

# Ultim<sup>®</sup> Max ∞ EDS Detectors



## Unlock the Infinite potential of EDS analysis in the SEM

The **Ultim Max ∞** ("Infinity") SDD detector unlocks the infinite potential of EDS for characterising materials in the SEM. It combines unparalleled accuracy, sensitivity and speed, to power AZtecLive software to solve more complex analysis challenges.



**Infinity means guaranteed performance**, tested on installation, beyond the typical specifications of any other detector including:

The highest sensitivity guaranteed with sensor sizes from 40 mm<sup>2</sup> up to 170 mm<sup>2</sup> all offering the exact same analytical performance.

Only premium specifications are available.

For the best nano-characterisation and light element detection:

- Resolution guaranteed at **CKα of 46 eV** or better at all count rates up to **50,000 cps**

For rapid micro-analysis:

- Resolution guaranteed at **MnKα of 127 eV** or better at all count rates up to **200,000 cps**.

For the most accurate qualitative and quantitative analysis:

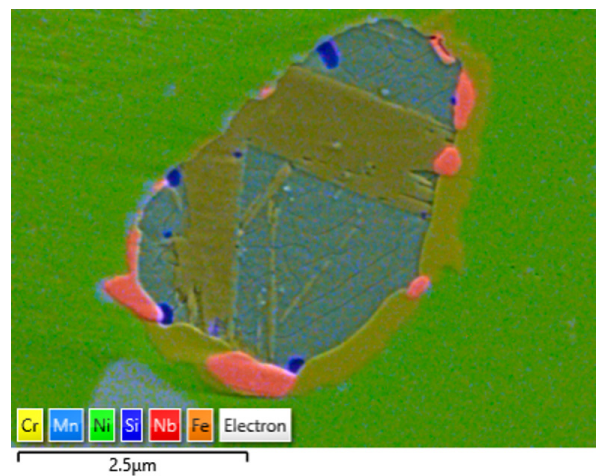
- Unique **new** Tru-Q IQ spectrum processing. Each detector is individually characterised on SEM during manufacturing and optimised for accurate data processing

For the highest count rate X-ray mapping revealing true element variations in seconds:

- **Infinity pulse processing and pile-up correction** combine to identify elements and display artefact-free element distribution

### The best nano-characterisation and light element detection

With all large area Ultim Max ∞ detectors, achieving 46 eV or better at CKα, low kV analysis of nano-structures and light elements becomes possible for smaller structures, lower concentrations and more complex element combinations.



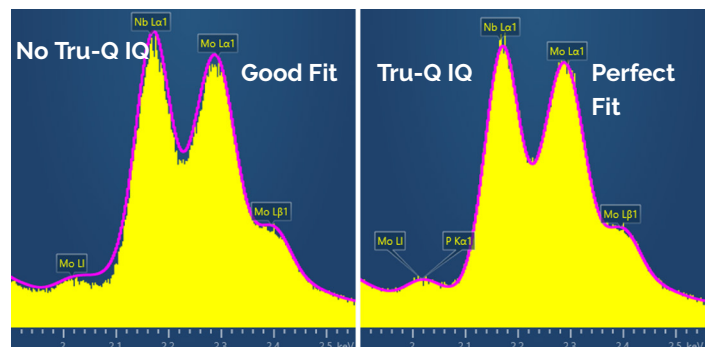
Mapping of 30-100 nm nano-structures at 3 kV using Ultim Max ∞170, separating overlapping CrL, MnL, NiL, SiL, NbM and FeL lines from CK, NK, OK, SL and MoM (not shown).

### For the most accurate qualitative and quantitative analysis

New Tru-Q IQ means every detector produces the same high quality, reliable results to solve the most difficult overlaps

and find the most hidden elements. The output from each detector is individually characterised to optimise the spectrum processing engine in AZtecLive. No matter how

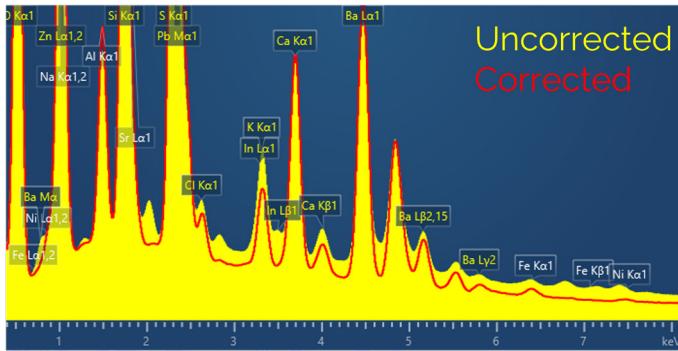
complex, peak shape and position at all energies fits the collected data, so the smallest signals are revealed.



With Tru-Q IQ, every Infinity detector will be able to detect a minor amount of phosphorus in a molybdenum/ niobium matrix.

## For the highest count rate X-ray mapping revealing true element variations in seconds

Infinity processing is unique in that it optimises maximum peak count rate, rather than maximum spectrum count rate. This means it is straightforward to optimise the signal for the elements of interest, but also has the benefit that pulse pile-up artefacts which otherwise dominate spectra around 1,000,000 cps are minimised. Pile-up correction software handles what's left, with Tru-Q IQ ensuring it is optimised for each Infinity detector. Correction in AZtecLive even works on Sum Spectra to ensure the correct element X-ray maps are automatically selected and displayed.



Unique pile-up correction algorithms even work accurately on sum spectra used to identify the elements in a map, revealing minor elements like Na, Sr and Fe, and removing artefact elements like In.

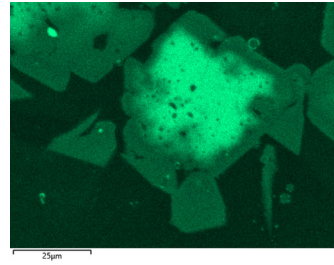
### Combining all these capabilities together:

- Best resolution at higher count rates using a large area sensor
- Tru-Q IQ optimised processing
- Pulse pile-up suppression
- Pulse pile-up correction

can produce some extraordinary results. Using QuantMap the raw signal is corrected for Peak Overlaps, X-ray background variation, Matrix absorption and fluorescence and even pulse pile-up to reveal complex minor element variations in the range of concentrations down to 0.1 wt%.

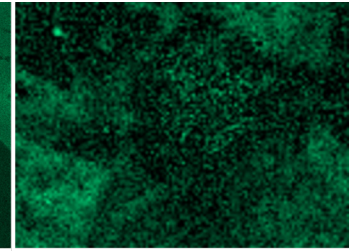
Mn Windows Integral

Mn Ka1



Mn QuantMap

Mn Wt%



QuantMap processing including removal of major element CrK overlap, variable X-ray background contribution and CrK+OK pile-up for the correction of Mn variation in a furnace slag. Complex minor element variation ranging from 0.1 to 0.6 wt% is invisible in the raw windows integral map.

### Ultim Max ∞ Detector Specification

EDS Hardware - Ultim Max ∞ with X4 electronics	
Sensor Sizes	40 mm <sup>2</sup> 65 mm <sup>2</sup> 100 mm <sup>2</sup> 170 mm <sup>2</sup>
Detection Range	Be (4) to Cf (98)
Resolution performance guaranteed as defined by ISO 15632:2021 (Section 4.2 - Energy Resolution)	C K < 46 eV @ 50,000 cps F K < 59eV @ 50,000 cps Mn K <127 eV @ 200,000 cps For all sensor sizes
Detector Optimisation with Tru-Q IQ	Detector performance characterised on SEM during manufacture and individually optimised for spectrum processing and pulse-pile up.
Detector Stability	Peak position and resolution guaranteed to change <1 eV between 5,000 cps and 100,000 cps
SATW Ultra Thin Polymer Window	For the best low energy performance Resistant to ballistic damage
Cooling	LN <sub>2</sub> - free, vibration free, Peltier Cooling
Motorised Slide	As standard
Multiple Detectors	Up to 4 detectors or up to 2 detectors + Unity use the same 4X electronics
In-situ Heating Compatibility	IR-filter option

Visit [nano.oxinst.com/NA-TKD](https://nano.oxinst.com/NA-TKD)

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