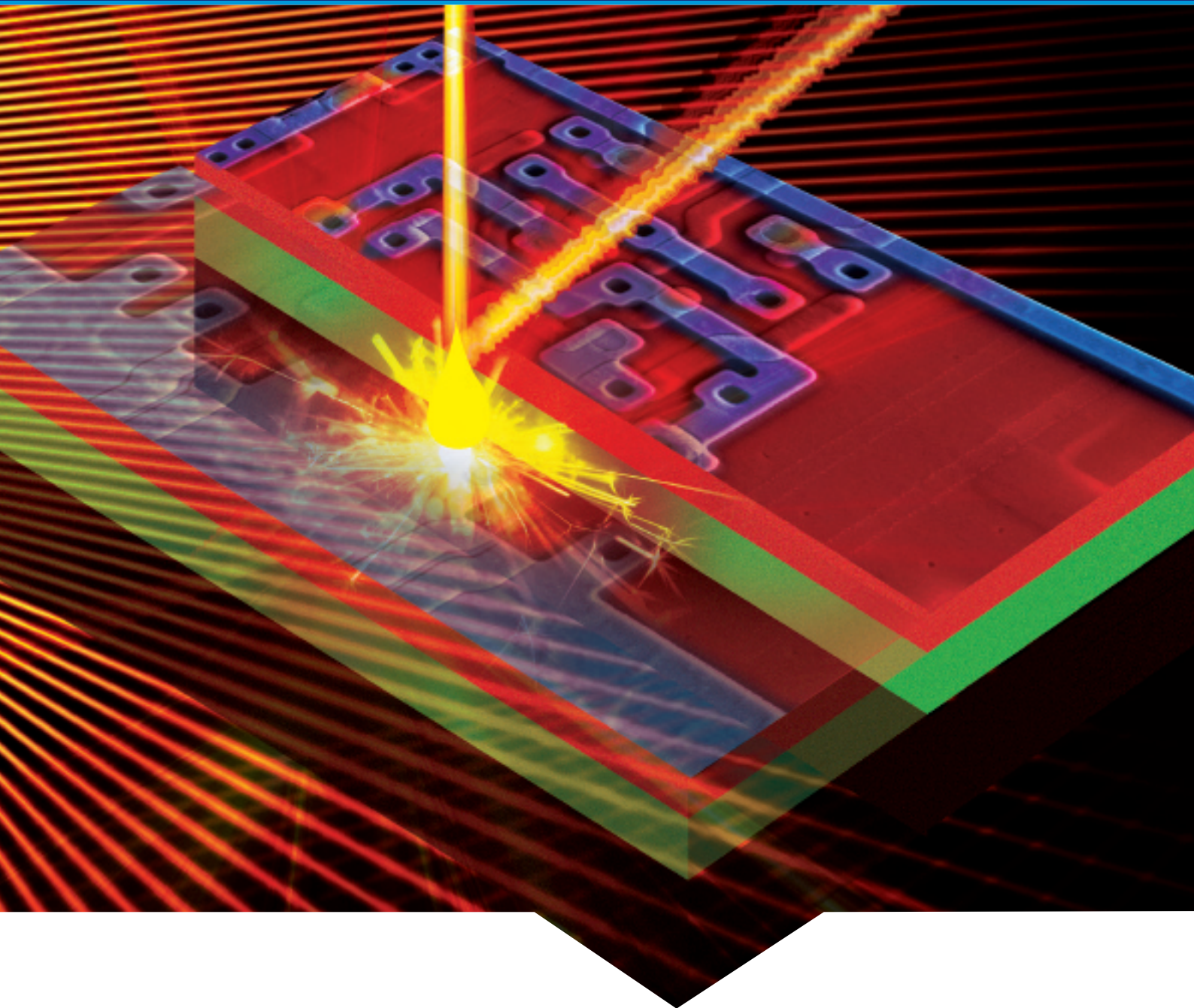


ThinFilmID

Thin Film Inspection & Dimension



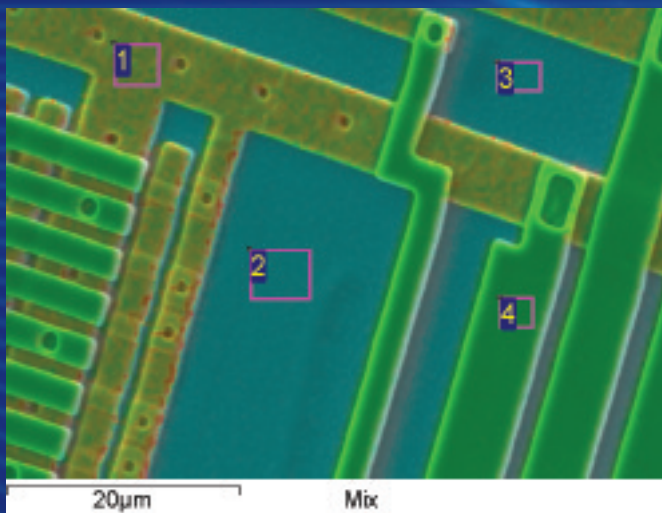
Analysis from Oxford Instruments
The Experts' Choice

The Business of Science®



ThinFilmID software determines in-situ composition and thickness of thin film structures.

Using a highly focussed electron beam to analyse a sample means the analysis is spatially resolved laterally as well as with depth, therefore nano-scale thin film structures can be measured.



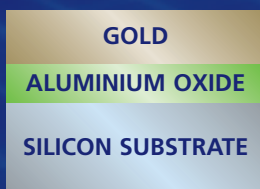
In-situ non-destructive analysis with excellent lateral resolution

The unique capabilities of **ThinFilmID** are;

- Determine thickness of layers from 2nm
- Determine composition of elements from less than 1wt%
- Lateral resolution down to 200nm or less
- Selects precise position of all measurements for complex structures
- Non destructive analysis with minimal sample preparation, (no need for cleaving or cross-sectioning)
- Rapid data collection and analysis
- Compatible with all SEMs using the world's leading EDS system **INCA**Energy

Measure
Layer Composition

O/Al = 1.6

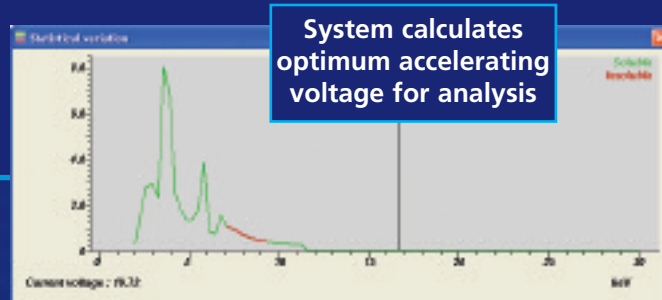
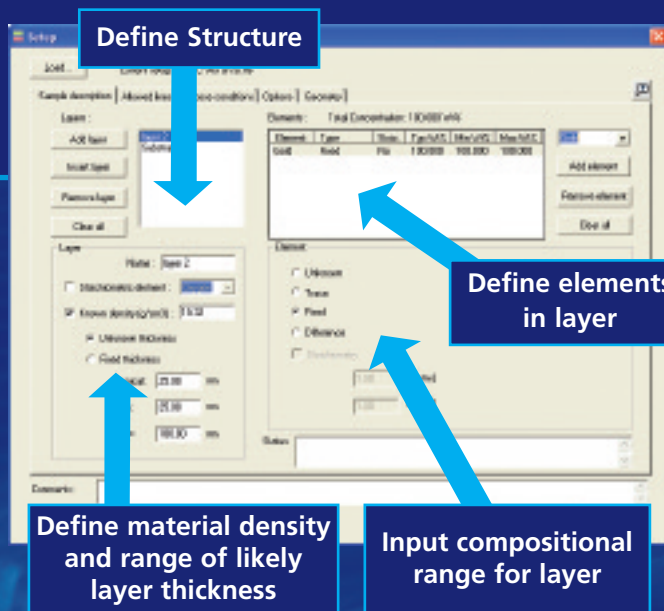


Measure
Layer Thickness

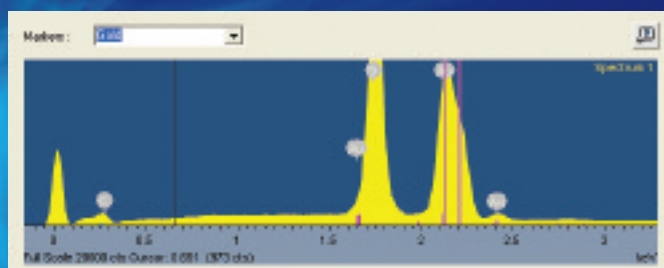
64nm
45nm

Determine composition and thickness of layers in a structure

Four Steps to Thin Film Measurement



- 1 Input all known parameters about the structure to determine:
 - Measurement solvability
 - Optimum data collection conditions
 - Any assumptions required to achieve a result



- 2 Collect an EDS spectrum from the structure at a single accelerating voltage using **INCAEnergy**



- 3 **ThinFilmID** reads the **INCA** project file and displays the **INCA** data tree

Layer	Element	Vol% (wt%)	Signo	Altitude	Density	Thickness (nm)	Signo	Mass (g)	Signo (g)
Layer 1	Au	100.00	100.00	10.00	19.30	5.11e	0.10	1.77e-24	0.10
Substrate	Si	100.00	100.00	10.00	2.33	1.00e	0.10	1.77e-24	0.10

- 4 Press quantify to calculate:
 - layer thickness and/or composition
 - measurement precision

Composition

Thickness

ThinFilmID calculates film composition and/or thickness:

- Uses **INCAEnergy**'s robust quantitative analysis algorithms
 - Choose 'out of the box' quant or standardise to optimise results
- Mass thickness and compositions are calculated using the established **STRATAGem*** thin film analysis engine which is fully integrated into **ThinFilmID**
- Mass thickness is converted to thickness by defining the density of the material in each layer

*STRATAGem ©SAMx

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OXFORD
INSTRUMENTS

ThinFilmID

Thin Film Inspection & Dimension

ThinFilmID includes 3 unique software modules for practical composition and thickness determination using EDS

Solvability Module

ThinFilmID determines the optimum conditions required for data acquisition and data reduction. Input thin film structure details to determine:

- Acquisition parameters such as microscope accelerating voltage
- Any assumptions required to calculate a solution

Synthesis Module

Simulates EDS spectra to aid further optimisation before any data needs to be collected.

- Calculate analysis precision
- Determine data collection time for desired precision
- Test whether a thin layer is detectable
- Determine best conditions for detection

Sensitivity Module

Tests what assumptions about a thin film structure will have the greatest effect on results obtained:

- Find out which parameters of the analysis and structure are most important to define precisely to achieve an accurate result
- Save time and minimise sample knowledge required to obtain results

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