



**Malvern  
Panalytical**  
a spectris company

# Zetium

Minerals edition





For recovery and processing, you need detailed knowledge throughout. This requires frequent analysis, often in highly demanding environments. The Minerals edition of the Zetium spectrometer is the solution. Delivering superior sensitivity, flexibility, analytical performance, stability, and speed, it's ideal for mineral exploration, mine management, and quality control in applications from antimony to zinc.

## Elemental innovation

### Continuous development, improved customer experience

Benefit-driven innovation on the Zetium Minerals edition has made it the most powerful multipurpose tool for the analysis of a wide range of minerals and concentrates.

## Elemental intelligence

### Advanced analytical software for advanced analytical hardware

Now, our SuperQ software is enabling even more technology combinations and analytical possibilities for the Zetium. Its Virtual Analyst also makes setting up and operating the system simpler.

## Elemental technology

### 60 years of experience: The ideal starting point

The Zetium Minerals edition is the next generation in a long line of wavelength-dispersive XRF platforms, including Axios, MagiX, and PW2400. Over the years, we've fine-tuned this proven technology – providing a strong foundation for the Zetium platform.

## Elemental support

### Reliable support – whatever the location

From service and training to laboratory analysis, we support you all the way. With a worldwide network of experienced engineers and application specialists, and full remote support, we'll make sure your spectrometer works at its best – wherever you are in the world.

# Superior performance, speed, and robustness

By seamlessly combining our core and innovative technologies, the Zetium Minerals edition delivers unrivaled analytical performance, speed, and robustness.

## Measure the element that makes your profit

The HiPer scint detector delivers unrivalled linearity at count rates of up to 3.5 Mcps, enabling the measurement of high concentrations of elements, that would usually be treated as part of the balance, making it ideal for the analysis of major mineral concentrates in production and quality control.

## In-house expertise with Virtual Analyst

The Virtual Analyst, delivered with our latest version of SuperQ analytical software, ensures that specialist-level expertise is available to you 24/7, for the development of new applications. The Virtual Analyst actively

calculates the ideal measurement conditions, taking into account the configuration of the spectrometer, sample preparation information, the required analytical range, detection limits and required precision.

## Struggling to find standards? Use WROXI - CRM!

Finding enough standards to set up reliable calibrations can be difficult and costly, that is why we have developed WROXI. The WROXI package consists of 20 synthetic Certified Reference Materials, reliable fusion recipes, application templates and monitor samples, making it an out-of-the-box solution for the analysis of major and minor elements in geological materials and mineral concentrates.

## Analyze more samples per shift

The Zetium platform features a new high-speed sample changer, which reduces overhead time by up to 30%, maximizing sample throughput in standard laboratory environments. The Zetium platform can also be fully integrated into automation environments, from container laboratories, that you can deploy anywhere in the world, to sophisticated central laboratories, that set the benchmarks for process and quality control.

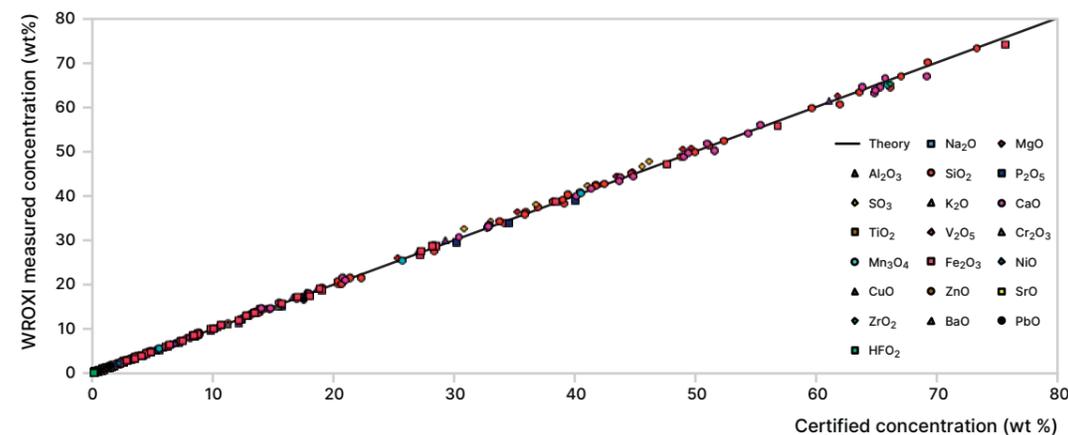
## Maximize instrument uptime, stability and precision

Unique drift-free SST R-MAX X-ray tubes eliminate the largest source of drift. Direct optical position sensing

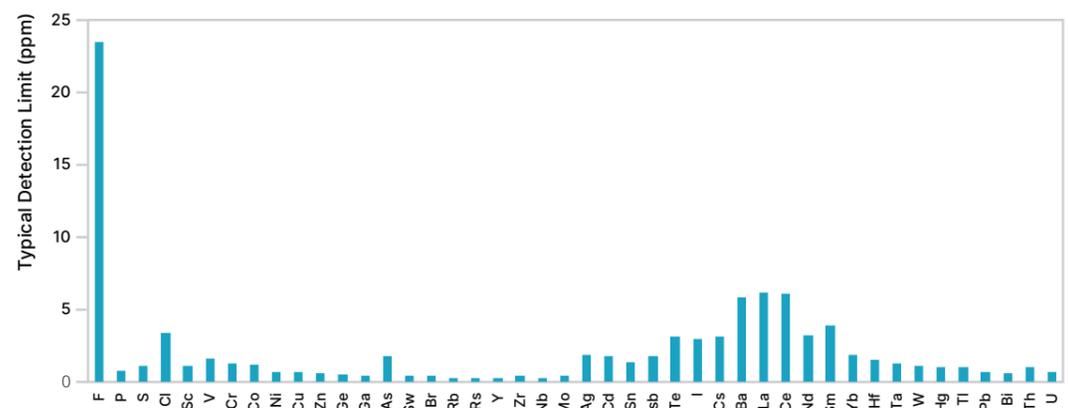
(DOPS) technology maximizes precision. Advanced technologies minimize sample contamination including automatic sample-type recognition, turret-style sample loading, preloading dust removal, and CHI-BLUE tube window protection.

## Interested in trace elements? Use Pro-Trace!

The analysis of trace elements is becoming increasingly important in geological applications from exploration to tails evaluation. Pro-Trace delivers unrivalled trace analysis of up to 44 elements in geological materials, without the need to determine major elements first.



WROXI measured vs. certified concentrations in a wide range of geological CRMS



Typical detection limits for trace elements in Pro-Trace using the Zetium spectrometer

# Revolutionary results with SumXcore

In the mining industry's large-volume, fast-moving environments, any time savings you can make without compromising accuracy and precision will give you a valuable increase in sample throughput and turnaround speed.

That's why, in the Zetium, we integrated the revolutionary energy-dispersive (ED) core with wavelength-dispersive (WD) XRF. The result is SumXcore: the powerful analytical heart of the Zetium, which delivers unique benefits for mining applications.

## Analyzing iron ores using SumXcore

In this example, we used 19 iron ore certified reference materials (CRMs) to set up applications using the WD core (conventional sequential WDXRF) and the SumXcore, and compared the time taken.

The applications contained calibration lines for 18 oxides. We measured all 18 oxides sequentially, using optimal settings, on the WD core.

In the SumXcore application, we measured 11 of the 18 oxides sequentially using the WD core and the remaining seven oxides simultaneously using the ED core.

Table 1 summarizes the measurement times. The combination of WD and ED cores in the SumXcore shortened the total analysis time by 36%, due to savings in both measurement time and overhead time (the time required to change crystals, collimators, filters, etc).

Table 2 demonstrates the accuracy of the SumXcore application when measuring Japanese Standard Sample JSS 830-3.

Table 1. Accuracy of the SumXcore application

Iron ores as fused beads	WD core	SumXcore
Oxides measured with WD core	18	11
Oxides measured with ED core	0	7
Measurement time (s)	216	136
Overhead time (s)	112.5	80
Total analysis time (s)	338.5	216
<b>Time saving with SumXcore</b>	<b>36%</b>	

## WD CORE + ED CORE = SUMXCORE

- -Analysis times up to 50% shorter
- -Unexpected elements identified and flagged
- -Fast sample screening
- -Spectrum archiving

Table 2. Achievable time savings with SumXcore technology

WD/ED	Element/compound (as per certificate)	Certified concentration (wt %)	SumXcore measured (wt %)
ED	Total Fe	60.57	60.52
	Mn	0.61	0.62
	SiO <sub>2</sub>	2.26	2.19
	TiO <sub>2</sub>	6.33	6.34
	V	0.30	0.30
	Zn	0.075	0.075
	WD	MgO	2.15
Al <sub>2</sub> O <sub>3</sub>		2.75	2.75
P		0.124	0.124
S		0.005	0.006
CaO		0.68	0.71
Cr		0.018	0.016
Cu		0.011	0.009
Ni		0.006	0.006



# SMART MANAGER, SMART ZETIUM

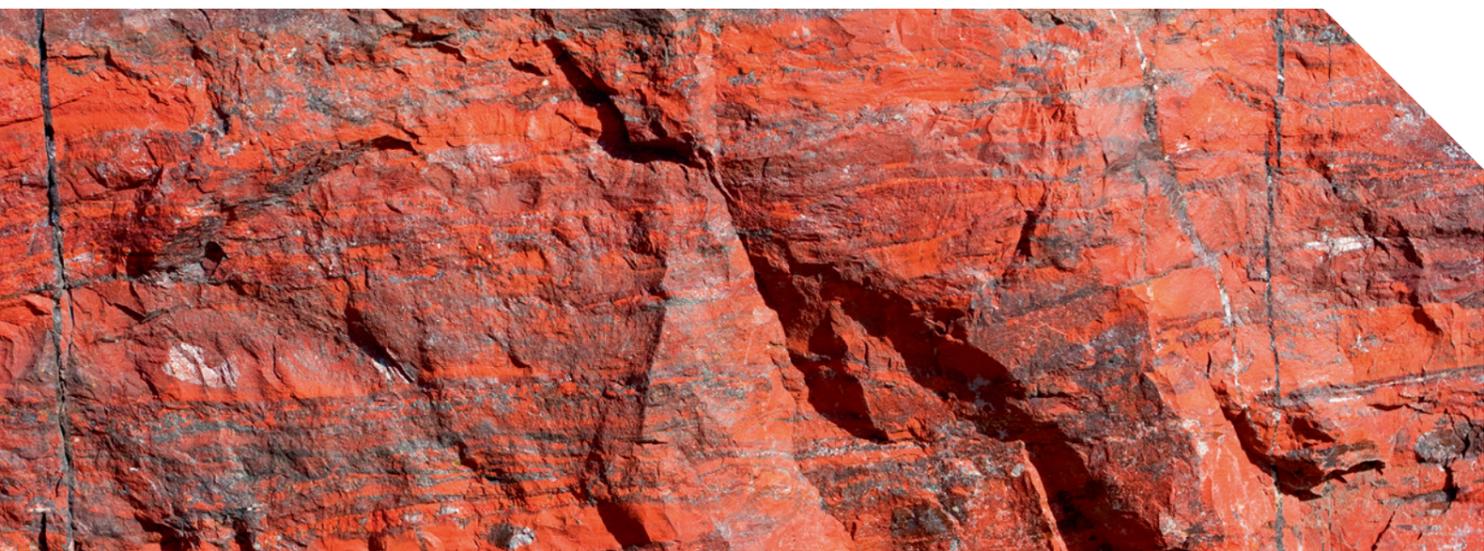
The distractions and demands of quality control management can make it difficult to get the most out of your instruments. To make it easier, we've connected the Zetium to our Smart Manager platform – making it a Smart Zetium.

## Meet your new trusted team member

This cloud-based 'control room' connects all your Zetium instruments, giving you a clear picture of their performance – wherever they are in the world. So you can keep on top of performance, optimize usage, reduce downtime, and unleash the potential of your data. Just like having a new, trusted member of your team!

## Maximum data security

And rest assured: all your data remains yours, and is only visible to Malvern Panalytical. Smart Manager uses the latest Microsoft Azure cloud technology, ensuring that your data is safe and secure at all times. We don't collect data from your own samples unless you explicitly request it.



## Why choose us?

**When you make the invisible visible,  
the impossible is possible.**

Our analytical systems and services help our customers to create a better world. Through chemical, physical and structural analysis of materials, they improve everything from the energies that power us and the materials we build with, to the medicines that cure us and the foods we enjoy.

We partner with many of the world's biggest companies, universities and research organizations. They value us not only for the power of our solutions, but also for the depth of our expertise, collaboration and integrity.

With over 2200 employees, we serve the world, and we are part of Spectris plc, the world-leading precision measurements group.

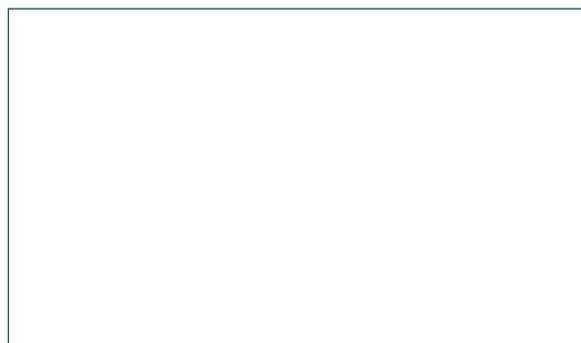
**Malvern Panalytical. We're BIG on small™**

## Service & Support

Malvern Panalytical provides the global training, service and support you need to continuously drive your analytical processes at the highest level. We help you increase the return on your investment with us, and ensure that as your laboratory and analytical needs grow, we are there to support you.

Our worldwide team of specialists adds value to your business processes by ensuring applications expertise, rapid response and maximum instrument uptime.

- Local and remote support
- Full and flexible range of support agreements
- Compliance and validation support
- Onsite or classroom-based training courses
- e-Learning training courses and web seminars
- Sample and application consultancy



## Malvern Panalytical

Groveswood Road, Malvern,  
Worcestershire, WR14 1XZ,  
United Kingdom

Tel. +44 1684 892456  
Fax. +44 1684 892789

Lelyweg 1,  
7602 EA Almelo,  
The Netherlands

Tel. +31 546 534 444  
Fax. +31 546 534 598