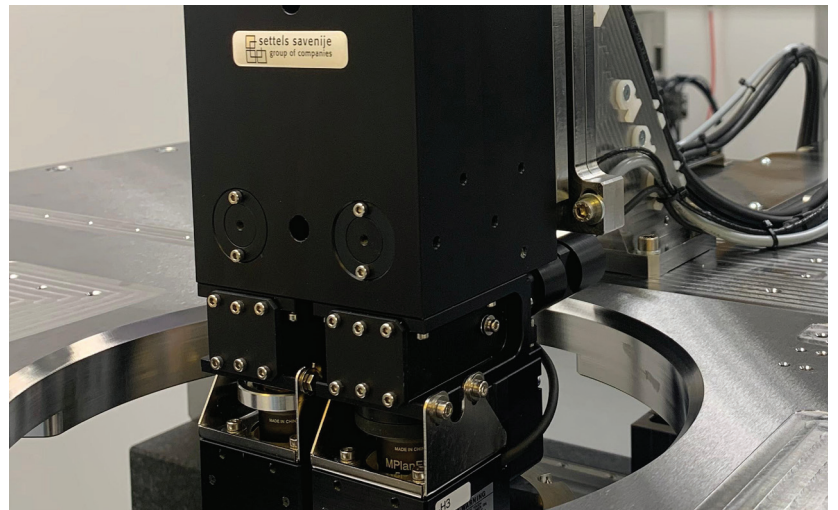


Settels Savenije combines research and practice in the MEKOPP project

With over 35 years of experience and a team of over 150 professionals, Settels Savenije invents, designs, manufactures, assembles, and tests high-tech equipment, products, and tools for an international customer base in industries like semicon, analytics, and research. Settels also participates in research and development (R&D) projects such as the MEKOPP project, in which they work with other leading companies to realise the efficient and sustainable production of photonic integrated circuits (PICs).

The most challenging fields

As MEKOPP intends to further develop a field in which the Netherlands is already strong, it relies on close collaboration between Dutch partners with specialised knowledge and expertise in a variety of areas. For Settels, the relevant know-how concerns the design and integration of industrial imaging, which combines high-resolution cameras, optimal lighting and high-performance optics, and design for precise, reliable operations. This enables optimal image quality at high throughput rates.



Additionally, the company has acquired a great deal of experience in high-precision and high-cleanliness projects. These projects combine strong optics and sensor expertise to develop and design optical systems that can image a wide range of materials and structures, which is crucial to the needs of the developing photonics industry. Under the same roof, Settels has a clean manufacturing facility and support for integration and testing. Combined with an invaluable network of connections to suppliers and partners, Settels designs, builds, and commissions systems and modules in the world's most challenging high-tech areas.

Internal and external collaboration

These factors combined allow Settels to play an important role in MEKOPP: Settels has developed the project system's imaging module, which is tuned to obtain sharp images of photonics structures. This has been designed to fit in a novel probing set-up developed by the

MEKOPP

Metrology Equipment for critical scale up of PIC Production

Photonic integrated circuits (PICs), combining photonics with chips, are a technology for which the Netherlands enjoys a leading position. With chips that use light instead of electricity, many new and improved applications can be realised in healthcare, energy, automotive, agrifood and IT. PICs also drive the global internet infrastructure and are highly suitable for the large amounts of data collected and combined in the Internet of Things. The MEKOPP project will therefore facilitate sustainable economic growth by preparing metrology equipment for the efficient production of PICs and reduction of production defects.

In doing so, MEKOPP brings together ten expert partners and focuses on two machines: a Photonics Test Prober and a Photonics Visual Inspection Tool. These will enhance PIC production sustainability, potentially reducing material, energy and water usage by 50%. Indirectly, the project will contribute to PIC market adoption and scaling, which are vital for digital communication infrastructure efficiency. And with an expected 21-31% year-on-year market growth for PICs, the consortium expects to achieve an annual revenue of over €100 million by 2030 and create ~400 jobs in the eastern Netherlands.



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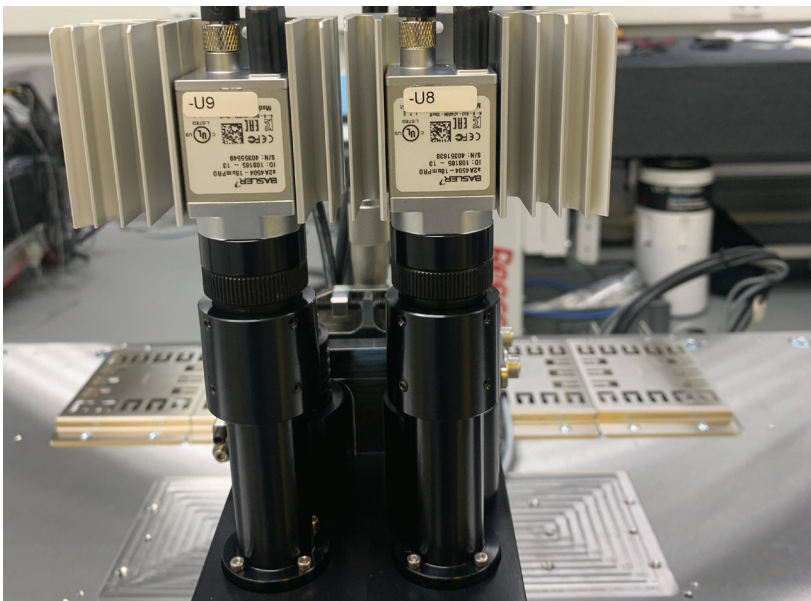
European Regional Development Fund.
Funded as part of the Union's response to the COVID-19 pandemic



European Regional Development Fund

consortium – with IMS as the integrating partner – and essentially serves as a custom-designed microscope and camera system with two different magnifications and two different means of illuminating the substrate. The imaging module has also been designed so that magnification and lighting options can easily be adapted to the needs of new customers or substrate and coating materials.

While this has been enabled through collaboration across the consortium, Settels also relies on internal team members with different competences and disciplines. These range from expertise in R&D in optics and control to the assembly and testing of the overall system, for which the company can draw from a pool of over 150 full-time employees. For MEKOPP, they assembled a small team consisting of a senior optical designer, a system architect, an electronics designer, mechatronics engineers, and an experienced integrator, all coordinated by their research project manager.



A golden opportunity

The MEKOPP project has now come to an end, with promising outcomes for all those involved. In supporting IMS and the consortium with the architecture and design of the prober system, Settels has developed, built, and tested a pre-alpha version of the imaging system. This imager was also integrated with the IMS prober in the autumn of 2023 and, towards the end of the year, the first full system tests were performed. A first customer demo is also being prepared. On this basis, the first commercial delivery of the Photonics Visual Inspection Tool (PVIT) imager was recently commissioned by IMS for application in a closely related field. At Settels, they hope that this will be the first in a long line of imagers that will contribute to the photonics revolution.

Because of the positive results of this project, Settels highly values the excellent collaboration with the consortium. Thanks to the project's automated routines for defect detection and analysis, outstanding images have been developed and a valuable evaluation is taking place of the first hardware in industrial PIC fab environments. Through MEKOPP, Settels has a golden opportunity to work with a strong set of partners towards the goal of developing a market-leading probing solution for the emerging photonics industry. The development will be taken to a full market introduction in the follow-up to the MEKOPP project as part of the National Growth Fund programme NXTGEN Hightech.

MEKOPP project partners

IMS

Development of equipment for high-precision positioning of Photonic Integrated Circuits (PICs), enabling the optimisation of back-end processes and cost reduction.

LioniX International

Develops and commercialises silicon-nitride (SiN)-based waveguide technology (TriPlex) for a variety of applications and is a leader in the photonic sector.

Nobleo Technology

Realisation of software for the automatic inspection of photonic chips (PICs).

Photonics Integration Technology Center (PITC)

Shortening the path to the commercial application of integrated photonics through application-driven technology programs and by offering access to shared infrastructure.

Salland Engineering

World-leading in test technology and engineering, specialised in solutions and services to improve efficiency and quality testing at semiconductor manufacturers.

Settels Savenije

Total solution supplier for high-tech equipment, systems, modules and critical components, including engineering and prototyping.

Technolution

Advanced electronics and embedded systems for complex instruments: specialist in the (combined) development of software, programmable logic and electronics for embedded and technical information systems.

TNO

One of the focus areas in the TNO expertise centre for semicon and quantum is optical metrology. TNO's goal is to bridge low TRL developments and businesses.

Workfloor

Development of software modules that interact with manufacturing execution systems.

High Tech NL Semiconductors

Fully focused on the vast and strong semicon industry and operates as a 'single point of contact' in all steps of the value chain. Drives and stimulates (international) cooperation and initiates and facilitates (international) innovation and crossover projects.

Berenschot

A consultancy company that supports High Tech NL with grant proposal writing and project management and facilitates cooperation between companies and the growth of ecosystems.