

## RFP milestone granted for E-Less NiAu Bumping in Hamburg

On November 8th, the RFP ( Release For Production ) qualification milestone for the E-Less NiAu Bumping process in Hamburg was successfully granted. The E-Less NiAu bumping process is a completely new process in NXP Europe and this qualification is a big step forward towards a higher quality in the bumping process and to make bumping even more cost effective than the so-called conventional bumping process.



The bumping process is a mounting technology, where the chip is directly placed on the printed circuit board ( PCB ). The interconnect is done by solder-balls, which form the bumps. These solder balls are about 300 um size and made of a lead-free Sn/Ag/Cu Alloy. To enable a solderable interconnect to the aluminum-pads, an Under Bump Metal ( UBM ) is deposited. This UBM is used as a adhesion-layer and diffusion barrier to keep materials away from the silicon during the soldering process. The UBM is critical for the quality of the complete process. In conventional UBM processes, as used by external suppliers, layers of Ti, Ni and Cu are sputtered and are patterned by lithography and etching processes.

With the E-less NiAu process, the UBM, which is a stack of Ni and Au, is deposited on the bondpads using an electroless, galvanic process. This is achieved with a maskless, self-aligned process, as the Ni only grows on the Aluminum bondpads. The advantages of the E-less NiAu technique versus the conventional technique, is a higher quality, lower cost and also higher throughput.

To run the E-less NiAu process at ICH, a complete new Cleanroom area was defined and installed. The PacLine processing bench, which is 14.6 Meters long, is the heart of this new Clean Room. This bench is the longest and most modern bench ever produced by the supplier PacTech. In addition there is the equipment for backside resist coating, resist stripping, automatic optical inspection and measurement in this new area.



The length of the bench comes about due to its high degree of process flexibility. It provides the option to process 150 mm, 200 mm and 300 mm wafers. The process can be done on Aluminum pads or Copper pads. The capacity of the bench is 600,000 wafers of 200mm per year.

A key activity was to ensure that all relevant safety requirements were fully met as this was the first installation of a totally encapsulated electroplating bench.

The release of the E-less NiAu process was carried out using the TEA5760 as a pilot product ( FM radio chip ). This product is manufactured in the BiMos 5 process at ICN8.

Additionally the TEA5766 and TEA5990, which are produced at ICN 8, SSMC and Chartered in BiMos and CMOS processes, are in progress for qualification.

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