

OPERATING INSTRUCTIONS

This document defines the rules and safety procedures for the access to this laboratory and the usage of equipments here available.

LABORATORY LOCATION:

UniMoRe FIM – Dept., Physic Building, Room : MO-17-00-02, Ground Floor.

Access from room MO-17-00-28

RESPONSIBILITY

- R.S.P.P. CNR – Istituto Nanoscienze : Dr. Milena Toselli
- Laboratory Responsible (Preposto) : Dr. Guido Paolicelli

ACCESS RULES

The access to the laboratory is organized in two different level:

- GUEST
- USER

GUEST is not allowed to operate on the equipments and must always be guided by authorized personnel (**USER**) . **GUEST** has to respect the general safety and conduct rules of the Lab as presented in this Manual (pag. 2) .

USER may operate on the equipments. **USER** could be a CNR employee, a collaborator with fixed-term contracts, a CNR associated, or a PhD student who has completed the “General Training Course on Prevention and Safety at Work”. In special cases, **USERS** could be requested to complete the training modules about specific hazards (chemical, biological).

USER permission is granted by the Responsible of the Laboratory who evaluates the applicant’s background knowledge and organizes a specific training about the safety procedures and the working methods to adopt with the equipment and/or the substances in the Laboratory.

USERS and **GUESTS** may ask the **Workers Health and Safety Representative (RLS)**, Dr. Andrea Bertoni, for assistance in case they perceive any hazard-related issue not properly managed by the Laboratory Responsible.

GENERAL SAFETY AND CONDUCT RULES

USERS and *GUESTS* must comply with the following general rules of prevention and security. Please note that non-observance of safety regulations involves, in addition to the penalties of law, taking disciplinary action against the defaulters.

IT IS IMPORTANT

- To memorize the location of access and exit ways
- To check the safety signs
- To locate the first aid box and the placement of individual (DPI) and collective (DPC) safety devices
- To locate the containers for waste disposal
- To promptly inform the Responsible of the Laboratory of any irregular situation in the operation of the instruments
- To collaborate with the Responsible of the Laboratory and with other users, in order to maintain the efficiency of the security system

IT IS MANDATORY

- To carefully read the machine handbook and to strictly follow the given specific rules.
- Before using any chemicals, to acquire information about their characteristics by way of safety data sheets, risk phrases and safety advice, and to follow instructions for their handling, storage and disposal.
- To keep electrical equipments as far away as possible from sources of moisture and/or flammable solvent vapors
- To always use protection devices (DPI and DPC) as indicated by the procedures. Keep them carefully, do not damage or remove them
- To dispose of all processing waste in dedicated containers
- To observe the existing prevention and safety laboratory regulations, and to closely follow the provisions issued by the Responsible
- In case of alarm, to leave the laboratory according to the evacuation procedures envisaged in case of emergency

IT IS FORBIDDEN

- To work alone in the lab, especially beyond the standard working hours
- to take and preserve food and drink inside the laboratory
- To use electrical equipment not compliant with CE regulation
- To carry out operations for which one has not been authorized and/or trained by the Responsible of the laboratory

SPECIFIC RULES FOR USING INSTRUMENTS PRESENT IN THIS LABORATORY

List of the main equipments present in the Laboratory:

1. **AFM Microscope** - Veeco
2. **Microtribometer** CETR UM 2
3. **Microtribometer** CETR
4. **Microtribometer** CSM
5. **Profilometer** Alpha Tencor
6. **Optical Absorption** table
7. **Auger and XPS** analysis system

SPECIFIC RULES

1) **AFM Microscope**

Brand name: Veeco-Digital Instruments

Model : Enviroscope

Control Unit : Nanoscope IV ; Additional Units : Heating Module and Temperature controller (Lakeshore)

Acquisition year : 2006

Standard measurements at room conditions

To power on the AFM system use the black switch located on the plugs box fixed on the left leg of the table (just at the left side of the computer).

The microscope, all hits control unit (with the exception of the vacuum meter) and the dedicated computer are simultaneously powered and switch on. The computer is protected by a password that the responsible will communicate only to authorized Users. The software controlling the AFM microscope can be accessed from the desktop. For any details about standard measurements at room conditions please refer to the dedicated instruction manual located in the cabinet n. 1 in SUPERMAN office room (MO-17-00-028). To handle sample holder, tip holder and all internal parts of the AFM chamber please wear a disposable glove. The glove box is located on the table's shelf .

Controlled atmosphere measurements

- Only inert gas like Argon and Nitrogen can be introduced into the AFM experimental chamber to perform experiments in controlled atmosphere. The use of flammable gases (Oxygen, Hydrogen, etc) is strictly forbidden.
- High pressure gas bottles have to be connected to AFM experimental chamber through the dedicated gas line.
- At the end of the experiment High pressure gas bottles must be disconnected and immediately placed into the external box.

Vacuum measurements

The vacuum system is composed by a turbo pump (Varian V 70) connected to the AFM chamber through an angle valve and by a scroll pump acting as primary stage for the turbo.

- Before start pumping ensure that the AFM door and the angle valve are closed.
- First switch on the scroll pump, then after 2 min open the angle valve to start pumping the AFM chamber. Switch on the pressure meter.
- When pressure reaches 10-2 mbar switch on the turbo pump.

For any other details about the AFM vacuum system please refer to the dedicated chapter in the instruction manual located in the cabinet n. 1 in SUPERMAN office room (MO-17-00-02)

Sample preparation

Chemical process for sample preparation and/or cleaning procedures using solvent (acetone, methanol etc.) are strictly forbidden in the AFM room. All these operations must be performed in Chemical or Lithography Labs.

Manuals

The instruction manual located in the cabinet n. 1 in SUPERMAN office room (MO-17-00-02)

EVACUATION PROCEDURES IN THE EVENT OF AN EMERGENCY

In case of emergency and warning, users and/or guests attending the laboratories must respect building evacuation procedure and in particular the following rules:

1. Proceed in an orderly way in order to leave the building by following the shortest route indicated by relevant signs, and gather at the meeting point
2. Do not use elevators
3. Do not perform any operation for which you have not been previously trained.
4. Do not reenter the building until you are told to do so by the Director or Safety coordinator.