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Mitsui Chemicals, Inc.

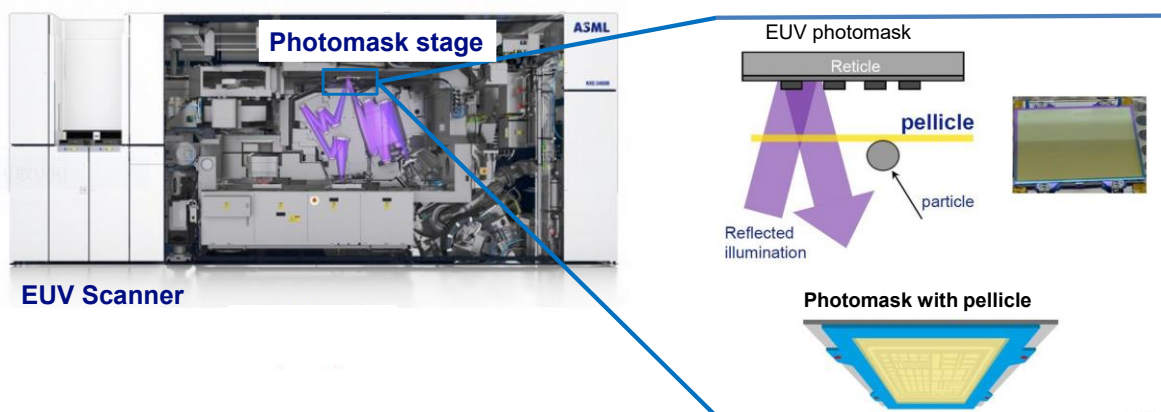
Mitsui Chemicals Sets up Production Facilities for CNT Pellicles to Be Used in Next-Gen EUV Lithography **Helping make higher performance semiconductors**

Mitsui Chemicals, Inc. (Tokyo: 4183; President & CEO: HASHIMOTO Osamu) today announced that it has decided to set up production facilities at its Iwakuni-Ohtake Works for carbon nanotube (CNT) pellicles suited to use in next-generation High NA^{*1}, high-output EUV lithography systems, which will be indispensable in further reducing the size and increasing the production efficiency of semiconductors.

■ **What is MITSUI PELLICLE™?**

MITSUI PELLICLE™ is a dustproof photomask cover for the photolithography process, which sees semiconductor wafers exposed to light in order to etch circuit patterns. The pellicle is designed with optimal thickness to allow for high transmittance, and its membrane material is selected to provide light resistance against each exposure wavelength used. Use of MITSUI PELLICLE™ keeps photomasks clean and helps improve semiconductor productivity. Since beginning pellicle sales in 1984, Mitsui Chemicals has continually strived to improve its pellicles and their quality in line with the downsizing of semiconductors.

Diagram showing exposure within an EUV lithography scanner + EUV pellicle



Source: ASML

■ **What are EUV pellicles?**

ICT, essential to solving social issues, is advancing at an increasing pace – in particular the use of 5G communications, AI, IoT and big data, leading us all into an increasingly digital society. The task of processing this data falls on semiconductors, and with the requirement for these semiconductors to have high-speed processing capabilities and low power consumption, there is an increasing need for ultrafine circuit widths of 7 nanometers or less. The industry is in turn seeing rising practical adoption of extreme ultraviolet (EUV) exposure technology with a wavelength of 13.5 nanometers, suitable for forming ultrafine circuits.

Mitsui Chemicals has a business licensed by Dutch company ASML Holding N.V. for producing EUV pellicles. The company became a global industry leader in 2021 by beginning commercial

production of EUV pellicles at its Iwakuni-Ohtake Works, allowing it to help meet growing demand for next-generation semiconductors.

■ What are CNT pellicles (next-gen EUV pellicles)?

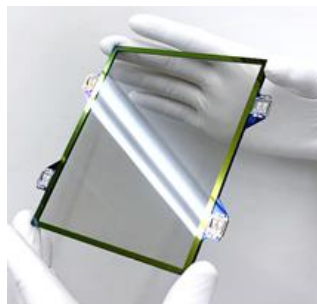
There is particular demand growth for High NA (numerical aperture of 0.55), high-output (600W or above) lithography, which represents the next generation of EUV lithography technology. And pellicles made from new materials will be essential to withstand the harsh lithography environments required to make this technology a reality.

In order to match these innovations in exposure technology, Mitsui Chemicals has decided to establish mass production facilities as a step toward commercializing CNT pellicles that have both high EUV transmittance (92% or above) and light resistance for exposure output of over 1kW.

By adding next-gen pellicle products using CNT as the membrane material to its lineup alongside conventional EUV pellicles made with a silicon-based membrane, Mitsui Chemicals hopes to contribute to improved semiconductor performance and productivity.



EUV pellicle



CNT pellicle

■ Overview of the planned new facilities

Product	MITSUI PELLICLE™ https://jp.mitsuichemicals.com/en/service/product/mitsui-pellicle/index.htm
Location	Mitsui Chemicals' Iwakuni-Ohtake Works https://jp.mitsuichemicals.com/en/corporate/ds/works/index.htm
Production capacity	5,000 sheets per year
Schedule	End of construction: December 2025 (tentative)

*1 NA: An abbreviation of “numerical aperture,” a term for a number that quantifies a lens’s ability to concentrate light – including the lens’s brightness, resolution and depth of focus. The larger the number, the more light rays a lens is able to capture, and the better it is able to narrow that light down to a small point.