X-RAY FLUORESCENCE

SMART-QUANT FP

Powerful Standardless Analysis Solution for the S2 PUMA Series 2

What is SMART-QUANT FP?

SMART-QUANT FP is the standardless solution for the elemental analysis of unknown samples and samples without available calibration standards in your lab!

What can SMART-QUANT FP do for me?

SMART-QUANT FP can analyze solid, fused bead, pressed pellet, loose powder, and liquid samples with elemental concentrations from ppm to 100%. It delivers reliable elemental data from Na to U with only very minimum user input: Place a sample into the instrument, select the solution, press Start – all with the instrument's unique TouchControl™.

Why SMART-QUANT FP?

SMART-QUANT FP works in full Fundamental Parameter (FP) mode – this means no calibrations necessary! The unique FP algorithm assumes all the analytical work and delivers quality results by push-button. More advanced users still have a tool box full of options to tweak the algorithm to their needs (see below).
This makes SMART-QUANT FP easy to operate and yet powerful and versatile for optimal analysis results.

How is SMART-QUANT FP different?

SMART-QUANT FP's full-spectrum background fitting includes ranges, lines, tails, shelfs, Compton, Rayleigh, and escape peaks. This state-of-the-art and future-compatible approach describes the full spectrum and thus delivers better results, e.g. through advanced overlap correction.

Quick Answers to Your Analytical Questions

Powerful and Flexible – That's SMART-QUANT FP

- **High-performance standardless analysis**
  The analytical intelligence of our FP engine delivers high-quality analytical results within minutes and makes calibrations and set-up samples obsolete – no more time-consuming configurations of solutions!

- **Change evaluation parameters after the fact**
  Change compound species, add elements, or use another analytical line: No need to re-measure, simply re-evaluate – with the Evaluation Plug-In!

- **Seamless results assessment and reporting**
  The complete integration of SMART-QUANT FP into the instrument software SPECTRA.ELEMENTS ensures smooth data handling. Analysis results can be viewed quantitatively and qualitatively with a wide range of display options in the Results Manager. Adjustable templates allow for print-by-click of customized result summaries.

Top Features for Best Performance

- Just three solutions cover all applications
- One global drift correction adjusts all linked solutions in one go
- Enhanced overlap correction for improved accuracy
- Element identification reduces compound list of elements for which no peak could be identified and reduces quantification speed
- Standardless analysis under air, helium, and in vacuum, for S2 PUMA with 30 and 50 kV

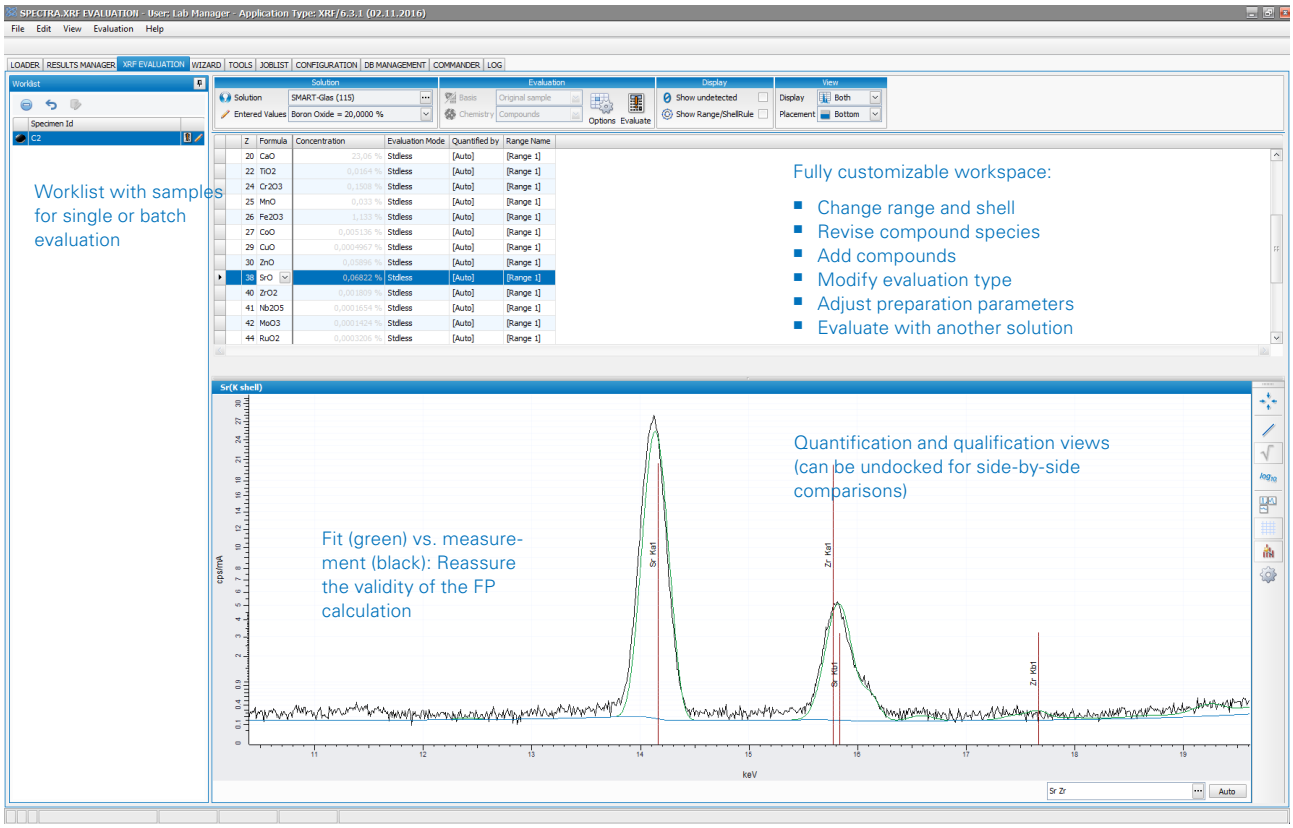
Optimized Solutions for Your Analytical Tasks

SMART-QUANT FP offers a wide range of Advanced Evaluation Options:

Parameter	Adjustment
Scaling by scattered background	Powerful small sample correction using Compton and Rayleigh scattering; useful when measuring with masks or irregularly shaped samples
Filter per range	Selects weighting of the calculation algorithm (acts as low/high pass filter)
Regions of interest per range	Useful to cut out unwanted areas of the spectrum, e.g. diffraction peaks
Lock X-ray line ratio	Can give better results for inhomogeneous and irregular samples
Range and shell selection for quantification	Lets user select the shell which gets used for quantification; implies full analytical flexibility and allows tweaking of results
Background offset fitting	Provides enhanced user flexibility and adjustments particularly for light element applications
Background model	Optional empirical background model for unusual samples
Number of iterations	Set for best analytical performance or evaluation speed
Optimization limit	The optimization limit defines the degree of the agreement between the simulation and measurement

The New Standard for Standardless Analysis – SMART-QUANT FP with Evaluation Plug-In

SMART-QUANT FP's powerful Fundamental Parameter algorithm delivers reliable results for unknown samples. To make our standardless solution an even better analytical tool, we created the Evaluation Plug-In which allows the modification of many evaluation parameters and the re-evaluation of the results.



SMART-QUANT FP: Analyze Any Sample

Three solutions, SMART-Elements, SMART-Oxides, and SMART-Matrix, cover all standardless applications. No matter if:

- Solid or liquid
- Prepared or as-is
- Small or bulk size
- Large- or small-spot samples

All in a matter of minutes: Get quick and reliable elemental analyses with SMART-QUANT FP.

Table 1
Standardless analysis of cement prepared as fused bead (1 g sample, 8 g flux)

	Certificate [wt.-%]	SMART-QUANT FP [wt.-%]
MgO	1.7	1.6
Al_2O_3	8.8	9.6
SiO_2	30.3	30.8
P_2O_5	0.19	0.00
SO_3	3.2	3.1
K_2O	2.1	1.9
CaO	48.2	48.2
TiO_2	0.47	0.48
Cr_2O_3	0.01	0.00
Mn_2O_3	0.12	0.08
Fe_2O_3	3.5	3.8
ZnO	0.04	0.00
SrO	0.25	0.25

Table 2
Standardless analysis of iron ore fused bead sample (1 g sample, 8 g flux)

	Certificate [wt.-%]	SMART-QUANT FP [wt.-%]
MgO	1.7	1.8
Al_2O_3	2.44	2.20
SiO_2	7.2	7.4
P_2O_5	0.34	0.31
K_2O	0.18	0.29
CaO	7.89	7.42
TiO_2	0.16	0.15
Cr_2O_3	0.03	0.07
MnO	0.66	0.64
Fe_2O_3	79.4	79.5
ZnO	0.01	0.00

Table 3
Standardless analysis of high-chrome steel sample

	Certificate [wt.-%]	SMART-QUANT FP [wt.-%]
Al	0.03	0.00
Si	0.48	0.59
P	0.03	0.03
V	0.12	0.06
Cr	17.2	17.1
Mn	1.28	1.22
Co	0.13	0.00
Ni	9.3	8.9
Cu	0.17	0.25
Nb	0.33	0.34
Mo	0.39	0.46
W	0.14	0.29
Fe (as balance)	70.40	70.76

Your SMART-QUANT FP Advantages

- Push-button solution for quick and reliable analysis of unknown samples
- Three standardless solutions fit all: SMART-Elements, SMART-Oxides, and SMART-Matrix
- Adjustable standardless solutions optimized for your tasks
- Powerful FP machine with optional empirical background for full operator flexibility
- Intelligent algorithm with peak identification
- Element ID for fast evaluations
- Advanced peak overlap correction
- Evaluation Plug-In to get the most out of your analysis without re-measuring
- Extended evaluation options for advanced user flexibility
- One global drift correction for all solutions

Bruker AXS is continually improving its products and reserves the right to change specifications without notice.
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