Accuracy Starts Here

Agilent Bond Elut Plexa and Polymeric SPE Selection Guide

The Measure of Confidence

Agilent Technologies

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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

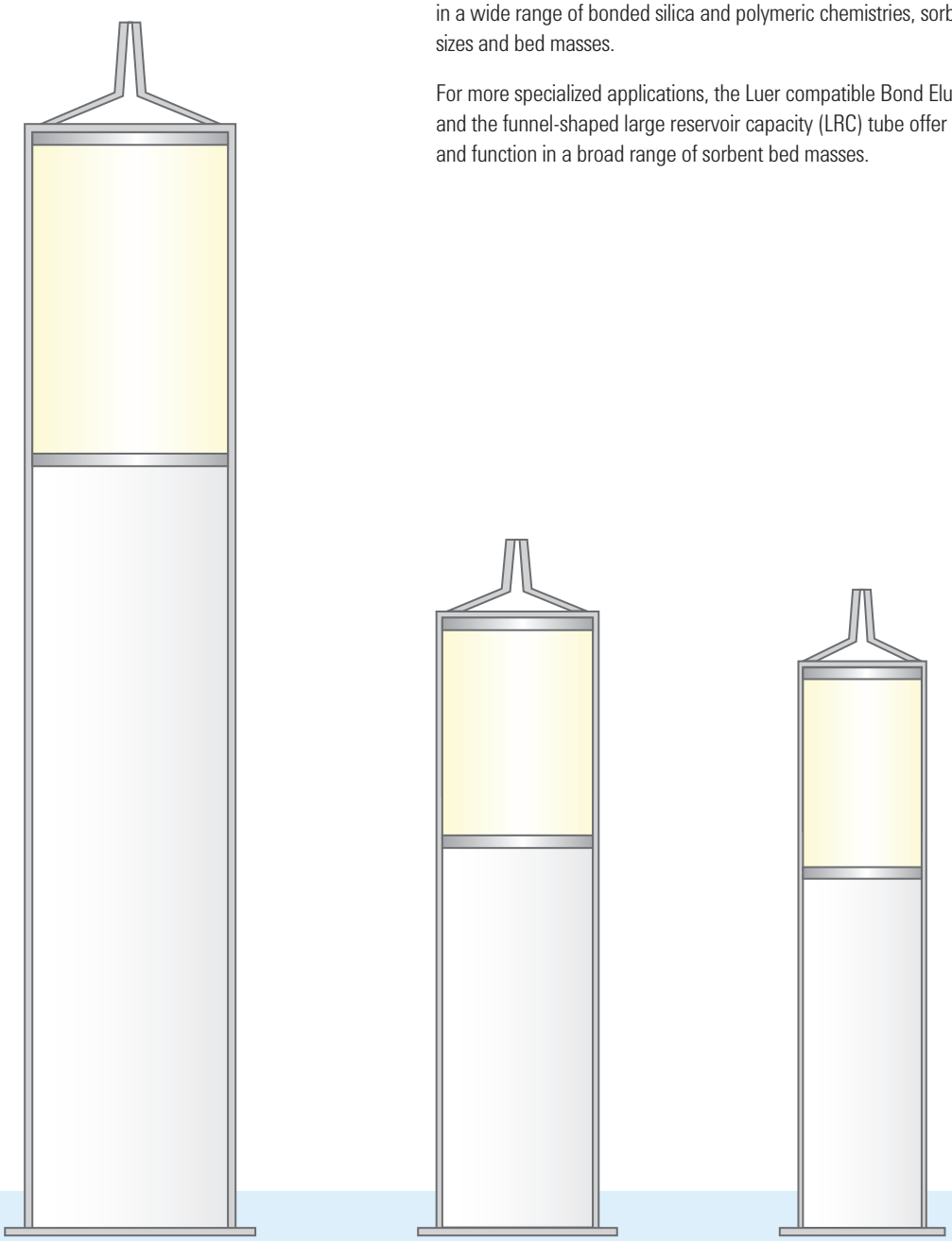
- **Heritage of Reliability:** With years of use in some of the most demanding analytical laboratories in the world, Bond Elut products have a proven track record resulting in a strong publication pedigree
- **Options for Your Needs:** Offering extraction solutions for the widest range of analytes and 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.

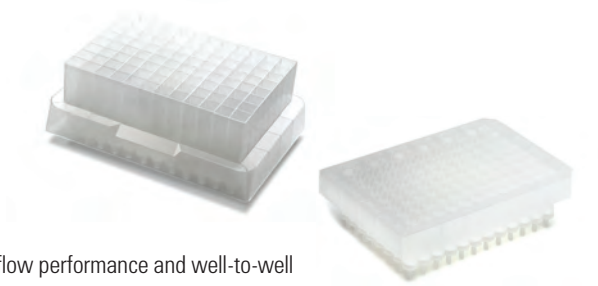


Diagrams are to scale

60 mL

20 mL

12 mL



Bond Elut 96-well Plates

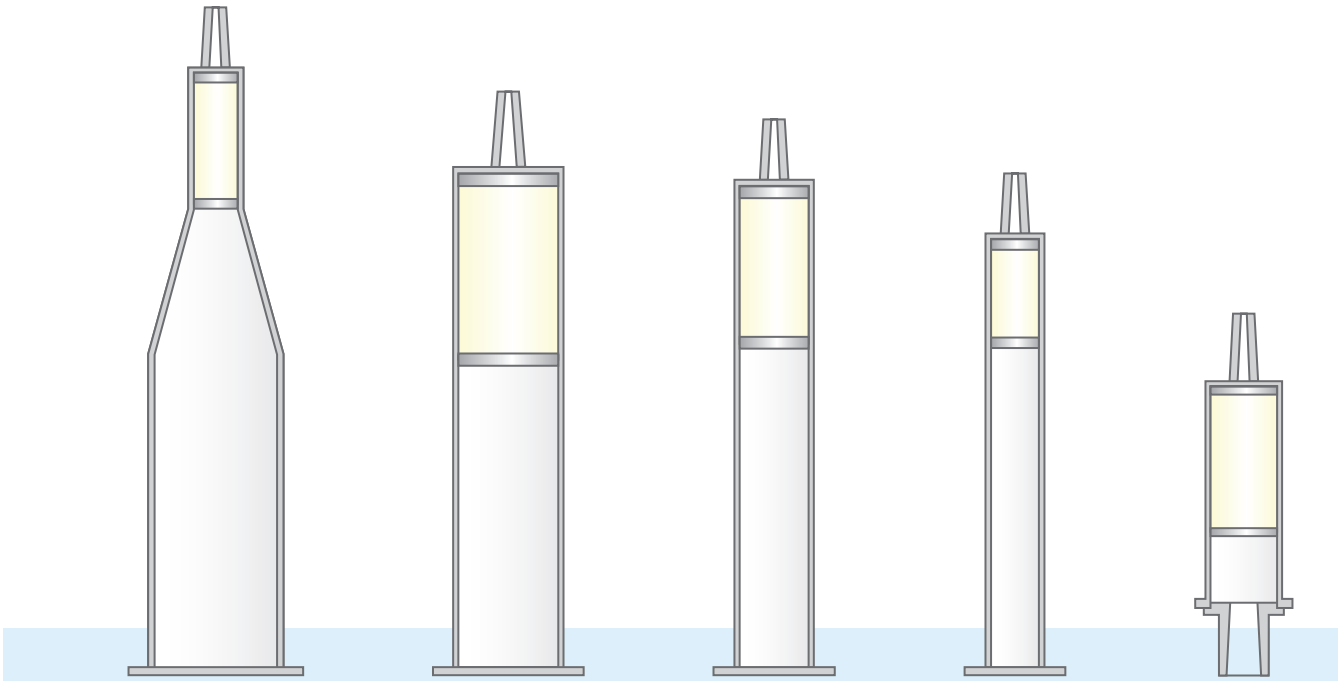
Bond Elut 96-well plate formats are best in class for flow performance and well-to-well reproducibility. These specially designed plates are available with well depths of 1 mL and 2 mL and in a large range of different sorbent chemistries.

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.



CROSS REFERENCE OF COMPARABLE PHASES BY MANUFACTURER

Different chemistries and manufacturing processes create sorbents that exhibit differences in selectivity, so there is no universal equalivent 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-X-C	MCX		Plexa PCX
Strata-X-A	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/PSA

For Silica-Based SPE products, see the Agilent Bond Elut Silica-Based SPE Selection Guide, publication number 5990-8593EN

Sorbent Specifications

Sorbent Phase	Category	Bonded Functional Group/Base Material	Format	Surface Area (m^2/g)	Particle Size (µm) and Shape	Mean Pore Size (Å)
Plexa	Polar enhanced	Hydrophilic styrene divinylbenzene	Packed bed	550	45, spherical monodisperse	100
Plexa PCX	Cation Mixed Mode	SCX functionalized hydrophilic styrene divinylbenzene	Packed bed	550	45, spherical monodisperse	100
Plexa PAX	Anion Mixed Mode	SAX functionalized hydrophilic styrene divinylbenzene	Packed bed	550	45, spherical monodisperse	100
PPL	Non-polar	Functionalized styrene divinylbenzene	Packed bed	600	125, spherical	150
ENV	Non-polar	Styrene divinylbenzene	Packed bed		125, spherical	450
LMS	Non-polar	Styrene divinylbenzene	Packed bed		75, spherical	300
NEXUS	Mixed mode	Mixed mode copolymer	Packed bed	575	70, spherical	100/450 Bimodal

Sample Preparation Reference Guide

Product	Typical Matrices	Primary Extraction Mechanism	Compound Types
Bond Elut Plexa	Plasma, urine, aqueous and biological fluids	Non-polar	Non-polar compounds with acidic/neutral fractionation PAHs from water
Bond Elut Plexa PAX	Plasma, urine, aqueous and biological fluids	Mixed mode: non-polar and anion exchange	Acidic compounds, carboxylic acid metabolites of drugs, peptides and amino acids
Bond Elut Plexa PCX	Plasma, urine, aqueous and biological fluids	Mixed mode: non-polar and cation exchange	Basic drugs, basic drugs of abuse
Bond Elut PPL	Water sources, biological fluids	Non-polar, electrostatic	Non-polar compounds, phenols
Bond Elut ENV	Water sources	Non-polar	Polar organic molecules, explosive residues
Bond Elut LMS	Urine, plasma, biological fluids	Non-polar	Non-polar compounds
Bond Elut NEXUS and Bond Elut NEXUS WCX	Horse urine, urine, biological fluids	Non-polar	Drugs of abuse, quaternary drugs, endocrine disruptors

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.

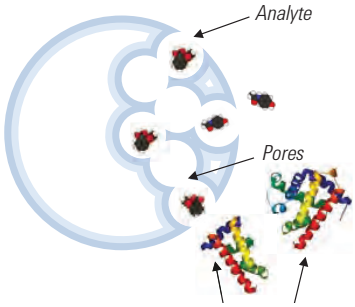
Tips & Tools

Learn the core concepts surrounding Solid Phase Extraction and best practices for Sample Prep. View the video at **www.agilent.com/chem/spevideo**

Advanced Polymer Architecture Improves Extraction Performance

LOAD:

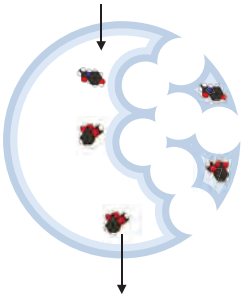
Water-rich, hydrophilic surface allows excellent phase transfer of analytes into the polymer core.



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

WASH:

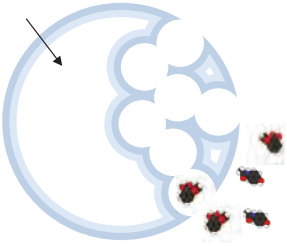
Analytes that have crossed the hydrophilic layers will remain tightly bound in the hydrophobic core.



Interferences wash away without leaching the analytes of interest.

ELUTE:

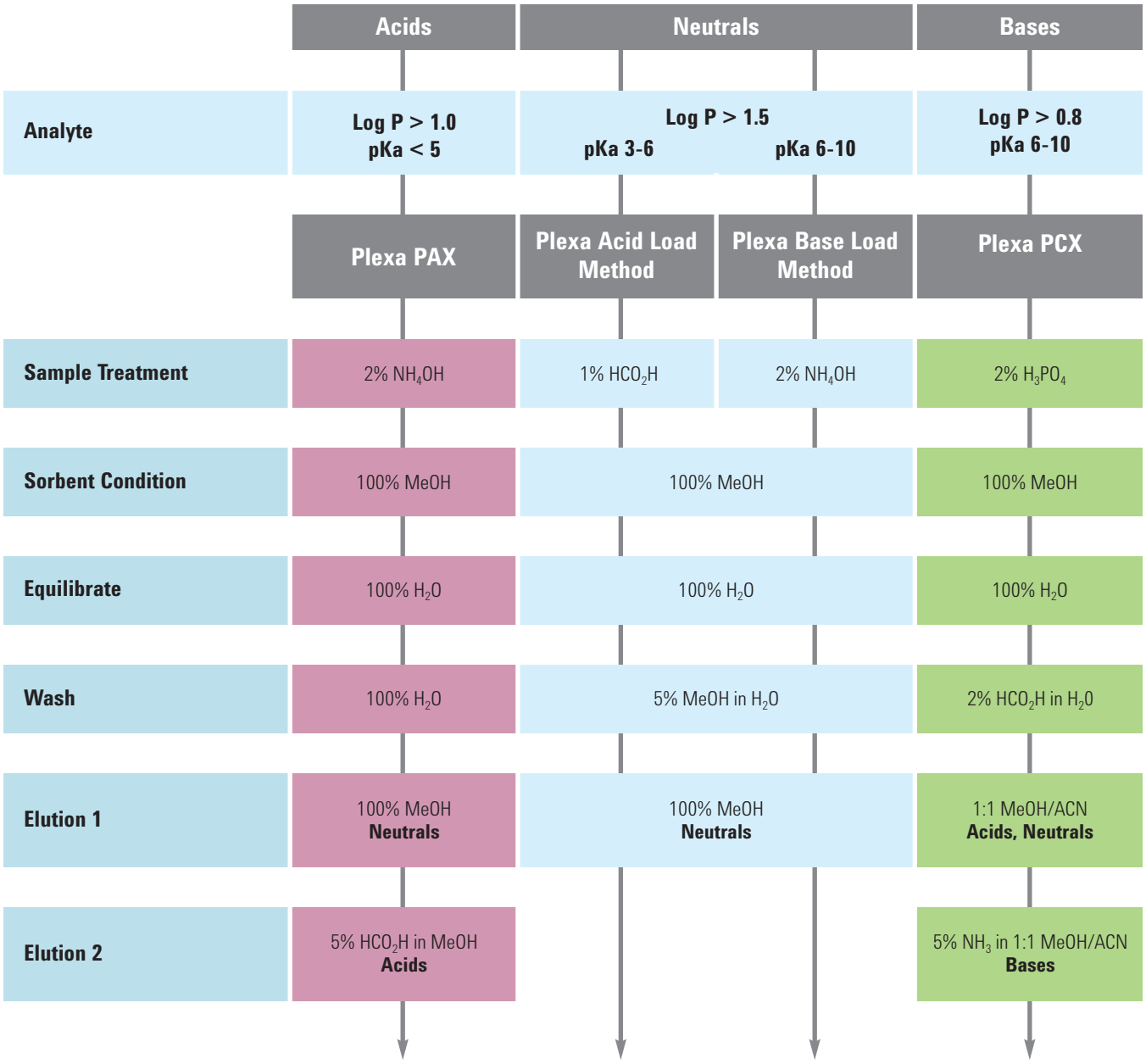
Specially engineered pore structure allows excellent mass transfer out of the polymer.



Clean extract with high recovery.

GENERAL PROTOCOL FOR TROUBLE-FREE SPE APPLICATIONS WITH BOND ELUT PLEXA

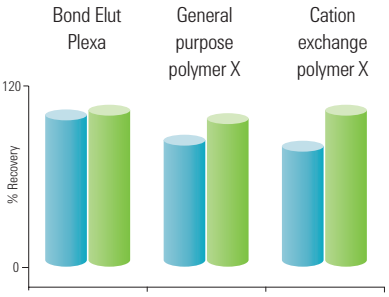
Regardless of your application or sample type, you will appreciate the difference the Bond Elut Plexa range makes. Plexa delivers simple methods, superior flow characteristics, and improved analytical performance, all leading to easier validation. Simple methods deliver clean extracts and high recoveries 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

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.

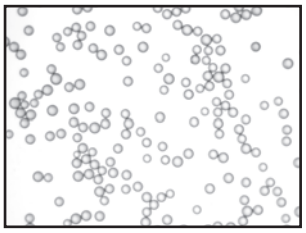
Plexa improves sensitivity by minimizing ion suppression effects and maximizing recovery



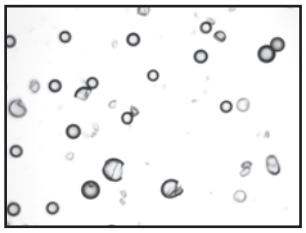
Key

- Metoprolol recovery calculated as response against spiked mobile phase
- Metoprolol recovery calculated as response against an extracted linear curve

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



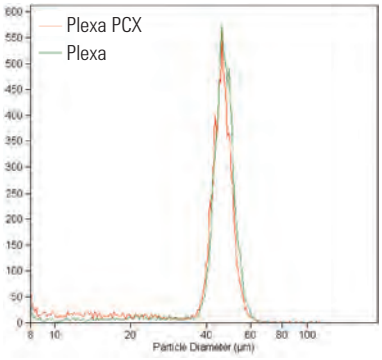
Bond Elut Plexa PCX



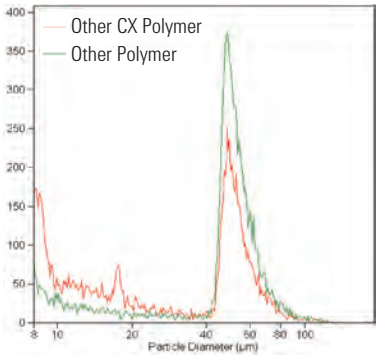
Alternative Cation Exchange Polymer

Comparison of particle size distributions of non-polar SPE sorbents

Bond Elut Plexa PCX



Other CX resin



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
Aqueous, biological fluids
Primary Extraction Mechanism
Non-polar
Compound Types
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
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

Bond Elut 96-well Plates

Description	10 mg	30 mg
1 mL round-well plates	A4969010	A4969030
2 mL square-well plates	A3969010	A3969030

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.

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

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 Method for Bond Elut Plexa PCX

Sample:
100 µL plasma

Pretreatment:
Dilute 1:3 with
2% H_3PO_4

Conditioning:
1. 500 µL MeOH
2. 500 µL H_2O

Washes:
Acidic wash: 500 µL aqueous 2% formc acid
Neutral wash: 500 µL CH_3OH/CH_3CN (1:1, v/v)

Elution:
500 µL CH_3OH/CH_3CN + 5% NH_3 (28-30%)

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

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
Other Formats		
Bond Elut Plexa PCX Prospekt Cartridge, 2 mm	96/pk	12221306
Bond Elut Plexa PCX 800 Series Cartridge	96/pk	12281306

Bond Elut 96-well Plates

Description	10 mg	30 mg
1 mL round-well plates	A4968010	A4968030
2 mL square-well plates	A3968010	A3968030

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
Plasma, urine, aqueous and biological fluids
Primary Extraction Mechanism
Mixed mode: non-polar and anion exchange
Compound Types
Acidic compounds, carboxylic acid metabolites of drugs, peptides and amino acids

Typical Method for Bond Elut Plexa PAX

Sample:
100 µL human plasma

Pretreatment:
Dilute 1:3 with 2% NH_4OH

Conditioning:
1. 500 µL MeOH
2. 500 µL H_2O

Washes:
1. 500 µL H_2O
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

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-well Plates

Description	10 mg	30 mg
1 mL round-well plates	A4967010	A4967030
2 mL square-well plates	A3967010	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
Water sources, biological fluids
Primary Extraction Mechanism
Non-polar, electrostatic
Compound Types
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

Cartridge:

Bond Elut PPL, 100 mg sorbent in 1 mL cartridge

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

Method:

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

Vacuum Conditions:

800 mbar (Vac Elut 20)

Vacuum:

800 mbar

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

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

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

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
Water sources
Primary Extraction Mechanism
Non-polar
Compound Types
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

200 mg/3 mL Bond Elut ENV cartridge

Sorbent Conditioning:
Adjust 500 mL sample to pH 2 using concentrated HCl

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

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

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

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

Tips & Tools

Learn the core concepts surrounding Solid Phase Extraction and best practices for Sample Prep. View the video at **www.agilent.com/chem/spevideo**

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

Bond Elut 96-well Plates

Description	10 mg	25 mg
1 mL round-well plates	A4961010	
2 mL square-well plates	A3961010	A3961025

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.

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

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.

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

Bond Elut 96-well Plates

Description	30 mg	60 mg
1 mL round-well plates	A4962030	
2 mL square-well plates		A3962060

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Printed in the USA July 12, 2011
5990-8589EN

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