

PROJECT SHOWCASE

EUREKA PROJECT > CATRENE EXEPT

“An open innovation network is crucial to success”

A BREAKTHROUGH IN EUV TECHNOLOGY

Since the international research project CATRENE EXEPT began in 2009, its leading company ASML has seen its stock value quadruple and continue on a strong upward trend.

EXEPT has led to the development of the ASML NXE:3300B, an Extreme Ultra Violet (EUV) lithography tool, drawing considerable attention from potential buyers with already 11 units already sold for 60-70 million euros a piece, and commitments for future orders. ASML has now taken its success to another level with the creation of a customer co-investment programme. Clients like Intel are committing hundreds of millions to the future of the company.

What does lithography do?

When asked who ASML's EUV competition is, John West of VLSI Research Europe, a leading market research company in the electronics sector, answered: 'there aren't any.' The project has secured a clear market advantage for ASML and its partners. The EUV tool developed as a

result of the project is expected to change the electronics market substantially: just about anything with a computer chip could have its prices drastically cut. Some experts even speculate that tablet computers could be half the cost of today once EUV has been fully implemented.

Nearly every electronic device you use has some of its key components beginning somewhere under a lithography machine. 'Similar to painting, an EUV machine brushes transistors with laser light onto a wafer,' explains project coordinator Gerold Alberga. Lithography exposes a sensitive piece of chemical-coated silicon wafer to pre-designed patterns of ultra violet light. When finished the process reveals the microscopic layers of a transistor. The technology has the particularity to allow a fine level of nano-sized detail by working in a deep portion of the light spectrum. This special type of light can only operate in a vacuum environment as even air disturbs its transmission on to the wafer.

To produce Extreme Ultra Violet Light ASML uses advanced mirror optics designed by partner in the EXEPT project Carl Zeiss, a renowned German optics manufacturer.

One microscopic flaw or dust particle on the surface of a mirror can be devastating and EUV is conducted in 'clean rooms', free of loose particles. While clean rooms are standard in the industry, many innovations were necessary to create the specific environment needed for the EUV machines to operate: the air filtration systems make the air in the clean rooms a staggering 10,000 times cleaner than outdoors: every two minutes the atmosphere in the room is filtered and exchanged completely.

The EXEPT project involved a consortium of participants from Belgium, France, Germany, Italy and the Netherlands. This international undertaking required significant political and financial support from national funding bodies part of the EUREKA Network. Germany alone, through the German Federal Ministry of Education and Research (BMBF), supported over ten German companies with some 16 million euro.

Read more on the project at www.eurekanetwork.org



Countries involved
Belgium, France, Germany, Italy,
Netherlands

Duration 36 months