

# 5 Reasons to add a Wave Spectrometer and AZtecWave to your SEM

The Wave Spectrometer and the AZtecWave software brings Wavelength Dispersive Spectrometry (WDS/WDX) to the Scanning Electron Microscope (SEM) – delivering advanced analytical capability for quantitative elemental analysis in a software package that has been designed to be instructive for the novice and flexible for the expert. Here are five key reasons why you should add a Wave spectrometer and AZtecWave to your SEM:

## 1. High spectral resolution

- Achieve the highest spectral resolution available on the SEM (Si K $\alpha$  = <2 eV, Fe K $\alpha$  = <25 eV)
- Fully separate challenging peak overlaps (e.g. S K $\alpha$ /Mo L $\alpha$ , Ti K $\beta$ /V K $\alpha$ ) that cannot be achieved with other techniques (e.g. EDS, parallel beam WDS)
- Make more accurate quantitative measurements

## 2. Low detection limits

- Achieve detection limits of <100 ppm for many elements (Si K $\alpha$  = 9 ppm, Fe K $\alpha$  = 15 ppm)
- Positively identify and accurately quantify trace elements
- Analyse a wide range of X-ray energies (max of 0.07 – 15.33 keV) - essential for many applications

## 3. Relative insensitivity to sample positioning

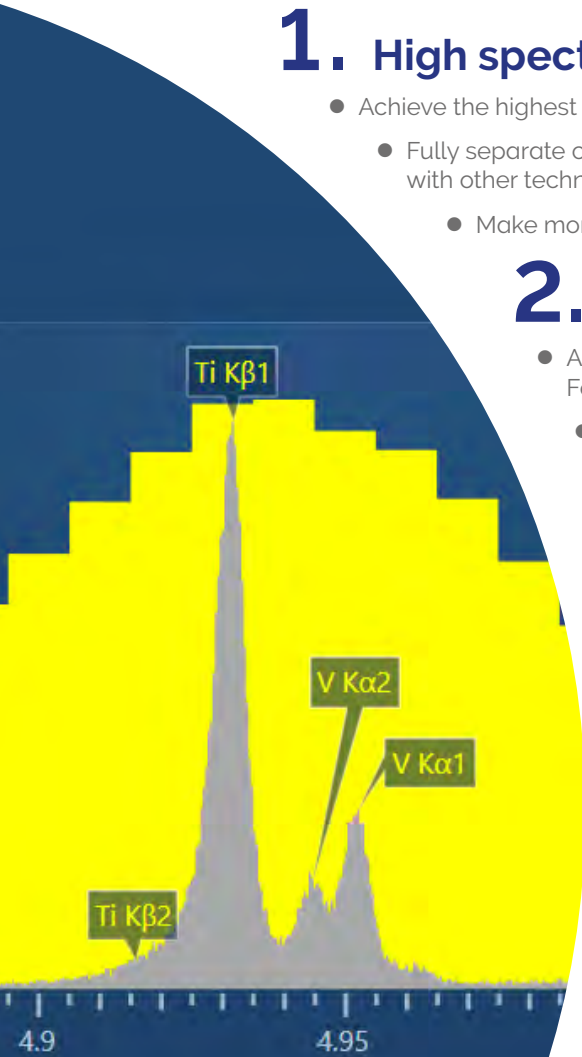
- Achieved by positioning the Rowland circle Wave spectrometer at an inclined angle
- Analytical focus can simply be achieved with SEM secondary electron imaging
- No need for time-consuming focussing routines

## 4. Full integration of WDS and EDS

- Simultaneously acquire and automatically combine Energy Dispersive Spectrometry (EDS/EDX) and WDS data
- Make the most of your time - obtain fast and accurate quantitative data for major elements with EDS, powered by Ultim Max EDS detectors and Tru-Q™ data processing
- Utilise WDS where it is really needed - for trace element quantification and separation of challenging peak overlaps

## 5. Ease of use of the AZtecWave software

- Guided, step-by-step workflows specifically designed for WDS (+/-EDS) acquisition
- Unique technology automatically sets up the optimal WDS (+/-EDS) collection settings and shows the expected WDS data quality prior to acquisition – saving you time
- Inbuilt spectrometer performance checks to ensure that the Wave spectrometer is set up and working correctly – giving you piece of mind

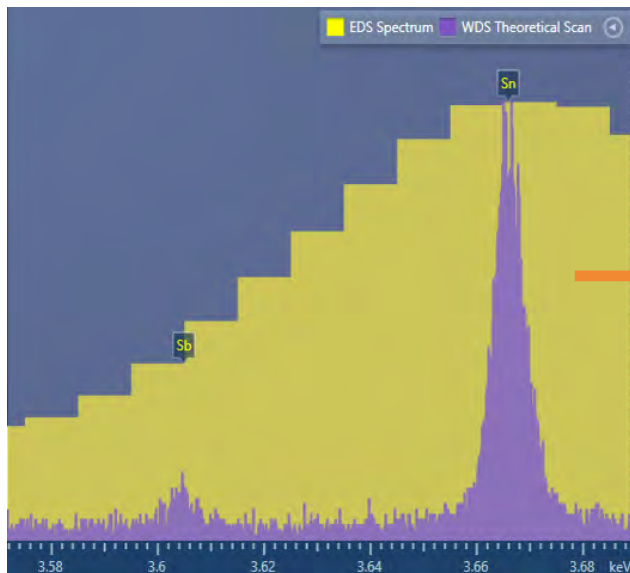


For more information please go to [nano.oxinst.com/products/wds/](http://nano.oxinst.com/products/wds/)  
or email [nano@oxinst.com](mailto:nano@oxinst.com)

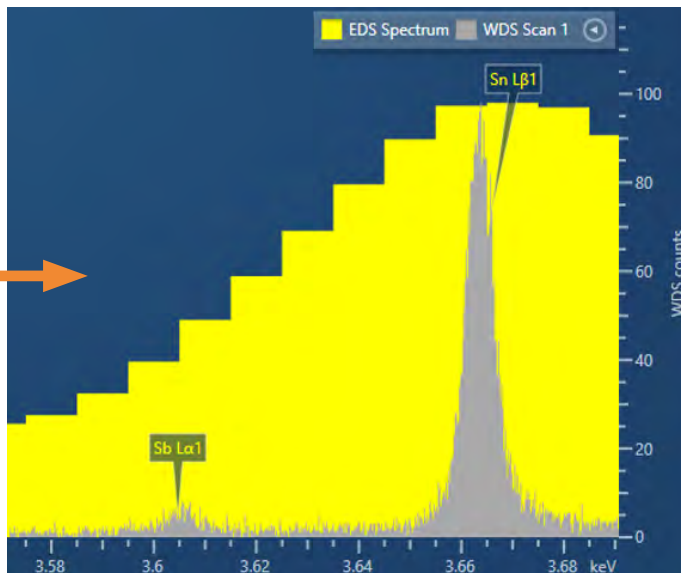
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Here is an example of how the unique software technology in AZtecWave makes collecting WDS data easy and efficient:

**Predicted** WDS scan with chosen acquisition settings



**Actual** WDS scan result



AZtecWave predicts the quality of a WDS scan prior to acquisition - ensuring the chosen collection settings will give the data quality required.

## Specifications

Wave Spectrometer with W1 electronics	
Design/geometry	Fully focussing 210 mm Rowland circle with a $2\theta$ range of $33^\circ$ to $135^\circ$ (i.e. electron microprobe style)
Orientation on SEM column	Inclined
Attachment to SEM	Interface with motorised gate valve as standard
Diffracting crystals	Maximum of 6 on rotating crystal turret Standard: TAP, PET, LiF (200), plus LSM80N or LSM60 and LSM200 Additional options: LSM200, LSM80N, LSM80E, LSM60, LiF (220)
Quantification range	Wave 500 spectrometer = 0.17 – 10.84 keV (B to Pu) Wave 700 spectrometer = 0.07 – 10.84 keV (Be to Pu) Maximum achievable = 0.07 – 15.33 keV
Spectral resolution	Si K $\alpha$ = <2 eV Fe K $\alpha$ = <25 eV
Detection limit	Si K $\alpha$ = 9 ppm Fe K $\alpha$ = 15 ppm
X-ray counters	P10 (Ar-CH <sub>4</sub> ) flow proportional counter and Xe sealed proportional counter mounted in tandem

LITR511964-1

For more information please go to  
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