

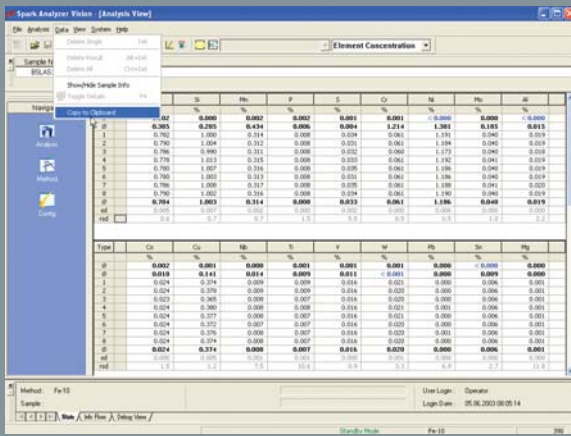


# SPECTROLAB

Extraordinary analytical capabilities, short measuring times, low cost

High power spectrometer for  
operation and minimal maintenance make the SPECTROLAB the ideal  
demanding metal analysis  
analytical instrument for numerous tasks in the metal industry.  
requirements



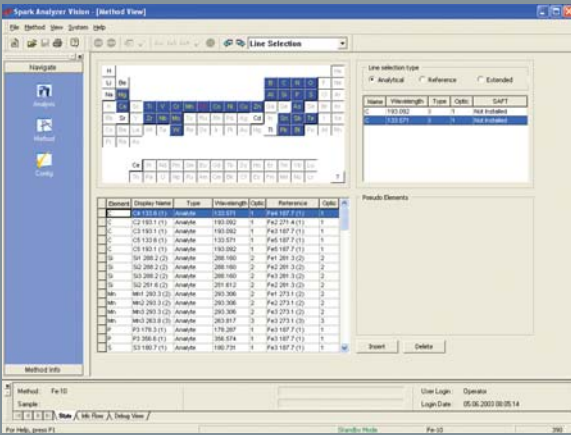


1

1 The operator oriented user interface of the SPECTRO Spark Analyzer Vision makes routine operation simple and safe.

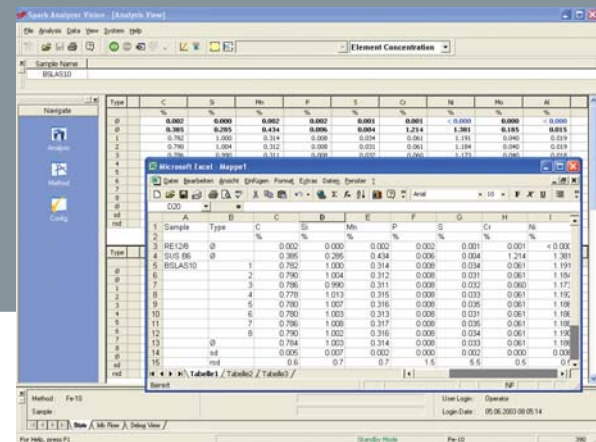
2 A powerful calibration module is integrated into the analytical software.

3 The results are archived in an SQL databank. Data can be exported using XML or the Windows Clipboard. SYS-GATE is also available, a data export module with parameters that can be set as required.



2

3



The new windows software **SPECTRO Spark Analyzer Vision** offers, in addition to simple and intuitive operation, significantly **expanded functionality** for instrument parameterization, data exchange with external computers and programs - as well as report generation and statistical analysis. Foundation for the data management is an **integrated SQL database**.

The SPECTRO Spark Analyzer Vision software layout is **clear and concise**. With the navigation bar, switching between the three major modes of operation - Analysis, Methods and Configuration - requires just a click of the mouse. The **measurement screen** offers the possibility of displaying multiple measurements and averages.

With the Windows Clipboard exporting data to other Windows programs is fast and easy.

In the configuration mode the management of a wide range of **instrument parameters** is straightforward. The required information is presented concisely on one page for clarity of operation.

*With SATEUS (SAfety TEST of USEfulness) for recognition of poor quality samples at the beginning of the prespark, SEREPS (SElf REGulating PreSpark) for optimization of the prespark and SETEME (SEcurity TEST for MEasurement) for recognition of poor quality samples during the integration time, the SPECTROLAB possesses important functions to protect from operational errors, poor sample preparation and bad samples.*

## Software

# SPECTROLAB

High power spectrometer for demanding metal analysis requirements



The SPECTROLAB high power metal analyzer is recognized around the world as the most successful product in its class. As soon as it was introduced to the market in 1983, the SPECTROLAB excelled with its innovative technology and a convincing cost effectiveness.

The **Multi-Optic concept** for high analytical capabilities and the **robust design** enabling disturbance-free operation in a **non-laboratory environment** were outstanding advances in the system; allowing spark spectrometry to claim new domains of use. Continuous development in the following years drove the instrument technology forwards.

New applications were added and the SPECTROLAB became the market-leader for foundries and metal producing, processing and recycling industries.

The current generation of the SPECTROLAB sets an additional milestone in metal analysis. With new developments in important components and further optimization of proven apparatus, it attains new heights in analytical capability, reliability and handling.

Employment of the SPECTRO **plasma generator** as a replacement for the conventional excitation source is one of the most important advances. **Complete digitalization** of the excitation procedure and excitation control makes it possible to exactly define and **regulate the energy in the plasma**. The precision of the system is distinctly increased and new analytical possibilities can be realized. Reproducibility can be improved and measuring times greatly reduced with source parameters that could not be obtained until now. The results for standard applications are available in less than 18 seconds; accelerating process control and increasing sample throughput rates.



1

1 The SPECTROLAB filter system binds the condensate removed from the spark stand by the self-cleaning mechanism.

### The new SPECTROLAB:

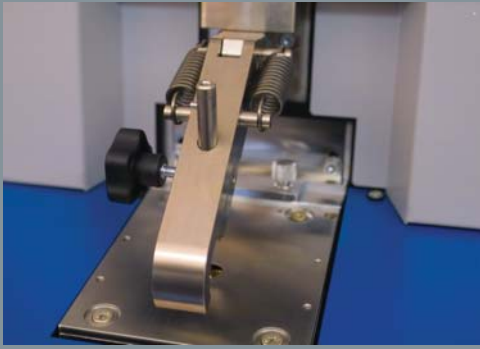
- **Rapid analysis and precise results:** The standard measuring cycle is reduced to 18 seconds with improved detection limits using fully digitalized excitation from the new plasma generator.
- **Low operating costs:** Argon consumption during the measurement reduced by 50 %
- **Reduced maintenance requirements:** Self cleaning system prevents fouling even after thousands of measurements
- **Easy to operate:** The SPECTRO Spark Analyzer Vision software takes you by the hand and makes each step of operation simple and straightforward
- **Practical Design:** Work and storage space designed for productive operation, small footprint and easy access to all components.



The **spark stand has been completely renovated**, enabling extraordinary characteristics: The optimized argon flows are extremely effective at preventing contamination in the spark stand, even after many thousand sparks. This **greatly lengthens the maintenance interval**. The SPECTROLAB has a new filter system to prevent the condensate removed from the spark stand from escaping the instrument. It effectively and permanently binds the particles with little maintenance required.

The small inner volume of the spark stand **reduces** argon consumption during the measurement process **by about half**; significantly reducing the operational costs. Adjusting the flow conditions simultaneously optimizes the quality of the argon atmosphere in the spark stand. The sample plate can be exchanged without the need for alignment tools. Simply unscrew the four fastening screws with an eighth of a rotation counterclockwise, exchange the plate and retighten the screws. Only a screwdriver is needed. The **integrated changeable window** can even be replaced without tools; only two screws need to be loosened by hand.

The **sample clamp**, with integrated safety circuit, **can be swung** to the right or left and allows for quick sample changing and the measurement of numerous sample formats. Special **adapters** for certain sample forms, like small pieces, wires and sheets improve the exactness and reproducibility of the analyses.



2

**2 The swinging sample clamp** with integrated safety circuit enables the analysis of even large and cumbersome samples.



3

**3 The optimized argon flow** in the inner chamber of the spark stand leads to a homogenous argon atmosphere and helps stabilize measuring results.

**4 Up to three optical systems** are utilized in the SPECTROLAB making superior analysis possible.

4



A **stronger measurement signal** along with an increase in the measuring accuracy was achieved through an improved interface between the optical systems and the spark stand. New components and new mounting techniques in the modified optical systems of the SPECTROLAB lead to excellent and, until now, unachieved precision and stability. Depending on the application and the number of elements to be measured, up to three of these systems are combined in an instrument. The optimization in multiple sections of the spectrum that this permits leads to a direct **improvement in the analytical performance** of the entire system. The SPECTROLAB is equipped with a patented, gas-filled

UV system for measurements in the ultraviolet wavelength range below 230 nm. The wavelength range can be extended to below 120 nm resulting in an obvious **analytical advantage**. All of this combined with an automatic cleaning system requires very little maintenance work.

The **well-thought out instrument design** is not limited to external good looks, but takes the **optimal accessibility** of all components, simple and safe operation and extension of the service interval into consideration. This **perceptibly relieves the operator** of daily, time consuming maintenance and control tasks and increases the time available for measurements.

Storage space to keep the utensils needed at hand and an ergonomic working height facilitate **productive operation**. The SPECTROLAB can be moved easily on its stable wheels and it is not necessary to reserve room for maintenance work, meaning that it requires **little space** around the instrument.

## Multi-Optic System

- Paschen Runge Mount, 750 mm focal length, Rowland Circle
- 120 - 800 nm wavelength range
- Patented gas filled SPECTRO UV-PLUS system for wavelengths < 230 nm with automated purification system
- 1<sup>st</sup> order optical resolution: 6 pm
- Selection of hundreds of analysis channels with individually optimized exit slits
- 3 optical systems per instrument
- Grating variations employed: 3600 g/mm, 2400 g/mm, 1800 g/mm
- Photo multipliers with differing spectral sensitivity, selected and optimized for the individual analytical application
- Photo multiplier rack-mount units for optimal positioning of the detector system
- Stray light protection system employing proprietary components

## Spark Stand

- Optimized argon flow with minimal consumption
- Exchangeable sample plates do not require centering tool
- Swivel mounted sample clamp for fast change of samples with varying geometries
- Optimized optical interface
- Integrated quick-change window, does not require tools
- Integrated safety circuit

## Excitation System

- Fully digitalized plasma generator with digital discharge definition, digital pulse generation and digital offline pulse control
- 32 MHz micro-controller
- Sampling rate: 400 in 200  $\mu$ s-discharge
- Energy resolution: 125 mW
- Max. spark duration: 4000  $\mu$ s
- Max. spark power 4 KW

## Instrument Control

- Time Resolved Spectroscopy (TRS) for improved detection limits and accuracy
- Spectrometer functions computer controlled
- Automatic diagnosis function
- Adjustment and control of all functions via TCP/IP coupled operating software

## Software

- SPECTRO Spark Analyzer Vision with calibration software module
- Result archiving using a SQL database
- Result export via XML or Windows Clipboard
- SYS-GATE integrated data export module
- SATEUS (Safety Test of Usefulness) for the automatic detection of bad samples during the pre-spark
- SEREPS (Self Regulating Pre-spark) for the automatic optimization of the pre-spark time

## Computer System

- SETEME (Security Test for Measurement) for the automatic detection of bad samples during the measurement integration
- Commercially available state-of-the-art computer with Windows XP Professional operating system
- 17" TFT flat screen monitor
- Commercially available color ink-jet printer

## Spectrometer Specifications

- 230 VAC - 15% + 10%, 50/60 Hz
- 1.5 kVA during the measurement
- 0.5 kVA during standby
- Main Fuse: 16A slow blow
- Depth: 1400 mm / 55"
- Width: 780 mm / 31"
- Height: 1520 mm / 60"
- Weight: approx. 375 Kg / 825 lbs.



[www.spectro.com](http://www.spectro.com)

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**AMETEK**  
SPECTRO ANALYTICAL INSTRUMENTS

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Specificații tehnice