BRUKER

2011 Catalog
ESI Products and Consumables

Advanced Sample Introduction Systems For Bruker ICPMS

Elemental Scientific

Inductively Coupled Plasma Mass Spectrometers

With the lowest achievable detection limits and widest dynamic range, ICP-MS is the technique of choice in today's modern analytical laboratory. And with Bruker, choosing an ICP-MS for all your elemental analysis needs has never been easier.

The Bruker 800-MS Series provides superior performance through technological innovations, including the highly-efficient and patented 90-degree ion mirror providing the world's most sensitive ICP-MS. With gigahertz sensitivity and double off-axis quadrupole design for low background noise, the 800-MS easily achieves sub-parts per trillion (ng/L) detection limits, making it ideal for semi-conductor, nuclear and medical industries.

The novel and patented collision reaction interface (CRI) system provides fast, flexible and interference-free analysis while the only all-digital detection system delivers nine decades of linear dynamic range in a single, pulse counting (digital) mode. This provides greater productivity and simpler, more routine analysis, making the Bruker 800-MS series well-suited to environmental, geochemical, food and agriculture fields.

The Bruker ICP-MS is designed to handle the toughest samples matrices, including volatile organic solvents, complex metallic solutions and even the direct analysis of solid samples using laser ablation. The highly-efficient plasma system with patented interlaced RF coils operates in cool plasma mode without the need for metal shield inserts as with competitive systems. Providing reduced matrix effects and exceptional stability, the Bruker 800-MS series sets the standard in ICP-MS performance.

Ordering Information:

You may contact us via phone, email or through our website.

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Preston, Victoria 3072
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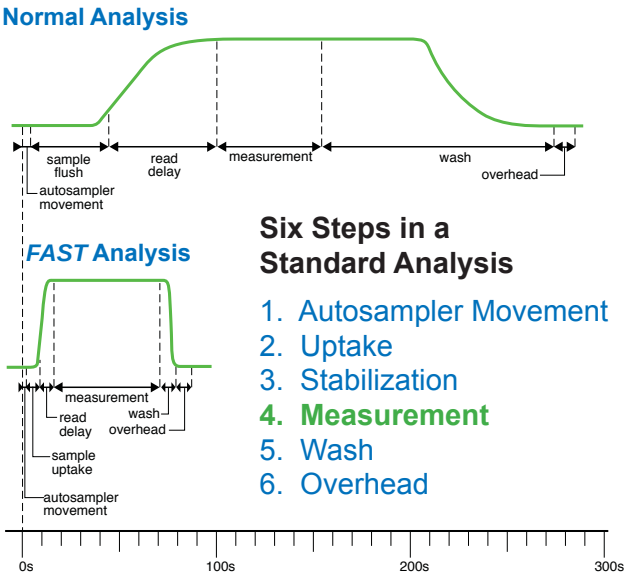
SC-DX *FAST* Sample Introduction System

The SC-DX *FAST* is a reliable, high-throughput, high-matrix automated sample introduction system for the BRUKER ICPMS. The combination of SC-*FAST* with BRUKER ICPMS provides the perfect platform to introduce the most demanding high matrix samples for analysis.

- High Productivity
- Long Analytical Runs
- High Matrix/High TDS Sample Analysis
- Low Sample Consumption
- Reduced Operating Costs
- Online Dilution
- Low sample flow rates with high speed analysis

SC-DX *FAST* is available in four autosampler sizes, holding up to fourteen large sample racks.

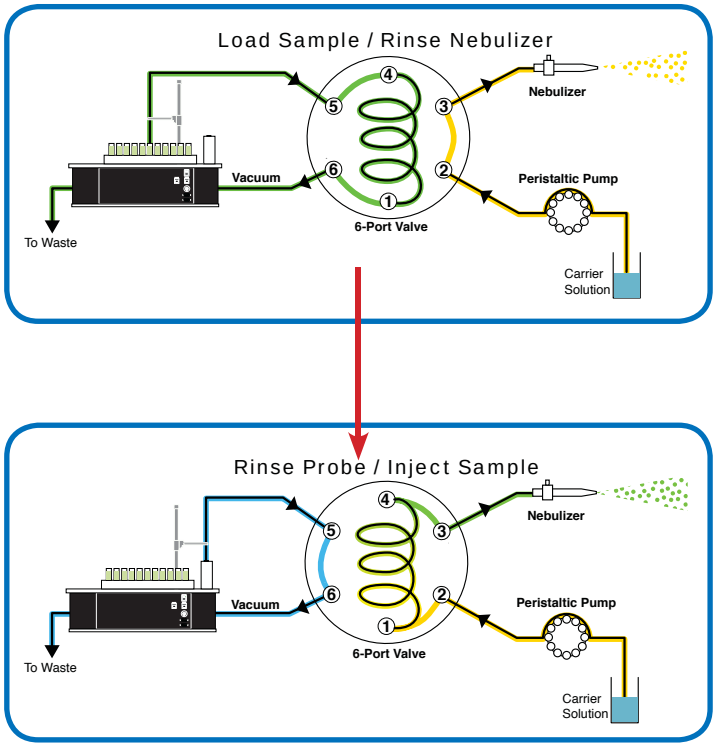


Six Steps in a Standard Analysis

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

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

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



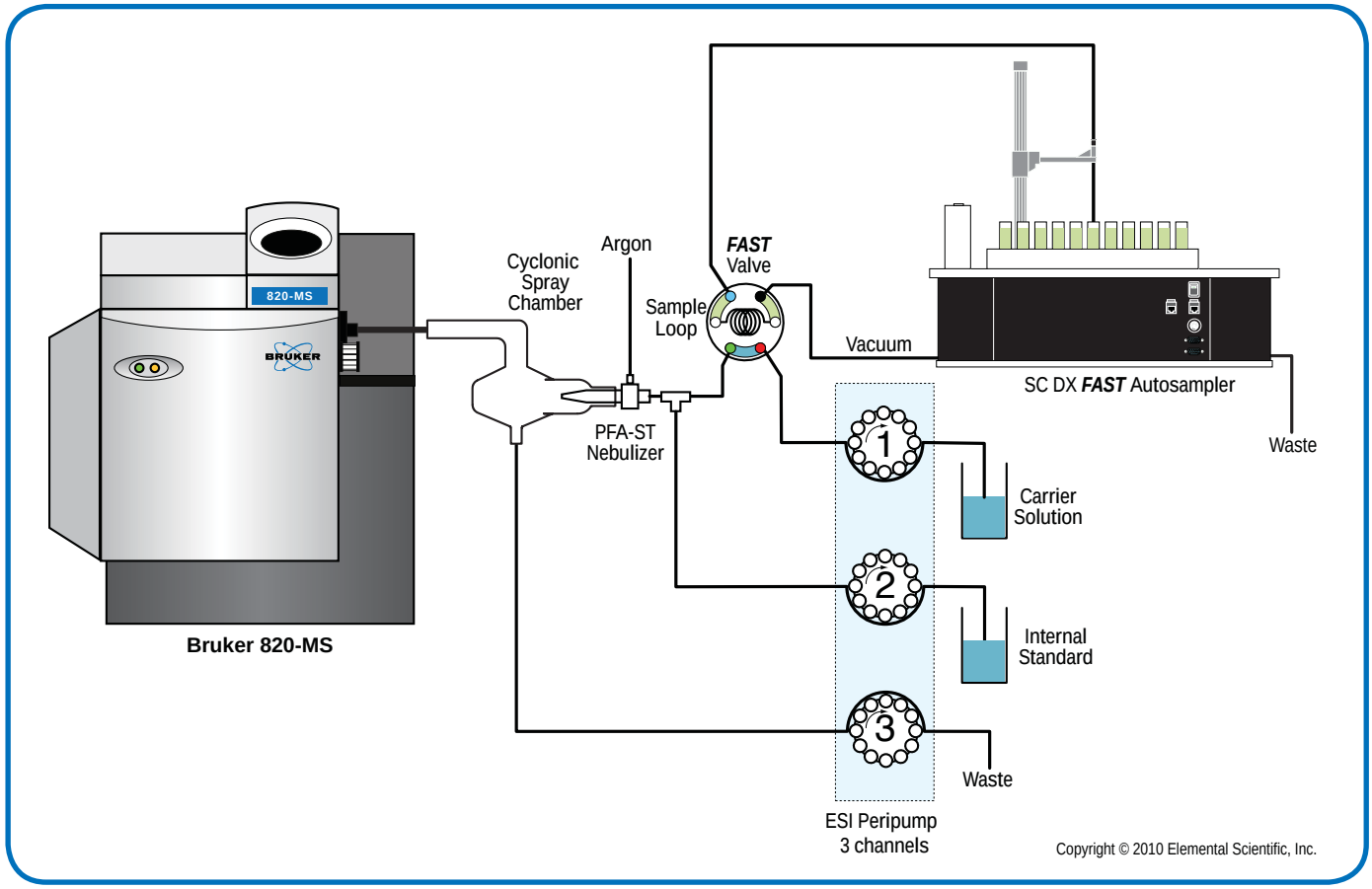
The autosampler probe and tubing are rinsed while the sample is analyzed.

FAST DXi Integrated Sample Introduction System

The *FAST* DXi offers the same advantages of the SC-DX *FAST* system, but integrates directly into the BRUKER instrument. The *FAST* DXi integrates both the MP^2 precision low-flow peristaltic pump and the high-purity *FAST* injection valve adjacent to the nebulizer.

- Directly integrates with BRUKER instrument
- Precision analysis with MP^2 peripump
- 12 closely-spaced rollers maintain consistent flow rate (nL/min to 10 mL/min)
- Chemically-resistant ceramic pins and Teflon®-coated metal components
- 1, 2, 3, 4 and 6 Channels
- Instrument or ESI SC software control

FAST DXi for BRUKER ICPMS



BRUKER ICPMS with SC-*FAST* System Diagram

SC-DX / DXi *FAST* SYSTEM CONFIGURATIONS

SC-DX *FAST* Systems for BRUKER ICPMS

Basic *FAST* System
(Stand-alone valve)

+

+

***FAST* DXi PC³**
(Integrated *FAST* module including MP² Pump and *FAST* Valve along with Peltier-Cooled Cyclonic Spray Chamber)

or

+

PC³ *FAST*
(Peltier-Cooled Cyclonic Spray Chamber)

or

+

***FAST* DXi**
(Integrated *FAST* module including MP² Pump and *FAST* Valve)

The SC-DX *FAST* for the BRUKER ICPMS comes in the following four configurations:

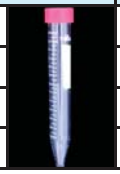
Basic *FAST* System - Uses instrument peripump and instrument Scott spray chamber

PC³ *FAST* - PC³ Peltier-cooled cyclonic spray chamber, uses instrument peripump

***FAST* DXi** - *FAST* valve and MP² precision micro peristaltic pump integrated into the ICPMS instrument

***FAST* DXi PC³** - *FAST* valve and MP² precision micro peristaltic pump integrated into the ICPMS instrument and PC³ Peltier-cooled cyclonic spray chamber

System	SC-2 DX P/N	SC-4 DX P/N	SC-8 DX P/N	SC-14 DX P/N
Basic *FAST*	2DXF-83A	4DXF-83A	8DXF-83A	14DXF-83A
PC³ *FAST*	2DXFP-83C	4DXFP-83C	8DXFP-83C	14DXFP-83C
FAST DXi	2DXFi-83C	4DXFi-83C	8DXFi-83C	14DXFi-83C
FAST DXi PC³	2DXFiP-83C	4DXFiP-83C	8DXFiP-83C	14DXFiP-83C

Autosampler Capacity								
Autosampler	**50 mL**		**15 mL**		**8 mL**		**Microtiter-96 (2 mL)**	
SC-2 DX (Super rack)	52 (64)		120 (160)		180 (240)		384	
SC-4 DX	94		240		360		576	
SC-8 DX	208		480		720		N/A	
SC-14 DX	304		840		1260		2880*	

*Special version SC-14 for microtiter plates

SC-2 DX *FAST*

The SC-2 DX *FAST* is a compact autosampler with dual flowing rinse stations that holds 2 large racks or 4 micro racks.

All *FAST* Systems Include:
- *FAST* Valve
- PFA-ST MicroFlow Nebulizer
- 2 Sample Probes
- Standards Rack (10 positions)
- 4 Large Racks (21, 40, 60, 90 positions)
- 50 mL Standards Vials (10 ea)
- 15 mL Sample Vials (60 ea)

SC-2 DX System	SC-2 DX P/N
Basic *FAST*	2DXF-83A
PC³ *FAST*	2DXFP-83C
FAST DXi	2DXFi-83C
FAST DXi PC³	2DXFiP-83C

SC-4 DX *FAST*

The SC-4 DX *FAST* is an autosampler with dual flowing rinse stations that holds 4 large racks or 6 micro racks. It is ideal for labs with moderate sample throughput needs.

All *FAST* Systems Include:
- *FAST* Valve
- PFA-ST MicroFlow Nebulizer
- 2 Sample Probes
- Standards Rack (10 positions)
- 4 Large Racks (21, 40, 60, 90 positions)
- 50 mL Standards Vials (10 ea)
- 15 mL Sample Vials (60 ea)

SC-4 DX System	SC-4 DX P/N
Basic *FAST*	4DXF-83A
PC³ *FAST*	4DXFP-83C
FAST DXi	4DXFi-83C
FAST DXi PC³	4DXFiP-83C

SC-8 DX *FAST*

The SC-8 DX *FAST* is an autosampler with dual flowing rinse stations that holds 8 large racks. It is ideal for labs with high sample throughput needs.

- Smallest footprint of any 8 rack autosampler
- Holds up to 40 Standards/QC solutions (50 mL vials)

All *FAST* Systems Include:
- *FAST* Valve
- PFA-ST MicroFlow Nebulizer
- 2 Sample Probes
- Standards Rack (10 positions)
- 4 Large Racks (21, 40, 60, 90 positions)
- 50 mL Standards Vials (10 ea)
- 15 mL Sample Vials (60 ea)

SC-8 DX System	SC-8 DX P/N
Basic *FAST*	8DXF-83A
PC³ *FAST*	8DXFP-83C
FAST DXi	8DXFi-83C
FAST DXi PC³	8DXFiP-83C

SC-14 DX *FAST*

The SC-14 DX *FAST* is an autosampler with dual flowing rinse stations that holds 14 large racks. It is ideal for labs with the highest sample throughput needs.

All *FAST* Systems Include:
- *FAST* Valve
- PFA-ST MicroFlow Nebulizer
- 2 Sample Probes
- Standards Rack (10 positions)
- 4 Large Racks (21, 40, 60, 90 positions)
- 50 mL Standards Vials (10 ea)
- 15 mL Sample Vials (60 ea)

SC-14 DX System	SC-14 DX P/N
Basic *FAST*	14DXF-83A
PC³ *FAST*	14DXFP-83C
FAST DXi	14DXFi-83C
FAST DXi PC³	14DXFiP-83C

Autosamplers without *FAST*

The SC-DX improves resistance to damaging chemicals. All components are resistant to acids extending the component life by a factor of 10.0. Dual X-rails and large diameter Z-rail provide precise sampling, virtually eliminating missed samples—even on microtiter plates.

SC-Micro

The SC-Micro is a small-footprint, low-cost autosampler with dual flowing rinse stations that holds two microtiter plates or two micro racks and ten standards vials. The control electronics are external to the autosampler unit, making it ideal for customized glovebox applications.*

Includes:
- 2 Sample Probes
- 20 mL PFA Standards Vials (10 ea)
- 2 mL PFA Sample Vials (10 ea)
- Standards Rack (10 positions)
- 3 Microtiter Plates (24, 48, 96 positions)
- 3 Micro Racks (21, 40, 90 positions)

Part Number	Description
SC-8106-9000	Micro-autosampler with dual flowing rinse

*Contact your sales representative to discuss customizing the SC-Micro for glovebox applications

SC-2 DX

The SC-2 DX is a compact autosampler with dual flowing rinse stations that holds two large racks or four micro racks.

Includes:
- 2 Sample Probes
- 50 mL Standards Vials (10 ea)
- 15 mL Sample Vials (60 ea)
- Standards Rack (10 positions)
- 4 Large Racks (21, 40, 60, 90 positions)

Part Number	Description
2DX	SC-2 DX with dual flowing rinse

See page 12 for SC-2 DX dimensions

SC-2 DX Semiconductor

The SC-2 DX Semiconductor is an autosampler designed for ultrapure semiconductor applications where the lowest possible background levels are required. It has a PTFE autosampler deck and two independent rinse control valves.

Includes:
- 2 Ultem Sample Probes
- 2 PTFE Sample Probes
- 50 mL Standards Vials (10 ea)
- 15 mL Sample Vials (60 ea)
- 2 mL PFA Sample Vials (30 ea)
- Standards Rack (10 positions)
- 4 Large Racks (21, 40, 60, 90 positions)
- 1 Micro Rack (21 positions)
- High-purity PFA dual rinse kit

Part Number	Description
2DX-SEMI	SC-2 DX Semiconductor with dual flowing rinse

SC-4 DX

The SC-4 DX is an autosampler with dual flowing rinse stations that holds four large racks or six micro racks. It is ideal for labs with moderate sample throughput needs.

Includes:
- 2 Sample Probes
- 50 mL Standards Vials (10 ea)
- 15 mL Sample Vials (60 ea)
- Standards Rack (10 positions)
- 4 Large Racks (21, 40, 60, 90 positions)

Part Number	Description
4DX	SC-4 DX with dual flowing rinse

See page 12 for SC-4 DX dimensions

High Capacity DX Autosamplers

Function

- FAST
- Low Sample Consumption
- Low Detection Limits
- HF Resistant
- High Throughput
- High Precision/ Isotope Ratio
- Micro Samples
- Preconcentration
- Speciation

Application

- Clinical
- Environmental
- Geochemistry
- Nuclear
- Organic Solvents
- Remote Monitoring
- Semiconductor

SC-8 DX

The SC-8 DX is an autosampler with dual flowing rinse stations that holds 8 large racks. It is ideal for labs with high sample throughput needs.

- Smallest footprint of any 8 rack autosampler
- Holds up to 40 Standards/QC solutions (50 mL vials)

Includes: 2 Sample Probes
50 mL Standards Vials (40 ea)
15 mL Sample Vials (60 ea)
4 Standards Racks (10 positions)
4 Large Racks (21, 40, 60, 90 positions)

Part Number	Description
8DX	SC-8 DX with dual flowing rinse

See page 13 for SC-8 DX dimensions

SC-14 DX

The SC-14 DX is an autosampler with dual flowing rinse stations that holds 14 large racks. It is ideal for labs with the highest sample throughput needs.

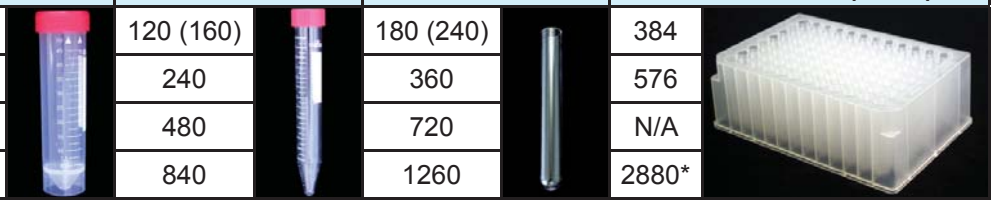
Includes: 2 Sample Probes
50 mL Standards Vials (10 ea)
15 mL Sample Vials (60 ea)
Standards Rack (10 positions)
4 Large Racks (21, 40, 60, 90 positions)

Part Number	Description
14DX	SC-14 DX with dual flowing rinse

See page 13 for SC-14 DX dimensions

Sample Capacity

System	50 mL	15 mL	8 mL	Microtiter-96 (2 mL)
SC-2 DX (Super rack)	52 (64)	120 (160)	180 (240)	384
SC-4 DX	94	240	360	576
SC-8 DX	208	480	720	N/A
SC-14 DX	304	840	1260	2880*



*Special version SC-14 for microtiter plates

Autosampler Enclosures

ppq

Enclosures protect samples and standards from airborne contamination. An exhaust port (50 mm, included) may be connected to the laboratory ventilation system to exhaust acid fumes and protect the laboratory environment and equipment.

Autosampler Model	Enclosure	Enclosure with ULPA Filter
Enclosure for SC-Micro	SC-8106	
Enclosure for SC-2 DX	SC-1207-DX	SC-1207-DX-1200
Enclosure for SC-4 DX	SC-1407-DX	SC-1407-DX-1200
Enclosure for SC-8 DX	SC-1807-DX	SC-1807-DX-1000
Enclosure for SC-14 DX	SC-1107-DX	SC-1107-DX-1030

Ultra-Low Particulate Arrester Air Filter

ppq

The ULPA (Ultra-Low Particle Arrester) 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.

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

Part Number	Description
SC-0602	ULPA Filter for ESI enclosures.

Mobile Stands for SC-2 and SC-4 DX Autosampler

The mobile stand positions the autosampler close to the BRUKER ICPMS and offers the following benefits:

- **Convenience** – Autosampler, pumps, rinse and waste bottles contained in a single unit.
- **Compact** – Footprint only slightly larger than autosampler itself, saving valuable lab space and maintaining accessibility to sample racks.
- **Mobile** – Locking wheels easily unlatch to move autosampler for instrument maintenance.
- Eliminates unnecessary external connections to rinse solution and waste reservoirs.
- The intermediate shelf houses automation options such as syringe pumps or provides storage of optimization solutions.
- The lower shelf holds rinse solution and waste bottles and allows the rinse container to be refilled in place.

SC-4 DX on Mobile Stand (SC-1410-DX)

SC-2 DX on Mobile Stand (SC-1210-DX)

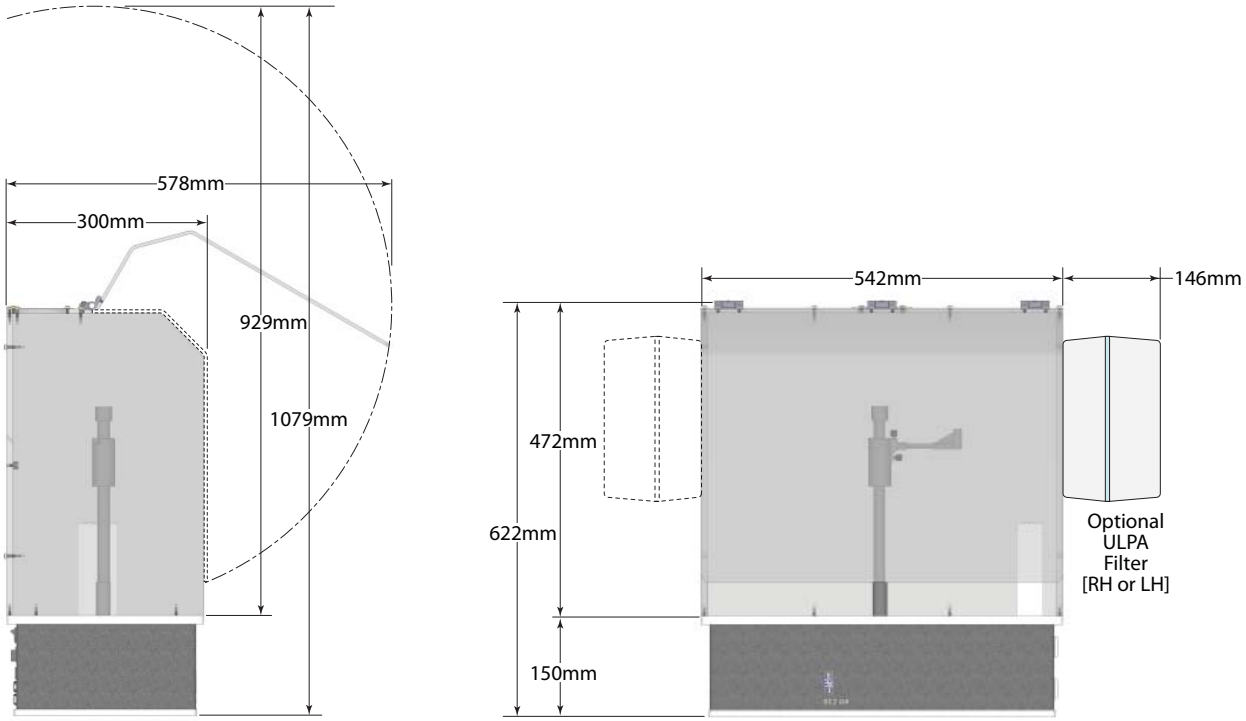
Storage space for racks, solutions and accessories

Accessible rinse bottle can be refilled in place

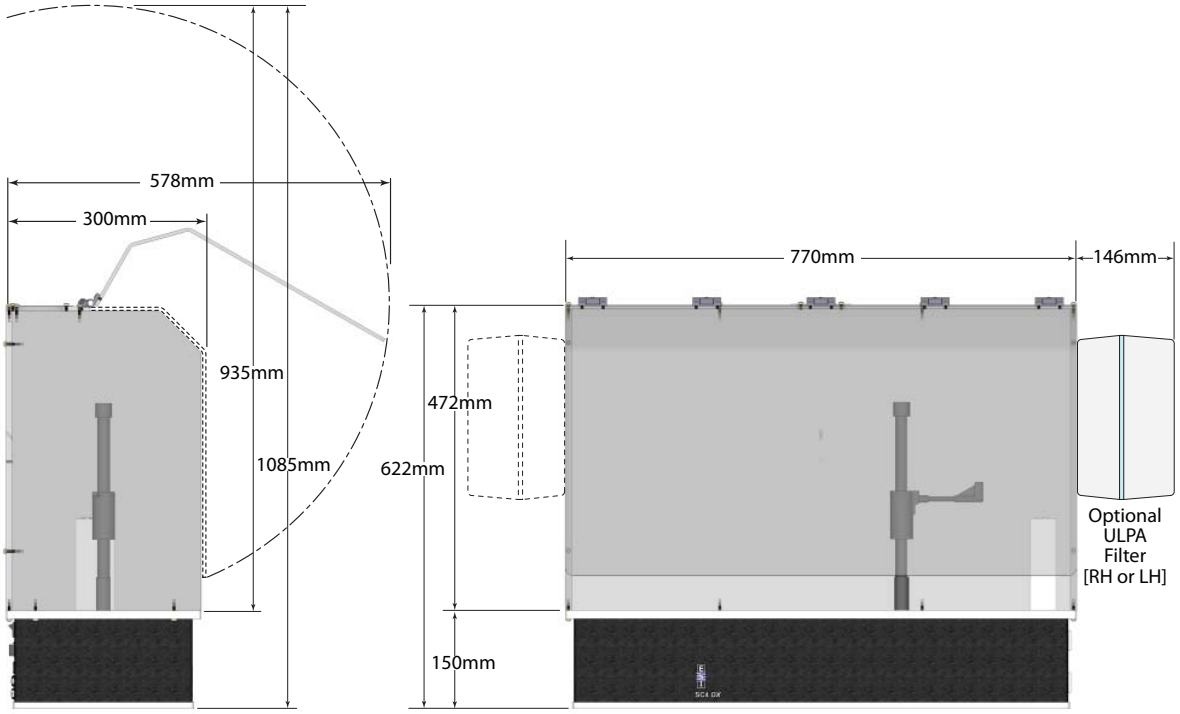
Part Number	Description
SC-1210-DX	Mobile stand for SC-2 DX
SC-1410-DX	Mobile stand for SC-4 DX

SC-DX AUTOSAMPLER DIMENSIONS

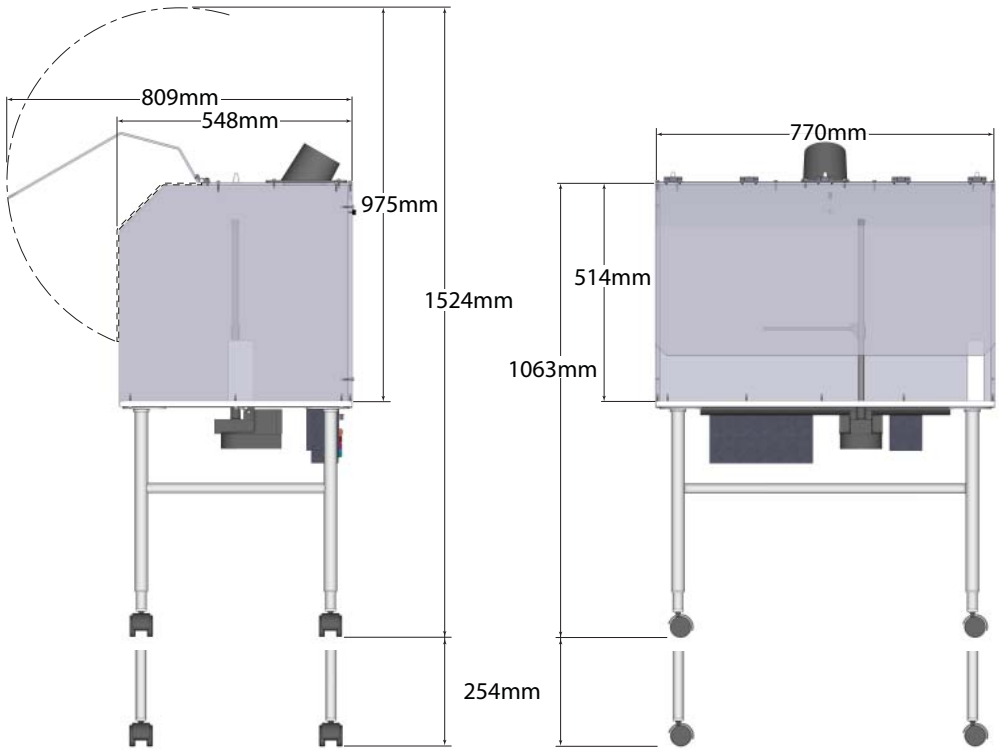
SC-2 DX Autosampler with Enclosure and ULPA Filter Dimensions



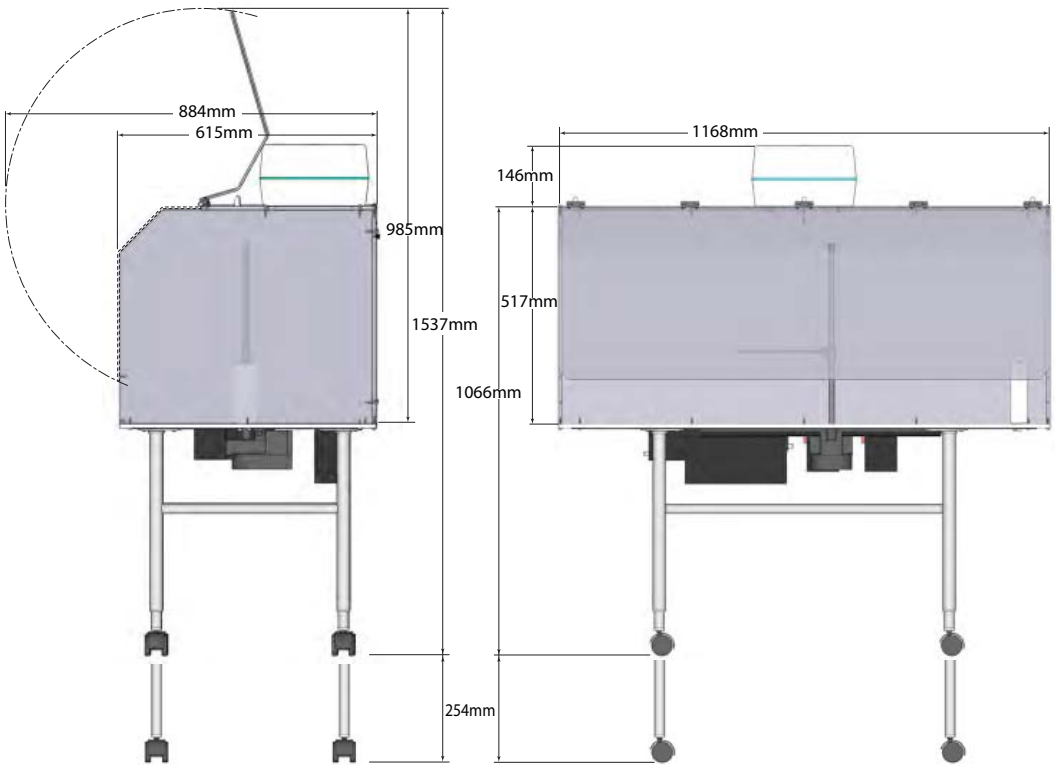
SC-4 DX Autosampler with Enclosure and ULPA Filter Dimensions



SC-8 DX Autosampler with Enclosure Dimensions



SC-14 DX Autosampler with Enclosure and ULPA Filter Dimensions



APPLICATIONS

Environmental

Drinking water, waste water, seawater, soils and other environmental samples

SC-*FAST* **apex *FAST*** TRU***FAST***
sea*FAST* **chrom*FAST***

Functions

- *FAST*
- Low Sample Consumption
- Low Detection Limits (ppq)
- HF Resistant (HF)
- High Throughput
- High Precision/ Isotope Ratio
- Micro Samples
- Preconcentration
- Speciation

Geochemistry

Highly acidified mining samples for transition metals and platinum group elements

geo*FAST* **SC-*FAST***

Nuclear

Samples containing Th, U, Pu or other actinides requiring small volumes and careful handling

SC-*FAST* **apex *FAST***
TRU***FAST*** **micro*FAST***

Clinical

Small volume and high matrix samples such as blood, urine and serum

SC-*FAST* TRU***FAST***
micro*FAST*

Organic Solvents

Sample introduction for wear oils and volatile organic samples for petrochemical applications

micro*FAST* **DIN*FAST***

Semiconductor

Ultra-trace analysis of high matrix samples in clean room environments

micro*FAST* TRU***FAST***
micro*FAST*$_{HF}$

Remote Monitoring

Custom online monitoring and high-efficiency sample transport for remote chemical baths

scout$_{DX}$

APPLICATION SOLUTIONS

BRUKER ICPMS

SC-*FAST*
A reliable, high throughput system for high matrix samples that dramatically increases throughput and decreases instrument maintenance without compromising analytical quality.

geo*FAST*
For high throughput and fast washout of highly-acidified samples with online sample dilution for multi-element geochemical analysis.

sea*FAST*
A completely automated sample introduction system for multi-mode determination of ultra-trace metals in undiluted seawater, sea*FAST* lowers procedural blanks and improves detection limits for a variety of elements through advanced, online sample preparation such as preconcentration, matrix elimination, online dilution, and hydride generation.

TRU*FAST*
Automates preconcentration for detection of radioisotopes at the lowest levels for environmental monitoring and research.

micro*FAST*
Automate delivery and analysis of micro-volume samples. The micro*FAST* system enables the direct analysis of ultra-low-volume samples without waste using both syringes and micro peristaltic pumps.

DIN*FAST*
Achieve fast washout, signal stability, uniform analyte response and full automation for the analysis of memory-prone elements. The DIN*FAST* uses a thermally conductive Pt Direct Injection Nebulizer (DIN) inside an ICP torch. Optimum analytes include Hg, B and Os.

scout$_{DX}$
A custom solution for temporary or permanent online monitoring and high-efficiency sample transport from remote liquid streams or chemical baths. Ten or more process streams may be monitored within several hundred meters of a centrally located ICPMS.

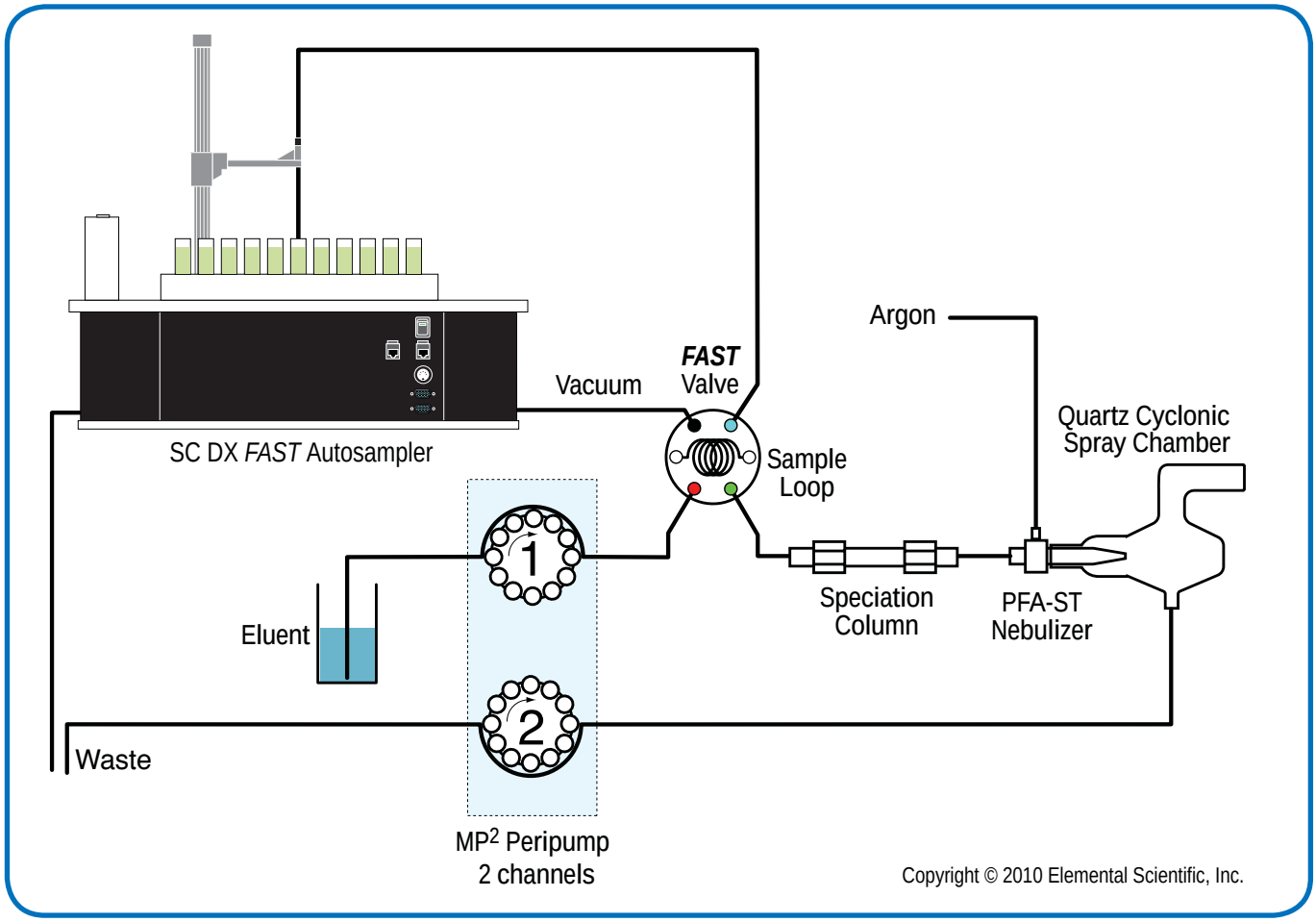
chrom*FAST*
Online, low pressure chromatographic speciation systems for species like Cr, As, Se and Hg using the SC-*FAST*.

apex *FAST*
Increase sensitivity to 10x or more with a desolvating nebulizer to achieve high sample transport efficiency.

The chrom*FAST* speciation kit, coupled with the SC-DX *FAST* automated sampling system, is an economical, robust, and easy-to-use system that uses a peristaltic pump and a low-pressure anion exchange column to separate, detect, and quantify species of various elements such as Cr, As, Se, and Hg.

Advantages of SC-*FAST* for Elemental Speciation

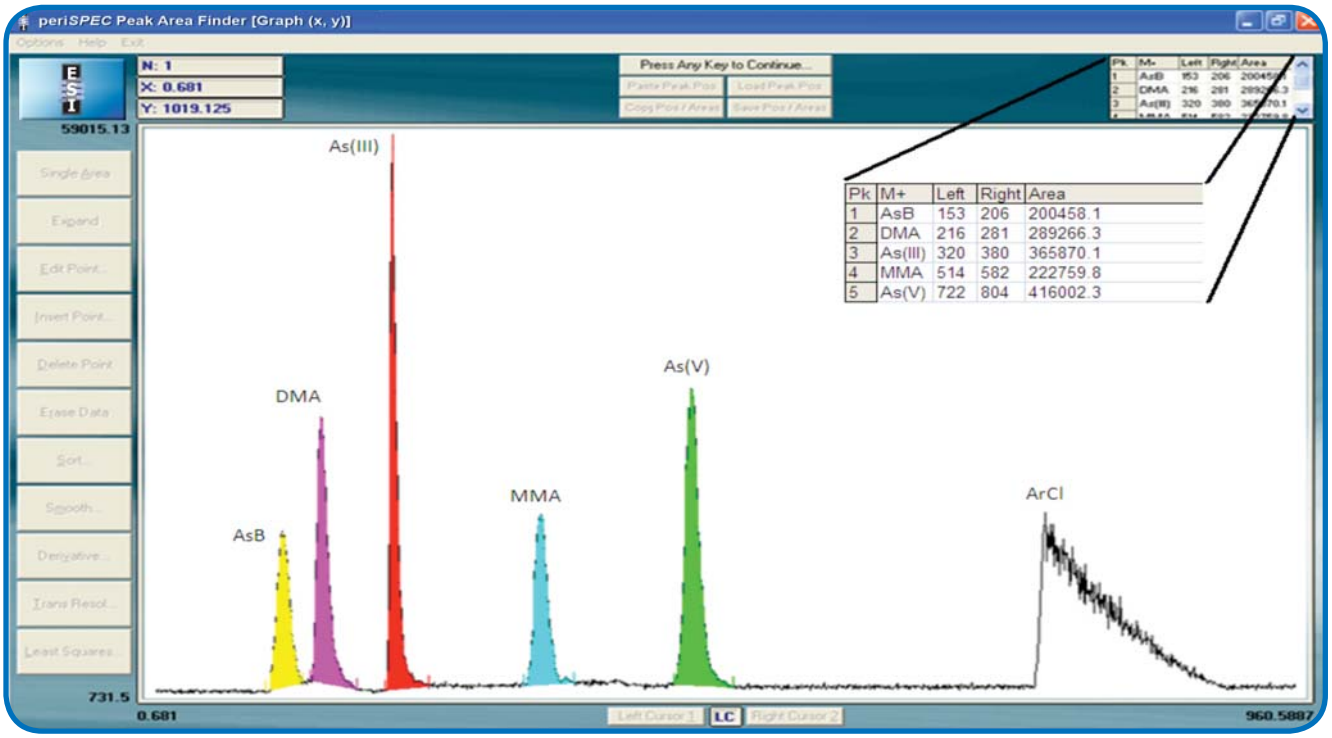
- Eluent delivered using an MP^2 micro peripump or standard instrument peripump.
- Isocratic or step-gradient chromatographic *FAST* methods.
- A variety of anion exchange and reverse phase columns available.
- Timing of chromatographic injection controlled by ICPMS software.
- Chromatographic method optimization for specialized separations is faster when using peripump-delivered eluents.
- Easy to switch between total element and speciation determinations.
- Low detection limits (sub-ppb) of species can be achieved.
- Available peri*SPEC* Peak Area Finder software is a simple way to analyze collected speciation data.



chrom*FAST* System Diagram

Automated, Low-Pressure LC-ICPMS

Low-pressure chromatographic speciation kits and the SC-*FAST* system coupled to the BRUKER ICPMS can separate and detect inorganic and organic species of many elements, including As, Se, Cr, and Hg. Even in high mineral content groundwater samples, the separation is not impacted by the matrix components. Detection limits of a few ppt or lower and excellent spike recoveries make this approach a viable and economical alternative to the more expensive and labor-intensive HPLC technology. In addition, the faster separation capability of this low pressure approach makes it ideally-suited to the demands of a high sample throughput environment.



ESI's peri*SPEC* software is a convenient way to detect LC-ICPMS peaks. Here five arsenic species separated from $ArCl^+$ using low pressure LC-ICPMS are detected and integrated.

Speciation Kits for chrom*FAST*	
Part Number	**Description**
CF-KIT-As35	Arsenic 3/5 speciation kit for *FAST*
CF-KIT-Cr36	Chromium 3/6 speciation kit for *FAST*
CF-KIT-MeHg	Methyl Mercury speciation kit for *FAST*
CF-KIT-Se46	Selenium 4/6 speciation kit for *FAST*
periSPEC Chromatography Software	
ES-2999-4001	peri*SPEC* chromatography Peak Area Finder software

seaFAST™

A completely automated sample introduction system for determination of ultra-trace metals in undiluted seawater, the sea*FAST* lowers procedural blanks and improves detection limits for a variety of elements through advanced online preconcentration and matrix removal.

Features:

- Automated preconcentration and matrix elimination
- Simple external calibration with acid standards
- Ppt to ppq detection limits in undiluted seawater
- Eliminate manual sample preparation
- Reduced procedural blanks

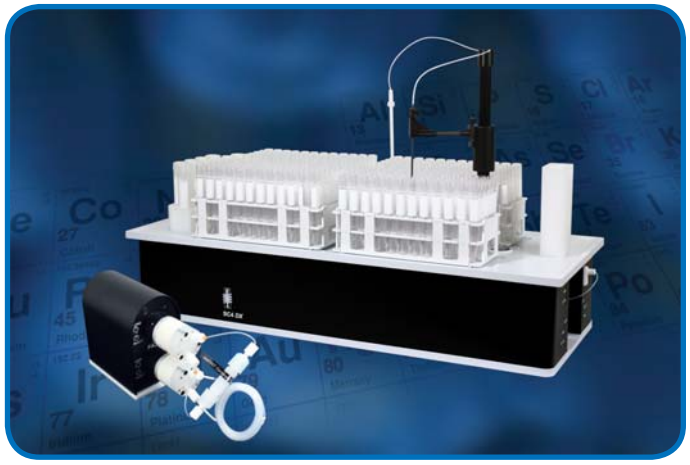
The sea*FAST* system includes:

- SC Autosampler with *FAST* PC^3 Complete
- 6-channel precision MP^2 micro peristaltic pump
- High-purity fluoropolymer injection valves with all connections
- sea*FAST* column with all PFA construction and PTFE frits
- Trace metals cleanup column (2 ea)
- Suggested methods

sea*FAST* 1
Preconcentration Mode: A chelation column binds transition metals and rare earth elements but allows matrix Na^+, Cl^-, Ca^{2+}, and Mg^{2+} ions to be rinsed out. After the preconcentration step, analytes are eluted and detected by ICPMS.
(2 valves)

The sea*FAST* system may be configured to operate as a high throughput SC-*FAST* system for direct sample analysis.

sea*FAST* System Part Numbers for the BRUKER ICPMS		
Description	SC-2 DX	SC-4 DX
sea*FAST* 1 system	2SF-1-83C	4SF-1-83C



SC-4 DX sea*FAST* system for BRUKER ICPMS

Comparison of reference CASS-5 results and ESI sea*FAST* results in ppt		
Analyte	Measured	Certified
Mn55	2450	2620 ± 200
Ni60	331	330 ± 23
Cu65	389	380 ± 28
Cd111	20.6	21.5 ± 1.8
Pb208	8	11 ± 2

CASS-5, a certified reference material collected in Halifax Harbor off of the coast of Nova Scotia, Canada, was analyzed to verify system performance.

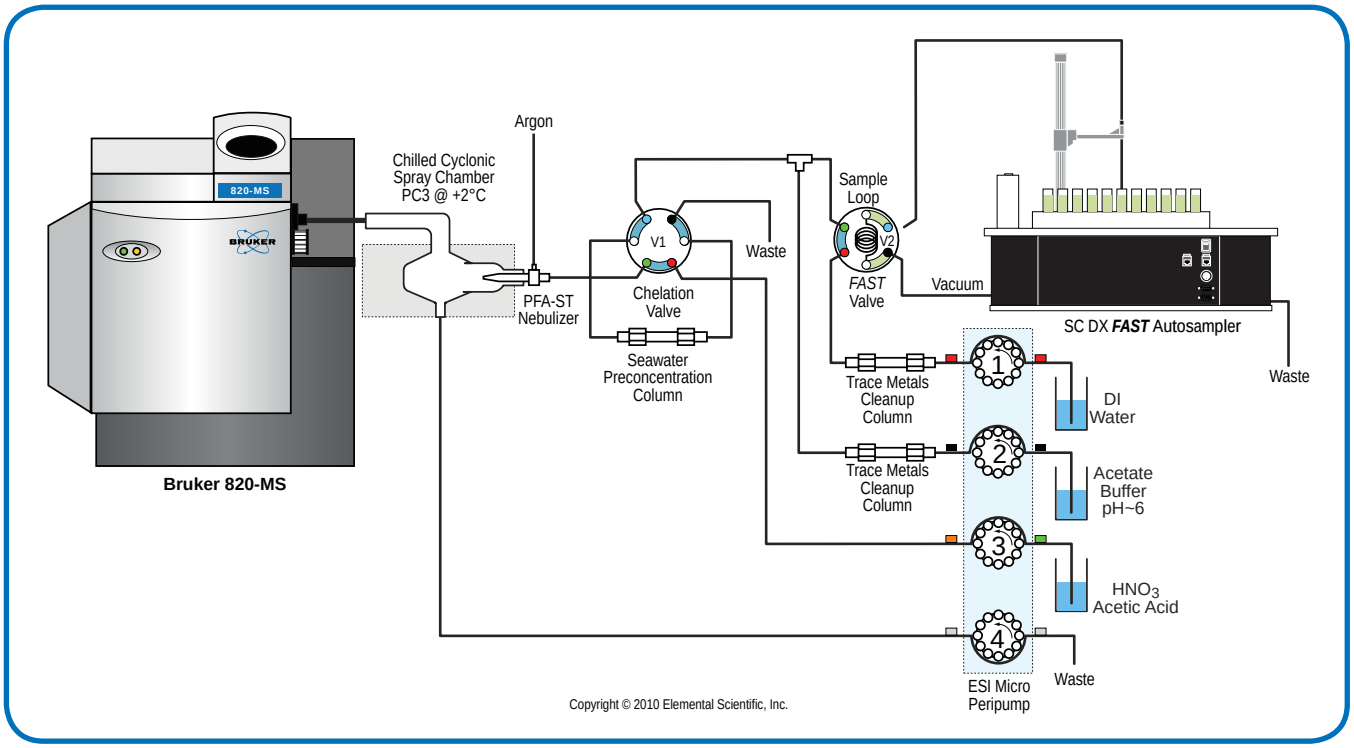
sea*FAST* Preconcentration Column

Part Number	Description
CF-N-0200	Spare sea*FAST* preconcentration column
CF-IDA	Spare sea*FAST* trace metal cleanup column

seaFAST 1

Preconcentration mode

1 H																	2 He
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba		72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra																
Lanthanides		57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu	
Actinides		89 Ac	90 Th	91 Pa	92 U												



seaFAST 1 System Diagram

microFAST™

The micro*FAST* automates delivery and analysis of micro-volume samples by ICPMS, making it possible to achieve the maximum amount of analytical data from a minimal amount of sample.

A SYRIX syringe pump is used to accurately place micro-volume samples into a *FAST* loop. The sample is then delivered to the plasma using either an MP^2 peristaltic pump or continuum syringe pump-depending on micro*FAST* system- at low flow rates with excellent precision.

HF-resistant versions of micro*FAST* 1 (micro*FAST* HF1) and micro*FAST* 2 (micro*FAST* HF2) are available with fluoropolymer wetted parts, including syringe barrels and spray chambers.

SC-4 DX micro*FAST* 2 system for BRUKER ICPMS

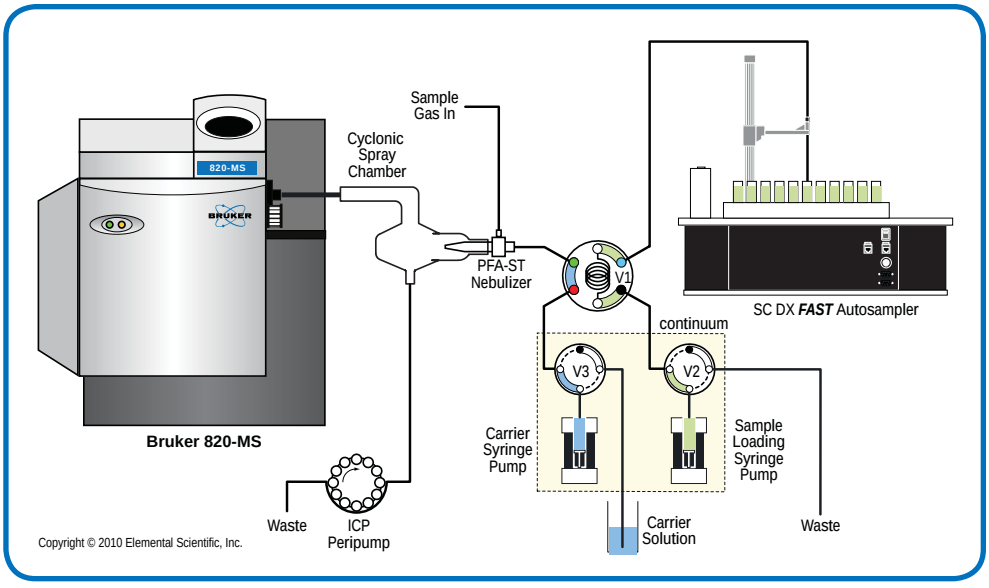
micro*FAST* 1 and micro*FAST* HF1 Includes:

- SC Autosampler with *FAST* PC^3 Complete
- Two high-purity fluoropolymer injection valves with all connections
- Integrated precision *FAST* micro peristaltic pump
- SYRIX high-purity syringe pump
  - 3 mL quartz/PTFE syringes for micro*FAST* 1
  - 3 mL PFA/PTFE syringes for micro*FAST* HF1

micro*FAST* 2 and micro*FAST* HF2 Includes:

- SC Autosampler with *FAST* PC^3 Complete
- Three high-purity fluoropolymer injection valves with all connections
- continuum dual syringe pump system
  - 3 mL and 300 µL quartz/PTFE syringe for micro*FAST* 2
  - 3 mL and 300 µL PFA/PTFE syringe for micro*FAST* HF 2

continuum system for micro*FAST* 2



micro*FAST* 2 System Diagram

micro*FAST* Applications

Ultra-low total volume (tens of microliters) samples

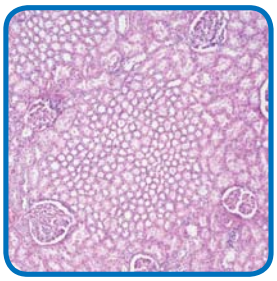
- Controlled uptake and delivery of micro-samples
- Measure up to 100% of sample with high sensitivity
- Flow rates as low as 1-5 µL/min
- Perform repeat multi-element analysis or precise isotope ratio measurements on a single sample as small as 50 µL
- Ideal for nuclear applications to minimize sample prep volume and waste

Volatile high-purity organic solvents

- Reliable sample introduction at 5 and 10 µL per minute allows samples to be analyzed using conditions similar to those used for water
- Reduced instrument drift, improved stability and lower instrument maintenance
- SC Autosamplers offer an optional metal-free piercing probe for covered samples to reduce contamination and evaporation
- Optional continuum pump eliminates pump tubing
- Requires platinum cones and oxygen addition gas

Climate research applications

- Particulates in seawater, starting with as little as 10 L of seawater
- Elemental and isotopic ratio analysis of a single planktonic foraminifera
- Micrometeorite multi-element analysis



Clinical micro-samples

- Elemental analysis of limited volume cell samples
- Metal uptake in living tissue
- Elemental analysis of premature infant blood

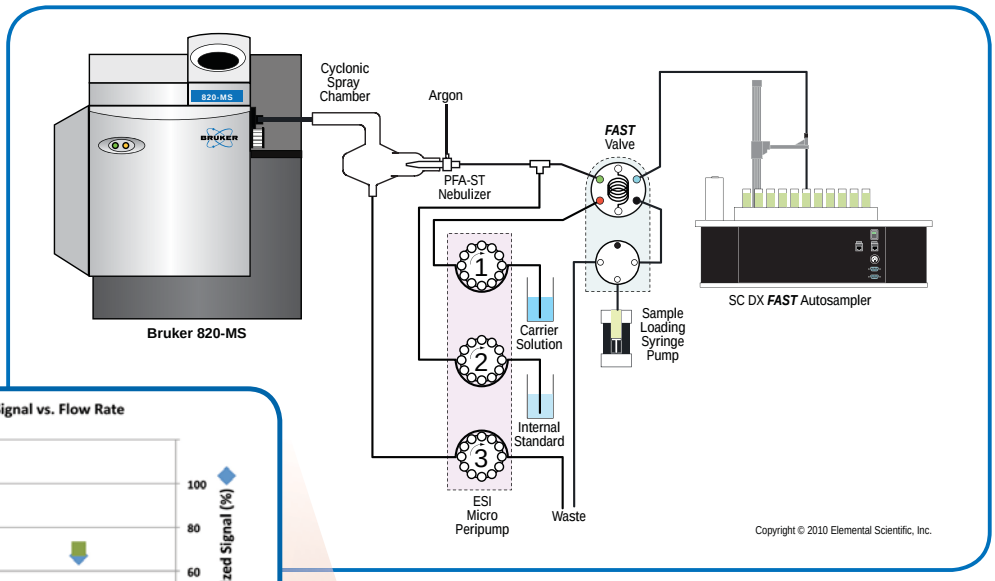
High-TDS and high-purity metals

- Measure high-TDS or high-purity metal solutions without dilution
- Reduced matrix effects
- Prevent cone clogging
- Reduce amount of matrix reaching the ICPMS, reducing carryover and instrument contamination from matrix elements

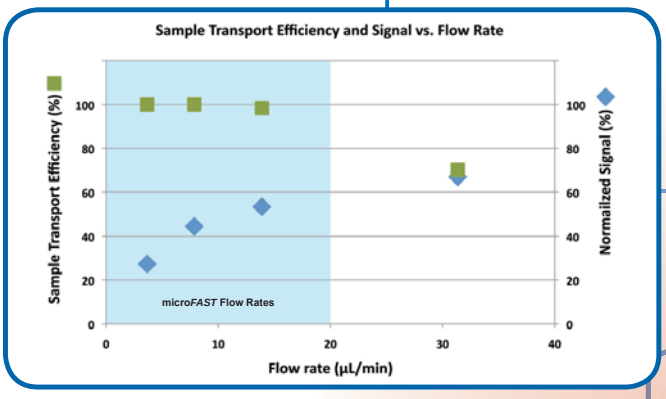
High-precision isotope ratios with maximum absolute sensitivity

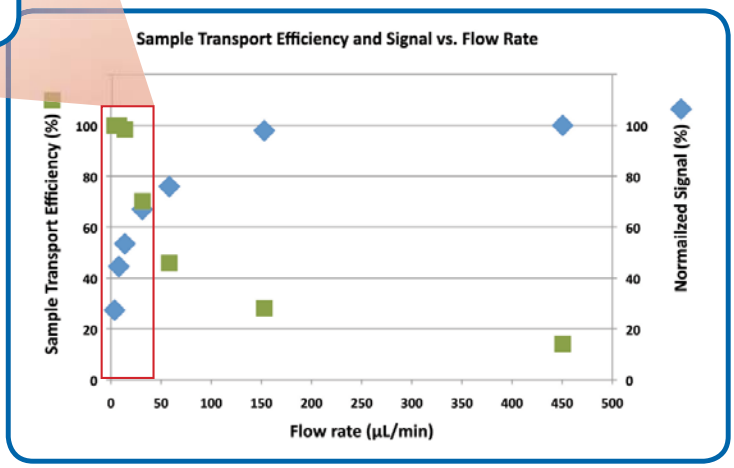
- Sample transport efficiency nears 100% at flow rates < 20 µL/min
- Measure 100 µL or smaller samples with high precision
- Highest sensitivity per unit volume for best precision

microFAST™



microFAST 1 System Diagram





Sample transport efficiencies near 100% are obtained at flow rates below 20 µL/min.

Both the MP² and syringe show good stability at low flow rates, but the syringe offers exact day-to-day flow rate reproducibility with the convenience of not having to change peristaltic pump tubing.

Typical % RSD, *n* = 5 at 10 µL/min with cyclonic spray chamber				
Element	Mg	Y	In	U
microFAST 1 (MP²)	1.3	0.9	0.9	1.2
microFAST 2 (Syringe)	1.2	1.0	0.9	1.2

microFAST System Part Numbers for the BRUKER ICPMS			
Description		SC-2 DX	SC-4 DX
microFAST 1 System		2MF2-83C	4MF2-83C
microFAST 2 System		2MF3-2-83C	4MF3-2-83C
microFAST HF1 System	HF	2MF2-HF-83C	4MF2-HF-83C
microFAST HF2 System	HF	2MF3-2-HF-83C	4MF3-2-HF-83C

System	Part Number	Description
Upgrade to microFAST 2	SC-0700-DX	continuum system upgrade for microFAST 1/HF1 or FAST System. Converts system to microFAST 2/HF2. A dual syringe pump system eliminates contact between the carrier liquid and peristaltic pump tubing. Pump volatile solvents or aggressive carrier liquids. Obtain exactly the same flow rate with day-to-day usage without changing peristaltic pump tubing.
Upgrade to microFAST HF2	SC-0700-DX-HF	

TRU*FAST*™

The TRU*FAST* automatically performs online preconcentration of specific radionuclides to reduce matrix-related interferences and enhance sensitivity by an order of magnitude or more. TRU*FAST* can eliminate lengthy off-line sample preparation, speed up analytical results, better control blanks, and improve detection limits for radioisotopes by ICPMS.

All TRU*FAST* systems include:

- SC autosampler with PC^3 *FAST* Complete system
- Integrated precision MP^2 micro peristaltic pump
- Two high-purity fluoropolymer injection valves with all connections
- Chelation column(s)
- Suggested methods

SC-4 DX TRU*FAST* system for BRUKER ICPMS

• Ra

Radium analysis in natural waters: Polyatomic interferences arising from Ba and Sr are automatically removed online using ion exchange techniques, providing extremely low background levels and superb detection limits.
(Cation exchange column, Sr preconcentration column)

• Th, U

Th in transition metal matrices: Thorium impurities in high-purity Cu may be measured by chelating Th while removing the Cu matrix ions via an ion exchange column. Thorium is then eluted and measured in an ICPMS.

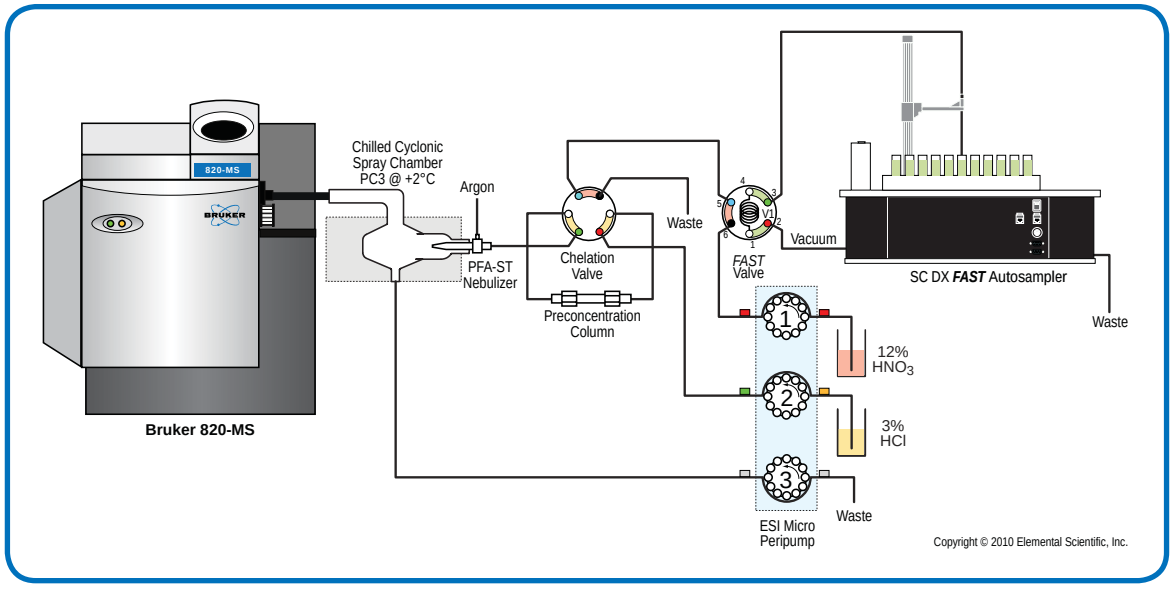
(Th/U preconcentration column)

Th and U may also be determined in high saline matrices using the sea*FAST* system.

TRU*FAST* System Part Numbers for the BRUKER ICPMS

Description	SC-2 DX	SC-4 DX
TRU*FAST* Th/U System	2TF-ThU-83C	4TF-ThU-83C
TRU*FAST* Ra System	2TF-Ra-83C	4TF-Ra-83C

Part Number	Description
CF-CX-2000-AG	Spare cation exchange column
CF-Sr-0200	Spare Sr preconcentration column
CF-ThU-0200	Spare Th/U preconcentration column



TRU*FAST* Th in Cu System Diagram

High-Efficiency MicroFlow Nebulizers

MicroFlow nebulizers are constructed entirely from chemically-resistant fluoropolymers, ideal for strong acids, alkalis, organics, high salt solutions and high solid concentrations. They are resistant to clogging, are reliably self-aspirated or pumped, and produce a fine aerosol for high transport efficiency and high sensitivity.

PFA-ST Nebulizer

HF

The PFA-ST Nebulizer features the same high-purity, HF resistance, and high performance of the PFA MicroFlow nebulizers, along with an exchangeable external sample uptake capillary. The sample uptake rate is controlled by the diameter of the external capillary or probe.

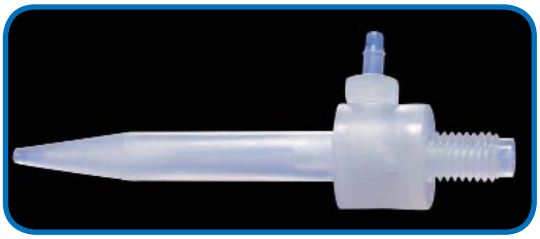
- Exchangeable uptake capillaries allow one nebulizer to be used at different self-aspiration rates from 20µL/min to 700µL/min
- All-Teflon® construction
- Chemically resistant—ideal for strong acids, alkalis, organics
- Can be pumped from < 0.1 mL/min to 3.0 mL/min
- Direct analysis of volatile and non-volatile organic solvents
- Longer lifetime than glass or quartz nebulizers

Part Number	Description
ES-2040-83	Self-aspirating nebulizer with detachable sample capillary

PolyPro-ST Nebulizer

HF

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



Part Number	Description
ES-4040-83	Self-aspirating nebulizer with external threaded connector

PFA-ST3 MicroFlow Nebulizer

HF

The PFA-ST3 MicroFlow Nebulizer is designed for superior clog resistance and higher sensitivity compared to the standard PFA nebulizer.

Part Number	Description
ST3-50	PFA-ST3 MicroFlow nebulizer with external threaded connector. High performance, clog resistant and chemically inert nebulizer for ICP and ICPMS.

Syringe Flush Kit

Use syringe and white adapter to back-flush the carrier line or tee-line. Use syringe and red adapter to forward flush the carrier line, the side port of the tee-line, and to forward flush the PFA nebulizer.

Part Number	Description
SC-0599-0109	Syringe flush kit (Includes 3 mL syringe, two luer to 1/4-28 adapters)

Function

- FAST
- Low Sample Consumption
- Low Detection Limits
- HF Resistant
- High Throughput
- High Precision/ Isotope Ratio
- Micro Samples
- Preconcentration
- Speciation

Application

- Clinical
- Environmental
- Geochemistry
- Nuclear
- Organic Solvents
- Remote Monitoring
- Semiconductor

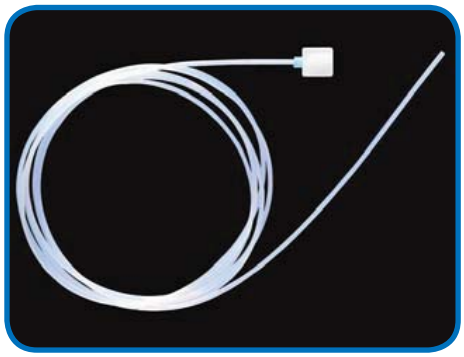
Nebulizer Obstruction Removal Kit

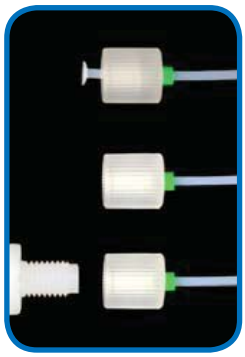
While naturally resistant to obstructions, PFA nebulizers may occasionally require maintenance. Use this kit to safely remove obstructions in all PFA-ST nebulizers for long-term high performance. Never back-flush a PFA-ST nebulizer.

Part Number	Description
ES-2046-0001	Obstruction Removal Kit for ST nebulizers

Sample Capillaries for ST Nebulizers

i.d.	Self-aspiration rate (@1L/m Ar)	ESI SC
0.15 mm	20 µL/min (red)	ES-2045
0.2 mm	50 µL/min (purple)	ES-2043
0.25 mm	100 µL/min (green)	ES-2042
0.3 mm	200 µL/min (yellow)	ES-2047
0.5 mm	400 µL/min (orange)	ES-2041
0.8 mm	700 µL/min (blue)	ES-2044
1.0 mm	1 mL/min (gray)	ES-2049





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 can be custom-made to your specifications of length and materials at no extra charge.

Self-aspirating Probes with Carbon Fiber Support

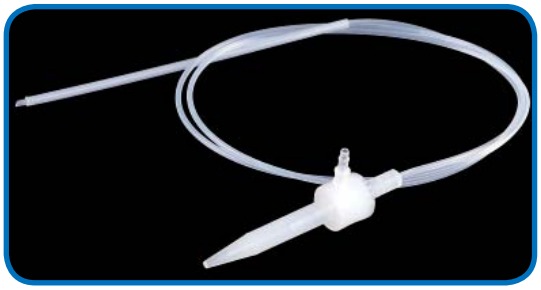
Probe i.d.	Self-aspiration rate (@1L/m Ar)	ESI SC	BRUKER SPS
0.25 mm	100 µL/min	ES-5037-3255-150	ES-5037-2250-150
0.50 mm	400 µL/min	ES-5037-3505-150	ES-5037-2500-150
0.8 mm	800 µL/min	ES-5037-3755-150	ES-5037-2750-150

Also available with Ultem support

MicroFlow PFA Self-Aspirating Nebulizers

MicroFlow PFA Nebulizers with Integrated Capillaries

An integrated capillary PFA nebulizer for self-aspiration. PFA MicroFlow nebulizers are constructed entirely from chemically-resistant fluoropolymers, ideal for strong acids, alkalis, organics and high salt solutions. They are resistant to clogging, and produce a fine aerosol for high transport efficiency and high sensitivity.



- Integrated capillary for self-aspiration, ideal for low flow, clean applications
- All-Teflon® construction
- Chemically-resistant—ideal for strong acids, alkalis, organics
- Low, spike-free background for important elements such as Fe and Ca
- Produces a fine aerosol for high transport efficiency and high sensitivity
- Direct analysis of volatile and non-volatile organic solvents

PFA Nebulizers with Integrated Fluoropolymer Capillaries

Model	Part Number	Measured self-aspiration rate (@1L/m Ar)
PFA-20	ES-2020-0002	20 µL/min
PFA-50	ES-2000-0002	50 µL/min
PFA-100	ES-2002-0002	100 µL/min
PFA-200	ES-2003-0002	200 µL/min
PFA-400	ES-2005-0002	400 µL/min

Other flow rates made to order

apex MicroFlow PFA Self-Aspirating Nebulizers

Part Number	Description	Application
ES-2040-7000	apex-ST PFA MicroFlow Nebulizer with external 1/4-28 threaded connector	High temperature PFA-ST nebulizer recommended for use with apex high sensitivity desolvation system.
ES-2002-7000	apex-100 PFA Nebulizer	High temperature PFA-100 nebulizer with integrated 100 µL/min self aspiration capillary. Recommended for apex high sensitivity desolvation system.

MICROFLOW PFA NEBULIZERS WITH INTEGRATED PROBES

Function

- *FAST*
- Low Sample Consumption
- Low Detection Limits
- HF Resistant
- High Throughput
- High Precision/ Isotope Ratio
- Micro Samples
- Preconcentration
- Speciation

Application

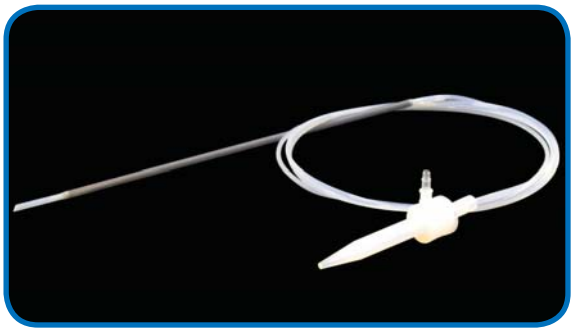
- Clinical
- Environmental
- Geochemistry
- Nuclear
- Organic Solvents
- Remote Monitoring
- Semiconductor

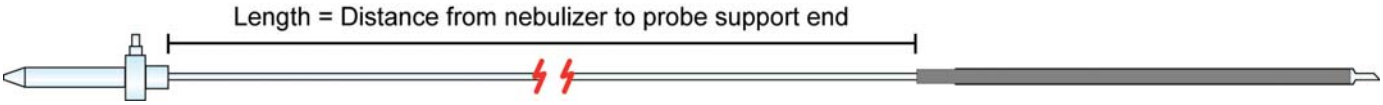
High-Efficiency MicroFlow PFA Nebulizers

Self-Aspirating PFA Nebulizers with Integrated Probes

These nebulizers allow self-aspiration at low sample consumption rates with any autosampler while providing the same benefits of the PFA MicroFlow nebulizer. The integrated sampling probe is constructed by encapsulating a rigid support material between layers of Teflon® to provide a chemically-resistant probe that is mechanically stable and resilient.

Probes can be custom-made to your specifications of length and materials at no extra charge.





PFA MicroFlow Nebulizer with Integrated Autosampler Probe (Carbon Fiber support) for Environmental/Clinical Applications

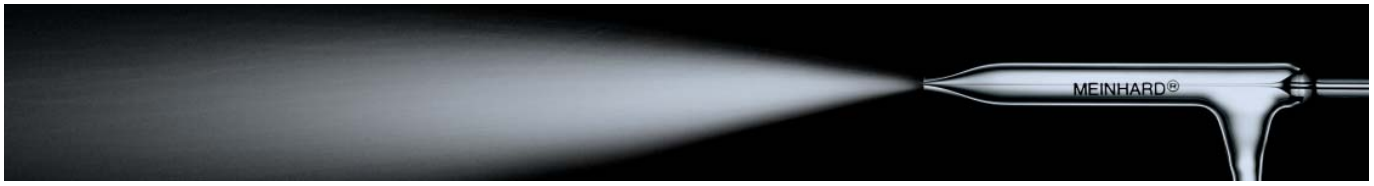
Model	Self-aspiration rate (@1L/m Ar)	For SC Autosampler
PFA-20	20 µL/min	ES-2020-3503-150
PFA-50	50 µL/min	ES-2000-3503-150
PFA-100	100 µL/min	ES-2002-3503-150
PFA-200	200 µL/min	ES-2003-3503-150
PFA-400	400 µL/min	ES-2005-3503-150

PFA MicroFlow Nebulizer with Integrated Autosampler Probe (Ultem support) for High-purity Semiconductor Applications

Model	Self-aspiration rate (@1L/m Ar)	For SC Autosampler
PFA-20	20 µL/min	ES-2020-3505-150
PFA-50	50 µL/min	ES-2000-3505-150
PFA-100	100 µL/min	ES-2002-3505-150
PFA-200	200 µL/min	ES-2003-3505-150
PFA-400	400 µL/min	ES-2005-3505-150

Also available with PEEK support and for ASX 500 / 520 Autosampler

MEINHARD®
Concentric Nebulizers



Quartz Nebulizers

NEW SilQ+ Ultra-high Purity Quartz Nebulizer

SilQ+ Ultra High Purity Quartz Nebulizer, low internal volume inlet. Self-aspiration rate 0.5 mL/min with argon flow 1 L/min at 50 PSI (3.4 bar/ 345 kPa). Peristaltic pumped rate 0.3 mL/min to 3.0 mL/min. Includes FG+ Quick Connect (PFA) and FSD+ Quick Connect with 0.5 mm i.d. (orange marker) capillary 70 cm length.

Part Number	Application
SILQ-50	For use with all standard applications of the SilQ nebulizer

NEW TQ+ Quartz Nebulizer

TQ+ Quartz High Performance A-type Nebulizer, low internal volume inlet. Self-aspiration rate 0.5 mL/min with argon flow 1 L/min at 50 PSI (3.4 bar/345 kPa). Peristaltic pumped rate 0.3 mL/min to 3.0 mL/min. Includes FG+ Quick Connect (PFA) and FSD+ Quick Connect with 0.5 mm i.d. (orange marker) capillary 70 cm length.

Part Number	Application
TQP-50	For use with all standard applications of the TQ nebulizer

Borosilicate Glass Nebulizer

NEW TR+ Borosilicate Glass Nebulizer

TR+ Glass High Sensitivity Nebulizer, low internal volume inlet. Self-aspiration rate 0.5 mL/min with argon flow 1 L/min at 50 PSI (3.4 bar/345 kPa). Peristaltic pumped rate 0.3 mL/min to 3.0 mL/min. Includes FG+ Quick Connect (PFA) and FSD+ Quick Connect with 0.5 mm i.d. (orange marker) capillary 70 cm length.

Part Number	Application
TRP-50	For use with all standard applications of the TR nebulizer

NEW SilQ+ High Purity Quartz ICPMS Nebulizer

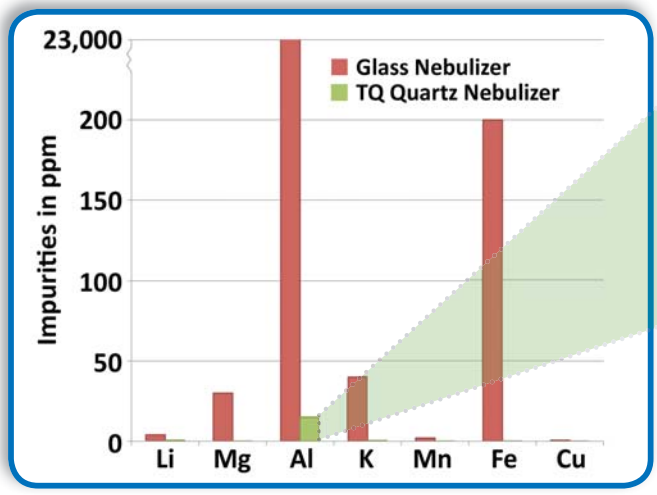
The SilQ+ nebulizer by MEINHARD® is perfect for applications requiring high sensitivity. Made from the highest purity synthetic quartz, the SilQ+ nebulizer has low levels of trace elemental impurities, reducing the risk of sample contamination. SilQ+ nebulizers improve wash-out rates and generate low, stable blanks that can enhance ICPMS detection limits.

SilQ+ comes equipped with PFA FitKit+ gas and sample quick connect fittings that eliminate contaminants from conventional connectors commonly used on other nebulizers. The fittings can be rapidly attached and removed. The gas quick connect creates a snug seal around the maria on the SilQ+ sidearm.

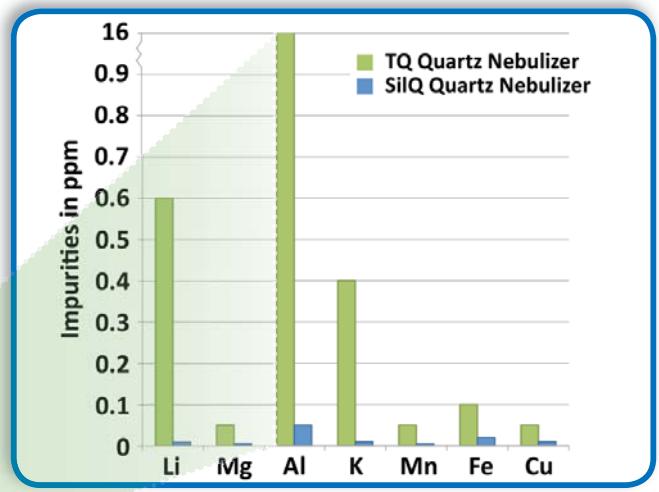
Each nebulizer is manufactured and tested to exacting specifications. The standard SilQ+ nebulizer requires 50 psi for 1 L/min of argon carrier and 0.5 mL/min solution uptake. Other versions are available.

MEINHARD® SilQ+ high purity nebulizer with PFA FitKit+

Potential Blank from Nebulizer



Comparison of metal impurity in Glass and TQ Quartz nebulizers. Glass nebulizers have high levels of impurity for elements such as Al, Fe, K, Mg.



Comparison of metal impurity in SilQ+ and TQ Quartz nebulizers. SilQ+ impurities on average are 60 times lower than standard quartz nebulizers. Aluminum impurities in SilQ+ nebulizers are more than 400,000 times lower than glass.

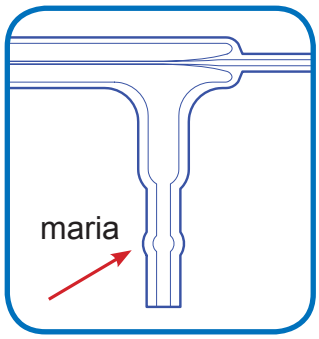
NEW + Nebulizer PFA Fit Kit Quick Connects

Elemental Scientific introduces the PFA FitKit^{+}, a revolutionary new sample and gas connection system for MEINHARD® nebulizers. The kit includes an FG^{+} gas connection and FS^{+} sample connection.

FG^{+} gas connection forms a tight seal over the bubble-shaped 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 and ICPMS 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 include:

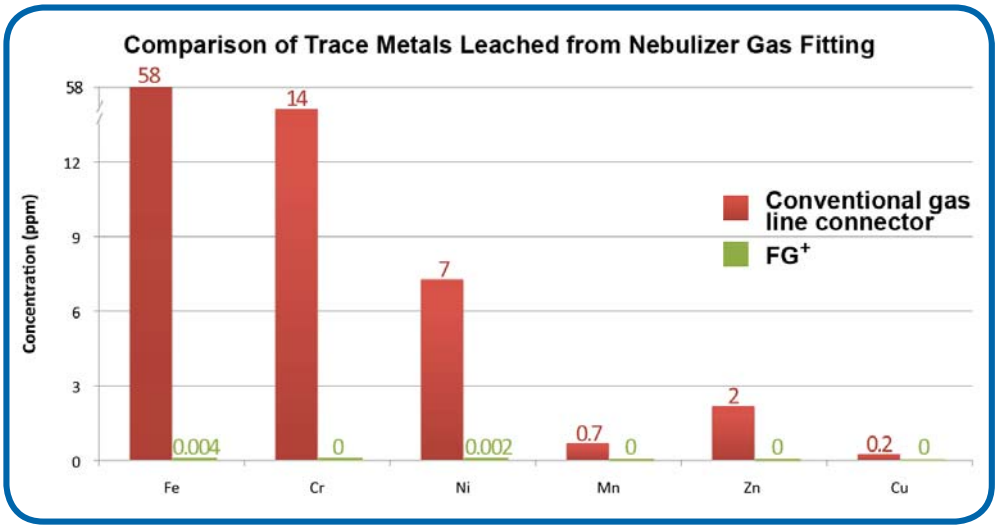
- High-purity PFA fluoropolymer construction
- Easy to connect and disconnect
- One connection fits any MEINHARD® nebulizer



FG^{+} Gas Quick Connect for MEINHARD® Nebulizers

FG^{+} Gas Quick Connect for MEINHARD® Nebulizer with maria for both small bore and standard bore nebulizers.

Part Number	Application
FGP	For use with all MEINHARD® Nebulizers



Conventional gas line connector

PFA FG^{+} quick connect gas line

Figure 1. Leach test of a conventional gas line connector and PFA FG^{+}

FS+ sample connection is a low dead-volume quick connect for small bore MEINHARD® nebulizers. FS+ 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 and ICPMS applications.

Benefits include:

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

FS+ connectors available:

FSD: Detachable capillary for a wide range of applications.
FS1: Encapsulated micro tubing for microflow rates with the lowest internal volume of any nebulizer.
FS2: Standard integrated capillary for self-aspiration or pumping.

Sample Tubing Options

FSD+ Detachable Capillary

FSD+ Detachable capillary for a wide range of applications. Includes 0.5 mm i.d. (orange marker) 70 cm long capillary.

Part Number	Application
FSD-50-070	Compatible with all MEINHARD® Plus Nebulizers.

FS1+ Encapsulated Micro Tubing

FS1+ Encapsulated micro tubing for microflow rates with the lowest internal volume of any nebulizer. Includes 0.25 mm i.d. (green marker) 70 cm long micro capillary.

Part Number	Application
FS1-25-070	Compatible with all MEINHARD® Plus Nebulizers.

FS2+ Integrated Capillary

FS2+ integrated capillary for self-aspiration or pumping. Includes 0.5 mm i.d. (orange marker) 70 cm long capillary.

Part Number	Application
FS2-50-070	Compatible with all MEINHARD® Plus Nebulizers.

Cyclonic Spray Chambers

ESI cyclonic chambers feature o-ring-free connections to the nebulizer and torch injector, secure, leak-free threaded drain port, internal baffle, and threaded auxiliary port for addition gas.

Part Number	Description
ES-3183-1111-16	O-ring-free, baffled quartz cyclonic spray chamber with 1/4-28 threaded auxiliary gas port.

Part Number	Description
ES-3183-3111-11	O-ring-free, baffled PFA cyclonic spray chamber with 1/4-28 threaded auxiliary gas port.

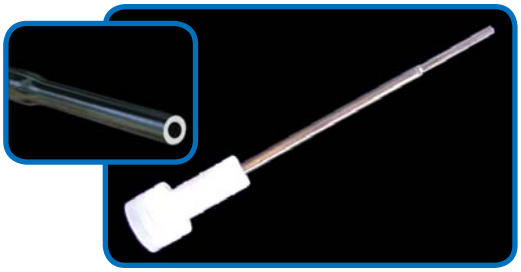
PFA-Quartz Ball Joint Socket Adapter

Part Number	Description	Application
ES-5510	Adapter, PFA/quartz, 12/5 ball joint to ESI Spray Chambers	Connects ESI spray chambers to standard BRUKER ICPMS injector with glass ball joint inlet.

INJECTORS FOR O-RING-FREE TORCH / SHIELD DISC

O-Ring-Free Platinum Injectors for BRUKER ICPMS Torch

Part Number	Size	Description
ES-1841-0100	1 mm	Platinum injector, 1 mm, o-ring-free injector. For introducing volatile organic solvents containing HF. Used for semiconductor and other applications. [Pt cones recommended]
ES-1841-0150	1.5 mm	Platinum injector, 1.5 mm, o-ring-free injector. For solvents and HF-containing semiconductor-grade chemicals
ES-1841-0200	2 mm	Platinum injector, 2 mm, o-ring-free injector. For semiconductor HF applications and low-ppt Al determinations.



O-Ring-Free Sapphire Injectors for BRUKER ICPMS Torch

Part Number	Size	Description
ES-1843-0180	1.8 mm	Sapphire injector, 1.8 mm, o-ring-free injector. HF-resistant. For geochemistry and HF applications where low-ppt Al is not required.

O-Ring-Free Quartz Injectors for BRUKER ICPMS Torch

Part Number	Size	Description
ES-1844-0100	1 mm	Quartz injector, 1 mm, o-ring-free injector. For volatile organic solvent introduction
ES-1844-0150	1.5 mm	Quartz injector, 1.5 mm, o-ring-free injector
ES-1844-0200	2 mm	Quartz injector, 2 mm, o-ring-free injector. Recommended for a wide range of non-HF applications
ES-1844-0250	2.5 mm	Quartz injector, 2.5 mm, o-ring-free injector. Improved stability for high matrix/high TDS environmental samples

O-Ring-Free Shield Disc for a PFA Injector Base

- Protects PFA Teflon® injector base from damage caused by heat and light from the instrument
- Extends injector lifetime
- Improves long-term instrument stability

Part Number	Description
ES-1101-3107	Platinum shield disc for o-ring-free torch, BRUKER ICPMS. *For platinum & sapphire injectors only.*

Platinum Shield Disc Installed

HF-RESISTANT SAMPLE INTRODUCTION KITS

PFA Sample Introduction Kits for BRUKER ICPMS

A reliable, ultra-pure sample introduction kit to complement the BRUKER ICPMS.

- Easy installation on the BRUKER ICPMS
- Clean Teflon® PFA components for lower background equivalent concentration (BEC) and detection limits
- Chemically resistant—suitable for nearly all samples, including strong acids, alkalis and organic solvents
- Sapphire or platinum injector
- Self-aspirated or pumped PFA nebulizers included
- Low sample consumption—ideal for VPD and preconcentrated samples

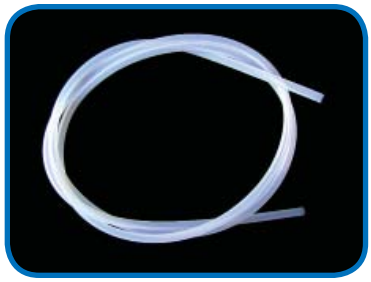
PFA-Sapphire HF Resistant Sample Introduction Kit

Part Number	Description
ES-2240-4350-27	Complete HF-resistant sample introduction system for BRUKER ICPMS. All wetted surfaces are Teflon® and Sapphire. Provides a chemically inert and clean introduction system. Includes a PFA MicroFlow Nebulizer, PureCap PFA endcap with additional gas port, PFA spray chamber, Sapphire injector, Pt Shield and quartz torch.
ES-2241-4350-19	Complete high-purity sample introduction system for BRUKER ICPMS. All wetted surfaces are Teflon® and Pt. Used by a majority of semiconductor labs worldwide for the analysis of semiconductor grade chemicals and Si wafer samples. Includes 2 PFA MicroFlow Nebulizers, PureCap PFA endcap with additional gas port, PFA spray chamber, Pt injector, Pt Shield and quartz torch.

PFA-Platinum High Purity Sample Introduction Kit

PFA Sample Introduction Kit Consumables

Part Number	Description
ES-1843-8300 ppq	O-ring-free demountable quartz torch for BRUKER ICPMS. Use o-ring-free injectors with this torch.



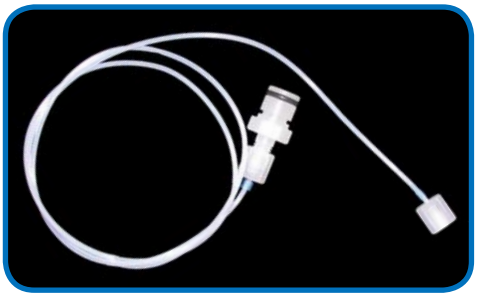
Part Number	Description
ES-2502	Teflon gas line, 4 mm

Part Number	Description
ES-2501-83	MicroFlow gas line adapter for Bruker

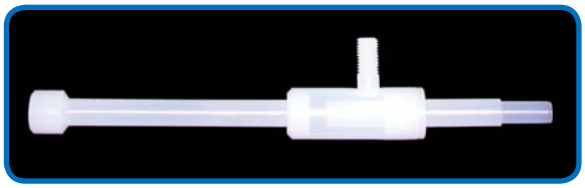
HF-RESISTANT SAMPLE INTRODUCTION CONSUMABLES

Part Number	Size	Description
ES-1841-0200	2 mm	Platinum injector, 2 mm, o-ring-free injector. For semiconductor HF applications and low-ppt Al determinations.

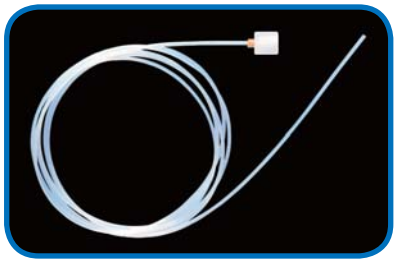
Part Number	Size	Description
ES-1843-0180	1.8 mm	Sapphire injector, 1.8 mm, o-ring-free injector. HF-resistant. For geochemistry and HF applications where low-ppt Al is not required.



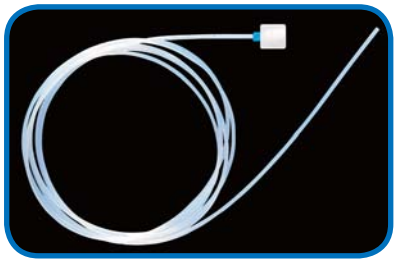
Part Number	Description
ES-2044-0202	Sheath gas line, drain line and fitting kit for Bruker ICPMS



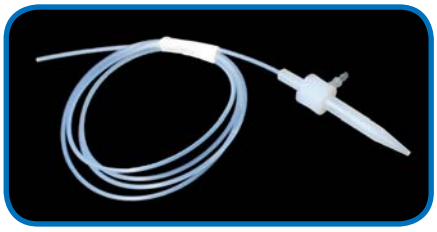
Part Number	Description
ES-1883-0001	Sheath gas adapter for Bruker ICPMS



Part Number	Description
ES-2042	0.25 sample capillary, 100 µL/min
ES-2041	0.5 sample capillary, 400 µL/min

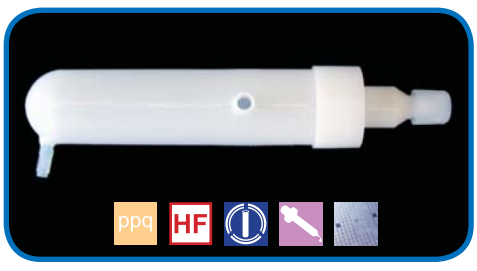


Part Number	Description
ES-2044	Drain line and fitting, 0.8 mm



Part Number	Description
ES-2002-83	PFA 100 Nebulizer, 100 µL/min

Part Number	Description
ES-2183-5351	The 35 mm PureChamber and PureCap offers a spray chamber with high aerosol transmission with excellent short-term and long-term stability. Constructed from PFA Teflon® for low contamination and long lifetime, the o-ring-free seal reduces contamination and provides an easy to clean, low maintenance system.
ES-5010-0351-83	35 mm PFA PureCap endcap for Bruker ICPMS
ES-3199-0001	6 mm PFA spray chamber nut



oneFAST - Universal, High-Throughput Sample Introduction System

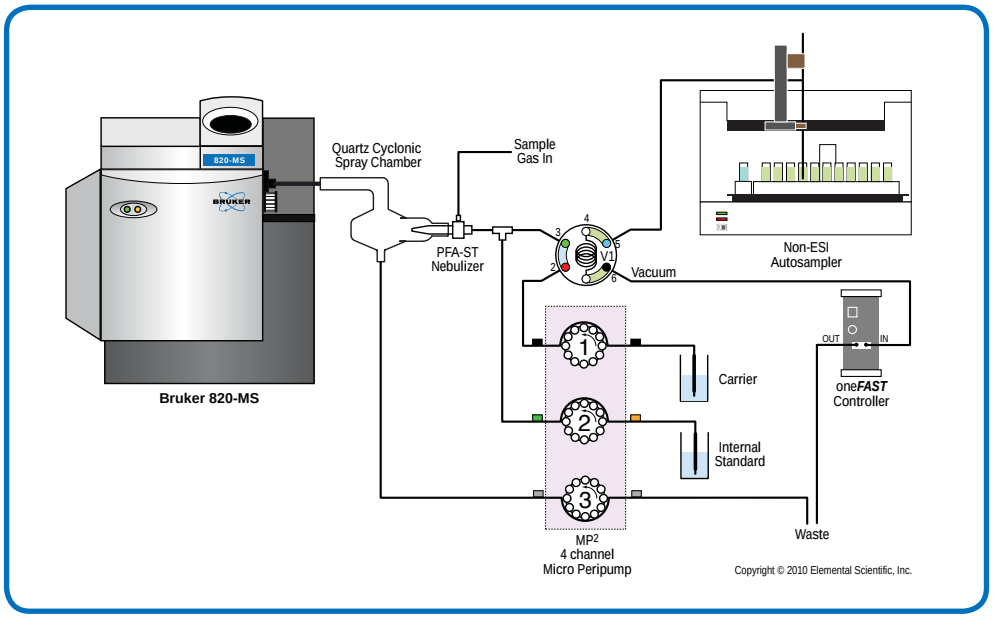
The oneFAST brings the field-proven capabilities of the SC-FAST to non-ESI autosamplers. The oneFAST hardware and software has been optimized and integrated with the BRUKER ICPMS to immediately increase throughput by speeding stabilization time and rinse-out. The oneFAST reduces instrument matrix exposure, maintenance and improves long-term performance.

oneFAST for the BRUKER ICPMS

The oneFAST increases throughput with non-ESI autosamplers.

Includes:
- FAST Valve
- oneFAST controller
- PFA-ST Nebulizer
- Probes-Teflon/Carbon Fiber
- All required tubing

Part Number	Description
SC-0400	oneFAST Basic system for BRUKER ICPMS



oneFAST Complete for BRUKER ICPMS

Part Number	Description
ES-2999-8321	FAST valve mounting bracket for Bruker ICPMS

Part Number	Description
ES-2999-8322	PC³ / PC³-FAST mounting bracket for BRUKER ICPMS

one*FAST* Complete Systems

Function

- *FAST*
- Low Sample Consumption
- Low Detection Limits
- HF Resistant
- High Throughput
- High Precision/ Isotope Ratio
- Micro Samples
- Preconcentration
- Speciation

Application

- Clinical
- Environmental
- Geochemistry
- Nuclear
- Organic Solvents
- Remote Monitoring
- Semiconductor

one*FAST* Complete

The one*FAST* Complete without Peltier cooling includes an injector and spray chamber, making any non-ESI autosampler ready for increased throughput needs.

Includes:
- *FAST* Valve
- one*FAST* controller
- PFA-ST Nebulizer
- Probe - Teflon/Carbon Fiber
- Quartz Cyclonic Spray Chamber
- Sapphire Injector
- All required tubing

Part Number	Description
SC-0483	one*FAST* complete for BRUKER ICPMS

one*FAST* PC³ Complete

The one*FAST* PC³ Complete with Peltier cooling increases throughput with non-ESI autosamplers. The addition of the PC³ reduces solvent load and keeps the spray chamber thermally stable, improving signal stability and performance.

Includes:
- *FAST* Valve
- one*FAST* controller
- PFA-ST Nebulizer
- Probe - Teflon/Carbon Fiber
- Quartz Cyclonic Spray Chamber
- Sapphire Injector
- PC³ Peltier-cooled Quartz Cyclonic Spray Chamber
- All required tubing

Part Number	Description
SC-0483-41	one*FAST* PC³ complete for BRUKER ICPMS (with Peltier cooler)

oneFAST DXi Complete Systems

The oneFAST with DXi has all the advantages of the oneFAST system plus the convenience of an integrated peripump and FAST valve. The FAST DXi integrates the MP² precision low flow peristaltic pump and FAST sample injection valve directly into the BRUKER ICPMS. The DXi offers faster analysis with high precision.

oneFAST DXi Complete

The oneFAST DXi Complete without Peltier cooling has an integrated valve and microperipump, making any non-ESI autosampler ready for stable low flow and increased throughput needs.

Includes:
- FAST valve DXi with Integrated Micro Peripump
- oneFAST controller
- PFA-ST Nebulizer
- Probe - Teflon/Carbon Fiber
- Quartz Cyclonic Spray Chamber
- Sapphire Injector
- All required tubing

Part Number	Description
SC-0483-DXi	oneFAST DXi complete for BRUKER ICPMS (without Peltier cooler)

See page 5 for more information of the DXi.

oneFAST DXi PC³ Complete

The oneFAST DXi Complete with Peltier cooling has an integrated valve and microperipump, making any non-ESI autosampler ready for stable low flow and increased throughput needs. The addition of the PC³ reduces solvent load and keeps the spray chamber thermally stable, improving signal stability and performance.

Includes:
- FAST Valve DXi with Integrated Micro Peripump
- oneFAST controller
- PFA-ST Nebulizer
- Probe - Teflon/Carbon Fiber
- Quartz Cyclonic Spray Chamber
- Sapphire Injector
- PC³ Peltier-cooled Quartz Cyclonic Spray Chamber
- All required tubing

Part Number	Description
SC-0483-41-DXi	oneFAST PC³ DXi complete for BRUKER ICPMS (with Peltier cooler)

See page 5 for more information of the DXi.

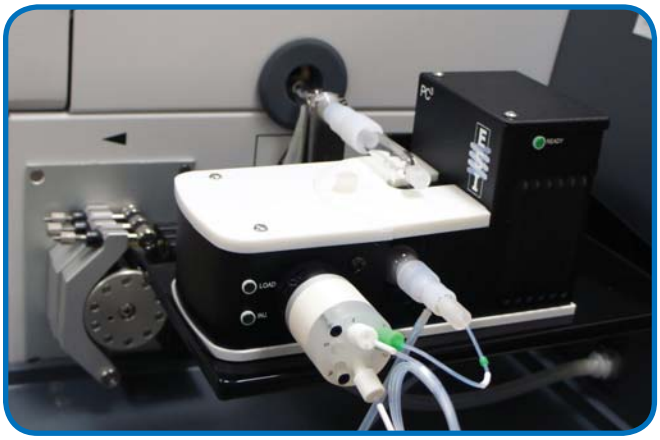
Function

- *FAST*
- Low Sample Consumption
- Low Detection Limits
- HF Resistant
- High Throughput
- High Precision/ Isotope Ratio
- Micro Samples
- Preconcentration
- Speciation

Application

- Clinical
- Environmental
- Geochemistry
- Nuclear
- Organic Solvents
- Remote Monitoring
- Semiconductor

PC³ Peltier Coolers



The PC³ is a small and robust Peltier cooler for ICPMS cyclonic spray chambers. The cyclonic spray chamber offers the advantages of low-memory effects, fast rinse-out and high sample transport efficiency. The PC³ cools the outer walls of the cyclonic spray chamber to a constant temperature, enhancing long-term signal stability, reducing polyatomic interferences such as oxides, and reducing solvent loading when volatile organic solvents are analyzed.

PC³ / PC³-LT

The PC³ has two preset temperatures +2°C / -5°C and is ideal for analysis of aqueous or aqueous/organic mixtures.

The PC³-LT operates at +2°C / -20°C to reduce the solvent load on the plasma for analysis of 100% volatile organic solvents.

Part Number	Description	Temperature	Spray Chamber	Additional Gas Port
SC-4190-83-29	PC³ organic sample introduction kit - Peltier cooler for BRUKER ICPMS	+2°C / -5°C	Quartz (PFA option)	Yes
SC-9190-83-29	PC³-LT organic sample introduction kit - Peltier cooler for BRUKER ICPMS	+2°C / -20°C	Quartz (PFA option)	Yes
SC-4199-1210-83	PC³-*FAST* organic sample introduction kit - Peltier cooler for BRUKER ICPMS	+2°C / -5°C	Quartz (PFA option)	Yes

Additional Spray Chambers Available for the PC³

Part Number	Description
ES-3183-1111-16	O-ring-free, baffled quartz cyclonic spray chamber with 1/4-28 threaded auxiliary gas port.

HF

Part Number	Description
ES-3183-3111-11	O-ring-free, baffled PFA cyclonic spray chamber with 1/4-28 threaded auxiliary gas port.

High Sensitivity Desolvation Nebulizers

apex Q - Quartz Inlet System
Features an o-ring-free quartz flow path for high sensitivity and low background for samples that do not contain hydrofluoric acid. The apex Q sample path design ensures rapid rinse-out of any high sensitivity ICP introduction system.

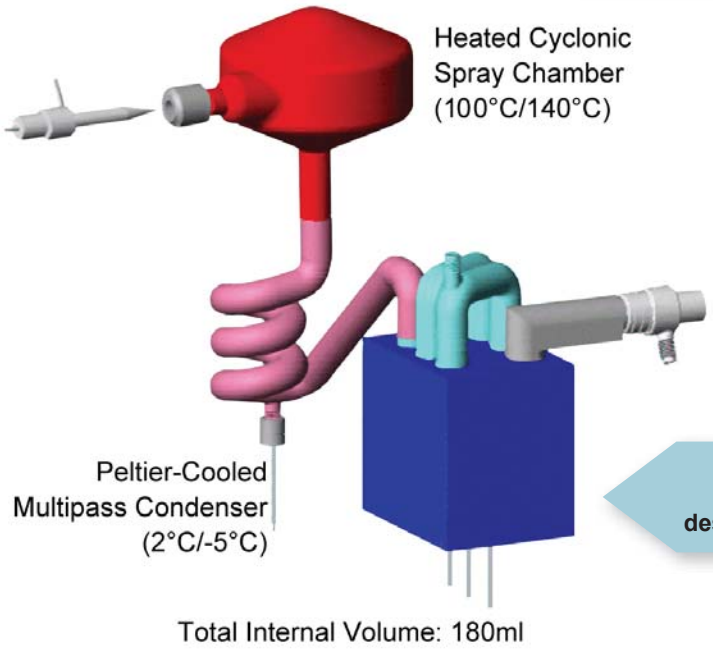
ppq

apex IR for Isotope Ratio Analysis
Developed for isotope ratio analysis, the apex IR has a quartz flow path and includes an additional mixing chamber that further homogenizes and stabilizes the sample aerosol stream, resulting in a more stable signal from the ICPMS.

ppq

apex HF for Hydrofluoric Acid Resistance
Uses a high-purity o-ring-free PFA Teflon® flow path to provide resistance to hydrofluoric acid. The apex HF is recommended for many geochemistry and semiconductor applications where samples containing HF are analyzed.

HF ppq



ppq

Preset dual temperature settings for heater and cooler. Patented flow path design ensures rapid wash-in / washout.

Function

- *FAST*
- Low Sample Consumption
- Low Detection Limits
- HF Resistant
- High Throughput
- High Precision/ Isotope Ratio
- Micro Samples
- Preconcentration
- Speciation

Application

- Clinical
- Environmental
- Geochemistry
- Nuclear
- Organic Solvents
- Remote Monitoring
- Semiconductor

Combination of apex inlet system with *FAST* injection valve

FAST High Sensitivity Desolvating Nebulizers

The apex *FAST* is a compact, high performance sample introduction system for ICPMS. The apex *FAST* is available in Q, HF and IR options. It can be controlled via any SC Autosampler or one*FAST* unit making it fully automated and integrated to any ICP or ICPMS.

Requires FAST-enabled autosampler.

	Part Number	HF-Resistant	Integrated Valve	High Sensitivity	O-ring-free	Dual Temperature	Mixing Chamber for Isotope Ratios
apex Q	ES-4383-1000-21			✓	✓	✓	
apex IR	ES-4583-1000-21			✓	✓	✓	✓
apex HF	ES-4483-1000-21	✓		✓	✓	✓	
apex Q *FAST*	ES-43FH-21-83		✓	✓	✓		
apex IR *FAST*	ES-45FH-21-83		✓	✓	✓		✓
apex HF *FAST*	ES-44FH-21-83	✓	✓	✓	✓		

spiro TMD

Heated Membrane Desolvator

The spiro TMD is a heated macro-porous PTFE Teflon® membrane desolvation module that reduces solvent-derived polyatomic interferences in ICPMS. Both aqueous and organic solutions can be desolvated, making the spiro ideal for HPLC applications.

- Heated macro-porous PTFE Teflon® membrane
- Desolvation of aqueous and organic solutions
- Reduces solvent derived oxide, hydride and carbide polyatomic interferences
- Suitable for sample flow rates < 400µL/min through apex
- Removes volatile acid matrix, i.e. HCl, HF
- Fast rinse-out
- Resistant to clogging
- Can be used with or without the apex
- Add membrane desolvation to standard introduction systems
- Easy to maintain and clean. User replaceable membrane sheets
- CeO^+:Ce^+ ratio approximately 0.03%

spiro TMD heated membrane desolvation module

Part Number	Description
ES-4599-3000	spiro TMD heated membrane desolvation module.

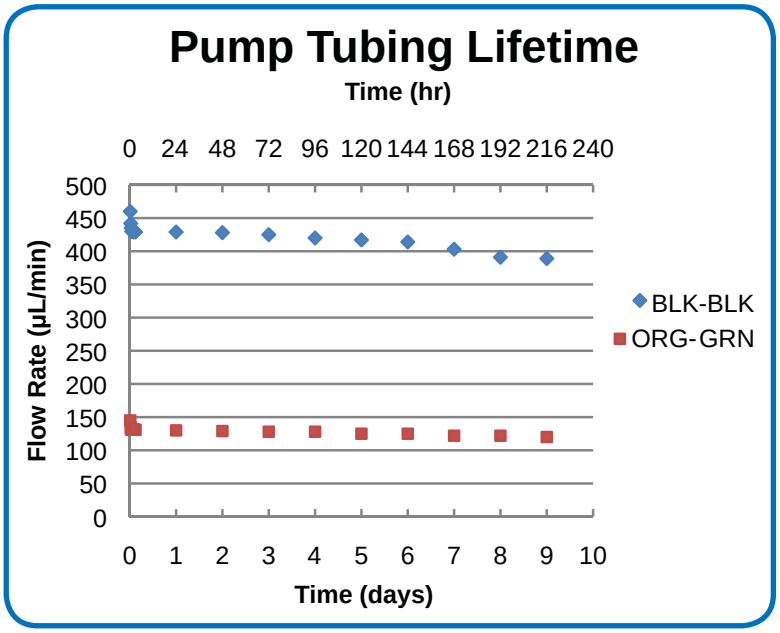
Integrated MP² Precision Micro Peristaltic Pumps

Micro peristaltic pumps offer advantages over standard peristaltic pumps due to precision machining and a roller configuration that minimizes the gaps between rollers, resulting in consistent pressure points along the pump tubing.

The MP² creates less pulsation in sample delivery, smaller relative standard deviations in signal, and consequently, improved detection limits. Also, the pump offers improved mixing of internal standards or diluents in online mixing tees.

BENEFITS:

- 12 Roller Micro Peripump
  - Plastic/ceramic rollers
  - Very low pulsation
  - Precision internal standard addition
- Wide Flow Range
  - (< 1µL/min - > 10mL/min)
- Optimized for Low Flow Rates
- Linear Relationship Between Pump Speed and Flow Rate
- Stand Alone and Integrated Versions
- 1 to 6 Channels
- High Chemical Resistance
- Pump Network Software Control



Pump tubing flow rates measured over 9 days of continuously pumping

MP² SPECIFICATIONS:

Channels:

1-6 Channels

Flow Rates:

< 1µL/min - > 10mL/min per channel

Tubing:

0.13 mm i.d. to 3.17 mm i.d.

Part Number	Description
MP2-3-83	MP² integrated three channel precision micro peristaltic pump for Bruker ICPMS
MP2-4-83	MP² integrated four channel precision micro peristaltic pump for Bruker ICPMS
MP2-6-83	MP² integrated six channel precision micro peristaltic pump for Bruker ICPMS

MP² PRECISION MICRO PERISTALTIC PUMPS

Function

- FAST
- Low Sample Consumption
- Low Detection Limits
- HF Resistant
- High Throughput
- High Precision/ Isotope Ratio
- Micro Samples
- Preconcentration
- Speciation

Application

- Clinical
- Environmental
- Geochemistry
- Nuclear
- Organic Solvents
- Remote Monitoring
- Semiconductor

MP² Precision Micro Peristaltic Pumps

The MP² precision standalone micro peripump has very low pulsation, a wide dynamic range (< 1µL/min to > 10 mL/min), is available with 1 to 8 channels and is optimized for low flow rates. The MP² uses either MPP tubing or standard 3-stop pump tubing.

CTFE PERIPUMP FITTINGS

Part Number	Qty	Size	
ES-2501-PPF2	1 ea.	Female (small)	
ES-2501-PPM2	1 ea.	Male (small)	

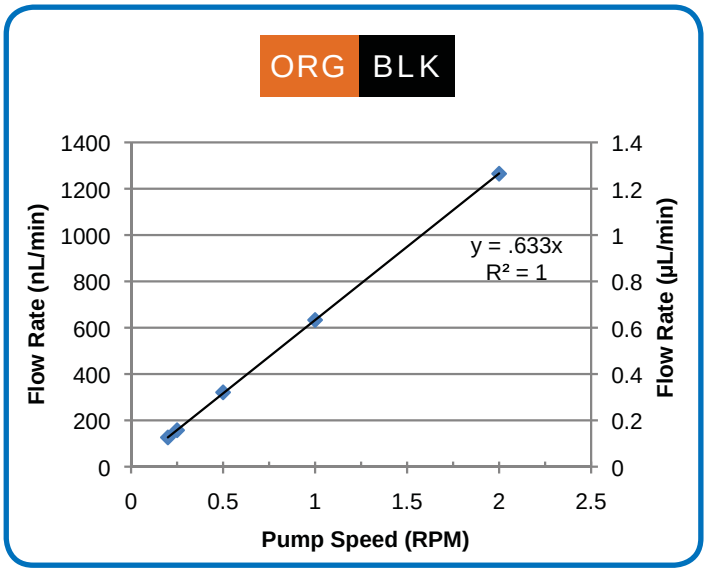
STAND-ALONE PERIPUMP CONTROLLED BY THE INSTRUMENT PC USB PORT

Part Number	Number of Channels
MP2-1-PC	One channel MP² precision micro peristaltic pump
MP2-2-PC	Two channel MP² precision micro peristaltic pump
MP2-3-PC	Three channel MP² precision micro peristaltic pump
MP2-4-PC	Four channel MP² precision micro peristaltic pump
MP2-6-PC	Six channel MP² precision micro peristaltic pump
MP2-8-PC	Eight channel MP² precision micro peristaltic pump

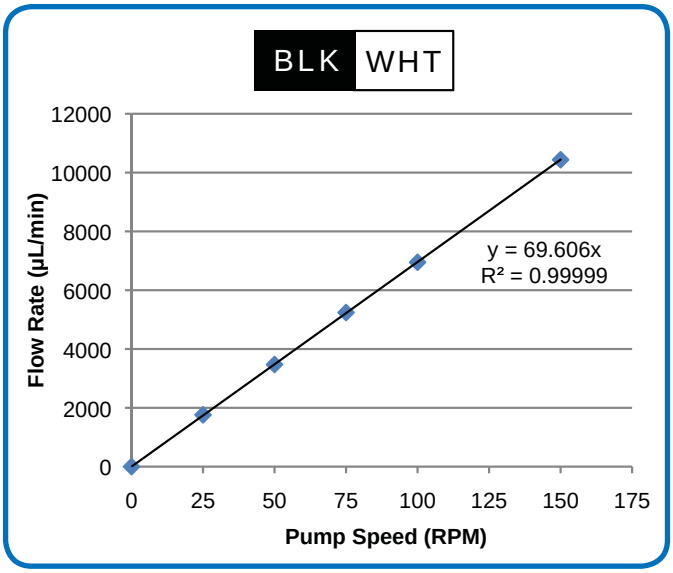
Includes: Cable to control with DX Autosampler

Interchannel Reproducibility at 125 nL/min

RPM	Ch. 1	Ch. 2	Ch. 3	Ch. 4
0.2	126	124	128	124
RSD	**1.26 %**			



MP² pump linearity < 1 µL/min



MP² pump linearity up to 10 mL/min

MP² PERIPUMP TUBING

Tubing for MP² Micro Peristaltic Pumps (Packs of 12)

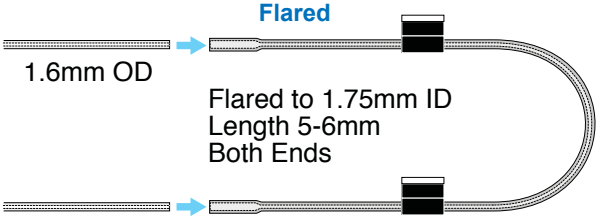
				Non-Flared			Flared*	
i.d.	Stop Colors		Calibration Slope (µL/min per RPM)	PVC 2-stop	Santoprene 2-stop	Solva 2-stop	PVC 2-stop	SOLVA 2-stop
0.13 mm	Orange	Black	0.6	MPP-013-PVC			MPP-013-F-PVC	MPP-013-F-S
0.19 mm	Orange	Red	1.3	MPP-019-PVC			MPP-019-F-PVC	MPP-019-F-S
0.27 mm	Orange	Blue	2.7	MPP-027-PVC			MPP-027-F-PVC	MPP-027-F-S
0.38 mm	Orange	Green	4.7	MPP-038-PVC	MPP-038-PHR		MPP-038-F-PVC	MPP-038-F-S
0.44 mm	Green	Yellow	7.6	MPP-044-PVC			MPP-044-F-PVC	MPP-044-F-S
0.51 mm	Orange	Yellow	9.5	MPP-051-PVC			MPP-051-F-PVC	MPP-051-F-S
0.57 mm	White	Yellow	11	MPP-057-PVC			MPP-057-F-PVC	MPP-057-F-S
0.64 mm	Orange	White	14	MPP-064-PVC			MPP-064-F-PVC	MPP-064-F-S
0.76 mm	Black	Black	19	MPP-076-PVC	MPP-076-PHR	MPP-076-S	MPP-076-F-PVC	MPP-076-F-S
0.89 mm	Orange	Orange	24	MPP-089-PVC		MPP-089-S	MPP-089-F-PVC	MPP-089-F-S
0.95 mm	White	Black	28	MPP-095-PVC		MPP-095-S	MPP-095-F-PVC	MPP-095-F-S
1.02 mm	White	White	31	MPP-102-PVC		MPP-102-S	MPP-102-F-PVC	MPP-102-F-S
1.09 mm	White	Red	33	MPP-109-PVC		MPP-109-S	MPP-109-F-PVC	MPP-109-F-S
1.14 mm	Red	Red	35	MPP-114-PVC		MPP-114-S	MPP-114-F-PVC	
1.22 mm	Red	Grey	46	MPP-122-PVC		MPP-122-S		
1.30 mm	Grey	Grey	47	MPP-130-PVC	MPP-130-PHR	MPP-130-S		
1.42 mm	Yellow	Yellow	50	MPP-142-PVC		MPP-142-S		
1.52 mm	Yellow	Blue	51	MPP-152-PVC	MPP-152-PHR	MPP-152-S		
1.65 mm	Blue	Blue	55	MPP-165-PVC		MPP-165-S		
1.75 mm	Blue	Green	58	MPP-175-PVC		MPP-175-S		
1.85 mm	Green	Green	61	MPP-185-PVC		MPP-185-S		
2.06 mm	Purple	Purple	64	MPP-206-PVC		MPP-206-S		
2.20 mm	Purple	Black	65	MPP-220-PVC		MPP-220-S		
2.54 mm	Purple	Orange	67	MPP-254-PVC		MPP-254-S		
2.79 mm	Purple	White	69	MPP-279-PVC		MPP-279-S		
3.17 mm	Black	White	70	MPP-317-PVC	MPP-317-PHR	MPP-317-S		
Bridge Length				72 mm	72 mm	72 mm	72 mm	72 mm

*For easy insertion of Teflon® capillaries **MPP-idd** **idd = internal diameter**

Non-Flared

PVC **Santoprene** **SOLVA**

Flared



NEW!

MP² PUMP TUBING STARTER KIT

Part Number	Description
MPP-K-1	MP² Pump Tubing Starter Kit comprising 34 packs of 12 tubes, one package of each light-blue 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:** 20 CTFE Fluoropolymer Peripump Fittings (5 each ES-2501-PPF1, 5 each ES-2501-PPM1, 5 each ES-2501-PPF5 and 5 each ES-2501-PPM5).

SYRIX Syringe Pump

SYRIX features an innovative drive mechanism for the precise control of liquid samples and reagents. Wetted parts are o-ring-free and offer the highest chemical resistance.

SYRIX is highly configurable for a wide range of applications such as micro-sample loading and remote monitoring.

Features:

- Wide flow rate range
  - < 1 µL/min to > 100 mL/min
- A variety of syringe sizes
  - 0.3 mL to 10 mL
- O-ring-free
- Syringe material
  - PTFE/Quartz
  - PTFE/PFA
- Optional integrated switching valve
- Convenient software control interface
- Connects directly to SC-DX autosampler

SYRIX syringe pump with valve
(SX-6503-1030-DX)

SYRIX syringe pump
(SX-6500-1030-DX)

SYRINGE PUMPS		
Part Number	**Description**	**Application**
SX-6500-1030-DX	SYRIX precision o-ring-free programmable syringe pump system without integrated 3 port valve. Controlled by the SC-2/SC-4 DX.	Precise, controlled delivery of sample to the BRUKER ICPMS. Useful for volatile / viscous samples and for accurate online continuous dilution.
SX-6503-1030-DX	SYRIX precision o-ring-free programmable syringe pump system with integrated 3 port valve. Controlled by the SC-2/SC-4 DX.	Accurately delivers micro-volume samples to the *FAST* loop.

With additional options, two syringe barrels may be operated with a single SYRIX drive mechanism for applications such as continuous dilution.

SYRINGE PUMP SPARES	
Part Number	**Description**
SX-0599-1003	0.3 mL quartz syringe
SX-0599-1030	3 mL quartz syringe
SX-0599-3003	0.3 mL PFA syringe
SX-0599-3030	3 mL PFA syringe
SX-0599-3100	10 mL PFA syringe
SX-A-33	PTFE adapter to mount both 0.3 mL and 3 mL syringe barrels on Syrix

3.0 mL quartz syringe
(SX-0599-1030)

0.3 mL PFA syringe
(SX-0599-3003)

HIGH-PURITY VALVES

High-purity valve stators and rotors provide a liquid path with low contamination and low carryover for the best ICPMS results. PTFE rotors offer the cleanest, most chemically-resistant flow path. PEEK/PTFE composite rotors offer excellent chemical resistance and longer lifetimes than PTFE rotors.

High-Flow Valves

4 Port Valve P/N: SC-0599-1015

Description: CTFE High-flow 4 port valve head for SC-*FAST*
Specifications: CTFE Stator, PTFE Rotor, 0.8 mm
Applications: micro*FAST* selection valve, oil*FAST*

6 Port Valve P/N: SC-0599-1010 (PTFE Rotor) SC-0599-1011 (PEEK Composite Rotor)

Description: CTFE High-flow 6 port valve head for SC-*FAST*
Specifications: CTFE Stator, PTFE or Composite Rotor, 0.8 mm
Applications: Standard *FAST*, sea*FAST*, TRU*FAST*, chrom*FAST*, apex *FAST*

6 Port Valve P/N: SC-0599-1028 (PTFE Rotor) SC-0599-1026 (PEEK Composite Rotor)

Description: CTFE High-flow 6 port valve head for SC-*FAST*
Specifications: CTFE Stator, PTFE or Composite Rotor, 1 mm
Applications: Standard *FAST*, TRU*FAST*

The new FS valve has the fastest stabilization and rinse-out (<5 s)

6 Port Valve - FS P/N: SC-0599-1025

Description: CTFE High-flow 6 port FS valve head for SC-*FAST*
Specifications: CTFE Stator, Composite Rotor, proprietary valve combines benefits of high-flow with fast stabilization times.
Applications: Standard *FAST*, geo*FAST*, soil*FAST*

7 Port Valve P/N: SC-0599-1024 (PTFE Rotor) SC-0599-1033 (PEEK Composite Rotor)

Description: CTFE High-flow 7 port valve head for SC-*FAST*
Specifications: CTFE Stator, PTFE or Composite Rotor proprietary valve combines benefits of high-flow and fast stabilization times with internal standard mixing.
Applications: Standard *FAST*, TRU*FAST*, sea*FAST*

8 Port Valve P/N: SC-0599-1013

Description: CTFE High-flow 8 port valve head for SC-*FAST*
Specifications: CTFE Stator, PTFE Rotor, 0.8 mm
Applications: DIN*FAST*, GDP, sample pre-loading

10 Port Valve P/N: SC-0599-1012

Description: CTFE High-flow 10 port valve head for SC-*FAST*
Specifications: CTFE Stator, PTFE Rotor, 0.8 mm
Applications: Dual loop/dual carrier injection

Low flow Valves

4 Port Valve **P/N: SC-0599-1022**

Description: Low flow 4 port valve head for SC-*FAST*
Specifications: PEEK Stator, Composite Rotor, 0.4 mm
Applications: micro*FAST*

6 Port Valve **P/N: SC-0599-1008**

Description: Low flow 6 port valve head for SC-*FAST*
Specifications: CTFE Stator, PTFE Rotor, 0.4 mm
Applications: micro*FAST*, DIN*FAST*

6 Port Valve **P/N: SC-0599-1009**

Description: Low flow 6 port valve head for SC-*FAST*
Specifications: PEEK Stator, Composite Rotor, 0.8 mm
Applications: Low flow

Examples of Materials

Description
CTFE replacement stator for high-flow valve

Description
PTFE rotor for high-flow valve

Description
Composite (PEEK/PTFE) rotor for high-flow valve

Spare Rotors and Stators for *FAST* Valves

HIGH-FLOW VALVE WITH REPLACEMENT STATORS AND ROTORS						
P/N Complete Valve	**# of Ports**	**Bore Size**	**P/N Stator**	**Stator Material**	**P/N Rotor**	**Rotor Material**
SC-0599-1015	4	0.8 mm	SC-0599-1015-01	CTFE	SC-0599-1015-02	PTFE
SC-0599-1010	6	0.8 mm	SC-0599-1010-01	CTFE	SC-0599-1010-02	PTFE
SC-0599-1028	6	1 mm	SC-0599-1026-01	CTFE	SC-0599-1026-02	PTFE
SC-0599-1011	6	0.8 mm	SC-0599-1010-01	CTFE	SC-0599-1010-05	Composite (PEEK/PTFE)
SC-0599-1026	6	1 mm	SC-0599-1026-01	CTFE	SC-0599-1026-05	Composite (PEEK/PTFE)
SC-0599-1025	6 - FS	FS	SC-0599-1025-01	CTFE	SC-0599-1025-05	Composite (PEEK/PTFE)
SC-0599-1032	6	1.5 mm	SC-0599-1032-01	PPS	SC-0599-1032-05	Composite (PEEK/PTFE)
SC-0599-1024	7 - FS7	FS7	SC-0599-1024-01	CTFE	SC-0599-1024-02	PTFE
SC-0599-1033	7 - FS7	FS7	SC-0599-1024-01	CTFE	SC-0599-1024-05	Composite (PEEK/PTFE)
SC-0599-1013	8	0.8 mm	SC-0599-1013-01	CTFE	SC-0599-1013-02	PTFE
SC-0599-1027	8	1 mm	SC-0599-1027-01	CTFE	SC-0599-1027-05	Composite (PEEK/PTFE)
SC-0599-1029	9 - F9	0.8 mm	SC-0599-1029-01	CTFE	SC-0599-1029-02	PTFE
SC-0599-1012	10	0.8 mm	SC-0599-1012-01	CTFE	SC-0599-1012-02	PTFE
LOW-FLOW VALVE WITH REPLACEMENT STATORS AND ROTORS						
P/N Complete Valve	**# of Ports**	**Bore Size**	**P/N Stator**	**Stator Material**	**P/N Rotor**	**Rotor Material**
SC-0599-1022	4	0.4 mm	SC-0599-1022-01	PEEK	SC-0599-1022-05	Composite (PEEK/PTFE)
SC-0599-1008	6	0.4 mm	SC-0599-1008-01	CTFE	SC-0599-1008-02	PTFE
SC-0599-1009	6	0.8 mm	SC-0599-1009-01	PEEK	SC-0599-1009-05	Composite (PEEK/PTFE)

FAST Probes

CARRIER/INTERNAL STANDARD

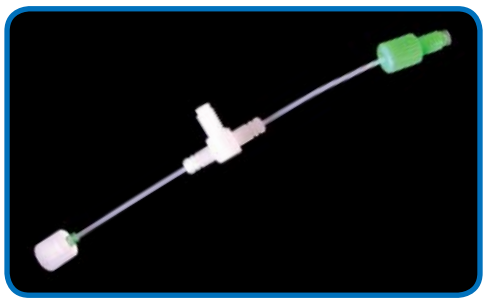
Part Number	Size	Description
SC-5037-3500	0.5 mm i.d. 100 cm long	For high-flow SC-*FAST* valve

FAST SAMPLE PROBE

Part Number	Size	Description
SC-5037-3995-100	1.0 mm i.d., 100 cm, gray marker	Carbon fiber support Teflon® SC autosampler probes for high-flow SC-*FAST* valve
SC-5037-3755-100	0.80 mm i.d., 100 cm, blue marker	
SC-5037-3995-150	1.0 mm i.d., 150 cm, gray marker	
SC-5037-3755-150	0.8 mm i.d., 150 cm, blue marker	

Low Volume Internal Standard Addition Tee

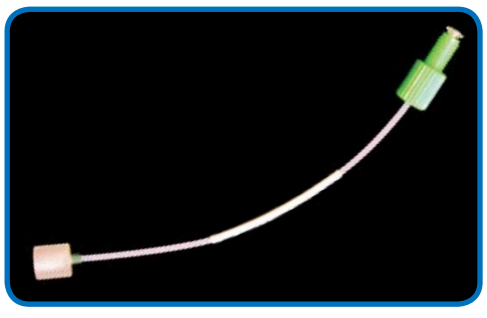
Specially designed mixing tee is perfect for online addition of internal standard or online dilution. Achieves excellent mixing with minimal dead volume. 0.5 mm i.d. capillary is recommended for applications with flow rates > 0.3 mL/min.



Part Number	Description
SC-0317-1250	0.25 i.d. (Green)
SC-0317-1500	0.5 i.d. (Orange)

Low Volume *FAST* Valve Connecting Line

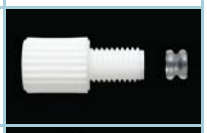
Connects the *FAST* valve to an ST nebulizer to achieve fast signal stabilization time and short wash times.



Part Number	Description
SC-0317-0250	0.25 i.d. (Green)
SC-0317-0500	0.5 i.d. (Orange)

FITTINGS AND PFA TUBING

Easy to use, ultra-clean fittings and PFA tubing are ideal for all trace metal analysis applications. For high-flow applications, ferrules install quickly and easily. Low flow valve fittings quickly create low-dead-volume, leak-free connections without ferrules.

Part Number	Description	Suggested Use	
SC-0599-0116-K	Black, high-flow nut (1/4-28) for *FAST* valve and 1/16" (1.6 mm) ferrule (10 ea)	Use with 1/16" (1.6 mm) o.d. PFA tubing for low and moderate flow rates (0.1 mL/min - 2 mL/min)	
SC-0599-0108-W	White, high-flow nut (1/4-28) for *FAST* valve and 1/8" (3.2 mm) ferrule (10 ea)	Use with 1/8" (3.2 mm) o.d. PFA tubing for high-flow rates and vacuum applications (> 2 mL/min)	
SC-0599-F16	1/16" Ferrule for high-flow fitting (1/4-28) (10 ea)	Use with 1/16" (1.6 mm) o.d. PFA tubing	
SC-0599-F08	1/8" Ferrule for high-flow fitting (1/4-28) (10 ea)	Use with 1/8" (3.2 mm) o.d. PFA tubing	
SC-0599-0001	Black, low flow nut (10-32/ M5) for *FAST* valve (10 ea)	Use with 1/16" (1.6 mm) o.d. PFA tubing for low flow rates (<0.1 mL/min)	

HF

High-Purity PFA Tubing (5 m coil)			
Part Number	**i.d.**	**o.d.**	**Color Code**
5MT-015	0.006" (0.15 mm)	1/16" (1.6 mm)	(red)
5MT-02	0.008" (0.2 mm)	1/16" (1.6 mm)	(purple)
5MT-025	0.010" (0.25 mm)	1/16" (1.6 mm)	(green)
5MT-03	0.014" (0.3 mm)	1/16" (1.6 mm)	(yellow)
5MT-05	0.019" (0.5 mm)	1/16" (1.6 mm)	(orange)
5MT-08	0.031" (0.8 mm)	1/16" (1.6 mm)	(blue)
5MT-1	0.039" (1.0 mm)	1/16" (1.6 mm)	(gray)
5MT-16	0.063" (1.6 mm)	1/8" (3.2 mm)	

SC-*FAST* Spares Kits	
Part Number	**Description**
SC-0370	SC-*FAST* Complete Spares Kit - Assorted fittings and tubing for *FAST* systems. Includes a PFA-ST nebulizer, spare *FAST* valve and internal standard tee.
SC-0380	SC-*FAST* Basic Spares Kit - Assorted fittings and tubing for *FAST* systems.

SAMPLE LOOPS

Elemental Scientific's SC-*FAST* loops are all Teflon® with crimp-free loops that provide low resistance for fast loading and rinse-out.

SC-*FAST* High-Flow Sample Loops

Part Number	Size	Description
SC-0319-01	100 µL loop (0.8 mm i.d.)	Multipurpose *FAST* loops for high flow valves. Recommended for use with 0.8 mm i.d. (blue) probe.
SC-0319-02	200 µL loop (0.8 mm i.d.)	
SC-0319-03	300 µL loop (0.8 mm i.d.)	
SC-0319-05	500 µL loop (0.8 mm i.d.)	
SC-0319-10	1 mL loop (0.8 mm i.d.)	
SC-0319-15	1.5 mL loop (0.8 mm i.d.)	
SC-0319-20	2 mL loop (0.8 mm i.d.)	
SC-0319-25	2.5 mL loop (0.8 mm i.d.)	
SC-0319-30	3 mL loop (0.8 mm i.d.)	
SC-0319-40	4 mL loop (0.8 mm i.d.)	

0.8 mm i.d. x 1.6 mm o.d. Sample Loops (Teflon tubing and ¼-28 fittings)

SC-0319-10 1mL sample loop

Part Number	Size	Description
SC-0318-03	300 µL loop (1 mm i.d.)	Multipurpose *FAST* loops for high flow valves. Recommended for use with 1.0 mm i.d. (gray) probe.
SC-0318-05	500 µL loop (1 mm i.d.)	
SC-0318-10	1 mL loop (1 mm i.d.)	
SC-0318-15	1.5 mL loop (1 mm i.d.)	
SC-0318-20	2 mL loop (1 mm i.d.)	
SC-0318-25	2.5 mL loop (1 mm i.d.)	
SC-0318-30	3 mL loop (1 mm i.d.)	
SC-0318-40	4 mL loop (1 mm i.d.)	

1.0 mm i.d. x 1.6 mm o.d. Sample Loops (Teflon tubing and ¼-28 fittings)

SC-0318-25 2.5mL sample loop

Part Number	Size	Description
SC-0315-025	250 µL loop (1.6 mm i.d.)	High volume and flow, fast loading *FAST* loops for high flow valves with 1 mm rotor. Recommended for use with 1.0 mm i.d. (gray) probes and applications requiring larger sample volumes or high flow rates.
SC-0315-05	500 µL loop (1.6 mm i.d.)	
SC-0315-10	1 mL loop (1.6 mm i.d.)	
SC-0315-20	2 mL loop (1.6 mm i.d.)	
SC-0315-30	3 mL loop (1.6 mm i.d.)	
SC-0315-40	4 mL loop (1.6 mm i.d.)	
SC-0315-60	6 mL loop (1.6 mm i.d.)	
SC-0315-80	8 mL loop (1.6 mm i.d.)	

1.6 mm i.d. x 3.2 mm o.d. Sample Loops (Teflon tubing and ¼-28 fittings)

SC-0315-30 3mL sample loop

SC-*FAST* Low flow Sample Loops

Part Number	Size	Description
SC-0312-01	100 µL loop (0.8 mm i.d.)	Low volume, low flow *FAST* loops for low flow valves. Recommended for use with 0.8 mm i.d. (blue) or smaller probe.
SC-0312-02	200 µL loop (0.8 mm i.d.)	
SC-0312-03	300 µL loop (0.8 mm i.d.)	
SC-0312-05	500 µL loop (0.8 mm i.d.)	
SC-0312-10	1 mL loop (0.8 mm i.d.)	
SC-0312-20	2 mL loop (0.8 mm i.d.)	

0.8 mm i.d. x 1.6 mm o.d. Sample Loops (Teflon tubing and M5/10-32 fittings)

SC-0312-10 1mL sample loop

PFA Vials

PFA vials are ideal for applications that require the highest sensitivity. 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
V-14-0311CG	SR4-60-14, MR-21-14, MR-21-14-08, MR-40-14, MR-40-14-08, MR-21-14.3, MR-40-14.3
V-14-0312CG	
V-14-0314CG	

Part Number	Qty
V-14-0311CG	1
V-14-0311CG-X	10
V-14-0311CG-C	100
Description	**Volume**
14 mm o.d. graduated PFA micro vial	1 mL Brim full 2 mL

Part Number	Qty
V-14-0312CG	1
V-14-0312CG-X	10
V-14-0312CG-C	100
Description	**Volume**
14 mm o.d. graduated PFA micro vial	2 mL Brim full 3 mL

Part Number	Qty
V-14-0314CG	1
V-14-0314CG-X	10
V-14-0314CG-C	100
Description	**Volume**
14 mm o.d. graduated PFA micro vial	4 mL Brim full 4.5 mL

Part Number	Qty
ES-7225-0001	1
Description	
ETFE Tweezers for removal of PFA cap with knob	

Part Number	Qty
V-14-0309	1
V-14-0309-X	10
V-14-0309-C	100
Description	
PFA cap for 14 mm micro vials	

Part Number	Qty
V-15-0300	1
V-15-0300-X	10
V-15-0300-C	100
Description	
PFA snap-on cap for 14 mm graduated PFA micro vials	

Part Number	Qty
V-15-0301	1
V-15-0301-X	10
V-15-0301-C	100
Description	
PFA cap with knob for 14 mm graduated PFA micro vials.	

PFA LABWARE

The PFA-T16 sample tube is recommended for aggressive samples where chemical resistance and low blanks are required. It is made from high purity PFA and is self-standing. Internally the tube has a tapered bottom to allow analysis of small volume liquid samples.

• Non-contaminating • Preserves sample integrity • Leak-proof seal

Tube	Fits Racks
PFA-T16	LRM-60-16-R, LR-60-16, LR-60-16-GR, SR2-80-16, HR-60-16, MRH-21-16

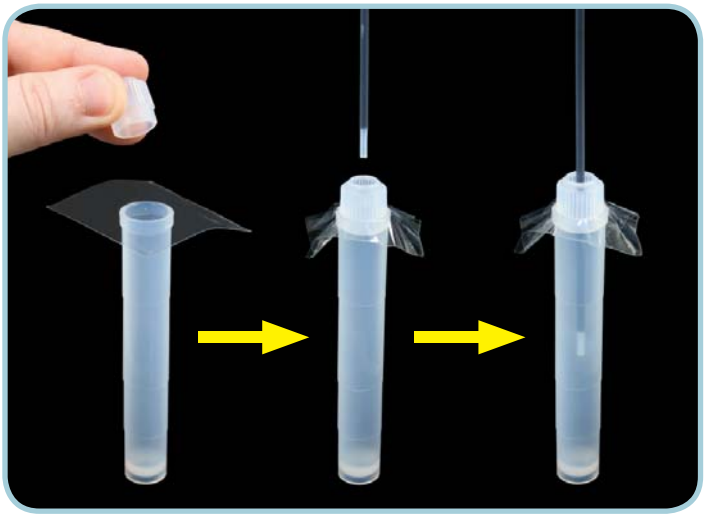
Part Number	Qty
PFA-T16	1
PFA-T16-X	10
PFA-T16-C	100
Description	**Volume**
16 mm o.d. PFA tube with graduation marks at 2mL, 5mL and 10 mL, flat bottom (self standing)	12 mL

MRH-21 autosampler micro rack with 12 mL PFA-T16 tubes and PFA-C16 caps

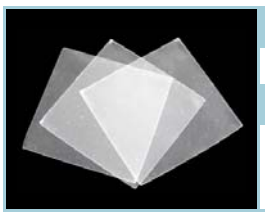
The PFA-C16 cap forms a leak-proof seal

Part Number	Qty
PFA-C16	1
PFA-C16-X	10
PFA-C16-C	100
Description	
PFA insert cap for 16 mm PFA tube [PFA-T16], Knurled grip	

Part Number	Qty
PFA-PC16	1
PFA-PC16-X	10
PFA-PC16-C	100
Description	
PFA septum pierce cap for 16 mm PFA tube [PFA-T16]. Knurled grip. Cap holds a thin PFA sheet in place and has an opening to allow the autosampler probe to pass through. (Does not include PFA sheet)	



The PFA septum pierce cap is a convenient way of reducing sample contamination until they are sampled. The PFA-PC16 cap fits snuggly over a protective PFA sheet that is easily pierced by the autosampler probe.



Part Number	Qty
PFA-S16-C	100
Description	
PFA sheets for Septum Pierce Cap with 16 mm PFA Tube	

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

• Non-contaminating • HF-resistant • Temperature range of -200 °C to 260 °C

Bottles / Vials	Fits Racks
V-29-15	SR2-21-30, MR-10-30
V-29-30	ST10-31, SR2-21-30, SR2-27-31, MR-10-30
V-29-60	LRM-21-30-R, LR-21-30, HR-21-30
V-28-0360	SR2-27-28, ST10-28, ST10-28-MR, ST10-28-CP, ST10-1
V-27-0360	SR2-21-27
V-50-0360	SR2-12-50, SR14-40-50

Part Number	Qty
V-28-0360	1
V-28-0360-X	10
V-28-0360-C	100
Description	**Volume**
28 mm o.d. bottle and cap	20 mL

Part Number	Qty
V-29-15	1
V-29-15-X	10
V-29-15-C	100
Description	**Volume**
29 mm o.d. vial	15 mL

Part Number	Qty
V-27-0360	1
V-27-0360-X	10
V-27-0360-C	100
Description	**Volume**
27 mm o.d. bottle with TFM insert	25 mL

Part Number	Qty
V-29-30	1
V-29-30-X	10
V-29-30-C	100
Description	**Volume**
29 mm o.d. vial	30 mL

Part Number	Qty
V-50-0360	1
V-50-0360-X	10
V-50-0360-C	100
Description	**Volume**
50 mm o.d. bottle and cap with TFM insert	125 mL

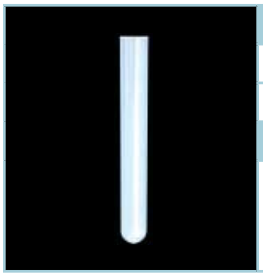
Part Number	Qty
V-29-60	1
V-29-60-X	10
V-29-60-C	100
Description	**Volume**
29 mm o.d. vial	60 mL

Polypropylene / Polystyrene Tubes

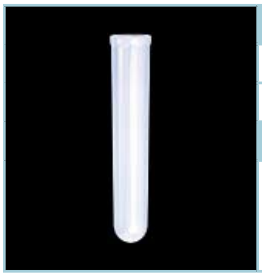
Vials	Fits Racks
V-13-0200-R	LRM-90-13-R, LRM-90-13-R-3T, LR-90-13-R, LR-90-13-GR, LR-90-13
V-16-0200R	LRM-60-16-R, LR-60-16, LR-60-16-GR, SR2-80-16, HR-60-16, MRH-21-16
V-16-0225	LRM-60-16-R, LR-60-16, LR-60-16-GR, SR2-80-16, HR-60-16, MRH-21-16
V-20-0290	LR-40-20, LR-40-20-GR, HR-40-20
V-24-0290	LR-24-25, ST10-24
V-28-0260	SR2-27-28, ST10-28, ST10-28-MR, ST10-28-CP, ST10-1
V-13-0500-R	LRM-90-13-R, LRM-90-13-R-3T, LR-90-13-R, LR-90-13-GR, LR-90-13
V-16-0555	LRM-60-16-R, LR-60-16, LR-60-16-GR, SR2-80-16, HR-60-16, MRH-21-16
V-6-0502	MR-90-06
V-8-0505	MR-60-08, MR-90-08

Part Number	Qty
V-6-0502-C	100
Description	**Volume**
6 mm o.d. centrifuge tube	0.2 mL

Part Number	Qty
V-8-0505-C	100
Description	**Volume**
8 mm o.d. centrifuge tube	0.5 mL



Part Number	Qty
V-13-0200-R-D	500
V-13-0200-R-M	1000
Description	**Volume**
13 mm o.d. polypropylene tube with rounded bottom	8 mL



Part Number	Qty
V-16-0200R-D	500
V-16-0200R-M	1000
Description	**Volume**
16 mm o.d. polypropylene tube with rounded bottom	12 mL

Part Number	Qty
V-13-0500-R-D	500
V-13-0500-R-M	1000
Description	**Volume**
13 mm o.d. polystyrene tube with rounded bottom	8 mL

Part Number	Qty
V-20-0290-D	500
Description	**Volume**
20 mm o.d. polypropylene tube with screw cap	20 mL

Part Number	Qty
V-16-0555-D	500
Description	**Volume**
16 mm o.d. polystyrene tube with screw cap	15 mL

Part Number	Qty
V-24-0290-D	500
Description	**Volume**
25 mm o.d. polypropylene tube with screw cap	25 mL

Part Number	Qty
V-16-0225-D	500
Description	**Volume**
16 mm o.d. polypropylene tube with screw cap	15 mL

Part Number	Qty
V-28-0260-D	500
Description	**Volume**
28 mm o.d. polypropylene tube with screw cap	50 mL

BOTTLES

Polyethylene / Polypropylene Bottles

Vials	Fits Racks
V-76-0290	SC-0304-0012
V-76-0291	SC-0304-0012
V-76-0292	SC-0304-0012
V-61-0660	SR14-40-61, ST5-61, ST-7-60
V-61-0661	SR14-40-61, ST5-61, ST-7-60

Part Number	Qty
V-61-0660	1
V-61-0660-X	10
V-61-0660-C	100
Description	**Volume**
61 mm o.d. polyethylene narrow mouth bottle	250 mL

Part Number	Qty
V-61-0661	1
V-61-0661-X	10
V-61-0661-C	100
Description	**Volume**
61 mm o.d. polyethylene wide mouth bottle	250 mL

FAST Solutions Organizer Kit

Part Number	Suggested Use
SC-0304-03	Used to organize *FAST* solutions. Kit Includes holder, *FAST* internal standard bottle (500 mL), carrier solution bottle (500 mL) and rinse vials (50 mL)
SC-0304-0012	Replacement holder

Part Number	Qty
V-50-0260	1
V-50-0260-X	10
V-50-0260-C	100
Description	**Volume**
125 mL HDPE Bottle and cap, 50 mm OD	250 mL

Part Number	Qty
V-73-0292	1
V-73-0292-X	10
V-73-0292-C	100
Description	**Volume**
73 mm o.d. polypropylene bottle with ported cap	500 mL

Part Number	Qty
V-73-0290	1
Description	**Volume**
73 mm o.d. polypropylene bottle with ported cap, labeled "*FAST* Internal Standard"	500 mL

Part Number	Qty
V-73-0291	1
Description	**Volume**
73 mm o.d. polypropylene bottle with ported cap, labeled "*FAST* Carrier Solution"	500 mL

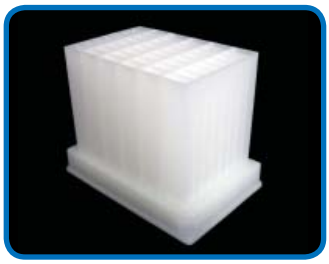
Microtiter Plates

All microtiter plates can be used on the following Elemental Scientific autosamplers:
SC-2, SC-4, SC-2 DX, SC-4 DX, SC-Micro

Part Number	Description
MT-24-10ML-02	24 well, 10 mL microtiter plate, square well, pyramid bottom, Qty 5

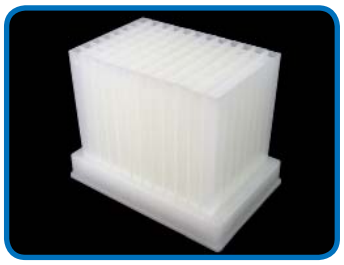
Part Number	Description
MT-48-5ML-02	48 well, 5 mL microtiter plate, square well, pyramid bottom, Qty 5

Part Number	Description
MT-48-7.5ML-02	48 well, 7.5 mL microtiter plate, square well, pyramid bottom, Qty 3



Part Number	Description
MT-48-10ML-02	48 well, 10 mL microtiter plate, square well, pyramid bottom

Part Number	Description
MT-96-2ML-02	96 well, 2 mL microtiter plate, square well, pyramid bottom, Qty 5



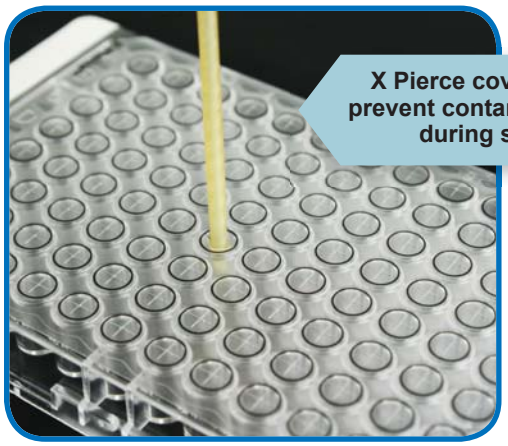
Part Number	Description
MT-96-4ML-02	96 well, 4 mL microtiter plate, square well, polypropylene

Part Number	Description
MT-96-500-05-V	96 well, 500 µL microtiter plate, polystyrene, Qty 5
MT-96-500-05-C	96 well, 500 µL microtiter plate, polystyrene, Qty 100

X Piercing Microtiter Plate Cover

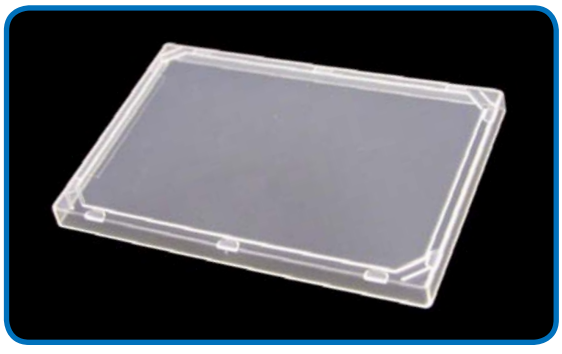
X Piercing Cover for 96 Well Microtiter Plate		
Part Number	**Qty**	**Suggested Use**
MT-96-XP	25	Minimizes evaporation of micro samples awaiting analysis and protects against environmental contamination.
MTC-96-XP	25	Sterile, Minimizes evaporation of micro samples awaiting analysis and protects against environmental contamination.

Remove X Piercing cover from it's backing and place on the microtiter plate



X Pierce cover helps prevent contamination during sampling

XP Probe Arm for SC-2 DX / SC-4 DX	
Part Number	**Suggested Use**
SC-0105-DX-XP	Must be used in place of reset probe when X-Piercing cover is applied to microtiter plates.



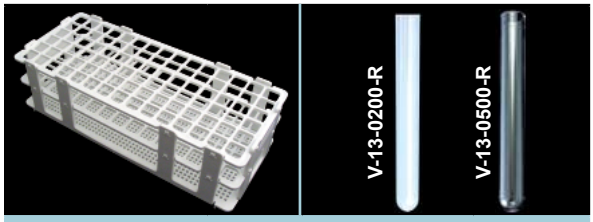
Cover for Microtiter Plates		
Part Number	**Qty**	**Suggested Use**
MT-00-02	5	Used to protect against environmental contamination

SC-AUTOSAMPLER RACKS

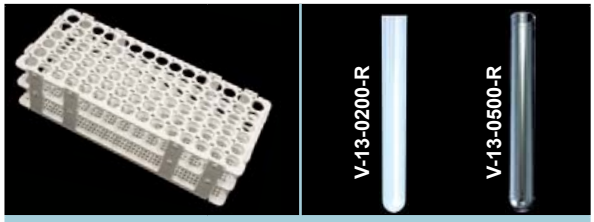
SC-Autosampler Racks (LR Size)

Plastic large racks are recommended for aqueous samples.

All LR racks can be used on the following ESI autosamplers:
SC-2, SC-4, SC-8, SC-14, SC-2 DX, SC-4 DX, SC-8 DX, SC-14 DX



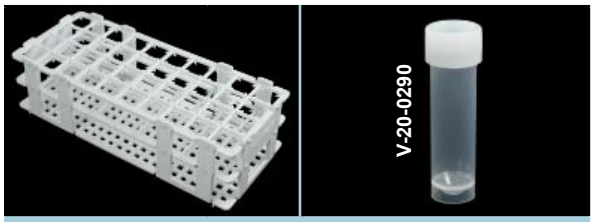
Part #	Diam.	Description
LR-90-13	13 mm	90 position large sample rack for 8 mL tubes



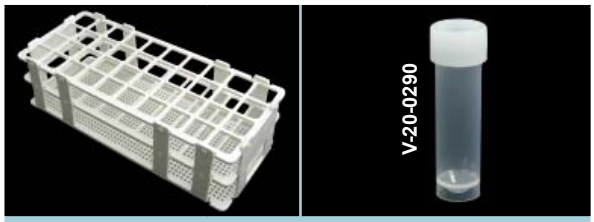
Part #	Diam.	Description
LR-90-13-R	13 mm	90 position large sample rack for 8 mL tubes

Part #	Diam.	Description
LR-60-16-GR	16 mm	60 position large grip rack for 15 mL tubes

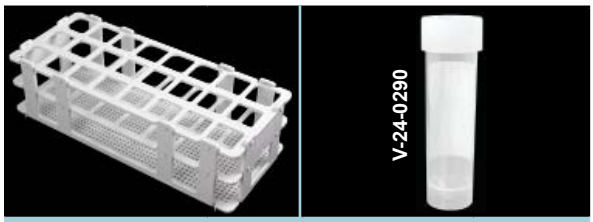
Part #	Diam.	Description
LR-60-16	16 mm	60 position large sample rack for 15 mL tubes



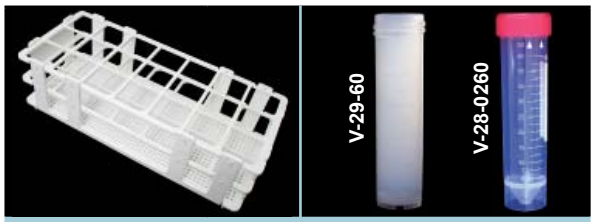
Part #	Diam.	Description
LR-40-20-GR	20 mm	40 position large grip rack for 20 mL tubes



Part #	Diam.	Description
LR-40-20	20 mm	40 position large sample rack for 20 mL tubes



Part #	Diam.	Description
LR-24-25	25 mm	24 position large sample rack for 25 mL tubes



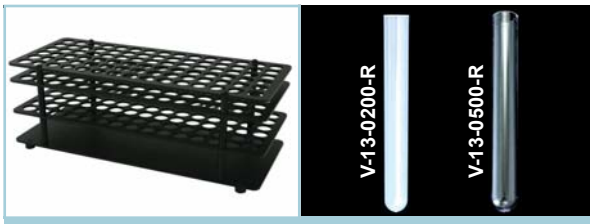
Part #	Diam.	Description
LR-21-30	30 mm	21 position large sample rack for 50 mL tubes

SC-Autosampler Coated Metal Racks (LR Size)

Metal racks are coated with an epoxy paint that forms a protective barrier over the rack material. These racks are designed for organic solvents or oil samples which can dissolve plastic racks.

All coated metal racks can be used on the following Elemental Scientific autosamplers:
SC-2, SC-4, SC-8, SC-14, SC-2 DX, SC-4 DX, SC-8 DX, SC-14 DX

Part #	Diam.	Description
LRM-90-13-R	13 mm	90 position large sample rack for 8 mL tubes



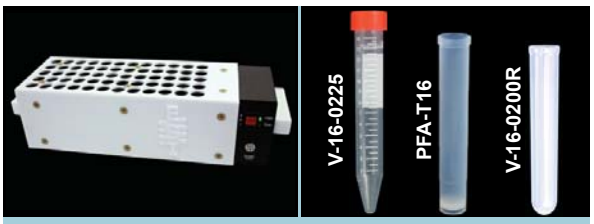
Part #	Diam.	Description
LRM-90-13-R-3T	13 mm	90 position large sample rack for 8 mL tubes

Part #	Diam.	Description
LRM-60-16-R	16 mm	60 position large sample rack for 15 mL tubes

Part #	Diam.	Description
LRM-21-30-R	30 mm	21 position large sample rack for 50 mL tubes

SC-Autosampler Heated Racks (LR Size)

All heated racks can be used on the following ESI autosamplers:
SC-2, SC-4, SC-8, SC-14, SC-2 DX, SC-4 DX, SC-8 DX, SC-14 DX



Part #	Diam.	Description
HR-60-16	16 mm	60 position heated large sample rack for 15 mL tubes

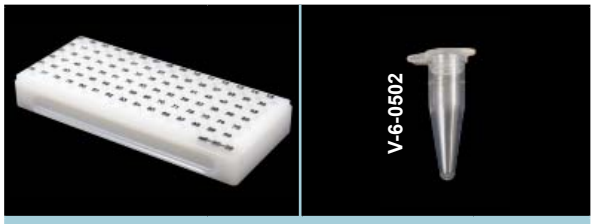
Part #	Diam.	Description
HR-40-20	20 mm	40 position heated large sample rack for 20 mL tubes

Part #	Diam.	Description
HR-21-30	30 mm	21 position heated large sample rack for 50 mL tubes

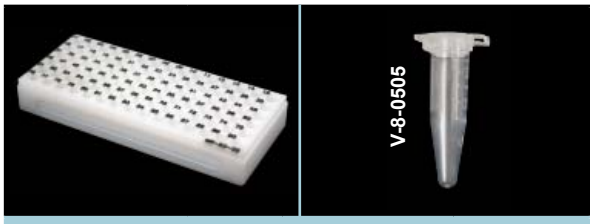
SC-AUTOSAMPLER RACKS

SC-Autosampler Racks (MR Size)

All MR racks can be used on the following ESI autosamplers: SC-2, SC-4, SC-2 DX, SC-4 DX, SC-Micro



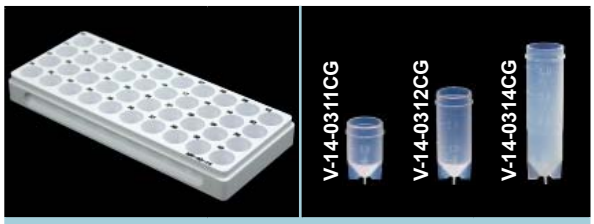
Part #	Diam.	Description
MR-90-06	6 mm	90 position micro sample rack for tubes/vials



Part #	Diam.	Description
MR-90-08	8 mm	90 position CPVC micro sample rack for tubes/vials

Part #	Diam.	Description
MR-60-08	8 mm	60 position CPVC micro sample rack for tubes/vials

Part #	Diam.	Description
MR-40-11	11 mm	40 position micro sample rack for tubes/vials

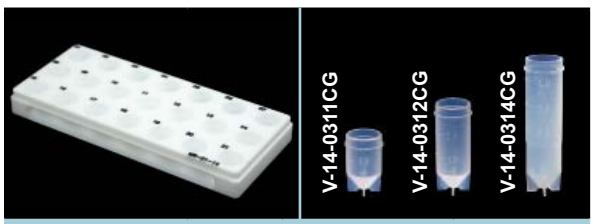


Part #	Diam.	Description
MR-40-14	14 mm	40 position micro sample rack for tubes/vials

Part #	Diam.	Description
MR-40-14-08	14 mm	40 position PTFE micro sample rack for tubes/vials

Part #	Diam.	Description
MR-40-14.3	14.3 mm	40 position micro sample rack for tubes/vials

Part #	Diam.	Description
MR-21-14	14 mm	21 position micro sample rack for tubes/vials



Part #	Diam.	Description
MR-21-14-08	14 mm	21 position PTFE micro sample rack for tubes/vials

Part #	Diam.	Description
MR-21-14.3	14.3 mm	21 position micro sample rack for tubes/vials

Part #	Diam.	Description
MRH-21-16	16 mm	21 position micro sample rack for tubes/vials, tall version

Part #	Diam.	Description
MR-12-22	22 mm	12 position micro sample rack for tubes/vials

Part #	Diam.	Description
MR-10-30	30 mm	10 position micro sample rack for tubes/vials

Part #	Description
MR-00-01	Cover for micro racks

SC-Autosampler Racks (SR2 Size)

All SR2 racks can be used on the following ESI autosamplers: SC-2, SC-2 DX

Part #	Diam.	Description
SR2-80-16	16 mm	80 position super sample rack for 15 mL tubes

Part #	Diam.	Description
SR2-27-22	22 mm	27 position super sample rack for tubes/vials

Part #	Diam.	Description
SR2-27-28	28 mm	27 position super sample rack for 50 mL tubes

Part #	Diam.	Description
SR2-27-31	31 mm	27 position super sample rack for 30 mL tubes

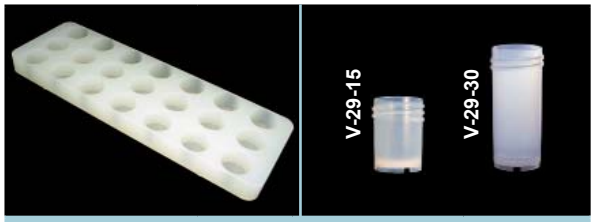
SC-AUTOSAMPLER RACKS

SC-Autosampler Racks (SR2 Size)

Part #	Diam.	Description
SR2-21-22	22 mm	21 position super sample rack for tubes/vials

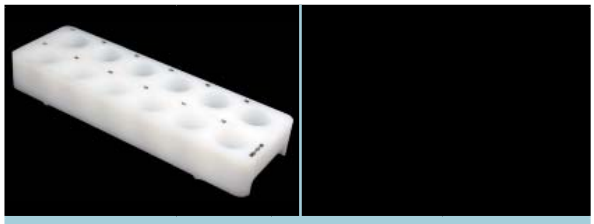
Part #	Diam.	Description
SR2-21-22-T	22 mm	21 position PTFE super sample rack for tubes/vials

Part #	Diam.	Description
SR2-21-27	27 mm	21 position super sample rack for 30 mL tubes



Part #	Diam.	Description
SR2-21-30	30 mm	21 position super sample rack for PFA tubes

Part #	Diam.	Description
SR2-21-35	35 mm	21 position super sample rack for tubes/bottles



Part #	Diam.	Description
SR2-12-38	38 mm	12 position super sample rack for tubes/bottles

Part #	Diam.	Description
SR2-12-40	40 mm	12 position super sample rack for tubes/bottles

Part #	Diam.	Description
SR2-12-50	50 mm	12 position super sample rack for PFA bottles

SC-Autosampler Racks (SR4 Size)

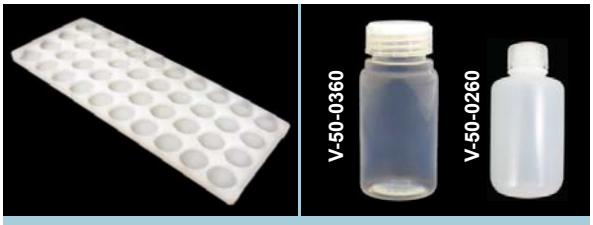
All SR4 racks can be used on the following Elemental Scientific autosamplers:
SC-2, SC-4, SC-2 DX, SC-4 DX, SC-E2, SC-E4, SC-E2 DX, SC-E4 DX

Part #	Diam.	Description
SR4-60-14	14 mm	60 position super sample rack for 15 mL tubes

Part #	Description
SR4-00-01	Cover for 60 position SR-4 super rack

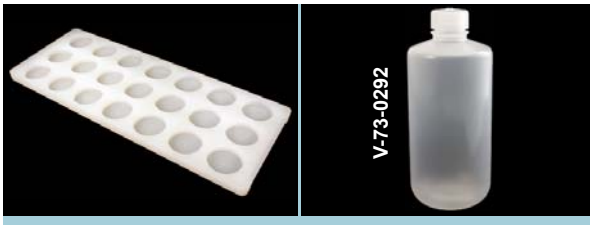
SC-Autosampler Racks (SR14 Size)

All SR14 racks can be used on the following Elemental Scientific autosamplers: SC-14, SC-14 DX



Part #	Diam.	Description
SR14-40-50	50 mm	40 position super sample rack for 125 mL bottles

Part #	Diam.	Description
SR14-40-61	61 mm	40 position super sample rack for 250 mL bottles



Part #	Diam.	Description
SR14-21-73	73 mm	21 position super sample rack for 500 mL bottles

SC-AUTOSAMPLER RACKS

SC-Autosampler Racks (ST Size, Type 1)

All ST type 1 racks can be used on the following Elemental Scientific autosamplers:
SC-2, SC-4, SC-8, SC-14, SC-2 DX, SC-4 DX, SC-8 DX, SC-14 DX

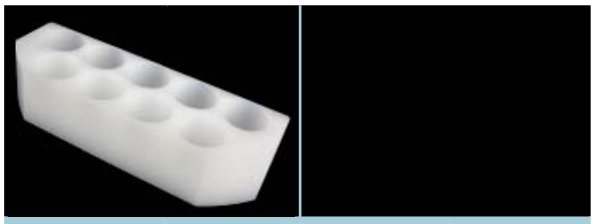
Part #	Diam.	Description
ST10-24	24 mm	10 position standards rack for 25 mL tubes

Part #	Diam.	Description
ST10-1	28 mm	10 position standards rack for 50 mL tubes

Part #	Diam.	Description
ST10-28	28 mm	10 position standards rack for 50 mL tubes

Part #	Diam.	Description
ST10-28-CP	28 mm	10 position standards rack for 50 mL tubes, closely packed

Part #	Diam.	Description
ST10-31	31 mm	10 position standards rack for PFA vials



Part #	Diam.	Description
ST9-34	34 mm	9 position standards rack for tubes/vials

Part #	Description
ST-00-01	Stackable standards rack riser

SC-Autosampler Racks (ST Size, Type 2)

The ST type 2 rack can be used on the following Elemental Scientific autosamplers:
SC-4 DX, SC-14, SC-14 DX

Part #	Diam.	Description
ST7-60	60 mm	7 position standards rack for 250 mL bottles

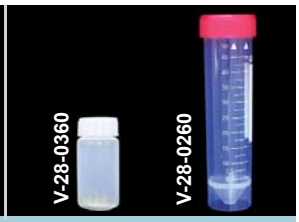
SC-Autosampler Racks (ST Size, Type 3)

The ST type 3 rack can be used on the following Elemental Scientific autosamplers: SC-14, SC-14 DX

Part #	Diam.	Description
ST5-61	61 mm	5 position standards rack for 250 mL bottles

SC-Autosampler Racks (ST Size, Type 4)

The ST type 4 rack can be used on the following Elemental Scientific autosampler: SC-Micro



Part #	Diam.	Description
ST10-28-MR	28 mm	10 position standards rack for 50 mL tubes

INSTALLATION & TRAINING

Silver Level ESI Installation & Training

Includes: Hardware installation

Basic system familiarization

Travel time & expenses for ESI employee or contractor

SC-*FAST* basic spares kit

Part Number	Description
FI-SC-01	On-site installation (1 day) and method development for SC-*FAST* or one*FAST* on ICP/ ICPMS in US, Canada, or Western Europe.

Gold Level ESI Installation & Training

Includes: Hardware installation

Basic system familiarization

Travel time & expenses for ESI employee or contractor

SC-*FAST* complete spares kit

Part Number	Description
FI-SC-02	On-site installation (2½ day) and method development for SC-*FAST* or one*FAST* on ICP/ ICPMS in US, Canada, or Western Europe.

The SC-*FAST* & one*FAST* Consumables/Spares Kit is a great value at no extra expense with the Gold Installation & Training.

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