ZETIUM
Metals edition
ELEMENTAL INNOVATION

Continuous development, improved customer experience
Scientifically sound, benefits-driven innovations implemented in the Metals edition of the Zetium spectrometer make it the most powerful multipurpose tool for the analysis of a wide range of raw materials, production samples and final metal products.

ELEMENTAL TECHNOLOGY

60 years of experience and heritage - the ideal starting point
The Metals edition of the Zetium spectrometer represents the next generation of a remarkably successful series of WDXRF platforms, including the Axios, MagiX and PW2400. Proven technology has been refined and brought forward onto the Zetium platform, infusing a level of heritage and prestige.

ELEMENTAL INTELLIGENCE

Advanced analytical software for advanced analytical hardware
A quantum step for our renowned SuperQ software gives access to new technology combinations and analytical possibilities. Starring the Virtual Analyst, it enhances the user experience in setting up and operating the system.

ELEMENTAL SUPPORT

Transparent and reliable support in your neighborhood
From service to expertise, training to laboratory analysis the Metals edition of the Zetium spectrometer is supported from every angle. With a worldwide network of experienced engineers coupled with the industry’s largest pool of application scientists, Malvern Panalytical is always on hand to help you meet your analytical requirements.

The Metals edition of the Zetium spectrometer provides a complete dedicated tool for the analysis of the raw materials needed in the manufacturing of metal as well as specific metals solutions to meet the demanding analytical requirements of process control. This is made possible by delivering dedicated solutions, a fusion of optimized hardware and built-in expertise templates. To meet customer’s expectations, spectrometers can be optimised to your budget and performance requirements.
ONE SOLUTION FOR THE ENTIRE SUPPLY CHAIN

The Metals edition of the Zetium XRF spectrometer delivers unrivalled analytical performance, speed and robustness through the seamless amalgamation of Malvern Panalytical’s core and innovative technologies.

Superior uptime and long-term stability
Uptime and stability are key parameters in metals production. The unique drift-free SST R-mX X-ray tubes eliminate the largest source of drift and result in stable calibrations that can be used for many months.

Outstanding accuracy across the entire periodic table
Light-element performance results from the combination of a thin X-ray tube window, dedicated multilayer and curved crystals and high-yield collimators. Transition row and heavy elements are rapidly analysed using the combination of Hi-Per scint and duplex detectors. The Metals edition of the Zetium spectrometer is also capable of performing simultaneous analysis for up to two elements using HiPer channels, optimizing analysis time.

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 is not just another wizard, it 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.

Save time and money
Advanced sample handling and completely integrated solutions maximize return on investment by minimizing time spent on manual operations. For optimized process control, fully automated systems can be configured, including complementary technologies such as optical emission (OES) and X-ray diffraction (XRD).

Combined technologies, unlimited benefits
One single platform combines sequential and simultaneous analysis. SumXcore, the innovative combination of WD- and EDXRF technologies, offers a fast and powerful screening tool for XRF analysis. The entire spectrum can also be quickly collected during routine analysis facilitating fast detection of contaminants during process control. The ED core features a small spot mapping SD2 detector, adding a compositional mapping functionality for fast and accurate determination of compositional trends and heterogeneities.

Ready to analyse a wide variety of materials
Designed for extreme flexibility, the Zetium spectrometer is capable of analyzing a wide range of materials, from incoming raw materials to process control samples and finished products. Using WROXI (our package for the analysis of major and minor oxides) or application modules for the analysis of metals samples, like NiFeCo, LAS and Cu-base. Specific software applications such as Type Standardization are available for grade composition monitoring and melt correction to optimize production control and maximize throughput.

Ensuring the quality of your multilayered materials
The Virtual Analyst expert software will guide you to the best choice of measurement and analysis settings using the Stratos software package for your multilayer measurements. By automating the complexity of the analysis steps, you are enabled to meet your specifications for single and multilayer coatings on metallic substrates.
Metal coatings are widely applied on sheet steel to increase its corrosion resistance, an important property for automotive applications. To achieve the best performance for these materials, it is crucial to accurately monitor the coating process by analyzing thickness and composition of the layers across the sheet. This type of analysis is easily performed by the Metals edition of the Zetium spectrometer in combination with Stratos. 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 and the Virtual Analyst provides the expert assistance for advanced method development.

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

The tabulated data illustrate the capabilities of Zetium and Stratos at analyzing single and/or multiple layers on different types of coated steel. Repeated measurements of each individual sample also demonstrate stability of the instrument and the excellent analytical precision achievable. This shows that the Metals edition of the Zetium XRF spectrometer with Stratos is an excellent solution for production control of coatings in the steel industry.

### Ni on steel

<table>
<thead>
<tr>
<th></th>
<th>NBS 1331</th>
<th>NBS 1334</th>
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<tbody>
<tr>
<td>Nominal</td>
<td>3.81</td>
<td>18.3</td>
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<tr>
<td>Stratos</td>
<td>3.71</td>
<td>18.3</td>
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<tr>
<td>RMS Rel %</td>
<td>0.05</td>
<td>0.14</td>
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</table>

### Cr on steel

<table>
<thead>
<tr>
<th></th>
<th>Sample 304</th>
<th>Sample 305</th>
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<tbody>
<tr>
<td>Nominal</td>
<td>570</td>
<td>250</td>
</tr>
<tr>
<td>Stratos</td>
<td>570</td>
<td>253</td>
</tr>
<tr>
<td>RMS Rel %</td>
<td>0.1</td>
<td>0.2</td>
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</table>

### Ti/Sn on steel

<table>
<thead>
<tr>
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<th>Sample 20100062 B3</th>
<th>Sample 20100059 B3</th>
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</thead>
<tbody>
<tr>
<td>Nominal</td>
<td>3.1</td>
<td>1.6</td>
</tr>
<tr>
<td>Stratos</td>
<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>RMS Rel %</td>
<td>0.7</td>
<td>0.2</td>
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</table>

### Cr/Zn on steel

<table>
<thead>
<tr>
<th></th>
<th>Sample 17</th>
<th>Sample 14</th>
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<tbody>
<tr>
<td>Nominal</td>
<td>31</td>
<td>15</td>
</tr>
<tr>
<td>Stratos</td>
<td>32</td>
<td>15</td>
</tr>
<tr>
<td>RMS Rel %</td>
<td>0.2</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Comparison of the thicknesses measured by Zetium with the nominal thickness provided for four different coated steel samples. Repeatability data (RMS Rel%) are based on ten consecutive measurements for type of sample.
WHY CHOOSE MALVERN PANALYTICAL?

We are global leaders in materials characterization, creating superior, customer-focused solutions and services which supply tangible economic impact through chemical, physical and structural analysis.

Our aim is to help you develop better quality products and get them to market faster. Our solutions support excellence in research, and help maximize productivity and process efficiency.

Malvern Panalytical is part of Spectris, the productivity-enhancing instrumentation and controls company.

www.spectris.com

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

www.malvernpanalytical.com/zetium

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