



Welcome to SPECTRO Live – The Winter Issue!

A lot has happened since the last issue of the SPECTRO Live and we have several new and interesting stories to tell you.

- In our [title story](#), we let you know where XRF and ICP come into play for the testing of toys, cosmetics or coffee machines.
- One of the many strengths of the [SPECTROLAB](#) is the analysis of gold and zinc alloys. We've provided an introduction to the two applications.
- The [SPECTRO ARCOS](#) presents itself as a high precision and thrifty instrument. Read about the innovative components in the ICP analyzer that help you save work time and money.
- Last but not least: The [SPECTRO xSORT](#) and [iQ II](#) track down the contents of waste oil and decode the life stories told by motor oils.

That's enough of an introduction. Enjoy your read!

What's in, What's new?

Lead-Free Please!
Consumer product testing with the SPECTRO xSORT



Time Saved Is Money Earned:
Innovative components in the SPECTRO ARCOS



Good Reading:
New XRF and ICP application reports



Is Everything that Glitters Gold?
Zinc and gold analysis with the SPECTROLAB



Oily Stories:
Waste oil analysis with iQ II and xSORT



Current Dates:
Trade Show dates for 2010





Lead-Free Please!

“Lead in Baby Bib,” “Toxic Lead in Wood Paint,” “Contamination in Toys” – headlines like these are seen again and again on newspaper front pages and in the news on TV. The consequence? Toy manufacturers recall thousands of products because of a lead content that is too high; one that is a health hazard. In 2009 alone, the American [CPSC](#) (U.S. Consumer Product Safety Commission) counted 26 recalls due

to high lead contents; affecting almost 1.5 million products.

Toys, clothing, cosmetics, electronics – a long list of consumer products is subject to content controlling. The list of harmful materials to be controlled is just as long: [Lead](#), [cadmium](#) and [mercury](#) are just a small selection.



The [SPECTRO xSORT](#) willingly accepts the challenge of consumer product analysis. The light and flexible handheld XRF instrument analyzes quickly and non-destructively. The silicon drift detector is the heart of the xSORT. It processes the signals ten times faster than the silicon pin detector typically used in XRF instruments. "In the field, this means that the contents for all of the important elements between silicon and uranium are displayed in just 30 seconds – independent of sample material and without complicated sample preparation," explains

Dirk Wissmann, XRF Product Manager at SPECTRO. Within the shortest of times, the controller for incoming and outgoing inspections knows whether or not the recently received DVD players or toy cars conform to the specified thresholds. For a high number of units, this quickly adds up to a time savings of several hours. Another important advantage to the xSORT: The operator doesn't have to be an XRF specialist. The intuitive and easy instrument operation utilizing a graphical interface enables even unpracticed users to perform screening analysis.



SPECTRO xSORT

Four new white papers provide you with information about the wide range of SPECTRO xSORT handheld XRF applications. Send us an [e-mail](#) requesting your copy of our brochures:

- Positive Material Identification (PMI) using spectrochemical analysis
- Sorting of scrap metal
- Environmental Screening with XRF analysis
- Elemental Compliance Screening with XRF analysis

Additionally, our "SPECTRO xSORT" flash film shows you all about the operation and technical highlights of the handheld XRF instrument. [Take a look!](#)



Legally Compliant Test Results

The xSORT is ideal for the rapid black or white analysis onsite-testing whether a product is clearly contaminated with hazardous substances or whether it is free of dangerous contents. But the measurement accuracy of XRF instruments is often not enough for measurements in the “grey” area in between. It is also necessary to remember that while XRF technology is an established method for screening, other procedures are frequently required for reference analyses. The [SPECTRO ARCOS](#) and the [SPECTRO GENESIS](#) fill the gap here. “ICP-OES spectrometer sensitivity is much higher than that of XRF instruments. This is especially true for the analysis of paint layers,” reports Olaf Schulz, ICP Product Manager at SPECTRO. “Besides, the ICP

Tightened Restrictions

The new [European Toy Regulation](#) went into effect on July 20, 2009. It replaces the 88/378/EWG guideline that has been in effect for 20 years. Important reforms include the extension and tightening of threshold values for material transitions. Eleven parameters have been added to the existing eight heavy metals. In addition, manufacturers are obliged to subject toys to a hazard analysis and the manufacturers must also be able to provide comprehensive technical documentation. There is a transition period of two years for fulfillment of the guideline; the chemical regulations will go into effect in 2013.





technology is a legally admissible testing method with which manufacturers and importers can document compliance with harmful material tolerances in consumer products.

The SPECTRO ARCOS is the only ICP instrument able to record the

entire spectrum during every measurement and achieves detection limits in the lower ppb range. With the SPECTRO GENESIS, SPECTRO offers an inexpensive basic ICP-OES spectrometer. With the detection limits achieved, both spectrometers are well equipped to meet the standards in place today and tomorrow. They make testing laboratories, manufacturers and importers fit for future consumer product analyses. "The legal restrictions concerning consumer protection will become stricter worldwide," Dirk Wissmann is sure of this.



In the spring of 2009, the SPECTRO GENESIS basic ICP underwent a model upgrading. The weight of the GENESIS was reduced together with slimming down of the internal components. The GENESIS now uses [SMART ANALYZER VISION 4.0](#) as its standard system software.

Lead Contaminated Ledgers

In October 2009, a company in the USA was sentenced to a [fine](#) of 600,000 US dollar, because they deliberately imported and sold lead contaminated toys. In connection with this, the CPSC stressed that importers have the same obligations to maintain threshold values for lead as manufacturers.



Is Everything that Glitters Really Gold?

SPECTROLAB convinces for the analysis of gold and zinc alloys

For months now, the gold price has been breaking records. Bars, coins and jewelry are more popular with investors than ever. But gold is not all the same: The 24 Karat ounce of fine gold, the reddish-yellow copper alloyed Krugerrand with 22 Karat and a 9 Karat silver alloyed earring are not just poles apart in price but also in content.

The alloys may be very different, but at the beginning of every gold product is the same starting material: Pure [gold](#), with a gold content of 99.99 percent

or even more. "Gold refineries around the world all operate according to the same principle. First they remove all trace elements and contamination from the gold with complicated procedures until they have pure gold. This is then alloyed to the desired gold content," explains Kay Tödter, Product Manager for stationary metal analyzers at [SPECTRO](#).

In addition to the acid testing reference method, most gold refineries depend on XRF instruments to monitor the quality of the alloys and to examine the





material to be used. But now SPECTRO has shown that spark spectrometry is another solution for gold analysis: For several measurement series, the [SPECTROLAB](#) metal analyzer recently delivered not only precise but also rapid results with detection limits in the ppm range for all trace elements. "In laboratory operation, the SPECTROLAB has proven itself to be an excellent alternative to other techniques, especially for determination of the degree of purity but also for the analysis of alloys. It is very precise

and because it is easy to operate it has a high sample throughput," confirms Kay Tödter. His tip: "Anyone looking for a new gold analyzer should really consider a spark spectrometer."

[Contact us](#) to find out more about gold analysis with the SPECTROLAB in the application report "SPECTROLAB: Analysis of Gold."

Read more about the analysis of zinc alloys [here!](#)

Good, Better, SPECTROLAB

The [SPECTROLAB](#) is SPECTRO's stationary metal analyzer flagship. The current generation of this bestseller offers:

- A digital plasma generator with a stable discharge that guarantees constant conditions for all measurements.
- A hybrid optic combining two spectral modules with CCD detectors and photomultipliers. The emitted light is simultaneously processed and the entire spectrum recorded in one measurement.





We also recommend a second SPECTROLAB application report: Our new report “The Analysis of Zinc and Zinc Alloys.”

Zinc is a metal that can be used universally. We encounter it constantly in daily life: A building material in architecture, rust protection in the automotive industry, as a faucet in the morning and in the anti-aging cream at night. “Worldwide, almost nine

million tons of zinc are acquired every year,” reports Kay Tödter. “Zinc is used in just about every industry. As one would expect, the demand for powerful instruments for quality control is high. Here, the SPECTROLAB achieves detection limits of a few ppm; making it one of the top systems on the market.”

This report can also [be obtained](#) free-of-charge.

No More Small Parts Mikado!

High-tech and knowhow aren’t everything in metal analysis. When screws, pins and washers, wires or foils have to be centered on the spark stand, laboratory technicians needed a good eye and steady

hands. Until now: A modified small parts adapter is now available for the SPECTROLAB. With it, small pieces can be quickly and precisely placed on the measuring aperture. And the best news is that it comes complete with the required method package!



SPECTRO ARCOS: Time Saved is Money Earned

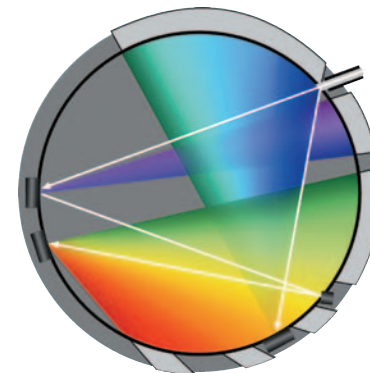


Laboratory supervisors in widely varying industries recognize and appreciate the precision and reliability of the [SPECTRO ARCOS](#). Even with its operating costs, SPECTRO ARCOS is a manager's dream. With the UV-PLUS system the instrument really tackles argon costs; innovative components help reduce valuable work time:

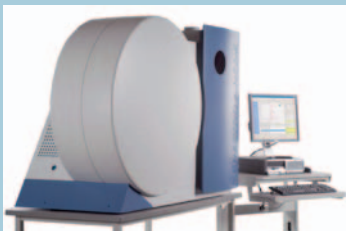
1. **Simultaneous optic.** With its patented new development, the SPECTRO ARCOS' optical system achieves a resolution power of 8.5 picometers in the main working range of 130 to 340 nanometers and, for larger wavelengths, a resolution of 15 picometers. And there's more: The SPECTRO ARCOS simultaneously records the entire spectrum from 130 to 770 nanometers in the first order in a single measurement. Multiple measurements of a sample for different spectral ranges are a thing of the past.



- 2. Post processing and re-calculation of the results.** Because the [SMART ANALYZER VISION](#) analytical software stores the entire recorded spectrum for each measurement, subsequent processing of the analysis is possible at any time. Other, or additional, lines can be evaluated or the evaluation parameters can be changed without having to re-measure a sample. It is even possible to add new elements to the analysis so that they can at least be semi-quantitatively determined at a later time.
- 3. ICAL Intelligent Calibration Logic.** This logic system continuously monitors the state of the system and automatically conducts a calibration of the SPECTRO ARCOS if there are deviations from the target state – i.e., only when it's necessary. The instrument is always ready for operation.
- 4. Standard-conforming “Plug and Analyze” method package.** SPECTRO provides complete method packages for typical industrial and environmental applications.



The SPECTRO ARCOS records the entire relevant spectrum from 130 to 770 nanometers in the first order.



SPECTRO ARCOS

The [SPECTRO ARCOS](#) sets standards – for performance, speed and optics. The instrument's striking left side houses the novel newly developed optical system. The ICP-OES spectrometer is ideally suited to exacting applications in industry, environmental protection and research.

UV-PLUS: The Piggy Bank

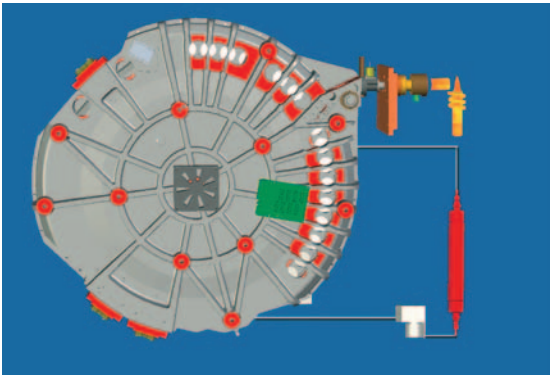
The argon consumption of an ICP-OES spectrometer determines its operating costs. If it's not necessary to constantly flush the optic with [argon](#), the operating costs are greatly reduced – a job for the UV-PLUS system.

The patented procedure uses a closed loop system. Filled once with argon, the gas is then circulated in the SPECTRO ARCOS' optical system and continuously cleaned. This prevents the contamination of the optical components, a frequent problem in other systems, and ensures a constant, optimum analytical

environment. A pleasant effect for your wallet: The UV-PLUS system reduces the argon consumption to a minimum. The savings achieved every year quickly run up into the thousands.

For the Calculating: Our ICP cost calculator

[SPECTRO's ICP cost calculator](#) shows you how high your savings could be. Simply enter argon and power prices, click on a button and the yearly costs for an ICP spectrometer with continuous flush are compared with those for the SPECTRO ARCOS and SPECTRO GENESIS – exact to the euro/dollar and cent.



In the patented UV-PLUS system, the optical system chamber is filled once with argon. The argon is circulated through a cleaning device.



Waste(d) Oil?

The disposal of waste oil is strictly controlled worldwide; an impossible job without powerful analytical techniques

[Waste oil](#) is toxic to the environment. A single drop is enough to pollute hundreds of liters of drinking water – and 500 million liters are produced per year in Germany alone. The lion's share consists of contaminated motor and machine oil.

The procedures for dealing with waste oil have been specified in detail in most countries. Usually, waste oil is collected and disposed of in two ways:

- A large portion is recycled according to substance – which means that, depending on the quality, it is processed to base oil, fuel oil, lubricating oil or bunker fuel. In Germany, this happens with about 70 percent of the waste oil.
- The remaining waste oil is burned, usually in the [cement industry](#).

In order to prevent toxic substances from being released during recycling according to substance or thermal recycling, the waste oil should be tested for a number of harmful substances, especially chlorine and heavy metals. "The values being monitored tend to be in a low concentration range," explains Dirk Wissmann, Product Manager for XRF at SPECTRO. "XRF can really demonstrate its strengths with these fast screening analyses: It is inexpensive, simple, rapid and precise."



With its xSORT und iQ II XRF instruments, SPECTRO offers two instruments that are exceptionally suited to the examination of waste oil.

- As a portable instrument, the [SPECTRO xSORT](#) is ideal for onsite analyses – for incoming inspection at cement plants, for example. The extremely simple instrument operation is a major plus point. Even non-technical personnel can quickly make the most of this flexible instrument.
- Our [SPECTRO iQ II](#), was developed for the petrochemical industry and has consequently been optimized for the analysis of waste oil. It works quickly and reliably and delivers dependable results at the press of a button.

In two application reports, we have documented how waste oil analysis is conducted with these instruments. Just [let us know](#) you're interested and we'll send you a copy.

[On the next page](#) we tell you why waste oil analysis is an important matter for shipping and railway companies as well as for Formula 1 racing teams.



**Exceptionally
suited to the
examination of
waste oil:
SPECTRO iQ II**

Oil: Stories in Iridescent Colors

Every used motor oil tells a story. The wear metals and trace elements in oil can tell us a lot about the history and state of the motor

Since the 1940's it has been well known that it is worth the trouble to take a good look at [motor oils](#). Back then, the American railway companies began to examine the wear particles in the lubricating oils for their heavy diesel locomotives. The simple rule was: A lot of little particles mean dirty oil and thus an oil change was needed. It was worse when there were large wear particles – these were frequently an indication for motor damage.

70 years later, motor oil analysis has made much progress: "Today, regular oil testing has become standard in industry, shipping, aviation and even car racing," declares Dirk Wissmann, Product Manager for

XRF at SPECTRO. Companies have long discovered that not only the wear particles but also many trace elements can provide decisive information: An increased silicon content indicates contamination by sand or dust; traces of tin are often a sign of damaged ball or anti-friction bearings.

SPECTRO has the right products for the analysis of motor oils. But the individual application scenario determines the right solution:

- The inexpensive and compact [SPECTRO iQ II](#) XRF instrument is perfect for simple trend analyses – e.g., monitoring how the contaminant content in motor oil develops within a year.

- The [SPECTRO GENESIS](#) and [SPECTRO ARCOS](#) ICP instruments enable detailed analyses in the ppb range and, with their speed (an analysis including sample preparation requires less than a minute) come into use where large numbers of samples need to be tested for wear particles. Especially companies with a great deal of machinery are able to prevent untimely break-downs in this way. As a standard technology for this application, SPECTRO's ICP spectrometers analyze up to 1000 samples per day – fully automatically.

Thrilling, don't you think? If you want detailed information about the different products and application areas, just send us a short [e-mail](#).



Pay attention to these indicators for wear, contamination and additives in motor oil:

- | | | | | |
|---|--|--|--|---|
| <p>1. Wear</p> <ul style="list-style-type: none"> • iron • chromium • lead • copper • tin • antimony | <ul style="list-style-type: none"> • aluminum • nickel • silver • molybdenum • zinc • titanium • vanadium | <p>2. Contamination</p> <ul style="list-style-type: none"> • silicon • boron • sodium • potassium | <p>3. Additive</p> <ul style="list-style-type: none"> • calcium • phosphorous • zincZink • molybdenum • silicon • boron | <ul style="list-style-type: none"> • magnesium • barium |
|---|--|--|--|---|



New application reports for XRF and ICP

SPECTRO xSORT

- XRF-53 Analysis of Solid Metal Samples with SPECTRO xSORT Non-Alloy
- XRF-58 Screening Analysis of Rh, Pd and Pt in Used Automobile Catalytic Converters

SPECTRO xSORT W-Anode

- XRF-59 Screening Analysis of Used and Waste Oil

SPECTRO xSORT Ag-Anode

- XRF-60 Screening Analysis of Used and Waste Oil

SPECTRO iQ II und SPECTRO xSORT

- XRF-57 Analysis of FeCr Powder

SPECTRO MIDEX 2009

- XRF-54 Analysis of Plastics according RoHS Directive with 2 mm Working Distance
- XRF-55 Analysis of Plastics according RoHS Directive with 20 mm Working Distance
- XRF-56 Locating and Identifying Inclusions in Plastics

SPECTRO ARCOS SOP

- ICP-69 High Throughput Analysis of Oils by ICP OES

SPECTROLAB

- SMA-48 Analysis of Zinc and Its Alloys
- SMA-43/3 Analysis of Precious Metals (Au/Ag/Pt/Pd)

A list of all application reports is available at www.spectro.com!



Trade Show Calendar: Where you can find us in the first half of 2010

PITTCON ORLANDO, FLORIDA
FEBRUARY 28 – MARCH 5
WWW.PITTCON.ORG
CONFERENCE & EXPO **2010**

28.2.–5.3., Orlando, FL, USA

 **analytica**
23.–26. MÄRZ | 2010 | MÜNCHEN

23.–26.3., Munich, Germany

January

- Plasma Winter Conference, 4.–9.1., Fort Myers, FL, USA
- ARABLAB, 9.–12.1., Dubai, UAE
- EUROGUSS, 19.–21.1., Nuremberg, Germany

March

- CAST EXPO, 20.–23.3., Orlando, FL, USA
- ANALYTICA, 23.–26.3., Munich, Germany

February

- IFEX, 5.–7.2., Ahmedabad, India
- WI Mini Expo, 7.–8.2., Milwaukee, WI, USA
- Pittcon, 28.2.–5.3., Orlando, FL, USA

May

- CONTROL, 4.–7.5., Stuttgart, Germany
- ISRI, 4.–8.5., San Diego, CA, USA
- DGZfP, 10.–12.5., Erfurt, Germany

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