Revolutionary New Valve for *FAST* & prep*FAST*

SAMPLESENSE

Automatically detects and injects the sample and triggers the ICP/ICPMS

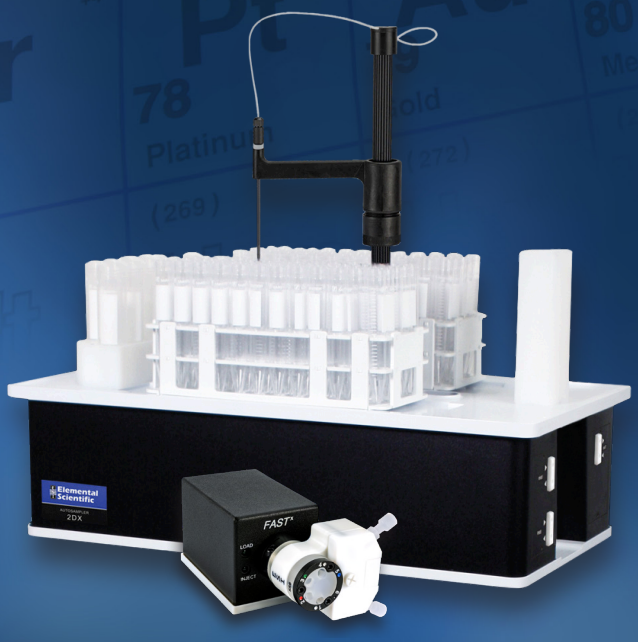
Elemental Scientific
ICP | ICPMS
WWW.ICPMS.COM

What is SAMPLESENSE?

SampleSense (patent pending) is a fully automated sampling valve for ICP and ICPMS that provides:

- Active verification of sample loading
- Automatic triggering for analysis
- Full integration with Elemental Scientific autosamplers and *FAST* technologies

SampleSense SS7+ Valve



SC2-DX Autosampler and *FAST* with SampleSense

Ease of Use

- Eliminate all sample uptake method development – no uptake delays required
- Change sample loop sizes without needing to alter method settings

Intelligent Sample Verification (ISV)

- Support small volume samples
- Minimize sample consumption
- Automatically load samples that vary in viscosities

Productivity Enhancement

- Improve sample throughput by 2-5x with discrete sampling
- Reduce exposure of samples to instrument for lower required maintenance
- Reduce consumption of argon, power and reagents

How is SAMPLESENSE Unique?

Viscosity Differences

One valve, one loop and one method for multiple sample types. SampleSense accounts for viscosity and automatically adjusts timing.

Time Savings

Operator time for sample introduction method development is eliminated. Just run samples.

Sample Savings

The sample is injected at precisely the right time. Every time. Even for small samples.

Error Notification

Incomplete sample loading or bubbles in the sample are detected and logged.

SampleSense with ISV technology also provides these capabilites:

- Optimized loading conditions for each sample matrix
- Automatic compensation for drift caused by kinked lines or partial blockages
- Monitors and logs sample loading issues caused by:
  - Empty tubes or positions
  - Capped vials
  - Empty standard or QC
  - Bubbles present in sample loop

FAST with SAMPLESENSE

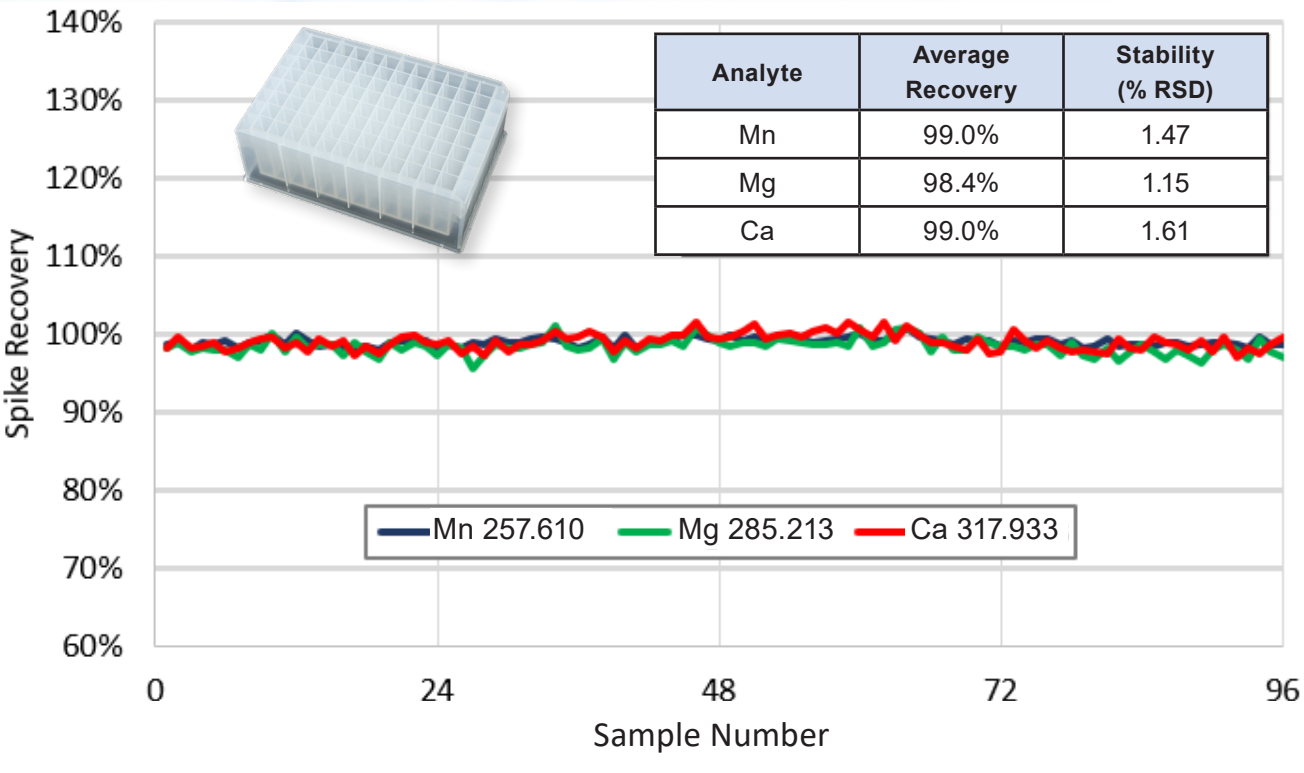
***FAST* has been trusted for over a decade in thousands of ICP/ICPMS laboratories worldwide.**

FAST is a valve injection automation system with rapid vacuum sample loading that more than doubles sample throughput, saves time, reagents and utilities.

Combining *FAST* with SampleSense provides an even higher level of automation, ease-of-use and sample throughput. Liquid samples are instantly detected, injected and the analysis is triggered automatically.

***FAST* valve module with SampleSense**

***FAST* with SampleSense – Small Volume Sample Loading from 96 Well Microtiter Plate**



Analyte	Average Recovery	Stability (% RSD)
Mn	99.0%	1.47
Mg	98.4%	1.15
Ca	99.0%	1.61

Figure 1. *FAST* with SampleSense demonstrating support for small volume samples. 96 well microtiter plate positions were filled with 750 µL of a 1 ppm QC standard and then loaded utilizing SampleSense into 250 µL sample loop. Excellent reproducibility exhibited for automated loop loading with SampleSense on ICP-OES system.

prep*FAST* with SampleSense

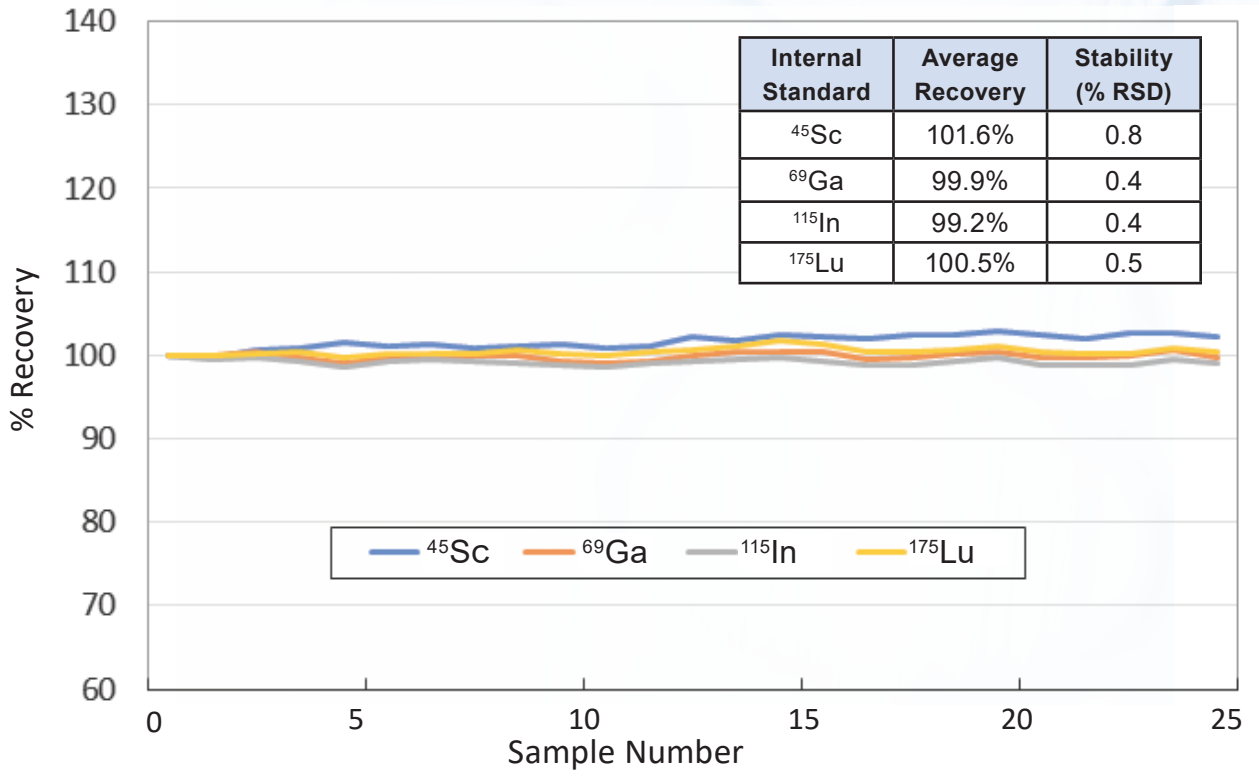
prep*FAST* is an automated inline dilution system for ICP/ICPMS sample introduction.

The high-throughput prep*FAST* system eliminates manual dilution, reduces reagent usage and improves laboratory productivity.

SampleSense integrates fully with the prep*FAST* for an even higher level of automation and ease-of-use.

prep*FAST* valve module with SampleSense

prep*FAST* with SampleSense - Viscous Sample Loading of Concentrated Sulfuric Acid

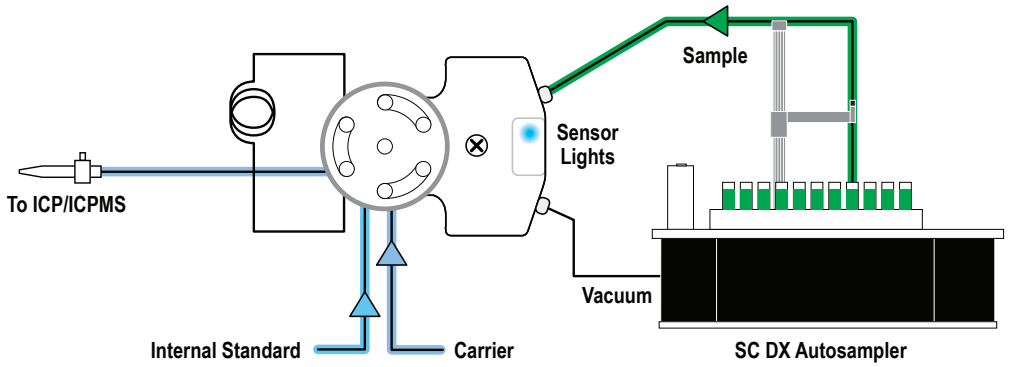


Internal Standard	Average Recovery	Stability (% RSD)
^{45}Sc	101.6%	0.8
^{69}Ga	99.9%	0.4
^{115}In	99.2%	0.4
^{175}Lu	100.5%	0.5

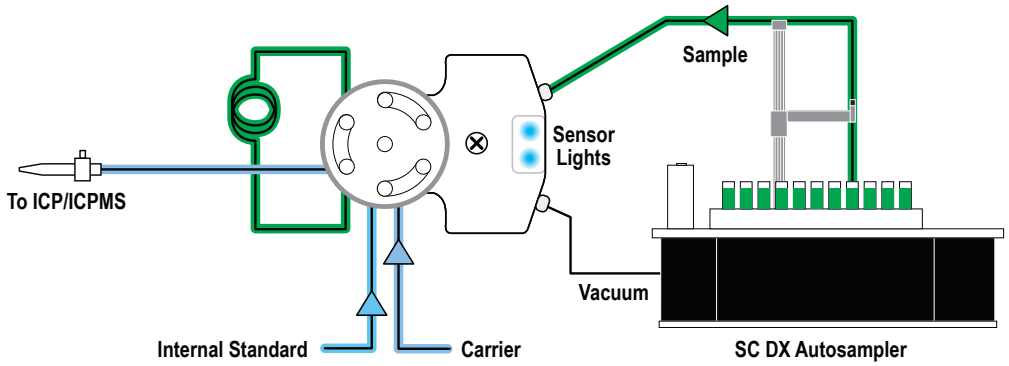
Figure 2. prep*FAST* with SampleSense for viscous sample loading. Concentrated sulfuric acid (H_2SO_4) was loaded without dilution into a 1.5 mL sample loop, then immediately diluted online 50x with prep*FAST*. The H_2SO_4 was automatically determined by SampleSense to require 100 sec to fully load the sample loop; water only requires 8 seconds. Results are from analysis by ICPMS over 2.5 hours showing excellent stability in this highly viscous matrix as displayed by the internal standard species.

Automated SAMPLESENSE Operation for *FAST* Technologies

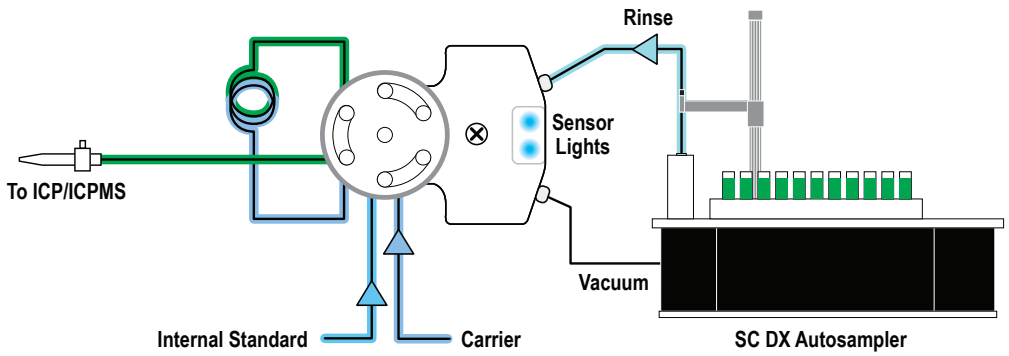
① Initiate Sample Loading - Inlet Sensor Activated



② Sample Loading Complete - Exit Sensor Activated



③ Sample Analysis Automatically Triggered by SampleSense

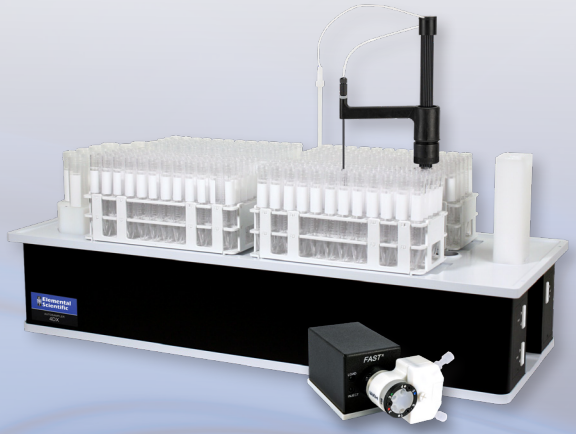


*Note: prep*FAST* sample loading follows same process as shown above

FAST Systems with SAMPLESENSE

SampleSense is exclusively available for *FAST* technologies

- Completely automate the entire sample introduction process with ISV technology
- Eliminate method development for sample uptake
- Dynamically optimize sample loading
- Automatically trigger ICP/ICPMS data acquisition



SC4-DX Autosampler and *FAST* with SampleSense

SC2-DX Autosampler and prep*FAST* with SampleSense

The only sample introduction valve on the market with optical sensor technology.

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