Icarus Model

Cu Electrolytic Deposition after die attach/bonding

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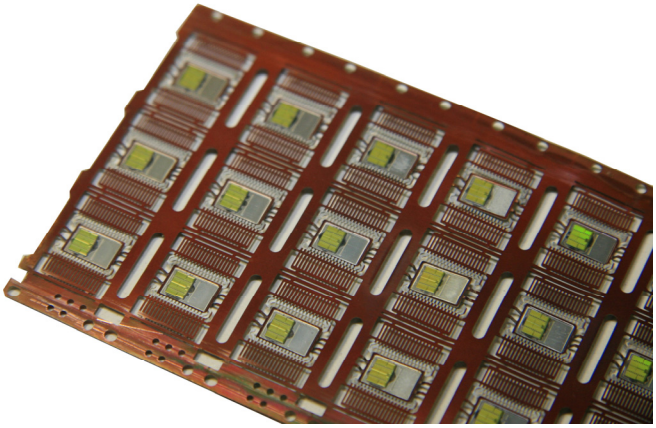
SPM has been researching new approaches for semiconductor devices, to reduce costs. In particular, we have considered the connection thread between dice and lead frame: actually companies use a golden thread of different diameters, according to available device and power.

We are using another type of metal, highly conductive, malleable, stretchable and *cheaper than gold*: **copper**.

In recent years, many engineers approached this innovative technology, even if it presents some difficulties in bonding welding, loosing in reliability of the results. Bonding welding can result difficult depending of the different substrates.

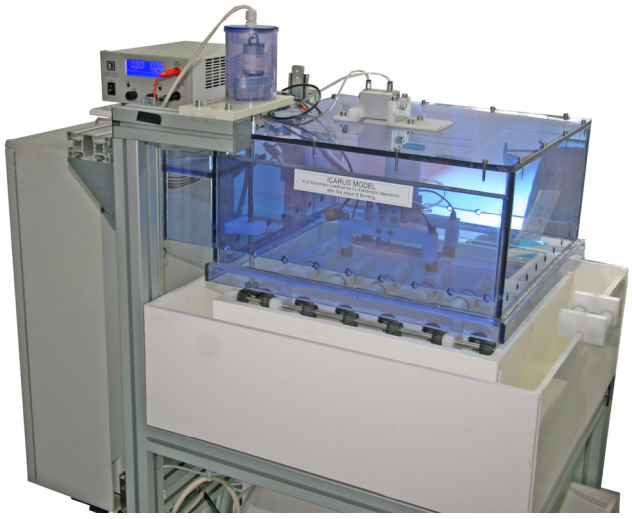
SPM suggests making the bonding using the copper thread, making an *almost complete coverage of copper by electrolytic deposition*.

We have made some tests in our laboratory, using a prototype that we have called "Icarus Model".



SPM "Icarus Model" effectuates copper deposition in a reliable way, obtaining a good product.

No doubt that the total electrolytic coverage of the strip, after molding operation, gives the possibility to make following processes of final deposition using other metals: Ni, Sn, or others.



PATENT PENDING

Back-end PROCESSING

20 November 2013

Special Plastic Module for semiconductor industry

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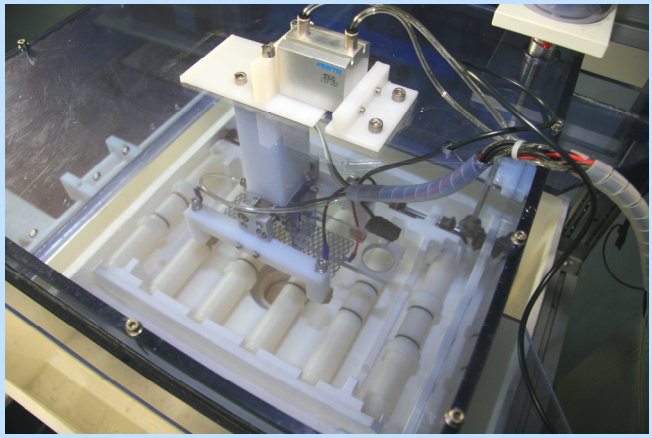
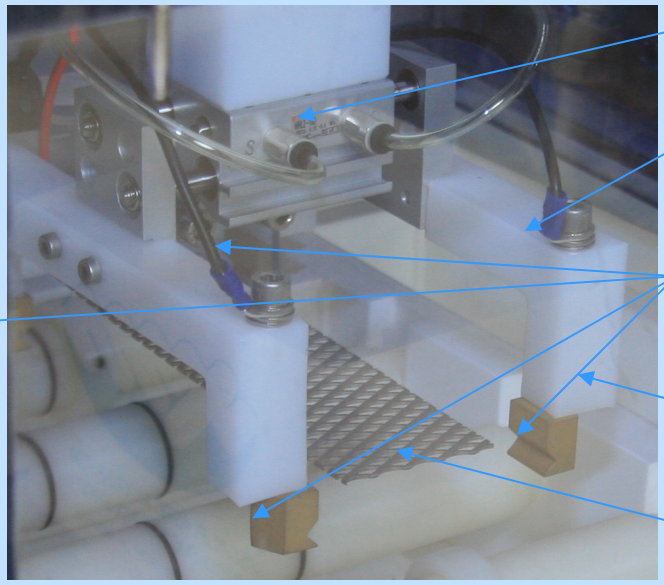
PROCESS TANK

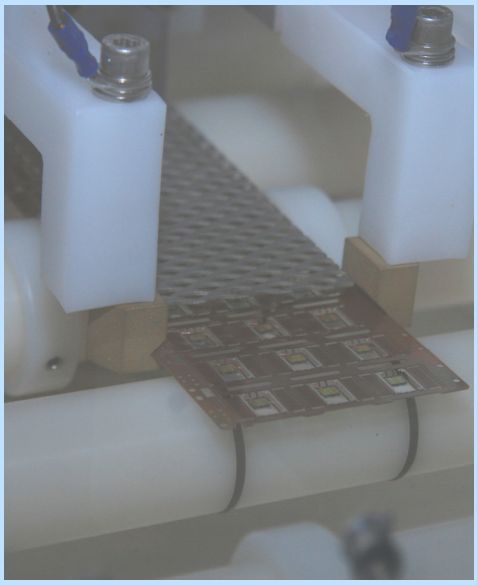
Icarus Model principle of work is based on a plastic rollers conveyor. Leadframes are transported thanks to the rollers rotation up to a PNE gripper.

Under the gripper 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 gripper fingers.



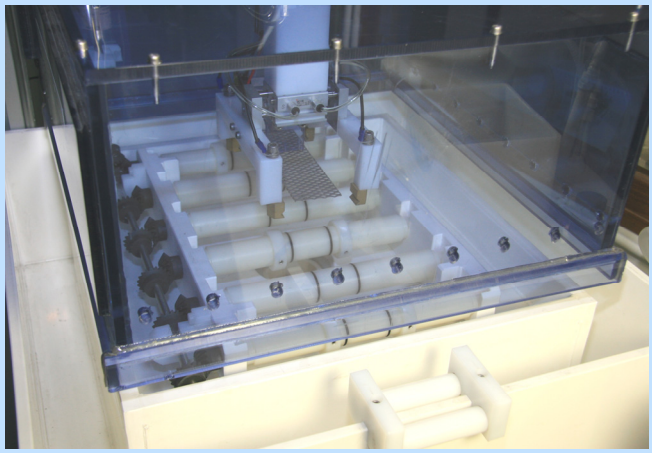
Process tank - top view





Icarus Model is ruled by PLC and touch screen to coordinate the complete process sequence:

- Leadframe inlet by conveyor
- Automatic Cover Close
- PNE gripper grasps leadframe
- Start power supply to anode and cathode
- PNE gripper agitation



Process tank - front view

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BUFFER TANK

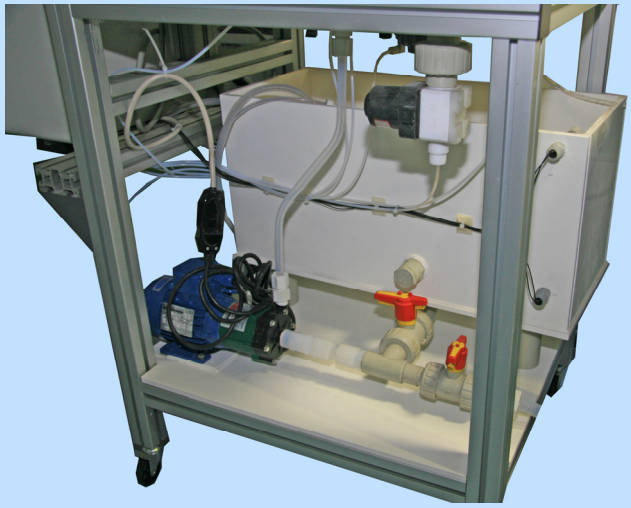
The system is composed by a safety tank that is located under the process chambers to collect the solution.

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 tank, by a centrifugal pump.

The buffer tank is equipped with:

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



Buffer tank with Centrifugal pump

GENERAL CONTROL

The prototype is equipped with a touch screen that enable the full control of system parameters and status. At 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 the main intent is to develop an automatic version.

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

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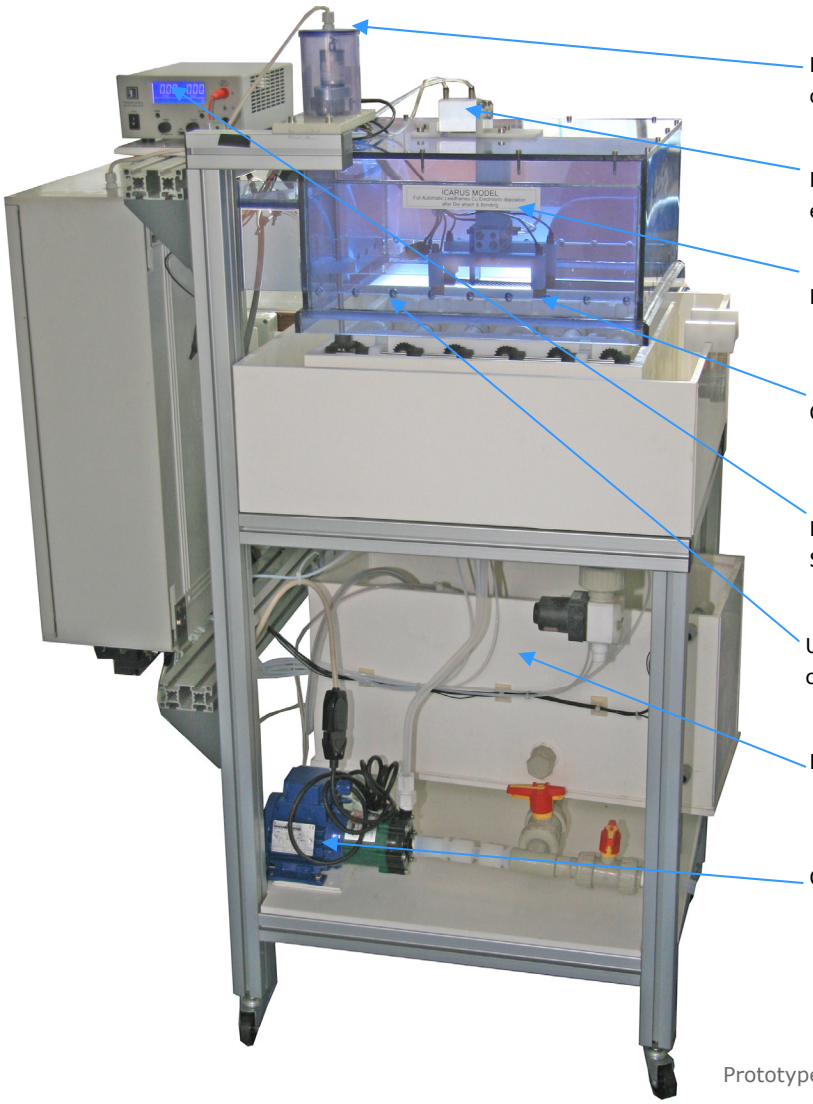

Prototype for testing

For futher information don't hesitate to contact us!

Special Plastic Module for semiconductor industry

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