Single Substrate "Floating Process"

Double Face Electrolytic Process

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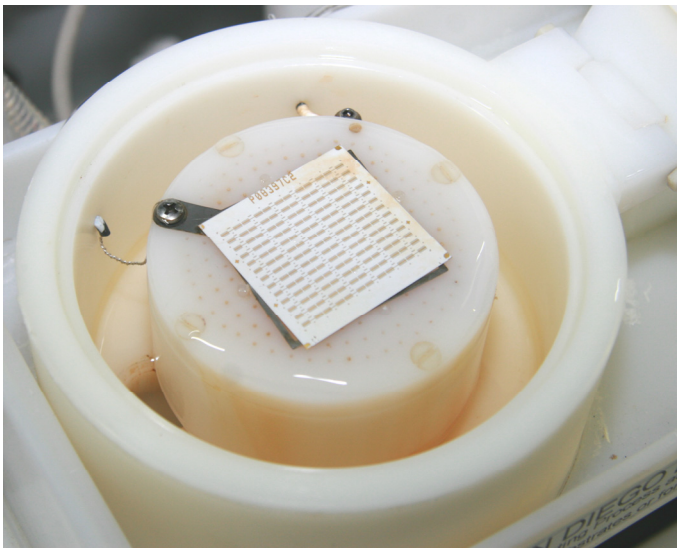
SPM is proud to present its new prototype for single substrate processing.

The original idea that focused us on the problem was to find an innovative method to process single substrate instead of the actual complicated and expensive mechanism.

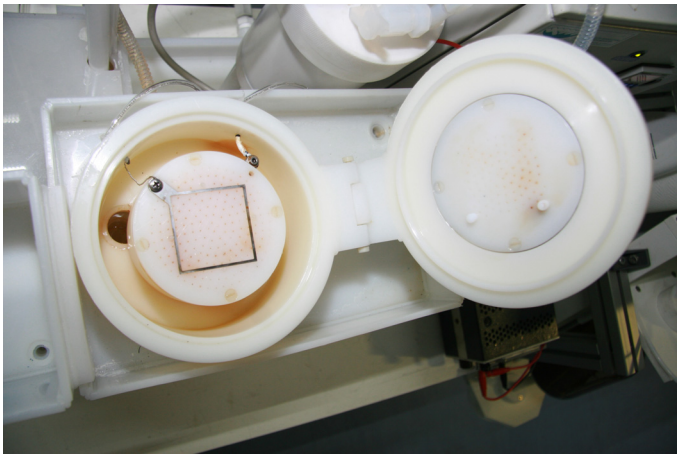
Starting with that objective SPM engineer found a new design for process tank based on the principle of floating the wafer on the chemical solution.

The "floating effect" is obtained thanks to a centrifugal pump that spread the solution from the bottom of the tank to the top. When the liquid reach a special disc, the flow change immediately its direction moving on the edge of the disc. That phenomenon creates particular waves that come out around the disc. A secondary disc (called diffuser) is placed after this. This diffuser has more or less the dimension of the wafer-solar cell-substrate you are using and it's full of high precision holes arranged concentrically.



Waves arrive in a strong way on the bottom plane of the diffuser, but they are immediately cushioned passing through the small holes. This creates on the top plane of the disc a "liquid pillow".

This particular effect permits to liquid to keep a constant level and a perfect homogeneity of chemical distribution.



PATENT PENDING

Front-end PROCESSING

11 November 2013

Special Plastic Module for semiconductor industry

PROCESS TANK

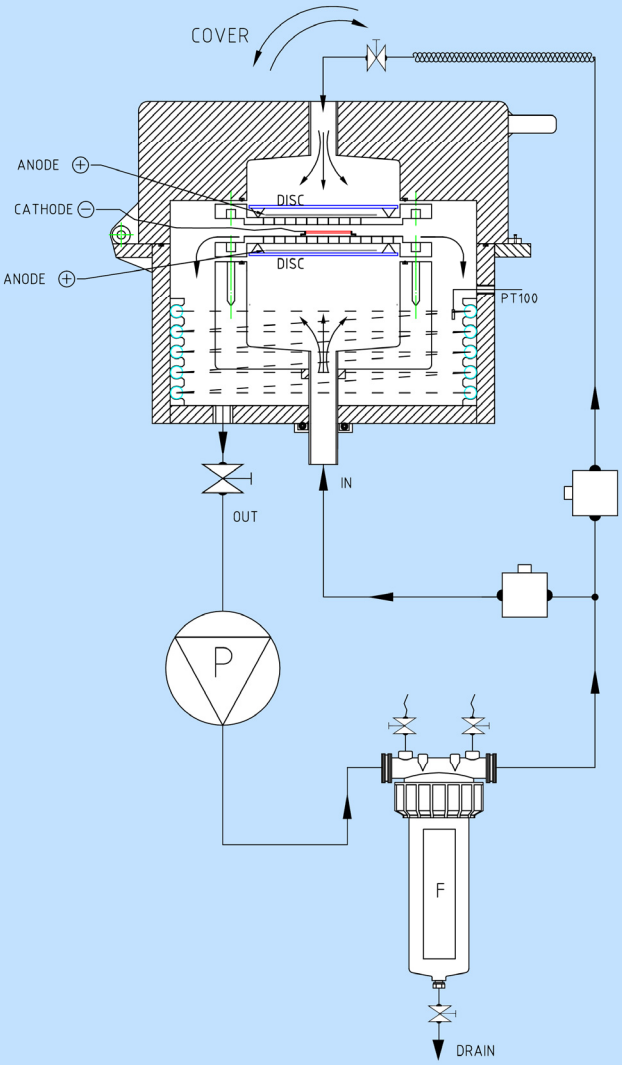
The prototype process tank is obtained lathering a PE cylinder.

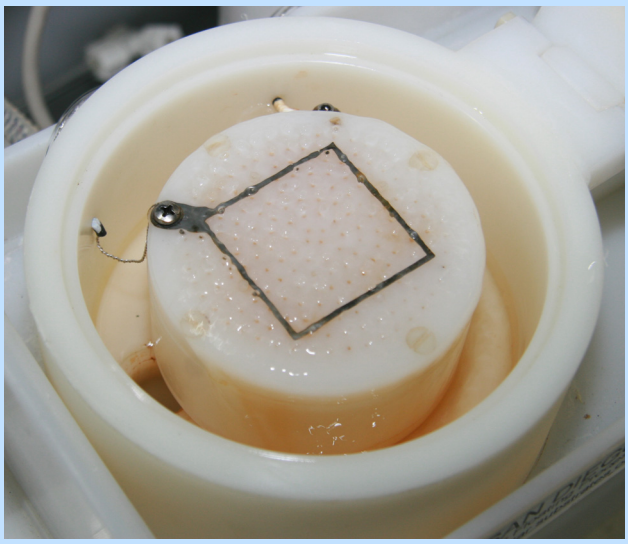
The cylindrical shape is necessary to obtain the "pillow effect" and to warrant a very low particle deposition on tank walls, since there are no welding points and edges as on squared tanks.

A surrounding cylindrical tank (overflow) collects the solution and route it to the centrifugal pump.

A filter to ensures that eventual debris coming from chemical etch will not block diffuser holes.

An infrared heater installed on the piping line heat up the solution to the temperature settled by operator.





The *electrolytic processes is possible thanks to* **platinated titanium nets** (anode) placed before top and bottom diffuser. A peripheral titanium contact (cathode) is fixed on the top face of the bottom diffuser surrounded by plastic pins that keep in place the substrate.

The electrolytic process can be performed with different metals like: **Cu**, **NiFe**, **AgSn**, **Au**, **PbSn**, **Sn**, **Ni**, ecc…, just changing the anodic electrodes.

The system can be used also for anodic and cathodic roughing, clean up process, etching and oxide removal.

Substrates can be squared, rectangular and circular too with every dimensional options.

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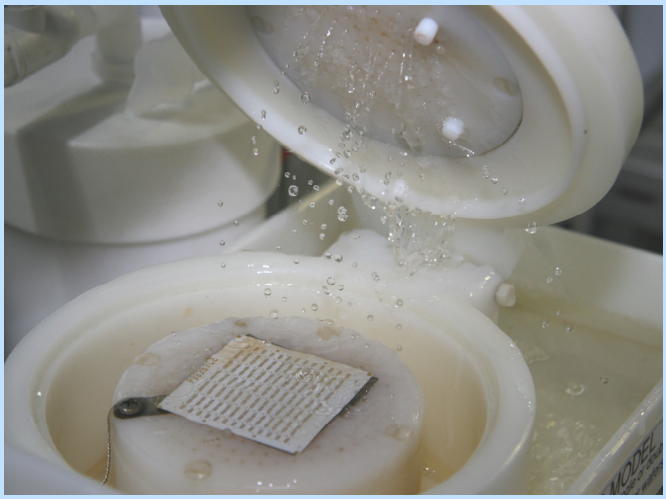
DOUBLE FACE

The tank is equipped with special cover that includes a top diffuser and a cathode for double face process. When the cover is open the back side is totally not affected because of the floating effect that protects it from the contact with the chemical solution. When cover is closed, and the top diffuser is activated, the substrate front side comes in touch with the solution and the process become double face.



Simulation of double face process

GENERAL CONTROL

The prototype is equipped with a thermo-regulator and a timer. Specific buttons activate pump, heater and timer. At the process end, a buzzer will alert operator that process is finished.

Power Supply for Electrolytic Process

INFINITE POSSIBILITY

The prototype is designed for a simple manual process, but our idea is to develop also an automatic version. We are now working on different automatic transfer methods from process to rinse tanks, including dryer, ultrasounds and other options. We can realize “Floating effect” process tanks for every supports (wafer, solar cells, substrates) and formats up to 450mm of diameter. For this last format we have already realized one tank to process 450mm wafer to test diffusion behavior and we have already obtained good results also with this big dimensions tank. We are ready to propose, to interested companies, this new technology matching to our 26 years experience on semiconductor world.

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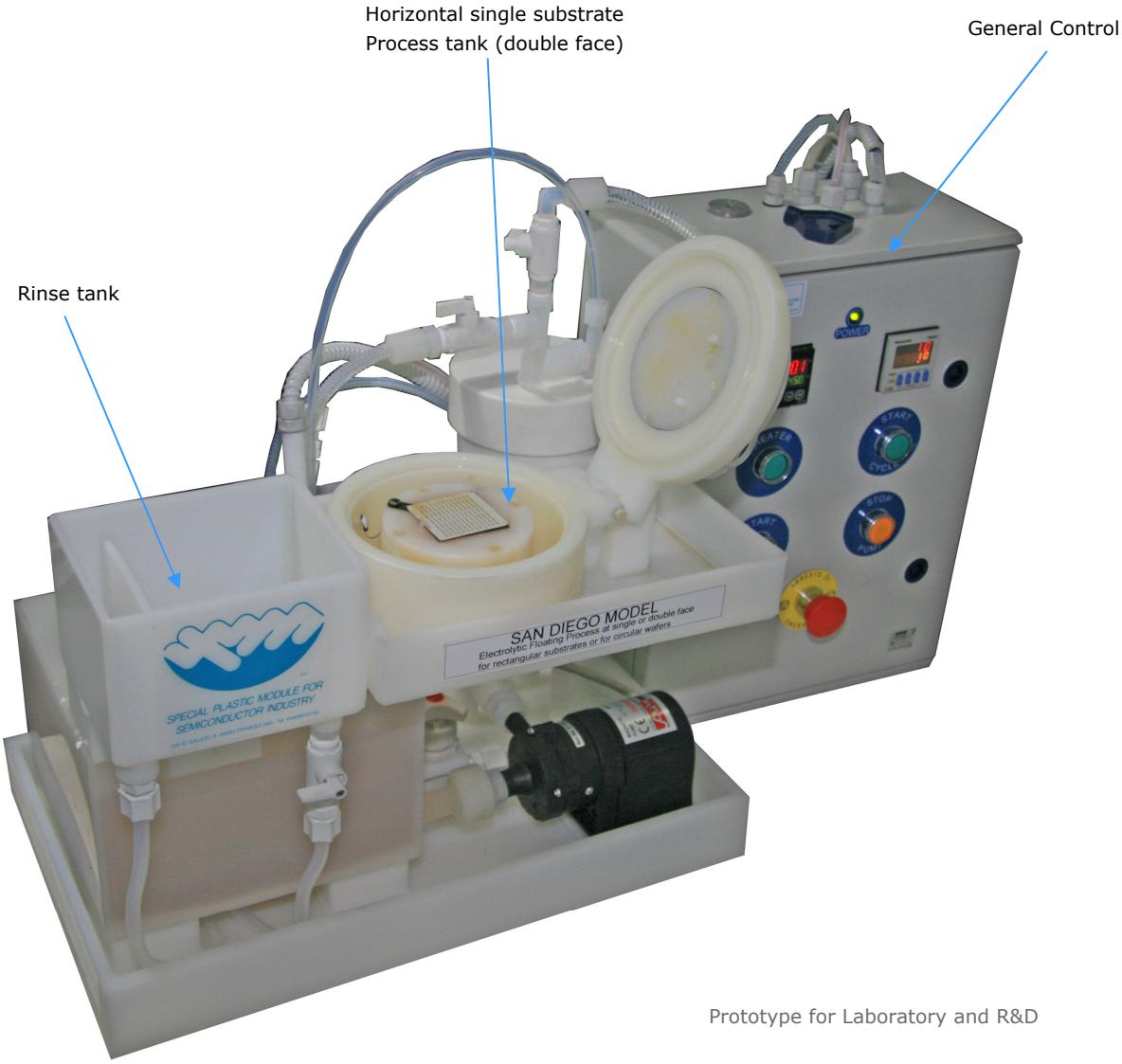

Prototype for Laboratory and R&D

For futher information don't hesiatate to contact us!

Special Plastic Module for
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