

Welcome to the newest issue of the SPECTRO Live!

You may have heard that it's official, SPECTRO now offers a handheld XRF spectrometer! Our product for this growing market is the new SPECTRO xSORT – more about it in the title story.

Another interesting tip for the XRF specialists among you: Take a deeper look into the SPECTRO XEPOS – and we'll let you in on how the special TurboQuant software can help you analyze unknown samples. For those of you interested in metals, we report on the “more than just a face lifting” that has rejuvenated our mobile top seller, the SPECTROTEST! And, in this Live, we present new applications for our PHOENIX II benchtop instrument as well as for our flagship SPECTROLAB.

Our film tip: The first SPECTRO production has been on Youtube for a couple of weeks now! In the three minute film, our ICP-OES expert, Dr. Dirk Ardeit, demonstrates, with a pretty drastic experiment, just how robust the SPECTRO ARCOS generator is. [This way](#) to the showing, please.

And now, enjoy the SPECTRO Live!

### What's in, What's new?

**Hands on XRF:  
The mobile XRF  
SPECTRO xSORT**



**Exactng Look at the  
Sulfur Content:  
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**New Materials: New  
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**Top Brand – Brand New:  
Mobile OES  
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**Who's Who:  
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Analysis Division**



## SPECTRO xSORT: Hands on XRF

### New handheld XRF measures 41 elements in two seconds

At this year's [Stainless Steel Expo](#) (September 9/10, 2008, Houston), a murmur went through the analytical industry: SPECTRO announced the introduction of its long awaited first handheld XRF instrument: The [xSORT](#).

First impression from visitors: A compact instrument. Weighing in at just 1.7 kilos (3.7 lbs), it's easy to hold. Measurements with the arm stretched out or above the head? Both are possible – without aching muscles. And, something else was evident: The xSORT is also suited to harsh environments. The rechargeable battery and PDA are completely integrated into the robust housing, a cover protects them from wind and weather. Practically speaking: You won't have to stop testing because of a dead battery. Two rechargeable batteries, each capable of 3.5 hours of continuous operation, are included in the xSORT scope of supply.

Visitors were impressed with the first results demonstrated in the booth: The xSORT was held to the sample, the start button pushed and presto! Seconds later, the analytical results including Al, Mg, Si, P and S were displayed on the PDA! How can this be? [A deeper look into the xSORT shows it all!](#)



## Finished Ten Times Faster

### SPECTRO xSORT: Technical Highlights

“The heart of the [SPECTRO xSORT](#) is its redeveloped silicon drift detector,” reports Marcus Freit, Product Manager for mobile metal analyzers at SPECTRO. “It processes signals ten times faster than the silicon pin detector more commonly used in handheld XRF instruments. With the excellent readout rate, we achieve more accurate results more quickly.”

The [xSORT](#) records 41 elements between magnesium and thorium in two seconds. The SDD detector even identifies the light elements, Al, Mg, Si, P and

S – without helium, a vacuum pump or other additional equipment. And, it does it fast: Differentiating between Al and Mg grades requires only 10 seconds.

The xSORT has been equipped with many safety features: This includes the analytical shutter that automatically closes the aperture when this is not covered by a sample and the collar that protects against stray radiation as well as two additional safety modes that prevent unintentional measurements. Continue here with [applications for the xSORT!](#)



The non-destructive mobile XRF is even used for airplane maintenance.

## Analyzes Artwork and Other Stuff

Whether jewelry or junk,  
the xSORT does it all!



“The metal industry is our most important target market,” explains Marcus Freit. The [xSORT](#) is fast, inexpensive, robust and simple to operate, Freit continues: “Scrap dealers can use it to analyze expensive nickel alloys just as well as precious metals – without having to clean or alter the analytical instrument between different types of samples.” Precious metal dealers have also expressed interest in the xSORT, in order to determine the gold content in old gold.

SPECTRO sees potential with plant infrastructure control for the chemical and petrochemical industries: Because there are no sparks when using [XRF](#),

the new instrument can be optimally used for installation maintenance in explosion protected areas. It even convinces during the analysis of hot pipelines or infrastructure during operation: Samples with temperatures up to 500° C can be tested.

A third application for the xSORT is quality control in automotive, aviation and medical technology. Freit: “Because the xSORT is non-destructive, it is well suited to final QC of finished components; an area in which we were hardly present in the past.”

Want to know more about the xSORT? Send us an [e-mail!](#)



## Top Brand – Brand New



*More than 1,000 current generation SPECTROTESTs have been sold since appearing on the market in 2005. SPECTRO proudly presents the improved model with a new sample probe and better analytical capabilities; the determination of carbon in steel in air with arc discharge, for example, and the identification of high alloy steel using the nitrogen content – onsite, of course.*

The [SPECTROTEST](#) has been SPECTRO's top selling brand for almost 30 years. How could the classic mobile OES manage to remain at the head of its class for three decades? Quite simple actually: By continuously perfecting the instrument and constantly

adapting it to the latest technology. Again in 2008: SPECTRO presented its improved SPECTROTEST at the [Stainless Steel Expo](#) in Houston. It's more flexible and dominates in many new application areas. At first glance, one thing is obvious: The smaller sample probe. Not a cosmetic correction, emphasizes Product Manager Marcus Freit, but a big enhancement in ease-of-use: "The lighter weight plays a big role in reducing fatigue. The smaller size makes it more flexible; users can now readily access hard to reach spots."

The insides of the SPECTROTEST have also been remodeled. More about it [here!](#)





**Testing the weldability of steels? No problem with the SPECTROTEST!**

“The SPECTROTEST has been the industry leader for nearly 30 years. It perfectly demonstrates our philosophy of continuously improving our instruments.”

*Tom Milner, Marketing Director at SPECTRO*

## Keep it Clean!

*With a new scrubbing system, the SPECTROTEST convincingly determines carbon in low alloy steel with arc excitation (in air)!*

In the course of the current facelift, SPECTRO has equipped the [SPECTROTEST](#) with a patented scrubbing system (US-Patent-Nr. US7,227,636). The filters clean the air between the electrode and the sample; making it possible to determine carbon in steel down to 500 ppm using arc excitation. The rapid grade identification of low alloy steel using the carbon content is now possible. We'll send you the respective application report [on request!](#)

The identification of micro-alloys in arc has also been improved using the optimized selection of line pairs.

The metal industry will definitely appreciate the new SPECTROTEST, especially with the new ability to identify steel onsite based on the nitrogen content.

More about this important application [here!](#)

## Focus on an Application – Mobile Nitrogen Determination

*Interested in Metals? The SPECTROTEST OES spark spectrometer is now able to differentiate between duplex steels!*

The nitrogen content is the only difference between duplex steels and other stainless steels. Thus, the measurement of nitrogen is a necessary but challenging application. Mobile spark spectrometers weren't even considered previously. But that's changing now: The SPECTROTEST masters this difficult discipline and reliably differentiates between duplex steels as well as high alloy austenitic steels that differ from each other by nitrogen contents of at least 500 ppm.

The key to the new application? The newly developed special probe with integrated UV optic. When this is used on the SPECTROTEST in place of the standard sample probe, it is possible to accurately measure even short wavelength elements such as nitrogen with the spark spectrometer.

Curious? Send us an [e-mail](#) requesting your copy of the application report, free-of-charge!



### Your Guide: Duplex Steels

Duplex steels are steels with a two-phased structure: They consist of a ferrite forming matrix with austenitic islands. Generally, nitrogen, nickel or manganese is used as austenite. Duplex steels are very acid and corrosion resistant, even at high temperatures, making them among the most important materials for the construction of chemical and petrochemical installations.



## PHOENIX II: Exacting Look at the Sulfur Content

Reduction of the harmful CO<sub>2</sub> emissions has become a major topic in environmental politics; forcing other environmental evils, such as acid rain, to the periphery of our awareness. But it is acid rain that makes life difficult for one of the natural protectors from CO<sub>2</sub>: The forest. The main cause for acid rain is atmospheric pollution by sulfur-containing exhausts. The goal of the new regulations for the sulfur content in automotive fuels is to reduce these. Beginning in 2009, the highest permitted value for sulfur will be reduced to ten milligrams per kilogram (10 ppm) in the EU. The USA will be tightening their regulations a year later: Only diesel with a sulfur content of less than 15 ppm will be permitted for road use as of 2010.

For petroleum companies, this means that the tighter limits for sulfur in their products must be more accurately monitored and documented. A major outlay in time and money? Not necessarily. The compact and easy-to-use SPECTRO PHOENIX II Sulfur Pro is the specialist for this task. Find out more about the PHOENIX II [here!](#)





## Fast, Simple and Robust

The inexpensive benchtop XRF instrument with polarized excitation achieves detection limits of 1.5 milligrams per kilogram for the analysis of sulfur; meeting not only the requirements for the standards as of 2009, but also providing performance capacity for future, tighter controls.

The PHOENIX II Sulfur Pro is notable for simple operation, designed for less experienced personnel.



Control and configuration of the XRF instrument is performed using an integrated computer and an intuitive touch screen. Simply press the touch screen to start a sulfur analysis. The analytical results are displayed in

less than six minutes. With its stable and robust housing, the PHOENIX II is especially convincing for use in extreme surroundings, during crude oil production, in the refinery or right at the pipeline.

In addition to ultra-low sulfur fuels, the PHOENIX II Sulfur Pro analyzes fuels such as bunker fuel or kerosene, in which a higher sulfur content is permitted. The PHOENIX II can be also be optionally configured for the analysis of additional elements.

Want to know more about the SPECTRO PHOENIX II Sulfur Pro? Find the current brochure for sulfur analysis with the PHOENIX II Sulfur Pro at [www.spectro.com/sulfur](http://www.spectro.com/sulfur).





## TurboQuant: The Assistant

Special software for the SPECTRO XEPOS:  
Higher accuracy for unknown samples in XRF

*Whether Mother Earth in an agricultural laboratory or waste that is to be incinerated or the resulting ash are being examined, the analysis of unknown samples is an important application for XRF. An area in which the XEPOS shines – thanks to its TurboQuant software.*

Screening analyses with [XRF](#) are fast and uncomplicated: Place the sample on the plate, press a button and wait a short time; the chemical composition is displayed. “The results are only reliable when the instrument recognizes the sample matrix before the analysis,” warns Dirk Wissmann, Product Manager for HE-XRF at SPECTRO. Is a powder a carbonate or an oxide? Is a liquid aqueous or oil based? Anyone

who tries to conduct an analysis without this information risks measurement errors of up to 70 percent! This is why SPECTRO’s competitors require users to select a matrix from a list before beginning the measurement. For truly unknown samples, this frequently means: Guess!

SPECTRO has a better solution: The current [XEPOS](#) is equipped with software called TurboQuant. This automatically determines the matrix of unknown samples and takes it into consideration during the analysis. The result: If the sample is correctly prepared, you can expect maximum measurement error of 10 to 20 percent! How? Find out [here](#).





**Oil? Water? Glycerin? Without TurboQuant, laboratory technicians have to recognize the solvent matrix.**

## Insider's Tip: TurboQuant

### Minimize "noise" in unknown samples!

The idea behind TurboQuant is really quite simple: Every time excited radiation hits the sample, matrix-specific reflected radiation is generated in addition to the fluorescence. The SDD detector in the [XEPOS](#) records this radiation and TurboQuant automatically determines which matrix is present.

This means that the XEPOS recognizes, for example, whether a powder is a carbonate or an oxide, it then corrects the matrix influences accordingly; minimizing error.

TurboQuant is already preinstalled in the new generation of the XEPOS for many customers. The user only needs to decide whether he/she wants TurboQuant for liquid or solid samples. Laboratories that want more detailed information or that want to equip an already installed [SPECTRO XEPOS](#) with TurboQuant should simply send us an [e-mail](#)!

"The interaction between optimized excitation, powerful detector and TurboQuant provides the XEPOS with lower detection limits and better accuracy for an equivalent measuring time."

*Dirk Wissmann, Product Manager for XRF at SPECTRO*

## SPECTROLAB: New Materials

**Application reports for cobalt, magnesium,  
nickel, titanium and tin now available!**



The fact that the [SPECTROLAB](#) as a hybrid metal spectrometer received top grades for the analysis of iron and aluminum alloys was documented by SPECTRO shortly after its introduction in two application reports. Increasing demands from the copper industry could be met a short time later with a further report.

Now, five additional application reports are available to help you make the most of your SPECTROLAB:

- The Analysis of Cobalt and Cobalt Alloys
- The Analysis of Magnesium and Magnesium Alloys
- The Analysis of Nickel and Nickel Alloys
- The Analysis of Titanium and Titanium Alloys
- The Analysis of Tin and Tin Alloys

With its hybrid optic, that makes use of CCD and PMT technologies, the SPECTROLAB achieves excellent detection limits in all five cases: Even trace elements with concentrations in single digit ppm ranges are quickly and reliably determined with the laboratory instrument.

All of the application reports are available at [www.spectro.com](http://www.spectro.com).

## Who's Who in the AMETEK Material Analysis Division?

For the last two years, SPECTRO with [CAM-ECA](#), [EDAX](#) and [Vision Research](#) have formed the AMETEK Material Analysis Division. Today, we'd like to present our sister companies:

- Secondary ion mass spectrometry
- Electron probe micro-analysis
- Low energy electron induced X-ray emission spectrometry
- Tomographic atom probe

 **CAMECA**

**EDAX** TSL

- Micro-XRF: Micro X-ray fluorescence
- EDS: Energy dispersive spectroscopy
- WDS: Wavelength dispersive spectroscopy
- EBSD: Electron back scatter diffraction
- ACT: Automated crystallography for TEM

- EDXRF: Energy-dispersive X-ray fluorescence spectrometry
- ICP OES: Inductively coupled plasma



**SPECTRO**

- MMA: Mobile metal analysis
- SMA: Stationary metal analysis

**ViSiON**  
RESEARCH

- Proprietary CMOS sensor designs
- High-throughput camera architecture
- Embedded technology for image acquisition, analysis, storage and transport
- High-throughput, high-capacity, removable memory magazines and docking station

Find out more about us [here](#) – in the new AMETEK Material Analysis Division brochure.



## New application reports for XRF and OES

### ***SPECTRO ARCOS***

- ICP-65 Analysis of Molybdenumoxide by ICP-OES with Axial Plasma Observation
- ICP-66 Analysis of High Purity Copper by ICP-OES with Radial Plasma Observation
- ICP-67 Analysis of High Purity Zinc using ICP-OES with Radial Plasma Observation

### ***SPECTRO PHOENIX II***

- 4112 Determination of Sulfur in Crude Oil and Fuel Oils
- 3941/1 Determination of Lead and Sulfur in Fuel Oils
- 4063 Determination of Zinc in Polystyrene using Direct Excitation

### ***SPECTRO XEPOS***

- XRF-48 Analysis of Small Amounts of Powdered Samples
- XRF-46 Analysis of Rh, Pd and Pt in Automobile Catalytic Converters

### ***SPECTROTEST***

- MMA-7 Grade Identification Using the Nitrogen Content in Fe Base (Duplex Steels, High Alloy Austenite)
- MMA-10 Analysis of Steel; Identification of Low Alloy and Chrome Steels Using Carbon with Arc Excitation

### ***SPECTRO xSORT***

- MMA-9 Analysis of Solid Metal Samples

***All of the application reports are available at [www.spectro.com](http://www.spectro.com)!***



## Don't forget!

Where you can find us: SPECTRO will attend the following trade fairs.



### ARABLAB

10.–13.1., Dubai, UAE, Hall 7

#### February

- Analyses Industrielles, 3.–5.2., Paris, France
- IFEX Foundry Exhibition, 13.–15.2., Kolkata, India
- Mid-Atlantic Soils Show, 18.–19.2., Richmond, VA, USA

#### March

- PITTCON 2009, 8.–13.3., Chicago, IL, USA



### Gulf Coast Conference (GCC)

20.–21.1., Galveston, Texas, USA

#### March (continued)

- Made In Steel, 18.–20.3., Brescia, Italy
- FLOWEXPO 2009, 25.–27.3., Guangzhou, China

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