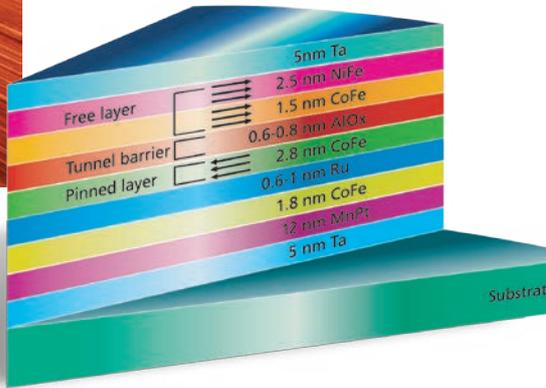


# STRATOS

Layer thickness and composition analysis software for XRF

Sophisticated analysis made easy



# STRATOS

## Accurate results for layer thickness and composition

Stratos is a comprehensive layer analysis software module with built-in intelligence. Advanced Fundamental Parameter algorithms correct for fluorescence variances found in complex layered stacks.



## Benefits

Superior accuracy, without the need of XRF knowledge

Analyze multi-layer materials with bulk standard samples

Includes the Virtual Analyst, your consultant for advanced method development

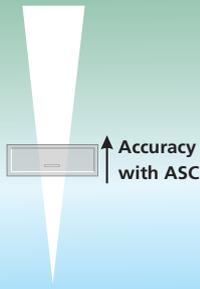
Full flexibility for data entry and reporting:

- Mass thickness units
- Concentrations units
- Stoichiometry
- Thickness units
- Density units

Applicable to single and multi-layer analysis of:

- ✓ Metals
- ✓ RoHS and WEEE
- ✓ Catalysts
- ✓ Plastics
- ✓ Solar cells
- ✓ Batteries
- ✓ Bath control

## In-type standards



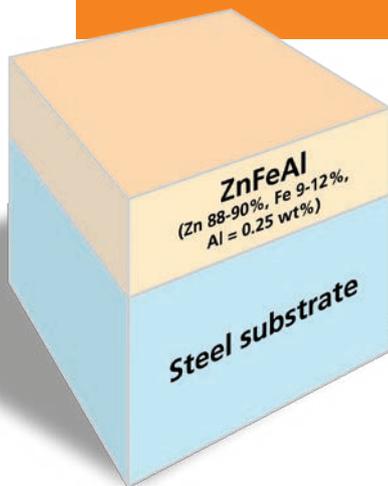
## Generic bulk standards

## Improved accuracy by using Adaptive Sample Characterization

Stratos uses fundamental parameters to determine the thickness and composition of coatings and layers. Moreover, calibrations can be carried out using conventional bulk reference materials or multi-layer samples that differ from the unknown samples.

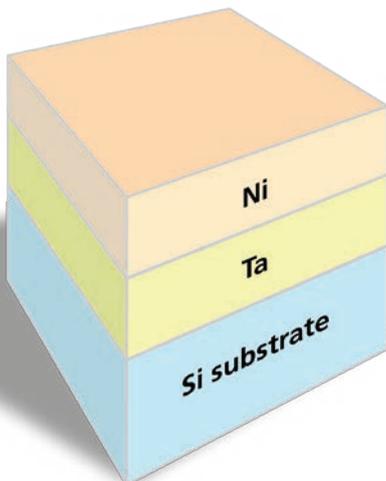
Accuracy can be further improved by adding in-type standards to the main calibration by using Adaptive Sample Characterization (ASC).

## Application examples



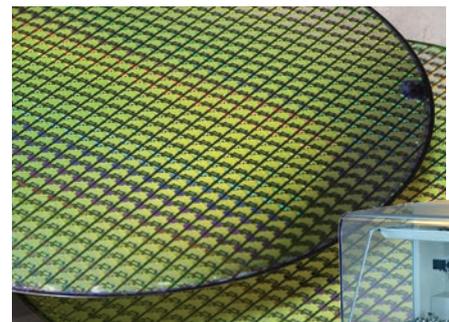
### Accurate analysis of layer thickness and concentrations of ZnFeAl coated steel

Accurate determination of the thickness and composition of a protective 40-55 g/m<sup>2</sup> ZnFeAl coating on steel is demonstrated.



### Accurate and fast layer thickness analysis of a NiTa bi-layer

Accurate determination of the layer thickness and thickness variations across different fragments of the same sample. The sample structure in this application study is a NiTa bi-layer copper diffusion barrier on a silicon wafer substrate.





*Epsilon 3 range*

Results	Nominal value	Stratos
Mass thickness (g/m <sup>2</sup> )	50.5	51.3
Zn (wt%)	89.22	90.84
Fe (wt%)	10.5	9.0
Al (wt%)	0.18	0.16

### Stratos benefits

Virtual Analyst for optimal analytical X-ray lines selection for best accuracy

Improved accuracy by interlayer matrix effect corrections

Non-layered bulk samples can be used and produce good results

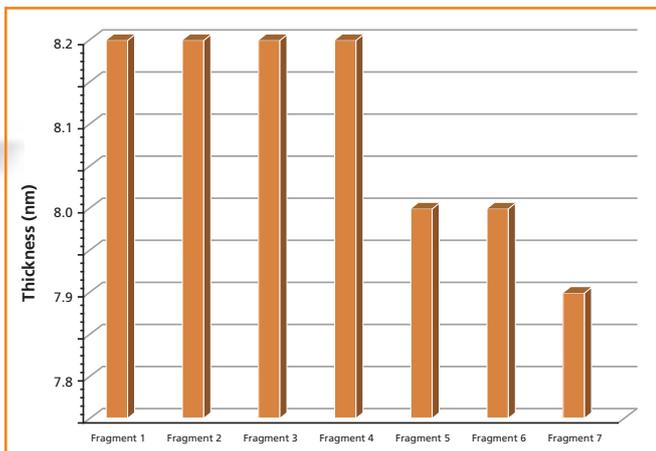
Adaptive Sample Characterization allows choosing between conventional bulk-reference materials or multi-layered reference materials



*Axios range*

Repeatability	Ta (nm)	Ni (nm)
Nominal values	~7	~20
Stratos mean value of 10 measurements	8.1	19.6
RMS* value (n=10)	0.03	0.05

\* RMS: Root Mean Square is a statistical evaluation of the repeatability. The smaller the RMS, the better the repeatability.

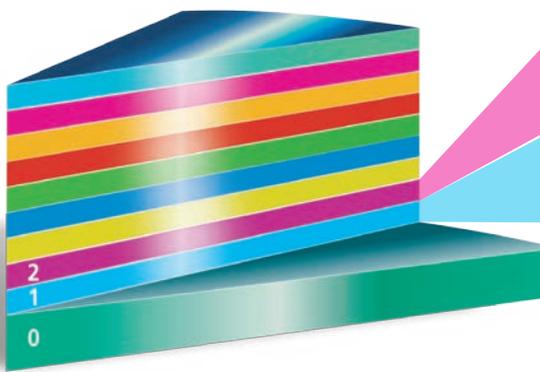
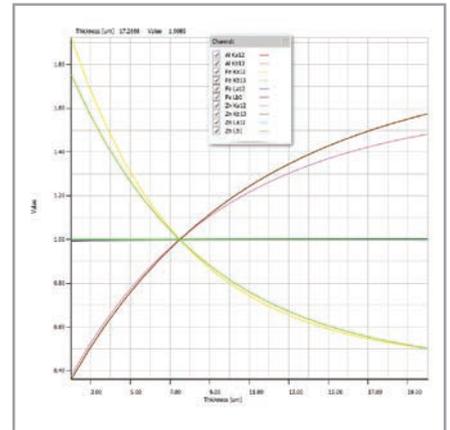


*Thickness variation of tantalum between fragments*

# Virtual Analyst – method development made easy

Based on a definition of your sample structure, the Virtual Analyst simulates fluorescent response of the sample and gives you the optimal settings for analysis. Thereby eliminating time-consuming trial-and-error experiments normally required to set-up these complicated applications.

*A user-friendly interface allows straightforward input of required information.*



Name	Nominal	Lower	Upper	Analysis	Fixed	Manual	Unit	Report	Report Name
Thickness	420.00			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	µm	<input type="checkbox"/>	Thickness
Density	21.4500			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	g/cm³	<input type="checkbox"/>	Density
Compound	Nominal	Lower	Upper	Analysis	Fixed	Manual	Unit	Report	Report Name
Si	0			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	%	<input type="checkbox"/>	Si
Ti	0			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	%	<input type="checkbox"/>	Ti
Rt	100.0000			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	%	<input type="checkbox"/>	Rt
Au	0			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	%	<input type="checkbox"/>	Au
Sum:	100.0000 %								

## What if you don't have any standards?

With Stratos you have all you need to perform multi-layer analysis. Combining Stratos with Omnia, the industry benchmark for standardless analysis, you can benefit from the availability of optimized calibrations based on Omnia standards. Now you are provided with a time-saving solution for most of your multilayered samples even if you don't have any standards.

Furthermore the Virtual Analyst simulation and proposed application set-up in Stratos are enhanced by incorporating information derived from Omnia.

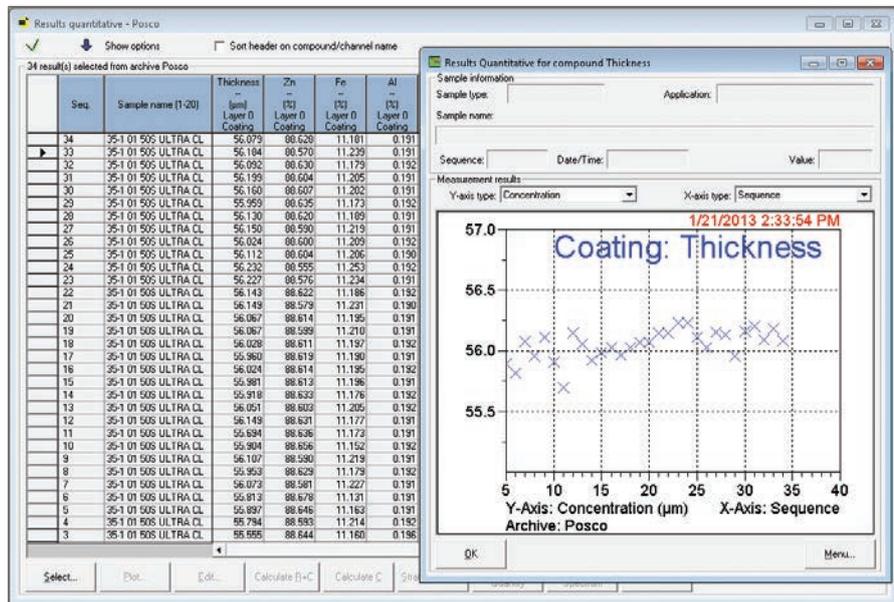
# Seamless integration

## Seamless integration with SuperQ and Epsilon 3 software

Results fully integrated into Results Viewer for advanced data analysis.

Easily compare, print or transfer data to LIMS

Easily export results to MS Word and Excel for reporting.



## PANalytical

PANalytical is the world's leading supplier of analytical instrumentation and software for X-ray diffraction (XRD) and X-ray fluorescence spectrometry (XRF), with more than half a century of experience. The materials characterization equipment is used for scientific research and development, for industrial process control applications and for semiconductor metrology.

PANalytical, founded in 1948 as part of Philips, employs around 1000 people worldwide. Its headquarters are in Almelo, the Netherlands. Fully equipped application laboratories are established in Japan, China, the USA, and the Netherlands. PANalytical's research activities are based in Almelo (NL) and on the campus of the University of Sussex in Brighton (UK). Supply and competence centers are located on two sites in the Netherlands: Almelo (development and production of X-ray instruments) and Eindhoven (development and production of X-ray tubes). A sales and service network in more than 60 countries ensures unrivalled levels of customer support.

The company is certified in accordance with ISO9001-2008 and ISO 14001.

The product portfolio includes a broad range of XRD and XRF systems and software widely used for the analysis and materials characterization of products such as cement, metals and steel, nanomaterials, plastics, polymers and petrochemicals, industrial minerals, glass, catalysts, semiconductors, thin films and advanced materials, pharmaceutical solids, recycled materials and environmental samples.

Visit our website at [www.panalytical.com](http://www.panalytical.com) for more information about our activities.

PANalytical is part of Spectris plc, the productivity-enhancing instrumentation and controls company.

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