

SAMPLE PREPARATION



In this Chapter

Solid Phase Extraction (SPE)

- 152** Bond Elut Plexa
- 161** Polymeric SPE
- 166** Silica-Based SPE
- 190** Inorganic SPE
- 193** Specialty SPE
- 202** Diatomaceous Earth Sorbents
- 204** Bulk SPE
- 206** Bond Elut Accessories
- 220** Disk SPE
- 225** Micro-volume SPE

- 228** **QuEChERS**

- 235** **Captiva Filtration**
- 242** **Sample Filtration**

- 248** **TOXI-TUBES**





Application Guide

Industry	Application	Technique	Product
Pharmaceutical	Bioanalysis	Solid Phase Extraction	Bond Elut Plexa
			Bond Elut Plexa PCX
			Bond Elut Plexa PAX
			Bond Elut
			Mega Bond Elut
			OMIX
			SPEC
		Liquid/Liquid Extraction	Chem Elut
		Protein Precipitation	Captiva ND ^{Lipids}
		Filtration	Captiva
Biotechnology	Protein/Peptide Purification	Supported Liquid Extraction (SLE)	Chem Elut
Clinical and Forensic	Bioanalysis	Lysate Filtration	Captiva
		Micro-volume SPE	OMIX
		Solid Phase Extraction	Bond Elut
			Bond Elut Plexa
			Bond Elut Plexa PCX
			SPEC
			OMIX
		Supported Liquid Extraction (SLE)	Chem Elut
		Protein Precipitation	Captiva ND ^{Lipids}
		Filtration	Captiva
Environmental Monitoring	Semi-volatiles	Solid Phase Extraction	Bond Elut
			SPEC
	Oils and Grease	Solid Phase Extraction	Bond Elut
			SPEC
		Water Removal	Bond Elut
			Na ₂ SO ₄
Food and Beverage	Pesticides and Herbicides	Solid Phase Extraction	Captiva
			Bondesil Bulk Silica
			QuEChERS
		Supported Liquid Extraction (SLE)	Chem Elut

■ SOLID PHASE EXTRACTION (SPE)



Agilent Bond Elut: Accuracy Starts Here

For over 30 years, Bond Elut has been 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 performance. 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. Optical scanners installed throughout our automated assembly process inspect each Bond Elut tube at multiple points. And during manufacture, 25 different tests are conducted to ensure reproducibility. If an imperfection is spotted, the tube is removed from the assembly line. The result is consistently reliable Bond Elut cartridges, time and time again.

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).

The Bond Elut Difference

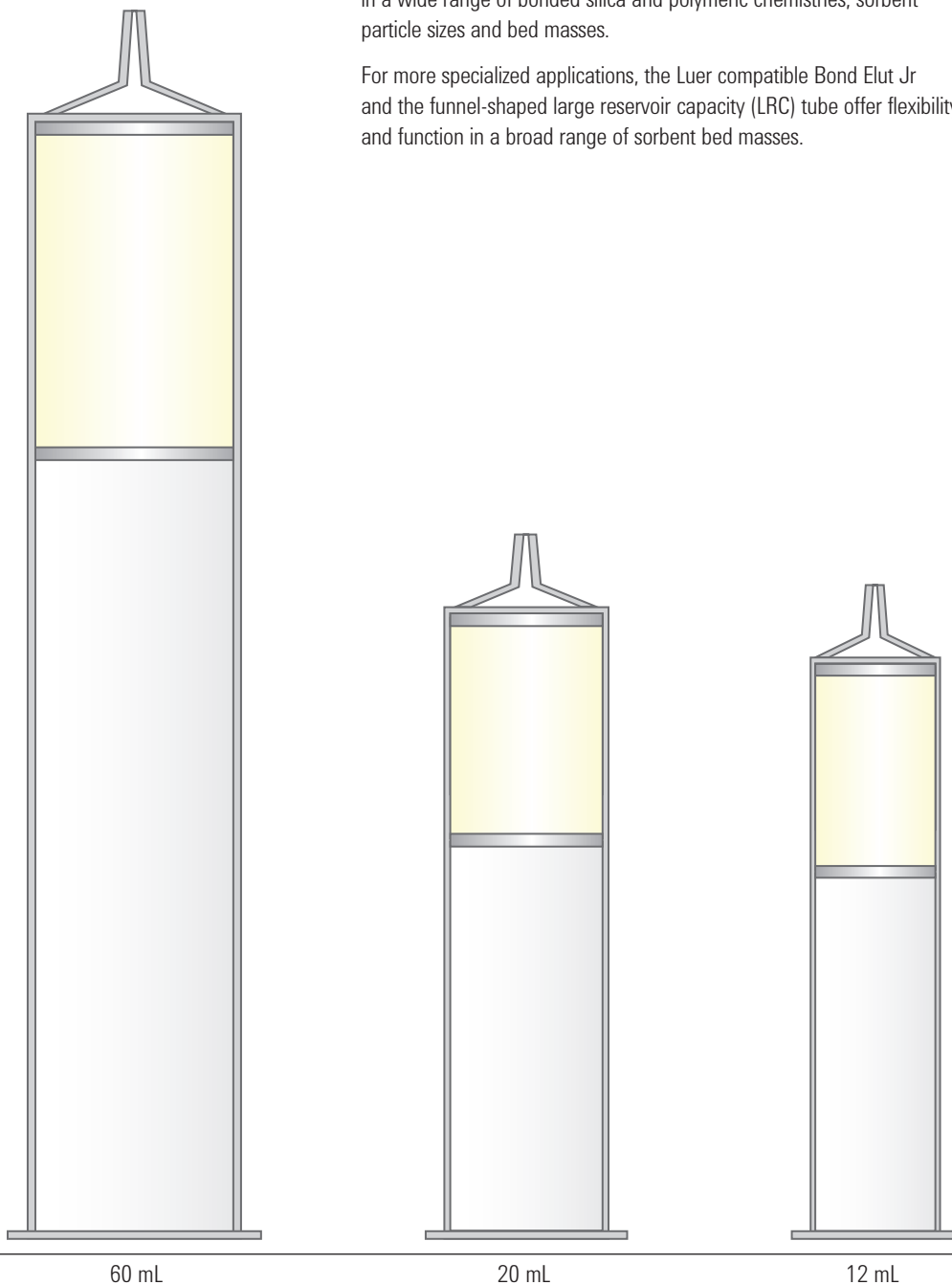
- **Heritage of Reliability:** With years of use in some of the most demanding analytical laboratories in the world, Bond Elut products have a proven track record resulting in a strong publication pedigree
- **Options for Your Needs:** Offering extraction solutions for the widest range of analytes and matrices, with over 40 bonded silica phases for high specificity methods and polymeric phases for rapid method development, Bond Elut has the largest choice of formats and sorbents in the market
- **Innovative Products Designed for Lab Efficiency:** Whether it be fast flow polymeric particles or our patented 96-well plate design, all Bond Elut products are created for ease-of-use and flexibility to meet both manual and automated requirements
- **Technical Support at Every Step:** For your specific applications, or to help solve occasional technical issues, a global team of analytical scientists is on hand to assist
- **World Class Manufacturing and Quality:** Unrivaled manufacturing control, plus exacting ISO 9001: 2000 compliant inspections guarantee the consistent quality of Bond Elut

Sample Preparation Formats

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

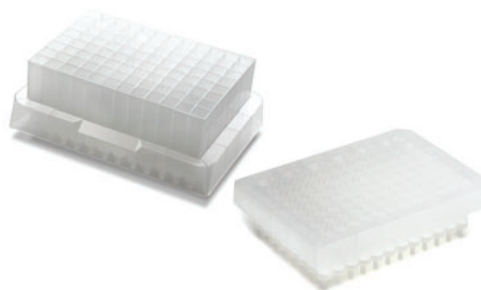
We have a full set of straight barrel SPE tubes ranging from 1-150 mL in a wide range of bonded silica and polymeric chemistries, sorbent particle sizes and bed masses.

For more specialized 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 Plates

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



VersaPlate

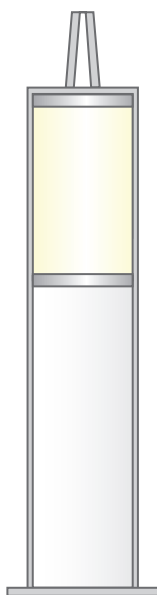
VersaPlate is a highly innovative, flexible design that lets you customize plates. Insert different phases for sorbent screening or insert only enough tubes to match the number of samples to be extracted for minimal waste. VersaPlate can be purchased in a pre-packed format or as loose tubes.

Packed Formats for Automation

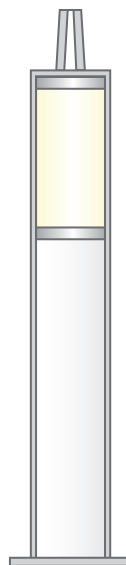
Bond Elut sorbents are also available in packed bed formats for automation platforms, such as the Spark Holland Symbiosis, Gilson ASPEC and Gerstel MPS systems. Agilent's unique OMIX pipette format is also used with a wide range of liquid handling devices, ranging from hand-held pipettors to high-throughput automated systems.



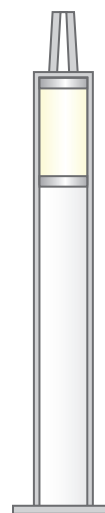
10 mL LRC



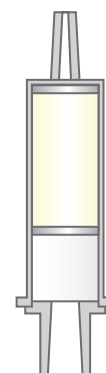
6 mL



3 mL



1 mL



Bond Elut Jr

Cross Reference of Comparable Phases by Manufacturer

Different chemistries and manufacturing processes create sorbents that exhibit differences in selectivity, so there is no universal equivalent for every application. However, the performance of products can be similar in many applications. This table provides suggestions for using Agilent Bond Elut products in comparison to products from other manufacturers.

Polymers			
If you are using...			Try this...
Phenomenex Strata	Waters Oasis	Supelco Supelclean/Discovery	Agilent Bond Elut
Strata-X	HLB		Plexa
SDB-L		ENVI-ChromP	ENV or LMS
Strata-XC	MCX		Plexa PCX
	MAX		Plexa PAX
Silica-Based and Other Sorbents			
If you are using...			Try this...
Phenomenex Strata	Waters Sep-Pak	Supelco Supelclean/Discovery	Agilent Bond Elut
C18-E	tC18	ENVI-18, DSC-C18, LC-18	C18
C18-U	C18		C18 OH
C8	C8	DSC-8, Envi-8, LC-8	C8
	tC2		C2
Phenyl (PH)		DSC-Ph, LC-Ph	PH
Screen-C			Certify
Si-1	Silica	DSC-Si, LC-SI	SI
FL-PR	Florisil	LC and ENVI Florisil	FL
NH2	Amino Propyl	DSC-NH2, LC-NH	NH2
		DSC-Diol, LC-Diol	2OH
CN	Cyano Propyl	DSC-CN, LC-CN	CN-U
	Alumina A, B, N	LC-Alumina A, B, N	Alumina A, B, N
SAX	AccellPlus QMA	DSC-SAX, LC-SAX	SAX
SCX	AccellPlus CM	DSC-SCX, LC-SCX	SCX
		ENVI-Carb	Carbon
		ENVICarb-II/NH2	Carbon/NH2
		ENVICarb-II/PSA	Carbon

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 (NH ₂)	Polar/Anion Exchanger	Aminopropyl/silica based	No	Packed bed	6.7	500	40 and 120, irregular	60
SPEC Aminopropyl (NH ₂)	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				
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

(Continued)

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)
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 (20H)	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/silica based	No	Packed bed	7.9	500	40, irregular	60
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

(Continued)

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)
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 Exchanger	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 actual lot analyses, you will see that the actual mean is around 55 µm. 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. 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 that the actual average particle in our regular silica Bond Elut is the same now as it was 30 years ago when we first pioneered SPE as a sample prep technology.

Sample Preparation Reference Guide				
Product	Typical Matrices	Primary Extraction Mechanism	Compound Types	Page No.
Bond Elut AccuCAT	Urine, plasma and biological fluids, beverages and food	Strong cation and anion exchange	Catecholamines, acrylamide in liquids and food	187
Bond Elut Alumina	Non-polar organics	Polar	Polar cleanup	191
Bond Elut Atrazine	Water sources	Non-polar	Atrazine and atrazine by-products	196
Bond Elut C1	Urine, plasma, biological fluids	Non-polar, polar (as a normal phase extraction)	Strongly non-polar compounds	173
Bond Elut C18	Aqueous samples, biological fluids	Non-polar	Non-polar compounds, desalting	166
Bond Elut C18 EWP	Aqueous samples, biological fluids	Non-polar	Extra wide pore for larger, macro molecules up to 15 kDa	168
Bond Elut C18 OH	Aqueous samples, biological fluids, non-polar extracts	Non-polar, hydrogen bonding	Vitamin D, fat-soluble compounds, steroids/hormones	169
Bond Elut C2	Aqueous samples, biological fluids	Non-polar	Strongly non-polar compounds	174
Bond Elut C8	Aqueous samples, biological fluids	Non-polar	Non-polar compounds	170
Bond Elut CBA	Aqueous samples, biological fluids	Weak anion exchange	Strong and weak acids	185
Bond Elut Cellulose	Aqueous and non-polar organics	Polar (Hydroxyl)	Polar impurities/compounds	196
Bond Elut CH (cyclohexyl)	Aqueous samples, biological fluids	Non-polar	Non-polar compounds	172
Bond Elut CN-E	Aqueous samples, biological fluids	Non-polar, dipole	Mid-range polarity compounds	176
Bond Elut Carbon	Organic plant and tissue extracts	Wide range non-polar retention	Cleanup of pigments and endogenous plant extracts for pesticide and herbicide analysis	193
Bond Elut Certify	Urine, plasma, saliva, blood, biological fluids	Non-polar and strong cation exchange	Basic drugs, basic drugs of abuse	188
Bond Elut Certify II	Urine, plasma, saliva, blood, biological fluids	Non-polar and strong anion exchange	Acidic drugs, acidic drugs of abuse	189
Bond Elut DEA	Water, biological fluids, non-polar extracts	Weak cation exchange	Weak and strong basic compounds	186
Bond Elut Diol (2OH)	Aqueous, biological fluids, non-polar organics	Polar and non-polar	Polar, weakly non-polar	177
Bond Elut ENV	Water sources	Non-polar	Polar organic molecules, explosive residues	163
Bond Elut Florisil	Non-polar organics	Polar compounds	Organic extracts, non-polar environmental extracts	190
Bond Elut LMS	Urine, plasma, biological fluids	Non-polar	Non-polar compounds	164

(Continued)

Sample Preparation Reference Guide

Product	Typical Matrices	Primary Extraction Mechanism	Compound Types	Page No.
Bond Elut Mycotoxin	Aqueous and polar organic grain extracts (beer, wine, sake)	Ionic cleanup	Mycotoxins (trichothecenes and zearalenones)	198
Bond Elut NEXUS and Bond Elut NEXUS WCX	Horse urine, urine, biological fluids	Non-polar	Drugs of abuse, quaternary drugs, endocrine disruptors	165
Bond Elut NH2	Aqueous, biological fluids, buffered organics	Weak anion exchange	Polar and non-polar strong anions, polar structural isomers	178
Bond Elut PBA	Plasma, urine, aqueous and biological fluids	Covalent bonding	cis-diol-containing compounds, catecholamines, ribonucleotides, amino alcohols, diketo and triketone compounds	200
Bond Elut PCB	Water sources	Non-polar	PCBs	197
Bond Elut PH	Aqueous and biological fluids	Non-polar	Strongly non-polar compounds, aromatics	171
Bond Elut PPL	Water sources, biological fluids	Non-polar, electrostatic	Non-polar compounds, phenols	161
Bond Elut PRS	Aqueous, biological fluids, buffered organics	Cation exchange	Basic compounds (amine + pyridinium containing)	183
Bond Elut PSA	Aqueous, biological fluids, buffered organics	Strong anion exchange	Acidic compounds (fruit acid removal for QuEChERS)	184
Bond Elut Plexa	Aqueous, biological fluids	Non-polar	Non-polar compounds with acidic/neutral fractionation PAHs from water	156
Bond Elut Plexa PAX	Plasma, urine, aqueous and biological fluids	Strong cation exchange	Acidic compounds, carboxylic acid metabolites of drugs, peptides and amino acids	160
Bond Elut Plexa PCX	Aqueous, biological fluids, buffered organics	Mixed mode: non-polar and cation exchange	Basic drugs, basic drugs of abuse	158
Bond Elut SAX	Aqueous, biological fluids	Anion exchange	Weak acidic compounds	180
Bond Elut SCX	Aqueous, biological fluids, buffered organics	Cation exchange	Weak basic compounds	182
Bond Elut SI	Non-polar organics, oils, lipids	Polar	Cleanup of polar impurities	175
EnvirElut	Water sources, extracted soil samples	Non-polar	Pesticide and industrial chemical residues	201
Chem Elut	Aqueous, biological fluids, organic reaction mixtures (scavenging)	Solid supported LLE	Nitrosamines, pesticides, herbicides	202
Hydromatrix	Aqueous, biological fluids, organic reaction mixtures (scavenging)	Solid supported LLE	Nitrosamines, pesticides, herbicides	202



Bond Elut Plexa

The Bond Elut Plexa Family 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 is a non-polar divinylbenzene-based neutral polymeric sorbent. This sorbent is the best choice for non-ionic 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 is therefore suitable for the extraction and cleanup 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.

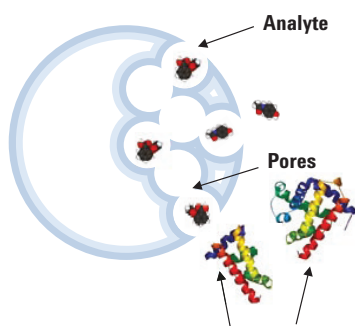
Bond Elut Plexa PAX

Bond Elut Plexa PAX is based on the same innovative base polymer particle technology as the other members of the Plexa SPE family. This advanced material offers excellent flow characteristics due to its monodisperse particle size distribution, affording superior ease-of-use, with minimal clogging of the packed bed. The amide-free particle technology does not provide binding sites for endogenous interferences such as proteins and lipids.

Advanced Polymer Architecture Improves Extraction Performance

LOAD:

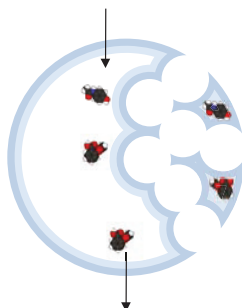
Water-rich, hydrophilic surface allows excellent phase transfer of analytes into the polymer core.



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

WASH:

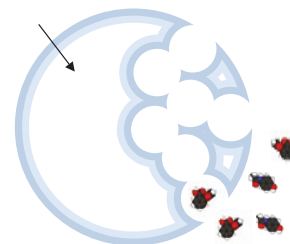
Analytes that have crossed the hydrophilic layers will remain tightly bound in the hydrophobic core.



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.

Tips & Tools

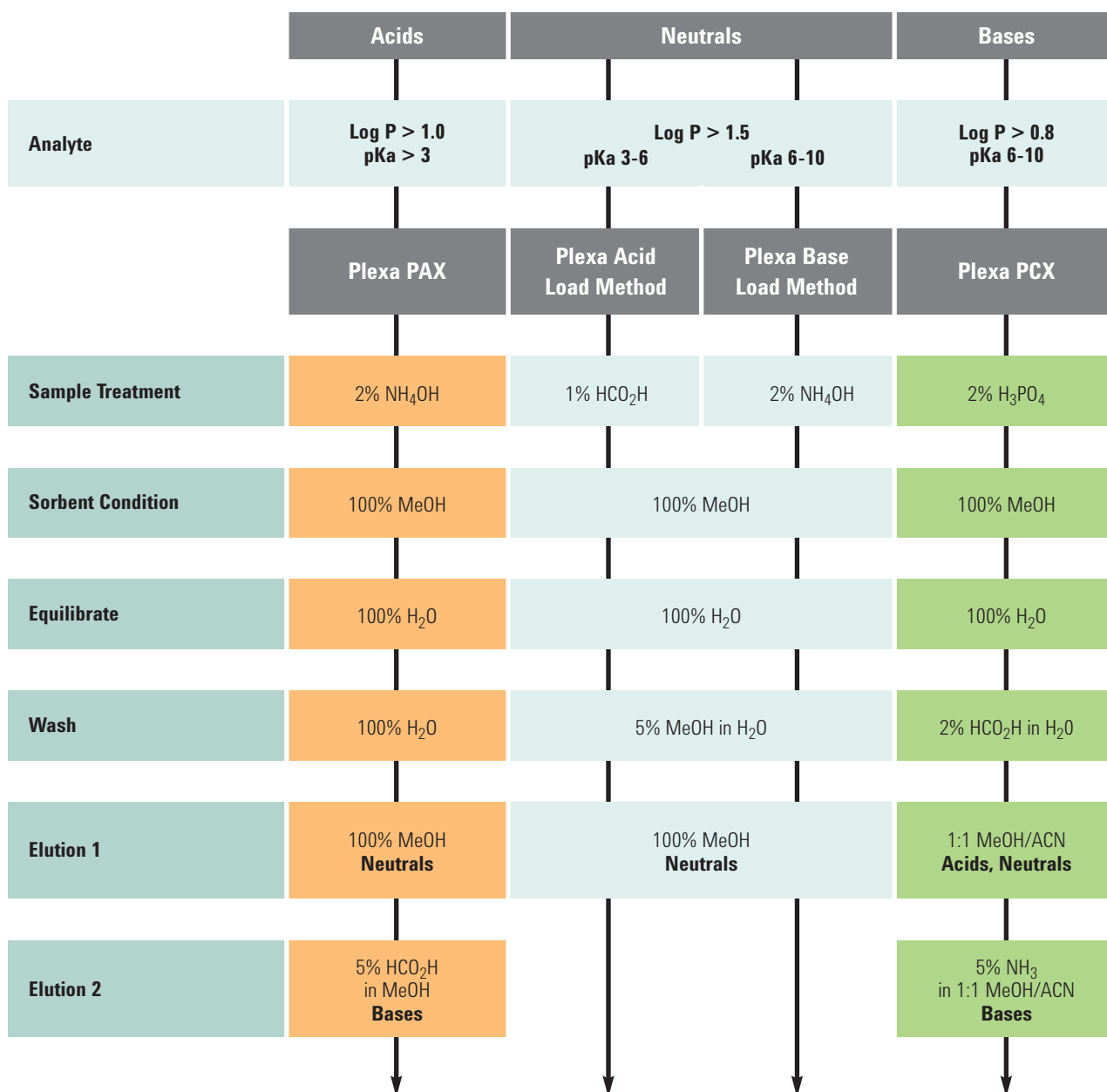
More information is a click away. We have a variety of educational primers, application notes, maintenance guides, and literature available from Agilent for free.

To learn more, visit www.agilent.com/chem/OnlineLibrary



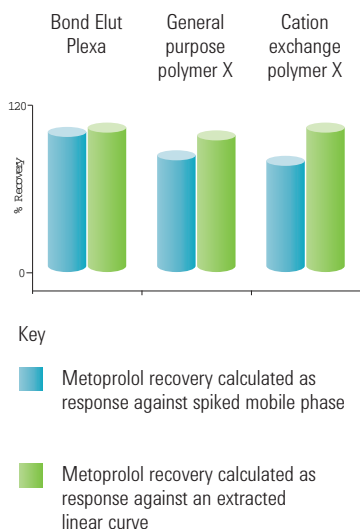
General Protocol for Trouble-Free SPE Applications with Bond Elut Plexa

Regardless of your application or sample type, you will appreciate the difference the Bond Elut Plexa range 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.



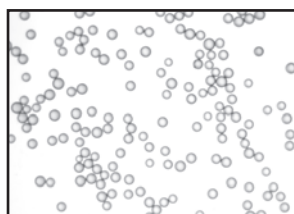
Improved Sensitivity

Plexa improves sensitivity by minimizing ion suppression effects and maximizing recovery

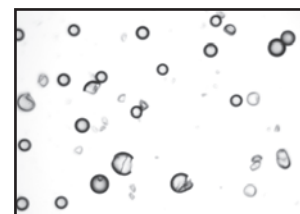


Matrix interferences can result in significantly decreased analytical sensitivity due to ion suppression. Bond Elut Plexa gives you higher recoveries in cleaner extracts, which translates into better sensitivity. Plexa delivers high recoveries regardless of whether absolute or relative calculations are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

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

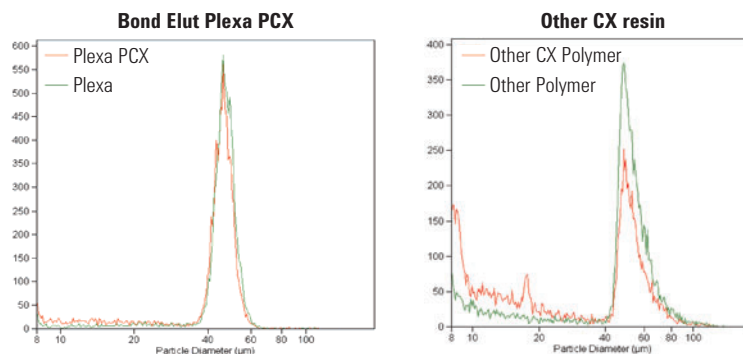


Bond Elut Plexa PCX



Alternative Polymer

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

- Non-polar retention mechanism
- Improved extract cleanliness minimizes sample matrix interferences
- Simple methods are amenable to a very broad range of analytes
- Fast flow, reproducible performance and ease-of-use

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 biofluid 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.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous, biological fluids	Non-polar	Non-polar compounds with acidic/neutral fractionation PAHs from water

Bond Elut Plexa

Description	Unit	Part No.
Straight Barrel Cartridges		
30 mg, 1 mL	100/pk	12109301
30 mg, 3 mL	50/pk	12109303
60 mg, 1 mL	100/pk	12109601
60 mg, 3 mL	50/pk	12109603
200 mg, 3 mL	50/pk	12109610
200 mg, 6 mL	30/pk	12109206
500 mg, 3 mL	30/pk	12109703
500 mg, 6 mL	30/pk	12259506
Bond Elut Jr		
300 mg, 6 mL	50/pk	12169610B
Bond Elut 96 Round-well Plates		
10 mg, 1 mL	1/pk	A4969010
30 mg, 1 mL	1/pk	A4969030
Bond Elut 96 Square-well Plates		
10 mg, 2 mL	1/pk	A3969010
30 mg, 2 mL	1/pk	A3969030
Mega Bond Elut Plexa		
500 mg, 12 mL	20/pk	327832
Other Formats		
Bond Elut Plexa Prospekt cartridge, 2 mm	96/pk	12221305
Bond Elut Plexa 800 Series cartridge	96/pk	12281305
60 mg, 3 mL, Gerstel format	50/pk	167816G
200 mg, 3 mL, Gerstel format	50/pk	167822G



**Typical Method
for Bond Elut Plexa PCX****Sample:**

100 µL plasma

Pretreatment:Dilute 1:3 with 2% H₃PO₄**Conditioning:**

1. 500 µL MeOH
2. 500 µL H₂O

Washes:

Acidic wash: 500 µL aqueous 2% formic acid

Neutral wash: 500 µL CH₃OH-CH₃CN (1:1, v/v)**Elution:**500 µL CH₃OH-CH₃CN + 5% NH₃ (28-30%)

Volumes stated are for Bond Elut 96 30 mg, 1 mL, P/N A4968030.

Bond Elut Plexa PCX

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

Bond Elut Plexa PCX is another 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 near 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.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous, biological fluids, buffered organics	Mixed mode: non-polar and cation exchange	Basic drugs, basic drugs of abuse

Bond Elut Plexa PCX

Description	Unit	Part No.
Straight Barrel Cartridges		
30 mg, 1 mL	100/pk	12108301
60 mg, 1 mL	100/pk	12108601
30 mg, 3 mL	50/pk	12108303
60 mg, 3 mL	50/pk	12108603
200 mg, 6 mL	30/pk	12108206
500 mg, 6 mL	30/pk	12258506
Bond Elut 96 Round-well Plates		
10 mg, 1 mL	1/pk	A4968010
30 mg, 1 mL	1/pk	A4968030
Bond Elut 96 Square-well Plates		
10 mg, 2 mL	1/pk	A3968010
30 mg, 2 mL	1/pk	A3968030
Other Formats		
Bond Elut Plexa PCX Prospekt Cartridge, 2 mm	96/pk	12221306
Bond Elut Plexa PCX 800 Series Cartridge	96/pk	12281306

Tips & Tools

Don't forget, we have special offers throughout the year.

To learn more, visit www.agilent.com/chem/specialoffers



**Typical Method
for Bond Elut Plexa PAX****Sample:**

100 µL human plasma

Pretreatment:Dilute 1:3 with 2% NH₄OH**Conditioning:**

1. 500 µL MeOH
2. 500 µL H₂O

Washes:

1. 500 µL H₂O
2. 500 µL MeOH

Elution:

500 µL 5% formic acid:MeOH

Volumes stated are for Bond Elut 96
1 mL Well Plate, P/N A4967010.

Bond Elut Plexa PAX

- Mixed mode, non-polar polymeric anion exchanger offers high level of analyte selectivity
- Exclusion of endogenous interferences offers superior cleanliness and minimizes ion suppression
- Simple, single method for ease-of-use, reduces method development time

Bond Elut Plexa PAX sets the new performance standard in analyte cleanup and reproducibility for polar and non-polar acidic analytes. Existing polymeric anion exchange sorbents can exhibit a broad range of ion exchange capacity from batch to batch, leading to method irreproducibility and compromised data. Plexa PAX particles are functionalized using a proprietary process which allows anion exchange loadings to be controlled with a very high degree of reproducibility, giving more robust performance across the lifetime of your compound study or method.

This mixed-mode SPE device comes with a simple, single method for non-polar acidic and polar acidic analytes that offers excellent clean up, even in complex matrices such as plasma. The optimized anion exchange methodology offers clean extracts, high recoveries and low RSDs, reducing method development time, sample repeats and overall cost per sample in the process.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Plasma, urine, aqueous and biological fluids	Strong cation exchange	Acidic compounds, carboxylic acid metabolites of drugs, peptides and amino acids

Bond Elut Plexa PAX

Description	Unit	Part No.
Straight Barrel Cartridges		
30 mg, 1 mL	100/pk	12107301
60 mg, 1 mL	100/pk	12107601
30 mg, 3 mL	50/pk	12107303
60 mg, 3 mL	50/pk	12107603
200 mg, 6 mL	30/pk	12107206
500 mg, 6 mL	30/pk	12257506
Bond Elut 96 Round-well Plates		
10 mg, 1 mL	1/pk	A4967010
30 mg, 1 mL	1/pk	A4967030
Bond Elut 96 Square-well Plates		
10 mg, 2 mL	1/pk	A3967010
30 mg, 2 mL	1/pk	A3967030



Polymeric SPE

Reversed Phase Polymeric SPE

Bond Elut PPL

- 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-divinylbenzene (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 Matrices	Primary Extraction Mechanism	Compound Types
Water sources, biological fluids	Non-polar, electrostatic	Non-polar compounds, phenols



Bond Elut PPL

Description	Unit	Part No.
Straight Barrel Cartridges		
50 mg, 1 mL	100/pk	12105002
100 mg, 1 mL	100/pk	12105003
100 mg, 3 mL	50/pk	12105004
200 mg, 3 mL	50/pk	12105005
500 mg, 3 mL	50/pk	12105006
500 mg, 6 mL	30/pk	12255001
1 g, 3 mL	50/pk	12102148
1 g, 6 mL	30/pk	12255002

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 ethanol/ 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)

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

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

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

Bond Elut ENV

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

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

Typical Matrices	Primary Extraction Mechanism	Compound Types
Water sources	Non-polar	Polar organic molecules, explosive residues

Bond Elut ENV

Description	Unit	Part No.
Straight Barrel Cartridges		
50 mg, 1 mL	100/pk	12105012
100 mg, 1 mL	100/pk	12105013
100 mg, 3 mL	50/pk	12105014
200 mg, 3 mL	50/pk	12105015
200 mg, 6 mL	30/pk	12255014
500 mg, 3 mL	50/pk	12105016
500 mg, 6 mL	30/pk	12255011
1 g, 6 mL	30/pk	12255012

Extraction of explosive residues from water

Sorbent Conditioning: 200 mg/3 mL Bond Elut ENV cartridge

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

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

Analyte Elution: 5 mL DI H₂O, then dry the cartridge for 3 min

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

Compounds	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

Bond Elut LMS

- 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 solvent mixtures of low ionic strength compatible with the HPLC mobile phase. These characteristics are crucial to allow compatibility with LC/MS or other delicate analytical techniques.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Urine, plasma, biological fluids	Non-polar	Non-polar compounds

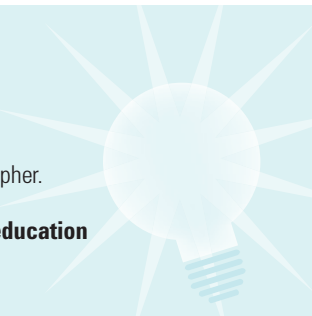
Bond Elut LMS

Description	Unit	Part No.
Straight Barrel Cartridges		
25 mg, 1 mL	100/pk	12105021
100 mg, 1 mL	100/pk	12105023
100 mg, 3 mL	50/pk	12105024
200 mg, 3 mL	50/pk	12105025
500 mg, 3 mL	50/pk	12105026
500 mg, 6 mL	30/pk	12255021
1 g, 6 mL	30/pk	12255022

Tips & Tools

Agilent offers a variety of e-Seminars and on-site training to help you learn how to be a more effective chromatographer.

For more information, visit www.agilent.com/chem/education



Mixed Mode Polymeric SPE

Bond Elut NEXUS and Bond Elut NEXUS WCX

- 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.

References

Wynne, PM, Barry, DC, Vine, JH & Simpson, NKJ (2004) Approaches to the solid phase extraction of equine urine. *Chromatography*, 59, S51-S60.

Wynne, PM, Barry, DC, Vine, JH & Simpson, NKJ (2000) An improved method for the extraction of anabolic steroids from equine urine. In: RB Williams, E Houghton & J Wade (eds) *Proc. 13th Int. Conf. Racing Analysts and Veterinarians*. R & W Publications, Newmarket, UK.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Horse urine, urine, biological fluids	Non-polar	Drugs of abuse, quaternary drugs, endocrine disruptors

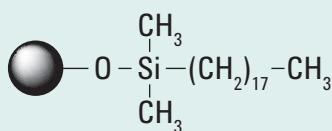
Bond Elut NEXUS and Bond Elut NEXUS WCX

Description	Unit	Part No.
LRC Cartridges		
30 mg, 10 mL	50/pk	12113100
60 mg, 10 mL	50/pk	12113101
Straight Barrel Cartridges		
30 mg, 1 mL	100/pk	12103100
60 mg, 3 mL	100/pk	12103101
60 mg, 3 mL, NEXUS WCX	100/pk	12102157
200 mg, 6 mL	30/pk	12103102
200 mg, 12 mL	20/pk	12253101
500 mg, 12 mL	20/pk	12253102
500 mg, 20 mL	20/pk	12253103

Silica-Based SPE

Reversed Phase (Non-Polar) Silica SPE

Reversed phase sorbents are non-polar and are used to retain (extract) non-polar analytes from polar matrices. For reversed phase sorbents, retention decreases as the eluting solvent becomes more non-polar.



Bond Elut C18

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

Bond Elut C18 is the most hydrophobic, bonded silica sorbent in the Bond Elut range. It is the most popular SPE sorbent because of its extremely retentive nature for non-polar compounds. C18 is generally regarded as having the broadest spectrum of retention among bonded silica sorbents, 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.

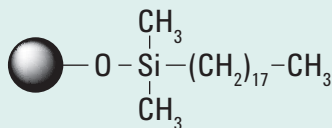
Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous samples, biological fluids	Non-polar	Non-polar compounds, desalting

Bond Elut C18

Description	Unit	40 µm Particle Size	120 µm Particle Size
LRC Cartridges			
100 mg, 10 mL	50/pk	12113001	14113001
200 mg, 10 mL	50/pk	12113024	14113024
500 mg, 10 mL	50/pk	12113027	14113027
Straight Barrel Cartridges			
50 mg, 1 mL	100/pk	12102058	14102058
50 mg, 3 mL	50/pk	12105027	
100 mg, 1 mL	100/pk	12102001	14102001
100 mg, 3 mL	50/pk	12102099	
200 mg, 1 mL	100/pk	12102096	
200 mg, 3 mL	50/pk	12102025	14102025
500 mg, 3 mL	50/pk	12102028	14102028
500 mg, 6 mL	30/pk	12102052	14102052
1 g, 3 mL	50/pk	12102118	
1 g, 6 mL	30/pk	12256001	14256001
1 g, 60 mL	16/pk	12256060	
2 g, 12 mL	20/pk		14256015
5 g, 20 mL	20/pk		14256023
10 g, 60 mL	16/pk		14256031
Bond Elut Jr			
500 mg	100/pk	12162028B	
1 g	100/pk	12166001B	
Other Formats			
Prospekt cartridge, 800 Series	96/pk	12281001	
Prospekt cartridge, 800 Series, 1 mm	96/pk	12281024	
100 mg, 3 mL, Gerstel format	50/pk	161818G	
200 mg, 3 mL, Gerstel format	50/pk	161822G	
500 mg, 3 mL, Gerstel format	50/pk	161832G	

VersaPlate Formats

Description	Particle Size (µm)	25 mg	50 mg	100 mg
Preassembled 96-well plate	40		75401050	7540101C
VersaPlate tubes, 96/pk	40	75501025	75501050	7550101C
	120		75502050	



Bond Elut C18 EWP

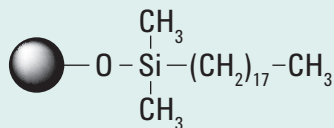
- No exclusion of large molecules
- Good for desalting proteins
- Successful separation of proteins, peptides or nucleotides

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

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous samples, biological fluids	Non-polar	Extra wide pore for larger, macro molecules up to 15 kDa

Bond Elut C18 EWP

Description	Unit	Part No.
LRC Cartridges		
50 mg, 10 mL	50/pk	12113068
500 mg, 10 mL	50/pk	12113071
Straight Barrel Cartridges		
50 mg, 1 mL	100/pk	12102136
100 mg, 1 mL	100/pk	12102137
500 mg, 3 mL	50/pk	12102139



Bond Elut C18 OH

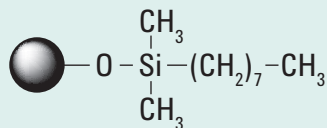
- Silanol activity permits metabolite fractionation
- Tight QC tolerances deliver batch-to-batch reproducibility
- 150Å pore size expands utility to higher molecular weight compounds

Bond Elut C18 OH is a non-encapped 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 encapped C18.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous samples, biological fluids, non-polar extracts	Non-polar, hydrogen bonding	Vitamin D, fat-soluble compounds, steroids/hormones

Bond Elut C18 OH

Description	Unit	Part No.
Straight Barrel Cartridges		
100 mg, 1 mL	100/pk	12102020
500 mg, 3 mL	50/pk	12102046
1 g, 6 mL	30/pk	12256040



Bond Elut C8

- 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.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous samples, biological fluids	Non-polar	Non-polar compounds

Bond Elut C8

Description	Unit	Part No.
Bond Elut Jr		
500 mg	100/pk	12162029B
LRC Cartridges		
100 mg, 10 mL	50/pk	12113002
200 mg, 10 mL	50/pk	12113025
500 mg, 10 mL	50/pk	12113028
Straight Barrel Cartridges		
50 mg, 1 mL	100/pk	12102059
50 mg, 3 mL	50/pk	12105028
100 mg, 1 mL	100/pk	12102002
100 mg, 3 mL	50/pk	12102100
200 mg, 3 mL	50/pk	12102026
500 mg, 3 mL	50/pk	12102029
500 mg, 6 mL	30/pk	12102053
1 g, 6 mL	30/pk	12256002
5 g, 20 mL	20/pk	12256024
10 g, 60 mL	16/pk	12256032

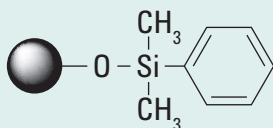
(Continued)

Bond Elut C8

Description	Unit	Part No.
Other Formats		
Prospekt cartridge, 800 Series	96/pk	12281002
Prospekt cartridge, 800 Series, 1 mm	96/pk	12281025
100 mg, 3 mL, Gerstel format	50/pk	161618G
200 mg, 3 mL, Gerstel format	50/pk	161622G
500 mg, 3 mL, Gerstel format	50/pk	161632G

VersaPlate Formats

Description	Particle Size (µm)	50 mg	100 mg
Preassembled 96-well plate	40		7540301C
VersaPlate tubes, 96/pk	40	75503050	7550301C

**Bond Elut PH**

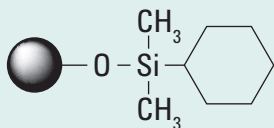
- Added selectivity compared to other non-polar sorbents
- Enhanced retention of planar, conjugated organic molecules
- Similar polarity to C8

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 Matrices	Primary Extraction Mechanism	Compound Types
Aqueous and biological fluids	Non-polar	Strongly non-polar compounds, aromatics

Bond Elut PH

Description	Unit	40 µm Particle Size	120 µm Particle Size
LRC Cartridges			
100 mg, 10 mL	50/pk	12113005	14113005
500 mg, 10 mL	50/pk	12113031	14113031
Straight Barrel Cartridges			
50 mg, 1 mL	100/pk	12102062	14102062
100 mg, 1 mL	100/pk	12102005	14102005
500 mg, 3 mL	50/pk	12102032	14102032
1 g, 6 mL	30/pk	12256004	14256004



Bond Elut CH (cyclohexyl)

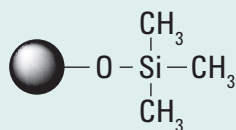
- Non-polar CH with polarity similar to C2
- Retains polar analytes from aqueous matrices
- Good choice when common non-polar sorbents do not provide the required selectivity

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.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous samples, biological fluids	Non-polar	Non-polar compounds

Bond Elut CH (cyclohexyl)

Description	Unit	Part No.
LRC Cartridges		
500 mg, 10 mL	50/pk	12113032
Straight Barrel Cartridges		
50 mg, 1 mL	100/pk	12102063
100 mg, 1 mL	100/pk	12102006
500 mg, 3 mL	50/pk	12102033
1 g, 6 mL	30/pk	12256005
2 g, 12 mL	20/pk	12256039



Bond Elut C1

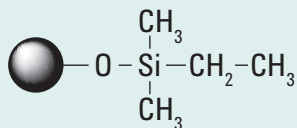
- Least retentive of all alkyl group bonded phases
- Easy retention and release of polar compounds
- Easy retention and release of multi-functional compounds

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 Matrices	Primary Extraction Mechanism	Compound Types
Urine, plasma, biological fluids	Non-polar, polar (as a normal phase extraction)	Strongly non-polar compounds

Bond Elut C1

Description	Unit	Part No.
LRC Cartridges		
100 mg, 10 mL	50/pk	12113004
300 mg, 10 mL	50/pk	12113053
500 mg, 10 mL	50/pk	12113030
Straight Barrel Cartridges		
50 mg, 1 mL	100/pk	12102061
100 mg, 1 mL	100/pk	12102004
100 mg, 3 mL	50/pk	12102090
500 mg, 3 mL	50/pk	12102031



Bond Elut C2

- 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.

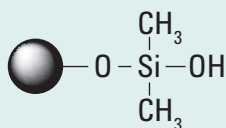
Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous samples, biological fluids	Non-polar	Strongly non-polar compounds

Bond Elut C2

Description	Unit	Part No.
Straight Barrel Cartridges		
50 mg, 1 mL	100/pk	12102060
50 mg, 3 mL	50/pk	12105029
100 mg, 1 mL	100/pk	12102003
100 mg, 3 mL	50/pk	12102117
200 mg, 3 mL	50/pk	12102027
500 mg, 3 mL	50/pk	12102030
500 mg, 6 mL	30/pk	12102115
1 g, 6 mL	30/pk	12256003

Normal Phase (Polar) Silica SPE

Normal phase sorbents are polar and used to retain (extract) polar analytes. For normal phase sorbents, retention decreases as the eluting solvent becomes more polar.



Bond Elut SI

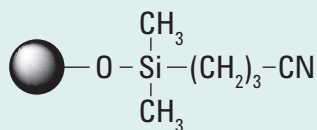
- Highly polar phase retains polar molecules from non-polar matrices
- High purity silica
- Separate compounds with very similar structures

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.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Non-polar organics, oils, lipids	Polar	Cleanup of polar impurities

Bond Elut SI

Description	Unit	40 µm Particle Size	120 µm Particle Size
LRC Cartridges			
100 mg, 10 mL	50/pk	12113010	14113010
500 mg, 10 mL	50/pk	12113036	14113036
Straight Barrel Cartridges			
50 mg, 1 mL	100/pk	12102068	14102068
100 mg, 1 mL	100/pk	12102010	14102010
500 mg, 3 mL	50/pk	12102037	14102037
1 g, 6 mL	30/pk	12256008	14256008
1.5 g, 3 mL	50/pk	12102119	
2 g, 6 mL	30/pk		14256018
5 g, 20 mL	20/pk		14256026
10 g, 60 mL	16/pk		14256034
Bond Elut Jr			
500 mg	100/pk	12162037B	
1 g	100/pk	12166008B	
Other Formats			
500 mg, 3 mL, Gerstel format	50/pk	167232G	



Bond Elut CN-E

- 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.

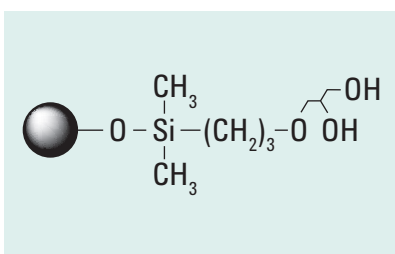
References

Pucci, V, Bugamelli, F, Mandrioli, R, Bartoletti, C, Rossi, N & Raggi, MA (2003) Liquid chromatographic analysis of the cis(Z)- and trans(E)-isomers of clopenthixol in human plasma using a novel solid phase extraction procedure. J. Chromatogr. B., 792, 313-321.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous samples, biological fluids	Non-polar, dipole	Mid-range polarity compounds

Bond Elut CN-E

Description	Unit	Part No.
LRC Cartridges		
100 mg, 10 mL	50/pk	12113007
500 mg, 10 mL	50/pk	12113033
Straight Barrel Cartridges		
50 mg, 1 mL	100/pk	12102064
100 mg, 1 mL	100/pk	12102007
500 mg, 3 mL	50/pk	12102034
5 g, 20 mL	20/pk	12256025



Bond Elut Diol (20H)

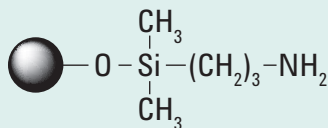
- Provides polar and non-polar modes
- Strong hydrogen bonding with analytes
- Resembles un-bonded silica in its capabilities

Bond Elut Diol resembles un-bonded silica in its tendency for strong hydrogen bonding with analytes. 20H 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.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous, biological fluids, non-polar organics	Polar and non-polar	Polar, weakly non-polar

Bond Elut Diol (20H)

Description	Unit	Part No.
LRC Cartridges		
100 mg, 10 mL	50/pk	12113009
500 mg, 10 mL	50/pk	12113035
Straight Barrel Cartridges		
50 mg, 1 mL	100/pk	12102067
100 mg, 1 mL	100/pk	12102009
500 mg, 3 mL	50/pk	12102036
1 g, 6 mL	30/pk	12256007



Bond Elut NH2

- Normal phase or anion exchange sorbent
- Weaker anion exchange than SAX
- Amenable to separating structural isomers

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.

References

Schenck, F, Lehotay, S, & Vega, V (2002)
Comparison of solid phase extraction sorbents
for cleanup of pesticide residue analysis in fresh
fruit and vegetables. J. Sep. Sci., 25, 883-890.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous, biological fluids, buffered organics	Weak anion exchange	Polar and non-polar strong anions, polar structural isomers

Bond Elut NH2

Description	Unit	40 µm Particle Size	120 µm Particle Size
LRC Cartridges			
100 mg, 10 mL	50/pk	12113014	14113014
200 mg, 10 mL	50/pk	12113067	
500 mg, 10 mL	50/pk	12113040	14113040
Straight Barrel Cartridges			
50 mg, 1 mL	100/pk	12102076	14102076
100 mg, 1 mL	100/pk	12102014	
200 mg, 3 mL	50/pk	12102089	
200 mg, 6 mL	30/pk	12102106	
300 mg, 3 mL	50/pk	12102108	
500 mg, 3 mL	50/pk	12102041	14102041
500 mg, 6 mL	30/pk	12256045	
1 g, 3 mL	50/pk	12102107	
1 g, 6 mL	30/pk	12256012	14256012
2 g, 12 mL	20/pk		14256020
5 g, 20 mL	20/pk		14256028
Bond Elut Jr			
500 mg	50/pk	12162041B	
1 g, 3 mL	50/pk	12166012B	
Other Formats			
200 mg, 3 mL, Gerstel format	50/pk	165022G	
500 mg, 3 mL, Gerstel format	50/pk	165032G	

VersaPlate Formats

Description	Particle Size (µm)	50 mg	100 mg
Preassembled 96-well plate	40	75405050	7540501C
VersaPlate tubes, 96/pk	40	75505050	7550501C

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:**(Cholesterol 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

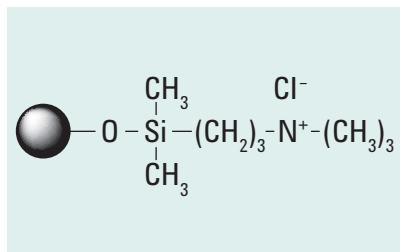
(Monoglycerides)

2:1 chloroform:methanol

Simpson, N & Van Horne, C (eds) (1993) The Handbook of Sorbent Extraction Technology. Varian, Inc., Walnut Creek CA, USA.

Ion Exchange Silica SPE

Ion exchange phases are more dependent on pH, ionic strength, and counter-ion strength than on solvent strength. These phases depend on ionic interactions as the primary retention mechanism.



Bond Elut SAX

- 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.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous, biological fluids	Anion exchange	Weak acidic compounds

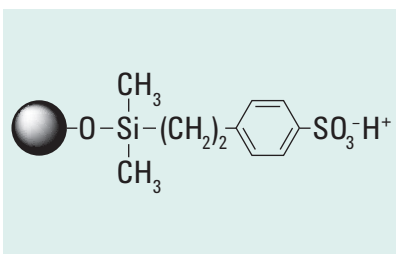


Bond Elut SAX

Description	Unit	40 µm Particle Size	120 µm Particle Size
LRC Cartridges			
100 mg, 10 mL	50/pk	12113017	14113017
500 mg, 10 mL	50/pk	12113043	14113043
Straight Barrel Cartridges			
50 mg, 1 mL	100/pk	12102079	14102079
100 mg, 1 mL	100/pk	12102017	14102017
100 mg, 3 mL	50/pk	12102125	
500 mg, 3 mL	50/pk	12102044	14102044
500 mg, 6 mL	30/pk	12102144	
1 g, 3 mL	50/pk	12102087	
1 g, 6 mL	30/pk	12256013	14256013
2 g, 6 mL	30/pk	12256051	
2 g, 12 mL	20/pk	12256021	14256021
5 g, 20 mL	20/pk	12256029	14256029
10 g, 60 mL	16/pk	12256037	14256037
Bond Elut Jr			
500 mg	100/pk	12162044B	
1 g	100/pk	12166013B	
Other Formats			
Prospekt cartridge, 800 Series	96/pk	12281022	

VersaPlate Formats

Description	Particle Size (µm)	50 mg
Preamsembled 96-well plate	40	75408050
VersaPlate tubes, 96/pk	40	75508050



Bond Elut SCX

- Useful for compounds with both cationic and non-polar characteristics
- Superior cleanup from a single sorbent
- Very low pKa ligand elicits strong analyte interaction

Bond Elut SCX is a strong cation exchanger with a very low pKa. Although the pKa 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.

References

Codony, R, Compañó, R, Granados, M, Garcia-Regueiro, JA & Dolores 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, Shaman, 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.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous, biological fluids, buffered organics	Cation exchange	Weak basic compounds

Bond Elut SCX

Description	Unit	40 µm Particle Size	120 µm Particle Size
LRC Cartridges			
100 mg, 10 mL	50/pk	12113013	14113013
500 mg, 10 mL	50/pk	12113039	14113039
Straight Barrel Cartridges			
50 mg, 1 mL	100/pk	12102075	14102075
100 mg, 1 mL	100/pk	12102013	14102013
100 mg, 3 mL	50/pk	12102098	
500 mg, 3 mL	50/pk	12102040	14102040
1 g, 6 mL	30/pk	12256011	14256011
1.5 g, 3 mL	50/pk	12102104	
2 g, 12 mL	20/pk	12256053	14256019
3 g, 6 mL	30/pk	12256054	
5 g, 20 mL	20/pk		14256027
10 g, 60 mL	16/pk		14256035

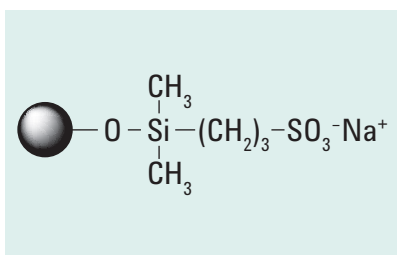
(Continued)

Bond Elut SCX

Description	Unit	40 µm Particle Size	120 µm Particle Size
Bond Elut Jr			
500 mg	100/pk	12162040B	
1 g	100/pk	12166011B	
Other Formats			
200 mg, 3 mL, Gerstel format	50/pk	167022G	

VersaPlate Formats

Description	Particle Size (µm)	50 mg	100 mg
Preassembled 96-well plate	40		7540701C
VersaPlate tubes, 96/pk	40	75507050	7550701C

**Bond Elut PRS**

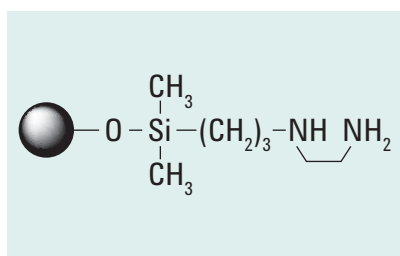
- Strong cation exchange sorbent, also capable of polar and hydrogen bonding interactions
- No appreciable non-polar interactions
- Unique selectivity properties

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 pKa of PRS, it is recommended for weaker cationic species such as pyridinium compounds.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous, biological fluids, buffered organics	Cation exchange	Basic compounds (amine + pyridinium containing)

Bond Elut PRS

Description	Unit	Part No.
LRC Cartridges		
100 mg, 10 mL	50/pk	12113012
500 mg, 10 mL	50/pk	12113038
Straight Barrel Cartridges		
50 mg, 1 mL	100/pk	12102074
100 mg, 1 mL	100/pk	12102012
200 mg, 3 mL	50/pk	12102094
500 mg, 3 mL	50/pk	12102039
1 g, 6 mL	30/pk	12256010



Bond Elut PSA

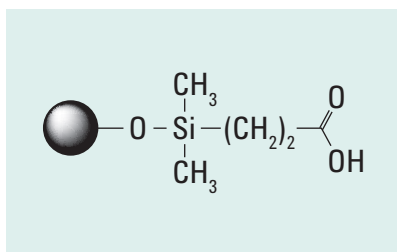
- Alternative choice to Bond Elut NH2 for polar compounds
- Higher ionic capacity than NH2

Bond Elut PSA is an alkylated amine sorbent that contains two different amino functionalities – one secondary and one primary. This gives a slightly higher pKa and ionic capacity compared to Bond Elut NH2. PSA has a significantly higher carbon load than most amino functional sorbents, thus is a better choice for polar compounds, which retain too strongly on Bond Elut NH2.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous, biological fluids, buffered organics	Strong anion exchange	Acidic compounds (Fruit acid removal for QuEChERS)

Bond Elut PSA

Description	Unit	Part No.
LRC Cartridges		
100 mg, 10 mL	50/pk	12113015
500 mg, 10 mL	50/pk	12113041
Straight Barrel Cartridges		
50 mg, 1 mL	100/pk	12102077
100 mg, 1 mL	100/pk	12102015
500 mg, 3 mL	50/pk	12102042
1 g, 6 mL	30/pk	12256140
2 g, 12 mL	20/pk	12256055
Bond Elut Jr		
500 mg	100/pk	12162042B
1 g	100/pk	12166050B



Bond Elut CBA

- 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 can be used with a wider range of counter-ions than lower pKa sorbents like SCX, and will demonstrate easier elution of quaternary amine functionalized analytes.

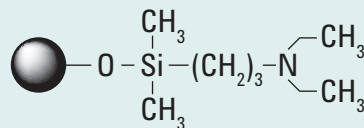
References

Murayama, N. & Sudo, K (1997) High performance liquid chromatographic method for determination of DX-9065a, a novel anticoagulant, in human urine and feces using cation-exchange solid-phase extraction. J. Chromatogr. Biomed. Appl., 692, 389-396.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous samples, biological fluids	Weak anion exchange	Strong and weak acids

Bond Elut CBA

Description	Unit	Part No.
LRC Cartridges		
100 mg, 10 mL	50/pk	12113011
500 mg, 10 mL	50/pk	12113037
Straight Barrel Cartridges		
50 mg, 1 mL	100/pk	12102073
100 mg, 1 mL	100/pk	12102011
200 mg, 3 mL	50/pk	12102097
200 mg, 3 mL	50/pk	12102124
500 mg, 3 mL	50/pk	12102038
1 g, 6 mL	30/pk	12256009
2 g, 12 mL	20/pk	12256058



Bond Elut DEA

- Weak anion exchanger
- More polar than C8 but less polar than C2 or CN
- Alkyl side chains confer moderately non-polar characteristics

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.

References

Kline, W., Matuszewski, B & Bayne, W (1990) Determination of 4-amino-1-hydroxybutane-1, 1-bisphosphonic acid in urine by automated pre-column derivatization with 2,3-naphthalene dicarboxyaldehyde and high performance liquid chromatography with fluorescence detection. J. Chromatogr. Biomed. Appl., 534, 139-149.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Water, biological fluids, non-polar extracts	Weak cation exchange	Weak and strong basic compounds

Bond Elut DEA

Description	Unit	40 µm Particle Size	120 µm Particle Size
LRC Cartridges			
100 mg, 10 mL	50/pk	12113016	14113016
500 mg, 10 mL	50/pk	12113042	14113042
Straight Barrel Cartridges			
50 mg, 1 mL	100/pk	12102078	14102078
100 mg, 1 mL	100/pk	12102016	14102016
500 mg, 3 mL	50/pk	12102043	14102043

VersaPlate Formats

Description	Particle Size (µm)	50 mg	100 mg
Preamsembled 96-well plate	40		7540701C
VersaPlate tubes, 96/pk	40	75507050	7550701C

Mixed Mode Silica SPE

Bond Elut AccuCAT

- SCX and SAX functionalities offer broad analyte extraction potential
- Ultra clean, mixed sorbent bed delivers reproducible extractions
- 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.

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.

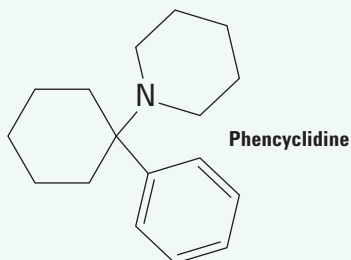
Lenders, JW, Eisenhofer, G, Armando, I, Keiser, HR, Goldstein, DS and Kopin, IJ (1993) Determination of metanephrines in plasma by liquid chromatography with electrochemical detection. *Clin. Chem.*, 39, 97-103.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Urine, plasma and biological fluids, beverages and food	Strong cation and anion exchange	Catecholamines, acrylamide in liquids and food

Bond Elut AccuCAT

Description	Unit	Part No.
LRC Cartridges		
200 mg, 10 mL	60/pk	12282005
600 mg, 10 mL	60/pk	12282001
Straight Barrel Cartridges		
200 mg, 3 mL	60/pk	12282003
200 mg, 6 mL	30/pk	12282004
400 mg, 6 mL	30/pk	12282006
600 mg, 3 mL	60/pk	12282002

Extraction of phencyclidine (PCP) from human urine using Bond Elut Certify



Sorbent Conditioning:

100% MeOH then 0.1 M phosphate buffer, pH 6.0

Sample Treatment:

To 5 mL urine, add 2 mL 0.1 M 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 1.0 M AcOH then dry sorbent under vacuum for 5 min
2. 6 mL MeOH, dry sorbent for 2 min

Analyte Elution:

2 mL 2% NH₄OH in EtOAc

Bond Elut Certify

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

The Bond Elut Certify extraction cartridge is a mixed mode sorbent containing non-polar C8 strong cation exchanger functionalities. 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.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Urine, plasma, saliva, blood, biological fluids	Non-polar and strong cation exchange	Basic drugs, basic drugs of abuse

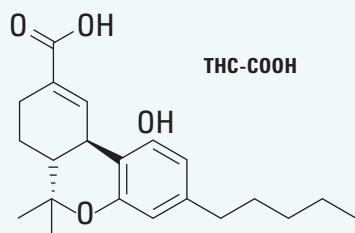
Bond Elut Certify

Description	Unit	40 µm Particle Size	120 µm Particle Size
LRC Cartridges			
130 mg, 10 mL	50/pk	12113050	14113050
200 mg, 10 mL	50/pk	12113054	14113054
300 mg, 10 mL	50/pk	12113052	14113052
Straight Barrel Cartridges			
50 mg, 3 mL	50/pk	12105030	
100 mg, 3 mL	50/pk	12102051	14102051
100 mg, 6 mL	30/pk	12256146	
200 mg, 3 mL	50/pk	12102145	
200 mg, 6 mL	30/pk	12256145	
300 mg, 3 mL	50/pk	12102081	
300 mg, 6 mL	30/pk	12102082	
500 mg, 6 mL	30/pk	12102093	14102093
1 g, 6 mL	30/pk	12102085	14102085
Other Formats			
Prospekt cartridge, 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, 96/pk	40	75509025	75509050	7550901C

Extraction of THC-COOH from human urine using Bond Elut Certify II



Sorbent Conditioning:

100% methanol then 0.1 M acetate buffer, pH 7.0

Sample Treatment:

To 6 mL urine, add 300 μ L 10 M potassium hydroxide and matrix spike standard. Vortex, hydrolyze at 60°C for 15 min, cool. Add 165 μ L glacial acetic acid and 2 mL 95% 0.1 M 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 H₂O/MeOH, then dry sorbent under vacuum for 10 min
2. 2 mL EtOAc, dry sorbent for 0.5 min

Analyte Elution:

2 mL 1% AcOH in 25% EtOAc/75% hexane

Bond Elut Certify II

- Ideal for non-polar and anionic compounds
- Optimized for acidic drug analysis
- 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 with non-polar C8 and strong anion exchange (SAX) functionalities. It has been optimized for acidic drugs such as 11-nor- Δ^9 -tetrahydrocannabinol-carboxylic acid, salicylic acid, ibuprofen, acetaminophen and other compounds that possess both non-polar and anionic characteristics.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Urine, plasma, saliva, blood, biological fluids	Non-polar and strong anion exchange	Acidic drugs, acidic drugs of abuse

Bond Elut Certify II

Description	Unit	40 μ m Particle Size	120 μ m Particle Size
LRC Cartridges			
100 mg, 10 mL	50/pk	12113063	
200 mg, 10 mL	50/pk	12113051	14113051
Straight Barrel Cartridges			
50 mg, 3 mL	50/pk	12105031	
200 mg, 3 mL	50/pk	12102080	14102080
500 mg, 6 mL	30/pk	12102084	14102084
1 g, 6 mL	30/pk	12102088	14102088
Other Formats			
Prospekt cartridge, 800 Series	96/pk	12281102	

Inorganic SPE

The following SPE phases have varying degrees of polarity and surface acidity or basicity. They are primarily used to retain polar analytes. For these phases, solvent retention generally decreases as the solvent becomes more polar.

Bond Elut Florisil

- Pesticide Residue (PR) grade
- For cleanup of polar interferences from non-polar samples
- Economical
- Fast flow, 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 is therefore an attractive alternative to silica if the sample matrix is particularly viscous.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Non-polar organics	Polar compounds	Organic extracts, non-polar environmental extracts

Bond Elut Florisil

Description	Unit	Part No.
LRC Cartridges		
500 mg, 10 mL	50/pk	12113049
Straight Barrel Cartridges		
100 mg, 1 mL	100/pk	12102024
500 mg, 3 mL	50/pk	12102050
1 g, 3 mL	50/pk	12102109
1 g, 6 mL	30/pk	12256014
1 g, 20 mL	20/pk	12256047
2 g, 12 mL	20/pk	12256022
2 g, 20 mL	20/pk	12256046
5 g, 20 mL	20/pk	12256030
10 g, 60 mL	16/pk	12256038
Bond Elut Jr		
500 mg, 100/pk	100/pk	12162050B
1 g, 100/pk	100/pk	12166014B
Other Formats		
500 mg, 3 mL, Gerstel format	50/pk	164632G

Bond Elut Alumina

- Available in acidic (A), basic (B) and neutral (N) formats
- High extraction efficiency
- 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.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Non-polar organics	Polar	Polar cleanup

Bond Elut Alumina A

Description	Unit	Part No.
Straight Barrel Cartridges		
50 mg, 1 mL	100/pk	12102069
500 mg, 3 mL	50/pk	12102047
1 g, 6 mL	30/pk	12256043

Bond Elut Alumina B

Description	Unit	Part No.
Straight Barrel Cartridges		
500 mg, 3 mL	50/pk	12102048
1 g, 6 mL	30/pk	12256044
Bond Elut Jr		
500 mg	100/pk	12162048B

Bond Elut Alumina N

Description	Unit	Part No.
LRC Cartridges		
500 mg	50/pk	12113048
Straight Barrel Cartridges		
100 mg, 1 mL	100/pk	12102023
500 mg, 3 mL	50/pk	12102049
20 g, 60 mL	16/pk	12256059
Bond Elut Jr		
500 mg	100/pk	12162049B
1 g	100/pk	12166045B

Bond Elut Sodium Sulfate Drying Cartridges

- Highly effective pre-packed dessicant
- Clean ACS grade, anhydrous sodium sulfate
- 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.

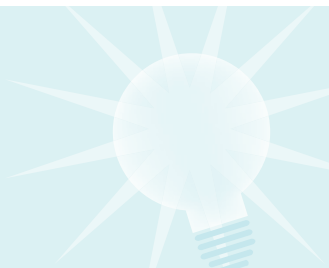
Bond Elut Sodium Sulfate Drying Cartridges

Description	Unit	Part No.
LRC Cartridges		
1 g, 10 mL	100/pk	12131033
Straight Barrel Cartridges		
15 g, 60 mL	100/pk	12132004
Bond Elut Jr		
1.4 g	100/pk	12162052B
2.2 g	100/pk	12162054B
3 g	100/pk	12162051B

Tips & Tools

Agilent offers Bond Elut Adapters compatible with these tube formats.

Turn to page 212.



Specialty SPE

Bond Elut Carbon

- Excellent retention for small organics, including those 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 of analytes across the polarity range, for improved multi-residue analysis

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

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).

Typical Matrices	Primary Extraction Mechanism	Compound Types
Organic plant and tissue extracts	Wide range non-polar retention	Cleanup of pigments and endogenous plant extracts for pesticide and herbicide analysis

Bond Elut Carbon

Description	Unit	Part No.
Straight Barrel Cartridges		
50 mg, 1 mL	100/pk	126414
100 mg, 1 mL	100/pk	126418
250 mg, 6 mL	30/pk	12102201
500 mg, 6 mL	30/pk	12252201

Bond Elut Carbon/NH2

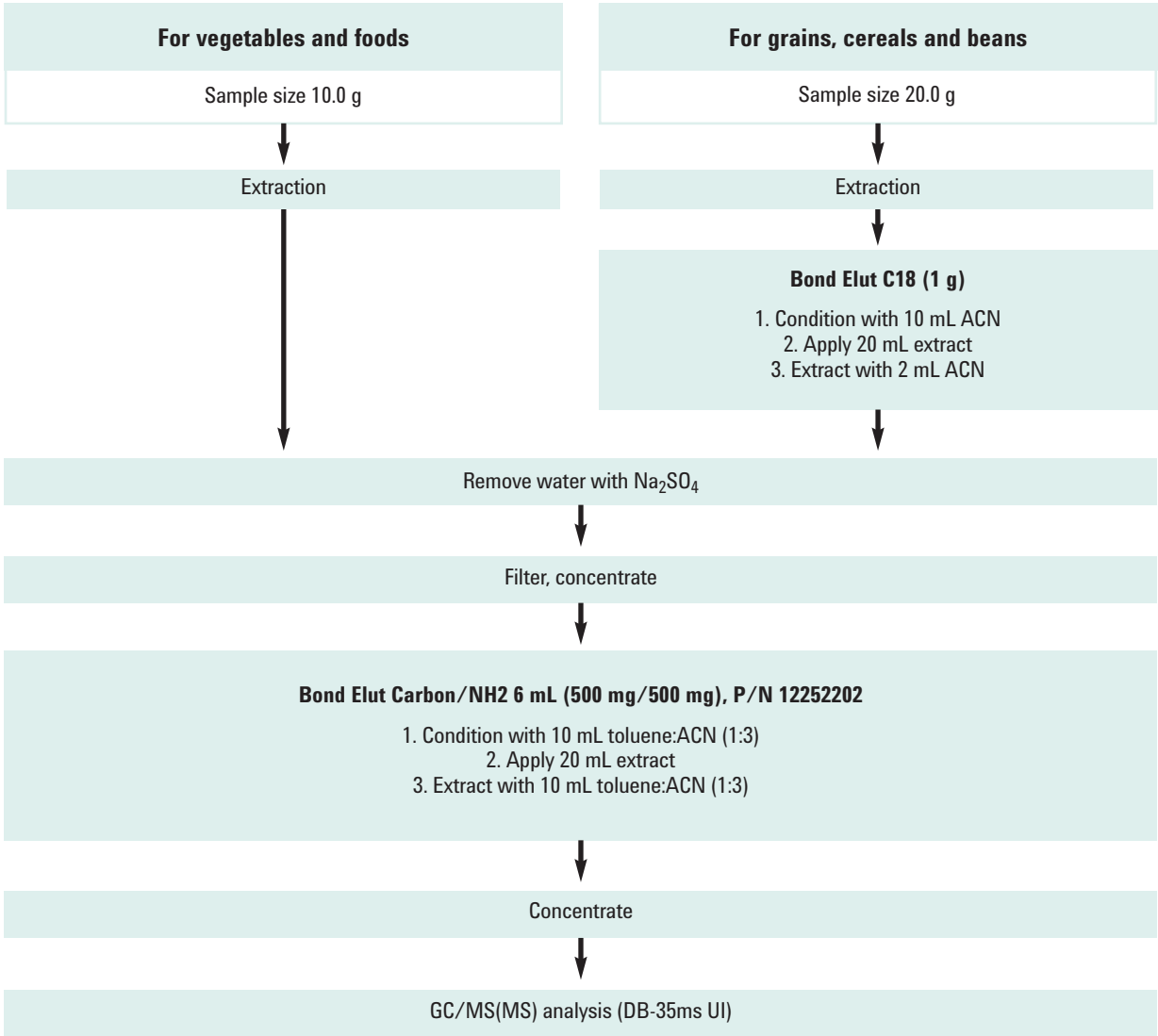
Description	Unit	Part No.
Straight Barrel Cartridges		
500/500 mg, 6 mL	30/pk	12252202
500/500 mg, 20 mL	20/pk	3664325032

Bond Elut Carbon/PSA

Description	Unit	Part No.
Straight Barrel Cartridges		
250/250 mg, 3 mL	50/pk	12102042C250
500/500 mg, 6 mL	30/pk	12102042C500



Method for the simultaneous monitoring of pesticide residues in agricultural products – extraction, refining (cleanup) and quantitative analysis



Bond Elut Atrazine

- 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.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Water sources	Non-polar	Atrazine and atrazine by-products

Bond Elut Atrazine

Description	Unit	120 μ m Particle Size
Straight Barrel Cartridges		
3 g, 20 mL	20/pk	12256111

Bond Elut Cellulose

- 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 use a pure micro-granular cellulose powder that is packed between two 20 μ m polyethylene frits. The cellulose phase is very stable over a wide pH range with extremely low metal content. 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.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous and non-polar organics	Polar (Hydroxyl)	Polar impurities/compounds

Bond Elut Cellulose

Description	Unit	Part No.
Straight Barrel Cartridges		
300 g, 3 mL	500/pk	12102095

Bond Elut PCB

- Optimized bed mass affords 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 easy 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 Matrices	Primary Extraction Mechanism	Compound Types
Water sources	Non-polar	PCBs

Bond Elut PCB

Description	Unit	Part No.
Straight Barrel Cartridges		
1 g, 3 mL	50/pk	12105032

Tips & Tools

Agilent offers a variety of e-Seminars and on-site training to help you learn how to be a more effective chromatographer.

For more information, visit www.agilent.com/chem/education



Bond Elut Mycotoxin

- 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.

The Bond Elut Mycotoxin method for extraction and cleanup is successful with 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 way – the toxin analytes pass through the cartridge while the food matrix components are retained.

References

Kiötzel, 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.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous and polar organic grain extracts (beer, wine, sake)	Ionic cleanup	Mycotoxins (trichothecenes and zearalenones)

Bond Elut Mycotoxin

Description	Unit	Part No.
500 mg, 3 mL	50/pk	12102167
Bond Elut Jr		
500 mg	100/pk	12165001B

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/H₂O (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 cartridge.
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/H₂O (20/80; v/v).
5. Inject into LC/MS/MS.

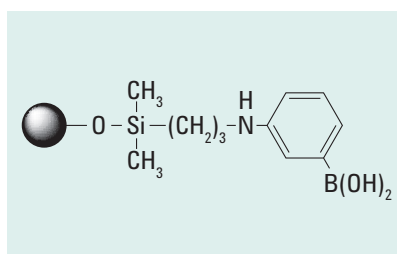
Wheat beer

	% 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 cleanup of type A- and B-trichothecenes [deoxynivalenol [DON], HT-2 toxin [HT-2], T-2 toxin [T-2] and zearalenone (ZEA).



Bond Elut PBA

- Unique phenylboronic acid sorbent
- High specificity for cis-diol compounds
- Amenable for a broad range of bio-molecule applications

Bond Elut PBA is a unique silica SPE sorbent containing a phenylboronic acid functionality that can retain analytes via a reversible covalent bond. This very strong covalent retention mechanism enables high specificity and cleanliness. The boronate group has a strong affinity for cis-diol containing compounds such as catechols, nucleic acids, some proteins, carbohydrates and PEG compounds. Aminoalcohols, alpha-hydroxy amides, keto compounds, and others can also be retained.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Plasma, urine, aqueous and biological fluids	Covalent bonding	cis-diol-containing compounds, catecholamines, ribonucleotides, amino alcohols, diketo and triketo compounds

Bond Elut PBA

Description	Unit	Part No.
LRC Cartridges		
100 mg, 10 mL	50/pk	12113018
Straight Barrel Cartridges		
100 mg, 1 mL	20/pk	12102018
100 mg, 1 mL	100/pk	12102019
500 mg, 6 mL	30/pk	12102105

Generic Method

Condition:

1. 70:30 H₂O:ACN with 1% TFA
2. 50 mM phosphate buffer (pH 10)

Sample Addition:

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

Interference Wash:

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

Analyte Elution:

70:30 H₂O: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

EnvirElut

- 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 Matrices	Primary Extraction Mechanism	Compound Types
Water sources, extracted soil samples	Non-polar	Pesticide and industrial chemical residues

EnvirElut

Description	Unit	Part No.
Straight Barrel Cartridges		
50 mg, 3 mL (Herbicide)	50/pk	12272006
100 mg, 6 mL (PAH)	30/pk	12272005
500 mg, 6 mL (Pesticide)	30/pk	12272004

Diatomaceous Earth Sorbents

Chem Elut and Hydromatrix

- High purity sorbent supported liquid extraction (SLE) applications
- Available in pre-packed cartridges or bulk
- Packing method delivers excellent tube-to-tube reproducibility

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 base-treated cartridge can remove residual acid compounds from a variety of matrices.

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

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.

Typical Matrices	Primary Extraction Mechanism	Compound Types
Aqueous, biological fluids, organic reaction mixtures (scavenging)	Solid supported LLE	Nitrosamines, pesticides, herbicides



Combilute plate, 200 mg, 65401507

Chem Elut Cartridges

Buffered pH	Volume (mL)	Unit	Part No.
4.5	3	100/pk	12198004
9.0	3	100/pk	12198005
Unbuffered	0.3	100/pk	12198001
	1	100/pk	12198002
	3	100/pk	12198003
	5	100/pk	12198006
	10	100/pk	12198007
	20	100/pk	12198008
	50	50/pk	12198009
	100	25/pk	12198010
	300	15/pk	12198011

Hydromatrix

Description	Part No.
Hydromatrix bulk material, 1 kg	198003
Hydromatrix bulk material, 4 kg	198004

Other Formats

Description	Part No.
Combilute plate, 200 mg	65401507
Preamsembled 96-well plate	75430260
VersaPlate tubes, 96/pk	75530260

Bulk SPE

Bondesil Bulk Sorbents

- Ideal for dispersive cleanup techniques
- Advanced bonding offers reproducible batch-to-batch performance
- Multi-kilo quantities available upon request

Bondesil Bulk Sorbents

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

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 require washing, drying and re-packing after every sample.

Mega Bond Elut Flash

Description	Sorbent Mass (g)	Volume (mL)	Unit	40 µm Particle Size
C18	1	60	16/pk	12256060
	2	12	20/pk	12256015
	5	20	20/pk	12256023
	10	60	16/pk	12256031
	20	60	16/pk	12256078
	25	150	8/pk	12256079
	50	150	8/pk	12256080
	75	150	8/pk	12256081
NH2	2	12	20/pk	12256020
	5	20	16/pk	12256028
	10	60	16/pk	12256036
	20	60	16/pk	12256074
	25	150	8/pk	12256075
	50	150	8/pk	12256076
	70	150	8/pk	12256077
SCX	20	60	16/pk	12256066
	25	150	8/pk	12256070
	50	150	8/pk	12256072
	70	150	8/pk	12256073
SI	2	12	20/pk	12256018
	5	20	20/pk	12256026
	10	60	16/pk	12256034
	15	60	16/pk	12256068
	20	150	16/pk	12256042
	25	150	8/pk	12256069
	50	150	8/pk	12256067
	70	150	8/pk	12256071



Bond Elut 96 Round-well plates

Bond Elut Accessories

Bond Elut 96 Round-well Plates

- 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 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.

Polymeric Sorbents

Description	Loading (mg)	Part No.
Plexa	10	A4969010
	30	A4969030
Plexa PCX	10	A4968010
	30	A4968030
Plexa PAX	10	A4967010
	30	A4967030
LMS	10	A4961010
NEXUS	30	A4962030

All Bond Elut silica 96 round-well plates are 40 µm particle size

Silica Sorbents

Description	Loading (mg)	Part No.
C2	50	A4961150
	100	A496111C
C8	25	A4960325
	50	A4960350
	100	A496031C
C18	25	A4960125
	50	A4960150
	100	A496011C
C18 OH	100	A496291C
CBA	25	A4960625
	50	A4960650
	100	A496061C
CH	25	A4962225
	50	A4962250
	100	A496221C
CN-E	25	A4960425
	50	A4960450
	100	A496041C
CN-U	50	A4961450
Certify	25	A4960925
	50	A4960950
	100	A496091C
PBA	100	A496121C
PH	100	A496151C
NH2	25	A4960525
	50	A4960550
	100	A496051C
SAX	100	A496301C
SCX	25	A4960725
	50	A4960750
	100	A496071C

All Bond Elut silica 96 round-well plates are 40 µm particle size



Bond Elut 96 Square-well plate

Bond Elut 96 Square-well Plates

- 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 adds 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.

Polymeric Sorbents

Description	Loading (mg)	Part No.
Plexa	10	A3969010
	30	A3969030
Plexa PCX	10	A3968010
	30	A3968030
Plexa PAX	10	A3967010
	30	A3967030
LMS	10	A3961010
	25	A3961025
NEXUS	60	A3962060

Silica Sorbents

Description	25 mg	50 mg	100 mg
C8	A3960325	A3960350	A396031C
C18	A3960125	A3960150	A396011C
C18-OH	A3962925	A3962950	A396291C
CBA	A3960625	A3960650	A396061C
Certify	A3960925	A3960950	A396091C
NH2	A3960525	A3960550	A396051C
PH	A3961525	A3961550	A396151C
PBA			A396121C
SAX	A3960825	A3960850	A396081C
SCX	A3960725	A3960750	A396071C

Manifolds and Accessories

Description	Part No.
96-well manifold, acrylic	5133000
96-well manifold, shimset	12236104
Square-well collection plates, 2 mL	5133009
Square-well collection plates, 1 mL	5133008
Square-well collection plates, 350 µL	5133007
Square-well collection plate cover	WA77040004
Sealing tape pad	12143105

Bond Elut Empty SPE Cartridges

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

A variety of empty reservoirs is available for packing custom SPE cartridges with bulk Bondesil or other desired sorbents. Cartridges are available from 1 to 60 mL. Order frits separately, or see below for reservoirs with pre-installed frits.

Bond Elut Empty SPE Cartridges

Volume (mL)	Unit	Part No.
1	100/pk	12131007
3	100/pk	12131008
6	100/pk	12131009
12	100/pk	12131010
20	100/pk	12131011
60	100/pk	12131012

Bond Elut Empty SPE Cartridges with Two Frits

- 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.

Bond Elut Empty SPE Cartridges with Two Frits

Volume (mL)	Unit	Part No.
1	100/pk	12131013
3	100/pk	12131014
6	100/pk	12131015
12	100/pk	12131016
20	100/pk	12131017
60	100/pk	12131018

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.



Polypropylene Frits, 12131021

20 µm Polypropylene Frits for SPE Cartridges

Diameter (mm)	To Fit Tube Size (mL)	Unit	Part No.
6.4	1	100/pk	12131019
9.5	3	100/pk	12131020
12.7	6	100/pk	12131021
15.9	12	100/pk	12131022
20.6	20	100/pk	12131023
27.0	60	100/pk	12131024

Bond Elut Adapters

- 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, allowing the following configurations:

Bond Elut Adapters

Description	Unit	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



Bond Elut Adapter Configurations

Configuration 1: Stack two cartridges to perform multi-sorbent methods

Configuration 2 + 3: Increase 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 adapter. Gentle pressure can then be 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 high vacuum.

Luer Stopcocks

- 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 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.



Luer stopcocks, 12131005

Luer Stopcocks

Description	Unit	Part No.
Luer stopcocks	15/pk	12131005

ASPEC Adapter Caps

- 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

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



Gilson adapter cap, 12131034

ASPEC Adapter Caps

Description	Unit	Part No.
Gilson adapter cap, 1 mL, yellow	1000/pk	12131034
Gildson adapter cap, 3 mL, blue	1000/pk	12131035

Vac Elut 20 Manifold

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

Engineered to increase laboratory productivity, the corrosion-resistant Vac Elut 20 permits 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.

The Vac Elut 20 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 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.

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
Racks for Glass Basins	
Standard glass basin	12234505
Collection rack for 10 x 75 mm test tubes	12234517
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
Replacement Components and Accessories	
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



Vac Elut 20 manifold tall glass basin, 12234104

Vac Elut 20 Manifold Tall Glass Basin

- 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.

Vac Elut 20 Manifold Tall Glass Basin

Description	Part No.
Vac Elut 20 Manifold with tall glass basin and collection rack for 16 x 150 mm test tubes, complete system	12234104



Vac Elut 12 manifold, 5982-9110

Vac Elut 12 Manifold

Agilent manifolds and accessories complement the quality of our sorbents. Configurations and individual components can be purchased, providing flexibility and increased capability at any stage, from method development to high-throughput operation.

Vac Elut 12 Manifold

Description	Part No.
12-port vacuum manifold processing station Includes rack for 16 x 100 mm tubes	5982-9110

Replacement Parts for Vacuum Manifolds

Description	Part No.
Manifold ball ring/vacuum quick release	5982-9106
Manifold exit valve replacement kit	5982-9107
Manifold vacuum gauge assembly with valve	5982-9108
White cover for 12-port manifold	5982-9111
Sealing gasket for 12-port manifold	5982-9112
Glass chamber for 12-port manifold	5982-9113
12-port rack for 13 x 75 mm tubes	5982-9114
12-port rack for 13 x 100 mm tubes	5982-9115
12-port rack for 16 x 75 mm tubes	5982-9116
12-port rack for 16 x 100 mm tubes	5982-9117

Parts and Disposables for Cartridge Manifolds

Description	Unit	Part No.
Manifold disposable needle tip	20/pk	5982-9100
Manifold stainless steel needle with polypropylene coating	20/pk	5982-9101
Manifold short valve stopcock	20/pk	5982-9102
Manifold long valve stopcock	20/pk	5982-9103
Manifold male luer plugs	25/pk	5982-9104
Manifold needle tip ejector tool		5982-9105
Cartridge stacking adapters	12/pk	5982-9109



Vac Elut SPS 24 manifold

Vac Elut SPS 24 Manifold

- 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 simultaneous processing of up to 24 SPE cartridges. 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 ultimate feature of the SPS 24 manifold is its waste diversion funnel, which enables all steps of the SPE procedure to be completed without removing the lid. Since the collection rack is placed inside the unit before extraction begins, splash back and cross contamination are eliminated, while hazardous waste and biohazard exposure are minimized.

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.

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
Replacement Components and Accessories	
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	12234005
Includes base exit tube, hose connector, washer, center tube, 900 connector elbow	
Stainless steel delivery needles, 25/pk	12234038
Waste funnel for 12 x 75 or 13 x 100 mm test tubes, 5/pk	12234032

Vacuum Manifolds for 96-well Plates

- Can handle 96-well fixed position plates or second version to handle 96-well flexible format plate
- Constructed with polypropylene base and polyethylene lid
- Small footprint
- Supplied with on/off valve, vacuum gauge, and fine vacuum control valve
- disposable reservoir tray collects excess sample and wash solvents
- Spacer inserts can be placed into the base so that collection plates of differing heights can be processed (both deep-well and standard microtiter plates), ensuring maximum penetration of the SPE plate into the collection plate and reducing well-to-well contamination
- Solvent resistance gasket in the manifold lid



96-well vacuum manifold base assembly,
5185-5797

Vacuum Manifolds for 96-well Plates

Description	Part No.
96-well vacuum manifold base assembly Includes base, vacuum gauge and needle valve	5185-5797



Base O-ring, 5185-5779



Collection plate spacer in sizes to match the collection plate used

Parts and Disposables for 96-well Plate Manifolds

Description	Unit	Part No.
Base O-ring for 96-well plate manifold		5185-5779
Collection plate spacer for Agilent 1 mL deep-well, 12 mm		5185-5775
Collection plate spacer for microtiter plate and Agilent 0.5 mL shallow well plate, 29 mm		5185-5781
Collection plate spacer for most industry-standard deep-well plates, 2 mm		5185-5780
Disposable reservoir tray for 96-well manifold	25/pk	5185-5782
96-well vacuum manifold base assembly Includes base, vacuum gauge and needle valve		5185-5797
Lid for 96-fixed well vacuum manifold		5185-5798
Lid gasket for 96-well plate manifold		5185-5778
Luer adapters for 96-well flexible cartridge	25/pk	5185-5789
Needle valve for 96-well manifold		5185-5783
On/off valve for 96-well manifold		5185-5785
Vacuum gauge for 96-well manifold		5185-5786
Vacuum outlet (Ni plated) for 96-well manifold		5185-5784

Sealing Mats

Sealing mats help prevent sample contamination or evaporation that can occur when plates are exposed to environmental conditions.

Sealing Mats

Description	Unit	Part No.
96-well plate sealing mats, round	50/pk	5042-1389
96-well plate sealing mats, square	10/pk	5982-9996

Disk SPE

SPEC Disk SPE

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

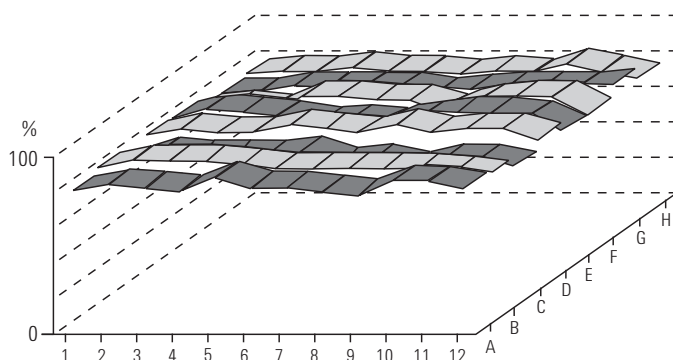
Using an advanced disk design, SPEC delivers superior flow characteristics and trouble-free automation. Due to the low volume of the extraction bed, very low elution volumes can be used. This means that, in some applications, evaporation and reconstitution steps can be eliminated, resulting in accelerated 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 provides high recoveries at low elution volumes — as low as 100 μ L. 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

Uniform recovery and reproducibility between wells from the same well plate

- **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 cleanup 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.



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 96-well plate

SPEC 96-well Plates

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

SPEC 96-well Plates, 15 mg

Sorbent Phase	Part No.
Silica-based Sorbents	
C18	A59603
C18AR	A59619
C18AR, 30 mg	A5960330
C2	A59601
C8	A59602
CN	A59606
DAU	A596DAU
NH2	A59607
Phenyl	A59610
Ion Exchange Sorbents	
SAX	A59605
SCX	A59604
Mixed Mode Sorbents	
MP1	A59611
MP3	A59620
Method Development Kit	
C2, C8, C18, C18AR, CN, MP1, MP3, PH	A59630

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.

SPEC SPE Cartridges, 100/pk

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



SPEC disks, C8, A74702,
and SPEC SPE Cartridges, C18, A5320320

SPEC Disks and Accessories

Description	Part No.
SPEC disks, C8, 47 mm, 24/pk	A74702
SPEC disks, C18AR, 47 mm, 20/pk	A74819
SPEC disks, C18AR, 90 mm, 12/pk	A79019
SPEC environmental disk manifold	A712
SPEC environmental disk holder, 47 mm	A713
SPEC flask, 1 L, 40/35 mm	A714

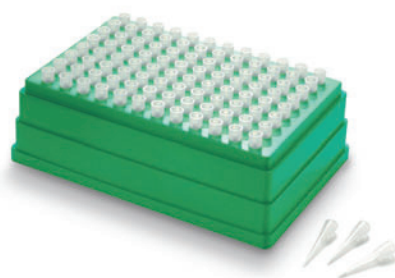
Empore Disk SPE

- 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 and two diameters, 47 and 90 mm. Increasing the diameter of the disk gives better solvent flow rates through the disk.

Empore Disk SPE

Description	Unit	Part No.
Anion extraction disks, 47 mm	20/pk	12145012
Chelating extraction disks, 47 mm	20/pk	12145029
SDB-XC extraction disks, 47 mm	20/pk	12145010
SDB-XC extraction disks, 90 mm	10/pk	12145011
C8 extraction disks, 47 mm	20/pk	12145002
C8 extraction disks, 90 mm	10/pk	12145034
C18 extraction disks, 47 mm	20/pk	12145004
C18 extraction disks, 90 mm	10/pk	12145007



Micro-volume SPE

OMIX Tips

- Fast, uniform flow maximizes productivity and reproducibility
- Minimal peptide losses lead to higher recoveries
- Available in three phases and sizes to deliver better sequence coverage

OMIX tips with monolithic sorbent tip technology offer dependable purification and superior results in proteomics research. Agilent OMIX pipette tips reliably purify and enrich femtomole and picomole levels of peptides and proteins prior to MALDI-TOF or LC/MS/MS. The unique monolithic sorbent technology used in OMIX consistently outperforms other tips by delivering uniform flow and strong analyte-to-surface interactions. The high binding capacity of OMIX delivers high productivity – the 10 μ L tips bind up to 8 μ g of peptide – twice as much as tips from other suppliers. OMIX's superior flow and exceptional binding capacity ensure reliable recovery of your peptides, minimizing peptide loss during multi-aliquot, multi-tip and evaporation steps.

OMIX Tips

Description	Elution Volume	Unit	C4 Part No.	C18 Part No.	SCX Part No.
10 μ L Mini-Bed	0.5 - 2 μ L	1 x 96 tips	A57009MB	A57003MB	A57004MB
		6 x 96 tips	A57009MBK	A57003MBK	
10 μ L	2 - 10 μ L	1 x 96 tips	A5700910	A5700310	A5700410
		6 x 96 tips	A5700910K	A5700310K	
100 μ L	10 - 100 μ L	1 x 96 tips	A57009100	A57003100	A57004100
		6 x 96 tips	A57009100K	A57003100K	

OMIX Tips for Robotic Automation

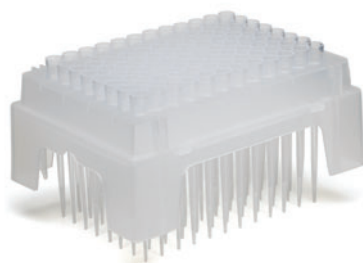
- Fast, uniform flow maximizes productivity and reproducibility
- Small monolithic tip delivers low elution volumes, increasing sensitivity and reducing solvent usage
- Vacuum-free processing improves reproducibility and shortens processing times

OMIX 96-well VersaPlate

OMIX automation-friendly 96-well monolithic SPE plates are 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 bioanalysis applications.

OMIX 96-well VersaPlate

Description	Part No.
OMIX 96-well VersaPlate, C4 with tubes	A57109
OMIX C4 tubes only	A57109A
OMIX 96-well VersaPlate, C18 with tubes	A57103
OMIX C18 tubes only	A57103A
OMIX 96-well VersaPlate, MP1 with tubes	A57111
OMIX MP1 tubes only	A57111A



OMIX C18 for Tomtec Quadra, A57303SPL



Close-up of OMIX tips for Tomtec Quadra

OMIX Tips for Tomtec Quadra

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

OMIX Tips for Tomtec Quadra

Description	Unit	Part No.
OMIX C18	1 x 96 tips	A57303SPL
OMIX C18	5 rack x 96 tips	A57303
OMIX MP1	1 x 96 tips	A57311SPL
OMIX MP1	5 x 96 tips	A57311



OMIX C18 for Hamilton 300 µL, A57403SPL



Close-up of OMIX tips for Hamilton

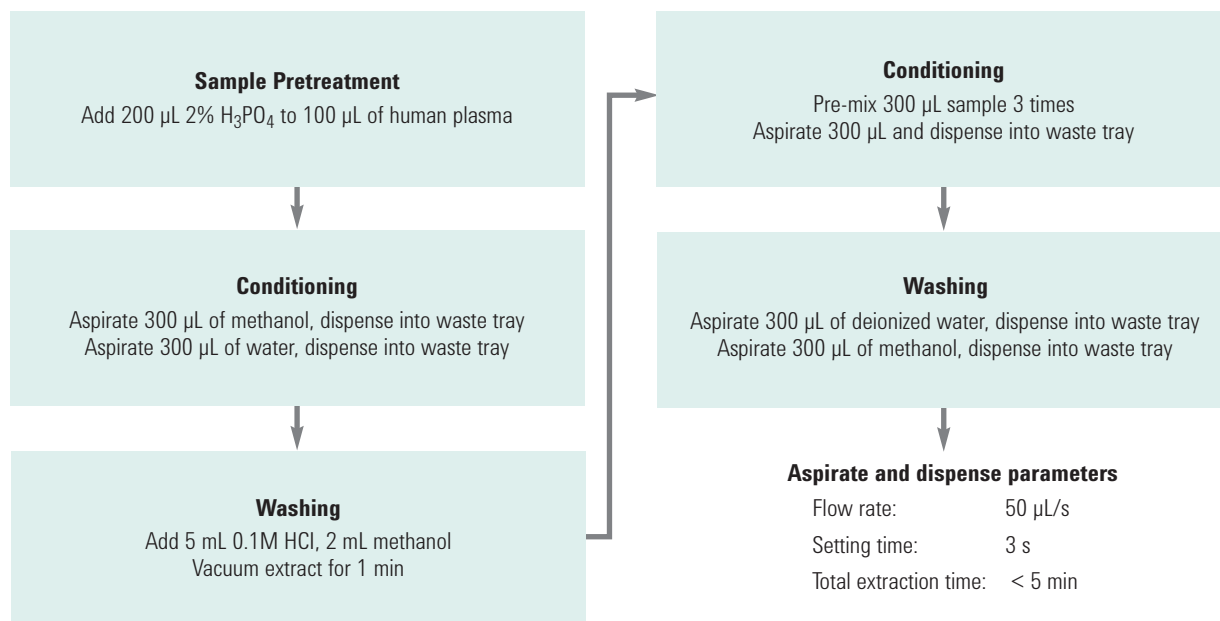
OMIX Tips for Hamilton Microlab STAR Line

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

OMIX Tips for Hamilton Microlab STAR Line, 300 µL

Description	Unit	Part No.
OMIX C18	1 x 96 tips	A57403SPL
OMIX C18	5 x 96 tips	A57403
OMIX MP1	1 x 96 tips	A57411SPL
OMIX MP1	5 x 96 tips	A57411

OMIX Tips for Hamilton STAR, MP1, 5 mg



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 recovery 96%, RSD 3%

■ QUECHERS

Agilent's QuEChERS Kits provide an easy way to take advantage of the simple, time-saving QuEChERS method – because they are pre-packaged to give you greater efficiency and reliability.

QuEChERS Kits help you take advantage of the benefits of the QuEChERS method through:

No guesswork or measuring – Pre-packed extraction and dispersive kits are assembled to suit specific food types and screening protocols

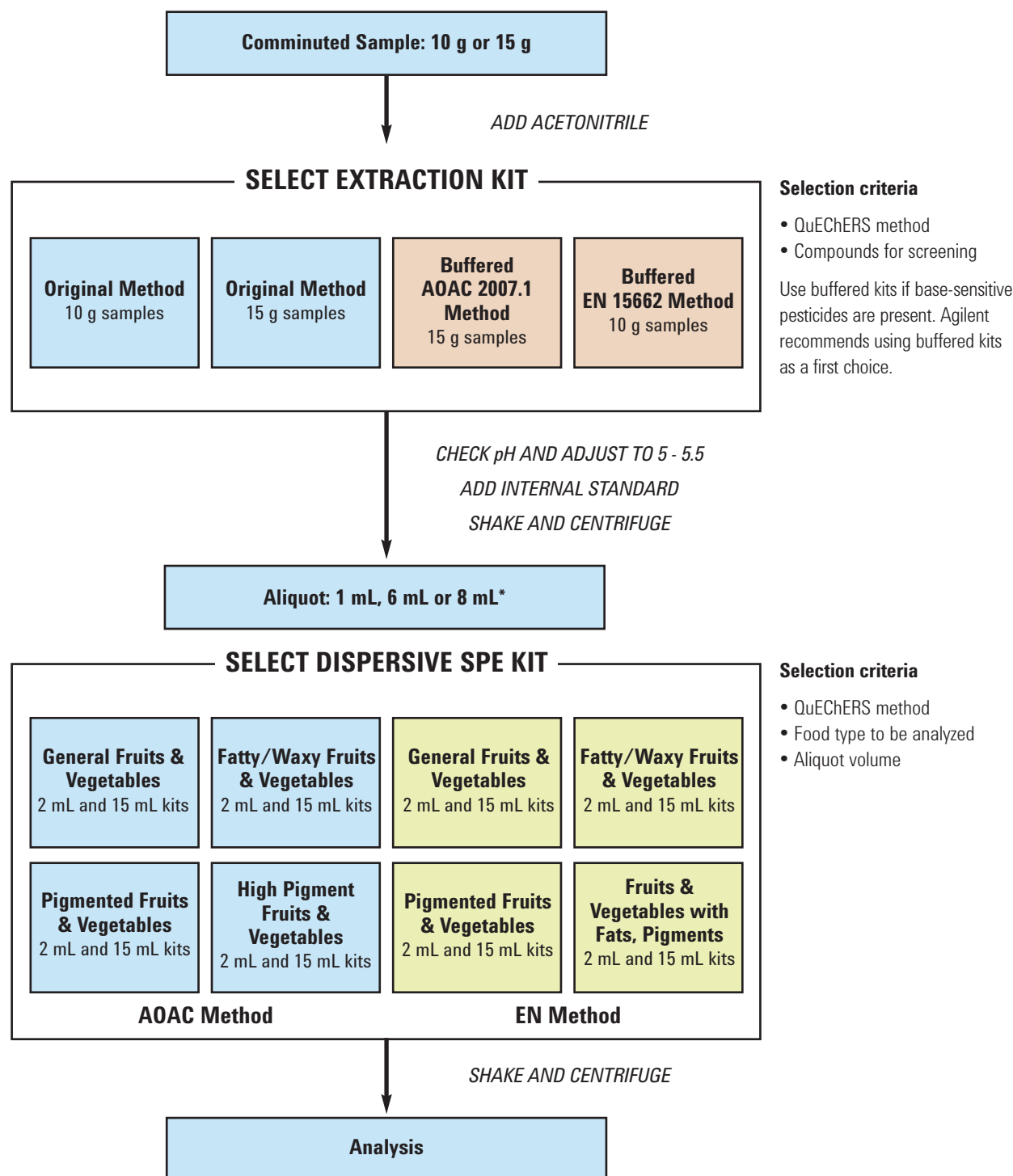
Uniquely packaged extraction kits – Now available with or without 50 mL centrifuge tubes, extraction kits package pre-weighed salts in anhydrous packets, enabling you to add the salts at the appropriate time

Wide selection of dispersive kits – Sorbents and salts for dispersive SPE are supplied in 2 mL or 15 mL centrifuge tubes, for 1 mL, 6 mL or 8 mL aliquot volumes, as specified by the various QuEChERS methodologies

Ceramic homogenizers save 70% of your time per sample – Agilent's ceramic homogenizers can cut your required extraction time from 60 seconds to less than 20 seconds

Agilent Recommended Standard Operating Procedure for QuEChERS

In just 3 easy steps, you can prepare any fruit or vegetable sample for multi-class, multi-residue pesticide analysis.



*Aliquot size is specified by the method, and kits are created for these specific amounts. For pesticides with acidic groups (phenoxyalkanoic acids), analyze directly by LC/MS/MS at this point (skip the dispersive SPE stage). These acidic groups interact with the PSA that is part of the dispersive SPE step.

QuEChERS Extraction Kits

- Available with or without 50 mL centrifuge tubes and caps
- Include MgSO_4 , NaCl, or other salts for buffering; pre-weighed in anhydrous packet

Step 1: Extraction

Adding solvent and salts to a small (10 g or 15 g) comminuted fruit or vegetable sample enables you to extract the pesticides of interest into the organic layer. However, adding a food sample with a high percentage of water directly to the salts may create an exothermic reaction that can affect your analyte recoveries. Choose the extraction salt packet based on your method of analysis, AOAC or EN. The buffered extraction salts are amenable for more labile pesticides.

Agilent pre-packages its QuEChERS salts and buffers in anhydrous packages. This allows you to add them after adding your solvent to the sample, as specified in QuEChERS methodologies.

QuEChERS Extraction Kits

Method	Buffered	Contents	Ceramic Homogenizers	With Tubes	Packets Only	
					50/pk	200/pk
AOAC	Yes	6 g MgSO_4 ; 1.5 g NaAcetate	Yes	5982-5755CH	5982-6755CH	5982-7755CH
			No	5982-5755	5982-6755	5982-7755
Original (10 g samples)	No	4 g MgSO_4 ; 1 g NaCl	Yes	5982-5550CH	5982-6650CH	5982-7550CH
			No	5982-5550	5982-6650	5982-7550
Original (15 g samples)	No	6 g MgSO_4 ; 1.5 g NaCl	Yes	5982-5555CH	5982-6555CH	5982-7555CH
			No	5982-5555	5982-6555	5982-7555
EN	Yes	4 g MgSO_4 ; 1 g NaCl; 1 g NaCitrate; 0.5 g disodium citrate sesquihydrate	Yes	5982-5650CH	5982-6650CH	5982-7650CH
			No	5982-5650	5982-6650	5982-7650
Acrylamides*	No	4 g MgSO_4 ; 0.5 g NaCl	No	5982-5850		

*Katerina Mastovska and Steven J. Lehotay have done work to extend the scope of QuEChERS beyond fruits and vegetables(1), using it to extract acrylamides in potato chips and other fried foods.

1: "Rapid Sample Preparation Method for LC-MS/MS or GC-MS Analysis of Acrylamides in Various Food Matrices", J. Agric. Food Chem, 2006, 54, 7001-7008.

QuEChERS Dispersive Kits

Step 2: Dispersive SPE Cleanup

Select the Dispersive SPE kit suited to the type of food being analyzed and the method you are following. In this step, an aliquot of the sample extract from Step One is added to a 2 mL or 15 mL centrifuge tube containing a small amount of SPE sorbent and MgSO_4 . The sorbent will pull out interfering matrix materials from the sample, while the MgSO_4 helps remove excess water and improve analyte partitioning. Select kits are now available with ceramic homogenizers (2 per tube). Their part numbers are designated by a CH.

QuEChERS Dispersive Kits



Kit	Size	Unit	AOAC 2007.01 Method	European Method EN 15662
			Kit Contents Part No.	Kit Contents Part No.
General fruits and vegetables: Removes polar organic acids, some sugars and lipids	2 mL	100/pk	50 mg PSA	25 mg PSA
			150 mg MgSO_4	150 mg MgSO_4
			5982-5022	5982-5021
	15 mL	50/pk	5982-5022CH	5982-5021CH
			400 mg PSA	150 mg PSA
			1200 mg MgSO_4	900 mg MgSO_4
Fruits and vegetables with fats and waxes: Removes polar organic acids, some sugars, more lipids and sterols	2 mL	100/pk	50 mg C18EC	25 mg C18EC
			150 mg MgSO_4	150 mg MgSO_4
			5982-5122	5982-5121
	15 mL	50/pk	5982-5122CH	5982-5121CH
			400 mg PSA	150 mg PSA
			400 mg C18EC	150 mg C18EC
Pigmented fruits and vegetables: Removes polar organic acids, some sugars and lipids, and carotenoids and chlorophyll; not for use with planar pesticides	2 mL	100/pk	1200 mg MgSO_4	900 mg MgSO_4
			5982-5158	5982-5156
			5982-5158CH	5982-5156CH
	15 mL	50/pk	50 mg PSA	25 mg PSA
			50 mg GCB	2.5 mg GCB
			150 mg MgSO_4	150 mg MgSO_4
	2 mL	100/pk	5982-5222	5982-5221
			5982-5222CH	5982-5221CH
	15 mL	50/pk	400 mg PSA	150 mg PSA
			400 mg GCB	15 mg GCB
			1200 mg MgSO_4	900 mg MgSO_4
			5982-5258	5982-5256
			5982-5258CH	5982-5256CH

Part numbers ending in CH indicate tubes containing ceramic homogenizers.

QuEChERS Dispersive Kits



Kit	Size	Unit	AOAC 2007.01 Method	European Method EN 15662
			Kit Contents Part No.	Kit Contents Part No.
Highly pigmented fruits and vegetables: Removes polar organic acids, some sugars and lipids, plus high levels of carotenoids and chlorophyll; not for use with planar pesticides	2 mL	100/pk		25 mg PSA 7.5 mg GCB 150 mg MgSO ₄ 5982-5321 5982-5321CH
	15 mL	50/pk		150 mg PSA 45 mg GCB 900 mg MgSO ₄ 5982-5356 5982-5356CH
Fruits and vegetables with pigments and fats: Removes polar organic acids, some sugars and lipids, plus carotenoids and chlorophyll; not for use with planar pesticides	2 mL	100/pk	50 mg PSA 50 mg GCB 150 mg MgSO ₄ 50 mg C18EC 5982-5421 5982-5421CH	
	15 mL	50/pk	400 mg PSA 400 mg GCB 1200 mg MgSO ₄ 400 mg C18EC 5982-5456 5982-5456CH	
Other Food Methods Removes biological matrix interferences, including hydrophobic substances (fats, lipids) and proteins	2 mL	100/pk	25 mg C18 150 mg MgSO ₄ 5982-4921 5982-4921CH	
	15 mL	50/pk	150 mg C18 900 mg MgSO ₄ 5982-4956 5982-4956CH	
All Food Types Removes virtually all matrix interfering materials including polar organic acids, lipids, sugars, proteins, carotenoids and chlorophyll	2 mL	100/pk	50 mg PSA 50 mg C18 7.5 mg GCB 150 mg MgSO ₄ 5982-0028 5982-0028CH 400mg PSA 400 mg C18 45 mg GCB 1200 MgSO ₄ 5982-0029 5982-0029CH	

Part numbers ending in CH indicate tubes containing ceramic homogenizers.

QuEChERS Ceramic Homogenizers

Ceramic homogenizers increase your overall lab productivity and give you greater confidence in your results. They make analyte extraction easier by:

- Cutting the required extraction time from 60 seconds to as little as 20 seconds – a time savings of 70% per sample
- Maintaining high, reproducible extractions in a third of the time
- Minimizing variance between technicians
- Breaking up salt agglomerates and maintaining a consistent grinding of homogenizing material
- Increasing your overall lab productivity and having greater confidence in your results

The same great ceramic homogenizers available in our QuEChERS Kits are also available for bulk purchase, providing excellent grinding capabilities of the samples.

QuEChERS Ceramic Homogenizers

Description	Unit	Part No.
Ceramic homogenizer for 50 mL tubes	100/pk	5982-9313
Ceramic homogenizer for 15 mL tubes	100/pk	5982-9312
Ceramic homogenizer for 2 mL tubes	200/pk	5982-9311



QuEChERS Bulk Sorbents and Salts

If you prefer to pack your own tubes for QuEChERS, use these high-quality bulk sorbents and salts.

QuEChERS Bulk Sorbents and Salts

Description	Unit	Part No.
Magnesium Sulfate	100 g bottle	5982-8082
Sodium Acetate	100 g bottle	5982-5751
Sodium Chloride	100 g bottle	5982-5750
PSA (Primary Secondary Amine)	25 g bottle	5982-8382
	100 g bottle	5982-5753
C18EC	25 g bottle	5982-1382
	100 g bottle	5982-5752
Graphitized Carbon Black (GCB)	25 g bottle	5982-4482
Si-SAX	25 g bottle	5982-2082

Standards for QuEChERS Products

In addition to our industry-leading SampliQ QuEChERS Kits, Agilent makes your analysis easier by providing standards for the most commonly used regulatory methods, including AOAC and EN.

- Save time and inconvenience of making standards
- Available for both GC and LC instruments
- Ready to use for QuEChERS extractions – no dilutions required

Standards for QuEChERS Products

Description	Concentration	Kit Contents	Part No.
HPLC & GC Internal Standard, AOAC Method	1000 µg/mL	Parathion-d10 (diethyl-d10), Alpha-BHC-d6 (alpha-HCH-d6)	5190-0502
QC Solution, AOAC Method	500 µg/mL	Triphenyl phosphate	5190-0503
HPLC Internal Standard, EN Method	100 µg/mL	Tris (1,3-dichloroisopropyl) phosphate, Nicarbazin	5190-0500
GC Internal Standard, EN Method	5000 µg/mL	(2,2',5,5'-tetrachlorobiphenyl), Triphenylmethane, Tris (1,3-dichloroisopropyl) phosphate	5190-0501
QC Surrogate for GC Standard, EN Method	500 µg/mL 1000 µg/mL	(2,2',3,4,4',5'-hexachlorobiphenyl) Anthracene-d10	5190-0499
GC Standard Mix, EN Method	100 µg/mL	Malathion, Methyl parathion, Parathion (ethyl), Chlorpyrifos, Fenitrothion, Dichlorvos, Deltamethrin, Chlorpyrifos-methyl, Heptachlor, Bromopropylate, Gamma-HCH, Aldrin, Dieldrin, Disulfoton, Fenvalerate, Procymidone, Hexachlorobenzene, Lambda-cyhalothrin, 4,4'-DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, 4,4'-DDE, 4,4'-DDD, Alpha-BHC, Beta-BHC	5190-0497

For more information on QuEChERS, download the brochure at
www.agilent.com/chem/quechersbrochure

CAPTIVA FILTRATION



Captiva's unique dual-depth filtration media provides complete removal of precipitated proteins and outstanding resistance to sample clogging, with no loss of analytes. 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 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.

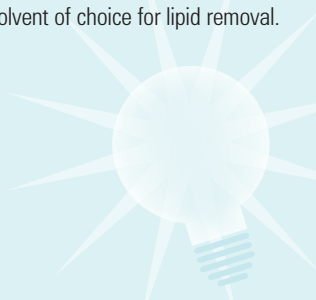
The Captiva range includes:

- 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



Tips & Tools

Using Captiva ND^{Lipids} with methanol is an excellent replacement for acetonitrile as the precipitation solvent. 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. Methanol can now be your solvent of choice for lipid removal.



Captiva ND^{Lipids}

- More precise and reproducible quantitation with removal of phospholipids and proteins
- Increased productivity due to extended column lifetimes and cleaner MS ion sources
- Simple 3-step procedure

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. 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 throughput and helps reduce instrument downtime, with virtually no need for method development on a wide range of analytes.

Captiva ND^{Lipids}

Description	Part No.
Captiva ND ^{Lipids} 96-well filtration starter kit Includes 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	A59640002SK
Captiva ND ^{Lipids} 96-well filtration replacement kit Includes 2 Captiva ND ^{Lipids} filter plates, 2 Captiva 96 deep-well 1 mL collection plates and 2 Captiva collection plate pierceable covers	A59640002RK
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 96-well plate seals, 10/pk	A8961008

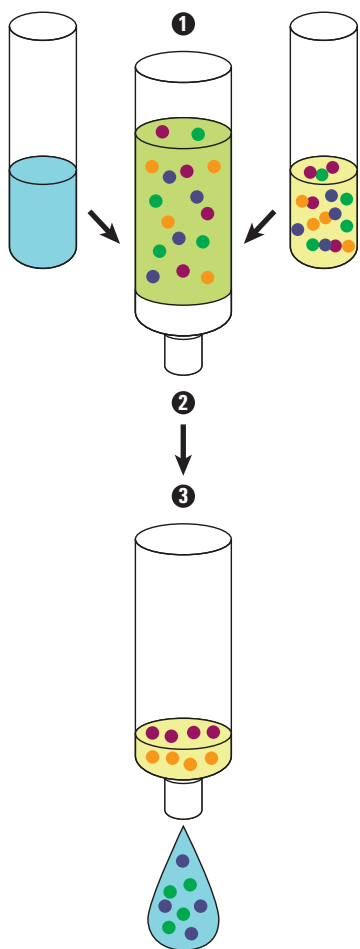
Simple and Easy-to-Use Captiva ND^{Lipids}

Easy 3-Step Procedure

1. Add precipitation solvent and plasma sample in desired ratio into the 96-well plate
2. Precipitate
3. Filter

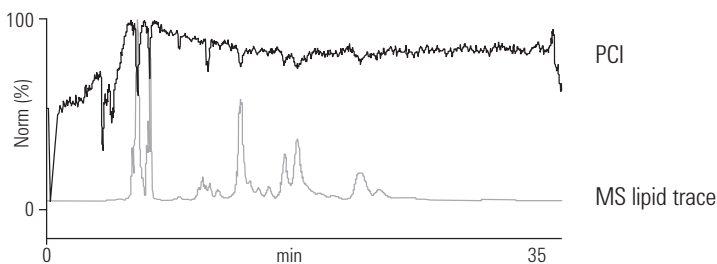
Key

- Salts
- Proteins
- Lipids
- Analyte

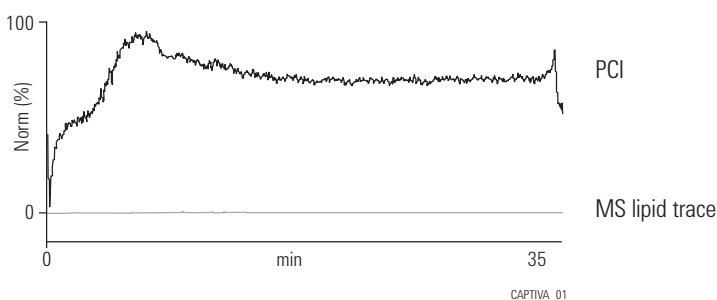


Post-column infusion of albuterol before treatment with Captiva ND^{Lipids}

Note that the ion-suppression features (top trace) correlate with the elution of phospholipids (bottom trace).

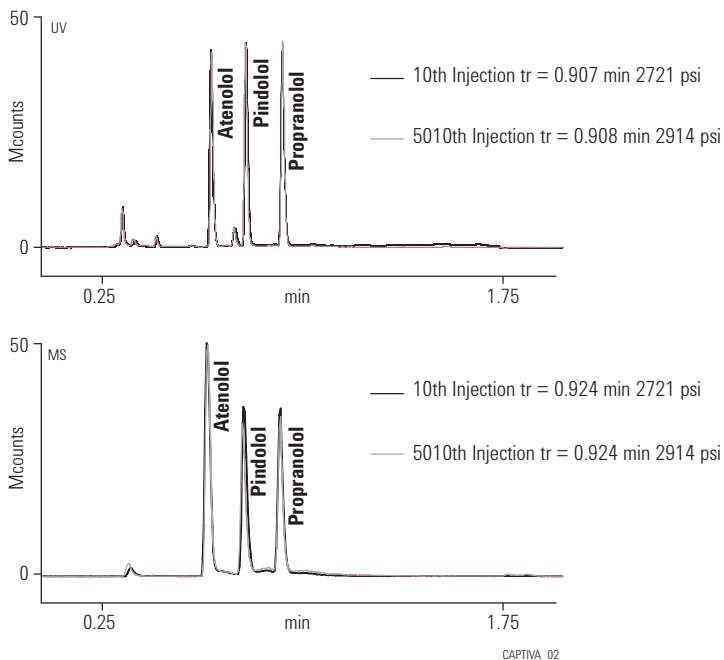


Same experiment after protein and lipid depletion with Captiva ND^{Lipids}



Ion suppression is dramatically reduced and the lipids are almost non-detectable.

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

- The industry standard for centrifugation-free protein precipitation
- 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, your plasma samples are processed quickly and reliably, and 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. 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.



Captiva 96-well filter kit

Captiva 96-well Filter Kits

Pore Size (µm)	Filter Material	Part No.
Starter Kits		
0.2	Polypropylene	A5960002SK
0.45	Polypropylene	A5960045SK
10	Glass fiber	A596401000SK
Includes 1 CaptiVac vacuum collar, 5 Captiva filter plates, 10 DuoSeal 96 96-well plate seals, 5 Captiva 96 deep-well 1 mL collection plates, 5 Captiva collection plate pierceable covers		
Replacement Kits		
0.2	Polypropylene	A5960002K
0.45	Polypropylene	A5967045K
	Polyvinylidene fluoride and polypropylene	A5960045K
Includes 5 Captiva filter plates, 10 DuoSeal 96 96-well plate seals, 5 Captiva 96 deep-well 1 mL collection plates, 5 Captiva collection plate pierceable covers		



Captiva 96-well Filter Plates

- 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 valuable HPLC columns. Captiva 0.2 μm and 0.45 μm depth filter plates are ideal for preparing precipitated protein samples for LC/MS analysis. 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 DuoSeal 96 96-well seals.

Captiva 96-well Filter Plates, 5 x 96 well

Pore Size (μm)	Filter Material	Part No.
0.2	Polypropylene	A5960002
0.45	Polyvinylidene fluoride and polypropylene	A5967045
	Polypropylene	A5960045
10	Glass fiber	A596401000
20	Polypropylene	A596002000
	Polypropylene	A596002000B
	Bulk Pack, 100 x 96 well	



Captiva 96-well Collection Plates and Cover

- Designed for Captiva filtration, SPEC and Bond Elut 96 applications
- Standard 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, ensuring 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.



Captiva 96-well collection plate, A696001000

Captiva 96-well Collection Plates and Cover

Description	Unit	Part No.
Captiva 96-deep well collection plate, 1 mL	10/pk	A696001000
Captiva pierceable 96-well collection plate cover	10/pk	A8961007
DuoSeal 96	10/pk	A8961008

Captiva Filter Cartridges

- 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 μ m and 0.45 μ m filter cartridges are ideal for preparing precipitated protein samples for LC/MS analysis. The Captiva 10 μ m 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.



Captiva filter cartridges, glass fiber, A500401000

Captiva Filter Cartridges

Pore Size (μ m)	Filter Material	Volume (mL)	Unit	Part No.
0.2	Polyvinylidene fluoride and polypropylene	3	100/pk	A5300002
0.45	Polyvinylidene fluoride and polypropylene	3	100/pk	A5307045
10	Glass fiber	10	100/pk	A500401000



CaptiVac vacuum collar, A796

CaptiVac Vacuum Collars

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

For use with Captiva Filtration 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 Captiva collar forms a pre-set, pre-aligned vacuum seal between the filtration and collection plate, which positions the outlet tips at a specified distance inside each well, so as to prevent cross contamination of samples.

CaptiVac Vacuum Collars

Description	Part No.
CaptiVac vacuum collar	A796
CaptiVac gasket kit, 5/pk	A796G

■ SAMPLE FILTRATION

Various methods of sample filtration can be used to clarify samples that need further analysis or where particulate matter may cause a problem. Agilent provides a range of standard and economy syringe filters conveniently housed in inert polymeric housings for easy use and disposal, as well as the innovative Mini-UniPrep Syringeless Filters from Whatman.



2-in-1 Filter

Syringe Filters

Membrane syringe filters are used most often to clarify small-volume sample solutions prior to HPLC and ion chromatography. The membrane filters are contained in an inert polymeric housing. No glue or binders are used in their construction to ensure that no extractables are present. The housing is designed to spread the sample solution over the entire surface of the membrane so that maximum membrane capacity is used. Syringe filters are ready-to-use and are quite convenient. You merely attach the Luer-tipped syringe filled with the sample solution to the housing and push the sample through the pre-cleaned filters.

Why Filter Your Samples for HPLC?

- To protect your column against plugging (blockage) from sample particulate matter
- To protect your injection valve components from possible damage, scratching and increased wear by sample particulate matter
- To minimize downtime

How to Select the Right Membrane Syringe Filter

Filter types should be selected based on sample volume. All filter inlets are female Luer-compatible, have inert polypropylene or polycarbonate housings and come in three diameters:

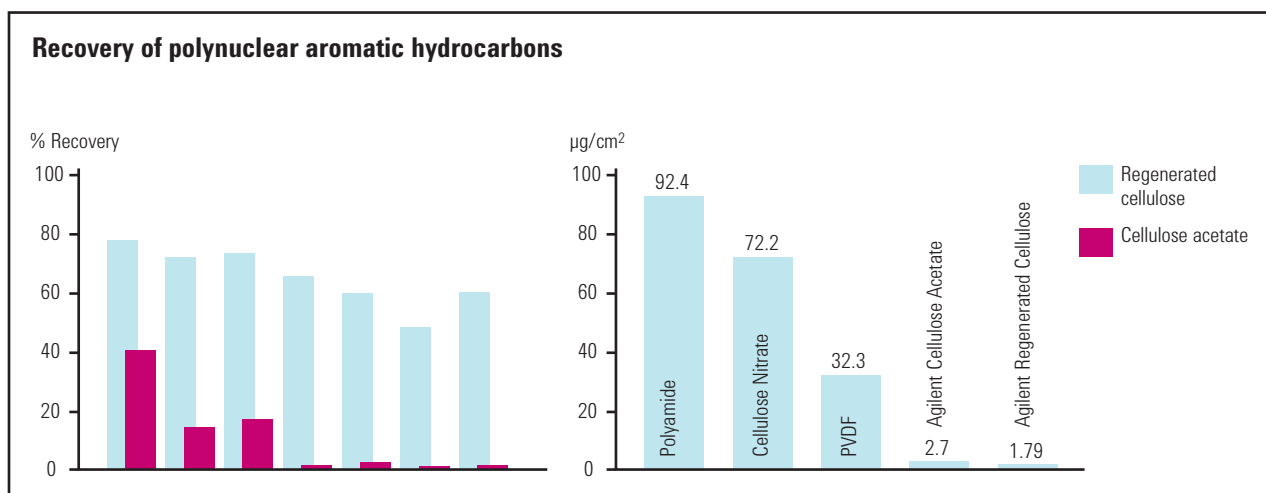
- 30 mm filters are designed for larger sample volumes or for solvent filtration and offer increased filtration speed. The holdup volume is less than 50 μL .
- 25 mm Econofilters offer a moderately wide cross-sectional area (4.2 cm^2) with a holdup volume of less than 50 μL .
- 13 mm filters are ideal for most applications and offer the best compromise between holdup volume and sample volume. Sample volumes are typically in the 1-10 mL range and the holdup volume is less than 10 μL .

Porosity should be determined by the size of potential particulates in your sample. Finer porosities require more pressure to filter.

Two porosities are available: 0.45 μm pores to remove particles that are detrimental to most columns and 0.20 μm pores to remove the smallest particles.

Membrane Filters

When selecting membrane filters, solvent compatibility is the most important criterion. The chemical resistance table lists the most popular solvents used in HPLC along with the compatible membrane types.



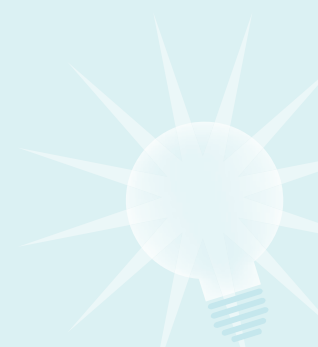
Regenerated cellulose membranes are recommended for general HPLC sample preparation, as well as filtration of aqueous biological samples and organic solvents. PTFE membranes are compatible with almost all solvents, acids and bases.

Cellulose nitrate is primarily used for pre-filters.

Cellulose acetate membranes are not compatible with organic solvents. They are specially recommended for proteins and protein-related samples.

Why Purchase Agilent Syringe Filters?

Agilent offers the most popular sizes, porosities and membrane types at attractive pricing. All of our syringe filters are pre-sterilized by gamma irradiation, and our regenerated cellulose filters are batch-tested under HPLC conditions.



Chemical Resistance Table for Membrane Filters

Substances	Membrane filters				
	Cellulose nitrate	Cellulose acetate	Regenerated cellulose	Nylon	PTFE
1,4-Dioxane	-	-	+	N/A	0
Acetic acid, 10% & 25%	+	0	+	-	+
Acetone	-	-	+	+	+
Acetonitrile	-	-	+	+	-
Alcohols (i-Propanol, 1-Hexanol, Cyclohexanol)	+	+	+	+	+
Aliphatic hydrocarbons	+	+	+	+	+
Aromatic hydrocarbons	+	+	+	N/A	+
Carboxylic acid	+	+	+	-	+
Cyclohexane	0	0	+	+	+
Diethylether	0	0	+	+	0
Dimethyl formamide	-	-	0	+	+
Dimethyl sulfoxide	-	-	0	N/A	+
Ethanol = <98%	-	+	+	+	+
Ethyl acetate	-	-	+	+	+
Formic acid, 25%	+	0	+	-	+
Hexane	+	+	+	+	+
Hydrochloric acid, 25%	+	-	+	-	+
Methanol	-	+	+	0	+
Nitric acid, 25%	0	0	+	-	+
Phosphoric acid, 45%	0	0	0	0	+
Potassium hydroxide, 1 M	-	-	0	-	+
Salt solutions, aqueous	+	+	+	+	+
Sodium hydroxide, 1 M	-	0	-	-	+
Tetrahydrofuran	-	-	+	+	0
Toluene	+	+	+	+	+
Trichloroacetic acid, 10%	+	-	-	0	+
Trichloroethane	+	0	+	0	+
Xylene	+	+	+	+	+

Code for Table: + = Resistance, 0 = Limited resistance, - = Not resistant, N/A = Not available

Premium Syringe Filters

Agilent premium syringe filters are high-quality, ready-to-use, tested and certified for the absence of UV-absorbing substances at typical HPLC wavelengths with water, methanol and acetonitrile.

Premium Membrane Filters, 100/pk

Description	Diameter (mm)	Pore Size (µm)	Part No.
PTFE with Luer tip	30	0.2	3150-0753
PTFE with Luer tip	30	0.45	3150-0754
PTFE with Luer tip	13	0.45	5185-5836
PTFE with mini tip	13	0.45	5185-5837
Cellulose Acetate with Luer tip	30	0.45	5061-3363



Regenerated cellulose filters, 5061-3364

Premium Regenerated Cellulose Membrane Filters, 100/pk

Description	Diameter (mm)	Pore Size (µm)	Part No.
Luer tip	30	0.2	5061-3354
Luer tip	30	0.45	5061-3364
Luer tip	13	0.2	5064-8222
Luer tip	13	0.45	5064-8221
Mini tip	13	0.2	5061-3366
Luer tip	13	0.45	5061-3365

Econofilters

High quality econofilters are shipped in large packs and are ideal for busy labs that need fast, efficient filtration at a reasonable price.



Membrane Econofilters, 5185-5830

Membrane Econofilters, 200/pk

Description	Diameter (mm)	Pore Size (µm)	Part No.
Regenerated cellulose	25	0.2	5185-5830
Regenerated cellulose	25	0.45	5185-5831
Nylon	25	0.2	5185-5832
Nylon	25	0.45	5185-5833
PTFE	25	0.2	5185-5834
PTFE	25	0.45	5185-5835

Pre-Filters (Standalone)

Pre-filters have a 100% borosilicate glass fiber membrane that is chemically inert and resistant to most solvents. The high surface area of the rigid fiber structure provides outstanding particle retention capacity while maintaining low flow resistance. The GF-53 will retain coarse particles down to approximately 3 µm in diameter and the GF-92 down to approximately 2 µm in diameter. They can be used standalone or in a series with a membrane filter.

Pre-Filters (Standalone), 100/pk

Description	Part No.
Glass fiber (GF-53)	5042-1393
Glass fiber (GF-92)	5042-1370

2-in-1 Filters

2-in-1 filters are recommended for difficult-to-filter samples because they have a two-layered filter in a single housing. The coarse, top layer pre-filter removes larger particulates before getting to the membrane filter, requiring less force to push liquid sample through the filter, thereby providing higher throughput, and saving time, sample and money.

2-in-1 Filters, 100/pk

Description	Diameter (mm)	Pore Size (µm)	Part No.
Glass Fiber/Cellulose Nitrate	30	0.45	5042-1391
Glass Fiber/Regenerated Cellulose	30	0.45	5042-1392

Syringes for Sample Filters, 10/pk

Description	Part No.
Disposable syringes, 20 mL	5062-8534



Mini-UniPrep Syringeless Filters

Agilent is pleased to offer Mini-UniPrep Syringeless Filters from Whatman. The Mini-UniPrep is a pre-assembled, disposable filtration device, ideal for removing particulate matter from samples. This small filter performs the functions of syringe filters, disposable syringes, vials, septa and caps in one small package, and protects your valuable HPLC column from contamination.

- Ideal for samples that undergo demanding HPLC analysis
- Equivalent in size to standard 12 x 32 mm vial, with a filtering capacity of 0.5 mL
- Innovative design reduces costs, materials, time to prepare samples, and is environmentally-responsible
- Compatible with all Agilent 1100 and 1200 Series autosamplers and manual injectors

Mini-UniPrep Syringeless Filters, 100/pk

Description	Part No.
0.45 µm PTFE For aggressive samples	5190-1415
0.45 µm Nylon For aqueous and organic samples, pH 3-10	5190-1416
0.45 µm PP For solvent-based samples, low water breakthrough values	5190-1417
0.45 µm regenerated cellulose For aqueous or organic solvents, very low non-specific protein binding membrane	5190-1418
0.20 µm PTFE For aggressive samples	5190-1419
0.20 µm Nylon For aqueous and organic samples, pH 3-10	5190-1420
0.20 µm PP For solvent-based samples, low water breakthrough values	5190-1421
0.20 µm regenerated cellulose For aqueous or organic solvents, very low non-specific protein binding membrane	5190-1422

Tips & Tools

For more information, including chemical compatibilities, visit www.agilent.com/chem/miniuniprep





TOXI-TUBES

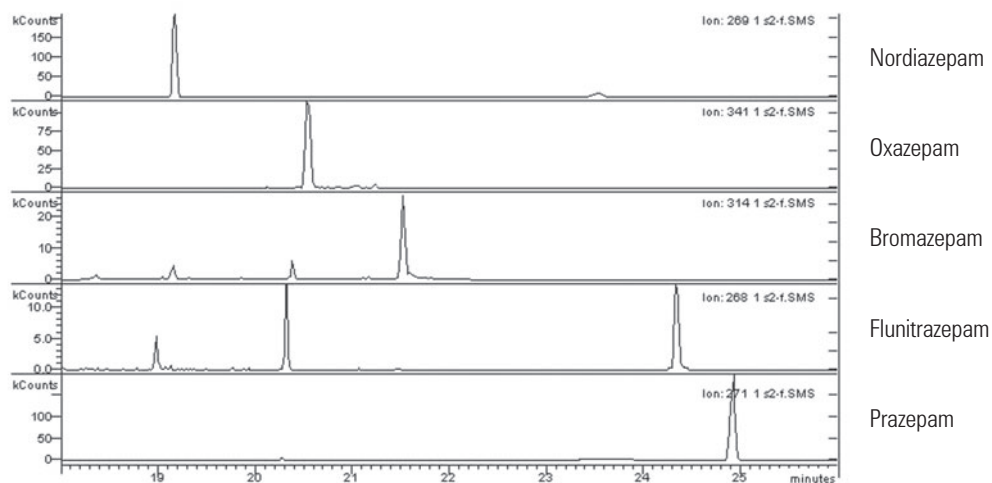
- Boost LC/MS and GC/MS efficiency with fast, simple drug extractions
- Reduce risk of system downtime and increase throughput by reducing column changes
- Quick, easy, clean extraction of drugs from samples

Use the quickest, easiest, and cleanest liquid/liquid extraction procedure available to increase your GC/MS and LC/MS efficiency. TOXI-TUBES give you a clean one-step process for extracting a broad range of drugs from biological or non-biological specimens.

TOXI-TUBES

Description	Use With	Unit	Part No.
TOXI-TUBES A Pre-measured solution of buffering salts (pH 9) and organic solvents	Organic bases and neutral drugs	100/pk	A109A100
TOXI-TUBES B Pre-measured solution of buffering salts (pH 4.5) and organic solvents	Acidic and neutral drugs	100/pk	A109B100

Selected profiles of five benzodiazepines extracted from a whole blood sample using TOXI-TUBES A. Each drug was spiked at 50 ng/mL in blood.



Benzodiazepine	Recovery Ratio (%)	
	Whole Blood	Urine
Nordiazepam	75.5	88.2
Oxazepam	72.0	85.9
Bromazepam	67.8	91.2
Flunitrazepam	72.7	89.8
Prazepam	74.7	93.2