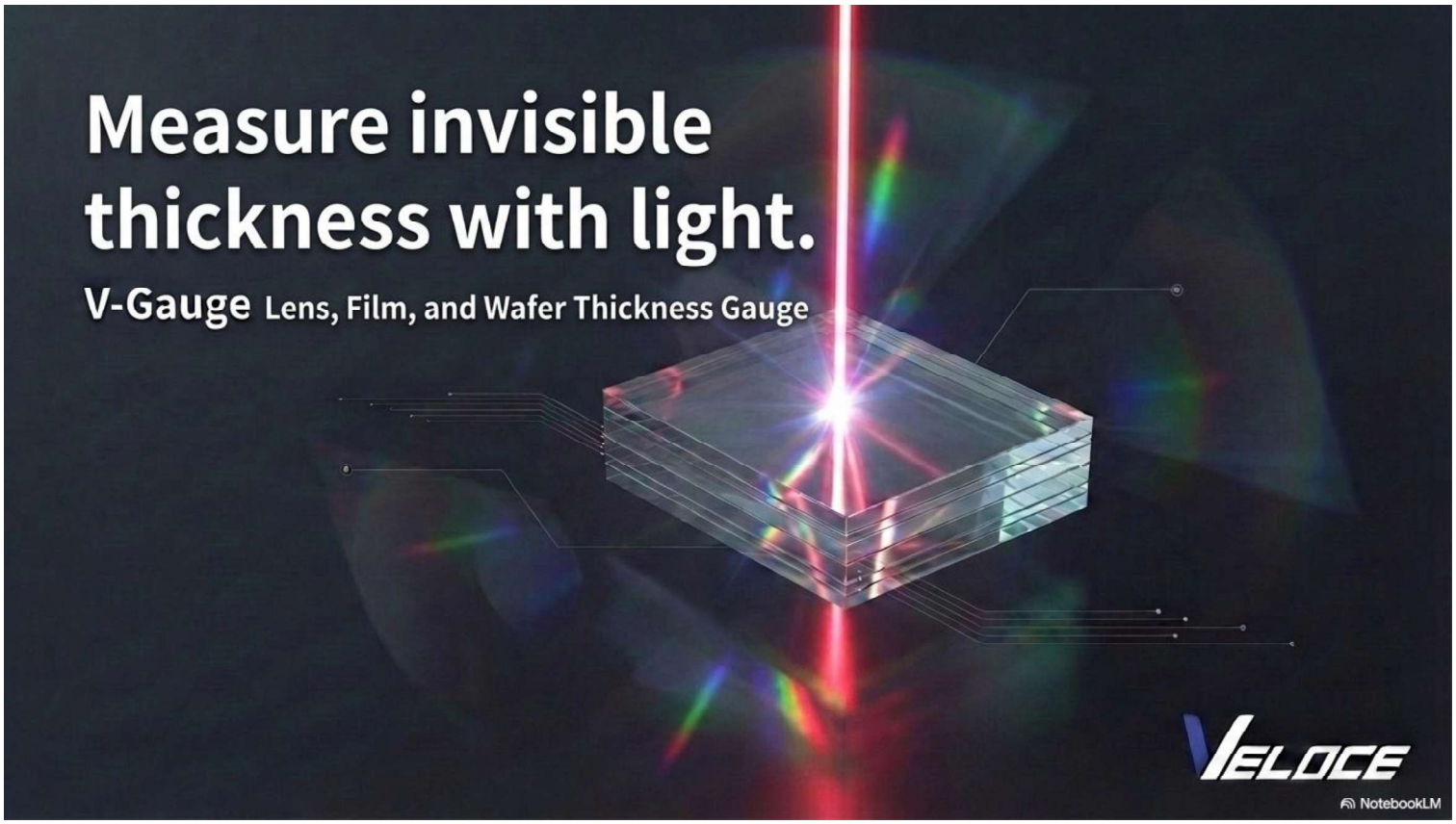
Measure invisible thickness with light.
V-Gauge Lens, Film, and Wafer Thickness Gauge
VELOCE
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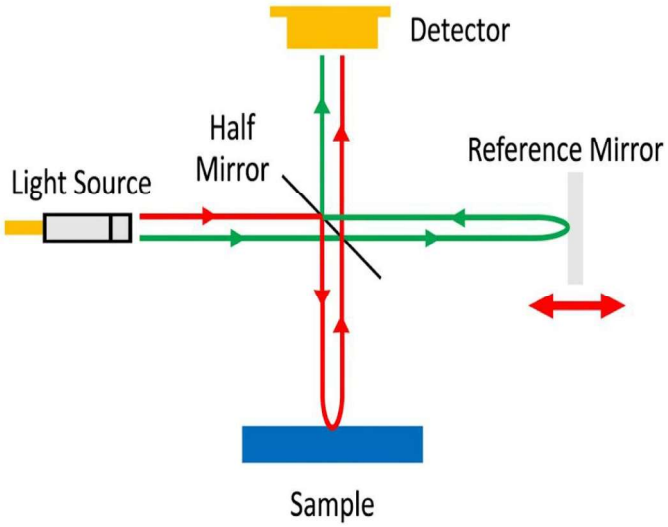
V-Gauge

Overview

Uses light interference to measure thickness with sub-micron accuracy, non-contact.

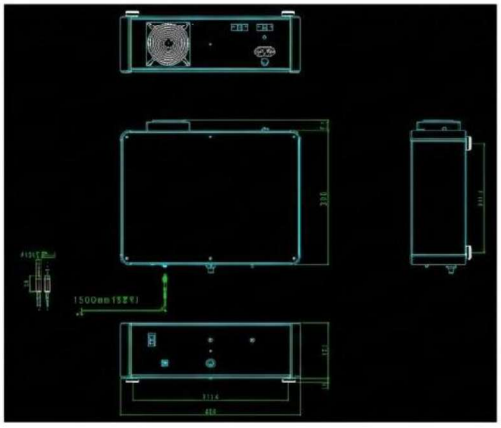


What is the V-Gauge Lens, Film, and Wafer Thickness Gauge?

- It is a **linear scanning method** measuring instrument that applies the principle of OCT (Optical Coherence Tomography).
- Light is split between the sample and a reference mirror, and the **"interference"** of the reflected light is observed to reveal the **depth** (thickness) and **internal structure** of the target object **non-destructively** and **non-contact**.
- Compatible with single lenses, lens groups, and balsam thickness (11μm or more).

Specifications

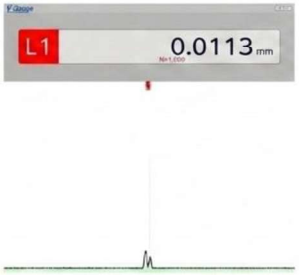
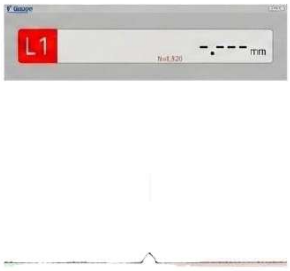
Employs a linear scanning method, enabling a wide range of measurements from plastic wrap to 16mm thick materials.



Basic Specifications	
Measurement Targets	Glass, Film, Pipe, Si Wafer
Measurement Range	11μm (Plastic wrap) ~ 16mm (BK-7)
Resolution	Sub-micron
Repeatability	±1μm (Room temperature ±3°C)
Measurement Spot Size	Φ400μm or less
Additional Features	Calculation of "Refractive Index" based on measured thickness

Case01

Ultra-thin Film Measurement: Accurately capturing thicknesses down to the 11μm limit.

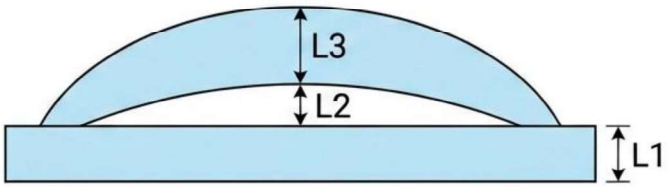
Commercial Wrap Film	Condom
	
Measurement result: 0.0113mm (11.3μm) / Refractive index n=1.600. Two interference peaks clearly appear, proving that the boundaries of the ultra-thin layer can be identified.	Peaks merge because the thickness is 11μm or less. This indicates the thickness is 0.01mm or less, as displayed.

Case02

Multi-Layer and Air Gap Measurement: Simultaneously measures not only glass layers but also the air gap (space) between them.

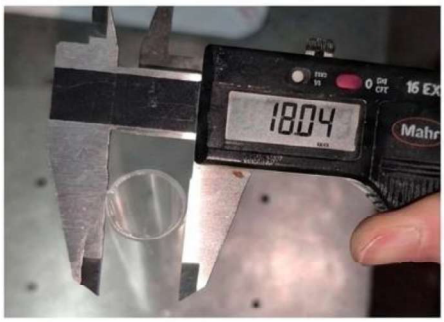
Measurement with a convex meniscus lens placed on a glass plate.

- Convex meniscus lens on a glass plate.
- L1 Glass plate 0.55mm
- L2 Air gap between glass plate and lens back surface (SAG)
- L3 Distance between lens back surface and lens top surface (Lens thickness)

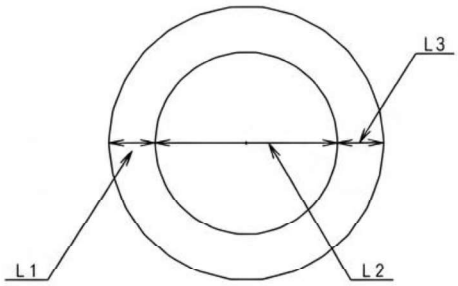


Case03

Curved & Pipe Shapes: Measures the wall thickness and inner diameter of quartz pipes, etc., with precision equal to or better than a vernier caliper.



Physical measurement with a vernier caliper (ϕ18 pipe)



L1=Front wall thickness /
L2=Inner diameter /
L3=Back wall thickness

OCT measurement waveform of ϕ18 pipe (Layers are clearly separated)

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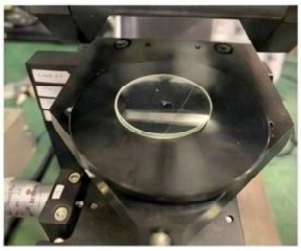
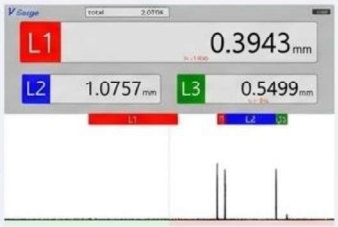
Case04

Liquid Boundary Detection: Utilizing refractive index differences to distinguish layered structures of liquids and solids.



Oil and Substrate Boundary Detection Experiment

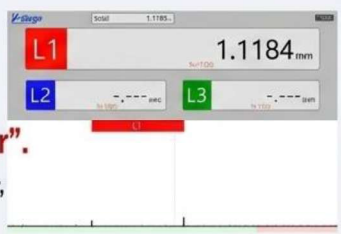
【Oil + Si (Silicon) 】



→ Boundary Peak "Appears".

Reason: Due to the large refractive index difference between Oil and Si, their respective thicknesses (L1, L2) can be measured separately.

【Oil + BK7 (Glass) 】



→ Boundary Peak "Does Not Appear".

Reason: Because their refractive indices are similar, they are detected as a combined thickness.

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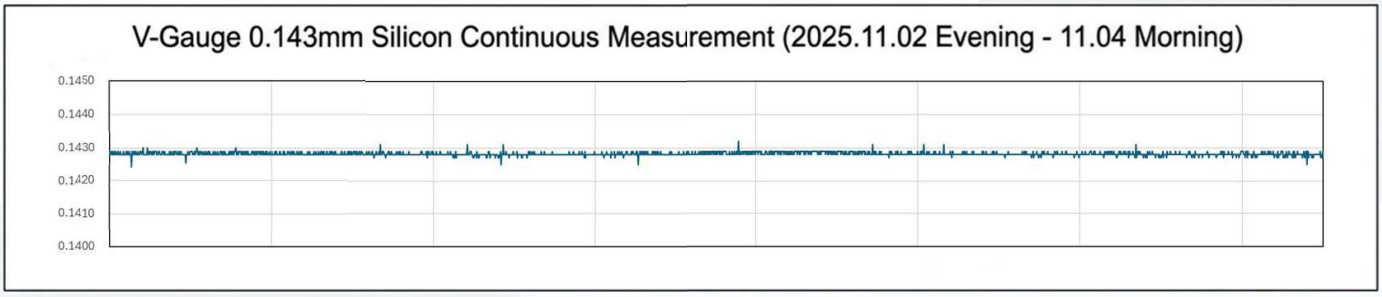
Case05

Long-term Stability: Maintaining sub-micron accuracy even during continuous measurement over several days.



Data from approximately 2 days of continuous measurement of silicon (0.143mm).
Demonstrates extremely high stability with a standard deviation of 0.00007mm (0.07μm).

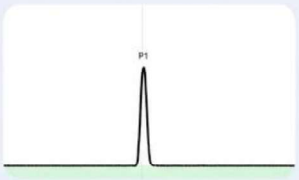
※ Provides reliability suitable for inline integration, even under environmental factors such as room temperature changes.

Average	0.1428
Standard Deviation	0.00007
Maximum	0.1432
Minimum	0.1424

Case06

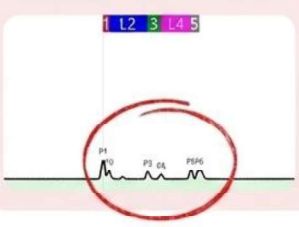
Non-destructive Inspection of Organic Materials: Visualizing Differences in Internal Structures of Akoya and Freshwater Pearls via Waveforms.

V-Gauge Pearl Measurement Setup



Akoya Pearl / Freshwater Pearl

Only a single strong peak (P1) appears. This indicates that reflection at the surface is dominant.



Akoya Sample (Multi-layered Structure/Coating)

Numerous fine peaks appear due to internal multiple layers. It is possible to non-destructively distinguish the pearl's "maki" (nacre thickness) and differences in internal structure.

Contact

- We welcome inquiries about sample measurements and customization. Please feel free to contact us.
- On our website, you can find information on V-Gauge as well as our other products, including EAGLE (Autocollimator) and Q-PEA (Space Charge Measurement System).

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