

Amsterdam nanoCenter cleanroom - rules and protocols

The Amsterdam nanoCenter at AMOLF consists of three parts, **one cleanroom, one thin layer lab, one SEM room**. In this file the rules and protocols for the cleanroom are described, as detailed as possible. Lots of these rules also count for the non-cleanroom parts, but there different work is done, so also some different rules apply.

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1. Entering the cleanroom

Access is restricted to users who had a short cleanroom introduction.

The cleanroom is available 24/7.

Chemicals may only be handled on workdays from 8.30 to 17.00.

The cleanroom can be entered through the access-corridor. In this access-corridor is a step over bench. To enter the cleanroom you have to wear a **hairnet, cleanroom-lab-coat** and **shoe covers**.

- ▶ Sit down on the bench
- ▶ Put on a **hairnet**
- ▶ Put on one **shoe cover** and put it on the cleanroom side
- ▶ Put on the other **shoe cover** and put that foot also on the cleanroom side
- ▶ Put on a **cleanroom-lab-coat**
- ▶ Step on the **sticky mat** a couple of times
- ▶ Enter the cleanroom
- ▶ Put on gloves

When you take a **new cleanroom-lab-coat** please **write the date in the collar**. From this date the coat can be used maximum **two** weeks.

When you leave the cleanroom.

- ▶ Hang your **cleanroom-lab-coat** back on a hook
- ▶ Take of your shoe covers and hairnet as you put them on
- ▶ If you come back later in the day, you can put you shoe covers and hairnet in a box under the bench, remember the number you put it in
- ▶ If you do not come back later in the day, discard of you shoe covers and hairnet in the trash bin next to the sink.

Other considerations for the cleanroom

- ▶ Lab journals/notes are allowed inside the cleanroom (**not in the wet benches!**)
- ▶ **Pencils are not allowed** (carbon dust), ink pens are allowed

2. General working in the cleanroom

These are some general rules for working in the cleanroom, specific rules for specific machines or parts of the cleanroom will be described later.

- ▶ **Gloves must be worn at all times!**
- ▶ There are protective goggles
- ▶ Please do your work **calm and tidy**. This improves the working itself and also the quality of you sample!
- ▶ **Clean up after yourself**

3. Wet benches / Chemicals

Working

In the two wet benches we work with chemicals, so these are described in the same chapter.

We distinguish between two types of chemicals, **organic** and **inorganic**.

- ▶ Working with **organic** and **inorganic** chemistry should **never be mixed**
- ▶ The **left** wet bench is for **organic** chemistry
- ▶ The **right** wet bench is for **inorganic** chemistry
- ▶ Chemistry should only be handled **inside** a wet bench
- ▶ Always keep the screen between you and the chemistry
- ▶ **Never** stick your **head** in the wet bench

To be clear what chemical is in the bench and who uses it:

- ▶ Put beakers on tissue
- ▶ Write your name and what chemical is in what beaker on tissue
- ▶ After disposing the chemicals leave beakers on the tissue to dry
- ▶ Check if the neck and the top of the chemical bottle is clean/dry before you store it back in the cabinet. If not wipe it with a soft tissue (no absorbing tissues) before placing the cap.
- ▶ Clean it all up when beakers are dry (beakers in washing machine, tissue in solid waste)

In the benches there are little waste bags for solid waste; tissues, syringes (without needles), pipette tips. etc. When a bag is full make sure the waste is dry and throw the bag in the shaft above the washing machine. **No** glass or **sharp** objects. For sharps there is a yellow sharps container above the washingmachine.

Organic bench (left)

The organic bench has a **spincoater** and two **hotplates**. These three items make the bench very full. If someone is spincoating, one more person can work there. For instance post-exposure baking, developing with **organic** chemicals.

Inorganic bench (middle)

The inorganic bench has an **ultrasonic bath**. In this bench you can do your inorganic work such as piranha cleaning, metal etching, developing with **inorganic** chemicals.

If you need to use the ultrasonic bath in combination with your **organic** chemistry, you may only do this if **no inorganic** work is being done.

“Dirty” bench (right)

This bench is called “dirty” because it does not have an HEPA filter which means this bench is less clean as the organic/inorganic benches. The third bench has a **megasonic bath**. In this bench you do all your dirty work i.e. pre-cleaning (prior to base piranha) of samples, cutting samples (wafers, glass etc.) and **all** the lift off work.

In this bench we also work with HF (Hydrogen Fluoride, Hydro Fluoric Acid). When someone does this, **no** other work can be done in this bench. HF may only be handled by those instructed and in couples. For using HF there is a special protocol not described here, you need to get the instruction.

Cleaning

When you are done in the wet bench, there are a couple of things to clean up. Chemicals, beakers, tools and the bench itself.

- ▶ Dispose of the chemicals in the appropriate waste container
- ▶ In case of **organic** chemicals wash out the beaker with IPA
- ▶ In case of **inorganic** chemicals wash out the beaker with water, dispose of this water in the same waste container as the chemical you used
- ▶ Clean your tools, such as tweezers, with a tissue and IPA
- ▶ Make sure there are no drops of any liquid in the bench, if there are, wipe them up
- ▶ After disposing the chemicals leave beakers on the tissue to dry
- ▶ Clean it all up when beakers are dry

Chemistry disposal

We have 4 different types of chemical waste in the cleanroom, they each have their own waste container. When you put the container back in the cabinet, make sure the lid is not too tight, so any gas can come out and no pressure is build up inside the container.

- ▶ White container for **organic**
- ▶ Blue container for **organic with halogens**
- ▶ Red container for **acid**
- ▶ Green container for **base**

When a container is full, please notify a nanoCenter technician.

4. Machines in the cleanroom

To use **any** of the machines installed in the cleanroom, you need to be **instructed** by a **nanoCenter technician**.

5. Stock

All items have to be ordered by a nanoCenter technician. Most chemicals as well, but they might also be bought by a group technician, although in agreement with a nanoCenter technician.

- ▶ Warn a nanoCenter technician **before** anything runs out, order and delivery times might be long. You can e-mail or call a technician or use the stock form on the entrance door of the cleanroom.
- ▶ For some chemicals we have a bigger storage in the technical corridor. When any of these chemicals run out in the cleanroom you may get those yourself from the corridor. Keep in mind that this is our **ONLY** stock. Please be informed by a nanoCenter technician

6. Evacuation

The following situations require immediate evacuation of all occupants within the cleanroom.

- ▶ Major chemical spill (warn nanoCenter technician)
- ▶ Mask aligner lamp explosion (mercury vapors!), (warn nanoCenter technician)
- ▶ Ventilation system failure

7. Miscellaneous

- ▶ **If you're not sure about something, ASK a nanoCenter technician**
- ▶ For aggressive acids/bases there are extra thick rubber gloves

8. Contact

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