

CLEAN ROOM POLICY

Version 2

December 2001



This Clean room policy is based on the attached plan of the clean room, which is located in the basement of the Semiconductor institute of Johannes Kepler University. It includes the names of each particular clean room (RR1, RR2, RR3 and RR4) and Service rooms (Grauräume) (G1, G2, G3, G4 and G5), as well as the flow-boxes' numbers (FB, laminar airflow)) and vents (AB, inhomogeneous ventilation). Also the integrated disposal stations and emergency doors are depicted.

Entering the Clean Room

1. Wearing outdoor shoes is forbidden in the entire clean room area. Jackets and outdoor shoes have to be put off before entering the dressing room, which is only allowed with clean room shoes. When going into the clean room, place your name at the magnet board on the clean room door!
2. In case you use the clean room on your own, in particular between 7pm and 7am, at weekends and public holidays, the 'Hausdienst' (Porter) has to be informed by phone. Furthermore, you have to report to the porters telephonically every two hours following. The phone number is 8231!
3. The clean rooms are only to be entered with designated clean room garments. Clean room overalls are stored in the ventilated cupboard in the dressing room. Before crossing the bench in the dressing room the clean room garments have to be put on, without touching the floor. For working in the clean room, a light clean-room cap is necessary. In RR1 it is obligatory to wear (non-powdered) gloves at all times.
4. When entering and exiting the clean room, please wash your hands. It is forbidden to store or consume any food or drink in the clean and dressing room.
5. When entering the clean room the display showing the functional status of the clean room has to be checked. The display lamps for the different areas have the following meaning
 - Red: failure of ventilation or case of fire
 - Green - on: normal operation
 - Green - off: stand-by operation
 - Yellow: clean room conditions do not meet the specifications
 - Blue: water leakage

In case of red or blue light, inform immediately a responsible person!

When entering the clean rooms, required room lights have to be switched on. In RR2 only the yellow bulb may be used, white light is reserved for service purposes only (in order to see colours appropriately). White light in RR2 will expose the photoresists and make them useless!



6. The sliding door between RR3 and RR4 has to be closed (due to different clean room classes and different pressure).

Behaviour and Security in Clean Rooms:

7. When handling liquid nitrogen according safety glasses have to be used. For bottling more than 10 litres of LN₂, the drainpipe leading outdoors must be used.
8. Handling toxic and acidly material requires the wearing of safety masks and acid-resistant gloves.
9. Chemicals are stored in different places (ventilated units) in the clean rooms, see attached plan. Further stock is to be found in the chemicals' cabinet in Service room ('Grauraum') 1. When taking out material from there, the provided list has to be filled in accordingly. Glass bottles should be transported in a safety container, one being in the chemistry laboratory, another one in RR4 next to the transfer hatch. Boxes for chemicals have to be absolutely clean when being brought into the clean room.
10. Handling of chemicals must happen in designated flow-boxes. The bottles are never to be left open!
11. Special chemicals are only to be used in appointed flow-boxes:
 - HF in FB8, FB2, and AB6
 - Br in FB10
 - IV-VI-compounds in FB9
 - II-VI-compounds in FB10
 - Photo-resist in FB1, FB3, and AB5
12. It is strictly forbidden to dispose chemicals in the sink. Acids, dissolver and chlorinated hydrocarbonats are to be disposed in the appropriate basin. Chemicals containing Br (Br₂, HBr, Br₂-Methanol) as well as special chemicals such as remover, Chlorbenzene and hydrofluoric acid have to be collected in glass/plastic (HF) bottles and disposed separately.
13. Each flow-box must be put on with the main switch in order to provide proper functioning of water, nitrogen, plugs and draining of the disposal basin. After using the flow-box it has to be switched off, the ventilation will continue.
14. RO (Reverse Osmose) respectively DI (de-ionised) water must be used only. Normal tap-water may be used only for cooling purposes of equipment.
15. The disposal containers in G2, G3, G4 and G5 have to be regularly checked on proof, function and filling level. When a container is filled up, clean room personal has to carry it to the central collection point at the University.



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16. Replacement parts and spare materials are stored in following units:
 - For IV-VI MBE in RR4, Unit 1
 - For Si-Ge MBE in RR4, Unit 2
 - For II-VI MBE in RR4, Unit 3
 - Evaporation-material in RR3, Unit 4
17. When handling chemicals, contact with skin and eyes has to be avoided. Vapours are not to be inhaled. Warmth, sparks and open flames must not get in contact with vapours at any time.
18. Gloves have to be used when handling quartz-glass ampoules. Evacuated ampoules have to be handled with great care in order to avoid mechanical damages (danger of implosion).
19. All installations with high voltage (MBE-, evaporation-, plasma-equipment, laser) have to be protected with security constructions according to the Austrian norm. Extensions and repair work are to be done by professionals only. When working on or servicing any high-voltage part, the entire installation has to be cut off from the main power supply. Please note, that electric charge is stored in capacitors, which can release voltage spikes even after disconnecting the installation. Capacitors have to be discharged by short circuiting before reparation or service.
20. Cleaning of clean rooms has to occur by users as follows:
 - a. Weekly one user is disposed for:
 - dressung room and lock room (Schleuse) have to be wiped (do not cover red lines with the adhesive mats in the gate, otherwise doors won't open manually in an emergency case!).
 - b. regularly: "Great-Cleaning-Event" ("Großputzaktion"): including wiping of floors and walls in all clean rooms, as well as tidying up cupboards and storage units.
21. All clean room users are responsible for keeping order as well as strictly following all safety regulations.

In case of emergency

- 1) Fire case:
 - Alarm:
 - Activate fire detector
 - Inform fire department **0-122**
 - Give information: where and what is burning, injured persons?
 - Save:
 - Help injured persons
 - Leave building via emergency exits
 - Warn endangered persons
 - Do not use lifts
 - Close all fire-proof doors
 - Extinguish:
 - Extinguish fire with designated devices (fire extinguisher)

Wait for fire brigade at entrance (keep safe distance) and direct them.
Inform them on special dangers!

- 2) In case of injured persons provide first aid (do not endanger yourself!) and call the ambulance 0-144
- 3) **A First-Aid-Kit, two fire extinguishers and a fire alarm are to be found in the dressing room.**
A fire extinguisher and a fire axe are placed in RR4.
- 4) In case the air condition breaks down, leave clean rooms as fast as possible. It is only permitted to switch off installations that could cause or take damage.
- 5) **In case of emergency the normal doors (yellow doorknobs) and the emergency exits (red doorknobs) have to be to escape. The emergency exits have to be used only in case of emergency, as using them will start an alarm signal. In RR4 a fire-axe is place at the wall, with which windows may be cracked in order to escape.**

FIRE DEPT.	0-122
POLICE	0-133
AMBULANCE	0-144

Internal university phone:
Hausdienst, Porters: 8231



Storage of Chemicals:

- FB 1:** Acetone
Methanol
Ethyl alcohol
Hydrofluoric
- FB 1a:** Acetone –VLSI
Methanol – VLSI
- FB 2:** Developer AR 300-47
AR 300-49
AR 300-56
Remover AR 600-70
Stopper AR 600-60
Solvent AR 600-01
Photoresist AR P 671.04
AR P 631.01
AR P 641.04
AR P 631.04
AR P 610.04
AR P 610.08
AR P 610.03
AR N 7700.08
- FB 3:** Microposit EC-Solvent
Microposit Developer MF-319
Microposit Primer
Microposit Remover
- AB 4:** Acetone
Chlorbenzene
Chrom(VI)oxid
Essigsäure
Ethyl Alcohol
Hydrofluoric
Methanol
Hydrochloric acid
Hydrochloric acid „smoking“
Sulfuric acid
Trichloroethylene
Hydro peroxide
- AB 5:** Injection with Photoresist
(S1818, S1813, S1805)
- AB 6:** Hydrofluoric
Kalilauge
Acetone (Spray bottle)
Methanol (Spray bottle)
- AB 7:** Chrom(VI)oxid
- FB 8:** Flußsäure
Salzsäure
Ammonia solution
Hydroperoxide
Chrome(VI)oxide
Antimon
- FB 9:** keine Chemikalien
- FB 10:** Ammonia sulphide solution
Boron
Bromine
Ethyl alcohol
Trichloroethylene
Iso-propanol
Sulfuric acid
- AB 11:** Acetone
Ba₂F₂
Ba₂Te₃
Europium
Gallium
Indium
InGa
Methanol
PbSe
PbTe
Telluride
- AB 12:** Acetone
Methanol
- AB 13:** HF 20%
Cadmium
GalliumArsenide
Buffered HF
Magnesium
Manganese
Sulfuric
Selenium
Tellur
Zinc

Chemical laboratory :

Acetone	Kaliumdichromat
Ammonia solution	Kaliumhydroxid
Ammonia cer(IV)nitrate	Kaliumiodid
Ammonia fluoride	Methanol
Bromine	Natrium hydroxide
Bromine hydro acid	ortho-Phosphorsäure
Calcium chloride	2-Propanol
Chloroform	Salpetersäure
Chrome (III)-oxide	Salzsäure rauchend
Di chloridemethane	Schwefelsäure
Dimethylsulfoxide	Technisches Petroleum
Ferro (II)-chloride-Tetrahydrate	Tetrachlorkohlenstoff
Essigsäure	Titriplex III
Ethanol	Toluol
Ethylenglycol	Trichlorethylen
Hydrofluoric acid	Wasserstoffperoxid
Iodine sublimiert	Xylol
Isobutylmethylketon	Zinn (II)-chlorid-Dihydrat
Caustic potash solution	

Grey room 2:

Gasschränke: Argon
Oxygen

Ammonia gas
Silane
Laughing gas (nitrous oxide)

Grey room 3:

Refrigerator: Microposit Photoresists S1818, S1813, S1805
AZ 1518
AZ 5218

Grey room 4:

Gasschrank: Sulfric hexa fluoride
Tetra fluore methane



Hydrogen
Methane

Phone Numbers:

Dressing Room: 9625

Clean Room 1: 9631

Clean Room 2: 9630

Clean Room 3: 9628

Clean Room 4: 9626, 9629, 9635

Service room (Grey room): 9632

Confirmation:

With signing below, users confirm to have read, accepted and follow this clean room policy. Clean room personnel will be happy to answer questions or give further detail when required. When being handed out the key to the clean rooms, users are obliged to do their best to maintain safety, order and cleanliness, as well as take part in clean room meetings.