AtOMS

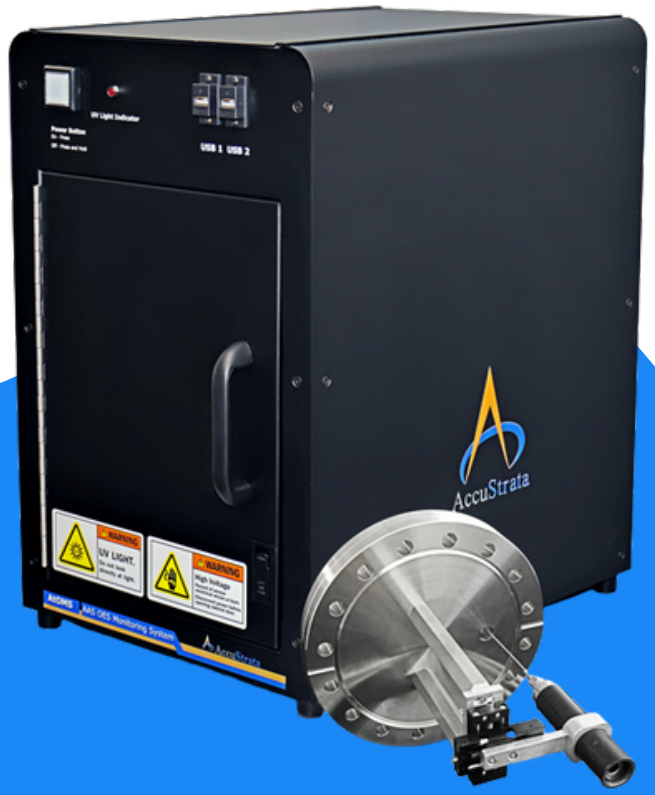
Optical metrology tool for real-time monitoring and control of vacuum thin film deposition processes and dry etching

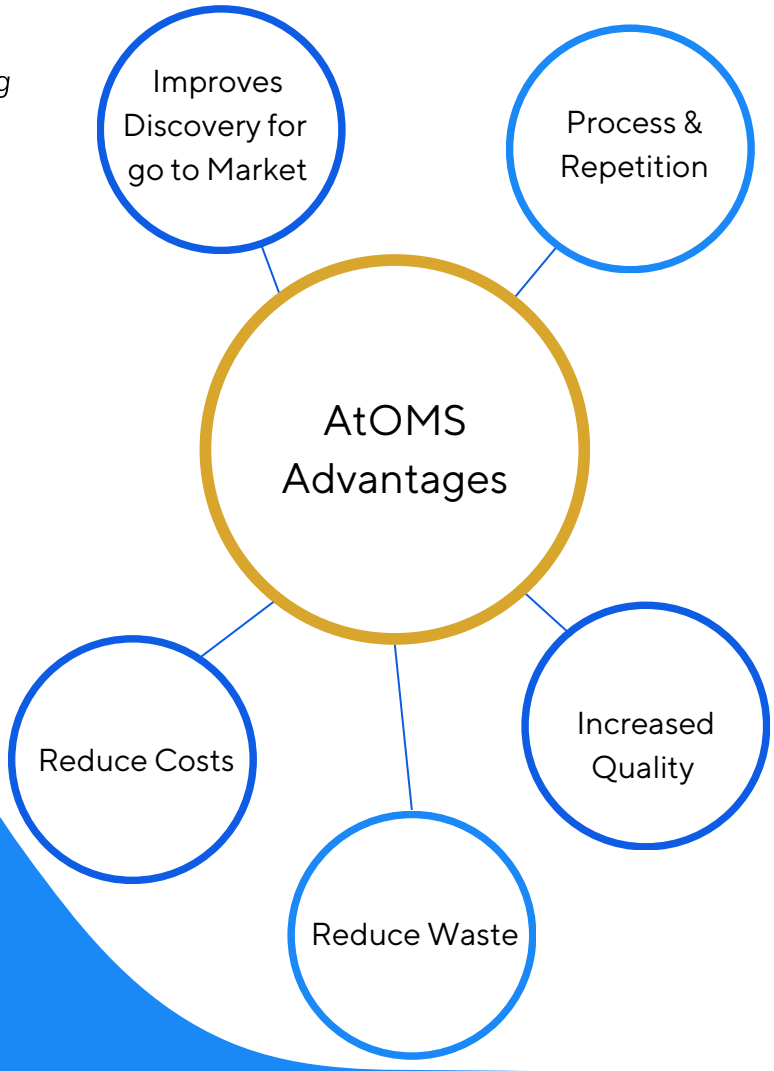
Atomic Optical Monitoring System

- ***VERSATILE INSTALLATION FOR PVD CHAMBERS***
- ***FIBER OPTIC BASED MEASUREMENT SYSTEM***
  Completely fiber optics-based solutions enables the use of switches that rapidly change system config. to allow accurate data processing
- ***BROAD SPECTRUM DETECTOR***
  Allows for a single detector to be used for rapid element detection
- ***ELEMENTAL SELECTIVIITY***
  Leads to precis multi-element composition monitoring
- ***3 PROBE CHANNELS***
  Monitor multiple locations to view variations across systems

What are the Benefits?

- It pays for itself in 1-4 months depending on the process
- It can substantially increase profit margins
- It can save millions a year
- It results in a higher quality more predictable product





Applications

- ***VACUUM PROCESSES***
  - *Physical Vapor Deposition*
  - *Magnetron Sputtering*
  - *Ion Beam Sputtering*
  - *Electron Beam Evaporation*
  - *Thermal Evaporation*
  - *Molecular Beam Epitaxy*
  - *Plasma Etching*
- ***COATING TYPES***
  - *Complex Multilayer & Thin Film Structures*
  - *Extremely Thin Multilayers*
  - *Coatings with Engineered Interface Layers*
  - *Thin Films and Structures with Gradient Bandgap Profiles*
  - *Multi-Element Coating*
  - *Alloys & Compounds*

Features

- over 80 + single elements and multi-element light sources enable element selectivity
- co-deposition: each element can be monitored individually
- measure independent of substrate shape, orientation and motion
- configure up to 3 probing beams in a single AtOMS system
- suitable for both deposition and etch processes
- measures process from within chamber
- measures only the region where the process is occurring
- installation on chambers with minimal retrofitting
- configure in multi bounce geometry for even greater sensitivity
- increasing validation of new elements as more research is developed

Competitive Advantages

Capability	AtOMS	Optical Monitoring	Crystal Monitor
Simultaneous multi-element deposition rate monitoring	✓	✓	✓
Element concentration of multi-element depositions	✓	✗	✗
Monitoring of multi-element chemical composition	✓	✓	✗
>60 different chemical elements can be uniquely monitored	✓	✗	✗
Monitoring extremely thin films (<3 nm)	✓	✗	✓
Monitoring very high deposition rates	✓	✗	✓
Deposition rate accuracy of 0.005 Å/sec	✓	✗	✗
Film composition accuracy of 0.1 at.%	✓	✗	✗
Monitoring Optically Opaque Materials, Metals and Alloys	✓	✗	✓