

Gatan Cryo-TEM (626) Holder

User Operation Guidelines

For users utilizing the Gatan Cryo-TEM (626) holder, the following guidelines must be adhered to.

NOTE: Should you wish to use the cryo-TEM holder with any electron microscope other than the FEI Osiris STEM, then you accept liability for any potential product damage caused during its use.

Before use of the cryo-TEM holder:

- The holder MUST have its vacuum recently regenerated by pumping and baking of its zeolite using the Gatan Dry Pumping Station and SmartSet controller before use in any electron microscope.
- Check the holder log-book for when these tasks were last performed. It is recommended to check this the day prior to your cryo-TEM work session in order that you still have time to perform the holder pumping and zeolite-baking without having to delay your planned cryo-TEM session.
- If the holder was last pumped and zeolite-baked more than 7 days ago and it is not currently stored under the required vacuum (i.e., $<10^{-5}$ Torr), you must perform a fresh holder pumping and zeolite-baking before your cryo-TEM session.

Holder insertion and removal in the FEI Osiris STEM:

- Only 4D LABS staff may insert the cryo-TEM sample-holder into the FEI Osiris STEM microscope. This is a high-risk operation, which can cause vacuum leakage in the microscope column, and a period of microscope down time while the vacuum level recovers. User assistance may be required for emptying and/or refilling of liquid N₂ during the insertion and removal of the holder. Always follow instructions given by the 4D LABS staff member(s).

During use of the holder in the FEI Osiris STEM:

- To maintain a target cryo-temperature, the dewar of the cryo-holder must be filled with liquid N₂ throughout your microscope session. The level must be checked hourly, and topped up when necessary by a user or staff member who is qualified to handle liquid N₂. Liquid N₂ will be depleted faster when heating is used to keep the sample at a medium-range cryo temperature.

After completing your use of the cryo-TEM holder:

- At the end of your session, please ensure that the cryo-TEM holder is pumped and warmed to room temperature, and subsequently perform the zeolite-baking cycle using the Gatan Dry Pumping Station and SmartSet controller. The baking cycle allows the zeolite desiccant in the insulation of the cryo-holder dewar to be regenerated. The holder can be kept stored under vacuum on the Dry Pumping Station. A member of the 4D LABS staff can assist you with this procedure.
- Record your usage of the holder, its regeneration status, and any concerns in the logbook.