

DRYWISE

3D PRINTING FILAMENT DRYER

On-demand, repeatable and reliable filament drying



USER MANUAL

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1. Introduction

1.1. Intended use of Drywise dryer

Drywise dryer is designed and built for use in FDM/FFF 3D printing to be used in-line with a 3D printer. The device removes excess humidity from the filament before and during 3D printing.

1.2. General disclaimer

This user manual describes the intended workflow for the Drywise dryer.

Please carefully read and understand the contents of this user manual. Failure to read the manual may lead to personal injury, inferior results or damage to the Drywise dryer, 3D Printer or its peripherals. Make sure that anyone who uses this device knows and understands the contents of the manual to make the most out of the Drywise dryer.

The conditions or methods used for assembling, handling, storage, use, maintenance or disposal of the device are beyond Thought3D's control and may be beyond its knowledge. For this and other reasons, Thought3D does not assume responsibility and expressly disclaims liability for loss, injury, damage or expense arising out of or in any way connected with the assembly, handling, storage, use, maintenance or disposal of the product.

The information in this document was obtained from sources which Thought3D believes are reliable. However, the information is provided without any warranty, express or implied, regarding its accuracy.

2. Safety

This guide contains warnings and safety notices:



Provides helpful information to do a task or avoid problems.



Warns against situations that may cause material damage or injury if the safety instructions are not followed.

2.1. General safety information

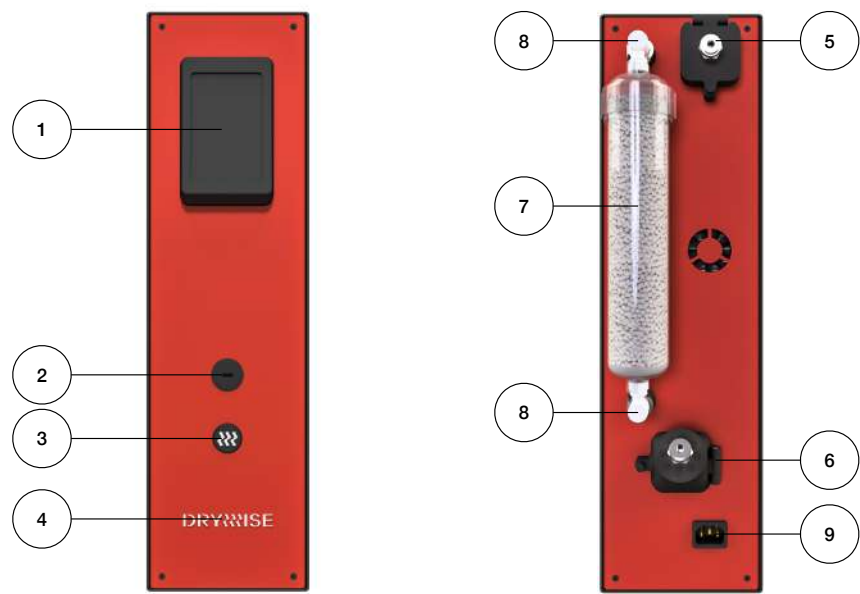
- Read and understand safety measures before use of the Product.
- Use the product for intended purpose only.
- Use the product with caution. The internal components of the Product generate high temperatures that can cause injury. Do not open / remove the case or dismantle the Product. Allow at least 30 minutes for Product to cool down, before performing any maintenance or modification.
- Do not modify or change any parts of the product unless the change or modification is authorised by the manufacturer or this manual.
- Follow standard electrical safety procedures.
- Follow instructions and safety indicators on the screen of the product and/or follow safety warning labels on the product components.
- Install the product near the 3D printer safely. When the device is connected to the 3D printer via filament, the forces of the extruder may pull the device.
- Do not manually pull or push on filament when the product is in operation unless instructed by the product user interface.
- This product is not intended for use by children.
- Thought3D products (including Drywise Dryer) are not intended for use by persons with reduced physical and/or mental capabilities, lack of experience or knowledge, unless they are supervised or have been given instructions concerning the use of the product by a person responsible for their safety.
- Do not insert any foreign objects other than approved hygroscopic filament for FDM/FFF 3D printing into the pathway of the filament.

2.2. Health and safety

- The Product dries third party materials. Please follow the safety procedures of the manufacturers of such materials.
- The Product operates in conjunction with third-party 3D printers. Please follow the safety procedures of the manufacturers of such devices.
- Follow safety instructions for desiccant handling and regeneration.
- Third party materials may release volatile organic compounds (VOCs) and/or ultrafine particles (UFPs). It is recommended that the Product is set up in a well-ventilated area.

3. The Drywise Filament Dryer

3.1. Main components



1. Touchscreen 2. USB-C port 3. Power button 4. Functional LED logo	5. Filament entry port 6. Filament movement sensor / Filament exit port 7. Desiccant tube 8. Attaching / Detaching connectors 9. Power socket
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3.2. Specifications

Properties	
Device	Filament Inline Dryer
Technology	Fused filament fabrication filament pre-processing (FFF)
Interface	- 4.3" capacitive touch panel - Guiding LED lights
Filament Path	Guided input and output filament port
Filament Diameter	2.85mm
Compatible Material	- Nylon materials and *reinforced nylon materials from main filament brands - Updated list on https://drywise.co/materials * Reinforced nylons require an additional add-on (sold separately) to be processed satisfactorily by the Drywise machine.
Operating Sound	<50dBA
Connectivity	USB-C port

Physical Dimensions	
Dimensions	(520*500*145) (inc. Desiccant container 590*500*145)
Net Weight	10kg (inc. Desiccant container 10.5kg)
Shipping Weight	around 12kg
Electrical Requirements	
Voltage	100 – 240 VAC
Frequency	50 – 60 Hz
Power	Max. 350W
Warranty	Twenty four (24) months in EU countries and twelve (12) months outside of EU countries.

4. Installation

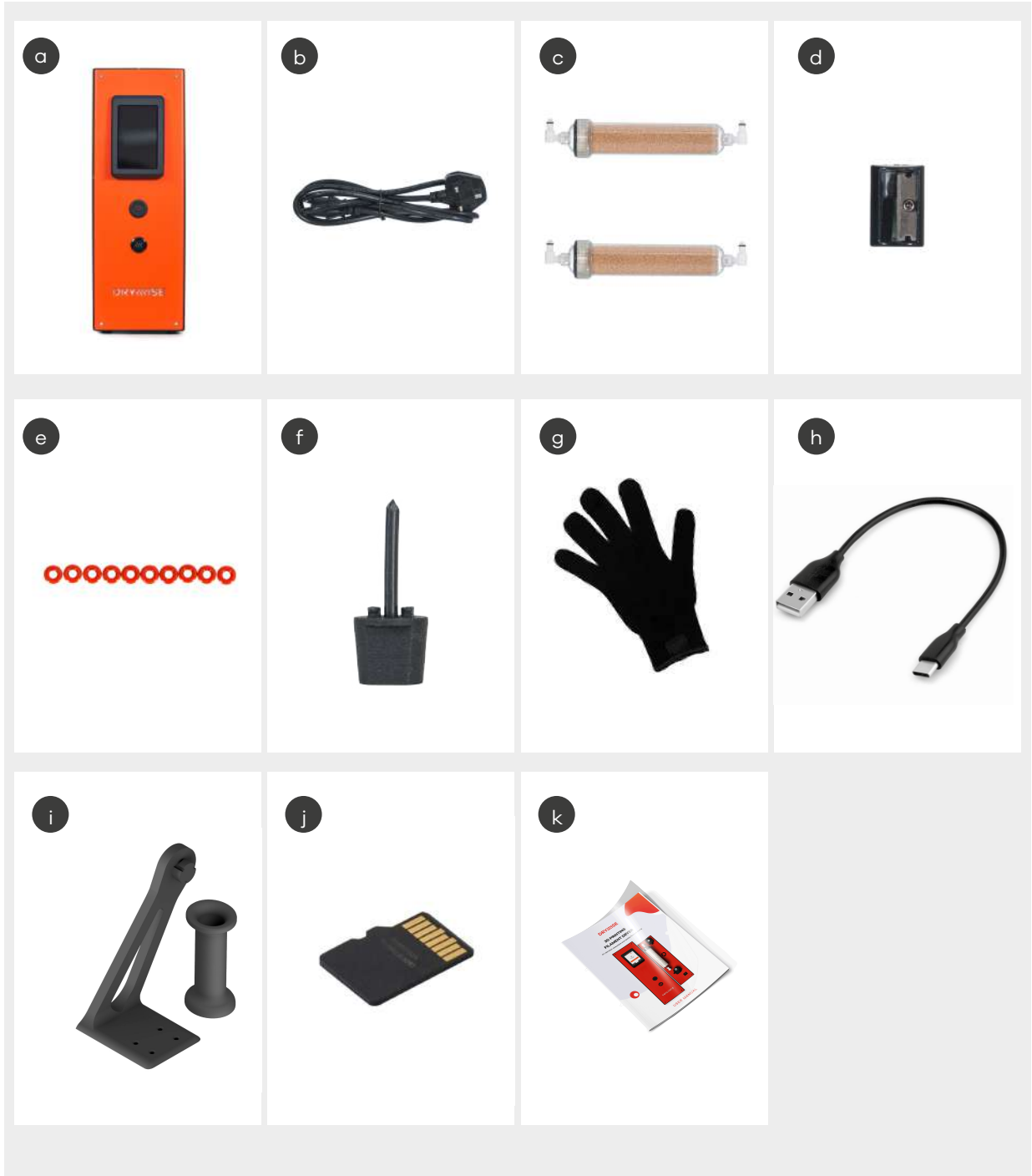
4.1. Unboxing



In order to respect our environment we have opted to use mostly cardboard as our packaging material. Kindly recycle the packaging material or dispose of according to local legislation in order to help reduce the environmental footprint.

Place the box vertically with the sticker facing the right way up. Open the packaging tape and fold out the cardboard flaps. Take hold of the inner packaging and pull out the packaging and the device. Remove the support blocks and place the device on a solid surface. All the remaining accessories are packed in the secondary box that you should find in the main packaging.

4.2. What's in the box



- a - Drywise machine
- b - Power cord
- c - Desiccant tube filled with desiccant (x2)
- d - Filament tip sharpener
- e - Spare o-rings bag

- f - Port closing kit
- g - Heat resistant gloves
- h - USB to USB-C cable
- i - Spool holder
- j - SD card
- k - User Manual

4.3. Hardware installation and first interaction



a) Remove shipping screw

For shipping purposes, the pump inside the device is secured with the help of a screw. This needs to be removed before the operation of the device. The screw is clearly shown in the image. Remove the screw and store this for future use if needed.



b) Install the bowden tube

A bowden tube can be attached to the output port to facilitate the movement of the filament and avoid any entanglements. To insert a bowden tube, connect the provided connector by screwing it in place, then push a length of bowden tubing securely in the connector.



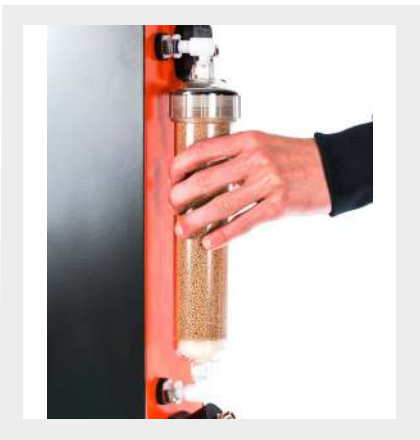
c) Attach spool holder base

To install the spool holder, remove the 4 screws as shown in the image. Place the spool holder base and align the holes. Secure the spool holder base in place with the 4 screws that you have just removed. The cylindrical part of the spool holder can then be screwed in place.



d) Attach desiccant tube

Attach the desiccant tube as shown in image. Both clips should snap into place and click.



- e) Place the Drywise machine near 3D printer



- Place the Drywise machine as close to the filament extruder of your 3D printer as possible. A shorter path ensures less filament is exposed to the atmosphere after being properly dried. It might also mean less setup time before printing can be started.
- ! Do not obstruct the air outflow from the right hand side of the device (when looking at the Drywise from the front) as warm air needs to be expelled from here.
- ! Make sure the filament paths to the Drywise machine and from the Drywise to the printer are not obstructed so that there is no chance for the filament to get snagged.

- f) Attach the power cord to the device and plug it in a mains socket.

- g) Switch on the device and follow the instructions on the touchscreen.

5. Operation

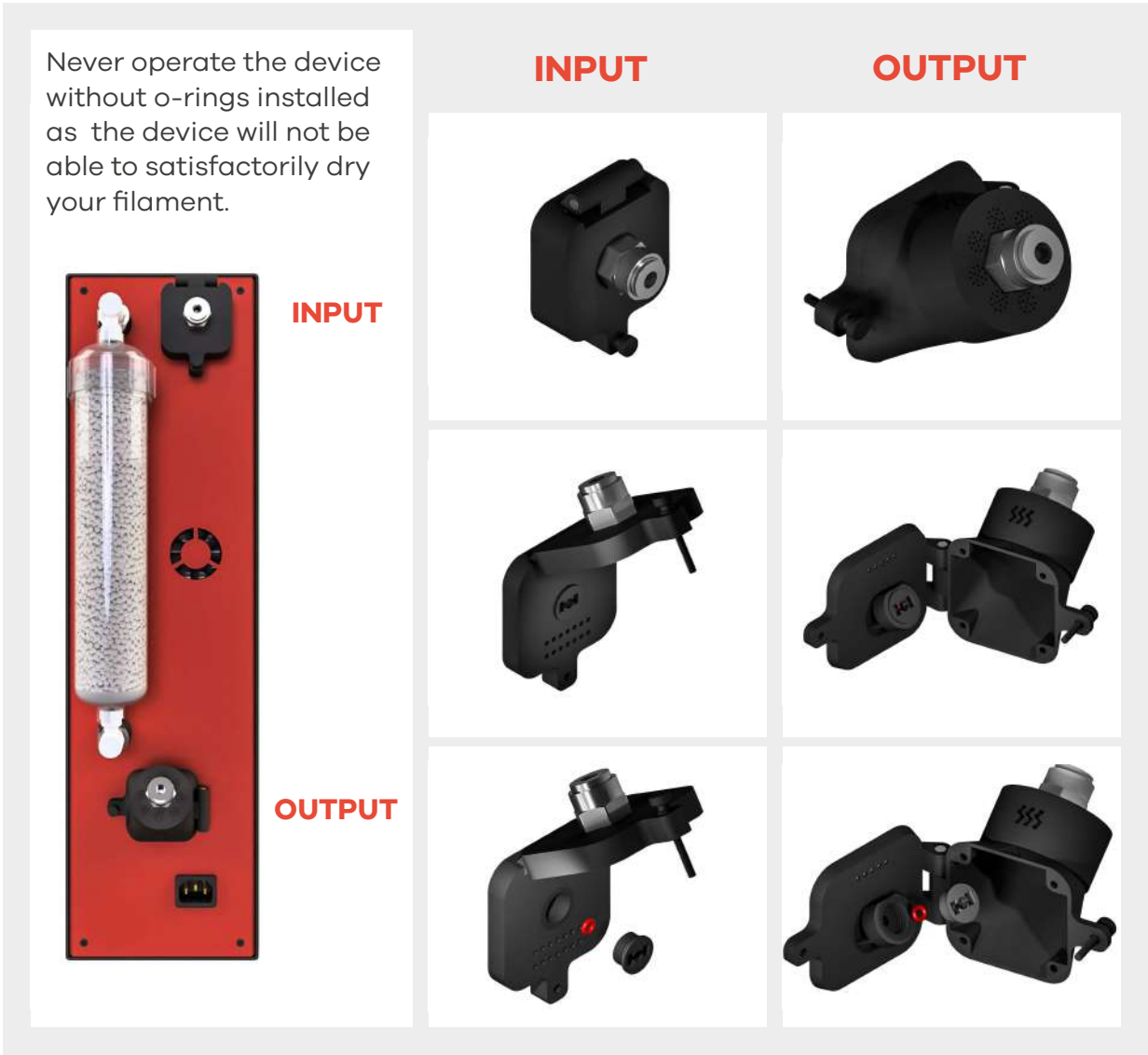
5.1. Recommendations


Ensure that the Drywise machine is placed in a suitable position and environment. The device should be in an upright position on a solid surface. For the best performance it should be operated at an ambient temperature of between 15 and 35°C (59 - 95°F).

Ensure that there is at least 10cm of free space to the right side of the Drywise device for unrestricted airflow. When in use the device should be positioned out of direct sunlight and away from liquids or humidity.



Always check that the filament can move freely without any obstructions from the dryer to the printer as these can hamper the operation of the device.



 The device was intended for filament that has achieved a high level of moisture content naturally. Filament which has been immersed in water might not perform sufficiently well.

5.2. Material compatibility

Drywise filament dryer, is compatible with a number of materials. The list of tested and approved materials is always growing and for an updated list kindly check our website at drywise.co/materials

The following filaments have been tested and are Drywise approved filaments:

- Nylons
 - Covestro (former DSM) Novamid ID 1030
 - Covestro (former DSM) Novamid ID 1070
 - BASF Ultrafuse PA
 - Ultimaker Nylon
 - Polymaker COPA



It is essential to use Drywise Pre-Heater (sold separately) to be able to dry the following materials:

- Carbon fibre filled nylons
- Glass fibre filled nylons
- Luvocom PAHT resin based filaments
- Other specific materials as instructed by the Drywise UI.

Specific profiles are present on the device and these should be used with the appropriate filament for the best performance.



DO NOT insert a different type of material other than that specific filament instructed on the dryer and corresponding to that specific profile. Failure to observe this could result in damage to the filament and the device.




If the filament that you want to use does not have a profile, kindly check the Drywise website or reach out for help before trying to test with any other profile. Damage caused to the device in this way is not covered under warranty.

Designed for 2.85mm filament only.

5.3. The drying process (normal operation)


Drying a filament and preparing it for consistent and optimal printing with your 3D printer is easy with the Drywise dryer device:

A




Switch on the device using the power button.

B



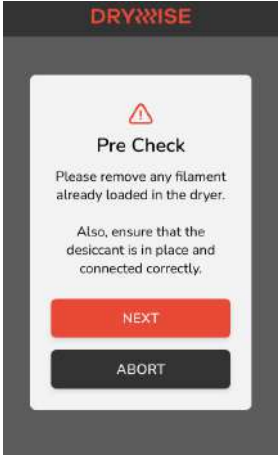
Select the "Start Drying" option once the device loads to the home screen.

C



Check that the desiccant container is connected correctly on the back of the device.

D



Check that no previous filament is inserted.

Check that the filament input and output ports are securely fixed in place and the o-rings installed.

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The whole process from here on will be guided by the device software:

1

Select the filament that you would like to use and click "NEXT" to continue.

For some specific materials, including all CF and GF materials, the Drywise Pre-Heater add-on is needed. These materials cannot be selected unless the add-on is attached. Add-on is sold separately

More details are available at Drywise website <https://drywise.co/add-ons>.

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Select Filament

Choose a filament you need to dry.

Novamid ID1030

Novamid ID1070

Ultrafuse PA

PAHT 9825 NT

ABORT

NEXT

2

The device will now prompt you to prepare the filament that you want to use by shaping the end to a cone point. This can be done with any of your preferred tools or else using the tool provided. **This is a very important step** as it ensures that the filament will slide smoothly through the device.

DRYWISE

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Prepare Your Filament

Cut filament to a point

BACK

NEXT

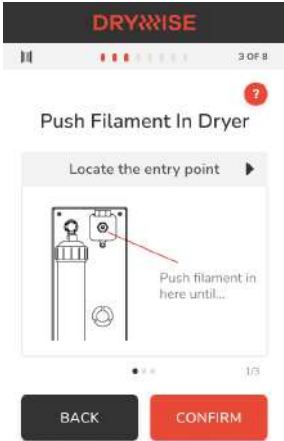
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3

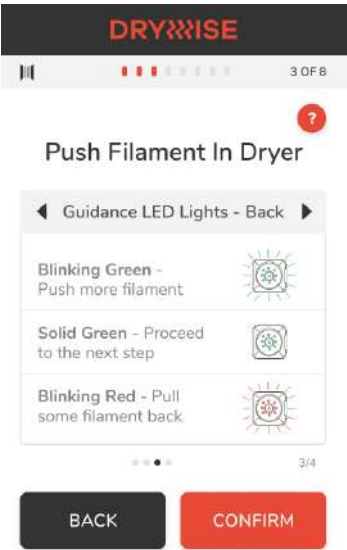
It is now time to insert the filament from the input port all the way to the output port. Insert the filament with the previously shaped side first and push the filament until the LEDs turn solid green.

Press "CONFIRM" once you have correctly loaded the filament.



3

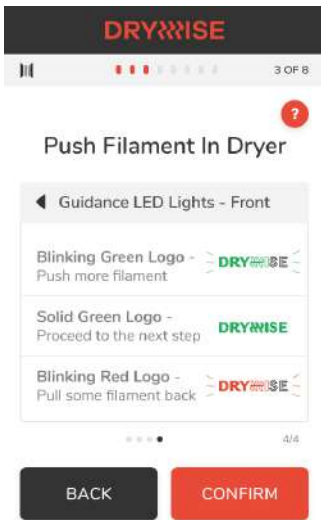
To load the filament the interaction with the device has to happen on the backend. To help and guide the user with this process the Drywise dryer machine has LEDs built in the filament movement sensor. These light up in different patterns to help you gauge how much filament to push or pull. The same lighting pattern is also replicated on the front of the machine where the Drywise logo lights up.



3

Follow these guidelines to make the most out of the light indications:

- When flashing green it is ok to pull the filament from the out port.
- When solid green the filament is loaded correctly needing no more adjustments and you can move on to the next steps.
- When flashing red the filament has been pulled out too much. You are requested to pull some filament back into the device.



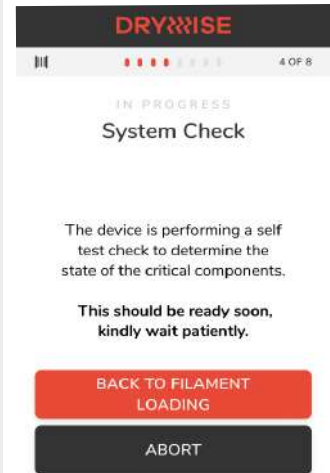
4

Once the filament has been correctly loaded, the system will check that everything is in order to ensure the correct filament drying.

The device will alert you if any of the components are not functioning correctly.

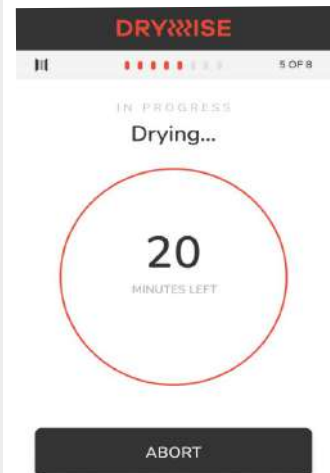
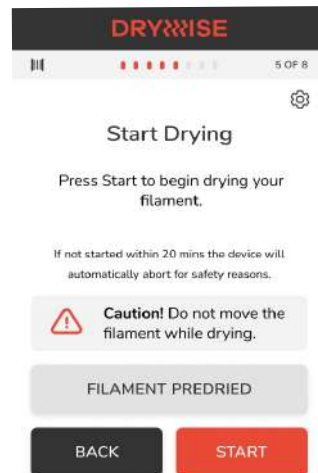
Such alerts could be:

- To check if the input and output ports are sealed correctly
- If the o-rings are fine or need replacing
- If the desiccant is connected correctly
- If the desiccant needs replacing with a regenerated one



5

It is now time to start drying the loaded filament. Press Start and a drying cycle will begin. This will take about 40 minutes. The countdown timer shows how much time is remaining for this drying cycle to be complete. Once this drying cycle is done the dryer will start beeping to alert you.



Anytime the dryer is left idle (i.e. there is no filament movement detected during printing or no human interaction after a prompt), it will go into standby mode for safety purposes. This means that the user might need to restart the cycle.



Always wear gloves when handling filament which has just been conditioned by the Drywise dryer. Filament coming out of the output port after a drying cycle might be too hot to handle with bare hands.



6

When the pre-drying cycle is complete the machine will start beeping. If you press on the **mute button** the beeping (indicator noise) will stop.

Beeping signals that the first part of the filament is dried and ready to be loaded into the printer. **Wear the heat resistant gloves** and pull the filament as guided by the LEDs. It is important to pull out the filament until the LED lights are solid green.

If the LEDs are flashing red, pull some filament back into the device. (it might actually be easier to pull the filament from the input port instead of pushing from the output port).



Caution when handling the conditioned filament, as it might still be hot to the touch.



6

Once the filament has been pulled, proceed with cutting the first 10 cm of the filament and loading into the printer.

For the best results purge the filament until dry filament starts to be extruded. This can be observed when the filament starts extruding out of the nozzle smoothly and without any bubbling.

Once your printer is successfully loaded, you can press “PRINTER LOADED” on the dryer. This will start preparing the next part of the filament. page.

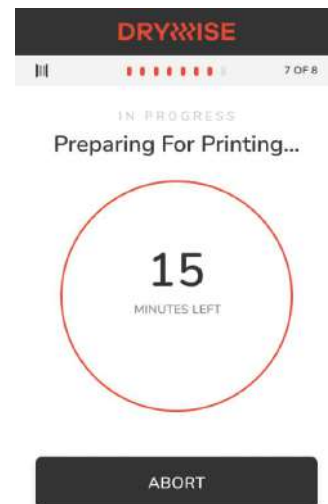


7

Once “PRINTER LOADED” has been pressed, the dryer will prepare the start of the next section of filament before continuous drying during printing can commence.

Without this preparation there could be a filament section that would still remain undried and will give suboptimal results.

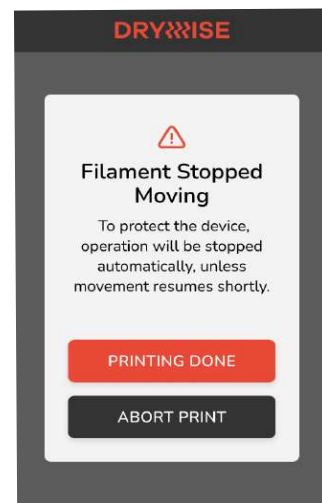
Once this step is done you will be prompted by the dryer, which will start beeping.



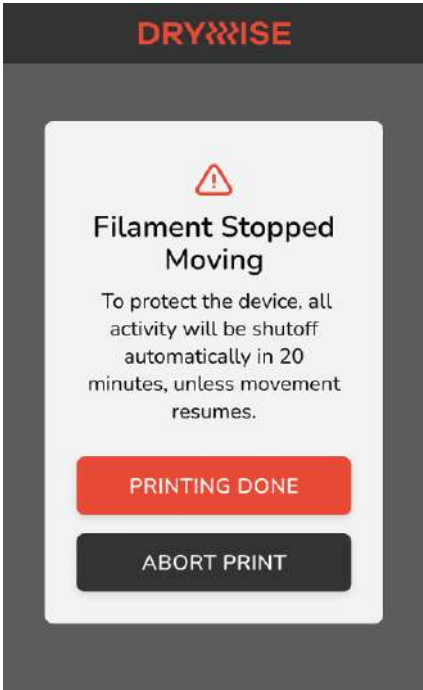
8

Pressing the mute button will stop the beeping. Please proceed with starting the print job on your printer and hitting the “PRINT STARTED” button on the dryer. This will put the dryer in printing mode.

The device will continue drying your filament, inline, until you press “PRINTING COMPLETED” or if the device does not sense any filament movement for more than 20 minutes during printing.



If for some reason the printer stops printing, the dryer will sense this and after giving the user time to fix the issue, it will abort the current operation if filament movement does not resume. Drying will also automatically stop once printing is finished.



6. Maintenance

The Drywise device has a self-test routine that checks the vital components in the machine and reports the status of each of these components. If any component needs to be replaced it will be highlighted here. It is suggested to run this self-test at least once a month.



For the best filament drying performance, the integrity of the closed loop is critical. **Thus, ensuring that the o-rings are in good shape is essential.** The machine will sense if there is an issue with the o-rings or any other component in the seal of the system. It will highlight this to you via an on-screen message. Please make sure to follow through.

6.1. Desiccant

If the desiccant needs regeneration the system will inform you. Refer to the “User Operations” section in this manual for the right steps to regenerate the desiccant.

If you won't be operating the device for a long period of time remove the desiccant container from the device. The desiccant container has valved connectors which, once engaged (by removing from the mating connector) should be able to protect the desiccant from absorbing humidity.



Operating the device with saturated desiccant will not give satisfactory results.

6.2. Firmware

Having the latest firmware ensures that you can get the most out of your Drywise dryer machine.

To update the firmware:

- Download the firmware update file from <https://drywise.co/downloads> to your laptop or computer.
- Connect your Drywise filament dryer device to the laptop or computer.
- Run the downloaded file and wait for the update procedure to finish.
- The Drywise filament dryer device should be updated with the latest firmware.

6.3. Cleaning

When carrying out any of these cleaning procedures, always switch off and unplug the machine from the mains supply.

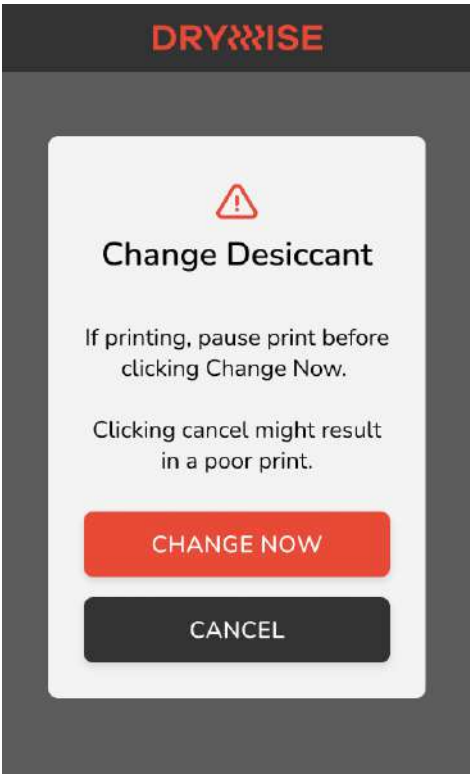
Cleaning the fans - use a brush to gently clean the fans from the outside of the device if these accumulate dust. Compressed air can also be used to do this.

Outer surface - use a damp cloth to clean the outer surfaces of the device.

7. Warning Message Screens

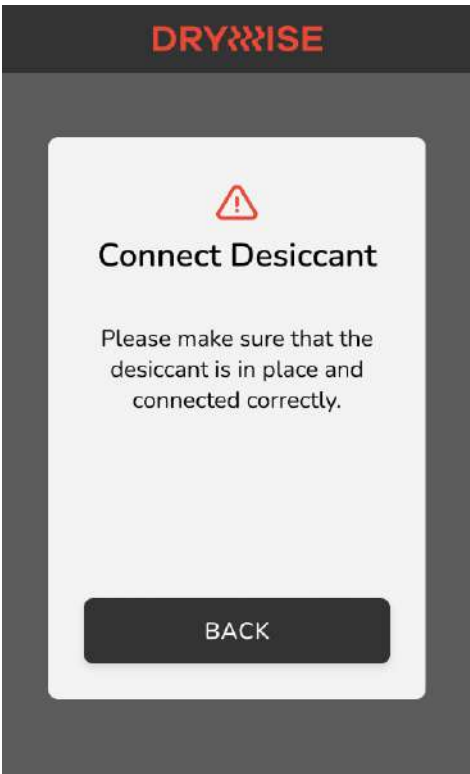
7.1. Change desiccant

This screen will pop-up when the system senses that the desiccant might need regeneration. You can follow the instructions to replace the desiccant with a previously regenerated one and continue with normal operation. If you do not have a previously regenerated desiccant kindly abort the dryer operation and regenerate the desiccant before trying to dry the filament. For the correct procedures to replace the desiccant container and to regenerate the desiccant kindly refer to the "User Operations" section in this manual.



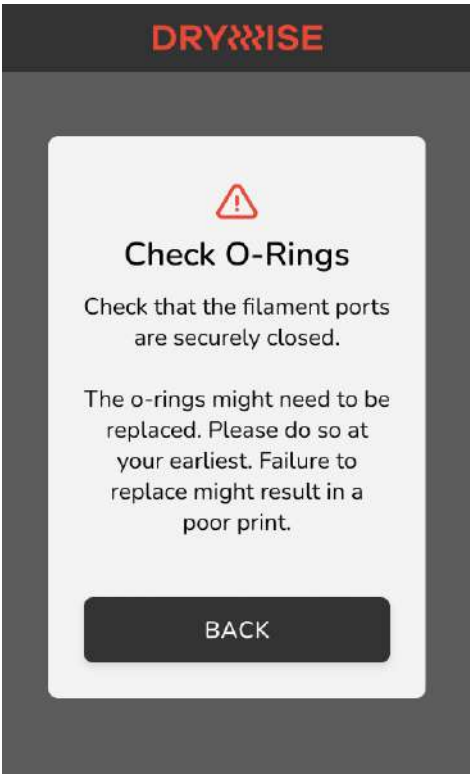
7.2. Connect desiccant

This screen will pop-up if the system senses that the seal on the system is not sufficient. This means that the o-rings need to be replaced or re-seated as they are not providing a good enough seal on the filament. For the correct o-ring replacement procedure refer to the "User Operations" section in this manual.



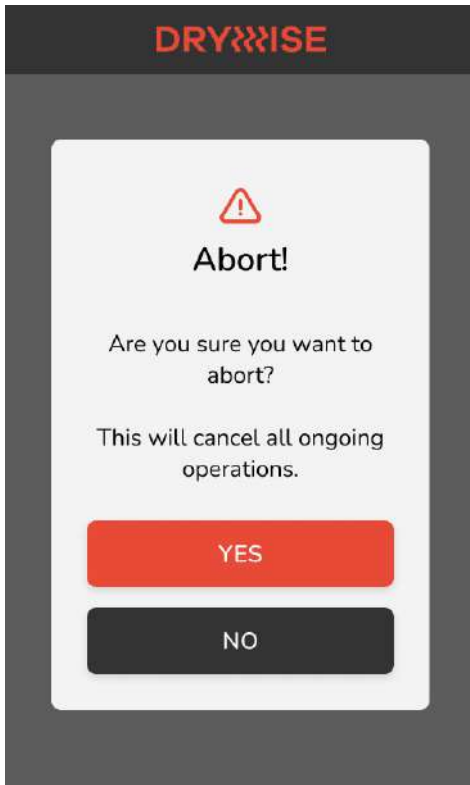
7.3. Check o-rings

This screen will pop-up if the system senses that the seal on the system is not sufficient. This means that the o-rings need to be replaced or re-seated as they are not providing a good enough seal on the filament. For the correct o-ring replacement procedure refer to the "User Operations" section in this manual.



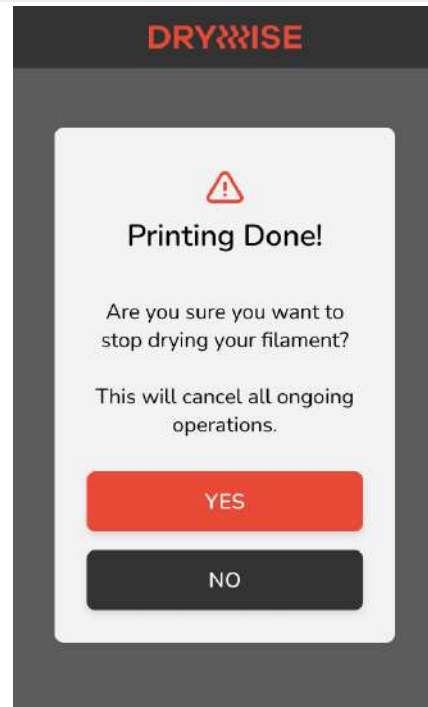
7.4. Abort confirmation screen

This screen will pop-up if at any time during normal operation you hit the "ABORT" button. This will allow you to confirm that you really want to abort current operation and that the "ABORT" button was not hit by accident. Select "YES" to confirm and abort the operation or "NO" to go back and continue with the previous operation.



7.5. Printing done

This screen will pop-up if at any time during the printing operation you hit the "PRINT DONE" button. This will allow you to stop the current drying operation by selecting "YES", or if this option was selected by mistake pressing "NO" would take you back to continue drying your filament during printing.

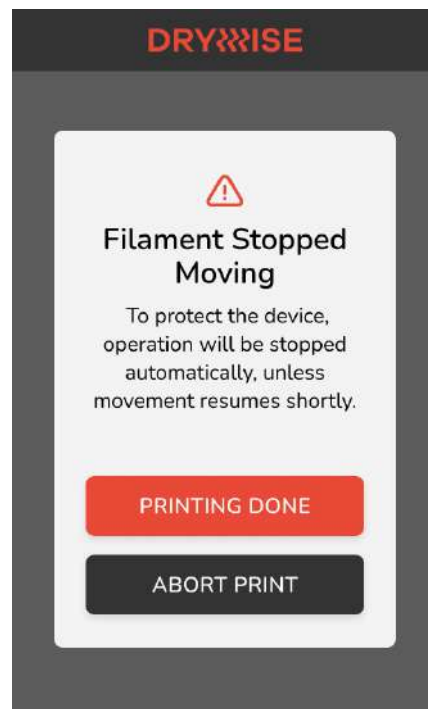


7.6. Filament stopped moving

This screen will pop-up during the printing process anytime the filament sensor does not feel filament movement for a long period of time.

Filament could have stopped moving because:

- the print finished successfully - in this case you can select "PRINTING DONE"
- the print failed - in this case you can select "ABORT PRINT"
- the filament ran out - in this case the drying process has to be started from the beginning again as a pre-drying cycle is needed once more. Select "PRINTING DONE" to continue and start a new process.
- there is an issue with the printer, nozzle blocked or something else:
 - If the issue can be easily resolved and the print continued, repair the fault and continue the print. This pop-up will automatically disappear once filament movement resumes.
 - Else, if the issue cannot be resolved, select "ABORT PRINT" on the dryer to terminate the process.



7.7. Automatic shut-off

This screen will follow if the filament stopped moving alert was on and there was no user interaction and filament movement was not resumed. This screen shows how much filament had passed through the device and for how long the device was in operation, before it stopped. If the print finished printing successfully, select "PRINT SUCCESSFUL" to go to the next screen. If the print failed, select "ERROR OCCURRED".

DRYWISE

Automatic Shut-Off

Filament stopped moving and no user interaction happened within 20 mins.

Time in operation

10h 5min

Filament passed through the device

10m


PRINT SUCCESSFUL

ERROR OCCURED

7.8. Operation failed

You will get to this screen if you select "ERROR OCCURRED" after the automatic shut-off occurred or by aborting the print from the filament stopped moving screen, or the printing screen. This screen offers some basic statistics about the previous operation. Press "OK" to go back to the home screen.

DRYWISE



Operation Failed!


Time in operation

10h 5min


Filament passed through the device

10m

Desiccant status



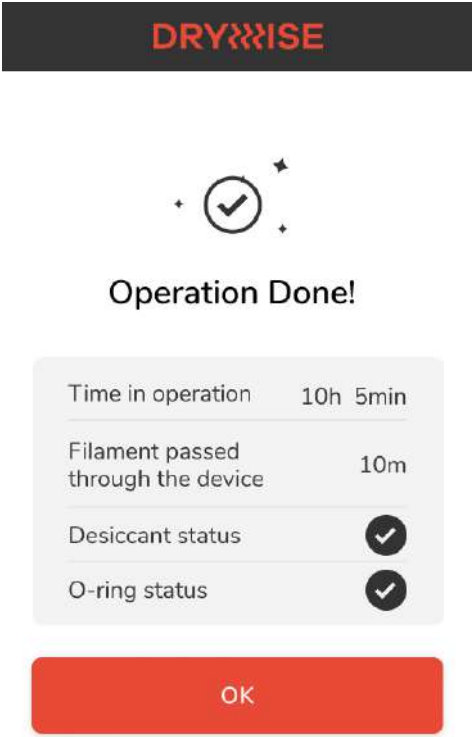
O-ring status



OK

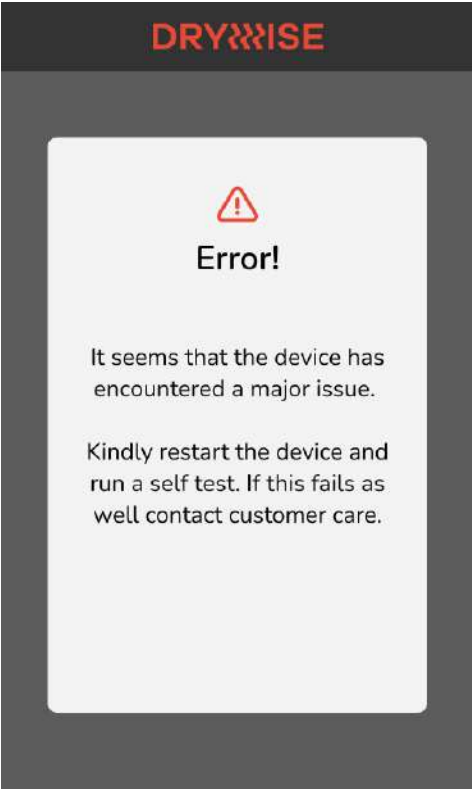
7.9. Operation done

You will get to this screen by selecting “PRINTING DONE” on the Filament Stopped Moving screen or selecting “PRINT SUCCESSFUL” on the Automatic Shut-Off screen. This screen offers some basic statistics about the previous operation. Press “OK” to go back to the home screen.



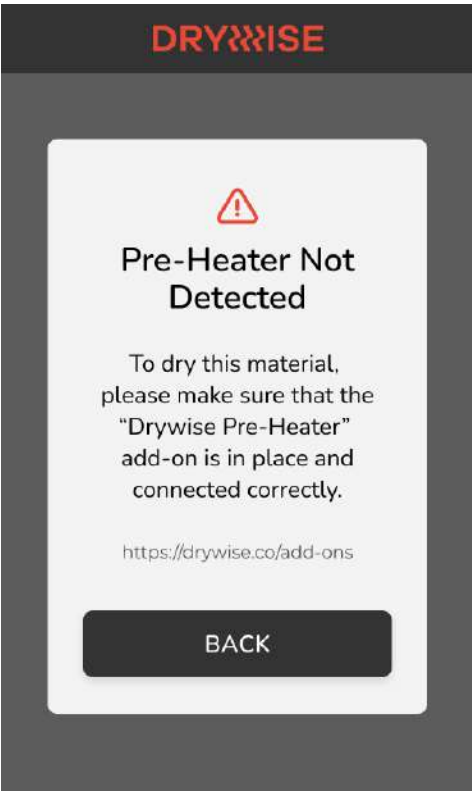
7.10. Fatal error

This screen will only ever pop-up if something that is non-user serviceable has failed inside the dryer. The Drywise device will need to be sent in for repairs. Kindly contact your reseller.



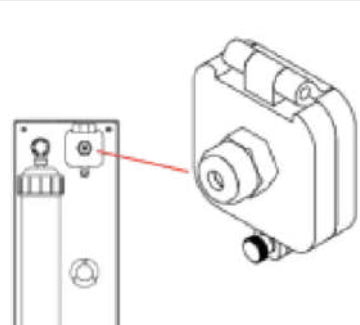

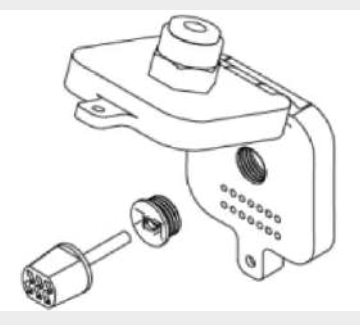
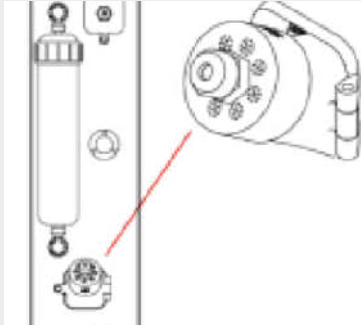
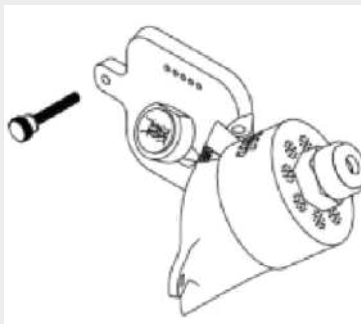
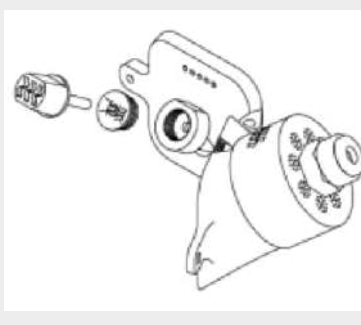
7.11. Incompatible material

This screen will pop-up if an incompatible material is selected. The selected material requires that the Drywise Pre-Heater add-on is installed. If you want to use this material kindly make sure this add-on is correctly installed and functional. Otherwise press "BACK" and select a different material. Kindly find more details on <https://drywise.co/add-ons>.



8. User Operations

8.1. Replacing the o-rings

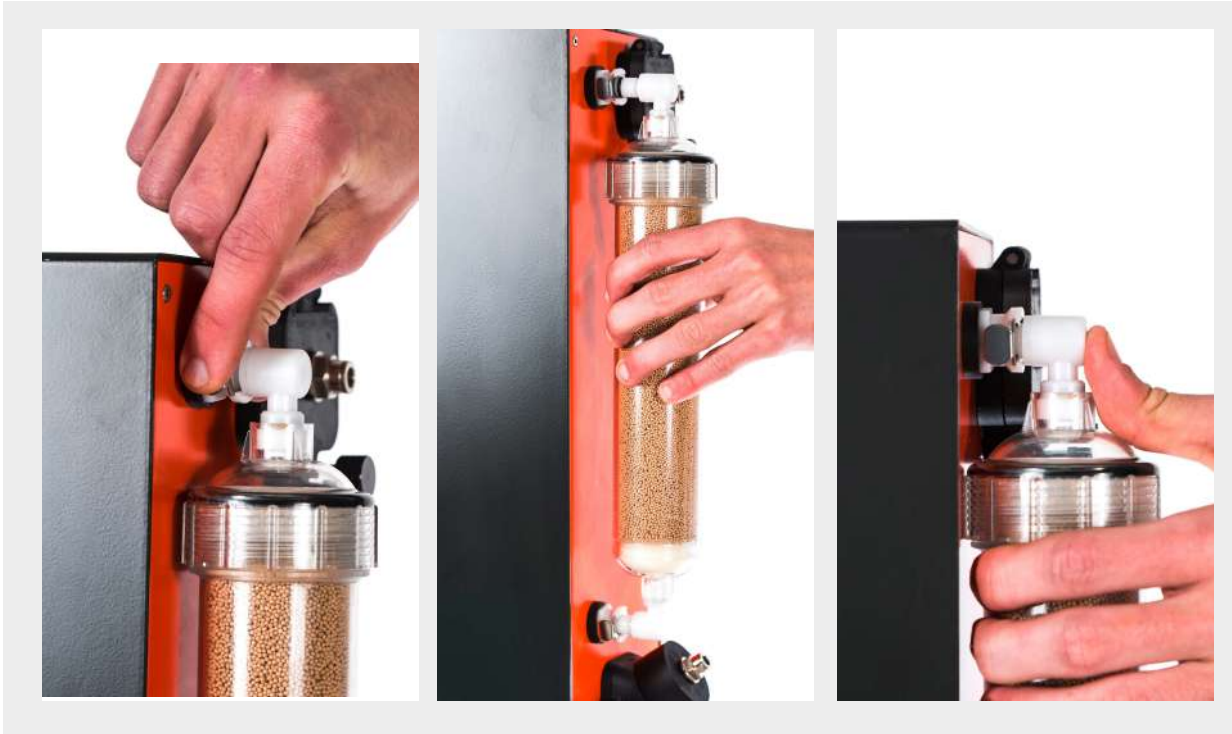
	INPUT	OUTPUT
<p>The o-rings play a vital role in the filament drying performance of the Drywise dryer device. Follow the steps to asses their state and replace them when prompted by the system:</p> <ol style="list-style-type: none">1. Remove any filament if such is present inside the device.2. Unscrew the thumbscrew and open the hinged part on the output or input port.3. Insert the provided tool in the filament ports and rotate anti-clockwise until the cap is loose.4. Remove the o-ring and replace it with a new one.5. Follow the previous steps in reverse to re-install the new o-rings.6. Repeat for the other port as well.	  	  

8.2. Replacing the desiccant

If the desiccant needs replacing the system will warn you. However for extra peace of mind you can replace the desiccant with freshly regenerated desiccant at any time apart from when the dryer is in operation.

To change the desiccant cartridge:

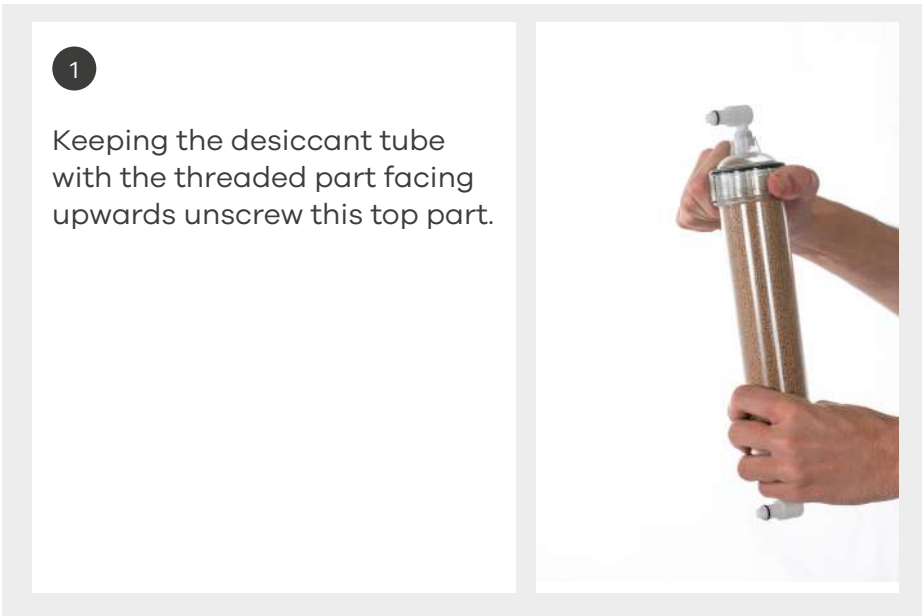
1. Locate the desiccant tube on the back of the device. There are two connectors, one at the top and one at the bottom of this tube.
2. Pinch the metallic part on the connectors until you hear them click.
3. Pull the desiccant tube out backwards.
4. Get the regenerated desiccant tube.
5. Place the connectors on the desiccant tube in the mating connector (the thread on the desiccant tube should be facing up) and push in until you hear a click. Make sure that both connectors have clicked in place.



You are done with the desiccant cartridge replacement and can proceed with normal drying operation.

8.3. Regenerating the desiccant

To regenerate the desiccant follow the changing desiccant procedure to remove the desiccant tube with the desiccant that needs to be regenerated. While handling the desiccant particles, avoid dust formation and avoid inhaling dust. Take care to avoid contact with the skin, eyes and clothing. Never ingest the desiccant. Always wear suitable protective clothing and gloves. Care should be taken not to get the desiccant particles damp or wet.



2

Remove the retainer plastic



3

Pour the desiccant material into an oven proof container.



4

Put the container in the oven at 240-280 °C for at least 4 hours.

5

Switch off the oven and let it cool down until safe to handle. **Take care not to leave the desiccant exposed to the environment as it will start re-absorbing moisture as it is cooling down.**

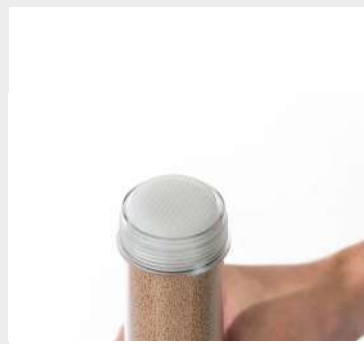
6

Take the container out and pour the desiccant into the tube provided with the Drywise dryer.



7


Put the plastic retainer back in place and close the container by screwing the cap portion securely. **When closing the desiccant container take care not to catch any beads in the thread.**



8.4. Loading filament


1

Shape the filament to a point using the provided tool or any tool of preference.



2

Feed the filament with the shaped tip first, into the dryer from the input port.

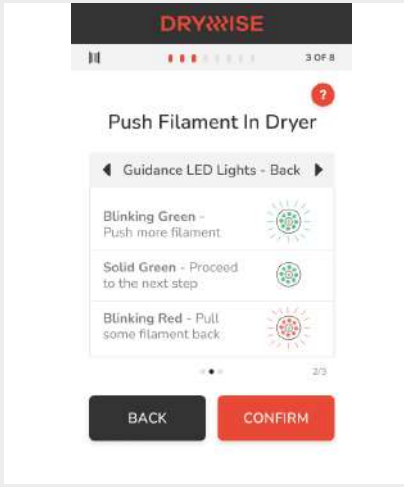


3

Push the filament in until the LEDs turn from blinking green to solid green. The filament should be visible at the output port.

4

If the LEDs turn blinking red, pull the filament backward until solid green.



9. Warranty

9.1. General

Thought3D Ltd grants a standard warranty on the Drywise dryer product ("Product") in the country where the product was purchased. From the date the product is sold and delivered to an end-customer for the first time, as evidenced by the original customer's purchase invoice, Thought3D Ltd warrants the product is free from defects in material, design and workmanship for a period of twenty four (24) months for countries inside the European Union and twelve (12) months for countries outside the European Countries.

Only the original purchaser is entitled to claim warranty and the warranty period is limited to his/her lifetime. For a warranty claim to be valid

- (i) notification must be made before the end of the warranty period,
- (ii) conform to any additional stipulations of the warranty, as defined below,
- (iii) must be substantiated with the original customer's purchase invoice,
- (iv) the serial number sticker must still be on the product(s) and
- (v) the product must be returned in the original packaging.

Since customers will only be entitled to make a warranty claim on submission of the original invoice and packaging, we advise that both the invoice and official packaging are kept in a safe place. If the original packaging is not available anymore, Thought3D Ltd reserves the right to accept or reject the return, or apply depreciation of the product.

The customer – provided that they are a natural person who is not acting in the course of their profession or business – may claim the rights to which they are entitled under the warranty without prejudice to their rights or claims in accordance with the law.

9.2. Conditions

The Thought3D Ltd warranty is granted under the explicit condition that:

- The Product was sold, delivered and assembled by Thought3D Ltd or a recognized Thought3D Ltd reseller.
- The Product was newly manufactured on the date of purchase and not sold as used, refurbished or manufacturing seconds.
- That the installation and maintenance instructions as described in the manual for the Product, provided by Thought3D Ltd, have been observed.
- If a part of the Product is repaired or replaced during the warranty period, the warranty period still remaining for the entire Product will apply to this part. However, repair and/or replacement will not extend the warranty period.

9.3. Notification

Thought3D Ltd deals with this warranty unless stated differently. Therefore, any notification on the basis of this warranty must be made to Thought3D Ltd.

Thought3D Ltd reserves the right to request additional information to assess the cause of the fault. Any warranty claim must first be recognized as justified. If so, Thought3D Ltd is obliged to rectify the defects free of charge according to this warranty.

If the defect cannot be repaired, Thought3D Ltd, within the warranty period, will replace the broken part or the Product free of charge with an identical Product, or, if the Product is no longer manufactured, by a similar replacement of the same value or offer an appropriate refund.

Depending on the country, the warranty may not automatically include costs incurred for shipping defective products for scrutiny and/or repair, nor for shipping costs of replacement or repaired product(s) back to the claimant.

9.4. Exclusions

The warranty does not apply to and therefore does not cover:

- Consumable components, such as the o-rings, filament sharpener, desiccant.
- Any defect or damage caused by inappropriate, incorrect or improper use, installation, maintenance, operation and cleaning or normal wear and tear. For correct use, reference is made to the appropriate sections of this user manual.
- Any other event, act, default or omission outside Thought3D Ltd's control
- Failure of the product caused by an accident

In any event, Thought3D Ltd is not liable for indirect or consequential damages, including but not limited to loss of use, loss of profit or revenue. Furthermore, Thought3D Ltd's liability is limited to the purchase value of the product.

9.5. Applicable law and competent court

This warranty is exclusively governed by Malta law. Any dispute arising out of or in connection with this warranty will be exclusively submitted to the jurisdiction of the court of Malta. Any dispute shall be held in English.

