HARVESTRIGHT



PHARMA FREEZE DRYER
OWNER'S MANUAL

SOFTWARE VERSION 6

The Essential Guide for Every Pharma Freeze Dryer Owner

HARVESTRIGHT

CONGRATULATIONS!

The Harvest Right Pharma Freeze Dryer is smart; it knows how to perfectly freeze and dry your material. 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.

Please contact Harvest Right with all inquiries, including questions about setup, warranty, or repair. Do not contact the retail location where you purchased your freeze dryer.
801-386-8960

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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
- 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 **801-386-8960.**

> ⚠ **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.

WARNING:

- Electrical shock can cause personal injury or death.
- This device is designed for indoor installation only.
- Do not allow the device to become clogged with dust or other debris. See 'Care and Cleaning', page 24.

GENERAL INFORMATION

MAJOR COMPONENTS

Harvest Right Freeze Dryer

Power Switch: Located on the back of the freeze dryer ("0" is off, "I" 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 (Figure 1, page 5). Make sure the vacuum pump "on/off" switch is set to the "ON" position ("O" is off, "I" 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 pumps that use oil.

Drain Line: This is a clear tube, located on the side, toward the bottom-back of the freeze dryer. This tube should be 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 (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.

- Do not run the freeze dryer when the room temperature exceeds 105º. Doing so will void the warranty. The freeze dryer records ambient room temperature during each batch. If it is found that batches are being run in temperatures that exceed 105º, your warranty will be voided.

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 801-386-8960 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). Do not run the freeze dryer when the room temperature exceeds 105°.

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.

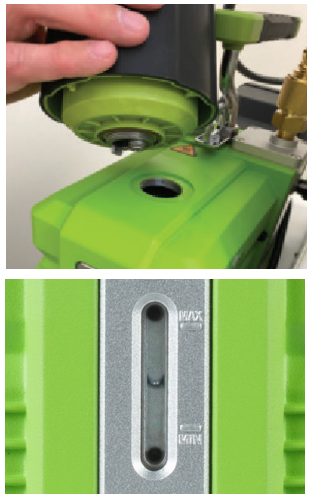


FIGURE 1

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 unscrewing the oil demister on top of the pump. Fill your vacuum pump slightly above the center of the sight glass and replace the cap (Figure 1).
5. Connect the hose to the freeze dryer (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 add any additional Teflon tape, or any type of adhesive, when installing the vacuum hose. Doing this usually creates a vacuum

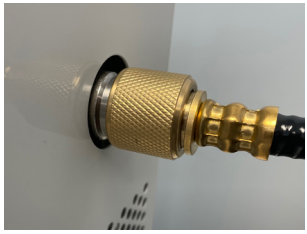
leak because it interferes with the O-ring in the hose. Instructions for connecting the oil-free pump are on page 27.

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. 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.



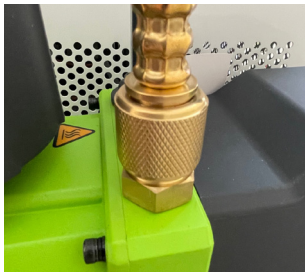


FIGURE 2



FIGURE 3

10. 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 (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.

11. 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.

12. 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.

13. 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 no longer display an 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.

WARRANTY REGISTRATION

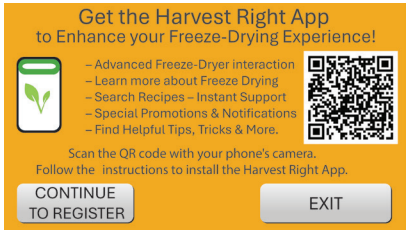
If you have a Harvest Right WiFi Adapter, prior to completing the Registration process, follow the instructions to set up WiFi for your freeze dryer. This will automatically complete the warranty registration and you may skip the following steps in this section.

Power on your freeze dryer. When you do that, the following screen will appear on the unit.



In order to use your freeze dryer, you should first register your warranty. To do this, press REGISTER.

There are two ways to register your warranty. One is through the Harvest Right App, the other is by going to www.HarvestRight.com/warranty. When you follow one of these courses, at the end of the process you will be given an “activation code” that will be used to complete your warranty registration.

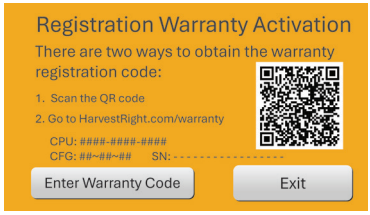


If you don’t want to register your freeze dryer warranty at this time, you can run a batch by pressing the SKIP FOR NOW button. The screen will advance to the first image in the section titled RUNNING YOUR FIRST BATCH. You will only be able to skip the warranty registration for three batches.

1. We strongly encourage you to get the App on your phone or other smart device. This App will greatly enhance your freeze drying experience. Additionally, it will simplify your warranty registration. If you have not yet downloaded the Harvest Right App, using your phone you may scan the QR code on your freeze dryer screen. This will automatically take you to the App store where you can download the Harvest Right App for free. Once it is downloaded and opened, you will be asked to create an account.

   After you have downloaded the App and created an account, you may then click on the button on your freeze dryer that says CONTINUE TO REGISTER. When you select this button, it will display the screen shown in Registration Step 3.

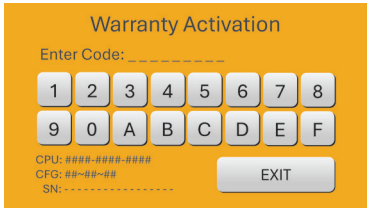
2. If you have downloaded the App, you may continue and scan the QR code shown on your freeze dryer screen. Doing this will open the App and automatically display all the information needed for your warranty. Follow the instructions on the App, then scroll down and press REGISTER. This will give you your warranty activation code.



   Once you have the warranty code, press the ENTER WARRANTY CODE button on your freeze dryer screen.

3. Correctly enter your warranty code on this screen and your registration will be complete.

   Do not press the EXIT button unless you no longer want to activate your warranty.



RUNNING YOUR FIRST BATCH

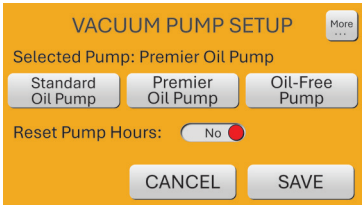
1. This screen provides you with three ways to freeze dry. Harvest Right's patented CANDY mode is on the left, CUSTOM mode is in the center and Harvest Right's patented Automatic mode, START, is on the right.



   For most foods (except candy and a few exotic items), the easiest way to use your freeze dryer is to just press the START button. Selecting this method will automatically freeze dry any food or material.

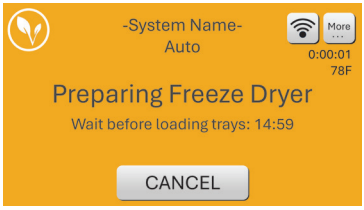
2. On this screen, when you press START the first time, a screen will appear and prompt you to choose the type of vacuum pump you are using. It is most likely that the pump you received with your freeze dryer is the green PREMIER OIL PUMP.

   Once selected, press SAVE. The Preparing Freeze Dryer screen will appear.



3. During the PREPARING FREEZE DRYER process, the freeze dryer will cool the chamber for the amount of time shown on the display.

   This is a good time to prepare your food for loading into the freeze dryer.



   When loading your trays with food, all trays should be completely filled but should not be overloaded above the tops of the trays.

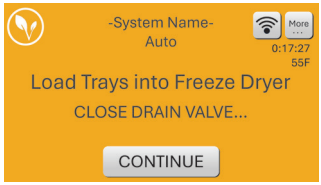


   If you are loading pre-frozen food, we recommend that the food be frozen for 48 hours before loading it into the freeze dryer.

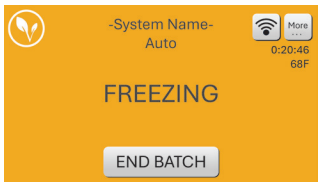
4. When the PREPARING FREEZE DRYER process is complete, the next screen prompts you to load your food in the freeze-dryer and close the drain valve.

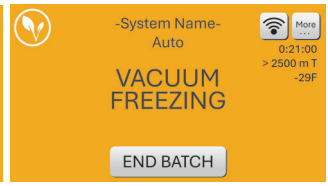
The drain valve is located on the bottom right-hand side of the freeze dryer.

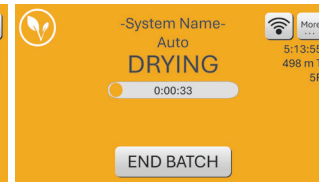
5. Place trays in the shelving unit, close the door, and turn the door latch clockwise as far as it will go, compressing the door against the rubber gasket. Visually check to make sure the door is sealed properly to the gasket.



Now press CONTINUE. The unit will begin freezing the material in the freeze dryer. Pre-frozen food will shorten the freeze time. The rest of the freeze drying process is automated. The system will automatically advance through the following phases:

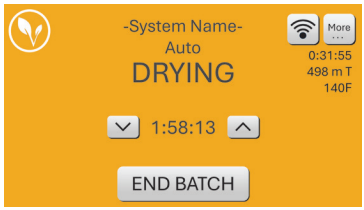






Do not press the END BATCH button unless you want to terminate your batch and start over.

6. During the DRYING process (as shown in the screen above), you will see an orange status bar that displays an approximate amount of drying time completed and yet to be completed. This is just an approximation.



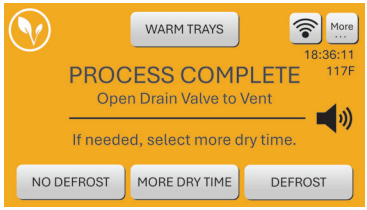
When the DRYING process is nearly complete, the system will begin to countdown extra drying time. The EXTRA DRY TIME of two hours is preset, as shown on this screen. You can increase or decrease extra dry time, as desired.

7. When EXTRA DRY TIME is finished, the PROCESS COMPLETE screen will appear and prompt you to “Open Drain Valve to Vent”. Before doing so, check to make sure the drain hose is not submerged in water. If it is, pull the drain hose out of the drain bucket. 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 so that the door may be opened and the trays removed.

If you are unable to remove trays immediately, the freezing process will continue and will preserve your freeze-dried food until you are ready to remove it.

8. At the end of the batch the trays will remain warm for two to four hours. If you don't take the trays out during this time period they will, again, get extremely cold.



If the trays were not removed immediately after the batch completed, and have cooled again, you can warm up the trays by pressing the WARM TRAYS button. The trays will quickly warm and be easy to handle. More importantly, the food will not collect water from the atmosphere as they will when the trays are extremely cold. Removing warm trays prevents condensation on your food when it is removed from the freeze dryer.

When you remove the trays from the freeze dryer, be sure and check the material thoroughly to make sure it is completely dry. You can do this by breaking a thicker piece in half to see if it is dry. If just a few pieces are not dry, when you package the material it will spoil the whole batch—everything in the bag will turn wet and soft.

9. If you find that there is still moisture in the food, place it back in the freeze dryer and close the door. Press MORE DRY TIME to allow the freeze dryer to finish drying. The screen will prompt you to close the drain valve. After drain valve is closed, press CONTINUE. You can increase or decrease the extra dry time by pressing the up and down arrows.



10. When MORE DRY TIME is finished, the PROCESS COMPLETE screen will again appear.

When the food is dry, be sure to open the drain valve, remove your trays and package your food quickly so that it doesn't rehydrate from the natural humidity in the air. When packaging food, you can use cans, Mylar bags, and

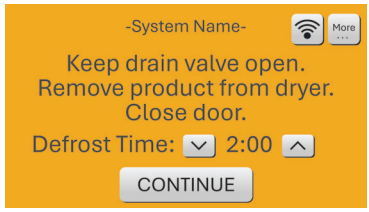
glass jars. Always use an appropriate oxygen absorber and seal the food in an airtight container.

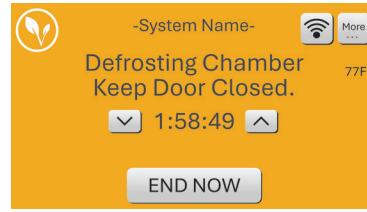
11. Now you should select either “NO DEFROST” or “DEFROST”. It is important to note that the chamber must be completely free of ice and water before another batch is started (except when running in the CANDY mode). If you plan to immediately start another batch, you should use the “DEFROST” button.

    NO DEFROST: When this button is pressed, the freeze-drying process will end (unless you have an oil free pump). Then, the outside ambient air will gradually melt the chamber ice. Be sure and leave the door and the drain valve open.

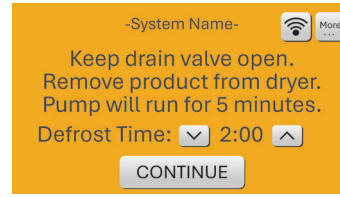
    DEFROST: Turns on the heaters in the shelving unit and accelerates melting the ice. When doing this, the door should be completely closed and latched.

    If you select DEFROST, the following screens will appear:

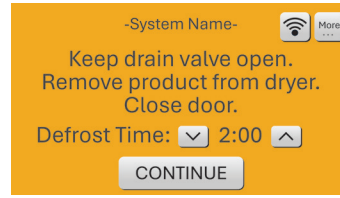




If you have an OIL-FREE PUMP, this screen appears after pressing the DEFROST or NO DEFROST buttons. At this time the chamber will still be cold and covered with ice.

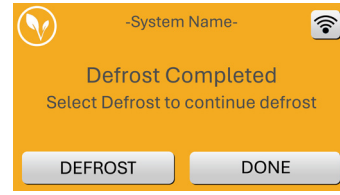


When you press CONTINUE, the vent process will begin as shown on the next screen:



During this time the oil free vacuum pump will run for 5 minutes to purge any water that may have gotten in during the DRYING process.

When the DEFROST process is complete, the system will display “Defrost Completed”.



12. If there is still ice in the freeze dryer, press DEFROST. When the freeze dryer is finished with the DEFROST cycle, make sure all of the ice and water are now removed from the vacuum chamber and press DONE. The freeze dryer will return to the startup screen. You can now start a new batch.

MORE OPTIONS

At the top of the screens on the right-hand side there are two buttons.



The first is for WiFi. The WiFi option may be used when you purchase Harvest Right's WiFi accessory. It will significantly enhance your freeze drying experience.



The MORE button provides HELP along with other freeze drying options. It will be on every screen and will be specific to each screen.



When your unit is on the home screen, you can press the MORE button and it will display the screen options shown below. If you press the LESS button after you have pressed MORE, it will bring you back to the Home Screen.



When the MORE button is pressed on any screen you will see that there are many selectable options to help you better manage your freeze dryer.

For instance, after selecting MORE from the home screen, then HELP, a QR code will display that can be scanned to take you to the Harvest Right App User Manual. Whereas the second button, SET FREEZE-DRYER NAME, makes it possible for you to choose a personal name for your freeze dryer such as "Frosty" or anything you want.

To customize the name of your freeze dryer, first press the button that says SET FREEZE-DRYER NAME.

That will take you to the next screen shown here.



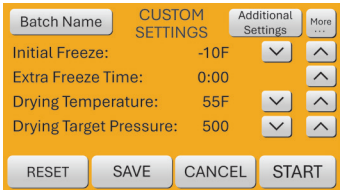
Just type in the name you want your freeze dryer to be known as and press SAVE.

CUSTOM SETTINGS

Most food products are best freeze dried using the START button which is a Harvest Right patented automatic process. However, there are some products that may have a high sugar, salt, or other content that would be better dried using CUSTOM settings. Please consult “Drying Tips” in your Harvest Right App to review specific instructions and custom settings regarding these products.

The CUSTOM settings may be viewed by pressing the CUSTOM button on the home screen.

The Batch Name button will then appear and will allow you to enter the name of the food that you will be drying.





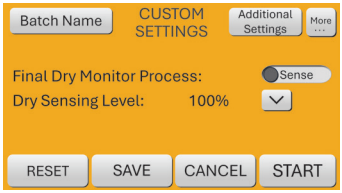
Once you are on the Custom Settings screen you may also press the MORE button to see other options.

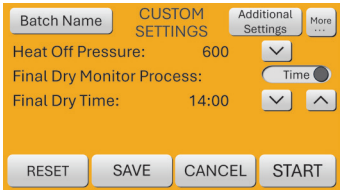
One of those options will display a button for DRYING TIPS. Selecting this button will display a QR code, that when scanned with your phone, will take you directly to the App where you can review “Drying Tips” for a variety of foods.

Another button displayed when you press MORE is HELP. Select HELP to display a QR code that when scanned will provide you with instructions for using CUSTOM settings.

Under CUSTOM settings (shown in the screen above), You can change the initial freeze temperature and extra freeze time, and you can decrease or increase the temperature at which something dries. With some foods or materials that have a lot of sugar or salt, it is good for the food/material to be frozen longer and colder before drying. Increasing drying temperatures may cause some foods/materials to scorch. Decreasing the temperature can cause longer batches but the food may turn out better. The standard drying temperature is 55˚ F. The Drying Target Pressure determines the pressure at

which the product will be dried at. The standard Drying Target Pressure is 500. This means that the heaters turn on when the vacuum pressure drops below 500 and the heaters turn off when the pressure rises above 500. This cycle occurs over and over until the product is dry. This can be adjusted depending on the product that you wish to run. To access the second page of custom settings simply tap the “Additional Settings” button on the page.





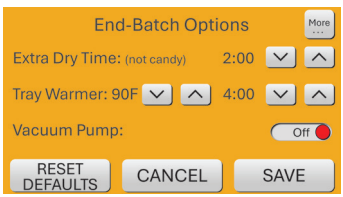
When you set the Final Dry Monitor Process to Sense (shown in the screens above), you can adjust the Dry Sensing Level. This setting lets you choose how dry you want your product to be at the end of the batch. You can select a dryness level between 85% and 100%. The freeze dryer will automatically end the batch when your chosen dryness level is reached.

If you set the Final Dry Monitor Process to Time, you can choose exactly how long you want the batch to dry. This is different from “Extra Dry Time”—it sets the minimum amount of time your batch will spend in the Drying stage. You can set this time anywhere from 4 to 99 hours, in 15-minute increments.

When you have modified any of the custom freeze and temperature settings, you will need to press the START button on this screen. Your last CUSTOM change will be saved. But you will always have to access them through the CUSTOM button on the home screen. The START button on the home screen, will not run these custom settings.

If you wish to reset these customized settings back to the Harvest Right default settings, press the RESET button, as shown above.

If you want to increase the amount of extra drying time that is added to the end of the drying process, you can do that by pressing MORE. When the MORE button is pressed, one of the choices that comes up is END BATCH OPTIONS. When pressed, it will display the End-Batch Options screen shown below.

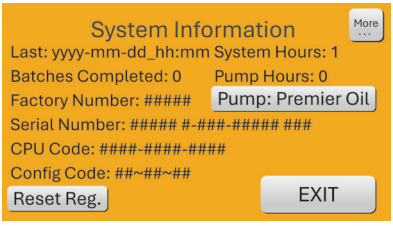


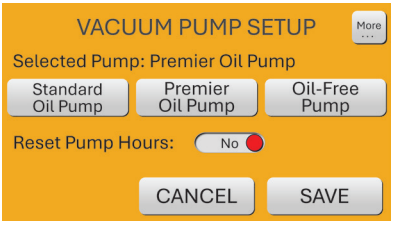
Change Pump

If you ever need to change the type of pump you are using, press the “More” button on the home screen (seen above) and select “Sys Info” from the dropdown menu.



In the System Information menu (bottom left) tap the “Pump” button to access the Vacuum Pump Setup (bottom right) where you can choose which vacuum pump to assign to the freeze dryer. After assigning a new pump simply press “Save.





CANDY MODE

1. The new, patented Harvest Right Candy Mode gives you complete control over the candy drying process with expanded temperature ranges and options. In the Harvest Right App, under the Drying Tips section, you will find a variety of candy recipes with instructions and settings. These recipes will explain how to optimally freeze dry most types and brands of candy.

   If you have WiFi, all you need to do is press the appropriate recipe in the App and the drying temperatures and times will automatically be set on your freeze dryer. Then you can just follow the instructions on the screen of your freeze dryer.



   If you don't have WiFi, you are still able to use Harvest Right's App to help you know how to freeze dry a particular type of candy. In the App, under Drying Tips, select and read the recipe for the type of candy you want to freeze dry. Then press the CANDY button on your freeze dryer's Home screen. This will take you to the second screen, titled CANDY DRYING. On this screen you will set the temperature and time for the candy you selected in the App.

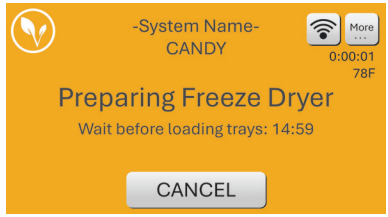
- The Candy Name button will then appear and will allow you to enter the name of the candy that you will be drying.





- The Tray Loading Temperature feature will warm the shelves while the freeze dryer is cooling the chamber. This is important for freeze drying candy.

2. While the chamber is being cooled, and the shelves are warming, you will have time to load the candy on your trays. The Pre-Warm feature will keep the candy at an appropriate temperature to make sure that



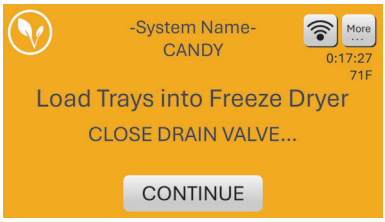
the candy on each tray is dried correctly.
Some candy works better when warmed prior to the freeze drying process. As a general rule, you should consult Drying Tips on your Harvest Right App for candy warming and drying instructions because some types of candies need to be warmed and dried differently than others.

3. If you haven't done it already, the Harvest Right App can be downloaded to your phones and smart devices. On the app, under Drying Tips, you will find recipes for the candy. Set the Time and Temperature as instructed for warming and drying.

- Once you have selected appropriate Pre-Warm and Dry Time settings, press "Start" to begin the batch.

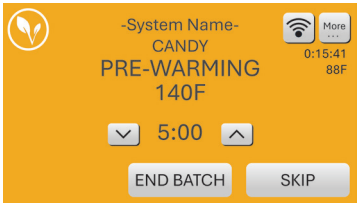
4. As you can see, this screen has a WiFi button as well as a MORE button. WiFi can be used to automatically dry all your candy types appropriately without needing to change the settings yourself. If you have WiFi, you can go to the Harvest Right App and select the candy setting you want. The system will automatically set your freeze dryer to warm and dry the candy at the appropriate temperatures.

5. The MORE button provides HELP and other options to assist you in the candy drying process. One of those options will display a button for DRYING TIPS. Selecting this button will then display a QR code that when scanned with your phone will take you directly to the App where you can review Drying Tips for a candy as well as for a variety of other foods. Just follow those instructions and your candy will dry perfectly.



6. Once you press START, the Preparing Freeze Dryer process chills the chamber walls, prior to drying the candy, so that the walls can collect the moisture that comes out of the candy. This prevents the water vapor from damaging your vacuum pump. When this process is complete, the Load Trays screen will appear.

7. When the trays have been loaded, close the drain valve, close the door, and press continue. Everything will function automatically. The screens shown below simply describe the processes that will occur automatically.





The trays will warm to the preset temperature, then the warming time countdown will begin. Once the trays finish the warming time, the unit will automatically begin the drying process.

8. When finished, the PROCESS COMPLETE screen will appear. You will then remove and package your food as was described previously.



One of the great things about using this system to run a candy batch is that the batches typically take 2 to 3 hours to finish.

This system allows you to run many batches of candy without defrosting your system before each batch. Just press START NEW CANDY BATCH and the candy freeze drying process starts over without having to go through the defrosting process.

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 make 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

PREMIER OIL PUMP MAINTENANCE

Oil Filtration

In a properly maintained Premier Pump, an oil change will only need to take place every 20-30 batches if the oil remains clear. If the oil gets cloudy, or looks dirty, change it immediately. (See “Filtration FAQs” on page 23.)

The system will display a reminder on the home screen after every 20th batch that says, “Premier vacuum pump owners, it is time to change oil.” The on-screen notification will go away after you start a new batch.

BEFORE OPERATING YOUR PREMIER PUMP, PLEASE NOTE:

- **Gas Ballast Must Always Be Open In Order For Pump To Work Properly.**

When you use this pump, please be sure that the gas ballast switch is open* (Figures 5 & 6, page 23). If the pump is used incorrectly, with the gas ballast closed, you will ruin it.

* *If you do not open the gas ballast the oil is only good for 4 to 5 batches, then it needs to be replaced.*

- **Pump Must Always Be Kept Level. Do Not Tilt While Carrying Or Draining Oil As That Will Cause Oil To Fill The Oil Demister.**

If the demister becomes saturated with oil when the pump is running, it may cause an oil mist cloud to fill the room. A saturated demister and will need to be cleaned. Refer to your Premier Pump Owner’s Manual for instructions on cleaning the demister filter.

Oil Change

1. To ensure that the pump and oil are warm, run pump for approximately one minute prior to changing oil. Do not run longer than this, as it may be possible to damage the pump.
2. Turn off pump. Open the oil drain plug, and drain used oil into an appropriate vessel and filter or dispose of properly.
3. As oil stops draining, tip the pump to drain any remaining oil in the bottom of the pump. Do not over-tilt the pump. It will fill the demister with oil.
4. Close oil drain valve.
5. Uncscrew and set aside oil demister. (Figure 7, page 23). Pour in new oil and fill your pump slightly above the center of the sight glass (Figure 8, page 23).
6. When finished, replace the oil demister.



OIL DRAINS OUT FROM HERE



FIGURE 5: Premier Oil Pump showing gas ballast switch location and oil demister



FIGURE 6: Gas ballast shown in “open” position



FIGURE 7: Demister removed, showing oil opening



FIGURE 8: Sight glass, showing oil level

FILTRATION FAQS

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

To order replacement cartridges or a new filter set, please contact Harvest Right at 801-386-8960 or visit www.harvestright.com.



Oil filter cartridge may be used approximately 20-30 batches (but may need to be changed sooner if the oil looks very dirty). See images above.

CARE AND CLEANING

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.

DIRTY OR DUSTY ENVIRONMENT

Do not operate the freeze dryer in a dirty or dusty environment. This could lead to the unit becoming clogged with dust/debris and potentially void the warranty. If you start to see dust buildup, remove it with a nylon brush, lightly wiped in the direction of the fins.

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, or if the freeze dryer is not in use for an extended period of time, empty the freeze dryer and keep it turned off. Wipe any moisture from the inside and leave the door open to keep odor and mold from developing. **Drain the pump and fill with fresh oil**. If dirty oil is left inside the pump when it is not in use, it will corrode the internal parts and could cause premature failure.

TROUBLESHOOTING

FREQUENTLY ASKED QUESTIONS

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

Warmer temperatures will affect your freeze drying times. If your freeze dryer is in an area that gets hot, such as your garage, you should expect longer batch times. If temperatures exceed 90 degrees in the area you are freeze drying in, you may want to purchase a fan and have it blow on your vacuum pump. 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, and moisture content, some materials with high amounts of 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. Premier Vacuum Pump oil should be changed and filtered every 20-30 batches. As the oil in your pump gets older, the cycle time for material 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?

When the process is finished, the "Process Complete" screen will appear. 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 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 material 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 material, 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 SETUP

OIL-FREE VACUUM PUMP SET UP

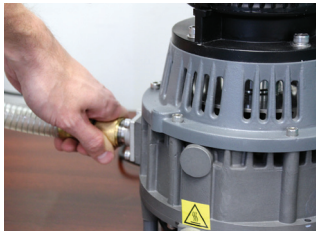


FIGURE 9

1. Connect the vacuum hose to the vacuum pump and to the freeze dryer, and tighten (Figure 9). 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.

After each batch has completed, the system will run a 5-minute venting process. This will remove water and particulates that may have accumulated in the pump during the batch. Allowing this process to run is very important in extending the life of the oil-free 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. 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 MATERIAL

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 material in the package.

WARRANTY INFORMATION

HARVEST RIGHT WARRANTY

Full One-Year Warranty
Warranty Period: For one year from original ship date (includes the U.S. continental 48 states).
Included: Freeze Dryers, premier oil vacuum pumps, and oil-free vacuum pumps.

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

Consumer will be responsible for replacement parts caused by consumer misuse and neglect of product. See Normal Responsibilities of the Consumer below.

Limited Warranty, Years Two and Three
Warranty Period: For years two and three from the original ship date. (includes the U.S. continental 48 states).
Included: Compressor, Condenser, and Evaporator

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.
Included: Freeze Dryers, Premier oil vacuum pumps, and oil-free vacuum pumps.

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. The consumer will be responsible for the cost of transportation of the product to the repair shop or the travel cost of the technician to the consumer's location.

Consumer will be responsible for: Costs of local service and costs of parts for consumer misuse and neglect of product. Costs for transportation and delivery of freeze dryers, vacuum pumps, and all parts, for any reason, to Harvest Right and to Consumer

Limited International Warranty (includes all countries not described above)
Warranty Period: For one year from original ship date.
Included: Freeze Dryer, Premier oil vacuum pumps, and oil-free vacuum pumps.
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 home or business facility wiring.

4. The appliance must be operated in a clean open area that has plenty of airflow and is not above 90°F (32°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 misuse of the freeze dryer nor 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
2320 N 2200 W
Salt Lake City, UT 84116
USA
801-386-8960

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%.

Inquiries

Please contact Harvest Right with all inquiries, including questions about setup, warranty, or repair. Do not contact the retail location where you purchased your freeze dryer.

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.



801.386.8960 HARVESTRIGHT.COM

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