Nanonex NX-1000 Nanoimprintor S.O.P.

Emergency Stop:
(All emergency stops must be reported to the administrator)
The administrator needs to reset the machine according to the following procedure:

1. Make sure that the machine is in a normal operating condition. Check the pressure gauge on the gas panel to make sure that there is no pressure in the chamber

2. Power up the machine and reset the RED Emergency button

3. Open the software and log on as *administrator*

4. The software will initialize the machine. In the process of initialization, the cylinder will lower

Powering Up:

1. Before powering up the system, verify the tower and panels are on the machine

2. Check four jumpers on the rear panel of the machine. Make sure that all circuit breakers are in the *ON* position

3. Turn on the computer monitor and the computer

4. Turn on the Low-pressure nitrogen switch

5. Turn on the High-pressure nitrogen switch. Verify the pressure of the nitrogen gas being delivered to the machine is approximately 500 or 550 psi, depending on the machine specs

6. Wait at least 5 seconds after switching Circuit Break 4 on before switching the control key to the "*one*" position

Loading a Sample:
Two plastic thin films (membranes) are needed to do an imprint

1. Place the smaller diameter thin film on the wafer holder. Make sure the film covers the large inner hole and extends to the outside edge of the first ring. The film must be FLAT with no wrinkles

2. Place the mask and wafer in the center of the wafer holder

3. Place the larger diameter thin film on the Top Film Ring Holder. The film is held in place by eight magnets. The magnets must be placed over cone point protrusion. The film needs to be flat with no wrinkles

4. Place the Top Film Ring Holder onto the wafer holder. Align the cut out notches on the holder with the guide pins on the wafer chuck. The magnet side of the holder faces down

5. Gently push the drawer into the chamber until there is an audible "click"

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Imprinting:

1. Open control program by double clicking on the *NX Control v3.8* icon on computer desktop

2. Click "users" → "Log in", enter ID and Password, and click "OK" to log onto the system. If for some reason, you don't want to log in, just click "EXIT" in the log in pop up menu – the program will then terminate

3. After log onto the system, you will see a pop-up menu

    a. Click "yes" if you want to perform UV nanoimprint processes during the session, which will turn on the UV lamp power. The UV lamp needs up to 5 minutes to warm up. Wait until the indicator "UV Lamp Ready".

CAUTION

The UV lamp life is reduced each time it is started. To avoid premature lamp deterioration, leave the UV unit on through a short period. These UV light source is designed for continuous operation. If the power is momentarily lost, shut the unit "off" and let it cool down for 5 to 10 minutes then switch it back "on" and wait for warm-up

    b. Click "No" if you will only perform thermal nanoimprint during the session

4. Click "recipe" to load the default imprinting recipes, or use *User Set* to compile a new one. If select *User Set*, input the following in the Process Parameters window.

    a. Aligned Sample: switch it on if you want to imprint aligned samples

    b. Pumping Time in Pump box

    c. Pre-temperature and Pre-pressure in Pre-Imprint box

    d. Temperature, Pressure, UV "on/off", Processing Time and UV on time in Imprint box. Click the UV icon and input the processing time and UV on time. The process will keep the sample at temperature and pressure for the duration of processing time, and then turn on the UV lamp

    e. Venting temperature in Cooling and Vent box. If both Pre-temperature and Temperature settings are less than 25 degrees Celsius, the thermal heaters will not be turned on during imprint process. To save a current recipe, press save button and select a path. To save current run file, click "Profiles" and "Save" after selecting a file path. Once the recipe is selected, the indicators will show whether the thermal heater and UV lamp will be on during the current process

5. Click green "Begin" button. After click the "OK" button in the pop-up menu, the chamber closes automatically and the vacuum pump starts to pump the chamber.

WARNING
From this point on, DO NOT pull out the drawer until the program is finished and the chamber has stopped moving.

When user-set pumping time expires, the imprinting process begins automatically. During the process, temperature and pressure inside the chamber are monitored in real-time and displayed on the monitor.

6. When imprinting is finished, the chamber vents and opens automatically. The status indicator at the bottom of the screen shows "To begin a new run". The operator can open the drawer and remove the sample at this time.

7. To Save current process data, click Profiles, select a file path and click Save.

8. Repeat Step 3 through 5 for the next imprint run.

9. After finishing all imprint runs, click "Login" → "exit" to exit the program

10. During imprint, you can click the "skip imprint" button to skip current imprint and directly go to cooling of sample.

Shut Down:
1. Switch the control key to "0" position.

2. Turn off High-pressure nitrogen switch.

3. Turn off Low-pressure nitrogen switch.

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