Technical Data

Analytical performance

The S4 EXPLORER combines the analytical performance of a wavelength-dispersive X-ray spectrometer and the advantages of space saving and cost efficiency like an energy-dispersive X-ray spectrometer.

The improved light element analysis of the S4 EXPLORER is based on multilayer analyzer crystals, very coarse collimators and close sample/X-ray tube coupling, but optimized by its unique 75µm ultra thin X-ray tube window and innovative Pro4 Super High Transmission sealed proportional counter.

Analysis range	Beryllium to Uranium
Concentration range	concentrations from sub ppm to 100%
Sample form	powder, solid, liquid, paste, coating, slurry, film, filter deposit, etc.
Sample size	loose powder and liquids: up to 50 ml solid, film, paper: to 51 mm (2'') ø, 47 mm (1.8'') height

Room planning

Mains	230 V 1p or 3p, 254 V 1p, 208 V 1p; 50 or 60 Hz
(Generator stability ± 0.0005% of the set value at main voltage fluctuations of ± 1%)	
Detector gas	not required
External cooling water	not required
Vacuum pump	vacuum pump integrated in spectrometer
Gas for analysis of liquids or loose powders	Helium or Nitrogen, at reduced or normal atmospheric pressure

(Sample and spectrometer chamber are separated by a programmable air lock (vacuum seal) minimizing the helium consumption and pump-down times, increasing detector stability and analytical reproducibility)

Dimensions	131 cm x 84 cm x 88 cm; 390 kg 51.6" x 33.1" x 34.6" (height x width x depth, weight)
Quality & Safety	DIN ISO 9001 / EN 29001 CE Certified Fully Radiation Protected System (e.g. DIN 54113)

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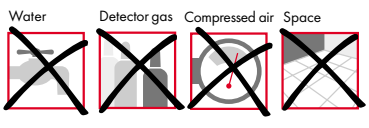

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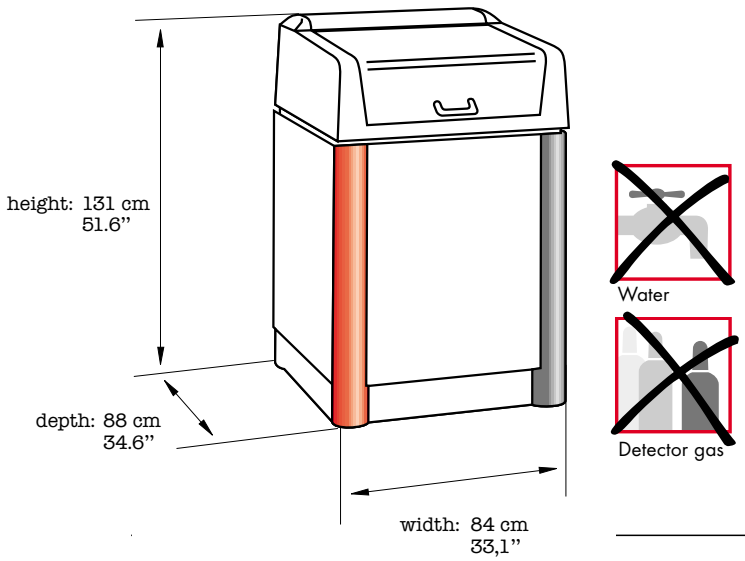
SPECTROMETRY SOLUTIONS
S4 EXPLORER

The whole periodic table with just a mouse click?

S4 EXPLORER – The Little Giant!



find out what's inside

Multi-element analysis with the S4 EXPLORER – little effort in sample preparation but gigantic versatility

With XRF analysis for multi-elemental analysis, time improvements and optimization start with sample preparation. Time and labor for this is minimal.

Multi-elemental analyses with the S4 EXPLORER ensure a non-destructive and environmentally safe analytical method, which doesn't require the dissolution (and consequently the loss) of samples or the disposal of hazardous waste solvents, as do all the wet chemical methods.

Whether you analyse liquids, loose powders, metals, pressed powder pellets or fused beads – preparation of your samples is always simple: pour or place the sample directly into the sample cup and then you can explore your sample.

Data relating to the preparation of samples, such as the loss on ignition, binding agents or dilutions and any additional chemical information can be easily inserted or directly taken over from your laboratory network.

- ***preparation of solid and powder materials within minutes***
- ***safe and fast direct analysis of liquids and loose powders***
- ***direct measurement of small and irregularly sized samples***

S4 EXPLORER – let's introduce The Little Giant









The S4 EXPLORER combines the superior analytical performance of a sequential wavelength dispersive X-ray spectrometer, such as high reproducibility and sensitivity for light element analysis, and the advantages of space saving and cost efficiency like an energy-dispersive X-ray spectrometer.

The S4 EXPLORER fits everywhere, whether in the clean environment of the lab or in the rugged surroundings of the production site, exactly what is to be expected from a proper space saving spectrometer.

The installation and running costs are minimal since its operation doesn't require compressed air, cooling water or detector gas.

S4 EXPLORER –

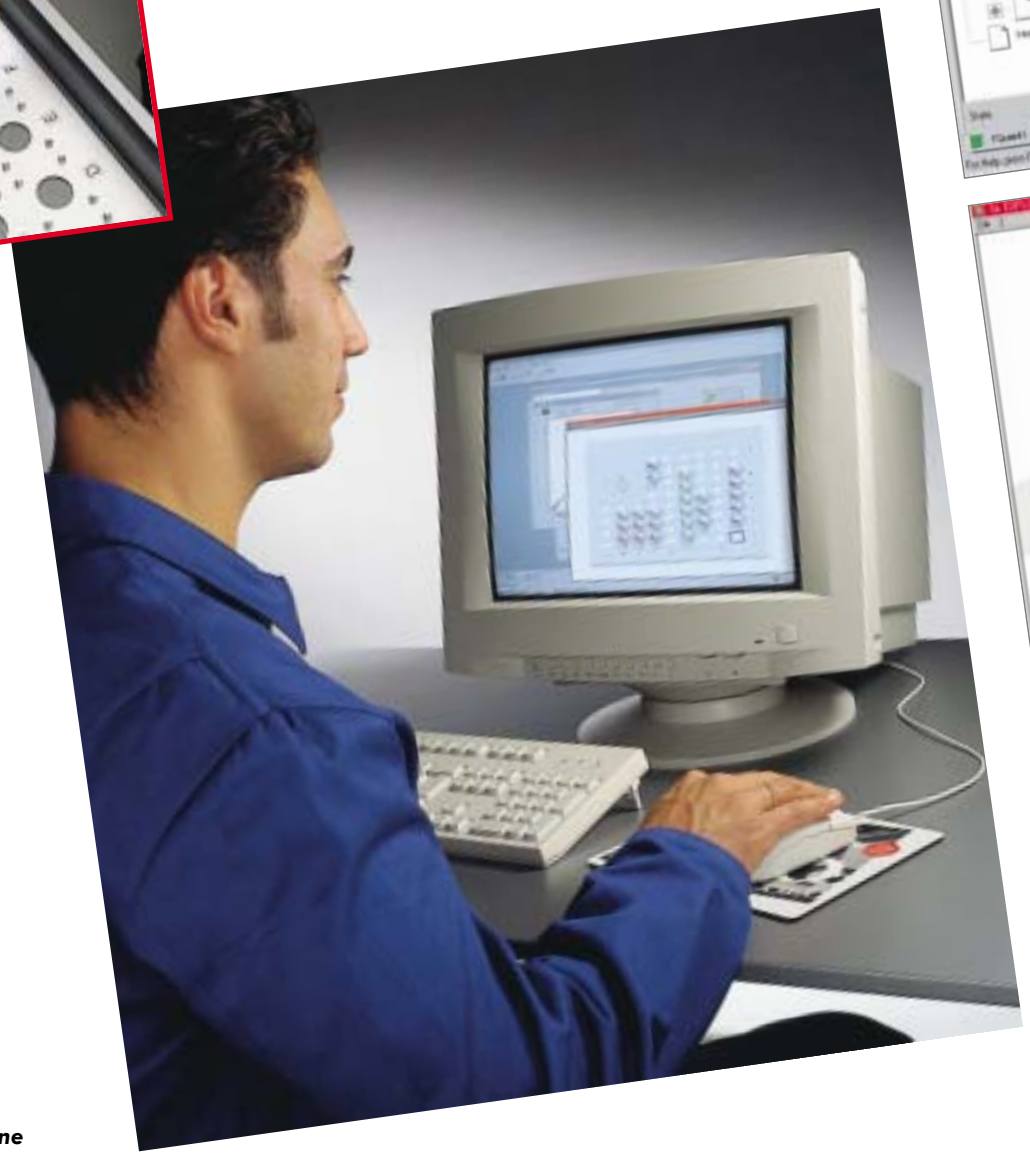
little in

- ***space***
- ***operational costs***
- ***installation requirements***
- ***effort for setup and calibration***
- ***training required***

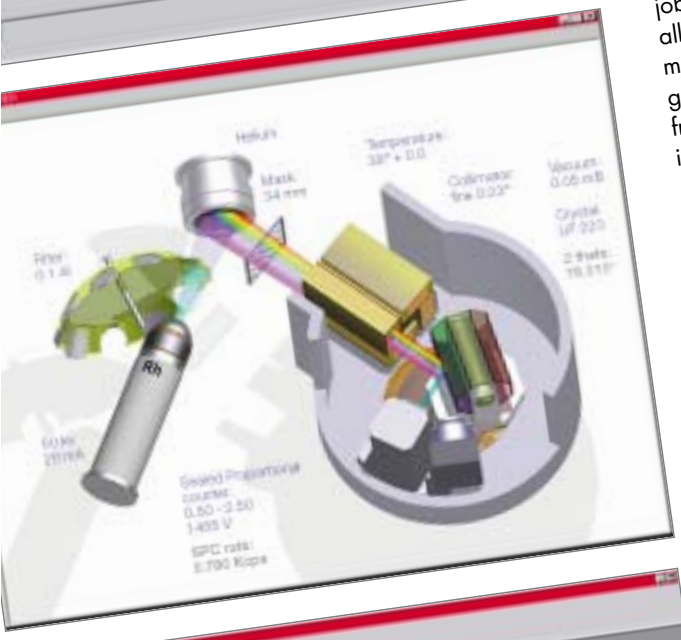
gigantic in

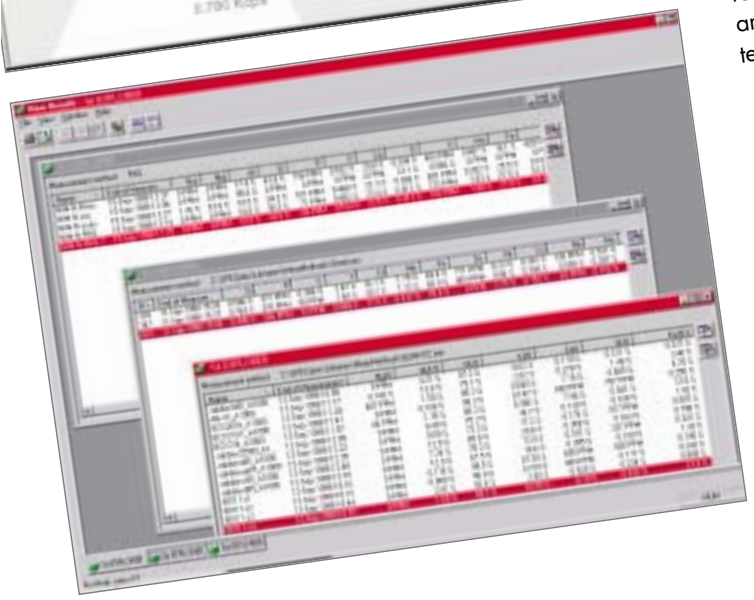
- ***integrated intelligence***
- ***analytical flexibility***
- ***sensitivity***
- ***reproducibility***
- ***sample through-put***

Just one mouse click and you'll explore the whole periodic table – S4 EXPLORER with SPECTRA*plus*



- ***ACS total Automatic setup and Calibration System***
- ***Totally Integrated Analytical Intelligence***
- ***virtual, real-time display of spectrometer and sample magazine status***
- ***simple data transfer within the Windows™ world and ease of networking***





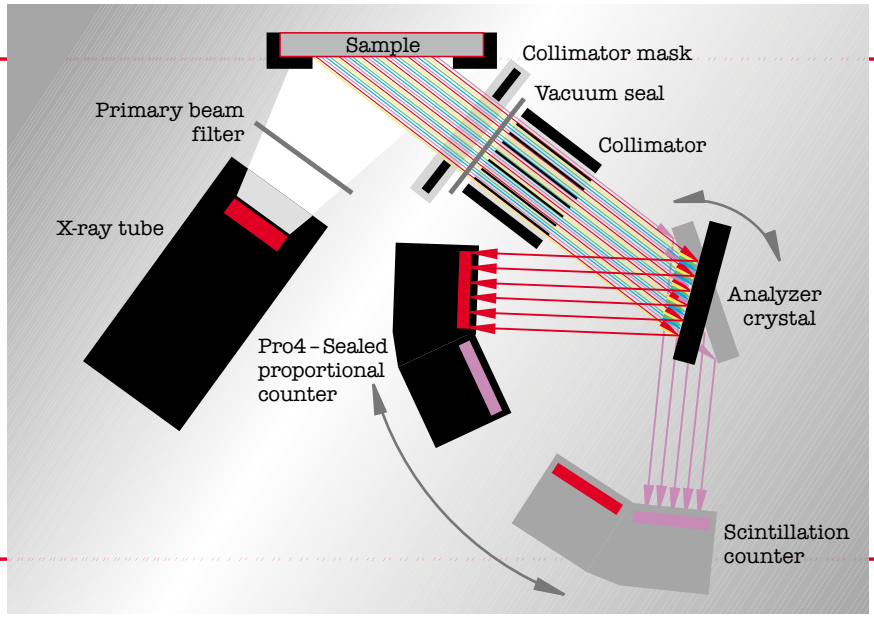
A daily measuring routine in XRF means: the loading and unloading of samples and the starting of measurement jobs. In relation to both, we kept, above all, your comfort in mind. A large sample magazine and a safe measuring routine guarantee high sample throughput, freeing you for your other responsibilities in the lab.

Measurement jobs are rapidly defined and started with minimal operator input. Even faster and easier than sample preparation; you can select or create a measuring job. For example, you just define the elements and the required analytical accuracy and SPECTRA^{plus} automatically selects the best measuring conditions and evaluation methods.

No special technical training or expertise is required to achieve precise results. Start the measurement and the analytical results are automatically printed in just a short time.

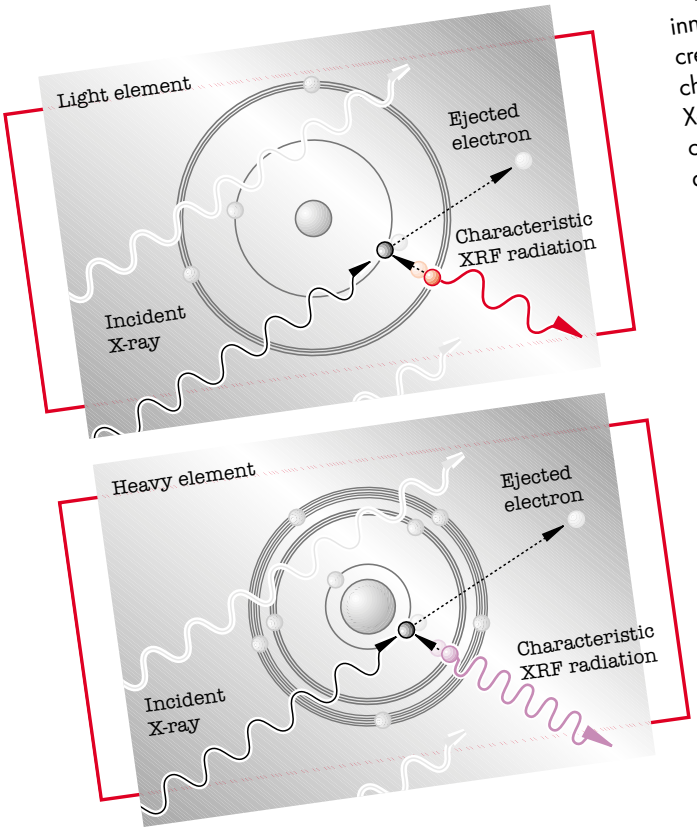
Internal data communication in SPECTRA^{plus} is based on the TCP/IP Client/Server Principle. Therefore, the complete functionality of SPECTRA^{plus} is available on any computer within your network. This means that your spectrometer can be controlled or analytical data can be evaluated by SPECTRA^{plus} from any computer within your network or, for example, from your portable PC, wherever you are, via modem.

Sequential wavelength-dispersive XRF analysis with the S4 EXPLORER – the better way …



Sequential wavelength-dispersive XRF analysis:

- ***best light element sensitivity***
- ***high count rates (up to one million cps per element line) for high accuracy and short measuring time***
- ***best line resolution for accurate results***
- ***flexible background determination for reliable trace element analysis***



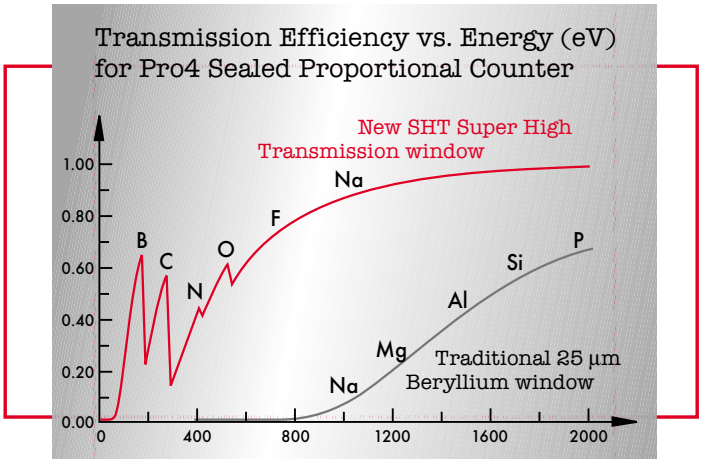
Electron transitions between the inner shells of atoms (K-, L- and M-shell) create X-rays of wavelengths (or energies) characteristic of the element. X-ray fluorescence analysis (XRF) uses this characteristic radiation for qualitative and quantitative element analysis.

The transitions between inner shells of atoms are not disturbed by chemical binding. Therefore another advantage of XRF analysis is that solid and liquid samples can be analyzed directly, whereas optical methods require evaporation of the sample material.

From fluorescence radiation the element characteristic wavelength (or energy) can be separated either by energy-dispersive ED-XRF analysis or by reflection at an analyzer crystal (wavelength-dispersive WD-XRF analysis).

WD-XRF analysis offers the advantage of the highest count rates and the best resolution.

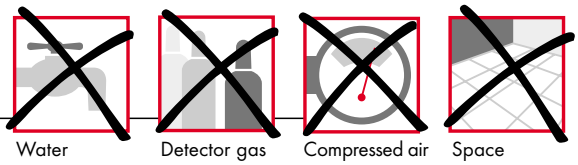
… realized in a totally new design – look what's inside:



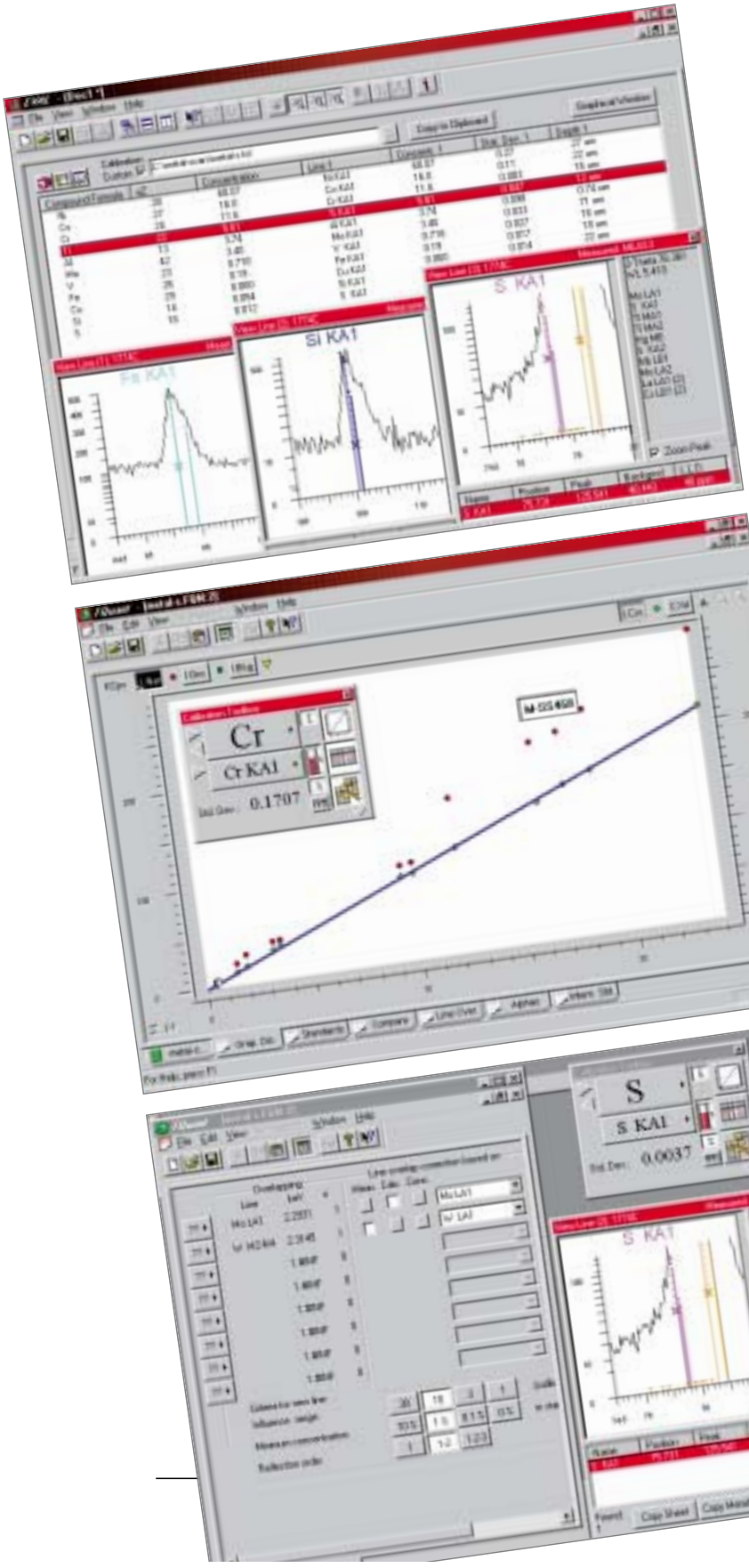
The analysis of very light elements requires an extremely thin detector window. Up to now the choice was a sealed proportional counter with a Beryllium window of low transparency or a flow proportional counter with a high transparency window, but with the requirement of a constant gas flow.

For the first time the Pro4 Super High Transmission sealed proportional counter offers ultra light element analysis with a closed detector.

- unique 1000 W excitation, up to 50 kV or 50 mA
- close coupling ceramic X-ray tube with 75 µm ultra thin X-ray tube window
- up to 10 primary beam filters
- vacuum seal for safe operation of liquids and loose powders
- up to 4 collimators
- up to 8 analyzer crystals
- encoder controlled goniometer with decoupled Theta and 2Theta
- scanning speed up to 200°/min
- Pro4 Super High Transmission sealed proportional counter for light elements
- high efficiency scintillation counter for heavy elements
- stable vacuum operation for optimal sensitivity and reproducibility
- minimized pumping times based on individual vacuum control of sample airlock



S4 EXPLORER and SPECTRA^{plus} – fully Integrated Analytical Intelligence …



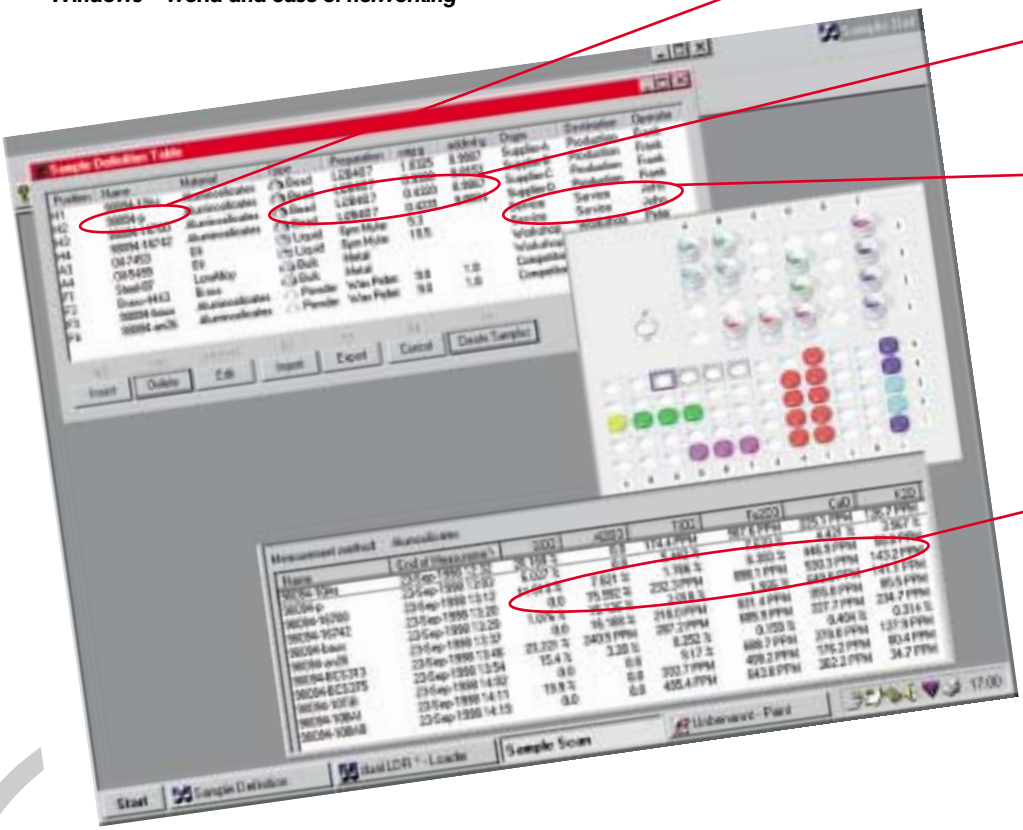
Standardless analysis with a minimum of user input or specific calibrations for the highest accuracy or lowest detection limits – S4 EXPLORER and SPECTRA^{plus} offer a seamless integration of qualitative, standardless ("semiquantitative") and quantitative methods.

The fully Integrated Analytical Intelligence is based on more than 40 years of experience in XRF analysis.

- ***precalibrated for all types of materials***
- ***intelligent measuring strategies applying the best parameters***
- ***totally flexible interactive data evaluation***
- ***automatic correction of spectral overlaps***
- ***fully integrated matrix correction with fundamental parameters individually calculated for each sample ("variable alphas")***
- ***simple and fast optimization with material specific standard samples***

… and open communication and unlimited data management

- ***integrated data base for all sample data***
- ***flexible integration of external sample data, for example from preparation or results of other analytical methods***
- ***simple data transfer within the Windows™ world and ease of networking***



manual or automatic input of sample name

sample data from preparation and other analytical methods

further sample data

SiO_2 56,3 % XRF results

spread sheet calculations

SPC applications (statistical process control)

graphical evaluations and presentations

reports, documentation, documents, etc.

S4 EXPLORER integration into LIMS (laboratory information management systems)

integrated data base with sample data sets

selection of results by specific criteria, such as date and time, operator, material, etc.