

The Expanding World of Nanofabrication – *an update from NanoFabrication Kingston*

November 10, 2023

Good day,

You are receiving this important update as a user of NFK, as a supervisor of a user, or as someone who requested to receive these updates.

Technical problems

NFK has seen the worst stretch of bad luck in our existence over the last couple of weeks. There are multiple issues with a variety of equipment, so have a close look at the details below because the probability that something will affect your fabrication work is high.

Spin coater. The vacuum line on the spin coater got plugged again, but this time it could not be resurrected. We have already ordered a new spin coater that should be delivered in a week or two. In the meantime, we are actively working on a temporary solution. **If you have a spin coater that you could lend us** for a couple of weeks, we would be very grateful. Until further notice, however, anyone who requires spin coating for their fabrication must reconsider their schedule.

Badge reader. The badge reader that gates access to the gowning room died when the city shut down the power after some moron got into the power transfer station down the street. New badge readers are being installed at the entrance door and gowning room door over the next few days. Your existing badges should work on these doors once the system setup is complete. Until then, use the paper log sheet to sign in and out of the cleanroom and the remote button to open the gowning room door.

Evaporator. We have had difficulty getting a focused electron beam from the e-gun on the evaporator. It behaves like the beam is elongated in the lateral axis. We are ordering a new magnet to hopefully correct this problem. Until the new magnet is installed, please watch closely for signs that electrons are hitting the crucible liner and adjust lateral beam position if necessary. Ask me for details if you are not confident about what to do.

Deionized water. The pump motor on the water purification system has seized. A new one has been ordered, but in the meantime, we must rely on the inlet pressure to get the water to flow through the purification media. This works OK most of the time, but if the water tap isn't opened for a long time, the quality of the water in the line diminishes. For applications that require the best water quality, such as diluting your aqueous solutions, you only need to run the water for a while before using it.

Reactive ion etcher (RIE).

The pump motor on the water chiller that services the RIE started running very loud yesterday, so I shut it down. While I troubleshoot that problem, the RIE will not be available.

Furthermore, the bottle of chlorine ran out and our supplier informed us they don't sell chlorine anymore. We have since purchased chlorine from a new supplier and had Trion make a new fitting for our cabinet to interface with the new cylinder type. Unfortunately, in an unrelated matter, the mass flow controller for chlorine has failed. Until the new one is delivered (should be ~2 weeks), chlorine will be unavailable.

Plasma cleaner. We have replaced the gas controller on the plasma cleaner, so there is no longer a problem igniting the plasma at any power level. We have also purchased a new reactor for the plasma cleaner that will be installed soon. I will be testing the new unit to verify etching rates for the usual resist materials, but in the meantime, you can assume similar etch rates to the current plasma cleaner.

Security

The building is monitored constantly with security personnel on site 24/7, as it always has been, but security incidents have been on the rise. Not surprisingly, with the high level of construction activity and low numbers of permanent tenants in the building, it is more difficult than ever to track people that shouldn't be in the building. To my knowledge, no NFK user has been involved in any security incident, but with reports of trespassers on the grounds and in the building, visitors to NFK should be aware of the risks. The following advice should be taken at any time, but especially during this construction phase:

1. Lock your vehicle doors and close your windows.
2. Do not leave anything valuable visible in your vehicle.
3. Lock your bicycle to a rack provided, or if you prefer, we can arrange for you to bring your bicycle inside the building.
4. Do not engage with strangers on the grounds and make an effort to avoid suspicious characters.
5. Do not allow anyone to enter the building with you ("tailgating") if they do not have a working security badge or FOB.

Shoes

There is still a shocking number of shoes that are unclaimed. If you have shoes at NFK that you want to keep and haven't been to the lab in several months, please let me know so I can put them back on the shelf for you. I will be discarding old unclaimed shoes in the new year.

Humidification

The replacement humidifier has not yet been delivered. Until it is installed and working, keep an eye on the sensors in the cleanroom if your process is sensitive to humidity.

See you at the lab!

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