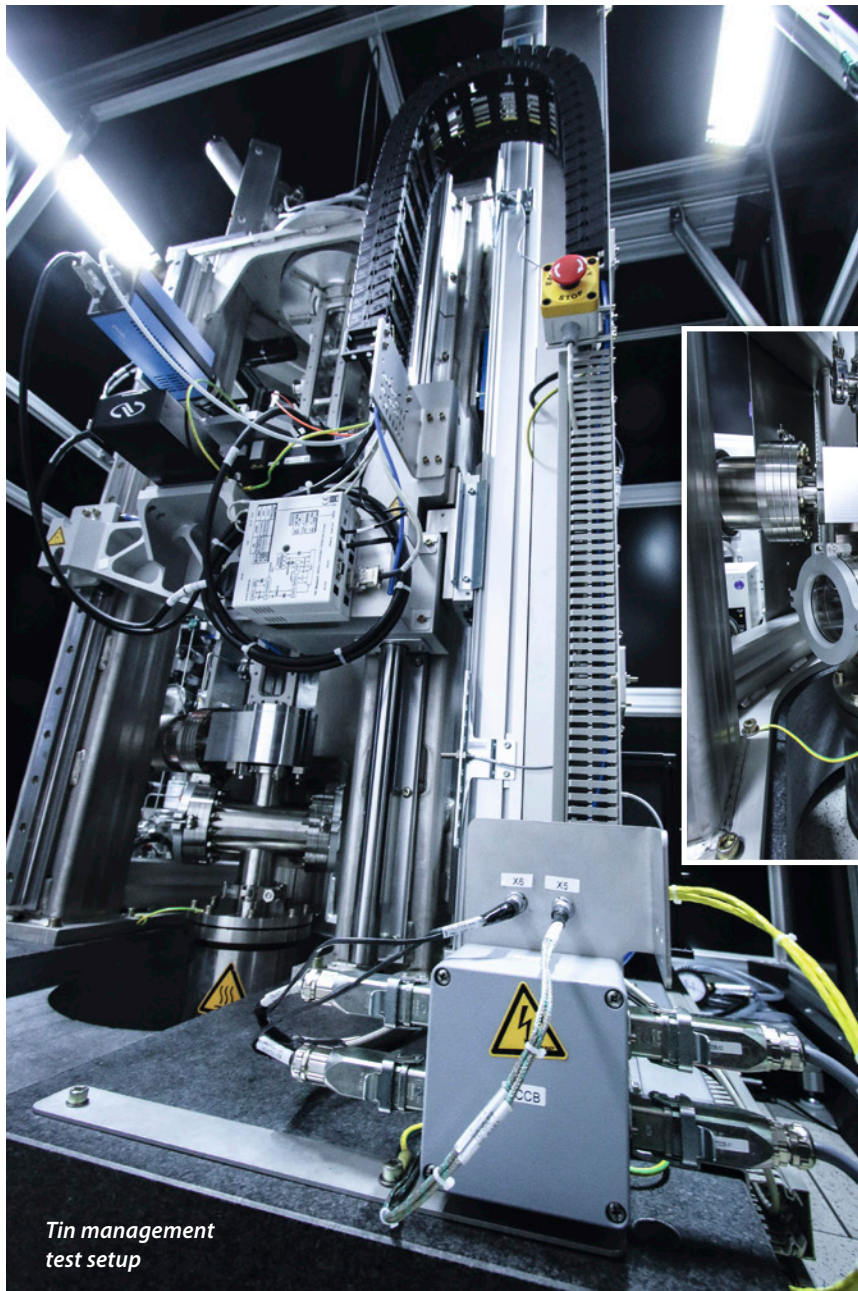


Moving up the supply chain: ASML's stimulus in the Brainport region

Over the past fifteen years, Settels Savenije has carried out numerous projects for ASML. These projects have been instrumental in growing Settels into a high-tech company that works for a variety of larger international enterprises. Settels' Sven Pekelder discusses the company's evolution with ASML's Ton Aantjes.

Nieke Roos



*Tin management
test setup*

The Brainport region is unique in its capacity to combine the strengths of multiple companies to offer one overall solution to their customers. With its open innovation philosophy on working with suppliers, research institutes and strategic partners, ASML plays an important role in the region.

One of these Brainport companies is Settels Savenije. 'ASML has been our customer for fifteen years now,' says CTO Sven Pekelder. 'Our team started off as part of a job assignment programme.

We became familiar with ASML's technology and methodologies. After five years the first design projects were outsourced to our company. At present, on average, two or three of our teams work concurrently on ASML-related programmes.'

Settels' roots lie in research and design, explains Pekelder. 'We link the analysis and understanding of complex physics to the designing of mechatronic systems. Since our acquisition of Bakker in 2010, we've covered the full process of R&D, supply chain design, manufacturing, assembly and qualification in our own factory. We design ultra-high and ultra-clean vacuum systems, deposition technology programmes, precision mechanics performing in a temperature range of -50 to 500 degrees Celsius and ultra-high pressure systems up to 9,000 bar.'

When Pekelder thinks back on the work that Settels has done for ASML over the past fifteen years, three key development programmes spring to mind: its close collaboration with ASML and VDL ETG on the development and manufacturing of the vessel for the EUV source, the development and manufacturing of a tin management test tool for EUV applications, and the development and industrialization of multiple beam transport systems for EUV machines.



Settels' Sven Pekelder (left) discusses his company's evolution with ASML's Ton Aantjes (right).

Experienced and bold

'We have many talented people in our growing organization,' states Ton Aantjes, ASML's senior director of optomechanics. 'But we also incorporate our suppliers' extra brain and manufacturing power. Speedy delivery is of the utmost importance. And it's a challenge. We're always working on cutting-edge technology solutions.'

For Aantjes, the Settels group is a supplier who combines key features that ensure a successful working relationship with ASML. 'Suppliers need to understand our technology, or at least sufficient aspects of it, both in detail and at a high level. They also need to understand our organization. Both features take several years to master. Sven and part of his team have been assigned to internal ASML jobs for at least five years in a row, during the initial phase of our collaboration with Settels.'

When ASML started its EUV programme, it asked Settels to get involved with the vessel design. 'The job was in their key area

of expertise and their team included experienced and very creative senior system architects, whom I knew would make a difference,' remembers Aantjes. 'People like Rine Dona and Piet van Rens came up with brilliant, out-of-the-box yet very advanced suggestions, which are still part of the vessel design. These kinds of technicians make the difference in creating good designs.'

Looking at the way ASML operates, Aantjes finds it interesting to analyze why some design teams are successful and others are not. 'Before you can start engineering things, you need to understand the physics behind them. Your success is determined by experts who can bring in new ideas by thinking out of the box. You're always looking for the expert who's knowledgeable, experienced and bold enough to make choices, which are sometimes based on intuition alone. Successful teams always have a few of those leading experts. At Settels you'll find several.'

'ASML was a major new account for us back in 2001,' says Pekelder, looking back.

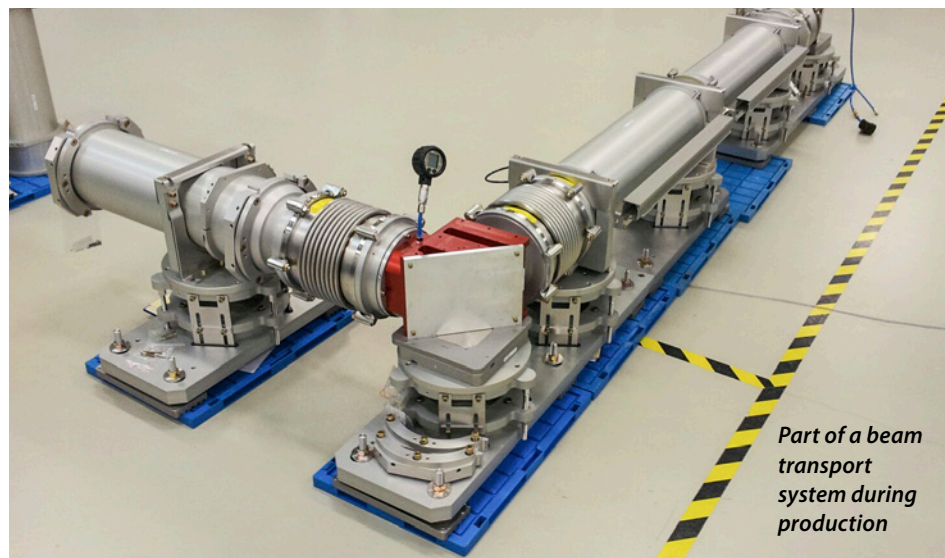
'Our collaboration took off with five technology professionals participating in various programmes at ASML. We made a real impact in those projects, and that didn't go unnoticed. Somehow, a natural flow arose and we started joining forces as colleagues in various projects. We helped ASML, and ASML gave us the opportunity to participate in projects on the cutting edge of new technology. Today our teams are very interconnected with ASML as a company, intimately familiar with both its culture and its technology. At the same time, we feel free to perform in a way that's no longer possible within ASML itself.'

ASML is a very diversified and complex R&D organization in which processes, procedures and 'a unified standard way of working' are key, Pekelder says. 'I see a company like ours adding value through speedy decision-making. We're still small, which enables us to offer rapid support and creative engineering to ASML.'

Not easy, but doable

According to Aantjes, the biggest pitfall for a company like Settels lies in its ambition to take the step from an engineering company to a supplier in its customers' normal 'volume' supply chain. 'The creative world of R&D is fundamentally different from the process-oriented world of manufacturing.'

Manufacturing enterprises that incorporate engineering and development encounter challenges, Aantjes notes. 'They have to recruit a creative team and invest in it for many years to make it work. A philosophy that hiring engineers will be a fast way to generate new business for the plant doesn't always match what creative people are looking for. Key for ASML is to have a mix of the two: we need creativity, but we also need a design that's reliable and can be manufactured for the right cost.'

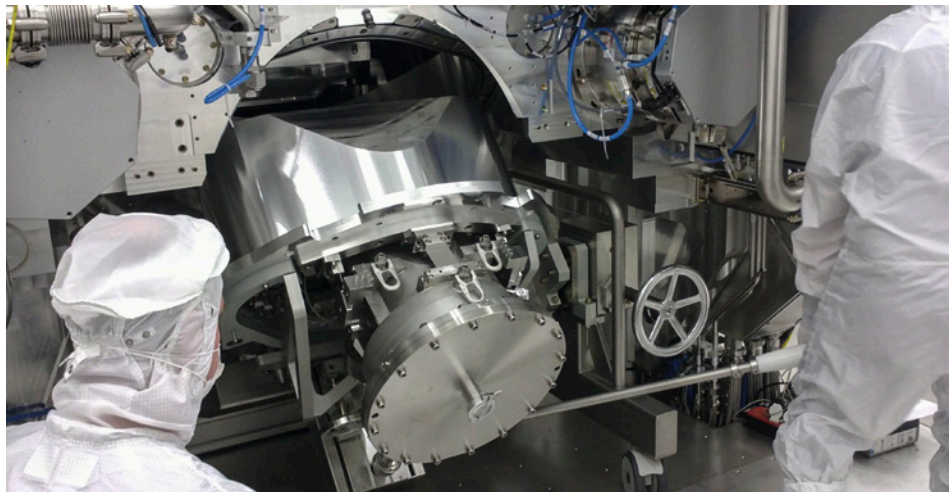


Part of a beam transport system during production

Aantjes has seen the Settels team evolve from a company with its core in conceptual design to one with a broader setup that adequately covers both design and full industrialization. 'A good example is the beam transport system programme. Concept design and industrialization belong together. You can't conquer the world with good concepts alone. During the vessel project, Rine Dona discussed his design challenges with the craftsmen behind the machines at VDL ETG. I believe designers should do that more often. We call this 'early supplier involvement'.'

Pekelder agrees: 'Our team managed to speed up and deliver full technical product documentation in the BTS programme, combined with a design-for-manufacturing and a design-to-cost approach, both of which were highly appreciated by the customer. We're used to entering the workplace of any machining enterprise and integrating manufacturing knowledge into our designs. By collaborating with ASML we've learned how to realize seemingly 'impossible' innovation challenges.'

Pekelder is convinced that working for ASML has given Settels the courage to take on projects for other customers that



Prototype of an intermediate focus module

it never would have taken on without that experience. 'At the same time, we've built up a portfolio of projects that we can show to our international clients to give them faith in our capacities. As a result, we're increasingly being involved in various R&D programmes for other leading OEMs around the world. Our present turnover in the Brainport area only amounts to 40 per cent of our total turnover. Working for

other leading international companies has given us a broader outlook in our areas of expertise. It's shown us other approaches and technologies that we've absorbed and can now use to take on more, different and larger challenges for ASML.'

ASML has taught the region what system engineering entails, Pekelder says. 'Martin van den Brink and Erik Loopstra have taught us how to disentangle enormous technological challenges into small, manageable and doable tasks. At a speed that's impressive and gives us a major competitive edge over most of the world's enterprises.'

About Settels Savenije

Settels Savenije was founded almost thirty years ago. After a downturn in the local economy in 2004, CEO John Settels decided to approach things differently. 'From now on we're not going to look for customers; nor will we look for challenging projects,' he said. 'We're going to create the best and most inspiring platform for talented technology professionals. A place where they can work, grow and develop; nothing more, nothing less. If we manage to do that, the best professionals will join our team and, as a result, clients will come knock on our door with the most inspiring projects.'

In 2006 Settels Savenije moved to new premises in Eindhoven with a staff of ten, half of whom were involved in R&D programmes at ASML. Now it has a staff of 100 FTEs and realizes 50 per cent of its turnover through international customers in the UK, Germany and the US. In March 2017 the company will move again, to characteristically industrial premises that used to belong to Philips, located in the heart of Eindhoven. These new premises will combine offices and facilities for R&D, production and training. There, Settels Savenije expects to double its turnover in the next five years.



Settels' new premises, which used to belong to Philips, are located in the heart of Eindhoven.

Genes and bones

Settels has the profile that Aantjes is looking for in a design and manufacturing partner. 'I want a partner who challenges the questions we ask, a partner who thinks and argues about the right approach to take, before accepting the challenge. A true design and manufacturing partner doesn't deliver what I order; it delivers what I need.'

What's the biggest challenge for Settels in the coming years? Aantjes doesn't hesitate: 'Incorporating the genes and bones of volume manufacturing in small systems and modules, linked to their specific areas of expertise. They started out with a magnificent conceptual team. Four years later they'd incorporated a second team with a professional design-for-manufacturing and engineering-to-cost approach. Now they're building a new factory right in the old industrial heart of Eindhoven. Smaller companies, covering the spectrum from R&D to qualification, can help ASML be flexible and deliver quickly.' ☺