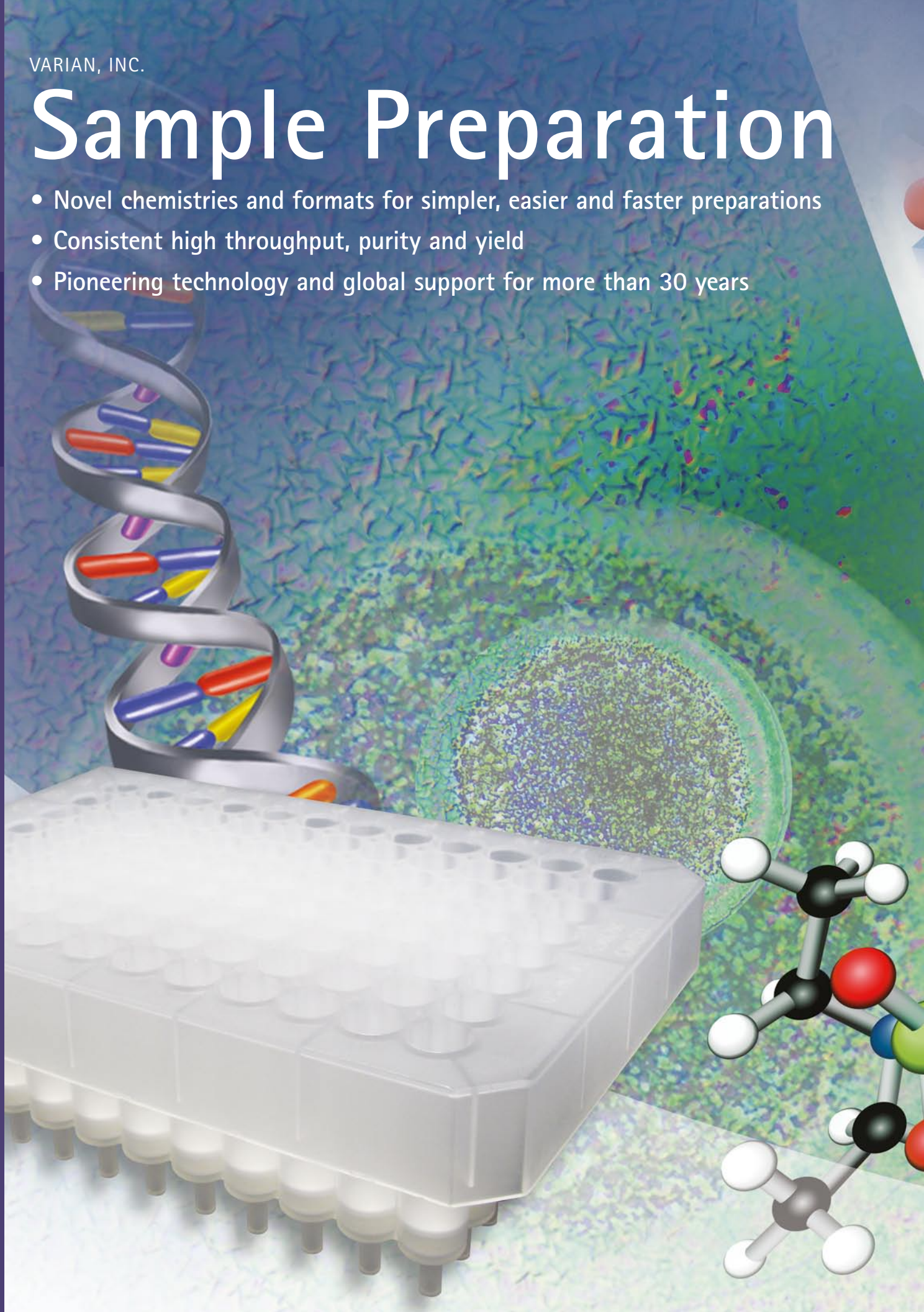
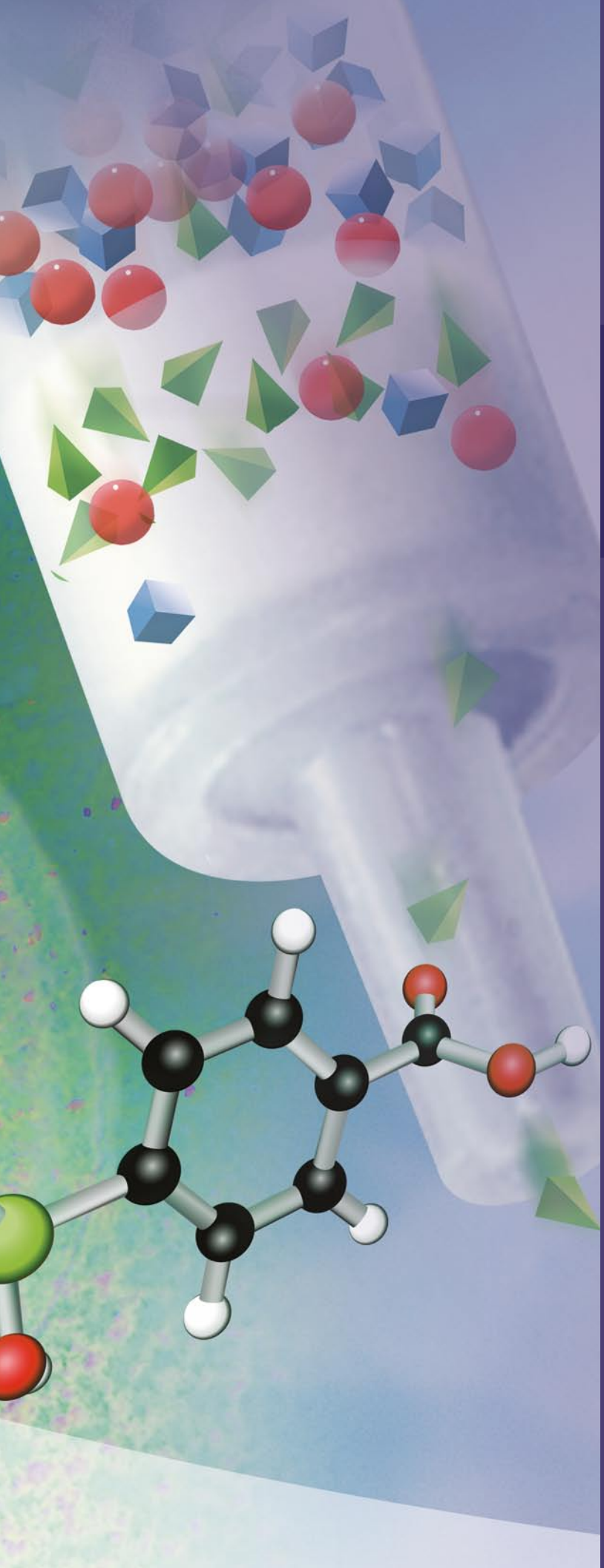
VARIAN, INC.

Sample Preparation

- Novel chemistries and formats for simpler, easier and faster preparations
- Consistent high throughput, purity and yield
- Pioneering technology and global support for more than 30 years





Contents

Varian sets the pace in sample preparation, with a comprehensive product line that includes filtration, protein precipitation, solid phase extraction and liquid/liquid extraction. Our innovative products and dedicated customer support ensure you have the right answer for all your sample preparation needs.

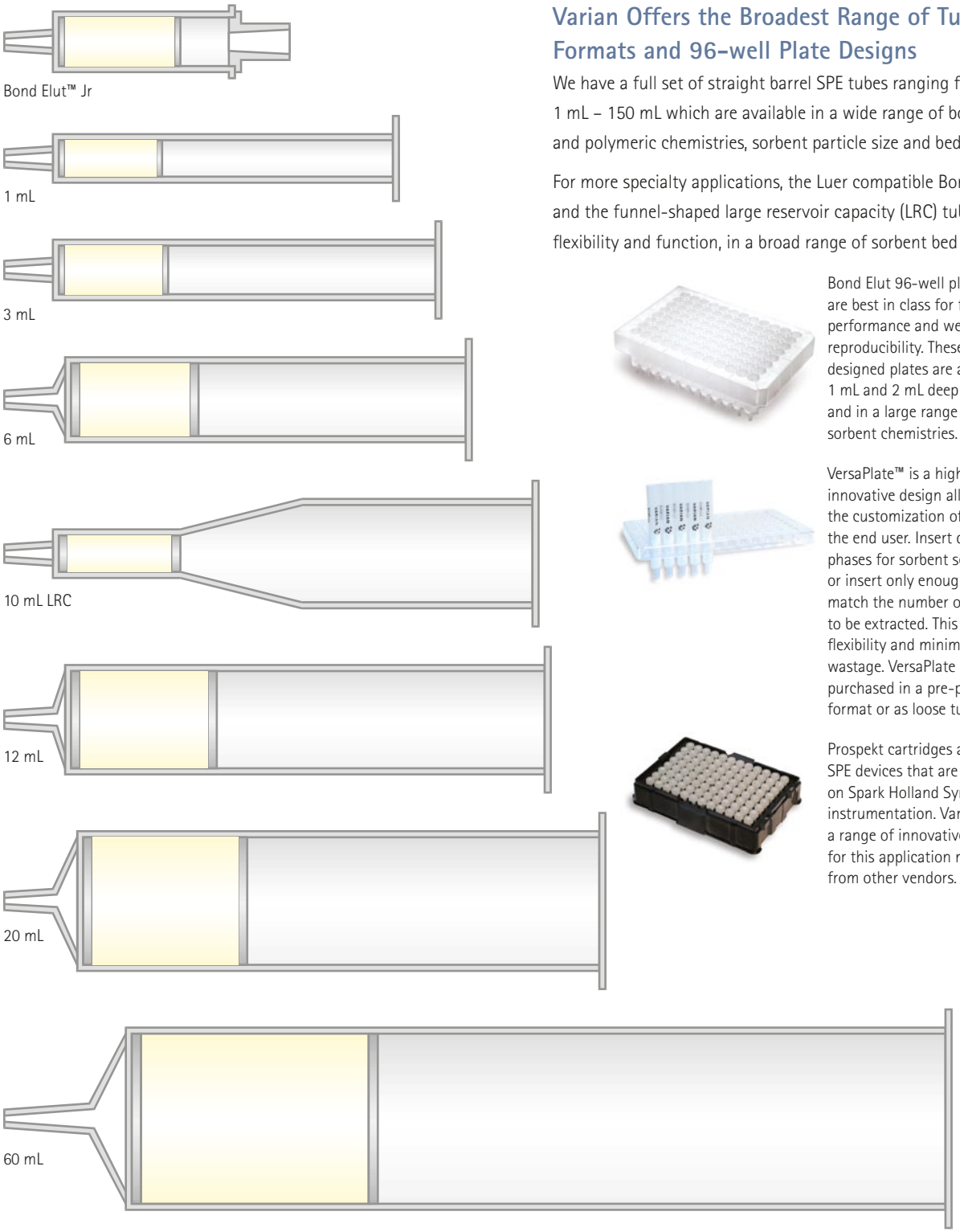
Varian filtration plates give you plasma extracts almost totally free from lipids, proteins and surfactants.

Solid Phase Extraction Application Guide

Select Your Products by Industry, Application and Technique

Industry	Application	Technique	Product
Pharmaceutical	Bioanalysis	Solid Phase Extraction	Bond Elut Plexa™
			Bond Elut Plexa PCX
			Focus™
			OMIX™
			SPEC™
		Liquid/Liquid Extraction	Chem Elut™
		Protein Precipitation Filtration	Captiva™ ND^{Lipids}
			Captiva
			Mega Bond Elut™
		Solid Phase Extraction	Bond Elut™
		Supported Liquid Extraction (SLE)	Chem Elut
Biotechnology	Protein/Peptide Purification	Lysate Filtration	Captiva
		Micro-volume SPE	OMIX
Clinical and Forensic	Bioanalysis	Solid Phase Extraction (Manual)	Bond Elut
			Bond Elut Plexa
			Bond Elut Plexa PCX
		Solid Phase Extraction	SPEC
			OMIX
		Liquid/Liquid Extraction	Chem Elut
		Protein Precipitation Filtration	Captiva ND^{Lipids}
			Captiva
Environmental Monitoring	Semi-volatiles	Solid Phase Extraction	SPEC
			Focus
			Bond Elut
	Oils and Grease	Solid Phase Extraction	SPEC
			Bond Elut
		Water Removal	Na_2SO_4
			Chem Elut
	Particle Removal	Filtration	Captiva
Food and Beverage	Pesticides and Herbicides	Solid Phase Extraction	Bondesil™ Bulk Silica
			Chem Elut
			Bond Elut
	Particle Removal	Filtration	Captiva
Industrial	General	Solid Phase Extraction	Bond Elut
			Mega Bond Elut

Sample Preparation Formats



(Diagrams are to scale)

150 mL Mega Bond Elut™ cartridges are also available: see page 62

Varian Offers the Broadest Range of Tube Formats and 96-well Plate Designs

We have a full set of straight barrel SPE tubes ranging from 1 mL – 150 mL which are available in a wide range of bonded silica and polymeric chemistries, sorbent particle size and bed masses.

For more specialty applications, the Luer compatible Bond Elut Jr and the funnel-shaped large reservoir capacity (LRC) tube offer flexibility and function, in a broad range of sorbent bed masses.

Bond Elut 96-well plate formats are best in class for flow performance and well-to-well reproducibility. These specially designed plates are available in 1 mL and 2 mL deep well format and in a large range of different sorbent chemistries.

VersaPlate™ is a highly innovative design allowing for the customization of plates by the end user. Insert different phases for sorbent screening or insert only enough tubes to match the number of samples to be extracted. This offers flexibility and minimizes well wastage. VersaPlate can be purchased in a pre-packed format or as loose tubes.

Prospekt cartridges are on-line SPE devices that are used on Spark Holland Symbiosis instrumentation. Varian offers a range of innovative sorbents for this application not available from other vendors.

Bond Elut Plexa™

The Bond Elut Plexa Family of Innovative SPE Products

Bond Elut Plexa is a new generation of polymeric SPE products, designed for simplicity, improved analytical performance and ease-of-use. Its uniqueness lies in the novel hydroxylated exterior, hydrophobic interior and advanced polymeric architecture.

Bond Elut Plexa

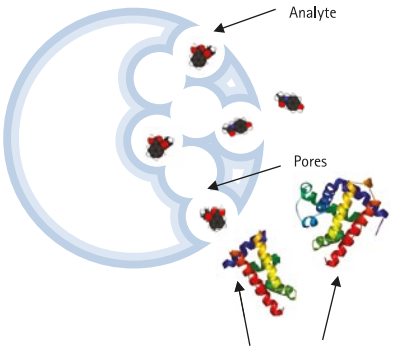
Bond Elut Plexa, with an internal non-polar surface, is universally applicable and the best choice for the extraction of a wide range of acidic, neutral and basic analytes from different matrices.

Bond Elut Plexa PCX

Bond Elut Plexa PCX is a cation exchanger with mixed mode sorbent characteristics and therefore suitable for the extraction and clean up of weak bases from biofluids. Bond Elut Plexa PCX demonstrates the same excellent particle size distribution and integrity as Bond Elut Plexa. A highly controlled sulfonation process results in zero fines for Bond Elut Plexa PCX.

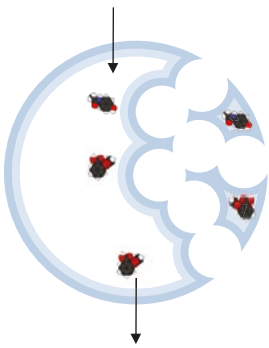
Advanced polymer architecture improves extraction performance

LOAD:
Water-rich, hydrophilic surface allows excellent phase transfer of analytes into the polymer core.



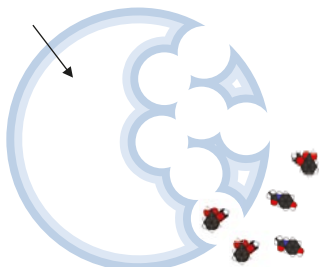
Large endogenous proteins do not bind to the surface of the polymer and cannot access pore structure.

WASH:
Analytes that have crossed the hydrophilic layers will remain tightly bound in the hydrophobic core.



Interferences wash away without leaching the analytes of interest.

ELUTE:
Specially engineered pore structure allows excellent mass transfer out of the polymer.



Clean extract with high recovery.

For more information, please visit www.varianinc.com/plexa.html or visit www.varianinc.com/products.html to place an order.

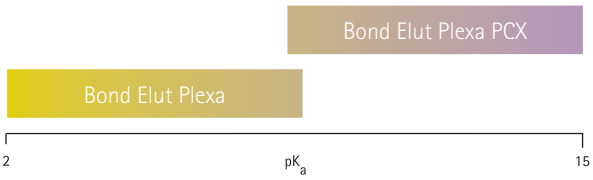
Bond Elut Plexa™

General Protocol for Trouble-Free SPE Applications with Bond Elut Plexa or Bond Elut Plexa PCX

Regardless of your application or sample type, you will appreciate the difference the Plexa range of products makes. Plexa delivers simple methods, superior flow characteristics, and improved analytical performance, all leading to easier validation. Simple methods deliver clean extracts and high recoveries from a wide range of acidic, basic and neutral analytes. The advanced polymeric design effectively eliminates the common matrix interferences that cause ion suppression, resulting in improved analytical sensitivity and data quality.

Bond Elut Plexa products make it easy to improve your SPE so you can get better information, faster.

General acid/basic screening using Bond Elut Plexa and Plexa PCX



ACIDIC: Method optimized for acids

1. Conditon: 500 µL CH_3OH, followed by 500 µL water
2. Apply 100 µL plasma diluted 1:3 with 1% formic acid
3. Wash: 500 µL 5% CH_3OH
4. Elute: 500 µL CH_3OH

NEUTRAL: Method optimized for bases and neutrals

1. Conditon: 500 µL CH_3OH, followed by 500 µL water
2. Apply 100 µL plasma diluted 1:3 with 2% NH_3
3. Wash: 500 µL 5% CH_3OH
4. Elute: 500 µL CH_3OH

BASIC: Mixed-mode method optimized for bases

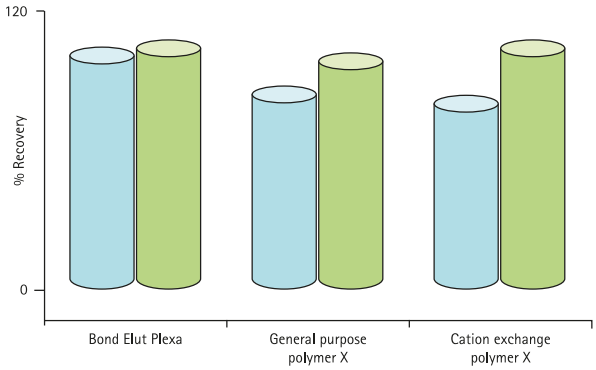
1. Conditon: 500 µL CH_3OH, followed by 500 µL water
2. Apply 100 µL plasma diluted 1:3 with 2% H_3PO_4
3. Acidic wash: 500 µL aqueous 2% formic acid
4. Neutral wash: 500 µL CH_3OH-CH_3CN (1:1, v/v)
5. Elute: 500 µL CH_3OH-CH_3CN + 5% NH_3 (28-30%)

Volumes stated are for a Plexa 30 mg plate

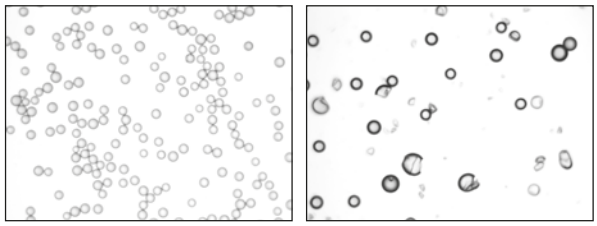
Improved Sensitivity

Matrix interferences can result in significantly decreased analytical sensitivity due to ion suppression. Bond Elut Plexa gives you higher recoveries in cleaner extracts, which translates into better sensitivity. Plexa delivers high recoveries regardless of whether absolute or relative calculations are used. This indicates that ion suppression is minimized and maximum sensitivity is achieved. Relative recovery calculations (blue bars) are routinely used, but mask the effects of ion suppression, which are normalized.

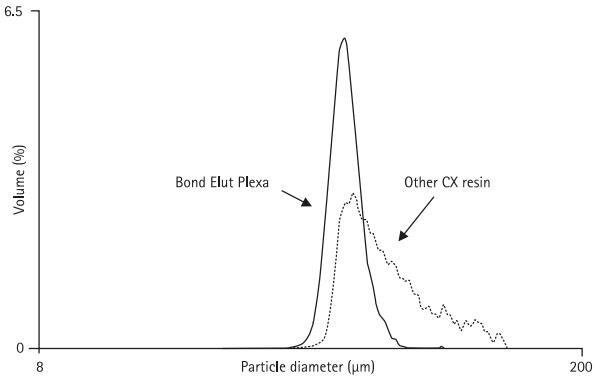
Plexa improves sensitivity by minimizing ion suppression effects and maximizing recovery



Comparison of particle sizes of non-polar SPE polymers by imaging analysis



Comparison of particle size distributions of non-polar SPE sorbents



The narrow particle size distribution offers reproducible, superior flow characteristics with minimal clogging

Bond Elut Plexa™

Advanced Polymer Technology for Simplified SPE

- **Improved extract cleanliness minimizes sample matrix interferences**
- **Simplified extraction method improves productivity**
- **Minimized method development time**

Bond Elut Plexa offers simple, easy-to-use methods with general purpose extraction mechanisms to simplify SPE. In addition, Plexa provides performance enhancements due to a unique polymeric architecture with a non-retentive, hydroxylated, amide-free surface and a non-polar PS/DVB core for retaining small molecules. Binding of proteins and lipids on the polymer surface is minimized, resulting in cleaner samples and reduced ion suppression. Plexa is therefore ideal for high throughput assays requiring validated performance with minimal method development. The standard non-polar retention mechanism is applicable to almost any analyte type, and the performance features operate at the sample loading step, making them largely method independent.

By minimizing the need for extensive method development for multiple sorbents, Bond Elut Plexa simplifies SPE. The water-wettable, hydroxylated exterior allows excellent flow of bio-fluid samples. A gradient of polarity on the polymer surface shunts small analytes to the more hydrophobic center of the polymer bead where they are retained prior to washing and elutions steps.

References

Varian Application Note SI-00602: Extraction of acidic drugs from plasma.

Varian Application Note SI-00603: Extraction of basic drugs from plasma.

Varian Application Note SI-00969: Fractionation of fungal fermentation broth using a polymeric solid phase extraction sorbent.

See also

- Bond Elut Plexa PCX, mixed mode polymeric cation exchanger, page 13

Typical Applications

Extraction of small molecules from plasma

Ordering Information

Bond Elut Plexa

Description	Tube Size (mL)	Bed Mass (mg)	Quantity (/pk)	Part No.
Bond Elut Plexa Cartridge	1	30	100	12109301
	3	30	50	12109303
	1	60	100	12109601
	3	60	50	12109603
	3	200	50	12109610
	3	500	30	12109703
	6	200	30	12109206
Bond Elut Plexa Jr	6	300	50	12169610B
Bond Elut 96 Round-well Plexa	1	10	1	A4969010
	1	30	1	A4969030
Bond Elut 96 Square-well Plexa	2	10	1	A3969010
	2	30	1	A3969030
Mega Bond Elut™ Plexa	6	500	30	12259506
	12	500	20	327832
Bond Elut Plexa Prospekt Cartridge, 2 mm			96	12221305
Bond Elut Plexa PCX 800 Series Cartridge			96	12281305

Bond Elut Plexa™ PCX

Polymeric Cation Exchange for Simplified SPE

- **Faster flow rates improve productivity**
- **Extraction cleanliness and reduced ion suppression improves precision**
- **Simplified, single method for ease-of-use**

Bond Elut Plexa PCX is a further milestone in the development of simple and robust SPE methods. Plexa PCX uses a polymeric cation exchange resin that combines the outstanding properties of Bond Elut Plexa – superior flow characteristics and improved analytical performance – with strong cation exchange functionalities. This mixed-mode SPE sorbent removes neutral and acidic interferences from the matrix, concentrates basic analytes and therefore improves sensitivity in the determination of basic compounds.

The Plexa PCX particles are virtually mono-dispersed, resulting in homogenous packing. Reproducible results are the norm, with very good tube-to-tube and well-to-well performance. Ion suppression is reduced because the highly polar, hydroxylated polymer surface is entirely amide-free and does not provide binding sites for endogenous species such as proteins and lipids.

Plexa PCX comes with a simple, single method approach for basic drugs that offers improved recoveries, cleaner extracts and reduced method development time and cost. Flow rate is improved because Plexa PCX particles have much narrower particle size distribution with no fines to cause blockages.

Ordering Information

Bond Elut Plexa PCX

Description	Tube Size (mL)	Bed Mass (mg)	Quantity (/pk)	Part No.
Bond Elut Plexa PCX	1	30	100	12108301
	1	60	100	12108601
	3	30	50	12108303
	3	60	50	12108603
	6	200	30	12108206
	6	500	30	12258506
Bond Elut Plexa Prospekt Cartridge, 2 mm	96			12221306
Bond Elut Plexa PCX 800 Series Cartridge	96			12281306
Bond Elut 96 Round-Well Plexa PCX	1	10	1	A4968010
	1	30	1	A4968030
Bond Elut 96 Square-Well Plexa PCX	2	10	1	A3968010
	2	30	1	A3968030

Typical Applications

Pharmacokinetics, pharmacodynamics, forensics, toxicology, foodstuffs, environmental investigation

Extraction of melamine from liquid milk and milk powder

Sample Pre-Treatment:
5 g of powdered milk or 10 mL of liquid milk was dissolved in 24 mL acetonitrile/H_2O (50:50, v/v) and 1 mL of 1.0 M HCl. The solution was mixed for 1.5 min with an Ultra Turrax mixer. The sample was then centrifuged for 5 min at 4000 rpm at 5 °C. The extract was filtered with a 0.45 µm filter and then subjected to solid phase extraction (SPE) as described below.

SPE Method:
Bond Elut Plexa PCX (200 mg, 6 mL cartridge)

Bond Elut Plexa PCX Conditioning
5 mL methanol, 5 mL H_2O

↓

Sample Loading
Add supernatant fluid, gravitational extraction

↓

Washing
Add 5 mL 0.1M HCl, 2 mL methanol
Vacuum extract for 1 min

↓

Elution
5 mL 5% ammonia:95% methanol (v/v)
(5 mL ammonia + 95 mL methanol

↓

Evaporation and Reconstitution
Evaporate to dryness with N_2 stream at 50 °C
Add 95:5 acetonitrile:ammonium formate (20mM)
Bring to volume of 1 mL
Centrifuge for 10 s, filter using 0.45 µm membrane

↓

Injection
Direct injection into the 320-MS LC/MS/MS

References

Varian Application Note SI-01120: Extraction of sulfa drugs from honey using Plexa PCX.

Varian Application Note SI-01334: Extraction of benzodiazepines from urine with polymeric cation exchange.

Varian Application Note SI-01013: Extraction of acidic, neutral and basic drugs from plasma using polymeric cation exchange.

Varian Application Note SI-01014: Extraction of non-polar drugs from plasma.

Varian Application Note SI-01015: Extraction of polar drugs from plasma.

See also

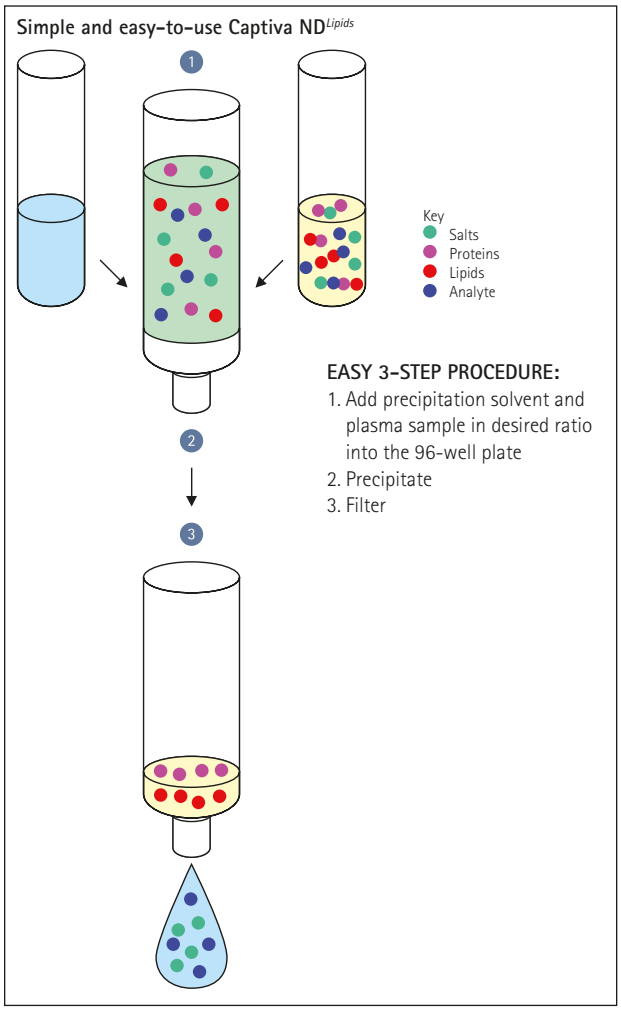
- Bond Elut Plexa, advanced polymeric sorbent for bioanalysis, page 12

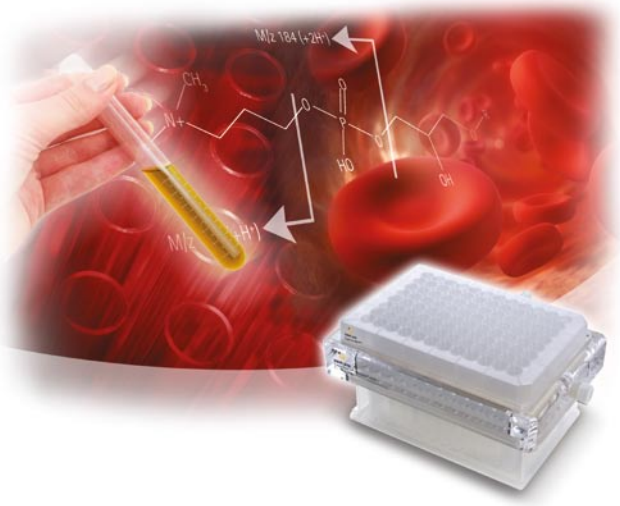
Captiva™ Filtration

Captiva: Complete Removal of Precipitated Proteins

Captiva's unique dual depth filtration media provides complete removal of precipitated proteins and outstanding resistance to sample clogging, with no loss of analytes or non-specific binding. All Captiva components are ultra clean, and rigorously tested to ensure against non-specific binding. With Captiva, your plasma samples are processed quickly and reliably. Captiva is easily automated for enhanced productivity, and also excellent for sample storage.

Time-consuming sample transfer steps required with conventional precipitation are now a thing of the past. With Captiva, clean, clear filtrates are ready for injection in minutes – this user-friendly filtration device is simple and streamlined with an easy to follow 3-step process. And because Captiva samples are pellet-free, you can sample directly from the collection plate.





The Captiva range includes:

- Captiva ND^{Lipids}, the non-drip filtration plate for lipid and protein depletion
- Captiva 96-well filter plates, for preparing precipitated proteins for LC/MS
- Captiva filter cartridges, all the usual Captiva benefits in a standard SPE cartridge format

Tip

Using Captiva ND^{Lipids} with methanol is an excellent replacement for acetonitrile as the precipitation solvent. The methods with methanol show better removal of lipids than with acetonitrile. Converting to methanol is advantageous when the supply or cost of acetonitrile is restrictive, and now, may be your first solvent of choice for lipid removal.

Captiva™ Filtration

Captiva ND^{Lipids}: Improve Analysis by Depleting Phospholipids During Precipitation

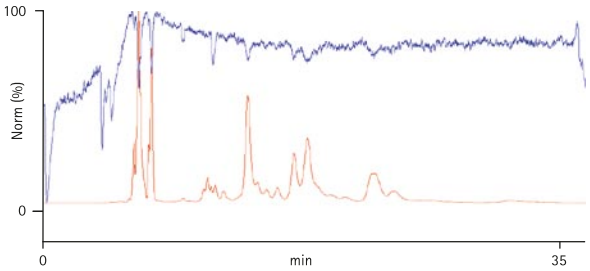
- **More precise and reproducible quantitation with removal of phospholipids and proteins**
- **Increased productivity due to extended column lifetimes and cleaner MS ion sources**
- **Reduced costs and increased productivity due to the decrease in instrument downtime**

Captiva ND^{Lipids} is as simple and easy-to-use as a standard protein precipitation plate. The non-drip 96-well filtration plate is specially designed to effectively remove phospholipids from biofluids. Using Captiva ND^{Lipids} removes lipids, proteins, surfactants and other matrix interferences from plasma extracts. Ion suppression is significantly reduced for enhanced sensitivity and precision during trace analysis. The depletion of lipid compounds also gives you better peak shapes and reproducible retention times so that standard operating procedures are easily validated. In addition, the fast, in-well precipitation technology of Captiva ND^{Lipids} ensures high sample throughputs and helps reduce instrumentation downtime in the laboratory, with virtually no need for method development on a wide range of analytes.

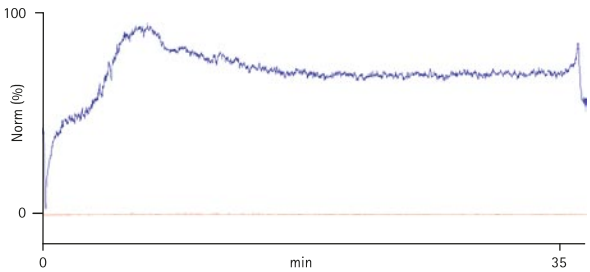
Typical Applications

Antidepressants, antihistamines

Post column infusion experiment using Captiva ND^{Lipids}



Post column infusion experiment (PCI) of albuterol without Captiva ND^{Lipids} (Blue: PCI, Red: MS lipid trace).



The same experiment using Captiva ND^{Lipids}: Ion suppression is dramatically reduced and the lipids are almost non-detectable.

Relative Response* of Drugs in Plasma Samples After Filtration with Captiva ND^{Lipids} Compared to Protein Precipitation/Centrifugation**

Analytes	LogP	Relative Response vs. Protein Precipitation Alone (%)
Zolpidem	3.32	109.6
Mianserin	3.52	167.4
Tranylcypromine	1.40	251.4
Nefazodone	4.70	144.9
Amoxapine	3.10	171.1
Maprotiline	5.10	159.0
Nomifensine	2.94	162.6
Warfarin	3.51	100.5
Sulindac	3.59	136.7
Loratidine	3.65	103.4
Loperamide	6.25	106.7
Vardenafil	6.01	106.5

* Relative to protein precipitation alone under similar conditions
** 3:1 acidified methanol:plasma precipitation from rat or porcine plasma

References

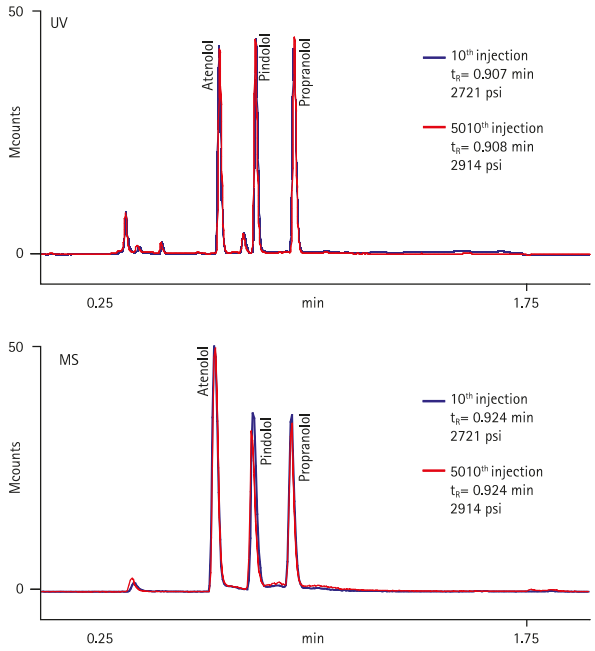
Varian application note SI-01735: depletion of lipids and proteins by Captiva ND^{Lipids} filtration plate for fast and easy bioanalysis of antihistamines.

Varian application note SI-01736: improved bioanalysis of antidepressants from plasma using Captiva ND^{Lipids} filtration plates.

Varian application note SI-01737: using Captiva ND^{Lipids} filtration plates for a simple, fast, and easy-to-use method for the determination of clozapine and norclozapine in plasma.

Captiva™ Filtration

Longevity study illustrating prolonged column lifetime when using Captiva ND^{Lipids}



No significant changes in back pressure, retention time, and peak shape with Captiva ND^{Lipids} after 10 and 5010 injections for LC/MS or LC/MS/MS bioanalysis (top = UV detection; bottom = MS detection).

Captiva 96-well Filter Kits: Outstanding Resistance to Clogging

- **Rigorous quality control eliminates non-specific binding**
- **Fast and reliable processing improves productivity**
- **Starter kits contain everything you need**

Faster than centrifugation and easily automated, Captiva's unique dual depth filtration media provide complete removal of precipitated proteins and outstanding resistance to sample clogging. With Captiva you can avoid fibrinogen clogging forever. The plates are also excellent for sample storage. All Captiva components are ultra clean, and rigorously tested to ensure against non-specific binding. With Captiva, your plasma samples are processed quickly and reliably. Starter kits contain everything you need to get up and running with minimum fuss. Replacement kits include everything you need to replenish your Captiva system*.

Ordering Information

Captiva ND^{Lipids} kits

Description	Part No.
Captiva ND^{Lipids} 96-well Filtration Starter Kit	A59640002SK
Captiva ND^{Lipids} 96-well Filtration Replacement Kit	A59640002RK
DuoSeal 96 (10pk)	A8961008

1 CaptiVac™ Vacuum Collar, 2 Captiva ND^{Lipids} Filter Plates, 2 Captiva 96 Deep-Well 1 mL Collection Plates and 2 Captiva Collection Plate Pierceable Covers. Each replacement kit contains the same items but without the CaptiVac Vacuum Collar.

Captiva ND^{Lipids} plates

Description	Part No.
Captiva ND^{Lipids} 96-well Filter Plate, 1 mL Well	A59640002I
Captiva ND^{Lipids} 96-well Filter Plates, 1 mL Well (5/pk)	A59640002V
DuoSeal 96 (10pk)	A8961008

Captiva ND^{Lipids} tubes

Description	Part No.
Captiva ND^{Lipids} tube 3 mL (100pk)	A53040002

Ordering Information

Captiva 96-well starter filter kits

Pore Size (µm)	Filter Material	Part No.
0.20	Polypropylene	A5960002SK
0.45	Polypropylene	A5960045SK
10.00	Glass Fiber	A596401000SK

1 CaptiVac Vacuum Collar, 5 Captiva Filter Plates, 10 Duo Seal 96 96-well plate seals, 5 Captiva 96-Deep Well 1 mL Collection Plates, 5 Captiva collection plate pierceable covers.

Captiva replacement kits

Pore Size (µm)	Filter Material	Part No.
0.20	Polypropylene	A5960002K
0.45	Polypropylene	A5967045K
	Polyvinyldifluoride and Polypropylene	A5960045K

5 Captiva Filter Plates, 10 Duo Seal 96 96-well plate seals, 5 Captiva 96-Deep Well 1 mL Collection Plates, 5 Captiva collection plate pierceable covers.

* Does not include the CaptiVac vacuum collar

For more information, please visit www.varianinc.com/captiva.html or visit www.varianinc.com/products.html to place an order.

Captiva™ Filtration

Captiva 96-well Filter Plates: Avoid Clogging Expensive HPLC Columns

- **Protect HPLC columns from clogging to reduce instrument downtime**
- **Clean and clear filtrates offer improved sensitivity**
- **High analyte recovery with simple robust methods allows faster method development**

Filtration is simple, versatile, and necessary to prevent clogging of expensive HPLC columns. The Captiva 0.2 µm and 0.45 µm depth filter plates are ideal for preparing precipitated protein samples for LC/MS analysis. The Captiva 10 µm and 20 µm glass fiber filter plates are designed for clarifying highly particle-laden samples, such as freshly thawed plasma and hepatocyte filtration, preventing sample transfer problems from pipette tip clogging. They are perfect for automated systems and for use with Duo Seal 96-well seals.

Captiva 96-well Collection Plates and Cover: Prevent Sample Contamination

- **Designed for Captiva filtration and SPEC™, Bond Elut™ 96 applications**
- **Regular 1 mL format offers compatibility with further automation or liquid handling**
- **Silicone cover preserves sample integrity**

Captiva 96-well Collection Plates are specially designed for use with Captiva Filtration Plates, SPEC SPE 96-well Plates and Bond Elut 96-well Plates. The 1 mL capacity provides the volume needed to collect all of your filtrate or eluate. Captiva Pierceable 96-well Silicone Covers are easily applied to completely seal the plates. This ensures no sample loss due to spillage or evaporation, and no sample contamination. The silicone is specially designed for 96-well auto injectors, providing easy piercing and removal.

Ordering Information

Captiva 96-well filter plates, (5 x 96-well)

Pore Size (µm)	Filter Material	Part No.
0.20	Polypropylene	A5960002
0.45	Polyvinyldifluoride and Polypropylene	A5967045
	Polypropylene	A5960045
10.00	Glass Fiber	A596401000
20.00	Polypropylene	A596002000
	Polypropylene Bulk Pack (100 x 96-well)	A596002000B

Ordering Information

Captiva 96-well collection plates and cover, (10/pk)

Description	Part No.
Captiva 96-well Collection Plate	A6960010000
Captiva Pierceable 96-well Collection Plate Cover	A8961007
DuoSeal 96 (10pk)	A8961008

Captiva™ Filtration

Captiva Filter Cartridges: All the Benefits of Captiva in a Standard SPE Cartridge

- **Standard SPE format**
- **Ideal for LC/MS samples**
- **Avoid sample transfer problems**

Captiva filter cartridges bring all of the benefits of Captiva filtration to the standard SPE cartridge format. The 0.2 µm and 0.45 µm depth filter cartridges are ideal for preparing precipitated protein samples for LC/MS analysis. The Captiva 10 µm glass fiber filter cartridge is designed for clarifying highly particle-laden samples, such as freshly thawed plasma, preventing sample transfer problems due to pipette tip clogging.

CaptiVac™ Vacuum Collars: Prevent Cross Contamination

- **Pre-aligned for trouble free operation**
- **Vacuum sealed for maximum efficiency**
- **Simple, cost effective solution**

For use with Captiva Filtration and 96-well Collection Plates and SPEC™ 96-well Plates, this patented vacuum collar is a completely transparent device that joins Captiva or SPEC plates directly onto our collection plate. The unique design of the CaptiVac collar forms a pre-set, pre-aligned vacuum seal between the filtration plate and the collection plate, which positions the outlet tips at a specified distance inside each well, so as to prevent cross contamination of samples.

CaptiVac Vacuum Collar

Ordering Information

Captiva filter cartridges, (100/pk)

Pore Size (µm)	Filter Material	Volume (mL)	Part No.
0.20	Polyvinyldifluoride and Polypropylene	3	A5300002
0.45	Polyvinyldifluoride and Polypropylene	3	A5307045
10.00	Glass Fiber	10	A500401000

Ordering Information

CaptiVac vacuum collars

Description	Part No.
CaptiVac Vacuum Collar	A796
CaptiVac Vacuum Collar for Hamilton Microlab® ATplus 2	A796H

CaptiVac accessories

Description	Part No.
CaptiVac Gasket Kit (5)	A796G

For more information, please visit www.varianinc.com/captiva.html or visit www.varianinc.com/products.html to place an order.

OMIX™ Tips for Robotic Automation

OMIX: True High Throughput Flexibility for Pharmaceutical Bio Analysis

- **Fast, uniform flow maximizes productivity and reproducibility**
- **Small monolithic tip delivers low elution volumes, increasing sensitivity and reducing solvent usage**
- **Vacuum-free processing improves reproducibility and shortens processing times**

OMIX 96-well VersaPlate™:

OMIX are automation friendly 96-well monolithic SPE plates specially designed to process small samples. They offer small extraction beds with almost no "dead" volume. Elution is achieved with microliter solvent volumes allowing direct injection and improving assay speed and sample throughput. OMIX tips are highly amenable to ADME/DMPK* bio analysis applications.

OMIX Tips for Tomtec™ Quadra:

These Tomtec compatible tips contain a slice of monolithic SPE material.This allows for vacuum-free processing and walk-away automation. With hands-free SPE the process becomes much more streamlined and reproducible.

OMIX Tips for the Hamilton Microlab® Star Line:

Offers excellent versatility and end-user productivity enhancements. Processing of 96 samples can be reduced to just a few minutes in certain applications. The tips have an operating volume of 300 µL, allowing flexibility in sample size.

* Absorption, Distribution, Metabolism and Excretion/Drug Metabolism and PharmacoKinetics

Ordering Information

OMIX SPE in VersaPlate format

Description	Part No.
OMIX 96-well VersaPlate, C4 with Tubes	A57109
OMIX C4 Tubes Only (96)	A57109A
OMIX 96-well VersaPlate, C18 with Tubes	A57103
OMIX C18 Tubes Only (96)	A57103A
OMIX 96-well VersaPlate, MP1 with Tubes	A57111
OMIX MP1 Tubes Only (96)	A57111A

OMIX Tips for Tomtec

Description	Part No.
OMIX C18 for Tomtec Quadra (1 rack x 96 tips)	A57303SPL
OMIX C18 for Tomtec Quadra (5 racks x 96 tips)	A57303
OMIX MP1 for Tomtec Quadra (1 racks x 96 tips)	A57311SPL
OMIX MP1 for Tomtec Quadra (5 racks x 96 tips)	A57311

Typical Applications

Small sample processing

Varian OMIX Tips for Hamilton Star, MP1, 5 mg

Sample Pretreatment
Add 200 µL 2% H_3PO_4 to 100 µL of human plasma

↓

Conditioning
Aspirate 300 µL of methanol, dispense into waste tray
Aspirate 300 µL of water, dispense into waste tray

↓

Washing
Add 5 mL 0.1M HCl, 2 mL methanol
Vacuum extract for 1 min

↓

Conditioning
Pre-mix 300 µL sample 3 times
Aspirate 300 µL and dispense into waste tray

↓

Wash
Aspirate 300 µL of deionized water, dispense into waste tray
Aspirate 300 µL of methanol, dispense into waste tray

Aspirate and dispense parameters

Flow rate:	50 µL/s
Setting time:	3 s
Total extraction time:	<5 min

Albuterol Relative Recoveries

Amount (ng/mL)	% Recovery
48.0	96
46.0	92
49.7	99
46.6	93
49.1	98
47.4	95
Mean	96
RSD	3

Ordering Information

OMIX Tips for Hamilton

Description	Part No.
OMIX C18 for Hamilton 300 µL (1 rack x 96 tips)	A57403SPL
OMIX C18 for Hamilton 300 µL (5 racks x 96 tips)	A57403
OMIX MP1 for Hamilton 300 µL (1 rack x 96 tips)	A57411SPL
OMIX MP1 for Hamilton 300 µL (5 racks x 96 tips)	A57411

SPEC™ Disk SPE

SPEC: Innovative Monolithic Disk Technology

- **No loose sorbent means no channelling of sample**
- **Uniform flow and extraction properties offers robust performance**
- **Low elution volume affords excellent concentration of analyte, improving sensitivity**

Using an advanced disk design, SPEC delivers superior flow characteristics and trouble free automation.

Due to the low volume of the extraction bed, very low elution volumes can be used. This means that in some applications, evaporation and reconstitution steps can be eliminated, resulting in accelerated sample processing times. The combination of low bed masses, ultra-clean base materials and a broad toolbox of selectivities, delivers higher recoveries free of the matrix interferences that can cause ion suppression.

SPEC delivers high recoveries at low elution volumes - as low as 100 µL. This is due to the very high surface area yet small physical volume of the monolithic disk. Overall, extraction efficiency is very high for this format of sample preparation product, and the range of functionalities allows fast method development.

Unique phases available in SPEC 96-well and SPE Tube formats

DAU: This functionalized SPEC disk is specifically designed for the analysis of drugs of abuse in urine. Its unique sorbent chemistry results in excellent sample clean-up and concentration of samples prior to GC/MS and LC/MS.

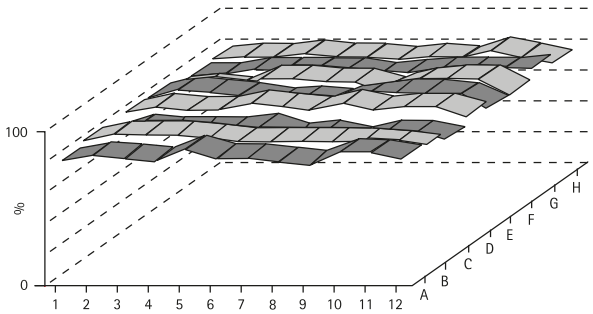
MP1: SPEC MP1 is a mixed-mode, non-polar/SCX monolithic disk ideal for analytes with polar functional groups in plasma. The dual retention mechanism results in cleaner extracts. The SCX functionality strongly binds polar basic analytes allowing rigorous washing steps to be employed. Bond Elut™ Certify™ offers similar selectivity to SPEC MP1.

MP3: SPEC MP3 is slightly more polar than MP1, making it ideal for hydrophobic analytes that would bind too strongly to MP1. MP3 chemistry is particularly suited to the extraction of opiate alkaloids from biological fluids.

Typical Applications

Drugs of abuse, pharmaceutical small molecules

The uniform recovery and reproducibility between wells from the same well plate



Note the high recovery (Y Axis) with an average deviation across the 96 wells of just 3.2% (well positions are shown on the X and Z axes). SPEC provides the predictable flow characteristics analysts require for true walk-away automated processing. With SPEC you need not worry about clogging, and as an added benefit, the typically low vacuum pressure requirement prevents cross-talk (e.g. spraying of fast running eluates between wells in the collection plate).

SPEC™ Disk SPE

SPEC 96-well Plates

When used on an automated platform, SPEC 96-well plates offer outstanding flow characteristics. Flow across all 96 wells is uniform and highly reproducible, meaning your recoveries are, too.

Ordering Information

Method development kit

Sorbent Phase	Part No.
C2, C8, C18, C18AR, CN, MP1, MP3, PH (15 mg)	A59630

This kit provides a range of sorbents to help you optimize your sample preparation method.

Silica-based sorbents (15 mg except A5960330)

Sorbent Phase	Part No.
C18	A59603
C18AR	A59619
C18AR (30 mg)	A5960330
C2	A59601
C8	A59602
CN	A59606
DAU	A596DAU
NH_2	A59607
Phenyl	A59610

Ion-exchange sorbents (15 mg)

Sorbent Phase	Part No.
SAX	A59605
SCX	A59604

Mixed mode sorbents (15 mg)

Sorbent Phase	Part No.
MP1	A59611
MP3	A59620

SPEC SPE Cartridges

SPEC functionalities are also available in standard straight barrel tube format, offering flexibility in sample size. Use on any standard vacuum manifold such as the Vac Elut™ 20 or SPS 24.

Ordering Information

SPEC SPE cartridges (100/pk)

Description	Size (mL)	Sorbent Mass (mg)	Part No.
C18	3	15	A5320320
C18	3	30	A5320330
C18AR	3	15	A5321920
C18AR	3	30	A5321930
C2	3	30	A5320130
C8	3	15	A5320220
C8	3	30	A5320230
DAS	3	15	A532DAS
DAU	3	15	A532DAU
MP1	3	15	A5321120
MP1	3	30	A5321130
MP3	3	15	A5322020
MP3	3	30	A5322030
NH2	3	15	A5320720
Phenyl	3	15	A5321020
Phenyl	3	30	A5321030
SAX	3	15	A5320520
SAX	3	30	A5320530
C18AR	10	35	A5021935
C18/MP3	10	70	A5022570
MP1	10	35	A5021135
MP1	10	70	A5021170
MP3	10	35	A5020735
NH2	10	70	A5020770
SAX	10	35	A5020535

SPEC disks and accessories

Description	Diameter (mm)	Part No.
C8 (24/pk)	47	A74702
C18AR (20/pk)	47	A74819
C18AR (12/pk)	90	A79019
SPEC Environmental Disk Manifold		A712
SPEC Environmental Disk Holder (47 mm)		A713
SPEC 1 L Flask (40/35 mm)		A714

Bond Elut™ SPE

The Original Packed Bed SPE Cartridge

Bond Elut is the original and still the most trusted name in solid phase extraction. Years of use by demanding chemists at top companies worldwide have thoroughly documented its many applications and proven its properties. To this day, you will find more literature references for Bond Elut than any other SPE product in the industry.

Bond Elut is manufactured using state-of-the-art automation to guarantee quality and consistency. During manufacture, 25 different tests are conducted to ensure reproducibility. Optical scanners installed throughout our automated assembly process inspect each Bond Elut tube at multiple points. If an imperfection is spotted, the tube is removed from the assembly line. The entire process is in compliance with the newest ISO 9001:2000 Quality System guidelines. The result is consistently reliable Bond Elut cartridges, time and time again. With the attention we give to maintaining the highest possible quality standards, it is no wonder Bond Elut has been the world's leading SPE brand for over 30 years.

Over 40 different sorbent functionalities are available in a variety of cartridge formats including straight barrel, large reservoir capacity (LRC) and Bond Elut Junior (JR).

Sorbent Specifications

Sorbent Phase	Category	Bonded Functional Group/ Base Material	Endcapped	Format	Typical Carbon Loading (%)	Surface Area (m^2/g)	Particle Size (µm) and Shape	Mean Pore Size (Å)
AccuCAT	Mixed Mode	Sulfonic acid (SCX) and quaternary amine (SAX) silica based	No	Packed bed	7.0	500	40 and 120, irregular	60
Alumina (AL-A)	Polar	Aluminium oxide - acidic		Packed bed	0.0		25	
Alumina (AL-B)	Polar	Aluminium oxide - basic		Packed bed	0.0		25	
Alumina (AL-N)	Polar	Aluminium oxide - neutral		Packed bed	0.0		25	
Aminopropyl (NH2)	Polar/Anion Exchanger	Aminopropyl/silica based	No	Packed bed	6.7	500	40 and 120, irregular	60
SPEC™ Aminopropyl (NH2)	Polar/Anion Exchanger	Aminopropyl/silica based	No	Monolithic disk		220		70
C1	Non-polar	Methyl/silica based	Yes	Packed bed	4.1	500	40, irregular	60
C2	Non-polar	Ethyl/silica based	Yes	Packed bed	5.6	500	40 and 120, irregular	60
SPEC C2	Non-polar	Dimethyl/silica based	No	Monolithic disk	2.7	220		70
C8	Non-polar	Octyl/silica based	Yes	Packed bed	12.2	500	40 and 120, irregular	60
SPEC C8	Non-polar	Octyl/silica based	Yes	Monolithic disk	5.0	220		
Carbon	Strongly Non-polar	Graphitized carbon	No	Packed Bed				

For more information, please visit www.varianinc.com/bondelut.html or visit www.varianinc.com/products.html to place an order.

Sorbent Specifications Continued

Sorbent Phase	Category	Bonded Functional Group/ Base Material	Endcapped	Format	Typical Carbon Loading (%)	Surface Area (m^2/g)	Particle Size (µm) and Shape	Mean Pore Size (Å)
C18	Non-polar	Trifunctional octadecyl/ silica based	Yes	Packed bed	17.4	500	40 and 120, irregular	60
SPEC C18	Non-polar	Monofunctional octadecyl/ silica based	No	Monolithic disk	8.0	220		70
SPEC C18 AR	Non-polar	Trifunctional octadecyl/ silica based	Yes	Monolithic disk	9.0	220		70
C18 EWP	Non-polar	Trifunctional octadecyl/ silica based	Yes	Packed bed	6.0	80	40, irregular	500
C18 INT	Non-polar	Trifunctional octadecyl/ silica based	Yes	Packed bed	13.0	500	40, irregular	60
C18 LO	Non-polar	Trifunctional octadecyl/ silica based	Yes	Packed bed	11.8	500	40, irregular	60
C18 OH	Non-polar	Monofunctional octadecyl/ silica based	No	Packed bed	14.9	300	40 and 120, irregular	150
CBA	Cation Exchanger	Carboxylic acid silica based	Yes	Packed bed	7.4	500	40 and 120, irregular	60
Certify™	Mixed Mode	Octyl and benzenesulfonic acid (SCX)/silica based	No	Packed bed	9.0	500	40 and 120, irregular	60
Certify II	Mixed Mode	Octyl and quaternary amine (SAX)/silica based	No	Packed bed	8.6	500	40 and 120, irregular	60
CH	Non-polar	Cyclohexyl/silica based	Yes	Packed bed	9.6	500	40 and 120, irregular	60
Cyano (CN-E)	Non-polar	Cyanopropyl/silica based	Yes	Packed bed	8.1	500	40 and 120, irregular	60
SPEC Cyano	Polar	Cyanopropyl/silica based	No	Monolithic disk		220		70
SPEC DAU	Application specific	Silica based		Monolithic disk		220		70
DEA	Anion Exchanger	Diethylaminopropyl/ silica based	No	Packed bed	8.5	500	40 and 120, irregular	60
Diol (2OH)	Polar	Diol/silica based	No	Packed bed	6.8	500	40, irregular	60
ENV	Non-polar	Styrene divinylbenzene		Packed bed			125, spherical	450
EnvirElut™ 1664	Application Specific	Trifunctional octadecyl/ silica based	No	Packed bed	18.0	500	40 and 120, irregular	60
FL	Polar	Florisil		Packed bed			200	
Focus™	Polar-enhanced	Polar functionalized styrene divinylbenzene		Packed bed		640	44, spherical	120
LMS	Non-polar	Styrene divinylbenzene		Packed bed			75, spherical	300
SPEC MP1	Mixed Mode	Non-polar and benzenesulfonic acid (SCX)/ silica based		Monolithic disk	6.0	220		70
SPEC MP3	Mixed Mode	Slightly polar and benzenesulfonic acid (SCX)/ silica based		Monolithic disk		220		70
NEXUS	Mixed mode	Mixed mode copolymer		Packed bed		575	70, spherical	100/450 Bimodal
PBA	Covalent	Phenylboronic acid	No	Packed bed	7.9	500	40, irregular	60

Bond Elut™ SPE

Sorbent Specifications Continued

Sorbent Phase	Category	Bonded Functional Group/ Base Material	Endcapped	Format	Typical Carbon Loading (%)	Surface Area (m^2/g)	Particle Size (µm) and Shape	Mean Pore Size (Å)
PCB	Application Specific	Layered phase		Packed bed		500		
PH	Non-polar	Phenyl/silica based	Yes	Packed bed	10.7	500	40 and 120, irregular	60
Plexa™	Polar enhanced	Hydrophilic styrene divinylbenzene		Packed bed		550	45, spherical monodisperse	100
Plexa PCX	Cation Mixed Mode	SCX functionalized hydrophilic styrene divinylbenzene		Packed bed		550	45, spherical monodisperse	100
PPL	Non-polar	Functionalized styrene divinylbenzene		Packed bed		600	125, spherical	150
PRS	Cation Exchange	Propylsulfonic acid/silica based	No	Packed bed	1.7	500	40, irregular	60
PSA	Anion Exchanger	Ethylenediamine-N-propyl/ silica based	No	Packed bed	7.5	500	40 and 120, irregular	60
SPEC™ PSA	Anion Exchanger	Ethylenediamine-N-propyl/ silica based	No	SPEC disk		220		70
SPEC PH	Non-polar	Phenyl/silica based	Yes	Monolithic disk		220		70
SAX	Anion Exchanger	Trimethylaminopropyl/silica based	No	Packed bed	7.5	500	40 and 120, irregular	60
SPEC SAX	Anion Exchanger	Trimethylaminopropyl/silica based	No	Monolithic disk		220		70
SCX	Cation Exchanger	Benzenesulfonic acid/silica based	No	Packed bed	10.9	500	40 and 120, irregular	60
SPEC SCX	Cation Exchanger	Benzenesulfonic acid/silica based	No	Monolithic disk		220		70
SI	Polar	Silica	No	Packed bed		600	40 and 120, irregular	60
SPEC SI	Polar	Silica	No	Monolithic disk		220		70
TCA	Application Specific	Ethyl/silica based	Yes	Packed bed		500	40 and 120, irregular	60

Particle Size Specifications

You will note that our most common silica-based Bond Elut packings are described as 40 µm materials, yet if you look at the specifications and actual lot analyses, you will see that the actual mean is around 55 µm. The reason is that the silica is in fact irregular rather than spherical and thus the concept of a diameter is a loose one. We have been making silica-based Bond Elut packings since 1979, using the same diameter silicas; in that time, the models used to estimate irregular particle "diameters" and the testing equipment have changed. This has resulted in the value being different from what it would have been in 1979. We have retained the term "40 µm" however, because there are so many official methods that specify a 40 µm Bond Elut sorbent. As other suppliers attempted to copy the successful Bond Elut product specifications, the term has become an industry standard. You can be assured, however, that the actual average particle in our regular silica Bond Elut is the same now as it was 30 years ago when Varian first pioneered SPE as a sample preparation technology.

Bond Elut™ Cartridge SPE

Bond Elut AccuCAT: Extraction of Analytes From Urine

- **Ultra clean, mixed sorbent bed delivers for reproducible extractions**
- **SCX and SAX functionalities offer broad analyte extraction potential**
- **Compatible with many biological fluids for easy method transfer**

Bond Elut AccuCAT cartridges are mixed bed SPE cartridges consisting of a strong cation exchange (SCX) and a strong anion exchange (SAX) sorbent packed into one bed. AccuCAT is effective for the extraction of acidic, basic and neutral analytes from urine and other biological samples. AccuCAT is particularly effective for catecholamine extraction from bio fluids.

Typical Applications

Urine and other biofluids

Sorbent Specifications

Characteristics	
Primary retention mechanism	Mixed mode
Bonded functional group, base material	Sulfonic acid (SCX) and quaternary amine (SAX) methyl, silica
Endcapped	No
Format	Packed bed
Typical carbon loading (%)	7
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

Ordering Information

Bond Elut LRC cartridges (40 µm, 60/box)

Sorbent Mass (mg)	Volume (mL)	Part No.
200	10	12282005
600	10	12282001

Bond Elut straight barrel cartridges (40 µm)

Sorbent Mass (mg)	Volume (mL)	Quantity (box)	Part No.
200	3	60	12282003
	6	30	12282004
400	6	30	12282006
600	3	60	12282002

References

Andrzejewski, D, Roach, JAG, Gay, ML and Musser, SM (2004) Analysis of coffee for the presence of acrylamide by LC-MS/MS. J. Agric. Food Chem., 52, 1996-2002.

Lenders, JW, Eisenhofer, G, Armando, I, Keiser, HR, Goldstein, DS and Kopin, IJ (1993) Determination of metanephrines in plasma by liquid chromatography with electrochemical detection. Clin. Chem., 39, 97-103.

See also

- Bond Elut SCX, strong cation exchanger, page 49

Bond Elut™ Cartridge SPE

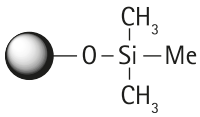
Bond Elut C1: Low Retention Sorbent for Multifunctional Analytes

- **Least retentive of all alkyl group bonded phases**
- **Easy retention and release of polar compounds**
- **Easy retention and release of multi-functional compounds**

Due to the methyl group and subsequent low carbon load, Bond Elut C1 is the least retentive of all alkyl group bonded phases for non-polar compounds. However, due to the extensive endcapping of this sorbent to mask polar silanol activity, retention and elution of polar and multi-functional analytes can still be achieved.

Typical Applications

Plasma, urine, aqueous samples



Sorbent Specifications

Characteristics	
Primary retention mechanism	Very weakly non-polar
Bonded functional group, base material	Methyl, acid washed silica
Endcapped	Yes
Format	Packed bed
Typical carbon loading (%)	4.1
Surface area (m^2/g)	500
Particle size (µm), shape	40, irregular
Mean pore size (Å)	60Å

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Part No.
100	10	12113004
300	10	12113053
500	10	12113030

Bond Elut straight barrel cartridges

Sorbent Mass (mg)	Volume (mL)	Quantity (box)	Part No.
50	1	100	12102061
100	1	100	12102004
	3	50	12102090
500	3	50	12102031

See also

- Bond Elut C2, low carbon load, non-polar sorbent, page 27
- Bond Elut C8, suitable for strongly retained analytes, page 28
- OMIX™ C4, high throughput and automation friendly, page 19

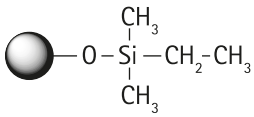
Bond Elut C2: Less Retention Than C8

- **C2 is a low carbon load sorbent**
- **Can be used alongside CN and C8 phases**
- **Popular for drug extraction from plasma and for flat baselines**

Bond Elut C2 is a fairly non-polar sorbent because of the short chain length of the functional group. C2 is often used during the process of method development if analytes are retained too strongly on a C8 or C18 phase. The polarity of C2 is slightly lower than a cyano phase for polar interactions.

Typical Applications

Plasma, urine, aqueous samples



Sorbent Specifications

Characteristics	
Primary retention mechanism	Weak non-polar
Bonded functional group, base material	Ethyl, acid washed silica
Endcapped	Yes
Format	Packed bed
Typical carbon loading (%)	5.6
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Part No.
100	10	12113003
200	10	12113026
500	10	12113029

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Quantity (box)	Part No.
50 mg	1	100	12102060
	3	50	12105029
100 mg	1	100	12102003
	3	50	12102117
200 mg	3	50	12102027
500 mg	3	50	12102030
	6	50	12102115
1 g	6	30	12256003

See also

- Bond Elut C1, low retention for multi-functional analytes, page 26

Bond Elut™ Cartridge SPE

Bond Elut C8: Less Retentive Alternative to C18

- **Excellent for strongly-retained analytes**
- **Polar interactions not significant**
- **Less retentive than C18**

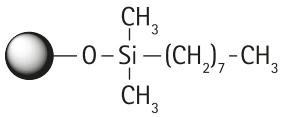
Bond Elut C8 is very similar in property to C18, but is not as retentive for non-polar compounds due to its shorter hydrocarbon chain and therefore reduced carbon loading. C8 is an excellent replacement for C18 when analytes are too strongly-retained for effective elution. The potential for polar interactions is somewhat higher than for C18 because there is less coverage of the silica surface. These polar interactions are not, however, a significant property of C8.

Sorbent Specifications

Characteristics	
Primary retention mechanism	Moderately non-polar
Bonded functional group, base material	Octyl, acid washed silica
Endcapped	Yes
Format	Packed bed
Typical carbon loading (%)	12.2
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

Typical Applications

Simultaneous extraction of fat- and water-soluble vitamins



Ordering Information

Bond Elut Jr (100/box)

Sorbent Mass (mg)	Part No.
500	12162029B

Bond Elut LRC cartridges

Sorbent Mass (mg)	Volume (mL)	Part No.
100	10	12113002
200	10	12113025
500	10	12113028

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Quantity (/Box)	Part No.
50 mg	1	100	12102059
	3	50	12105028
100 mg	1	100	12102002
	3	50	12102100
200 mg	3	50	12102026
500 mg	3	50	12102029
	6	30	12102053
1 g	6	30	12256002
5 g	20	20	12256024
10 g	60	16	12256032

Prospekt cartridges

Description	Part. No
Prospekt Cartridges, 800 Series, 96/pk	12281002
Prospekt Cartridges, 800 Series, 1 mm, 96/pk	12281025

VersaPlate™ formats

Description	Particle Size (µm)	Part No.	
		50 mg	100 mg
Preassembled 96-well Plate	40		7540301C
VersaPlate Tubes 96pk*	40	75503050	7550301C

* Tubes need to be inserted into a VersaPlate base plate Part No. 75400000

See also

- Bond Elut C18, universal, non-polar SPE sorbent, page 29
- SPEC™ C8, outstanding flow characteristics, page 21
- OMIX™ C8, high throughput and flexible, page 19

For more information, please visit www.varianinc.com/bondelut.html or visit www.varianinc.com/products.html to place an order.

Bond Elut™ Cartridge SPE

Bond Elut C18: The Universal, Non-polar SPE Sorbent

- **Extremely retentive for non-polar compounds**
- **Effective for desalting aqueous mixtures**
- **The most hydrophobic, bonded silica sorbent**

Bond Elut C18 is the most hydrophobic silica sorbent available in this range. It is the most popular SPE sorbent because of its extreme retentive nature for non-polar compounds. C18 is generally regarded as the least selective silica-based sorbent, since it retains most organic analytes from aqueous matrices. When analyzing small to intermediate molecules, Bond Elut C18 can be used for desalting aqueous matrices prior to ion exchange, as salts pass through the sorbent unretained.

Sorbent Specifications

Characteristics	
Primary retention mechanism	Strongly non-polar
Bonded functional group, base material	Trifunctional octadecyl, acid washed silica
Endcapped	Yes
Format	Packed bed
Typical carbon loading (%)	17.4
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

See also

- Bond Elut C8, selective for strongly retained analytes, page 28
- SPEC™ C18, outstanding flow characteristics, page 21
- OMIX™ C18, high throughput and automation friendly, page 19

Ordering Information

Bond Elut Jr (100/box)

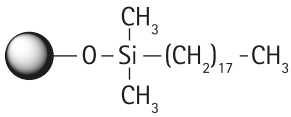
Sorbent Mass	Part No.
500 mg	12162028B
1 g	12166001B

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Particle Size (µm)	Part No.
100	10	40	12113001
	10	120	14113001
200	10	40	12113024
	10	120	14113024
500	10	40	12113027
	10	120	14113027

Typical Applications

Water and aqueous biological fluids



Ordering Information

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Particle Size (µm)	Quantity (/Box)	Part No.
50 mg	1	40	100	12102058
	1	120	100	14102058
	3	40	50	12105027
100 mg	1	40	100	12102001
	1	120	100	14102001
	3	40	50	12102099
200 mg	1	40	100	12102096
	3	40	50	12102025
	3	120	50	14102025
500 mg	3	40	50	12102028
	3	120	50	14102028
	6	40	30	12102052
	6	120	30	14102052
1 g	3	40	50	12102118
	6	40	30	12256001
	6	120	30	14256001
	60	40	16	12256060
2 g	12	120	20	14256015
5 g	20	120	20	14256023
10 g	60	120	16	14256031

Prospekt cartridges

Description	Part. No
Prospekt Cartridges, 800 Series, 96/pk	12281001
Prospekt Cartridges, 800 Series, 1 mm, 96/pk	12281024

VersaPlate™ formats

Description	Particle Size (µm)	Part No. 25 mg	Part No. 50 mg	Part No. 100 mg
Preassembled 96-well Plate	40		75401050	7540101C
VersaPlate Tubes 96pk*	40	75501025	75501050	7550101C
	120		75502050	

* Tubes need to be inserted into a VersaPlate base plate Part No. 75400000

Bond Elut™ Cartridge SPE

Bond Elut C18 EWP: Efficient Extraction of Large Molecules

- **No exclusion of large molecules**
- **Good for desalting proteins**
- **Successful separation of proteins, peptides or nucleotides**

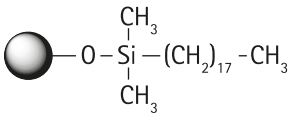
Bond Elut EWP is based upon standard particle size silica but with 500 Å pores to allow more efficient extraction of large molecules (>15,000 MW), which are typically excluded from standard porosity silica phases.

Sorbent Specifications

Characteristics	
Primary retention mechanism	Strongly non-polar
Bonded functional group, base material	Trifunctional octadecyl, acid washed silica
Endcapped	Yes
Format	Packed bed
Typical carbon loading (%)	12.2
Surface area (m^2/g)	80
Particle size (µm), shape	40, irregular
Mean pore size (Å)	500

Typical Applications

Small molecule extraction from water, aqueous samples and biological fluids



See also

- Bond Elut C18, universal, non-polar SPE sorbent, page 29
- SPEC™ C18, outstanding flow characteristics, page 21

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Part No.
50	10	12113068
500	10	12113071

Bond Elut straight barrel cartridges

Sorbent Mass (mg)	Volume (mL)	Quantity (box)	Part No.
50	1	100	12102136
100	1	100	12102137
500	3	50	12102139

Bond Elut C18 LO: Low Carbon Loading

- **Unique selectivity**
- **Optimized bonding density for extracting polar compounds from environmental samples**
- **Delivers excellent recoveries of difficult analytes**

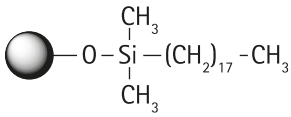
Bond Elut C18 LO is a highly retentive non-polar silica-based sorbent with a much lower carbon loading than our standard C18 product. C18 LO therefore has unique selectivity over other octadecyl-bonded sorbents. The density of bonding has been optimized for polar analyte extraction from environmental matrices where the underlying silica polarity provides additional retention.

Sorbent Specifications

Characteristics	
Primary retention mechanism	Strongly non-polar
Bonded functional group, base material	Trifunctional octadecyl, acid washed silica
Endcapped	Yes
Format	Packed bed
Typical carbon loading (%)	4.7
Surface area (m^2/g)	500
Particle size (µm), shape	40, irregular
Mean pore size (Å)	60

Typical Applications

Water, aqueous biological fluids



See also

- Bond Elut C18, universal, non-polar SPE sorbent, page 29
- SPEC C18, outstanding flow characteristics, page 21

Ordering Information

Bond Elut straight barrel cartridges

Sorbent Mass (mg)	Volume (mL)	Quantity (box)	Part No.
100	1	100	12102111
200	3	50	12102112
500	3	50	12102113

Bond Elut™ Cartridge SPE

Bond Elut C18 OH: Balanced Retention of Polar Analytes

- **Silanol activity permits metabolite fractionation**
- **Tight QC tolerances deliver batch-to-batch reproducibility**
- **150 Å pore size expands retention window to higher molecular weight compounds**

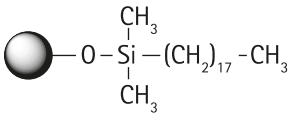
Bond Elut C18 OH is a non-endcapped version of the octadecyl bonded phases that enables the silanols on the silica surface to be more active. This low-load C18 has well-controlled silanol activity that permits the fractionation of metabolites and enhances retention of basic compounds compared to an endcapped C18. The pore size makes it a good choice for peptide extraction.

Sorbent Specifications

Characteristics	
Primary retention mechanism	Moderately non-polar
Bonded functional group, base material	Monofunctional octadecyl, acid washed silica
Endcapped	No
Format	Packed bed
Typical carbon loading (%)	14.9
Surface area (m^2/g)	300
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	150

Typical Applications

Water, aqueous biological fluids



See also

- Bond Elut C18, universal, non-polar SPE sorbent, page 29
- SPEC™ C18, outstanding flow characteristics, page 21

Ordering Information

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Quantity (box)	Part No.
100 mg	1	100	12102020
500 mg	3	50	12102046
1 g	6	30	12256040

Bond Elut CBA: Broad Selectivity for Cations

- **Cation exchange with no need for extreme basic conditions**
- **Wider selectivity range provides more eluent options**
- **Polar or non-polar depending on matrix or solvent**

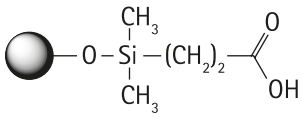
CBA is a mid-polarity sorbent and weak cation exchanger (pKa 4.8). It has a wider range to counter-ions than lower pKa sorbents and easier elution for quaternary amines.

Sorbent Specifications

Characteristics	
Primary retention mechanism	Weak cation exchange
Bonded functional group, base material	Carboxylic acid
Endcapped	Yes
Format	Packed bed
Typical carbon loading (%)	7.4
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

Typical Applications

Water, aqueous biological fluids



See also

- Bond Elut NEXUS WCX, weak cation exchange polymer, page 40
- Bond Elut SCX, strong cation exchanger, page 49

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass	Volume (mL)	Part No.
100 mg	10	12113011
500 mg	10	12113037

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Quantity (box)	Part No.
50 mg	1	100	12102073
100 mg	1	100	12102011
	3	50	12102097
200 mg	3	50	12102124
500 mg	3	50	12102038
1 g	6	30	12256009
2 g	12	20	12256058

Bond Elut™ Cartridge SPE

Bond Elut Carbon and Carbon/NH2: Optimized for Pesticide Analysis

- **Excellent retention for small organics, including ones that are too polar to retain on C18 or polymeric SPE**
- **Removal of chlorophyll and other pigments leads to fewer chromatographic or mass interferences**
- **Broader retention and easier elution for analytes right across the polarity scale, for improved multi-residue analysis**

Bond Elut Carbon barrels are packed with ultra pure graphitized carbon particles that have been optimized for the adsorption of pigments in food, fruits and vegetables, and small organic residues in waste water. The powerful retention mechanisms of these products thus deliver a broad range of extractions for many analytes. In addition, careful manufacturing techniques result in lower carbon fines on the wall of the device.

The two-layer Bond Elut Carbon/NH2 is compliant with the Japanese Positive List System for the analysis of pesticide residues in food.

References

Japanese Positive List System for Agricultural Chemical Residues in Food. http://www.ffcr.or.jp.

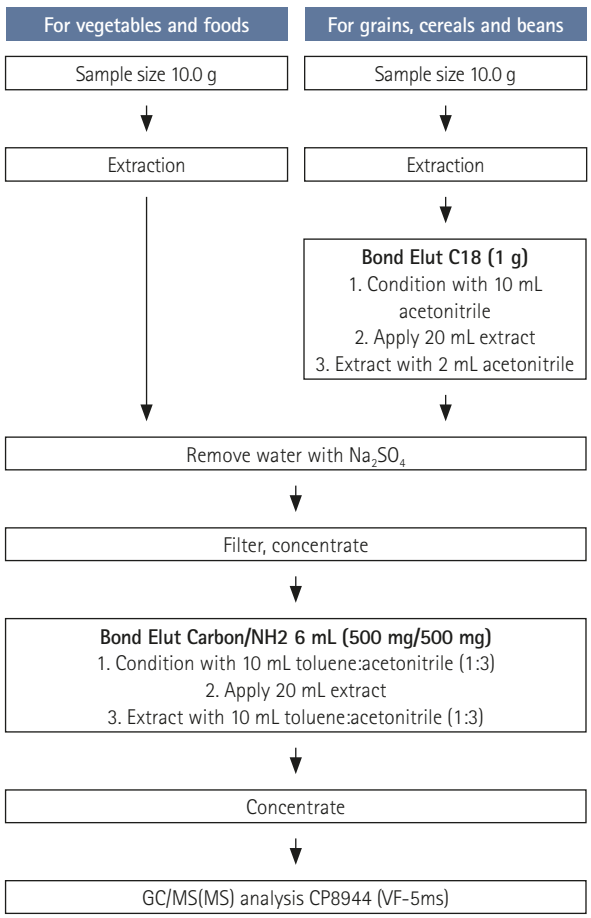
EPA Method 535: Measurement of Chloroacetanilide and Other Acetamide Herbicide Degradates In Drinking Water By Solid Phase Extraction And Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS).

Varian Complete Solutions for Pesticide Residue Analysis in Foods brochure.

Typical Applications

Herbicide residues

Method for the simultaneous monitoring of pesticide residues in agricultural products. Extraction, refining (clean-up) and quantitative analysis



Ordering Information

Bond Elut straight barrel cartridges

Description	Sorbent Mass (mg)	Volume (mL)	Quantity (box)	Part No.
Bond Elut Carbon	50	1	100	126414
	100	1	100	126418
	250	6	30	12102201
	500	6	30	12252201
Bond Elut Carbon/ NH2	500/500	6	30	12252202
	500/500	20	20	3664325032

See also

- FactorFour VF-5ms GC columns for pesticide analysis, page 112

Bond Elut™ Cartridge SPE

Bond Elut CH (cyclohexyl): Unique Selectivity

- **Non-polar CH with polarity similar to C2**
- **Retains polar analytes from aqueous matrices**
- **Good choice when common non-polar sorbents do not provide the required selectivity**

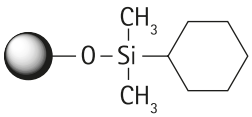
Bond Elut CH is a mid-polarity sorbent that exhibits unique selectivities for certain analytes. When employed as a non-polar sorbent, CH has the approximate polarity of a C2 sorbent. Bond Elut CH is often a good choice when non-polar sorbents such as C18, C8 or C2 do not provide the desired selectivity.

Sorbent Specifications

Characteristics	
Primary retention mechanism	Moderately weak non-polar
Bonded functional group, base material	Cyclohexyl
Endcapped	Yes
Format	Packed bed
Typical carbon loading (%)	9.6
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

Typical Applications

Water and aqueous samples



See also

- Bond Elut C2, low carbon load non-polar sorbent, page 27
- Bond Elut C8, selective for strongly retained analytes, page 28

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass	Volume (mL)	Part No.
100 mg	10	12113006
500 mg	10	12113032

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Quantity (box)	Part No.
50 mg	1	100	12102063
100 mg	1	100	12102006
500 mg	3	50	12102033
1 g	6	30	12256005
2 g	12	20	12256039

Bond Elut CN-E: Unique Selectivity for Extremely Non-polar Compounds

- **Ideal for extracting aqueous analytes**
- **Retention in aqueous and organic matrices**
- **Useful for many applications**

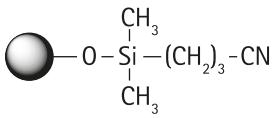
A medium polarity sorbent with many uses, Bond Elut CN-E is ideal for applications in which extremely non-polar compounds would be irreversibly retained on high carbon load sorbents such as C8 and C18. This endcapped version of the cyano sorbent is best utilized when extracting analytes from an aqueous matrix.

Sorbent Specifications

Characteristics	
Primary retention mechanism	Moderately non-polar (aqueous matrix) or polar (non-polar organic matrix)
Bonded functional group, base material	Cyanopropyl
Endcapped	Yes
Format	Packed bed
Typical carbon loading (%)	8.1
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

Typical Applications

Aqueous (non-polar) and organic (polar)



See also

- Bond Elut C8, selective for strongly retained analytes, page 28
- Bond Elut C18, universal, non-polar SPE sorbent, page 29

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass	Volume (mL)	Part No.
100 mg	10	12113007
500 mg	10	12113033

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Quantity (box)	Part No.
50 mg	1	100	12102064
100 mg	1	100	12102007
500 mg	3	50	12102034
5 g	20	20	12256025

Bond Elut™ Cartridge SPE

Bond Elut Certify™: Very Useful for Extracting Basic Drugs

- **Special mixed-mode sorbent bed**
- **Broad application range for aqueous extraction**
- **Bimodal, non-polar and strong cation exchange**

The Bond Elut Certify extraction cartridge utilizes a packed bed consisting of a special, non-polar C8 sorbent and a strong cation exchanger (SCX). Certify is most commonly used to extract basic (cationic) drugs from urine and blood, but it is also very effective for extraction of a wide range of compounds from a diverse range of aqueous matrices.

Sorbent Specifications

Characteristics	
Primary retention mechanism	Bimodal non-polar and strong cation exchange
Bonded functional group, base material	Octyl (C8) and benzenesulfonic acid (SCX)
Endcapped	No
Format	Packed bed
Typical carbon loading (%)	9.0
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

See also

- Bond Elut Certify II, efficient extraction of acidic drugs, page 35
- Bond Elut C8, suitable for strongly-retained analytes, page 28
- Bond Elut SCX, strong cation exchanger, page 49

Ordering Information

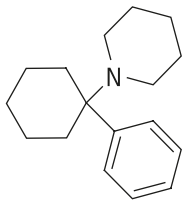
Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Particle Size (µm)	Quantity (box)	Part No.
50 mg	3	40	50	12105030
100 mg	3	40	50	12102051
	3	120	50	14102051
	6	40	30	12256146
200 mg	3	40	50	12102145
	6	40	30	12256145
300 mg	3	40	50	12102081
	6	40	30	12102082
500 mg	6	40	30	12102093
	6	120	30	14102093
1 g	6	40	30	12102085
	6	120	30	14102085

Typical Applications

Drugs in urine or blood, biological fluids

Extraction of phencyclidine (PCP) from human urine



Phencyclidine

Sorbent Conditioning:
100% MeOH then 0.1M phosphate buffer, pH 6.0.

Sample Treatment:
To 5 mL urine, add 2 mL 0.1M phosphate buffer, pH 6.0, and matrix spike standard. Vortex, check that pH lies between 5.0 and 7.0. Pass through sorbent at <4 mL/min flow rate.

Interference Wash:
1. 1 mL 1.0M AcOH then dry sorbent under vacuum for 5 min
2. 6 mL MeOH, dry sorbent for 2 min

Analyte Elution:
2 mL 2% NH_4OH in EtOAc.

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Particle Size (µm)	Part No.
130	10	40	12113050
	10	120	14113050
200	10	40	12113054
	10	120	14113054
300	10	40	12113052
	10	120	14113052

Prospekt cartridges

Description	Part. No
Prospekt Cartridges, 800 Series, 96/pk	12281101

VersaPlate™ formats

Description	Particle Size (µm)	25 mg	50 mg	100 mg
Preassembled 96-well Plate	40		75409050	7540901C
VersaPlate Tubes 96pk*	40	75509025	75509050	7550901C

* Tubes need to be inserted into a VersaPlate base plate Part No. 75400000

For more information, please visit www.varianinc.com/bondelut.html or visit www.varianinc.com/products.html to place an order.

Bond Elut™ Cartridge SPE

Bond Elut Certify™ II: Rapid Extraction of Acidic Drugs

- **Optimized for non-polar and anionic compounds**
- **Specially designed mixed-mode sorbent bed**
- **Bimodal, non-polar and strong anion exchange**

Bond Elut Certify II was developed specifically for the rapid and effective extraction of acidic drugs and metabolites from urine and other biological matrices. Certify II is a mixed-mode cartridge packed with non-polar C8 and strong anion exchange (SAX) sorbent. It has been optimized for acidic drugs such as 11-nor-delta-9-tetrahydrocannibinol-carboxylic acid, salicylic acid, ibuprofen, acetaminophen and other compounds that possess both non-polar and anionic characteristics.

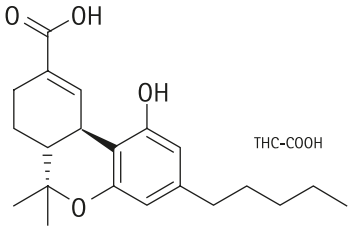
Sorbent Specifications

Characteristics	
Primary retention mechanism	Bimodal non-polar and strong cation exchange
Bonded functional group, base material	Octyl (C8) and quaternary amine (SCX)
Endcapped	No
Format	Packed bed
Typical carbon loading (%)	8.6
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

Typical Applications

Drugs in urine or blood, biological fluids

Extraction of THC-COOH from human urine



Sorbent Conditioning:
100% Methanol then 0.1M acetate buffer, pH 7.0.

Sample Treatment:
To 6 mL urine, add 300 µL 10M potassium hydroxide and matrix spike standard. Vortex, hydrolyze at 60 °C for 15 min, cool. Add 165 µL glacial acetic acid and 2 mL 95% 0.1M acetate buffer/5% MeOH, pH 7.0. Adjust sample pH to between 4.5 and 6.5 with glacial acetic acid. Pass through sorbent at < 4 mL/min flow rate.

Interference Wash:
1. 10 mL 50:50 H_2O/MeOH, then dry sorbent under vacuum for 10 min
2. 2 mL EtOAc, dry sorbent for 0.5 min

Analyte Elution:
2 mL 1% acetic acid in 25% ethyl acetate/75% hexane.

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Particle Size (µm)	Part No.
100	10	40	12113036
200	10	40	12113051
	10	120	14113051

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Particle Size (µm)	Quantity (box)	Part No.
50 mg	3	40	50	12105031
200 mg	3	40	50	12102080
	3	120	50	14102080
500 mg	6	40	30	12102084
	6	120	30	14102084
1 g	6	40	30	12102088
	6	120	30	14102088

Prospekt cartridges

Description	Part. No
Prospekt Cartridges, 800 Series, 96/pk	12281102

See also

- Bond Elut Certify, efficient extraction of basic drugs, page 34
- Bond Elut C8, suitable for strongly-retained analytes, page 28
- Bond Elut SAX, strong anion exchanger, page 48

Bond Elut™ Cartridge SPE

Bond Elut DEA: Medium Polarity Sorbent

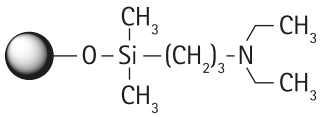
- **More polar than C8 but less polar than C2 or CN**
- **Lower ionic capacity than NH2**
- **Alkyl side chains confer moderately non-polar chracteristics**

Bond Elut DEA bears some resemblance to Bond Elut NH2 in its properties but with a slightly lower capacity as an anion exchange sorbent. DEA has a moderately non-polar character due to the alkyl side chains on the amino functionality. These groups still afford a medium level of polarity, higher than C8 but less polar than C2 or CN-E.

Bond Elut DEA is an excellent phase for the extraction of bisphosphonates from human serum and urine. Bisphosphonates are extremely hydrophilic and structurally similar to many endogenous phosphorylated compounds, making their selective extraction from serum or urine very challenging. The unique chemistry of Bond Elut DEA offers excellent selectivity of this class of compounds.

Typical Applications

Water, biological fluids, non-polar extracts



Sorbent Specifications

Characteristics	
Primary retention mechanism	Weak cation exchange (aqueous matrix) or polar (non-polar organic matrix)
Bonded functional group, base material	Diethylaminopropyl
Endcapped	No
Format	Packed bed
Typical carbon loading (%)	8.5
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Particle Size (µm)	Part No.
100	10	40	12113016
	10	120	14113016
500	10	40	12113042
	10	120	14113042

Bond Elut straight barrel cartridges

Sorbent Mass (mg)	Volume (mL)	Particle Size (µm)	Quantity (box)	Part No.
50	1	40	100	12102078
	1	120	100	14102078
100	1	40	100	12102016
	1	120	100	14102016
500	3	40	50	12102043
	3	120	50	14102043

See also

- Bond Elut C2, low carbon load non-polar sorbent, page 27
- Bond Elut CN-E, unique selectivity for very non-polar compounds, page 33

Bond Elut™ Cartridge SPE

Bond Elut Diol (2OH): Polar Extractions from Non-polar Solvents

- **Provides polar and non-polar modes**
- **Strong hydrogen bonding with analytes**
- **Resembles un-bonded silica in its capabilities**

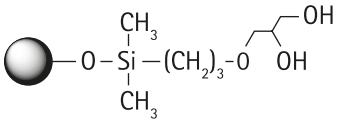
Bond Elut Diol resembles un-bonded silica in its tendency for strong hydrogen bonding with analytes. 2OH can also be employed in the non-polar mode because the hydrocarbon spacer on its functional group provides enough non-polar character for retention of hydrophobic analytes. Bond Elut Diol is a listed SPE device for the DIN 14333-1 method on benzimidazole fungicides.

Sorbent Specifications

Characteristics	
Primary retention mechanism	Polar
Bonded functional group, base material	Diol
Endcapped	No
Format	Packed bed
Typical carbon loading (%)	6.8
Surface area (m^2/g)	500
Particle size (µm), shape	40, irregular
Mean pore size (Å)	60

Typical Applications

Non-polar organic extracts, oils and lipids



See also

- Bond Elut SI, highly polar-free silanol sorbent, page 50

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass	Volume (mL)	Part No.
100 mg	10	12113009
500 mg	10	12113035

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Quantity (box)	Part No.
50 mg	1	100	12102067
100 mg	1	100	12102009
500 mg	3	50	12102036
1 g	6	30	12256007

Bond Elut ENV: Optimized for Large Volume Environmental Samples

- **Excellent extraction of polar biomolecules**
- **High flow through**
- **Efficient elution characteristics**

Bond Elut ENV, a PS/DVB polymer, is designed for the extraction of polar organic residues. It contains 125 µm spherical particles with a high degree of cross linking, advantageous for high volume, fast flow-through applications.

Typical Applications

Herbicides, explosive residues

Extraction of explosive residues from water

200 mg/3 mL Bond Elut ENV cartridge

Sorbent Conditioning: 2 x 3 mL ACN then 6 mL DI H_2O

Sample Treatment:
Adjust 500 mL sample to pH 2 using concentrated HCl.

Apply Sample:
500 mL of water sample at a flow rate between 10 and 15 mL/min.

Interference Wash: 5 mL DI H_2O, then dry the cartridge for 3 min.

Analyte Elution:
1. 2.5 mL ACN (2 mL of which re-eluted x 4 after 1st elution)
2. 1.5 mL fresh ACN

Compound	Recoveries (%)
1,3,5-Trinitrobenzene	99.8
Nitrobenzene	92.1
2,4-Dinitrotoluene	97.7
2,6-Dinitrotoluene	86.8
2-Amino-4,6-dinitrotoluene	93.2
4-Amino-2,6-dinitrotoluene	93.3
4-Nitrotoluene	85.3

See also

- Bond Elut LMS, polymeric sorbent with strong retention, page 38
- Bond Elut PPL, polymer with enhanced selectivities, page 45

Ordering Information

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Quantity (box)	Part No.
50 mg	1	100	12105012
100 mg	1	100	12105013
	3	50	12105014
200 mg	3	50	12105015
	6	30	12255014
500 mg	3	50	12105016
	6	30	12255011
1 g	6	30	12255012

Bond Elut™ Cartridge SPE

EnvirElut™: Pesticide, Herbicide and PAH Extraction

- **Extreme purity offers cleanliness in extract**
- **High capacity allows for the processing of large sample volumes**
- **Broad compound specificity**

EnvirElut sorbents are specially designed for the extraction of a wide range of compounds from aqueous matrices. EnvirElut Herbicides, PAH and Pesticides are available in standard SPE straight barrel cartridges, which can be used on conventional Vac Elut™ vacuum manifolds*.

Typical Applications

Pesticide and Industrial chemical residues in water and soil

Ordering Information

Bond Elut straight barrel cartridges

Sorbent Mass (mg)	Volume (mL)	Quantity (box)	Part No.
50	3	50	12272006
100	6	30	12272005
500	6	30	12272004

* They are not compatible with the EnvirElut 1664 manifold system

Bond Elut LMS: Elution With no Need for Modifiers, Buffers or Acids

- **Ultra clean styrene-divinylbenzene polymer**
- **Optimized 75 µm particle size for reproducible flow**
- **High capacity and surface area for efficient extraction**

Bond Elut LMS polymeric sorbent lets you elute without having to add amine modifiers, buffers, or acids. The elimination of secondary interactions means that elution of analytes can be achieved with pure organic solvents or HPLC mobile phase-compatible solvent mixtures of low ionic strength. These characteristics are crucial to allow compatibility with LC/MS or other delicate analytical techniques.

Typical Applications

Extraction of polar analytes from urine, plasma and serum

See also

- Bond Elut ENV, large particle polymer for large sample volumes, page 37
- Bond Elut PPL, polymer with enhanced selectivities, page 45
- Bond Elut Plexa™, advanced polymeric sorbent for bioanalysis, page 12

Ordering Information

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Quantity (box)	Part No.
25 mg	1	100	12105021
100 mg	1	100	12105023
	3	50	12105024
200 mg	3	50	12105025
500 mg	3	50	12105026
	6	30	12255021
1 g	6	30	12255022

Bond Elut™ Cartridge SPE

Bond Elut Mycotoxin: Simplified SPE for Mycotoxin Determination in Food for LC/MS Determination

- **Simple methodology saves time and increases throughput**
- **Use with a broad range of food matrices**
- **Economic and time-saving alternative to immunoaffinity techniques**

Bond Elut Mycotoxin is a novel sorbent which cleans up food extracts for improved trichothecene and zearalenone analysis. Results are comparable or superior to competing methods, including immunoaffinity columns (IAC) and charcoal/alumina columns. The sorbent is a proprietary silica-based ion exchange material available in the Bond Elut Jr format.

The Bond Elut Mycotoxin method for extraction and clean-up has been successful on a variety of food and grain sample types, including wheat, corn, durum, oats, bread, muesli and infant food.

Bond Elut Mycotoxin is easy to use, and acts in a selective non-retention mechanism – the toxin analytes pass through the cartridge while the food matrix components are retained.

References

Klötzel, M, Lauber, U & Humpf, H-U (2006) A new solid phase extraction clean-up method for the determination of 12 type A and B trichothecenes in cereals and cereal-based food by LC-MS/MS. Mol. Nutr. Food Res., 50, 261–269.

Bretz, M, Beyer, M, Cramer, B & Humpf, H-U (2006) Stable isotope dilution analysis of the fusarium mycotoxins deoxynivalenol and 3-acetyldeoxynivalenol. Mol. Nutr. Food Res., 50, 251-260.

Varian Application SI-00295: New SPE sorbent for clean-up of fusarium toxin contaminated cereals and cereal-based foods using BE Mycotoxin.

Varian Application SI-01075: Improved isolation and analysis of mycotoxins from cereals, beer and wine- using BE Mycotoxin and Polaris C18-A.

Typical Applications

Mycotoxins in grain

General mycotoxin methods

For Solids

1. Finely grind 25 g sample and extract with a solution of 100 mL acetonitrile/water (80:20) by blending at high speed for 3 min. For simultaneous determination of zearalenone, spike extract at a level of 50 ng/g sample with zearalanone (ZAN) solution in acetonitrile internal standard. Filter.
2. Pass 4 mL of the filtrate through a Bond Elut Mycotoxin column.
3. Evaporate 2 mL of eluate to dryness at 50 °C under a gentle stream of nitrogen.
4. Reconstitute in 0.5 mL ACN/H_2O (1:4; v/v). Inject 10 µL into LC for analysis.

For Beverages

1. Sonicate the beverage sample for 30 min. Filter.
2. Pass 4 mL of the filtrated sample extract through a Bond Elut Mycotoxin column.
3. Evaporate 2 mL of the eluate to dryness at 50 °C under a gentle stream of nitrogen.
4. Reconstitute in 0.5 mL ACN/H_2O (20/80; v/v).
5. Inject into LC/MS/MS.

Wheat beer

	% Recovery	% RSD	% Recovery	% RSD
Mycotoxin	**35 ng/g**		**350 ng/g**	
DON	92.0	2.6	95.5	1.5
ZEA	116.0	6.1	101.9	1.3
T-2	61.3	12.6	60.1	1.1
HT-2	81.8	5.6	76.1	1.4

Sake wine

	% Recovery	% RSD	% Recovery	% RSD
Mycotoxin	**35 ng/g**		**350 ng/g**	
DON	94.3	7.4	96.8	0.5
ZEA	99.3	1.3	99.8	0.8
T-2	101.3	1.3	66.0	0.9
HT-2	113.9	8.3	111.0	1.0

This application shows the optimized extraction and clean up of type A- and B-trichothecenes [deoxynivalenol [DON], HT-2 toxin [HT-2], T-2 toxin [T-2] and zearalenone (ZEA).

Ordering Information

Bond Elut Jr (100/box)

Sorbent Mass (mg)	Part No.
500	12165001B

Bond Elut straight barrel cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Part No.
500	3	12102167

See also

- Bond Elut Plexa™, advanced polymeric sorbent for bioanalysis, page 12

Bond Elut™ Cartridge SPE

Bond Elut NEXUS and Bond Elut NEXUS WCX: Pre-conditioned Free Polymeric SPE

- **Large particle size allows excellent flow for viscous samples**
- **Non-conditioning method saves time and improves throughput**
- **WCX offers enhanced selectivity for certain analytes such as quaternary amine drugs**

Bond Elut NEXUS is an ultra-clean polymeric sorbent which has bi-modal porosity and a high surface area. NEXUS offers a non-polar retention mechanism with no pre-conditioning required. The large particle size makes NEXUS ideal for extractions from highly viscous samples such as horse urine.

Based on the same base polymer technology, Bond Elut NEXUS WCX is a weak cation exchange sorbent that offers extra selectivity for analytes such as quaternary ammonium drugs and anabolic steroids.

Sorbent Specifications

Characteristics	
Primary retention mechanism	Mixed mode
Bonded functional group, base material	Mixed mode copolymer
Format	Packed bed
Surface area (m^2/g)	575
Particle size (µm), shape	70, spherical
Mean pore size (Å)	100/450 bimodal

References

Wynne, P.M., Barry, D.C., Vine, J.H. & Simpson, N.K J. (2004) Approaches to the solid phase extraction of equine urine. Chromatographia, 59, S51-S60.

Wynne, P.M., Batty, D.C., Vine, J.H. & Simpson, N.K.J. (2000) An improved method for the extraction of anabolic steroids from equine urine. In: R.B. Williams, E.Houghton & J. Wade (eds) Proc. 13th Int. Conf. Racing Analysts and Veterinarians. R & W Publications, Newmarket, UK.

See also

- Bond Elut Plexa™, advanced polymeric sorbent for bioanalysis, page 12
- Bond Elut Plexa PCX, mixed mode polymeric cation exchanger, page 13
- Focus™, amide-based sorbent for polar compound extraction, page 51

Typical Applications

Horse urine, anabolic steroids, trace endocrine disrupters in water

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Part No.
30	10	12113100
60	10	12113101

Bond Elut straight barrel cartridges

Sorbent Mass (mg)	Volume (mL)	Quantity (box)	Part No.
30	1	100	12103100
60	3	100	12103101
60	3	100	12102157 (NEXUS WCX)
200	6	30	12103102
	12	20	12253101
500	12	20	12253102
	20	20	12253103

Prospekt cartridges

Description	Part. No
Prospekt Cartridges, 800 Series, 96/pk	12281302

Bond Elut™ Cartridge SPE

Bond Elut PBA: Covalent Retention Affords Complete Clean up

- **Unique sorbent**
- **High specificity for cis-diol compounds**
- **Very effective in separating DNA and RNA**

PBA is a unique sorbent consisting of a phenylboronic acid covalently linked to a silica gel surface. Covalent processes result in a higher retention to the sorbent surface than other mechanisms, resulting in superior clean-up. The boronate group has a high specificity for cis-diol containing compounds such as catechols, nucleic acids, low molecular weight proteins and carbohydrates.

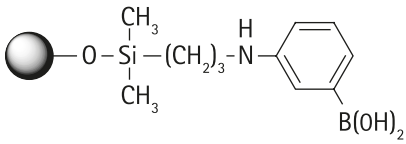
Bond Elut PBA can also be used to retain oligomeric materials such as polyethylene glycols (PEGs) from a variety of aqueous or biological matrices.

Sorbent Specifications

Characteristics	
Primary retention mechanism	Covalent
Bonded functional group, base material	Phenylboronic acid
Endcapped	No
Format	Packed bed
Typical carbon loading (%)	7.9
Surface area (m^2/g)	500
Particle size (µm), shape	40, irregular
Mean pore size (Å)	60

Typical Applications

Aqueous and biological fluids



GENERIC METHOD

Condition:

1. 70:30 H_2O:ACN with 1% TFA
2. 50mM phosphate buffer (pH 10)

Sample Addition:
Sample should be buffered to pH 8.5 with 50mM phosphate buffer

Interference Wash:
10mM phosphate buffer (pH 8.5) with 5% ACN

Analyte Elution:
70:30 H_2O:ACN with 1% TFA

Compound Class	Examples
Polyhydroxy	Mannitol, fructose-6-phosphate, CDP-ethanol-amine, glycoproteins
Aromatic O-dihydroxy	Catechols, tannins, epinephrine
α-Hydroxy acids	Lactate, 6-phospho-gluconate
Aromatic O-hydroxy acids and amines	Salicylate, salicylamide
1,3-Dihydroxy	Tris, pyridoxine
Diketo & triketo	Dehydroascorbic acid, benzil, alloxan
Other dihydroxys	Steroids, prostaglandins

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Part No.
100	10	12113018

Bond Elut straight barrel cartridges

Sorbent Mass (mg)	Volume (mL)	Quantity (box)	Part No.
100	1	20	12102018
	1	100	12102019
500	3	50	12102105

See Also

- Bond Elut Plexa™, advanced polymeric sorbent for bioanalysis, page 12
- Bond Elut Plexa PCX, mixed mode polymeric cation exchange, page 13

Bond Elut™ Cartridge SPE

Bond Elut NH2: Retention of Very Strong Anions

- **Weaker anion exchange than SAX**
- **Very good for separating structural isomers**
- **Uses hydrogen bonding and anion exchange**

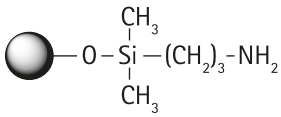
Bond Elut NH2 is a weaker anion exchanger than sorbents such as SAX (a quaternary amine sorbent that is always charged) and is therefore a better choice for retention of very strong anions, such as sulfonic acids, which may retain irreversibly on a SAX sorbent. Similar to Diol and SI sorbents, Bond Elut NH2 is excellent for the separation of structural isomers.

Sorbent Specifications

Characteristics	
Primary retention mechanism	Weak anion exchange (aqueous matrix) or polar (non-polar organic matrix)
Bonded functional group, base material	Aminopropyl
Endcapped	No
Format	Packed bed
Typical carbon loading (%)	6.7
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

Typical Applications

Structural isomers



The isolation of lipids from serum and tissue

EXTRACTION METHOD

Matrix:
Chloroform extract of serum or adipose tissue

Sorbent Conditioning:
Hexane

Apply Sample:
Through Bond Elut NH2 cartridge

ELUTION 1:
(Neutral lipids):
(All except fatty acids and phospholipids) - 2:1 chloroform: 2 propanol

(Fatty acids):
2% acetic acid in diethyl ether

(Phospholipids):
Methanol

(The neutral lipid fraction is then dried down, reconstituted in hexane, and passed through a second NH2 tube conditioned with hexane)

ELUTION 2:
(Cholesteryl esters):
Hexane

(Another Bond Elut NH2 sorbent column is attached below the existing one to trap cholesterol that breaks through the first during triglyceride elution)

ELUTION 3:
(Triglycerides):
Hexane containing 1% diethyl ether and 10% methylene chloride

(The Bond Elut NH2 tubes are separated, cholesterol is eluted from both, and finally the di- and monoglycerides are eluted from the upper NH2 tube)

ELUTION 4:
(Cholesterol):
5% ethyl acetate in hexane

(Diglycerides):
15% ethyl acetate in hexane

(Monoglycerides):
2:1 chloroform:methanol

Courtesy: The handbook of sorbent technology. Available as a downloadable pdf from www.varianinc.com

See Also

- Bond Elut DEA, excellent extraction of phosphorylated compounds, page 36
- SPEC™ NH2, amino functionalized SPE monolith, page 21

Bond Elut™ Cartridge SPE

Ordering Information

Bond Elut Jr (100/box)

Sorbent Mass	Part No.
500 mg	12162041B
1 g	12166012B

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Particle Size (µm)	Part No.
100	10	40	12113014
	10	120	14113014
200	10	40	12113067
500	10	40	12113040
	10	120	14113040

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Particle Size (µm)	Quantity (box)	Part No.
50 mg	1	40	100	12102076
	1	120	100	14102076
100 mg	1	40	100	12102014
200 mg	3	40	50	12102089
	6	40	30	12102106
300 mg	3	40	50	12102108
500 mg	3	40	50	12102041
	3	120	50	14102041
	6	40	30	12256045
1 g	3	40	50	12102107
	6	40	30	12256012
	6	120	30	14256012
2 g	12	120	20	14256020
5 g	20	120	20	14256028

Prospekt cartridges

Description	Part. No
Prospekt Cartridges, 800 Series, 96/pk	12281019

VersaPlate™ formats

Description	Particle Size (µm)	50 mg	100 mg
Preassembled 96-well Plate	40	75405050	7540501C
VersaPlate Tubes 96pk*	40	75505050	7550501C

* Tubes need to be inserted into a VersaPlate base plate Part No. 75400000

Bond Elut PCB: Designed for PCB Extraction

- **Optimized bed mass affording excellent extraction reproducibility**
- **Special dual-phase enhances PCB selectivity**
- **All extractions can be completed with one solvent to simplify procedures**

Bond Elut PCB is a specially designed sorbent which allows for the facile extraction of polychlorinated biphenyl (PCB) compounds from a variety of matrices. Desired analytes can be loaded and eluted using a simple, single solvent method prior to analysis by GC/ECD.

Typical Applications

PCB

See also

- Bond Elut SI, highly polar free silanol sorbent, page 50
- Bond Elut C18, universal, non-polar SPE sorbent, page 29
- SPEC™ C18, outstanding flow characteristics, page 21

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass (g)	Volume (mL)	Part No.
1	3	12105032

Bond Elut™ Cartridge SPE

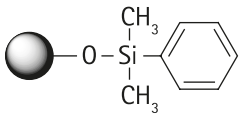
Bond Elut PH: Pi-pi Selective Non-polar Extractions

- **Added selectivity compared to other non-polar sorbents**
- **Enhanced retention of planar, conjugated organic molecules**
- **Similar polarity to C8**

Bond Elut PH is a non-polar bonded silica material which exhibits a different selectivity to alkyl or aliphatic functionalized phases such as C8 or cyclohexyl. The electron density present in the aromatic ring affords an enhancement in the retention of conjugated or aromatic ring-containing analytes due to desirable pi-pi interactions.

Typical Applications

Water, biological fluids



Sorbent Specifications

Characteristics	
Primary retention mechanism	Non-polar, pi-pi
Bonded functional group, base material	Phenyl
Endcapped	Yes
Format	Packed bed
Typical carbon loading (%)	10.7
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Particle Size (µm)	Part No.
100	10	40	12113005
	10	120	14113005
500	10	40	12113031
	10	120	14113031

Sorbent Mass	Volume (mL)	Particle Size (µm)	Quantity (box)	Part No.
50 mg	1	40	100	12102062
	1	120	100	14102062
100 mg	1	40	100	12102005
	1	120	100	14102005
500 mg	3	40	50	12102032
	3	120	50	14102032
1 g	6	40	30	12256004
	6	120	30	14256004

See also

- Bond Elut LMS, polymeric sorbent with strong retention, page 38
- Bond Elut PPL, polymer with enhanced selectivities, page 45
- Bond Elut ENV, large particle polymer for large sample volumes, page 37

For more information, please visit www.varianinc.com/bondelut.html or visit www.varianinc.com/products.html to place an order.

Bond Elut™ Cartridge SPE

Bond Elut PPL: Retains Even the Most Polar Analytes

- **Modified styrene-divinylbenzene polymer**
- **Large particle size allows fast extraction speeds**
- **High surface area and capacity for polar analytes**

Bond Elut PPL is a styrene-divinylvenzene (SDVB) polymer that has been modified with a proprietary non-polar surface. PPL will retain even the most polar classes of analytes, including phenols. The large particle size allows ease of flow for viscous or particulate rich water samples, while the high surface area and strong hydrophobicity ensure reproducible extractions with high recoveries upon elution.

Bond Elut PPL is suitable for EPA Method 528 'Determination of Phenols in Drinking Water by SPE and Capillary GC/MS'.

Typical Applications

Extraction of phenols from waste water

Determination of organophosphates in lake water

Vacuum Manifold:
Vac Elut™ 20

Vacuum:
800 mbar

Cartridge:
Bond Elut PPL, 100 mg sorbent in 1 mL cartridge

Condition cartridge with 1 mL methanol, 1 mL methanol/acetonitrile (1/1)

Method:
1. Apply 1.5-2.5 L water sample
2. Dry the cartridge using nitrogen
3. Elution with 3 x 333 µL methanol/acetonitrile (1/1)

Recoveries and LODs of organophosphates; extracted from the water sample with SPE

Analyte	Recovery (%)	LOD (ng/L)
Tris (1-chloro-2-propyl)-phosphate (TCPP)	91	1
Tris (2-chloroethyl)-phosphate (TCEP)	95	2
Tris (1,3-dichloro-2-propyl)-phosphate (TDCP)	99	1
Tri-n-butylphosphate (TnBP)	89	1
Tri-isobutylphosphate (TiBP)	85	2
Tris(2-butoxyethyl)-phosphate (TBEP)	93	3

Courtesy: Application Note SI-02094 Determination of Organophosphates in Lake Water

Ordering Information

Bond Elut straight barrel cartridges (125 µm)

Sorbent Mass	Volume (mL)	Quantity (box)	Part No.
50 mg	1	100	12105002
100 mg	1	100	12105003
	3	50	12105004
200 mg	3	50	12105005
500 mg	3	50	12105006
	6	30	12255001
1 g	3	50	12102148
	6	30	12255002

See Also

- Bond Elut LMS, polymeric sorbent with strong retention, page 38
- Bond Elut ENV, large particle polymer for large sample volumes, page 37

Bond Elut™ Cartridge SPE

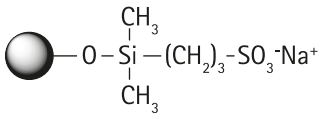
Bond Elut PRS: Weak Cation Exchange

- **Capable of polar and hydrogen bonding interactions**
- **No appreciable non-polar interactions**
- **Unique selectivity properties**

Bond Elut PRS is a strong cation exchange sorbent that is also relatively high in polarity. With no appreciable degree of hydrophobicity, in non-polar solvents, PRS is capable of polar and hydrogen bonding interactions. Due to the very low pK_a of PRS, a high ionic strength eluent must be used, and so the use of PRS is recommended for weaker cationic species such as pyridinium compounds.

Typical Applications

Pyridinium in water and biological samples



Sorbent Specifications

Characteristics	
Primary retention mechanism	Strong cation exchange
Bonded functional group, base material	Propylsulfonic acid
Endcapped	No
Format	Packed bed
Typical carbon loading (%)	1.7
Surface area (m^2/g)	500
Particle size (µm), shape	40, irregular
Mean pore size (Å)	60

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Part No.
100	10	12113012
500	10	12113038

Bond Elut straight barrel cartridges (40 µm)

Sorbent Mass	Volume (mL)	Quantity (box)	Part No.
50 mg	1	100	12102074
100 mg	1	100	12102012
200 mg	3	50	12102094
500 mg	3	50	12102039
1 g	6	30	12256010

See also

- Bond Elut Plexa™ PCX, mixed mode polymeric cation exchanger, page 13
- Bond Elut SCX, strong cation exchanger, page 49
- SPEC™ MP1, mixed mode SPE monolith, page 21

For more information, please visit www.varianinc.com/bondelut.html or visit www.varianinc.com/products.html to place an order.

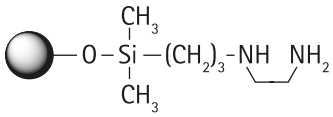
Bond Elut PSA: Amino Functionalized Chelating Sorbent

- **Very effective bidentate ligand**
- **Alternative choice for polar compounds to Bond Elut NH2**
- **Higher ionic capacity than NH2**

Bond Elut PSA is an alkylated amine sorbent that contains two different amino functionalities, one secondary and one primary. This gives a slightly higher pK_a and ionic capacity compared to Bond Elut NH2. The PSA functional group is a very effective bidentate ligand and is therefore an excellent sorbent for chelation applications. PSA has a significantly higher carbon load than most amino functional sorbents and thus is a better choice for polar compounds, which retain too strongly on Bond Elut NH2.

Typical Applications

Chelation compounds in water and biological samples or organic extracts



Sorbent Specifications

Characteristics	
Primary retention mechanism	Weak anion exchange (aqueous matrix), polar (non-polar organic matrix), or chelation
Bonded functional group, base material	Ethylenediamine-N-propyl
Endcapped	No
Format	Packed bed
Typical carbon loading (%)	7.5
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

Ordering Information

Bond Elut Jr (100/box)

Sorbent Mass	Part No.
500 mg	12162042B
1 g	12166050B

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Part No.
100	10	12113015
500	10	12113041

Bond Elut straight barrel cartridges

Sorbent Mass	Particle Size µm)	Volume (mL)	Quantity (box)	Part No.
50 mg	40	1	100	12102077
100 mg	40	1	100	12102015
500 mg	120	3	50	12102042
1 g	40	6	30	12256140
2 g	40	12	20	12256055

See also

- Bond Elut NH2, amino bonded silica, page 42
- Bond Elut DEA, excellent extraction of phosphorylated compounds, page 36
- SPEC™ NH2, amino functionalized SPE monolith, page 21

Bond Elut™ Cartridge SPE

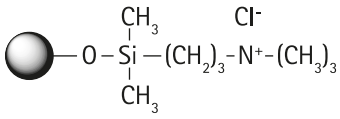
Bond Elut SAX: Strong Anion Exchanger

- **Retains compounds that elute from weak anion exchange sorbents**
- **Selectivity can be user-modified for increased flexibility**
- **Minimal non-polar interactions**

Bond Elut SAX is a strong anion exchange sorbent ideally suited for the extraction of compounds such as carboxylic acids, which may not retain effectively on weak anion exchange sorbents. The sorbent is supplied in the chloride counter ion form. You can modify the selectivity of the phase by replacing the chloride ion with other anions, such as acetate and hydroxide.

Typical Applications

Aqueous and biological samples



Sorbent Specifications

Characteristics	
Primary retention mechanism	Strong anion exchange
Bonded functional group, base material	Trimethylaminopropyl
Endcapped	No
Format	Packed bed
Typical carbon loading (%)	7.5
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

See also

- SPEC™ SAX, anion exchange SPE monolith, page 21

Ordering Information

Bond Elut Jr (100/box)

Sorbent Mass	Part No.
500 mg	12162044B
1 g	12166013B

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Particle Size (µm)	Part No.
100	10	40	12113017
	10	120	14113017
500	10	40	12113043
	10	120	14113043

Ordering Information

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Particle Size (µm)	Quantity (box)	Part No.
50 mg	1	40	100	12102079
	1	120	100	14102079
100 mg	1	40	100	12102017
	1	120	100	14102017
	3	40	50	12102125
500 mg	3	40	50	12102044
	3	120	50	14102044
	6	40	30	12102144
1 g	3	40	50	12102087
	6	40	30	12256013
	6	120	30	14256013
2 g	6	40	30	12256051
	12	40	20	12256021
	12	120	20	14256021
5 g	20	40	20	12256029
	20	120	20	14256029
10 g	60	40	16	12256037
	60	120	16	14256037

Prospekt cartridges

Description	Part No.
Prospekt Cartridges, 800 Series, 96/pk	12281022

VersaPlate™ formats (50 mg)

Description	Particle Size (µm)	Part No.
Preassembled 96-well Plate	40	75408050
VersaPlate Tubes 96pk*	40	75508050

* Tubes need to be inserted into a VersaPlate base plate Part No. 75400000

Bond Elut™ Cartridge SPE

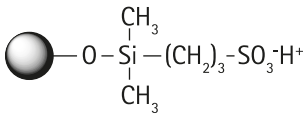
Bond Elut SCX: Strong Cation Exchanger

- **Useful for compounds with cationic and non-polar characteristics**
- **Superior clean up from a single sorbent**
- **Very low pK_a**

Bond Elut SCX is a strong cation exchanger with a very low pK_a. Although the pK_a is similar to Bond Elut PRS, the presence of the benzene ring in the functional group increases the potential for non-polar interactions. This non-polar characteristic becomes particularly important when conducting ion-exchange from aqueous systems, where selectivity towards compounds exhibiting cationic and non-polar character is seen.

Typical Applications

Aqueous and biological fluids



Sorbent Specifications

Characteristics	
Primary retention mechanism	Strong cation exchange
Bonded functional group, base material	Benzenesulfonic acid
Endcapped	No
Format	Packed bed
Typical carbon loading (%)	10.9
Surface area (m^2/g)	500
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

References

Codony, R, Compañó, R, Granados, M, García-Regueiro, JA & Dolors Prat, M (2002) Residue analysis of macrolides in poultry muscle by liquid chromatography-electrospray mass spectrometry. J. Chromatogr. A, 959, 131-141.

Horie, M, Saito, K, Ishii, R, Yoshida, T, Haramaki, Y & Nakazawa, H (1998) Simultaneous determination of five macrolide antibiotics in meat by high-performance liquid chromatography. J. Chromatogr. A, 812, 295-302.

Stubbings, G, Tarbin, J, Cooper, A, Sharman, M, Bigwood, T & Robb, P (2005) A multi-residue cation-exchange clean up procedure for basic drugs in produce of animal origin. Analyt. Chim. Acta, 547, 262-268.

See also

- SPEC™ SCX, cation exchange SPE monolith, page 21
- Bond Elut Plexa™ PCX, mixed mode polymeric cation exchanger, page 13

Ordering Information

Bond Elut Jr (100/box)

Sorbent Mass	Part No.
500 mg	12162040B
1 g	12166011B

Ordering Information

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Particle Size (µm)	Part No.
100	10	40	12113013
	10	120	14113013
500	10	40	12113039
	10	120	14113039

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Particle Size (µm)	Quantity (box)	Part No.
50 mg	1	40	100	12102075
	1	120	100	14102075
100 mg	1	40	100	12102013
	1	120	100	14102013
	3	40	50	12102098
500 mg	3	40	50	12102040
	3	120	50	14102040
1 g	6	40	30	12256011
	6	120	30	14256011
1.5 g	3	40	50	12102104
2 g	6	40	30	12256053
	12	120	20	14256019
3 g	6	40	30	12256054
5 g	20	120	20	14256027
10 g	60	120	16	14256035

VersaPlate™ formats

Description	Particle Size (µm)	Part No. 50 mg	Part No. 100 mg
Preassembled 96-well Plate	40		7540701C
Versaplate Tubes 96pk*	40	75507050	7550701C

* Tubes need to be inserted into a VersaPlate base plate Part No. 75400000

Bond Elut™ Cartridge SPE

Bond Elut SI: High Polarity Sorbent

- **Separate compounds with very similar structures**
- **Add polar modifiers to achieve good separations**
- **Contains native silica**

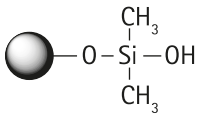
Native silica is generally regarded as the most polar SPE sorbent available. Bond Elut SI is particularly effective at separating compounds with a very similar structure. Applying the analytes in a non-polar solvent, then increasing the solvent polarity by increasing the concentration of a polar modifier, such as THF or ethyl acetate, delivers effective separations.

Sorbent Specifications

Characteristics	
Primary retention mechanism	Polar
Bonded functional group, base material	Silica
Endcapped	No
Format	Packed bed
Surface area (m^2/g)	600
Particle size (µm), shape	40 and 120, irregular
Mean pore size (Å)	60

Typical Applications

Non-polar organic solvents, oils and lipids, industrial product QC



Ordering Information

Bond Elut Jr (100/box)

Sorbent Mass	Part No.
500 mg	12162037B
1 g	12166008B

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Volume (mL)	Particle Size (µm)	Part No.
100	10	40	12113010
	10	120	14113010
500	10	40	12113036
	10	120	14113036

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Particle Size (µm)	Quantity (box)	Part No.
50 mg	1	40	100	12102068
	1	120	100	14102068
100 mg	1	40	100	12102010
	1	120	100	14102010
500 mg	3	40	50	12102037
	3	120	50	14102037
1 g	6	40	30	12256008
	6	120	30	14256008
1.5 g	3	40	50	12102119
2 g	6	120	30	14256018
5 g	20	120	20	14256026
10 g	60	120	16	14256034

See also

- SPEC™ SCX, cation exchange SPE monolith, page 21
- Bond Elut Plexa™ PCX, mixed mode polymeric cation exchanger, page 13

For more information, please visit www.varianinc.com/bondelut.html or visit www.varianinc.com/products.html to place an order.

Focus™ Polar-enhanced SPE

Focus: Amide-based Sorbent for the Extraction of Polar Compounds

- **Simple, universal method reduces method validation times**
- **"Power Rinse" delivers cleaner extracts, improving sensitivity**
- **Hydrogen bond donor capability increases retention of basic analytes**

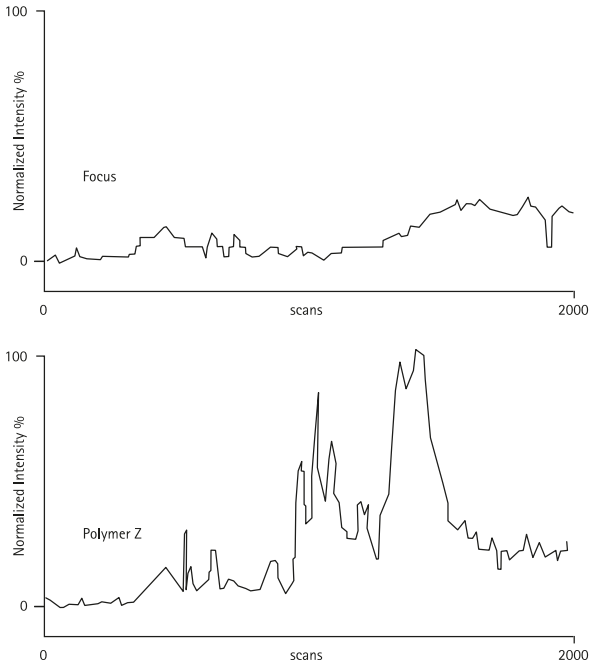
Focus features a unique amide functionalized polar-enhanced sorbent technology that delivers outstanding retention for polar and non-polar analytes. The extraction method is simple, universal, and eliminates the complex pH adjustments necessary with ion-exchange and mixed mode methods. The unique ligand chemistry on the sorbent exhibits hydrogen bond donor capability, dramatically increasing the retention of basic analytes.

The improved retention for polar analytes with Focus allows the use of a strong "Power Rinse" without causing analyte loss. Rigorous washes using 10-20% ACN and MeOH can be used to aggressively remove endogenous matrix interferences. For very polar analytes that are held by strictly polar interactions, e.g. atenolol, washes of up to 100% can be used.

Typical Applications

Drug detection in biological fluids

Elution fraction of cleaned bovine plasma samples using manufacturer's suggested methods



Standard Method	Very Polar Bases	(Log P <1)	Acids
Sample Pre-treatment	None	Add 2% NH_4OH	Add 2% formic Acid
Condition	1 mL MeOH 1 mL DI H_2O	1 mL MeOH 1 mL DI H_2O	1 mL MeOH 1 mL DI H_2O
Apply Sample	Up to 1 mL sample volume		
Rinse	1 mL DI H_2O 1 mL 10% ACN	1 mL DI H_2O 1 mL 10% ACN	1 mL DI H_2O 1 mL 10% ACN
Elute	6:3:1 MeOH/ ACN/H_2O with 0.1% TFA	6:3:1 MeOH/ ACN/H_2O with 0.1% TFA	6:3:1 MeOH/ ACN/H_2O with 0.1% TFA

Ordering Information

Focus 96-well SPE

Sorbent Mass (mg)	Part No
10	A59660

Bond Elut straight barrel cartridges (100/box)

Sorbent Mass (mg)	Volume (mL)	Part No.
10	1	A5106010
20	3	A5306021
60	3	A5306022
50	6	A5606050

Other formats (1 x 96 pk)

Description	Sorbent Mass (mg)	Part No
VersaPlate™ Tubes	10	12113100
Prospekt Cartridge 800 Series	60	12113101

See also

- Bond Elut Plexa™, advanced polymeric sorbent for bioanalysis, page 12

Bond Elut™ 96 Round-well Plates

Bond Elut Quality in a 96 Round-well Plate

- **Available with many of our most popular Bond Elut sorbents**
- **Fast revalidation of cartridge to 96-well SPE methods**
- **Low-profile, automation-friendly design**

Conversion of cartridge-based methods to an automation friendly 96-well format has never been easier or faster. The same trusted Varian silica-based sorbents in Bond Elut cartridge products are now available in the streamlined Bond Elut 96-well plates. Bond Elut 96 components are specially formulated to offer superior cleanliness, flow reproducibility, and reliability. And because we manufacture in-house, fast delivery times are standard.

Varian, Inc. also offers complementary 96-well SPE products – SPEC™, VersaPlate™, and Focus™.

SPEC 96-well plates provide the low elution volumes and superior extraction efficiency characteristic of monolithic disk-based SPE.

VersaPlate features a 96-well plate with removable tubes giving you added flexibility for method development or running partial plates.

Our broad range of polymeric sorbents Plexa™, Plexa PCX Focus, LMS and NEXUS are all available in 96-well format.

These plates offer a unique polar-enhanced SPE phase ideal for preparing biofluid samples for LC/MS analysis with minimal ion suppression and overall cleaner extracts.

Ordering Information

Polymeric sorbents

Bond Elut 96 Round-Well	Loading (mg)	Part No.
Focus	10	A59660
	30	A59663
Plexa	10	A4969010
	30	A4969030
Plexa PCX	10	A4968010
	30	A4968030
LMS	10	A4961010
NEXUS	30	A4962030

Typical Applications

Pharmacokinetics, pharmacodynamics, forensics, toxicology, foodstuffs, environmental investigation

Ordering Information

Silica sorbents (particle size 40 µm)

Bond Elut 96 Round-well	Loading (mg)	Part No.
C18	25	A4960125
	50	A4960150
	100	A496011C
C8	25	A4960325
	50	A4960350
	100	A496031C
C2	25	A4961125
	50	A4961150
	100	A496111C
CN-E	25	A4960425
	50	A4960450
	100	A496041C
CN-U	25	A4961425
	50	A4961450
	100	A496141C
NH2	25	A4960525
	50	A4960550
	100	A496051C
CBA	25	A4960625
	50	A4960650
	100	A496061C
SCX	25	A4960725
	50	A4960750
	100	A496071C
SAX	100	A496301C
Certify™	25	A4960925
	50	A4960950
	100	A496091C
PH	100	A496151C
C18-OH	100	A496291C
CH	25	A4962225
	50	A4962250
	100	A496221C

For more information, please visit www.varianinc.com/bondelut.html or visit www.varianinc.com/products.html to place an order.

Bond Elut™ 96 Square-well Plates

Bond Elut Quality in a 96 Square-well Plate

- **Enhanced quality for trouble-free high throughput**
- **Added flexibility for method development**
- **Automation friendly to free up operator time**

Bond Elut 96 Square-well Plates are specially designed to offer superior cleanliness, flow reproducibility and reliability, ensuring trouble-free, high throughput operation. Conversion of cartridge-based methods to an automation-friendly 96-well plate format has never been easier or faster. The 2 mL wells accommodate the larger processing volumes from older methods, making method transfer and revalidation quick and easy. The large 2 mL well volume gives added flexibility when developing new methods, for example, when larger wash volumes or higher sorbent capacities are required. In addition, Bond Elut 96 Square-well is designed to ensure compatibility with existing robots and vacuum manifolds.

Bond Elut 96 Square-well plate is compatible with the manifolds designed for square-well 96-well plates, including the Bond Elut Matrix Manifold. It can also be used with the Varian VersaPlate™ and manifolds with the use of collection plate shims for appropriate height adjustment.

Ordering Information

Silica sorbents (particle size 40 µm)

Bond Elut 96 Square-well	25 mg	50 mg	100 mg
C18	A3960125	A3960150	A396011C
C8	A3960325	A3960350	A396031C
NH2	A3960525	A3960550	A396051C
CBA	A3960625	A3960650	A396061C
SCX	A3960725	A3960750	A396071C
SAX	A3960825	A3960850	A396081C
Certify™	A3960925	A3960950	A396091C
PH	A3961525	A3961550	A396151C
C18-OH	A3962925	A3962950	A396291C

Polymer sorbents

Bond Elut 96 Square-well	Loading (mg)	Part No.
Plexa™	10	A3969010
	30	A3969030
Plexa PCX	10	A3968010
	30	A3968030
LMS	10	A3961010
	25	A3961025
NEXUS	60	A3962060

Manifolds and accessories

Description		Part No.
96-well Manifold	Acrylic	5133000
	Shimset	12236104
Collection Plates	2 mL, Square-well	5133009
	1 mL, Square-well	5133008
	350 µL, Square-well	5133007
Collection Plate Accessories	Cover, Square-well	WA77040004
	Sealing tape pad	12143105

Inorganic Sorbents

Bond Elut™ Alumina: High Purity, Economical Alumina Sorbents

- **High extraction efficiency**
- **Ideal for electron-rich compounds**
- **Better high pH stability than unfunctionalized silica**

Alumina, like silica, is an extremely polar sorbent. The alumina surface tends to be slightly more stable under high pH conditions than unfunctionalized silica. The small particle size of the Bond Elut Alumina range ensures high extraction efficiency even when small bed masses are used.

Bond Elut Alumina products are prepared with an electrically neutral surface. This favors the retention of electron-rich compounds such as aromatic species and aliphatic amines. It also favors the retention of species containing electronegative groups (for example, functional groups which contain oxygen, sulphur or phosphorus atoms).

Typical Applications

Aromatic species, aliphatic amines

Alumina-N Specifications

Description	
Sorbent	Alumina Al_2O_3
pH	7.5 (neutral)
Particle size	25 µm
Primary retention mechanism	Lewis acid/base, polar and ion exchange

Ordering Information

Bond Elut Jr (100/box)

Sorbent Mass	Part No.
500 mg	12162049B
1 g	12166045B

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Part No.
500	12113048

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Quantity (/Box)	Part No.
100 mg	1	100	12102023
500 mg	3	50	12102049
20 g	60	16	12256059

Alumina-A Specifications

Description	
Sorbent	Alumina Al_2O_3
pH	4.5 (acid treated)
Particle size	25 µm
Primary retention mechanism	Lewis acid/base, polar and ion exchange

Ordering Information

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Quantity (box)	Part No.
50 mg	1	100	12102069
500 mg	3	50	12102047
1 g	6	30	12256043

Alumina-B Specifications

Description	
Sorbent	Alumina Al_2O_3
pH	pH 10 (base treated),
Particle size	25 µm
Primary retention mechanism	Lewis acid/base, polar and ion exchange

Ordering Information

Bond Elut Jr (100/box)

Sorbent Mass (mg)	Part No.
500	12162048B

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Quantity (box)	Part No.
500 mg	3	50	12102048
1 g	6	30	12256044

Inorganic Sorbents

Bond Elut™ Florisil: Magnesia-Loaded Silica

- **High purity**
- **Economical**
- **Fast flow so ideal for viscous samples**

Florisil is a magnesia-loaded silica gel. Like silica, it is extremely polar in nature and ideal for the isolation of polar compounds from non-polar matrices. The larger particle size of the sorbent enables fast flow for large sample volumes and therefore can be an attractive alternative to silica if the sample matrix is particularly viscous.

Typical Applications

Non-polar environmental samples, organic extracts

See also

- Bond Elut SI, highly polar free silanol sorbent, page 50

Sorbent Florisil

MgO_3Si, particle size 200 µm, primary retention mechanism polar.

Ordering Information

Bond Elut Jr (100/box)

Sorbent Mass	Part No.
500 mg	12162050B
1 g	12166014B

Bond Elut LRC cartridges (50/box)

Sorbent Mass (mg)	Part No.
500	12113049

Bond Elut straight barrel cartridges

Sorbent Mass	Volume (mL)	Quantity (box)	Part No.
100 mg	1	100	12102024
500 mg	1	50	12102050
1 g	3	50	12102109
	6	30	12256014
	20	20	12256047
2 g	12	20	12256022
	20	20	12256046
5 g	20	20	12256030
10 g	60	16	12256038

Sodium Sulfate Drying Cartridges: Simplify Drying Processes with Pre-packed Devices

- **Easy to use**
- **Available in different formats**
- **Pre-packed for convenience**

Simplify sodium sulfate mediated drying steps by using cartridges pre-packed with ACS grade, granular anhydrous sodium sulfate. Available in three formats (LRC, Bond Elut Jr and straight barrels).

Bond Elut Jr cartridges have top and bottom Luer fittings allowing easy sample processing when used in conjunction with standard SPE cartridges. Bond Elut LRC cartridges have a large reservoir above the sorbent bed and are suitable for use on any standard SPE vacuum manifold.

See also

- Bond Elut Syringe Filters, remove particulates and improve sample integrity, page 59

Ordering Information

Sodium sulfate drying cartridges (100/pk)

Sorbent Mass (g)	Column Format	Volume (mL)	Part No.
1.0	LRC	10	12131033
1.4	Bond Elut Jr	N/A	12162052B
2.2	Bond Elut Jr	N/A	12162054B
3.0	Bond Elut Jr	N/A	12162051B
15.0	Straight Barrel (16/pk)	60	12132004

Diatomaceous Earth Products

Hydromatrix™ and Chem Elut™: Supported Liquid/Liquid Extraction

- **High purity sorbent eliminates contamination and leachables**
- **Available in pre-packed or bulk formats for flexibility**
- **Packing method delivers excellent tube to tube and well to well reproducibility**

Hydromatrix is a high purity, inert diatomaceous earth sorbent available in 96-well plate formats and also as bulk material, offering end user flexibility and an excellent diversity of applications.

Chem Elut products contain Hydromatrix loose material in convenient, ready to use cartridges. Chem Elut is an economical broad performance sorbent for rapid, general sample preparation of biological samples such as plasma, serum, whole blood and urine. Chem Elut products are available in buffered and unbuffered formats. The buffered devices can be used for simple scrubbing operations on organic reactions. The acid buffered cartridge effectively removes excess amines from a synthetic transformation, while the base-treated cartridge can remove residual acid compounds from a variety of matrices.

References

Plum, J & Daldrup, T (1986) Detection of digoxin, digitoxin, their cardioactive metabolites and derivatives by high performance liquid chromatography and high performance liquid chromatography-radioimmunoassay. J. Chromatogr. A, 377, 221-231.

Biondi, PA, Guidotti, L, Montana, M, Manca, F, Brambilla, G & Lucarelli, C (1991) A derivatization procedure suitable for HPLC analysis of clenbuterol. J. Chromatogr. Sci., 29(5), 190-193.

Raou, S, Gremaud, E, Biaudet, J & Turesky, R (1997) Rapid solid-phase extraction method for the detection of volatile nitrosamines in food. J. Agricultural and Food Chem., 45, 4706-4713.

European method for azodyes in manufactures, EN 1471.

See also

- Bond Elut™ SPE Range, the original SPE cartridge, page 22
- StratoSpheres Scavenger Resins, selective polymers for sample clean-up, page 384

Typical Applications

Detection of nitrosamines in food

Ordering Information

Hydromatrix

Description	Part No.
Hydromatrix Bulk Material (1 kg)	198003
Hydromatrix Bulk Material (4 kg)	198004
VersaPlate™ 96-well Plate, 260 mg	75430260
VersaPlate Well Tubes, 260 mg (96/pk)	75530260

Chem Elut cartridges

Buffered pH	Volume (mL)	Quantity (/pk)	Part No.
4.5	3.0	100	12198004
9.0	3.0	100	12198005
Unbuffered	0.3	100	12198001
	1.0	100	12198002
	3.0	100	12198003
	5.0	100	12198006
	10.0	100	12198007
	20.0	100	12198008
	50.0	50	12198009
	100.0	25	12198010
	300.0	15	12198011

Combilute formats (200 mg)

Description	Part No.
Combilute Plate (sorbent mass)	64501507

VersaPlate formats

Description	260 mg
Preassembled 96-well Plate	75430260
VersaPlate Tubes 96pk*	75530260

* Tubes need to be inserted into a VersaPlate base plate Part No. 75400000

Bond Elut™ Accessories

Empty SPE Cartridges: Increase Sample Capacity

- **Made with high purity polypropylene for cleaner extracts**
- **Uniform batch-to-batch size for consistent performance**
- **Economical for every day use**

A variety of empty reservoirs is available to increase the sample capacity of Bond Elut extraction cartridges. These tubes can also be used to pack custom SPE cartridges with bulk Bondesil™ sorbents or other desired sorbent. They are available from 1 to 60 mL. Order frits separately, or see below for reservoirs with pre-installed frits.

Ordering Information

Empty SPE cartridges (100/pk)

Volume (mL)	Part No.
1	12131007
3	12131008
6	12131009
12	12131010
20	12131011
60	12131012

Frits: 20 µm Polypropylene Frits for SPE Cartridges

- **Made with high grade, clean polyethylene for clean extracts**
- **Pre-cut to correct size for accuracy**
- **Use with reservoirs or custom packing**

These frits are pre-cut to fit into Bond Elut reservoirs for use in filtration applications or for custom SPE sorbent packing.

Ordering Information

Frit for SPE cartridges (100/pk)

Diameter (mm)	Volume (mL)	Part No.
6.4	1	12131019
9.5	3	12131020
12.7	6	12131021
15.9	12	12131022
20.6	20	12131023
27.0	60	12131024

Empty SPE Cartridges with Two Frits: Designed for Simple Filtration

- **Pre-installed frits for ease-of-use**
- **Broad range of filtration operations for maximum flexibility**
- **Customizable packing for specific applications**

These clean polypropylene reservoirs contain two polypropylene frits pre-inserted, an ideal configuration for simple filtration. For custom sorbent packing, additional frits can be purchased separately. Available from 1 to 60 mL.

Ordering information

Empty SPE cartridges with two frits (100/pk)

Volume (mL)	Part No.
1	12131013
3	12131014
6	12131015
12	12131016
20	12131017
60	12131018

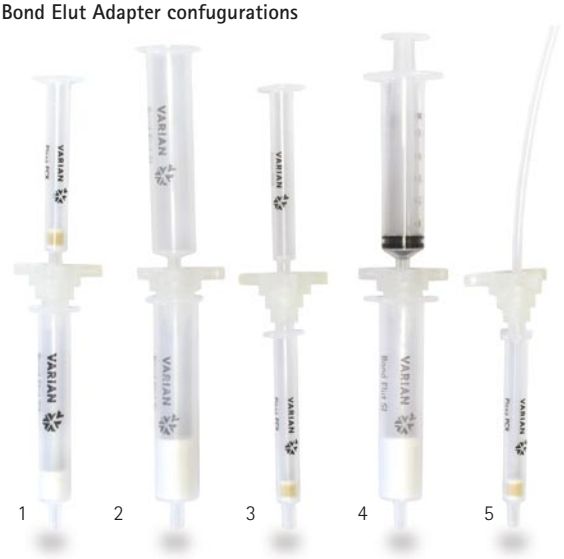
Bond Elut™ Accessories

Bond Elut Adapters: Versatility for SPE Processing

- **Connect SPE cartridges in series for large samples**
- **Expand cartridge volume for even more applications**
- **Transfer large-volume samples to any SPE cartridge**

Bond Elut adapters fit on top of any Bond Elut cartridge and contain a female Luer fitting that accommodates the tip of another cartridge. This allows the following configurations:

Bond Elut Adapter confugurations



Configuration 1: The stacking of two cartridges in order to perform multi-sorbent methods.

Configuration 2 + 3: Increasing any cartridge's volume by stacking an empty reservoir on top of the device.

Configuration 4: Standard Luer-tipped syringes will fit into any Bond Elut adaptor. Gentle pressure can be then used to apply conditioning solvents, samples, rinsing solvents and eluents. This configuration is particularly useful for single sample processing, where a vacuum manifold is not required.

Configuration 5: For excessively large sample volumes, 1/8 in. OD tubing can be connected to the end of an adapter and the sample can be drawn directly from the sample container via a high vacuum.

To select the appropriate adapter, choose one specified for the size of the lower Bond Elut cartridge. All Bond Elut cartridges and empty reservoirs have standard Luer tips and are fully compatible across the adapter range.

Ordering Information

Description	Part No.
Adapter Cap for 1, 3 and 6 mL Bond Elut Cartridges (15/pk)	12131001
Adapter Cap for 12 and 20 mL Bond Elut Cartridges (10/pk)	12131003
Adapter Cap for 60 mL Bond Elut Cartridges (10/pk)	12131004

Luer Stopcocks: For Independent Flow Control

- **Control flow rates during SPE**
- **Improve method reproducibility**
- **Instant isolation from vacuum reduces accidental tube drying**

Luer stopcocks are used to provide independent flow control of each individual Bond Elut cartridge when used in conjunction with vacuum manifolds. They are made from solvent resistant high-grade polypropylene, are reusable and can be readily cleaned using organic solvents such as methanol or acetone.

Ordering Information

Luer Stopcocks (15/pk)

Description	Part No.
Luer Stopcocks	12131005

ASPEC™ Adapter Caps: Use Bond Elut Cartridges With Gilson SPE Systems

- **Enhance the high throughput compatibility of Bond Elut cartridges**
- **Converts 1, 3 and 6 mL cartridges for use in Gilson SPE systems**
- **Specially engineered for leak free operation**

These Gilson engineered caps produce a positive pressure seal with the needle in the Gilson ASPEC, ASPEC XL and ASPEC XL4 solid phase extraction systems.

Ordering Information

ASPEC Adapter Caps (1000/pk)

Description	Part No
Gilson Adaptor Cap 1 mL, Yellow	12131034
Gilson Adaptor Cap 3 mL, Blue	12131035

For more information, please visit www.varianinc.com/bondelut.html or visit www.varianinc.com/products.html to place an order.

Bond Elut™ Accessories

Varian Syringe Filters: Improve Sample Integrity With the Widest Range of Filter Membranes

- **Particulate removal reduces clogging and downtime**
- **Improved sample integrity delivers clearer data**
- **Variety of filter membranes offers application selectivity**

A wide variety of disposable single-use syringe filters is available for applications requiring the highest quality membrane-based devices. These tips are compatible with all Luer slip syringe devices and are available in a range of diameters, porosities and membrane chemistries.

Hydrophilic membranes

Nylon: This material has a base hydrophilicity due to its polyamide structure. Nylon exhibits high levels of protein binding, high mechanical stability and can be loaded with a high level of particulate. This type of device is often used for samples that are directly injected into HPLC sample loops.

Regenerated cellulose (RC): Hydrophilic, solvent resistant membrane. RC is a very low protein binder and is ideal for the filtration of samples containing biomolecules such as enzymes, proteins and peptides.

Polyvinylidene difluoride (PVDF): A hydrophilic membrane suitable for most general-purpose applications. PVDF is a low protein binder with a broad chemical and solvent compatibility.

Hydrophobic membranes

PTFE (Teflon®): Hydrophobic, low protein binding, recommended for HPLC solvents or GC filtration. Can be used with aggressive solvents but requires pre-wetting when used with aqueous samples.

Glass fiber pre-filters are recommended when samples have high particulate matter to reduce filter bed clogging.

Ordering Information

Syringe Filters

Diameter (mm)	Filter Type	Pre-filter	Quantity (/pk)	Pore Size (µm)	Part No.
4	Nylon	None	100	0.20	A4101
	Nylon	None	100	0.45	A4100
	PTFE	None	100	0.20	A4103
	PTFE	None	100	0.45	A4102
	PVDF	None	100	0.45	A4136
	RC	None	100	0.20	A4140
17	Nylon	None	200	0.20	A4131
	Nylon	None	200	0.45	A4130
	PTFE	None	200	0.20	A4135
	PTFE	None	500	0.45	A4170
	PVDF	None	200	0.45	A4137
	RC	None	200	0.20	A4142
	RC	None	200	0.45	A4143
30	Nylon	None	100	0.20	A4105
	Nylon	None	100	0.45	A4104
	Nylon	None	500	0.45	A4132
	PTFE	Glass fiber	100	0.20	CP201950
	PTFE	Glass fiber	100	0.45	CP201951
	PTFE	None	100	0.20	A4107
	PTFE	None	100	0.45	A4106
	PTFE	None	500	0.45	A4131
	PVDF	Glass fiber	100	0.45	CP201955
	PVDF	None	100	0.45	A4138
	RC	None	100	0.20	A4145
	RC	None	100	0.45	A4144

Vacuum Manifolds

Vac Elut™ 20: Process up to 20 Bond Elut™ Cartridges at the Same Time

- **Increased productivity/sample throughput**
- **Disposable needles eliminate cross contamination**
- **Rugged, reliable construction**

Engineered to increase laboratory productivity, the corrosion-resistant Vac Elut 20 allows simultaneous processing of up to 20 Bond Elut cartridges. The manifold's clear glass base allows careful monitoring of the entire sample collection process. Its compact, linear design requires very little bench space.

On the Vac Elut 20, the vacuum control valve, vacuum gauge, and quick release valve are mounted on the lid, away from the corrosive solvent stream and within convenient reach. The solvent-resistant polypropylene rack is available in a variety of sizes to accommodate the collection tubes commonly used in sample preparation.

To minimize the risk of sample carryover, low-cost, disposable, medical grade polypropylene delivery needles can be easily replaced. Polypropylene extender tips are also available as a replacement for the standard needle valves, ensuring a direct path into the collection tube. Correct sample identification is also ensured by an interlocking fit between the lid and internal test tube rack.

Ordering Information

Vac Elut 20 Manifold

Description	Part No.
Vac Elut 20 Manifold with Collection Rack for 10 x 75 mm Test Tubes	12234105
Vac Elut 20 Manifold with Collection Rack for 13 x 75 mm Test Tubes	12234100
Vac Elut 20 Manifold with Collection Rack for 13 x 100 mm Test Tubes	12234101
Vac Elut 20 Manifold with Collection Rack for 16 x 75 mm Test Tubes	12234102
Vac Elut 20 Manifold with Collection Rack for 16 x 100 mm Test Tubes	12234103

Vac Elut 20 Manifold Tall Glass Basin: For Larger Elution Volumes

- **For extractions greater than 10 mL**
- **Transparent glass base allows you to monitor the whole collection operation**
- **Simple vacuum adjustment**

The Vac Elut 20 with a large glass basin and collection rack accommodates larger 16 x 150 mm test tubes. The same high quality material and features on the standard Vac Elut system are incorporated on this special unit. These collection vessels can be utilized in combinatorial chemistry applications using large boiling tubes for collection of purified synthesis mixtures, or for any SPE extraction in which an elution volume greater than 10 mL is required.

Ordering Information

Vac Elut 20 Manifold

Description	Part No.
Vac Elut 20 Manifold with Tall Glass Basin and Collection Rack for 16 x 150 mm Test Tubes, Complete System	12234104
Collection Rack for 10 x 75 mm Test Tubes	12234517

Vac Elut 20 manifold racks for glass basins

Description	Part No.
Standard Glass Basin	12234505
Collection Rack for 13 x 75 mm Test Tubes	12234507
Collection Rack for 13 x 100 mm Test Tubes	12234508
Collection Rack for 16 x 100 mm Test Tubes	12234510

Vac Elut 20 manifold replacement components and accessories

Description	Part No.
Polypropylene Delivery Needles (25/pk)	12234511
Replacement Exit Valve for Glass Basin	12234506
Replacement Lid Gasket	12234502
Vac Elut 20 Lid Cover	12234501
Vacuum Gauge Assembly	12234504

For more information, please visit www.varianinc.com/samprep_ac.html or visit www.varianinc.com/products.html to place an order.

Vacuum Manifolds

Vac Elut™ SPS 24 Manifold: Process up to 24 SPE Cartridges at the Same Time

- **Closed operation prevents cross contamination**
- **Stainless steel tips deliver maximum extract purity**
- **Range of rack sizes covers most tube configurations**

The Vac Elut SPS 24 allows you to process up to 24 SPE cartridges simultaneously. Like all Vac Elut manifolds, the SPS 24 is made from durable, solvent-resistant materials and engineered to last. The glass sides allow easy viewing of the entire sample collection process.

The highlighting feature of the SPS 24 system is its waste diversion funnel that enables all steps of the SPE procedure to be completed without removing the lid. The collection rack can be placed inside the unit before the extraction begins. This unique characteristic of the SPS 24 eliminates splash back, prevents cross contamination, and minimizes hazardous waste, and biohazard exposure.

Complete with replacement stainless steel delivery tips for maximum extract purity, the Vac Elut SPS 24 system also includes a vacuum controller/release, collection rack, and port sealing plugs. Racks for several different collection tube configurations are available.

Ordering Information

Vac Elut SPS 24 Manifold

Description	Part No.
Vac Elut SPS 24 Manifold with Collection Rack for 10 x 75 mm, Test Tubes	12234003
Vac Elut SPS 24 Manifold with Collection Rack for 12 x 75 mm Test Tubes	12234041
Vac Elut SPS 24 Manifold with Collection Rack for 13 x 100 mm Test Tubes	12234022
Vac Elut SPS 24 Manifold with Collection Rack for 16 x 100 mm Test Tubes	12234004

Accessories and parts

Description	Part No.
Collection Rack and Funnel Set for 12 or 15 mL Conical Tubes	12234027
Collection Rack and Funnel Set for 12 x 75 mm Test Tubes	12234030
Collection Rack and Funnel Set for 13 x 100 mm Test Tubes	12234031
Collection Rack and Funnel Set for 16 x 100 mm Test Tubes	12234028
Elastic Lid Fasteners (6/pk)	12234034
SPS 24 Lid Cover	12234025
SPS 24 Waste Tower Repair Kit, Base Exit Tube, Hose Connector, Washer, Center Tube, 90° Connector Elbow	12234005
Stainless Steel Delivery Needles (25/pk)	12234038
Waste Funnel for 12 x 75 or 13 x 100 mm Test Tubes (5/pk)	12234032

Bulk SPE Devices and Sorbents

Bondesil™ Bulk Sorbent: Scale-up Without Loss in Performance

- **Clean sorbents offer clean bulk extractions**
- **Advanced bonding offers reproducible batch-to-batch performance**
- **Range of particle sizes allows seamless scale-up**

See also

- Mega Bond Elut™ cartridges, large volume SPE devices, page 62
- SuperFlash cartridges, page 67

Ordering Information

Sorbent Phase	Particle size (µm)	Quantity (g)	Part No.
2OH (Diol)	40	100	12213030
Alumina –N	25	1000	12213073
C18	40	10	12213011
	40	100	12213012
	40	1000	12213013
	120	100	14213012
	120	1000	14213013
C18 OH	40	100	12213049
C2	40	100	12213006
C8	40	100	12213009
CBA	40	100	12213033
CN-E	40	100	12213061
DEA	40	100	12213047
ENV (polymeric)	125	100	12216061
EnvirElut™	40	100	12214016
	40	1000	12214019
FL	200	100	12214013
	200	1000	12214015
NH2	40	10	12213020
	40	1000	12213021
	120	100	14213021
PH	40	100	12213015
PRS	40	100	12213036
PSA	40	10	12213023
	40	100	12213024
	40	1000	12213025
SAX	40	100	12213042
	40	1000	12213043
SCX	40	100	12213039
	120	1000	12213040
	12	100	14213039
SI	40	500	12213001

Mega Bond Elut Flash

- **Convenient disposable cartridges eliminate the need for packing glass columns**
- **Flexible "open" tube design for either liquid or solid samples**
- **Reliable, consistent flow characteristics deliver high-resolution performance**

Varian Mega Bond Elut flash cartridges offer excellent levels of performance and productivity for the purification of organic compounds, but also for scale-up, solid phase extraction. Pre-packed, disposable cartridges offer greater convenience than glass columns that have to be washed, dried and re-packed after every sample.

Ordering Information

Mega Bond Elut Flash cartridges

Sorbent Phase	Sorbent Mass (g)	Volume (mL)	Quantity (/Pk)	Part No. (40 µm)
C18	1	60	16	12256060
	2	12	8	12256015
	5	20	8	12256023
	10	60	8	12256031
	20	60	16	12256078
	25	150	8	12256079
	50	150	8	12256080
	75	150	8	12256081
NH2	2	12	8	12256020
	5	20	16	12256028
	10	60	16	12256036
	20	60	16	12256074
	25	150	8	12256075
	50	150	8	12256076
	70	150	8	12256077
SCX	20	60	16	12256065
	25	150	8	12256070
	50	150	8	12256072
	70	150	8	12256073
SI	2	12	8	12256018
	5	20	8	12256026
	10	60	8	12256034
	20	150	8	12256042
	15	60	16	12256068
	25	150	8	12256069
	50	150	8	12256067
	70	150	8	12256071

For more information, please visit www.varianinc.com/bondelut.html or visit www.varianinc.com/products.html to place an order.

Speciality Phases

Bond Elut™ Atrazine: Optimized Sorbent for Atrazine Extraction

- **Large particle size allows flow of large sample volumes**
- **Controlled carbon content enhances atrazine selectivity**
- **Large bed mass offers optimized capacity for atrazine**

Bond Elut Atrazine is a specially bonded, low load, high-flow C18 phase designed for atrazine extraction. Methods are fast, reproducible and require minimal organic solvent consumption.

See also

- Bond Elut C18, universal, non-polar SPE sorbent, page 29
- Bond Elut ENV, large particle polymer for large sample volumes, page 37

Ordering Information

Straight barrel cartridges, (120 µm, 20/box)

Sorbent Mass (g)	Volume (mL)	Part No.
3	20	1225611

Bond Elut Cellulose: Highly Polar Sorbent With pH Stability

- **High purity micro-granular cellulose with high α-cellulose content**
- **Stable across a broad pH range**
- **Extremely low metal content (Fe, Cu <5 ppm)**

Bond Elut Cellulose columns utilize a pure micro-granular cellulose powder that is packed between two, 20 µm polyethylene frits. The cellulose phase is very stable over a wide pH range and contains an extremely low metal content (Fe and Cu content less than 5 ppm). The combination of surface area and polymeric structure results in a sorbent with excellent capacity. The cellulose media contains numerous hydroxyl groups; because of its polar nature, it is able to accept high loading of many polar substances from aqueous and organic phases.

See also

- Bond Elut C18, universal, non-polar SPE sorbent, page 29
- Bond Elut ENV, large particle polymer for large sample volumes, page 37

Ordering Information

Straight barrel cartridges, (500/box)

Sorbent Mass (g)	Volume (mL)	Part No.
300	3	12102095

Empore™ Disk SPE: Optimized Disk Technology

- **Good flow of large sample volumes**
- **Range of versatile sorbent chemistries**
- **Available in two disk diameters for better performance**

Empore extraction disks provide a high flow rate solution for large volume sample preparation, and are available in a variety of bonded phases. The Empore disks are available in two diameters, 47 and 90 mm. By increasing the diameter of the disk used, the disk surface area available for sample passage increases, resulting in better solvent flow rates through the disk.

See also

- SPEC™ C8, outstanding flow characteristics, page 21
- SPEC C18, outstanding flow characteristics, page 21

Ordering Information

Empore Disk SPE

Description	Disk diameter (mm)	Quantity (/Box)	Part No.
Anion Extraction Disks	47	20	12145012
Chelating Extraction Disks	47	20	12145029
SDB-XC Extraction Disks	47	20	12145010
	90	10	12145011
C8 Extraction Disks	47	20	12145002
	90	10	12145034
C18 Extraction Disks	47	20	12145004
	90	10	12145007