

Compresstome[®] VF-700-0Z User Manual



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INTRODUCTION

Congratulations on your purchase of a Compresstome[®] VF-700-0Z from Precisionary Instruments! The Compresstome[®] VF-700-0Z microtome is specially designed for cutting fixed tissue slices for histology studies. The most significant feature of the VF-700-0Z microtome is the structure of the cutting stage, which offers two-point stabilization of the blade holder. These designs eliminate unwanted chatter marks on the surfaces of tissue slice, producing smooth, even, and consistent slices.

The VF-700-0Z is fully automated to section fixed tissues with a thickness range of 4 μ m to 2000 μ m with an adjustable precision of 1 μ m.

The Compresstome[®] VF-700-0Z excels at sectioning slices used for:

- Immunohistochemistry
- In-situ hybridization
- And much more!

At Precisionary Instruments, we are thrilled to help you get started with your new vibrating microtome, and we take great pride in quality customer service. Please read the following manual to help you get started with the Compresstome[®] VF-700-0Z.

CONTACT US

We have multiple ways for you to contact us:

Website: www.precisionary.com

E-mail: info@precisionary.com

Phone:

Customer Service & Quotes: (617) 682-0586

Technical Support: (508) 810-0111

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Mailing address for documents:

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Natick, MA 01760

Mailing address for slicers/parts:

Precisionary Instruments
2340 Dovedale Drive, Unit B
Greenville, NC 27834

ANATOMY OF THE COMPRESSTOME® VF-700-0Z

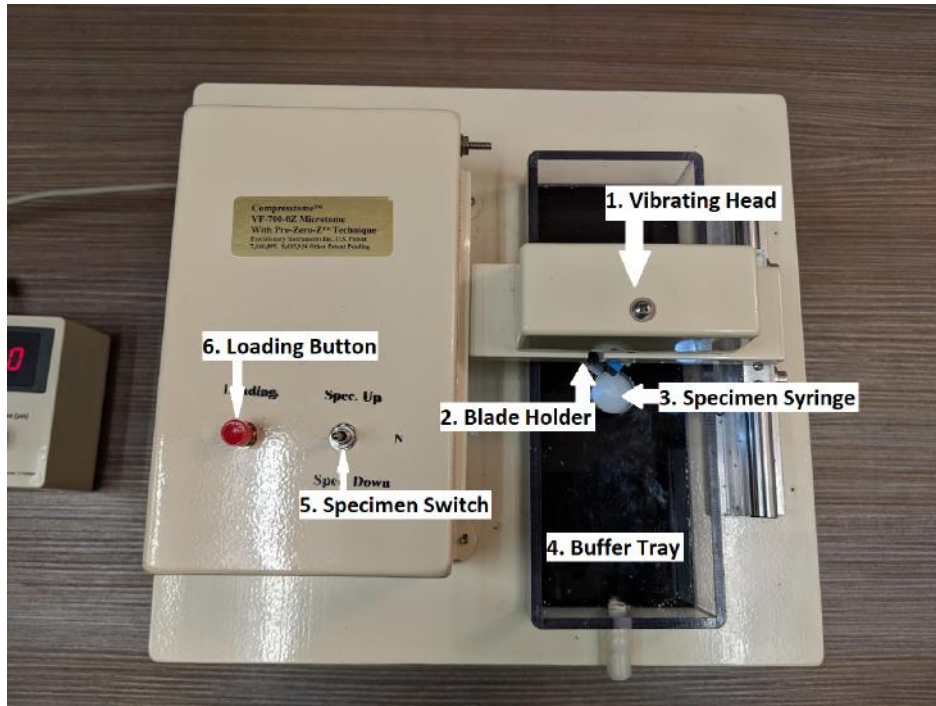


Figure 1: The VF-700-0Z Vibrating Blade Microtome



Figure 2: The VF-700-0Z Control unit

LIST OF VF-700-0Z COMPONENTS

All of our Compresstome[®] parts can be ordered online at:

<http://precisionary.com/e-store/>

As shown in the **Figure 1** above, the VF-700-0Z microtome is composed of the following components:

Figure Number	Compresstome [®] Part	Function
1	Vibrating Head	Motorized assembly that drives the blade forward and back. Houses the blade's oscillation functions
2	Blade Holder	Removable blade holder for attaching and replacing cutting blades
3	Specimen Syringe	Stainless steel tube for holding embedded tissue samples for sectioning.
4	Buffer Tray	Made of polycarbonate, this is where you will pour your buffer solution during sectioning
5	Specimen Switch	Controls the movement of the white plunger inside the specimen tube up or down in order to glue and embed the tissue. Should be in neutral position during cutting.
6	Loading Button	Manually moves the cutting stage all the way back and away from the specimen tube to enable loading of the tube.

The VF-700-0Z control box is shown in **Figure 2**. The followings are sockets, switches, knobs and their functions:

Figure Number	Compresstome [®] Part	Function
1	DC Power Socket	Connect DC power adapter to this socket
2	Control Cable	Connect the VF-700-0Z control cable to this socket
3	Power Switch	Turns the machine on/off
4	Mode Switch	Select operating mode between single slice cutting mode and continuous slice cutting mode.
5	Thickness Adjustment	Select slice thickness.
6	Thickness Indicator	Indicates slice thickness in micrometers (μm).
7	Advance	Adjust cutting speed of the machine.
8	Oscillation	Adjust oscillation frequency of the cutting blade.
9	Start Button	Initiates the cutting process.
10	Stop Button	Stop the cutting process only when the machine is in the single cutting mode. Turning off the power switch can stop the machine in any mode.

LIST OF STARTER KIT COMPONENTS

All of our Compresstome[®] consumables can be ordered online at:

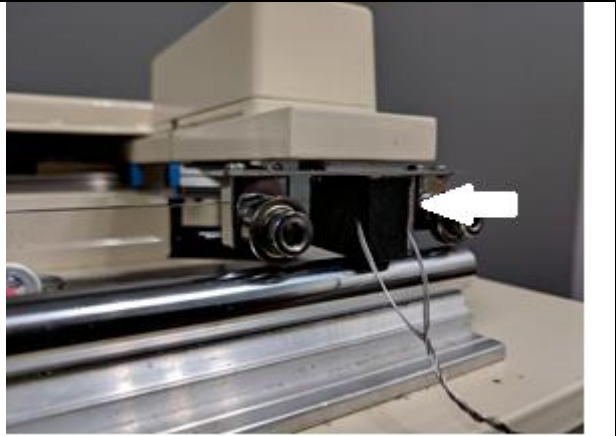
<http://precisionary.com/e-store/>

Contact us directly at info@precisionary.com, and we will sent you a quote.

Consumable	Part Number	Application and Advantages
Agarose Tablets	VF-AGT-VM-10	The Starter Kit comes with 10 agarose tablets. This is low melting agarose for embedding the tissue.
Ceramic Blades	VF-BL-VM-CB	Included are 2 extra ceramic blades. The VF-700-0Z only uses ceramic cutting blades.
Pipettes	—	Plastic disposable pipettes are included for easy transfer of agarose into the specimen tubes for embedding.
Glue	VF-VM-GLUE	Used for securing tissue specimens to the specimen tube.
Forceps	—	Small forceps for easy manual manipulation of tissue sample.
Machine Oil	VF-VM-Oil	Clear, colorless, and environmentally friendly machine oil for maintenance. Recommended use: 1X/week apply to all moving and oscillating parts of tissue slicer, then run machine for 5-10 minutes continuously to ensure thorough application.

SETTING UP THE COMPRESSTOME[®] SLICER:

Remove the transportation fixture to allow the vibrating head to be free to move.

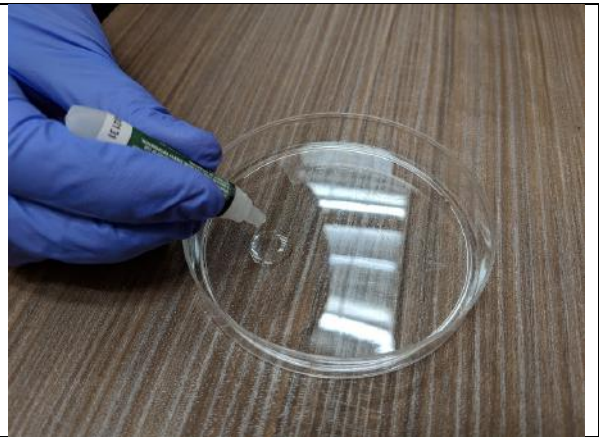


OPERATION OF THE COMPRESSTOME[®]

MOUNTING THE CUTTING BLADE TO THE BLADE HOLDER

For ceramic blades, remove one of the blades carefully from the pack.

Squeeze a small amount of super glue onto a petri dish or other solid surface.



Pipette 5 μ L of the super glue onto the blade holder.



Position the cutting blade onto the blade holder.

CAUTION! Make sure that you do not touch the blade edge!

Allow the glue to dry for up to 3 minutes before use.

Make sure there is no glue on blade to avoid tissue sticking to the blade.



After the glue dries, you are ready to use the blade holder and blade for sectioning.

Remember: The blade holder needs to be cleaned with acetone between each blade change, so that the glue residue does not build up. You can use an acetone swab, or a paper towel dipped in acetone.

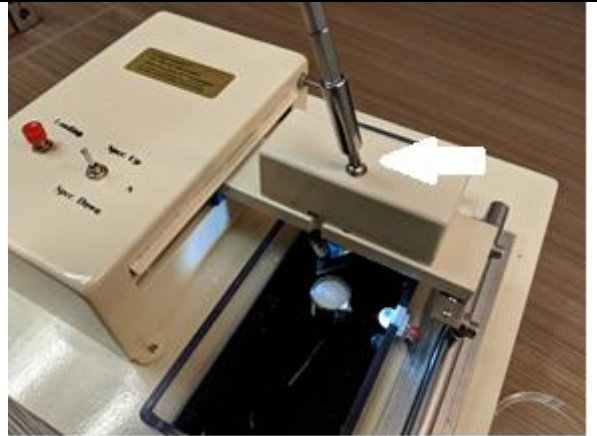


CHANGING THE CUTTING BLADE

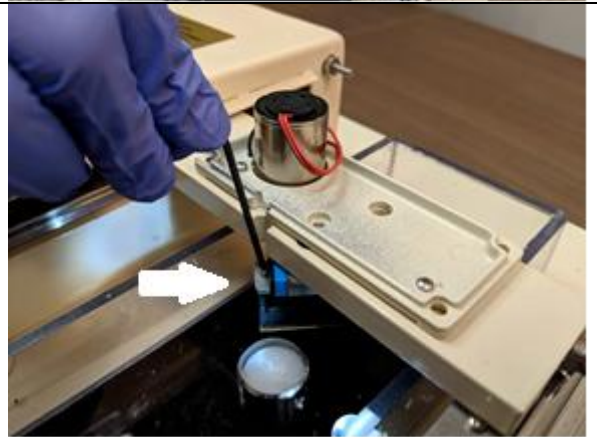
The sharpness of the blade can directly affect the quality of the slices. Ceramic blades typically last 2-3 months depending on the degree of usage. The VF-700-0Z only uses ceramic blades, and thus we include two (2) of these blades to help you get started in your Starter Kit. The blades should be cleaned with acetone and ethanol before use.

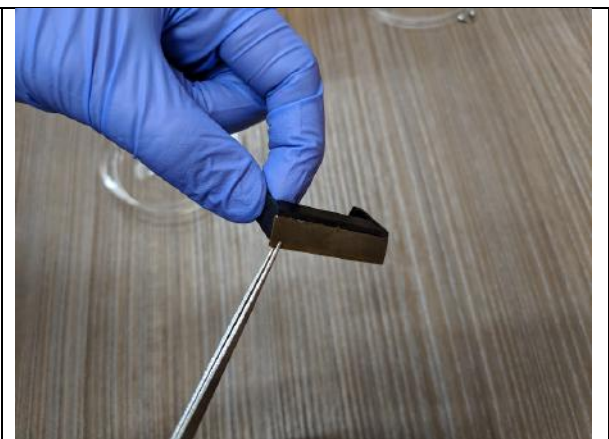

Follow these instructions on changing blades for the VF-700-0Z.

Remove the metal cover that houses the vibrating motor and provides access to the screws holding the blade holder in place.




To remove the blade holder from the sliding cutting stage assembly, loosen the two small screws with a small Allen wrench accessed from above, and remove the blade holder from the vibrating head.

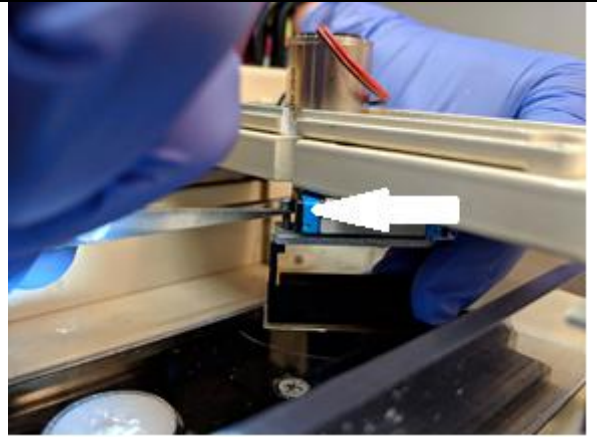


<p>Remove the old cutting blade and dispose of it safely into a sharps container.</p>	
<p>Using an acetone swab, or a paper towel dipped in acetone, rub off any residual glue remaining on the blade-holder.</p> <p>DISCLAIMER – Please only use acetone to clean the blade holder and specimen tube. The buffer tray is not made of Acetone safe materials.</p>	
<p>Follow the instructions under “Mounting the Cutting Blade onto the Blade Holder” to install a new cutting blade.</p>	<p>See page 8.</p>

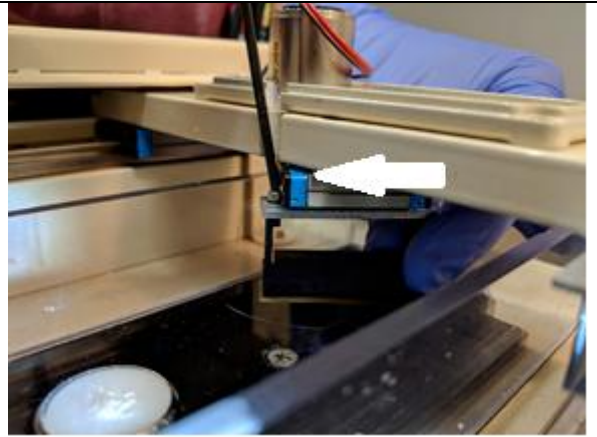
RE-ATTACHING THE BLADE HOLDER FOR SECTIONING

<p>By hand, visually align the screw holes of the blade holder with the holes on the cutting stage</p>	
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While holding the blade holder in place, re-insert the screws into their 2 respective holes. This process can be made easier by using a pair of small forceps (included in starter kit) to place the screws into the holes from the side.



Using the small Allen wrench, tighten the screws until the blade holder is completely secure. No part of the blade holder should be loose.



PREPARING THE AGAROSE FOR EMBEDDING:

We recommend using agarose type-Ib, or low melting point agarose. All tissue specimens should be embedded in agarose. Type-Ib agarose powder can also be purchased through Sigma Aldrich at:

<http://www.sigmaaldrich.com/catalog/product/sial/a0576?lang=en®ion=US>

The following procedure assumes you are using a 0.5 mg agarose tablet. This table summarizes the buffer volumes to use for agarose tablets. We recommend using a 2.0% or 2.5% agarose solution.

Agarose Tablet Chart			
Solution volume needed to achieve % agarose (mL)			
Agarose %	1 tablet	2 tablets	3 tablets
1.5%	33	67	100
1.8%	28	56	83
2.0%	25	50	75
2.2%	23	45	68
2.5%	20	40	60
3.0%	17	33	50
3.2%	16	31	47
3.5%	14	29	43

Each tablet contains is 0.5 mg of agarose. Depending on the gel strength you want for slicing, you can add the appropriate amount of water or buffer solution to the glass vial. We recommend adding 20-25 mL of solution to each glass vial containing 1 agarose tablet.



Dissolve the agarose tablet for 2 minutes by swirling the glass vial.

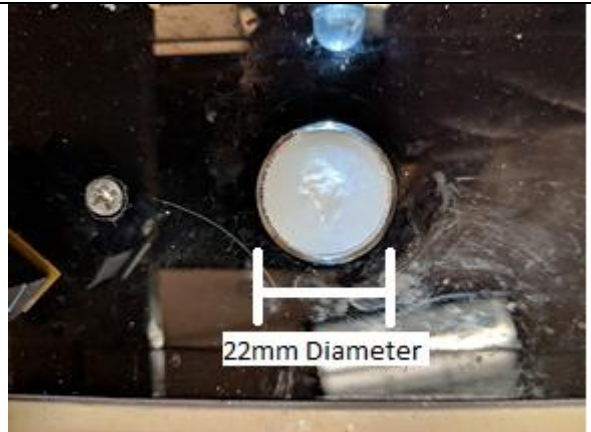


Heat the agarose as you normally would, which can be done in a microwave. Microwave the agarose solution for 10 seconds, then shake to mix it up, and repeat until the agarose solution has become clear. Heating the solution in 10 second runs helps prevent the solution from overflowing. You may see a lot of bubbles in the solution, which is normal. Then allow it to cool for 5 minutes on a 32 °C bath.

1. We recommend using agarose that has a low transition temperature, which means that the agarose will remain in a “liquid-like” state without congealing at low temperatures. This way, keeping melted agarose in a warm water bath will allow you to have ready-made agarose when sectioning several different specimens.
2. Advantages of using our Compresstome[®] agarose preparation:
 - a. Eliminates weighing agarose for individual experiments
 - b. Agarose tablets are fast dissolving in just 2 minutes
 - c. Environmentally friendly with no organic solvents that could harm tissues
 - d. Produces consistent, reproducible gels that are clear

EMBEDDING TISSUE SAMPLES IN AGAROSE:

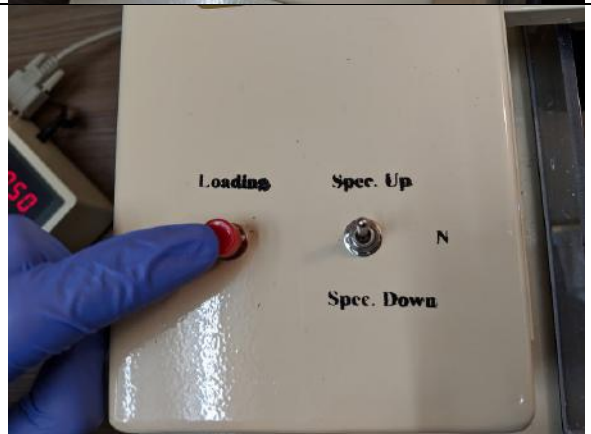
Prepare your tissue sample by cutting it so that the tissue fits inside the specimen tube.



Use the “Spec. Up” switch to advance the specimen tube all the way to the top.



Use the Loading button to move vibrating head up and away from the specimen tube giving you room to work on mounting the tissue.



Squeeze a small amount of super glue (~5 μ L) onto the specimen tube base.



Using forceps, position the tissue onto the specimen tube base and glue your tissue to the base.



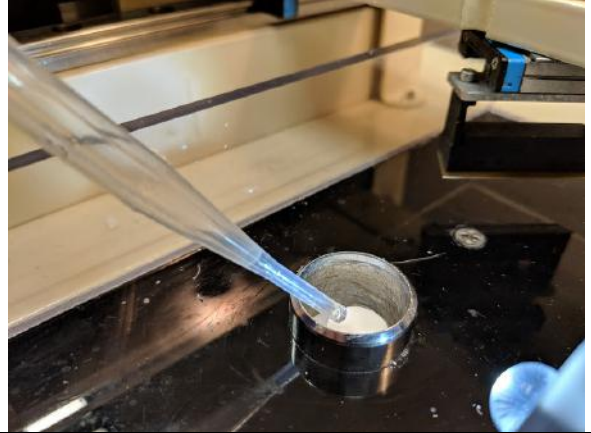
Withdraw the syringe tube downwards so that the tissue sample enters the tube by using the Spec. down switch until the tissue sample is entirely inside the specimen tube.

***We recommend leaving some additional space above the tissue for extra agarose so that you can calibrate without wasting tissue. (calibration described on pg. 17)**



Pipette enough agarose into the specimen tube to fully cover the tissue sample. Visually inspect the agarose and remove air bubbles with a pipette as best you can.


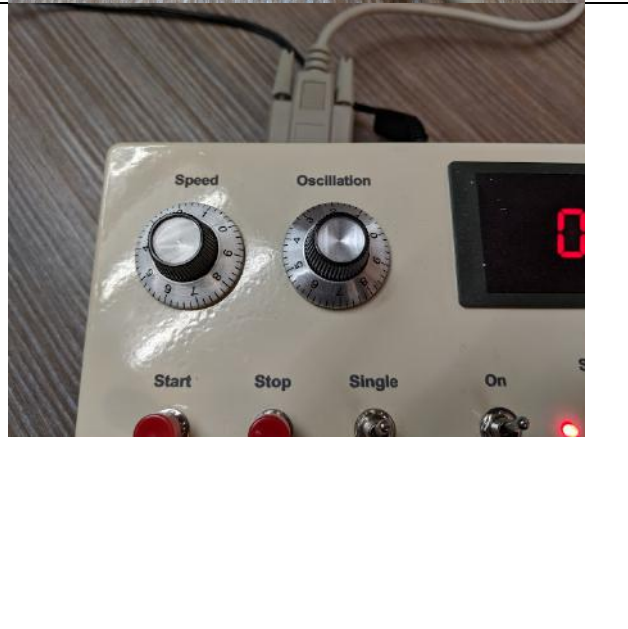
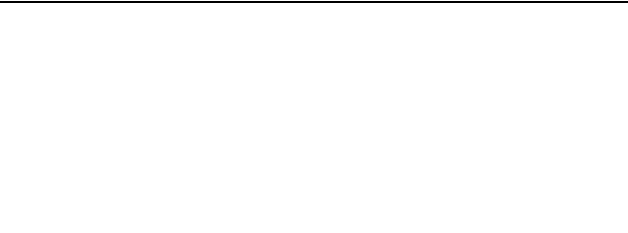
*We recommend adding additional agarose above the tissue so that you aren't wasting tissue for during initial thickness adjustment described on Pg. 17



If you want to accelerate the process of the agarose forming a gel, you can pour some chilled buffer solution into the buffer tray (up to the level of the specimen tube, but make sure that no buffer solution mixes with the agarose solution while it is solidifying). Or, place some ice cubes along with buffer solution into the buffer tray.

Once your tissue is embedded into agarose, you are ready for sectioning with the Compressome[®] slicer!

SECTIONING WITH THE COMPRESSTOME[®] SLICER:

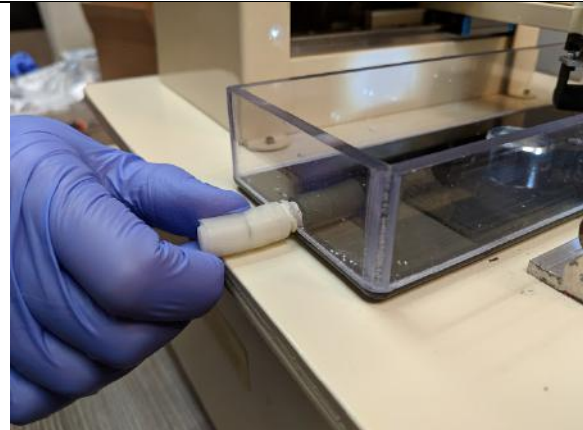
<p>Connect the supplied power cable to the control box and the control box to the VF-700-0Z microtome. Make sure the connections are good by tightening both screws on the connector or the machine will not work properly. Turn the power on.</p>	
<p>Adjust desired sectioning speed and oscillation frequency based on guidelines and experience.</p> <p>Do not set the control box immediately to your desired thickness. To best create slices with consistent thickness and accuracy, start sectioning ~30-50 microns higher than desired thickness. Section continuously while reducing the thickness in smaller and smaller increments.</p> <p>*EXAMPLE: My desired thickness is a 10 μm thick slice so I will cut 40 μm > 30 μm > 25 μm > 20 μm > 15 μm > 12 μm > 10 μm.</p>	
<p>Continue cutting with the Compresstome[®] slicer. You can adjust the slice thickness, sectioning speed, and frequency of oscillation to best suite your experimental needs.</p>	

CLEANING UP THE COMPRESSTOME® VF-700-0Z:

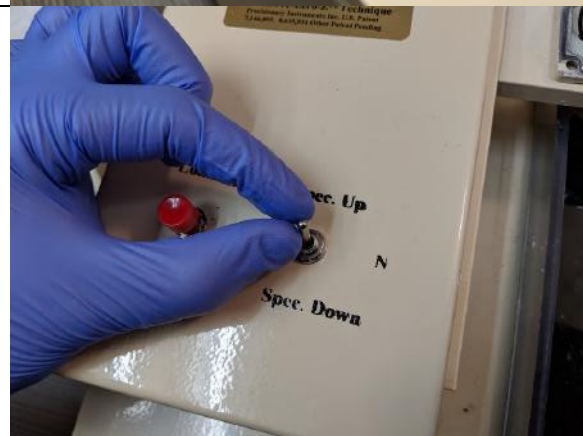
Empty buffer from the buffer tank by removing the plug and draining the tank.

We recommend using 70% Ethanol or 10% bleach solutions to clean the Buffer Tray.

DISCLAIMER – Please only use acetone to clean the blade holder and specimen tube. The buffer tray is not made of Acetone safe materials.



Advance the specimen up all the way using the “Spec. Up” controls.

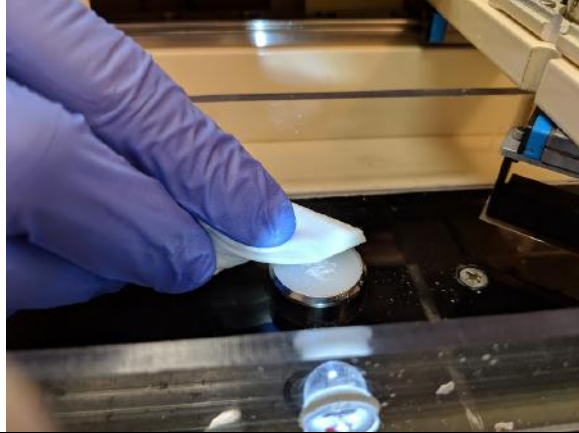


Remove any remaining tissue sample from the specimen tube.

*We recommend using a sharp-edged blade to scrape off any remaining tissue or glue residue.

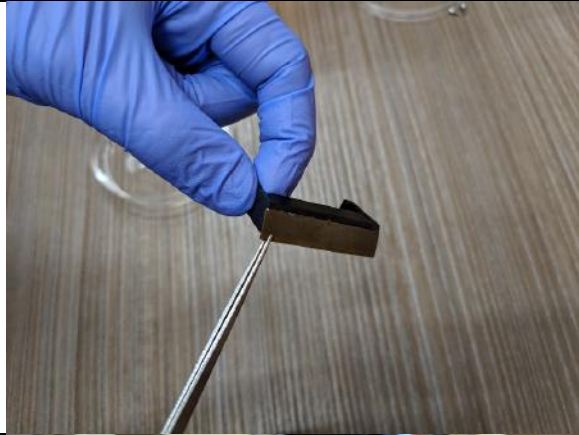


Clean up any debris on the plunger and inside of the syringe tube with acetone swabs or soft brush.



Remove ceramic blade from blade holder.

*Ceramic blades can last 1-3 months depending on usage, so you do not need to do this step too often.



Clean up the residual glue on the blade holder with acetone swabs.

*It is Important to ensure the surface is clean before placing a new blade onto it. Built up glue residue can cause the blade to sit unevenly and thus can become a source of error for poor slicing quality.

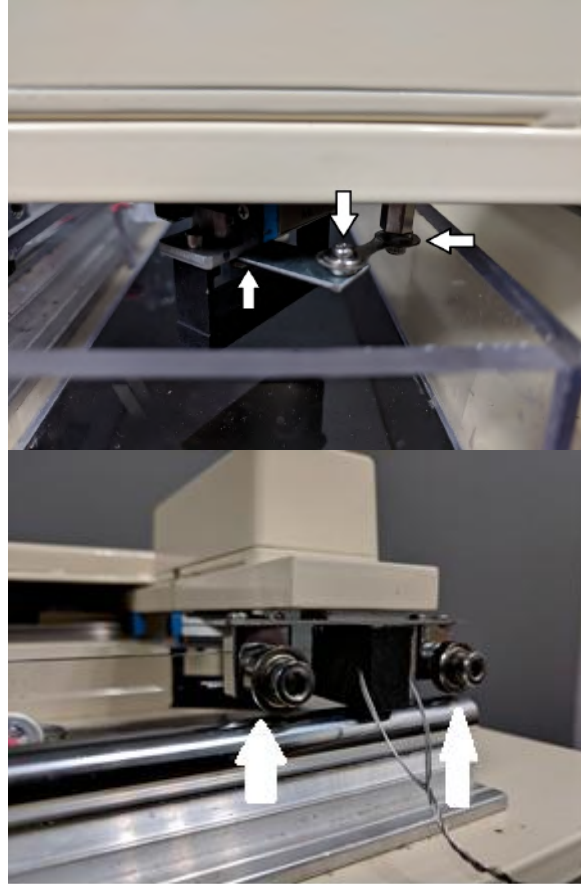
DISCLAIMER – Please only use acetone to clean the blade holder and specimen tube. The buffer tray is not made of Acetone safe materials.



Using a soft brush, spread a small amount of machine oil on any moving parts of the vibrating head (pictured right).

Also spread a small amount of oil on the wheels that slide along the bar to the side of the buffer tray.

***NOTE: This should be done every 1-2 weeks.**



THE AUTO ZERO-Z[®] TECHNOLOGY

Auto Zero-Z[®] is our latest breakthrough technology at Precisionary Instruments. This is a patented feature designed to allow the blade holder to operate in near zero Z-axis deflection without the need to optically align every single time.

Before arriving to your lab, the Compressstome[®] slicer is precisely aligned in the factory to work in the optimal condition (zero ΔZ). Please ensure that you follow the special instructions for blade mounting to ensure that Auto Zero-Z[®] works every time you slice.

The advantages of the Auto Zero-Z[®] combined with Compressstome[®] techniques are:

- Healthier slices and better surface structure preservation.
- Thinner minimum slice thickness. By combining the Auto Zero-Z[®] and Compressstome[®] technology it is now possible to achieve an unprecedented fixed brain slice thickness of 4 μm without paraffin embedding or freezing.

- No vibration marks on the fixed brain slices. The result is a very smooth and flat slice surface which is optimal for histological processing.
- No optical alignment device is required for zero-Z operation.
- No blade alignment procedure is required when changing to a new blade.

TROUBLESHOOTING

- Avoid trapping any air bubbles in the agarose during embedding.
- Glue residue on the blade holder will misalign the blade and deteriorate the slice quality.

WARRANTY

There is a one (1) year warranty for the VF-700-0Z microtome. Additional years of warranty are available for purchase. All demos for Compresstome® slicers and consumables are considered to last 30 days from date of delivery (arrival). Consumables and accessories are non-returnable after any use. Delivery is considered to be completed when items arrive to the customer. Acceptance of items is deemed complete after 7 days of delivery (arrival), with no further signature required.

CONTACT INFORMATION

Additional questions? Want some assistance?

We have multiple ways for you to contact us, including:

Website: www.Precisionary.com

E-mail: info@precisionary.com

Phone:

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