NEWS RELEASE

Hamamatsu Photonics Develops "HyperGauge® In-plane Film Thickness Meter" Achieves Full-Surface Measurement of 300 mm Wafers in Just 5 Seconds, Boosting Productivity Improvements in Semiconductor Manufacturing. Orders Accepted from December 1.

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Hamamatsu Photonics has developed the "HyperGauge In-plane Film Thickness Meter C17319-11," a new device designed to enhance productivity in semiconductor manufacturing processes. This product features our proprietary wavelength detection technology, "λ-Capture®*1," which uses a high-sensitivity camera to enable full-surface measurement of wafers up to 300 mm in diameter in just 5 seconds. The device offers both high resolution and excellent measurement reproducibility, making it suitable for both bare and patterned wafer inspection. Its introduction is expected to reduce process losses and improve yield in semiconductor manufacturing.

Orders for this product will be accepted from December 1 (Monday), targeting domestic and international semiconductor manufacturers, semiconductor equipment manufacturers, and semiconductor inspection equipment manufacturers.

*1: λ-Capture: A proprietary wavelength detection technology that enables two-dimensional wavelength measurement without a spectrometer, allowing for high-speed spectral measurement across the entire wafer surface.

Background of Development

In semiconductor manufacturing, film thickness variations can occur on wafers due to factors such as pin temperature inside processing chamber. Such non-uniformity can negatively impact product quality, making it essential to maintain consistent film thickness across processes. Currently, point sensor-type devices are widely used for film thickness measurement, however as they measure only one point at a time, the process is time-consuming. This makes it extremely difficult to efficiently obtain in-plane measurements and distributions while maintaining productivity. In practice, manufacturers often limit the number of measurements or measurement points to balance productivity and quality. As a result, there is a growing demand for more efficient film thickness measurement and accurate in-plane distribution analysis to further enhance productivity.

Product Overview

This product is a device that measures wafer film thickness in two dimensions using a high-sensitivity camera. It can measure the full thickness of wafers up to 300 mm in diameter in just 5 seconds. Wafer mapping is performed simultaneously with film thickness measurement. This makes it easier to select measurement locations and align positions compared to point sensor methods, while also enabling rapid acquisition of thickness distribution. The device combines high resolution and high measurement reproducibility, providing the precision required for both bare and patterned wafer inspection.

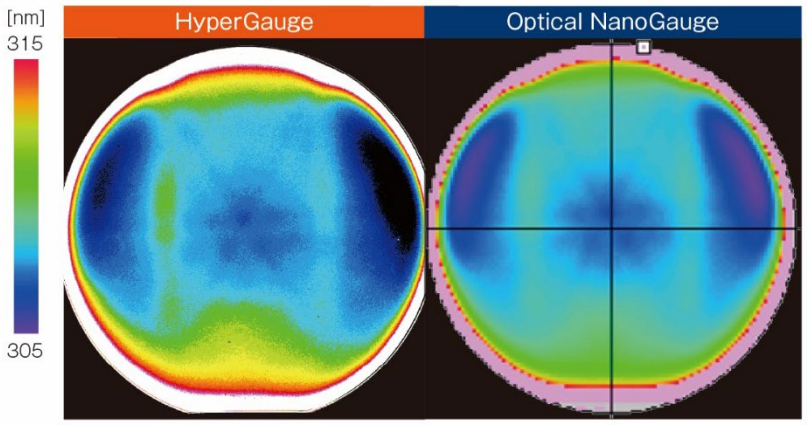
Applications and Expected Benefits

This product is suitable for a wide range of applications, including observing the full-surface thickness distribution of wafers with thickness irregularities or ultra-thin wafers, as well as evaluating structures on patterned wafers. Integrating this device into semiconductor manufacturing equipment enables efficient film thickness inspection at each process stage, reduces process losses, improves yield, and contributes significantly to both productivity and quality. Prior to its release, several major domestic semiconductor manufacturers evaluated the product, giving it high marks for its new concept of “snapshotting in-plane film thickness distribution” and its performance.

Product Features

- High-speed measurement: Acquire thickness distribution in just 5 seconds[*2]
- High spatial resolution: Detailed measurement with 0.3 mm accuracy
- No moving parts: Minimizes risk of particle generation
- Easy detection of specific points: Facilitates measurement of desired wafer locations compared to point sensor methods
- Equipped with proprietary “λ-Capture” technology: New film thickness measurement method achieves both accuracy and reproducibility

*2: When measuring φ300 mm all at once



Comparison of Thickness Distribution Measurement for Samples with Small Variations
Left: HyperGauge In-plane Film Thickness Meter
Right: Our Point Sensor Type Film Thickness Meter
(Sample: SiOx 300 nm)

HyperGauge In-plane Film Thickness Meter C17319-11