

V2 Pen & Cartridge Guide



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V2 PENS..... 101

The V2 pen is an extremely popular choice for researchers of all types.

FIRST & FORMOST..... DO NOT test your skills or “practice” using your pen or cartridges with your research product!! It is much cheaper to sacrifice a cartridge or two than it is to blow an entire vial of product out the bottom of a cartridge. Trust me, it hurts! Water is cheap! Practice filling cartridges and loading your pen with water, I prefer a drop of food coloring to make things exciting!

There are actually 3 V2 pen models available.

- **V2.1 Reasearch Pen:** Generally features a durable metal construction with a standard clickable dose mechanism suitable for research settings. With improvements made to the V2 pens, I will be slowly discontinuing the V2.1 pen. Most of the V2.1 cartridge holders do not have the units marked on them. Personally, I don't use them anyway!
- **V2.2 Research Pen:** Introduces refined improvements, such as a more robust activation mechanism for better grip and smoother injection, enhancing the user experience over earlier models.
- **V2.3 Research Pen:** Even more refinements on the dial mechanism as well as larger numbers on the dial

There are little differences between the 3 pens outside of minor mechanical improvements and small cosmetic differences. It is important to note that the cartridge holders ARE NOT interchangeable. Colors can vary between the 3 models.



GETTING TO KNOW YOUR PEN



When disassembling your pen, PULL the cap off, DO NOT unscrew it. If you unscrew it, the cartridge holder/frame will remain inside of the cap and you will then message me to tell me that I forgot to send part of the pen!! If you do happen to unscrew it the first time because you didn't read this first, simply screw it back together and then pull the cap off. (New pens tend to have tight threads and may require a little extra pressure to reconnect.)

- Cartridge Requirements: All V2 Pens use 3ml cartridges. Pep Supplies Plus offers sterile 3ml cartridges in 2 styles; Standard & EZ Fill
- Care for your plunger: The plunger (lead screw) inside of the pen body can be gently pushed back into place. It is a corkscrew mechanism and needs to turn freely as it is being pushed in (allow it to spin underneath your finger while pushing in.) It is a fragile component, treat with care.
- **IMPORTANT:** The plunger will not advance out of the pen without a cartridge installed in the cartridge holder.

GETTING TO KNOW YOUR CARTRIDGES

STYLE

Be aware of the style cartridge that you are using.

A standard cartridge will blow product out of the bottom without a vent needle!!



An EZ Fill Cartridge will not fill with a vent needle!

STANDARD CARTRIDGE NEEDS VENT NEEDLE

EZ FILL DOES NOT REQUIRE VENT NEEDLE

STERILITY

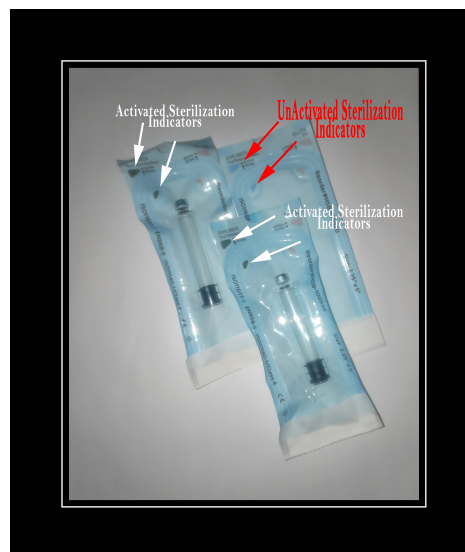
PEP Supply Plus Cartridges are autoclaved in a Tuttnauer 1730 Class S Autoclave. This model is known in the medical field to be an old work horse, providing years of successful sterilization by Doctors and Dentists around the globe.

We run a cycle of 25 minutes at 273 degrees Fahrenheit, with a minimum of 15psi, followed by a 25 minute dry time. These times and temperatures exceed CDC recommendations.

Spore testing is performed on this autoclave on a regular basis, and most recent results will be posted on the site.

A Few Sterilization Facts:

- Sterilization pouches have indicators that verify that the item has been sterilized by Steam (Autoclave) or Chemical Sterilization. The indicators will change color when activated
- Pouches state what the activated color will be.
- The “Golden Standard” for sterilizing medical and dental equipment is by way of steam sterilization in an Autoclave.
- Cartridges in inactivated pouches HAVE NOT been sterilized in an Autoclave. 90% of cartridges sold today come packaged in inactivated pouches.
- Many cartridges are stated to have been sterilized by UV light. UV Light can not penetrate most glass, so unless a light was placed inside of each cartridge, sterilization is questionable. “UV light only disinfects surfaces that the light can directly touch, meaning shadows or deep crevices in bottles may not be fully sterilized.”
- If a cartridge is sterilized in an autoclave with it’s stopper in place, the inside of the cartridge has NOT been sterilized (the steam needs to contact ALL surfaces in order to sterilize / the steam can not get through a stopper) Also, air in said cartridge will likely cause the stopper to “pop” out of the cartridge due to pressure in the autoclave.
- PEP Supplies Plus STANDARD cartridges are sterilized in an autoclave without the stopper in place. A sterile stopper is then inserted into the cartridge in a sterile field.
- PEP Supplies Plus EZ Fill cartridges are first sterilized empty to ensure complete sterilization of the entire inside of the cartridge. A sterile stopper is inserted all of the way into the cartridge removing air, assembly completed and cartridge is sterilized a second time in an Autoclave.



Filling the Standard Cartridge

Prepare and mix your solution and draw into the syringe (no larger than 3ml.) Remove air and bubbles from the syringe. It is not necessary, but I recommend replacing the needle that was used to mix and draw up your peps. Set this syringe aside while prepping the cartridge.

*The goal here is to provide an escape for the air that is in the cartridge. You notice that the stopper is at the bottom of the cartridge.... Which indicates that there is air between the stopper and the top. If you were to try to push your liquid into this cartridge as it sits, the pressure from the syringe would blow the stopper out of the bottom of the cartridge.... along with any liquid you had in the syringe. A stopper blow out is devastating! This stuff isn't cheap, and trust me, if you make that mistake once... you will never make it again! The air in the cartridge must be displaced in order to introduce liquid into the cartridge. We do this by **venting** the cartridge.*

- Remove the new cartridge from its sterile package. Wipe the injection port (top of the cartridge) with an alcohol pad.
- Insert a **new, sterile** small gauge needle (28-30 is fine) into the injection port on the top of the cartridge. You can also use an insulin syringe with the plunger removed. *(I try to put my vent needles off to the side a little so I can put my syringe needle into the center.)* You want to be able to see that this needle has gone completely through the self healing rubber and into the cartridge.
- Leaving the vent needle in the cartridge, insert your solution filled syringe into the injection port of the cartridge.
- Inject the liquid slowly into the cartridge. You can sometimes hear the air escaping from the vent. ***Remember... no more than 3ml of solution in the cartridge!!*** Once your cartridge has been filled, you can remove the vent needle. If you choose to purge air from the cartridge at this time, simply pull back lightly of the plunger of the syringe. You will see the stopper rise as the air is drawn out of the cartridge into the syringe. Some people prefer to purge air when they place the cartridge into the pen for use.



Filling the EZ Fill Cartridge

The EZ Fill Cartridge was designed to simplify filling of the cartridge by eliminating the need for a venting needle and reducing the risk of stopper blowouts.

Do not remove the EZ Fill Cartridge completely from its sterile packaging.

Instead, peel the packaging open from the top, exposing the top only and leaving the open portion of the cartridge with the stopper inside of the packaging while filling. You can also push the top of the cartridge through the sterilization pouch just enough to expose the injection port. This ensures that the sterility of the inside of the vial is not compromised during the filling process.

- Follow all of the same prep steps that you would for filling any cartridge, including alcohol swabbing any surface that a needle will be injected into.
- Prepare and mix your solution and draw into the syringe. Make sure the air and bubbles have been removed from the syringe, as any trapped air can create pressure inside of the cartridge.
- Carefully insert the needle into the self-sealing top of the cartridge. Be sure to place the needle in between the top and stopper of the cartridge, making sure to avoid pushing the needle into the stopper.
- Apply pressure to the syringe to begin injecting the solution into the cartridge. You will feel a little bit of resistance, but continue to apply steady pressure and the stopper will begin to move down the cartridge. Continue injecting the solution at a slow and steady rate. *Monitor the stopper during filling, especially if you are placing a full 3ml volume in the cartridge. Do not push the stopper past the bottom edge of the vial!!*
- If you do end up with any air in the cartridge, you can simply pull your needle back a little and withdraw the air back into your syringe.

After a few times using the EZ Fill Cartridge, you will get a feel for just how much pressure it takes to release the stopper!



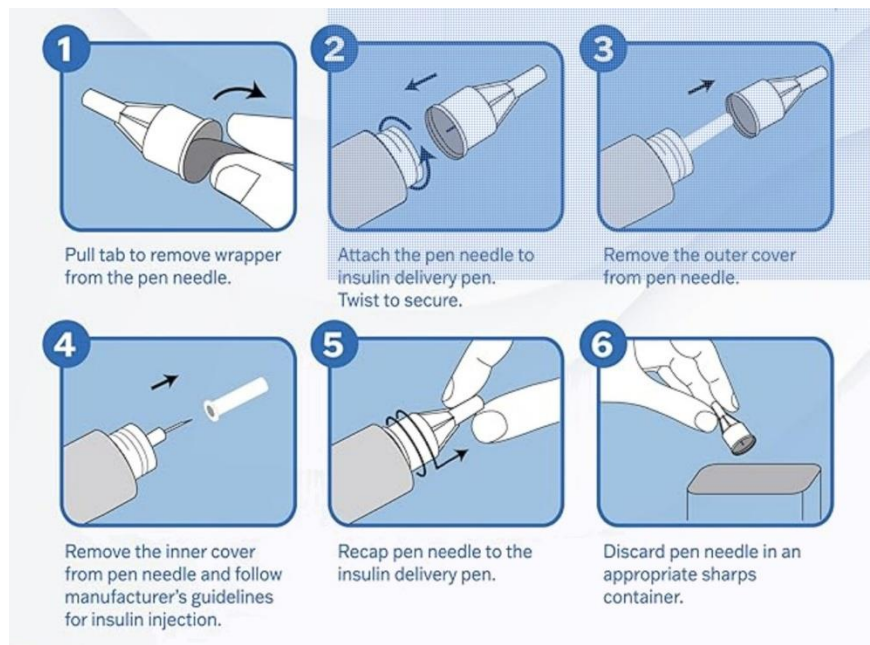
LOADING CARTRIDGES & PRIMING THE PEN

- Disassemble the pen by pulling the cap off of the pen body. (Do Not Unscrew)
- After cap has been removed, unscrew the clear cartridge holder from the pen body.
- Push the black plunger all the way up inside of the pen body if it is sticking out at all. Be gentle and remember this is a corkscrew mechanism, so allow it to turn under your finger, or it will bend and break.
- Insert the prepared cartridge into cartridge holder and screw it back on to the pen body. Remember... the threads may be tight early on!
- Screw on a pen tip needle and REMOVE ALL COVERS and guards so the needle is exposed. While holding the pen with needle facing up, gently “flick” the cartridge holder to get any air to float up to the tip of the cartridge.
- Turn the dial on the pen 3- 5 clicks (keep the pen pointed upwards,) press the bottom end of the pen (injection push button.) This engages the plunger and moves the stopper up into the cartridge. Repeat this (turning dial and pushing.) As you repeat, you are pushing up the plunger to meet the cartridge stopper and then you will be pushing the air out of the cartridge. With the standard cartridge you may meet resistance when the plunger reaches the stopper. You may have to increase pressure just a little to break the stopper free from the bottom of the cartridge .
- Continue turning the dial and pushing upward until the air is removed from cartridge. You will see droplets of fluid at the end of the needle.
- REMEMBER: the plunger will not activate or move without a cartridge in the holder. If you turn the dial and push before inserting a cartridge, the unit will appear to be defective. It requires resistance to actuate.
- Store your loaded pen in the refrigerator until used.

PEN NEEDLES



- Research pens require disposable needles that typically range from 4mm to 12mm length with varying gauges (thickness) from 29g to 32g. Gauges can be a bit tricky, as the larger gauges are thinner than the smaller gauges. Example: a 29g needle is thinner than a 32g. A thicker gauge needle would be used for thicker fluids. A thicker gauge needle would inject water-like fluids faster than a thinner gauge. We also need to remember that a thinner gauge needle is more fragile and easier to bend. Generally, for research purposes, 30g & 31g are the most common.
- When it comes to length, generally 6-8mm is sufficient.
- One thing to consider is the unique feature of the V2 pen.... the “Inject-thru” feature. It allows you to prep and place the needle on the pen and replace the cap prior to injecting. This “hides” the needle itself from view. It is recommended to use a 5mm or longer needle if using this feature. Also note that you may be able to see a very small tip of the needle sticking out from the end of the cap after it is placed back on the pen.
- Pen needles are sterile and only recommended for 1 time usage. It is not recommended to keep a needle on the pen while not in use. Dispose of sharps properly.



A FEW NOTES TO FINISH UP

UNDER CONSTRUCTION