2019

Products and Consumables Catalog

Advanced Sample Introduction Systems

For PerkinElmer Avio 200 & 500 ICP

PerkinElmer®
For the Better

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Quick Reference

Introduction to Automation

SC DX Autosamplers
Durable, chemically inert autosamplers featuring dual flowing rinse stations to reduce carryover. DX autosamplers are *FAST* ready and have two rinse pumps to supply independent solutions to each rinse station, while DXe autosamplers have a common rinse pump that uses a tee connection to supply single rinse solution to both stations. (Pages 4-5)

FAST
High-throughput, automated sample introduction system that uses valve injection with rapid vacuum sample loading to more than double the productivity, minimize instrument maintenance, and reduce operating costs. (Pages 6-7)

prep*FAST*
Automated inline dilution system that eliminates manual dilution, reduces reagent usage, and improves laboratory productivity. These systems use a syringe module to perform precise and accurate inline dilutions of standards and samples. prep*FAST*, base version; prep*FAST* e, economical; prep*FAST* M5, syringe-driven sample loading. (Pages 8-19)

Application Systems
Advanced automation systems that combine *FAST* and prep*FAST* technologies with application specific sample introduction components to allow for the analysis of nanoparticles, high matrix samples, semiconductor chemicals and chromatography samples. (Pages 20-29)

pergo
Argon humidifier with a water vapor permeable membrane that improves performance and stability of all concentric nebulizers, specifically when analyzing brines, fusion digests, and high TDS samples. (Pages 42-43)

PC^{3X}
Peltier-cooled or heated inlet system for cyclonic spray chambers that provides thermal stabilization to improve short and long-term stability. (Page 56)

PC^{3}-LT
Peltier-cooled low temperature inlet system for cyclonic spray chambers that reduces the solvent load on the plasma for the analysis of 100% organic solvents. (Page 57)

Terminology

Rinse Pump	Supplies solution to rinse station; DXe has common rinse pump that uses a tee connection to supply single rinse solution to each station; DX has two rinse pumps to supply independent rinse solutions to each station.
Dual Rinse	DX autosamplers come with two rinse stations; the first to remove residue from the previous sample from the probe exterior, and the second for vacuuming rinse solution to rinse the entire system.
MP^{2}	Precision micro peristaltic pump.
***FAST* (DXe & DX)**	Valve and loop combination that rapidly vacuum loads and injects sample.
***FAST* Pump**	Allows rapid, vacuum sample loading into a loop on a *FAST* valve.
***FAST* Basic**	*FAST* system that includes nebulizer.
***FAST* Complete**	*FAST* system that includes torch, injector, spray chamber, nebulizer, and PC.^{3}

TABLE OF CONTENTS

SC DX Family of Autosamplers

SC DX autosamplers are durable, chemically inert, and feature dual flowing rinse stations to reduce carryover. Versatile rack configurations along with the ability to upgrade to any high-throughput *FAST* or autodiluting prep*FAST* system, make the SC DX autosampler the perfect foundation for automation in any trace metal lab. They are available in seven models having five capacities ranging from the SC Micro to the SC 14DX, the largest on the market.

Benefits:

- Durable dual rail system
- Dual flowing rinse stations
- Precision sampling
- Reset probe – prevents probe damage
- Flexible rack configurations
- Upgradeable to *FAST* or prep*FAST*
- SC2 DXe and SC4 DXe economical versions available

SC DXe Economical Autosampler vs. SC DX *FAST* Ready Autosampler		
Configurations	**DX**	**DXe**
Probe	2	1
Sample & Standards Rack Pkg	1	1
Polypropylene Rinse Bottle (4L)	2	1
FAST Vacuum Pump	1	0
Dual Flowing Rinse Stations	1	1
Rinse Pump	2	1

SC14 DX

SC8 DX

SCMicro DX

SC2 DX

SC4 DX

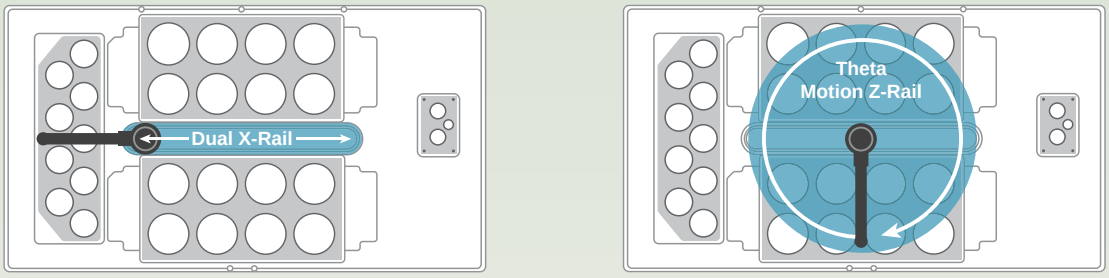
Economical Autosamplers

SC2 DXe

SC4 DXe

SC DX Autosamplers are Engineered to be Precise and Durable

All SC DX autosamplers are designed for the trace metal lab. They utilize a Dual X-rail design combined with a large diameter Z-rail with theta angular motion for precise sampling. All SC DX components are constructed using chemically resistant materials for an exceptionally long lifetime.

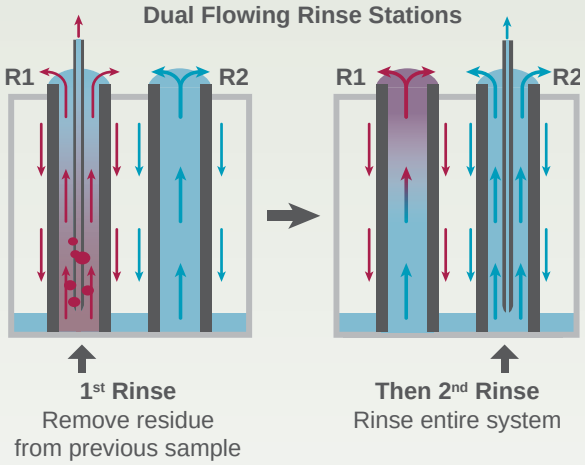


SC Micro DX autosampler shown

Dual Rinse Stations Reduce Carryover

Eliminating carryover is vital for accurate data and paramount to the production laboratory.

All SC DX and SC DXe autosamplers have dual rinse stations to minimize sample-to-sample carryover. Rinse liquid is supplied by a common rinse pump (DXe) split between two rinse stations or with two independent rinse pumps (DX), one for each rinse station. With independent rinse pumps, each station can use a different rinse solution to effectively rinse wide-ranging sample types while minimizing rinse solution consumption.



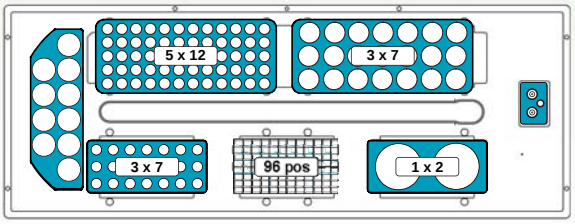
SC DX Autosamplers are Versatile and Upgradeable

SC DX autosamplers are available in a range of sizes, with capacities from 2 micro racks (SC Micro DX) to 14 large racks (SC14 DX).

Flexible rack configurations permit almost any sample size, from microplates and micro vials up to 500 mL and larger bottles to be automatically analyzed.

All SC DX autosamplers have the ability to upgrade to any *FAST* high throughput or prep*FAST* autodilution system.

Versatile Rack Configurations



SC4 DX shown with 5 x 12 and 3 x 7 large racks, 3 x 7 micro rack (MR), 96 well microplate, MR bottles - 2 x 250 mL

Model	Part Number	Large Rack Capacity	Microplate/ Micro Rack Capacity	MAXIMUM SAMPLE CAPACITY			
				50mL	15mL	8mL	MT-96
SCMicro DX	N8150392	0	2	20	42	80	192
SC2 DX	N8150390	2	4	52	120	180	384
SC2 DXe	N0786010						
SC4 DX	N8150391	4	6	94	240	360	576
SC4 DXe	N0786011						
SC8 DX	N8150393	8	-	208	480	720	-
SC14 DX	N8150394	14	30*	304	840	1260	2880*

*Special version SC14 for microplates

FAST SYSTEM
for Avio 200/500 ICP

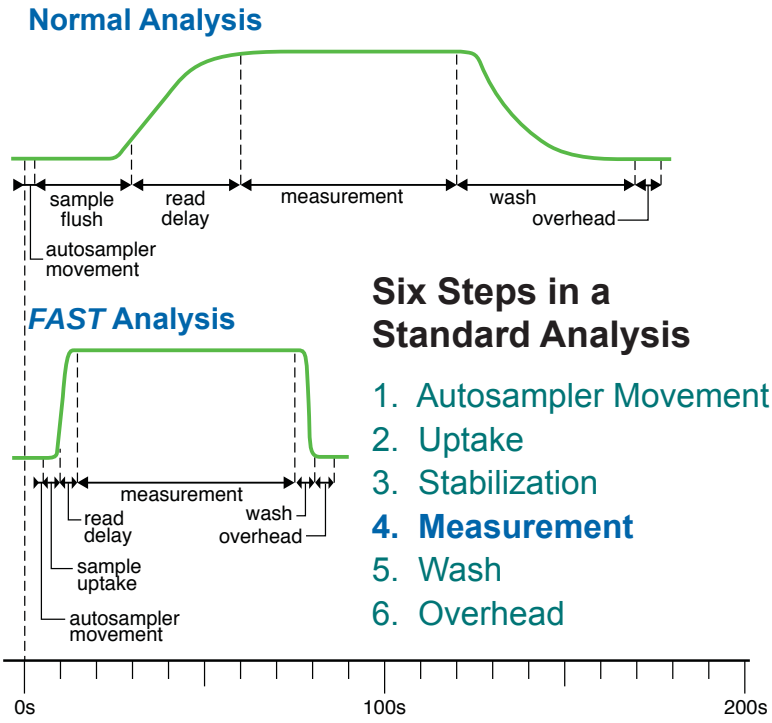
The *FAST* is a high-throughput, automated sample introduction system for the Avio 200/500 ICP. The *FAST* system uses valve injection with rapid vacuum sample loading to more than double the productivity of the Avio ICP, minimize instrument maintenance, and reduce operating costs.

FAST Benefits:

- High sample throughput
- *FAST* uptake, stabilization, and washout
- Specially-designed P-Series valve and loop combination has superb washout
- Options with and without segmented air bubbles ensures high precison for every application

Improved Efficiency

By presenting the sample for a short period of time while the measurement is being performed, contamination of the sample introduction system is minimized, resulting in stable analytical runs with reduced sample carryover and maintenance. The SC-*FAST* reduces consumption of argon, power, and reagents.



Six Steps in a Standard Analysis

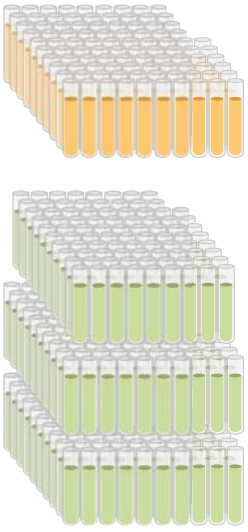
1. Autosampler Movement
2. Uptake
3. Stabilization
4. **Measurement**
5. Wash
6. Overhead

The SC-*FAST* system has the fastest signal stabilization and most complete rinse-out of any sample introduction system. This reduces uptake and wash times while increasing sample throughput.

Increased Sample Throughput

In addition to higher throughput gained by using an autosampler, the *FAST* system analyzes a sample 2-5 times faster than it takes a standard autosampler to perform the same task.

FAST also benefits labs with relatively few samples by reducing operating costs and shortening analytical runs.



STANDARD ANALYSIS
96 SAMPLES

FAST ANALYSIS
288 SAMPLES

2-5X HIGHER SAMPLE THROUGHPUT
WITH *FAST* SYSTEM
DEPENDING ON APPLICATION

Superior P-Series *FAST* Valve

- PFA rotors for long life and low maintenance
- Chemically resistant compression ring
  - Uniform pressure
  - Keyed for easy assembly
  - Prevents damage from overtightening
- All fluoropolymer flow path
- Internal components PTFE-coated to prevent corrosion
- In-valve mixing of internal standard (P7 valve)

P7 *FAST* Valve

Avio 500 ICP

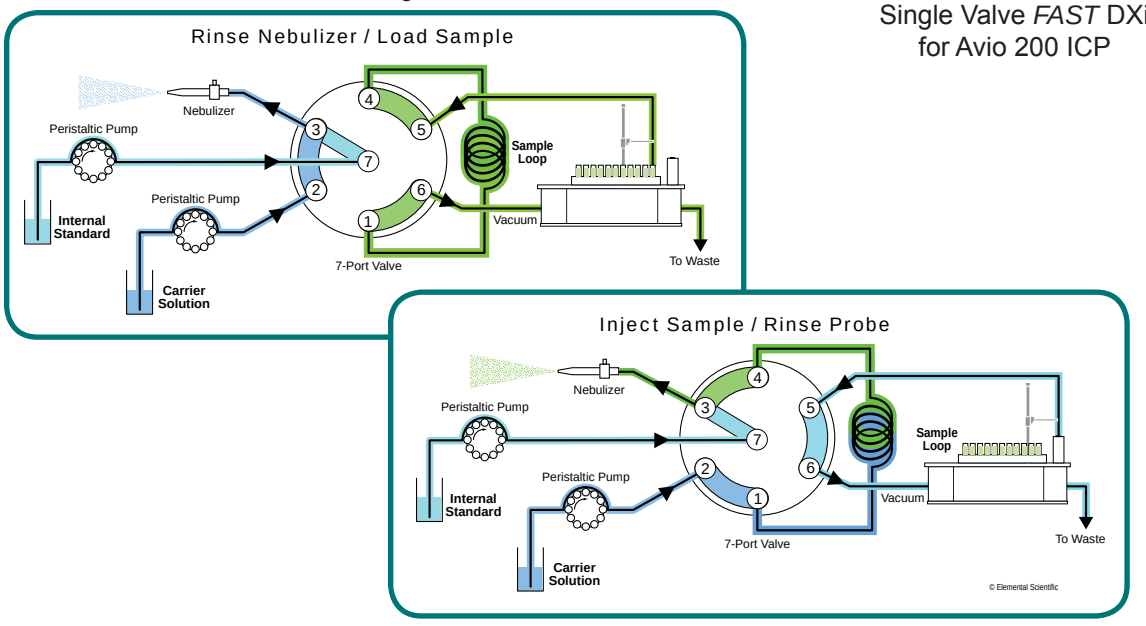
FAST DXi:

- Integrated MP^2 peristaltic pump and *FAST* valve for the Avio 200/500ICP
- High quality ceramic bearing peristaltic pump for long lifetime and high precision
- Upgradeable to prep*FAST*

Single Valve *FAST* DXi for Avio 500 ICP

Single Valve *FAST* DXi for Avio 200 ICP

The *FAST* loads the sample loop as the nebulizer and tubing are cleaned.



The autosampler probe and tubing are rinsed while the sample is analyzed.

FAST SYSTEM PART NUMBERS FOR AVIO 200 & 500 ICP

Description		SC2 DX *FAST*	SC4 DX *FAST*	SC8 DX *FAST*	SC14 DX *FAST*
FAST basic systems for high throughput and *FAST* washout (Includes SC-DX autosampler)	Avio 200	N0790964	N0790965	N0790966	N0790967
	Avio 500	N0810870	N0810871	N0810872	N0810873

See page 4 for more information on SC DX autosamplers.

prep*FAST*™ Inline Dilution

Variable Autodilution, Inline Autocalibration, and Overrange Dilution

The prep*FAST* is an automated inline dilution system. The prep*FAST* eliminates manual dilution, reduces reagent usage, and improves laboratory productivity. These systems combine the SC DX autosampler, high-throughput *FAST* technology and a syringe module to perform precise and accurate inline dilutions of standards and samples.

prep*FAST* Automates Daily Lab Functions

Autodilution

Samples are automatically inline syringe-diluted and prepared for analysis.

- Automatic inline dilution modes
  - Constant dilution (e.g. all samples diluted 10x)
  - Variable dilution (i.e. user-specified dilution factor sample-by-sample)
- Improve precision and accuracy
- Reduce vial and reagent usage
- Improve sample throughput and washout

Autocalibration

Automate inline preparation of ICP calibration standards.

- Save time and improve laboratory efficiency
- Improve linearity
- Standards rack (9 x 125 mL) holds both calibration and QC compliance standards
- Save time and improve laboratory efficiency

Overrange Dilution

Automatically dilute and reanalyze samples having analyte concentrations above the calibration range.

- Autodilute overrange samples
- Automatic serial dilution brings even extremely high concentration samples into range
- Optimize laboratory throughput by generating reportable results from the initial sample run

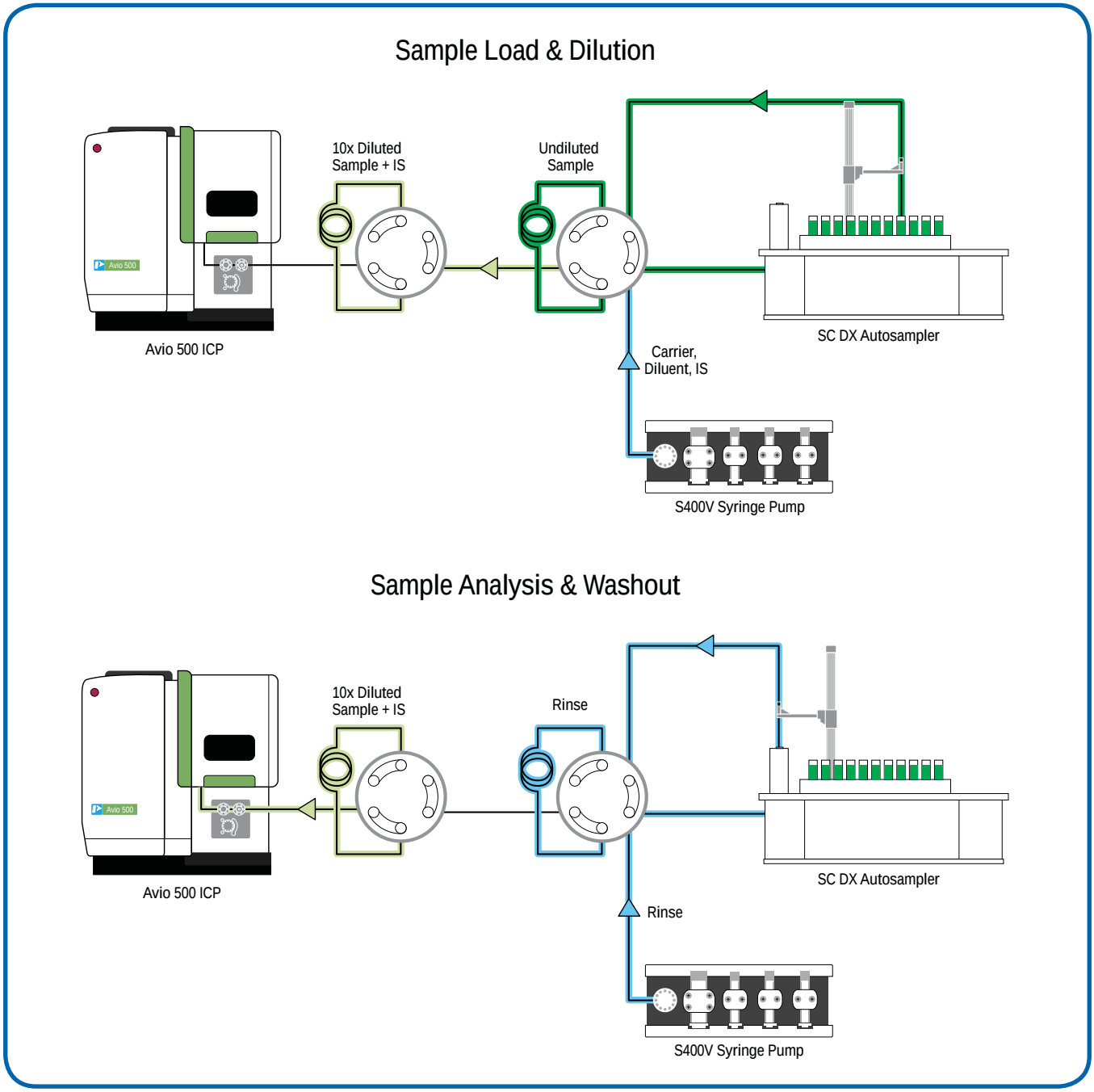
SC2 DX prep*FAST*

PerkinElmer Offers Three prep*FAST* Systems:

- prep*FAST* e – Economical two syringe dilution system; max dilution factor of 50x
- prep*FAST* "prep*FAST* 2" – High-throughput dilution system with rapid washout; max dilution factor of 400x
- prep*FAST* M5 – High-throughput dilution system with ultimate washout and precision sample loading for viscous and small volume (<2-3 mL) samples; max dilution factor of 400x

Rapid, Variable, In-Valve Autodilution

Samples are quickly vacuum-loaded (prep*FAST* e, prep*FAST* and prep*FAST* M5) or precision syringe-loaded (prep*FAST* M5) into a loop. Sample is mixed with diluent and internal standard using a patented mixing valve at the dilution factor prescribed by Syngistix software. The diluted and mixed sample is then introduced into the ICP while the sample loop is syringe rinsed and readied for the next sample. This sampling and dilution process takes place in seconds.



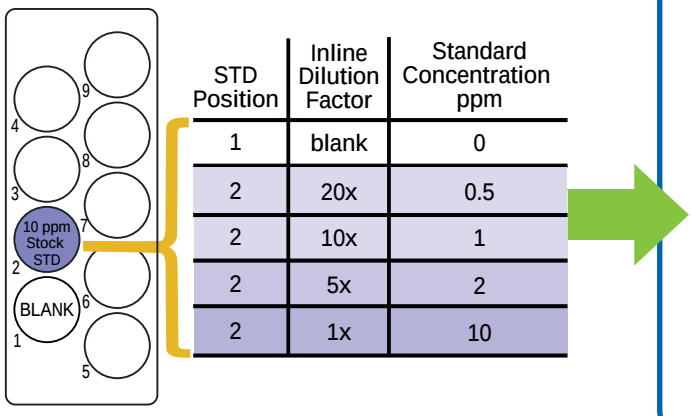
prep*FAST* dilution diagram for Avio 500 ICP

Autocalibration

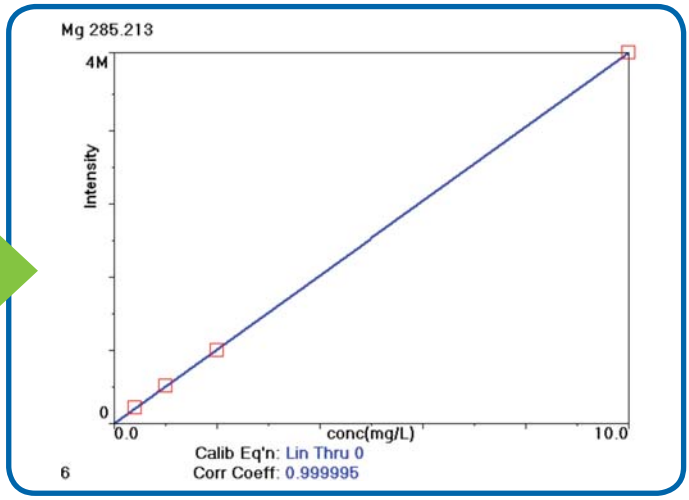
The prep*FAST* can create multipoint calibration curves from a single bottle of stock standard. Each point of the calibration curve is prepared by autodilution of a single stock calibration standard placed on the autosampler deck. The prep*FAST* automatically generates highly linear and consistent ICP calibration curves. If necessary, multiple standards can be used for large concentration ranges or when standard matrices are incompatible.

prep*FAST* Autocalibration

Inline Prep from 1 Blank + 1 Standard

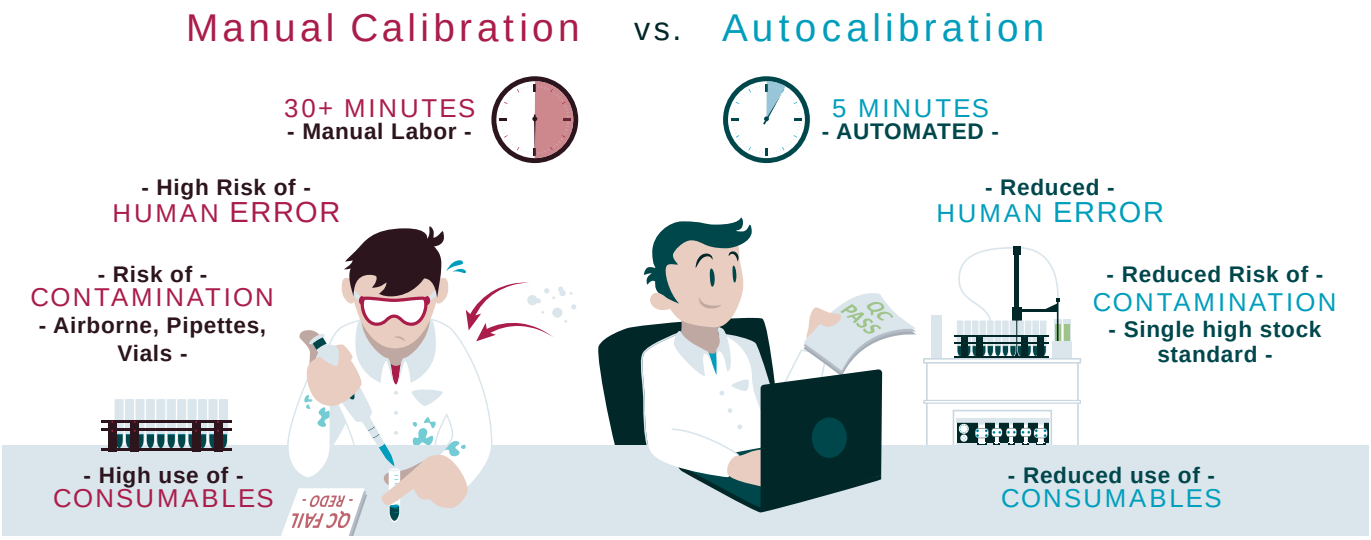


STD Position	Inline Dilution Factor	Standard Concentration ppm
1	blank	0
2	20x	0.5
2	10x	1
2	5x	2
2	1x	10



Autocalibration of Mg from a 10ppm stock standard

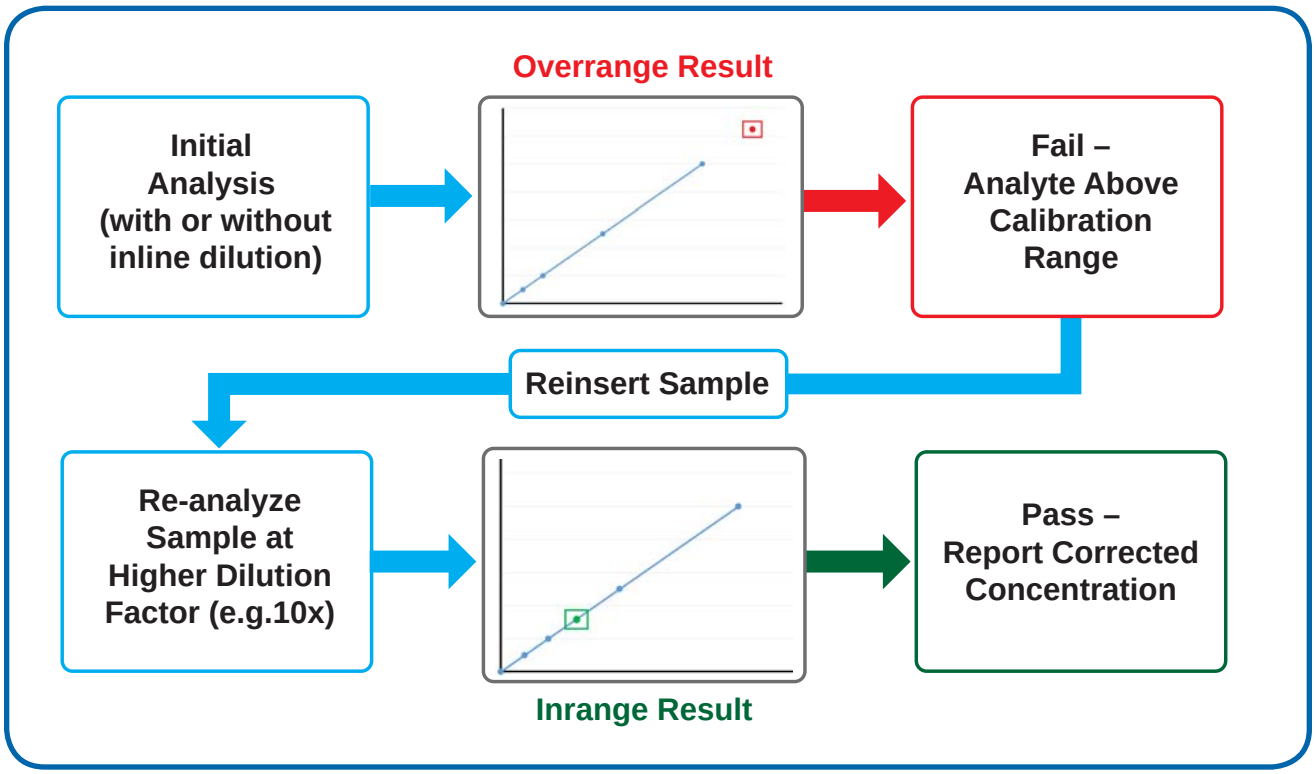
Autocalibration improves laboratory efficiency by eliminating the need for labor-intensive and error prone standard preparation. It reduces laboratory waste by reducing calibration vial, reagent, and standard waste. prep*FAST* autocalibration is particularly important for low concentration standards near the detection limit.



prep*FAST*™ Overrange Dilution

Overrange Analyte Autodilution

The prep*FAST* automatically dilutes samples when an analyte goes above method-specified quality control levels. The sample is automatically reinserted into the sample list and reanalyzed at a higher dilution factor until the determined concentration falls within the specified range.



Automated overrange sample dilution maximizes laboratory throughput. Without this feature high concentration samples have to be manually diluted and rerun later. Overrange autodilution automatically dilutes samples into the appropriate range without any user input or time lost waiting for a result.

Out-of-Range Internal Standard Autodilution

Internal standard out-of-range conditions occur when a high matrix present in a sample causes response changes in the ICP signal, which is identified by monitoring internal standard recoveries. Syngistix can be configured to automatically detect these limit failures, and instructs the prep*FAST* to automatically dilute the sample for reanalysis during the same analysis run.

Economical Inline Autodilution System

The prep*FAST* e economical inline dilution system provides low cost syringe dilution and laboratory automation. The prep*FAST* e is especially effective for applications having long analysis times or lower sample throughput requirements. Capable of dilution factors ranging from 1 to 50, the prep*FAST* e is recommended for use with sample volumes greater than 2-3 mL. The prep*FAST* e supports final analysis volumes between 0.5 and 6.0 mL.

SC2 DX
prep*FAST* e

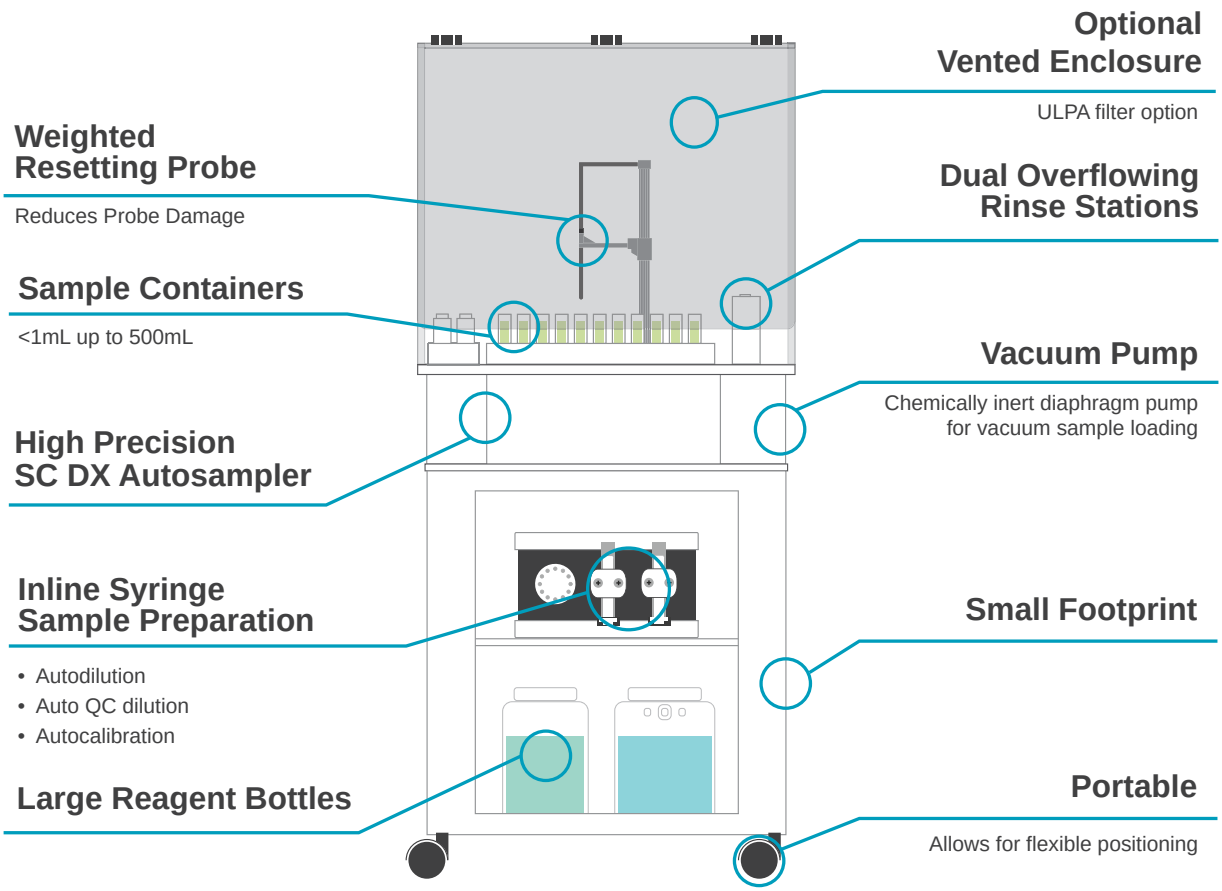
Features

- Autocalibration
- Autodilution - 1 to 50x
- Automatic overrange dilution
- Peristaltic-pumped internal standard addition
- Fast vacuum sample loading

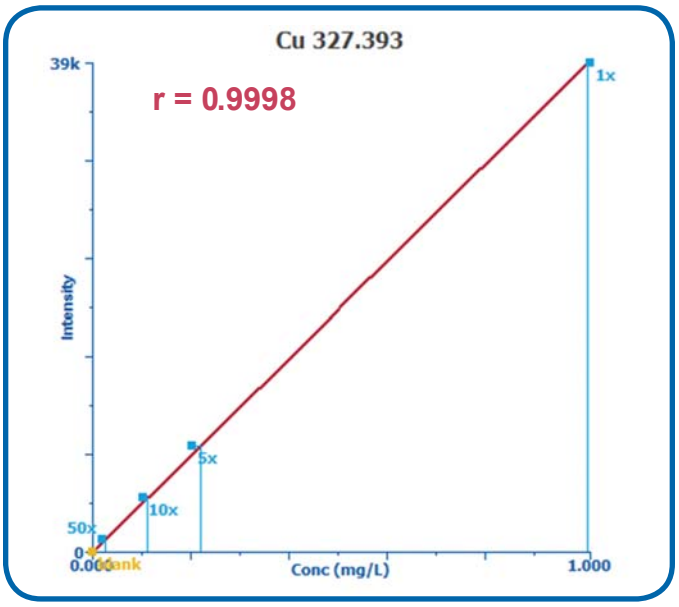
Benefits

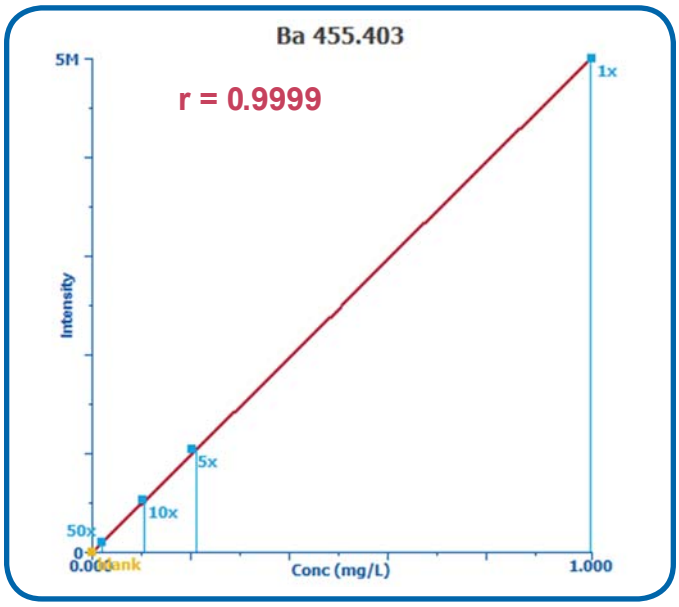
- Automate sample dilution
- Reduce laboratory waste
- Available in SC2, SC4, SC8, and SC14 models

prep*FAST* e Features Diagram



prep*FAST* e Automated Calibrations





Autocalibrations on Avio 500 with prep*FAST* e. Standard concentrations prepared at 20, 100, 200, and 1000 µg/L.

Fully Automated Inline Dilution

The prep*FAST* (prep*FAST* 2) inline dilution system fully automates laboratory dilutions while providing high sample throughput. The prep*FAST* delivers high precision autodilution, syringe-driven internal standard addition, and high speed washout. Capable of dilution factors from 1 to 400, the prep*FAST* is suggested for labs requiring the highest sample throughput and where the available sample volume is about 2-3 mL or more.

Features

- Autocalibration
- Autodilution – 1 to 400x
- Auto QC dilution
- Syringe-driven internal standard
- High speed rinse
- *FAST* vacuum sample loading

Benefits

- Automate sample dilution
- Improve sample throughput
- Reduce laboratory waste
- Available in SC2, SC4, SC8, and SC14 models

SC4 DX prep*FAST*

prep*FAST* Features Diagram

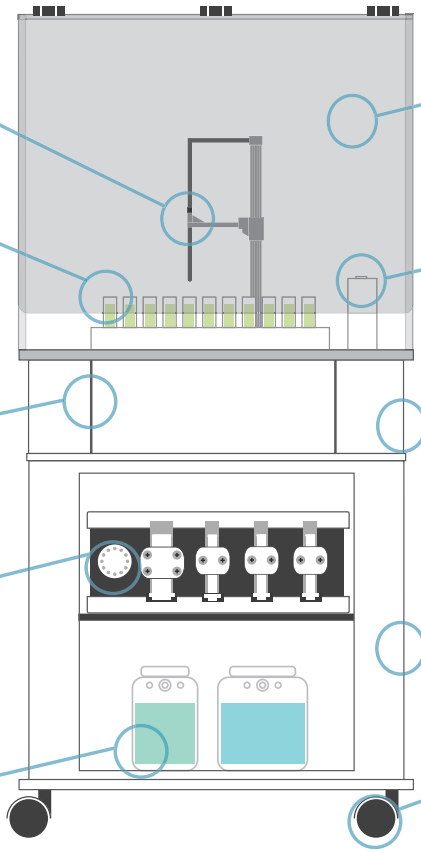
Weighted Resetting Probe
Reduces Probe Damage

Sample Containers
<1mL up to 500mL

High Precision SC DX Autosampler

Inline Syringe Sample Preparation
- Sample dilution
- Internal standard addition
- Overrange dilution

Large Volume Reagent Bottles



Optional Vented Enclosure
ULPA filter option

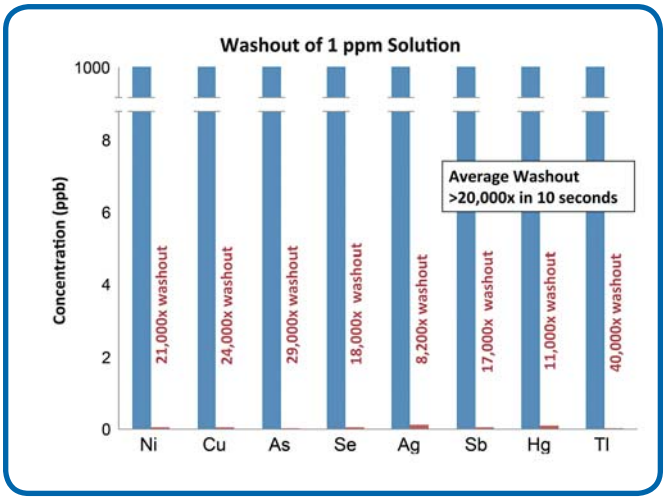
Dual Overflowing Rinse Stations

Vacuum Pump
Vacuum loaded sampling
Rapid rinsing & cleaning

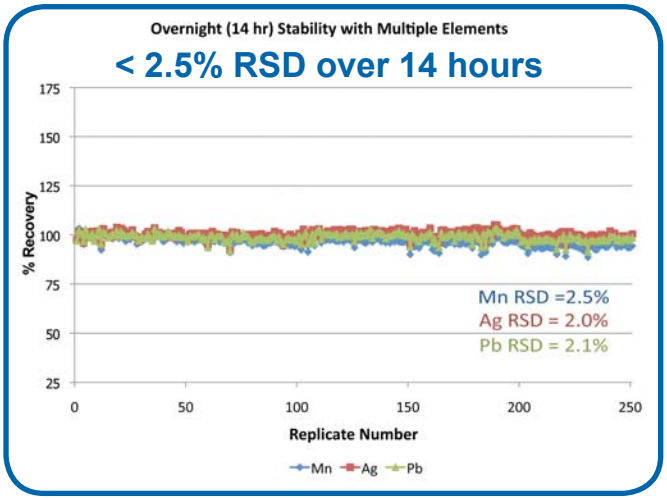
Small Footprint

Portable
Allows for flexible positioning

prep*FAST* Performance



FAST washout even for memory-prone elements



Long-term stability

Syringe Sample Loading + Syringe-driven Inline Dilution

The prep*FAST* M5 inline dilution system delivers maximum laboratory automation. The prep*FAST* M5 provides precision syringe loading of samples or high-throughput vacuum loading. Syringe loading is used when sample volumes are limited – 2-3 mL – or when sample viscosity becomes an issue, such as organic solvents, viscous brines or biological samples. *FAST* vacuum loading can be used when sample volumes are large – above 2-3 mL – or when sample viscosity is not an issue. The prep*FAST* M5 delivers high precision autodilution, syringe-driven internal standard addition, flexible sample loading and ultimate sample washout. Capable of dilution factors from 1 to 400, the prep*FAST* M5 is perfect for labs requiring high sample throughput and where available sample volumes are as low as 0.1 mL.

S500V2 Syringe Module

Features

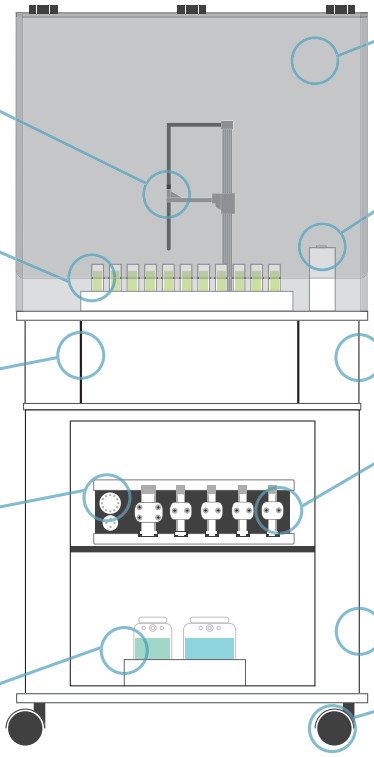
- Autocalibration
- Autodilution – 1 to 400x
- Auto QC dilution
- Syringe-driven internal standard addition
- High speed rinse
- Ultimate washout
- Precision syringe loading or high speed vacuum loading
- High pressure syringe-driven probe rinsing

Benefits

- Automate sample dilution
- High sample throughput
- Minimize sample use
- Reduce laboratory waste
- Best rinse-out performance
- Available in SC2, SC4, SC8, and SC14 models

SC4 DX
prep*FAST* M5

prep*FAST* M5 Features Diagram



Weighted Resetting Probe

Reduces Probe Damage

Sample Containers

<1mL up to 500mL

High Precision SC DX Autosampler

Inline Syringe Sample Preparation

- Sample dilution
- Internal standard addition
- Washing
- Overrange dilution

Large Reagent Bottles

Optional Vented Enclosure

ULPA filter option

Dual Overflowing Rinse Stations

Vacuum Pump

Optional vacuum loaded sampling.
Rapid rinsing & cleaning.

Syringe Sample Loading

Precise sample loading for small samples or multiple reanalysis.

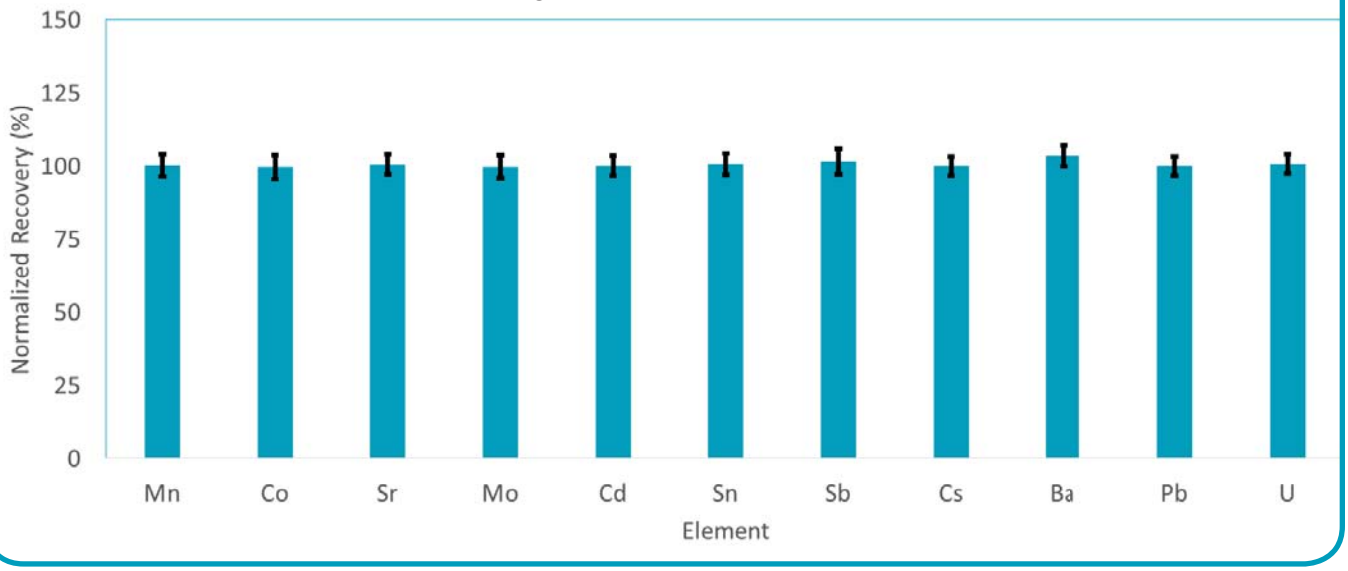
Small Footprint

Portable

Automated micro sample analysis in a difficult matrix

prep*FAST* M5 with 100µL Urine Samples

250 Replicate Urine Analysis
Average RSDs <4%



prepFAST Systems Comparison

prep*FAST* inline dilution systems automatically perform precise and accurate dilutions for samples and standards, improving laboratory workflow, productivity, and data quality.

SC4 DX Autosampler with Mobile Station

prep*FAST* e Provides:

- Autocalibration
- Autodilution
- Auto overrange dilution
- Peristaltic pump driven internal standard addition
- Dilution range: 1-50

prep*FAST* e

prep*FAST* Provides:

- Autocalibration
- Autodilution
- Auto overrange dilution
- Improved washout and higher throughput
- Syringe-driven internal standard addition
- Dilution range: 1-400

prep*FAST*

prep*FAST* M5 Provides:

- Autocalibration
- Autodilution
- Auto overrange dilution
- Precision syringe sample loading for micro or viscous samples
- Best washout performance of any sample introduction system
- Syringe-driven internal standard addition
- Dilution range: 1-400

prep*FAST* M5

prepFAST Systems Comparison

PerkinElmer offers three versions of prepFAST: prepFAST e, prepFAST, and the prepFAST M5. Compare each system's features below to determine which prepFAST system is right for your lab.

Description	Autocalibration	Autodilution	Auto Overrange Dilution	Syringe-Driven Internal Standard	High Pressure Rinse Ultimate Washout	Micro Volume Sample Analysis	Volatile Organic Solvent Analysis	Dilution Range
prepFAST e	✓	✓	✓					1 - 50
prepFAST	✓	✓	✓	✓				1 - 400
prepFAST M5	✓	✓	✓	✓	✓	✓	✓	1 - 400

Avio 200

prepFAST e

	Part Number
SC2 DX	N0790976
SC4 DX	N0790977
SC8 DX	N0790978
SC14 DX	N0790979

prepFAST

	Part Number
SC2 DX	N0790960
SC4 DX	N0790961
SC8 DX	N0790962
SC14 DX	N0790963

prepFAST M5

	Part Number
SC2 DX	N0790968
SC4 DX	N0790969
SC8 DX	N0790970
SC14 DX	N0790971

Avio 500

prepFAST e

	Part Number
SC2 DX	N0810879
SC4 DX	N0810880
SC8 DX	N0810881
SC14 DX	N0810882

prepFAST

	Part Number
SC2 DX	N0810862
SC4 DX	N0810863
SC8 DX	N0810864
SC14 DX	N0810865

prepFAST M5

	Part Number
SC2 DX	N0810866
SC4 DX	N0810867
SC8 DX	N0810868
SC14 DX	N0810869

prep3™ for Avio 200 & 500 ICP

Automated Inline Dilution System for PerkinElmer Avio

prep3 is an inline dilution system which uses peristaltic pumps to perform precise and accurate inline dilution of samples and standards. Syngistix software controls three microperistaltic pumps that deliver sample, diluent, and internal standard to an inline, low-volume mixing device and then into the nebulizer. The total liquid flow is constant, but the ratio of sample to diluent varies to perform the inline dilutions.

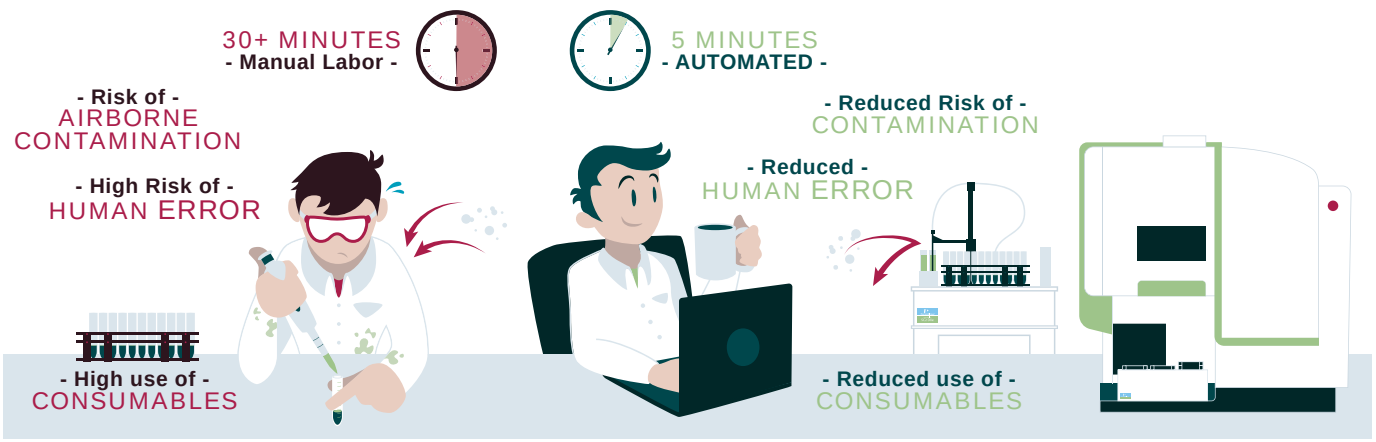
Features

- Triple low-pulsing microperistaltic pump
  - P1 = Carrier
  - P2 = Diluent
  - P3 = Internal standard
- Low-volume mixing device

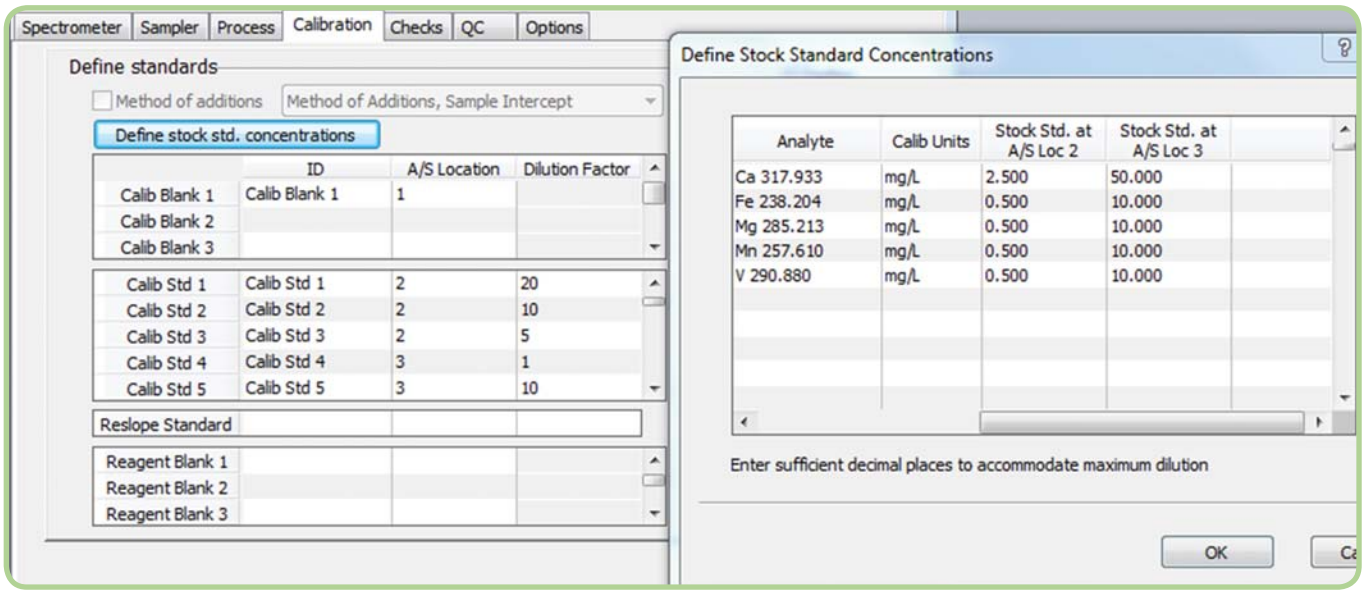
Benefits

- Automatic calibration from stock standard solution(s)
- Automatic sample dilution
- Automatic over-range dilution
- Automatic internal standard out-of-range dilution
- Analyze samples from undiluted to up to 25x diluted
- Fully supported by Syngistix software

SC2 DXe prep3 on the Avio 200 ICP



Autocalibration of multiple stock standards



Defining stock standard concentration and autosampler location in Syngistix software is performed in the calibration tab. In this example, autocalibration from two stock standards creates a calibration curve from 0.025 ppm to 10 ppm for Fe, Mg, Mn, V, and 2.5 ppm to 50 ppm for Ca. Syngistix uses the stock standard locations, concentrations, and dilutions to autocalibrate the Avio.

Automatic predefined dilution of samples
to eliminate manual offline dilution of samples

Sample No	A/S Location	Sample ID	Auto Dil. Factor #
1	101	Sample1	10
2	102	Sample2	10
3	103	Sample3	10
4	104	Sample4	10
5	105	Sample5	10
6	106	Sample6	10
7	107	Sample7	10
8	108	Sample8	10

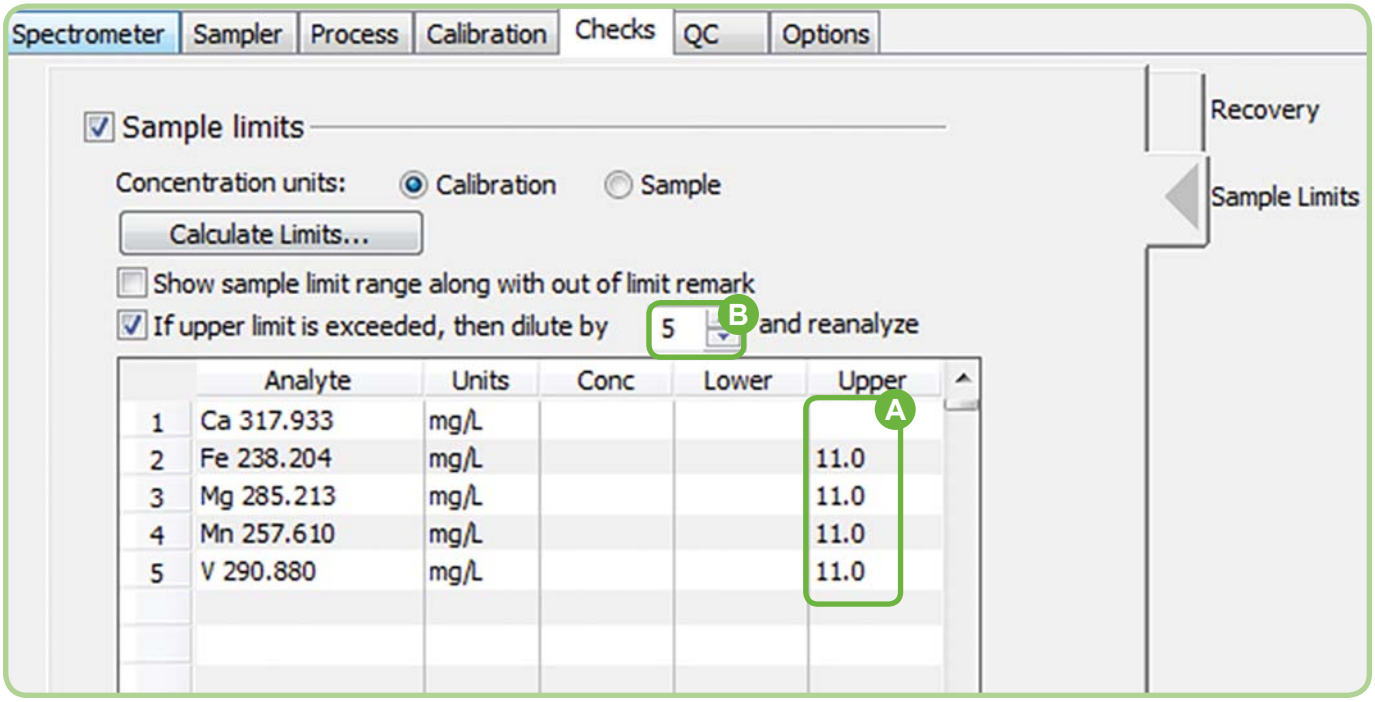
A

Sample No	A/S Location	Sample ID	Auto Dil. Factor #
1	101	Sample1	20
2	102	Sample2	20
3	103	Sample3	
4	104	Sample4	1
5	105	Sample5	10
6	106	Sample6	5
7	107	Sample7	15
8	108	Sample8	25

B

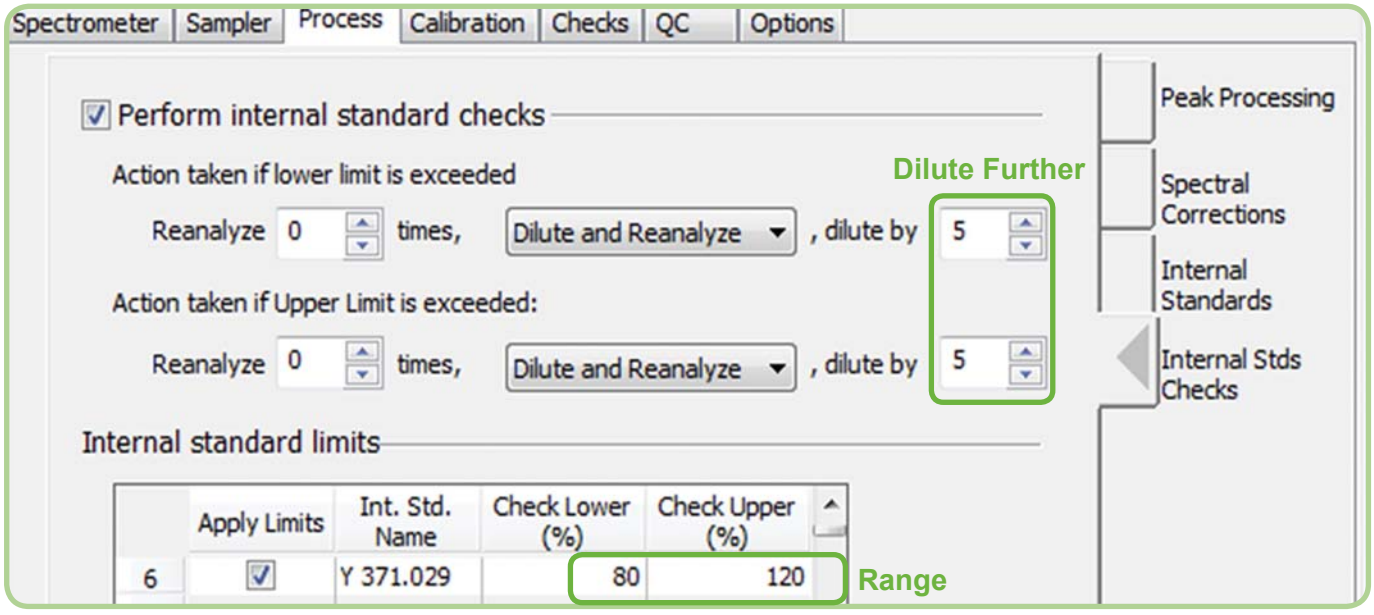
Syngistix flexibility allows autodilution factors to be the same for all samples (example A) or sample specific (example B). The prep3 eliminates offline manual dilution of samples.

Autodilution of over-range samples
for over-range analytes



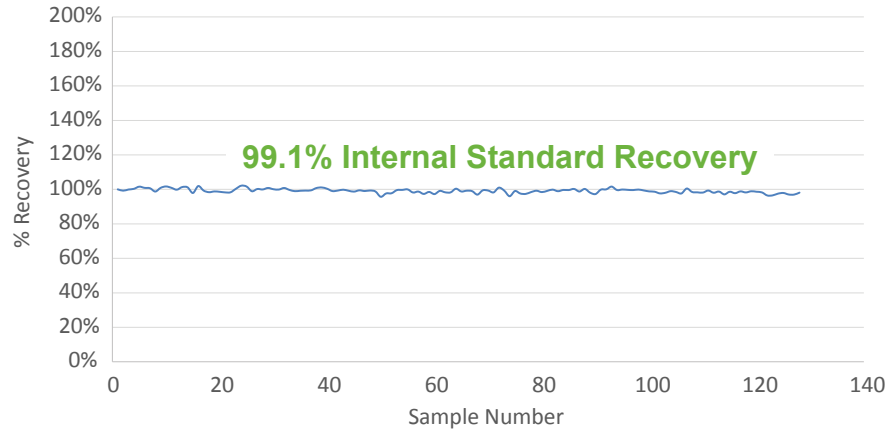
The upper concentration range for one or more analytes can be defined for automatic dilution of over-range samples. Set the upper limit (A) and the over-range dilution factor (B).

Autodilution for out-of-range internal standard



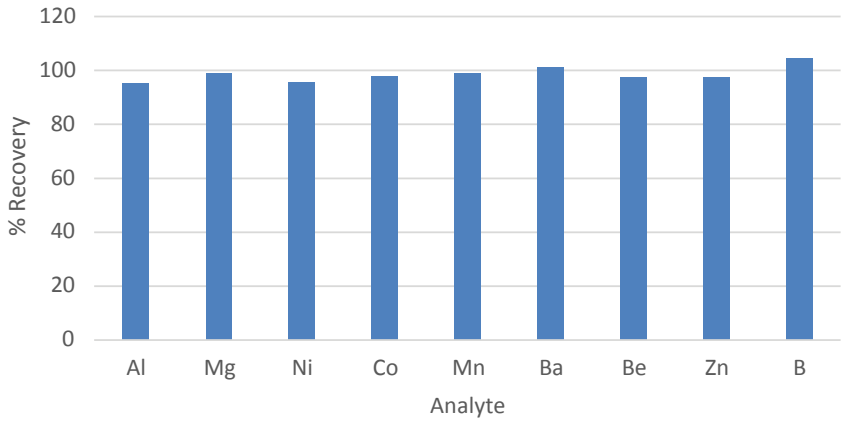
Syngistix monitors the internal standard and the prep3 automatically dilutes out-of-range samples further for reanalysis.

Internal Standard Recovery - 1 ppm Y



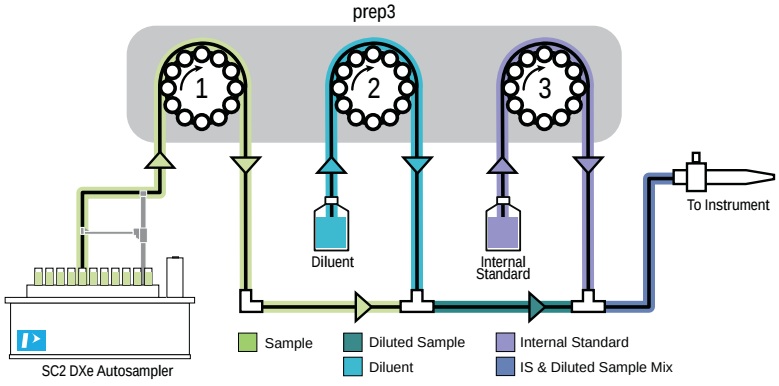
10 hours internal standard recovery. Average recovery: 99.1%

Average Analyte Recoveries



Average recovery for 10 ppm analytes over 13 hours of continuous test. Average recovery: 98.6%

prep3 Flow Path



Description	Part Number
prep3 Inline Autodilution System for PerkinElmer Avio: Includes nebulizer, Triple micro peristaltic pump and autodilution tee assembly, lines, and fittings. (DX Autosampler required, not included)	N0786012
2DXe prep3 Inline Autodilution System for PerkinElmer Avio: Includes 2DXe autosampler, triple micro peristaltic pump and autodilution tee assembly, nebulizer, lines, and fittings.	N0786013
4DXe prep3 Inline Autodilution System for PerkinElmer Avio: Includes 4DXe autosampler, triple micro peristaltic pump and autodilution tee assembly, nebulizer, lines, and fittings.	N0786014

brine*FAST* S4™ *for Avio 500 ICP*

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

The brine*FAST* 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.

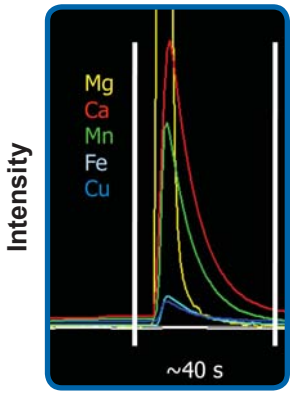
SC2 DX brine*FAST* S4 system for PerkinElmer Avio 500

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

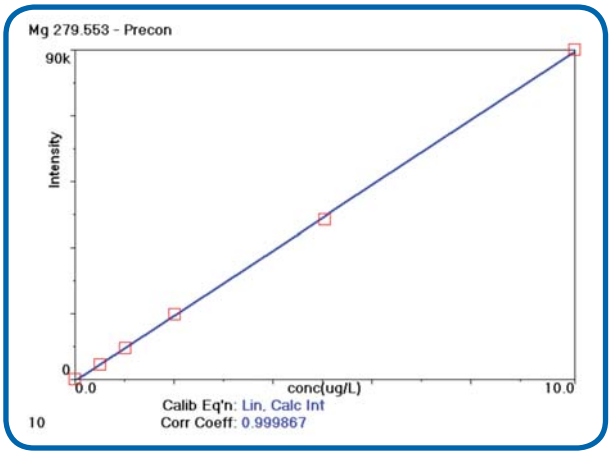
Applications:

- 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

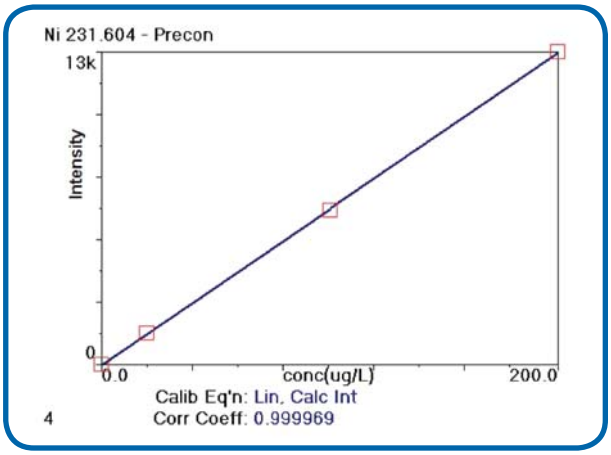


Elution Profiles

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



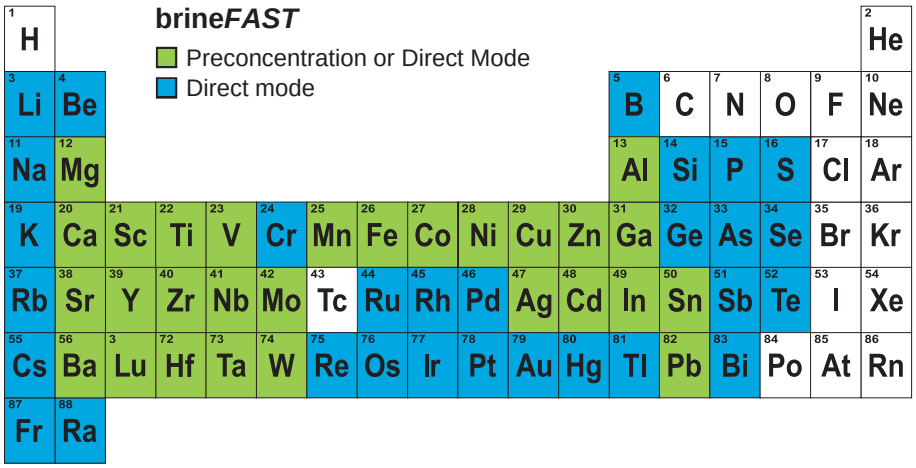
Typical calibration for 50% caustic soda (10x diluted) demonstrating linearity at higher concentrations. If needed, higher level calibrations at the ppm level are also linear.

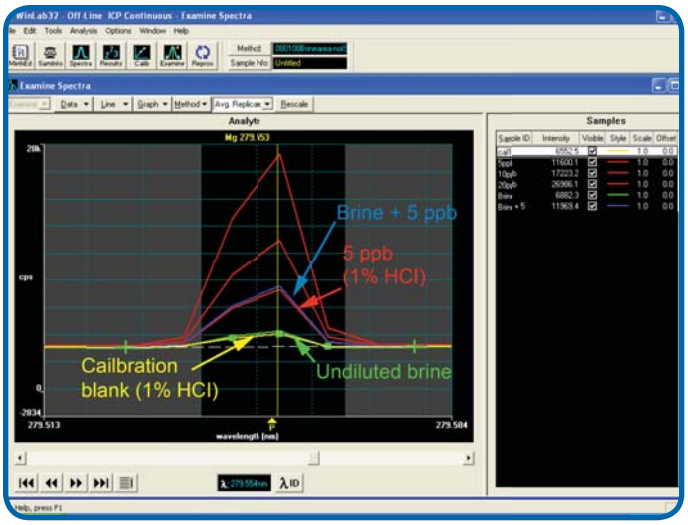


Typical calibration for ultra-pure brine, <10 ppb.

All brine*FAST* S4 Systems Include:

- DX *FAST* autosampler
- S400V syringe pump module
- *FAST* DXi dual valve module and all connections
- brine*FAST* S4 concentrator column
- brine*FAST* 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).

Percent Spike Recovery Comparison in 30% Brine		
Analyte	Traditional Introduction (spiked at 100 ppb)	brine*FAST* 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 brine*FAST* S4 preconcentration technique. Note that the spike levels are 20x lower with the brine*FAST* S4 than with the original introduction system.

Method Detection Limits Comparison in 30% Brine			
Analyte	Traditional (ppb)	brine*FAST* 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

Description	Part Number
SC2 DX brine*FAST* S4 system for Avio 500	N0810874
Spare brine preconcentration column	N0777470
Spare trace metals cleanup column	N8145357

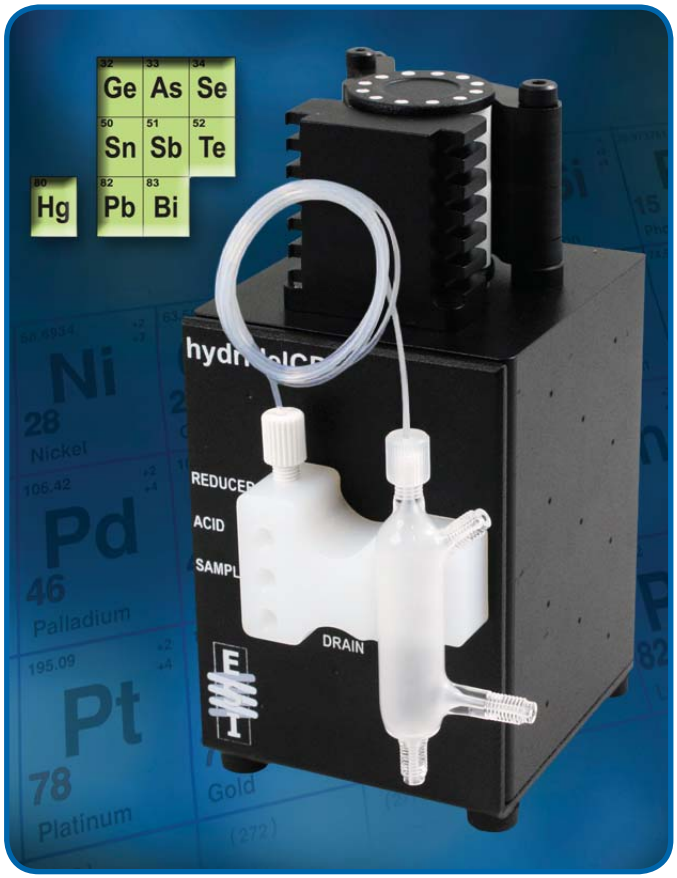
hydrideICP™

Compact Hydride Generation System for Avio 200/500 ICP

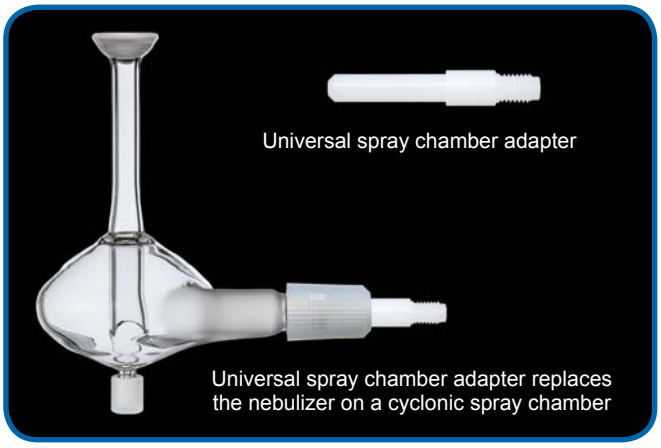
The hydrideICP, a standalone hydride generation system with precision micro peristaltic pump, provides sub-ppb detection limits for hydride-forming elements such as As, Se, Sb and Hg.

Benefits:

- Increased sensitivity, up to 100x for hydride-forming elements (As, Hg, Se, Sb,)
- Simultaneous hydride generation and nebulization for high sensitivity multielement analysis
- Improved stability
  - MP^2 micro peristaltic pump precisely mixes sample and reagents, producing a stable formation of H_2 gas and hydrides
- Compact
  - hydrideICP is the smallest system of its kind on the market (95 mm x 118 mm x 140 mm)
- Chemically resistant construction
  - MP^2 micro peristaltic pump with ceramic pins, a PFA mixing block and quartz GLS
- Convenient
  - hydrideICP is completely integrated into the MP^2 pump

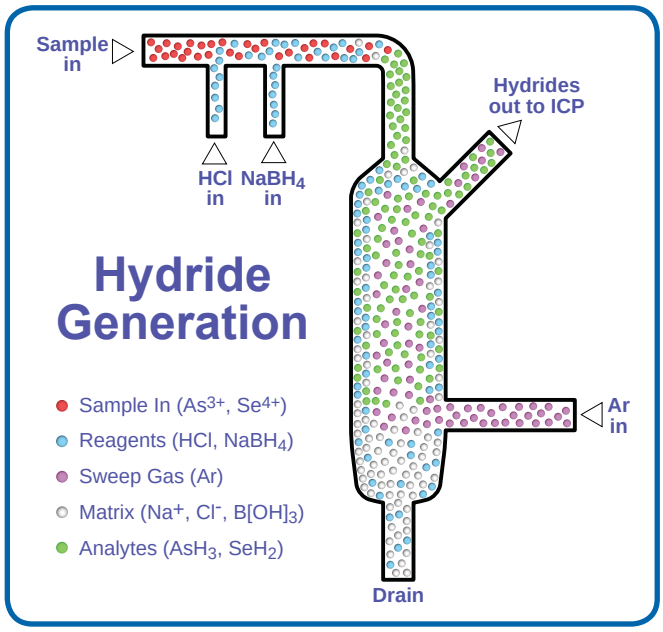


hydrideICP System

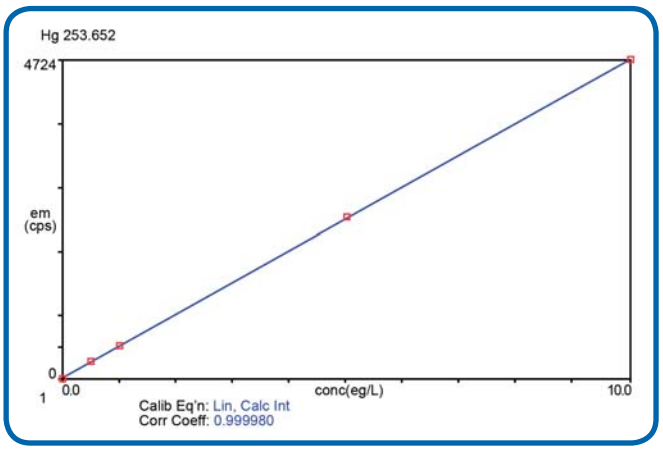


Universal spray chamber adaptor (P/N N0782031) used with hydrideICP operating in hydride-only mode.

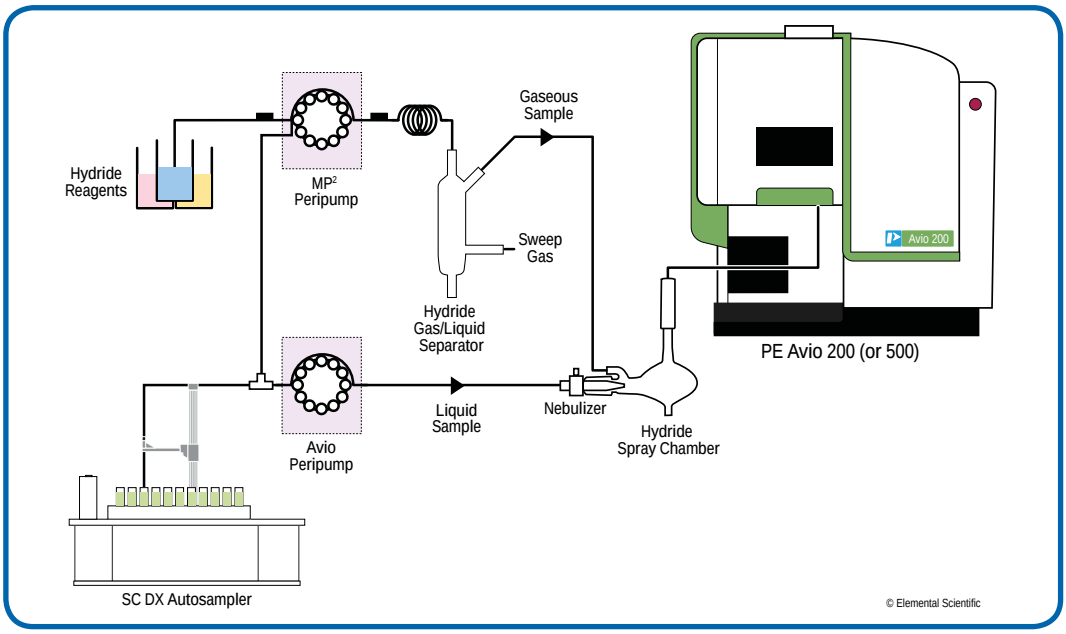
Dual-Inlet spray chamber (P/N N0810919) used with hydrideICP operating in simultaneous hydride and direct nebulization mode.



HydrideICP's gas liquid separator is the smallest, highest performing and most stable on the market. The design promotes rapid mixing of sample and reagents, resulting in an efficient reaction and separation of hydride gases from sample liquids in a small volume.



Hg Calibration – 0, 0.5, 1, 5, and 10 ppb (Normal Resolution)



HydrideICP configured to operate in simultaneous mode with both hydride generation and direct nebulization introduction being analyzed in one analysis.

Description	Part Number
HydrideICP Generation System. HydrideICP Generator Kit (Hydride quartz gas-liquid separator, four way tee, MP^2 precision micro peristaltic pump, universal spray chamber adapter and mounting plate).	N8122470
Quartz spray chamber with two inlets. Supports simultaneous hydride and direct nebulization modes with the hydrideICP.	N0810919

hydride S31™ *for Avio 500 ICP*

Hydride Generation with hydride S31 *FAST*

The hydride S31 is a compact, syringe-driven hydride generation system that produces ultra-low detection limits for hydride-forming elements.

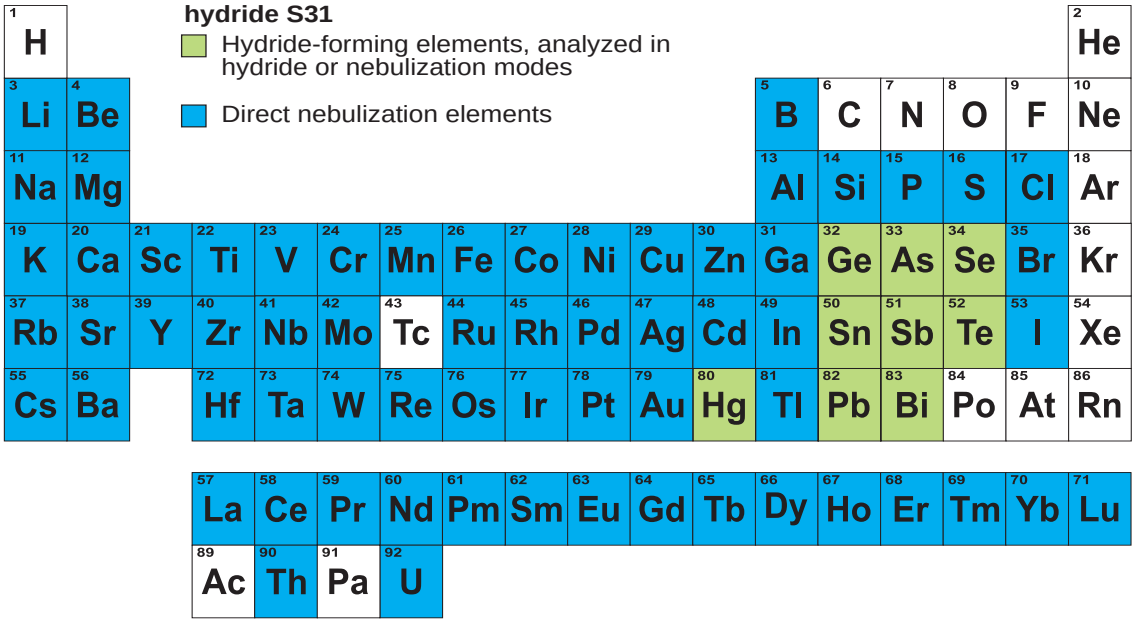
The 3-in-1 syringe barrel on the syringe module provides pulse-free reagent delivery for the best precision, and the patent-pending hydride gas liquid separator provides high sensitivity. The *FAST* sample valve in the S31 system provides high sample throughput and excellent analyte washout.

hydride S31 system
for the Avio 500 ICP

Design Features:

- Syringe-driven reagents for hydride generation; no peristaltic pump reagent lines to replace
- *FAST* for high-throughput and excellent washout
- Sub-ppb detection limits for hydride-forming elements
- Simple operation with Avio 500 ICP and SC-DX autosamplers

hydride S31 for the PerkinElmer Avio 500 ICP		
Detection limits (3s) for hydride-forming elements (in hydride mode)	**Analyte**	LOD (ppb)
	As	0.08
	Se	0.1
	Sb	0.3
	Hg	0.1



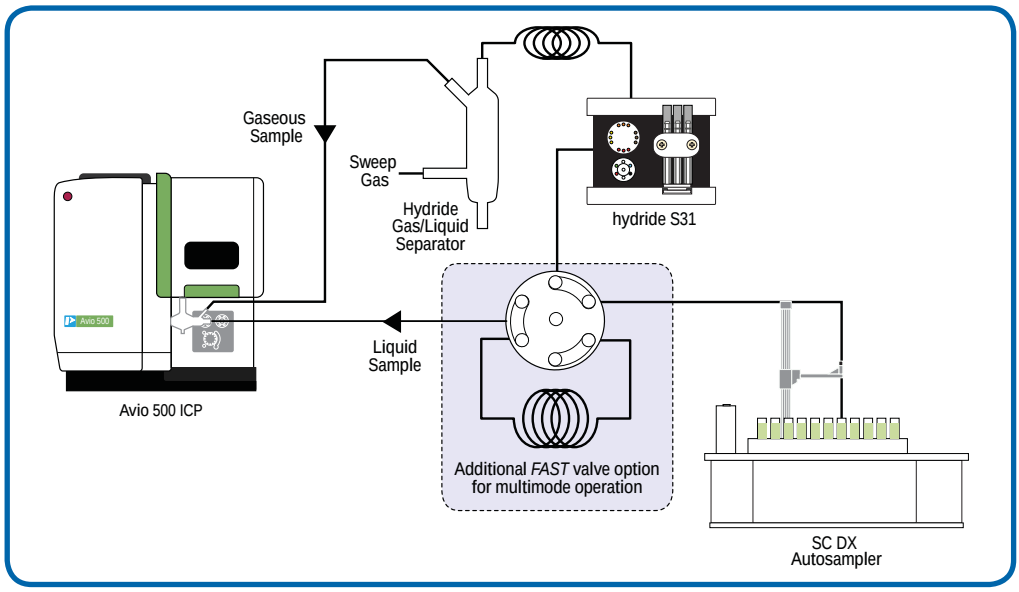
Simultaneous Hydride Generation and Direct Nebulization with hydride S31

The integration of an additional *FAST* valve provides multi-mode functionality to the hydride S31 and the Avio 500 for the highest flexibility and sample throughput.

• Selection between the following modes of operation:

- Simultaneous determination of hydride-forming elements with hydride generation and direct nebulization for other elements
- Hydride and direct nebulization determinations run sequentially
- Independent analysis by either hydride or direct nebulization

Single Valve *FAST* DXi for Avio 500 ICP required for simultaneous hydride and direct nebulization option (not included)



hydride S31 system diagram including autosampler and *FAST* valve

Hydride S31 configuration with additional *FAST* valve for high throughput multi-mode analysis. Non-hydride forming elements are analyzed through the Liquid Sample pathway using a nebulizer. Hydride forming elements benefit from high sensitivity hydride generation through Gaseous Sample pathway. The Avio 500 acquisition can be configured to analyze hydride-forming elements while the nebulizer is introducing carrier liquids, thus analyzing only for the hydride species. Hydride S31 can also be operated simultaneously or sequentially with direct nebulization.

hydride S31 System	
Description	**Part Number**
hydride S31 module for any DX *FAST* system. Includes S31 module for hydride generation. (SC DX *FAST* autosampler and N8145562 spray chamber required, not included)	N0786018
Quartz AMS Hydride spray chamber; includes matrix gas port, AMS metal-free matrix gas line, additional hydride port, and drain line (see page 45). For use with Avio ZipTorches (see page 47).	N0811909

Turn ANY DX FAST System Into a hydride S31 System!
Just add the hydride S31 module

Autosampler Enclosures and ULPA Filtered Environments

Autosampler Enclosures

Enclosures protect samples and standards from airborne contamination. An exhaust port (100 mm, included) may be connected to the laboratory ventilation system to exhaust acid fumes and protect the laboratory environment and equipment. Enclosures can be purchased with or without an ULPA filter.

N0777208
Enclosure for DX autosampler with ULPA Filter (autosampler not included)

Autosampler Model	Enclosure Only	Enclosure with ULPA Filter
Enclosure for SC-Micro DX	N8145080	N8145332
Enclosure for 2 DX	N0777209	N0777208
Enclosure for 4 DX	N0777210	N0777040
Enclosure for 8 DX	N0777347	N0777346
Enclosure for 14 DX	N0777325	N0777041

Ultra-Low Particulate Arrester Air Filter and Mounting Plate

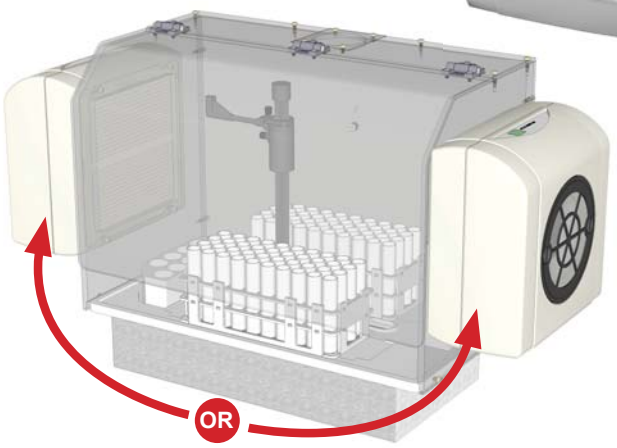
The ULPA filter creates a clean, positive pressure environment for samples and standards and prevents airborne contamination. The ULPA filter removes 99.999% of 0.12 micron particles.

N8145081
ULPA Filter

ULPA Filter Specifications		
Air Volume	Noise level	Power
1 m^3/min	56 dBA	25W

Description	Part Number
ULPA filter for DX autosampler enclosures	N8145081
ULPA filter mounting plate for 2 DX or 4 DX	N0777831

The ULPA filter mounting plate fits the 2 DX and 4 DX on either the right or left side of the enclosure.



Mobile Stations for 2 DX and 4 DX Autosampler

2 DX and 4 DX Mobile Autosampler Stations

The mobile autosampler station provides a small-footprint platform for the 2 DX or 4 DX.

Benefits:

- Mobile with locking wheels for flexible positioning
- Convenient location for rinse and waste containers
- Shelf for additional sample introduction equipment, such as prep*FAST*

N0777206 mobile station with 2 DX autosampler

N0777748 mobile station with 4 DX autosampler

Description	Part Number
Mobile autosampler station for 2 DX including electrical conduit (autosampler not included)	N2024021
Mobile autosampler station for 2 DX (autosampler not included)	N8145574

Description	Part Number
Mobile autosampler station for 4 DX including electrical conduit (autosampler not included)	N2024041
Mobile autosampler station for 4 DX (autosampler not included)	N8145575

brine*FAST*™

Improved Detection Limits For Alkaline Earth And Transition Metals In High Purity Brines

The brine*FAST* 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.

See page 24 for more information.

PerkinElmer®
For the Better

PFA and Polypropylene High-Efficiency MicroFlow Nebulizers for the Avio 200 and 500 ICP

MicroFlow nebulizers are resistant to clogging and are reliably self-aspirated or pumped to produce a fine aerosol for high transport efficiency and high sensitivity.

PFA-ST Nebulizers

The PFA-ST MicroFlow nebulizer is made from high purity, HF resistant PFA. It has an exchangeable external sample uptake capillary. The sample uptake rate is controlled by the diameter of the external capillary or probe.

Benefits:

- All PFA construction
- Exchangeable uptake capillaries allow one nebulizer to be used at different self-aspiration rates from 20 µL/min to 700 µL/min
- Chemically resistant—ideal for strong acids, alkalis and organics
- Can be pumped from < 0.02 mL/min to 3.0 mL/min
- Direct analysis of volatile and non-volatile organic solvents
- Longer lifetime than glass or quartz nebulizers

Description	Application	Part Number
ST3-70 MicroFlow PFA nebulizer with external 1/4-28 threaded connector.	For general high sensitivity and high performance	N0777676
PFA-ST for prep*FAST* self-aspirating nebulizer with external 1/4-28 threaded connector.	prep*FAST*	N8145368

PolyPro-ST Nebulizer

The PolyPro-ST nebulizer is a low-cost, HF-resistant alternative to the PFA nebulizer. The PolyPro nebulizer has a lower chemical resistance than the PFA nebulizer but has the same high-efficiency aerosol generation. Both are robust nebulizers that can self-aspirate with an exchangeable external sample uptake capillary or can be used with a peristaltic pump.

Description	Part Number
Poly-pro self-aspirating nebulizer with external 1/4-28 threaded connector.	N0777219

Syringe Flush Kit / Nebulizer Gas Line / Obstruction Removal

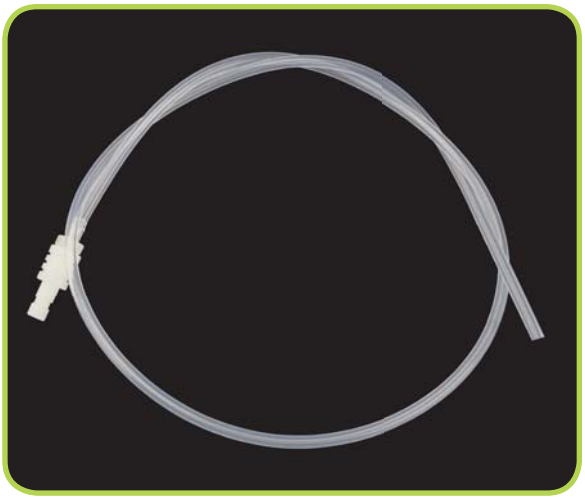
Syringe Flush Kit for ST Nebulizers

The syringe flush kit is used in two ways. With the white fitting it can back flush the sample capillary leading to the ST nebulizer. With the red fitting it can attach to the sample liquid port on the ST nebulizer for foreflushing.

Description	Part Number
Syringe flush kit. Includes 3 mL syringe, two luer to 1/4-28 adapters.	N8121035

Nebulizer Gas Line

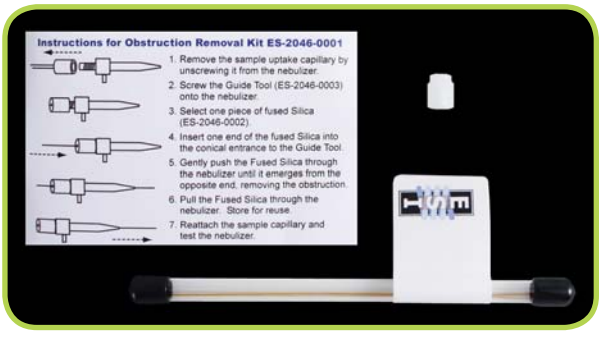
The Nebulizer Gas Line connects the nebulizer to the argon gas supply on the instrument. This nebulizer gas line contains quick connects for a secure connection to any PFA-ST nebulizer.



Description	Part Number
Gas line for PFA-ST nebulizers	N0791856

Nebulizer Obstruction Removal Kit

While naturally resistant to obstructions, PFA nebulizers may occasionally require maintenance. Use this kit to safely remove obstructions in all PFA-ST nebulizers for long-term high performance. Never back-flush a PFA-ST nebulizer.

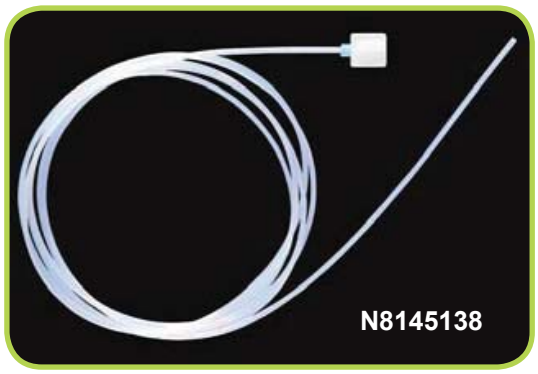


Description	Part Number
Fused silica obstruction removal kit for ST-type nebulizers. Includes one guide, 10 pieces of fused silica and instructions.	N8145236

Sample Capillaries / Probes

Sample Capillaries for ST Nebulizers

I.D.	Self-aspiration rate (@1L/m Ar)	Part Number
0.15 mm	20 µL/min (red)	N8122382
0.20 mm	50 µL/min (purple)	N8145135
0.25 mm	100 µL/min (green)	N8122383
0.30 mm	200 µL/min (yellow)	N8145136
0.50 mm	400 µL/min (orange)	N8122384
0.80 mm	700 µL/min (blue)	N8145137
1.00 mm	1 mL/min (gray)	N8145138



Sample capillary attached to PFA Nebulizer

Carbon Fiber Supported Autosampler Probes for ST Nebulizers

ST nebulizer probes connect directly to any ST-type nebulizer. The 1/4-28 threaded fitting provides a secure, zero-dead-volume connection with no additional fittings required.

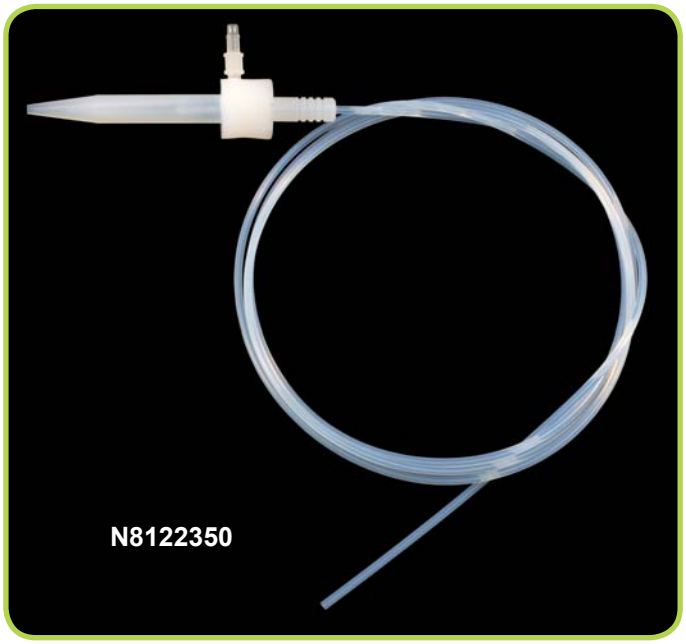
Probes for SC DX Autosamplers			
Probe i.d.	Capillary Length	Self-aspiration rate (@1L/m Ar)	Part Number
0.25 mm	80 cm	100 µL/min	N0777223
0.50 mm	80 cm	400 µL/min	N0777225
0.25 mm	150 cm	100 µL/min	N0777826
0.50 mm	150 cm	400 µL/min	N0777827

Also available with Ultem support.

PFA Nebulizers with Integrated Capillaries for the Avio 200/500 ICP

PFA Nebulizers with Integrated Capillaries

Self-aspirating PFA MicroFlow fluoropolymer nebulizers are chemically resistant and an essential part of the ICP laboratory. PFA nebulizers can produce a fine aerosol from aggressive acids, alkalis, organics, and high-salt solutions. They are resistant to clogging and produce high sensitivity at a low sample flow rate. They are the ideal nebulizer for ICP instruments with a wide range of sample types or when unknown samples are analyzed.



Benefits:

- Integrated capillary for connection-free introduction of samples at low flow rates
- Available with self-aspiration rates between 20 and 400 microliters per minute
- Chemically-resistant, ideal for strong acids, alkalis, and organic solvents
- Produces a fine aerosol for high transport efficiency and high-sensitivity
- Can be peristaltic pumped when introducing organic solvents

PFA Nebulizers with Integrated Fluoropolymer Capillaries		
Model	Measured self-aspiration rate (@1L/m Ar)	Part Number
PFA-20	20 µL/min	N8122350
PFA-50	50 µL/min	N8145102
PFA-100	100 µL/min	N8122351
PFA-200	200 µL/min	N8145103
PFA-400	400 µL/min	N8145104

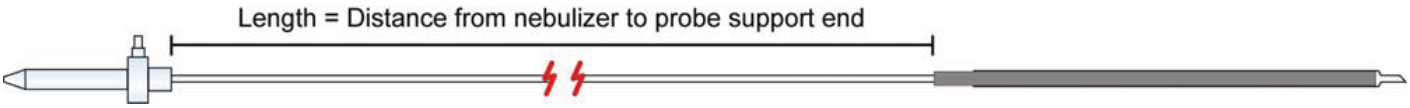
Other flow rates made to order

PFA Nebulizers with Integrated Probes for the Avio 200/500 ICP

Self-Aspirating PFA Nebulizers with Integrated Probes

These nebulizers self-aspirate at low flow rates with the same benefits of the PFA MicroFlow nebulizer. The integrated sampling probe is constructed by encapsulating a rigid support material between layers of fluoropolymer to provide a chemically-resistant probe that is mechanically stable and resilient.

Probes can be custom made to specific lengths and materials at no extra charge.



PFA MicroFlow Nebulizers with Integrated Autosampler Probe

Model	Autosampler Type	Self-aspiration rate (@1L/m Ar)	Length	support material	Application	Part Number
PFA-20	SCMicro DX SC DX	20 µL/min	80 cm	Carbon Fiber	Environmental/Clinical	N0777214
			100 cm	Ultem	High Purity Semiconductor	N8145141
PFA-50	SCMicro DX SC DX	50 µL/min	80 cm	Carbon Fiber	Environmental/Clinical	N0777215
			100 cm	Ultem	High Purity Semiconductor	N8145142
PFA-100	SCMicro DX SC DX	100 µL/min	100 cm	Carbon Fiber	Environmental/Clinical	N0777216
				Ultem	High Purity Semiconductor	N8145143
PFA-200	SCMicro DX SC DX	200 µL/min	100 cm	Carbon Fiber	Environmental/Clinical	N0777217
				Ultem	High Purity Semiconductor	N8145144
PFA-400	SCMicro DX SC DX	400 µL/min	100 cm	Carbon Fiber	Environmental/Clinical	N0777218
				Ultem	High Purity Semiconductor	N8145275

MEINHARD®

Concentric Nebulizers for Avio 200/500 ICP

MEINHARD® Plus Nebulizers have the lowest dead volume of any glass or quartz nebulizer. The low dead volume and high sensitivity provide excellent detection limits and washout.

Each MEINHARD® Plus nebulizer comes with the FitKit+ gas and sample quick connect fittings. Patented permanent non-degradable PFA connector eliminates contamination risk and risk of leak. The gas connection fits snugly over the maria on the sidearm of the nebulizer.

Features for all MEINHARD® Plus Nebulizers:

- Self aspiration rate 0.5 mL/min with argon flow 1 L/min at 50 PSI (3.4 bar/345 kPa).
- Peristaltic pumped rate 0.1 mL/min to 3.0 mL/min.
- Includes FG Gas Quick Connect (PFA).

Glass Concentric Nebulizers

The Type K borosilicate glass nebulizer is an economical concentric nebulizer used for high solids.

Description	Part Number
MEINHARD® borosilicate glass, high solids nebulizer, Type K, 0.7mL/min, 50 PSI	N0811287

TR+ glass high sensitivity concentric nebulizer with low internal volume.

Description	Part Number
MEINHARD® TR+ glass nebulizer, Type K, low internal volume	N0777707

MEINHARD TR+,
Type K low dead volume
high performance nebulizer

Nebulizer Lines

Description	Part Number
FAST connector for MEINHARD® Plus Series Nebulizer (F2), 0.25mm i.d	N8145346

Description	Part Number
4 mm nebulizer liquid-end connnector kit F2.	N0811288

Description	Part Number
Nebulizer gas line for MEINHARD® concentric nebulizers	N0791843

Plus Nebulizer PFA Liquid Quick Connectors

The sample connector is a low dead-volume quick connect for MEINHARD® Plus nebulizers. It offers a fast stabilization time and a reliable seal with chemically resistant PFA. Three versions are available in a variety of flow rates for different ICP applications.

Benefits:

- Fast stabilization time and ultra-low dead-volume
- High purity PFA fluoropolymer construction
- Easy to connect and disconnect

Sample connectors available:

F0: Encapsulated micro tubing for microflow rates with the lowest internal volume of any nebulizer.
F1: Detachable solution capillary for a wide range of applications, optional for all Plus-series nebulizers.
F2: Integrated solution capillary for self-aspiration or pumping, included with all Plus-series nebulizers.

F0 Encapsulated Micro Tubing

F0 Encapsulated micro tubing for low uptake rates from 0.1 to 0.5 mL/min and the lowest internal volume of any nebulizer.

Includes	Part Number
0.25 mm i.d. ■ (green marker) 70 cm long micro capillary.	N8121038

F1 Detachable Capillary

F1 Detachable capillary for a wide range of applications.

Includes	Part Number
0.80 mm i.d. ■ (blue marker) 70 cm long capillary.	N8121037

F2 Standard Integrated Capillary

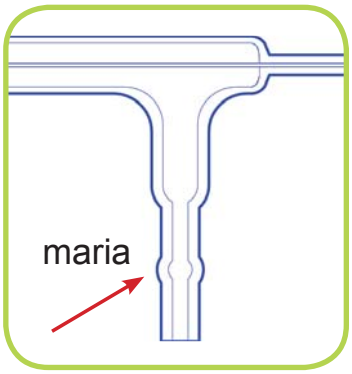
F2 Standard integrated capillary for self-aspiration or pumping.

Includes	Part Number
0.5 mm i.d. ■ (orange marker) 70 cm long capillary.	N8121039

Plus Nebulizer PFA FitKit Nebulizer Gas Quick Connect

The PFA FitKit Quick Connects are, a revolutionary new gas and sample fitting system for MEINHARD® Plus nebulizers. The kit includes a gas connection (FG), standard integrated capillary sample connection (F2) and two other sample connection (F1 and F0) options to choose from.

FG gas connection forms a tight seal over the maria on the sidearm of the MEINHARD® nebulizers. FG offers the benefits of an easy-to-use quick connect while maintaining high purity for sensitive ICP applications. In a test that simulated a backflow event, FG produced concentrations of elements like Fe and Cr that were four orders of magnitude lower than concentrations leached from a conventional fitting (Figure 1).



Benefits:

- High-purity PFA fluoropolymer construction
- Easy to connect and disconnect nebulizer line
- One connection fits any MEINHARD® nebulizer

FG Gas Quick Connect for MEINHARD® Nebulizers

FG Gas Quick Connect for MEINHARD® Nebulizers with maria for both small bore and standard bore nebulizers.

Application	Part Number
For use with all MEINHARD® nebulizers	N8121036

FG Gas Quick Connect with connector for PFA tubing

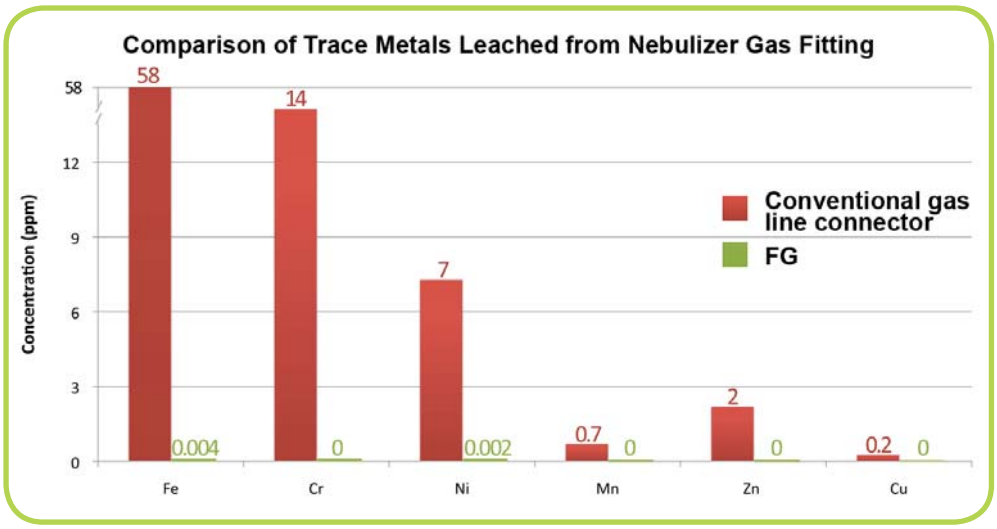


Figure 1. Leach test of a conventional gas line connector and PFA FG

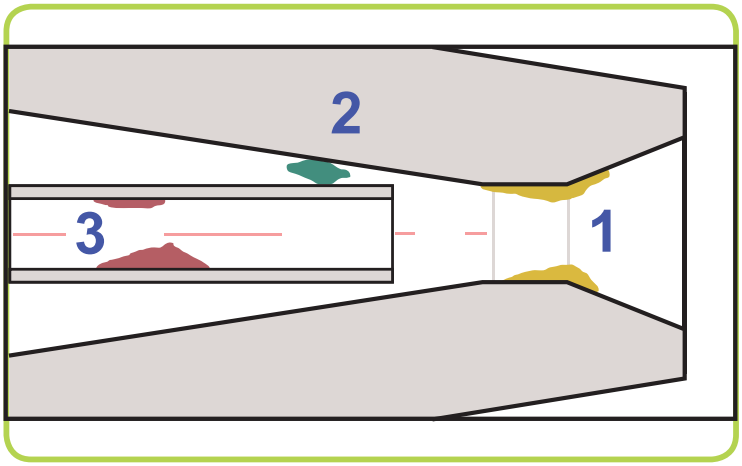
Conventional gas line connector

PFA quick connect gas line (FG)

Pearl Nebulizer Cleaner For All Quartz And Glass Concentric Nebulizers

With this device a cleaning solution can be pumped manually in reverse, through both the sample and gas passages. Recommended cleaning solutions are - Sigma-Aldrich RBS-25 diluted about 20x, Deconex similarly diluted; - or - either of these, but with the addition of 10% methanol. When the wet-cleaning process is finished, rinse with DI water and flush dry with compressed air or inert gas.

The diagram below shows the 3 main types of blockages that can occur in pneumatic concentric nebulizers.

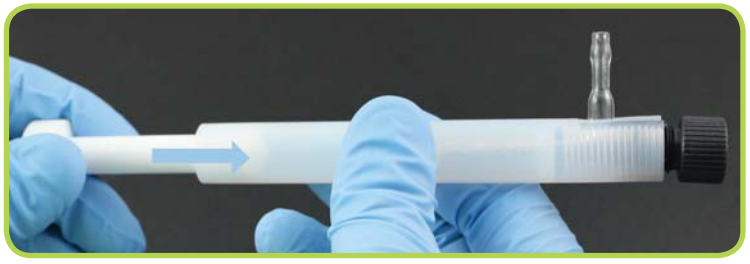


PRL-02 Nebulizer Cleaner

1. Deposits at this point are typically composed of salts coming out of solution. Such deposits can usually be removed by repeated rinsing of a concentric nebulizer with an appropriate solvent.

2. This sort of obstruction is the worst type, capable of breaking the tip of a glass capillary. If the deposit is insoluble, the only sure way to remove it is with a PEARL cleaner.

3. Deposits inside the capillary may go unnoticed for quite a while, particularly if the sample is pumped. Paper and textile fibers are often at fault.



Pumping cleaning solution through concentric nebulizer.

Description	Part Number
Pearl nebulizer cleaner for all glass and quartz concentric nebulizers	N8145457

pergo High Solids Accessory

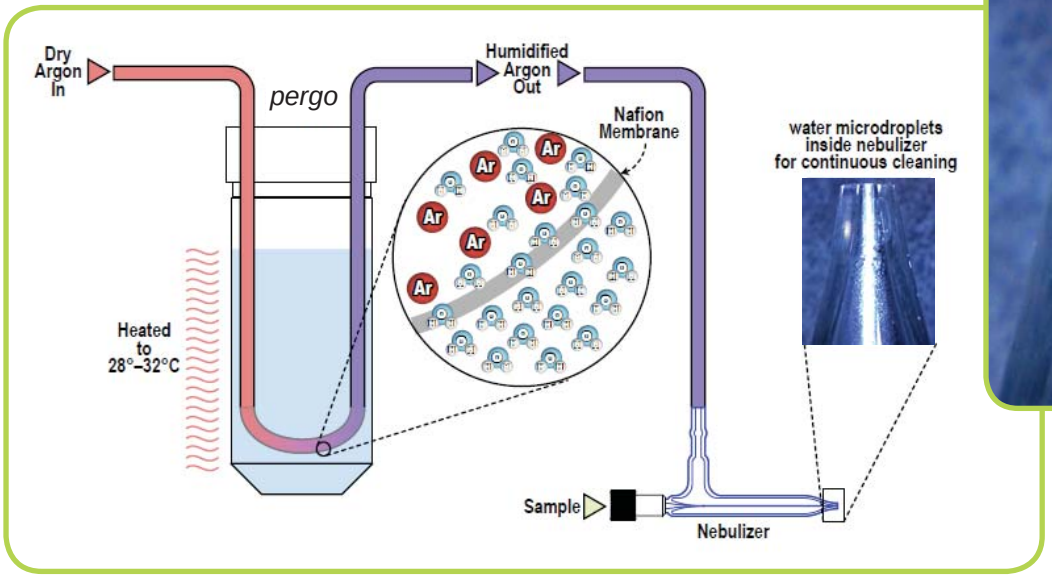
The *pergo* improves performance of all concentric nebulizers for the routine analysis of brines, fusion digests, and other high-TDS samples.

A water vapor permeable membrane humidifies the ICP nebulizer gas stream. By increasing humidity in the argon nebulizer gas, the *pergo* prevents salt deposits at the nebulizer, improving short and long-term signal stability.

N8145315 *pergo*
high solids accessory

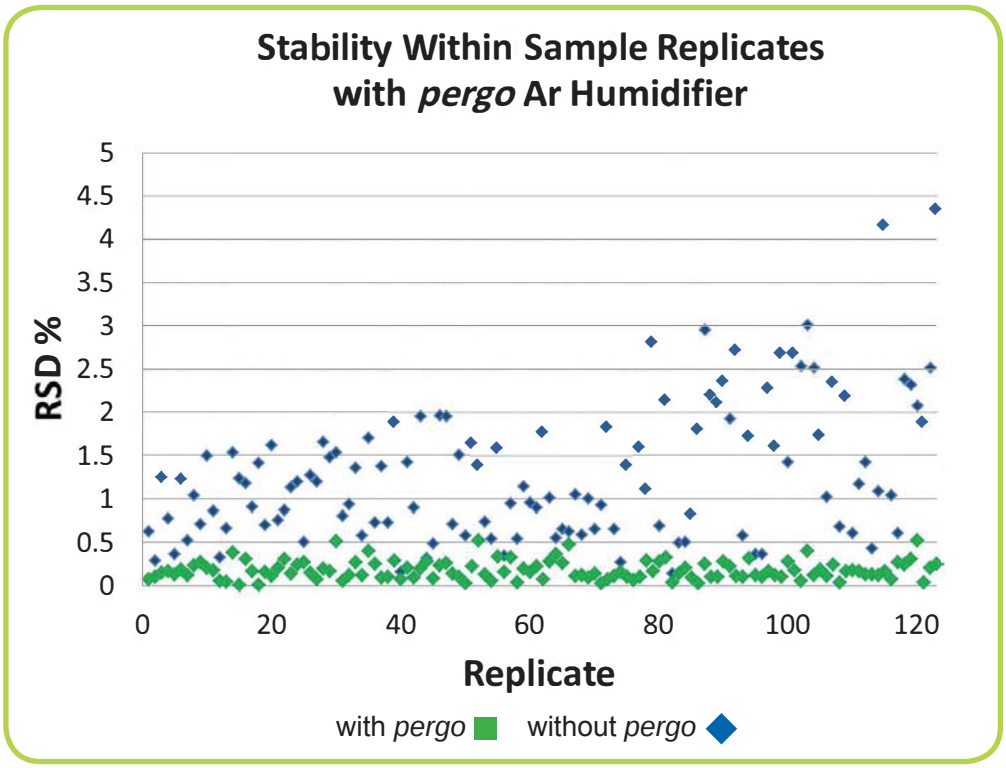
Benefits:

- Improved RSDs
- Improved short and long-term stability
- Improved detection limits
- Faster washout
- Ability to use high-sensitivity nebulizers for high-TDS samples
- Reduce long-term drift
- Extends the length of analytical runs



Ar nebulizer gas is humidified using a tube-shaped membrane placed in a PFA water reservoir at atmospheric pressure. The water vapor condenses inside the nebulizer tip, preventing salt build-up.

Water microdroplets continuously clean the inside of the nebulizer and prevent salt deposits.

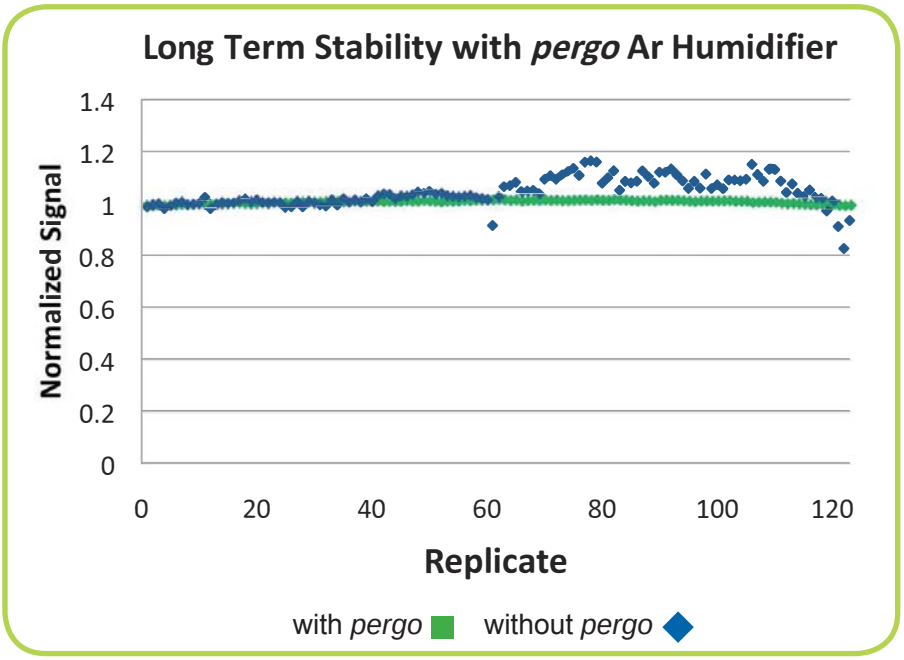


RSDs for seawater samples improve significantly when the *pergo* is utilized

The unique *pergo* design offers many advantages over other types of argon humidifiers.

Advantages:

- Higher, more consistent humidity
- Superior long-term stability
- Safe and easy to use
  - Atmospheric pressure water reservoir
- Optional USB communication for programmable humidity levels



Improved long term stability is achieved when utilizing the pergo, reducing signal drift and extending the length of analysis runs.

Description	*pergo* Part Number
pergo argon high solids accessory.	N8145315
pergo argon high solids accessory. Includes a MEINHARD® TR+ high performance nebulizer.	N8145316
pergo argon high solids accessory. Includes a PFA-ST HF-resistant high performance nebulizer.	N8150427

Online Mixing Kits for Addition of Internal Standard

Online Mixing Kit

The kit for online addition of internal standard is an easy way to use internal standards without having to manually spike each sample with internal standard. The kit can also be used to mix any two reagents for other purposes. The low dead-volume, fluoropolymer mixing tee ensures good mixing at all typical ICP flow rates for a wide variety of liquids, including HF.

Online mixing kit for addition of internal standard

Includes:

- Low dead-volume, fluoropolymer mixing tee
  - 0.25 mm I.D. (green) for flow rates < 1 mL/min
  - 0.5 mm I.D. (orange) for flow rates > 0.3 mL/min
- Internal standard probe and addition line
- Fluoropolymer peripump fittings
- Peristaltic pump tubing starter pack

Online Dilution:

The online mixing kits include a starter pack of peristaltic pump tubing for the MP^2 micro peristaltic pump. Approximate dilution factors are defined by choosing the size of the sample and internal standard peristaltic pump tubing. Other pump tubing sizes are available.

Dilution Factors with Starter Pack Tubing

Sample Tubing		IS / Diluent Tubing					
		Orange	Green	Black	Black	Red	Red
Orange	Green	2		5		10	
Black	Black	1.25		2		3.25	
Red	Red	1.11		1.44		2	

Online Mixing Kits

Part Numbers		
0.25 mm I.D. (Green)	0.5 mm I.D. (Orange)	Description
N8145358	N8145359	For use with PFA-ST nebulizers.
N8145360	N8145361	For use with MEINHARD® Plus nebulizers.*
N/A	N8145362	For use with MiraMist and similar nebulizers.

* Adapter below for other glass nebulizers

Online Mixing Kits with Nebulizer Included

Part Numbers		
0.25 mm I.D. (Green)	0.5 mm I.D. (Orange)	Description
N8145363	N/A	For use with PFA-ST nebulizers. Includes PFA-ST nebulizer.
N/A	N8145364	For use with MEINHARD® Plus nebulizers. Includes TR+ high sensitivity glass nebulizer.

Quartz Cyclonic Spray Chambers

Press Fit Cyclonic Spray Chambers for ZipTorch

Description	Avio 200 Part Number	Avio 500 Part Number	Addition Gas Port	Hydride	PC³ Compatible
Quartz cyclonic baffled cyclonic spray chamber with PFA outlet connection for One-Piece ZipTorch	N0791842	N0811901			✓
Quartz cyclonic baffled cyclonic spray chamber with addition gas port and PFA outlet connection for One-Piece ZipTorch	N0790981	N0810884	✓		✓
Quartz cyclonic baffled cyclonic spray chamber with hydride gas port and PFA outlet connection for One-Piece ZipTorch	N0790980	N0810919		✓	✓

Used with one-piece ZipTorches on page 47, 51.

Ball/Socket Cyclonic Spray Chambers for Standard Avio Torch

Description	Avio 200 Part Number	Avio 500 Part Number	Addition Gas Port	Hydride	PC³ Compatible
Quartz cyclonic baffled cyclonic spray chamber with 12/5 socket connection for standard Avio injector	N0791841	N0811900			✓
Quartz cyclonic baffled cyclonic spray chamber with addition gas port and 12/5 socket connection for standard Avio injector	N0790983	N0810883	✓		✓
Quartz baffled cyclonic spray chamber with hydride gas port and 12/5 socket connection for standard Avio injector	N0790984			✓	

High Performance HF-resistant PFA Spray Chambers

High Performance PFA Spray Chambers

HF resistant, high sensitivity PFA spray chambers for high purity applications.

Description	Application	Part Number
High Performance PFA spray chamber with o-ring-free PFA endcap	HF resistant, high sensitivity PFA spray chamber for semiconductor and other high purity applications.	N0791847
High Performance PFA spray chamber with o-ring-free PFA endcap and **additional gas port**		N0791848

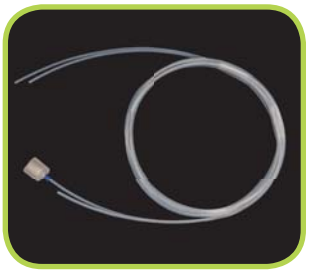
Spray Chamber Accessories

Spray Chamber Clamp

The socket clamp maintains a secure connection between the 12/5 injector ball and spray chamber socket.

Description	Part Number
Clamp for 12/5 socket.	N8145311

Spare Spray Chamber Drain Line



Description	Part Number
Spray chamber drain line kit for Avio 200/500. Includes 32 cm line leading from spray chamber drain to peripump and 160 cm line from peripump to waste bottle. 32 cm line has ¼-28 fitting common to all Avio 200/500 spray chamber drain ports.	N8152456

Spray Chamber Plugs

Description	Application	Part Number
Cyclonic spray chamber AMS matrix gas plug	Plugs the matrix gas port when AMS gas is not used or during storage.	N8145516
Spray chamber nebulizer port plug	Plugs the nebulizer port to prevent contamination during storage.	N8145517
Spray chamber outlet plug	Plugs the spray chamber outlet to prevent contamination.	N8145518

PFA Secure Nut

Description	Application	Part Number
Long (6mm) PFA spray chamber secure nut	Secures nebulizer to Avio spray chamber.	N8145321

Spray Chamber Adapter

Description	Application	Part Number
Avio 200/500 cyclonic spray chamber adapter	Adapts cyclonic spray chamber to Avio sapphire and platinum injectors.	N8152551

Avio 200 and 500 Interchangeable ZipTorches

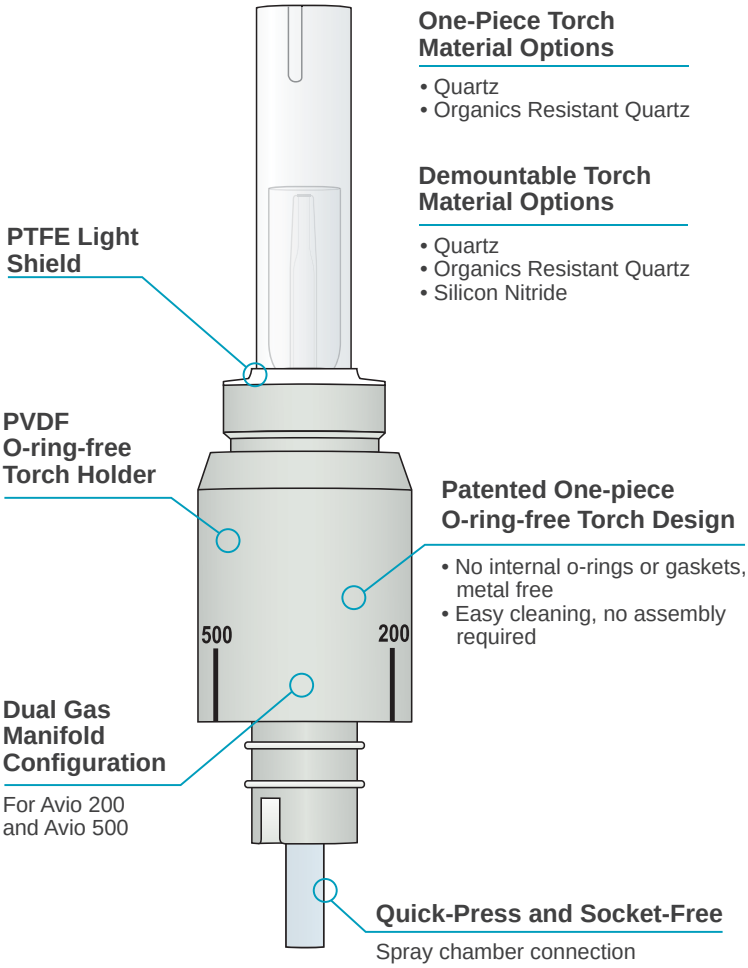
The ZipTorch is a new torch design for Avio 200 and Avio 500 ICPs. ZipTorches can be used interchangeably between the two systems. They are available with fixed or demountable injector options to work with any application on either – or both – Avio systems.

ZipTorch Design

- One-piece base
- Dual gas connections to support both Avio 200 & 500
- No internal o-rings
- Quick-press and socket-free spray chamber connection
- Available in
  - One-piece or demountable
  - Silicon nitride, quartz or organics quartz

ZipTorch Benefits

- Easy cleaning
- Highly reproduceable installation position
- No user contact with torch tubes
- One torch for both Avio 200 and 500
- Torch or injector can be exchanged in seconds
- Eliminate ground glass ball joint connectors and clamps



ZipTorch For Avio – Ease of Installation

The interchangeable ZipTorch can be installed in seconds in either the Avio 200 or 500

Installing a ZipTorch on Avio 200

Installing a ZipTorch on Avio 500

SAMPLE INTRODUCTION

Ultimate in Chemical Resistance and Extended Lifetime

The Nitride ZipTorch is a direct replacement for the standard Avio 200 & 500 torches. It provides substantial enhancements in chemical resistance over standard quartz torches, significantly reducing both replacement costs and observed backgrounds levels.

Nitride torch while nebulizing Yttrium on the Avio ICP

N0811913
Demountable Nitride
ZipTorch

Strength

- Silicon nitride is a ceramic material that is not compromised by the high temperatures of the argon plasma.
- Heat is conducted more evenly across the silicon nitride torch body, reducing thermal stress and resulting in significant advantages over quartz torches that can form stress cracks and fail.

Chemical Resistance

- The Nitride torch is highly resistant to chemical attack by high matrix components in the plasma. Nitride torches do not devitrify and have a long lifetime.
- Nitride ZipTorch is the optimal torch for analyzing samples high in salts, fusion digests, and organic solvents.
- Low background levels for silicon measurements are achieved.

Economical

- Compared to quartz, up to 100x lifespan can be expected when running high matrix samples.
- Eliminating frequent replacement of quartz torches results in significantly reduced operating costs.

Nitride ZipTorch installed in Avio 500

Quickly and easily install injectors into demountable torches

Nitride ZipTorch Design Advantages

- Direct replacement of standard Avio 200 and 500 torches
- No impact on analytical performance – same detection capability
- Utilizes the same interchangeable injectors (quartz, sapphire, and platinum) as the Quartz Demountable ZipTorch for flexibility when application demands change
- Unique construction with both the intermediate and outer tubes made from silicon nitride provides the longest life and highest possible chemical resistance

***Every* ICP-OES System Should Experience the Benefits of a Silicon Nitride ZipTorch**

Selecting the Best Torch for your Application(s)

✓ = Good ✓ = Better ☑ = Best

1-1.5 mm injectors for organic solvents, 2 mm standard size, and 2.5 mm for high matrix samples

Torch	Aqueous	Low Volatility Organics	High Volatility Organics	High Salt Matrix / Fusion	Benefits
Quartz One-Piece	✓	✓			Simplicity with one-piece design
Quartz Demountable	✓	✓	✓		Flexibility to change injectors, injector material, injector diameter
Quartz One-Piece Organic	✓	✓	✓		-Greater resistance to cracking from heat -Simplicity with one-piece design
Quartz Demountable Organic	✓	✓	✓		-Greater resistance to cracking from heat -Added flexibility to change injectors
Silicon Nitride Demountable	☑	☑	☑	☑	-No devitrification from sample matrix -Greatly extended life without replacement--lower cost -Flexibility to change injectors -Appropriate for all sample types

One-piece ZipTorches

The one-piece ZipTorch has an integrated quartz injector for simplicity, easy maintenance and quick torch alignment.

Description	Injector Size	Avio 200/500 Part Number
Quartz one-piece ZipTorch with injector and PVDF o-ring-free holder for Avio ICP	1 mm	N0811902
	1.5 mm	N0811903
	2 mm	N0811906
	2.5 mm	N0811907
Organics quartz one-piece ZipTorch with injector and PVDF o-ring-free holder for Avio ICP	1 mm	N0791864
	1.5 mm	N0791865
	2 mm	N0791866

N0811906 One-piece ZipTorch

Demountable ZipTorches

The demountable ZipTorch utilizes a removable and replaceable injector. Recommended for use with HF applications (using sapphire or Pt injectors) or when the user prefers to remove the injector for cleaning without dismounting the torch.

Description	Avio 200/500 Part Number
Demountable quartz ZipTorch with PVDF o-ring-free holder for Avio ICP	N0811908
Demountable organic ZipTorch with PVDF o-ring-free holder for Avio ICP	N0811935
Demountable silicon nitride ZipTorch with PVDF o-ring-free holder for Avio ICP	N0811913

N0811908 Demountable Quartz ZipTorch

N0811935 Demountable Quartz Organics ZipTorch

N0811913 Demountable Silicon Nitride ZipTorch

Injectors for Demountable ZipTorches

These injectors are designed for use with the quartz, organics and silicon nitride demountable torches.

- Quartz is used for wide range of non-HF aqueous applications and organic solvents
- Sapphire is utilized for environmental, geochemistry, and HF applications
- Platinum is used with volatile organic solvents and HF-containing semiconductor-grade chemicals

Description	Size	Avio 200/500 Part Number
Quartz demountable injectors for Avio ZipTorches	1 mm	N0791859
	1.5 mm	N0791860
	2 mm	N0791861
	2.5 mm	N0791862
Sapphire demountable injectors for Avio ZipTorches	1.5 mm	N0791850
	2 mm	N0791851
Platinum demountable injector for Avio ZipTorches	2 mm	N0791849

N0791860 Quartz Injector

N0791850 Sapphire Injector

N0791849 Platinum Injector

FAST DXi

Upgradable Integrated Precision Micro Peristaltic Pump for Avio 200/500

The *FAST* DXi is a microperistaltic pump integrated to the Avio 200/500. It can be easily upgraded to *FAST*, prep*FAST* or other automation applications by adding valve actuators and other necessary components. It allows laboratories the flexibility to start with a high-quality, long-lived peristaltic pump and add automation components as needed.

- Direct replacement for standard peristaltic pump
- Connects to any SC-DX autosampler
- Integrated to Syngistix software control

Precision

- Accurate pumping across a wide range of rates from low 0.20 µL/min to 10 mL/min
- Faster analysis with high precision.

Low Pulsation

- 12 closely-spaced rollers maintain consistent flow rate and improve signal stability

Chemical Resistance

- Ceramic pins and PTFE-coated metal components are resistant to acids and organic solvents
- Long-life motor and drive assembly

N0790956
FAST valve actuator

N0790982
FAST DXi populated with a dual valve actuator.
(Valve shown but not included)

N0790954
FAST DXi populated with a single valve actuator.
(Valve shown but not included)

FAST DXi's for Avio 200/500			
Description	# of Valve Actuators	Avio 200 Part Number	Avio 500 Part Number
FAST DXi integrated 4 channel MP² peripump with single *FAST* valve actuator	1	N0790954	N0810852
FAST DXi integrated 4 channel MP² peripump with dual *FAST* valve actuators	2	N0790982	N0810885

Valve not included with actuators.

FAST Valve Actuator		
Description	Avio 200 Part Number	Avio 500 Part Number
Additional *FAST* valve actuator to convert integrated MP² to *FAST* with one actuator for *FAST*.	N0790956	N0810853
Additional *FAST* valve actuator to convert *FAST* DXi from *FAST* to prep*FAST* with two actuators for prep*FAST*.	N0790955	N0810854

Stand Alone MP² Precision Micro Peristaltic Pumps

MP² Precision Micro Peristaltic Pumps

The MP² is a compact, precise, stand-alone micro peristaltic pump with a flow rate range from 0.20 µL/min to 10 mL/min and is available with one to eight channels. Optimized for low-flow rates, the MP² uses either MPP tubing or standard 3-stop pump tubing.

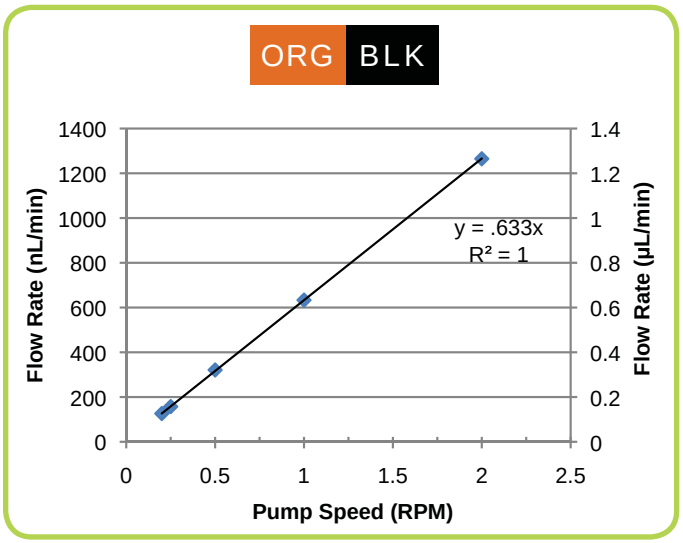
CONTROLLED BY THE INSTRUMENT PC USB PORT	
Number of Channels	**Part Number**
1 channel MP² precision micro peristaltic pump	N8145092
2 channel MP² precision micro peristaltic pump	N8145093
3 channel MP² precision micro peristaltic pump	N8145094
4 channel MP² precision micro peristaltic pump	N8145095
6 channel MP² precision micro peristaltic pump	N8145096
8 channel MP² precision micro peristaltic pump	N0777833

Includes: Cable to control with DX Autosampler

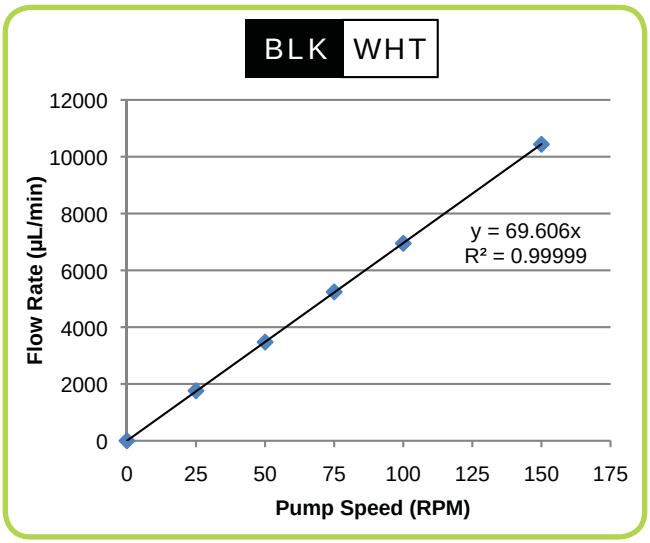
N8145095
stand-alone, precision
micro peristaltic pump

CTFE PERIPUMP FITTINGS (Non-barbed) Used in Low Pressure Applications			
	Qty	**Size**	**Part Number**
	1	Female (small)	N8145018
	1	Male (small)	N8145017
	5	Female	N0786030
	5	Male	N0786036

CTFE PERIPUMP FITTINGS (Barbed) Used in High Pressure Applications			
	Qty	**Size**	**Part Number**
	1	Female (small)	N0777829
	1	Male (small)	N0777830
	5	Female	N8152388
	5	Male	N8152453



MP² pump linearity < 1 µL/min



MP² pump linearity up to 10 mL/min

SAMPLE INTRODUCTION

MP² Pump Tubing

Tubing for MP² Micro Peristaltic Pumps (Packs of 12)

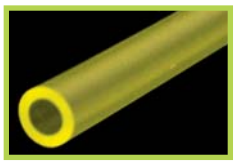
i.d.	Stop Colors		Calibration Slope (µL/min per RPM)	Non-Flared PVC 2-stop	Non-Flared *Santoprene® 2-stop	Non-Flared Solva 2-stop	Flared* PVC 2-stop	Flared* Solva 2-stop
0.13 mm	Orange	Black	0.6	N8145145			N8145194	N8145208
0.19 mm	Orange	Red	1.3	N8145146			N8145195	N8145209
0.27 mm	Orange	Blue	2.7	N8145147			N8145196	N8145210
0.38 mm	Orange	Green	4.7	N8145148	N8145171		N8145197	N8145211
0.44 mm	Green	Yellow	7.6	N8145149			N8145198	N8145212
0.51 mm	Orange	Yellow	9.5	N8145150			N8145199	N8145213
0.57 mm	White	Yellow	11	N8145151			N8145200	N8145214
0.64 mm	Orange	White	14	N8145152			N8145201	N8145215
0.76 mm	Black	Black	19	N8145153	N8145172	N8145176	N8145202	N8145216
0.89 mm	Orange	Orange	24	N8145154		N8145177	N8145203	N8145217
0.95 mm	White	Black	28	N8145155		N8145178	N8145204	N8145218
1.02 mm	White	White	31	N8145156		N8145179	N8145205	N8145219
1.09 mm	White	Red	33	N8145157		N8145180	N8145206	N8145220
1.14 mm	Red	Red	35	N8145158		N8145181	N8145207	
1.22 mm	Red	Grey	46	N8145159		N8145182		
1.30 mm	Grey	Grey	47	N8145160	N8145173	N8145183		
1.42 mm	Yellow	Yellow	50	N8145161		N8145184		
1.52 mm	Yellow	Blue	51	N8145162	N8145174	N8145185		
1.65 mm	Blue	Blue	55	N8145163		N8145186		
1.75 mm	Blue	Green	58	N8145164		N8145187		
1.85 mm	Green	Green	61	N8145165		N8145188		
2.06 mm	Purple	Purple	64	N8145166		N8145189		
2.29 mm	Purple	Black	65	N8145167		N8145190		
2.54 mm	Purple	Orange	67	N8145168		N8145191		
2.79 mm	Purple	White	69	N8145169		N8145192		
3.17 mm	Black	White	70	N8145170	N8145175	N8145193		
Bridge Length				72 mm	72 mm	72 mm	72 mm	72 mm

*For easy insertion of PFA capillaries **i.d. = internal diameter**

Non-Flared

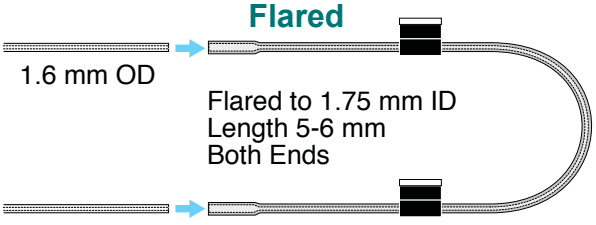
PVC

Santoprene®



SOLVA

Flared



MP² PUMP TUBING KIT	
Description	**Part Number**
MP² Pump Tubing Kit comprised of 34 packs of 12 tubes, one package of each white highlighted part number in the table above. Includes: 26 packs of PVC tubing (0.13 to 3.17 mm i.d.) 3 packs of *Santoprene® tubing and 5 packs of Solva tubing. Kit also includes: 30 CTFE Fluoropolymer Peristaltic pump Fittings: 5 small female, 5 small male, 5 medium female, 5 medium male, 5 large female and 5 large male.	N8145221

*Santoprene® is a product of ExxonMobil.

Replacement Syringes for Syringe Pumps

Syringes

Replacement Syringes			
Size	**Material**	**Application**	**Part Number**
0.3 mL	Quartz	Micro volume applications	N8145222
0.3 mL	CTFE	Micro volume applications	N8145225
3 mL	Quartz	prep*FAST*	N8145223
3 mL	CTFE	HF applications	N8145226
6 mL	Quartz	prep*FAST* e	N8152754
6 mL	CTFE	HF applications	N8152756
12 mL	CTFE	prep*FAST*	N8145227

0.3 mL quartz syringe
N8145222

3 mL quartz syringe
N8145223

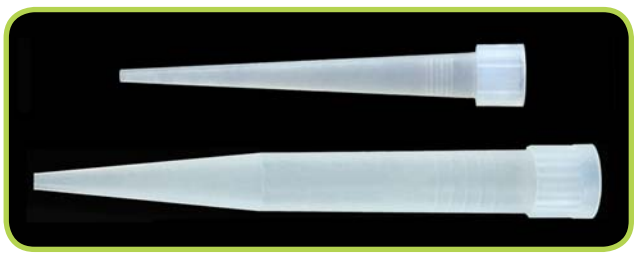
6 mL Quartz syringe
N8152754

12 mL CTFE syringe
N8145227

High Purity PFA Pipette Tips

High purity PFA pipette tips are used to minimize contamination of semiconductor and biological samples.

Description	Volume	Qty	Part Number
Pre-cleaned PFA Pure Tip pipette tips	100-200 µL	10 pk	N0777394
Pre-cleaned PFA Pure Tip pipette tips	100-200 µL	96 pk	N8145342
Pre-cleaned PFA Pure Tip pipette tips	1000 µL	10 pk	N0777395
Pre-cleaned PFA Pure Tip pipette tips	1000 µL	60 pk	N8145343



PC³ Peltier Cooled Cyclonic Spray Chambers

The PC³ is a small, robust Peltier cooled cyclonic spray chamber. The PC³ spray chambers offer the advantages of low memory effects, constant temperature, fast rinse-out, and high sample transport efficiency when coupled with the Avio 200/500 ICP systems. The cooled outer walls of the PC³ spray chamber enhances long-term signal stability and reduces solvent loading when both aqueous and organic solvents are analyzed. For low flow rate applications, the heating mode can be used to improve sensitivity by increasing transport efficiency into the plasma.

N0790959 PC^{3X} on the Avio 200

PC^{3X} Peltier Cooler / Heater

The PC^{3X} is a compact, Peltier-cooled or heated inlet system which incorporates the Avio cyclonic spray chamber. It operates in both cooling and heating modes for the spray chamber. The thermal stabilization of the spray chamber improves the long-term stability of the ICP response by isolating the sample introduction from laboratory temperature changes during the analysis.

System Design

- Temperature control from -10°C to +80°C
- Temperature stability +/- 0.1 °C
- Improved long-term stability through thermal stabilization of spray chamber
- Completey o-ring-free for organic solvent analysis

PC^{3X} Complete Kit for Avio Includes:

- PFA-ST MicroFlow Nebulizer
- Quartz Cyclonic Spray Chamber
- PC³ Adjustable Mounting Shelf

Description	Avio 200 Part Number	Avio 500 Part Number
PC^{3X} Complete system for Avio ICP	N0790959	N0810860
PC^{3X} thermally stabilized inlet system for Avio cyclonic spray chamber (Spray chamber and mounting shelf not included)	N0790972	
PC^{3X} adjustable mounting shelf for Avio ICP	N0790973	N0810876

N0790959
PC^{3X} on the Avio 200

PC-LT on the Avio 500 for volatile organic solvent analysis

PC^3-LT

The PC^3-LT is a low temperature Peltier cooler for cyclonic spray chambers on the Avio 200 / 500 ICP systems. It provides lower temperatures to reduce the solvent load on the plasma for the analysis of volatile organic solvents.

System Design

- Controlled directly through Syngistix 2.0 and higher
- Temperature control from -20°C to +2°C
- Temperature stability +/- 0.1 °C
- Completey o-ring-free for organic solvent analysis

PC-LT Complete Kit for Avio Includes:

- PFA-ST MicroFlow Nebulizer
- Quartz Cyclonic Spray Chamber
- Transfer Line

Description	Temperature	Part Number
PC^3-LT Peltier-cooled sample introduction system with spray chamber for Avio.	+2°C / -20°C	N0790025

Direct ICP Analysis of Solid Samples

NWR Series Laser Ablation

Laser Ablation (LA) is a direct, solid sample introduction technique for Inductively Coupled Plasma Mass Spectrometry (ICPMS) and Optical Emission Spectroscopy (OES). LA can be used to directly analyze any solid sample. The sample is accommodated inside an ablation cell and interrogated by a high power, pulsed laser ranging from a few microns (for high resolution spatial analysis) or hundreds of microns (for bulk analysis) in diameter. The aerosol generated is swept to the ICP/ICPMS for subsequent vaporization and ionization via a simple transport line.

The NWR laser ablation platform was designed and developed with an emphasis on superior performance and analytical results, application flexibility, operating convenience and reliability.

NWR Platform

Elemental Scientific has a complete laser product portfolio including:

- UV Femtosecond
- 193 nm Eximer
- 213 nm Solid State
- 266 nm Solid State
- Infrared
- Imaging Systems
- Automated Sampling

Applications Include*:

Geochemistry
Geochronology
Fluid Inclusions
Elemental ratios
Isotope ratios
Purity testing
Material characterization
Bulk Analysis
Failure Analysis
(Bio-) Imaging/Mapping
Depth Profiling

Materials Include*:

Alloys
Rocks
Minerals
Glasses
Plastics
Powders
Biological
Thin films
Ceramics
Metals

*The lists above are not exhaustive.

Elemental Scientific LASERS

INNOVATION to ILLUMINATE

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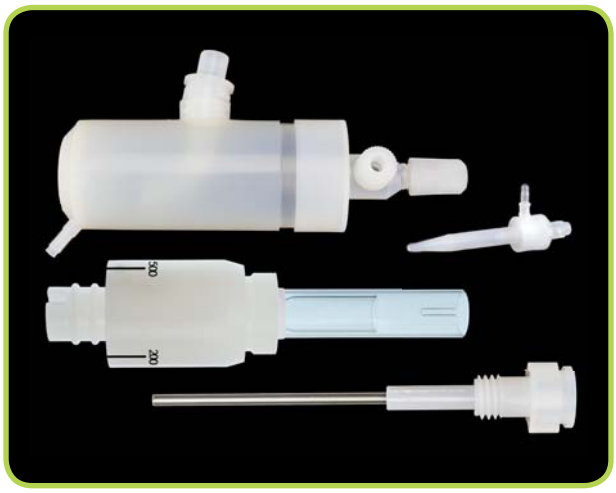
406-586-3159 | lasers@icpms.com | www.nwrlasers.com

HF-Resistant Sample Introduction Kit

Sample Introduction Kit

The PFA kit is an ultra-pure, HF-resistant introduction system for the Avio ICP. All wetted surfaces are PFA and the injector is sapphire. It is used for the analysis of HF-containing samples for mining, semiconductor and other applications.



N0810914 Series HF-Resistant PFA Sapphire Sample Introduction Kit for PE Avio

Benefits:

- Easy installation
- Clean PFA components for lower background equivalent concentration (BEC) and detection limits
- O-ring-free connections—ensures lowest BEC's, highest chemical resistance and easy cleaning
- Chemically resistant—suitable for nearly all samples, including strong acids, alkalis and organic solvents
- Low sample consumption—ideal for VPD and preconcentrated samples
- Fast washout

N0810914 HF-Resistant Sample Introduction Kit installed on the Avio 500

Description	Part Number
Complete HF-resistant sample introduction kit for PerkinElmer Avio ICP. Includes: High Performance PFA spray chamber with PFA PureCap endcap, ST3 High Pressure MicroFlow PFA nebulizer, Demountable quartz torch with PVDF o-ring-free holder and 2mm demountable sapphire injector.	N0810914

High Purity Valves

High purity valve stators and rotors provide for the selection of liquid flow path with low contamination and low carryover for the optimum ICP results.

P-Series Two position sampling valves

V-Series Syringe pump refill valves

M-Series Multiposition stream selector/flow director valves

S-Series Semiconductor grade ultra-high purity valves

8 Port Valve - P7+ Part Number: N0777750

Description: P7+ CTFE high-flow 8 port valve head for prep*FAST*
Specifications: CTFE stator, PFA rotor, 1 mm, 0.5 mm
Applications: prep*FAST,* inline dilution and internal standard addition

6 Port Valve - P7 Part Number: N8145371

Description: 7 port syringe loading valve
Specifications: CTFE stator, PFA rotor, 1.0 mm
Applications: *FAST,* prep*FAST* e

12 Port Syringe Valve - V12 Part Number: N8145388

Description: 12 port syringe loading valve
Specifications: CTFE stator, PFA rotor, 1.0 mm
Applications: S400V, brine*FAST* syringe valve

8 Port Valve - M8 Part Number: N8145454

Description: M8 CTFE high-flow 8 port stream selector valve
Specifications: CTFE stator, PFA rotor
Applications: SmartTuner

11 Port Syringe Valve - S11 Part Number: N8152664

Description: 11 port syringe loading valve
Specifications: CTFE stator, PFA rotor, 1.0 mm
Applications: prep*FAST* S and scoutDX

Examples of a Stator and Rotor

Description

CTFE replacement stator for V12 *FAST* valve

Description

1 mm PFA rotor

High Purity Valves with Spare Rotors and Stators

P-SERIES VALVES WITH REPLACEMENT STATORS AND ROTORS						
# of Ports	Bore Size	Stator Material	Rotor Material	Part Number Complete Valve	Part Number Stator	Part Number Rotor
3 - P3	1.0 mm	CTFE	PFA	N8152617	N8152618	N8152619
4 - P4	1.0 mm	CTFE	PFA	N8145369	N8145377	N8145383
6 - P6	P6	CTFE	PFA	N8145370	N8145378	N0777751
7 - P7	P7	CTFE	PFA	N8145371	N0777752	N0777751
7 - P7	P7	PPS	PFA	N8145372	N8145380	N0777751
8 - P7+	P7	CTFE	PFA	N0777750	N8145379	N8145384
8 - P8	1.0 mm	CTFE	PFA	N8145373	N8145381	N8145385
10 - P10	1.0 mm	CTFE	PFA	N8145374	N8145382	N8145386
11-P11	1.0 mm	CTFE	PFA	N8145375	N8145393	N8145386
11-A11b	A11b	CTFE	PFA	N8145376	N8145392	N8145396
13 - P13	P13	CTFE	PFA	N8145455	N8152620	N8152621
5 - A5e	A5e	CTFE	PFA	N8145451	N8152622	N8152623
7 - A7µ	A7µ	CTFE	PFA	N8145452	N8152624	N8152625
6 - PM6	0.4 mm	CTFE	PFA	N8152626	N8152627	N8152628
8 - PM7+	0.4 mm	CTFE	PFA	N8152629	N8152630	N8152628
4 - P4H	1.6 mm	CTFE	PFA	N8152631	N8152632	N8152633
5 - P5H	1.6 mm	CTFE	PFA	N8152634	N8152635	N8152633

V-SERIES VALVES WITH REPLACEMENT STATORS AND ROTORS						
# of Ports	Bore Size	Stator Material	Rotor Material	Part Number Complete Valve	Part Number Stator	Part Number Rotor
6 - V6	1.0 mm	CTFE	PFA	N8145387	N8145390	N8145395
6 - V6H	1.6 mm	CTFE	PFA	N8145453	N8152637	N8152638
9 - V9	1.0 mm	CTFE	PFA	N0777758	N0777761	N0777759
12 - V12	1.0 mm	CTFE	PFA	N8145388	N8145391	N8145397
13 - V13	1.0 mm	CTFE	PFA	N8145389	N8145394	N8145398
V8C	1.0 mm	CTFE	PFA	N8145559	N8152640	N8145397
V9H	1.6 mm	CTFE	PFA	N8152641	N8152642	N8152643

M-SERIES STREAM SELECTION VALVE						
# of Ports	Bore Size	Stator Material	Rotor Material	Part Number Complete Valve	Part Number Stator	Part Number Rotor
3 - M3H	1.6 mm	CTFE	PFA	N8152644	N8152645	N8152646
4 - M4	M4	CTFE	PFA	N8152647	N8152648	N8152649
6 - M6	M6	CTFE	PFA	N8152650	N8152651	N8152652
8 - M8	M8	CTFE	PFA	N8145454	N8152653	N8152654
10 - M10	M10	CTFE	PFA	N8152655	N8152656	N8152657

S-SERIES VALVES WITH REPLACEMENT STATORS AND ROTORS						
# of Ports	Bore Size	Stator Material	Rotor Material	Part Number Complete Valve	Part Number Stator	Part Number Rotor
4 - S4	S4	CTFE	PFA	N8145560	N8152659	N8152660
9 - S9	S9	CTFE	PFA	N8152661	N8152662	N8152663
11 - S11	S11	CTFE	PFA	N8152664	N8152665	N8152666

Manual Sampling Probes

Probes

These probes offer high chemical resistance for applications involving strong acids, alkalis, and organics. A contoured design reduces carryover, while an all-fluoropolymer wetted sample flow path reduces contamination.

Description	Size	Part Number
PFA carrier / internal standard probe for *FAST* valve	0.50 mm i.d. ■ (orange), 150 cm	N0777286
PFA internal standard probe for use with standard addition tee or P7 *FAST* valve internal standard addition line		N8145344

Description	Size	Part Number
PFA *FAST* sample probe for high-flow *FAST* valve, carbon fiber supported	0.80 mm i.d. ■ (blue), 150 cm	N0777523
	1.00 mm i.d. ■ (gray), 150 cm	N0777522

Internal Standard Addition Tee for PFA-ST Nebulizer

Specially designed mixing tee is perfect for online addition of internal standard or online dilution. Achieves excellent mixing with minimal dead volume. 0.5 mm i.d. capillary is recommended for applications with flow rates > 0.3 mL/min.

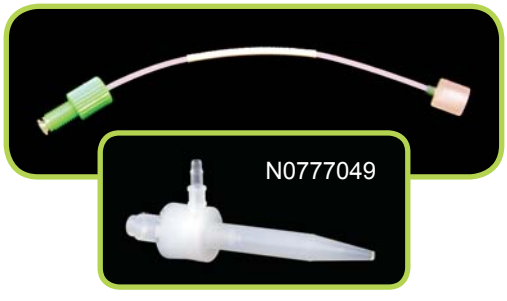
Description	Part Number (14 cm)	DXi Part Number (25 cm)
0.25 mm i.d. ■ (green) Attaches to port #3	N0777294	N0777662
0.50 mm i.d. ■ (orange) Attaches to port #3	N0777295	N0777663

PFA-ST Nebulizer

FAST Valve Connecting Line for PFA-ST Nebulizer

Connects the *FAST* valve to an PFA-ST nebulizer to achieve fast signal stabilization time and short wash times.

Description	Part Number (14 cm)	DXi Part Number (25 cm)
0.25 mm i.d. ■ (green) Attaches to port #3 of the *FAST* valve.	N0777287	N0777655
0.50 mm i.d. ■ (orange) Attaches to port #3 of the *FAST* valve.	N0777288	N0777657



PFA-ST Nebulizer

PFA-ST or MEINHARD® nebulizers are recommended for use with the *FAST* system for optimum throughput and performance. Connecting lines are offered for most nebulizers that laboratories may already have.

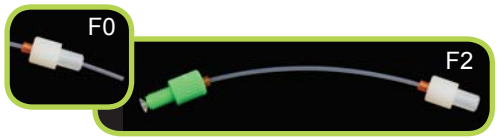
Internal Standard Addition Line for P7 *FAST* Valve

Connects the internal standard peripump tubing or probe to a P7 valve for online addition of internal standard.

Description	Part Number
Internal standard line for P7 valve with XL fitting. 0.5 mm i.d. ■ (orange)	N8145345

FAST Valve Connecting Line for MEINHARD® Plus Nebulizers

PTFE *FAST* valve line that connects the *FAST* valve (port #3) to a MEINHARD® Plus nebulizer to achieve fast signal stabilization time and short wash times.



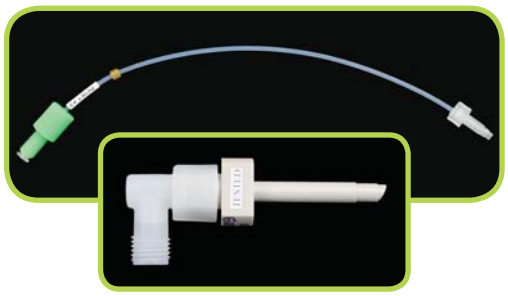
Description	Fitting Type	Part Number (14 cm)	DXi Part Number (25 cm)
0.25 mm i.d. ■ (green), 14 cm Attaches to port #3 of the *FAST* valve.	F0	N8145461	N8145463
	F2	N8145346	N8145465
0.50 mm i.d. ■ (orange), 14 cm Attaches to port #3 of the *FAST* valve.	F0	N8145462	N8145464
	F2	N8145347	N8145466

MEINHARD® glass and quartz nebulizers

See page 39 for more information about the F0 and F2 fittings.

FAST Valve Connecting Line for PerkinElmer Gem Cone Nebulizer

PTFE *FAST* valve line that connects the *FAST* valve (port #3) to a PerkinElmer Gem Cone nebulizer to achieve fast signal stabilization time and short wash times.

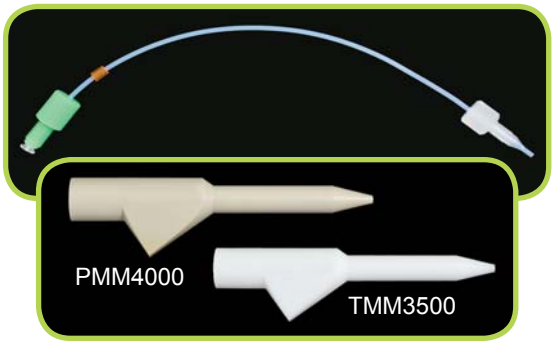


PerkinElmer Gem Cone Low-flow Nebulizer

Description	Part Number
0.50 mm i.d. ■ (orange), 25 cm. Attaches to port #3 of the *FAST* valve.	N8145467
1.00 mm i.d. ■ (gray), 25 cm. Attaches to port #3 of the *FAST* valve.	N8145468

FAST Valve Connecting Line for MIRA MIST Nebulizer

PTFE *FAST* valve line that connects the *FAST* valve (port #3) to a MIRA MIST nebulizer to achieve fast signal stabilization time and short wash times.



MIRA MIST PEEK and PTFE Nebulizers

Description	Part Number
0.50 mm i.d. ■ (orange), 17 cm. Attaches to port #3 of the *FAST* valve.	N0777658
1.00 mm i.d. ■ (gray), 17 cm. Attaches to port #3 of the *FAST* valve.	N0777660

Fittings / PFA Tubing / Spares Kits

Easy to use, ultra-clean fittings and PFA tubing are ideal for all trace metal analysis applications. Ferrules install quickly and easily for high-flow applications. Low-flow valve fittings have low dead volume, leak-free integrated ferrule connections.

	Description	Qty	Suggested Use	P/N
	Black, high-flow nut (1/4-28) for *FAST* valve and 1/16" (1.6 mm) ferrule	10	Use with 1/16" (1.6 mm) o.d. PFA tubing for low and moderate flow rates (0.1 mL/min - 2 mL/min)	N0777283
	White, high-flow nut (1/4-28) for *FAST* valve and 1/8" (3.2 mm) ferrule	10	Use with 1/8" (3.2 mm) o.d. PFA tubing for high-flow rates and vacuum applications (> 2 mL/min)	N0777297
	1/16" (1.6 mm) Ferrule for high-flow fitting (1/4-28)	10	Use with 1/16" (1.6 mm) o.d. PFA tubing	N8145237
	1/8" (3.2 mm) Ferrule for high-flow fitting (1/4-28)	10	Use with 1/8" (3.2 mm) o.d. PFA tubing	N8145238
	Black, low-flow nut (M5/10-32) for *FAST* valve	10	Use with 1/16" (1.6 mm) o.d. PFA tubing for low-flow rates (<0.1 mL/min)	N0777284
	Female Perilink fitting, barbed	1	Adapts 10/32 to pump tubing	N8152388
	Female Perilink fitting	5	Adapts 10/32 to pump tubing	N0786030
	Male Perilink fitting, barbed	1	Adapts 10/32 to pump tubing and for use with internal standard tee	N8152453
	Male Perilink fitting	5	Adapts 10/32 to pump tubing and for use with internal standard tee	N0786036
	PFA-ST Nebulizer to Micro Fitting Adapter, PFA	1	Allows for use of tubing with 10/32 fitting with PFA-ST nebulizer	N8145520
	MEINHARD® Plus Nebulizer to micro fitting adapter	1		N8152387
	CTFE peristaltic pump fittings, female	1	For use in low pressure applications.	N8145018
	CTFE peristaltic pump fittings, female, barbed	1	For use in high pressure applications	N0777829
	CTFE peristaltic pump fittings, male	1	For use in low pressure applications	N8145017
	CTFE peristaltic pump fittings, male, barbed	1	For use in high pressure applications	N0777830

High Purity Fluoropolymer Tubing (5 m coil)			
I.D.	O.D.	Color Code	Part Number
0.006" (0.15 mm)	1/16" (1.6 mm)	■ (red)	N8145239
0.008" (0.20 mm)	1/16" (1.6 mm)	■ (purple)	N8145240
0.010" (0.25 mm)	1/16" (1.6 mm)	■ (green)	N8145241
0.014" (0.30 mm)	1/16" (1.6 mm)	■ (yellow)	N8145242
0.019" (0.50 mm)	1/16" (1.6 mm)	■ (orange)	N8145243
0.031" (0.80 mm)	1/16" (1.6 mm)	■ (blue)	N8145244
0.039" (1.00 mm)	1/16" (1.6 mm)	■ (gray)	N8145245
0.063" (1.60 mm)	1/8" (3.2 mm)		N8145246

Sample Loops

PTFE crimp free *FAST* or prep*FAST* loops provide low resistance for fast loading and rinse out.

Standard for *FAST* Systems

1 mm i.d. *FAST* High-Flow Sample Loops

Description	Size	Part Number
Recommended for use with 1.0 mm i.d. ■ (gray) probe. 1.6 mm o.d., 1/4-28 fittings.	300 µL loop	N0777477
	500 µL loop	N0777478
	1.0 mL loop	N0777664
	1.5 mL loop	N0777665
Applications	2.0 mL loop	N0777479
FAST, prep*FAST*, prep*FAST* M5, prep*FAST* e, brine*FAST*, sea*FAST*	2.5 mL loop	N0777666
	3.0 mL loop	N0777667
	4.0 mL loop	N0777480

N0777666 2.5mL sample loop

0.8 mm i.d. *FAST* High-Flow Sample Loops

Description	Size	Part Number
Recommended for use with 0.8 mm i.d. ■ (blue) probe. 1.6 mm o.d., 1/4-28 fittings.	100 µL loop	N0777428
	200 µL loop	N0777429
	300 µL loop	N0777430
	500 µL loop	N0777289
	1.0 mL loop	N0777290
Applications	1.5 mL loop	N0777668
Legacy *FAST* systems, and special applications	2.0 mL loop	N0777431
	2.5 mL loop	N0777669
	3.0 mL loop	N0777670
	4.0 mL loop	N0777671

N0777290 1mL sample loop

1.6 mm i.d. *FAST* High-Flow Sample Loops

Description	Size	Part Number
Recommended for use with 1.0 mm i.d. ■ (gray) probes and applications requiring larger sample volumes or high flow rates. 3.2 mm o.d., 1/4-28 fittings.	250 µL loop	N0777046
	500 µL loop	N0777832
	1.0 mL loop	N8145469
	2.0 mL loop	N0777291
Applications	3.0 mL loop	N0777292
soil*FAST*, oil*FAST*, and large volume *FAST*	4.0 mL loop	N0777293
	6.0 mL loop	N0777653
	8.0 mL loop	N0777654

N0777292 3mL sample loop

CONSUMABLES

PFA Sample Vessels

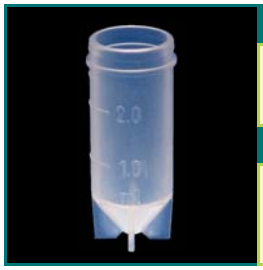
PFA Vials

PFA vials are ideal for applications that require the highest purity. Made of ultra-pure, ultra-chemically resistant material, these vials are an excellent choice for high purity, semiconductor and micro samples.

- **Non-contaminating**
- **HF-resistant**
- **Graduated**
- **Conical bottom**
- **Temperature range of -200 °C to 260 °C**
- **Self-standing**

Vials	Fits Racks
N0777403	N0777229 (pg 73), N0777230 (pg 73), N0777397 (pg 75)
N0777404	
N0777405	

Part Number	Qty
N0777403	10
Description	**Volume**
14 mm o.d. graduated PFA micro vial	1 mL Brim full 2 mL



Part Number	Qty
N0777404	10
Description	**Volume**
14 mm o.d. graduated PFA micro vial	2 mL Brim full 3 mL

Part Number	Qty
N0777405	10
Description	**Volume**
14 mm o.d. graduated PFA micro vial	4 mL Brim full 4.5 mL

Part Number	Qty
N0777396	1
Description	
ETFE tweezers for removal of PFA cap with knob	

Part Number	Qty
N0777402	10
Description	
PFA cap for 14 mm micro vials	

Part Number	Qty
N0777393	10
Description	
PFA snap-on cap for 14 mm graduated PFA micro vials	

Part Number	Qty
N0777392	10
Description	
PFA cap with knob for 14 mm graduated PFA micro vials.	

PFA Bottles and Vials

PFA bottles and vials are ideal for a wide range of demanding fluid handling and storage applications in general laboratory, semiconductor, and environmental industries.

Bottles / Vials	Fits Racks
N8145132	N0777249 (pg 74), N8122463 (pg 73)
N8145133	N8145130 (pg 74), N8122463 (pg 73), N8145131 (pg 76)
N8145134	N0777242 (pg 72), N0777641 (pg 72), N8145130 (pg 74), N0777639 (pg 73), N8145131 (pg 76)
N0777406	N0777248 (pg 74), N0777228 (pg 76)
N0777407	N0777252 (pg 74), N0777772 (pg 77), N0777771 (pg 77), N0777822 (pg 75)

Part Number	Qty
N0777406	5
Description	**Volume**
28 mm o.d. PFA bottle and cap	20 mL

Part Number	Qty
N0777407	1
Description	**Volume**
50 mm o.d. PFA bottle and cap with TFM insert	125 mL

- Semiconductor, high-purity, and aggressive chemical applications
- The most translucent PFA vials available
- Low absorption of biological materials for many research applications

Part Number	Qty
N8145132	10
Description	**Volume**
30 mm o.d. graduated PFA vial	15 mL

Part Number	Qty
N8145133	10
Description	**Volume**
30 mm o.d. graduated PFA vial	30 mL

Part Number	Qty
N8145134	10
Description	**Volume**
30 mm o.d. graduated PFA vial	60 mL

Part Number	Qty
N8145105	10
Description	
Screw cap for 30 mm o.d. vials	

2 mL PVDF Autosampler Vial

A low cost alternative to PFA for many ultra-trace metal analyses

PVDF sample vials are a lower cost alternative to our high-performance PFA vials. These high-tensile-strength, fluoropolymer vials can replace more expensive PFA vials in many applications.

- Semiconductor-grade PVDF fluoropolymer
- High dielectric and mechanical strength, flexible
- Excellent for the analysis of Nitric Acid, Hydrochloric Acid, Hydrofluoric Acid, or Ammonium Hydroxide
- Resistant to most mineral and organic acids, as well as aliphatic and aromatic hydrocarbons, alcohols, halogenated solvents, and oxidizing agents
- Self-standing
- Conical internal bottom for micro-sample analysis
- Suitable for most semiconductor pure chemicals
- Not recommended for ketones, acetone, ethyl acetate, and MIBK
- Optional PFA enclosures
- Available standard or pre-cleaned

N8145473
2 mL PVDF
autosampler vial

N8145473
2 mL PVDF autosampler vial
with PFA cap

PVDF Vials and PFA Caps		
Description	**Qty**	**Part Number**
PVDF vial, 2 mL	10	N8145473
PVDF vial, 2 mL	100	N8145474
PVDF vial, 2 mL	1000	N8145475
PFA cap for V-14 vial	10	N0777402
PFA cap for V-14 vial	100	N8145476

Pre-cleaned PVDF Vials and Caps		
Description	**Qty**	**Part Number**
Pre-cleaned PVDF vial, 2 mL	100	N8145352
Pre-cleaned PFA cap for V-14 vial	100	N8145353

Bottles / Vials	Fits Racks
N8145473	N0777229 (pg 73), N0777230 (pg 73), N0777397 (pg 75)

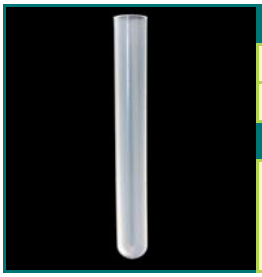
Non-PFA Sample Vessels

Non-PFA Vials, Tubes and Bottles

Non-PFA sample vessels manufactured from plastics, such as polypropylene, polyethylene and polystyrene, are a sensible alternative to consider when breakage, surface inertness, and/or disposal costs are a concern.

Vials	Fits Racks
N8121043	N0777231 (pg 73), N0777232 (pg 73)
N8145125	N0777245 (pg 72), N0777643 (pg 72), N0777644 (pg 72), N8145317 (pg 76)
N0777815	N0777243 (pg 72)
N0777471	N0777640 (pg 73), N0777244 (pg 72), N0777642 (pg 72), N0777247 (pg 74), N8145317 (pg 76)
N8145124	N0777639 (pg 73), N0777228 (pg 76), N0777242 (pg 72), N0777641 (pg 72), N0777248 (pg 74), N8145317 (pg 76), N0782019 (pg 76)
N0777820	N0777822 (pg 75), N0777252 (pg 74), N8145317 (pg 76), N0777772 (pg 77), N0777771 (pg 77)
N0777818	N0777823 (pg 75), N8122464 (pg 77), N8145317 (pg 76), N0782019 (pg 76)

Part Number	Qty
N8121043	100
N0777813	500
Description	**Volume**
8 mm o.d. centrifuge tube	0.5 mL



Part Number	Qty
N8145125	90
N0777814	500
Description	**Volume**
13 mm o.d. polypropylene tube with rounded bottom	8 mL

Part Number	Qty
N0777471	60
B0193233	500
Description	**Volume**
16 mm o.d. polypropylene tube with screw cap	15 mL

Part Number	Qty
N8145079	50
N0777815	500
Description	**Volume**
20 mm o.d. polypropylene tube with screw cap	20 mL

Part Number	Qty
N8145124	50
B0193234	500
Description	**Volume**
28 mm o.d. polypropylene tube with screw cap	50 mL

Part Number	Qty
N0777820	12
N0777821	24
Description	**Volume**
50 mm o.d. HDPE wide mouth bottle with cap	125 mL

Part Number	Qty
N0777818	12
N0777819	100
Description	**Volume**
61 mm o.d. polyethylene wide mouth bottle	250 mL

Microplates

Microplates

Microplates are ideal for micro-volume applications such as storage and sample transfer.

All microplates can be used on the following SC DX autosamplers:
SC2 DX, SC4 DX

Description	Part Number
1 Pk (5 ea) 24 well, 10 mL microplate, square well, pyramid bottom	N0777236

Description	Part Number
1 Pk (5 ea) 48 well, 5 mL microplate, square well, pyramid bottom	N0777237

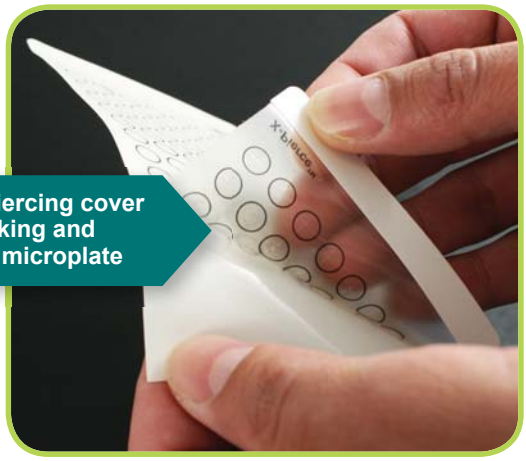
Description	Part Number
1 Pk (3 ea) 48 well, 7.5 mL microplate, square well, pyramid bottom	N0777238

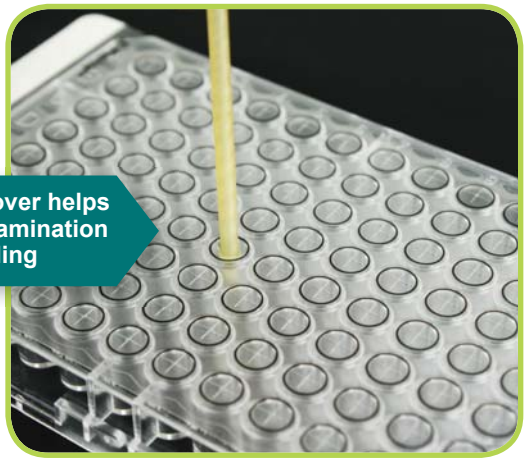
Description	Part Number
1 Pk (5 ea) 96 well, 2 mL microplate, square well, pyramid bottom	N0777239
1 Pk (5 ea) 96-well, 500 µL microplate, polystyrene	N8145354

X-Piercing Film Cover / XP Probe Arm

X-Piercing Microplate Cover

The X-piercing cover minimizes evaporation of micro samples awaiting analysis and protects against environmental contamination.





Description	Qty	Part Number
X-Piercing film cover for 96 well microplate	25	N8145129

XP Probe Arm

The XP probe arm must be used in place of the reset probe arm when an X-Piercing cover has been applied to a 96 well microplate.

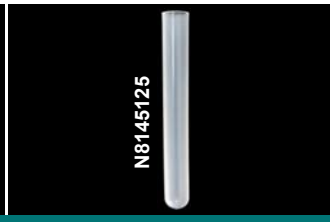
Description	Qty	Part Number
XP Probe arm for 2 DX / 4 DX Autosampler	1	N8145271

Large Autosampler Racks

Autosampler Racks (LR Size)

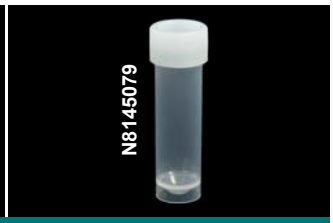
Plastic large racks are recommended for aqueous samples.

All LR racks can be used on the following SC DX autosamplers: SC2 DX/SC2 DXe, SC4 DX/SC4 DXe

Description	Diam.	Part Number
90 position large polypropylene sample rack for 8 mL tubes	13 mm	N0777245


Description	Diam.	Part Number
60 position large polypropylene sample rack for 15 mL tubes	16 mm	N0777244

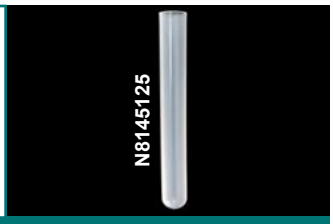
Description	Diam.	Part Number
40 position large polypropylene sample rack for 20 mL tubes	20 mm	N0777243


Description	Diam.	Part Number
21 position large polypropylene sample rack for 50 mL and 60 mL tubes	30 mm	N0777242

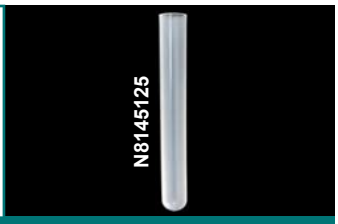
Autosampler Coated Metal Racks (LR Size)

Metal racks are coated with an epoxy paint that forms a protective barrier over the rack material.

All coated metal racks can be used on the following SC DX autosamplers: SC2 DX/SC2 DXe, SC4 DX/SC4 DXe

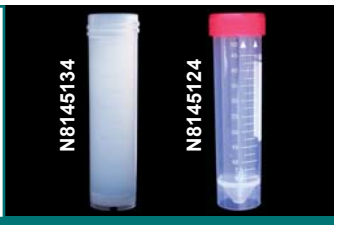



Description	Diam.	Part Number
90 position metal large sample rack for 8 mL tubes	13 mm	N0777643

Description	Diam.	Part Number
90 position 3 tier metal large sample rack for 8 mL tubes	13 mm	N0777644


Description	Diam.	Part Number
60 position metal large sample rack for 15 mL tubes	16 mm	N0777642

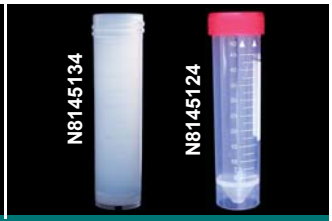
Description	Diam.	Part Number
21 position metal large sample rack for 50 mL and 60 mL tubes	30 mm	N0777641

Heated and Micro Autosampler Racks

Autosampler Heated Racks (LR Size)

All heated racks can be used on the following SC DX autosamplers: SC2 DX/SC2 DXe, SC4 DX/SC4 DXe


Description	Diam.	Part Number
60 position heated large sample rack for 15 mL tubes	16 mm	N0777640

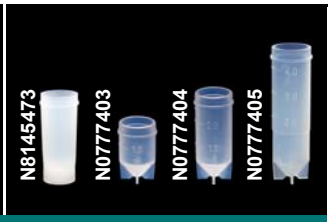
Description	Diam.	Part Number
21 position heated large sample rack for 50 mL and 60 mL tubes	30 mm	N0777639

Autosampler Racks (MR Size)

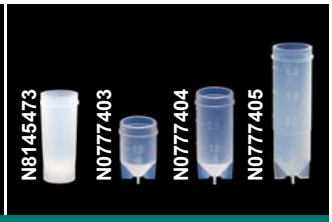
All MR racks can be used on the following SC DX autosamplers: SC2 DX/SC2 DXe, SC4 DX/SC4 DXe SC-Micro DX


Description	Diam.	Part Number
90 position CPVC micro sample rack for 0.5 mL tubes	8 mm	N0777232


Description	Diam.	Part Number
60 position CPVC micro sample rack for 0.5 mL tubes	8 mm	N0777231

Description	Diam.	Part Number
40 position CPVC micro sample rack for 1 mL, 2 mL and 4 mL tubes	14 mm	N0777230

Description	Diam.	Part Number
21 position CPVC micro sample rack for 1 mL, 2 mL and 4 mL tubes	14 mm	N0777229


Description	Diam.	Part Number
10 position PVCC micro sample rack for 15 mL and 30 mL tubes	30 mm	N8122463

Description	Part Number
PVCC Cover for SC-micro racks	N0777233

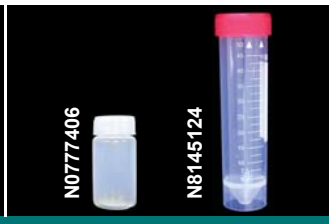
Super Autosampler Racks

Large-volume samples can be analyzed using Avio super racks without transferring the sample to a smaller tube, reducing prep time and chance of contamination.

Autosampler Racks (SR2 Size)

All SR2 racks can be used on the following SC DX autosamplers: SC2 DX/SC2 DXe


Description	Diam.	Part Number
80 position HMPE super sample rack for 15 mL tubes	16 mm	N0777247

Description	Diam.	Part Number
27 position HMPE super sample rack for 20 mL and 50 mL tubes	28 mm	N0777248

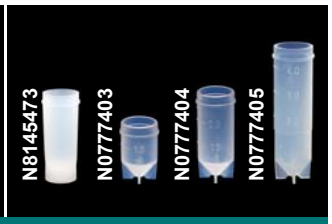

Description	Diam.	Part Number
27 position HMPE super sample rack for 15 mL, 30 mL and 60 mL tubes	31 mm	N8145130


Description	Diam.	Part Number
21 position HMPE super sample rack for 15 mL tubes	30 mm	N0777249


Description	Diam.	Part Number
12 position HMPE super sample rack for 125 mL bottles	50 mm	N0777252

Autosampler Racks (SR4 Size, Type 1)

All SR4 racks can be used on the following SC DX autosamplers: SC2 DX/SC2 DXe, SC4 DX/SC4 DXe



Description	Diam.	Part Number
60 position HMPE super sample rack for 1 mL, 2 mL and 4 mL tubes	14 mm	N0777397

Description	Part Number
PP Cover for 60 position SR-4 super rack	N0777398

Autosampler Racks (SR4 Size, Type 2)

All SR4 type 2 racks can be used on the following SC DX autosamplers: SC4 DX/SC4 DXe

Description	Diam.	Part Number
15 position HMPE super sample rack for 250 mL bottles	60 mm	N0777823

Description	Diam.	Part Number
20 position HMPE super sample rack for 125 mL bottles	50 mm	N0777822

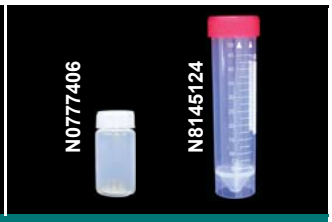
The N0777823 super rack will hold fifteen 100 mL volumetric flasks or 250 mL bottles

N0777823 super rack with 100 mL volumetric flasks

CONSUMABLES

Autosampler Racks (ST Size, Type 1)

All ST type 1 racks can be used on the following SC DX autosamplers: SC2 DX/SC2 DXe, SC4 DX/SC4 DXe



Description	Diam.	Part Number
10 position PVDF standards rack for 20 mL and 50 mL tubes	28 mm	N0777228

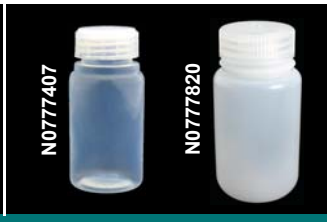
Description	Diam.	Part Number
10 position PP high purity standards rack for 30 mL and 60 mL tubes	31 mm	N8145131

Description	Diam.	Part Number
5 position HMPE extra standards rack for 50 mL and 250 mL bottles. Fits over SC DX rinse station.	28 mm 60 mm	N0782019

Description	Diam.	Part Number
5 position HMPE priority samples rack for 8 mL, 15 mL, 50 mL, 125 mL and 250 mL bottles. Fits over DX rinse station. For PE prep*FAST* only.	13 mm 16 mm 28 mm 50 mm 60 mm	N8145317

Autosampler Racks (ST Size, Type 2)

All ST type 2 racks can be used on the following SC DX autosamplers: SC2 DX/SC2 DXe



Description	Diam.	Part Number
9 position HMPE standards rack for 125 mL bottles. Recommended for prep*FAST* with SC DX. Includes 9, 125 mL HDPE bottles w/cap.	50 mm	N0777772

Autosampler Racks (ST Size, Type 3)

The ST type 3 rack can be used on the following SC DX autosamplers: SC4 DX/SC4 DXe

Description	Diam.	Part Number
7 position HMPE standards rack for 250 mL bottles	60 mm	N8122464

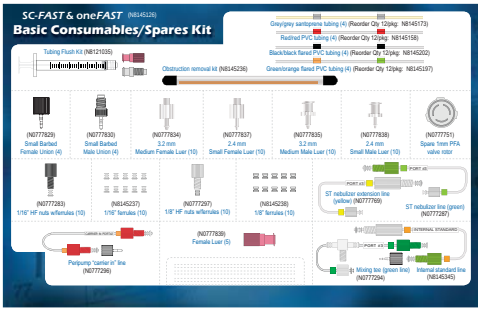
Description	Diam.	Part Number
9 position HMPE standards rack for 125 mL bottles. Recommended for prep*FAST*. Includes 9, 125 mL HDPE wide mouth standard bottles w/caps.	50 mm	N0777771

FAST Spares Kits

FAST Spares Kit

Assorted fittings and tubing for *FAST* systems.

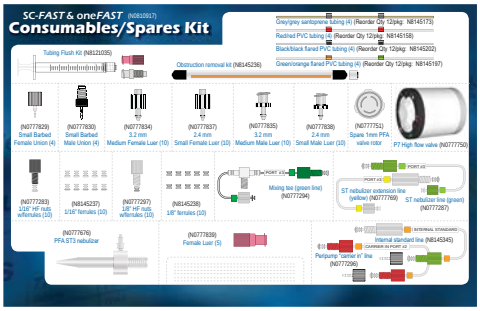
Description	Part Number
FAST Spares Kit for Avio 200/500	N8145126



FAST Deluxe Spares Kit

All of the assorted fittings and tubing in the *FAST* Spares Kit with the addition of a PFA-ST nebulizer, spare *FAST* valve, and internal standard tee.

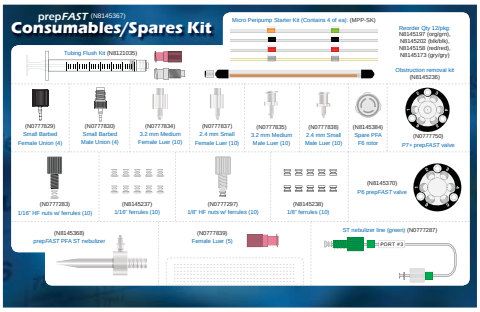
Description	Part Number
FAST Deluxe Spares Kit for Avio 200/500	N0810917



prep*FAST* Spares Kit

Includes prep*FAST* PFA-ST3 nebulizer, P7+ and P6 valves, PFA F6 rotor, tubing flush kit, ST nebulizer line, and spare fittings and tubing for prep*FAST*.

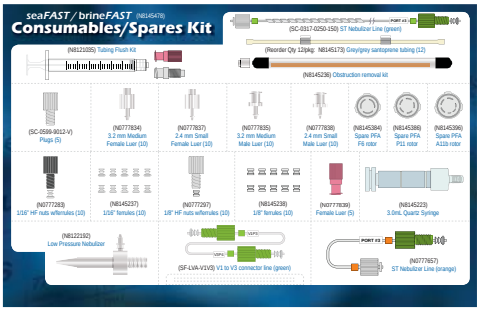
Description	Part Number
prep*FAST* Spares Kit	N8145367



sea*FAST* / brine*FAST* Spares Kit

Includes all of the assorted fittings and tubing in the *FAST* Spares Kit with the addition of a PFA-ST nebulizer, 3 mL quartz syringe, and assorted fittings.

Description	Part Number
sea*FAST*/brine*FAST* Spares Kit	N8145478



Silver Level ESI Installation & Training

The silver level installation and training package is a 1-day on-site installation and method development for SC-*FAST*.

Includes: Hardware installation
Software methods
Basic system familiarization
Travel time & expenses for ESI employee or contractor
SC-*FAST* standard spares kit (N8145126)

Description	Part Number
On-site, 1-day installation and application development for SC-*FAST* high throughput system	N0777426

Gold Level ESI Installation & Training

The gold level installation and training package is a 2½-day, on-site installation and method development for the SC-*FAST* and prep*FAST*.

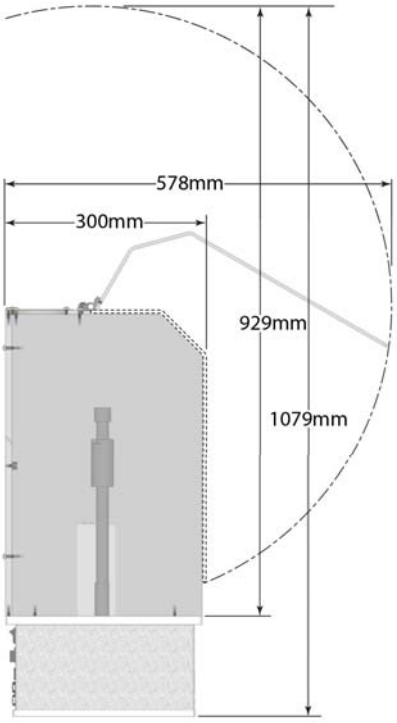
Includes: Hardware installation
Software methods
Basic system familiarization
Necessary method validation
User Training
Travel time & expenses for ESI employee or contractor
Spares kit (see page 78)

Description	Part Number
On-site, 2½-day installation and application development for SC-*FAST* systems	N0777205
On-site, 2½-day installation and application development for prep*FAST* systems	N8145366
On-site, 2½-day installation and application development for sea*FAST*/brine*FAST* systems	N8145477

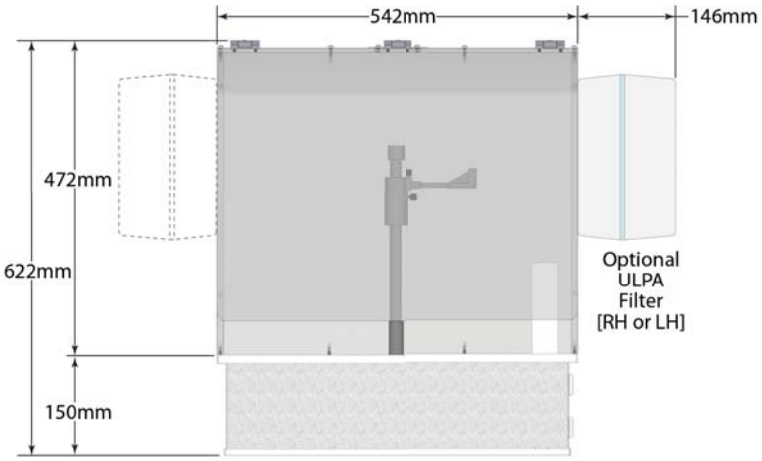
The *FAST* Deluxe, prep*FAST*, or sea*FAST*/brine*FAST* Spares Kit is included with the Gold Installation & Training.

Autosampler Dimensions

SC2 DX Autosampler with Enclosure and ULPA Filter Dimensions

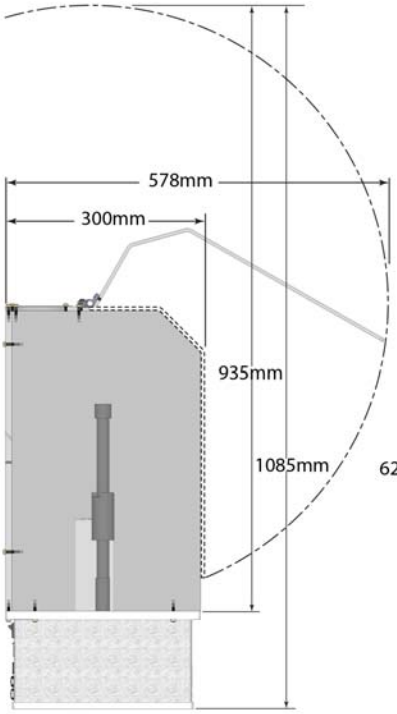


SC2 DX Autosampler Enclosure with ULPA Filter (P/N: N0777208)

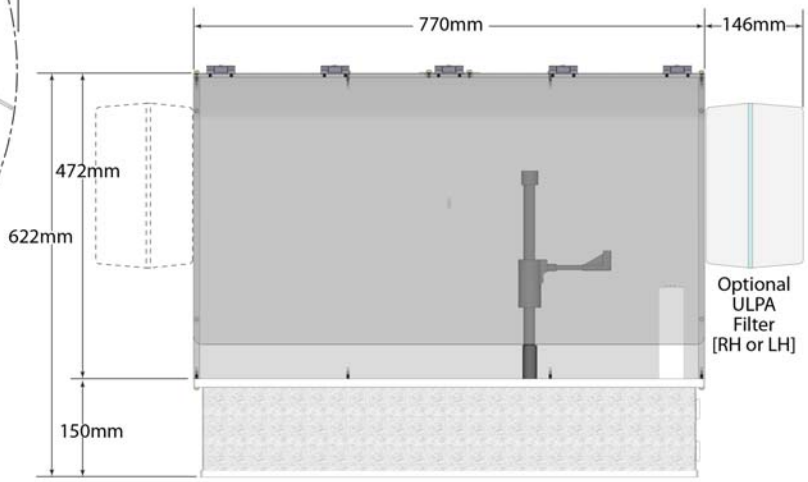


SC2 DX autosampler with mobile stand and enclosure and ULPA Filter, W x D X H: 54.2 cm x 34.6 cm x 127.3 cm

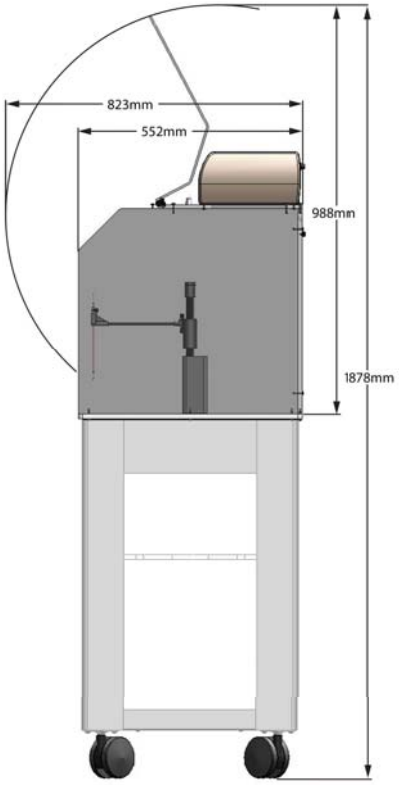
SC4 DX Autosampler with Enclosure and ULPA Filter Dimensions



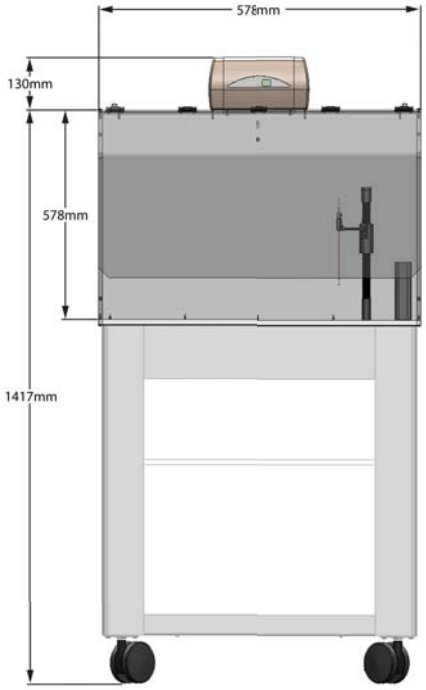
SC4 DX Autosampler Enclosure with ULPA Filter (P/N: N0777040)



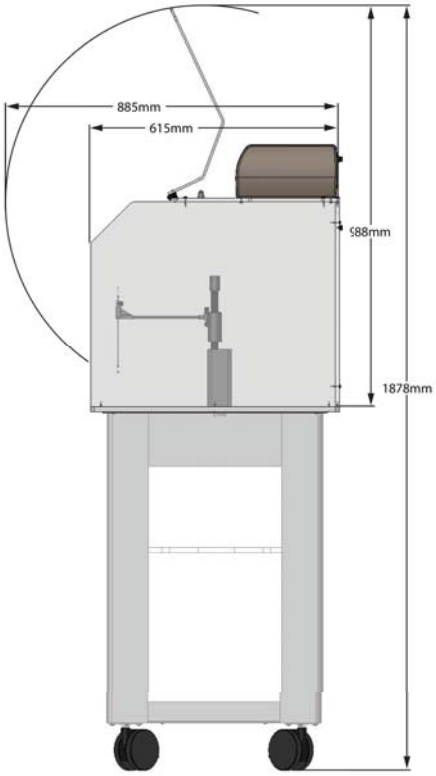
SC8 DX Autosampler with and ULPA Filter Enclosure Dimensions



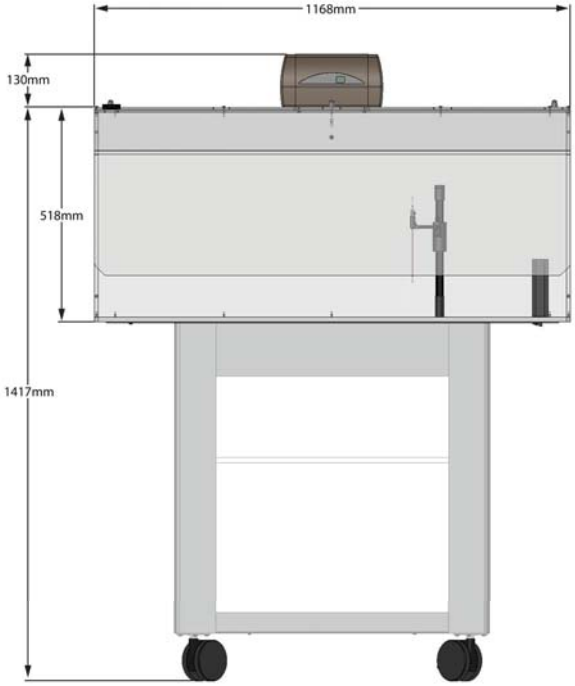
SC8 DX Autosampler Enclosure with ULPA Filter (P/N: N0777346)



SC14 DX Autosampler with Enclosure and ULPA Filter Dimensions



SC14 DX Autosampler Enclosure with ULPA Filter (P/N: N0777041)



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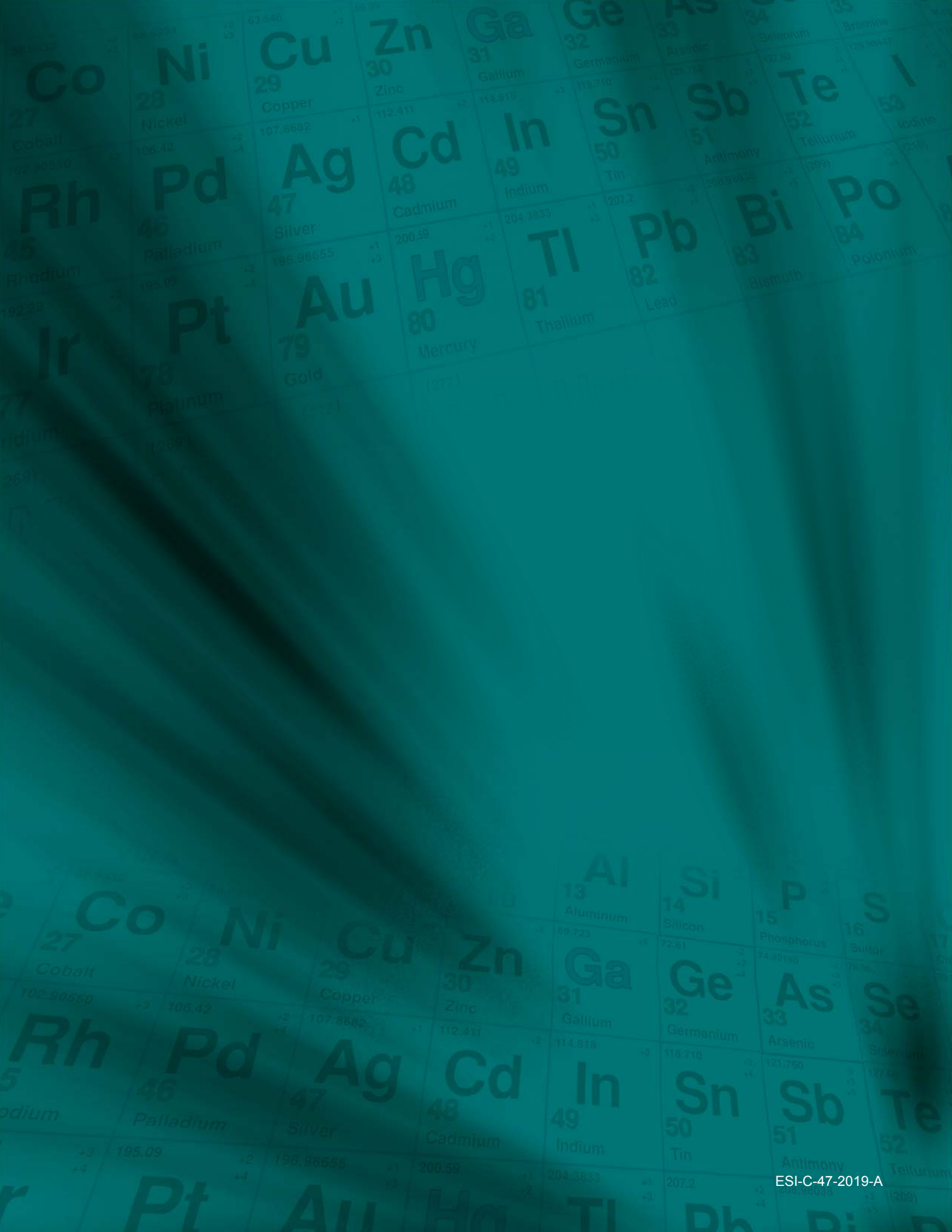
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