

# Nautilus Model

## Selective Metal Deposition (Double Face)

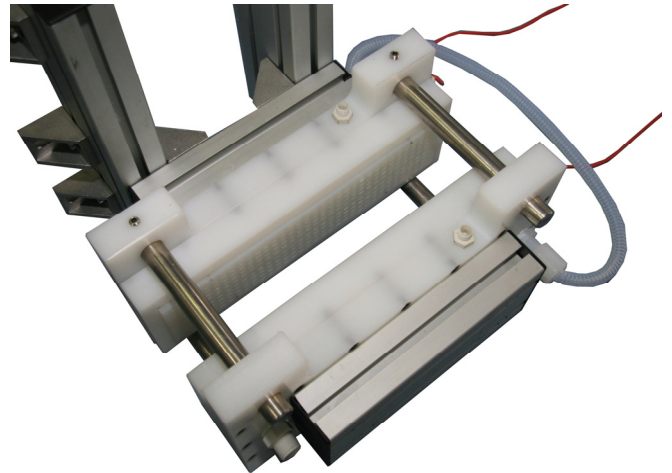
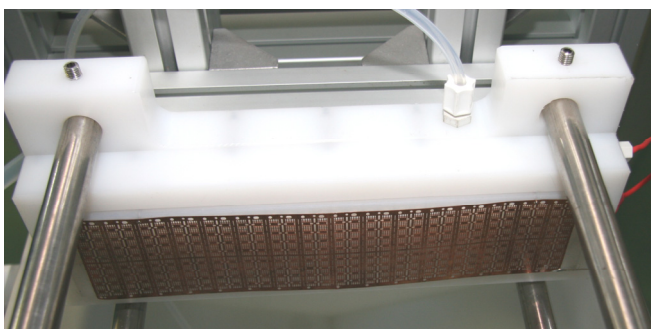
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Nautilus Model is one of SPM innovative equipment for R&D and/or pre-production.

It accomplishes **electrolytic metal deposition in selective mode**, on both faces of the lead frame.

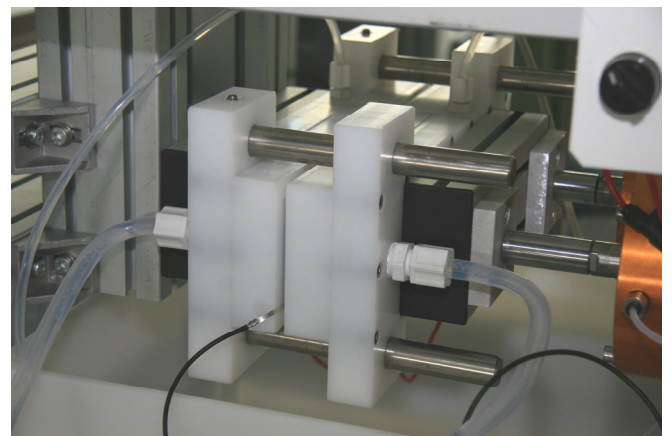
To enable this selective metal deposition we have projected a special double chamber, with a specific mechanism. When the double chamber closes, it forms a sort of sandwich that duly masks the lead frame. There are two masks in a soft material, realized using the **3D printing technology**, to obtain their clear definition.

Inside each chamber there is an anodic grid in platinised titanium; the connection cable to the power supply comes from this grid, while the cathodic contact comes from the lead frame.



This double chamber can deposit various metals: **Cu, Ni, Ag, Au**, etc...

Nautilus Model has a dedicated closing system for the two chambers, using two pistons at pneumatic command, ruled by PLC and touch screen.



It includes a safety tank for solution collection. During chambers opening, the fluid will go into the buffer tank underneath, by gravitation.

**PATENT PENDING**

Back-end PROCESSING

13 November 2013



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# Leadframes Selective Metal Deposition (Double Face)

## PROCESS CHAMBERS

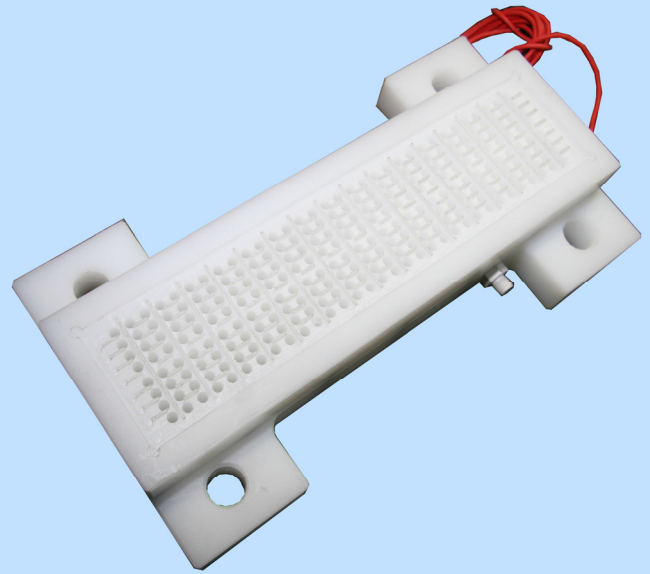
Process chambers have been milled using a CNC working center to ensure high precision during realization. It's very important to obtain a perfect alignment between the two chambers while closed.

To permit the fixation of the mask, a special gasket seat has been obtained on the internal face of the chamber.

Thanks to the alignment precision between gaskets, when the two process chambers are closed, a perfect water tightness is obtained. Process solution is pumped inside the left chamber and the liquid will reach the internal face where the mask is located. At the end of the left chamber there is a piping connection that connects with the right chamber. Liquid can so also reach the opposite mask.

When a leadframe is loaded between the two masks, the liquid can reach the exposed part of the strip and the metal deposition starts.

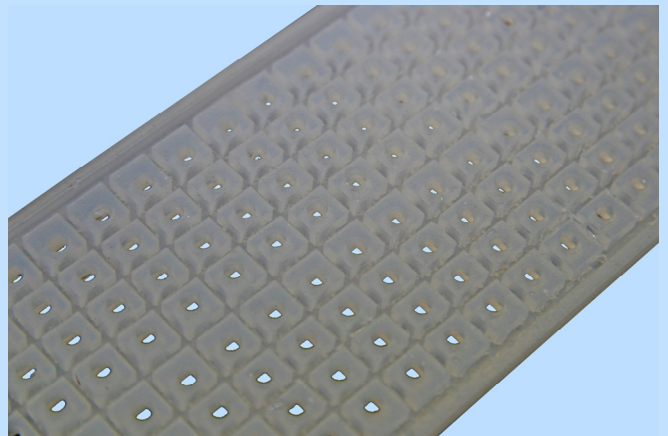
The electrolytic process is possible thanks to the internal cavity of chambers that permits to insert the anodic grid in platinised titanium. Inside the internal cavity we also have realized paths for chemical solution, to uniformly distribute the liquid along the process chamber.



Process chamber: in evidence gasket seat

## SPECIAL MASKS

The selective deposition is possible thanks to a special gasket realized using advanced **3D printing technology**. This technology permits to realize leadframe-chip shaped masks that ensure a precise selectivity of deposition. Gasket is encapsulated into the block and is perfectly adherent to its back support, ensuring a total water-tightness.



Special 3D printed silicone gasket-mask



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## BUFFER TANK

The system is composed by a safety tank that is located under the process chambers to collect the solution when chambers are opened.

The liquid reaches a plastic buffer tank for gravity.

The main purpose of this buffer tank is to recover the chemical solution and recirculate it to the process chambers, by a pneumatic pump.

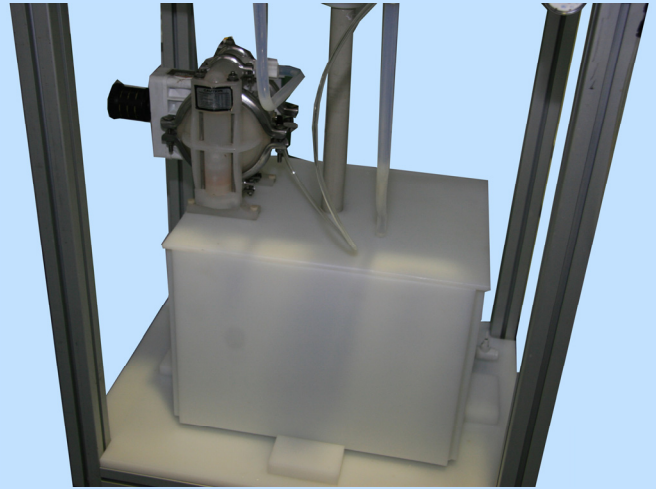
The buffer tank is equipped with:

- heating element & temperature control
- solution recirculation system & solution sending to the two process chambers
- solution filtration system

## INFINITE POSSIBILITY

The prototype is designed for a simple manual process, but it's possible to develop also automatic versions including rinse tanks, process tanks, waterjet and dryer.

We are ready to propose, to interested companies, this new technology matching to our 26 years experience on semiconductor world.



Buffer tank with PNE pump

## GENERAL CONTROL

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

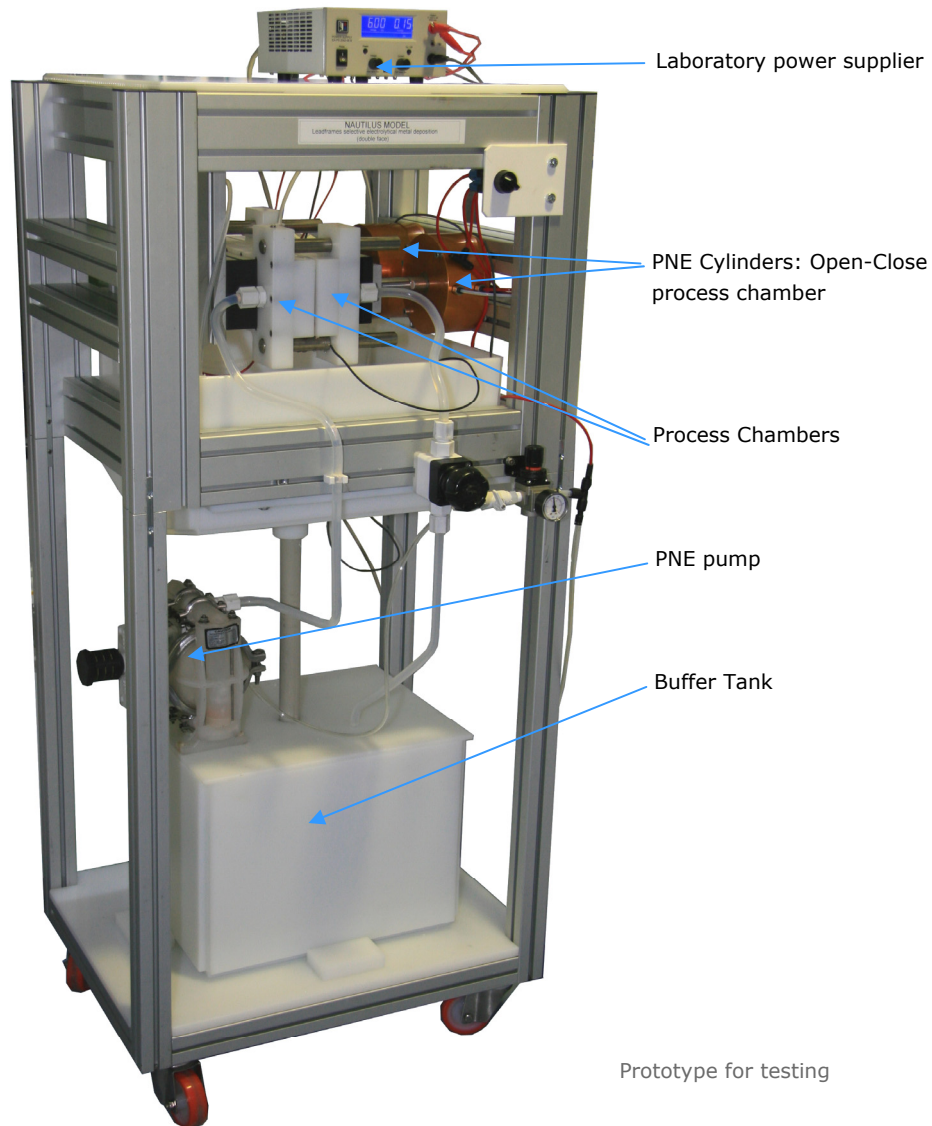


Power Supply for Electrolytic Process



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**For further information don't hesitate to contact us!**



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