CHIPS.
Newsletter
May 2012

I believe in being an innovator

(Walt Disney)

CEO's Note

Dear Readers,

Our 3D camera technology is really taking off. All our our customers who have seen the epc600 live in action are excited by this new system. A complete 3D camera measuring only 20×25×30mm! Distance measurements up to 10 meters within milliseconds in bright sunlight conditions. A system developers dream has become true! The new epc600 chip will become available soon, together with a simple to use evaluation kit. Order your kit today – first come first serve.

Agreed, I am really talking it up. But I am still surprised myself how much power is in this tiny device. For three decades, I have been a developer of sensors for industrial applications in the textile industry, automation technology, in elevators, logistics, and many more. How I wish I had such a technology available for my work during these years. We had so many ideas for innovative sensor solutions. But with the technologies available at the time there was simply no way to realize these ideas in commercially viable products. However, with epc things have now changed!

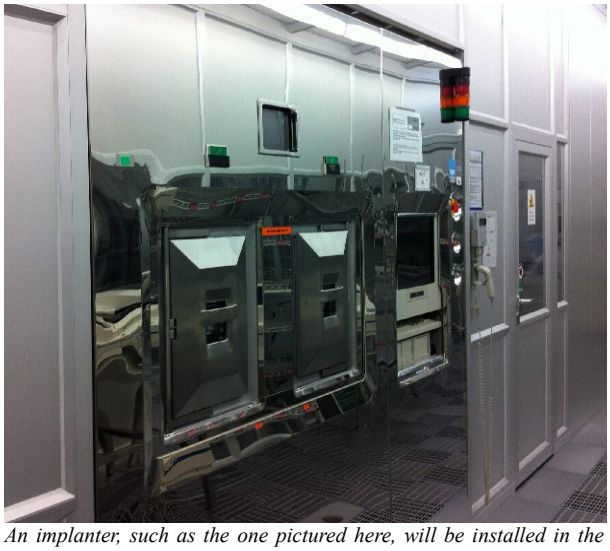
Beat De Coi

epc's Backside Processing Line

This year, we started with the project work for our backside processing line in Sargans. Our ESPROS Photonic CMOS™ process relies on highly specific semiconductor manufacturing steps that are unique in the open market. A good part of the "secret ingredients" are applied during the later steps of the silicon manufacturing process, the so called backside processing. As these steps are highly specific and constitute an important part of our technical USP, it was a strategic decision to implement these production steps into our headquarter's manufacturing portfolio. By end of 2011 the necessary tools were delivered to Sargans and the project was officially started in January 2012. During the course of this year we will install and ramp up this line which comprises production steps such as:

- Grinding
- Wet etching
- Implant
- Anneal
- Chemical vapour deposition

After three months of project planning and preparation the corner stone for the 600m^2 class 1 cleanroom was laid just recently. The backside processing line is the first production facility that is installed in the subterranean area that will eventually become our Mountain Fab. Infrastructure work and tool installation is planned to be completed after the summer break. The process ramp-up and fine tuning will keep our specialists busy for another couple of months. By the end of the year we expect to have our new backside processing line operating at stable conditions.



An implanter, such as the one pictured here, will be installed in the second cleanroom during 2012.

This facility is another important step towards our goal to establish a complete silicon detector manufacturing chain here in Sargans. And as this backside process comprises some of the most critical manufacturing steps, it is also a very important investment in our supply chain security and stability.

We proudly announce that we have officially started a development project with the French Space Agency CNES (Centre Nationale des Etudes Spatiales). ESPROS Photonics was chosen to develop the next generation of TDI imagers for satellite based earth observation.

But what is so special about TDI imagers that make the first choice for such applications? And how do they work?

It was in the early days of aerial reconnaissance when some smart engineers came up with the concept of "time delay and integration". The problem they were faced with was the limited exposure time available when planes were moving fast over the targets to be captured. The result with classical frame image technologies were either very low signal to noise ratios or blurry pictures due to smearing. The solution to that was both simple and ingenious. Instead of trying to increase the sensitivity of the camera system they would just increase the exposure time by leaving the shutter open and continuously move the film at the same speed as the target to be imaged. The result is an "endless" picture. Of course, the limit was the length of the film roll, but that constraint was later solved with the achievements of electronic imagers.

Modern CCD structures provide the benefit that they can be operated in a very similar way as these old days surveillance systems. The image information is stored as charge carriers in the CCD pixel. Until this charge information is read out by some ADC stages or similar subsystems, it can be handled within the CCD structures in a non-destructive way. The modern solution of TDI imagers consists of CCD cells with multiple registers (TDI stages). Instead of rolling a film strip, the charge information is moved from stage to stage at the same speed as the scene moves by the imager. By doing so, the image capturing process (the integration time) can last as long as it takes to clock the charge information through all stages of the TDI. Or, in other words, by incorporating the appropriate amount of stages, virtually any moving scene imaging problem can be solved with almost any order of sensitivity and signal to noise performance. Naturally, there are limits. If not for technical reasons there's always the cost aspects that come into play. And here we are back at epc's inherent advantages when it comes to handling image information as efficiently as possible. Based on our technology, the next generation space imagers can be smaller while having the same or even better performance. And with our CMOS signal handling capabilities within the same detector silicon, we open another door for the next generation of orbital imagers.

See you in space!