it that allows oil to drain back into the vacuum pump. However, if the white filter inside the oil demister becomes saturated with oil, it is important to wash and clean it with warm soapy water and then allow it to dry before using it again.
6. Freeze dryers should be allowed to run automatically. Those customers who take shortcuts and skip standard cycles such as "Freezing," "Vacuum Freeze," "Drying," and "Final Dry" do so at the peril of damaging their food and freeze dryer equipment. Harvest Right accepts no responsibility for intentional or unintentional acts performed by customers that circumvent Harvest Right's automatic "freeze dry" process(s).
7. Do not stand in puddles of water when using the freeze dryer.
8. Do not allow water to get on electric plugs and receptacles.
9. Do not touch exposed wires or any other components inside the freeze dryer while the unit is plugged into an electrical outlet.
10. Do not sleep in a room or other location where a freeze dryer and vacuum pump are being used.



11. On the back of the freeze dryer there is an electrical outlet for the vacuum pump to connect to. Do not plug anything else into that outlet.
12. Do not run the freeze dryer with the side panels removed. This may be an electrical hazard.
13. Do not add Teflon tape or other materials to hose joints.
14. Do not overfill oil vacuum pumps with oil and be sure to follow oil changing guidelines explicitly.
15. Keep the interior of the vacuum chamber and the shelves clean. Wash with warm soapy water. Do not place the shelf unit in a dishwasher. Wash it and rinse it by hand.
16. It is important to regularly pour a safe cleaning agent down the drain line to keep it clean and prevent mold and bacteria from growing inside it.
17. Make sure the drain hose is out of the water bucket before venting the vacuum chamber.
18. Make sure that food to be packaged is completely dry.
19. Food with animal fat may go rancid. Always freeze dry completely. Make sure a good oxygen absorber is in the package and that the Mylar bag is well sealed. Once opened, this food should be refrigerated or used immediately.
20. Harvest Right is not responsible for your use of the freeze dryer. Harvest Right is not responsible for food that has gone “bad” for any reason including lack of dryness, improper food storage techniques and materials.





**1.800.700.5508 HARVESTRIGHT.COM**