

SOP: Harrick Plasma Cleaner PDC-001-HP

Purpose: Modify the surface properties of PDMS microfluidic devices to bond onto glass slides

Location: BHE B8 (main area)

Required PPE: Flame-resistant lab coat; nitrile gloves; safety goggles; long pants; closed toe shoes

Protocol for Use:

1. Place the sample inside of the chamber. Ensure that the three-way valve is in the open position (arrow pointed right). (**Figure 1**)
2. After placing the sample inside the chamber, turn the three-way valve to the closed position (arrow pointed down) before starting up the plasma cleaner. To initiate the instrument, turn on the "PUMP" switch and then the "POWER" switch. Wait a couple minutes for the system to warm up. (**Figure 2**)
3. Once the switches have been turned on, check the oil in the pump window. The system is ready for use when the oil is bubbling throughout the window. (**Figure 3**).

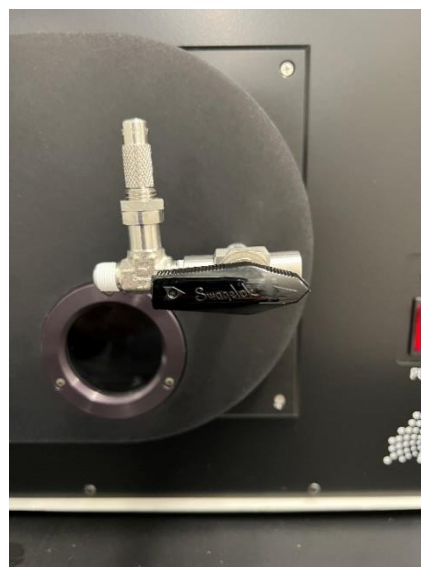


Figure 1: The three-way valve in an open configuration. Arrow denotes direction of the valve.



Figure 2: *Left:* The three-way valve in a closed configuration. Arrow denotes direction of the valve. *Right:* The set-up to initiate the plasma cleaner.

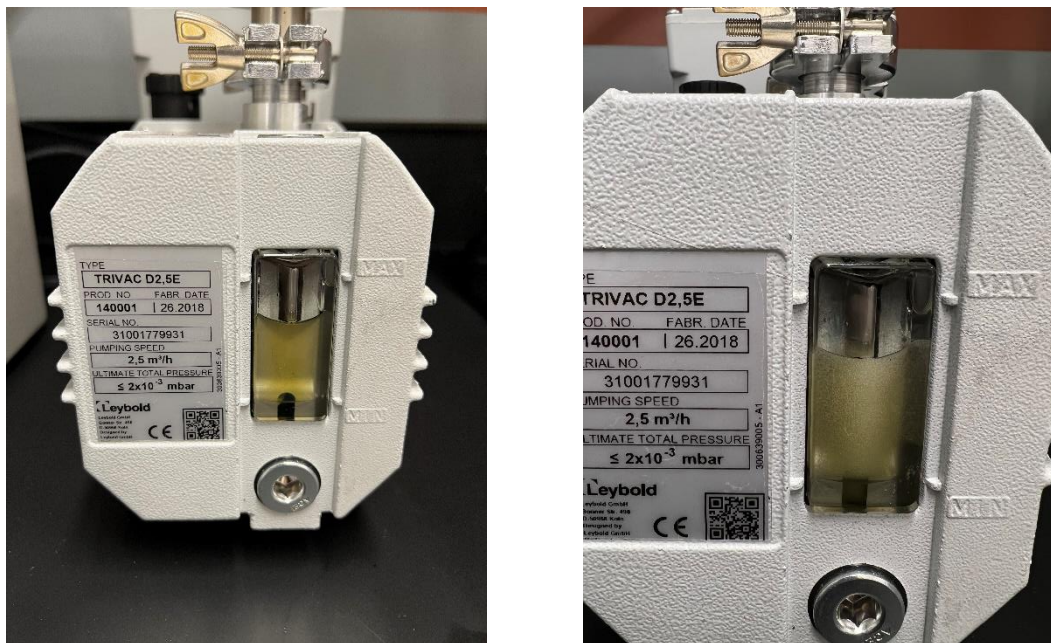


Figure 3: *Left:* The oil contained in the pump window prior to system initialization. *Right:* The oil bubbling in the pump window after a couple minutes of system warm up.

4. Once the oil is sufficiently bubbling, slowly turn the three-way valve to the “bleed” position (arrow pointed left) to bleed in room air for about 30 seconds. This is crucial to generate optimal air pressure in the system.
5. Once the system has the optimal air pressure, select the appropriate radio frequency (RF) power level (low, medium, or high). A violet-pink glow will appear in the chamber window. (**Figure 4**).
 - a. Adjust the RF power level to increase the brightness of the glow and use a timer to set the desired duration of the plasma treatment.
6. After the plasma treatment, turn the RF power level back to “OFF” and then turn off the “POWER” switch and finally the “PUMP” switch.
7. Slowly turn the three-way valve to the open configuration (arrow right) to vent and release the pressure inside of the chamber. If turned too quickly, the sudden rush of air will blow around the sample.
8. Once the sound of pressure release subsides, remove the sample and close the chamber.



Figure 4. *Left:* The dial on the plasma cleaner to adjust the RF power level (low, medium, or high) – shown on “HI”. *Right:* The violet-pink glow in the chamber window when the RF level is selected.

Maintenance Schedule:

With each use: clean any spilled liquid with a Kimwipe sprayed with 70% ethanol.

Contact Information:

Lab Manager: Nathan Cho, BHE B9, (213) 740-2093

Professor: Megan McCain, DRB 140, (213) 821-0791

Vendor Information: Harrick Plasma, (800) 640-6380, info@harrickplasma.com