



## X-RAY FLUORESCENCE

# S2 PUMA Series 2 Automation

### The Automated Benchtop EDXRF for Professionals – Elemental Analysis in Automated Labs

Stringent process control is required in more and more industries to ensure ever closer margins for increased profitability. This includes many applications, and one of the most important ones are process and product quality control.

Traditional techniques quickly are overstrained by the requirements, as they are either too slow or too expensive. X-ray fluorescence (XRF) is a well-established technique for elemental analysis in many industrial segments. Larger XRF instruments are used all over the world in different fully automated industry labs as a means to fast and reliable elemental data.

**The S2 PUMA Automation now combines the advantages of industry standard automation features with a smaller benchtop XRF instrument.**

This small but powerful energy-dispersive XRF (EDXRF) unit is set up to run 24/7 in industrial environments. It is purpose-built for high instrument uptime and low operating costs through an array of active

and passive instrument protection components and only needs electrical power as consumable.

This makes it the ideal choice to run process control analysis either standalone or as backup system for larger wavelength-dispersive XRF (WDXRF) units.

#### Features for reliability

The S2 PUMA Automation can be connected to a conveyer belt or a robot arm for sample feed. The **AXSCOM** software ensures that the system can be integrated seamlessly into new or existing automated labs. When running autonomously, an integrated **HD camera** can take pictures of every analyzed specimen for sample verification.

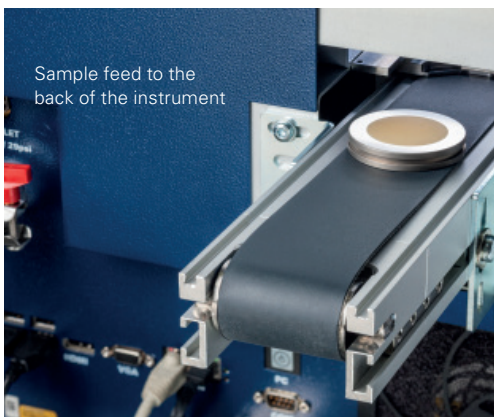
# S2 PUMA Series 2 Automation – Your Reliable Partner in Process Control



S2 PUMA Series 2  
EDXRF with WDXRF  
sample handling

Our intelligent uninterruptible power supply **Smart-UPS** ensures that the samples gets retrieved form the chamber before shutting down the system safely in case of a power outage. Our dedicated **SampleCare™** system against instrument contamination and the **heavy duty filter box** for dusty environments increase instrument uptime and add peace of mind. **Measurements under vacuum** increase analytical performance and reduce running cost due to the omission of expensive helium gas.

Industry-specific **QUANT** packages offer turn-key solutions with certified reference materials (CRMs) according to required norms, e.g. ASTM C114. This means, that the instrument is up-and-running without lengthy analytical installation routines.



Sample feed to the  
back of the instrument



Sample transportation  
into the instrument from  
conveyer belt or robot arm



Integrated sample flipper  
enables careful sample  
transportation on conveyer  
belt



Insertion of sample into  
sample chamber directly  
or via buffer positions

# Analytical Performance in Shortest Time – Every Time, all the Time

Instrument Features and Benefits	
Sample feed interface	Automated sample feed to the back of the instrument, leaves front accessible for out-of-line samples
Sample flipper	Ensures untouched sample surface gets analyzed for best analytical reliability
Buffer positions	Compensate for irregularities in the sample output of the automation process
EasyLoad tray	20 position sample tray for all non-automated samples
AXSCOM	Communication software to ensure full integration of the instrument into the automated lab environment
LIMS	Full lab information & management system (LIMS)-compatibility for data exchange
TouchControl	Easy and safe instrument control for routine analysis directly at the instrument and without external PC
HD camera	Integrated camera takes pictures of samples within chamber for verification
HighSense XP SDD	Fast X-ray silicon drift detector with short measurement times even for light elements (LE)
50 W X-ray tube	High-power X-ray tube for highest intensities contributes to short measurement times
Sample rotation	For best analysis results for pressed pellet samples
Vacuum atmosphere	Lowest running cost and highest analytical performance without the need for helium flushing
SampleCare	Multilayer system to protect vital instrument components against contamination for highest operational uptime and lowest running cost
Smart-UPS	Intelligent Uninterruptible Power Supply (UPS) which lets instrument retrieve sample from chamber before shutting down safely in case of a power outage
Heavy duty filter box	Additional filter box for dusty environments, an extra layer of safety to increase instrument uptime
QUANT packages	Industry-specific turn-key solutions based on CRMs (e.g. CEMENT-QUANT, GEO-QUANT Basic)
Bruker Support	Global Helpdesk and tailor-made LabScape Support Solutions

To demonstrate the short measurement times and high precision on the S2 PUMA Automation, a cement raw meal pressed pellet sample was analyzed 10 times under vacuum. The sample was retrieved from the chamber after every analysis. Measurement time was 100 seconds.

	Na <sub>2</sub> O	MgO	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	P <sub>2</sub> O <sub>5</sub>	SO <sub>3</sub>	Cl	K <sub>2</sub> O	CaO	TiO <sub>2</sub>	MnO	Fe <sub>2</sub> O <sub>3</sub>	SrO
	[wt.-%]												
Rep-01	0.137	1.81	4.45	15.91	0.026	0.680	0.126	0.418	39.84	0.228	0.021	2.50	0.019
Rep-02	0.136	1.84	4.44	15.85	0.027	0.685	0.125	0.422	39.79	0.223	0.024	2.48	0.020
Rep-03	0.142	1.87	4.51	15.86	0.026	0.678	0.126	0.422	39.87	0.225	0.022	2.49	0.021
Rep-04	0.145	1.85	4.48	15.97	0.027	0.683	0.127	0.429	39.82	0.222	0.025	2.49	0.019
Rep-05	0.134	1.83	4.46	15.90	0.027	0.679	0.125	0.422	39.75	0.225	0.023	2.49	0.019
Rep-06	0.140	1.79	4.44	15.84	0.027	0.676	0.125	0.425	39.81	0.220	0.021	2.48	0.019
Rep-07	0.148	1.84	4.45	15.89	0.027	0.681	0.124	0.423	39.78	0.224	0.022	2.49	0.020
Rep-08	0.145	1.83	4.47	15.99	0.026	0.683	0.125	0.424	39.82	0.227	0.023	2.48	0.017
Rep-09	0.140	1.84	4.47	15.94	0.026	0.674	0.125	0.422	39.87	0.230	0.022	2.48	0.016
Rep-10	0.145	1.85	4.44	15.96	0.026	0.685	0.125	0.422	39.86	0.225	0.022	2.48	0.020
Average [wt.-%]	0.141	1.83	4.46	15.91	0.027	0.680	0.125	0.423	39.82	0.225	0.023	2.49	0.019
Std. Dev. [wt.-%]	0.005	0.022	0.023	0.052	0.001	0.004	0.001	0.003	0.042	0.003	0.001	0.007	0.001
Rel. Std. Dev. [%]	3.25	1.20	0.52	0.33	1.99	0.55	0.66	0.66	0.10	1.30	5.64	0.27	7.85

## Your S2 PUMA Automation advantages

- Professional automation solution for benchtop EDXRF based on WDXRF sample handling technology
- Instrument retains its full analytical capabilities through sample feed interface at the back
- Powerful tube and detector for short measurement times and high analytical performance
- Versatile software for seamless integration into fully automated labs
- Easy-to-use operation without external PC via integrated touchscreen
- Integrated HD camera for sample documentation and verification
- Active and passive instrument protection systems for reliability and uptime
- Requires electrical energy as the only consumable for lowest operating costs
- Global support through our industry specialists



## The S2 PUMA is the ideal solution...

- ...for small automated (container) labs
- ...as a backup in complex automated environments with WDXRF as the main solution



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