

# Alltech Ion Chromatography

See  
what's **new**



New! Novosep™ A-2 Anion Columns

in **IC**



New! Amine & Organic Acid Standards



New! Suppressors and Detection Systems

Easily add **IC capability** to your **HPLC**

**Alltech**

**Brochure #484**

# Introduction to Ion Chromatography

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## Anion Exchange Columns

## Cation Exchange Columns

## Organic Acid Columns

## Specialty Columns

## Tips for IC Column Selection

### Particle Size

For common anion and cation separations, smaller particle size resins will result in better peak shapes and higher resolution than larger particle size resins. Larger particle sizes may offer better flow rates for some sample types.



### Polymer vs. Silica

Polymer-based columns have higher capacities and broader pH stability. Silica-based columns give sharper peaks and overall better efficiency, but have a limited pH range and are not compatible with suppressor-based methods.

### Suppressed vs. Non-Suppressed Detection

Most anion separations require suppression, while most cation separations do not. Consider whether a column has been optimized for suppressor-based detection, or is better suited to non-suppressed (single column) detection.

### Column Length:

For the same packing material, shorter columns provide faster run times, while longer columns provide better resolution. Always pick the packing that has the best selectivity for your sample, and then pick the column length based on the tradeoff between resolution and speed, taking into consideration the complexity of your sample and your desired run time.

### Column ID:

Narrower columns provide better mass sensitivity, accommodate smaller sample sizes, and significantly reduce solvent usage. Wider columns allow for larger sample sizes and minimize the negative effects of the system's dead volume.

# IC Column Selection Guide

IC Column Specifications						
COLUMN	COMPOSITION	pH RANGE	APPLICATIONS	EPA METHODS	OPTIMIZED FOR SUPPRESSED OR NON-SUPPRESSED CONDUCTIVITY	PAGE
<b>Allsep™</b>	polymer-based anion exchanger, 7µm	pH 2-10	inorganic anions, weak and strong acid ions, metal complexes, organic acids	300.0, Part A	both	4
<b>Allsep™ A-2</b>	polymer-based anion exchanger, 7µm	pH 2-11	inorganic anions, organic acids, suitable for both weak and strong anions in a single run	300.0, Part A	both	4
<b>Novosep™ A-1</b>	polymer-based anion exchanger, 7µm	pH 2-11	inorganic anions, weak and strong acid anions; ideal for separation of hydrophobic anions	314.0	suppressed	5
<b>Novosep™ A-2</b>	polymer-based anion exchanger, 5µm	pH 3-12	inorganic anions and oxyhalides; ideal for separation of 7 common anions plus 3 oxyhalide anions in one run	300.0, 300.1, 317.0, 326.0	suppressed	5
<b>Anion/S</b>	silica-based anion exchanger, 10µm	pH 2-5.5	inorganic anions		non-suppressed	6
<b>Anion/R</b>	polymer-based anion exchanger, 10µm	pH 2-12	inorganic anions, weak and strong acid ions		non-suppressed	6
<b>PRP®-X100</b>	polymer-based anion exchanger, 10µm	pH 1-13	inorganic anions, weak and strong acid ions		non-suppressed	7
<b>AN1™</b>	polymer-based anion exchanger, 9µm	pH 2-13	inorganic anions, weak and strong acid ions, organic acids		both	7
<b>PRP®-X200</b>	polymer-based cation exchanger, 10µm	pH 1-13	groups I and II cations (separate runs), amines, lanthanides		non-suppressed	7
<b>Universal Cation</b>	silica-based cation exchanger, 7µm	pH 2-7	groups I and II cations, amines, divalent transition metals	300.7	both	8
<b>Universal Cation HR</b>	silica-based cation exchanger, 3µm	pH 2-7	groups I and II cations, amines, divalent transition metals; smaller particle size for improved peak resolution	300.7	both	8
<b>Prevail™ Organic Acid</b>	silica-based reversed phase, 3µm and 5µm	pH 1-9	organic acids		N/A	9
<b>Organic Acid</b>	polymer-based cation exchanger, 6.5µm, 8µm, and 9µm	pH 1-14	organic acids, aromatic acids, sugars/organic acids/alcohols in one run; multiple particle sizes available		non-suppressed	9
<b>Anion Exclusion</b>	polymer-based cation exchanger, 10µm	pH 1-13	organic acids, weak acid anions		non-suppressed	10
<b>Transition Metal</b>	silica-based reversed phase, 3µm and 7µm	pH 2-7	high capacity, separates divalent transition metals and metal-cyano complexes more selectively than a cation exchange column		non-suppressed	10
<b>Surfactant/R</b>	polymer-based reversed phase, 7µm	pH 1-14	anionic and cationic surfactants; separate short and long chain surfactants in one gradient run		both	11
<b>Surfactant C8</b>	silica-based reversed phase, 5µm	pH 2-7	short chain anionic surfactants		non-suppressed	11
<b>Surfactant C18</b>	silica-based reversed phase, 5µm	pH 2-7	long chain or aromatic anionic surfactants		non-suppressed	11

# Anion Columns

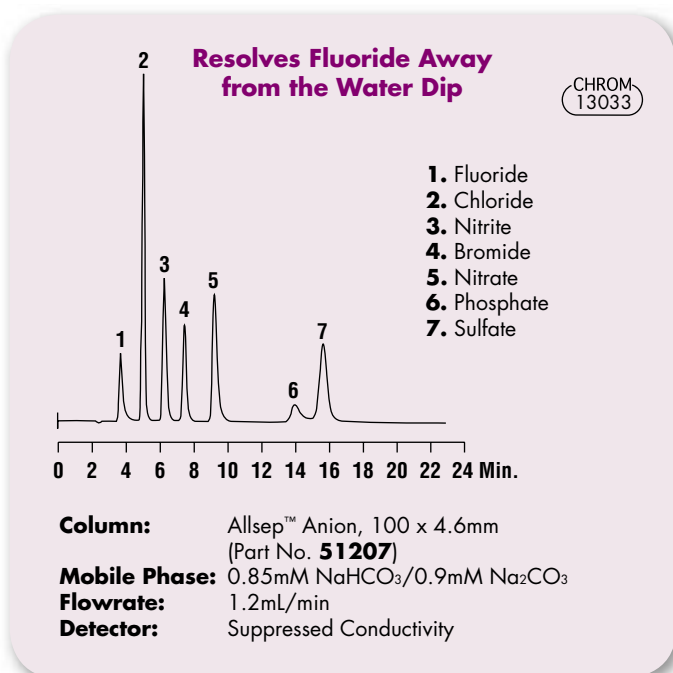
*Economical, general purpose anion columns*

## Allsep™ Anion IC Columns

- Resolve fluoride away from the water dip
- Meet requirements for U.S. EPA Method 300.0 part A

The Allsep™ Anion Column is compatible with common IC mobile phases: carbonate, bicarbonate, p-hydroxybenzoic acid, phthalic acid, succinic acid, and sodium octane sulfonate.

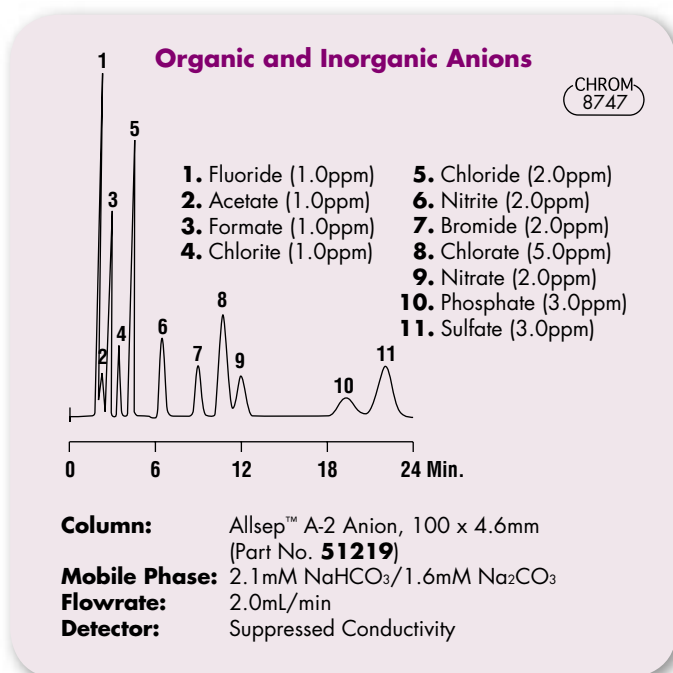
Use this column for performing EPA Method 300.0 Part A "Determination of Inorganic Anions in Water" per U.S. EPA guidelines.



## Allsep™ A-2 Anion IC Columns

- Separate both weak and strong acid anions in one run
- Resolve formate away from fluoride and chloride

The Allsep™ A-2 Anion Column separates both weakly retained organic and strongly retained inorganic anions in one run. The high capacity Allsep™ A-2 Anion Column is also suitable for the separation of chlorite and chlorate.



### Allsep™ Anion Specifications

**Composition:** Methacrylate based w/quaternary ammonium functional groups  
**Particle Size:** 7µm  
**Mobile Phase Limits:** pH 2-10, 0-100% organic modifier

### Allsep™ A-2 Anion Specifications

**Composition:** Methacrylate based w/quaternary alkanol amine functional groups  
**Particle Size:** 7µm  
**Mobile Phase Limits:** pH 2-11, 0-100% organic modifier

### Allsep™ Anion Columns

PACKING	PARTICLE SIZE	LENGTH x ID	PEEK PART NO.	SS PART NO.
<b>Allsep™ Anion</b>	7µm	30 x 4.6mm	<b>51217</b>	<b>51216</b>
		50 x 4.6mm	<b>51213</b>	<b>51214</b>
		100 x 4.6mm	<b>51207</b>	<b>51200</b>
		150 x 4.6mm	<b>51209</b>	<b>51208</b>

### Allsep™ A-2 Anion Columns

PACKING	PARTICLE SIZE	LENGTH x ID	PEEK PART NO.	SS PART NO.
<b>Allsep™ A-2</b>	7µm	50 x 4.6mm	<b>51221</b>	<b>51220</b>
		100 x 4.6mm	<b>51219</b>	<b>51218</b>

To protect your columns from contamination, select a guard column from page 12.

Allsep™ Anion is available in a starter kit, including buffers, standards, and guards. See page 13.

# Anion Columns

For demanding suppressor-based analyses

## Novosep™ A-1 Anion IC Columns

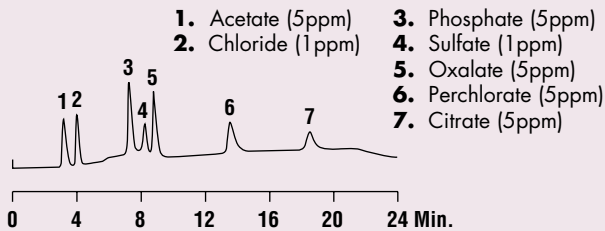
- Separate common anions and strongly retained hydrophobic anions
- Meet the requirements of U.S. EPA Method 314.0

The Novosep™ A-1 Column is your best choice for routine anion analysis and for determining other strongly retained hydrophobic anions that previously required specialty columns.

The Novosep™ A-1 Column can simultaneously separate weakly and strongly retained anions by gradient elution. Carbonate/bicarbonate gradients offer a powerful tool for separating anions that have a wide range of affinities for the column.

### Weakly and Strongly Retained Anions

CHROM  
9299



- |                    |                       |
|--------------------|-----------------------|
| 1. Acetate (5ppm)  | 3. Phosphate (5ppm)   |
| 2. Chloride (1ppm) | 4. Sulfate (1ppm)     |
|                    | 5. Oxalate (5ppm)     |
|                    | 6. Perchlorate (5ppm) |
|                    | 7. Citrate (5ppm)     |

**Column:** Alltech Novosep™ A-1, 100 x 4.6mm (Part No. **51406**)

**Mobile Phase:** **A:** Water **B:** 10mM Sodium Bicarbonate **C:** 10mM Sodium Carbonate with 1mM Cyanophenol

**Gradient:**

<b>Time:</b>	0	5	10	15	20	20.1
<b>%B:</b>	17	28	50	0	0	17
<b>%C:</b>	0	22	50	100	100	0

**Flowrate:** 1.5mL/min

**Detector:** Suppressed Conductivity

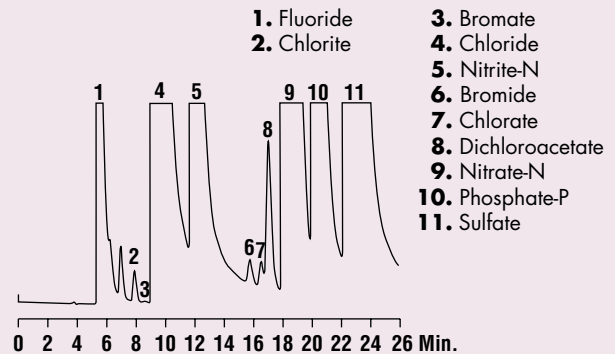
## Novosep™ A-2 Anion IC Columns

- Separate seven inorganic anions and three oxyhalide anions in a single run
- Meet the requirements of U.S. EPA Methods 300.0, 300.1, 317.0, and 326.0

The Novosep™ A-2 Anion Column is ideal for the separation of 10 inorganic anions by suppressor-based ion chromatography using U.S. EPA Method 300.1. The column can also be used to determine inorganic anions in drinking water per U.S. EPA Method 300.0 and trace bromate in drinking water using U.S. EPA Methods 317.0 and 326.0.

### Anions in High Ionic Strength Water by EPA Method 300.0

CHROM  
10121



- |             |                    |
|-------------|--------------------|
| 1. Fluoride | 3. Bromate         |
| 2. Chlorite | 4. Chloride        |
|             | 5. Nitrite-N       |
|             | 6. Bromide         |
|             | 7. Chlorate        |
|             | 8. Dichloroacetate |
|             | 9. Nitrate-N       |
|             | 10. Phosphate-P    |
|             | 11. Sulfate        |

**Column:** Novosep™ A-2 Anion, 250 x 4.0mm (Part No. **51410**)

**Mobile Phase:** 3.6mM NaHCO<sub>3</sub>

**Flowrate:** 0.8mL/min

**Detector:** Suppressed Conductivity

### Novosep™ A-1 Anion Specifications

**Composition:** Methacrylate based w/quaternary ammonium functional groups

**Particle Size:** 7µm

**Mobile Phase Limits:** pH 2-11, 0-100% organic modifier (methanol, acetonitrile, acetone)

### Novosep™ A-2 Anion Specifications

**Composition:** Polyvinyl alcohol based w/quaternary ammonium functional groups

**Particle Size:** 5µm

**Mobile Phase Limits:** pH 3-12, 0-100% organic modifier, 10% modifier is practical upper limit

### Novosep™ A-1 Anion Columns

PACKING	PARTICLE SIZE	LENGTH x ID	PEEK PART NO.	SS PART NO.
<b>Novosep™ A-1</b>	7µm	30 x 4.6mm	<b>51401</b>	<b>51402</b>
		50 x 4.6mm	<b>51403</b>	<b>51404</b>
		100 x 4.6mm	<b>51405</b>	<b>51406</b>
		150 x 4.6mm	<b>51407</b>	<b>51408</b>

### Novosep™ A-2 Anion Columns

PACKING	PARTICLE SIZE	LENGTH x ID	PEEK PART NO.
<b>Novosep™ A-2</b>	5µm	250 x 4.0mm	<b>51410</b>

To protect your columns from contamination, select a guard column from page 12.

Novosep™ Columns are available in starter kits, including buffers, standards, and guards. See page 13.

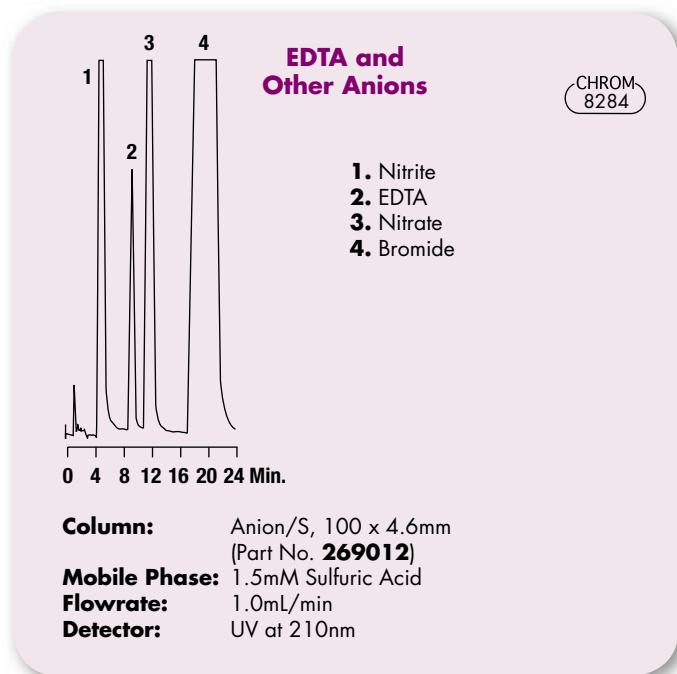
# Anion Columns

*Economical anion columns for non-suppressed analyses*

## Anion/S IC Columns

- Silica-based for symmetrical peak shapes
- Separate inorganic and organic anions

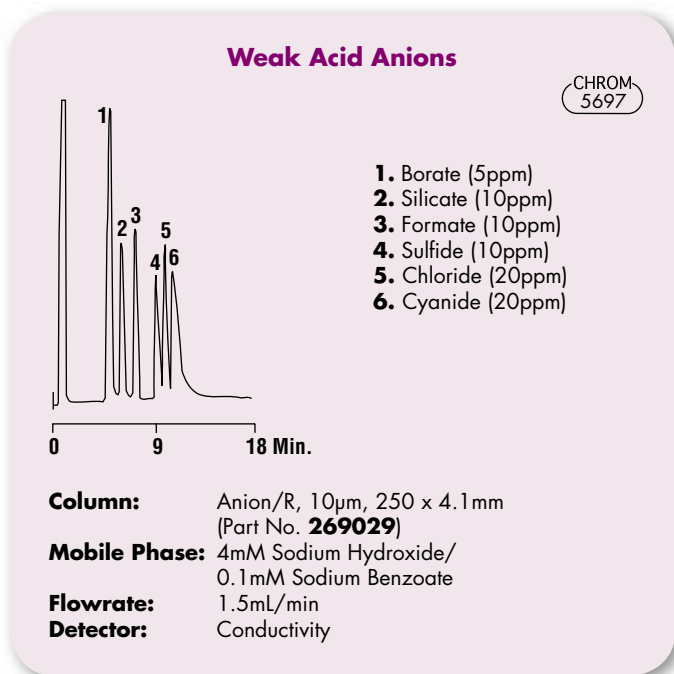
The Anion/S Columns are best suited for routine separations of chloride, bromide, nitrate, and sulfate. Not suitable for fluoride analysis.



## Anion/R IC Columns

- Polymer-based for broad pH stability
- Separate seven common inorganic anions

Because of its high pH stability, this column is ideal for the separation of anions using high pH mobile phases such as p-hydroxybenzoate, sodium hydroxide, and sodium carbonate/bicarbonate. The larger dimension columns (150mm and 250mm) are suitable for a high resolution separation of the seven common inorganic anions.



### Anion/S Specifications

**Composition:** Silica w/quaternary ammonium ion exchanger  
**Particle Size:** 10µm  
**Exchange Capacity:** 0.25meq/g  
**Mobile Phase Limits:** pH 2-5.5, 0-100% organic modifier

### Anion/R Specifications

**Composition:** Poly(styrene-divinylbenzene) Trimethylammonium  
**Particle Size:** 10µm  
**Exchange Capacity:** 0.19 ± 0.02meq/g  
**Mobile Phase Limits:** pH 2-12, 0 - 100% organic modifier

### Anion/S Columns

PACKING	PARTICLE SIZE	LENGTH X ID	PEEK PART NO.	SS PART NO.
<b>Anion/S</b>	10µm	100 x 4.6mm	-	<b>269013</b>
		250 x 4.6mm	-	<b>269001</b>
	100 x 4.6mm	<b>269012</b>	-	
	250 x 4.6mm	<b>269011</b>	-	

### Anion/R Columns

PACKING	PARTICLE SIZE	LENGTH X ID	PEEK PART NO.	SS PART NO.
<b>Anion/R</b>	10µm	100 x 4.1mm	-	<b>269031</b>
		250 x 4.1mm	-	<b>269029</b>
	100 x 4.6mm	<b>269036</b>	-	
	150 x 4.6mm	<b>269034</b>	-	

To protect your columns from contamination, select a guard column from page 12.

# Anion and Cation Columns

## Additional IC columns from Sarasep and Hamilton

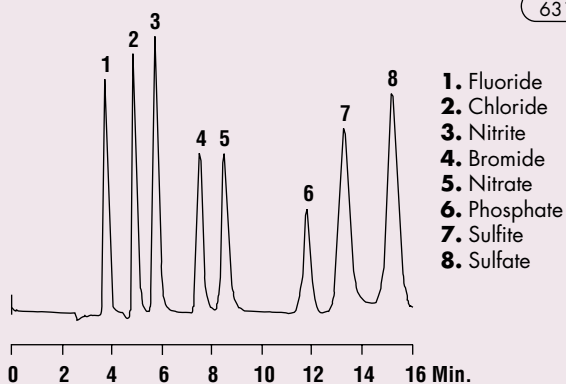
### Sarasep AN1™ IC Columns

- Separates anions with carbonate/bicarbonate and hydroxide mobile phases

The Sarasep AN1™ Column is compatible with both suppressor-based and non-suppressed detection. A variety of mobile phases including sodium carbonate/bicarbonate, sodium hydroxide, and borate/gluconate may be used.

#### Separation of Sulfite and Sulfate

CHROM  
6316



**Column:** Sarasep AN1™, 9µm, 250 x 4.6mm (Part No. **38140**)  
**Mobile Phase:** 1.8mM NaHCO<sub>3</sub>, 1.8mM Na<sub>2</sub>CO<sub>3</sub>  
**Flowrate:** 1.0mL/min  
**Detector:** Suppressed Conductivity

#### Sarasep AN1™ Specifications

**Composition:** Poly(styrene-divinylbenzene) alkyl dimethyl ethanol ammonium functional group  
**Particle Size:** 9µm  
**Exchange Capacity:** 0.05meq/g  
**Mobile Phase Limits:** pH 2-13, No organic solvents

#### Sarasep AN1™ Columns

PACKING	PARTICLE SIZE	LENGTH X ID	PEEK PART No.
<b>AN1™</b>	9µm	250 x 4.6mm	<b>38140</b>

### Hamilton IC Columns

#### PRP®-X100 Inorganic Anion Analysis Columns

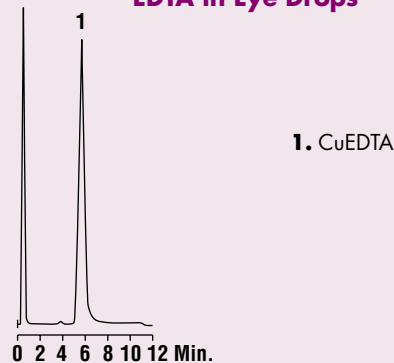
High pH stability makes this column ideal for the separation of weak anions. PRP®-X100 provides excellent resolution for the seven most frequently analyzed inorganic anions. For non-suppressed analyses only.

#### PRP®-X200 Cation Analysis Columns

For high resolution separations of the alkali metal and alkaline earth cations, in separate runs.

#### EDTA in Eye Drops

CHROM  
8068



**Column:** PRP®-X100, 10µm, 150 x 4.1mm (Part No. **79434**)  
**Mobile Phase:** 0.003N Sulfuric Acid  
**Flowrate:** 2mL/min  
**Detector:** UV at 254nm

#### Hamilton PRP® Specifications

**Composition:** X100: trimethylammonium psDVB copolymer  
X200: sulfonated psDVB copolymer  
**Particle Size:** 10µm, spherical  
**Exchange Capacity:** 0.19meq/g (X100), 35µmeq/g (X200)  
**Mobile Phase Limits:** pH 1-13, 0 - 100% organic modifier

#### Hamilton PRP® Columns

PACKING	PARTICLE SIZE	LENGTH X ID	PEEK PART No.
<b>PRP® X-100</b>	10µm	150 x 2.1mm	<b>79348</b>
	10µm	250 x 2.1mm	<b>79346</b>
	10µm	100 x 4.1mm	<b>79439</b>
	10µm	150 x 4.1mm	<b>79434</b>
	10µm	250 x 4.1mm	<b>79433</b>
<b>PRP® X-200</b>	10µm	150 x 2.1mm	<b>79394</b>
	10µm	250 x 2.1mm	<b>79347</b>
	10µm	150 x 4.1mm	<b>79441</b>
	10µm	250 x 4.1mm	<b>79442</b>

To protect your columns from contamination, select a guard column from page 12.

# Cation Columns

High-performance cation columns for suppressed or non-suppressed analyses

## Universal Cation and Universal Cation HR IC Columns

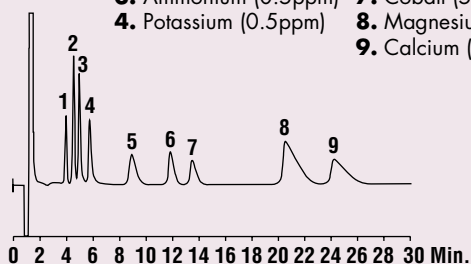
- Separate Group I and Group II cations in one isocratic run
- Separate transition metals without post-column reaction
- New Universal Cation HR 3µm particle size for improved efficiency

Compatible with a variety of mobile phases including complexing acids (citric acid, tartaric acid, oxalic acid), mineral acids (nitric acid, hydrochloric acid, sulfuric acid) and non-complexing organic acids (methanesulfonic acid).

### Metal Ions

CHROM 10318

- |                       |                        |
|-----------------------|------------------------|
| 1. Lithium (0.5ppm)   | 5. Nickel (5ppm)       |
| 2. Sodium (0.5ppm)    | 6. Zinc (5ppm)         |
| 3. Ammonium (0.5ppm)  | 7. Cobalt (5ppm)       |
| 4. Potassium (0.5ppm) | 8. Magnesium (0.35ppm) |
|                       | 9. Calcium (0.7ppm)    |

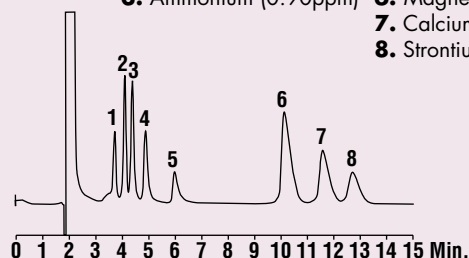


**Column:** Universal Cation, 7µm, 100 x 4.6mm (Part No. **27106**)  
**Mobile Phase:** 2mM Tartaric Acid/1mM Oxalic Acid  
**Flowrate:** 1.0mL/min  
**Detector:** Conductivity

### Cesium and Strontium

CHROM 13035

- |                       |                       |
|-----------------------|-----------------------|
| 1. Lithium (0.12ppm)  | 4. Potassium (1.5ppm) |
| 2. Sodium (0.90ppm)   | 5. Cesium (0.8ppm)    |
| 3. Ammonium (0.90ppm) | 6. Magnesium (1.2ppm) |
|                       | 7. Calcium (1.2ppm)   |
|                       | 8. Strontium (1.6ppm) |

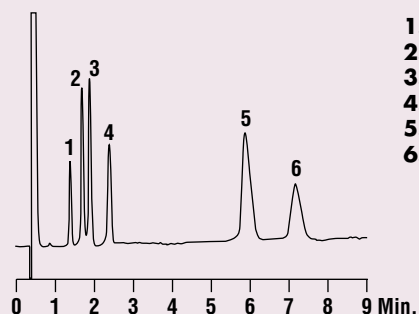


**Column:** Universal Cation, 7µm, 100 x 4.6mm (Part No. **27106**)  
**Mobile Phase:** 3mM Methanesulfonic Acid  
**Flowrate:** 1.0mL/min  
**Detector:** Conductivity

### Rapid Analysis of Monovalent and Divalent Cations

CHROM 13013

- |              |
|--------------|
| 1. Lithium   |
| 2. Sodium    |
| 3. Ammonium  |
| 4. Potassium |
| 5. Magnesium |
| 6. Calcium   |



**Column:** Universal Cation HR, 3µm, 53 x 7.0mm (Part No. **23109**)  
**Mobile Phase:** 3mM Methanesulfonic Acid  
**Flowrate:** 2.5mL/min  
**Detector:** Conductivity

### Universal Cation Specifications

**Composition:** Silica coated with polybutadiene/maleic acid copolymer  
**Particle Size:** 3µm and 7µm, spherical  
**Mobile Phase Limits:** pH 2-7, 0-100% organic modifier

### Universal Cation Columns

PACKING	PARTICLE		PEEK		SS
	SIZE	LENGTH x ID	PART NO.	PART NO.	PART NO.
<b>Universal Cation</b>	7µm	100 x 4.6mm	<b>27106</b>	<b>27100</b>	
<b>Universal Cation HR</b>	3µm	100 x 4.6mm	-	<b>23100</b>	
	3µm	53 x 7.0mm	-	<b>23109</b>	

To protect your columns from contamination, select a guard column from page 12.

Universal Cation is available in a starter kit, including buffers, standards, and guards. See page 13.



# Organic Acid Columns

Durable columns for organic acid separations

## Alltech Organic Acid Columns

- Analyze organic acids and alcohols in a single run
- Polymer-based for broad pH stability

### OA: selective for aliphatic and aromatic acids

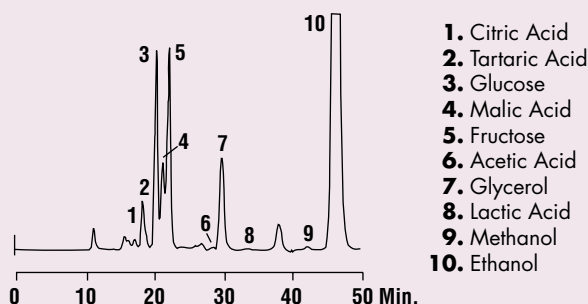
Use OA-1000 for inorganic anions and most organic acids. Use OA-2000 for low pKa organic acids, low molecular weight straight chain acids, and aromatic acids.

### IOA: separate short chain organic acids from fructose and glucose

Use IOA-1000 for TCA or Krebs cycle acids, carbohydrates, and alcohols. Use IOA-2000 for fast separation of acids and some alcohols.

### Wine Analysis by High Resolution Ion Exclusion

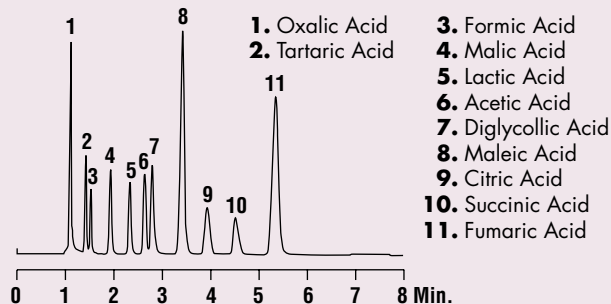
CHROM-5411



**Column:** IOA-1000, 300 x 7.8mm (Part No. **9646**)  
**Mobile Phase:** 0.005N Sulfuric Acid  
**Flowrate:** 0.3mL/min  
**Temp:** 60°C  
**Detector:** RI

### Organic Acids

CHROM-9384



**Column:** Prevail™ Organic Acid, 5µm, 150 x 4.6mm (Part No. **88640**)  
**Mobile Phase:** 25mM KH<sub>2</sub>PO<sub>4</sub>, pH2.5  
**Flowrate:** 1.5mL/min  
**Detector:** UV at 210nm

### Alltech Organic Acid Specifications

**Composition:** Highly sulfonated poly (styrene-divinylbenzene) cation exchanger  
**Particle Size:** 6.5µm, 8µm, and 9µm  
**Mobile Phase Limits:** pH 1-14, isocratic aqueous mobile phases only; no organics

### Prevail™ Organic Acid Specifications

**Composition:** Silica base, with specially modified reversed phase functional groups  
**Particle Size:** 3µm and 5µm  
**Mobile Phase Limits:** pH 1-9, 0-100% organic modifier

### Alltech Organic Acid Columns

PACKING	PARTICLE SIZE	LENGTH x ID	SS PART No.
<b>OA-1000</b>	9µm	300 x 6.5mm	<b>9046</b>
<b>OA-2000</b>	6.5µm	100 x 6.5mm	<b>9048</b>
<b>IOA-1000</b>	9µm	300 x 7.8mm	<b>9646</b>
<b>IOA-2000</b>	8µm	150 x 6.5mm	<b>9648</b>

### Prevail™ Organic Acid Columns

PACKING	PARTICLE SIZE	LENGTH x ID	SS PART No.
<b>Prevail OA</b>	3µm	100 x 4.6mm	<b>88650</b>
	3µm	150 x 4.6mm	<b>88655</b>
	5µm	150 x 4.6mm	<b>88640</b>
	5µm	250 x 4.6mm	<b>88645</b>

### Alltech Organic Acid Guard Columns

DESCRIPTION	QTY	PART No.
Organic Acid Guard Cartridge Kit Includes: 1 Holder, 2 Cartridges	Ea	<b>28883</b>
OA Cartridge, 24 x 4.0mm	2	<b>28884</b>

### Prevail™ Organic Acid Guard Columns

DESCRIPTION	QTY	PART No.
Prevail™ OA All-Guard™ Cartridge, PEEK	3	<b>96429</b>
All-Guard™ Cartridge Holder*	Ea	<b>80101</b>

\*Includes Direct-Connect™ Column Coupler.

# Specialty Columns

Unique columns for organic acids and transition metals

## Anion Exclusion IC Columns

- Separate organic acids and weak acid anions
- Polymer-based for broad pH stability
- Economical choice for small inorganics

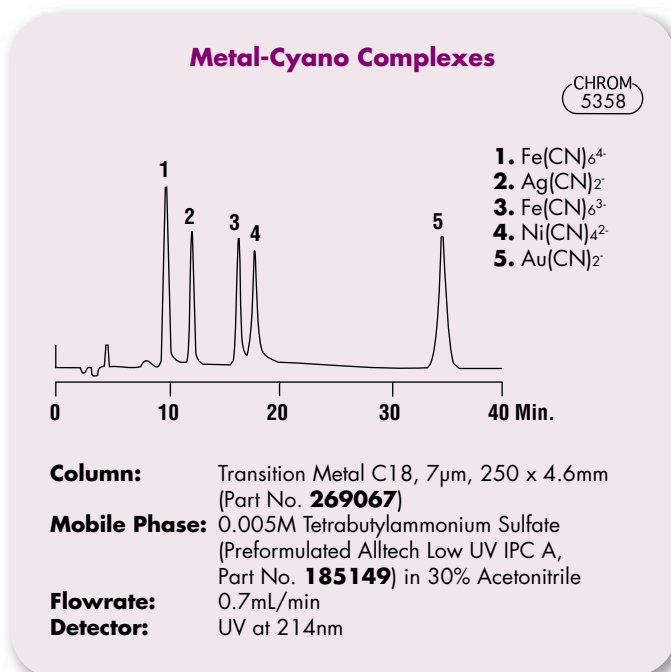
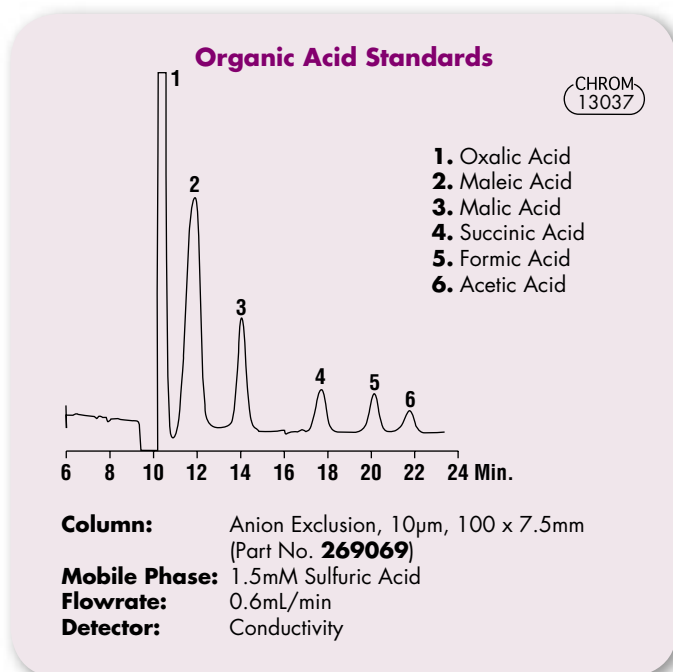
Anion Exclusion Columns separate organic acids and weakly ionized anions by an anion exclusion mechanism. Dilute mineral acids are the typical mobile phases for the separation. Acetonitrile may be used as an organic modifier to decrease the retention of hydrophobic compounds.

## Transition Metal IC Columns

- Separate divalent transition metals and metal-cyano complexes more selectively than a cation exchange column

To separate divalent transition metals, use conductivity detection for concentrations as low as 1ppm, or UV detection with post-column reaction for ppb-level concentrations

To separate metal-cyano complexes, use Alltech's low UV IPC A (Part No. **185149**) as the ion-pair reagent, and methanol or acetonitrile as the organic modifier.



### Anion Exclusion Specifications

**Composition:** Highly sulfonated poly(styrene-divinylbenzene) cation exchanger  
**Particle Size:** 10µm  
**Mobile Phase Limits:** <10% acetonitrile, no methanol <5% isopropyl or ethyl alcohols

### Transition Metal Specifications

**Composition:** Silica-based with C18 bonded phase (20% Carbon)  
**Particle Size:** 3µm and 7µm, spherical  
**Mobile Phase Limits:** pH 2-7

### Anion Exclusion Columns

PACKING	PARTICLE		PEEK		SS	
	SIZE	LENGTH X ID	PART NO.	PART NO.	PART NO.	PART NO.
<b>Anion Exclusion</b>	10µm	100 x 7.8mm	-	<b>269068</b>	-	-
		300 x 7.8mm	-	<b>269006</b>	-	-
		100 x 7.5mm	<b>269069</b>	-	-	-
		300 x 7.5mm	<b>269062</b>	-	-	-

### Transition Metal Columns

PACKING	PARTICLE		PEEK		SS	
	SIZE	LENGTH X ID	PART NO.	PART NO.	PART NO.	PART NO.
<b>C18</b>	3µm	100 x 4.6mm	<b>269064</b>	-	-	-
		7µm	250 x 4.6mm	<b>269067</b>	-	-

To protect your columns from contamination, select a guard column from page 12.

# Surfactant Columns

A choice of columns for surfactant analyses

## Surfactant/R IC Columns

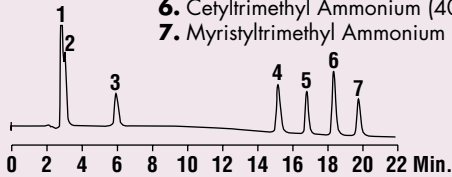
- Separate anionic and cationic surfactants
- Separate short and long chain surfactants in one gradient run

The Surfactant/R Column separates anionic and cationic surfactants by ion-pair chromatography along with suppressed conductivity detection. This column can also be used for other reversed-phase applications.

### Short and Long Chain Cationic Surfactants

CHROM-10317

1. Tetramethyl Ammonium (20ppm)
2. Tetraethyl Ammonium (20ppm)
3. Tetrapropyl Ammonium (20ppm)
4. Tetrabutyl Ammonium (30ppm)
5. Dodecyltrimethyl Ammonium (30ppm)
6. Cetyltrimethyl Ammonium (40ppm)
7. Myristyltrimethyl Ammonium (50ppm)



**Column:** Surfactant/R Column, 7µm, 150 x 4.6mm (Part No. **25101**)

**Mobile Phase:** **A:** 2mM Nonafluoropentanoic Acid  
**B:** 100% Acetonitrile

**Gradient:** **Time:** | 0 | 5 | 8 | 20 |  
**%B:** | 30 | 30 | 35 | 80 |

**Flowrate:** 1.0mL/min

**Detector:** Suppressed Conductivity

## Surfactant IC Columns

- For non-suppressed analyses
- Silica-based for symmetrical peak shapes

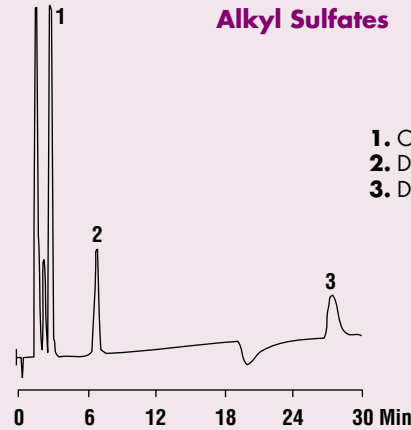
**Choose Surfactant C8** for short chain anionic surfactants such as alkyl sulfates and alkyl sulfonates

**Choose Surfactant C18** for long chain or aromatic surfactants such as xylene sulfonate and dodecyl benzene sulfonate.

### Alkyl Sulfates

CHROM-5998

1. Octyl Sulfate
2. Decyl Sulfate
3. Dodecyl Sulfate



**Column:** Surfactant C8, 5µm, 250 x 4.6mm (Part No. **269072**)

**Mobile Phase:** 0.02g/L Ammonium Acetate in 40% Methanol

**Flowrate:** 1.2mL/min

**Detector:** Conductivity

### Surfactant/R Specifications

**Composition:** Polydivinylbenzene (DVB) based resin

**Particle Size:** 7µm

**Mobile phase Limits:** pH 1-14, 0-100% organic modifier

### Surfactant Specifications

**Composition:** Silica-based C8 or C18

**Particle Size:** 5µm

**Mobile Phase Limits:** pH 2-7, 0-100% organic modifier

### Surfactant/R Columns

PACKING	PARTICLE		PEEK	SS
	SIZE	LENGTH x ID	PART NO.	PART NO.
<b>Surfactant/R</b>	7µm	150 x 4.6mm	<b>25101</b>	<b>25100</b>

### Surfactant Columns

PACKING	PARTICLE		PEEK	SS
	SIZE	LENGTH x ID	PART NO.	PART NO.
<b>C8</b>	5µm	250 x 4.6mm	<b>269072</b>	<b>269092</b>
<b>C18</b>	5µm	250 x 4.6mm	<b>269071</b>	<b>269091</b>

To protect your columns from contamination, select a guard column from page 12.

# Alltech Guard Cartridges

Extend the life of your IC columns



Inert, metal-free PEEK fluid path

## IC Guard Cartridges

- Convenient - change cartridges in seconds without tools
- No connecting tubing required
- All-Guard™ Holders work with other manufacturer's columns

Protect your IC columns from contaminants with All-Guard™ Cartridges. The All-Guard™ System's unique holder is open on the side for fast and easy installation of cartridges.

Save money with IC Guard Cartridge Starter Kits, including an All-Guard™ Holder and three guard cartridges. Connect the All-Guard™ Holder directly to your analytical column using Alltech's patented Direct-Connect™ Column Coupler, included with each holder.

### Starter Kits

DESCRIPTION	QTY	PART NO.
<b>All-Guard™ Kits</b> (Includes 3 PEEK Cartridges, 1 Holder, and 1 Direct-Connect™ Column Coupler)		
GA-1 Anion	Ea	<b>38109</b>
GC-1 Cation	Ea	<b>38113</b>
GC-2 Universal Cation	Ea	<b>27109</b>
GC-3 Universal Cation HR	Ea	<b>23115</b>
GIE-1 Anion Exclusion	Ea	<b>38117</b>
GRP-1 Resin Reversed-Phase	Ea	<b>38122</b>
GRP-2 Silica Reversed-Phase	Ea	<b>38123</b>

### Guard Holder (Includes Direct-Connect™ Column Coupler)

All-Guard™ Cartridge Holder	Ea	<b>80101</b>
Replacement Column Coupler	Ea	<b>28191</b>

### Guard Reference Table

COMPANY	COLUMN TYPE	CARTRIDGE TYPE	ALL-GUARD™ KIT PART No.
<b>Alltech</b>	Allsep™, Allsep™ A-2, Novosep™ A-1	GA-1	<b>38109</b>
	Novosep™ A-2	GA-1	<b>38109</b>
	Anion/R, Anion/S	GA-1	<b>38109</b>
	Universal Cation	GC-2	<b>271010</b>
	Universal Cation HR	GC-3	<b>23110</b>
	Anion Exclusion	GIE-1	<b>38117</b>
	Transition Metal C18	GRP-2	<b>38123</b>
	Surfactant/R	GRP-1	<b>38122</b>
	Surfactant C8, C18	GRP-2	<b>38123</b>
	<b>Dionex</b>	IonPac™ AS4, AS4A, AS4A-SC, AS7, AS9, AS10, AS11, AS12, AS14	GA-1
IonPac™ CS3, CS10, CS11		GC-1	<b>38113</b>
IonPac™ CS12, CS14, CS15		GC-2	<b>27109</b>
IonPac™ NS1		GRP-1	<b>38122</b>
IonPac™ AS1, AS5		GIE-1	<b>38117</b>
<b>Waters™</b>		IC-Pak™-A	GA-1
	IC-Pak™-M/D	GC-2	<b>27109</b>
	Ion Exclusion	GIE-1	<b>38117</b>
	µBondapak™ C18	GRP-2	<b>38123</b>
	Radial-Pak™ C18	GRP-2	<b>38123</b>
	Nova-Pak™ C18	GRP-2	<b>38123</b>
<b>Hamilton</b>	PRP®-X100	GA-1	<b>38109</b>
	PRP®-X200	GC-1	<b>38113</b>
	PRP®-X300	GIE-1	<b>38117</b>
	PRP®-1	GRP-1	<b>38122</b>
<b>Misc.</b>	Sarasep ANIONSEP AN1™	GA-1	<b>38109</b>
	Bio-Rad®, Aminex®, HPX-87	GIE-1	<b>38117</b>
	Interaction® ION-120	GA-1	<b>38109</b>
	Interaction® ION-210	GC-1	<b>38113</b>
	Interaction® ORH-801	GIE-1	<b>38117</b>
	Metrohm Metrosep	GA-1	<b>38109</b>
Metrohm SUPER SEP™	GC-2	<b>27109</b>	

### Replacement Cartridges

DESCRIPTION	QTY	PART No.
<b>All-Guard™ Replacement Cartridges, PEEK</b>		
GA-1 Anion	3	<b>38108</b>
GC-1 Cation	3	<b>38114</b>
GC-2 Universal Cation	3	<b>271010</b>
GC-3 Universal Cation HR	3	<b>23110</b>
GIE-1 Anion Exclusion	3	<b>38118</b>
GRP-1 Resin Reversed-Phase	3	<b>38124</b>
GRP-2 Silica Reversed-Phase	3	<b>38129</b>



For organic acid column guards, see page 9.



Alltech offers several IC kits to help you set up and maintain your IC system quickly and economically.

## Non-suppressed IC Anion Kit

- For the analysis of anions by non-suppressed IC methods

### Non-suppressed IC Anion Kit

DESCRIPTION	PART No.
<b>Non-suppressed IC Anion Kit</b>	<b>270102</b>

*Includes:*

- Part No. 51207: Allsep™ Anion Column, 100 x 4.6mm
- Part No. 38109: All-Guard™ GA-1 Guard Cartridge Kit
- Part No. 470212: 12 x 25mL EZ-LUTE™ 4mM pHBA Buffer Concentrates
- Part No. 37035: Anion Standards Kit

## U.S. EPA Methods Anion Kit

- U.S. EPA Methods 300.0, 300.1, 317.0, and 326.0

### U.S. EPA Methods Anion Kit

DESCRIPTION	PART No.
<b>U.S. EPA Methods Anion Kit</b>	<b>270107</b>

*Includes:*

- Part No. 51410: Novosep™ A-2 Anion Column, 250 x 4.0mm
- Part No. 38109: All-Guard™ GA-1 Guard Cartridge Kit
- Part No. 470123: 100mL EZ-LUTE™ 3.6mM Carbonate Buffer Concentrate
- Part No. 37085: Anion and Oxyhalide Standards Kit

## Suppressor-based IC Anion Kit

- For the analysis of anions by suppressor-based IC methods

### Suppressor-based IC Anion Kit

DESCRIPTION	PART No.
<b>Suppressor-based IC Anion Kit</b>	<b>270106</b>

*Includes:*

- Part No. 51407: Novosep™ A-1 Anion Column, 150 x 4.6mm
- Part No. 38109: All-Guard™ GA-1 Guard Cartridge Kit
- Part No. 470119: 100mL EZ-LUTE™ 1.7mM Bicarbonate/1.8mM Carbonate Buffer Concentrate
- Part No. 37035: Anion Standards Kit

## Mono- and Divalent Cation Kit

- For the simultaneous analysis of monovalent and divalent cations using the Universal Cation Column

### Mono- and Divalent Cation Kit

DESCRIPTION	PART No.
<b>Mono- and Divalent Cation Kit</b>	<b>269105</b>

*Includes:*

- Part No. 27106: Universal Cation PEEK Column, 100 x 4.6mm
- Part No. 27109: All-Guard™ GC-2 Guard Cartridge Kit
- Part No. 470211: 12 x 25mL EZ-LUTE™ 3mM Methanesulfonic Acid Buffer Concentrates
- Part No. 37040: Cation Standards Kit

## IC Accessory Kit

- A must for new and experienced IC users

### IC Accessory Kit

DESCRIPTION	PART No.
<b>IC Accessory Kit</b>	<b>269101</b>

*Includes:*

- Part No. 35712: 1/16" x 0.007" ID PEEK Tubing, 10ft
- Part No. 35702: 1/16" x 0.010" ID PEEK Tubing, 10ft
- Part No. 32233: One-Piece Fitting, 10/pkg
- Part No. 32141: PEEK 1/16" Union
- Part No. 90536: #22Ga Needle with CTFE Luer-Hub, 6/pkg
- Part No. 44701100: 1mL Plastic Syringe for Injection, 12/pkg
- Part No. 447018: 20mL Plastic Syringe for Priming Pump, 2/pkg
- Part No. 3206: Plastic Tubing Cutter
- Part No. 1998: Open-End Wrench
- Part No. 32170: Metal-Free Solvent-Inlet Filter
- Part No. 68250: Metal-Free In-Line Filter

### To Purchase Kit Components Separately:

Guard Cartridges.....	page 12
Allsep™ Columns .....	page 4
Novosep™ Columns .....	page 5
Universal Cation Columns .....	page 8
Standards .....	page 14
EZ-LUTE™ Buffers .....	page 15

# Certified IC Reagents and Standards

Certified IC standards improve the accuracy of your ion analyses



Certificate of analysis included

## IC Reagents and Standards

- Prepared from NIST standard reference materials
- Certified by two independent methods

### Individual Certified Anion and Cation Standards

#### Anion Standards (125mL)

STANDARD	1000PPM PART No.	200PPM PART No.
Bromate	<b>37058</b>	-
Bromide	<b>37005</b>	<b>37006</b>
Chlorate	<b>37034</b>	-
Chloride	<b>37009</b>	<b>37010</b>
Chlorite	<b>37038</b>	-
Chromate	<b>37042</b>	-
Fluoride	<b>37011</b>	<b>37012</b>
Iodide	<b>37013</b>	-
Nitrate	<b>37019</b>	<b>37020</b>
Nitrate-N	<b>37234</b>	-
Nitrite	<b>37021</b>	<b>37022</b>
Nitrite-N	<b>37235</b>	-
Perchlorate	<b>37048</b>	-
Phosphate	<b>37023</b>	<b>37024</b>
Phosphate-P	<b>37236</b>	-
Sulfate	<b>37031</b>	<b>37032</b>
Thiocyanate	<b>37046</b>	-

#### Cation Standards (125mL)

STANDARD	1000PPM PART No.	200PPM PART No.
Ammonium	<b>37001</b>	<b>37002</b>
Ammonium-N	<b>37233</b>	-
Calcium	<b>37007</b>	<b>37008</b>
Lithium	<b>37015</b>	<b>37016</b>
Magnesium	<b>37017</b>	<b>37018</b>
Potassium	<b>37025</b>	<b>37026</b>
Sodium	<b>37029</b>	<b>37030</b>

### Individual Certified Organic Anion Standards

#### Organic Anion Standards (125mL)

DESCRIPTION	1000PPM PART No.
Acetate	<b>37052</b>
Citrate	<b>37091</b>
Formate	<b>37050</b>
Glycolate	<b>37054</b>
Lactate	<b>37093</b>
Malate	<b>37095</b>
Maleate	<b>37099</b>
Methanesulfonate	<b>37221</b>
Nitritotriacetate (NTA)	<b>37228</b>
Oxalate	<b>37056</b>
Propionate	<b>37229</b>
Succinate	<b>37223</b>
Tartrate	<b>37224</b>

### Individual Certified Organic Acid Standards

#### Organic Acid Standards (125mL)

DESCRIPTION	1000PPM PART No.
Oxalic Acid	<b>37033</b>
Maleic Acid	<b>37037</b>
Malic Acid	<b>37039</b>
Succinic Acid	<b>37043</b>
Formic Acid	<b>37045</b>
Acetic Acid	<b>37047</b>
Citric Acid	<b>37049</b>
Tartaric Acid	<b>37051</b>
Lactic Acid	<b>37053</b>
Abietic Acid	<b>37055</b>
Methanesulfonic Acid	<b>37057</b>

### Individual Certified Amine Standards

#### Amine Standards (125mL)

DESCRIPTION	1000PPM PART No.
Ethanolamine	<b>37225</b>
Diethanolamine	<b>37226</b>
Triethanolamine	<b>37227</b>
Monomethylamine	<b>37230</b>
Dimethylamine	<b>37231</b>
Trimethylamine	<b>37232</b>



# Certified IC Reagents and Standards

Pre-formulated standards and buffers reduce prep time

## Certified Multi-Standard Kits

- Cost-effective ways to purchase multiple single-ion standards

### Multi-Standard Kits

DESCRIPTION	PART NO.
<b>Anion Kits</b>	
<b>200ppm Kit:</b> Contains 125mL ea of 200ppm Certified Cl, F, Br, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , & SO <sub>4</sub>	<b>37035</b>
<b>1000ppm Kit:</b> Contains 125mL ea of 1000ppm Certified Cl, F, Br, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , & SO <sub>4</sub>	<b>37036</b>
<b>Anion and Oxalate Kit:</b> (EPA 300.1Part B) Contains 125mL ea of 200ppm certified Cl, F, Br, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , SO <sub>4</sub> , ClO <sub>2</sub> , ClO <sub>3</sub> , BrO <sub>3</sub>	<b>37085</b>

### Cation Kits

<b>200ppm Kit:</b> Contains 125mL ea of 200ppm Certified Li, Na, NH <sub>4</sub> , K, Mg, & Ca	<b>37040</b>
<b>1000ppm Kit:</b> Contains 125mL ea of 1000ppm Certified Li, Na, NH <sub>4</sub> , K, Mg, & Ca	<b>37041</b>

## Certified Multi-Component Mixtures

- Multiple ions in a single mixture

### Multi-Component Mixtures (125mL)

DESCRIPTION	PART NO.
<b>Anion Mixtures</b>	
<b>Mix A:</b> 125mL Mixture Contains: F(10ppm), Cl(20ppm), NO <sub>2</sub> (20ppm), Br(20ppm), NO <sub>3</sub> (20ppm), PO <sub>4</sub> (30ppm), SO <sub>4</sub> (30ppm)	<b>26910200</b>
<b>Mix 1:</b> 125mL Mixture Contains: F(1ppm), Cl(5ppm), NO <sub>2</sub> (5ppm), Br(5ppm), NO <sub>3</sub> (5ppm), PO <sub>4</sub> (5ppm), SO <sub>4</sub> (5ppm)	<b>269106</b>
<b>Mix 2:</b> 125mL Mixture Contains: F(1ppm), Cl(10ppm), NO <sub>2</sub> (10ppm), Br(10ppm), NO <sub>3</sub> (10ppm), PO <sub>4</sub> (10ppm), SO <sub>4</sub> (10ppm)	<b>269107</b>
<b>Mix 3:</b> 125mL Mixture Contains: F(10ppm), Cl(20ppm), NO <sub>2</sub> (20ppm), Br(20ppm), NO <sub>3</sub> (20ppm), PO <sub>4</sub> (20ppm), SO <sub>4</sub> (20ppm)	<b>269108</b>
<b>Mix 4:</b> 125mL Mixture Contains: F(20ppm), Cl(40ppm), NO <sub>2</sub> (40ppm), Br(40ppm), NO <sub>3</sub> (40ppm), PO <sub>4</sub> (40ppm), SO <sub>4</sub> (40ppm)	<b>269109</b>
<b>Mix 5:</b> 125mL Mixture Contains: F(25ppm), Cl(50ppm), NO <sub>2</sub> (50ppm), Br(50ppm), NO <sub>3</sub> (50ppm), PO <sub>4</sub> (50ppm), SO <sub>4</sub> (50ppm)	<b>269110</b>
<b>Mix 6:</b> 125mL Mixture Contains: Cl(1000ppm), Br(1000ppm), NO <sub>3</sub> (1000ppm), PO <sub>4</sub> (1000ppm), SO <sub>4</sub> (1000ppm)	<b>269111</b>
<b>Mix 7:</b> 125mL Mixture Contains: Cl(15ppm), Br(15ppm), NO <sub>3</sub> (15ppm), PO <sub>4</sub> (15ppm), SO <sub>4</sub> (5ppm)	<b>269112</b>
<b>Mix 8:</b> 125mL Mixture Contains: F(25ppm), Cl(50ppm), SO <sub>4</sub> (100ppm)	<b>269113</b>

### Cation Mixtures

<b>Mix A:</b> 125mL Mixture Contains: Li(0.5ppm), Na(3ppm), NH <sub>4</sub> (3ppm), K(6ppm)	<b>26910300</b>
<b>Mix B:</b> 125mL Mixture Contains: Li(0.2ppm), Na(1.5ppm), NH <sub>4</sub> (1.5ppm), K(2.5ppm), Mg(2.0ppm), Ca(2.0ppm)	<b>26910400</b>



EZ-LUTE™ Buffers for accurate concentrations every time

## EZ-LUTE™ Buffer Concentrates

- Simplify mobile phase preparation
- For anion, cation, and organic acid analyses
- Dilution instructions included

### EZ-LUTE™ Buffer Concentrates\*

DESCRIPTION	PART NO.
<b>Non-suppressed Buffers, 12 x 25mL</b>	
4mM Phthalic Acid,	<b>470217</b>
4mM Phthalic Acid, pH 4.5	<b>470216</b>
4mM p-Hydroxybenzoic Acid	<b>470212</b>
5mM p-Hydroxybenzoic Acid	<b>470215</b>
7mM p-Hydroxybenzoic Acid	<b>470214</b>
5mM LiOH/Benzoate	<b>470213</b>
3mM Methanesulfonic Acid	<b>470211</b>
<b>Suppressor-based Buffers, 1 x 100mL</b>	
1.7mM Bicarbonate/1.8mM Carbonate	<b>470119</b>
2.8mM Bicarbonate/2.2mM Carbonate	<b>470201</b>
0.68mM Bicarbonate/0.72mM Carbonate	<b>470202</b>
2.1mM Bicarbonate/1.6mM Carbonate	<b>470203</b>
1.02mM Bicarbonate/1.08mM Carbonate	<b>470205</b>
0.85mM Bicarbonate/0.9mM Carbonate	<b>470208</b>
0.7mM Bicarbonate/1.2mM Carbonate	<b>470122</b>
3.6mM Carbonate	<b>470123</b>
500mM Bicarbonate	<b>470209</b>
500mM Carbonate	<b>470210</b>

\*Concentration after dilution.

# IC SPE Devices

Eliminate interferences from real-world samples



Maxi-Clean™ Cartridges are easy to process by syringe

## IC Maxi-Clean™ Cartridges

- Improve your chromatography – seven resin types available to remove interfering ions from your sample
- Protect your investment – remove metals, salts, and surfactants that can irreversibly damage expensive IC columns and instruments
- Metal-free construction

### IC Maxi-Clean™ Cartridges

RESIN TYPE	REMOVES	PART NO.
<b>0.5mL Bed Volume, 50/pkg</b>		
IC-RP	Hydrophobic components	<b>30260</b>
IC-OH	Anions, & increases pH	<b>30262</b>
IC-H	Cations, & decreases pH	<b>30264</b>
IC-Ag	Chloride, iodide, & bromide	<b>30266</b>
IC-Ba	Excess sulfate	<b>30268</b>
IC-Na	Cations	<b>30270</b>
IC-Chelate	Transition metals	<b>30250</b>

### 1.5mL Bed Volume, 25/pkg

IC-RP	Hydrophobic components	<b>30252</b>
IC-OH	Anions, & increases pH	<b>30254</b>
IC-H	Cations, & decreases pH	<b>30256</b>
IC-Ag	Chloride, iodide, & bromide	<b>30258</b>
IC-Ba	Excess sulfate	<b>30261</b>
IC-Na	Cations	<b>30263</b>
IC-Chelate	Transition metals	<b>30265</b>

## IC-Ag Removes Chloride

CHROM-10059

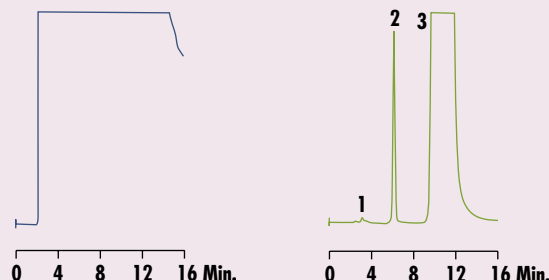
CHROM-10060

### Nitrate in Brine

Unextracted

Extracted

1. Fluoride
2. Nitrate
3. Sulfate



**Column:** Novosep™ A-1, 7µm, 150 x 4.6mm (Part No. **51407**)  
**Mobile Phase:** 1.7mM NaHCO<sub>3</sub>, 1.8mM Na<sub>2</sub>CO<sub>3</sub>  
**Flowrate:** 1.2mL/min  
**Detector:** Suppressed Conductivity

**IC-Ag removes high levels of chloride, revealing the other ions in the sample.**

## IC-Chelate Protects Anion Columns

CHROM-10057

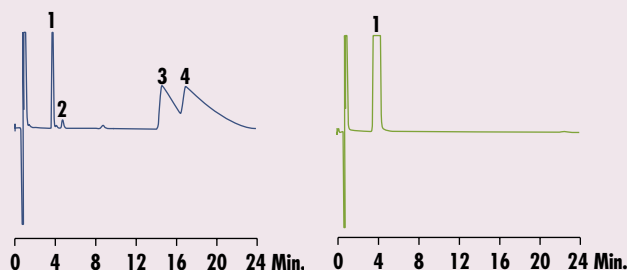
CHROM-10058

### Tap Water

Unextracted

Extracted

1. Sodium
2. Potassium
3. Magnesium
4. Calcium



**Column:** Universal Cation, 7µm, 100 x 4.6mm (Part No. **27106**)  
**Mobile Phase:** 3mM Methanesulfonic Acid  
**Flowrate:** 1.0mL/min  
**Detector:** Suppressed Conductivity

**IC-Chelate protects anion columns by removing polyvalent metals.**



# Metal-Free Tubing

Easily plumb IC systems with flexible, inert, polymeric tubing

## Flex-Connect™ Tubing

- Flexible coils stretch and contract to make connections easier
- Color identifies ID
- Includes 2 one-piece PEEK fittings



### Flex-Connect™ PEEK Tubing

COLOR	DIMENSIONS OD x ID	PRES. RATE (PSIG)	SIZE RANGE*	STRIPED PART NO.	SOLID PART NO.
<b>Red</b>	1/16" x 0.005"	7,000	1-5cm	<b>35851</b>	<b>35801</b>
	1/16" x 0.005"	7,000	2-10cm	<b>35852</b>	<b>35802</b>
	1/16" x 0.005"	7,000	3-15cm	<b>35853</b>	<b>35803</b>
	1/16" x 0.005"	7,000	5-25cm	<b>35854</b>	<b>35804</b>
<b>Yellow</b>	1/16" x 0.007"	7,000	1-5cm	<b>35861</b>	<b>35811</b>
	1/16" x 0.007"	7,000	2-10cm	<b>35862</b>	<b>35812</b>
	1/16" x 0.007"	7,000	3-15cm	<b>35863</b>	<b>35813</b>
	1/16" x 0.007"	7,000	5-25cm	<b>35864</b>	<b>35814</b>
<b>Blue</b>	1/16" x 0.010"	5,000	1-5cm	<b>35871</b>	<b>35821</b>
	1/16" x 0.010"	5,000	2-10cm	<b>35872</b>	<b>35822</b>
	1/16" x 0.010"	5,000	3-15cm	<b>35873</b>	<b>35823</b>
	1/16" x 0.010"	5,000	5-25cm	<b>35874</b>	<b>35824</b>
	1/16" x 0.010"	5,000	10-50cm	<b>35875</b>	<b>35825</b>
1/16" x 0.010"	5,000	15-75cm	<b>35876</b>	<b>35826</b>	
<b>Orange</b>	1/16" x 0.020"	4,000	1-5cm	<b>35881</b>	<b>35831</b>
	1/16" x 0.020"	4,000	2-10cm	<b>35882</b>	<b>35832</b>
	1/16" x 0.020"	4,000	3-15cm	<b>35883</b>	<b>35833</b>
	1/16" x 0.020"	4,000	5-25cm	<b>35884</b>	<b>35834</b>
<b>Green</b>	1/16" x 0.030"	4,000	1-5cm	<b>35891</b>	<b>35841</b>
	1/16" x 0.030"	4,000	2-10cm	<b>35892</b>	<b>35842</b>
	1/16" x 0.030"	4,000	3-15cm	<b>35893</b>	<b>35843</b>
	1/16" x 0.030"	4,000	5-25cm	<b>35894</b>	<b>35844</b>

\*First dimension is relaxed coil, second dimension is extended coil. Does not include 6" straight lengths at ends.

## Color-Coded Teflon® Tubing

- Maximum inertness
- For low pressures
- Color identifies ID



### Color-Coded Teflon® Tubing

COLOR	DIMENSIONS OD x ID	PRES. RATE (PSIG)	QTY	PART No.
<b>Blue</b>	1/16" x 0.010"	1500	10ft	<b>35660</b>
	1/16" x 0.010"	1500	50ft	<b>35661</b>
<b>Orange</b>	1/16" x 0.020"	1200	10ft	<b>35662</b>
	1/16" x 0.020"	1200	50ft	<b>35663</b>
<b>Green</b>	1/16" x 0.030"	900	10ft	<b>35664</b>
	1/16" x 0.030"	900	50ft	<b>35665</b>

## PEEK Tubing

- For high pressures
- Color identifies ID
- Choose solid or striped colors



### Color-Coded PEEK Tubing

COLOR	DIMENSIONS OD x ID	PRES. RATE (PSIG)	QTY	STRIPED PART No.	SOLID PART No.
<b>Red</b>	1/16" x 0.005"	7,000	10ft	<b>35714</b>	<b>35720</b>
<b>Yellow</b>	1/16" x 0.007"	7,000	10ft	<b>35712</b>	<b>35722</b>
<b>Blue</b>	1/16" x 0.010"	5,000	10ft	<b>35702</b>	<b>35728</b>
<b>Orange</b>	1/16" x 0.020"	4,000	10ft	<b>35708</b>	<b>35726</b>
<b>Green</b>	1/16" x 0.030"	4,000	10ft	<b>35710</b>	<b>35724</b>

## Teflon® Tubing

- Maximum inertness
- For low pressures



### Teflon® Tubing

DIMENSIONS OD x ID	PRES. RATE (PSIG)	QTY	PART No.
1/16" x 0.007"	1600	10ft	<b>35677</b>
1/16" x 0.010"	1500	10ft	<b>20064</b>
1/16" x 0.020"	1200	10ft	<b>20033</b>
1/16" x 0.030"	900	10ft	<b>20031</b>
1/16" x 0.040"	600	10ft	<b>20106</b>
1/8" x 0.063"	900	10ft	<b>20063</b>
1/8" x 0.100"	300	10ft	<b>20096</b>

## Plastic Tubing Cutter

- Ideal for PEEK, Tefzel®, and other plastic tubing up to 1/8" OD



### Plastic Tubing Cutter

DESCRIPTION	PART No.
Plastic Tubing Cutter	<b>3206</b>
Replacement Blade	<b>3214</b>

# Metal-Free Fittings

Durable, easy-to-use fittings for every need



High-pressure ergonomic fittings



Low-pressure, hassle-free nuts and ferrules

## SofGrip™ One-Piece Fittings

- Graph-Tite™ construction is 3X stronger than PEEK
- Soft elastomer cushion makes hand-tightening comfortable
- One-piece integrated ferrule eliminates handling small pieces
- No-Slip™ version lightly grips tubing which holds the fitting in place between connections

## Flange-Free™ Nuts and Ferrules†

- Connects to 1/4-28 flat bottomed ports without flanging tools
- Hand-tightens to a leak-free seal
- Inert, biocompatible construction

† U.S. Patent #4,690,437

### SofGrip™ Fittings

**Max. Temperature:** 100°C  
**Max. Pressure:** 5000psig  
**Thread Type:** 10-32 UNF  
**Connection:** 1/16" OD Tubing

### Flange-Free™ Fittings

**Max. Temperature:** 100°C  
**Max. Pressure:** 500psig for 1/8", 1000psig for 1/16"  
**Thread Type:** 1/4-28 UNF  
**Connection:** 1/8" or 1/16" OD Tubing

### SofGrip™ Fittings

LENGTH	COLOR	QTY	PART No.
<b>Standard One-Piece</b>			
Short	Black	10	<b>40501</b>
Short	Red	10	<b>40502</b>
Short	Blue	10	<b>40503</b>
Short	Green	10	<b>40504</b>
Short	Yellow	10	<b>40505</b>
Short	Assorted	10	<b>40507</b>

### No-Slip™ One-Piece

Long	Black	10	<b>40516</b>
Short	Black	10	<b>40511</b>
Short	Red	10	<b>40512</b>
Short	Blue	10	<b>40513</b>
Short	Green	10	<b>40514</b>
Short	Yellow	10	<b>40515</b>
Short	Assorted	10	<b>40517</b>

### Flange-Free™ Nuts and Ferrules

DESCRIPTION	MATERIAL	QTY	1/16" OD	1/8" OD
			TUBING PART No.	TUBING PART No.
<b>Finger-Tight™ Nuts</b>				
Natural	PEEK	10	<b>37065</b>	<b>37075</b>
Black	PEEK	10	<b>37067</b>	<b>37077</b>
Red	PEEK	10	<b>37062</b>	<b>37072</b>
Yellow	PEEK	10	<b>37064</b>	<b>37074</b>
Blue	PEEK	10	<b>37066</b>	<b>37076</b>
Green	PEEK	10	<b>37068</b>	<b>37078</b>

### Flange-Free™ Ferrules

PEEK	10	<b>201171</b>	<b>201271</b>
Kel-F®	10	<b>201152</b>	<b>201251</b>

# Polypropylene Vials

*Eliminate interferences by avoiding glass surfaces*



*Inert polypropylene for IC samples*



*Hinged lid with secure snap clasp*

## Polypropylene Vials

Metallic ions can leach from glass under certain conditions. Avoid these potential contaminants by choosing polypropylene vials.

### Polypropylene Vials and Caps

DESCRIPTION	PART NO.
<b>12x32mm Standard Mouth Screw Thread Vials, 100/pkg</b>	
600µL Polypropylene Vial with 8/425 Thread	<b>89073</b>
100µL Polypropylene Vial with 8/425 Thread	<b>12962</b>
8/425 Black Cap with TFE/Silicone Liner	<b>98061</b>

<b>12x32mm Wide Mouth Screw Thread Vials, 100/pkg</b>	
750µL Polypropylene Vial with 10/425 Thread	<b>98099</b>
500µL Polypropylene Vial with 10/425 Thread	<b>98310</b>
10/425 Black Cap with TFE/Butyl Liner	<b>97274</b>
10/425 Black Cap with TFE/Silicone Liner	<b>98144</b>

<b>12x32mm Crimp Style Vials, Use 11mm Seal, 100/pkg</b>	
750µL Polypropylene Vial	<b>98050</b>
600µL Polypropylene Vial	<b>88363</b>
500µL Polypropylene Vial	<b>98842</b>
300µL Polypropylene Vial	<b>12990</b>
100µL Polypropylene Vial	<b>12960</b>
11mm Aluminum Seal with TFE/Butyl Liner	<b>73070</b>
11mm Aluminum Seal with TFE/Silicone Liner	<b>98740</b>
11mm Poly Crimp™ Seal with TFE/Butyl Liner	<b>95232</b>
11mm Poly Crimp™ Seal with TFE/Silicone Liner	<b>95234</b>

<b>15x45mm (4mL) Vials, 100/pkg</b>	
2.5mL Polypro. Vial with 13/425 Screw Thread	<b>98091</b>
2.5mL Polypropylene Crimp Vial with 13mm Seal	<b>98054</b>
13/425 Black Cap with TFE/Silicone Liner	<b>98610</b>
13mm Snap TOP Cap™ with TFE/Butyl Liner	<b>98048</b>
13mm Snap TOP Cap™ with TFE/Silicone Liner	<b>98044</b>

<b>8x40mm (1mL) Shell Vials, 100/pkg</b>	
Polypropylene Shell Vial	<b>88625</b>
Polyethylene Starburst Snap Plug	<b>88613</b>

<b>Larger Volume Vials, Supplied with Caps and Liners</b>	
5mL Teflon® PFA Vials, 10/Pkg	<b>97050</b>
7mL Teflon® PFA Vials, 10/Pkg	<b>97070</b>
Replacement Liners for Teflon® Vials, 30/Pkg	<b>95363</b>
7mL Polyethylene Vials, 100/Pkg	<b>97052</b>

## Polypropylene Storage Boxes

- Stackable with writing panel on lid
- Alpha-numeric code on grids for easy sample ID
- Rated to -90°C
- Available in six colors

### Polypropylene Storage Boxes

DESCRIPTION	QTY	PART NO.
<b>For 12x32mm Vials to Hold 100 Vials</b>		
Clear	5	<b>95129</b>
Blue	5	<b>95131</b>
Green	5	<b>95132</b>
Orange	5	<b>95133</b>
Pink	5	<b>95134</b>
Yellow	5	<b>95135</b>
Assorted, 1 of Ea/5 Colors	5	<b>95005</b>
<b>to Hold 50 Vials</b>		
Clear	5	<b>95029</b>
Blue	5	<b>95106</b>
Green	5	<b>95027</b>
Orange	5	<b>95028</b>
Pink	5	<b>95089</b>
Yellow	5	<b>95108</b>
Assorted, 1 of Ea/5 Colors	5	<b>95008</b>



For the full listing of Alltech vials, request brochure #445, or visit our online technical library at [www.alltechWEB.com](http://www.alltechWEB.com).

# Other IC Accessories

*Metal-free filters, loops, valves, and syringes to complete your IC system*

## Metal-Free Mobile Phase Inlet Filters

- Easy connection to 1/4-28 fittings
- Inert PEEK and polyethylene construction



### Metal-Free Inlet Filters

DESCRIPTION	POROSITY	QTY	PART No.
for 1/8" OD	20µm	Ea	<b>32170</b>
for 1/16" OD	20µm	Ea	<b>32171</b>
Replacement Polyethylene Filter Elements	20µm	5	<b>32173</b>

## Metal-Free In-Line Filter

- Install between injection valve and column
- Inert PEEK and PAT\* construction
- Use with 10-32 fittings
- 5,000psig pressure limit



\*PEEK Alloyed with Teflon.

### Metal-Free In-Line Filters

DESCRIPTION	QTY	PART No.
For 1/16" OD	Ea	<b>68250</b>
Replacement PAT 2µm Filter Elements	5	<b>68152</b>

## Flex-Connect™ Sample Loops

- Flexible coil for easy installation
- Universal fittings prevent dead volume
- 100% PEEK construction prevents corrosion and sample loss
- Use with Rheodyne or other common injection valves



### Flex-Connect™ Sample Loops

DESCRIPTION	QTY	PART No.
<b>Flex-Connect™ Sample Loops (PEEK)</b>		
5µL Flex-Loop	Ea	<b>32194</b>
10µL Flex-Loop	Ea	<b>32196</b>
20µL Flex-Loop	Ea	<b>32195</b>
50µL Flex-Loop	Ea	<b>32202</b>
100µL Flex-Loop	Ea	<b>32204</b>
200µL Flex-Loop	Ea	<b>32206</b>
500µL Flex-Loop	Ea	<b>32210</b>
1mL Flex-Loop	Ea	<b>32222</b>

### Fittings (PEEK)

Short Hex-Head Nut and Ferrule	5	<b>32215</b>
Long Hex-Head Nut and Ferrule	5	<b>32217</b>
Two-Piece Ferrule	5	<b>32218</b>

## Plastic Syringes

- Economical and disposable
- All polypropylene construction
- Luer hub needles sold separately



### Disposable Plastic Syringes

DESCRIPTION	QTY	PART No.
1mL Plastic Syringe	12	<b>44701100</b>
5mL Plastic Syringe	12	<b>447012</b>
20mL Plastic Syringe	2	<b>447018</b>
CTFE Luer-Hub Needle for Rheodyne, Valco (VISF-2), and other common injection valves	6	<b>90536</b>

## Rheodyne® Manual PEEK Injection Valves

- For complete or partial loop filling
- 5,000psig maximum pressure
- Metal-free flow path



### Manual PEEK Injection Valves

DESCRIPTION	PART No.
Model 9725	<b>40010</b>
Model 9725i with Position Sensing Switch	<b>40011</b>
Suction Needle Adaptor	<b>40016</b>

## Rheodyne® MX Semi-Automatic Injection Valves

- The push of a button injects sample without the inconsistencies of manually turning a handle. Also capable of unattended injection.
- Installs easily without special software
- 5,000psig maximum pressure

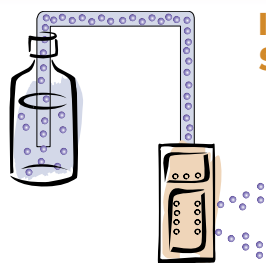


### Semi-Automatic Injection Valves

DESCRIPTION	PART No.
PEEK, 100-240VAC, 50/60Hz	<b>449925</b>
Stainless Steel, 100-240VAC, 50/60Hz	<b>447925</b>

# Instrument Introduction

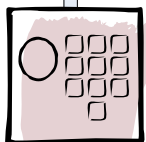
*Buy only the components you need or build a complete system*



## Ion Chromatography System Components

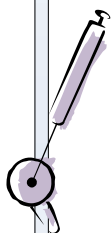
Degassers remove unwanted air from the mobile phase, giving stable baselines

**Page 24**



Pumps deliver the sample and solvents to the column

**Pages 22-23**



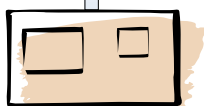
Injection valves or autosamplers inject samples onto the column

**Pages 20, 25**



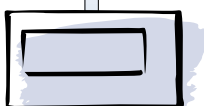
IC columns separate the ionic compounds in the sample

**Pages 4-11**



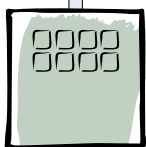
Column heaters control the temperature of the column

**Page 26**



Ion suppressors reduce the conductivity of the mobile phase for high-sensitivity anion analyses

**Pages 28-30**



Conductivity detectors visualize the ions in the sample based on their electrical conductance

**Pages 26**



Data system software can collect and log data from instruments

**Back Cover**

## Don't buy an entire system if all you need is detection-

Now you can easily and affordably add IC detection to your existing HPLC equipment with Alltech's conductivity detector and NEW low-cost, high-performance Models 640 and 641 Suppressors. More durable than membrane suppressors, these patented suppressors continuously regenerate and are compatible with carbonate mobile phases (even gradients!).



**Q: What is the difference between suppressed and non-suppressed detection?**

**A: Suppressor-based detection is the best method for anion analysis.** Suppression is only required when using a conductivity detector. What is suppression? Some anion exchange mobile phases are highly conductive, and can interfere with conductivity detection – they introduce too much background to visualize the low-level anions in the sample. Mobile phase conductivity needs to be “suppressed” to efficiently detect sample anions at low concentrations. Suppressors allow the ppb-level sensitivity required for many EPA methods. Suppressors also let you use gradient elution for complex samples.

**Non-suppressed detection is the best method for cation analysis.** It is sometimes called Single Column Ion Chromatography (SCIC). It is also useful for anion exchange applications that do not require ppb-level sensitivity. It allows more mobile phase choices than suppressed IC, such as phthalic acid or p-hydroxy benzoic acid mobile phases used for some separations.

*Can we help with your chromatography questions?  
Email us at [tech\\_service@alltechemail.com](mailto:tech_service@alltechemail.com)*



# Pumps

Low cost, high performance pumps



Two models available for standard or macro flow rates.

## Model 426 Pump

- Pressure monitoring and adjustable upper/lower pressure limits
- Isocratic, single-piston pump
- Automatic prime/purge for easy operation

The Model 426 pump is a low cost, high performance pump ideal for many LC and IC applications including semi-preparative, preparative, analytical research and development, and quality assurance. It is available in either traditional 316 stainless steel or biocompatible PEEK. It has interface features for control by another instrument, such as an autosampler or integrator. Use an RS-232C jack for remote operation from your PC.

## Biocompatible Polyethylene Bottle Kits

- Improve pump performance by pressurizing solvent bottles
- Thick-walled HDPE bottles will not break
- Safety pop-up valve

Kits include one bottle with purge vent valve cap, storage cap, tubing, and three titanium spargers.



## HDPE Bottle Kits

DESCRIPTION	PART No.
1L Bottle Kit	<b>90000365</b>
2L Bottle Kit	<b>90000362</b>
4L Bottle Kit	<b>90000360</b>

## Model 426 Pump Specifications

<b>Maximum Pressure:</b>	6,000psig (Standard, SS) 5,000psig (Standard, PEEK) 1,500psig (Macro)
<b>Flowrate Range:</b>	0.01 to 10mL/min (Standard) 0.04 to 40mL/min (Macro)
<b>Flowrate Precision:</b>	0.2% RSD
<b>Flow Accuracy:</b>	2.0%
<b>Dimensions:</b>	6" H x 11" W x 18" D (15 x 26 x 46cm)
<b>Weight:</b>	30 lbs (14kg)
<b>Warranty:</b>	3 year parts excluding seals and check valves; 1 year labor

## Model 426 Pumps

DESCRIPTION	VOLTAGE	PART No.
<b>Standard</b>		
<b>PEEK</b>	110V/50-60Hz	<b>426100</b>
	220V/50-60Hz	<b>426101</b>
<b>Stainless Steel</b>	110V/50-60Hz	<b>426200</b>
	220V/50-60Hz	<b>426201</b>
<b>Macro</b>		
<b>PEEK</b>	110V/50-60Hz	<b>426300</b>
	220V/50-60Hz	<b>426301</b>
<b>Stainless Steel</b>	110V/50-60Hz	<b>426400</b>
	220V/50-60Hz	<b>426401</b>

## Model 426 Kits and Accessories

DESCRIPTION	PART No.
<b>Pump Head Kits</b>	
Standard, PEEK	<b>120800</b>
Standard, Stainless Steel	<b>120799</b>
Macro, PEEK	<b>120802</b>
Macro, Stainless Steel	<b>120801</b>
<b>Replacement Parts</b>	
Piston Seal Kit, Standard Head, 10mL	<b>120680</b>
Piston Seal Kit, Macro Head, 40mL	<b>120681</b>
Piston, Standard Head, 10mL	<b>121486</b>
Piston, Macro Head, 40mL	<b>121504</b>
Check Valve Kit, Stainless Steel	<b>120679</b>
Check Valve Kit, PEEK	<b>060141</b>

## Isocratic pump upgrades to a binary system



Use one pump for isocratic applications, or choose a two-pump binary gradient system for high-pressure binary gradient applications.

### Model 626 Pump

- Suitable for standard and microflow applications
- Dual piston mechanism for pulse-free operation
- Pressure monitoring and adjustable upper/lower pressure limits
- Programmable flow rates from 0.001 mL/min to 12.0 mL/min

The Model 626 Pump is a rugged and reliable component for a basic analytical system, a sophisticated method development system, or for general laboratory or industrial use. It is available in either traditional 316 stainless steel or biocompatible PEEK.

Buy one pump now, and upgrade to a binary system later by purchasing a second pump and a High-Pressure Gradient Kit.

### Polypropylene Filter Funnel Systems

- Unbreakable, inert polypropylene
- Leak-proof GL45 threads
- Use with 47mm filter membranes
- In-line version available - visit our website



#### Polypropylene Filter Funnel System

DESCRIPTION	PART NO.
<b>1L Filter Funnel System</b> Includes: base, adaptor kit, mesh filter support, 1L funnel	<b>6409</b>
<b>2L Filter Funnel System</b> Includes: base, adaptor kit, mesh filter support, 2L funnel	<b>6429</b>

#### Model 626 Pump Specifications

<b>Maximum Pressure:</b>	6,000psig (Stainless Steel) 5,000psig (PEEK)
<b>Flowrate Range:</b>	0.001 - 12.0 mL/min
<b>Flowrate Precision:</b>	0.2% RSD
<b>Flow Accuracy:</b>	2.0%
<b>Gradient Programming:</b>	10 methods with up to 100 lines per method
<b>Dimensions:</b>	6" H x 11" W x 18" D (15cm x 26cm x 46cm)
<b>Weight:</b>	30 lbs (14 kg)
<b>Warranty:</b>	3 year parts excluding seals and check valves; 1 year labor

### Model 626 Pump

DESCRIPTION	PART NO.
<b>Isocratic System</b>	
<b>Stainless Steel</b>	
110V	<b>626100</b>
220V	<b>626101</b>
<b>PEEK</b>	
110V	<b>626200</b>
220V	<b>626201</b>

#### Binary Gradient System

Includes 2 pumps, system controller, control cables, mixing tee, tubing, and fittings

<b>Stainless Steel</b>	
110V	<b>626300</b>
220V	<b>626301</b>
<b>PEEK</b>	
110V	<b>626400</b>
220V	<b>626401</b>

### Model 626 Kits and Accessories

DESCRIPTION	PART NO.
<b>High Pressure Gradient Kit</b>	
Includes system controller, control cables, mixing tee, fittings & tubing	
PEEK	<b>105626</b>
Stainless Steel	<b>105624</b>
<b>Replacement Parts</b>	
Piston Seal Kit	<b>160566</b>
Piston	<b>160565</b>
Check Valve Kit, Stainless Steel	<b>120679</b>
Check Valve Kit, PEEK	<b>060141</b>

Note: All replacement parts contain parts for one pump head only.

# On-Line Degassing Systems

Upgradable systems to meet every need and budget



Alltech's On-Line Degassing System use the latest technology to remove air from your mobile phase efficiently and economically.

## On-Line Degassing Systems

- Most advanced degassing technology
- Choose from two families for basic or advanced features
- Choose from three flowrates, up to 10mL/min
- Upgrade the number of channels as your needs change

With today's smaller sample volumes and more sensitive detection methods, degassing your mobile phases has never been so important. Unwanted air in the mobile phase gives noisy baselines and fluctuating flow rates in your analytical results.

### Why choose an Alltech Degassing System?

1. Teflon® AF membranes for high efficiency and fast equilibration.
2. Continuous-run pumps for stable baselines.
3. NO-OX® tubing keeps the solvent degassed as it travels to the pump.

### Two families to choose from:

Choose the Elite™ Degassing System for output validation, Smart Sensor to detect leaks, a self-adjusting vacuum pump, and a 4-year warranty.

Choose the Select™ Degassing System for the same degassing efficiency with a cost-conscious price tag and a 1-year warranty.

### Channel Upgrade Capability

As your needs change, you can replace or add up to four degassing channels per unit. For example, upgrade from a 2-Channel Micro Degassing System to a 4-Channel Analytical Degassing System. Or, keep your current channels and add other channels for other flow rates. Change the channels yourself in under an hour or let Alltech do it for you.

### Degassing System Specifications

	ELITE™ FAMILY	SELECT™ FAMILY
<b>Membrane Type:</b>	Teflon® AF	Teflon® AF
<b>Pump Type:</b>	Continuous-run, self-adjusting speed	Continuous-run, one speed
<b>NO-OX® Tubing</b>	Yes	Yes
<b>Smart Vacuum Sensor:</b>	Yes	No
<b>Validation Output:</b>	Yes (5mVDC/1mm Hg)	No
<b>Warranty:</b>	4 year	1 year

## On-Line Degassing Systems

DESCRIPTION	ELITE™ FAMILY PART No.	SELECT™ FAMILY PART No.
-------------	---------------------------	----------------------------

### Micro, 0-1mL/min, 195µL internal volume

2 Channel	<b>590507</b>	<b>590500</b>
4 Channel	<b>590508</b>	<b>590501</b>

### Analytical, 0-5mL/min, 480µL internal volume

1 Channel	<b>590509</b>	<b>590502</b>
2 Channel	<b>590510</b>	<b>590503</b>
3 Channel	<b>590511</b>	<b>590504</b>
4 Channel	<b>590512</b>	<b>590505</b>

### Semi-Prep, 0-10mL/min, 925µL internal volume

1 Channel	<b>590517</b>	<b>590514</b>
2 Channel	<b>590513</b>	<b>590506</b>
3 Channel	<b>590518</b>	<b>590515</b>
4 Channel	<b>590519</b>	<b>590516</b>

### Channel Upgrade Kits\*

DESCRIPTION	PART No.
Micro, 0-1mL	<b>590520</b>
Analytical, 0-5mL	<b>590521</b>
Semi-Prep, 0-10mL	<b>590522</b>

\*Includes degassing channel, vacuum tubing, mounting screw, identification sticker, and instructions.

### Face Plates\*

DESCRIPTION	PART No.
For 1 Channel	<b>590506A</b>
For 2 Channel	<b>590506B</b>
For 3 Channel	<b>590506C</b>
For 4 Channel	<b>590506D</b>

\*To replace an existing degassing channel, only a channel upgrade kit is necessary. To add more channels, a new face plate is also required.

### Alltech Upgrade Labor Charge\*

DESCRIPTION	PART No.
Labor	<b>590525</b>

\*Channel upgrade kit and face plate must be ordered separately.



# Autosampler

Inject up to 96 samples reliably and reproducibly



Interfaces to any LC or IC system

## Model 570 Autosampler

- Low cost automation
- Nine injections per vial
- PEEK versions available

The Model 570 Autosampler is the perfect autosampler for everyday needs. It has input and output signals and programmable contact closures. This easy-to-use unit is ideal for routine automated IC or HPLC analysis.

### Choose the best model for you:

#### Loop Filling:

- Flushed – maximum precision and reproducibility
- Partial – ideal when sample waste must be minimized

#### Construction:

- PEEK – for ion-sensitive or biological applications, or for use with corrosive buffers
- Stainless Steel – for standard applications

#### Cooling:

- All models are available with or without a cooling option. Cooling prevents biological sample spoilage and gives more reproducible injections of volatile samples.

### 570 Autosampler Specifications

<b>Vial Capacity:</b>	96 samples (92 with needle wash)
<b>Injection Volume:</b>	<i>Flushed Loop Fill:</i> 5-500 $\mu$ L (dispenser controlled), 5-5000 $\mu$ L (by head space pressure). <i>Partial Loop Fill:</i> 10-490 $\mu$ L in steps of 10 $\mu$ L (depending on the loop volume, maximum 50% of the loop volume)
<b>Injections/Vial:</b>	9 Maximum
<b>Needle Wash:</b>	Selectable, 50 $\mu$ L fixed volume between vials
<b>Reproducibility:</b>	<i>Flushed Loop Injections:</i> RSD $\leq$ 0.5% <i>Partial Loop Injections:</i> RSD $\leq$ 1.0%
<b>Power:</b>	115 VAC/230VAC; 50/60Hz
<b>Dimensions:</b>	11.8" W x 17.3" D x 11.1" H (30cm W x 44cm D x 28cm H)
<b>Weight:</b>	34lbs (15.5kg)
<b>Warranty:</b>	1 year

## Model 570 Autosampler

DESCRIPTION	PART No.
<b>Flushed Loop Filling</b>	
Standard Volume, 1.5mL Vials	<b>575100</b>
Standard Volume w/Cooling Option	<b>575300</b>
Standard Volume, PEEK	<b>575500</b>
Standard Volume w/Cooling, PEEK	<b>575700</b>

### Partial Loop Filling

Standard Volume, 1.5mL Vials	<b>570150</b>
Standard Volume w/Cooling Option	<b>570350</b>
Standard Volume, PEEK	<b>570550</b>
Standard Volume w/Cooling, PEEK	<b>570750</b>

## Replacement Parts

DESCRIPTION	PART No.
Pump Tubing Cassette	<b>575115</b>
Side-Port Sample Needle, 3/pkg	<b>575130</b>
Large Volume Option, Field Installable	<b>575165</b>
Air Needle	<b>575125</b>
Sample Drain for Headspace Pressure	<b>575170</b>
Auxiliary and Control I/O Cable	<b>570101</b>
Tubing from Needle to Valve, 10ft	<b>20064</b>
Needle Connection Nut	<b>575175</b>
Needle Connection Ferrule, 10/pkg	<b>575185</b>
Standard Vial Tray	<b>575110</b>



See page 19 for polypropylene vials.

# Conductivity Detector and Column Heater

The easy way to add IC capability to any HPLC system



Use the conductivity detector alone, or in conjunction with its dedicated column heater for the best control and reproducibility of your results.

## Model 650 Conductivity Detector and Model 630 Column Heater

- Precise temperature control gives stable, drift-free baselines
- Detects charged species at ppb levels
- Compatible with suppressor-based and non-suppressed methods

Unlike other detectors, the Model 650 Conductivity Detector can discriminate between random noise and the analyte signal, improving sensitivity. You can easily program and store up to 10 methods through the front panel controls.

You can further improve your results by using the Model 630 Column Heater to eliminate problems caused by fluctuating column temperatures. The Model 630 Column Heater cannot be used as a stand-alone column heater; it is programmed and controlled by the Model 650 Conductivity Detector. Not sure you need a column heater? You can always add it to your system later.



Do you need a stand-alone column heater? Visit our website to learn about the Model 631 Column Heater.

### Model 650 Conductivity Detector Specifications

<b>Detection:</b>	Alternating current, synchronous detection, 3KHz frequency
<b>Range:</b>	0.01-5000 $\mu$ S in 12 steps
<b>Display:</b>	Graphical LCD
<b>Autozero:</b>	Offsets up to 10,000 $\mu$ S
<b>Time Constant:</b>	0.1, 0.5, 1, 5, 10sec, software selectable
<b>Method Storage:</b>	0-9, user defined
<b>Output:</b>	10mV, 100mV, 1V Full Scale
<b>Computer Interface:</b>	RS-232 Serial Communications
<b>Fluid Path:</b>	Teflon <sup>®</sup>
<b>Dimensions:</b>	10.5" W x 19" L x 5.5" H (26.7cm x 48cm x 14cm)

### Cell Compartment

<b>Size:</b>	2.25" W x 2.25" H x 6.25" L (5.7cm x 5.7cm x 15.9cm)
<b>Insulation:</b>	Minimum 1" (2.54cm) all sides
<b>Heater:</b>	25W DC heating element vulcanized to aluminum block
<b>Preheater:</b>	Teflon <sup>®</sup> tubing knitted and encased in high thermal mass housing
<b>Cell Temperature:</b>	Factory set at 35°C, User adjustable ambient to 60°C
<b>Temp. Precision:</b>	$\pm$ 0.05°C
<b>Cell Type:</b>	2 electrode, gold-plated SS electrodes
<b>Cell Volume:</b>	0.5 $\mu$ L
<b>Pressure Rating:</b>	400psig
<b>Fluid Path:</b>	Teflon <sup>®</sup>

### Model 630 Column Heater Specifications

<b>Cavity Dimensions:</b>	1.8" H x 5.0" W x 16.5" D (4.5 H x 12.7 W x 41.9 D cm)
<b>Preheater:</b>	2' x 0.01" ID PEEK coil cast in tin alloy block
<b>Temperature Control:</b>	Ambient to 60°C
<b>Temperature Accuracy:</b>	$\pm$ 2.5°C
<b>Temperature Stability:</b>	$\pm$ 1.25°C
<b>Operating Voltage:</b>	115V, 230V
<b>Fluid Path Construction:</b>	PEEK
<b>Dimensions:</b>	5.0" H x 10.3" W x 19.5" D (13cm H x 26cm W x 50cm D)

See page 31 for pricing on detection systems.

### Model 650 Conductivity Detector & Column Heater

DESCRIPTION	PART No.
<b>Model 650 Conductivity Detector</b>	
120V	<b>650100</b>
220V	<b>650101</b>
<b>Model 630 Column Heater</b>	
120V	<b>630100</b>
220V	<b>630200</b>

# UV Detectors

## UV detection for specialized IC applications



High efficiency, low drift UV/VIS detector operates from 190nm to 800nm



Affordability for today, adaptability for tomorrow

### Model 200, Variable Wavelength

- Simple analog controls
- Interchangeable flowcells and lamps

Includes a deuterium lamp for detection from 190nm to 365nm. Use the optional tungsten lamp to detect from 366nm to 800nm. Lamps and flowcells are easy to change and install.

### Model 460, Fixed Wavelength

- Low maintenance
- Upgrade as needed

Optional lamp and flowcells let you upgrade and customize for your ever-changing needs. Detect most aromatic compounds with the standard 254nm lamp. Change to the higher sensitivity 280nm lamp for proteins, peptides, phenols, and catecholamines. Lamps are easy to change and are self-aligning.

#### Model 200 UV/VIS Specifications

<b>Wavelength Range:</b>	190-800nm with deuterium and tungsten lamps
<b>Wavelength Precision:</b>	±1.0nm
<b>Spectral Bandwidth:</b>	6nm
<b>Noise:</b>	<±1.0 × 10 <sup>-5</sup> AU @ 254nm
<b>Drift:</b>	<2 × 10 <sup>-4</sup> AU/Hour after warm-up
<b>Absorbance Range:</b>	0.0005-2.0 AUFS
<b>Data Output:</b>	1 AU/V
<b>Recorder Outputs:</b>	10mV, 100mV, 1V FS
<b>Dimensions:</b>	6.3" H x 13.4" W x 9.8" D (16cm H x 34cm W x 25cm D)
<b>Weight:</b>	20lbs (9.1kg)
<b>Warranty:</b>	1 year, 90 days on flowcell

#### Model 460 UV Detector Specifications

<b>Wavelength:</b>	254nm or 280nm		
<b>Lamp Life:</b>	4000 – 6000 hours		
<b>Flow Cells:</b>	<b>Standard</b>	<b>Microbore</b>	<b>Preparative</b>
<b>Path Length:</b>	10mm	2mm	1mm
<b>Volume:</b>	19µL	1µL	15µL
<b>Wavelength Precision:</b>	> ± 0.2nm		
<b>Spectral Bandwidth:</b>	0.1nm		
<b>Noise:</b>	< ± 1 × 10 <sup>-5</sup> AU		
<b>Drift:</b>	< ± 1 × 10 <sup>-4</sup> AU		
<b>Absorbance Range:</b>	0.0005 – 4.0 AU/V with voltage range of ± 4 V at any scale		
<b>Data Output:</b>	1.0 V/AU		
<b>Inputs:</b>	Autozero and event mark		
<b>Dimensions:</b>	6.6" H x 9.4" W x 15" D		
<b>Weight:</b>	12lb (5.5kg)		
<b>Warranty:</b>	1 year		

### Model 200 UV/VIS Detector (C)

DESCRIPTION	PART No.
-------------	----------

#### Model 200 Detector

<b>With 6mm, 9µL SS Flowcell</b>	
110V	<b>27410000</b>
220V	<b>27410002</b>
<b>With 6mm, 9µL Kel-F® Flowcell</b>	
110V	<b>27410010</b>
220V	<b>27410020</b>

#### Lamps

Tungsten Lamp and Mounting Plate **2037079**



For additional replacement parts and accessories, request ISO22, or visit our online technical library at [www.alltechWEB.com](http://www.alltechWEB.com).

### Model 460 UV Detector (C)

DESCRIPTION	PART No.
-------------	----------

<b>460 UV Detector with 254nm Lamp</b>	
Standard Cell	<b>460300</b>
Microbore Cell	<b>460400</b>
Preparative Cell	<b>460500</b>

#### Lamp

Optional 280nm Lamp **460201**



For additional replacement parts and accessories, request ISO20, or visit our online technical library at [www.alltechWEB.com](http://www.alltechWEB.com).

# New! Suppressors

For high-sensitivity anion analysis that outlasts and outperforms membrane suppressors



Model 640 Suppressor for isocratic separations



Model 641 Suppressor for gradient separations

## Alltech Suppressors

- Continuous regeneration for automated runs
- Stand-alone units are easy to add to any IC or HPLC system
- Patented technology eliminates water dip and improves baseline stability
- Meets requirements of EPA Methods 300.0 and 300.1

Suppressors reduce background conductance of the mobile phase while simultaneously increasing the analyte signal, for ppb-level anion detection. Alltech's patented\* regeneration and degassing features make our suppressors the most reliable, flexible suppressor systems available. You won't find these critical features on any other suppressor.

### Reagent-free regeneration – no down-time, no chemicals, no extra equipment.

Alltech's suppressor cell continuously regenerates and is always ready for the next run. You need no extra reagents or regeneration steps, and never have to interrupt a run to regenerate or change cells. Alltech's suppressors make it easy to automate your procedures.

### Automatic degassing – reduce or eliminate water dips and baseline shifts.

Carbonate/bicarbonate mobile phases are powerful separation tools, but produce carbon dioxide during suppression, which can interfere with conductivity detection. Alltech's suppressors automatically degas the effluent, leaving your sample in pure, non-conductive water for maximum sensitivity. This lets you enjoy all the advantages of carbonate mobile phases (even gradients with the Model 641) without the disadvantages.

### Add IC detection to any HPLC system

With Alltech's suppressors and a conductivity detector, you can add high-performance IC capability to your favorite HPLC system. Our suppressors are simple to operate – say goodbye to long equilibration times and multiple operating modes!

\*U.S. patent number 6,444,475 6,468,804. Other patents pending.

## Two models to choose from

Choose the Model 640 for isocratic applications up to 20mM sodium hydroxide or 10mM sodium carbonate.

Choose the Model 641 for gradient applications up to 40mM sodium hydroxide or 20mM sodium carbonate.

## Simplify methods by using fewer columns and mobile phases

Alltech's suppressors streamline your IC methods. Use powerful, selective carbonate/bicarbonate mobile phases (even gradients with the Model 641) and just one or two column chemistries for almost any anion separation. With carbonate/bicarbonate, the separating power is in the mobile phase, so fewer column types are needed to perform most separations.

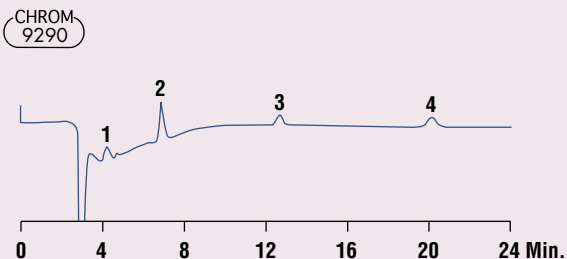
### Suppressor Specifications

<b>Display:</b>	LED Indicators
<b>Fluid path:</b>	PEEK and Teflon®
<b>Power:</b>	120/240 VAC, 50-60 Hz
<b>Outputs:</b>	Contact Closure (NO or NC) on error
<b>Dimensions:</b>	5.06"H x 10.33" W x 19" D, (12.9cm H x 26.2cm W x 48.3cm D)
<b>Weight:</b>	19.5lbs (8.8kg)
<b>Capacity:</b>	Model 640: 20mN sodium Model 641: 40mN sodium
<b>Warranty:</b>	1 year parts and labor, 6 months on suppressor cell

# New! Suppressors

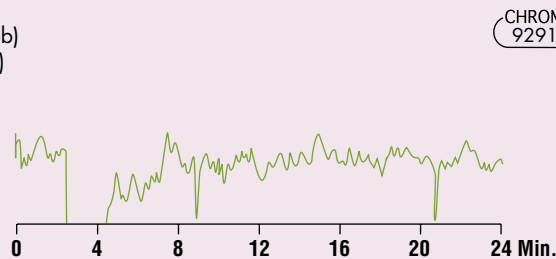
Alltech's suppressors give you superior results compared to other suppressors

## Trace Anions in Morpholine



With Alltech Suppressors

1. Fluoride (0.6ppb)
2. Chloride (5ppb)
3. Nitrate (3ppb)
4. Sulfate (2ppb)

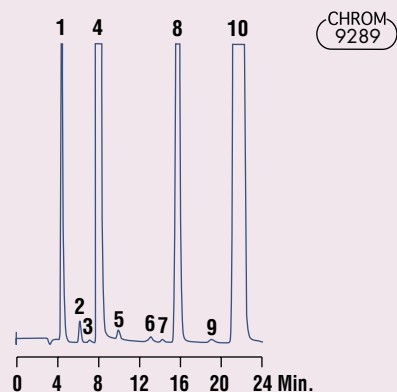


With Other Suppressors

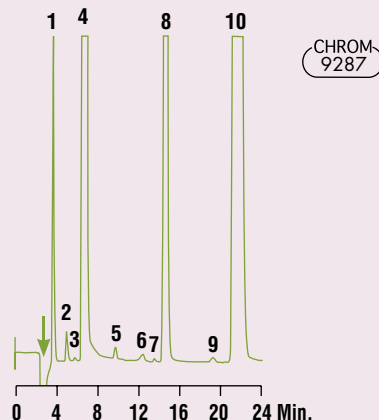
**Column:** AS9-HC, 250 x 4.0mm  
**Mobile Phase:** 9.0mM Na<sub>2</sub>CO<sub>3</sub>  
**Flowrate:** 1.0mL/min  
**Detector:** Suppressed Conductivity

Alltech's patented degassing feature improves sensitivity, baseline stability, and resolving power.

## Inorganic Anions and Oxalides



With Alltech Suppressors



With Other Suppressors

1. Fluoride (1 ppm)
2. Chlorite (0.5ppm)
3. Bromate (0.05ppm)
4. Chloride (50ppm)
5. Nitrite (0.1ppm)
6. Bromide (0.05ppm)
7. Chlorate (0.05ppm)
8. Nitrate (10ppm)
9. Phosphate (0.1ppm)
10. Sulfate (50ppm)

**Column:** AS9-HC, 250 x 4.0mm  
**Mobile Phase:** 9.0mM Na<sub>2</sub>CO<sub>3</sub>  
**Flowrate:** 1.0mL/min  
**Detector:** Suppressed Conductivity

Alltech's patented degassing feature dramatically reduces and often eliminates the water dip that interferes with early eluting peaks.

With these new, low cost suppressors, adding a complete IC detection system to your lab is easy and affordable! See page 31 for details.

### Alltech Suppressors



DESCRIPTION	PART No.
<b>Model 640 Suppressor (Isocratic)</b>	
120V	<b>640100</b>
240V	<b>640200</b>
<b>Model 641 Suppressor (Gradient)</b>	
120V	<b>641100</b>
240V	<b>641200</b>

# Suppressors

## Economical disposable cartridge suppressor



Installs easily in any IC or HPLC system

### Model 335 Suppressor

- Meets U.S. EPA Method 300.0 requirements
- Convenient disposable cartridges

Add the Model 335 Ion Suppressor to any IC or LC system that has a conductivity detector. Explore new separations or run existing suppressor-based methods, including EPA Method 300.0 part A and B.

This suppressor uses two disposable suppressor cartridges. While one cartridge provides suppression, the other is equilibrated or replaced. Changing the disposable cartridge is fast and easy.

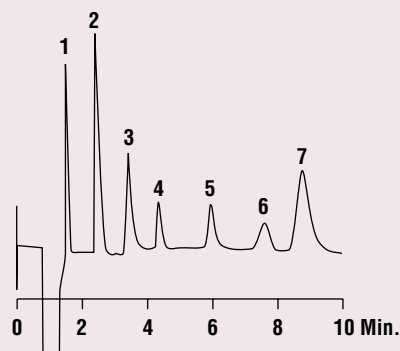


The Model 335 Suppressor is ideal for educational labs and labs that do not frequently use Ion Chromatography. For fully unattended, cartridge-free, sophisticated suppression, see our new Model 640 and Model 641 Suppressors on pages 28-29.

Can we help with your chromatography questions?  
Email us at [tech\\_service@alltechemail.com](mailto:tech_service@alltechemail.com)

### Low Level Anions per US EPA Method 300.0

CHROM  
8542

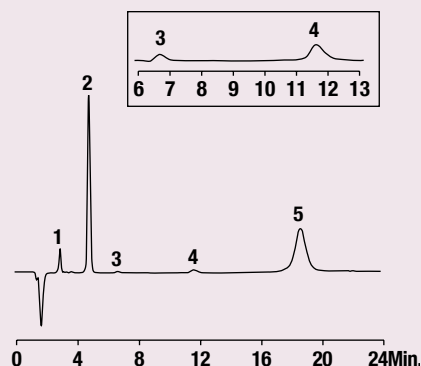


1. Fluoride
2. Chloride
3. Nitrite
4. Bromide
5. Nitrate
6. Phosphate
7. Sulfate

**Column:** Allsep™ Anion, 7µm, 100 x 4.6mm  
(Part No. **51207**)  
**Mobile Phase:** 0.85mM NaHCO<sub>3</sub>/0.9mM Na<sub>2</sub>CO<sub>3</sub>  
**Flowrate:** 2.0mL/min  
**Detector:** Suppressed Conductivity

### Tap Water Analysis with 335 Suppressor

CHROM  
13002



1. Fluoride
2. Chloride
3. Nitrite
4. Nitrate
5. Sulfate

**Column:** Allsep™ Anion, 7µm, 100 x 4.6mm  
(Part No. **51207**)  
**Mobile Phase:** 0.85mM NaHCO<sub>3</sub>/0.9mM Na<sub>2</sub>CO<sub>3</sub>  
**Flowrate:** 1.2mL/min  
**Detector:** Suppressed Conductivity

### Model 335 Suppressor Module

DESCRIPTION	PART NO.
Model 335 Suppressor Module (Includes 25 Anion Cartridges)	<b>335100</b>
Anion SPCS Cartridges, 25/pkg	<b>335002</b>



For more information on the 335 Suppressor Module, request instrument support sheet #019. Also available on our website.



# IC Detection Systems

Save on IC Detection System packages

## IC Detection Systems

- Compatible with suppressor-based and non-suppressed methods
- Modular-design is easy to change and upgrade

Choose the Model 650 Conductivity Detector in combination with other components to easily and economically add IC capability to your existing HPLC equipment. You can quickly switch between HPLC and IC applications.

### System Components:

**Model 650 Conductivity Detector** – compatible with suppressor-based and non-suppressed methods, detect anions to ppb-levels and cations to ppm-levels. Program and store up to 10 methods. See page 26 for more information.

**Model 630 Column Heater** – eliminates problems caused by fluctuating column temperatures. Works only in combination with the Model 650 Conductivity Detector. See page 26 for more information.

**Model 640 Suppressor** – economical, general-purpose suppressor suitable for most isocratic applications. See pages 28-29 for more information.

**Model 641 Suppressor** – high capacity, carbonate gradient compatible ion suppressor for demanding applications. See pages 28-29 for more information.

### For Cation Analysis

- Model 650 Conductivity Detector
- Model 630 Column Heater



### Cation Detection Systems



DESCRIPTION

PART NO.

#### Cation Detection System

Includes: Conductivity Detector and Column Heater

120V  
220V

597100  
597105

### For Anion Analysis

- Model 650 Conductivity Detector
- Choice of Model 640 or 641 Suppressors



### Anion Detection Systems



DESCRIPTION

PART NO.

#### Anion Isocratic Detection System

Includes: Conductivity Detector and Model 640 Suppressor

120V  
220V

597101  
597106

#### Anion Gradient Detection System

Includes: Conductivity Detector and Model 641 Suppressor

120V  
220V

597102  
597107

### For Cation and Anion Analysis

- Model 650 Conductivity Detector
- Model 630 Column Heater
- Choice of Model 640 or 641 Suppressors



### Cation and Anion Detection Systems



DESCRIPTION

PART NO.

#### Cation and Anion Isocratic Detection System

Includes: Conductivity Detector, Column Heater, & Model 640 Suppressor

120V  
220V

597103  
597108

#### Cation and Anion Gradient Detection System

Includes: Conductivity Detector, Column Heater, & Model 641 Suppressor

120V  
220V

597104  
597109



For added convenience, choose an IC Starter Kit! You can read more about them on page 13.

# Data Acquisition Software

An affordable, simple-to-use chromatography data system

## EZStart™ Data Acquisition Software

- Control instruments from many manufacturers
- PC-based data handling at low prices
- Easily upgrade to EZChrom Elite™

EZStart™ software provides the basic requirements for data acquisition and instrument control from a single workstation.

### Computer Requirements:

EZStart™ software requires Windows XP (SP1), Windows 2000 (SP3), or Windows NT (SP6), and Microsoft Internet Explorer version 4.0 or greater. Some EZStart™ packages require, but do not include, a GPIB card. RS232 ports on the computer may be required for some instruments. Recommended System: Pentium IV (800 MHZ), 128 MB RAM, 10 GB hard disk space.

### EZStart™ Software with SS420X Interface



DESCRIPTION	PART No.
120V	<b>1886011</b>
220V	<b>1886211</b>
100V (Japan)	<b>1886311</b>



For more information on EZStart™ Software, request document M078, or visit our online technical library at [www.alltechWEB.com](http://www.alltechWEB.com).

# 1

### Simple configuration

Collects data from any instrument generating an analog output using the Software's SS420X data interface.

# 2

### Run in one window

Set up all runs from a single window using simple wizards.

# 3

### Generate graphic reports

Select from existing templates or customize with the report editor.



## Your Online Technical Resource for Chromatography



The trademarks referred to herein are the property of their respective owners. Contact your Alltech office or distributor for current or local prices.

# Alltech

Alltech Corporate Headquarters:  
2051 Waukegan Road • Deerfield, IL 60015  
Phone: 847-948-8600 • Fax: 847-948-0477  
Email: [alltech@alltechemail.com](mailto:alltech@alltechemail.com)  
Web Site: <http://www.alltechWEB.com>

## Your Local Source for Alltech Products: