

User Guide
To
LivingDataBase
(Phoenix)

Don't Panic!

(For first-time User)

Content:

For Newcomer

We reduced the content to the absolute minimum. That's all you need as a newcomer.

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1. Important Rules

The database has been optimized for the actual version of Firefox!
Using a different browser, possibly individual functions may not work properly.

Clear regularly your browser's cache!

The system's software is regularly updated. It takes up to three days before a change in the database arrive your browser, because of the web cache and the server mirroring the old web content. A sign for this is that certain features are not available or no longer work.

In Firefox, you do so under  -> Options-> Advanced -> Network-> Cached Web Content
-> Clear Now.

Error in Data Processing

Unfortunately an error occurred within the application.
The Phoenix Software support team has been notified of this error.
In addition you can send an e-mail to support@phoenixbv.com with further details, like what you where doing when the error occurred.

Click [here](#) to continue.

Our apologies for any inconvenience.

Errors in data processing may occur. The system will detect the error automatically and sends a message to the support. Follow the instruction „Click here to continue“ and continue working.

Contrary Use of shown folder



Contrary to the normal use you must left-click on the "+" to open the folder. Clicking on the folder shown opens parent sum functions that you forget right again as a beginner. They are explained in chapter "Advanced Users" (coming soon).

Message: Invalid database connection

- You used umlauts. The system understands only English spellings, so ä = ae, ü = ue, ß = ss, etc. The system takes the umlauts and saves them, but then it has problems in the processing order.
-> Contact HNF-Office
- You access the system from outside of the research center. Your firewall or the firewall of your departmental or central server has problems with JAVA
-> Ask your system administrator
- You can exclude both, contact HNF-Office

3-Month Rule

- If you do not make a booking within 3 months, the system exclude you automatically from further bookings. The system will automatically notify you by e-mail.
- Apply via the HNF-Office for further access. The release includes a repetition of the security test. The system encourages you automatically.
- Should the period be longer than 4 months, you must repeat all instructions for needed equipment in any case.

Phoenix = Livingdatabase

The company is called Phoenix and booking database Living Database. Since the company logo on the home page is so present, it has become familiar to call the booking system Phoenix.

Time limit for uploading the Run sheet

Your run sheet has to be uploaded in Phoenix 14 days before the next cleanroom briefing. If you miss that your briefing skips to the next month. You find the briefing dates on the homepage <http://www.hnf.fz-juelich.de>

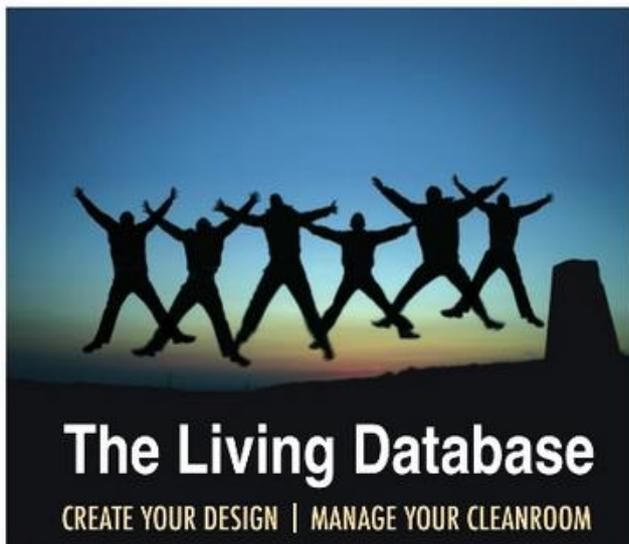
2. For Newcomers - Start Phönix

2.1 Start Page

You find the registration and booking system:

- **Registration/Access for HNF:**
<http://www.hnf.fz-juelich.de> -> Access -> User Application -> Phoenix
- **Gerätebuchung:**
<http://www.hnf.fz-juelich.de> -> Access -> Tool Booking -> Phoenix

After login you see:



Please login using the name provided by your administrator.

Username

Password

[Request a new password](#)
[Register for access](#)

You find here:

1. Log in system
2. Request a new password
3. Register for Access

2.2 Register for Access

Register for access to The Living Database

Enter your personal details, when submitting you will receive a confirmation email at the given email address

Personal details		In case of emergency	
First name	<input type="text"/>	Name in case of Emergency	<input type="text"/>
Middle name	<input type="text"/>	Phone in case of Emergency	<input type="text"/>
Last name	<input type="text"/>	Work address	
Birthday	<input type="text"/>	Street	<input type="text"/>
Nationality	<input type="text"/>	Zipcode	<input type="text"/>
Picture	<input type="button" value="Browse..."/> No file selected.	City	<input type="text"/>
Password & Captcha		Country	<input type="text" value="Choose One"/>
Password	<input type="text"/>	Phone	<input type="text"/>
Password (repeat)	<input type="text"/>	Mobile	<input type="text"/>
Captcha		Institute	<input type="text" value="Choose One"/>
Access information		Email	<input type="text"/>
Work description	<input type="text"/>		
Scientific Supervisor	<input type="text" value="Choose One"/>		
Additional documents	<input type="button" value="Browse..."/> No files selected.		
<input type="button" value="Submit"/>			

Register for Access

- Yellow = mandatory
- Only English spelling
ä= ae, ü=ue, ß=ss, etc. !
- Password, eight-digit, with special characters and number
- Work description – enter here what you need:
 - „SEM“
 - „Dicing Saw“
 - „Cleanroom“
 - „Nanocluster-Lab“
 - „AFM-Lab“
- Scientific Supervisor = working group leader
- Additional Documents = upload Run Sheet
- Use a correct mail address!
Any functioning mail address is welcome.

Attention! Run Sheet

- ➔ You will not be admitted without a run sheet.
- ➔ Create a Run Sheet according to the specifications. See appendix: How a Run Sheet looks like
- ➔ Create the Run Sheet and save it as a PDF. Upload it under "Additional Documents" in the system
- ➔ The Run Sheet is examined and you will receive an email with the assignment of equipment needed
- ➔ **Users who do not use the cleanroom but only SEM-Lab or AFM-Lab, or Nanocluster, or Dicing Saw do not need to upload a Run Sheet!**

➔ Click on „Submit“, if you are ready. You will get a mail from livingdatabase@fz-juelich.de:

Dear,

Thank you for registering for The Living Database. Below you will find the url to verify your registration:

<https://ibn-phoenix.ibn.kfa-juelich.de/ldb_wicket-juelich/verify/12c66768-3fbe-4cf9-9978-91407a9e8f3b>

Kind regards,
LDB Support

- Click on the link and confirm the registration. **Without the confirmation you are not registered!**

You did not get a mail within one hour? = you made a mistake entering the mail address

→ Call HNF-Office or do new registration



- You get a second mail:

Dear,

The verification was successful and the administration has been notified. Someone from the administration will contact you after your registration has been approved.

Your loginname:

- HNF-Office sets you active in Phoenix. You will get the mail:

Dear,

Your account has been activated and you can now do the exam to validate your knowledge on safety and cleanroom policies in HNF.

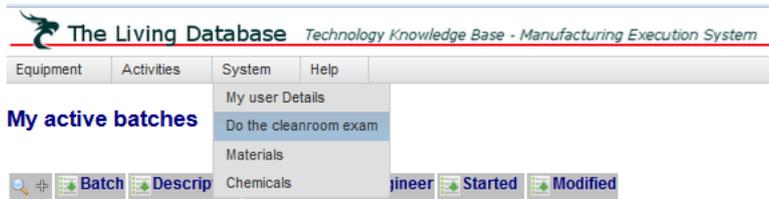
Go to: <https://ibn-phoenix.ibn.kfa-juelich.de/ldb_wicket-juelich/exam> where you will be required to login with the username and password that you entered at the registration.

Your loginname:

Under this link you will find access to the cleanroom safety test you must pass before you are invited to a cleanroom briefing. You can repeat the test as often you want. Teaching material can be found on the website under Downloads: Lecture HNF_Cleanroom (renewal).pdf

Forgot the Link to the Cleanroom Safety Test?

- Enter https://ibn-phoenix.ibn.kfa-juelich.de/ldb_wicket-juelich/exam in the browser window
- Or login in Phoenix. See System -> Do the cleanroom exam



- Teaching material see Homepage-> Downloads: Lecture HNF_Cleanroom(renewal).pdf

If you pass the exam, you will get the mail:

Dear,

You have passed the test and receive another security clearance for one year, unless other reasons lead to premature termination of the security clearance. You must sign the attached Certificate Safety Renewal and send to HNF Office within two weeks or your account is blocked.

Kind regards,

Anlage: CertificateSafteyRenewal.pdf

The HNF-Office receives an audit report and invites you to the next possible cleanroom briefing. Dates are usually in the first 9 days at the beginning of each month.

In this briefing you will also receive the electronic key, you need to access the building and the clean room

Print the Certificate Renewal Safety, sign it and give it as original to the HNF-Office before the first clean room briefing.

Without signed Certificate Renewal Safety no cleanroom briefing!



Traditional question after the cleanroom briefing: I cannot book equipment!?

That's right. You need an instruction by the Equipment Manager to book equipment. When you are ready, the Equipment Manager will unlock you for the device in Phoenix. Only then you can book the device.

2.3 How do I get an equipment instruction?

2.3.1 Check:

Cleanroom exam passed?	No	Yes
	→ https://ibn-phoenix.ibn.kfa-juelich.de/ldb_wicket-juelich/exam	
HNF-Office has the signed Certificate Safety Renewal?	No	Yes
	→ Sign it and send it! → Do not know where to find? → www.hnf.fz-juelich.de -> Downloads-> Certificate Safety Renewal	
Cleanroom briefing passed ?	No	Yes
	→ Ask HNF-Office for next appointment	
You got the mail with the release of the run sheet?	No	Yes
	→ Ask HNF-Office	

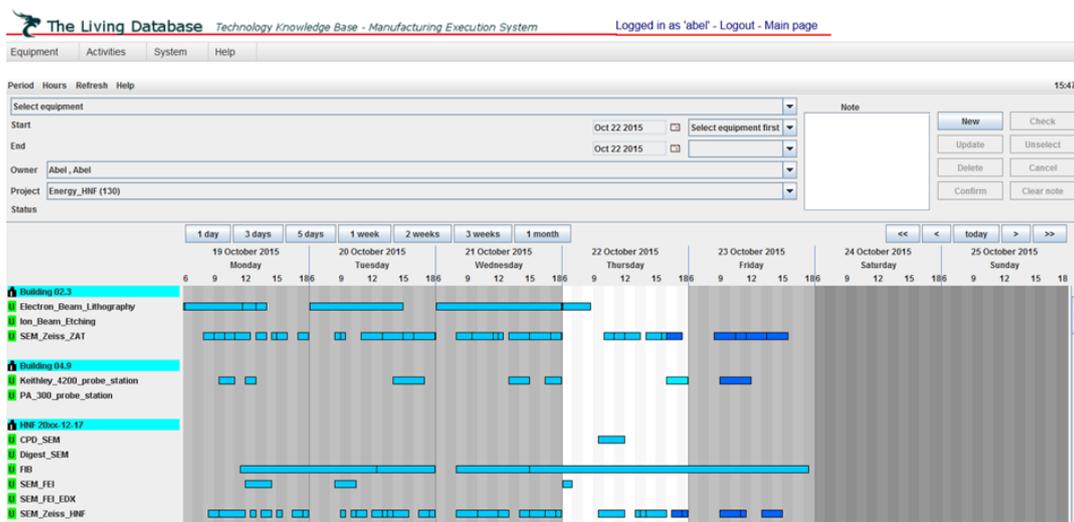
If you answered one of the questions with „No“, you will not get a training appointment.

2.3.2 How can I find an Equipment Manager?

- a) Login in Phönix
- b) See Activities -> Reservations



➔ Left-click on Reservations and you see:



- c) On the left side, the equipments are listed. Move the cursor to the desired equipment, and make a left-click. The following menu appears



- d) Contact the Equipment Managers.

2.3.3 When can I book equipment?

- The Equipment Manager agrees with you the training dates
- If the Equipment Manager decides that you meet the requirements, he unlocks you in the booking system.
- Then you may book yourself.

Attention!

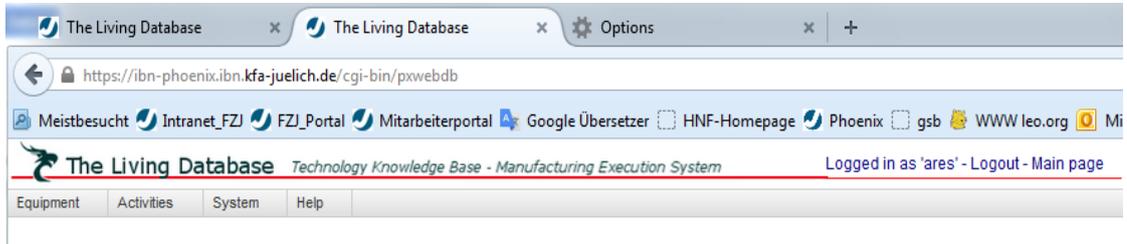
If you do not a booking within 3 month, the system revoke your access automatically. The system informs you via mail.

You apply further access via HNF-Office. The release includes a repetition of the security test. The system informs you automatically.

3 Using Phönix

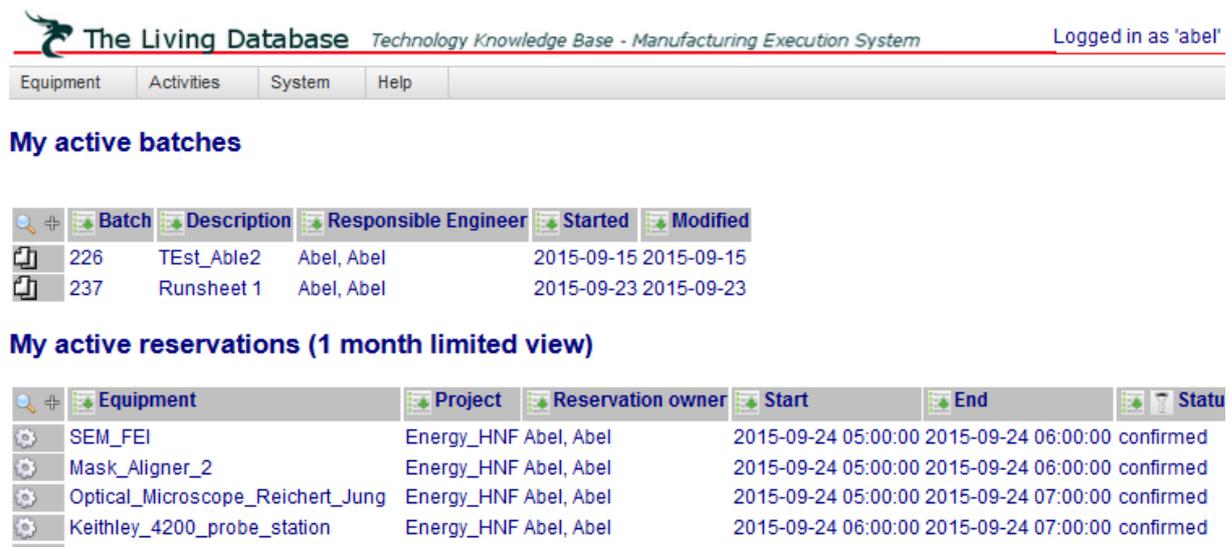
Login in Phoenix and see:

A) As new user without equipment release:



➔ Only accessible is “System”. See „My User Details“ und „Do the cleanroom exam“.

B) As user with equipment release



You see:

<u>Equipment</u>	<u>Activities</u>	<u>System</u>	<u>Help</u>
➔ Equipment	➔ Reservations ➔ My active batches ➔ My batches ➔ Our active batches ➔ Our batches ➔ wafers	➔ My user details ➔ Do the cleanroom exam ➔ Materials ➔ Chemicals	➔ Main Server ➔ Test Server ➔ General Documents ➔ About ➔ Logout ➔ User Manual

- C) **My active batches:** shows the processes you are working on -> See section Advanced
 D) **My active reservations:** shows the booked equipment for a month

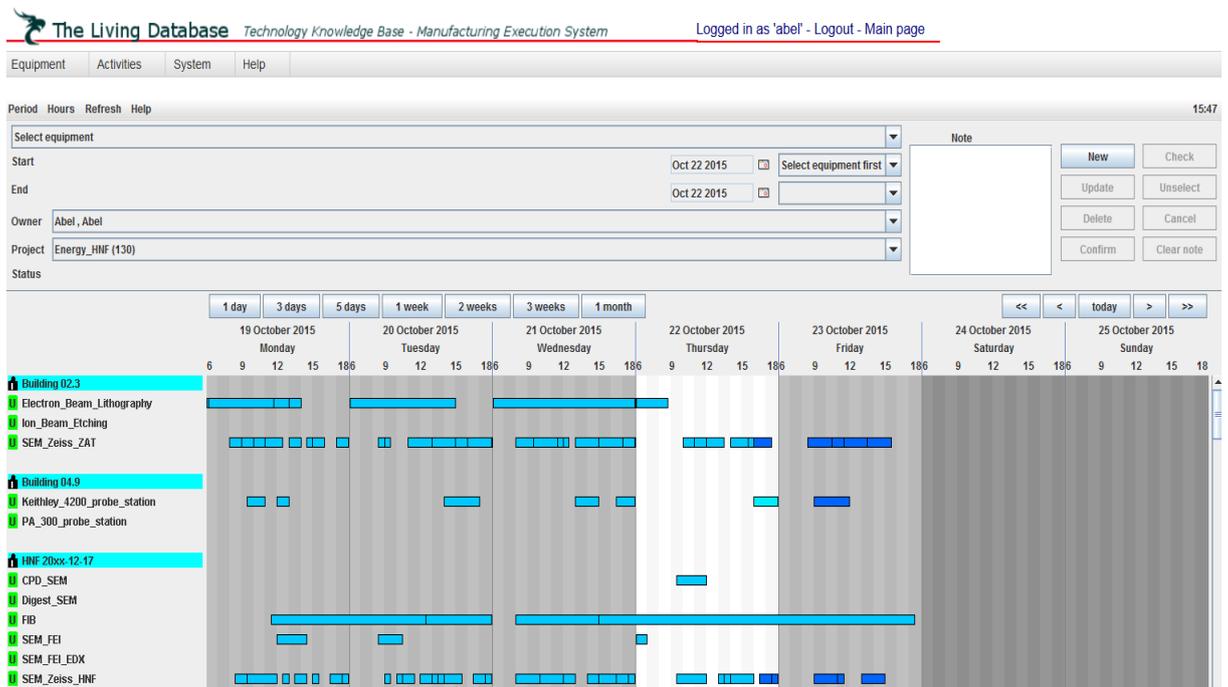
As beginner you need only two categories:

1. „Reservations“, to book equipment
2. „My User Details“, to control HNF access time

Everything else is not so important for the first time!
 If you have time later, you can see and click the further once.

3.1 Activities -> Reservations

➔ Click on Reservations and see:



3.1.1 Booking equipment

You choose the equipment you are instructed for with a right-click on the name, - i.e. RIE3. You see in the header:

Period Hours Refresh Help

RIE_3_Oxford_Plasmalab_100

Start Oct 22 2015 16:15

End Oct 22 2015 16:30

Owner Abel, Abel

Project Energy_HNF (130)

Status

You see here: the chosen equipment, your user name as owner of the booking the cost number of your project. If you have several cost numbers you can choose the appropriate here.

Click on the folder beside the fields for start and end and choose the dates. Then choose the time and duration.

Example:

Period Hours Refresh Help

RIE_3_Oxford_Plasmalab_100

Start Oct 30 2015 08:00

End Oct 30 2015 08:15

Owner Abel, Abel

Project Energy_HNF (130)

Status

➔ You book the equipment with a click on „New“

Note

New Check

Update Unselect

Delete Cancel

Confirm Clear note

The booking appears in the calendar as coloured rectangle

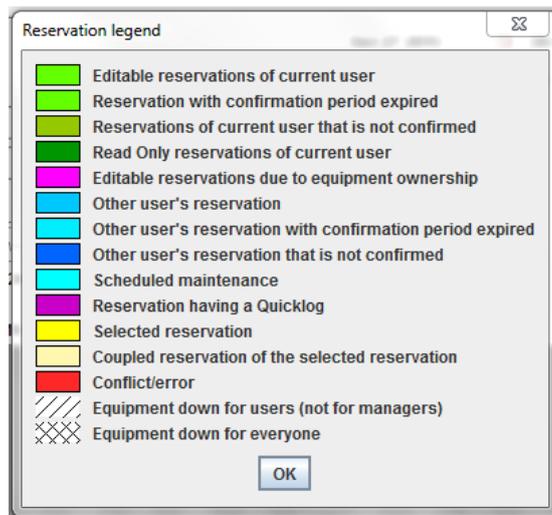
30 October 2015
Friday

186 9 12 15 186

All your bookings are rectangles with similar colour.

- ➔ You have reserved the appointment. To get the booking permanently, you need to confirm it. You can do it directly by a click on "Confirm" or wait the system reminder you a day before the appointment by e-mail. If the date is not confirmed, it may be taken over by another user. If you book short term the system do not reminder you.
- ➔ As long as you have not confirmed the date, you can delete or change it.
- ➔ Each appointment has a time limit to which it can be deleted or changed. This is usually an hour earlier. After that the equipment is automatically confirmed.
- ➔ Only Equipment Manager or System Administrators can delete confirmed bookings.

Colour legend:



😊 Have Fun!

Appendix: How a Run Sheet looks like!

All activities which should be done in the HNF require a proposal, which is evaluated by the TechCom in advance of starting the work in the HNF. This is due to several reasons.

We would like to see what materials you intend to work with in the HNF. For there is a wide range of different materials and scientific topics there is also a wide range of materials and chemicals needed to cope with that task. Unfortunately often those materials interfere with each other. E.g. Ka and Na are a major drawback for Si device processing and every work, which depends on the electrical properties of Silicon; for samples on which cells should be cultivated after processing it is necessary to avoid contamination with As, Te, Bi or other toxic materials. Especially when you need new chemicals we have to know about that, because we have to fulfill safety requirements in the cleanroom and the HNF at all.

Safety measures have to be taken to avoid harm to equipment and first and foremost people.

Many processes are taken from literature. This is of course reasonable, but it is as well reasonable to adopt the single process steps to our technology. E.g.: In the literature there might be a resist XYZ used to do a certain lithography step.

This non standard resist XYZ often can easily be replaced by e.g. our standard AZ5214 resist. The same is true for spin speed

during resist coating: if the authors use 2500rpm this might be due to standards in their laboratory, but not for technological reasons; so our standard of 3000rpm might do, too.

To be able to assign your work to different tools, we have to know the sample size and why this size is chosen. There might be technical reasons for you having samples of e.g. 7mm by 7mm size only, but often it is possible to do some of the process steps with larger samples before they will be cut to small pieces.

So when you write your proposal, keep the following in mind:

- Which samples do you have (size/material)
- Which materials are on the sample
- Which materials have been on the sample and how have they been removed
- Which chemicals have been used to treat the sample before
- What is the aim of the single step in your process (e.g. resist coating for optical lithography for patterning structures of $\sim 1\mu\text{m}$ times $10\mu\text{m}$ with RIE; etching depth $\sim 500\text{nm}$)
- Describe your process steps as detailed as possible (temperatures, spin speeds, etc...); for new processes describe your aim and the means you want to obtain it.
- A sketch of the process is helpful (at least for longer flows)
- Do you need special chemicals for your purpose
- Do you need special tools

If you are not used to technology feel free to contact us before, so we can help you to do develop the process flow and therewith the proposal. On the next page you can see an example how a proposal should look like.

Realization of μ -apertures on Si₃N₄ membranes

Starting material:

100mm Silicon (100) wafers polished from both sides.

1. Cleaning samples: Acetone/IPA/DI
2. Marker definition:
 - Lithography and subsequent etch of marker structures. Structure size several μm , etching depth $\sim 500\text{nm}$.
 - Resist coating:
 - UV26, 4000rpm ($\sim 1.7\mu\text{m}$); Soft bake: 130°C, 60 s hot plate;
 - Exposure:
 - dose to be tested Post Exposure Bake: 110°C; 60s hot plate;
 - Development:
 - MF-24-A 60s
 - RIE:
 - anisotropic etching of 500nm of Si; side wall angle $>75^\circ$
 - Resist stripping:
 - O₂- Plasma in RIE chamber
3. Cleaning:
 - H₂SO₄/H₂O₂ (2:1), 10 min, 60°C, Ultra Sonic
4. LPCVD:
 - Deposition of 300nm Si₃N₄ (both sides)
5. Lithography backside: opening of Nitride mask on backside
 - Resist coating:
 - UV26, 4000rpm ($\sim 1.7\mu\text{m}$); Soft bake: 130°C, 60 s hot plate;
 - Exposure:
 - dose to be tested Post Exposure Bake: 110°C; 60s hot plate;
 - Development:
 - MF-24-A 60s
6. Etching of nitride mask: RIE of Si₃N₄(CHF₃/CF₄)
7. Resist stripping: O₂-Plasma in RIE chamber
8. Cleaning:
 - H₂SO₄/H₂O₂(2:1), 10 min, 60°C, Ultra Sonic
9. Wet etch of Silicon:
 - HF-Dip: remove SiO₂ on Si with 1 min HF 1%
 - KOH etch: etching of Si; time dependent etching; stop before Si₃N₄. Parameters to be Clarified
 - Remove Si₃N₄ from backside: RIE CHF₃/CF₄
 - HF-Dip: remove SiO₂ on Si with 1 min HF 1%
 - KOH etch: etch through wafer; stop on Si₃N₄ on front side. Parameters to be clarified
10. Deposit 30nm Au on front side
11. Deposit 30nm Au on back side
12. FIB: etch 2 μm holes in Au/Si₃N₄/Au membrane

Schematic process flow

