

Imec and Mitsui Chemicals sign strategic partnership agreement to commercialize CNT pellicle technology for EUV lithography

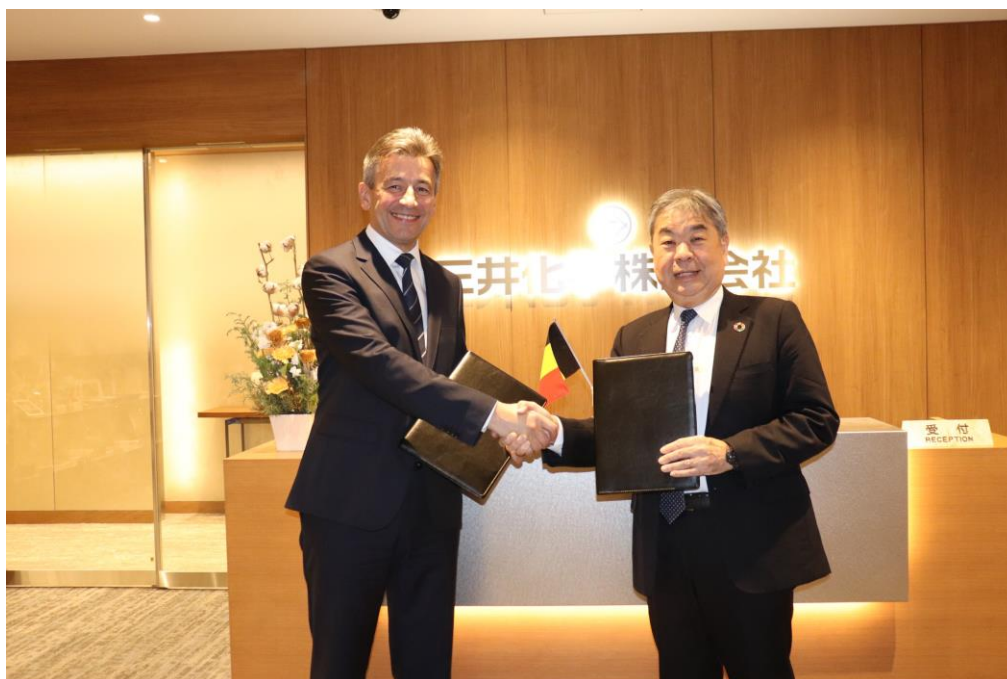
LEUVEN (Belgium), December 14, 2023—Imec, a world-leading research and innovation hub in nanoelectronics and digital technologies, and Mitsui Chemicals, a leading Japanese chemical company and EUV pellicle supplier, today announce the start of a strategic partnership on the commercialization of carbon-nanotube (CNT) based pellicles for extreme ultraviolet (EUV) lithography. Under this partnership, Mitsui Chemicals will integrate imec's fundamental CNT-based pellicle innovation into Mitsui Chemicals' CNT pellicle technology to achieve full production specifications, targeting its introduction in high-power EUV systems in the 2025-2026 timeframe. The signing took place in Tokyo during Semicon Japan 2023.

The strategic partnership intends to develop the membrane and EUV pellicle jointly through consultation and EUV scanner validation by imec for commercialization at Mitsui Chemicals. These pellicles, designed to protect the photomask from contamination during EUV exposure, have extremely high EUV transmittance ($\geq 94\%$), very low EUV reflectance and minimal optical influence – critical properties for high yield and throughput in advanced semiconductor manufacturing. The CNT pellicles are additionally able to withstand EUV power levels beyond 1kW, thereby supporting the future EUV source roadmap (>600W). These properties have generated strong interest from companies that use EUV lithography in high-volume manufacturing. Therefore, both parties will jointly develop industry-ready CNT pellicles to meet the market requirements.

“Imec has a long history of supporting the semiconductor ecosystem to advance the lithography roadmap. Since 2015, we collaborated with partners throughout the supply chain to develop an innovative CNT-based pellicle design for advanced EUV lithography,” says Steven Scheer, Senior Vice President Advanced Patterning, Process and Materials at imec. “We are confident that the in-depth knowledge we have on the metrology, characterization, properties and performance of CNT membranes will accelerate Mitsui Chemicals' product development. Together, we hope to bring CNT pellicles into production for future generations of EUV lithography.”

The lithography roadmap projects new pellicle introduction in the 2025-2026 timeframe, i.e., when next-generation ASML 0.33NA EUV lithography systems will support light sources with power levels of 600W and higher. This time frame is associated with the insertion of logic technology nodes beyond 2nm.

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Left: Thomas Piliszczuk, Senior Vice-President of Worldwide Strategic Partnerships and Strategy at imec
Right: HIRAHARA Akio, Business Sector President, ICT Solutions Business Sector at Mitsui Chemicals

About imec

Imec is a world-leading research and innovation center in nanoelectronics and digital technologies. Imec leverages its state-of-the-art R&D infrastructure and its team of more than 5,500 employees and top researchers, for R&D in advanced semiconductor and system scaling, silicon photonics, artificial intelligence, beyond 5G communications and sensing technologies, and in application domains such as health and life sciences, mobility, industry 4.0, agrofood, smart cities, sustainable energy, education, ... Imec unites world-industry leaders across the semiconductor value chain, Flanders-based and international tech, pharma, medical and ICT companies, start-ups, and academia and knowledge centers. Imec is headquartered in Leuven (Belgium), and has research sites across Belgium, in the Netherlands and the USA, and representation in 3 continents. In 2022, imec's revenue (P&L) totaled 846 million euro.

Further information on imec can be found at www.imec-int.com.

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About Mitsui Chemicals

Mitsui Chemicals' roots can be traced back to 1912 when it began producing raw material for chemical fertilizers from coal gas byproducts, the first company in Japan to do so. This undertaking significantly contributed to increasing agricultural productivity, a major social issue at the time. Later, the company evolved its technology from coal chemicals to gas chemicals, and in 1958 it built Japan's first petrochemical complex and so provided impetus to Japan's industry. Today, the company boasts many world-class products with sales standing at over 1,600 billion yen and with over 160 companies in 30 countries. Its business portfolio includes Life & Healthcare Solutions, Mobility Solutions, ICT Solutions, Basic & Green Materials .

Mitsui Chemicals will continue to contribute to solving social challenges with its state-of-the-art technology and by "Creating New Customer Value through Innovation".

More information can be found at <https://www.mitsuichem.com>

Contact Mitsui Chemicals [here](#)