



HARVESTRIGHT
— C O M M E R C I A L —



HRC 100 COMMERCIAL FREEZE DRYER

OWNER'S MANUAL

The Essential Guide For
Every Freeze Dryer Owner



HARVESTRIGHT
— C O M M E R C I A L —

CONGRATULATIONS!

You have purchased the world's first and only intelligent commercial 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.

We highly recommend always pre-freezing your food before loading it in the freeze dryer.

Please contact Harvest Right with all inquiries, including questions about setup, warranty, or repair.

801-386-8960

CONTENTS

UNPACKING	1
GENERAL INFORMATION	2
IMPORTANT SAFEGUARDS	
Safety Information.....	3
Never Operate the Freeze Dryer if it Appears Damaged.....	4
Be Careful About What You Put in Your Freeze Dryer.....	4
Vacuum Pump Runs Hot.....	4
Recommended Operating Temperatures.....	4
FREEZE DRYER ASSEMBLY	
Assembly Instructions.....	5
Important Information About Your First Batch.....	7
FREEZE DRYER OPERATION	
Operation Instructions.....	7
Using the “Customize” Settings.....	11
How to use the Candy Application.....	12
A CLOSED SYSTEM	
What is a Closed System?.....	15
Possible Leak Points on the Vacuum Pump.....	15
Possible Leak Points on the Freeze Dryer.....	15
OIL PUMP MAINTENANCE	
Premier Oil Pump Maintenance.....	16
Oil Change.....	16
Filtration Filtration FAQs.....	17
CARE AND CLEANING	
Cleaning the Interior and Exterior of Your Freeze Dryer.....	18
Cleaning Cautions.....	18
Moving or Long Absences.....	18
TROUBLESHOOTING	
Frequently Asked Questions.....	19
Vacuum Pump Isn’t Turning On During The Dry Cycle.....	20
LOADING AND PACKAGING FOOD	21
WARRANTY	23
Returns.....	25
SAFE USE OF FREEZE DRYERS & VACUUM PUMPS	26

UNPACKING

UNPACKING YOUR FREEZE DRYER

You should have uncrated 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 (internal)
- Vacuum Hose (attached to pump)
- Vacuum Pump Oil (pre-filled in pump)
- Shelving Unit
- Trays
- Owner's Manual
- Oil Filter
- Other materials, not listed here, may have been included

1. Inspect all items.

2. 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 18.

GENERAL INFORMATION

MAJOR COMPONENTS

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

Electrical Breaker: Located next to the power switch.

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: A dedicated 30 amp circuit is required for the HRC100. The power receptacle is the same as an electric dryer receptacle, which is a NEMA 10-30 plug (Figure 1).

Vacuum Pump: Make sure the vacuum pump “on/off” switch is set to the “ON” position (“O” 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 box attached to the top side of the vacuum pump. The demister cartridge is the knob that unscrews and slides out toward the front of the freeze dryer (Figure 2).

Purge/Clean Air Valve: This is a 3/8” ball valve located at the back right-hand side of the Freeze Dryer. Before you start a freeze drying cycle, make sure this is closed. After the cycle is complete, open this to repressurize the chamber.

Drain Line: This is a clear tube, located toward the middle-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 the bucket of water or the water will be sucked into the freeze dryer.

The drain valve is a 3/4” NPT female thread to adapt to a longer drain hose or drain.

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).



FIGURE 1



FIGURE 2

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.



FIGURE 1

- Do not block vent air holes. If the air holes are blocked, the freeze dryer could overheat. Keep vents clean (Figure 1).

- Keep the filter door and coils on the side of the freeze dryer clean of dust (Figure 2).



FIGURE 2

- 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 inside the appliance. Any sharp edges may cause personal injury.

- Do not insert the power plug with wet hands. It may cause electric shock. The peak amp draw is 28 amps. The unit is 220 volt, 60 hertz single phase. The circuit breaker needs to be 30 amp double pole. Usage of a dedicated 30 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.

- Do not run the freeze dryer when the room temperature exceeds 95°. 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 95°, 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 internal vacuum pump can reach approximately 160°F during operation. 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 most efficient temperature range is between 45-75°F. Although safe, operating your freeze dryer in temperatures above 75°F will increase batch times and may have an adverse effect on the condensing unit (freezer). Operating the freeze dryer in temperatures below 45°F may result in vacuum errors and can damage the drain hose. Do not run the freeze dryer when the room temperature exceeds 95°.

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

FREEZE DRYER ASSEMBLY

ASSEMBLY INSTRUCTIONS

Wait 24 hours before running your freeze dryer in order to facilitate proper settling of the refrigerant oil 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. The oil in your vacuum pump is pre-filled before shipping. Oil level should be slightly below the max line of the sight glass (Figure 1).

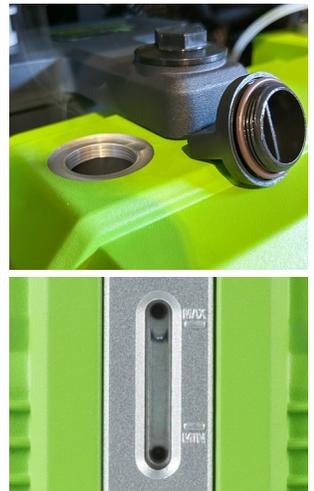


FIGURE 1

5. 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.
6. 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.
7. Make sure to close the drain valve on the freeze dryer, located toward the middle-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 or larger 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.
8. 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.
9. As described in previous steps, it is your responsibility to make sure the door is closed properly, the drain valve is closed, the vacuum release valve needs to be closed (Figure 2), 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.
10. You are now ready to start your first batch.



FIGURE 2

IMPORTANT INFORMATION ABOUT YOUR FIRST BATCH:

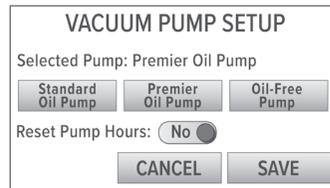
Throughout the freeze drying process, the system will monitor the cooling, vacuum, and heating functions. If it detects a problem, it will display information to help you resolve the issue. While waiting for you to respond to the error message, the system will attempt to resolve the issue itself. If it is successful, it will no longer display an error message and continue processing the batch.



FREEZE DRYER OPERATION

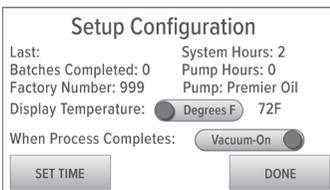
To customize freeze dryer name, please go to “Customize” settings, page 11.

1. From the startup, press START. The first time you use your freeze dryer, the next screen prompts you to choose which type of vacuum pump you are using. Select Premier Oil Pump.



2. Once selected, press SAVE. If you ever need to change the type of pump you are using, press the Harvest Right logo on the startup screen to see the selected pump. Press “Pump:” to change pump style.

After pressing DONE the home screen will again appear.



3. Press START. The freeze dryer will cool for 15 minutes, or until the temperature is 32°F, whichever comes first.



Your food should be pre-frozen for two days prior to placing it in the freeze dryer. It should only be one layer and should be lower than the tops of the trays. Again, we recommend that the food be frozen for at least 48 hours before loading it into the freeze dryer. This will help avoid potential vacuum issues later in the process and excessively long batch times.

After the 15 minutes of cooling, the next screen prompts you to load your food in the freeze dryer and close the drain valve. Load your food as soon as the screen prompts you. Do not let the food defrost. Doing so could cause vacuum issues later in the process. It could also lengthen the freeze drying process.

4. Place trays in the shelving unit, 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 may be a vacuum leak.
5. Press CONTINUE. The unit will begin freezing the material in the freeze dryer. From here, 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.



6. When the food or material being frozen is cold enough, the following screen will appear. Your vacuum pump will automatically turn on.



7. When the food is cold enough, and adequate vacuum is achieved, the DRYING process will begin, as shown. As the DRYING process continues, you will see an status bar:



8. When the DRYING process is nearly complete, the system will begin to countdown extra drying time. The EXTRA DRY TIME of 2 hours is pre-set, as shown on the following screen. This time can be also be adjusted to coordinate with your schedule and to ensure that product is completely dry. You can increase or decrease extra dry time, as desired. Extra dry time may not be required. The pre-set EXTRA DRY TIME of 2 hours can be permanently adjusted (see “Customize” settings, page 11).



9. When EXTRA DRY TIME is finished, the PROCESS COMPLETE screen will appear and prompt you to “Open Vacuum Release Valve to Vent”.

Opening the purge valve vents the vacuum and allows air to enter the chamber. Then the door may be opened and the trays removed.



***WARM TRAYS:** The freeze drying process includes drying stages that heat the trays. Trays will be warm immediately after the batch ends. If you are unable to remove the 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. Removing cold trays from the freeze dryer can cause condensation to collect on the trays and this will partially rehydrate your food upon removing it. The extremely cold trays can also be uncomfortable to remove with bare hands. To avoid both of these issues, you should warm the trays until they achieve at least room temperature. To do this, select WARM TRAYS, you should take the trays out within 5 to 10 minutes as once the trays reach the drying temperature the heaters will turn off and they will get cold again.*

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

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 in an airtight container.

If you find that there is still moisture in the material, place food/material back in the freeze dryer and latch 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.

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



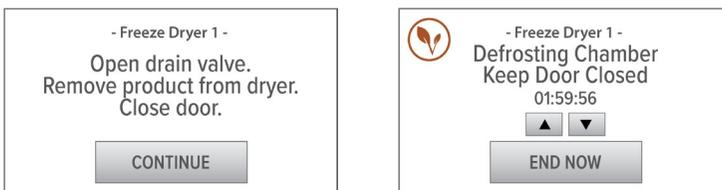
When the process is complete, the condenser will continue to run, which will keep your food dry, even with the pump off. This will preserve your food until you are ready to unload the freeze dryer.

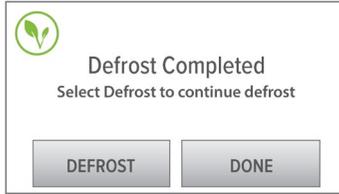
11. If the material is now completely dry, you will need to select "NO DEFROST" or "DEFROST".

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

DEFROST: This turns on the heaters in the shelving unit and accelerates melting the ice.

The following screen appears after pressing NO DEFROST or DEFROST. Press CONTINUE for the defrost process to begin.





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.

USING THE “CUSTOMIZE” SETTINGS

To customize the name of your freeze dryer:

Press - System Name - to customize the name of your freeze dryer, then follow on-screen instructions.



Extra Dry Time

If you want to change the amount of extra dry time that is added to the end of the DRYING process, do the following: On the startup screen, press the “CUSTOMIZE” button.



You can change the initial freeze temperature before vacuum freeze starts 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 colder before the vacuum freeze starts.

The Auto Target mTorr allows you to set the drying pressure. A drying pressure of 500 millitorr is sufficient for most materials. Increasing the pressure may shorten the batch time, but could cause the product to collapse. Decreasing the pressure may increase the batch time but could improve the quality of the product.

Increasing drying temperatures may cause some foods/materials to scorch and decreasing the temperature will cause longer batches. The standard drying temperature is 125° F.

These settings will remain set for future batches until you customize them again.



HOW TO USE THE CANDY APPLICATION

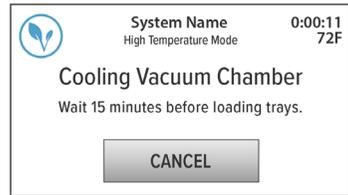
1. On the home screen select CUSTOMIZE.
2. Increase the drying temperature to somewhere between 130°F and 150°F.

Next, set the length of time (Extra Dry Time) you want the batch to run (default is 2 hours). It is important that you understand that in the “Candy Mode” there will be no standard “Dry Time.” The only drying that will occur, when in the Candy mode, will be during the “Extra Dry Time” that you set here. Usually, 2 to 3 hours is enough to dry any kind of candy.

3. Press the SAVE button.
4. Press START. For the next fifteen minutes you will need to wait for the chamber to cool down.



5. Once the chamber is cooled, you will then be able to turn ON the Candy process by pressing the Off/On button and switching it to On. Next, be sure to close your drain valve and then put your filled trays into the freeze dryer and press CONTINUE.



6. You will now see the WARM TRAYS screen. Some candy works better when warmed prior to the freeze drying process. As a general rule, the longer you have warmed candy prior to starting the vacuum, the more it will expand when dried. You may need to experiment to determine what is best.



If pre-warming the candy is not needed, press SKIP and you will immediately be taken to step 9. If you want to warm the candy trays, select START.



First, your trays will warm to 130 degrees or selected temperature. Then, your trays will warm for the selected time (default is 1 minute). You can increase or decrease the time by pressing the up and down arrows. You may add up to 59 minutes of warming time.

7. Once the trays finish the selected warming time, the unit will automatically begin the drying process and will dry for the amount of “Extra Dry” time you selected in Step 3.

You can modify that dry time on this screen by using the up and down arrows.

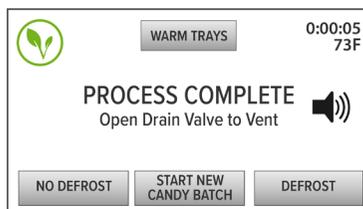
8. At the end of the batch, you will be asked if you want to run another batch of candy without defrosting the chamber (see below). This can be done repeatedly because there is not much water in candy. This is done by pressing the START NEW CANDY BATCH button and the process begins again at step 7.



9. Once you choose “DEFROST” or “NO DEFROST,” the software will immediately revert to the standard freeze-drying temperature of 125° and the “High Temperature/Candy Mode” will no longer display on the startup screens.



10. Once the freeze dryer has reset to its standard mode of operation it will freeze and dry at the standard temperatures. If you wish to run more candy batches, you will need to go into customize mode (see Step 2 at the beginning of this document) and increase the Dry Temp as well as the Extra Dry Time.



A NOTE ON CANDY BATCHES

Many candies react differently during a batch. Like with standard products, try to have similar candies in the same batch. Mixed batches of hard and soft candies could result in over-expanded soft candies or underdone hard candies. Some do not react much at all, including but not limited to: Licorice and sour gummies.

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. Ensure product is frozen to the core. 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

POSSIBLE LEAK POINTS ON THE FREEZE DRYER

- Drain valve is open
- Purge 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

When a freeze dryer is properly filled with product and when a Premier Oil Pump is properly maintained, an oil change will need to take place if the oil is not clear. If the oil gets cloudy, or looks dirty, change it immediately. (See “Filtering FAQs on page 17.) Oil change frequency is primarily based on the type of products being freeze dried in the HRC100. We recommend checking the oil after every batch. As long as the oil remains transparent, you do not need to drain and filter.

BEFORE OPERATING YOUR PREMIER PUMP, PLEASE NOTE:

• Pump Must Always Be Kept Level.

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 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. Close oil drain valve.
4. Open the black knob on the top, front of the pump and (using a funnel) pour in new oil. Fill slightly above the center of the sight glass (Figure 8, page 17).
5. When finished, replace the oil fill plug.



OIL DRAINS OUT FROM HERE

Oil Demister

The black box attached to the top side of the vacuum pump. The demister cartridge is the knob that unscrews and slides out toward the front of the freeze dryer (Figure 2).



FIGURE 2



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



FIGURE 6: Gas ballast shown



FIGURE 7: Fill plug 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)

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 when run through the filter.

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



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 during 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 tab is unlocked, press the other 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, 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.

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.

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. 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 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.

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 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.

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 Harvest Right oxygen absorbers. 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 when wet, one piece will 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.

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 (Figure 1).



FIGURE 1

- 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.



FIGURE 2

- During the freeze drying process, lots of candy will puff out and expand in size (sometimes getting up to 4 times as large). For this reason, it is important to leave extra space on the trays for candy to expand into (Figure 2). It is also recommended to cut some candy (like salt water taffy) into halves or even quarters. Failure to do so may cause candy to expand out of the tray causing a sticky mess on the shelving unit and in the freeze dryer chamber.



FIGURE 3

- 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 (Figure 3).



FIGURE 4

- The thicker something is, the longer it will take to dry.
- Foods 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, and scalloped potatoes) may be spread thickly across the trays (Figure 4).

- In general, foods should not be higher than the sides of the tray (Figure 5).



FIGURE 5

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:

- Always ensure that your product is pre-frozen for no less than 48 hours prior to loading it into the freeze dryer. This will ensure optimal batch times as non frozen batches will result in longer batches.
- 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

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(es).
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.



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