



# SPECTRO AI QUANT

Providing fast, easy AI &  
machine-learning-based  
semiquantitative analysis  
for SPECTRO ICP-OES instruments



# SPECTRO AI QUANT

The rapid route to easy elemental answers

Laboratories worldwide struggle to get and keep qualified personnel. So lab managers increasingly look to simplified, automated processes for reduction of operator workloads — plus savings in time and costs. One outstanding recent solution: the innovative SPECTRO AI QUANT semiquantitative software module for ICP-OES spectrometers from SPECTRO Analytical Instruments.

When a laboratory encounters an unknown sample, ICP-OES analyzer operators usually must develop a way to determine its composition. Semiquantitative analysis to approximate the sample's identification and concentration is the typical solution. SPECTRO AI QUANT adds the power and ease of artificial intelligence / machine learning to greatly streamline and supercharge this process.

With SPECTRO AI QUANT, there's no need to personally select elements and lines, or prepare various standards, or calibrate the analyzer for the new method. You simply click a few buttons — and get a semiquantitative analysis within minutes.

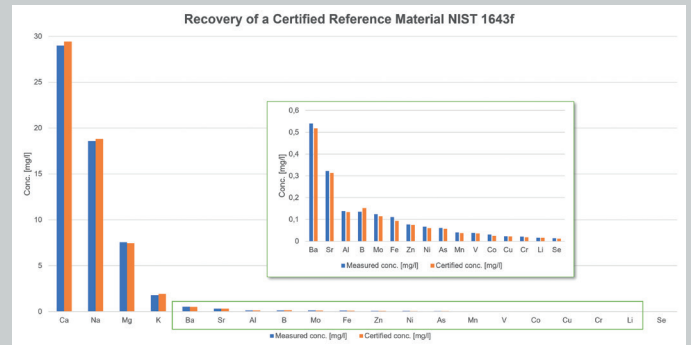
## PLUG-IN, POWERFUL, SECURE SOFTWARE

SPECTRO AI QUANT is an optional plug-in module for SPECTRO's proven ICP Analyzer Pro operating software. It packs targeted power and convenience for fast semiquantitative analysis. It's solidly secure: operating strictly locally, it never connects to any cloud. SPECTRO AI QUANT is currently available with purchase of, or as an upgrade to, the top-of-the-line SPECTRO ARCOS *inductively coupled plasma optical emission spectrometer (ICP-OES)*.

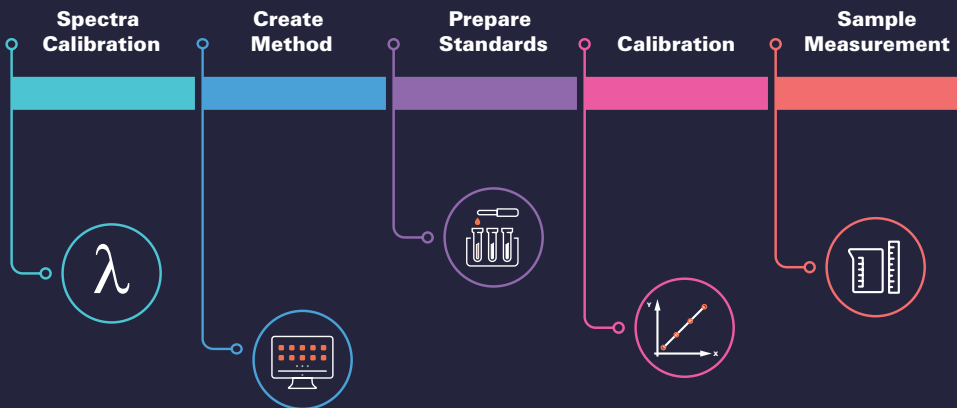
## SAVE TIME. AND TROUBLE.

SPECTRO AI QUANT can also accelerate the time-consuming process of developing new methods. And for certain samples, no such development may even be necessary; the software's initial semiquantitative measurement will prove sufficient. Depending on the task, users save hours ... or days.

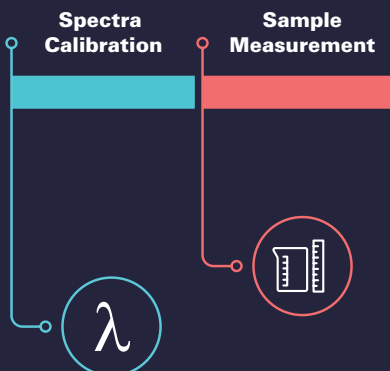
Even labs routinely running a variety of samples via an established method may benefit from adding a SPECTRO AI QUANT evaluation to the method, for quick identification of anomalies — covering elements not contained in the routine method.



### CONVENTIONAL WORKFLOW



### SPECTRO AI QUANT WORKFLOW



## ONLY ONE STANDARD. ONLY ONE SAMPLE.

Unlike other software, the unique SPECTRO AI QUANT semiquantitative method eliminates the need to painstakingly adapt models to a given instrument using multiple costly chemical reference standards, or to measure or recreate any standards. Instead, this advanced software module uses a single sample, to normalize the machine learning training data. The same sample is also used for Spectra Calibration, the SPECTRO method for normalizing the wavelength scale. So training data may simply be ported from one instrument to another, and can be supplied ready to use.



## TARGETED APPLICATION PACKAGES

SPECTRO AI QUANT software is initially released with an environmental application package bearing targeted training data. This set provides even better precision and accuracy specifically for relevant water/wastewater analyses.

Optionally available are these packages:



Food/Agronomy



Oil/Petrochemical



Precious Metals



Metallurgy



Rare Earths

Beyond its initial release for SPECTRO ARCOS, SPECTRO AI QUANT software will soon be available for SPECTROGREEN and SPECTRO GENESIS analyzers too.

# AI QUANT ADVANTAGES

Replacing traditional libraries, SPECTRO AI QUANT offers a brand-new lines library built entirely from scratch. Its 44,000 lines cover specific wavelengths for all 75 ICP-OES-analyzable elements. Based on empirical measurements of single-element standards, it characterizes every element. This even includes specific concentrations, since the new library provides — for the first time — sensitivity information for each line, normalized to the target instrument.

Additionally, the software may incorporate machine learning training data for a range of different applications. Available as optional plug-ins, these add even richer data sets targeted for specific applications. And as requested, the software can take method information already on the instrument and integrate it into SPECTRO AI QUANT training data.

Other software might require running relevant samples for the training package on each instrument. But SPECTRO AI QUANT can use proprietary SPECTRO Spectra Calibration to transfer training data from one instrument and normalize it on another.

## SIMPLE STEPS FROM START TO FINISH

The SPECTRO AI QUANT module features simple, intuitive displays providing advanced ease of use. For operators familiar with ICP analyzers, it takes only minutes to learn and use.

To begin, from the ICP Analyzer Pro main menu, select the new AI QUANT Analysis button. Then simply click on Start. Enter a sample ID. If needed, modify the measurement parameters. Then click the Measure button to begin analysis. The software does the rest.

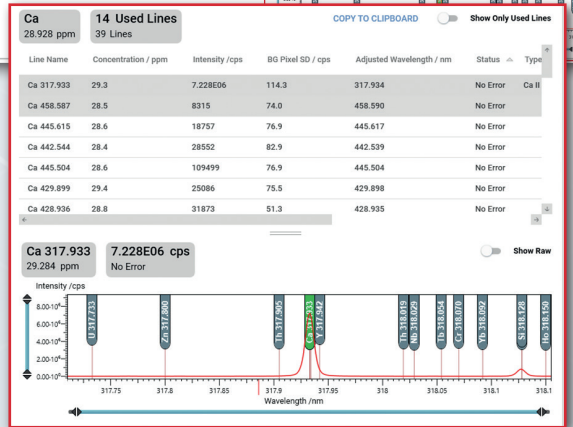
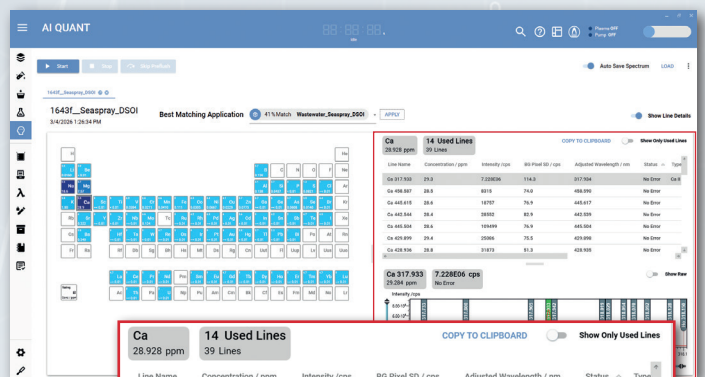
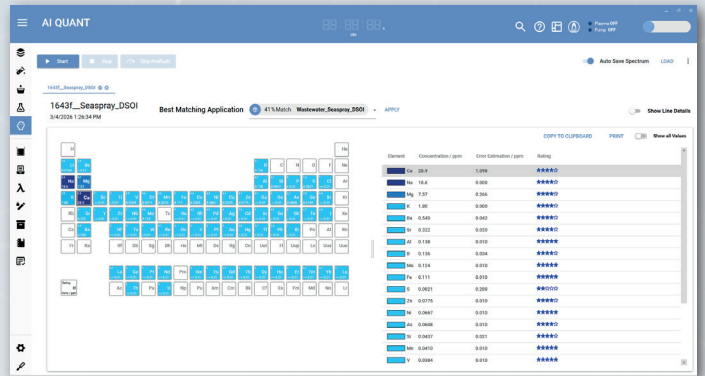
Your results are clear — and packed with information. A periodic table shows color-coded element concentrations as a heatmap (darker equals higher concentration). An accompanying list in descending concentration order includes an error estimate and a “safe” rating (the higher the rating, the greater the confidence). Click on any element to see details of each line used for evaluation of the result, including possible interfering lines.

## SUPPLEMENT ROUTINE ANALYSES

The software can also be run after a routine analysis. Analyze a sample with known elements, using an established quantitative method. Then AI QUANT can add a quick semiquantitative analysis — and give approximate concentrations of additional elements present.

## RE-ANALYZE STORED RESULTS

Since SPECTRO ICP-OES analyzers archive the complete spectrum for all analytical results, SPECTRO AI QUANT can even be run retrospectively. Thus long after a sample is gone, users can still semiquantitatively determine additional elements it contained that weren't sought in the initial analysis.



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# SPECTRO AI QUANT



## A SUPERIOR SET OF ICP-OES ANALYZERS

A global leader in ICP-OES and ED-XRF analytical technologies for more than 40 years, SPECTRO provides one of the industry's most comprehensive suites of advanced elemental analyzers. Its ICP-OES solutions include:

**SPECTRO ARCOS:** SPECTRO's flagship ICP-OES benchtop analyzer, delivering excellent performance for next-level elemental analysis.

**SPECTROGREEN:** an ultra-flexible ICP-OES benchtop analyzer, available in three versions, that applies innovative technologies for both challenging and routine applications.

**SPECTRO GENESIS:** a high-performance, high-value ICP-OES benchtop analyzer for routine analyses.

## OUTSTANDING SUPPORT

Maximize SPECTRO analytical reliability and uptime with AMECARE Performance Services. Hundreds of support engineers, based in over 50 countries, are highly trained in just the relevant technologies. So they can deliver focused, fast, smart, on-the-spot service. Results: virtually uninterrupted performance plus maximum ROI over your instrument's life. Available programs include targeted training (onsite as well as ultra-convenient online), plus proactive performance maintenance, performance upgrades, applications solutions, consultation, and ongoing support. Secure, unidirectional SPECTRO PROTEKT global monitoring even offers remote diagnostics and alerts!



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

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