SPECTRO

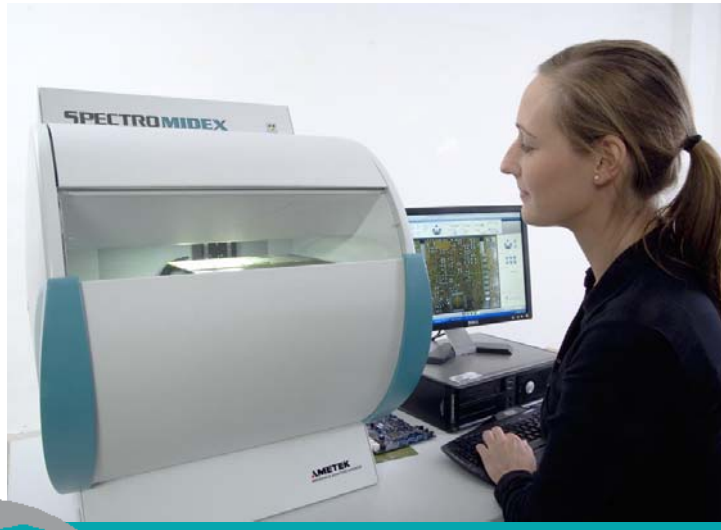
SPECTRO MIDEX

Micro X-ray Fluorescence Spectrometer

for Elemental Analysis:

Small Spot, Line Scan

and Mapping



AMETEK®
MATERIALS ANALYSIS DIVISION

SPECTRO MIDEX

Now in its third generation, the SPECTRO MIDEX X-ray fluorescence spectrometer has developed into an all-round talent for the fast, non-destructive analysis of small spots and the rapid mapping of large surfaces (up to double EC format, 233x160 mm, 9.2x6.3").

Many elemental analysis tasks in industry, research and the sciences require a non-destructive measuring system that is extremely sensitive and offers a small measuring spot.

The SPECTRO MIDEX X-ray fluorescence spectrometer was developed for these requirements down to the finest details. With input from our customers, it has been extended and optimized. The result is a SPECTRO MIDEX, that sets new standards for analytical performance and ease of use.

Application

- **RoHS compliance screening of parts and assemblies in the electronics industry**
- **The analysis of small components and detection of inclusions in the metal, automotive and aerospace industries**
- **The analysis of jewelry and precious metal alloys**
- **Forensics science applications**
- **Many other tasks where a small measuring spot is required or when the elemental distribution of a larger surface area must be determined.**

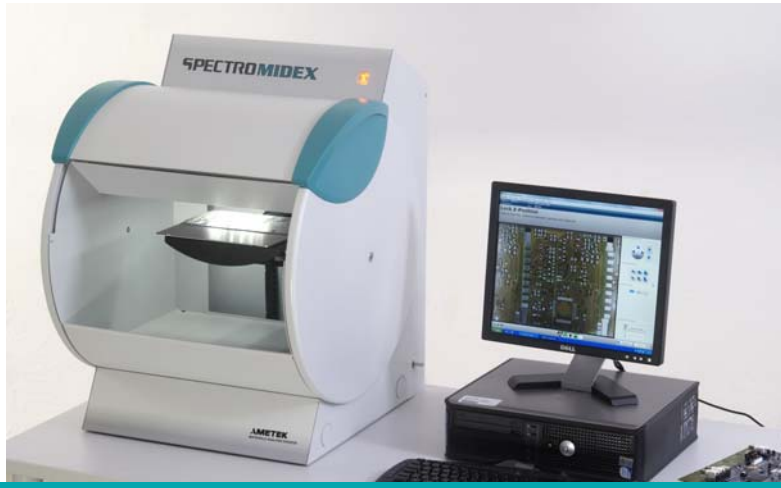
Excitation and Detector

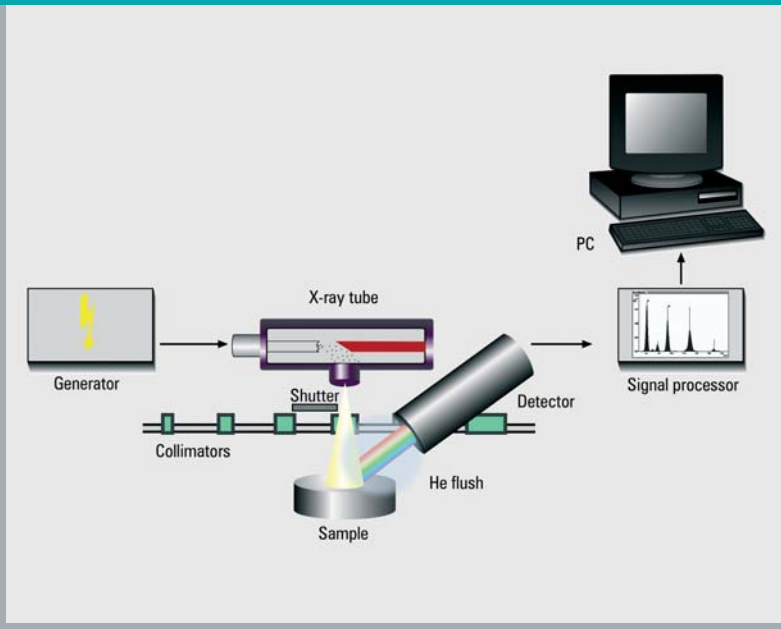
Excitation

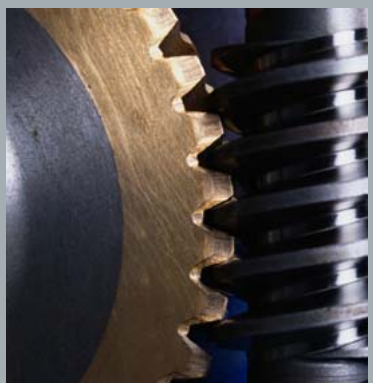
SPECTRO MIDEX utilizes an air-cooled low power X-ray tube with micro focus for collimated point sample excitation. With the incorporation of software controlled collimators, the size of the measuring spot can be selected in several fixed steps between 200 μm and 4 mm; enabling it to be optimized for a whole range of applications.

Detector

The high resolution detection system consists of a Si drift detector (SDD) with electrical Peltier-cooling. The system processes up to 250,000 pulses per second; making it more than twice as fast as instruments with conventional technology. For a fast point analysis of an unknown sample, it is possible to determine elements from magnesium to uranium in less than 180 seconds.







Sample Presentation

Sample Presentation

The SPECTRO MIDEX is equipped with a spaciously dimensioned sample chamber. Even when closed, it is possible to look into the chamber through the viewing window that can also be shuttered. The sample chamber has a large opening, making it very accessible so that samples can be easily placed into and removed from the chamber. An integrated video system permits exact measurment positioning.
The long travel path of the motor driven XYZ table enables line scans and mappings of large sample surfaces.
With the optional large working distance of 20 mm from the sample in SPECTRO MIDEX LD (long distance) it is possible to conduct analyses of the "valleys" between components. This is also true for irregularly formed jewelry or, for example, examination of the inside of rings.

The SPECTRO MIDEX is one of the fastest XRF mapping systems commercially available. The entire surface is first measured in a high-speed process; a mapping of a double EC board (233x160 mm, 9.2x6.3'') can be completed in less than 30 minutes. In a second step relevant areas can be re-scanned with higher sensitivity.

The XYZ table can also be used as a sample changer: After the software supported setting of positions, it is possible to automatically measure a large number of samples. Helium flushing is available for the analysis of light elements. This has no undesired influences on the sample, as can be the case when a vacuum system is used. Because it is only flushed in the immediate area of the measuring spot, the maximum helium consumption is less than 100 liters per hour.

Software

Software

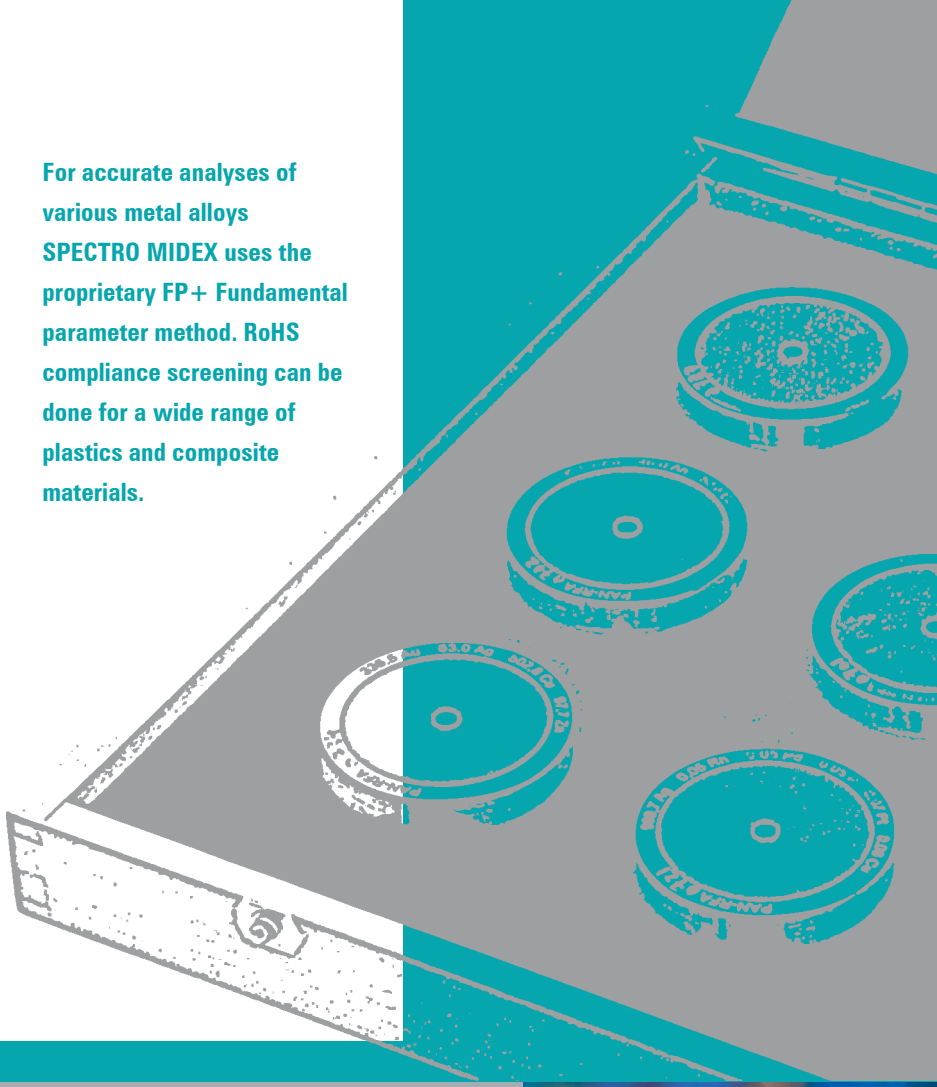
The new user interface allows quick and easy point measurements. Position the sample in focus, enter the sample name and start the analysis.

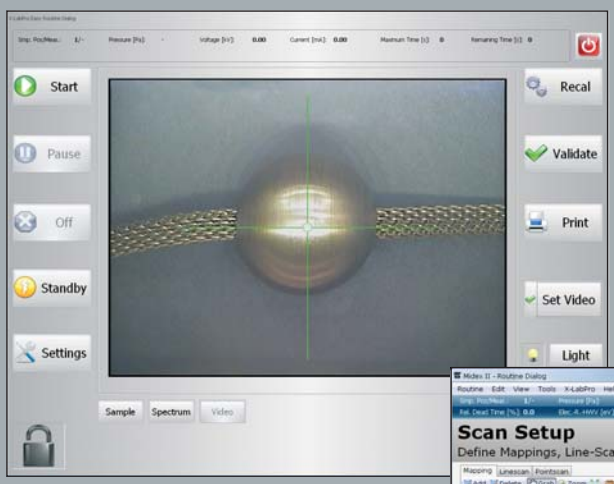
Setting up a measuring cycle with the optional xyz-stage is easier than ever. Just place the sample on the tray; a quick step-by-step procedure guides through defining point scans, line scans and mappings.

A world of flexibility:

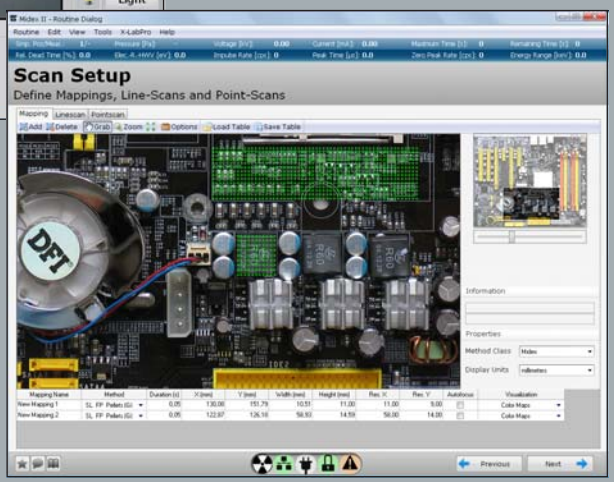
- Match analysis method and collimator size to spot selection
- Sample spot dependent excitation focussing for uneven surfaces
- Customize mappings - pick as many zoom areas on the sample as desired, and save them in any format.
- Picture in picture: See the spectrum and where it is coming from

For accurate analyses of various metal alloys SPECTRO MIDEX uses the proprietary FP+ Fundamental parameter method. RoHS compliance screening can be done for a wide range of plastics and composite materials.





With the simple user interface, point measurements are conducted quickly.



When defining line scans or mappings, the software guides you through the procedure step-by-step.

SPECTRO MIDEX: Technical Specifications

SPECTRO MIDEX SD
(2 mm working distance from sample)
SPECTRO MIDEX LD
(20 mm working distance from sample)

Excitation

- X-ray tube with Mo anode, max. power 30 W, max. voltage 48 kV
- Measurement spot size Midex SD: 1 mm, Midex LD: 1.2 mm

Sample Chamber

- Video system with sample display at various zoom levels
- Manually adjustable sample table
- Motor driven XYZ precision table with a maximum travel path of 235x178x160 mm/ 9.3x7.0x5.3“ (WxDxH) maximum sample weight of 3 kg/6.6 lbs

Evaluation System

- External computer system; Windows operating system
- Keyboard, mouse, monitor, printer
- Menu-based software for control of spectrometer functions and evaluation of data

Detection System

- Si-drift detector with Peltier cooling: Midex SD: 10 mm², Midex LD: 30 mm²
- Energy resolution: FWHM <160 eV, measured at the Mn Kα line with an input count rate of 10,000 cps
- Microprocessor control for detector and read-out electronics
- Pulse rate up to 250,000 cps

Spectrometer Data

- Nominal input voltage: 95-120V/200-240V, 50/60 Hz
- Power consumption spectrometer: 200 W
- Dimensions WxDxH: 580x670x740 mm/22.8x26.4x29.1“
- Footprint WxD: 500x550 mm/19.7x21.6“
- Weight 55-70 kg/121.3-154.3 lbs depending on configuration

Analyses

- Fundamental Parameters program FP+ for element analysis of alloys
- Calibration for RoHS compliance screening of plastics and composite material*

Environment

- Ambient temperature: 5-30°C (41-85°F), specified instrument performance at: 20-25°C (68-77°F)
- Rel. humidity at 25°C (77°F): 10-80 % non-condensing, free of corrosive vapor and high dust pollution

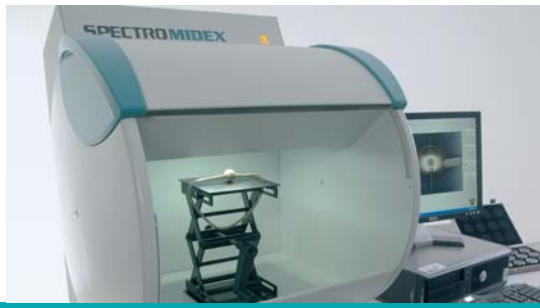
*Options

SPECTRO MIDEX SD only

- He flush for the improvement in detection sensitivity for the elements Mg-Cl
- Software-controlled collimators for measuring spots (in mm): 0.2/0.5/1/2.5/3.3

SPECTRO MIDEX LD only

- Software-controlled collimators for measuring spots (in mm): 0.25/0.7/1.2/3.5/4.4



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