HIDEN ANALYTICAL

# ALD

## ATOMIC LAYER DEPOSITION – VACUUM PROCESSING OF THIN FILMS

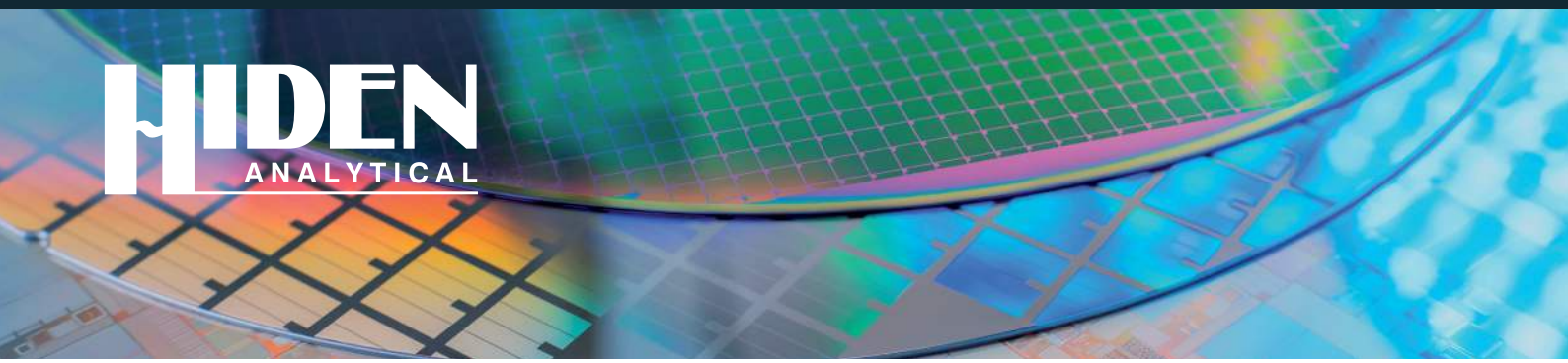



### Hiden's extensive range of systems for ALD Process and Film Analysis

Atomic Layer Deposition (ALD) is a ground-breaking method extensively employed in high-tech sectors such as electronics, energy, and materials science for fabricating ultra-thin, uniform films crucial to semiconductors, solar cells, and nanomaterials. Comprehending the film growth mechanisms is vital for ensuring precision and quality.

Hiden Analytical systems - HPR-30, EQP, HMT, and AutoSIMS - play a significant role by providing unmatched insights into ALD, supplementing traditional analytical techniques like X-ray diffraction and scanning electron microscopy.

W www.HidenAnalytical.com E info@hiden.co.uk



HIDEN ANALYTICAL

## HMT

# Residual gas analysis at high pressure



The Hiden HMT system provides an innovative approach to residual gas analysis in ALD, enabling real-time process monitoring from pressures of $5x10^{-3}$ mbar to UHV.

- HMT mode for high pressure operation to $5x10^{-3}$ mbar
- RGA mode for high sensitivity operation to $10^{-13}$ mbar
- 100 amu mass range
- Stability better than +/- 1% over 24 hours
- Fast access mixed mode scanning
- Real-time background subtraction

## AutoSIMS

# ALD film analytics



The Hiden AutoSIMS revolutionises surface analysis, providing information about the elemental composition and structure of material surfaces, a critical aspect in ALD.

- Composition, contamination, diffusion and interface analysis
- Nanometre depth resolution
- Fully automated, unattended, SIMS & SNMS Analysis
- 3D Characterisation and imaging

## HPR-30 Series

# Vacuum process gas analysis – wide sampling pressure range



The Hiden HPR-30 is a mass spectrometer designed for gas analysis in ALD, providing real-time measurements to optimise deposition conditions and monitor gas impurities. It is especially useful in ALD studies.

- Pump-down profiles
- Vacuum diagnostics
- Real-time precursor analysis
- Residuals
- Backfill
- Bakeout endpoint confirmation
- Leak checking

## EQP Series

# Analysis of the reaction kinetics of plasma assisted ALD processes



The EQP system is a specialised plasma analyser used in plasma-assisted atomic layer etching (ALE) and ALD. It tracks high-density plasma, enabling the creation of uniform patterns and monitoring plasma ions, radicals, and neutrals for reproducibility and contaminant monitoring.

- +ve and –ve ion analysis
- Mass resolved ion energy analysis
- Neutrals and neutral radical analysis
- Energy resolved mass analysis
- Mass range options to 1000 amu
- Energy range options to 1000 eV

TDS 198/1