



## A Quantum Leap in Plasmonic Sensing

### Continuous Nanostructured Metallic Thin-Film Sensor

---

Æon Core is a continuous, nano-structured metallic thin film grown, patterned, and layered at the atomic level. It features billions of uniformly engineered nanohemispheres across a single sensor chip surface. The one-piece, solid-state architecture is designed for manufacturing-grade repeatability, high signal-to-noise, and rapid, reliable quantitative readout in demanding technical and institutional contexts.

#### **Key technical attributes:**

- A robust continuous atomic-level thin-film construction (no particle suspensions).
  - Dense nanoantenna field (collective nanohemisphere response) supporting high signal-to-noise.
  - Tight spectral uniformity and high lot-to-lot reproducibility (supported by extensive internal characterization).
  - Compatible monitoring modalities: optical, digital, spectroscopic, electrochemical, and catalytic readouts.
- 

### Core architecture & signal behavior

The sensing interface is concentrated into a single engineered film. The collective nanoantenna array produces a collective plasmonic response with well-defined resonance behavior and highly stable signatures, which can be quantified via digital or imaging-derived proxies.

### Performance highlights (representative; assay-dependent)

- Narrow, stable plasmonic response supporting rapid, discriminating readout and robust quantitation.
- Quality factor  $\sim 13\text{--}15$ ; plasmon dephasing times  $\sim 3\times$  longer than representative colloidal Au benchmarks.
- Sensitivity typically translates to orders-of-magnitude limits-of-detection improvements versus many established rapid-detection implementations (assay-dependent).

Supports **readout geometry enabling miniaturization** normal-incidence reflection readout, enabling compact fixed-geometry optics that can be miniaturized for handheld, embedded, and wearable implementations.

## **Manufacturing & integration envelope**

- Flexible sizing from  $\sim 200 \mu\text{m}$  to  $\sim 2 \text{mm}$ ; substrates include glass, stainless steel, select polymers, and ceramics.
- Engineered for scalability and controlled manufacturability; growth-and-patterning protocols can be adapted across substrate classes for integration into cartridges, housings, and ruggedized form factors without changing underlying sensing physics.

## **Integration-ready adaptability**

Designed as a reader-agnostic, drop-in sensing element, supporting an upgrade path from compact digital capture to lab-grade spectroscopy or electrochemical readout without changing the underlying sensor.

**If these possibilities spark your interest, we're glad to connect and share details.**

 [Plasora.org](https://plasora.org)