

## **User Training for the “Laboratorio di Ateneo”**

# **PoliFAB**

**Building 30, via G. Colombo 81, 20133 Milano**

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## **General rules for access and safety**

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# General description

PoliFAB laboratory is a University facility directly subject to the Central Administration and the General Director, located at 81 Via G. Colombo, 20133 Milan in Building 30 of the Leonardo Campus. In the laboratory, work is carried out in the field of micro- and nano-fabrication of devices with different applications. It is configured as a service laboratory for internal users of Politecnico di Milano and external users. The activities are carried out in a clean room area of about 600 square meters, divided in two zones: gray zone (ISO class 8) and clean zone (ISO class 6). The gray zone includes: the access air-locks with air showers, a corridor, the Magnetic Thin Films area, and the Back-end area. The white zone includes: the Yellow Room, the Wet area, the Metrology area, and the Thin Films area. The Back-end also serves as a connection to a second air-lock with an air shower, which leads to another ISO 6 portion, equipped with an Advanced Lithography yellow room and a Deposition Area. Below is a floor plan of the cleanroom, showing the spaces.



The technical utilities (centralized vacuum system, liquid nitrogen tank, centralized cooling water system, gas cabinet, centralized compressed air system, refrigeration units, air treatment units, electrical systems, temporary waste storage) are located outside the cleanroom. Access to these spaces is prohibited to users and allowed only to Staff Personnel and construction or maintenance companies. The only exception is the supply of liquid nitrogen, which is possible for users with prior authorization and after appropriate training by the Staff.

## Access and general behavior rules

Access to Building 30 is possible only to authorized users, via badge scanner. **Opening times for building 30 are: Monday to Saturday from 8:00 a.m. to 8:00 p.m.;** while opening times for the cleanroom are: **Monday to Friday from 9:00 a.m. to 6:00 p.m.** This is to ensure surveillance of the laboratory and facilities by the Staff. Cleanroom access is controlled via badge scanner and it

is allowed to authorized users only, after training regarding general rules of behavior and safety in the cleanroom spaces. Users are required to pass a test about cleanroom behavior and safety procedures. To this end, the Staff will provide users study material regarding general and specific training and have them take an assessment test. Once the users have passed the test, they will be required to sign a register kept by the Staff Personnel and their badges will be enabled, giving them the right of access. It is mandatory to notify the Staff when users terminate their activity at the laboratory in order to disable their badge. The first access test is valid for one year, after which a renewal is required. The first renewal is valid for three years which is followed by a second renewal lasting five years. At each renewal, the user must pass a test about cleanroom behavior rules and safety.

For security reasons, anyone accessing the cleanroom must scan their personal badge both when entering and when exiting the cleanroom; this is also mandatory for accounting the number of cleanroom hours used by each individual user.

Access to the cleanroom is allowed only after appropriate gowning to be done in the airlock, an area of separation between lower and higher cleanliness spaces. In the airlock a bench separates the entrance from the clean area. Users are required to respect this limit, crossing the bench only after wearing overshoes. In order to maintain the cleanroom areas in their respective cleanliness classes, the gowning procedure illustrated in the figure below is mandatory and includes the use of: coverall suit with hood, gloves, boots and face mask. Cleanroom garments and personal protective equipment required for gowning are located in the closets and on the airlock shelves. If you have any questions or needs regarding gowning, please contact the Staff. It is recommended that users keep lockers and dressing areas in absolute order.



Access to the white areas is allowed only after passing through the air showers installed at the entrance of each ISO06 area. Only in case of emergency you are allowed to use the door connecting the grey corridor and the Thin Films area. To access the ISO08 area the air shower is not needed, but the same dressing with coverall suit and boots is required as for the ISO06 area. Whenever you move from ISO08 to ISO06, you have to go through the air shower, while for exiting ISO06 to ISO08 you can use the side doors.

The introduction to PoliFAB's cleanroom of materials like paper, notebooks, carton or textiles (that might spread dust and powders in the cleanroom) is strictly forbidden. Each research group can ask for a transparent plastic box for material storage (samples, wafers, etc.) and cleanroom compatible notebooks. Cleanroom boxes and notebooks must never leave the cleanroom. Cleanroom tables and instruments must be kept free of personal objects and tools, which must be stored in the cleanroom boxes and placed on storage shelves. Users are not allowed to take common cleanroom materials (pens, pencils, scissors, tweezers and beakers) and put labels or store in their personal boxes.

For cleanroom instrument operation, the Staff organizes (upon request) a dedicated training about how to operate the instrument and related safety. **Only after such training the users will be allowed to reserve and use the instrument independently. Trainings are valid only if provided by the Staff. Other users in the research group are encouraged to show and explain their processes to newcomers, but this is not acceptable as a substitute for an official training by the Staff.** If you want to ask for a training of a specific instrument, please contact the staff member who has in charge that instrument (you can find out the “contact person” on our website at the corresponding instrument web page) before reserving the instrument. **Machine reservation is mandatory and individual.** You can reserve an instrument on Polifab’s website, after logging in. We recommend not to exceed in the reservation time for equity towards all other users, and to respect the maximum reservation time for each instrument. Any user who will not follow working instructions and reservation rules (like non-used time slots or reservations made in someone else’s name) will get their access rights suspended.

Personal Protective Equipment (PPE) must be stored by all users in proximity of the instrument where they are required, and must never be removed. As an example, protective goggles must be stored besides the chemical fume hoods.

All users must always behave properly in the cleanroom working environment respecting all the rules, and acting carefully for their own health and safety, and for their colleagues’.

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## In case of emergency

The laboratory has two emergency exits with panic bar, located at the end of the grey corridor and in the second airlock. The exits lead to the back yard of Building 30. The emergency assembly point for all users in the cleanroom is located in the back yard, at the gate towards via Pascoli. In case of emergency, move towards the closest accessible emergency exit leaving the doors behind open, then evacuate the laboratory and gather at the assembly point in the back yard. May it be more convenient, you can use the emergency exit located on the stairs, halfway between the basement and the office floor.

In case of accidents during cleanroom work, the operator must act in total safety for him/her-self and for colleagues present in the laboratory. Even in case of accidents without damage to people or things, the operator must report as soon as possible and with as much detail as possible to the laboratory Staff personnel. The operator must also inform the Staff in case of situations or behaviors that could be dangerous for people and for the cleanroom itself, or that could be in contrast to the prescriptions reported in this document and the other cleanroom safety training documents.

In the event of leaks of any of the two dangerous gases (ammonia and silane) present in the lab, the corresponding visual alarm (red light) and acoustic alarm (siren) activate and all operators present in the cleanroom must evacuate the laboratory immediately through the emergency exits and gather to the emergency assembly point in the back yard, at the gate towards via Pascoli.

In the event of fire, push and activate the fire alarm button and inform the Staff. If you hear the fire alarm, prepare for evacuation through the emergency exits and gather at the emergency assembly point at the gate towards via Pascoli.

In case of spillovers of chemicals, if the substance is not dangerous for the operator and the amount dropped is not too large, the operator can dry up the liquid with the safety spillover kit and dispose of the contaminated cloth in the trash bins present besides the fume hoods; after that, in any case inform the Staff of the event as soon as possible. In case of dangerous substances or large amounts of chemicals, ensure you can secure the working area and call the Staff personnel

(also on the phone, if not present in the lab). Besides the chemical fume hoods you can find the safety spillover kits.

In the event of a health emergency, defined as any situation where one or more operators show health problems, even of light intensity, it is necessary to evaluate how dangerous the event is. Only after checking that the accident scene is not dangerous for other users, you can help the involved operators. At the same time it is mandatory to inform the Staff about the events. In case Staff members are not available and the event can be dangerous for other users, you must activate the fire alarm. In case of health emergency, defined as risk to human life, any user can call the emergency number 112. After this, inform the Staff personnel.

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## **Sanctions**

In case of gross negligence or repeated behavior not suitable or in contrast with the rules described in the training documents for cleanroom safety, the Staff can decide at its own discretion the proper sanctions. Involved users can be suspended from reserving and using a specific instrument or have their cleanroom access permission revoked, for a period of time commensurate to the violation.