

UiB NanoStructures Laboratory
Standard Operating Procedure
Temescal FC-2000 E-beam Evaporator

Purpose of the instrument:

The Temescal FC-2000 E-beam Evaporator is used for the deposition of metal and oxide thin films.

Location of the instrument:

Allégaten 55, room 286 (entrance via 276, E-Beam lithography Lab)

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Available source materials:

Gold (inside Tungsten Crucible), Chrome, Tungsten, Nickel, Aluminum, Silicon-oxide, Titanium (currently not loaded into source).



Figure 1: Temescal FC-2000 E-beam evaporator

WARNINGS

The instrument operates with a **high-power, high-voltage supply** delivering potentially lethal electrical currents. Under no circumstances operate the instrument with removed side-panels or without training.

Hot titanium may ignite when in contact with oxygen. Since titanium is a deposition material, users must wait for the system to cool down to a temperature below 40° C before opening the chamber. If the chamber is opened while the titanium is hot, a flash fire may occur.

The UiB NanoStructures Lab is operated for the benefit of all researchers. YOU MUST HAVE RECEIVED PERSONAL TRAINING ON THE INSTRUMENT TO BE PERMITTED TO OPERATE IT! IF YOU HAVE BEEN TRAINED AND ARE STILL UNCERTAIN AS TO HOW TO OPERATE THE INSTRUMENT CONTACT ONE OF THE STAFF MEMBERS. If you encounter any problems with this piece of equipment, please contact the staff member listed above immediately. There is never a penalty for asking questions. If the equipment is not behaving exactly the way it should, contact a staff member. This SOP only serves as a quick reference. For further details consult the manual and/or service engineers.

Maintenance Procedures

- 1) Source cleaning and replenishment.
- 2) Creating a gold melt.
- 3) Exchange of thickness monitor crystal.
- 4) Regeneration of cryopump:
 - a. Check the nitrogen supply (gauge at back of tool).
 - b. In Manual mode: close the cryopump HV valve.
 - c. In Auto mode: Click on detail and then on the cryopump in the system map. Then click on 'regenerate' and start.
 - d. The cryopump will start to regenerate. This can take several hours.
- 5) Exchange of chamber liners.
- 6) After power cut:
 - a. If power-cut happens while present at instrument, then quickly press 'reset' button when power is restored. If the cut was short enough the cryopump will just continue without needing re-generation.
 - b. If power is still off and will be for some time, then bring all switches into off position as described in the power down procedure. Power up system as in power-up procedure, once power is restored.
- 7) Power down of instrument:
 - a. Turn off HV power supply.
 - b. Change to Manual Mode.
 - c. Turn off mechanical pump.
 - d. Close Source isolation valve.
 - e. Close cryopump HV valve.
 - f. Turn off cryo pump (Click on detail and green field of cryopump in system map).
 - g. Turn off TC (Click on detail and TC under cryopump in system map).
 - h. Shutdown Software (Logoff User, Exit).
 - i. Shutdown PC.
 - j. Switch off all electronics at front of electronics rack (Sweep, Inficon, Pocket selector, UPS).
 - k. Turn off Circuit breakers right to left at back of electronics rack (you have to open the door first).
 - l. Turn off main breaker at the right of power distribution panel.
- 8) Power up of instrument:
 - a. Turn on main breaker at power distribution panel.
 - b. Turn on circuit breakers left to right at back of electronics rack (you have to open the door first).
 - c. Switch on electronics at front of rack (Sweep, Inficon, Pocket selector, UPS).
 - d. Wait until software starts up, then log in u:service, p: factory.
 - e. In Service pages set Source 1 Ebeam emission current scale to 1500 mA.
 - f. If there is a turret alarm, try switching the pocket selector off and on again. Then clear the alarm and using manual mode select a different pocket.
 - g. Regenerate the cryopump (see above).
- 9) Monthly operation check.
- 10) Accounting procedures.

Document History

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Version 0.2, July-2014, Author: Melanie Ostermann, Update: Primary staff contacts, page numbers, insert caption figure 1.