



microFAST

# Isotope2

## Precise Handling of Micro-Volume Samples for Precision Isotopic Analysis

- FluoroWand automatic sample covering
- Syringe-driven microflow sampling & injection
- Dual loop rinsing system
- Fluorometric drive



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Isotope2 with FluoroWand

## microFAST Isotope2

The Isotope2 is a next-generation sample injection system designed specifically for the determination of isotope ratios by multicollector ICPMS.

Design features take into consideration the challenges associated with the determination high precision (<10 ppm = 0.001%) isotope ratios in less than 1 mL of sample volume.

### Isotope 2 Features & Benefits

#### FluoroWand, automated sample covering

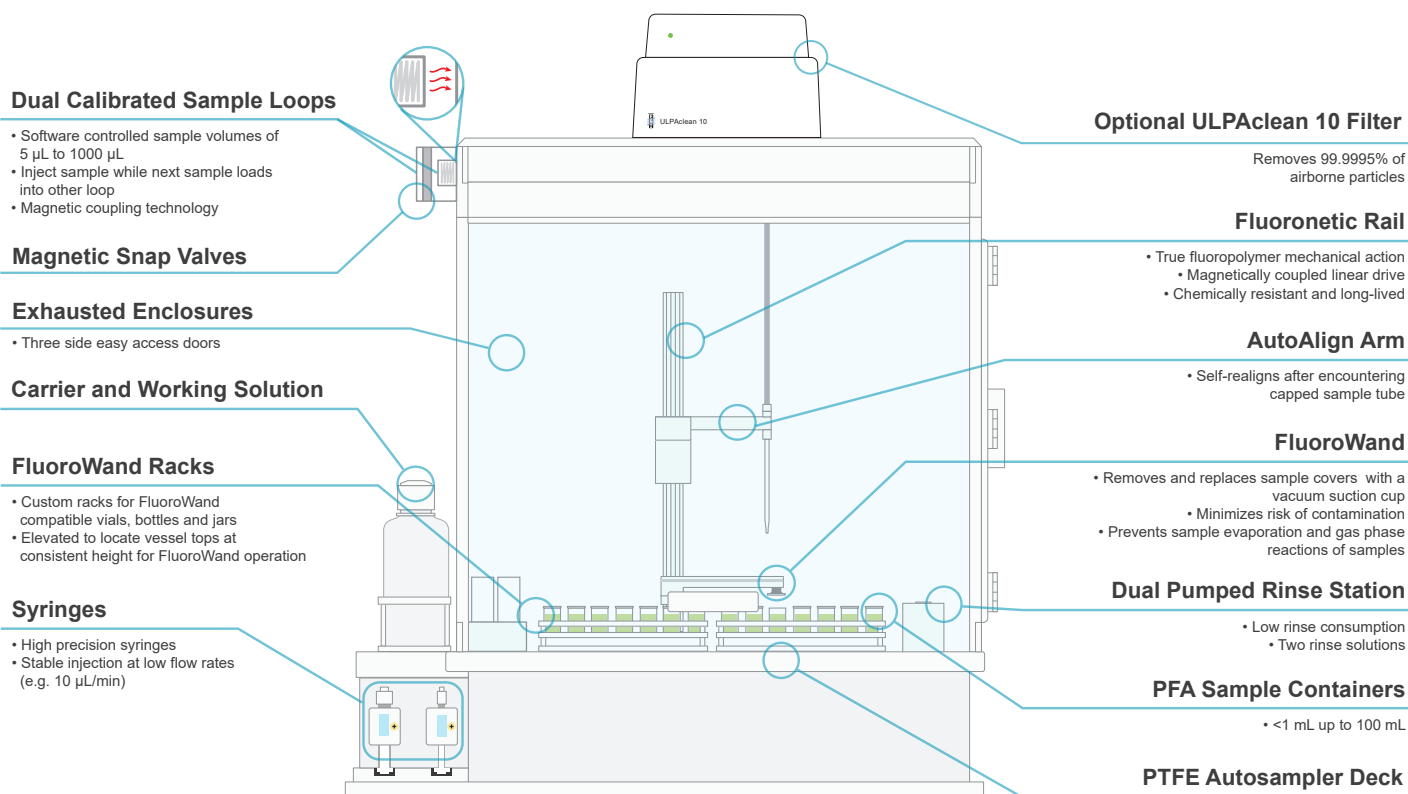
- Eliminate sample evaporation
- Maintain sample and standard concentration matching

#### Syringe loading and injection of microvolume samples

- Reliably run small volume samples
- Stable injection profiles for precise isotope ratios at low flow rates
- Combine with Apex Omega desolvating nebulizer for enhanced instrument sensitivity and low blanks
- Eliminates need for self-aspiration

#### Dual Loop system

- High throughput and reduced carryover



## FluoroWand

### Maintain Sample/Standard Integrity by Minimizing Contamination and Evaporation

- Automatically remove and replace covers from PFA sample containers
- Compatible with wide range of Sample and Standard vials (<1 mL to 100 mL)
- High Capacity for extended analytical sessions (>120 sample capacity)



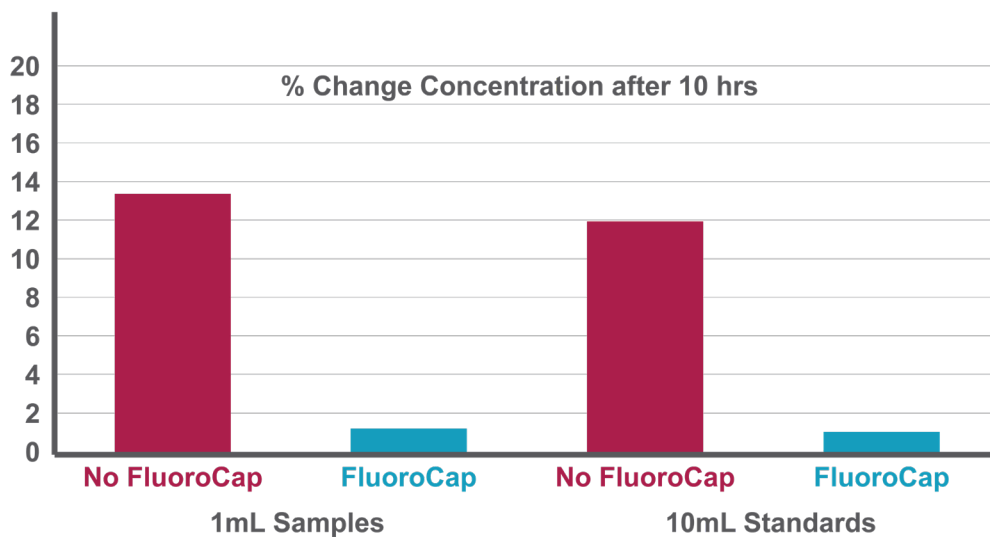
### Benefits

- Reduce sample evaporation by > an order of magnitude
- Prevent environmental sample contamination
- Minimize acid vapors



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### Highlights the Advantage of the FluoroWand for Minimizing Evaporation

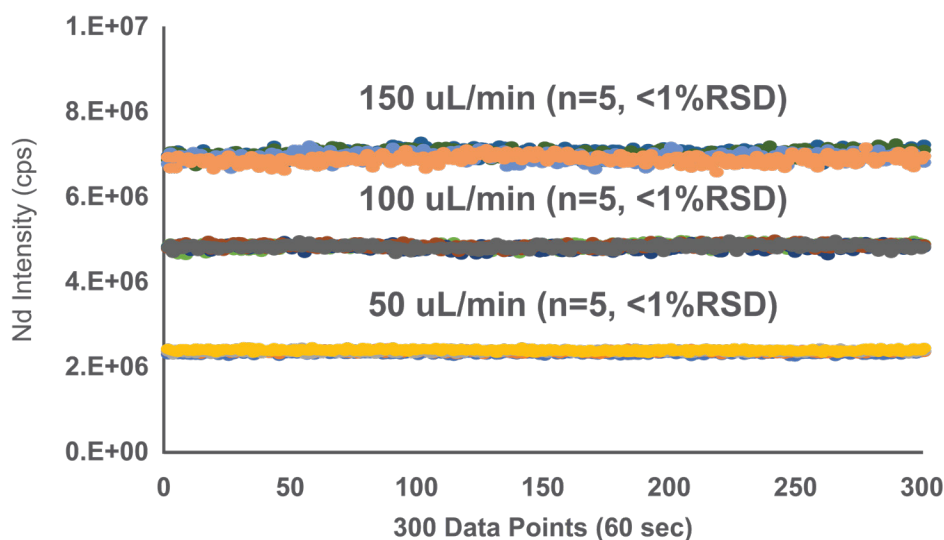


## Syringe Injection Profile Stability

The Isotope2 system, when combined with the Apex Omega, demonstrates exceptional injection profile stability across a range of flow rates (50, 100, and 150  $\mu\text{L}/\text{min}$ ). The system consistently achieves excellent injection reproducibility with an RSD of less than 1.0% at all each flow rate. This high level of precision is maintained across multiple injection profiles—fifteen in total, with five at each flow rate—resulting in internal precision of less than 1.5% for all profiles.



### Syringe Injection Signal Stability



\*All data collected in combination with Apex Omega.

## Dual Loop System

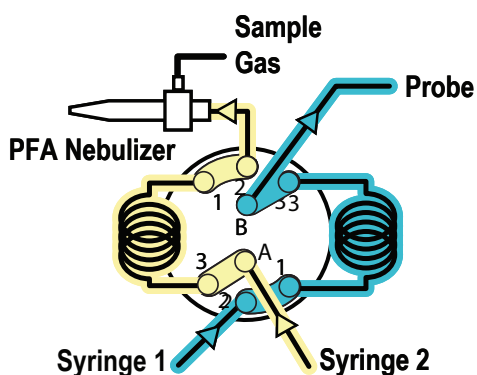
### Rinse One Loop While Injecting the Other

The system accurately loads a loop, then smoothly injects the solution into a  $\mu$ Flow concentric nebulizer at defined rates (5-1000  $\mu$ L/min). A valve selects from two discrete, parallel flow paths – this allows rapid switching between sample and standard solutions with minimal dead volume between the valve and the nebulizer.



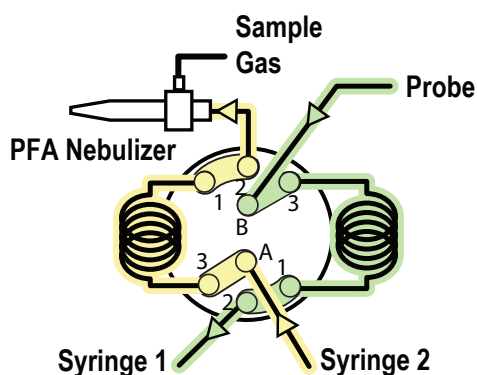
#### Step 1

Analyse Loop 1; Rinse Loop 2 and Probe



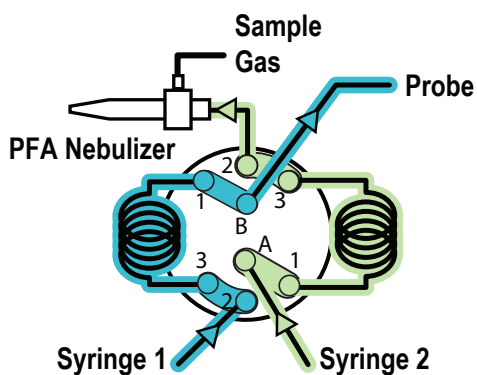
#### Step 2

Analyse Loop 1; Load Loop 2



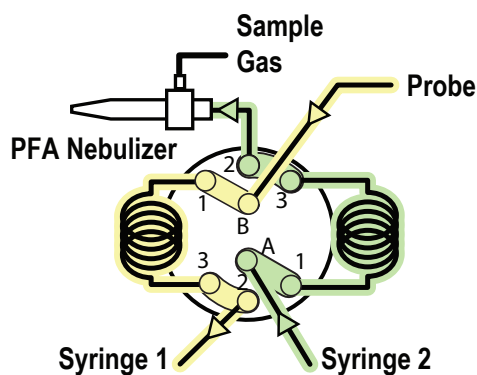
#### Step 3

Analyse Loop 2; Rinse Loop 1 and Probe



#### Step 4

Analyse Loop 2; Load Loop 1



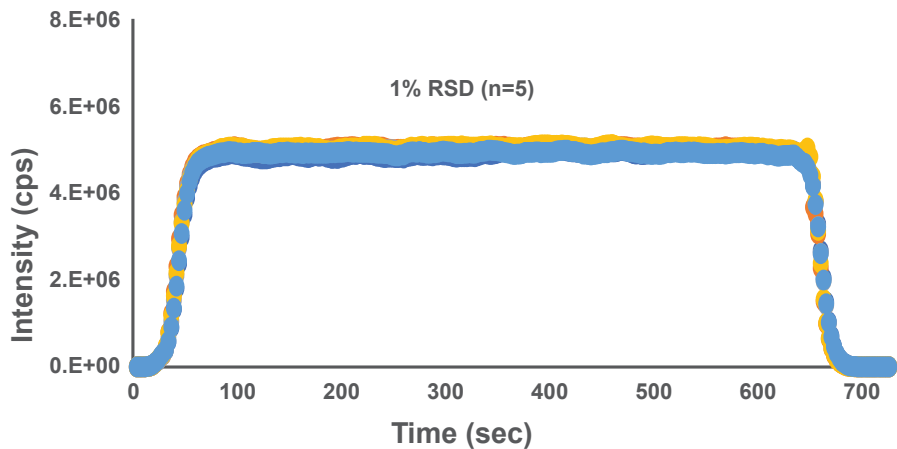
## Nd Long Term Stability: <2%

Nd isotope ratios are measured using the Isotope2 system. Syringe injecting 1 mL of sample at 100  $\mu\text{L}/\text{min}$  provides nearly 10 minutes of steady state signal for isotope ratio analysis. External reproducibility is improved for the smallest absolute sample amounts (6 ng) using low volume solution aliquots.

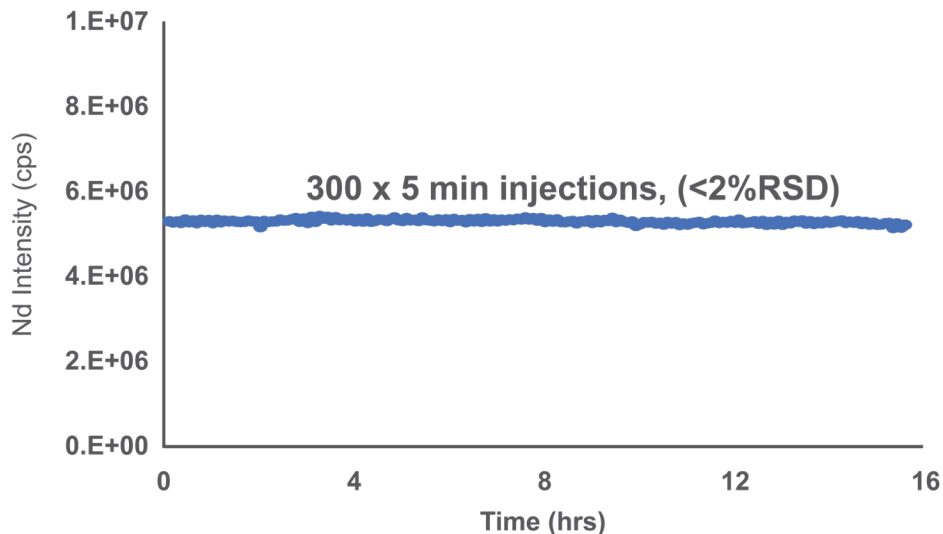
### Benefits

- <2% RSD over 16hr run
- Three Hundred (5 min) injections
- Nd is used to illustrate long term stability
- Syringe injection combined with Apex desolvation is the most stable platform for isotope ratio analysis

Five 1mL injection profiles at 100  $\mu\text{L}/\text{min}$



Long Term Reproducibility (16 hrs)

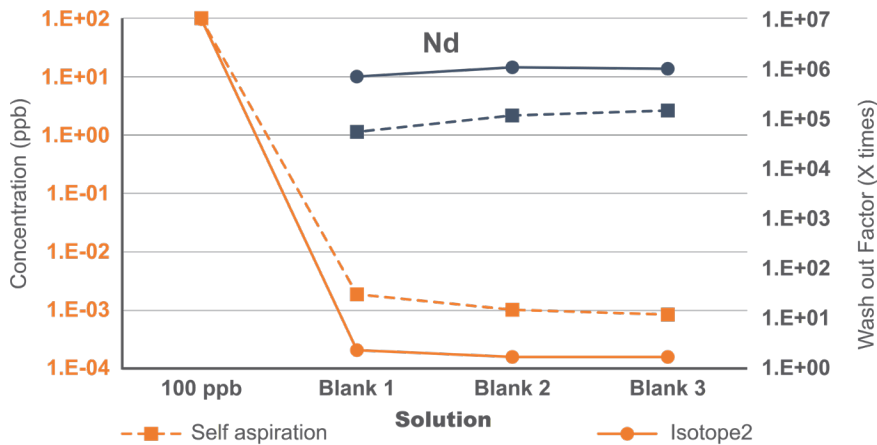


\*All data collected in combination with Apex Omega.

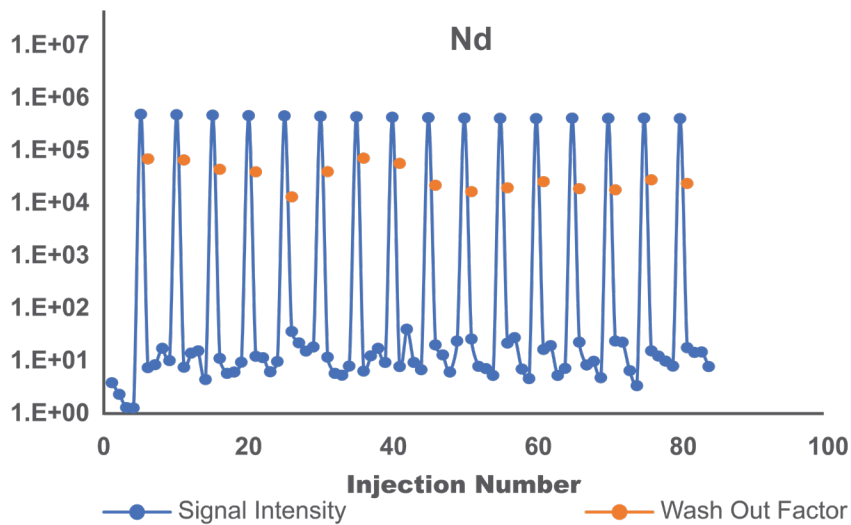
## Improved Washout

Each flow path is washed with 3 mL of rinse solution before loading next sample. This fast wash provides superior washout relative to self-aspiration which is limited to the sample analysis flowrate (typically 100  $\mu\text{L}/\text{min}$ ).

### Isotope2 Wash Out vs. Self-Aspiration



### 10 Hour Wash Out Study Illustrates Stable Blank



\*All data collected in combination with Apex Omega.

## Fluoronetic Rail

### Eliminates exposed metal

The Fluoronetic Rail – Magnetically coupled fluoropolymer linear drive eliminates exposed metal components above the autosampler deck.



## Syringe Module

### Robust, Accurate and Precise Sample Delivery

The Isotope2 system features a high-precision syringe for accurate sample loading (10-2000  $\mu\text{L}$ ) and user-defined injection flow rates (10-400  $\mu\text{L}/\text{min}$ ). Paired with the Apex Omega, it ensures high transport efficiency and near-total sample consumption, ideal for precise analyses.



## Magnetic SnapValves and Loops

### Easy installation and maintenance

The Isotope2 is equipped with innovative Magnetic SnapValves to streamline installation and maintenance. Simply snap on and off with your hands, eliminating the need for tools.





# Accessories

## Apex Omega with Integrated MFC

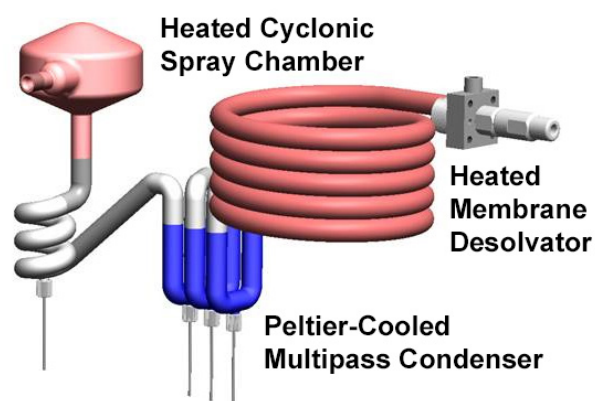
The highly successful Apex Omega maximizes ICP & ICPMS sensitivity by increasing sample transport efficiency while also enhancing stability. The oxide formation of nearly all water is driven out removing oxide polyatomic interferences.



## Benefits

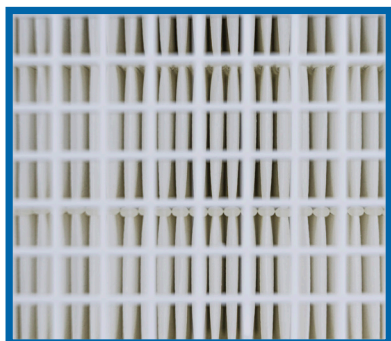
- Increase sensitivity by 6x to more than 10x, depending upon sample flow rate
- Significantly reduce oxides and solvent removal (<0.01% CeO+/Ce+)
- Two stage desolvation (Peltier-cooled and EPTFE membrane) imparts matrix tolerance higher than any membrane desolvator on the market
- Features complete software control of:
  - Ar sweep gas mass flow controller
  - N<sub>2</sub> addition gas mass flow controller
  - Heated spray chamber temperature
  - Peltier-cooled condenser temperature
  - Heated membrane temperature
  - Micro peristaltic drain pump

Custom temperature settings for heaters and cooler.



Model	Description	Part Number
Apex Omega	Apex Omega quartz high performance membrane desolvation system with quartz spray chamber, Peltier-cooled quartz condenser and EPTFE membrane desolvator	APX-O
Apex Omega HF	Apex Omega HF resistant high performance membrane desolvation system with PFA spray chamber, Peltier-cooled PFA condenser and EPTFE membrane desolvator	APX-O-HF

## ULPAclean 10 Filter



E-PTFE membrane



ULPAclean 10 is a U15 ULPA filter which is compatible with all DX autosampler enclosures and includes an easily replaceable boron-free, E-PTFE membrane

### Ultra Pure

- Purifies ambient air (U15 ULPA filter)
  - Removes 99.9995% of airborne particles with size of 0.1  $\mu\text{m}$  or larger
- E-PTFE filter material
  - Boron Free
- Reduces risk of sample contamination
  - Positively pressurizes enclosure
  - Prevents introduction of airborne contaminants

### Convenient Maintenance

- Simple ULPA filter replacement
  - Remove 4 screws, replace filter, replace screws
- Washable pre-filter

### Easy to Use

- Two air volume settings
  - 1.0 ( $\text{m}^3/\text{min}$ )
  - 0.5 ( $\text{m}^3/\text{min}$ )
- Quiet operation
- Compatible with all DX autosampler enclosures

**Part Number**

ULPA10

# IsotopeBench

## Compact METAL-FREE LAB Bench for Isotope2 & Apex Omega

The IsotopeBench is an all-in-one solution for your laboratory. IsotopeBench is built from metal-free materials and comfortably holds Isotope2, Apex Omega, with additional storage cabinets and drawers.

Engineered with a compact footprint to optimize space utilization, this system enhances laboratory efficiency while offering ample storage capacity. Its innovative waste and exhaust management system is vital to improving the safety of labs.

### Key Benefits:

- Designed for Isotope2 & Apex Omega systems
- Metal-free and corrosion-free
- Improve lab safety with waste & exhaust management
- Welded polypropylene

<b>Width:</b> 162 cm (64 in)
<b>Height:</b> 122 cm (48 in)
<b>Depth:</b> 61 cm (24 in)
<b>Weight:</b> 246 kg (581 lbs)

*Easily mobile for exchanging with other sample intro systems such as ESL laser ablation systems.*



### Part Number

AB-Isotope2



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