

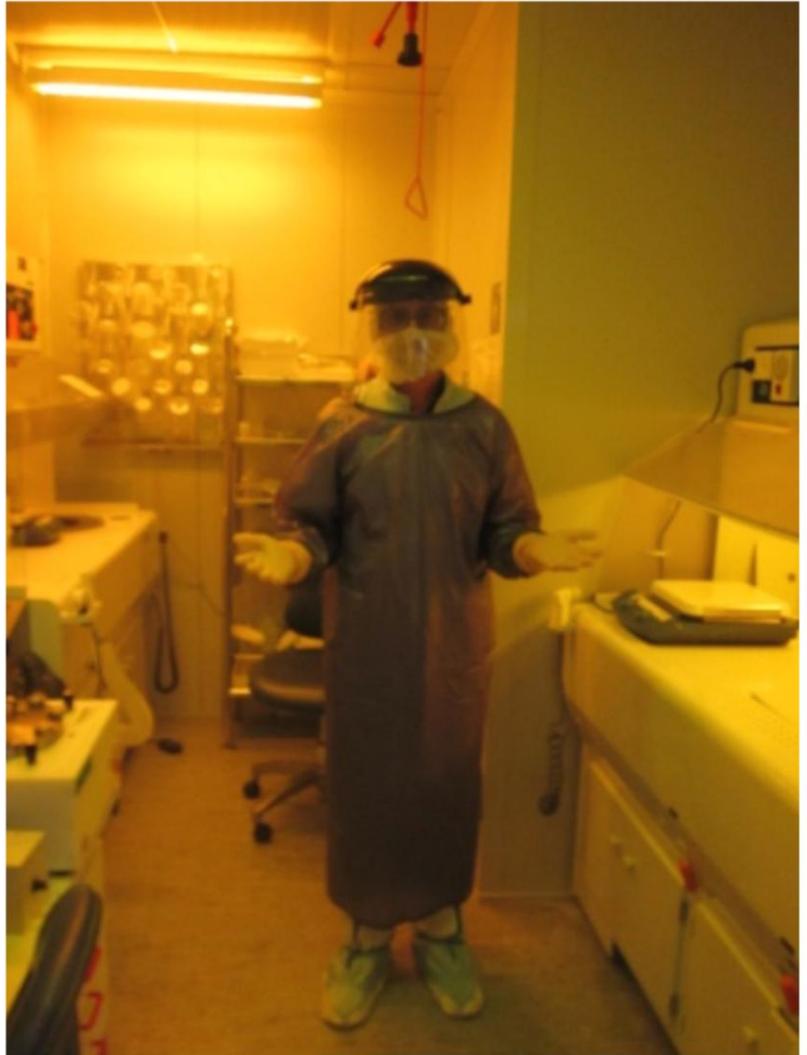
Piranha Etch SOP



Piranha solution should be prepared and used **only** when necessary. Try to avoid using Piranha if a less reactive reagent will work (NMP, Nano Strip, etc.). Piranha solution is not recommended for routine cleaning of glassware and masks.

1

Put on the protective apron, rubber gloves, and face shield.

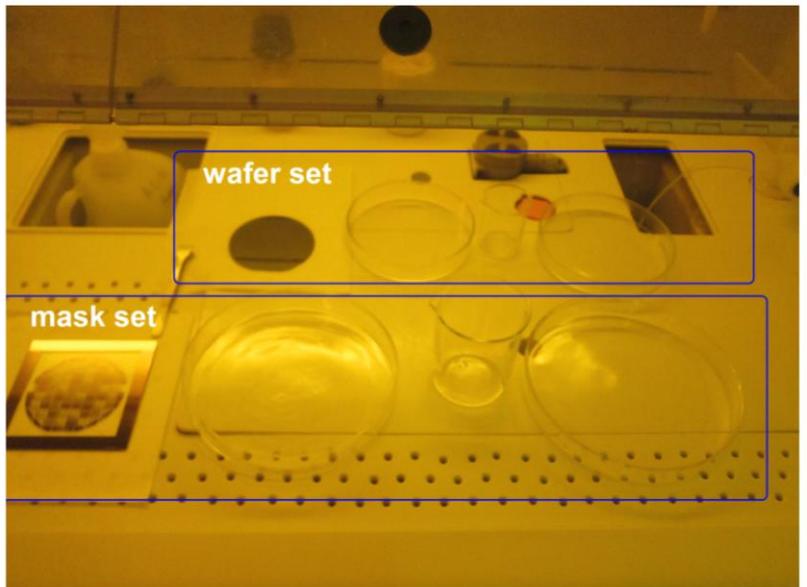


2

Use only glass or Pyrex containers:

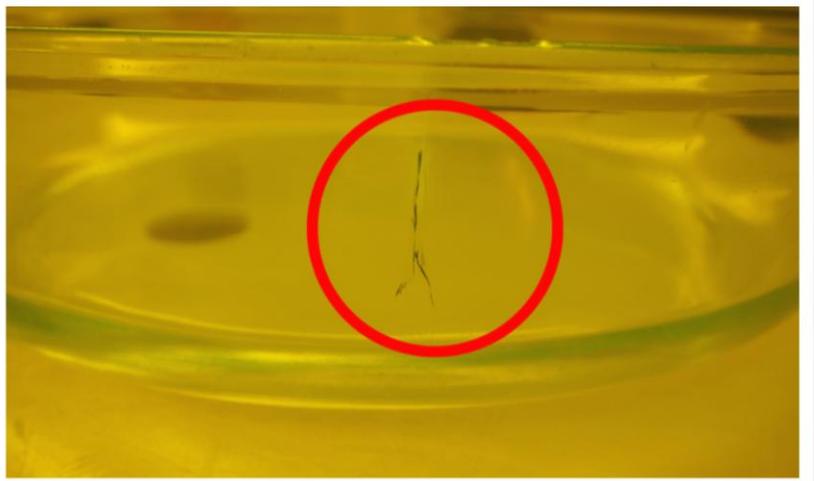
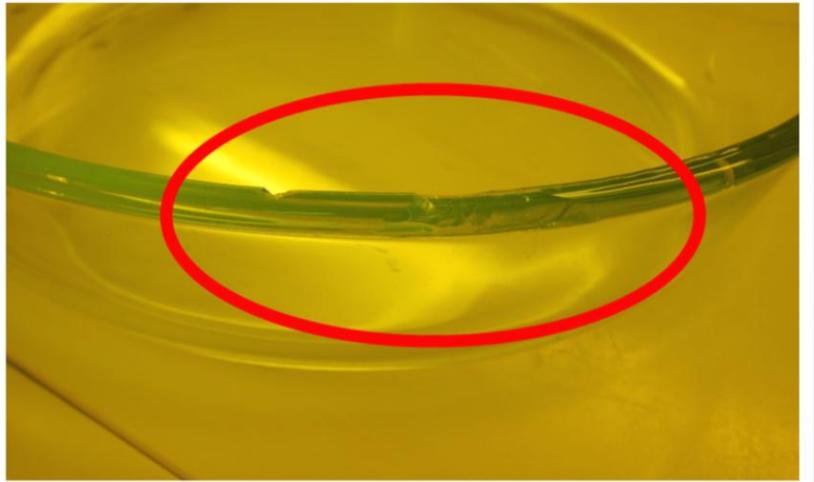
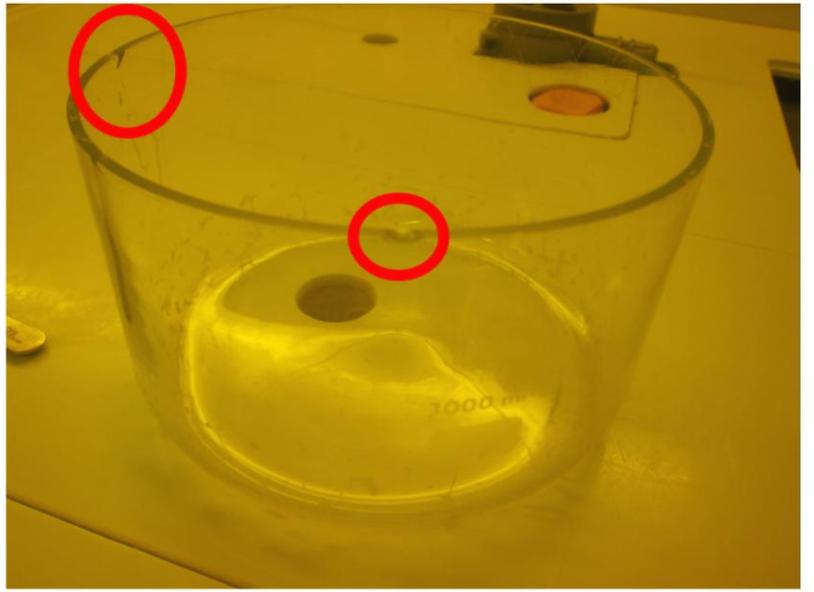
- Inspect for cracks or chipping.
- Rinse the container with water and dry well prior to use.
- Piranha solutions are not compatible with plastic.

There are two dish sets: wafer set & mask set – the mask set is larger. The goal is to use the lowest amount of solution as possible.



3

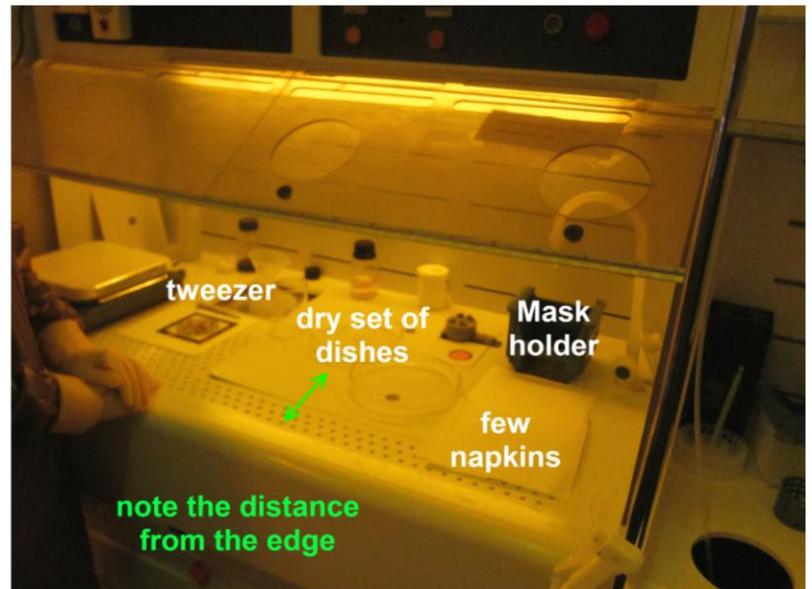
Example of damaged glassware. Don't use these dishes, put them aside and notify the clean room staff.



4

The procedure shown is for a mask cleaning.

Prepare the workplace – strong tweezers, dishes, napkins, mask holder (in the sink). It is important to work well inside the fume hood (far from the edge)!



5

Check the label!!! Take Hydrogen peroxide. Pour 50ml hydrogen peroxide into a measuring cup.



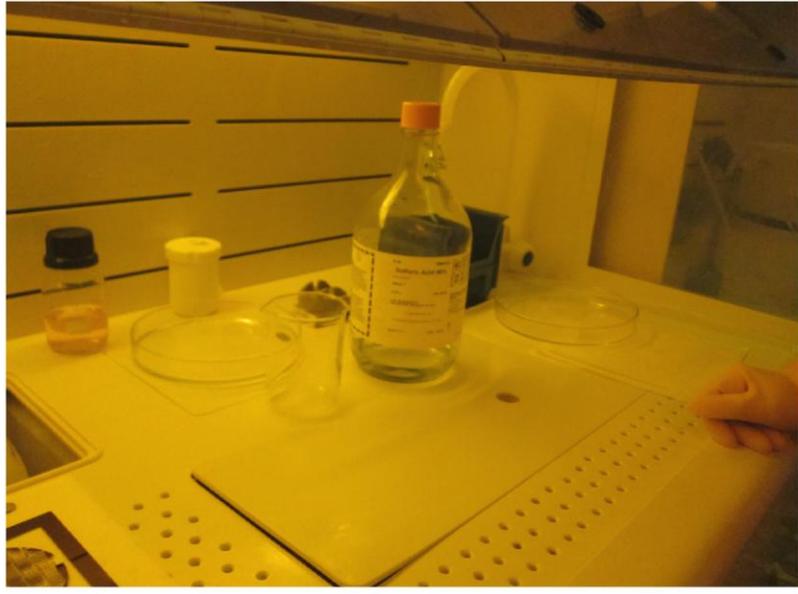
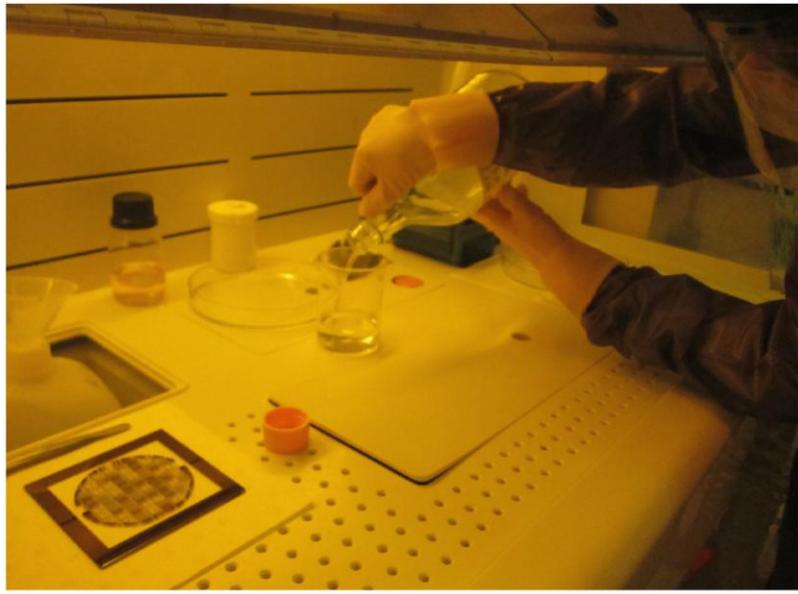
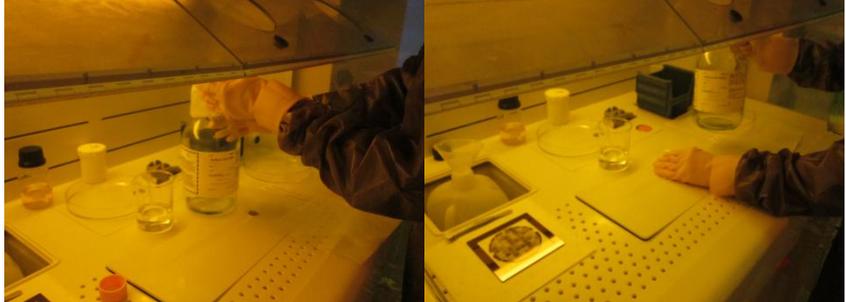
6

A typical mixture is 3:1 concentrated sulfuric acid to 30% hydrogen peroxide solution. The guide line is to use lowest possible amounts. For the mask cleaning procedure the amount is 150 ml sulfuric acid to 50 ml 30% hydrogen peroxide. For the wafer cleaning procedure the amount is 90 ml sulfuric acid to 30 ml 30% hydrogen peroxide.

Pour the hydrogen peroxide into the first dish.

Remember the AAA rule (Always Add Acid) – add the sulfuric acid to the hydrogen peroxide.



7	Take the sulfuric acid. Check the label!!!!	
8	Carefully pour the sulfuric acid (150ml) into a different measuring cup or rinse well the previous cup you used. You do not want to start the reaction yet!	
9	Clean the bottle neck and bottom, and the bench from acid drops. Return the bottle to the cabinet.	

10

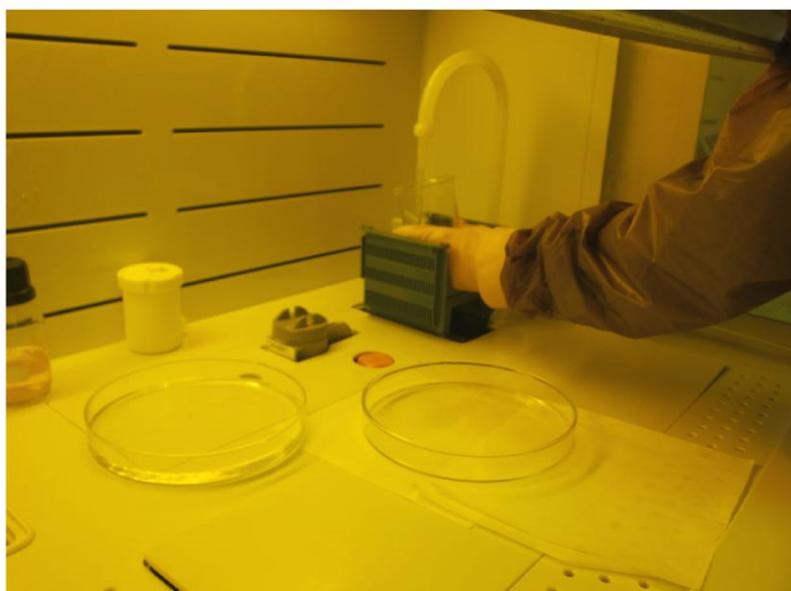
Pour the sulfuric acid to the first dish with the 30% hydrogen peroxide. You will start the reaction. The reaction is highly exothermic! Be careful and work well inside the fume hood (far from the edge)!

Let it stabilize for few minutes.



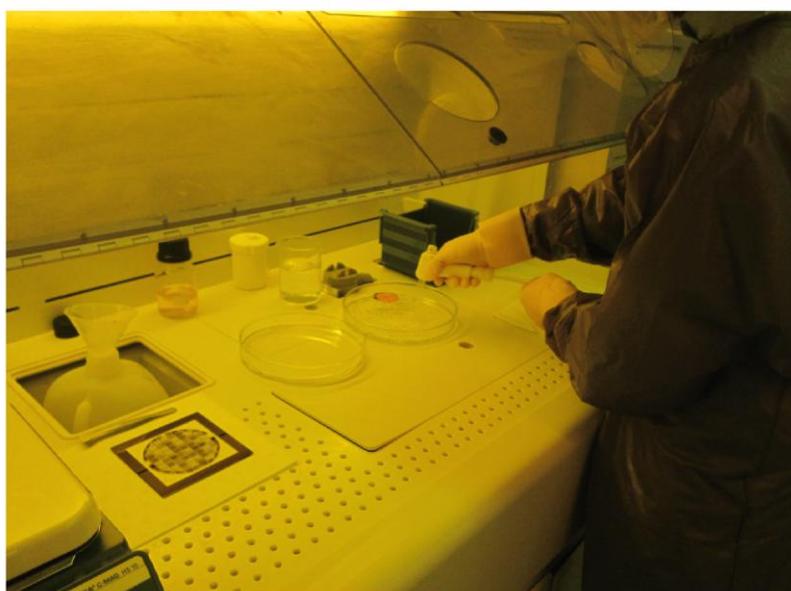
11

Wash the measuring cup and fill it with water. You will use it later to wash the tweezers.

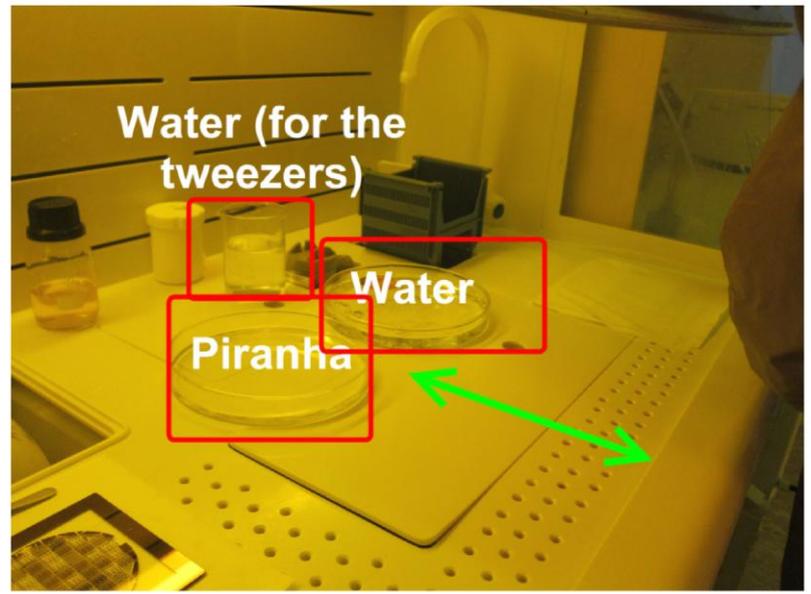


12

Fill water in the second dish.



13

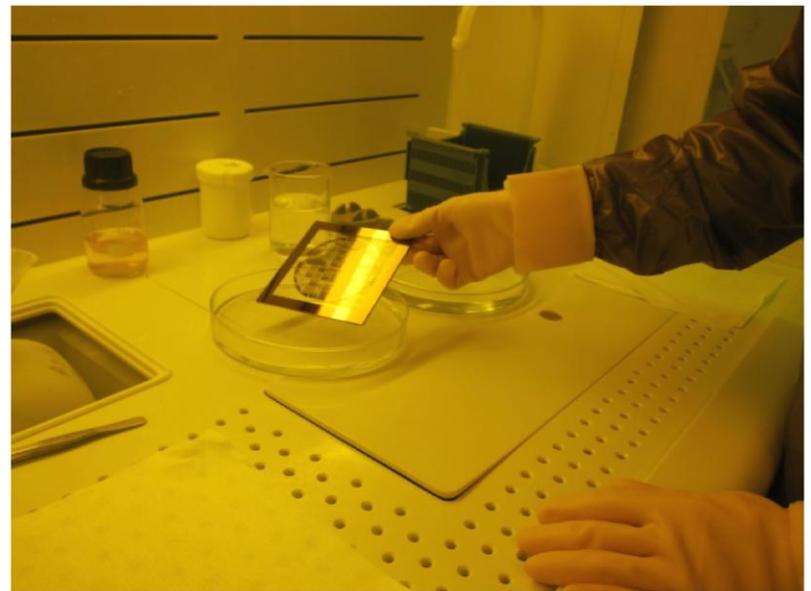


14

After the solution has settled and the temperature stabilized ~ 100 °C CAREFULLY put in the mask.

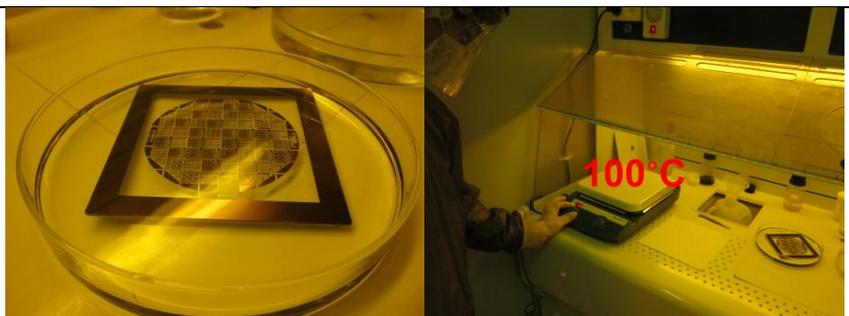
Piranha is used to remove photoresist and acetone residues, not the compounds themselves!
Large quantities of acetone residues can cause explosion!!!

The mask has to be “clean” before you put it into Piranha!



15

You will see bubbles rising up indicating the “dirty” areas. After ~ 15 min you can use a hot plate (100 °C) to maintain the reaction.



16

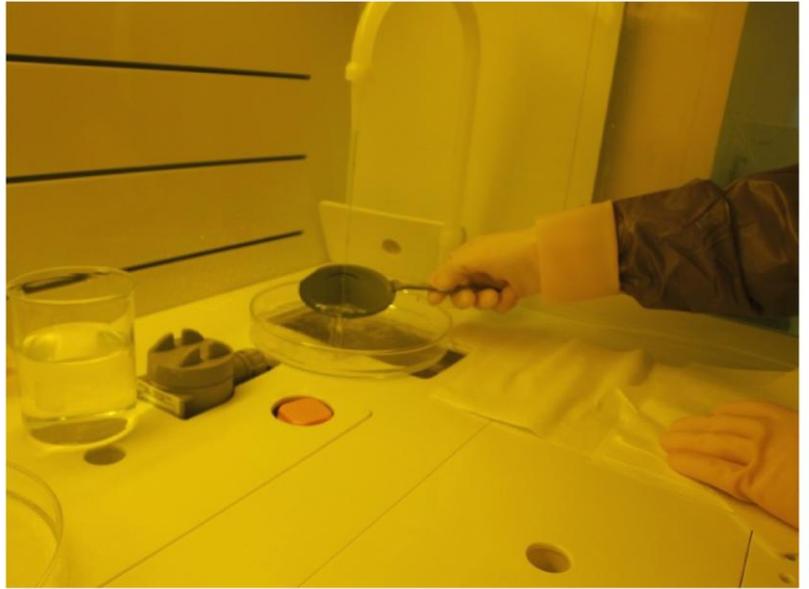
Usually, the cleaning process takes around 20 minutes.
After your mask is clean, using the strong tweezers, **CAREFULLY** transfer the mask to the water container.



17

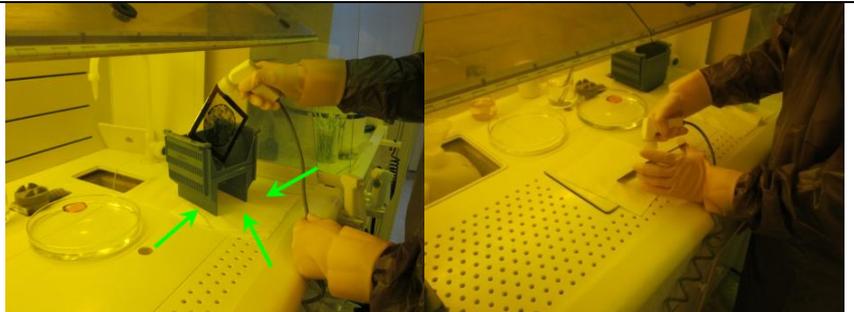
Take the mask out of the water container and put it under running water to rinse the residuals of the Piranha. We suggest that you use the mask holder.

If you are cleaning a wafer, we suggest that you cover the sink with another dish to prevent the wafer from falling to the sink.



18

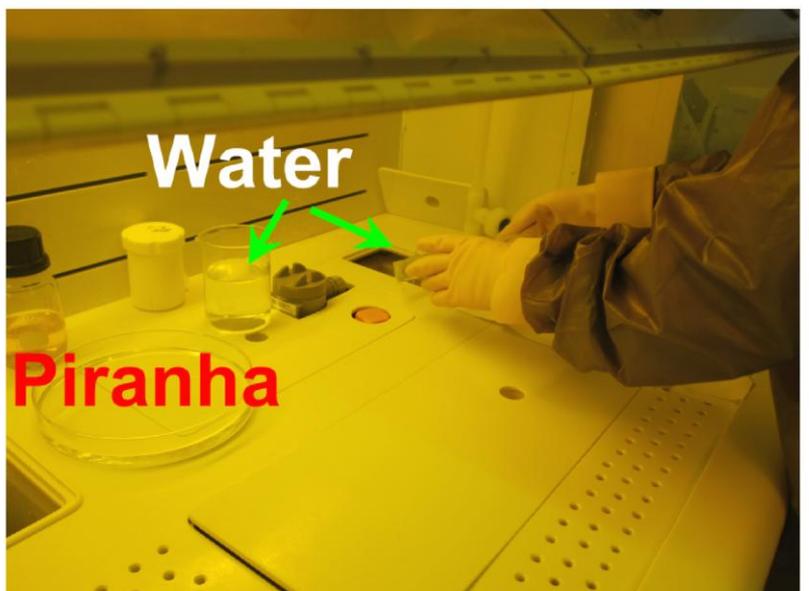
Dry the mask using nitrogen. Use napkins to collect the drops.



19

After you cleaned your mask and placed it in proper container, and waited for the Piranha to cool down you need to dispose the solution and clean the workplace.

First empty the water containers to the sink.



20

Leave the water running and start spilling the Piranha SLOWLY to the sink while diluting it with running water.



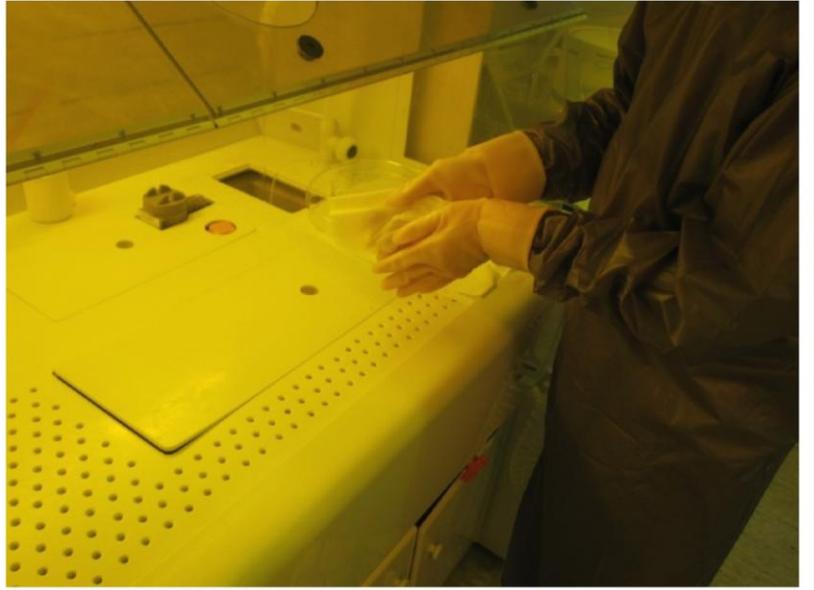
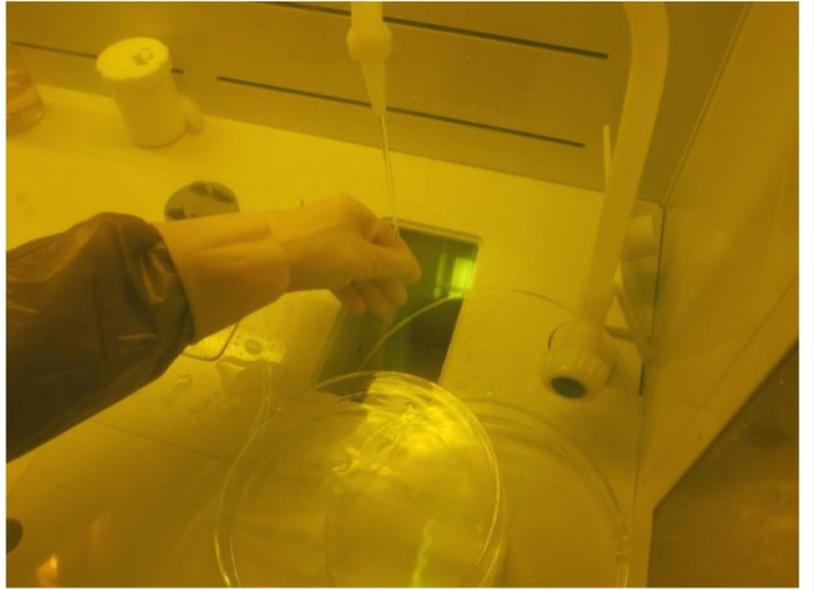
21

Rinse the dishes with water at least three times.



22

Rinse the gloves with water and dry them well.



23

Take off the gloves carefully and check for possible damages. If you see damage, throw the glove to the trash and notify the clean room staff to provide a new pair.



24

Put the dishes in the dish washer.



25

Clean the bench!

