

Fischione Model 1020 Plasma Cleaner

Standard Operating Procedure

Revision: 1.0 — Last Updated: Mar. 20/2015, Revised by Xin Zhang

Overview

This document will provide a detailed operation procedure of the Fischione Model 1020 Plasma Cleaner. Formal Training is required for all users prior to using the system.

Revision History

#	Revised by:	Date	Modification
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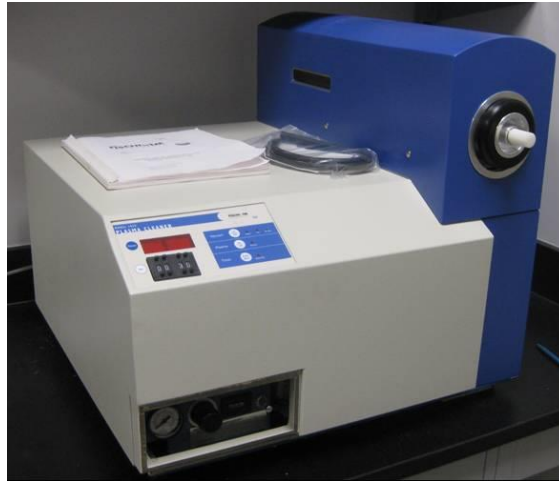
Document No. 4DSOP1020



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General Information



The Fischione Model 1020 Plasma Cleaner is designed to clean transmission and scanning electron microscope specimens and specimen holders, in a gentle O₂(25%)/Ar(75%) plasma environment. The purposes of this cleaning are:

- Enhance imaging and analytical results
- Remove existing carbonaceous contamination
- Prevent carbonaceous contamination during electron beam exposure

Within a reasonably selected cleaning time, i.e. < 60 s, the plasma cleaning should produce NO etching or sputtering of the specimen while achieving the cleaning purposes.

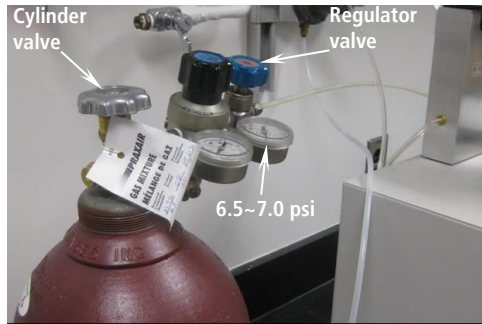
The Fischione Model 1020 Plasma Cleaner can be also used to obtain vacuum for the Model 9010 Vacuum Storage Container, to keep a TEM specimen holder in clean vacuum.



Operation

Cleaning a TEM/SEM sample

1. Open the valve on the O₂(25%)/Ar(75%) cylinder and the valve on the regulator.



2. Turn on the power of the plasma cleaner.
 - The switch is on the backside lower-right corner.
 - The plasma cleaner comes on line with venting by default. The **Vacuum Vent** indicator will be on (red).



3. **Wear gloves!!!** After 15-30 s venting, carefully remove the chamber sealing plug and place your TEM specimen holder in the chamber.

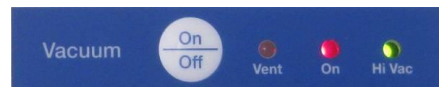


- For SEM sample cleaning, a custom-made sample carrier needs to be used. Users need to discuss with the tool owner regarding what SEM samples are allowed to clean with this tool.

4. Press the **Vacuum On/Off** button to start pumping the chamber.
 - The **Vacuum Vent** indicator will be off. The **Vacuum On** indicator will be on (red).



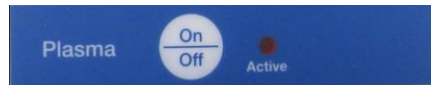
- In a few minutes, the **Vacuum Hi Vac** indicator will be on (green). The chamber is ready for plasma cleaning.



5. Excite plasma to clean the sample.

Manual timing

Have a timer in hand. Press the **Plasma On/Off** button to start plasma. The **Plasma Active** indicator will be on (red). Count your time to a desired value (30-45 s for cleaning a TEM holder or sample) and then press the **Plasma On/Off** button again to stop plasma.



Automatic timing

- a. If the **Timer Auto On** indicator is off, press the **Timer Auto/Man** button to switch to the automatic mode. The **Timer Auto On** indicator will be on (red).



- b. A preset timer value may (or may not) appear in the timer window. Press the **Reset** button in the timer window to set the timer to zero if necessary.



- c. In the timer dial panel, dial the minutes and seconds to set a desired cleaning time. Press the **Set** button in the timer dial panel. The desired cleaning time will appear in the timer window.



- d. Press the **Plasma On/Off** button to start plasma. The **Plasma Active** indicator will be on (red). The timer window will show counting-down time. Once it reaches zero, plasma will be stopped automatically and the **Plasma Active** indicator will be off.
6. Press the **Vacuum On/Off** button to start venting the chamber.
 The **Vacuum Vent** indicator will be on (red) and the **Vacuum Hi Vac** indicator will be off. Allow 15-30 s for the chamber to be completely vented.
 7. **Wear gloves!!!** Remove your TEM holder and replace the chamber sealing plug in the chamber.
 8. Close the valve on the O₂(25%)/Ar(75%) cylinder and the valve on the regulator.

9. Press the **Vacuum On/Off** button to start pumping the chamber.
10. Once the **Vacuum Hi Vac** indicator is on (green), press the **Vacuum On/Off** button to stop pumping and turn off the power of the plasma cleaner.

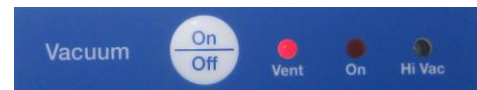
The residual gas in line should not be enough for completely venting the chamber, so that the chamber can remain in vacuum.

Pumping the Model 9010 Vacuum Storage Container

1. Open the valve on the O₂(25%)/Ar(75%) cylinder and the valve on the regulator.



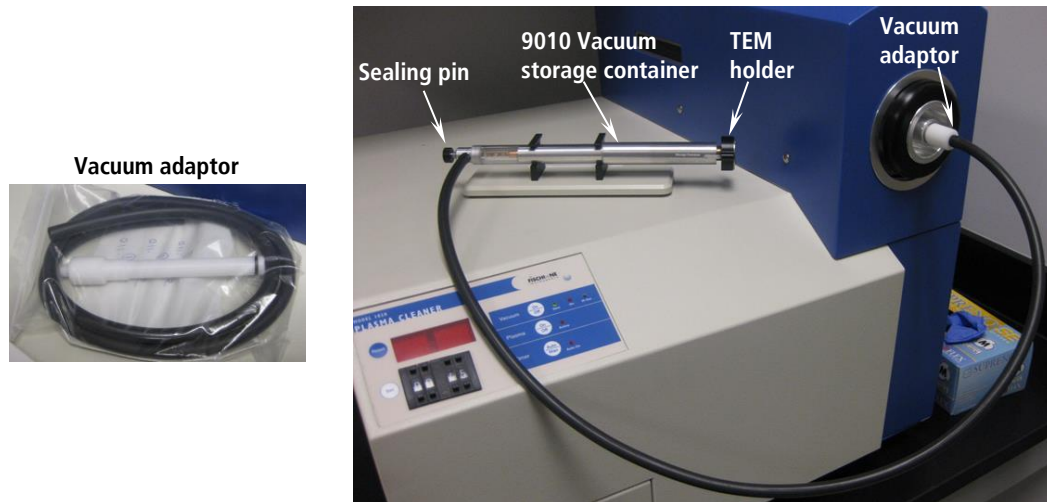
2. Turn on the power of the plasma cleaner.
 - The switch is on the backside lower-right corner.
 - The plasma cleaner comes on line with venting by default. The **Vacuum Vent** indicator will be on (red).



3. **Wear gloves!!!** After 15-30 s venting, carefully remove the chamber sealing plug.



4. Plug the vacuum adaptor in the cleaner chamber and connect the vacuum adaptor to the Model 9010 Vacuum Storage Container.



5. Pull the sealing pin at the tip of the Storage Container to the open position.

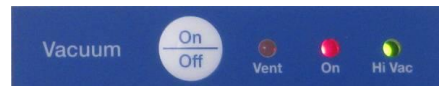


6. Press the **Vacuum On/Off** button to start pumping the chamber.

- The **Vacuum Vent** indicator will be off. The **Vacuum On** indicator will be on (red).



- In a few minutes, the **Vacuum Hi Vac** indicator will be on (green). The cleaner chamber and the storage container are both under good vacuum.



7. Push the sealing pin at the tip of the Storage Container to the closed position.

8. Press the **Vacuum On/Off** button to start venting the chamber.

The **Vacuum Vent** indicator will be on (red) and the **Vacuum Hi Vac** indicator will be off. Allow 15-30 s for the chamber to be completely vented.

9. **Wear gloves!!!** Remove the vacuum adaptor from the cleaner chamber, disconnect the vacuum adaptor from the Storage Container, and replace the chamber sealing plug in the chamber.

10. Close the valve on the O₂(25%)/Ar(75%) cylinder and the valve on the regulator.

11. Press the **Vacuum On/Off** button to start pumping the chamber.

12. Once the **Vacuum *Hi Vac*** indicator is on (green), press the **Vacuum *On/Off*** button to stop pumping and turn off the power of the plasma cleaner.

The residual gas in line should not be enough for completely venting the chamber, so that the chamber can remain in vacuum.

References and Files

The Fischione Model 1020 Plasma Cleaner manual and training notes.

Contact Information

Questions or comments in regard to this document should be directed towards Xin Zhang (zhang@4dlabs.ca) in 4D LABS at Simon Fraser University, Burnaby, BC, Canada.