



Figure 1: Results of the hybrid (via-middle) wafer-to-wafer bonding achieved by EVG and imec's collaboration achieving a 1.8μm pitch.

recognized conferences such as ECTC and 3DIC reporting 3.6μm pad size.

Second, the dielectric (via-last) wafer-to-wafer bonding technique was tackled by the collaborators. This technique requires extremely good overlay accuracy to align the copper pads from both wafers, which are then contacted by through-silicon vias (TSVs). In this case, 300nm overlay across the wafer was achieved.

"By joining forces, we achieved these excellent results on overlay accuracy," explained Eric Beyne, Fellow at imec. "We are excited that we can expand our collaboration with EVG with a JDP and the installation of EVG's GEMINI FB XT wafer bonder in our cleanroom. The GEMINI FB XT has the potential to further reduce the wafer-to-wafer overlay errors and therefore allow for the development of sub-micron wafer-to-wafer interconnects technologies."

"Further improving the overlay accuracy for wafer-to-wafer bonding into the sub-200nm range requires optimization of the interaction between the wafer bonding tool and processes as well as pre-and post-processing and the wafer material," noted Markus Wimplinger, Corporate Technology Development & IP Director at EVG. "We are excited to partner with imec in an effort to advance overlay accuracies for wafer-to-wafer bonding to meet the needs of future 3D IC designs that rely on high density interconnects"

Imec's 3D integration program explores technology options to define innovative solutions for cost-effective realization of 3D interconnect with TSVs. Imec's 3D integration processes are completely executed on 300mm. Imec also explores 3D design to propose methodologies for critical design issues, enabling effective use of 3D interconnection at the system level.



CORWIL Technology invests in portable clean environment for wafer sort

To satisfy demand for ultra-clean environments for wafer sort, CORWIL Technology (CORWIL) has added a Portable Clean Environment for wafer sort that is good to Class 1000. This is a one-stop solution from wafer sort, die prep, assembly, package test and reliability that provides the ability to understand how different pieces of the backend process affect each other in terms of yield.



Joe Foerstel, VP of Test for CORWIL said, "Customers have found that wafer sort in a very clean environment improves yield, especially when using certain RF probe technologies or probing devices with sensitive surface structures, particularly for our customers in the communications and medical industries."

"We have seen dramatic improvement of yields at Second Optical when customer's wafers arrive from a cleaner environment, especially when back grind is one of the steps in the process," added Jonny Corrao, CORWIL's Director of Die Prep.

Honeywell | Electronic Materials

Honeywell technology: keeping smartphones cool

Honeywell (NYSE: HON) has announced the availability of a thermal interface materials (TIM) solution to help

smartphone manufacturers and designers effectively manage heat dissipation in their phones. Honeywell pointed out that the worldwide smartphone market is expected to reach more than 1.9 billion units by 2020, according to a study from IDC Research. In addition, data needs are growing at unprecedented rates. To meet this challenge, the smartphone industry is leveraging technology that enables phones to provide optimal processing performance without overheating.

Honeywell's TIM technology is based on phase change materials (PCMs). The technology transfers thermal energy from phone chips to a heat sink or spreader, where it is dissipated into the surrounding environment. This functionality keeps the chips cool, so the phone can perform reliably even during the most data-intensive processes or during heat spikes. According to the company, Honeywell's solution is available worldwide and is already being used by some of the largest smartphone makers to upgrade the thermal designs of its latest phone models.

"Honeywell's innovative TIM technology provides customers with the ideal solution to optimize their phones' performances," said Olivier Biebuyck, VP and GM of Honeywell Electronic Materials. "As demand for smartphones grows around the world, these breakthrough designs help provide optimal user experience throughout the entire lifecycle of their devices."

The company's PCM series of thermal management materials are based on sophisticated phase-change chemistry and advanced filler technology that was developed specifically for high-performing electronic devices. TIM products are designed to optimize thermal impedance across the entire thermal path, providing an end-to-end solution for best-in-class thermal performance. The PCM design can be customized to fit diverse product applications and end uses.