

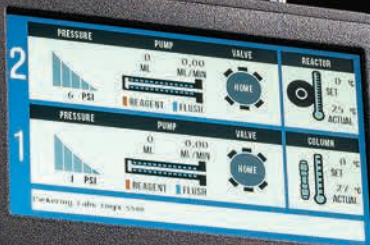


HPLC Post-Column Derivatization
Environmental, Food & Feed Analysis
Product Testing Solutions

Product Catalog

Instruments / Columns / Reagents / Standards

ONLYX PCXX



Evolution
in Innovation
Convenience, versatility & reliability
never looked so good.

PICKERING
LABORATORIES

As we approach our 40th year, we
celebrate the introduction of the

Onyx PCX!

It's the next generation of HPLC post-column derivatization instruments, resulting from Pickering Laboratories' decades of experience in post-column instrument manufacturing. Previously, the Pinnacle PCX set the benchmark for innovative design as the top-of-the-line PCX model. Now, it is surpassed by the Onyx PCX as the best post-column instrument available on the market.

Pickering Laboratories still offers the only instrumentation optimized for the analysis of Amino Acids, Carbamates, Glyphosate, Mycotoxins, Antibiotics and many other post-column applications. Each component is specifically designed to enhance sensitivity and selectivity. Only Pickering Laboratories provides complete application support, including chemicals, columns, methods and post-column systems. Because each part of the method is designed to work together, Pickering Laboratories can offer the extraordinary promise that the analysis is guaranteed to work for the intended application. The Onyx PCX reflects the ease of use, reliability and ruggedness customers have come to expect from Pickering Laboratories.

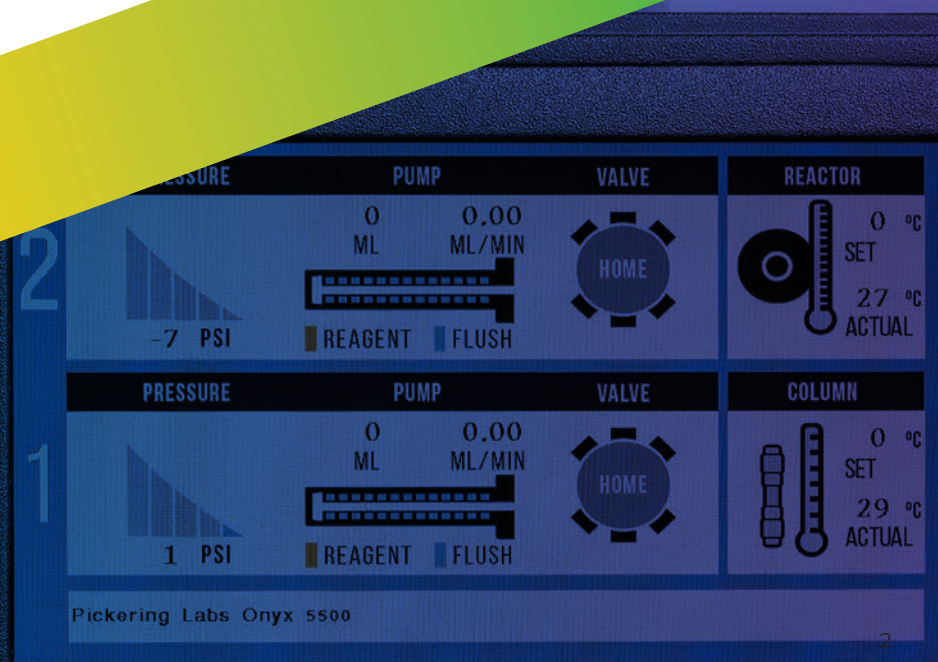


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Introduction

Customer Service & Technical Support

Pickering Laboratories has earned the reputation for strong Technical Support in HPLC post-column technology: chemistry, columns and derivatization instruments. We start with assisting our customers in identifying the best HPLC configuration required for a successful integration of our HPLC post-column system. Then we continue our support through and beyond the warranty period to ensure our customers' chromatograms reflect current standards of quality and reproducibility.

Contact us

For Customer Service and Technical Support contact:

Support@pickeringlabs.com
800-654-3330 / 650-694-6700

Place an Order

Please contact us directly to place an order:

Orders@pickeringlabs.com
800-654-3330 / 650-694-6700

Pickering Laboratories, Inc.
1280 Space Park Way
Mountain View, CA 94043

When ordering, please provide the following:

- Complete shipping and billing addresses
- Catalog number and quantity of each item
- Brief product description, as found in Catalog
- Purchase order number (and contract number, if applicable)
- Name and telephone number of person calling
- Special instructions, e.g., package markings, mode of transit if other than UPS
- If ordering a complete post-column system, please specify the brand of HPLC with which it

will be operating. We will advise you if any modifications to the HPLC are necessary.

Terms

- No minimum order required
- Net 30 days for established accounts, or prepayment in U.S. dollars, or Letter-of-Credit
- We accept MasterCard & VISA, Discover Card or American Express
- Prices are Ex-Works Seller's Factory, Mountain View, California

U.S. Destinations

Freight charges are prepaid and added to the invoice. Shipments are via UPS-Ground unless otherwise specified.

Destinations Outside of the U.S.

Freight charges are collect. Unless otherwise specified, shipments overseas will be via customer's freight forwarder.

Prices and specifications are subject to change without prior notice.

Establish Good Standing

New Accounts: Before a credit-line has been established, new account orders must be pre-paid. Freight charges are collect.

Installation & Training

We encourage you to take advantage of Pickering Laboratories' individualized two or three-day installation and training. For an all-inclusive fee we can provide post-column system installation and training at your site by an experienced chemist from Pickering Laboratories or its representatives. The training includes instrument operation, routine maintenance and troubleshooting, and chromatogram interpretation.

Some of our authorized distributors offer their own training and installation services.

When purchasing installation and training by Pickering Laboratories,

please call Technical Support early to schedule our visit to your site. This is especially important if you purchase installation through a distributor or HPLC Company because we need to hear all the details directly from you.

Individually tailored courses are also given at our facility in Mountain View, California. Please telephone or e-mail with your requirements and we will advise cost and schedule.

Product Returns

Products can be returned if unopened. A restocking fee of 15 % of list price will be applied. Before returning a product for any reason, please:

- Phone or e-mail requesting a Returned Goods Authorization Number.
- Package the product so that it will arrive undamaged. Use the original packing if possible. If in doubt, please call. Pickering Laboratories cannot assume responsibility for goods which arrive damaged in shipment.

Factory Repairs

Pickering Laboratories offers factory repair for its instruments (Onyx PCX, Pinnacle PCX and Vector PCX only). We will re-build or replace components as necessary in our judgment, then test the instrument to make certain that the original problem has been solved.

For repairs, we will charge for shipping, parts and labor (current shop rate).

What is Required

Contact support to obtain a Return Goods Authorization Number (RGA) and a Health and Safety Declaration form. When the instrument is returned it must have the RGA noted on the outside of the box and a completed Health and Safety Declaration, with the instrument.

Introduction

What is Done

Upon arrival, we evaluate your system to generate an estimated cost for repairs. Once we have your approval, we complete the repair. We will replace damaged parts, pressure test the instrument, and then test the instrument to confirm the system meets the products original manufacturer's specification.

What you get

The minimum parts replaced are: Restrictor(s)*, Seal(s) and Filters. If we test the instrument to determine that it meets the original manufacturer's specification, we will warranty the instrument for 1 year on all the parts that were replaced. If you request that we do not complete this test, we will not warranty our work.

Field Service

Because of our limited personnel, we prefer to resolve problems without site visits, but when necessary we will schedule a site visit with you. Please call for a quotation. On-site service entails an initial evaluation on the first day, with repairs potentially extending to the second day to allow for shipment of parts. The shipment of parts will be included in the invoice.

On-site repair costs will include travel time, air fare, hotel, car rentals, expenses, plus parts and labor.

Limited Warranty

Instruments

Instruments are warranted to be free of defects in material and workmanship under normal installation, use, and maintenance for a period of one year from the date of delivery to the customer. Pickering will replace or repair, without cost, any defective items. Expendable items such as check valves, pistons, piston seals, and filters are excluded from this warranty. In addition, physical damage, poor-quality reagent- and sample-induced damage, and instrument damage due to customer's misuse are not covered by this warranty.

Analytical Columns

Pickering's analytical columns are warranted for 90 days to be free of defects in materials and workmanship under normal installation, use, and maintenance, for the warranted time beginning from the date of delivery to the customer. Pickering Laboratories will replace the analytical column under warranty if found defective in material or workmanship. However, the warranty is void if the analytical column was damaged due to customer's misuse.

How to Obtain Warranty Service

If there is a problem with your instrument or analytical column within the warranty period, immediately notify Pickering or your local authorized representative. If the instrument or analytical column was not purchased directly from Pickering, please contact the vendor where it was purchased. Any instrument, part of the instrument, or analytical column returned to Pickering for examination or repair shall have Pickering's prior approval (call for a Returned Goods Authorization Number) and be shipped prepaid by the customer. Return transportation will be at Pickering's expense if the instrument, part of the instrument, or analytical column is found to be defective and under warranty.

* Vector systems only

Introduction

Health & Safety Declaration

Instruments and columns must be decontaminated and cleaned prior to returning to Pickering. To protect and ensure the safety of Pickering Laboratories personnel, customer must properly flush instrument of any and all hazards (e.g. reactive chemicals, blood borne pathogens). Please contact Pickering Laboratories to obtain a Health and Safety Declaration Form (B-0107) describing return instructions and customer responsibilities. Failure to do so will result in delay of service and/or additional charges.

Instrument & Service Plans

We encourage you to consider including a Pickering Laboratories Service Plan to match the quality and reliability you have come to expect from Pickering Laboratories. These offerings provide factory trained engineers experienced in HPLC and post-column technologies to service your Pickering Laboratories post-column derivatization instruments. Each plan has the features and benefits most requested by customers to offer the best value and effectiveness for today's busy laboratories.

When you sign-up for the Pickering Laboratories Service Plans, you are assuring the continued quality and reliability of your post-column instrument as well as your analysis.

Benefits of Service Agreements

- Free software upgrades
- Installation of all required performance upgrades
- PM/Service performed by Pickering Laboratories trained service specialists
- Fixed annual cost – no surprises
- Unlimited technical/analytical support
- Multi-unit service discounts available

Comparison of Service Plans			
Features	Warranty Upgrade**	Depot Service	Elite Service*
Telephone support to isolate and resolve technical problems	Monday - Friday 8 AM - 5 PM Excluding Holidays	Monday - Friday 8 AM - 5 PM Excluding Holidays	Monday - Friday 8 AM - 5 PM Excluding Holidays
Recertification	Included	Included	Included
Site Visits	Two (including PM)	At prevailing rates	Two (including PM)
Preventative Maintenance	One	One	One
Freight Charges	Included	Included	Included
Parts and Labor	Included	Included	Included

Service Plans offered for the Pickering Laboratories Onyx PCX, Pinnacle PCX and Vector PCX post-column derivatization instruments. Pre-service inspection is required for instruments that have an expired manufacturers warranty or service contract.

*The Elite Service plan provides a total of two service calls that will cover parts, labor and travel for the period of one year. Included is unlimited telephone support from Pickering Laboratories Technical Service Engineers and Applications Specialists.

**Applies to new systems only.

For more information and quotations:

Please contact Pickering Laboratories' Technical Support at support@pickeringlabs.com or 800-654-3330 / 650-694-6700.

Instruments & Hardware

Onyx PCX



Introducing the Onyx PCX

Pickering Laboratories' newest post-column instrument, the Onyx PCX, is part of our integrated family of instruments, chemistry and support.

Meet the Onyx PCX

It's the next generation of HPLC post-column derivatization instruments resulting from Pickering Laboratories' nearly 40 years of experience in post-column instrument manufacturing. Previously, the Pinnacle PCX set the benchmark for innovative design as the top-of-the-line PCX model. Now, it is surpassed by the Onyx PCX as the best post-column instrument available on the market.

Pickering Laboratories still offers the only instrumentation optimized for the analysis of Amino Acids, Carbamates, Glyphosate, Mycotoxins, Antibiotics and many other applications. Each component is specifically designed to enhance sensitivity and selectivity. Only Pickering

Laboratories offers complete application support, including chemicals, columns, methods and post-column systems. Because each part of the method is designed to work together, Pickering Laboratories can offer the extraordinary promise that the analysis is guaranteed to work for the intended application. The Onyx PCX reflects the ease of use, reliability and ruggedness customers have come to expect from Pickering Laboratories.

Accuracy, Durability, Speed and Convenience

- Instrument layout is focused on ease of use, quick monitoring and rapid service.
- The electronic syringe pump provides true pulse-free flow for superior sensitivity and consistency. The pump cylinder and head are made from a single piece of inert ceramic for durability and non-reactivity.
- Electronic valves eliminate troublesome check valves and allow automated pump flushing.

- Quick-change reactor cartridges make application switching easy and replacements fast and inexpensive.
- The column oven utilizes circulating air for consistency of heating and quick cooling within 1 °C of setpoint.
- Inert flow paths extend system life and reduce maintenance.
- The PCX control software allows for precise control of the reagent delivery and conservation.
- Pre-programmed testing and maintenance procedures take the guess work out of instrument care.
- Column oven temperature gradient programming improves separation and run times. Only Pickering Laboratories builds post-column systems with this feature.
- Works with any HPLC instrument, from any manufacturer.

Instruments & Hardware

Onyx PCX**Features and Benefits**

- All PCX components specifically designed for post-column derivatization
- Programmable temperature gradient column oven for faster Amino Acids Analysis run times
- Column oven is oriented for easy column switching and features improved tubing guards
- Electronic pulse-free syringe pump provides greater sensitivity
- Automatic piston wash and programmable system flush
- Full-size removable reagent tray provides convenience and meets secondary containment requirements
- Electronic valves have no expensive check valves to service and replace
- Quick change reactor cartridges enable fast application switching and easy cartridge replacement
- Inert flow path protects from metal contamination and extends system life while reducing maintenance
- Color LCD display provides for continuous system monitoring and critical message alerts
- All fluidics located on front panel for instant access and easy leak checks, drip tray included
- Improved pump access for expedient maintenance
- Integrated gas manifold allows for easy set-up and facilitates reagent preparation and preservation
- PCX control software runs from Windows PC for easy operation and reagent conservation between runs
- Software stores methods and sequences, allowing for flexible application setup and switching
- Seamless application migration from Pinnacle PCX to Onyx PCX, including method transfers
- Log files collect continuous data, from system status to error messages
- Pickering Support Team available for rapid log file interpretation and troubleshooting assistance
- Serviceability simplified with removable instrument side panels and isolated electronics
- Field calibration now available by trained Pickering Laboratories service engineers to support recertification

Programmable Temperature Gradient: Amino Acids Analysis

The Onyx PCX provides a unique opportunity to combine the eluant gradient capabilities of modern HPLC instruments with programmable column temperature gradients. As might be expected, this

capability helps reduce Amino Acids Analysis run times. Even more significant is the ability to resolve coelutions: consider such metabolic markers as Alloisoleucine (MSUD) and Argininosuccinic acid (ASA). Under standard isothermal conditions these amino acids coelute with Cystathionine and Isoleucine respectively, but both are resolved using a targeted temperature gradient program.

The ability to accomplish this derives from the multiple retention mechanisms of the gel-type resins employed in ion-exchange, enabling all the amino acids to appear in the same chromatogram. The exact position of each amino acid is influenced by an array of mechanisms including partitioning, adsorption, charge exclusion, etc. So even though two amino acids might coelute, their proximity is incidental. And since retention processes are affected differently by changes in pH, salt concentration and temperature, all these parameters have significant influence on selectivity.

PCX Control Software

The Onyx PCX is controlled by PCX Control Software, compatible with Windows 7 or newer Windows operating systems. Using the same computer as the HPLC, the PCX Control Software interfaces easily with Agilent ChemStation or communicates with any other modern HPLC using a relay connection.

The computer physically connects to the Onyx PCX unit through a USB cable. After an easy installation and configuration, the software runs in a window or as an icon on the computer desktop. The main software display matches the instrument's digital LCD display, where all PCX functions of temperature, flow rate and system status are displayed in real time. This allows for monitoring and control of the PCX and HPLC from one computer.



Instruments & Hardware

Onyx PCX

Methods are managed within the PCX Control Software and can be created, edited and saved to create a library for all application parameters. A sequence table is used to schedule multiple runs of the same or different methods in a series. At the end of the sequence a full system flush can be programmed. System and pump performance can be evaluated in the maintenance menu, using a pump pressure test and system pressure test. An instrument log file continually records system status and error messages for later reference and can be sent to Pickering Support for remote diagnostics.

Electronic Syringe Pumps and Valves

The syringe pump's cylinder and head are made from a single piece of 99.9 % Alumina for ruggedness and nonreactivity. The piston surface is made from PEEK® with an inert O-ring seal. The piston seal is protected by an automatic piston wash system that provides long seal life. The programmable flow rates range from 50 µL to 1500 µL/minute with a refill cycle of under 60 seconds. The electronic valve utilizes PEEK® and Teflon® with a port layout that eliminates cross contamination.

Reactor

The reactor is designed for quick heating and easy switching between applications. The heating and control electronics are in the base unit of the reactor while the coil volumes are inserted with a 'quick-change' cartridge on the front fluidics panel. The temperature range holds within 1 °C resolution from 5 °C above ambient room temperature to 130 °C maximum setpoint.

Column Heater

The column heater utilizes recirculating airflow technology to provide quick and uniform column heating. Fast column cooling is assisted by the introduction of a fresh air flow into the chamber. The temperature range holds within 1 °C resolution from 5 °C above ambient room temperature to 75 °C maximum setpoint. The temperatures can be programmed for a gradient with as many steps as required for fine-tuning an analysis.

Specifications**Dimensions**

- 22.4 H x 12.0 W x 19.15 D inches (56.9 x 30.5 x 48.6 cm), instrument with doors closed

Weight

- 60 lbs or 27 kg for dual-pump systems
- 50 lbs or 23 kg for single-pump systems

Electrical

- Factory configured as either 100-120 VAC, 50/60 Hz, 1.7 A, 200 W or 200-240 VAC, 50/60 Hz, 0.8 A, 200 W
- Mains voltage $\pm 10\%$ of nominal
- Current 5 A maximum
- Installation (over voltage) category II, pollution degree 2
- Fuses, 2 ea., 5 mm x 20 mm, 6.3 A, 250 VAC, time lag

Environmental

- Indoor use only
- Altitude up to 6500 ft (1981 m)
- Ambient temperature 15 ° - 29 °C
- Relative humidity up to 80 % at 31 °C

Reagent Pumps

- True pulse-free syringe pump with single piece ceramic barrels
- Maximum operating pressure 35 bar (500 psi)
- Programmable flow rates of 50 µL to 1500 µL/minute

- Refill cycle of 60 seconds or less
- Automatic piston wash
- Automatic reagent flush cycle
- No instrument check valves

Reactor

- Heated reactor temperature from 5 °C above ambient to 130 °C maximum setpoint
- Stability ± 0.5 °C
- Accuracy ± 1 °C
- Thermal safety switch limits temperature to prevent damage
- Easy replacement coil cartridges
- Range of reactor dwell volumes available, from 0.1 mL to 3 mL
- Reaction coil withstands up to 42 bar (600 psi) inlet pressure at 130 °C

Column Heater

- Heater accepts 6 or 8 mm OD (0.25 or 0.31 inch) x 50-250 mm in length Column and guard
- Temperature holds within ± 1 °C resolution from 5 °C above ambient to 75 °C maximum setpoint
- Programmable temperature gradient
- Easy access to column compartment and improved tubing guards
- Thermal safety switch limits temperature to prevent damage

Instrument Package and Flow Path

- Advanced fluidics valve management system
- Completely inert flow path
- Easy access to internal components
- Standard fittings
- Side panels remove easily for service
- Integrated reagent reservoir tray compliant with secondary containment requirements

Instruments & Hardware

Onyx PCX

Display

- LCD display, color 800 x 480 pixels, 153 x 85 mm viewing area
- Real time temperature, pressure and critical system alerts shown
- Intuitive system status icons

Gas Pressure Manifold and Regulator

- Panel-mounted gas manifold
- Regulator maintains 0.3 bar (3-5 psi) on reagent reservoirs with 3-5 bar (45-75 psi) source pressure

- Safety pressure-relief valve opens at 0.7 bar (10 psi)
- Manifold with anti-siphon valves and two 1/4-28 fittings

Safeguards

- In-line check valve prevents reagent back flow into the column when HPLC pressure drops
- Replaceable reagent filters to prevent reactor fouling
- Post-column system over-pressure protection from

pre-calibrated relief valve opens at 35 bar (500 psi) to prevent rupture of the post-column reactor tubing in the event of down-stream blockage

- Back-pressure regulator applies 7 bar (100 psi) to the detector flow cell outlet (waste line) to prevent detector noise and precipitation due to out-gassing or boiling

EMC Compliance

- Onyx PCX complies with EN 61326-1

Onyx PCX Derivatization Instruments	
Catalog No.	Description
1155-1011	Onyx, Single Pump, 0.15 mL, 120 V (Primary Amino Acids w/OPA, Aminoglycoside Antibiotics, Biogenic Amines, Sulfonamide Artificial Sweetener)
1155-1012	Onyx, Single Pump, 0.15 mL, 240 V (Primary Amino Acids w/OPA, Aminoglycoside Antibiotics, Biogenic Amines, Sulfonamide Artificial Sweetener)
1155-1021	Onyx, Single Pump, 0.5 mL, 120 V (Primary and Secondary Amino Acids w/TRIONE®, Bromate, Formaldehyde, B Vitamins, Theanine)
1155-1022	Onyx, Single Pump, 0.5 mL, 240 V (Primary and Secondary Amino Acids w/TRIONE®, Bromate, Formaldehyde, B Vitamins, Theanine)
1155-1031	Onyx, Single Pump, Knitted 1.4 mL, 120 V (Mycotoxins, Aflatoxins, Fumonisin, Sulfonamide Drugs)
1155-1032	Onyx, Single Pump, Knitted 1.4 mL, 240 V (Mycotoxins, Aflatoxins, Fumonisin, Sulfonamide Drugs)
1155-1051	Onyx, Dual Pump, 0.5 mL, 120 V (Carbamate, Glyphosate, Streptomycin, Primary and Secondary Amino Acids w/OPA)
1155-1052	Onyx, Dual Pump, 0.5 mL, 240 V (Carbamate, Glyphosate, Streptomycin, Primary and Secondary Amino Acids w/OPA)
1155-1061	Onyx, Dual Pump, Knitted 1.0 mL, 120 V (Paralytic Shellfish Toxins)
1155-1062	Onyx, Dual Pump, Knitted 1.0 mL, 240 V (Paralytic Shellfish Toxins)
1155-1071	Onyx, Dual Pump, Knitted 1.2 & 1.6 mL, 120 V (Tricothecene)
1155-1072	Onyx, Dual Pump, Knitted 1.2 & 1.6 mL, 240 V (Tricothecene)
1155-1081	Onyx, Dual Pump, Reverse Plumbing, Knitted 1.4 mL, 120 V (Polyether Antibiotics)
1155-1082	Onyx, Dual Pump, Reverse Plumbing, Knitted 1.4 mL, 240 V (Polyether Antibiotics)
1155-1101	Onyx, Single Pump, Knitted 3.5 mL, 120 V (Voglibose)
1155-1102	Onyx, Single Pump, Knitted 3.5 mL, 240 V (Voglibose)
1155-1103	Onyx, Single Pump, Dead-head Pressure Transducer, Knitted 1.0 mL, 120 V (Chromium VI)
1155-1104	Onyx, Single Pump, Dead-head Pressure Transducer, Knitted 1.0 mL, 240 V (Chromium VI)
1155-1105	Onyx, Single Pump, Dead-head Pressure Transducer, Knitted 2.0 mL, 120 V (Alprostadil)
1155-1106	Onyx, Single Pump, Dead-head Pressure Transducer, Knitted 2.0 mL, 240 V (Alprostadil)
1155-1096	Onyx, Dual Pump, Custom Reactor Volume, 120 V
1155-1097	Onyx, Dual Pump, Custom Reactor Volume, 240 V
1155-1098	Onyx, Single Pump, Custom Reactor Volume, 240 V
1155-1099	Onyx, Single Pump, Custom Reactor Volume, 120 V

Instruments & Hardware

Vector PCX



Vector PCX Derivatization Instrument

The Vector PCX serves as another post-column choice ideal for application-specific methods.

Vector PCX provides the selectivity and sensitivity required for most standard post-column applications while being reliable and easy to use. Since the Vector PCX does not have a column oven it is important to use the HPLC column oven to ensure stable column temperature and prevent retention time drifts and separation problems.

Features

- Inert pumps
- PEEK® liquid manifolds
- Integrated gas manifold
- Easy access and monitoring of fluidics
- Simple control interface (no computer required)
- Reduced bench space profile

Matched with Pickering Laboratories' Chromatographic Grade® reagents, eluants and columns, the Vector PCX instrument is a solid choice for laboratories' standard post-column needs.

Specifications

Dimensions

- (h x w x d): 43 x 21.6 x 41.2 cm (17 x 8.75 x 16 inches)

Weight

- 27.6 lbs (12.5 kg) –Duplex

Electrical

- 100 - 120 V, 50/60 Hz 1.7 A, 200 W or 200-240 V, 50/60 Hz, 0.8 A, 200 W
- Mains voltage $\pm 10\%$ of nominal
- Installation (over voltage) category II, pollution degree 2
- Indoor use only

Environmental

- Altitude up to 6,500 ft
- Ambient temperature 15 - 25 °C
- Relative humidity up to 80 % at 31 °C

Reagent Pumps

- Independently adjustable, low-pulsation
- Adjustable from 0.05 to 2.00 mL/minute against back-pressures of up to 2000 psi
- Flow Accuracy 3 %
- Flow Precision 0.5 % RSD
- Sapphire pistons
- Liquid ends, including check valve housing, PEEK®
- PEEK® bypass/purge valves for each pump located on front of instrument panel
- Automatic piston wash

Flow Path

- Independent pressure transducer for each pump 210 bar (0-3000 psi)
- Flow restrictors, matched to flow rate and viscosity of reagents
- PEEK® bypass/purge valves
- Replaceable reagent filter
- PEEK® mixing manifold

Instruments & Hardware

Vector PCX

Reactor

- Heater reactor controls at ± 0.4 °C for temperatures from 5 °C above ambient to 130 °C
- Range of reactor dwell volumes, 0.1 mL to 3.5 mL
- Reaction coil withstands up to 42 bar (600 psi) inlet pressure at 130 °C
- LCD display of actual temperature or set point
- Thermal safety switch limits temperature to 150 °C to prevent damage

Gas Pressure Manifold and Regulator

- Panel mounted manifold
- Regulator maintains 0.3 bar (3-5 psi) on reagent reservoirs with 3-5 bar (45-75 psi) source pressure
- Safety pressure relief valve opens at 0.7 bar (10 psi)

- Manifold has two 1/4-28 tubing connections
- Gas line with anti-siphon valve

Pressurized Reagent Reservoir

- One liter capacity (2 L reservoirs available)
- Maintained under inert gas pressure to inhibit oxidation of oxygen-sensitive reagents
- Valve built into reservoir cap permits sparging during reagent preparation
- Reagent reservoirs fitted with 3.1 mm (1/8") OD, oxygen-impermeable Air Barrier tubing for oxygen-sensitive reagents and/or with 3.1 mm (1/8") OD FEP tubing

Safeguards

- A pressure switch installed between LC (eluant) pump and sample injector turns off power to

reagent pumps and reactor when the eluant pump pressure drops to 30 bar (425 psi), ensuring that reagent will not flow upstream and damage the analytical column. Low eluant pressure can result from power failure, eluant pump malfunction, automatic or intentional shut-down, or an empty reservoir. The Vector PCX will not restart automatically.

- Post-column system over pressure: A pre-calibrated relief valve opens at 35 bar (500 psi) to prevent rupture of the post-column reactor tubing in the event of down-stream blockage
- Back-pressure regulator: Applies 7 bar (100 psi) to the detector flow cell outlet (waste) to prevent detector noise and precipitation due to out-gassing or boiling

Vector PCX Derivatization Instruments	
Catalog No.	Description
1154-4011	Vector, Single Pump, PEEK® Flow Restrictor, 0.15 mL, 120 V (Primary Amino Acids w/OPA, Aminoglycoside Antibiotics, Biogenic Amines, Sulfonamide Artificial Sweetener)
1154-4012	Vector, Single Pump, PEEK® Flow Restrictor, 0.15 mL, 240 V (Primary Amino Acids w/OPA, Aminoglycoside Antibiotics, Biogenic Amines, Sulfonamide Artificial Sweetener)
1154-4021	Vector, Single Pump Trione Flow Restrictor, 0.5 mL, 120 V (Amino Acids w/TRIONE®, Theanine)
1154-4022	Vector, Single Pump Trione Flow Restrictor, 0.5 mL, 240 V (Amino Acids w/TRIONE®, Theanine)
1154-4031	Vector, Single Pump, PEEK® Flow Restrictor, Knitted 1.4 mL, 120 V (Aflatoxins, Sulfonamide Drugs)
1154-4032	Vector, Single Pump, PEEK® Flow Restrictor, Knitted 1.4 mL, 240 V (Aflatoxins, Sulfonamide Drugs)
1154-4051	Vector, Dual Pump, PEEK® Flow Restrictors, 0.5 mL, 120 V (Carbamate, Glyphosate, Primary and Secondary Amino Acids w/OPA, Streptomycin)
1154-4052	Vector, Dual Pump, PEEK® Flow Restrictors, 0.5 mL, 240 V (Carbamate, Glyphosate, Primary and Secondary Amino Acids w/OPA, Streptomycin)
1154-4061	Vector, Dual Pump, PEEK® Flow Restrictors, Knitted 1.0 mL, 120 V (Paralytic Shellfish Toxins)
1154-4062	Vector, Dual Pump, PEEK® Flow Restrictors, Knitted 1.0 mL, 240 V (Paralytic Shellfish Toxins)
1154-4071	Vector, Dual Pump, PEEK® Flow Restrictors, Knitted 1.2 & 1.6 mL, 120 V (Tricothescene)
1154-4072	Vector, Dual Pump, PEEK® Flow Restrictors, Knitted 1.2 & 1.6 mL, 240 V (Tricothescene)
1154-4081	Vector, Dual Pump, Reverse Plumbing, PEEK® Tubing Flow Restrictors, Knitted 1.4 mL, 120 V (Polyether Antibiotics)
1154-4082	Vector, Dual Pump, Reverse Plumbing, PEEK® Tubing Flow Restrictors, Knitted 1.4 mL, 240 V (Polyether Antibiotics)
1154-4091	Vector, Single Pump, Custom Configuration, 120 V *
1154-4092	Vector, Dual Pump, Custom Configuration, 120 V *
1154-4093	Vector, Single Pump, Custom Configuration, 240 V *
1154-4094	Vector, Dual Pump, Custom Configuration, 240 V *
1154-4101	Vector, Single Pump, PEEK® Flow Restrictor, Knitted 3.5 mL, 120 V (Voglibose)
1154-4102	Vector, Single Pump, PEEK® Flow Restrictor, Knitted 3.5 mL, 240 V (Voglibose)
1154-4103	Vector, Single Pump, PEEK® Flow Restrictor, 0.5 mL, 120 V (Formaldehyde, B Vitamins)
1154-4104	Vector, Single Pump, PEEK® Flow Restrictor, 0.5 mL, 240 V (Formaldehyde, B Vitamins)

* Quote required for custom configurations. Contact support@pickeringlabs.com for questions.

Instruments & Hardware

UVE™



UVE™

Photochemical Reactor

Used for detection enhancement for Aflatoxins, Phenylurea Pesticides, Barbiturates and other compounds.

Photochemical derivatization is a simple, inexpensive and flexible technique that improves sensitivity and selectivity of detection for a broad range of analytes. Among the applications for the photochemical reactor are analysis of Aflatoxins in foods, Phenylurea Pesticides in water and Barbiturates in biological samples. Photochemical derivatization also allows for the identification of closely related compounds such as polyphenols.

Pickering Laboratories Multi-residue Mycotoxins method for DON, Aflatoxins, Fumonisin, Ochratoxin A and Zearalenone employs photochemical derivatization for Aflatoxins, allowing detection at sub-ppb levels.

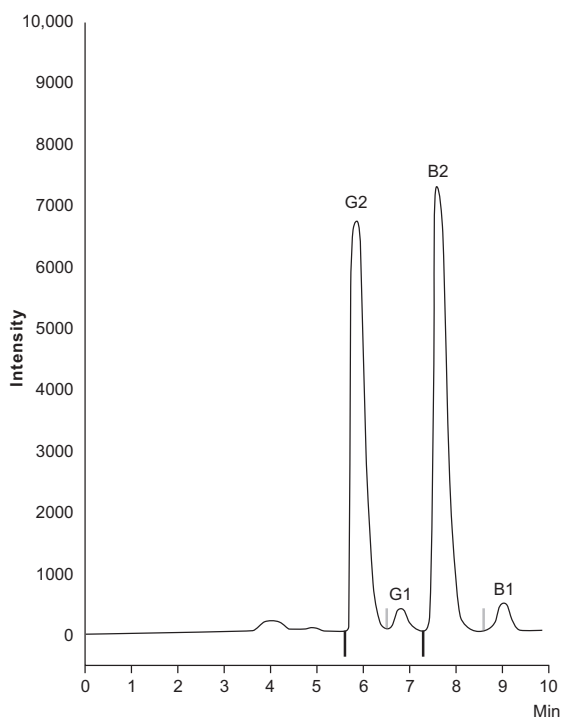
The photochemical reactor has a 254 nm lamp and a knitted reactor coil.

Feature Highlights

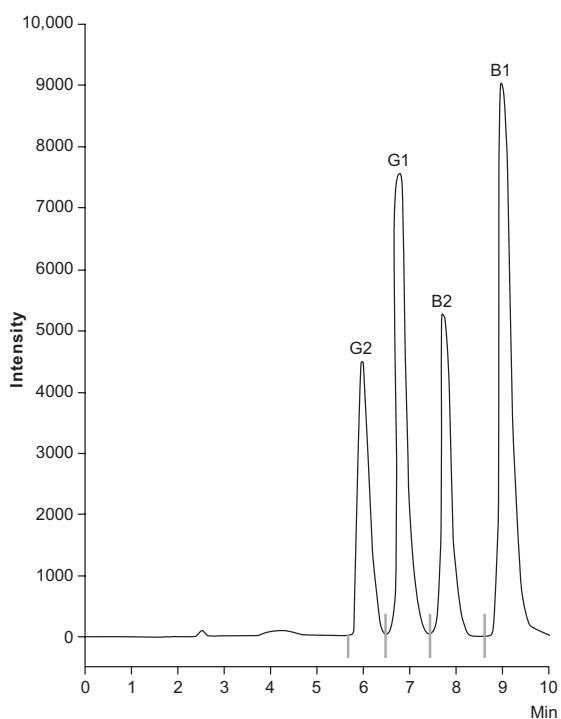
- 254 nm UV low pressure lamp with cooled reflector tube
- Long term stability of lamp and coil
- High light transmission
- Robust steel housing to meet laboratory requirements
- Specially designed fluorocarbon coil
- Comparable to electrochemical derivatization with Cobra Cell
- AOAC accepted methodology
- Standard reactor volume is 1.0 mL

UV Derivatization Results in Clear Peaks for Aflatoxins

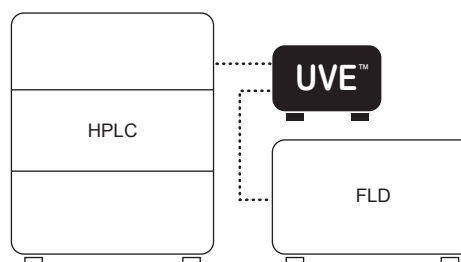
Note the short run time: B1 elutes at 9.5 Min



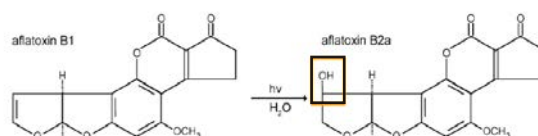
Without UVE™: Low response for G1 and B1



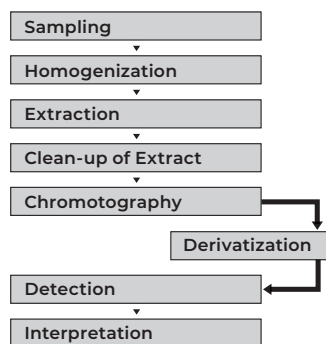
With UVE™: High response and no band spreading



Easy Handling: Simply place the UVE™ between your HPLC device and detector, switch it on - ready to use!



What actually happens? Aflatoxins B1 and G1 are transformed to stable fluorescent derivatives resulting in larger peaks



UVE™ Specifications	
CE Certified	Yes
UV Lamp	254 nm
Reactor Coil	Special
Dimensions	14.5 x 8.5 x 27 cm
Power Input	50 W
Weight	3 kg

UVE™ Catalog Information	
Catalog No.	Description
10519	UVE™ - Photochemical Reactor for Aflatoxin Analysis, 240 V
10742	UVE™ - Photochemical Reactor for Aflatoxin Analysis, 120 V
10520	Reactor Coil (only for UVE™ reactor), 1 mL; other coil sizes on request
10563	UV replacement lamp

Chromatograms, Columns & Guards



Pickering Laboratories columns and guards are intended for specific applications that require post-column derivatization. This technology guarantees detection of certain classes of compounds at very low concentrations—amino acids, carbamate pesticides and polyamines, for example.

Each column is packed and tested to separate the target compounds according to Pickering's chromatographic quality control standards and published analytical method. The following acceptance criteria apply to all of Pickering's columns:

- With guard column installed, produce a specified chromatogram of the compounds in a standard test mixture.
- Separate the compounds in the established order, with specified resolution of critical pairs.
- Operate within the specified range of back pressure.
- Be free of contaminating material which can cause baseline artifacts.
- Only after all criteria have been met can the column's serial number and label be applied.
- Quite simply, the column is guaranteed to produce a chromatogram for its intended application if it is operated according to the conditions and methods prescribed by Pickering Laboratories.

About Guard Columns

While it is true that any of our columns may be run without a guard, the practical consequence is a shorter column lifetime. Pickering Laboratories sells a variety of appropriate guard columns to protect our analytical columns. Additionally, GARD™ provides protection against contamination for cation-exchange applications without affecting column efficiency and it is far less expensive to replace than an analytical column. See page 17 for more information about our GARD™ column protection system.

Chromatograms, Columns & Guards

Cation-Exchange Columns & Guards

Lithium Columns	
Catalog No.	Description
0354675T	70-minute High-efficiency Lithium Cation-exchange Column, 4.6 x 75 mm, includes Amino Acid Test Mixture 1700-0075
0354100T	High-efficiency Lithium Cation-exchange Column, 4.0 x 100 mm, includes Amino Acid Test Mixture 1700-0075
0393250	Standard Lithium Cation-exchange Column, 3.0 x 250 mm, includes Amino Acid Test Mixture 1700-0075

Sodium Columns	
Catalog No.	Description
1154110T	30-minute High-efficiency Sodium Cation-exchange Column 4.6 x 110 mm, includes Amino Acid Test Mixture 1700-0075
1154150T	High-efficiency Sodium Cation-exchange Column for protein, collagen and oxidized feed hydrolysates, 4.0 x 150 mm, includes Amino Acid Test Mixture 1700-0075
1154150	High-efficiency Sodium Cation-exchange Column for protein and collagen hydrolysates, 4.0 x 150 mm, includes Amino Acid Test Mixture 1700-0075
1193250	Standard Sodium Cation-exchange Column 3.0 x 250 mm, includes Amino Acid Test Mixture 1700-0075

Glyphosate Column	
Catalog No.	Description
1954150	Cation-exchange Column for Glyphosate analysis, 4 x 150 mm, including Glyphosate Test Mixture 1700-0080

GARD™ Column Protection System (For use with any cation-exchange column)	
Catalog No.	Description
1700-3102	Cation-exchange GARD™ Assembly: Includes holder and 2 replaceable GARDs™
1700-3101	Replacement Cation-exchange GARDs™ (2/PK)
1700-3100	GARD™ Holder

Alkion Column	
Catalog No.	Description
9410917	ALKION™ Cation-exchange Column, K ⁺ form, 4.0 x 150 mm
9493020	ALKION™ Guard Column, K ⁺ form,

Reversed-Phase Columns & Guards

Carbamate Columns	
Catalog No.	Description
0846250	Carbamate Column, high resolution/capacity, C8, 4.6 x 250 mm, includes Carbamate Test Mixture 1700-0063
0840250	Carbamate Column, expanded resolution, C8, 4.0 x 250 mm, includes Carbamate Test Mixture 1700-0063
1846150	Carbamate Column, rapid analysis, C18, 4.6 x 150 mm, includes Carbamate Test Mixture 1700-0063
18ECG001	Guard Cartridge Holder with 3 guard cartridges
18ECG002	Guard Cartridges, 2/pk.

Polyether Antibiotics Column	
Catalog No.	Description
2381750	Polyether Reversed-phase Column, 4.6 x 250 mm
18ECG001	Guard Cartridge Holder with 3 cartridges
18ECG002	Guard Cartridges, 2/pk.

Mycotox Column	
Catalog No.	Description
1612124	MYCOTOX™ Reversed-phase Column, 4.6 x 250 mm
18ECG001	Guard Cartridge Holder with 3 cartridges
18ECG002	Guard Cartridges, 2/pk.



Chromatograms, Columns & Guards

Cation-Exchange GARD™ Column Protection System

Cation-exchange GARD™ uses a proprietary material to prevent matrix compounds from passing through (and thereby protecting the analytical column), but allows the analytes of interest to pass unimpeded through the GARD™ and onto the analytical column.

The GARD™ significantly prolongs column life without band spreading or added pressure. We demonstrated, by means of a performance comparison for Amino Acid Analysis, that the use of a GARD™ will effectively protect the analytical column, will be more cost-effective for the laboratory, is easy to change, is universal to cation-exchange applications, and most importantly has zero band spreading.

With GARD™ Column protection system from Pickering Laboratories the same cation-exchange GARD™ can be used for nearly all cation-exchange applications.



GARD™ Column Protection System (For use with any cation-exchange column)	
Catalog No.	Description
1700-3102	Cation-exchange GARD™ Assembly: Includes holder and 2 replaceable GARDs™
1700-3101	Replacement Cation-exchange GARDs™ (2/PK)
1700-3100	GARD™ Holder

Lithium Amino Acid Analysis Columns

Pickering Laboratories specialize in manufacturing of cation-exchange columns for amino acid analysis. No other techniques, including reversed-phase chromatography, have been shown to match post-column ion-exchange methods in quantitation and reproducibility. Advantages of this method, such as absence of matrix interferences, are especially important in the analysis of native samples.

Lithium columns and buffers systems have high selectivity and are perfect for physiological fluids and food analysis.

Post-column Conditions for Amino Acids Analysis:

Reagent: Trione®

Reactor: 130 °C, 0.5 mL

Reagent Flow Rate: 0.3 mL/min

Detection:

UV-Vis Detector: $\lambda=570$ nm for primary amino acids
 $\lambda=440$ nm for secondary amino acids

or

Reagent: 300 mg of OPA, 2 g Thiofluor™, 3 mL of 30 % Brij® 35 solution in 950 mL of OD104

Reactor: 45 °C, 0.15 mL

Reagent Flow Rate: 0.3 mL/min

Detection:

Fluorometer: λ_{ex} 330 nm, λ_{em} 465 nm

The recommended gradient conditions are subject to change without notice. This may happen because of lot-specific changes in the columns, or improvements in the overall method.

The recommended gradient for the column will always be included in the column package and it supersedes the information in this catalog. Use the program recommended on the column data sheet for the initial testing.

Column oven temperature programming gives additional flexibility when optimizing methods. Using a temperature gradient allows the user to improve separation, shorten analysis time and fine-tune the method for detecting compounds of interest.

Chromatograms, Columns & Guards

70-Min High-Efficiency Lithium Cation-Exchange Column (4.6 X 75 mm)

Catalog Number 0354675T

Use With Cation-Exchange Gard™ Column Protection System 1700-3102

Use for Physiological Samples

Temperature Gradient

HPLC Program				
Time	1700-1125 %	Li365 %	Li375 %	RG003 %
0	100	0	0	0
10	100	0	0	0
19	40	60	0	0
32	0	100	0	0
43	0	100	0	0
43.1	0	0	100	0
57	0	0	100	0
57.1	0	0	70	30
72	0	0	70	30
72.1	100	0	0	0

Column Oven Program	
Time	Temp °C
0	34
6	34
17	65
25	70
70	70
71	34

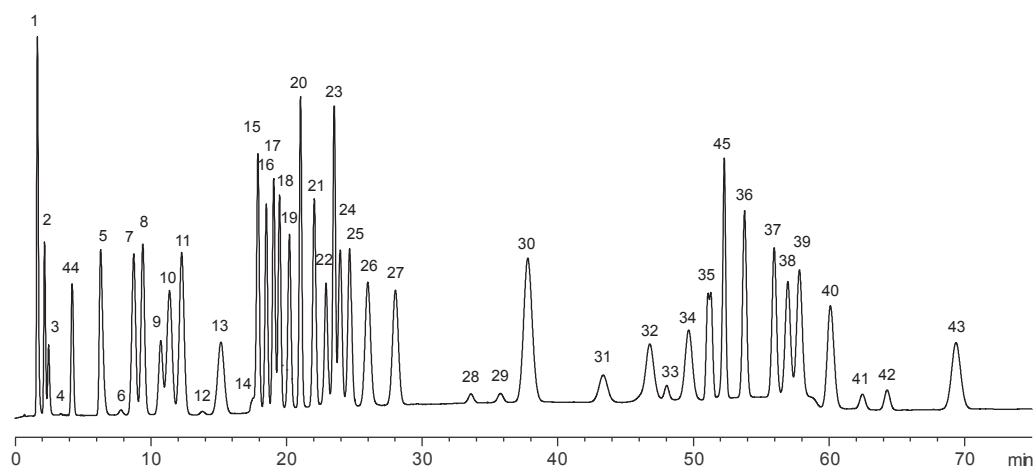
For more information see
Method Abstract MA 382
and Pickering Amino Acids
Brochure.

HPLC Flow Rate: 0.55 mL/min, Initial Temp.: 34 °C

Injection Volume: 10 µl of 0.25 µmole/ml std.

(P/N 1700-0170 with added Glutamine, AEC,

Glucosaminic acid, and Allo-Isoleucine.)



1 Phosphoserine	13 α-Aminoadipic acid	25 Leucine	37 Lysine
2 Taurine	14 Proline	26 Tyrosine	38 1-Methylhistidine
3 Phosphoethanolamine	15 Glycine	27 Phenylalanine	39 Histidine
4 Urea	16 Alanine	28 β-Alanine	40 3-Methylhistidine
5 Aspartic acid	17 Citrulline	29 β-Amino-i-butyric acid	41 Anserine
6 Hydroxyproline	18 α-Amino-n-butyric acid	30 Homocystine	42 Carnosine
7 Threonine	19 Valine	31 γ-Aminobutyric acid	43 Arginine
8 Serine	20 Cystine	32 Tryptophan	44 Glucosaminic Acid*
9 Asparagine	21 Methionine	33 Ethanolamine	45 2-Aminoethyl-cysteine (AEC)*
10 Glutamic acid	22 Allo-Isoleucine	34 Ammonia	
11 Glutamine	23 Cystathionine	35 Hydroxylysines	
12 Sarcosine	24 Isoleucine	36 Ornithine	

*Internal Standard

NOTE: This method utilizes column temperature gradient.
Use Onyx PCX column oven or Pinnacle PCX column oven
with temperature gradient capabilities.

Chromatograms, Columns & Guards

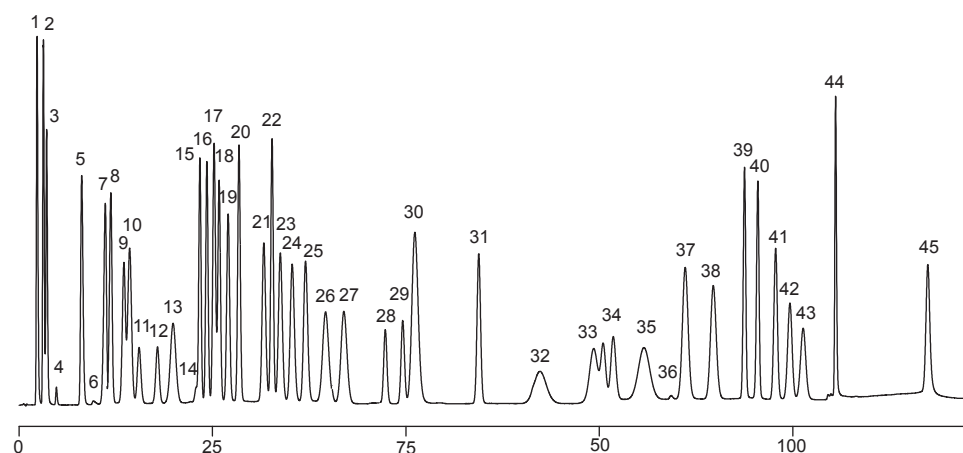
High-Efficiency Lithium Cation-Exchange Column (4.0 X 100 mm)

Catalog Number 0354100T

Use With Cation-Exchange Gard™ Column Protection System 1700-3102

Use for Physiological Samples and Complex Matrices

Temperature Isocratic



1 Phosphoserine	13 α-Aminoadipic acid	25 Norleucine	37 Ornithine
2 Taurine	14 Proline	26 Tyrosine	38 Lysine
3 Phosphoethanolamine	15 Glycine	27 Phenylalanine	39 Histidine
4 Urea	16 Alanine	28 β-Alanine	40 3-Methyl-histidine
5 Aspartic acid	17 Citrulline	29 β-Amino-i-butyric acid	41 1-Methyl-histidine
6 Hydroxyproline	18 α-Amino-n-butyric acid	30 Homocystine	42 Carnosine
7 Threonine	19 Valine	31 γ-Aminobutyric acid	43 Anserine
8 Serine	20 Cystine	32 Tryptophan	44 α-Amino-β-guanidinopropionic acid
9 Asparagine	21 Methionine	33 Ethanolamine	45 Arginine
10 Glutamic acid	22 Cystathionine	34 Hydroxylysines	
11 Glutamine	23 Isoleucine	35 Ammonia	
12 Sarcosine	24 Leucine	36 Creatinine	

Conditions					
Step	Time (Min)	Interval	Li275 %	Li750 %	RG003 %
0	0	0	100	0	0
1	8	8	100	0	0
2	46	38	65	35	0
3	86	40	0	100	0
4	90	4	0	100	0
5	115	25	0	94	6
6	122	2	0	94	6
7	122.1	0.1	100	0	0
8	140	17.9	100	0	0

Flow Rate: 0.35 mL/min, Column Temp: 37 °C,
Injection Volume: 10 µl of 0.25 µmole/ml std.
(P/N 011006P with added Glutamine)

For more information see Pickering Amino Acids Brochure.

Chromatograms, Columns & Guards

High-Efficiency Lithium Cation-Exchange Column (4.0 X 100 mm)

Catalog Number 0354100T

Use With Cation-Exchange Gard™ Column Protection System 1700-3102

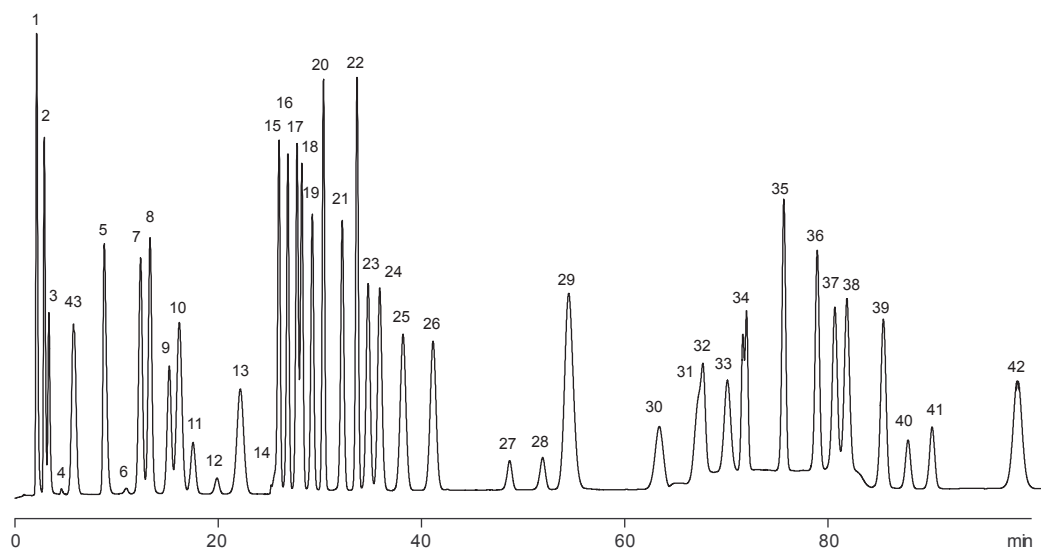
Use for Physiological Fluids

Temperature Gradient

Conditions					
Step	Time (Min)	1700-1125 %	Li365 %	Li375 %	RG003 %
0	0	100	0	0	0
1	15	100	0	0	0
2	27	40	60	0	0
3	45	0	100	0	0
4	60	0	100	0	0
5	60.1	0	0	100	0
6	78	0	0	100	0
7	78.1	0	0	70	30
8	95	0	0	70	30
9	95.1	100	0	0	0
10	115	100	0	0	0

Column Oven Program	
Time (Min)	Temp °C
0	34
13	34
30	65
67	66
80	70
97	70
98	34

HPLC Flow Rate: 0.4 mL/min, Initial Temp.: 34 °C
Injection Volume: 10 µL of 0.25 µmole/mL Std.
(P/N 1700-0170 with added Glutamine and Glucosaminic acid)



For more information
see Pickering Amino
Acids Brochure.

1 Phosphoserine	12 Sarcosine	23 Isoleucine	34 Hydroxylysines
2 Taurine	13 α-Aminoadipic acid	24 Leucine	35 Ornithine
3 Phosphoethanolamine	14 Proline	25 Tyrosine	36 Lysine
4 Urea	15 Glycine	26 Phenylalanine	37 1-Methylhistidine
5 Aspartic acid	16 Alanine	27 β-Alanine	38 Histidine
6 Hydroxyproline	17 Citrulline	28 β-Amino-i-butyric acid	39 3-Methylhistidine
7 Threonine	18 α-Amino-n-butyric acid	29 Homocystine	40 Anserine
8 Serine	19 Valine	30 γ-Aminobutyric acid	41 Carnosine
9 Asparagine	20 Cystine	31 Tryptophan	42 Arginine
10 Glutamic acid	21 Methionine	32 Ethanolamine	43 Glucosaminic Acid*
11 Glutamine	22 Cystathionine	33 Ammonia	

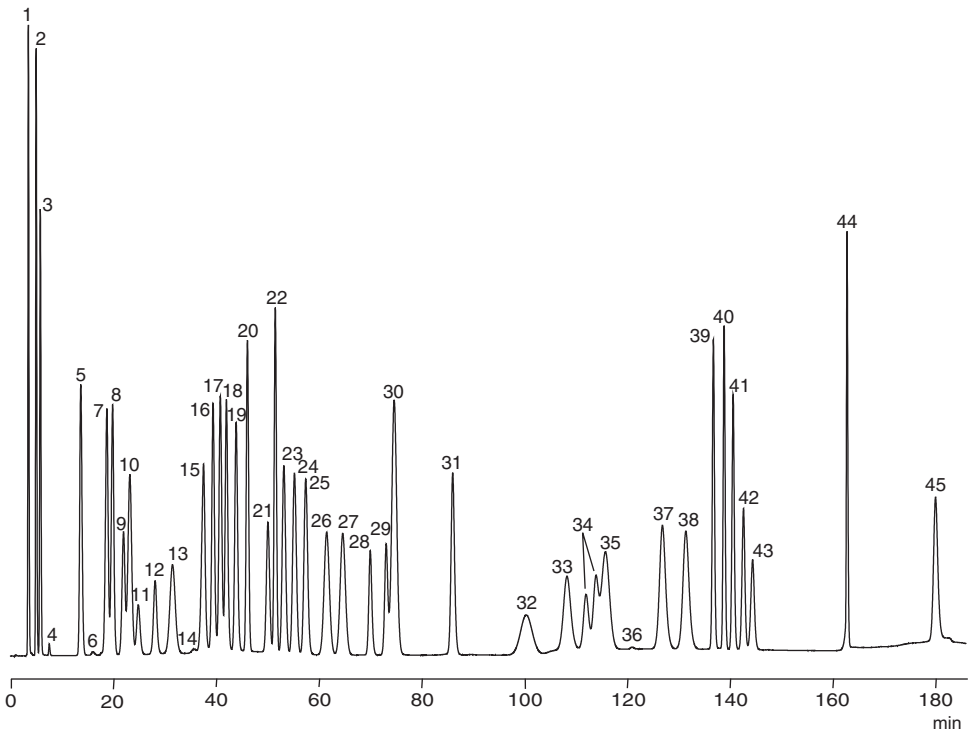
*Internal Standard

NOTE: This method utilizes column temperature gradient. Use Onyx PCX column oven or Pinnacle PCX column oven with temperature gradient capabilities.

Chromatograms, Columns & Guards

Standard Lithium Cation-Exchange Column 0393250 (3.0 X 250 mm)

Catalog Number 0393250
Use With Cation-Exchange Gard™ Column Protection System 1700-3102
Use for Physiological Fluids, Complex Matrices
Temperature Isocratic

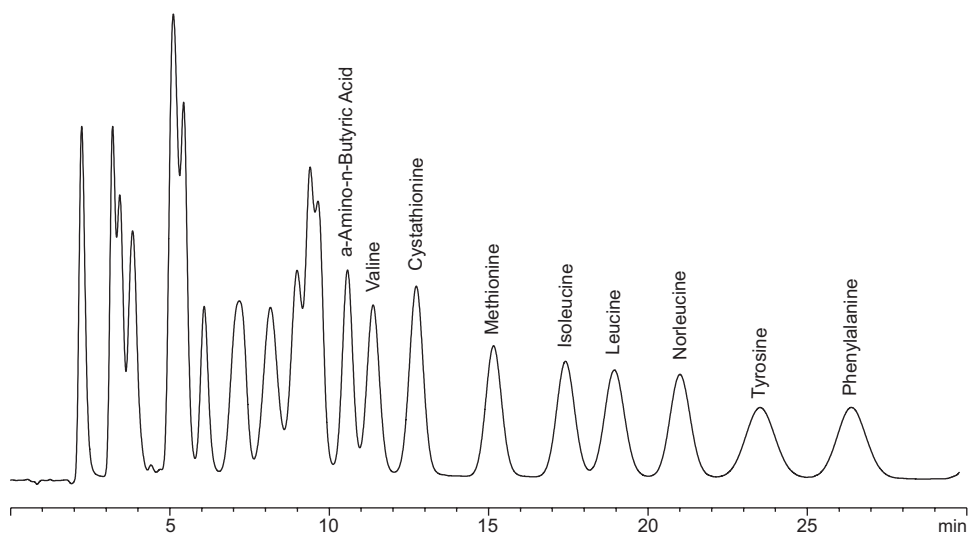


- | | |
|---------------------------|---------------------------|
| 1 Phosphoserine | 24 Leucine |
| 2 Taurine | 25 Norleucine |
| 3 Phosphoethanolamine | 26 Tyrosine |
| 4 Urea | 27 Phenylalanine |
| 5 Aspartic acid | 28 β-Alanine |
| 6 Hydroxyproline | 29 β-Amino-i-butyric acid |
| 7 Threonine | 30 Homocystine |
| 8 Serine | 31 γ-Aminobutyric acid |
| 9 Asparagine | 32 Tryptophan |
| 10 Glutamic acid | 33 Ethanolamine |
| 11 Glutamine | 34 Hydroxylysines |
| 12 Sarcosine | 35 Ammonia |
| 13 α-Aminoadipic acid | 36 Creatinine |
| 14 Proline | 37 Ornithine |
| 15 Glycine | 38 Lysine |
| 16 Alanine | 39 Histidine |
| 17 Citrulline | 40 3-Methyl-histidine |
| 18 α-Amino-n-butyric acid | 41 1-Methyl-histidine |
| 19 Valine | 42 Carnosine |
| 20 Cystine | 43 Anserine |
| 21 Methionine | 44 α-Amino-β- |
| 22 Cystathionine | guanidino propionic acid |
| 23 Isoleucine | 45 Arginine |

Conditions			
Time (Min)	Li275 %	Li750 %	RG003 %
0	100	0	0
17	100	0	0
65	65	35	0
128	0	100	0
145	0	100	0
185	0	94	6
185.1	100	0	0
210	100	0	0

Flow Rate: 0.3 mL/min, Column Temp.: 40 °C,
Injection Volume: 10 µL of 0.25 µmole/mL Std.
(P/N 011006P with added Glutamine)

Chromatograms, Columns & Guards

High-Efficiency Lithium Cation-Exchange Column (4.0 x 100 mm)**Catalog Number 0354100T****Use With Cation-Exchange Gard™ Column Protection System 1700-3102****Use for PKU/MSUD Screening of Physiological Fluids****Temperature Isocratic**

Conditions					
Step	Time (Min)	Interval	Li275 %	Li750 %	RG003 %
0	0	0	86	14	0
1	25	11	73	27	0
3	25.1	0.1	0	0	100
4	30	16.9	0	0	100
7	30.1	0.1	86	14	0
8	42	14.9	86	14	0

HPLC Flow Rate: 0.35 mL/Min, Column Temp.: 38 °C
 Injection Volume: 10 µl of 0.25 µmole/mL Std.

Lithium Columns	
Catalog No.	Description
0354675T	70-minute High-efficiency Lithium Cation-exchange Column, 4.6 x 75 mm, includes Amino Acid Test Mixture 1700-0075
0354100T	High-efficiency Lithium Cation-exchange Column, 4.0 x 100 mm, includes Amino Acid Test Mixture 1700-0075
0393250	Standard Lithium Cation-exchange Column, 3.0 x 250 mm, includes Amino Acid Test Mixture 1700-0075

GARD™ Column Protection System (For use with any cation-exchange column)	
Catalog No.	Description
1700-3102	Cation-exchange GARD™ Assembly: Includes holder and 2 replaceable GARDs™
1700-3101	Replacement Cation-exchange GARDs™ (2/PK)
1700-3100	GARD™ Holder

Chromatograms, Columns & Guards

Sodium Amino Acid Analysis Columns

Ion-exchange chromatography followed by post-column derivatization has been a method of choice for amino acid analysis for many years. Pickering Laboratories' ion-exchange columns allow you to obtain consistent results with sensitivity, stability, selectivity and speed.

Sodium columns and buffers systems are designed for amino acids analysis of hydrolyzed samples.

Post-column Conditions For Amino Acids Analysis:

Reagent: Trione®

Reactor: 130 °C, 0.5 mL

Reagent Flow Rate: 0.3 mL/min

Detection:

UV-Vis Detector: $\lambda=570$ nm for primary amino acids
 $\lambda=440$ nm for secondary amino acids

or

Reagent: 300 mg of OPA, 2 g Thiofluor™, 3 mL of 30 % Brij® 35 solution in 950 mL of OD104

Reactor: 45 °C, 0.15 mL

Reagent Flow Rate: 0.3 mL/min

Detection:

Fluorometer: λ_{ex} 330 nm, λ_{em} 465 nm

The recommended gradient conditions are subject to change without notice. This may happen because of lot-specific changes in the columns, or improvements in the overall method.

The recommended gradient for the column will always be included in the column package, and it supersedes the information in this catalog. Use the program recommended on the column data sheet for the initial testing.

The column oven temperature programming gives additional flexibility when optimizing methods. Using a temperature gradient allows the user to improve separation, shorten analysis time and fine-tune the method for detecting compounds of interest.

Chromatograms, Columns & Guards

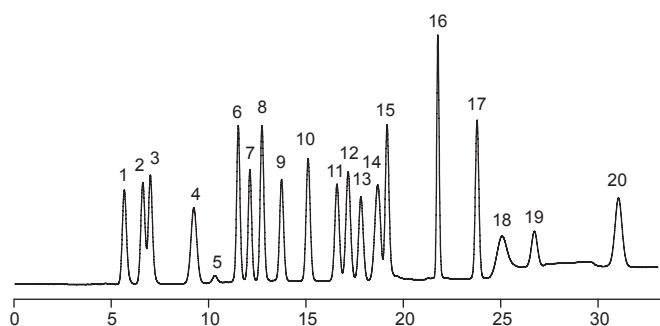
30-min High-Efficiency Sodium Cation-Exchange Column (4.6 x 110 mm)**Catalog Number 1154110T****Use With Cation-Exchange Gard™ Column Protection System 1700-3102****Use for Protein and Oxidized Feeds Hydrolysate****Temperature Gradient**

Fig 1. Chromatogram of protein hydrolysate standard

- | | | |
|-----------------|------------------|-----------------|
| 1 Aspartic Acid | 9 Valine | 17 Lysine |
| 2 Threonine | 10 Methionine | 18 Tryptophan |
| 3 Serine | 11 Isoleucine | 19 Ammonia |
| 4 Glutamic Acid | 12 Leucine | 20 Arginine |
| 5 Proline | 13 Norleucine | 21 Cysteic Acid |
| 6 Glycine | 14 Tyrosine | 22 Methionine |
| 7 Alanine | 15 Phenylalanine | Sulfone |
| 8 Cystine | 16 Histidine | |

Method for Protein Hydrolysate Samples				
TIME	Na315 %	Na425 %	Na640 %	RG011 %
0	100	0	0	0
4.0	100	0	0	0
15.0	0	100	0	0
16.0	0	0	100	0
31.0	0	0	100	0
31.1	0	0	0	100
33.0	0	0	0	100
33.1	100	0	0	0
40	100	0	0	0

HPLC Flow Rate: 0.6 mL/Min

Initial Temp.: 46 °C

Injection Volume: 10 µL of 0.25 µmole/mL Std.

(P/N 012506H with added Norleucine)

Column Oven Program	
Time	Temp °C
0	46
4	46
9	70
32	70
33	46

For more information see Method Abstract 380.1 (page 76) and Pickering Amino Acids Brochure.

NOTE: This method utilizes column temperature gradient. Use Onyx PCX column oven or Pinnacle PCX column oven with temperature gradient capabilities.

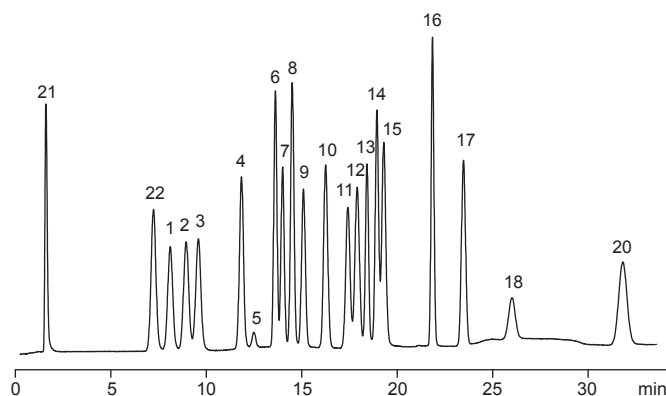


Fig 2. Chromatogram of oxidized feeds hydrolysate standard

- | | | |
|-----------------|------------------|-----------------|
| 1 Aspartic Acid | 9 Valine | 17 Lysine |
| 2 Threonine | 10 Methionine | 18 Tryptophan |
| 3 Serine | 11 Isoleucine | 19 Ammonia |
| 4 Glutamic Acid | 12 Leucine | 20 Arginine |
| 5 Proline | 13 Norleucine | 21 Cysteic Acid |
| 6 Glycine | 14 Tyrosine | 22 Methionine |
| 7 Alanine | 15 Phenylalanine | Sulfone |
| 8 Cystine | 16 Histidine | |

Method for Oxidized Feeds Hydrolysate Samples				
TIME	Na270 %	Na425 %	Na640 %	RG011 %
0	100	0	0	0
4.0	100	0	0	0
15.0	0	100	0	0
16.0	0	0	100	0
31.0	0	0	100	0
31.1	0	0	0	100
33.0	0	0	0	100
33.1	100	0	0	0
40	100	0	0	0

HPLC Flow Rate: 0.6 mL/min

Initial Temp.: 55 °C

Injection Volume: 10 µL OF 0.25 µmole/mL Std.

Column Oven Program	
Time	Temp °C
0	55
12	55
17	70
32	70
33	55

For more information see Method Abstract 380.1 and Pickering Amino Acids Brochure.

NOTE: This method utilizes a column temperature gradient. Use Onyx PCX column oven or Pinnacle PCX column oven with temperature gradient capabilities.

Chromatograms, Columns & Guards

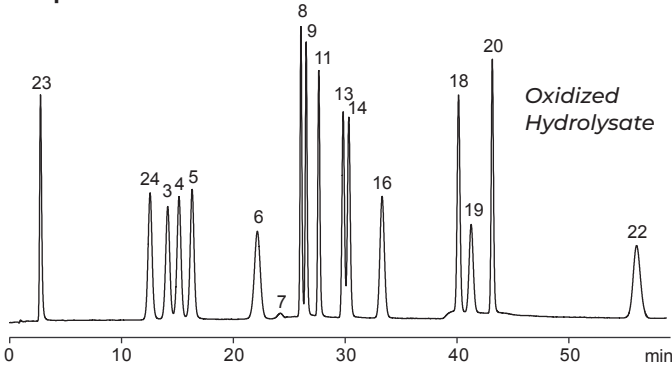
High-Efficiency Cation-Exchange Column (4.0 X 150 mm)

Catalog Number 1154150T

Use With Gard™ Column Protection System 1700-3102

Use for Oxidized Hydrolysate, Protein Hydrolysate, Collagen Hydrolysate

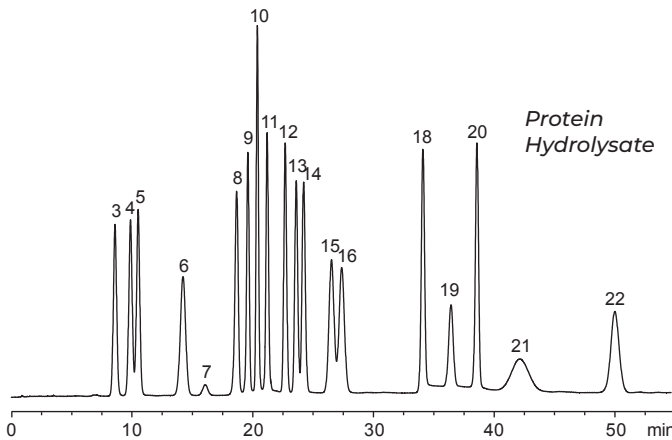
Temperature Isocratic



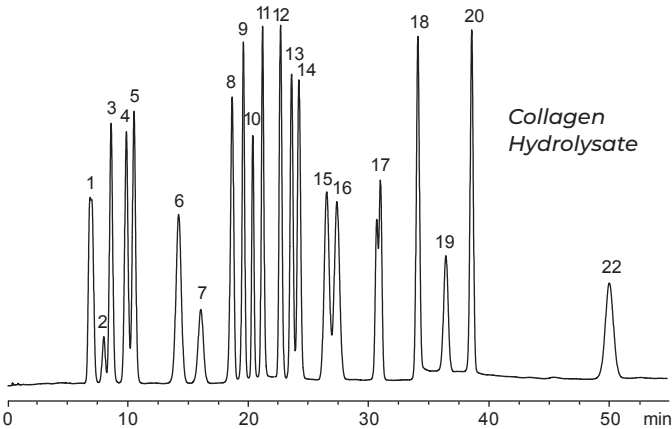
- | | |
|-----------------|-----------------------|
| 3 Aspartic Acid | 14 Leucine |
| 4 Threonine | 16 Phenylalanine |
| 5 Serine | 18 Lysine |
| 6 Glutamic Acid | 19 Ammonia |
| 7 Proline | 20 Histidine |
| 8 Glycine | 22 Arginine |
| 9 Alanine | 23 Cysteic Acid |
| 11 Valine | 24 Methionine Sulfone |
| 13 Isoleucine | |

Conditions for Oxidized Samples 1154150T			
Time (Min)	Na270 %	Na740 %	RG011 %
0	100	0	0
14	100	0	0
32	20	80	0
32.1	0	100	0
56	0	100	0
56.1	0	0	100
58	0	0	100
58.1	100	0	0
70	100	0	0

Flow Rate: 0.4 mL/Min, Column Temp.: 50 °C,
Injection Volume: 10 µL of 0.25 µmole/mL Std.
(P/N 1700-0155)



- | | |
|-----------------------------|-----------------------------|
| 1 Methionine-D,L-Sulfoxide | 13 Isoleucine |
| 2 trans-4-Hydroxy-L-Proline | 14 Leucine |
| 3 Aspartic Acid | 15 Tyrosine |
| 4 Threonine | 16 Phenylalanine |
| 5 Serine | 17 D,L & allo-Hydroxylysine |
| 6 Glutamic Acid | 18 Lysine |
| 7 Proline | 19 Ammonia |
| 8 Glycine | 20 Histidine |
| 9 Alanine | 21 Tryptophan |
| 10 Cystine | 22 Arginine |
| 11 Valine | |
| 12 Methionine | |



Conditions for Protein & Collagen Hydrolysate Samples			
Time (Min)	Na315 %	Na740 %	RG011 %
0	100	0	0
10	100	0	0
30	0	100	0
53	0	100	0
53.1	0	0	100
55	0	0	100
55.1	100	0	0
67	100	0	0

Flow Rate: 0.4 mL/Min, Column Temp.: 48 °C,
Injection Volume: 10 µL of 0.25 µmole/mL Std.
(P/N 012506H and 012506C)

Chromatograms, Columns & Guards

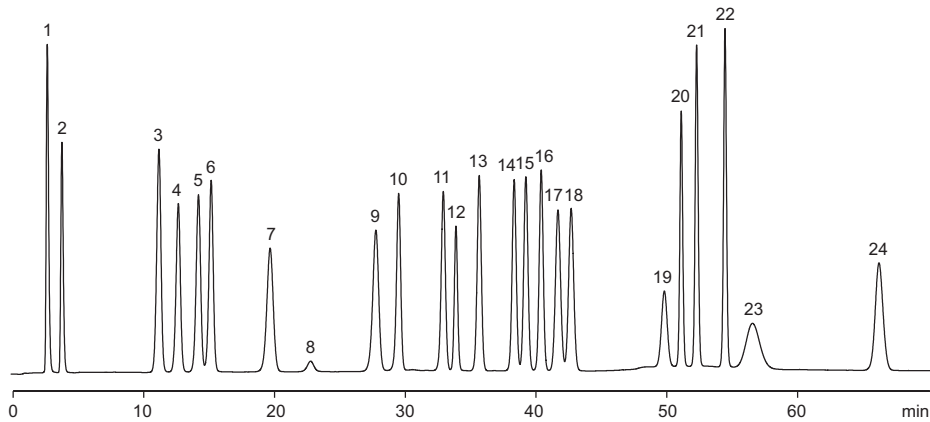
Expanded Amino Acid Analysis of Hydrolyzed Samples

Catalog Number 1154150T

Use With Cation-Exchange Gard™ Column Protection System 1700-3102

Use for Oxidized and Non-oxidized Samples

Temperature Gradient



1 Cysteic Acid	7 Glutamic Acid	13 Methionine	19 Ammonia
2 Taurine	8 Proline	14 Isoleucine	20 Ornithine
3 Methionine Sulfone	9 Glycine	15 Leucine	21 Lysine
4 Aspartic Acid	10 Alanine	16 Norleucine	22 Histidine
5 Threonine	11 Valine	17 Tyrosine	23 Tryptophan
6 Serine	12 Cystine	18 Phenylalanine	24 Arginine

Conditions for Oxidized and Non-Oxidized Samples			
Time (Min)	Na270 %	Na740 %	RG011 %
0	100	0	0
16	100	0	0
40	54	46	0
45	0	100	0
66	0	100	0
66.1	0	0	100
70	0	0	100
70.1	100	0	0
80	100	0	0

Column Oven Program	
Time	Temp °C
0	55
32	55
33	65
41	65
42	55

Sodium Columns	
Catalog No.	Description
1154110T	30-minute High-efficiency Sodium Cation-exchange Column 4.6 x 110 mm, includes Amino Acid Test Mixture 1700-0075
1154150T	High-efficiency Sodium Cation-exchange Column for protein, collagen and oxidized feed hydrolysates, 4.0 x 150 mm, includes Amino Acid Test Mixture 1700-0075
1154150	High-efficiency Sodium Cation-exchange Column for protein and collagen hydrolysates, 4.0 x 150 mm, includes Amino Acid Test Mixture 1700-0075
1193250	Standard Sodium Cation-exchange Column 3.0 x 250 mm, includes Amino Acid Test Mixture 1700-0075

GARD™ Column Protection System (For use with any cation-exchange column)	
Catalog No.	Description
1700-3102	Cation-exchange GARD™ Assembly: Includes holder and 2 replaceable GARDs™
1700-3101	Replacement Cation-exchange GARDs™ (2/PK)
1700-3100	GARD™ Holder

Chromatograms, Columns & Guards

Carbamate Pesticide Analysis Columns

Pickering Laboratories carbamate columns are guaranteed to produce the separation of carbamate residues, specified by EPA 531.1, EPA 531.2 and AOAC 985.23 methods.

Post-column conditions for pesticide analysis:

Reagent 1: Hydrolysis reagent CB130 or CB130.2

Reagent 2: 100 mg of OPA, 2 g Thiofluor™
in 950 mL of CB910

Reactor 1: 100 °C, 0.5 mL

Reactor 2: Ambient, 0.1 mL

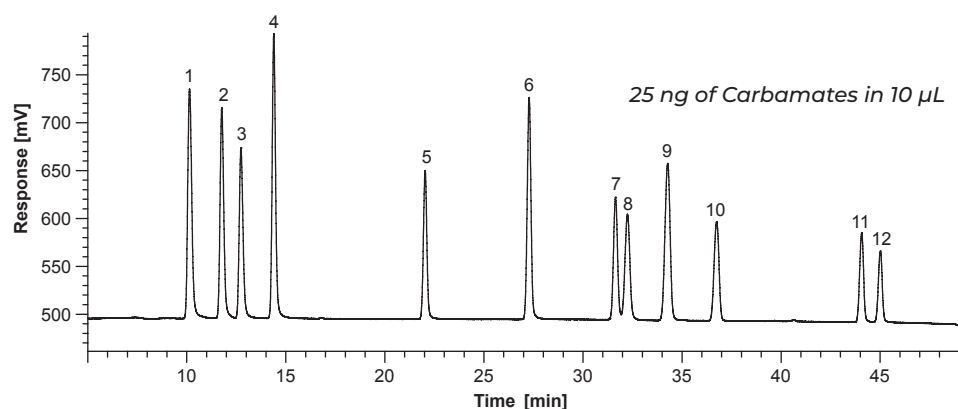
Reagents Flow Rate: 0.3 mL/min

Detection:

Fluorometer: λ_{ex} 330 nm, λ_{em} 465 nm

The recommended gradient conditions are subject to change without notice. This may happen because of lot-specific changes in the columns, or improvements in the overall method.

The recommended gradient for the column will always be included in the column package, and it supersedes the information in this catalog.

High Resolution / Capacity Carbamate Column 0846250 (4.6 x 250 mm), C₈, 5 µm

- | | | |
|----------------------|-----------------------|---------------|
| 1 Aldicarb sulfoxide | 5 3-Hydroxycarbofuran | 9 Carbaryl |
| 2 Aldicarb sulfone | 6 Aldicarb | 10 1-Naphthol |
| 3 Oxamyl | 7 Propoxur | 11 Methiocarb |
| 4 Methomyl | 8 Carbofuran | 12 BDMC |

Conditions for Aqueous Samples		
Time (Min)	Water %	MeOH %
0	100	0
1	100	0
1.1	82	18
36	30	70
39	30	70
39.1	0	100
41	0	100
41.1	100	0
55	100	0

Flow Rate: 1 mL/min,
Column Temp.: 42 °C,
Injection Volume: Up to 400 µL

Conditions for Methanolic Samples		
Time (Min)	Water %	MeOH %
0	85	15
1	85	15
44	25	75
44.1	0	100
49	0	100
49.1	85	15
57	85	15

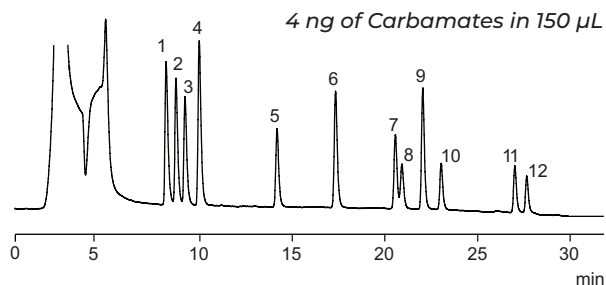
Flow Rate: 1 mL/min,
Column Temp.: 42 °C,
Injection Volume: 10 µL

Chromatograms, Columns & Guards

Rapid Analysis Carbamate Column 1846150 (4.6 x 150 mm), 5 µm

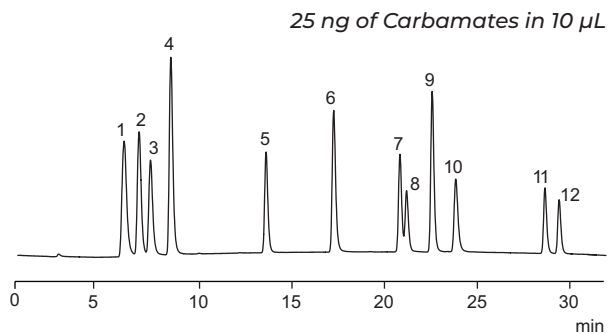
Conditions for Aqueous Samples		
Time (Min)	Water %	MeOH %
0	100	0
1	100	0
1.1	88	12
26	30	70
26.1	0	100
28	0	100
28.1	100	0
38	100	0

Flow Rate: 1 mL/Min,
Column Temp.: 42 °C,
Injection Volume: Up To 250 µL



Conditions for Methanolic Samples		
Time (Min)	Water %	MeOH %
0	85	15
0.5	85	15
28.5	30	70
28.6	0	100
33.5	0	100
33.6	85	15
41	85	15

Flow Rate: 1 mL/min,
Column Temp.: 42 °C,
Injection volume: 10 µL



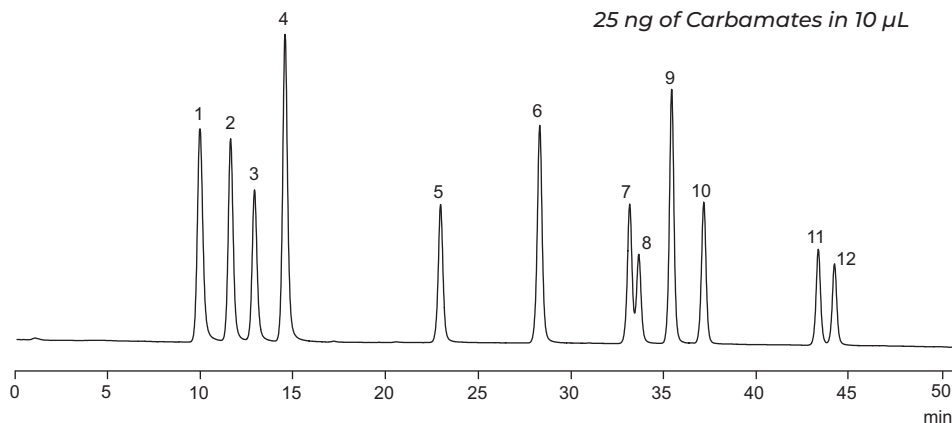
- | | |
|-----------------------|-----------------------------|
| 1 Aldicarb sulfoxide | 7 Propoxur |
| 2 Aldicarb sulfone | 8 Carbofuran |
| 3 Oxamyl | 9 Carbaryl |
| 4 Methomyl | 10 1-Naphthol |
| 5 3-Hydroxycarbofuran | 11 Methiocarb |
| 6 Aldicarb | 12 BDMC (internal standard) |

Chromatograms, Columns & Guards

Expanded Resolution Carbamate Column 0840250 (4.0 x 250 mm), 5 µm

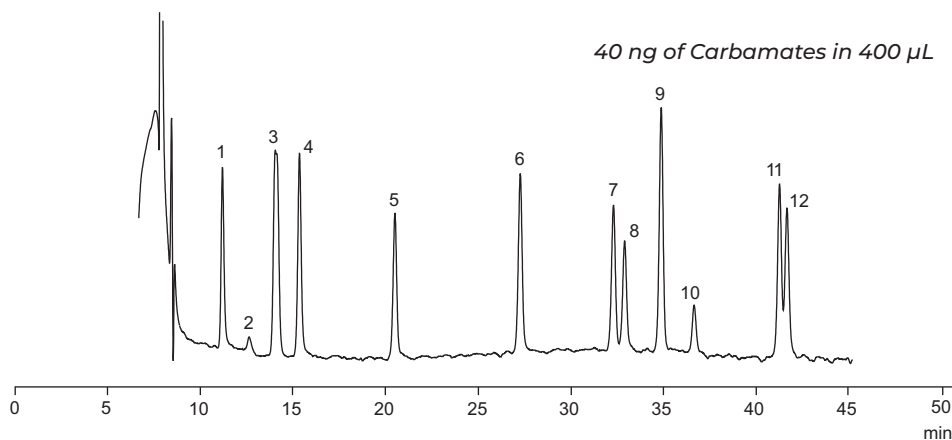
Conditions for Water/Methanol Gradient		
Time (Min)	Water %	MeOH %
0	85	15
2	85	15
42	30	70
46	30	70
46.1	0	100
51	0	100
51.1	85	15
59	85	15

Flow Rate: 0.8 mL/min,
Column Temp.: 50 °C,
Injection Volume: 10 µL for
methanolic and up to 400 µL for
aqueous samples



Conditions for Water/Acetonitrile Gradient		
Time (Min)	Water %	ACN %
0	90	10
2	90	10
46	49	51
46.1	30	70
49	30	70
49.1	90	10
59	90	10

Flow Rate: 0.8 mL/min,
Column Temp.: 50 °C,
Injection Volume: 10 µL for
methanolic and up to 400 µL for
aqueous samples



- | | | |
|----------------------|-----------------------|-----------------------------|
| 1 Aldicarb sulfoxide | 5 3-Hydroxycarbofuran | 9 Carbaryl |
| 2 Aldicarb sulfone | 6 Aldicarb | 10 1-Naphthol |
| 3 Oxamyl | 7 Propoxur | 11 Methiocarb |
| 4 Methomyl | 8 Carbofuran | 12 BDMC (internal standard) |

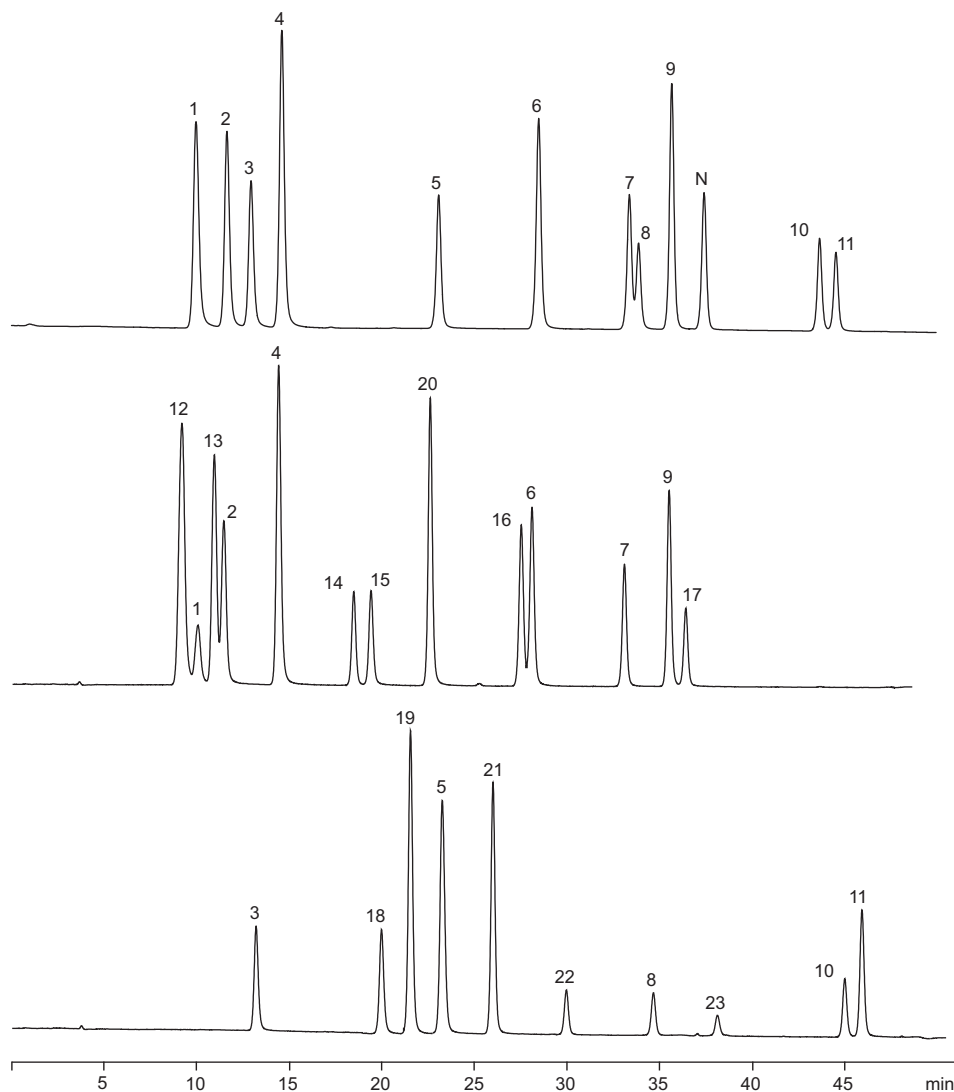
Chromatograms, Columns & Guards

Separation of 23 Carbamates Using 0840250 Column (4.0 x 250 mm)

Conditions for Water/Methanol Gradient		
Time (Min)	Water %	MeOH %
0	85	15
2	85	15
42	30	70
46	30	70
46.1	0	100
51	0	100
51.1	85	15
59	85	15

Flow Rate: 0.8 mL/min,
Column Temp.: 50 °C,
Injection Volume: 10 mL for methanolic
and up to 400 mL for aqueous samples

- 1 Aldicarb sulfoxide
- 2 Aldicarb sulfone
- 3 Oxamyl
- 4 Methomyl
- 5 3-Hydroxy
- 6 Aldicarb
- 7 Propoxur
- 8 Carbofuran
- 9 Carbaryl
- 10 Methiocarb
- 11 BDMC internal standard
- 12 Butocarboxim sulfoxide
- 13 Butocarboxim sulfone
- 14 Ethiofencarb sulfoxide
- 15 Ethiofencarb sulfone
- 16 Butocarboxim
- 17 Ethiofencarb
- 18 Thiofanox sulfoxide
- 19 Thiofanox sulfone
- 20 Methiocarb sulfoxide
- 21 Methiocarb sulfone
- 22 3-Ketocarbofuran
- 23 Thiofanox
- N 1-Naphthol



Carbamate Columns	
Catalog No.	Description
0846250	Carbamate Column, high resolution/capacity, C8, 4.6 x 250 mm, includes Carbamate Test Mixture 1700-0063
0840250	Carbamate Column, expanded resolution, C8, 4.0 x 250 mm, includes Carbamate Test Mixture 1700-0063
1846150	Carbamate Column, rapid analysis, C18, 4.6 x 150 mm, includes Carbamate Test Mixture 1700-0063
18ECG001	Guard Cartridge Holder with 3 guard cartridges
18ECG002	Guard Cartridges, 2/pk.

Chromatograms, Columns & Guards

Glyphosate Herbicide Analysis Column

Pickering Laboratories cation-exchange Glyphosate column is designed and tested for analysis of Glyphosate and its primary metabolite Aminomethylphosphonic acid (AMPA). This short, isocratic method provides separation of the peaks of interest. Reproducible performance is guaranteed run-to-run and column-to-column.

Post-column Conditions For Glyphosate Analysis:

Reagent 1: Oxidizing reagent—100 µL of 5 % Sodium Hypochlorite in 950 mL of GA116

Reagent 2: 100 mg of OPA, 2 g Thiofluor™ in 950 mL of GA104

Reactor 1: 36 °C, 0.5 mL

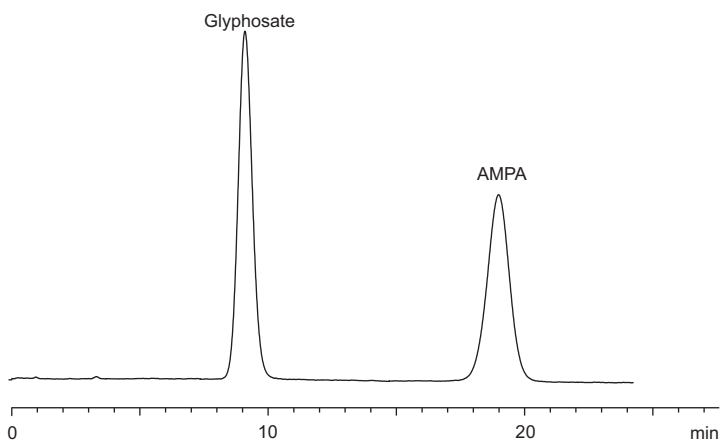
Reactor 2: Ambient, 0.1 mL

Reagents Flow Rate: 0.3 mL/min

Detection:

Fluorometer: λ_{ex} 330 nm, λ_{em} 465 nm

Glyphosate Column 1954150 (4.0 x 150 mm) K⁺ Cation-Exchange. To be Used With Cation-Exchange GARD™ Column Protection System 1700-3102



Glyphosate Test Mixture, 2.5 µg/mL

Conditions		
TIME (Min)	K200 %	RG019 %
0	100	0
15	100	0
15.1	0	100
17	0	100
17.1	100	0
27	100	0

Flow Rate: 0.4 mL/min,
Column Temp.: 55 °C,
Injection Volume: 10 µL

For more information see Method Abstract
MA 206 and MA 207 (pages 93 and 95).

Glyphosate Column	
Catalog No.	Description
1954150	Cation-exchange Column for Glyphosate analysis, 4 x 150 mm, including Glyphosate Test Mixture 1700-0080

GARD™ Column Protection System (For use with any cation-exchange column)	
Catalog No.	Description
1700-3102	Cation-exchange GARD™ Assembly: Includes holder and 2 replaceable GARDs™
1700-3101	Replacement Cation-exchange GARDs™ (2/PK)
1700-3100	GARD™ Holder

Chromatograms, Columns & Guards

Alkion™ Column

The stationary phase in the ALKION™ column is a rigid, non-porous polymeric phase that is surface sulfonated. The two modes of separation are ion-exchange and moderate partitioning. The low capacity of the ion-exchange resin makes it an ideal phase for the separation of strongly basic and positively charged compounds. The reversed-phase character allows for discrimination between closely related species.

The unique properties of this column allow for its use in a wide range of applications.

Alkion™ Column Analysis of Biogenic Amines

Post-column Conditions:

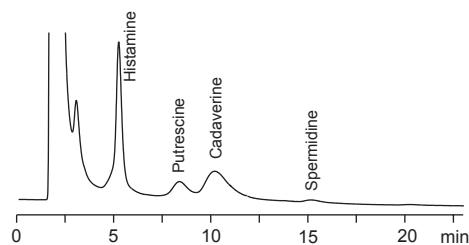
Reagent: 300 mg of OPA, 2 g Thiofluor™, 3 mL of 30 % Brij® 35 in 950 mL of OD104

Reactor: 45 °C, 0.15 mL

Reagent Flow Rate: 0.3 mL/min

Detection:

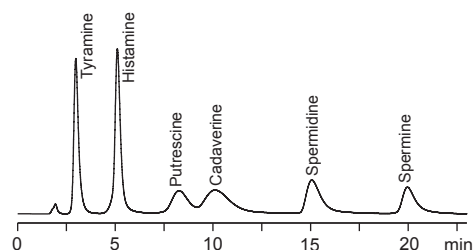
Fluorometer: λ_{ex} 330 nm, λ_{em} 465 nm



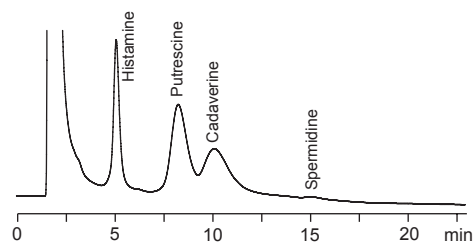
Chromatogram of fish sauce sample

Conditions			
Time (Min)	K600 %	K563 %	K130 %
0	100	0	0
6	100	0	0
15	0	100	0
21	0	100	0
21.1	0	0	100
23	0	0	100
23.1	100	0	0
29	100	0	0

Flow Rate: 0.8 mL/min,
Column Temp.: 45 °C,
Injection Volume: 10 mL



Chromatogram of calibration standard, 100 µM



Chromatogram of fish sample

Chromatograms, Columns & Guards

Alkion™ Column Analysis of Aminoglycoside Antibiotics in Feeds

Post-column Conditions:

Reagent: 300 mg of OPA, 2 g Thiofluor™, 3 mL of 30 % Brij® 35 in 950 mL of OD104

Reactor: 45 °C, 0.15 mL

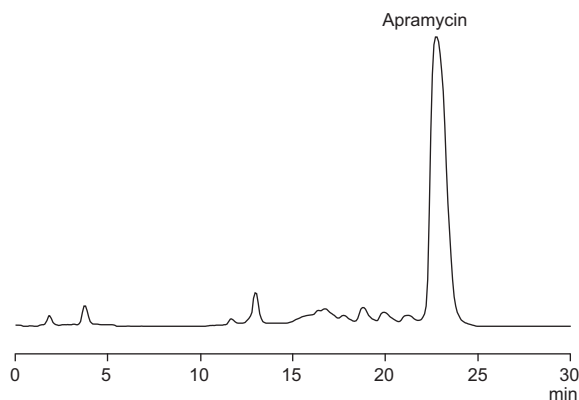
Reagent Flow Rate: 0.3 mL/min

Detection:

Fluorometer: λ_{ex} 330 nm, λ_{em} 465 nm

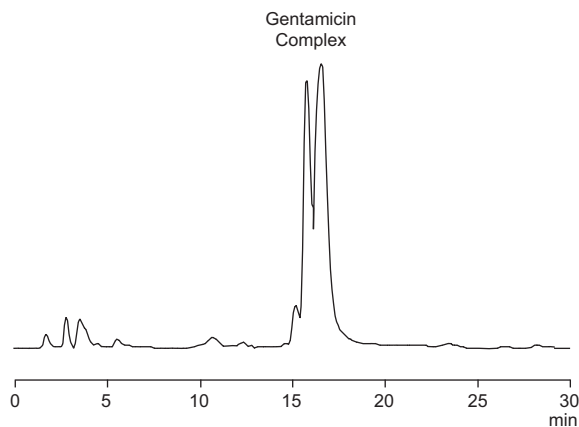
Conditions for Apramycin Analysis			
Time (Min)	1700-1101 %	1700-1102 %	1700-1103 %
0	67	33	0
5	67	33	0
15	14.7	7.3	78
20	14.7	7.3	78
20.1	0	22	78
21	0	22	78
21.1	67	33	0
28	67	33	0

Flow Rate: 0.8 mL/min,
Column Temp.: 40 °C,
Injection Volume: 10 mL



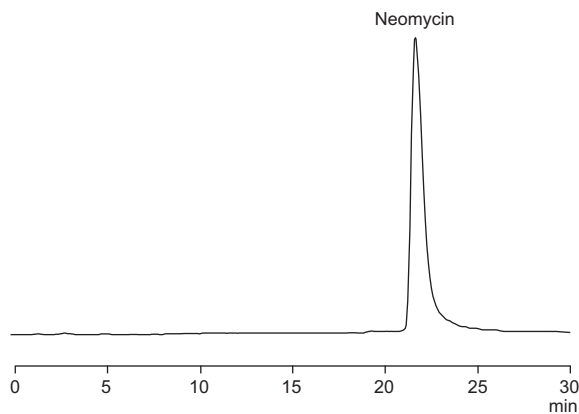
Conditions for Gentamicin Analysis			
Time (Min)	1700-1101 %	1700-1102 %	1700-1103 %
0	43	31	26
20	9	13	78
30	9	13	78
30.1	0	22	78
31	0	22	78
31.1	43	31	26
38	43	31	26

Flow Rate: 0.8 mL/min,
Column Temp.: 40 °C,
Injection Volume: 10 mL

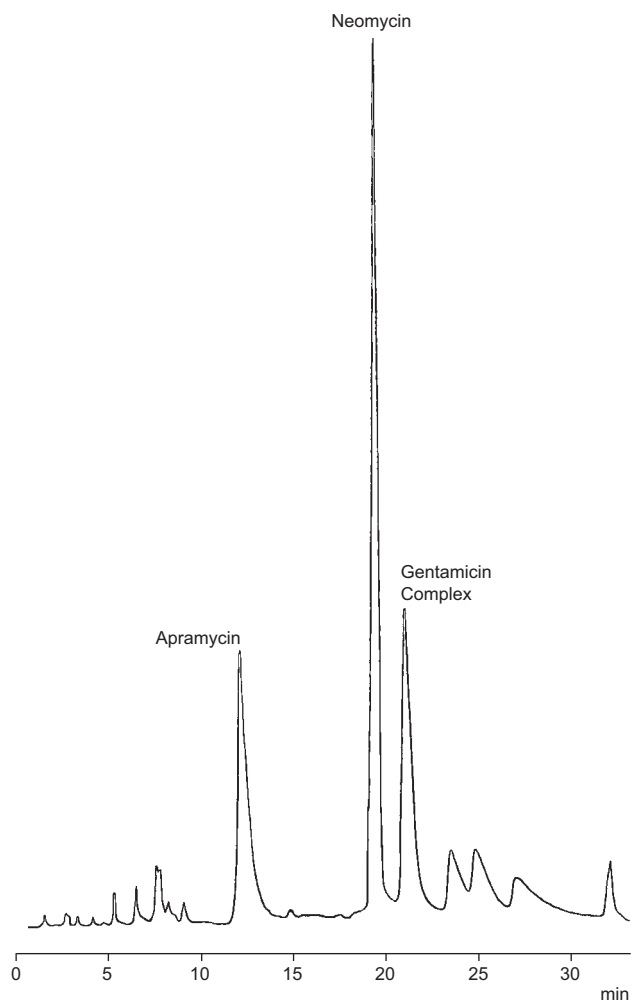


Conditions for Neomycin Analysis			
Time (Min)	1700-1101 %	1700-1102 %	1700-1103 %
0	60	40	0
15	13.2	8.8	78
25	11	11	78
25.1	0	22	78
26	0	22	78
26.1	60	40	0
32	60	40	0

Flow Rate: 0.8 mL/min,
Column Temp.: 40 °C,
Injection Volume: 10 mL



Chromatograms, Columns & Guards



Conditions for Separation of Apramycin Gentamicin and Neomycin			
Time (Min)	1700-1101 %	1700-1102 %	1700-1103 %
0	60	40	0
15	13.2	8.8	78
15.1	12	10	78
30	12	10	78
30.1	0	22	78
31	0	22	78
31.1	60	40	0
37	60	40	0

Flow Rate: 0.8 mL/min,
Column Temp.: 40 °C,
Injection Volume: 10 mL

Chromatograms, Columns & Guards

Alkion™ Column Analysis of Streptomycin

Post-column Conditions:

Reagent 1: 0.75 N Sodium Hydroxide

Reactor 1: ambient, 0.1 mL

Reagent 2: 0.6 % Ninhydrin

Reactor 2: 60 °C, 0.5 mL

Reagents Flow Rate: 0.3 mL/min

Detection:

Fluorometer: λ_{ex} 395 nm, λ_{em} 500 nm

or

Reagent 1: Oxidizing Reagent: 100 μ L of 5 % Sodium Hypochlorite in GA116

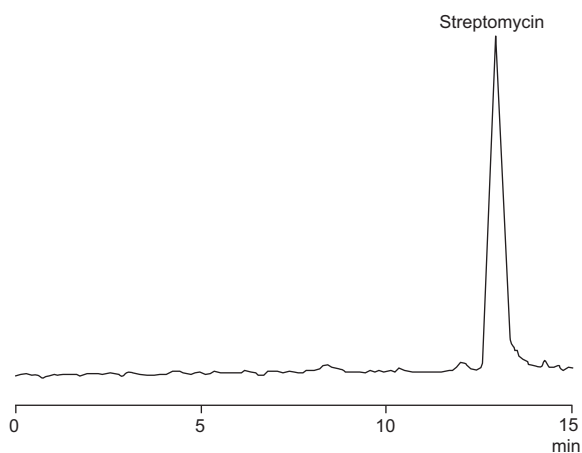
Reactor 1: 50 °C, 0.5 mL

Reagent 2: 300 mg of OPA, 2 g Thiofluor™, 3 mL of 30 % Brij® 35 solution in 950 mL of OD104

Reactor 2: Ambient, 0.1 mL

Detection:

Fluorometer: λ_{ex} 330 nm, λ_{em} 465 nm



Conditions			
Time (Min)	1700-1101 %	1700-1102 %	1700-1103 %
0	60	40	0
10	60	40	0
10.1	48	48	4
15	48	48	4
15.1	60	40	0
21	60	40	0

Flow Rate: 0.8 mL/min,
Column Temp.: 40 °C,
Injection Volume: Up to several mL

Alkion Column	
Catalog No.	Description
9410917	ALKION™ Cation-exchange Column, K ⁺ form, 4.0 x 150 mm
9493020	ALKION™ Guard Column, K ⁺ form

Chromatograms, Columns & Guards

Mycotox™ Reversed-phase Column for Mycotoxins Analysis

Aflatoxins Analysis

Aflatoxins are naturally occurring toxins belonging to the class Mycotoxins. They are produced by fungi and occur in peanuts, peanut meal, cotton-seed meal, wheat, milk and many other foods and feeds.

The most important feature of the post-column method described below is that all six Aflatoxins are detectable at the same fluorescence emission wavelength in a single isocratic HPLC analysis.

LC Conditions:

Flow Rate: 1.0 mL/min, column temperature 42 °C, injection volume 10 µL

Mobile Phase: Methanol/acetonitrile/water: (22:22:56), isocratic

Injection: 10 µL in Methanol
5 ng B₁ & G₁
1.5 ng B₂ & G₂
1.25 ng M₁ & M₂

Post-column Conditions:

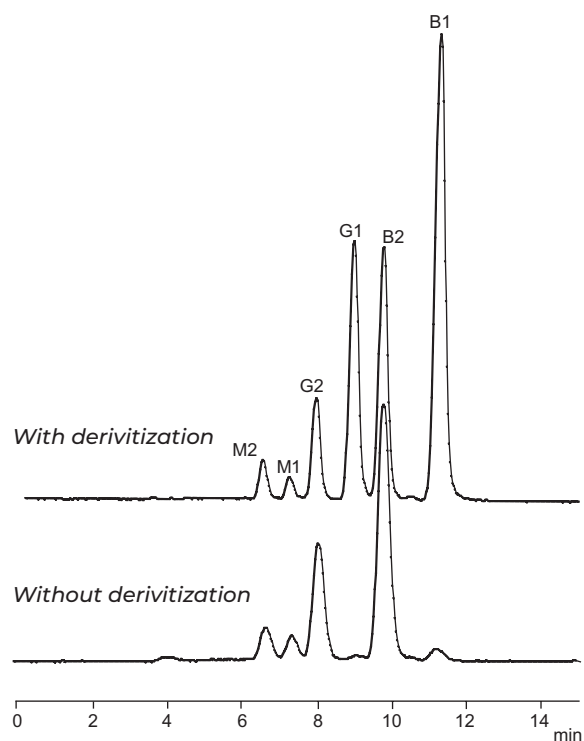
Reagent: I₂ 100 mg/L in water

Reactor: 90 °C, 1.4 mL

Reagent Flow Rate: 0.4 mL/min

Detection:

Fluorometer: λ_{ex} 365 nm, λ_{em} 430 nm



For more information see Method Abstract
MA 215, MA 208, MA 203.1 and MA 218

Mycotox Column	
Catalog No.	Description
1612124	MYCOTOX™ Reversed-phase Column, 4.6 x 250 mm
18ECG001	Guard Cartridge Holder with 3 cartridges
18ECG002	Guard Cartridges, 2/pk.

Chromatograms, Columns & Guards

Polyether Antibiotics Analysis Column

Polyether antibiotics, such as Monensin, Narasin and Salinomycin, found in raw material, premix, liquid supplements and final feeds, are best quantified using HPLC with post-column derivatization. Because of the selectivity of the post-column reaction, almost no sample clean-up is needed.

LC Conditions:

Flow Rate: 0.7 mL/min, column temperature 40 °C, injection volume 10 µL

Mobile Phase: 90:10 of Methanol / 5 % Acetic Acid in water, isocratic

Post-column Conditions

(non-metallic post-column derivatization system is required):

Reagent 1: Concentrated Sulfuric acid / Methanol (4:96 v/v)

Reactor 1: Ambient, 0.1 mL

Reagent 2: 60 g of Vanillin (or *p*-dimethylaminobenzaldehyde) in 950 mL of Methanol

Reactor 2: 90 °C, 1.4 mL

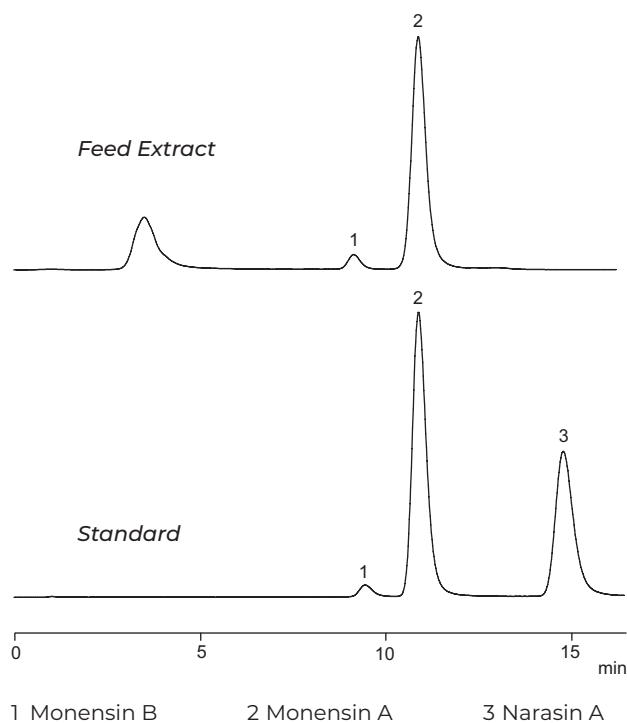
Reagents Flow Rate: 0.3 mL/min

NOTE: Using 2-reagent system for this application greatly extends life of reagents.

One-reagent method and post-column derivatization system are also available.

Detection:

UV-Vis Detector: Vanillin $\lambda=520$ nm, DMAB $\lambda=450$ nm



Polyether Antibiotics Column	
Catalog No.	Description
2381750	Polyether Reversed-phase Column, 4.6 x 250 mm
18ECG001	Guard Cartridge Holder with 3 cartridges
18ECG002	Guard Cartridges, 2/pk.

Reagents, Diluents & Sample Preparation Solutions



Trione® Ninhydrin Reagent

Chromatographic Grade™ A Prepared Reagent for Post-column Derivatization of Primary and Secondary Amines

TRIONE® Ninhydrin reagent is specially formulated for Amino Acid Analysis. It contains Ninhydrin, Hydrindantin (reduced Ninhydrin), a Lithium Acetate buffer, and Sulfolane, a water-miscible organic solvent. The solvent is necessary to maintain the solubility of both the Hydrindantin and the primary amine product, Ruhemann's Purple. The buffer is required because the reaction is pH dependent. The active ingredients - Ninhydrin and Hydrindantin are required for proper development of secondary and primary amines, respectively.

TRIONE® is so stable that it does not require refrigeration, either in shipment, storage, or in the reservoir. Quantitation is consistent from the first to the last mL, so there is no waste. The high signal-to-noise ratio of TRIONE®, when compared to DMSO-containing reagents, permits detection sensitivity to be increased with minimum increase in background noise - a feature particularly appreciated at sample concentrations of <50 picomoles.

Two preparations are available to suit your usage and storage requirements:

T100 and T100C

- Pour into your reservoir and use; the ultimate in convenience with a minimum of handling.
- 4-month* shelf life

T200

- Combine the two provided solutions, swirl, and use.
- 12-month* shelf life before mixing; one month in the reservoir after preparation.

Trione® Ninhydrin Reagent Catalog Information		
Catalog No.	Description	Quantity
T100	TRIONE® Ninhydrin Reagent (4-month* shelf life)	Each (950 mL/bottle)
T100C	TRIONE® Ninhydrin Reagent (4-month* shelf life)	Case of 4 (950 mL/bottle)
T200	TRIONE® Two-part Ninhydrin Reagent (12-month* shelf life before mixing)	To prepare case of 4 (900 mL/bottle)

* From date of manufacture

Reagents, Diluents & Sample Preparation Solutions

Thiofluor™

N,N-Dimethyl-2-Mercaptoethylamine Hydrochloride – Chromatographic Grade™ for Post-column Derivatization of Primary Amines

Primary amines form highly fluorescent adducts when reacted with o-Phthalaldehyde (OPA) and a mercaptan under basic conditions.

The products of this reaction, 1-alkyl-2-thioalkyl-substituted isoindoles, exhibit optimal excitation at 330 nm and maximal emission at 465 nm.

Pickering's Thiofluor™, a solid, nearly odorless nucleophile, is a superior substitute for 2-Mercaptoethanol in the preparation of OPA reagents. It forms a more stable reagent and a longer-lasting fluorophore with OPA than does 2-Mercaptoethanol, yet it has the same fluorescence properties.

Unlike the volatile 2-Mercaptoethanol, Thiofluor™ will not migrate through the gas manifold and regulator of the OPA reagent pressurization system.

Two grams of Thiofluor™ is equivalent to 1 mL of 2-Mercaptoethanol.



Thiofluor™	
Catalog No.	Description
3700-2000	Thiofluor™, each (10 g/bottle)

o-Phthalaldehyde (OPA)

Chromatographic Grade™ for Post-column Derivatization of Primary Amines

Primary amines form highly fluorescent adducts when reacted with o-Phthalaldehyde (OPA) and a mercaptan under basic conditions.

The products of this reaction, 1-alkyl-2-thioalkyl-substituted isoindoles, exhibit optimal excitation at 330 nm and maximal emission at 465 nm.

Pickering's OPA is specially prepared to meet the demanding requirements of high-sensitivity pre- and post-column HPLC derivatization methods. Our repurification process actually begins with commercially available 99 % material.

The entire process is controlled to eliminate trace interfering contamination. Lot quality is verified by post-column HPLC using a high-sensitivity fluorescence detector.



o-Phthalaldehyde (OPA)	
Catalog No.	Description
O120	o-Phthalaldehyde (OPA), each (5 g/bottle)

Vanillin

4-Hydroxy-3-Methoxybenzaldehyde Chromatographic Grade™ for Post-column Analysis of Polyether Antibiotics

Reagent formulation with Vanillin, Methanol and Sulfuric Acid allows specific post-column analysis of polyether antibiotics, such as Monensin, Narasin and Salinomycin. This reagent can also be used for the post-column derivatization of Sulfa Drugs. Polyether antibiotics are monitored at 520 nm and Sulfa Drugs at 400 nm.

Chromatographic Grade™ Vanillin meets the exacting purity requirements for a post-column chemical, ensuring that detection at 520 nm will be free of reagent artifacts. Because it is sensitive to oxygen, Pickering Laboratories Vanillin is sealed under Argon gas.



Vanillin	
Catalog No.	Description
3700-2200	Vanillin, each (30 g/bottle)
1700-2200	Vanillin, each (300 g/bottle)

Reagents, Diluents & Sample Preparation Solutions

Naphthalene-2,3-dicarboxaldehyde

Chromatographic Grade™ for Derivatization of Primary Amino Groups

Naphthalene-2,3-dicarboxaldehyde reacts with primary amines in presence of a nucleophile (e.g., mercaptan) and forms highly fluorescent 1-Alkylbenz-2-thioalkyl[f]isoindole derivatives.

This reagent is especially effective for post-column or precolumn derivatization of proteins, peptides and other large amines since the derivative is stable and doesn't internally quench.

Naphthalene-2,3-dicarboxaldehyde can also be used as a reagent for chemiluminescence analysis.



Naphthalene-2, 3-Dicarboxaldehyde	
Catalog No.	Description
3700-0100	Naphthalene-2,3-dicarboxaldehyde, each (500 mg/bottle)

p-Dimethylaminobenzaldehyde (DMAB)

Chromatographic Grade™ for Post-column Analysis of Sulfa Drugs in Feed and Animal Tissues

p-Dimethylaminobenzaldehyde (DMAB; Ehrlich's Reagent) reacts rapidly with many primary amines to form a complex with maximum absorbance at 450 nm.

Reversed-phase LC followed by post-column derivatization is used to determine the levels of Sulfamethazine, Sulfathiazole and related compounds in feeds, premixes and animal tissues. Although these compounds have a UV chromophore, so do most of the other constituents in the complex sample matrix. Forming a colored derivative post-column allows shifting of the detection wavelength into the visible range thus greatly enhancing selectivity.



p-Dimethyl Amino Benzaldehyde (DMAB)	
Catalog No.	Description
3700-0400	p-Dimethylaminobenzaldehyde (DMAB), each (30 g/bottle)
1700-0400	p-Dimethylaminobenzaldehyde (DMAB), each (300 g/bottle)

Nash Reagent

Reagent used for Formaldehyde Analysis

Formaldehyde is used in beauty products as a preservative, in textile industry, in making plywood, composite wood items, adhesives, and many other products. Consumers can be exposed to the chemical in tobacco smoke, construction materials, furniture, carpets, and other household products.

Formaldehyde is carcinogenic to humans, causes respiratory problems and skin irritation. It is now in the 20 high priority chemicals list for review by the EPA. In some industries, formaldehyde releasers are used and these slow-release free formaldehyde over time. The free and hydrolyzed forms of formaldehyde can be determined by HPLC method with post-column derivatization. The Pickering Nash reagent comes in two parts, and can be mixed right before use. We sell two formulations, one according to the AATCC method 206 for colorimetric determination and the other according to ASTM D5910 for free and hydrolyzed formaldehyde for HPLC post-column method.



Nash Reagent	
Catalog No.	Description
3700-5000	Nash Reagent - AATCC (900ml after mixing)
3700-5100	Nash Reagent - ASTM D5910 (900ml after mixing)

Reagents, Diluents & Sample Preparation Solutions

o-Phthalaldehyde (OPA) Diluent

Chromatographic Grade™ for Preparation of o-Phthalaldehyde Reagents

The derivatization of primary amines with o-Phthalaldehyde and a mercaptan requires basic conditions. To ensure the optimum pH of the reaction, it is important to use the correct diluent.

Three application specific diluents are available : CB910 and GA104 for Carbamate and Glyphosate analyses respectively, and OD104 for analysis of amino acids and other amines.

These borate buffers are produced from starting materials which are free of heavy metals and amines. As with most other products manufactured by Pickering Laboratories, the quality of the OPA Diluents is verified by actual post-column HPLC analysis.



o-Phthalaldehyde (OPA) Diluent	
Catalog No.	Description
CB910	o-Phthalaldehyde (OPA) Diluent for Carbamate Analysis, case of 4 (950 mL /bottle)
GA104	o-Phthalaldehyde (OPA) Diluent for Glyphosate Analysis, case of 4 (950 mL /bottle)
OD104	o-Phthalaldehyde (OPA) Diluent for Amino Acids and Amines analysis, case of 4 (950/bottle)

Hydrolysis Reagent CB130

Chromatographic Grade™

This 0.05 M NaOH/C47™ reagent is applied in the first stage of post-column Carbamate derivatization. At 100 °C the separated carbamates are converted from urethanes to methylamines. The methylamines can then react with OPA and Thiofluor™ to form the characteristically fluorescent isoindole.

Hydrolysis Reagent contains C47™ which prevents the precipitation of insoluble minerals (e.g. Ca²⁺, Mg²⁺) from samples of hard drinking water and ground water. The C47™ additive complexes these minerals and keeps them in solution.



Hydrolysis Reagent CB130.2

Chromatographic Grade™

The new Hydrolysis Reagent CB130.2 is formulated according to USEPA Method 531.2 and contains 0.075 M Sodium Hydroxide. This reagent is applied during the first stage of post-column derivatization for the analysis of Carbamate pesticides.

Hydrolysis Reagent CB130.2 contains C47™, which prevents the precipitation of insoluble minerals from samples of hard drinking and ground water, and protects your instruments from damage.

Hydrolysis Reagent	
Catalog No.	Description
CB130	Hydrolysis Reagent for Carbamate analysis 0.05 M, case of 4 (950 mL /bottle)
CB130.2	Hydrolysis Reagent for Carbamate analysis 0.075 M, case of 4 (950 mL /bottle)

Reagents, Diluents & Sample Preparation Solutions

Hypochlorite Diluent GA116

Chromatographic Grade™ for the Preparation of the Oxidizing Reagent for Post-column Glyphosate Herbicide Analysis

This diluent is used to prepare the oxidizing reagent required to convert Glyphosate to a primary amine prior to reacting it with OPA. The reagent is prepared by adding 100 µL of 5 % solution of Sodium hypochlorite to one 950 mL bottle of Diluent. The pH 11.6 diluent is formulated to ensure pH stability of the mixed stream of column effluent and oxidizing reagent. This diluent could also be used in fluorescence detection of other secondary amines.

**Hypochlorite Diluent**

Catalog No.	Description
GA116	Hypochlorite Diluent for Glyphosate analysis, case of 4 (950 mL/bottle)

Li220 & Na220L

Chromatographic Grade™ Samples and Standards Diluents for Amino Acid Analysis

Use of these diluents is essential to ensuring reproducibility from injection to injection. They establish a uniform pH and ion concentration at the outset, regardless of the source and pre-treatment of the sample. The sample is maintained buffered and at optimum pH for sample storage and analysis.

Use Li220 for prepared physiological samples and to dilute amino acid calibration standards for use with Lithium columns and buffers. Use Na220L for hydrolysate samples and to dilute amino acid calibration standards for use with Sodium columns and buffers.

**Li220 & Na220L**

Catalog No.	Description
Li220	Lithium Diluent, pH 2.36, case of 4 (250 mL/bottle)
Na220L	Sodium Diluent, pH 2.20, each (950 mL/bottle)

SERAPREP™ & URIPREP™

Chromatographic Grade™ Reagents for the Preparation of Native Samples for Amino Acid Analysis

Preparation of samples such as serum, urine, other physiological fluids, plant extracts, foods and beverages requires control of pH and normality, as well as removal of soluble protein.

The samples must be held to a narrow pH range between 2.1 and 2.5, and at the proper Lithium ion concentration to ensure reproducibility in the early part of the chromatogram.

SERAPREP™ and URIPREP™ replace commonly used protein precipitation reagents such as Acetonitrile, Perchloric acid, and Picric acid, and eliminate the need for dialysis, ultrafiltration, and the repeated centrifugation steps, followed by pH adjustment.

SERAPREP™ is used for preparing serum and other samples with high buffering capacity, e.g. sardine oil. URIPREP™ is used for urine and other samples with low buffering capacity, such as fruit juices, beer and wines. The efficiency of protein precipitation and need for post-centrifugation pH adjustment of the sample determine which reagent is best for your particular sample.

**SERAPREP™ & URIPREP™**

Catalog No.	Description
SP100	SERAPREP™, each (250 mL/bottle)
UP100	URIPREP™, each (250 mL/bottle)

Reagents, Diluents & Sample Preparation Solutions

Chlorac™ Buffer

Chromatographic Grade™ for Preservation of Aqueous Carbamate Samples

Trace analysis of Carbamate insecticide residues in drinking water is a mandated requirement in the United States. Because several of the common Carbamates—Carbaryl, Oxamyl, Hydroxycarbofuran - are labile in water due to oxidation or hydrolysis, the samples and standards must be preserved in order to obtain valid results.

ChlorAC™ Buffer from Pickering Laboratories is a highly purified Chromatographic Grade™ preservative. It is prepared from Monochloroacetic acid and Potassium acetate to EPA specifications. ChlorAC™ is guaranteed to be free of co-eluting interferences for the analytes in EPA 531.1.



ChlorAC™ Buffer	
Catalog No.	Description
1700-0132	ChlorAC Buffer, each (250 mL/bottle)
1700-0025	ChlorAC Buffer, case of 4 (25 mL/bottle)

RESTORE™

Chromatographic Grade™ for Removal of Metal Ion Contamination and Restoration of Proper Ion Balance in Glyphosate Analytical Columns and Guards

Glyphosate herbicide analysis by post-column derivitization and HPLC according to US EPA Method 547 employs a cation-exchange column. Many polyvalent metal ions which may be present in the sample, especially Iron, will accumulate in the guard or analytical column. As little as 100 nmole of Ferric Iron, for example, will cause serious degradation of column performance; larger amounts can actually cause the Glyphosate peak to vanish completely.

Glyphosate RESTORE™ rapidly removes Iron and all other polyvalent metals from the column and guard. In addition, it preserves the balance of K⁺/H⁺ in the resin, thus avoiding a lengthy re-equilibration.



RESTORE™	
Catalog No.	Description
1700-0140	RESTORE™, each (250 mL/bottle)

Chromatographic Grade™ Eluants

Pickering Laboratories eluants are manufactured under strictly controlled conditions to guarantee purity, stability and consistency for a reproducible high quality chromatogram. This quality standard guarantees the resulting chromatogram will be free of any noise and interference.

Lithium and Sodium eluants are not sensitive to oxidation and do not need refrigeration, either in storage or use. Degassing or filtration is not required. However, they should be protected from air to prevent contamination. Ambient air actually contains amines and amino acids that will dissolve in the low-pH eluants and will appear in the chromatograms.

All buffers are packaged in cases of four 950 mL polyethylene bottles. The regenerants are packaged in single 950 mL bottles because of the small volumes used during each analysis. Sample diluents are packaged in cases of four 250 mL borosilicate glass bottles.

Custom Eluants

We develop and manufacture custom eluants for customers who require our “Guaranteed Chemistry” commitment of purity and certified use. Let us make some for you! Call for details.



Amino Acid Analysis, Sodium-Based Solutions	
Catalog No.	Description
Na270	Sodium Eluant, pH 2.80, case of 4 (950 mL/bottle)
Na315	Sodium Eluant, pH 3.15, case of 4 (950 mL/bottle)
Na328	Sodium Eluant, pH 3.28, case of 4 (950 mL/bottle)
Na425	Sodium Eluant, pH 4.25, case of 4 (950 mL/bottle)
Na640	Sodium Eluant, pH 6.40, case of 4 (950 mL/bottle)
Na740	Sodium Eluant, pH 7.40, case of 4 (950 mL/bottle)
1700-0112	Sodium Eluant, pH 3.15, with 5 % Sulfolane, case of 4 (950 mL/bottle)
1700-0114	Sodium Eluant, pH 3.33, with 2.5 % Sulfolane, case of 4 (950 mL/bottle)
RG011	Sodium Column Regenerant, each (950 mL/bottle)
Amino Acid Analysis, Lithium-Based Solutions	
Li275	Lithium Eluant, pH 2.75, case of 4 (950 mL/bottle)
Li280	Lithium Eluant, pH 2.80, case of 4 (950 mL/bottle)
Li292	Lithium Eluant, pH 2.92, case of 4 (950 mL/bottle)
1700-1125	Lithium Eluant, pH 2.80, case of 4 (950 mL/bottle)
Li365	Lithium Eluant, pH 3.65, case of 4 (950 mL/bottle)
Li375	Lithium Eluant, pH 3.75, case of 4 (950 mL/bottle)
Li750	Lithium Eluant, pH 7.50, case of 4 (950 mL/bottle)
RG003	Lithium Column Regenerant, each (950 mL/bottle)
Glyphosate Herbicide Analysis	
K200	Glyphosate Potassium Phosphate Eluant, case of 4 (950 mL/bottle)
RG019	Glyphosate Column Regenerant, each (950 mL/bottle)
Potassium-Based Solutions for ALKION™ Column for Aminoglycoside Antibiotics, Paraquat/Diquat in Water Analysis & Streptomycin	
1700-1101	Potassium Phosphate Eluant, KO1, case of 4 (950 mL/bottle)
1700-1102	Potassium Hydroxide Eluant, KO2, case of 4 (950 mL/bottle)
1700-1103	Potassium Chloride Eluant, KO3, case of 4 (950 mL/bottle)
Biogenic Amines/Polyamines Analysis	
K130	Potassium Column Regenerant, each (950 mL/bottle)
K563	Potassium Phosphate Eluant, pH 5.63, case of 4 (950 mL/bottle)
K600	Potassium Phosphate Eluant, pH 6.00, case of 4 (950 mL/bottle)
Multi-Residue Mycotoxin Analysis	
1700-1108	Sodium Phosphate Eluant, pH 3.30, case of 4 (950 mL/bottle)

Test Mixtures & Standards

Calibration Standards

- Quantitative and guaranteed
- Each lot tested chromatographically
- Chromatographically-pure starting components

Pickering's Amino Acid Standards have a reputation worldwide for quality and reliability in all post-column systems and methods. Amino Acid Standard mixtures are available for a variety of applications. The standards are in 1 mL vials (5 per pack) in an appropriate citrate buffer or 0.1 N HCl.

Although they are stored frozen at the factory, Pickering's calibration standards remain stable when shipped at ambient temperatures. Upon receipt, however, it is important to place them into a freezer immediately and store frozen until ready for use.



Amino Acid Calibration Standards	
Catalog No.	Description
011006P	Native Sample Standard with Norleucine in Lithium Citrate Buffer, 0.25 μ mole/mL, pack (5x1 mL)
012006P	Native Sample Standard without Norleucine in Lithium Citrate Buffer, 0.25 μ mole/mL, pack (5x1 mL)
012506C	Collagen Hydrolysate Standard in Sodium Citrate Buffer, 0.25 μ mole/mL, Proline and Hydroxyproline 1.25 μ mole/mL, pack (5x1 mL)
012506H	Protein Hydrolysate Standard, in Sodium Citrate Buffer, 0.25 μ mole/mL, pack (5x1 mL)
1700-0155	Oxidized Feed Hydrolysate Standard in Sodium Citrate Buffer, 0.25 μ mole/mL, pack (5x1 mL)
1700-0170	Native Sample Standard without Norleucine & Alpha-Amino-Beta-Guanidinopropionic Acid in Lithium Citrate Buffer, 0.25 μ mole/mL, pack (5x1 mL)
1700-0175	Native Sample Standard, Basics, in 0.1 N HCl, 2.5 μ mole/mL, pack (5x1 mL)
1700-0180	Native Sample Standard, Acidics and Neutrals, in 0.1 N HCl, 2.5 μ mole/mL, Cystine 1.25 μ mole/mL, pack (5x1 mL)

Test Mixtures

- Qualitative mixtures
- For troubleshooting and establishing chromatographic analyte profile only

Test Mixtures	
Catalog No.	Description
1700-0075	4-peak Amino Acids Test Mixture in 0.01 N HCl, 0.25 μ mole/mL, each (5x1 mL/bottle), L-Cysteic Acid, L-Aspartic Acid, L-Threonine, L-Serine
1700-0063	Carbamate Test Mixture in Methanol, 2.5 μ g/mL, each (5.0 mL/bottle), Aldicarb, Aldicarb Sulfone, Aldicarb Sulfoxide, DMC (4-Bromo-3,5-dimethylphenyl-N-methylcarbamate), Carbaryl, Carbofuran, 3-Hydroxycarbofuran, Methomyl, Methiocarb, 1-Naphthol, Oxamyl, and Propoxur
1700-0080	Glyphosate Test Mixture in Water, 2.5 μ g/mL, each (5.0 mL/bottle), Glyphosate, AMPA (Aminoethyl-phosphonic acid)

Test Mixtures & Standards

Calibration Standards for Amino Acid Analysis								
Constituents	1700-0180*	1700-0175*	1700-0170	011006P	012006P	012506C	012506H	1700-0155
Beta-Alanine	•		•	•	•			
Alanine	•		•	•	•	•	•	•
D,L-a-Amino-adipic acid	•		•	•	•			
Gamma-Amino butyric acid		•	•	•	•			
Alpha-Amino-n-butyric acid	•		•	•	•			
D,L,b-Amino-i-butyric acid	•		•	•	•			
Alpha-Amino-Beta-guanidinopropionic acid				•	•			
Ammonia		•	•	•	•	•	•	•
Anserine		•	•	•	•			
Arginine		•	•	•	•	•	•	•
Asparagine	•		•	•	•			
Aspartic acid	•		•	•	•	•	•	•
Carnosine		•	•	•	•			
Citrulline	•		•	•	•			
Creatinine		•	•	•	•			
Cystathionine	•		•	•	•			
Cystine	• (1.25)		•	•	•	•	•	
Cysteic acid								•
Ethanolamine		•	•	•	•			
Glutamic acid	•		•	•	•	•	•	•
Glycine	•		•	•	•	•	•	•
Histidine		•	•	•	•	•	•	•
D,L-Homocystine		•	•	•	•			
L,L & allo-Hydroxylysine		•	•	•	•	•		
4-trans-L-Hydroxyproline	•		•	•	•	• (1.25)		
Isoleucine	•		•	•	•	•	•	•
Leucine	•		•	•	•	•	•	•
Lysine		•	•	•	•	•	•	•
Methionine	•		•	•	•	•	•	
Methionine-D,L-sulfoxide						•		
Methionine-D,L-sulfone								•
1-Methyl-histidine		•	•	•	•			
3-Methyl-histidine		•	•	•	•			
Norleucine				•				
Ornithine		•	•	•	•			
Phenylalanine	•		•	•	•	•	•	•
Phosphoethanolamine	•		•	•	•			
Phosphoserine	•		•	•	•			
Proline	•		•	•	•	• (1.25)	•	•
Sarcosine	•		•	•	•			
Serine	•		•	•	•	•	•	•
Taurine	•		•	•	•			
Threonine	•		•	•	•	•	•	•
Tryptophan		•	•	•	•		•	
Tyrosine	•		•	•	•	•	•	
Urea	•		•	•	•			
Valine	•		•	•	•	•	•	•

NOTE: Concentration of all the constituents in the Amino Acid standards is 0.25 µmole/mL unless otherwise specified.

*Concentration of all the constituents is 2.5 µmole/mL unless otherwise specified

Clean-Up Columns

AflaCLEAN™, OtaCLEAN™, Afla-OtaCLEAN™ & DONex™ Clean-Up Columns

Immunoaffinity & SPE Sample Clean-Up Columns

Aflatoxins and Ochratoxin A are produced by fungi, e.g. Aspergillus and Penicillium species. Therefore both toxin types are found together in many foods and animal feeds, e.g. cereals. Deoxynivalenol, also known as Vomitoxin, is a metabolite of various molds of the genus Fusarium (F. colormorum, F. graminearum) and can often be found together with other mycotoxins.

Of significant assistance is the clean-up of extracts by a combined immunoaffinity column (the Afla-OtaCLEAN column) for both Aflatoxins and Ochratoxin A in one step. The subsequent analysis may then be performed by HPLC with post-column derivatization or other techniques.



Simultaneous Clean-Up of Aflatoxins and Ochratoxin A

The combination sample clean-up column Afla-OtaCLEAN™ from LCTech is very tolerant towards many matrices and allows for a comprehensive clean-up of the aflatoxins B1, B2, G1 and G2 as well as Ochratoxin A. The high maximum capacity of 150 ng for Aflatoxin B1 and 200 ng for Ochratoxin A provides a wide measurement range. With a shelf-life of 1 year (from date of manufacture) at room temperature, the storage and use of the columns is very convenient.

Example Recoveries of Aflatoxin and Ochratoxins					
Matrix	B1	B2	G1	G2	OTA
Maize (Afla 10 ppb, OTA 14.3 ppb)	107 %	91 %	103 %	75 %	97 %
Rice (Afla 10 ppb, OTA 14.3 ppb)	107 %	93 %	98 %	85 %	101 %
Malt (Afla 10 ppb, OTA 14.3 ppb)	98 %	99 %	97 %	70 %	96 %
Raisins (Afla 10 ppb, OTA 14.3 ppb)	99 %	106 %	101 %	69 %	97 %

Aflatoxins & Ochratoxin a Sample Clean-Up Column	
11022	Afla-OtaCLEAN™, Aflatoxins B1, B2, G1, G2 & Ochratoxin A, Pkg 25, 18 month* shelf life at room temp. (Minimum order of 20 packs)
11771	Afla-OtaCLEAN™, Aflatoxins B1, B2, G1, G2 & Ochratoxin A, Pkg 500, 18 month* shelf life at room temp (Minimum order of 4 packs)

Sample Clean-Up Column for Aflatoxin Analysis

AflaCLEAN™ from LCTech was developed for the sample clean-up of foods, grains, feeds, etc. for aflatoxin analysis using HPLC post-column derivatization or other techniques. The AflaCLEAN™ column is selective for B1, B2, G1 and G2. The maximum loading capacity is 150 ng of Aflatoxin. The shelf-life is 2 years (from date of manufacture) at room temperature. Our cost-effective AflaCLEAN Select columns have a shelf-life of 9 months at 4 °C.

Example Recoveries of Aflatoxin				
Matrix	B1	B2	G1	G2
Peanut Butter	95 %	98 %	93 %	84 %
Peanuts	104 %	94 %	96 %	85 %
Dried Distillers Grain	109 %	97 %	90 %	77 %
Maize	101 %	98 %	103 %	80 %

Aflatoxin Sample Clean-Up Column	
Catalog No.	Description
10514	AflaCLEAN™, Aflatoxins B1, B2, G1, G2, Pkg 25, 24 month* shelf life at room temp.
12058	AflaCLEAN™ SELECT, Aflatoxins B1, B2, G1, G2, Pkg 25, 9 month* shelf life at 4 °C (Minimum order of 20 packs)
12062	AflaCLEAN™ SELECT, Aflatoxins B1, B2, G1, G2, Pkg 25, 9 month* shelf life at 4 °C (Minimum order of 20 packs)

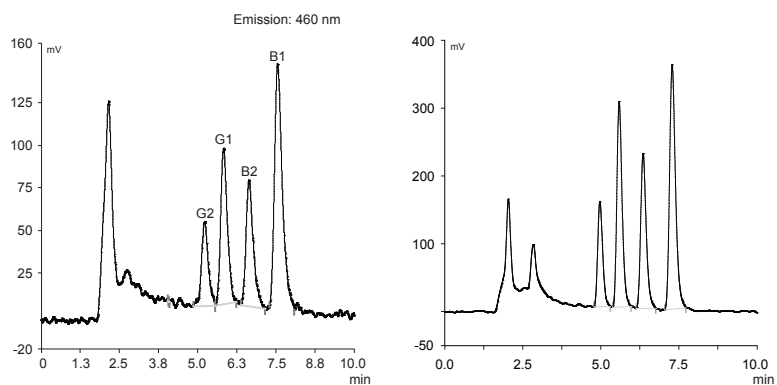
* From date of manufacture

Clean-Up Columns

AflaCLEAN Select Columns	
Catalog No.	Description
12058	AflaCLEAN™ SELECT, Aflatoxins B1, B2, G1, G2, Pkg 25, 9 month* shelf life at 4 °C (Minimum order of 20 packs)
12059	AflaCLEAN™ SELECT, Aflatoxins B1, B2, G1, G2, Pkg 500, 9 month* shelf life at 4 °C (Minimum order of 4 packs)
12062	AflaCLEAN™ SELECT, Aflatoxins B1, B2, G1, G2, Pkg 25, 9 month* shelf life at 4 °C (Minimum order of 20 packs)
12063	AflaCLEAN™ SELECT, Aflatoxins B1, B2, G1, G2, Pkg 500, 9 month* shelf life at 4 °C (Minimum order of 4 packs)

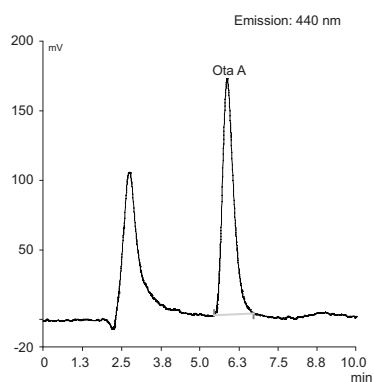
* From date of manufacture

AflaCLEAN™ SMART Cartridges, Special Small Format	
Catalog No.	Description
12862	AflaCLEAN™ SMART, Aflatoxins B1, B2, G1, G2, Pkg 100, 9 month* shelf life at 4 °C (Minimum order of 8 packs)
12863	AflaCLEAN™ SMART, Aflatoxins B1, B2, G1, G2, Pkg 1000, 9 month* shelf life at 4 °C (Minimum order of 2 packs)



Distillers grain spiked with 5 ppb total Aflatoxins

Peanut Butter spiked with 5 ppb total Aflatoxins



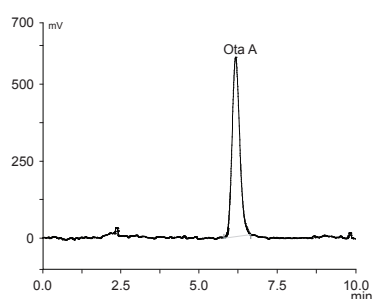
Distillers grain spiked with 5 ppb Ochratoxin A

Clean-Up Columns

Sample Clean-Up Column for Ochratoxin Analysis

OtaCLEAN™ was developed for sample clean-up of foods, grains, feeds, etc. for Ochratoxin A analysis using HPLC or other techniques. The antibody employed possesses a very high Ochratoxin A specificity. This leads to exceptional chromatographic results without any interfering secondary signals and very high recovery rates. Independent of the complexity of the matrix, excellent results can be achieved.

The maximum loading capacity is 200 ng Ochratoxin A. The shelf-life is 2 years (from date of manufacture) at room temperature.



*Roasted Coffee spiked with
5 ppb Ochratoxin A*

Example Recoveries of Ochratoxin A	
Matrix	Recovery Rate
Dried Distillers Grain	102 %
Duran Wheat	92 %
Coffee	100 %
Red Wine	108 %
Rye Bran	91 %
Beer	96 %
Grapes	91 %
Horse Feed	94 %
Wort	107 %

OtaCLEAN™ Sample Clean-Up Columns	
Catalog No.	Description
10515	OtaCLEAN™, Ochratoxin A, Pkg 25, 24 month* shelf life at room temp. (Minimum order of 20 packs)
11022	Afla-OtaCLEAN™, Aflatoxins B1, B2, G1, G2 & Ochratoxin A, Pkg 25, 18 month* shelf life at room temp. (Minimum order of 20 packs)
11535	OtaCLEAN™, Ochratoxin A, Pkg 500, 24 month* shelf life at room temp. (Minimum order of 4 packs)
12425	OtaCLEAN™, Ochratoxin A, Pkg 25, 24 month* shelf life at room temp. (Minimum order of 20 packs)
12427	OtaCLEAN™, Ochratoxin A, Pkg 500, 24 month* shelf life at room temp. (Minimum order of 4 packs)

OtaCLEAN™ SMART Sample Clean-Up Columns	
Catalog No.	Description
13346	OtaCLEAN™ SMART, Ochratoxin A, special small format, Pkg 100, 9 month shelf life* at 4 °C (Minimum order of 8 packs)
13351	OtaCLEAN™ SMART, Ochratoxin A, special small format, Pkg 1000, 9 month shelf life* at 4 °C (Minimum order of 2 packs)

* From date of manufacture

Clean-Up Columns

DONeX

Deoxynivalenol, also known as Vomitoxin, is a metabolite of various molds of the genus *Fusarium* (*F. culmorum*, *F. graminearum*) and can often be found on contaminated cereals (wheat, barley, oat).

Generally the toxin is analyzed with HPLC/UV detection or alternatively with HPLC / post column derivatization / fluorescence detection or LC / MS. Whichever method is chosen, a good sample preparation extends life time of the analyzer and of the HPLC column and reduces interferences by matrix components. Moreover the running times of the HPLC system can be reduced for easy matrices from about 25 to 10 minutes by pre-cleaning.

If HPLC/UV detection is used, sensitivity can be dramatically enhanced with larger sample volumes.

The DONeX column has a matrix load of up to 4 grams. It is ideally suited to many different matrices, including corn, barley, wheat, animal feeds, muesli, and bread.

DONeX™, SPE Clean-Up Cartridge for DON Analysis, 3 mL

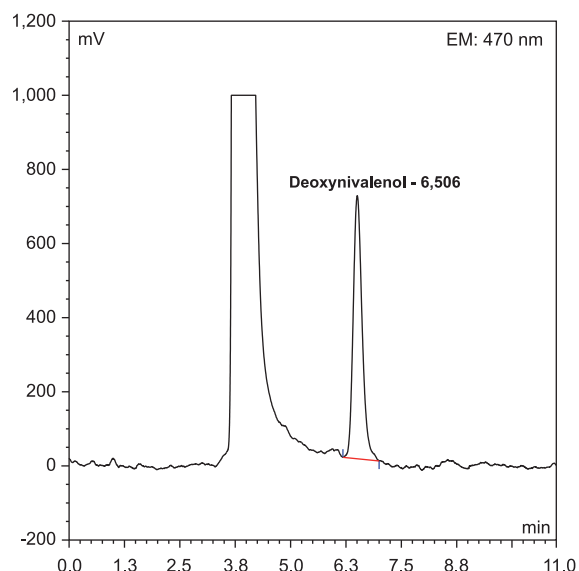
Catalog No.	Description
12792	DONeX™, SPE Clean-up Cartridge for DON Analysis, Pkg 25, no expiration at room temp. (Minimum order of 20 packs)
12793	DONeX™, SPE Clean-up Cartridge for DON Analysis, Pkg 500, no expiration at room temp. (Minimum order of 4 packs)

DONeX Column Recoveries

Matrix	Recoveries [%] DON
Bread	108
Corn	90
Chicken Feed	101
Distillers Grain	91
Oat Flakes	100
Pasta (Dried)	105
Poultry Feed	100
Rice	104
Rye	91
Wheat	100
Wheat Bran	99

* All matrices were spiked prior to the extraction. Spiking solution was incubated for at least 1 h with matrix before extraction was started. Calculation of recovery is based on subtraction of values obtained without spiking.

Recoveries for Nivalenol are similar to those observed for Deoxynivalenol.



Chromatogram of a cereal-based poultry feed sample, analyzed with HPLC/post column derivatization/FLD, sample was spiked with 1 ppm DON, extracted and purified, evaporated sample (1 g) was resolved in 2 mL HPLC solvent, 40 µL were injected (0.02 gram matrix equivalents represent 20 ng DON injected)

Application Kits

Amino Acid Analysis,
Sodium-Based Solutions

Amino Acid Analysis, Sodium-Based Solutions	
Catalog No.	Description
0352-0061	30-Minute High Efficiency Collagen Hydrolysate Kit:
1154110T	30-minute High-efficiency Sodium Cation-exchange Column 4.6 x 110 mm, includes Amino Acid Test Mixture 1700-0075
1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARDs™
Na220L	Sodium Diluent, pH 2.20, each (950 mL/bottle)
Na315	Sodium Eluant, pH 3.15, case of 4 (950 mL/bottle)
Na425	Sodium Eluant, pH 4.25, case of 4 (950 mL/bottle)
Na640	Sodium Eluant, pH 6.40, case of 4 (950 mL/bottle)
RG011	Sodium Column Regenerant, each (950 mL/bottle)
T100C	TRIONE® Ninhydrin Reagent (4-month* shelf life), case of 4 (950 mL/bottle)
012506C	Collagen Hydrolysate Standard in Sodium Citrate Buffer, 0.25 µmole/mL, Proline and Hydroxyproline 1.25 µmole/mL, each (5 mL/bottle)
0352-0062	Kit Identical to 0352-0061 with T200 Replacing T100C:
T200	TRIONE® Two-part Ninhydrin Reagent (12-month* shelf life before mixing), to prepare case of 4 (900 mL/bottle)
0352-0063	Kit Identical to 0352-0061 with OPA Replacing T100C:
OD104	OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
0352-0057	30-Minute High Efficiency Protein Hydrolysate Kit:
1154110T	30-minute High-efficiency Sodium Cation-exchange Column 4.6 x 110 mm, includes Amino Acid Test Mixture 1700-0075
1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARDs™
Na220L	Sodium Diluent, pH 2.20, each (950 mL/bottle)
Na315	Sodium Eluant, pH 3.15, case of 4 (950 mL/bottle)
Na425	Sodium Eluant, pH 4.25, case of 4 (950 mL/bottle)
Na640	Sodium Eluant, pH 6.40, case of 4 (950 mL/bottle)
RG011	Sodium Column Regenerant, each (950 mL/bottle)
T100C	TRIONE® Ninhydrin Reagent (4-month* shelf life), case of 4 (950 mL/bottle)
012506H	Protein Hydrolysate Standard, in Sodium Citrate Buffer, 0.25 µmole/mL, each (5 mL/bottle)
0352-0058	Kit Identical to 0352-0057 with T200 Replacing T100C:
T200	TRIONE® Two-part Ninhydrin Reagent (12-month* shelf life before mixing), to prepare case of 4 (900 mL/bottle)
0352-0059	Kit Identical to 0352-0057 with OPA Replacing T100C:
OD104	OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
0352-0020	30-Minute High Efficiency Oxidized Feed Hydrolysate Kit:
1154110T	30-minute High-efficiency Sodium Cation-exchange Column 4.6 x 110 mm, includes Amino Acid Test Mixture 1700-0075

1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARDs™
Na220L	Sodium Diluent, pH 2.20, each (950 mL/bottle)
Na270	Sodium Eluant, pH 2.80, case of 4 (950 mL/bottle)
Na425	Sodium Eluant, pH 4.25, case of 4 (950 mL/bottle)
Na640	Sodium Eluant, pH 6.40, case of 4 (950 mL/bottle)
RG011	Sodium Column Regenerant, each (950 mL/bottle)
T100C	TRIONE® Ninhydrin Reagent (4-month* shelf life), case of 4 (950 mL/bottle)
1700-0155	Oxidized Feed Hydrolysate Standard in Sodium Citrate Buffer, 0.25 µmole/mL, each (5 mL/bottle)
0352-0021	Kit Identical to 0352-0020 with T200 Replacing T100C:
T200	TRIONE® Two-part Ninhydrin Reagent (12-month* shelf life before mixing), to prepare case of 4 (900 mL/bottle)
0352-0022	Kit Identical to 0352-0020 with OPA Replacing T100C:
OD104	OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
AT30SH	Standard 60-Minute Protein Hydrolysate Kit:
1193250	Standard Sodium Cation-exchange Column 3.0 x 250 mm, includes Amino Acid Test Mixture 1700-0075
1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARDs™
Na328	Sodium Eluant, pH 3.28, case of 4 (950 mL/bottle)
Na740	Sodium Eluant, pH 7.40, case of 4 (950 mL/bottle)
T100C	TRIONE® Ninhydrin Reagent (4-month* shelf life), case of 4 (950 mL/bottle)
RG011	Sodium Column Regenerant, each (950 mL/bottle)
Na220L	Sodium Diluent, pH 2.20, each (950 mL/bottle)
012506H	Protein Hydrolysate Standard, in Sodium Citrate Buffer, 0.25 µmole/mL, each (5 mL/bottle)
0352-0030	Kit Identical to AT30SH with T200 Replacing T100C:
T200	TRIONE® Two-part Ninhydrin Reagent (12-month* shelf life before mixing), to prepare case of 4 (900 mL/bottle)
AO30SH	Kit Identical to AT30SH with OPA Replacing T100C:
OD104	OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
AT31FH	High-Efficiency 55-Minute Protein Hydrolysate Kit:
1154150T	High-efficiency Sodium Cation-exchange Column for protein, collagen and oxidized feed hydrolysates, 4.0 x 150 mm, includes Amino Acid Test Mixture 1700-0075
1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARDs™
Na315	Sodium Eluant, pH 3.15, case of 4 (950 mL/bottle)
Na740	Sodium Eluant, pH 7.40, case of 4 (950 mL/bottle)
T100C	TRIONE® Ninhydrin Reagent (4-month* shelf life), case of 4 (950 mL/bottle)
RG011	Sodium Column Regenerant, each (950 mL/bottle)
Na220L	Sodium Diluent, pH 2.20, each (950 mL/bottle)
012506H	Protein Hydrolysate Standard, in Sodium Citrate Buffer, 0.25 µmole/mL, each (5 mL/bottle)
0352-0031	Kit Identical to AT31FH with T200 Replacing T100C:

Application Kits

T200	TRIONE® Two-part Ninhydrin Reagent (12-month* shelf life before mixing), to prepare case of 4 (900 mL/bottle)
AO31FH	Kit Identical to AT31FH with OPA Replacing T100C:
OD104	OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
AT32FC	High-Efficiency 55-Minute Collagen Hydrolysate Kit:
1154150T	High-efficiency Sodium Cation-exchange Column for protein, collagen and oxidized feed hydrolysates, 4.0 x 150 mm, includes Amino Acid Test Mixture 1700-0075
1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARDs™
Na315	Sodium Eluant, pH 3.15, case of 4 (950 mL/bottle)
Na740	Sodium Eluant, pH 7.40, case of 4 (950 mL/bottle)
T100C	TRIONE® Ninhydrin Reagent (4-month* shelf life), case of 4 (950 mL/bottle)
RG011	Sodium Column Regenerant, each (950 mL/bottle)
Na220L	Sodium Diluent, pH 2.20, each (950 mL/bottle)
O12506C	Collagen Hydrolysate Standard in Sodium Citrate Buffer, 0.25 µmole/mL, Proline and Hydroxyproline 1.25 µmole/mL, each (5 mL/bottle)
O352-0032	Kit Identical to AT32FC with T200 Replacing T100C:
T200	TRIONE® Two-part Ninhydrin Reagent (12-month* shelf life before mixing), to prepare case of 4 (900 mL/bottle)
AO32FC	Kit Identical to AT32FC with OPA Replacing T100C:
OD104	OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
O352-0018	60-Minute Oxidized Feed Hydrolysate Kit:
1154150T	High-efficiency Sodium Cation-exchange Column for protein, collagen and oxidized feed hydrolysates, 4.0 x 150 mm, includes Amino Acid Test Mixture 1700-0075
1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARDs™
Na270	Sodium Eluant, pH 2.80, case of 4 (950 mL/bottle)
Na740	Sodium Eluant, pH 7.40, case of 4 (950 mL/bottle)
T100C	TRIONE® Ninhydrin Reagent (4-month* shelf life), case of 4 (950 mL/bottle)
RG011	Sodium Column Regenerant, each (950 mL/bottle)
Na220L	Sodium Diluent, pH 2.20, each (950 mL/bottle)
1700-0155	Oxidized Feed Hydrolysate Standard in Sodium Citrate Buffer, 0.25 µmole/mL, each (5 mL/bottle)
O352-0017	Kit Identical to O352-0018 with T200 Replacing T100C:
T200	TRIONE® Two-part Ninhydrin Reagent (12-month* shelf life before mixing), to prepare case of 4 (900 mL/bottle)
O352-0019	Kit Identical to O352-0018 with OPA Replacing T100C:
OD104	OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
O352-0006	70-Minute Physiologic Fluid/Native Sample Kit:
O354675T	70-minute High-efficiency Lithium Cation-exchange Column, 4.6 x 75 mm, includes Amino Acid Test Mixture 1700-0075

1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARDs™
1700-1125	Lithium Eluant, pH 2.80, case of 4 (950 mL/bottle)
Li220	Lithium Diluent, pH 2.36, case of 4 (250 mL/bottle)
Li365	Lithium Eluant, pH 3.65, case of 4 (950 mL/bottle)
Li375	Lithium Eluant, pH 3.75, case of 4 (950 mL/bottle)
RG003	Lithium Column Regenerant, each (950 mL/bottle)
1700-0170	Native Sample Standard without Norleucine & Alpha-Amino-Beta-Guanidinopropionic Acid in Lithium Citrate Buffer, 0.25 µmole/mL, each (5 mL/bottle)
SP100	SERAPREP™, each (250 mL/bottle)
UP100	URIPREP™, each (250 mL/bottle)
T100C	TRIONE® Ninhydrin Reagent (4-month* shelf life), case of 4 (950 mL/bottle)
O352-0007	Kit Identical to O352-0006 with T200 Replacing T100C:
T200	TRIONE® Two-part Ninhydrin Reagent (12-month* shelf life before mixing), to prepare case of 4 (900 mL/bottle)
O352-0008	Kit Identical to O352-0006 with OPA Replacing T100C:
OD104	OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
AT33SP	Standard 185-Minute Physiologic Fluid/Native Sample Kit:
O393250	Standard Lithium Cation-exchange Column, 3.0 x 250 mm, includes Amino Acid Test Mixture 1700-0075
1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARDs™
Li275	Lithium Eluant, pH 2.75, case of 4 (950 mL/bottle)
Li750	Lithium Eluant, pH 7.50, case of 4 (950 mL/bottle)
T100C	TRIONE® Ninhydrin Reagent (4-month* shelf life), case of 4 (950 mL/bottle)
RG003	Lithium Column Regenerant, each (950 mL/bottle)
Li220	Lithium Diluent, pH 2.36, case of 4 (250 mL/bottle)
11006P	Native Sample Standard with Norleucine in Lithium Citrate Buffer, 0.25 µmole/mL, each (5 mL/bottle)
SP100	SERAPREP™, each (250 mL/bottle)
UP100	URIPREP™, each (250 mL/bottle)
O352-0033	Kit identical to AT33SP with T200 Replacing T100C:
T200	TRIONE® Two-part Ninhydrin Reagent (12-month* shelf life before mixing), to prepare case of 4 (900 mL/bottle)
AO33SP	Kit Identical to AT33SP with OPA Replacing T100C:
OD104	OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)

Application Kits

(Continued) Amino Acid Analysis, Sodium-Based Solutions

0352-0015	High-Efficiency 120-Minute Physiologic Fluid/Native Sample Kit:
0354100T	High-efficiency Lithium Cation-exchange Column, 4.0 x 100 mm, includes Amino Acid Test Mixture 1700-0075
1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARDs™
Li275	Lithium Eluant, pH 2.75, case of 4 (950 mL/bottle)
Li750	Lithium Eluant, pH 7.50, case of 4 (950 mL/bottle)
T100C	TRIONE® Ninhydrin Reagent (4-month* shelf life), case of 4 (950 mL/bottle)
RG003	Lithium Column Regenerant, each (950 mL/bottle)
Li220	Lithium Diluent, pH 2.36, case of 4 (250 mL/bottle)
011006P	Native Sample Standard with Norleucine in Lithium Citrate Buffer, 0.25 µmole/mL, each (5 mL/bottle)
SP100	SERAPREP™, each (250 mL/bottle)
UP100	URIPREP™, each (250 mL/bottle)
0352-0011	Kit Identical to 0352-0015 with T200 Replacing T100C:
T200	TRIONE® Two-part Ninhydrin Reagent (12-month* shelf life before mixing), to prepare case of 4 (900 mL/bottle)
0352-0012	Kit Identical to 0352-0015 with OPA Replacing T100C:
OD104	OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
0352-0013	Temperature Gradient Physiologic Fluid/Native Sample Kit:
0354100T	High-efficiency Lithium Cation-exchange Column, 4.0 x 100 mm, includes Amino Acid Test Mixture 1700-0075
1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARDs™
1700-1125	Lithium Eluant, pH 2.80, case of 4 (950 mL/bottle)
Li220	Lithium Diluent, pH 2.36, case of 4 (250 mL/bottle)
Li365	Lithium Eluant, pH 3.65, case of 4 (950 mL/bottle)
Li375	Lithium Eluant, pH 3.75, case of 4 (950 mL/bottle)
RG003	Lithium Column Regenerant, each (950 mL/bottle)
1700-0170	Native Sample Standard without Norleucine & Alpha-Amino-Beta-Guanidinopropionic Acid in Lithium Citrate Buffer, 0.25 µmole/mL, each (5 mL/bottle)
SP100	SERAPREP™, each (250 mL/bottle)
UP100	URIPREP™, each (250 mL/bottle)
T100C	TRIONE® Ninhydrin Reagent (4-month* shelf life), case of 4 (950 mL/bottle)
0352-0014	Kit Identical to 0352-0013 with T200 Replacing T100C:
T200	TRIONE® Two-part Ninhydrin Reagent (12-month* shelf life before mixing), to prepare case of 4 (900 mL/bottle)
0352-0016	Kit Identical to 0352-0013 with OPA Replacing T100C:
OD104	OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)

* From date of manufacture

Pesticide & Herbicide Analysis Kits

Pesticide & Herbicide Analysis Kits	
Catalog No.	Description
0352-0002	Carbamate Pesticides Analysis Kit, 23+ Compounds
0840250	Carbamate Column, expanded resolution, C8, 4.0 x 250 mm, includes Carbamate Test Mixture 1700-0063
18ECG001	Guard Cartridge Holder with 3 guard cartridges
CB130	Carbamate Hydrolysis Reagent, case of 4 (950 mL/bottle)
CB910	Carbamate OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
1700-0025	ChlorAC Buffer, case of 4 (25 mL/bottle)
0352-0003	Carbamate Pesticides Analysis Kit, for EPA Method 531.1:
0846250	Carbamate Column, high resolution/capacity, 4.6 x 250 mm, includes Carbamate Test Mixture 1700-0063
18ECG001	Guard Cartridge Holder with 3 guard cartridges
CB130	Carbamate Hydrolysis Reagent, case of 4 (950 mL/bottle)
CB910	Carbamate OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
1700-0025	ChlorAC Buffer, case of 4 (25 mL/bottle)
0352-0009	Carbamate Pesticides Analysis Kit, for EPA Method 531.2:
0846250	Carbamate Column, high resolution/capacity, 4.6 x 250 mm, includes Carbamate Test Mixture 1700-0063
18ECG001	Guard Cartridge Holder with 3 guard cartridges
CB130.2	Carbamate Hydrolysis Reagent, case of 4 (950 mL/bottle)
CB910	Carbamate OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
0352-0004	Carbamate Pesticides Analysis Kit, for AOAC Method 985.23:
1846150	Analytical Column, rapid analysis/QC, 4.6 x 150 mm, includes Carbamate Test Mixture 1700-0063
18ECG001	Guard Cartridge Holder with 3 guard cartridges
CB130	Carbamate Hydrolysis Reagent, case of 4 (950 mL/bottle)
CB910	Carbamate OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
1700-0025	ChlorAC Buffer, case of 4 (25 mL/bottle)
0352-0010	Glyphosate Herbicide Analysis Kit, for EPA Method 547, AOAC Method 991.08:
1954150	Cation-exchange Column for Glyphosate analysis, 4 x 150 mm, including Glyphosate Test Mixture 1700-0080
1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARDs™

Application Kits

K200	Glyphosate Potassium Phosphate Eluant, case of 4 (950 mL/bottle)
RG019	Glyphosate Column Regenerant, each (950 mL/bottle)
GA104	Glyphosate OPA Diluent, case of 4 (950 mL/bottle)
GA116	Glyphosate Hypochlorite Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
1700-0140	RESTORE™, each (250 mL/bottle)

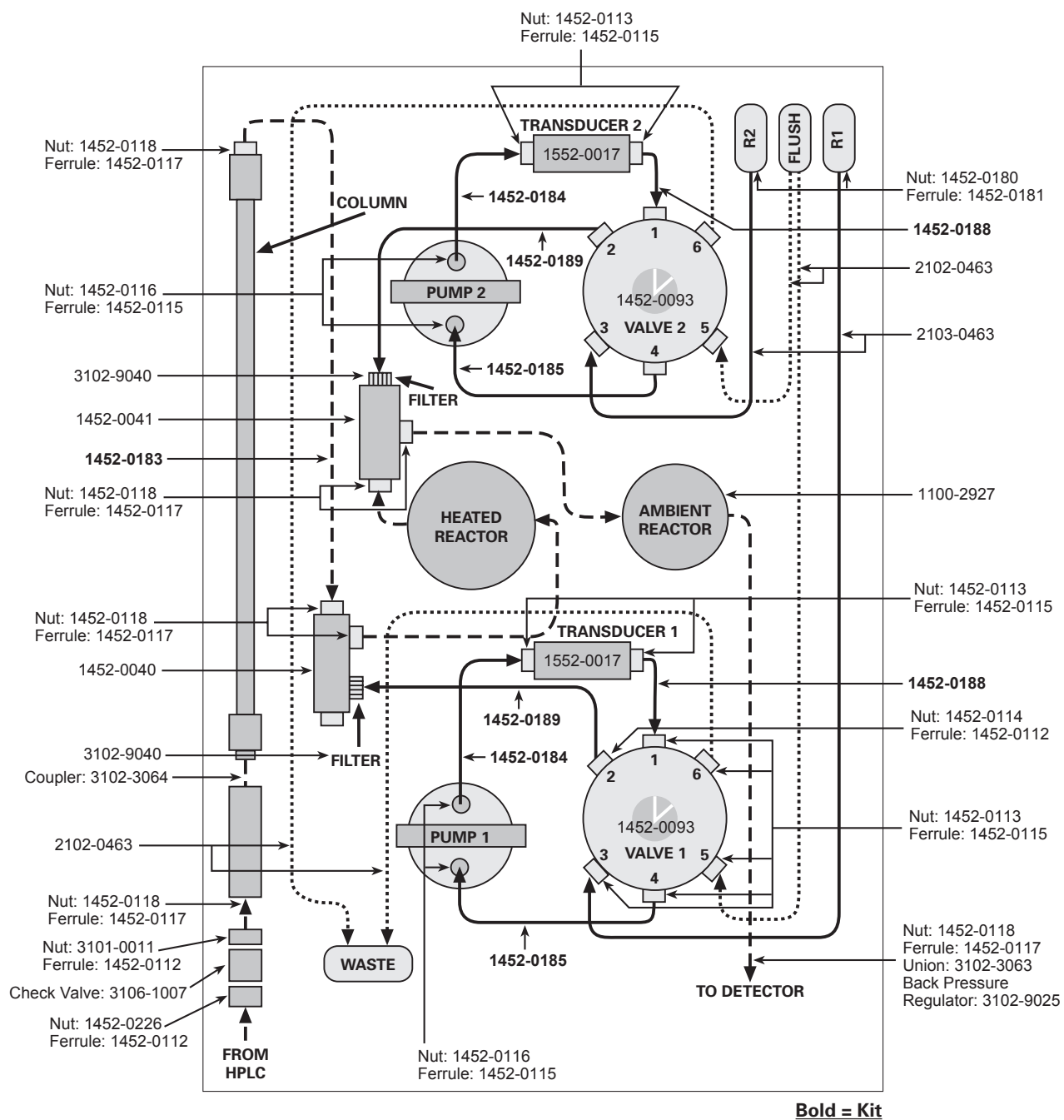
Other Post-Column Analysis Kits

Other Post-Column Analysis Kits	
Catalog No.	Description
0352-0040	Biogenic Amines/Polyamines Analysis Kit:
9410917	ALKION™ Cation-exchange Column, K ⁺ form, 4.0 x 150 mm
9493020	ALKION™ Guard Column, K ⁺ form
1100-0161	Flow Restrictor, PEEK Tubing, 0.005" ID, 550 psi @ 0.3 mL/min in 15% Methanol in Water
K563	Potassium Phosphate Eluant, pH 5.63, case of 4 (950 mL/bottle)
K600	Potassium Phosphate Eluant, pH 6.00, case of 4 (950 mL/bottle)
K130	Potassium Column Regenerant, each (950 mL/bottle)
OD104	OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
0352-0041	Aminoglycoside Antibiotics Analysis Kit:
9410917	ALKION™ Cation-exchange Column, K ⁺ form, 4.0 x 150 mm
9493020	ALKION™ Guard Column, K ⁺ form
1100-0161	Flow Restrictor, PEEK Tubing, 0.005" ID, 550 psi @ 0.3 mL/min in 15% Methanol in Water
1700-1101	Potassium Phosphate Eluant, KO1, case of 4 (950 mL/bottle)
1700-1102	Potassium Hydroxide Eluant, KO2, case of 4 (950 mL/bottle)
1700-1103	Potassium Chloride Eluant, KO3, case of 4 (950 mL/bottle)
OD104	OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)

0352-0053	Multi-Residue Mycotoxin Kit:
1612124	MYCOTOX™ Reversed-phase Column, 4.6 x 250 mm
18ECG001	Guard Cartridge Holder with 3 cartridges
OD104	OPA Diluent, case of 4 (950 mL/bottle)
O120	o-Phthalaldehyde, each (5 g/bottle)
1700-1108	Sodium Phosphate Eluant, pH 3.3, case of 4 (950 mL/bottle)
3700-2000	Thiofluor™, each (10 g/bottle), (2 per kit)
0352-0050	Aflatoxin Analysis Kit:
1612124	MYCOTOX™ Reversed-phase Column, 4.6 x 250 mm
18ECG001	Guard Cartridge Holder with 3 cartridges
0352-0051	Polyether Antibiotics Kit:
2381750	Polyether Reversed-phase Column, 4.6 x 250 mm
18ECG001	Guard Cartridge Holder with 3 cartridges
3700-2200	Vanillin, 30 g (2 per kit)

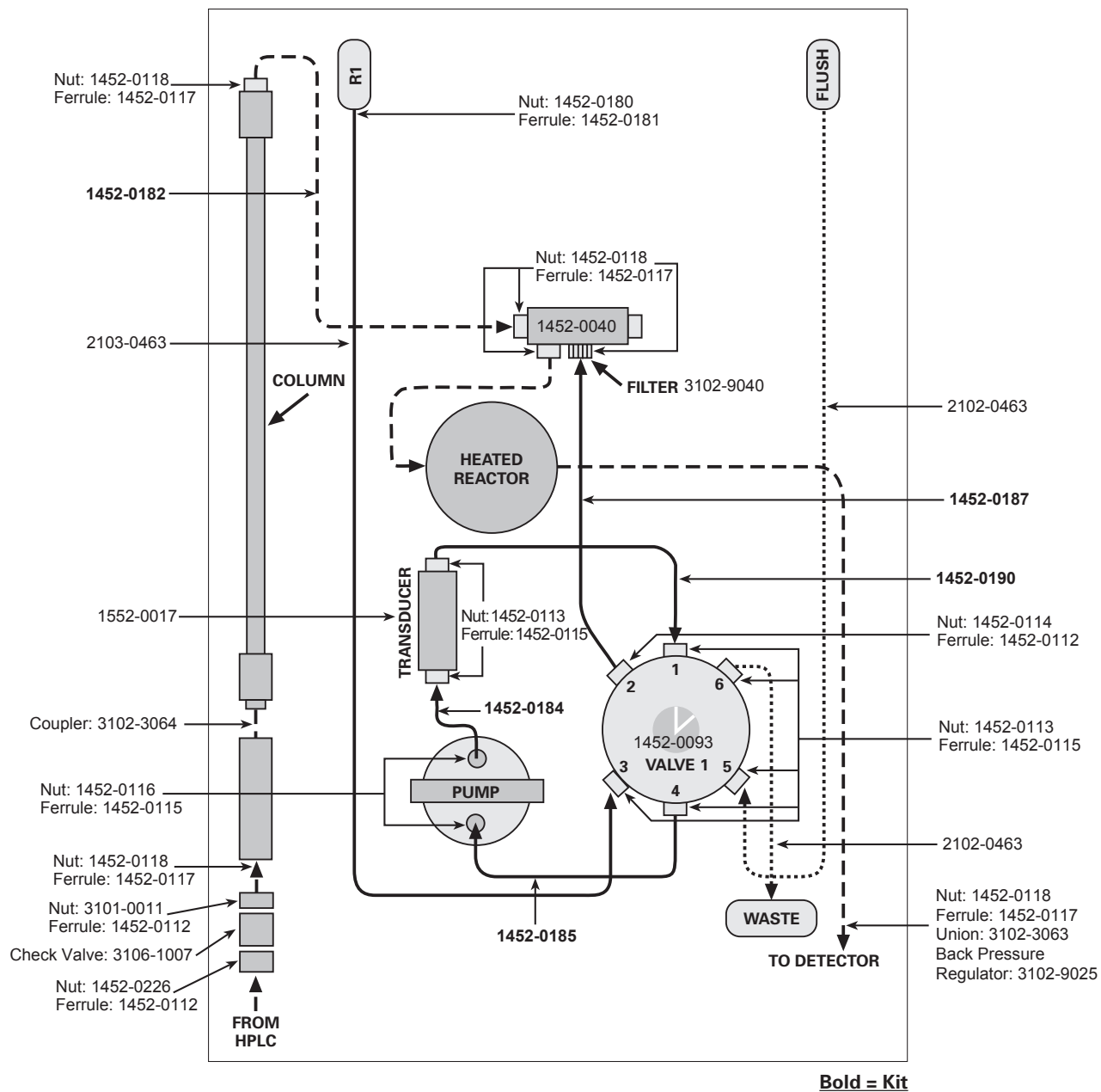
Replacement Components, Fittings & Tubing

Onyx PCX Flow Diagram – Two-Pump System



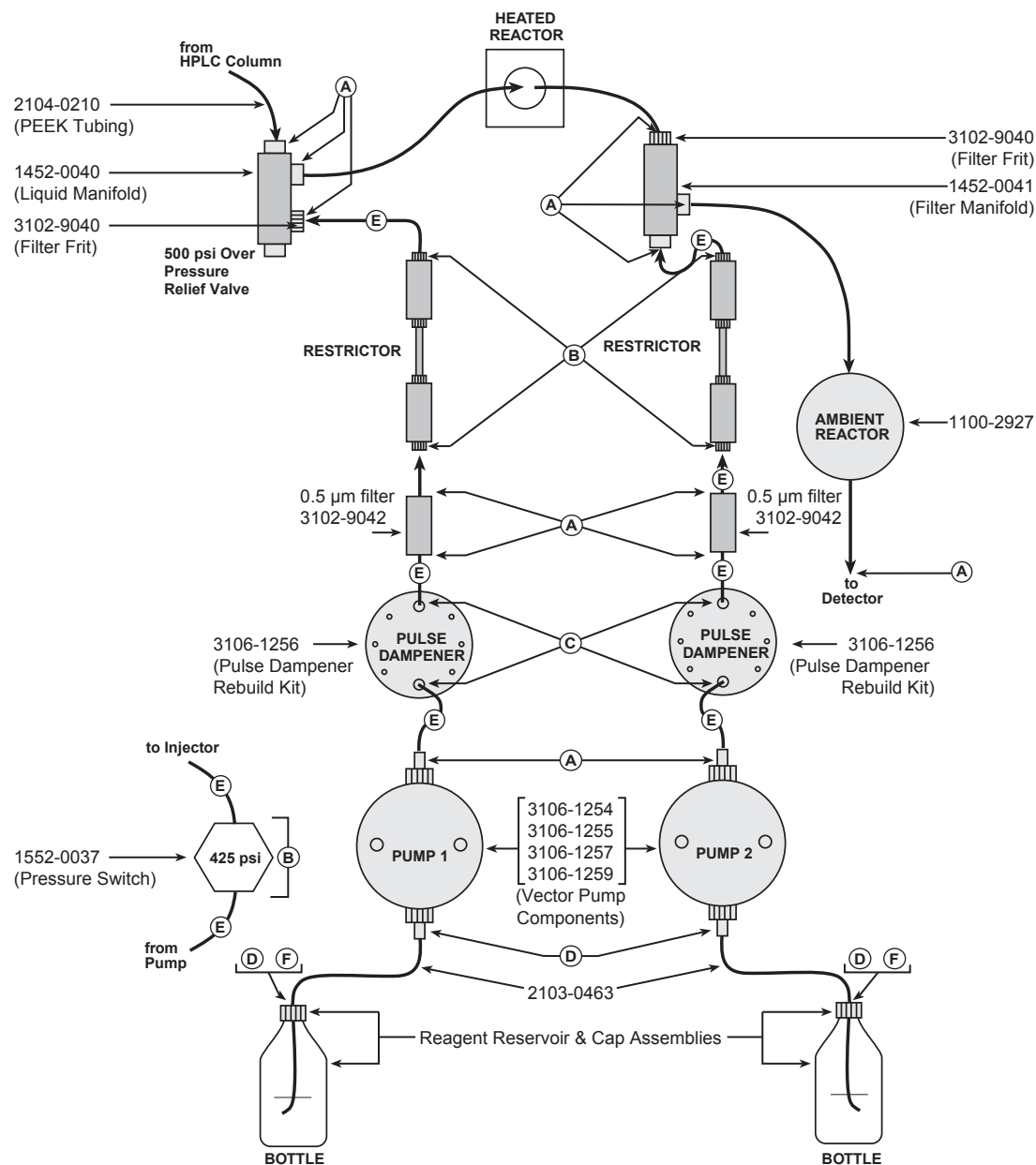
Replacement Components, Fittings & Tubing

Onyx PCX Flow Diagram – One-Pump System



Replacement Components, Fittings & Tubing

Vector PCX Flow Diagram



- | | | |
|--|--|---|
| (A) Nut: 1452-0118
Ferrule: 1452-0117 | (C) Nut: 1452-0177
Ferrule: 1452-0176 | (E) 2104-0220
(PEEK Tubing,
0.02" ID) |
| (B) Nut: 1452-0179
Ferrule: 1452-0178 | (D) Nut: 1452-0180
Ferrule: 1452-0181 | (F) 3106-1010 |

Replacement Components, Fittings & Tubing

Onyx PCX Reagent Pump and Valve Components

Onyx PCX Reagent Pump and Valve Components	
Catalog No.	Description
1000-1003	Single Syringe Pump PM Kit
1000-1004	Dual Syringe Pump PM Kit
1100-0550	Onyx PCX Tubing Kit - Dual Pump System
1100-0551	Onyx PCX Tubing Kit - Single Pump System
1352-0007	Syringe Pump Cylinder, Ceramic 70 mL
1352-0019	Syringe Pump PEEK® Face
1352-0020	Metal Piston Face
1452-0077	Onyx PCX Valve Assembly, Valve Face and Motor
1452-0079	Onyx PCX Pump Assembly, 70 mL with Motor
1452-0093	PCX Valve Face Assembly, Liquid End
1452-0122	Syringe Pump Seal Kit
1452-0200	PCX Valve Seal Tool
1452-0201	PCX Valve Seals Kit
1452-0202	PCX Valve Maintenance Kit (Seals and Tools)
1452-0332	Syringe Pump PEEK® Cylinder Front Assembly
1452-0349	Syringe Pump Rebuild Kit
1552-0017	PCX Pressure Transducer Assembly
1552-0040	PCX Dead-head Kit for Transducer for Chromium VI and Alprostadil Systems

Pinnacle PCX Reagent Pump and Valve Components

Pinnacle PCX Reagent Pump and Valve Components	
Catalog No.	Description
1000-1003	Single Syringe Pump PM Kit
1000-1004	Dual Syringe Pump PM Kit
1100-0500	Pinnacle PCX Tubing Kit - Dual Pump System
1100-0501	Pinnacle PCX Tubing Kit - Single Pump System
1352-0007	Syringe Pump Cylinder, Ceramic 70 mL
1352-0019	Syringe Pump PEEK® Face
1352-0020	Metal Piston Face
1452-0038	Pinnacle Syringe Pump Assembly, 70 mL with Motor
1452-0045	Pinnacle PCX Valve Assembly, Valve Face and Motor
1452-0093	PCX Valve Face Assembly, Liquid End
1452-0122	Syringe Pump Seal Kit
1452-0200	PCX Valve Seal Tool
1452-0201	PCX Valve Seals Kit
1452-0202	PCX Valve Maintenance Kit (Seals and Tools)
1452-0332	Syringe Pump PEEK® Cylinder Front Assembly

Pinnacle PCX Reagent Pump and Valve Components (Continued)	
Catalog No.	Description
1452-0349	Syringe Pump Rebuild Kit
1552-0017	PCX Pressure Transducer Assembly
1552-0040	Pinnacle PCX Dead-head Kit for Transducer for Chromium VI and Alprostadil Systems

Vector PCX Reagent Pump Components

Vector PCX Reagent Pump Components	
Catalog No.	Description
1000-1006	Vector PCX Dual Pump PM Kit
1452-0235	Check Valve Cartridge, PEEK® (2/pk) Vector
1452-0332	Syringe Pump PEEK® Cylinder Front Assembly
3102-9028	Inline Filter, 0.5 µm Frit
3106-1254	Pump Check Valve Kit, PEEK® (Inlet & Outlet)
3106-1255	Seal Kit (Piston seal, Back-up O-ring, Diaphragm, Tool)
3106-1256	Pulse Damper Rebuild Kit (Diaphragm, O-rings, Diaphragm seal, Seal tool, and 4 Hex wrenches)
3106-1257	Piston, Vector Pump
3106-1258	Prime/Purge Valve, PEEK®
3106-1259	Head Kit, Vector Pump, (Head, Check Valves, Piston and Seal)
3106-1260	Prime Purge Seal Kit, PEEK®
3106-1266	Piston Retainer Bushing

Onyx PCX Replacement Reactors

Onyx PCX Replacement Reactor Volume Cartridge Coils	
Catalog No.	Description
1452-0221	Reactor Cooling Coil, Voglibose
1452-0241	Onyx Reactor Heater Assembly
1452-0363	Onyx Reactor Cartridge Coil Assembly - 0.15 mL 130 °C
1452-0364	Onyx Reactor Cartridge Coil Assembly - 0.5 mL 130 °C
1452-0365	Onyx Reactor Cartridge Knitted Assembly - 1.4 mL 130 °C
1452-0366	Onyx Reactor Cartridge Knitted Assembly - 2.0 mL 80 °C
1452-0367	Onyx Reactor Cartridge Knitted Assembly - 3.0 mL 80 °C
1452-0368	Onyx Reactor Cartridge Coil Assembly - 3.5 mL 130 °C
1452-0369	Onyx Reactor Cartridge Knitted Assembly - 1.2 mL & 1.6 mL 130 °C
1452-0370	Onyx Reactor Cartridge Knitted Assembly - 1.0 mL
1452-0359	Calibration Reactor

Replacement Components, Fittings & Tubing

Pinnacle PCX
Replacement Reactors

Pinnacle PCX Replacement Reactor Volume Cartridge Coils	
Catalog No.	Description
1452-0063	Pinnacle Reactor Heater Assembly
1452-0064	Reactor Cartridge Coil Assembly - 0.5 mL 130 °C
1452-0094	Reactor Cartridge Coil Assembly - 0.15 mL 130 °C
1452-0096	Reactor Cartridge Knitted Assembly - 1.4 mL 130 °C
1452-0097	Reactor Cartridge Knitted Assembly - 2.0 mL 80 °C
1452-0098	Reactor Cartridge Knitted Assembly - 2.8 mL 80 °C
1452-0099	Reactor Cartridge Knitted Assembly - 3.0 mL 80 °C
1452-0100	Reactor Cartridge Knitted Assembly - 1.2 mL & 1.6 mL 130 °C
1452-0221	Reactor Cooling Coil, Voglibose
1452-0225	Reactor Cartridge Coil Assembly - 3.5 mL 130 °C
1452-0324	Reactor Cartridge Knitted Assembly - 1.0 mL

Vector PCX Substitute
Reactor Volumes or
Replacement Reactors

Vector PCX Substitute Reactor Volumes or Replacement Reactors	
Catalog No.	Description
1100-2927	OPA Ambient Reactor, 0.010 in ID TFE Tubing
1452-0160	Reactor Heater & Coil Assembly, 0.15 mL, 130 °C max, 120 V
1452-0161	Reactor Heater & Coil Assembly, 0.15 mL, 130 °C max, 240 V
1452-0162	Reactor Heater & Coil Assembly, 0.5 mL, 130 °C max, 120 V
1452-0163	Reactor Heater & Coil Assembly, 0.5 mL, 130 °C max, 240 V
1452-0166	Reactor Heater & Knitted Assembly, 1.4 mL, 130 °C max, 120 V
1452-0167	Reactor Heater & Knitted Assembly, 1.4 mL, 130 °C max, 240 V
1452-0168	Reactor Heater & Knitted Assembly, 2.0 mL, 130 °C max, 120 V
1452-0169	Reactor Heater & Knitted Assembly, 2.0 mL, 130 °C max, 240 V
1452-0170	Reactor Heater & Knitted Assembly, 2.8 mL, 130 °C max, 120 V
1452-0171	Reactor Heater & Knitted Assembly, 2.8 mL, 130 °C max, 240 V
1452-0172	Reactor Heater & Knitted Assembly, 3.0 mL, 130 °C max, 120 V
1452-0173	Reactor Heater & Knitted Assembly, 3.0 mL, 130 °C max, 240 V
1452-0174	Reactor Heater & Knitted Assembly, 1.2 & 1.6 mL, 130 °C max, 120 V
1452-0175	Reactor Heater & Knitted Assembly, 1.2 & 1.6 mL, 130 °C max, 240 V

Vector PCX Substitute Reactor Volumes or Replacement Reactors (Continued)	
Catalog No.	Description
1452-0223	Reactor Heater & Knitted Assembly, 3.5 mL, 130 °C max, 120 V
1452-0224	Reactor Heater & Knitted Assembly, 3.5 mL, 130 °C max, 240 V
1452-0325	Reactor Heater & Knitted Assembly, 1.0 mL, 130 °C max, 120 V
1452-0326	Reactor Heater & Knitted Assembly, 1.0 mL, 130 °C max, 240 V

Reagent Reservoirs &
Cap Assemblies

Reagent Reservoirs & Cap Assemblies	
Catalog No.	Description
1452-0120	Bottle, Piston Wash with Cap, Onyx, Pinnacle, & Vector PCX
1452-0121	Bottle, System Flush with Cap, Pinnacle/Onyx PCX
1452-0356	Reagent & Gas Line Clip, pack of 2
1925-0129	Cap for Flush Bottle, GL-38, Black, Pinnacle/Onyx PCX
1925-0130	Cap for Wash Bottle, GL-38, Black, Onyx, Pinnacle, & Vector PCX
3107-0137	Reservoir Bottle, Safety-coated, 1 L
3107-0138	Reservoir Cap for Storage of 1 L and 2 L Bottles, (No Valve)
3107-0145	Reservoir Bottle, Safety-coated, 2 L
3107-0147	Cap Assembly for 1 L Bottle, includes Cap with Integrated Valve
3107-0148	Cap Assembly for 2 L Bottle, includes Cap with Integrated Valve
3107-0300	Reservoir Assembly, includes 1 L Bottle, and Cap with Integrated Valve

Pressure Regulators,
Valves & Gauges

Pressure Regulators, Valves & Gauges	
Catalog No.	Description
1452-0141	Gas Manifold Assembly, PCX
1452-0343	Over Pressure Relief Valve Cartridge
3102-9010	Back Pressure Regulator 1000 psi
3102-9025	Pressure Regulator, 100 psi, 1/4-28 connection, for detector waste, PCX
3106-1007	Inline Check Valve, PCX
3106-1010	Check Valve, Reagent Cap

Replacement Components, Fittings & Tubing



Flow Restrictors

Flow Restrictors	
Catalog No.	Description
1100-0171	Flow Restrictor, TRIONE(R) Ninhydrin Reagent, 65 psi @ 0.3 mL/min
1100-0161	Flow Restrictor, PEEK® Tubing, 0.005" ID, 550 psi @ 0.3 mL/min in 15% Methanol in Water
1100-0125	Flow Restrictor, PEEK(R) Tubing, 0.005" ID, 200 psi @ 0.3 mL/min in 15% Methanol in Water
1100-0262	Flow Restrictor, 1150 psi @ 0.3 mL/min, 20 cm
1100-0263	Flow Restrictor, 550 psi @ 0.3 mL/min, 17 cm

Filters & Frits

Filters & Frits	
Catalog No.	Description
1452-0330	Vector 0.5um filter Upgrade Kit
3102-9040	Replacement Reagent 10 µm Frit
3102-9042	Replacement Reagent 0.5 µm Frit

Tees & Unions

Tees & Unions	
Catalog No.	Description
1452-0040	Liquid Manifold Assembly with Relief Valve, PCX
1452-0041	Liquid "T" Manifold Assembly, PCX

Tubing, Plastic

Tubing, Plastic	
Catalog No.	Description
2101-0212	TFE Tubing, 1/16" OD x 0.010" ID, 90 cm
2101-0216	TFE Tubing, 1/16" OD x 0.016" ID, 90 cm
2101-0220	TFE Tubing, 1/16" OD x 0.020" ID, 90 cm
2101-0225	TFE Tubing, 1/16" OD x 0.025" ID, 90 cm
2101-0232	C-Flex Tubing, 1/4" OD x 1/8" ID, 90 cm
2102-0463	FEP Tubing, 1/8" OD x 0.063" ID, 90 cm
2103-0463	Air Barrier Tubing, 1/8" OD x 0.063" ID, 90 cm
2104-0210	Inert PEEK® Tubing, 1/16" OD x 0.010" ID, 90 cm
2104-0220	Inert PEEK® Tubing, 1/16" OD x 0.020" ID, 90 cm

Fittings, Plastic

Fittings, Plastic	
Catalog No.	Description
1452-0112	Ferrule, 1/16 x 1/4-28 (PEEK®), Pinnacle PCX - Pack of 5
1452-0113	Nut, Short, 1/8 x 1/4-28 (PEEK®), Pinnacle PCX - Pack of 5
1452-0114	Nut, Short, 1/16 x 1/4-28 (PEEK®), Pinnacle PCX - Pack of 5
1452-0115	Ferrule, 1/8 x 1/4-28 (PEEK®), Pinnacle PCX - Pack of 5
1452-0116	Nut, Long, 1/8 x 1/4-28 (PEEK®), Pinnacle PCX - Pack of 5
1452-0117	Ferrule, 1/16 (PEEK®), Lite Touch - Pack of 5
1452-0118	Nut, 1/16 (PEEK®), Lite Touch - Pack of 5
1452-0176	Ferrule, PEEK® 1/16 x 10-32 S/T, 5 each
1452-0177	Nut, PEEK® Long 1/16 x 10-32 S/T, 5 each
1452-0180	Nut, 1/4-28, 1/8" (Polypropylene) - Pack of 5
1452-0181	Ferrule, 1/4-28, 1/8" (Tefzel) - Pack of 5
1452-0226	Nut, Long, 1/16 x 1/4-28 (PEEK®), Pinnacle PCX - Pack of 5
3101-0011	Nut, Female PEEK® 1/4-28
3101-0020	Plug (Male), 1/4-28 (Delrin)
3101-0030	Plug (Male), 10-32, 1/16" (Delrin)
3102-9160	Removal Tool, for Lite-Touch Ferrule

Fittings, Type 316 Stainless Steel

Fittings, Type 316 Stainless Steel	
Catalog No.	Description
1452-0178	Ferrule, Parker type, 1/16" - Pack of 5
1452-0179	Nut (Male), Parker type, 10-32, 1/16" - Pack of 5

Product Testing Solutions

Artificial Perspiration

Artificial Eccrine Perspiration

The Artificial Eccrine Perspiration we offer is a ready-to-use solution and the closest mimic to true human eccrine sweat. It consists of 19 amino acids, the seven most abundant minerals, and the four most abundant metabolites at a pH of 4.5. All concentrations closely match experimentally determined values for adult human eccrine sweat. Custom formulations are available on request.

Artificial Eccrine Perspiration List of Ingredients			
Metabolites	Uric Acid	Urea	
	Lactic Acid	Ammonia	
Minerals	Sodium	Iron	
	Calcium	Copper	Sulfate
	Magnesium	Potassium	Nitrate
	Zinc	Chloride	
Amino Acids	Glycine	L-Histidine	L-Serine (Largest amount)
	L-Alanine	L-Isoleucine	L-Threonine
	L-Arginine	L-Leucine	L-Tyrosine
	L-Asparagine	L-Lysine	L-Valine
	L-Aspartic acid	L-Methionine	Taurine
	L-Citrulline	L-Ornithine	
	L-Glutamic acid	L-Phenylalanine	

The stabilized solution is preserved with a fungicide and bactericide and can be stored at room temperature, while the non-stabilized product is stored frozen. Custom formulations at varying pH (2-9) can be made as either the stabilized or non-stabilized solutions.

Artificial Eccrine Perspiration	
Catalog No.	Description
1700-0022	Artificial Eccrine Perspiration, each (200 mL/bottle)
1700-0020	Artificial Eccrine Perspiration - Stabilized, each (200 mL/bottle)
1700-0024	Artificial Eccrine Perspiration - Stabilized, each (5 mL/bottle)
1700-0531	Artificial Eccrine Perspiration - Stabilized, each (950 mL/bottle)
1700-0023	Artificial Eccrine Perspiration, Custom pH, each (200 mL/bottle)
1700-0021	Artificial Eccrine Perspiration, Custom pH - Stabilized, each (200 mL/bottle)
1700-0535	Artificial Eccrine Perspiration, Custom Formulation - Stabilized, each (950 mL/bottle)
1700-0536	Artificial Eccrine Perspiration, Custom pH - Stabilized, each (950 mL/bottle)
1700-0559	Artificial Eccrine Perspiration, Custom Formulation (Minimum Order Qty 5), each (200 mL/bottle)

Artificial Apocrine Perspiration

Apocrine sweat is secreted by apocrine glands located in the areas of the body with an abundance of hair follicles such as the scalp, armpits and groins. Apocrine sweat is initially sterile and odorless but when acted upon by bacteria, it forms odorous compounds. Artificial Apocrine Perspiration was developed to mimic the composition of human apocrine sweat and contains several volatile fatty acids that are responsible for the unpleasant odor associated with it.

The ready-to-use solution is stored frozen and could be used for testing that requires the presence of mal-odor. It also could be used to culture bacteria that are commonly present on human skin.

Artificial Apocrine Perspiration List of Ingredients			
Metabolites	Urea	Citric Acid	Butyric Acid
	Ammonia	2-hydroxybuteric Acid	i-Valeric Acid
	Lactic Acid	3-hydroxybuteric Acid	
	Formic Acid	a-hydroxy-isobutyric Acid	
Sugars	Glucose		
Amino Acids	Alanine	Aspartic Acid	Citrulline
	Glutamic Acid	Glutamine	Glycine
	Isoleucine	Leucine	Lysine Monohydrochloride
	Phenylalanine	Proline	Serine
	Threonine	Tryptophan	Tyrosine
	Valine	Creatine	
Minerals	Sodium	Iron	Nitrate
	Calcium	Copper	Sulfate
	Magnesium	Potassium	
	Zinc	Chloride	
Free Fatty Acids	Palmitic Acid	Stearic Acid	Oleic Acid
	Linoleic Acid		
Other Components	Triglycerides of Fatty Acids	Cholesterol	Squalene
	Wax Esters		
Sebum			

Artificial Apocrine Perspiration	
Catalog No.	Description
1700-0556	Artificial Apocrine Perspiration, each (250 mL/bottle)

Product Testing Solutions

Artificial Perspiration

Artificial Sebum

Sebum is an oily secretion produced by sebaceous glands, which spreads over the hair and skin for waterproofing purposes. This solution is formulated according to ASTM designation D4265-14 or D4265-98. It is ready-to-use and provides the reliability, reproducibility and convenience needed for testing. This formulation can be used according to AATCC Standard Test Method 130-2010 for evaluating the efficacy of home laundry products and conditions to remove stains from fabric.

D4265-14 Artificial Sebum	
Catalog No.	Description
1700-0700	Artificial Sebum, ASTM D4265-14, Not Stabilized, each (25 g/bottle)
1700-0702	Artificial Sebum, ASTM D4265-14, Not Stabilized, each (200 g/bottle)
1700-0704	Artificial Sebum, (Minimum order Qty of 5) 500 g

Eccrine Perspiration-Sebum Emulsion

Inspired by the ASTM D4265-98 method for staining, Eccrine Perspiration is emulsified with Artificial Sebum. Prepared without dust/dirt for a more universal application, this emulsion mimics non-exercise induced skin surface film liquids (SSFL). As SSFL, it can be used to test any topical use product or the stability of any article that will come in contact with human sweat. This product requires refrigeration to remain in solution and prevent rancidity.

Eccrine Perspiration-Sebum Emulsion	
Catalog No.	Description
1700-0547	Artificial Eccrine Sweat-Sebum Emulsion, each (250 mL/bottle)
1700-0549	Artificial Eccrine Sweat-Sebum Emulsion, each (950 mL/bottle)

AATCC Test Method 15 Artificial Perspiration

Colorfastness to Perspiration for Fabric

This solution is used to determine the colorfastness of textiles to the effects of acid perspiration according to Test Method 15. The same formulation is also used to determine colorfastness to a combination of light and perspiration according to Test Method 125. It is applicable to dyed, printed or otherwise colored textile fibers, yarns and fabrics of all kinds.

(Custom pH and stabilized versions available)

AATCC Test Method 15 Artificial Perspiration	
Catalog No.	Description
1700-0012	AATCC Test Method 15 Artificial Perspiration, each (200 mL/bottle)
1700-0015	AATCC Test Method 15 Artificial Perspiration - Stabilized, each (200 mL/bottle)
1700-0527	AATCC Test Method 15 Artificial Perspiration, Custom pH, each (200 mL/bottle)
1700-0528	AATCC Test Method 15 Artificial Perspiration, Custom pH - Stabilized, each (200 mL/bottle)
1700-0541	AATCC Test Method 15 Artificial Perspiration - Stabilized, case of 4 (950 mL/bottle)
1700-0555	AATCC Test Method 15 - Stabilized, (19.8 L Carboy)
1700-0565	AATCC Test Method 15 Artificial Perspiration, (19.8 L Carboy)

ANSI-BHMA A156.18 Artificial Perspiration

For Testing Builders Hardware and Finishes

This artificial perspiration formulation is used to test finishes on various base materials as per the builder's hardware association. This formulation is not offered in a stabilized format.

(Custom pH version available)

ANSI-BHMA A156.189 Artificial Perspiration	
Catalog No.	Description
1700-0504	Artificial Perspiration, ANSI-BHMA A156.18, Not Stabilized, each (200 mL/bottle)
1700-0512	Artificial Perspiration, ANSI-BHMA A156.18, Custom pH, Not Stabilized, each (200 mL/bottle)

Product Testing Solutions

Artificial Perspiration

BS EN 1811:2011 Artificial Perspiration

For Release of Nickel

This pH 6.5 formulation is used to stimulate the release of Nickel from all post assemblies which are inserted into pierced ears and other pierced parts of the human body, and for articles intended to come into direct and prolonged contact with the skin. Spectacle frames and sunglasses are excluded from the scope of this European Standard.

(Custom pH and stabilized versions available)

BS EN 1811:2011 Artificial Perspiration	
Catalog No.	Description
1700-0009	Artificial Perspiration, BS EN 1811:2011, Not Stabilized, each (200 mL/bottle)
1700-0506	Artificial Perspiration, BS EN 1811:2011, Stabilized, each (200 mL/bottle)
1700-0521	Artificial Perspiration, BS EN 1811:2011, Custom pH, Not Stabilized, each (200 mL /bottle)
1700-0515	Artificial Perspiration, BS EN 1811:2011, Custom pH, Stabilized, each (200 mL /bottle)
1700-0566	Artificial Perspiration, BS EN 1811:2011, Stabilized, (19.8 L Carboy)

DIN-EN/IEC 60068-2-70 Artificial Perspiration

For Testing Resistance of Lettering & Markings to Abrasion

This formulation is used to determine the resistance of markings and letterings on flat or curved surfaces against abrasion as it may occur by manually operating actuators and keyboards. This formulation can also be used to determine resistance against fluid contamination as it may occur under normal use.

DIN-EN/IEC 60068-2-70 Artificial Perspiration	
Catalog No.	Description
1700-0542	DIN-EN/IEC 60068-2-70 Artificial Perspiration, Not Stabilized, each (200 mL /bottle)
1700-0543	DIN-EN/IEC 60068-2-70 Artificial Perspiration, Stabilized, each (200 mL /bottle)
1700-0583	Artificial Perspiration, DIN-EN/IEC60068-2-70 Sweat, Custom pH, Stabilized, each (200 mL /bottle)
1700-0593	Artificial Perspiration, DIN-EN/IEC60068-2-70 Sweat, Custom pH, Not Stabilized, each (200 mL /bottle)

GMW14334 Artificial Perspiration

Acid and alkaline perspiration solutions are formulated according to test procedure GMW14334 and they are designed to test chemical resistance of automotive trim materials and components.

GMW14334 Artificial Perspiration	
Catalog No.	Description
1700-0533	GMW14334 Artificial Perspiration, Acidic, each (200 mL /bottle)
1700-0534	GMW14334 Artificial Perspiration, 2-Part Alkaline, each (200 mL /bottle)

ISO 105-B07 and ISO 105-E04 Artificial Perspiration

Colorfastness to Light for Fabric

These test solutions are for all kinds of textiles and textiles in all forms. Textiles are wetted with either the acidic or alkaline solution to test the combined effect of perspiration solution and exposure to light according to ISO 105-B07, and to perspiration only according to ISO 105-E04. The pH of the acidic solution is 5.5 and that of the alkaline solution is 8.0.

(Custom pH and stabilized versions available)

ISO 105-B07 and ISO 105-E04 Artificial Perspiration	
Catalog No.	Description
1700-0010	Artificial Perspiration, ISO 105-B07/105-E04, Acidic, Not Stabilized, each (200 mL /bottle)
1700-0507	Artificial Perspiration, ISO 105-B07/105-E04, Acidic, Stabilized, each (200 mL /bottle)
1700-0544	Artificial Perspiration, ISO 105-B07/105-E04, Acidic, Stabilized, each (950 mL/bottle)
1700-0516	Artificial Perspiration, ISO 105-B07/105-E04, Acidic, Custom pH, Not Stabilized, each (200 mL/bottle)
1700-0522	Artificial Perspiration, ISO 105-B07/105-E04, Acidic, Custom pH, Stabilized, each (200 mL/bottle)
1700-0011	Artificial Perspiration, ISO 105-B07/105-E04, Alkaline, Not Stabilized, each (200 mL /bottle)
1700-0508	Artificial Perspiration, ISO 105-B07/105-E04, Alkaline, Stabilized, each (200 mL /bottle)
1700-0517	Artificial Perspiration, ISO 105-B07/105-E04, Alkaline, Custom pH, Not Stabilized, each (200 mL/bottle)
1700-0523	Artificial Perspiration, ISO 105-B07/105-E04, Alkaline, Custom pH, Stabilized, each (200 mL/bottle)

Product Testing Solutions

Artificial Perspiration

ISO 11641 Artificial Perspiration

Colorfastness to Perspiration for Leather

This formulation determines colorfastness to perspiration of leather at all stages of processing, particularly to gloving, clothing and lining leathers, and uppers of unlined shoes. This alkaline perspiration has a greater effect on the color of leather and is used to simulate the most demanding conditions.

(Custom pH and stabilized versions available)

ISO 11641 Artificial Perspiration	
Catalog No.	Description
1700-0013	Artificial Perspiration, ISO 11641, Not Stabilized, each (200 mL/bottle)
1700-0509	Artificial Perspiration, ISO 11641, Stabilized, each (200 mL/bottle)
1700-0518	Artificial Perspiration, ISO 11641, Custom pH, Not Stabilized, each (200 mL /bottle)
1700-0524	Artificial Perspiration, ISO 11641, Custom pH, Stabilized, each (200 mL /bottle)

ISO 12870 Artificial Perspiration

Ophthalmic Optics

This solution is used to determine the resistance to perspiration of unglazed spectacle frames designed for use with all prescription lenses and also to rimless mounts, semi-rimless mounts and folding spectacle frames. This is also applicable to frames made from natural organic materials, but not to custom-made spectacle frames or to products designed specifically to provide personal eye protection.

(Custom pH and stabilized versions available)

ISO 12870 Artificial Perspiration	
Catalog No.	Description
1700-0014	Artificial Perspiration, ISO 12870, Not Stabilized, each (200 mL/bottle)
1700-0510	Artificial Perspiration, ISO 12870, Stabilized, each (200 mL/bottle)
1700-0519	Artificial Perspiration, ISO 12870, Custom pH, Not Stabilized, each (200 mL /bottle)
1700-0525	Artificial Perspiration, ISO 12870, Custom pH, Stabilized, each (200 mL /bottle)

Buffered DIN 53160, BS EN 1811:2011 Artificial Perspiration

Method DIN 53160-2:2010-10 specifies an artificial perspiration solution that is used to determine the colorfastness of articles for common use. This test establishes whether coloring on materials can migrate from the daily use articles to the skin. The test method is applicable to all articles of daily use, independent of the coloring procedure applied (dyeing, staining or coating). Method BS EN 1811:2011 is used for the testing of nickel release from jewelries and other products that come with prolonged contact with skin. The primary perspiration components and pH described by methods BS EN 1811:2011 and DIN 53160-2:2010-10 are the same, now Pickering Laboratories is offering a buffered version of the original formulations. Phosphate ions do not affect color migration rates nor the rate of nickel release, so these modified formulations can be used for the same tests. The buffered formulation is offered at pH 6.5, specified by DIN 53160 and BS EN 1811:2011 methods, as well as at custom pH by customer request. Stabilized formulations contain a preservative to prevent bacteria growth and can be stored at room temperature.

Buffered DIN 53160, BS EN 1811:2011 Artificial Perspiration	
Catalog No.	Description
1700-0567	Artificial Perspiration DIN 53160, BS EN 1811:2011, Buffered, each (200 mL/bottle)
1700-0568	Artificial Perspiration DIN 53160, BS EN 1811:2011, Buffered - Stabilized, each (200 mL/bottle)
1700-0569	Artificial Perspiration DIN 53160, BS EN 1811:2011, Buffered, Custom pH, each (200 mL /bottle)
1700-0570	Artificial Perspiration DIN 53160, BS EN 1811:2011, Buffered, Custom pH - Stabilized, each (200 mL /bottle)

Product Testing Solutions

Artificial Perspiration / Artificial Saliva

ISO 3160 Artificial Perspiration

Corrosion Resistance for Alloys

This formulation is used to determine corrosion (tarnishing, oxidation and surface penetration) resistance for gold alloy coverings on watch cases and accessories, including bracelets when they are permanently attached to the case. The solution is at pH 4.7 per ISO 3160 specifications.

(Custom pH and stabilized versions available)

ISO 3160 Artificial Perspiration	
Catalog No.	Description
1700-0026	ISO 3160 Artificial Perspiration, each (200 mL/bottle)
1700-0511	ISO 3160 Artificial Perspiration - Stabilized, each (200 mL/bottle)
1700-0520	ISO 3160 Artificial Perspiration, Custom pH, each (200 mL/bottle)
1700-0526	ISO 3160 Artificial Perspiration, Custom pH - Stabilized, each (200 mL/bottle)
1700-0532	ISO 3160 Artificial Perspiration - Stabilized, each (950 mL/bottle)
1700-0537	ISO 3160 Artificial Perspiration with Added Pyruvic acid, Buffered - Stabilized, each (950 mL/bottle)
1700-0545	ISO 3160 Artificial Perspiration, Custom pH - Stabilized, each (950 mL/bottle)
1700-0557	ISO 3160 Artificial Perspiration - Stabilized, (19.8 L Carboy)
1700-0560	ISO 3160 Artificial Perspiration with added Pyruvic acid, buffered, Custom pH - Stabilized, each (950 mL/bottle)

ASTM D2322 Artificial Perspiration

Resistance of Shoe Upper Leather to Artificial Perspiration

ASTM method D2322-00 determines the resistance to grain cracking, area loss, and flexibility of shoe upper leather to artificial perspiration.

(Custom pH and stabilized versions available)

ASTM D2322 Artificial Perspiration	
Catalog No.	Description
1700-0548	ASTM D2322-00 Artificial Perspiration, each (200 mL/bottle)
1700-0550	ASTM D2322-00 Artificial Perspiration, Stabilized, each (200 mL/bottle)

AFNOR NF S91-141 Artificial Saliva

For Testing Biodegradability of Dental Metal Alloys

Artificial Saliva is prepared according to the AFNOR NF S91-141 standard procedure and is intended for testing biodegradability of dental metal alloys. The formulation consists of two parts that are mixed right before use. This minimizes changes in the solution during storage and allows for a longer shelf life. The pH of the solution after mixing is 7.8 +/- 0.1. Artificial Saliva should be stored refrigerated both before and after mixing. Premixed, ready-to-use solution is available upon request.

AFNOR NF S91-141 Artificial Saliva	
Catalog No.	Description
1700-0302	Artificial Saliva, AFNOR NF S91-141, 2-Part, Not Stabilized, each (200 mL/bottle)

Artificial Saliva DIN 53160-1:200, SN/T 1058.1-2013, GB/T 18886-2019

To Determine Colorfastness of Products Intended to be Taken Into the Mouth

Artificial saliva is prepared according to specifications of DIN 53160-1:200, SN/T 1058.1-2013 and GB/T 18886-2019 official methods. The formulation consists of two parts that are mixed right before use. This minimizes changes in the solution during storage and allows for a longer shelf life. The solution should be kept frozen for long-term storage. The pH of the solution after mixing is 6.8. A made-to-order pre-mixed formulation is available for customers who intend to use the artificial saliva within one month.

Artificial Saliva DIN 53160-1:200, SN/T 1058.1-2013, GB/T 18886-2019	
Catalog No.	Description
1700-0303	Artificial Saliva DIN 53160-1:200, SN/T 1058.1-2013, GB/T 18886-2019, each (200 mL/bottle)
1700-0323	Artificial Saliva DIN 53160-1:200, SN/T 1058.1-2013, GB/T 18886-2019, Premixed, 1-Month Shelf Life, each (950 mL/bottle)
1700-0310	Artificial Saliva DIN 53160, Custom pH, each (200 mL/bottle)

Product Testing Solutions

Artificial Saliva**Fusayama/Mayer Artificial Saliva****For Testing of Products for Corrosion, Colorfastness and Discoloration**

This ready-to-use solution closely resembles the mineral composition of natural saliva and is the most common media used for testing dental metal alloys. This formulation is at pH 4.9+/- 0.1 and should be stored refrigerated.

(Custom formulations at different pH are available)

Fusayama/Mayer Artificial Saliva	
Catalog No.	Description
1700-0301	Artificial Saliva, Fusayama/Mayer, Not Stabilized, each (200 mL/bottle)
1700-0306	Artificial Saliva, Fusayama/Mayer, Custom pH, Stabilized, each (200 mL/bottle)
1700-0307	Artificial Saliva, Fusayama/Mayer, Custom pH, Not Stabilized, each (200 mL/bottle)
1700-0309	Artificial Saliva, Fusayama/Mayer, Stabilized, each (200 mL/bottle)

Modified Fusayama/Mayer, Custom pH

This variation of classic Fusayama/Mayer formulation contains Potassium thiocyanate that is present in natural saliva and has been shown to be elevated in smokers. This formulation is manufactured according to customer's pH specifications in the range of pH 3.0-6.5. The formulation contains a preservative to prevent bacteria growth and can be stored at room temperature.

Modified Fusayama/Mayer, Custom PH Artificial Saliva	
Catalog No.	Description
1700-0314	Artificial Saliva, Modified Fusayama/Mayer, Custom pH up to 6.5, Stabilized, each (200 mL/bottle)
1700-0315	Artificial Saliva, Modified Fusayama/Mayer, Custom pH up to 6.5, each (200 mL/bottle)

Artificial Saliva for Medical and Dental Research

This Artificial Saliva is formulated according to literature references for medical and dental research. This formulation has similar composition to commercially available products used to treat dry mouth and other conditions. This ready-to-use solution contains Sodium carboxymethyl cellulose to increase viscosity of the solution and make it behave similar to natural human saliva. This formulation contains a preservative and can be stored at room temperature and has pH of 6.8. This solution is only intended for product testing and research, and not for medical use.

Artificial Saliva for Medical and Dental Research	
Catalog No.	Description
1700-0305	Artificial Saliva for medical and dental research, Stabilized, each (200 mL /bottle)
1700-0395	Artificial Saliva for medical and dental research, Stabilized, case of (4x950 mL/bottle)

Artificial Saliva for Pharmaceutical Research

Artificial Saliva is formulated according to literature for pharmaceutical research, such as studies of drug dissolution and drug delivery through oral mucosa. This is a ready-to-use formulation that should be stored refrigerated. The pH of the solution is 6.8 +/- 0.1.

Artificial Saliva for Pharmaceutical Research	
Catalog No.	Description
1700-0304	Artificial Saliva for pharmaceutical research, Not Stabilized, each (200 mL /bottle)
1700-0308	Artificial Saliva, Pharmaceutical Research, Custom pH each (200 mL/bottle)
1700-0355	Artificial Saliva for Pharmaceutical Research, (19.8 L Carboy)

ISO 10271-2011 Artificial Saliva**Corrosion Testing for Metallic Material in Dental Devices**

This Artificial Saliva is formulated according to ISO 10271-2011 standard procedure. ISO 10271-2011 specifies the method for corrosion testing for metallic material in dental devices. The solution should be stored in the refrigerator and has a 1 year shelf life. The pH of the solution is 2.3.

ISO 10271-2011 Artificial Saliva	
Catalog No.	Description
1700-0313	Artificial Saliva for corrosion testing for metallic material in dental devices, ISO 10271-2011, Not Stabilized, each (200 mL/bottle)

Product Testing Solutions

Artificial Saliva / Artificial Urine

Artificial Saliva ASTM E2720-16/
ASTM E2721-16 with Mucin

This artificial saliva formulation is prepared according to official methods ASTM E2720-16 and ASTM E2721-16, which specify for the evaluation of decontamination procedures for surfaces and materials contaminated with human pathogenic viruses. The formulation has a mineral composition and pH close to human saliva and contains Mucin to increase the viscosity and lubricating ability of the solution. This artificial saliva can also be used for dental, drug delivery or pharmaceutical studies. The stabilized solution is pre-mixed and has a preservative added to prevent bacterial growth; it is stored at room temperature. The two-part non-stabilized formulation comes with dry pre-weighted mucin powder to be mixed in before use. Non-stabilized solution should be stored refrigerated. The pH of the formulation is 7.

Artificial Saliva ASTM E2720-16/ ASTM E2721-16 with Mucin	
Catalog No.	Description
1700-0316	Artificial Saliva With Mucin, Stabilized, each (200 mL/bottle)
1700-0317	Artificial Saliva With Mucin 2-Part, each (200 mL/bottle)
1700-0318	Artificial Saliva With Mucin Custom pH, Stabilized, each (200 mL/bottle)
1700-0319	Artificial Saliva With Mucin, Custom pH, 2-Part, each (200 mL/bottle)
1700-0324	Artificial Saliva With Mucin, Stabilized, each (950 mL/bottle)

 α -Amylase

Amylase is the main enzyme in human saliva and is needed for starch digestion. As some applications require studying the effect of enzymes in saliva, Pickering Laboratories offers an easy way to add biological activity to your chosen artificial saliva product. Once added to the 200 mL bottle of artificial saliva, our Amylase product will provide 80 U/mL of enzyme activity.

Amylase	
Catalog No.	Description
1700-0320	α -Amylase From Aspergillus Oryzae, each (16 KU /bottle)

Artificial Urine for Corrosion
Testing of Urological Implants,
Stabilized

This artificial urine is designed for testing metallic biomaterials used to produce urological implants and catheters. This convenient product is a ready to use solution. The formulation contains non-toxic preservative to avoid bacteria growth and can be stored at room temperature. The pH of the final solution is 6.0+/- 0.4.

(Custom formulations are also available)

Artificial Urine for Corrosion Testing of Urological Implants, Stabilized	
Catalog No.	Description
1700-0016	Artificial Urine for Corrosion Testing of Urological Implants, Stabilized, each (200 mL/bottle)

DIN EN 1616:1999 Artificial Urine

For Testing Sterile Urethral Catheters

Artificial Urine is prepared according to DIN EN 1616:1999 standard procedure. DIN EN 1616 specifies the method to test sterile urethral catheters. This ready-to-use solution should be stored frozen to avoid bacteria growth. The pH of the solution is 6.6.

DIN EN 1616:1999 Artificial Urine	
Catalog No.	Description
1700-0017	Artificial Urine, DIN EN 1616:1999, Not Stabilized, each (200 mL/bottle)
1700-0558	Artificial Urine, DIN EN 1616:1999, Stabilized, each (200 mL/bottle)
1700-0603	Artificial Urine, DIN EN 1616:1999, Not Stabilized, each (19.8 L)

Artificial Urine / Simulated Lung Fluid

Artificial Urine Medium for Growing Urological Pathogens

This ready-to-use solution closely resembles composition of human urine and can be used for clinical studies as well as for product testing. This formulation supports growth of wide range of urinary pathogens and it is also capable of forming crystals similar to these found in natural urinary tract infections. It can be used as negative controls in laboratory testing. The pH of the Artificial Urine Medium is 6.5. This product is stored frozen.

Artificial Urine Medium for Growing Urological Pathogens	
Catalog No.	Description
1700-0018	Artificial Urine Medium for Growing Urological Pathogens, Not Stabilized, each (200 mL/bottle)

Artificial Urine Stabilized

This ready-to-use solution has the same composition as Artificial Urine Medium and closely resembles human urine. This formulation contains non-toxic preservative to avoid bacteria growth and can be stored at room temperature. The pH of Artificial Urine Stabilized is 6.5.

Artificial Urine Stabilized	
Catalog No.	Description
1700-0600	Artificial Urine, Stabilized, each (200 mL/bottle)
1700-0602	Artificial Urine, Stabilized, each (950 mL/bottle)

Simulated Lung Fluid

Gamble's solution represents the interstitial fluid deep within the lung and is used to simulate different lung conditions. It is used in pulmonary drug delivery studies as well as in studies of particles inhalation effects. Citrate is used in Gamble's solution instead of proteins to avoid foaming and acetate instead of organic acids. Gamble's solution has a pH of 7.4. Inquire about other simulated lung fluid formulations.

Simulated Lung Fluid	
Catalog No.	Description
1700-0800	Gamble's Simulated Lung Fluid, Not Stabilized, each (200 mL/bottle)
1700-0808	Simulated Lung Fluid, Stabilized, Gamble's Formulation, each (200 mL/bottle)

Simulated Lung Fluid with Surfactant

Dipalmitoylphosphatidylcholine (DPPC) is a phospholipid and one of the main pulmonary surfactants found in lung fluid. The main function of DPPC is to reduce the surface tension of liquid in the lungs and to help adsorption of oxygen into the air-liquid interface. It is known to be a difficult process to bring DPPC into solution. With that in mind, we offer a synthetic lung fluid with DPPC dissolved and pre-mixed for your convenience.

Simulated Lung Fluid with Surfactant	
Catalog No.	Description
1700-0818	Simulated Lung Fluid with DPPC Surfactant, each (200 mL/bottle)

Product Testing Solutions

Cerumen / Synthetic Blood**Artificial Cerumen “Earwax”**

Pickering Laboratories offers artificial ear wax that can be used for testing of hearing aids, ear buds and other electronic devices meant to be used in the ears. It contains lanolin, long chain fatty acids and paraffin oil.

Artificial Cerumen “Earwax”	
Catalog No.	Description
1700-0701	Artificial Cerumen, Not Stabilized, each (50 g/bottle)
1700-0711	Artificial Cerumen, Not Stabilized, each (200 g/bottle)

Synthetic Blood

This synthetic blood formulation is prepared according to official methods ASTM F1819-07, ASTM F1670, ASTM F1862 and ASTM F2100. It is intended for product testing and has the surface tension and viscosity close to human blood. Additionally, the color of the solution is intended to mimic the appearance of genuine human blood. The formulation can be used to evaluate the effectiveness of materials used in protective clothing. It can also be used to evaluate absorption capacity of materials that are in contact with human skin for prolonged periods. The formulation is not suitable for medical research. It can be stored at room temperature and has a shelf life of one year.

Synthetic Blood	
Catalog No.	Description
1700-0820	Synthetic Blood According to ASTM F1819-07, each (200 mL/bottle)
1700-0920	Synthetic Blood According to ASTM F1819-07, each (4x950 mL/bottle)
1700-0821	Synthetic Blood According to ASTM F1862/F1862M-17, each (200 mL/bottle)
1700-0921	Synthetic Blood According to ASTM F1862/F1862M-17, each (4x950 mL/bottle)

Product Testing Solutions

Simulated Waters

Substitute Ocean Water

Substitute Ocean Water is prepared according to official ASTM method D1141-98. This product could be successfully used in a wide variety of tests where solution simulating sea water is required, such as oil contamination testing, detergent evaluation and corrosion testing. The pH of the solution is 8.2.

The solution is ready-to-use and is stored at room temperature. Inquire about different sizes.

Substitute Ocean Water	
Catalog No.	Description
1700-0801	Substitute Ocean Water, ASTM D1141-98 (2003), Not Stabilized, case of (4x950 mL/bottle)
1700-0802	Substitute Ocean Water, ASTM D1141-98 (2003), Stabilized case of (4x950 mL/bottle)
1700-0803	Substitute Ocean Water, ASTM D1141-98 (2003), Stabilized, each (200 mL/bottle)

Synthetic Hard Water

Hard Water for product testing and dispersibility testing. Made according to ASTM E1945-02.

Synthetic Hard Water	
Catalog No.	Description
1700-0804	Synthetic Hard Water, Custom Hardness, ASTM E1945-02, each (200 mL/bottle)

Simulated Sea Water for Permeation Testing

This solution was formulated according to Test Operations Procedure 08-2-501A that describes permeation testing of materials with chemical agents or simulants (Swatch Testing).

Simulated Sea Water for Permeation Testing	
Catalog No.	Description
1700-0807	Simulated Sea Water for Permeation Testing, each (950 mL/bottle)

General Terms & Conditions

1 Controlling Document

These T & C's and only these T & C's apply to all goods sold and services provided by Seller to Buyer. By the placement of Buyer's purchase order, Buyer consents to these T & C's and no others.

2 Terms of Payment

All payments are due and payable thirty (30) days from the date of the invoice. A service charge of 1 1/2 % per month shall apply to all invoices not paid within 30 days.

3 Security Agreement

- (a) As security for Buyer's payment, Buyer grants Seller a purchase money security interest in the specific goods for which payment is due. Seller has the right to file a financing statement evidencing this security interest.
- (b) This security interest shall terminate upon receipt by Seller of payment for the specific goods.

4 Delivery, Title and Risk of Loss

Title to goods and risk of loss of goods shall pass to Buyer when Seller delivers such goods to a common carrier or Buyer's agent. Delivery shall be EX Works Seller's Factory. Delivery dates agreed to by Seller are approximate only. Seller shall not be liable for, nor shall Seller be in breach of its obligations to the Buyer because of any delivery made within a reasonable time after the stated delivery date. Seller may, by written notice to Buyer, change any delivery date, and such date shall become the agreed upon delivery date unless Buyer objects to such date in writing delivered to Seller within ten (10) days of receipt of Seller's notice.

5 Force Majeure

Seller shall not be liable for any failure to deliver, or delay in the delivery of, any goods or services due to any cause beyond its control, including but not limited to natural phenomena, government actions, fires, labor disputes, or inability to obtain components, energy, materials, manufacturing facilities, or transportation. In the event of such delay, the date of delivery or performance hereunder shall be extended by a period equal to the time lost by reason of such delay. In the event Seller's production is curtailed for any of the above reasons, Seller may allocate its production to its various Buyers.

6 Seller's Liability

If Buyer notifies Seller within 30 days after the date of invoice of a claimed defect, Buyer shall concurrently offer Seller an opportunity to investigate the claim and to inspect allegedly defective goods. Failure to offer Seller such opportunity shall constitute acceptance by Buyer and a waiver of all claims for defects. If Seller determines that Buyer's claim is valid, Seller may repair the defective goods or replace the defective goods with conforming goods at the Seller's Factory. Replacement of defective goods will only be made upon return of the defective product.

7 Seller's Remedies

If Buyer fails, with or without cause, to furnish Seller with specifications and/or instructions for, or refuses to accept deliveries of, any of the products sold under this contract, or is otherwise in default under or repudiates this contract or any other contract with Seller or fails to pay when due any invoice under this contract, then in addition to any and all remedies allowed by law, Seller without notice (1) may determine shipment under this or any contract between Buyer and Seller until such default, breach or repudiation is removed and/or (2) may cancel any undelivered portion of this and/or any other contract in whole or in part, Buyer remaining liable for damages.

8 Patent Indemnity

- (a) Seller shall, at its own expense, defend any suit that is instituted against Buyer to the extent such suit alleges that any goods, other than prototypes, or any part thereof sold or leased hereunder infringes on any United States patent, trademark, or copyright (except goods covered by Section 8(b) below), provided that such alleged infringement does not arise from any modification or addition to the goods by anyone other than Seller, or the use of such goods as a part of or in combination with any other device or parts or from the use of such goods to practice any method or process. Provided further that the Buyer gives Seller immediate notice in writing of any such suit and permits Seller, through counsel of its choice, to answer the charge of infringement and defend such suit; and the Buyer gives Seller all the needed information, assistance, and authority, at Seller's expense, to enable Seller to defend or settle such suit. In the case of a final award of damages in any such suit, Seller shall pay such award but shall not be responsible for any settlement made without its prior written consent. In the event the use, lease, or sale of the goods is enjoined, Seller may at its own option and expense: (1) procure for Buyer the right to use, lease, or sell such goods, (2) replace such goods, (3) modify such goods, or (4) remove such goods and refund the purchase price paid by Buyer less a reasonable sum for use, damage, and obsolescence. THIS SECTION STATES SELLER'S TOTAL RESPONSIBILITY AND LIABILITY, AND THE BUYER'S SOLE REMEDY FOR ANY ACTUAL OR ALLEGED INFRINGEMENT OF ANY PATENT, TRADEMARK, OR COPYRIGHT BY ANY GOODS DELIVERED HEREUNDER OR ANY PART THEREOF. THIS SECTION 8 IS IN LIEU OF AND REPLACES ANY OTHER EXPRESS, IMPLIED OR STATUTORY WARRANTY AGAINST INFRINGEMENT.
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General Terms & Conditions

9 Order Cancellation

Buyer may, at any time, cancel its purchase of goods or services but only by paying 15 % of the purchase price if such cancellation is received by Seller more than 90 days before the scheduled delivery date, 50 % if received more than 45 days but less than 90 days, 75 % if received more than 15 days but less than 45 days, and 100 % if received less than 15 days.

10 Warranty and Limitation of Liability

1) IN NO EVENT SHALL SELLER BE LIABLE FOR ANY LOSS PROFITS, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM SELLER'S PERFORMANCE OR FAILURE TO PERFORM HEREUNDER OR THE FURNISHING, PERFORMANCE, OR USE OF ANY GOODS OR SERVICES SOLD PURSUANT HERETO. (2) IN NO EVENT SHALL THE AMOUNT OF SELLER'S LIABILITY EXCEED THE AMOUNTS PAYABLE BY BUYER HEREUNDER. (3) IN NO EVENT SHALL SELLER BE LIABLE FOR DAMAGES RELATING TO ANY INSTRUMENT, EQUIPMENT OR APPARATUS WITH WHICH THE GOODS SOLD HEREUNDER ARE USED (4) SELLER EXPRESSLY DISCLAIMS ANY LIABILITY FOR ANY WARRANTY, EXPRESS, IMPLIED OR STATUTORY, INCLUDED BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, EXCEPT SUCH WARRANTIES EXPRESSLY IDENTIFIED AS WARRANTIES AS ARE SET FORTH IN SELLER'S CURRENT OPERATING MANUAL, CATALOG OR OTHER WRITTEN GUARANTY COVERING THE PRODUCT.

11 General

- (a) The sale of goods shall be governed by Uniform Commercial Code and others laws of the State of California and Santa Clara County, California shall be the appropriate venue and jurisdiction for the resolution of disputes hereunder.
- (b) The Buyer may not assign its rights or obligations under this acknowledgment without the prior written consent of Seller, and any purported assignment without such consent shall have no force or effect.
- (c) Any waiver by Seller of any default by the Buyer hereunder shall not be deemed to be a continuing waiver of such default or a waiver of any other default or any of the terms and conditions of this acknowledgment.
- (d) These T & C's may not be superseded, modified, or amended except in writing stating that there is such a modification and signed by an authorized representative of each party hereto, provided, however that Seller may modify the specifications of the goods sold hereunder if such modification does not change the form, fit, or function of such goods.
- (e) This document constitutes the entire terms and conditions agreement between the Buyer and Seller with regard to the goods or services purchased or provided and expressly supersedes and replaces any prior or contemporaneous agreements, written or oral relating to such goods or services.
- (f) Any lawsuit, sounding either in contract or tort, must be filed within a year from the date of delivery of the goods/services to the Buyer.

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Servicios Tecnicos De Ingenieria
 (SETISA)
<http://www.setisa.com.sv/>

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Guatemala

Biokim
<http://www.biokimsa.com/>

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Orgoma S.A.
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<https://www.berca-indonesia.com/>

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<http://www.thermofisher.co.nz/>

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<http://www.alphatech.co.nz/>

Shimadzu Oceania Pty Ltd.
<http://www.shimadzu.com.au/>

Nicaragua

Orgoma S.A.
<http://www.orgoma.com/>

Biokim
<http://www.biokimsa.com/>

Central American Merchandising Co.
<http://cammia.us/crouse.html/>

Panama

Analytical Technologies
<http://www.analytical.com/panama/>

Paraguay

ASM
<http://www.asm.com.uy/>

Peru

Científica Andina S.A.C.
<http://www.asm.com.uy/>

Puerto Rico

VWR – Puerto Rico
<https://pr.vwr.com/>

Singapore

IT Technologies Pte Ltd
<http://www.ittech.com.sg/>

Perkin Elmer – Singapore
<http://www.perkinelmer.com/>

Thermo Fisher Scientific Pte Ltd
 – Singapore
<http://www.fishersci.com.sg/>

Agilent – Singapore
<http://www.agilent.com/>

South Africa

Anatech Instruments (Pty) Limited
<http://anatech.co.za/>

Chemetrix Pty Ltd.
<http://chemetrix.co.za/>

Sri Lanka

Techno Solutions Pvt.Ltd
<http://www.technospl.com/>

Taiwan

Analab Corporation
<http://www.analab.com.tw/>

Vercotech Inc.
<http://www.vercopak.com.tw/>

Inpac Technologies, Inc.
<http://inpac.myweb.hinet.net/>

Sciencetech Corp.
<http://www.sciencetech.com.tw/>

Thailand

Fortune Scientific Co., Ltd.
<http://www.fortunesoci.co.th/>

Uruguay

Rideline
<http://www.rideline.com/>

ASM
<http://www.asm.com.uy/>

United States

Fisher
<http://www.fishersci.com/>

VWR International/USA
<https://us.vwr.com/store/>

Chrom Tech, Inc.
<http://www.chromtech.com/>

Alliance Calibrations Group, LLC
 (East Coast)
<http://www.acalgroup.biz/>

Kaydeetek (West Coast)
<http://www.kaydeetek.com/>

P.J. Cobert Associates Inc
<http://www.cobertassociates.com>

Distributors

Quantum Analytics
<http://www.lqa.com/>

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<http://www.govsci.com/>

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<http://www.unitechusa.com/>

Agilent Technologies, Inc.
<http://www.agilent.com/>

Perkin Elmer
<http://www.perkinelmer.com/>

MG Scientific
<http://www.mgscientific.com/>

MLS Technologies
<http://www.mlstechnologies.com/>

Shimadzu Corporation
<http://www.shimadzu.com/>

Venezuela

Corporacion Cientifica
 Venezolana, C.A.
<http://www.ccv.com.ve/>

Vietnam

Tegent
<http://tegent.com.vn/>

TRAMAT Co., Ltd
<http://www.tramat.com.vn/>

Saigon Instrumentation Joint
 Stock Company (SISC)
<http://www.sisc.com.vn/>

TRANSMED Co., Ltd
<https://www.transmed.com.vn/>

West Indies

Analogic Solutions
<http://www.analogicsolutions.com/>

Other

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