

Pluslife Howto  
*Notes from a simple consumer who read all the manuals and the  
virus.sucks FAQ*

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This is for handy reference, for people who have a Pluslife machine, have read the manuals at least once, and who know what I'm talking about when I refer to the different components. I have simply collated all of the fiddly details into one place to refer to later as necessary, for confidence. So, the following is not really a great introduction to the way the machine works, but something to have to hand as you do your test, once you feel you generally have a grasp of how it all works.

## About the equipment:

(the scary cautionary facts up front)

- The covid/flu A&B test cards seem to have a shelf life of a year. They do fail after that, including popping false negatives, so use them up before the expiry date.
- The machine itself only has a service lifetime of two years. They don't explain what could go wrong after that. Perhaps malfunctions will become more likely, and the company won't consider themselves responsible for them.
- The machine indicates that it is in an error state by beeping simultaneously while the red power light is blinking. Press the power button for three seconds to shut it off and end the test, so you can try again.
- Don't swap out any of the cables. Use the ones that came with the device.
- Don't place the device in the sun or expose it to direct sunlight, especially during the test.
- The device is destroyed by condensation, so try to avoid extreme temperatures while operating it.
- You can pool test, but more than four people may result in a liquid that is too thick to pass through the test card's capillaries. If you do pool test, buy only flocked nylon swabs. Copan brand FLOQswabs have been extensively tested and are recommended. Other materials may interfere with the chemical reaction.
- There are no moving parts in the machine, so it is as fragile as any electronic device.

## About the test mechanism:

- A covid-only test card has a sensitivity of 400 copies of viral RNA per millilitre. A covid + influenza A&B test card has a sensitivity of 1000 copies per millilitre. Laboratory PCR tests require between 50–1000 copies per millilitre, so that's pretty good for a home machine! Meanwhile, rapid antigen tests require millions of copies. Very poor rapid antigen tests require tens of millions of copies. So, the Pluslife is way, way, waaaay better. This means that the Pluslife can actually detect covid before you are infectious. The flip side is: a positive result does not necessarily mean that you are still infectious, if you have been sick/testing positive for a while. All you can count on is that a negative result means you are pretty much definitely not presently infectious.
- These results are probably good for 12–24 hours, after which, if you were cooking up an infection before that was too low to detect, you may have grown enough virus to become detectable, or perhaps infectious. In extremely high risk situations, keep those intervals in mind, and re-test to refresh your confidence.
- False positives are very rare. All known cases were caused by air bubbles in the test card. If you are worried about a bubble causing a false positive, test again. If the second result is negative, you can trust it. If the second result is positive, you can trust that too (and I'm sorry).
- Blood, food, or too much mucous (if you're very snotty) can contaminate the sample and cause test errors.
- PCR/LAMP tests like this one use more parts of the virus to identify, so they are more robust to mutations and continue to work with Omicron variants.
- A repeatably negative Pluslife result is more conclusive than a positive rapid test. The reasons for false positives in rapid tests are still being investigated, but may be related to mucosal response to infection from other pathogens, and/or the presence of acids (e.g. from reflux). If you are in a situation where you're testing positive on rapid tests and negative on Pluslife, please contact hi at virus dot sucks — they would like to study this phenomenon further!

# Process:

1. Environmental conditions should be reasonably comfortable and moderate.
  - a. Clean.
  - b. Non-dusty.
  - c. At a comfortable temperature.
  - d. With a relative humidity below 70%.
  - e. With a flat surface that is elevated enough that you can bend comfortably to get to eye level to assess fluid levels.
  - f. Not close to any radio equipment.
  - g. Being in a moving vehicle is actually okay, as long as all other factors are accounted for.
2. Don't eat or drink for an hour before the test. Especially avoid anything acidic. Don't use nasal sprays for several hours before the test.
3. Wash your hands first, of course.
4. Plug the Pluslife into the wall or a battery, using a simple plug adapter if needed: the included power supply brick will work with almost any mains supply in the world (100-240V and 50-60Hz) and convert it to what the machine needs.
  - a. If you have one, you may want to consider using a high quality power bank for a more stable power source than the wall. Note that this will require a power bank that can supply at least 3 amps on a *USB-A* port.
  - b. The USB-C port cannot be used to power the device. It is only used to communicate data.
5. Once you start with the **Power On** step below, be ready to follow through with the procedure until the end. It will take around 30 minutes. You mustn't stop in the middle, because chemical reactions begin immediately and test results will be invalid if you wait too long.
  - a. The only part that could be stored in a sealed plastic bag in the fridge for a while, if absolutely necessary, is a swabbed sample. Once you put the swab in the buffer solution, though, things are already happening so you just have to keep up.
6. Power on the Pluslife by pressing the blue button. The power light will flash red, as it is warming up. A solid blue light indicates that it is ready to receive a test.
7. Open the virus.sucks app ([https://virus.sucks/pluslife\\_app/](https://virus.sucks/pluslife_app/)) in a Chromium-based browser (like Google Chrome) and connect to the Pluslife.
  - a. You can use USB or Bluetooth.
  - b. Keep the app in the foreground during the test or it will forget what it's doing. The machine will still work, though, and you can still read your results off of the lights on the machine, you just won't be able to see a complete graph at the end.
8. Assemble the following components:
  - a. the blue test card holder.
  - b. a swab.
  - c. a vial of nucleic acid releasing agent.
  - d. a blue vial cap.
  - e. a biohazard waste bag.



- The nucleic acid releasing agent is corrosive, so you mustn't let it contact your skin or eyes. If it gets on your skin, wash with water immediately. If it gets in your eyes, rinse generously and perhaps contact medical help.
- You may want to consider using disposable protective gloves and/or goggles, according to

your accessibility needs.



- It's good to prepare all the components in the list above because they will be used in tandem, but the actual test card should stay in its wrapping until you are ready to use it.
- The test components are light reactive, so proceed with the test forthwith as soon as you have unwrapped the components above.

9. Swab throat, cheeks, under the tongue, and nostrils.
10. Rotate the swab in the nucleic acid releasing agent ten times while pinching in the soft plastic of the vial to squeeze it around the tip of the swab.
11. Dispose of the swab in the biohazard waste bag.
12. Screw the blue cap securely onto the vial. The pointy end should be facing up and out.
13. Invert and gently flick the vial to mix the reagents.
14. Do not wait; immediately open a test card. Be careful not to touch the surface of the test chambers.
15. Place the test card in the blue card holder, carefully; it's not that well designed. Put the label facing away from you so you can see the level markings on the neck. Remove the white cap on the top.
16. Unscrew the mini-cap on the blue vial cap, and pinch the vial to slowly pour the solution into the test card until its level is between the level markings. The level will drop as the solution fills the test chambers; this is okay, you do not need to add more.
17. Carefully screw the white test card cap back on and tighten it until it is airtight.
18. Let the card rest for fifteen seconds.
19. Press the air button on the cap of the test card, to push solution into all the test chambers.
20. Wait another ten seconds.
21. Quickly shake the card up and down ten times in five seconds, but don't go overboard or you may create air bubbles.
22. Check for air bubbles. If there are large air bubbles, or if bubbles take up more than a third of the chamber, discard everything and start over.
23. Slide the test card into the machine and close the lid.
24. Click the 'start test' button on the virus.sucks app. The power button will begin to flash blue.



- Don't press the power button, open the lid, or pick up the machine while the test is running.
- If the power fails during the test, start over.

25. The virus.sucks app will generate a graph in real time. One channel is the control, testing for the human  $\beta$ -Actin gene. It's supposed to curve upwards at approximately ten minutes, so don't let that scare you. Congratulations, you're human!
26. Wait for your results!! wheeeee. Your results will be given by the lights on the machine: red 'positive' means positive, green 'negative' means negative, and if both positive and negative are lit, that means the test results are invalid.
  - a. The app allows you to see which test returned a positive, if you have a test card that tests for multiple things (e.g. covid / influenza A / influenza B). The graph is also useful for interpreting your results a little more granularly and identifying air bubbles and so on.
  - b. Positive results will return faster than negative results (positive results average 10–15 minutes, while negative samples need to wait the entire 30-minute duration), because once the DNA concentration reaches a detectable threshold, the machine has received its answer. The higher the viral load, the faster it will reach that threshold; conversely, a very low viral load may take the whole diagnostic time to reach its threshold to indicate its positive result (up to thirty minutes).
27. Remove the test card promptly, because it does not have an automatic shut-off and will continue to heat and

evaporate the solution within the machine. If you want to follow up with another test cartridge, press the power button to reset and prepare it to start a fresh test. If you're finished, turn it off by holding down the button for three seconds, or simply by unplugging the machine.

28. Put the used test card in the biohazard disposal bag and throw it out. It can go in household waste, it's not hazardous.
  - a. A positive test is absolutely chock-full of amplified DNA sequences, which are not infectious or harmful to anyone, but invisible and very hard to destroy once they contaminate a surface, or even a person — which would mean creating false positives forevermore, since the machine will re-amplify even the tiniest trace of it. So, please be extra careful when removing a test card that has returned a positive result. This may be a good time for disposable gloves.
  - b. You can test for contamination by swabbing surfaces with a damp swab but without including a human sample. If that returns a positive result, there may be contamination.
  - c. Never open the cap on a test card after the reaction.
  - d. DNA contamination is very rare; the virus.sucks team is not aware of any cases outside of laboratories. So, be vigilant, but also take heart and have courage :) If you have a case of contamination, reach out to them and they can help you.

Congratulations! You're a science wizard now.