

# brineFAST S4™

for Avio 500 ICP

## Improve Detection Limits for Alkaline Earth and Transition Metals In High Purity Brines

The brineFAST is a fully-automated, online preconcentration and matrix removal system that improves detection limits for Ca, Mg, Fe, Ba, Sr, Mn and other elements in undiluted brines by more than an order of magnitude making trace impurity analysis possible with ICP.

Early detection of low and sub-ppb alkaline earth and transition metals in high-purity brines improves chlor-alkali plant process control and prevents costly damage to fluoropolymer membrane cells. Undiluted 30% brines may be sampled and analyzed directly, eliminating sample preparation and reducing contamination.

### Features:

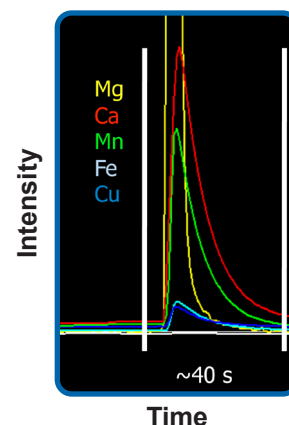
- Fully automated, inline preconcentration and matrix removal
- Direct mode with up to 50x fixed inline dilution
- Syringe-driven reagents
  - Consistent chemistry
  - Maximum throughput
  - Cleanliness
- No daily maintenance
- Detection limits in brine up to 400x better than traditional sample introduction

### Applications:

- Preconcentration mode for determination of low and sub-ppb Ca, Mg, and other metals in 30% brine
- Chlor-alkali plant product monitoring for caustic soda and bleach
- Determination of alkali earth metals and many transition metals in any high-matrix sample
- High throughput FAST analysis with inline dilution in direct mode

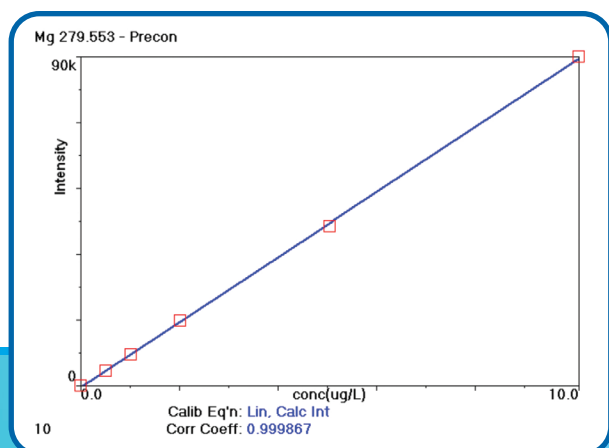


2 DXCi brineFAST S4 system for PerkinElmer Avio 500

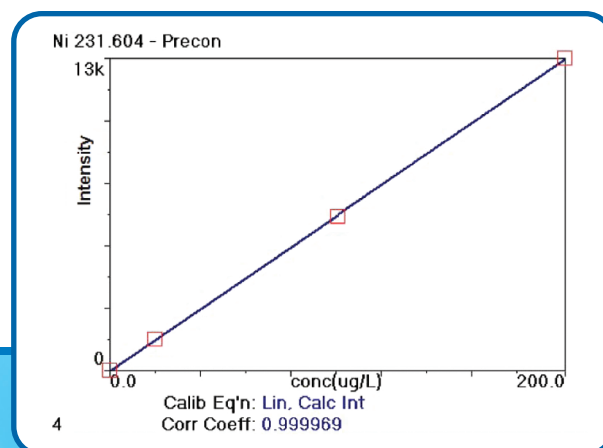


### Elution Profiles

Simultaneous elution profiles for preconcentration elements allows simple quantification after matrix removal.



Typical calibration for 50% caustic soda (10x diluted) demonstrating linearity at higher concentrations. If needed, higher level calibrations at the ppm level are also linear.

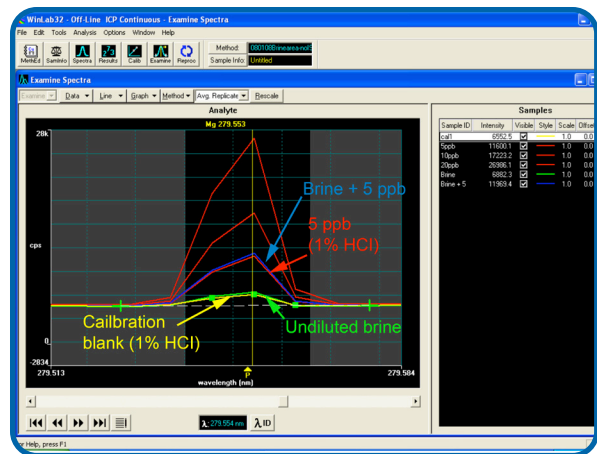
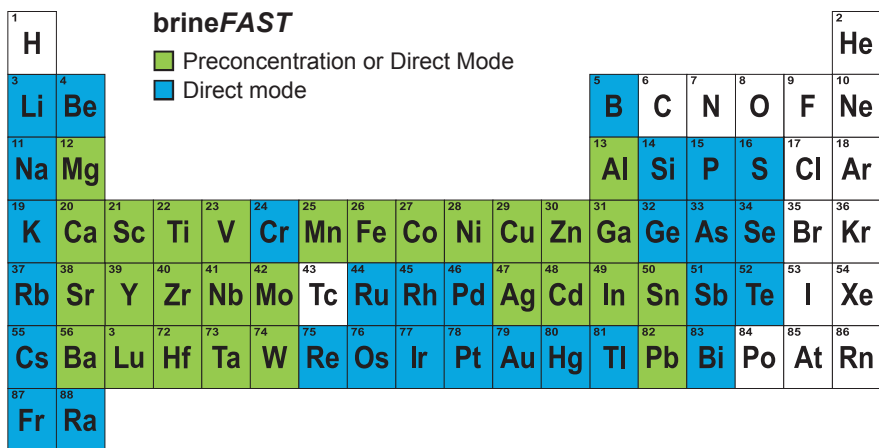


Typical calibration for ultra-pure brine, <10 ppb.

# brineFAST S4 - Fully Automated, Inline Preconcentration and Matrix Removal

## All brineFAST S4 Systems Include:

- DX FAST autosampler
- S400V syringe pump module
- FAST DXi dual valve module and all connections
- brineFAST S4 concentrator column
- brineFAST S4 cleanup column
- Mobile autosampler station



Spectral data shows equal response for a Mg spike in a 1% HCl standard and 30% brine.

### Spike recovery in 50% caustic soda (10x diluted)

Analyte	% Recovery
Fe	99
Ni	99
Cu	99
Pb	101

Spike recoveries in 50% caustic soda (10x diluted) show excellent recovery against a calibration prepared in diluted nitric acid. Spike level is 50 ppb (500 ppb for Fe).

### Method Detection Limits Comparison in 30% Brine

Analyte	Traditional (ppb)	brineFAST S4 (ppb)	Improvement Factor
Ca	8.0	0.02	410
Mg	1.7	0.01	190
Fe	6.3	0.2	28
Ba	1.4	0.2	7
Sr	1.1	0.01	150
Mn	1.2	0.02	57

### Percent Spike Recovery Comparison in 30% Brine

Analyte	Traditional Introduction (spiked at 100 ppb)	brineFAST S4 (spiked at 5 ppb)
Ca	132	103
Mg	64	96
Fe	104	95
Ba	106	99
Sr	75	99
Mn	111	99

Comparison of spike recoveries for traditional analysis and the brineFAST S4 preconcentration technique. Note that the spike levels are 20x lower with the brineFAST S4 than with the original introduction system.

brineFAST S4 System	
Description	Part Number
SC2 DX brineFAST S4 system for Avio 500	2BF-S4-37C
Spare brine preconcentration column	CF-IDA
Spare trace metals cleanup column	CF-M-0600