

Ensure reproducible Polymeric SPE workflow for high-throughput bioanalysis applications

Agilent Bond Elut Plexa vs. Waters Oasis Sample Prep Products

Reliability is a key parameter in developing rugged, high-throughput sample preparation methods. That is why **Agilent Bond Elut Plexa SPE products** combine innovative research, state-of-the-art manufacturing, and stringent quality-control monitoring to deliver consistently fast flow rates and reproducible results.

With Agilent Bond Elut Plexa SPE products, you can count on:

- **Faster flow rates:** Uniform particles with a narrow size distribution ensure optimal flow characteristics for sample addition and elution during solid-phase extraction.
- **Excellent cartridge-to-cartridge reproducibility:** Plexa sorbent particles are manufactured using proprietary polymerization techniques to eliminate fines and achieve a very narrow particle size distribution.

- **Less wasted time and sample:** The absence of sorbent fines significantly reduces cartridge clogging. This is critical in high-throughput laboratories, where SPE must be performed unattended and overnight. The elimination of fines also reduces the risk of frit blockage and sample loss – an important prerequisite when analyzing biofluids.
- **More reliable data:** Proprietary automated fritting and real-time QC processes minimize channels (or voids) in the packed sorbent bed, preventing analyte breakthrough and variable recoveries.

On the following pages, you'll find a side-by-side comparison of Agilent Bond Elut Plexa and Waters Oasis Sample Prep Products



Agilent Bond Elut Plexa SPE products deliver unrivaled ease-of-use and reproducible flow. And here's the **proof**.

Excellent particle integrity saves time and eases your workload

As you can see in Figure 1, Agilent Bond Elut Plexa shows excellent particle integrity with no oversized, damaged, or fine particles. In contrast, the Waters polymer shows numerous broken particles and fines that may cause frit blockage and sample loss.

A narrow particle size distribution improves flow rate and reduces the risk of blockage

The comparison of particle size distributions in Figure 2 reflects a similar mean particle diameter for both the Agilent Bond Elut Plexa polymer and the Waters Oasis polymer. However, the Bond Elut Plexa has a Gaussian-type distribution, whereas the Waters polymer shows a broad distribution with broken particles and sub-10 μm fines.

The consequences of a broader size distribution are slower flow rate, greater risk of blocked wells, and decreased precision (less reproducibility from cartridge-to-cartridge and well-to-well).

Agilent Bond Elut Plexa



Waters Oasis HLB

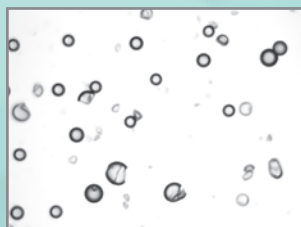


Figure 1. Magnified image analysis was used to compare SPE polymer particle sizes

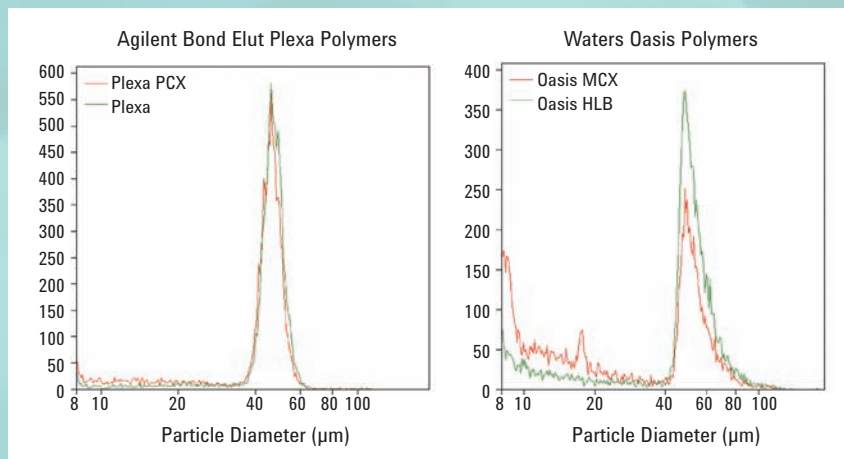


Figure 2. Particle size distribution comparison of polymeric SPE sorbents

Easy-to-use methods and general-purpose extraction protocols simplify your SPE

Two polymer choices cover a broad range of analyte classes and properties

- **Agilent Bond Elut Plexa (the non-polar polymer)** is universally applicable, and is the best choice for extracting a wide range of acidic, neutral, and basic analytes from different matrices.
- **Agilent Bond Elut Plexa PCX** is a strong cation exchanger with mixed-mode sorbent characteristics, making it suitable for the extraction and clean-up of polar and non-polar bases from biofluids. Bond Elut Plexa PCX demonstrates the same excellent distribution and outstanding particle integrity as Bond Elut Plexa.



Analyte	Acids	Neutrals	Bases
	pKa 3-6	Log P > 1.5 pKa 6-10	Log P > 0.8 pKa 6-10
	Plexa Acid Load Method	Plexa Base Load Method	Plexa PCX
Sample Treatment	1% HCO ₂ H	2% NH ₄ OH	2% H ₃ PO ₄
Sorbent Condition	100% MeOH		100% MeOH
Equilibrate	100% H ₂ O		100% H ₂ O
Wash	5% MeOH in H ₂ O		2% HCO ₂ H in H ₂ O
Elution 1	100% MeOH Acids	100% MeOH Neutrals	1:1 MeOH/ACN
Elution 2			5% NH ₃ in 1:1 MeOH/ACN Bases

Figure 3. The general protocol for trouble-free SPE applications with Bond Elut Plexa and Bond Elut Plexa PCX

To download the Agilent Bond Elut brochure, please visit
www.agilent.com/chem/BondElutSPE

Bond Elut Plexa – designed for simplicity, improved analytical performance, and ease-of-use

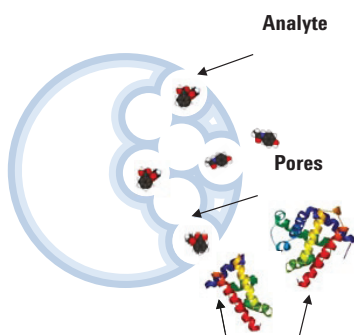
The Bond Elut Plexa Family is a new generation of polymeric SPE products. Its uniqueness lies in the novel hydroxylated exterior, hydrophobic interior and advanced polymeric architecture.

Advanced Polymer Architecture Improves Extraction Performance

LOAD:

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

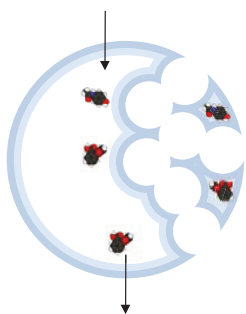
Large endogenous proteins do not bind to the surface of the polymer and cannot access pore structure.



WASH:

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

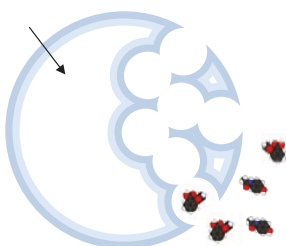
Interferences wash away without leaching the analytes of interest.



ELUTE:

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

The results are superior extract cleanliness and high recoveries.



Maximize flow rates and minimize clogging

Figure 4 shows the practical effect of particle integrity on flow rates. To compare flow rates between Plexa PCX and Waters Oasis MCX polymeric sorbent, 12 wells were conditioned with 500 μ L methanol followed by 500 μ L of water. Plasma, diluted to 1:3 with phosphoric acid, was then added to every well, and a constant vacuum of -5" Hg was applied. The time was recorded, enabling flow rates to be calculated.

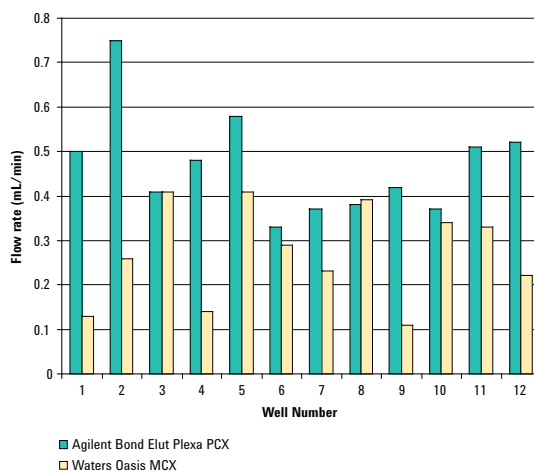


Figure 4. Agilent Bond Elut Plexa PCX (left) demonstrates faster and more reproducible flow rates across a row of twelve rows in a 96 well plate – mean flow rate for Plexa PCX = 0.47 mL/min (%RSD of flow = 24%), Waters Oasis MCX (right) mean flow rate = 0.27 mL/min (%RSD of flow = 38%)

Typical properties

Parameters	Bond Elut Plexa	Bond Elut Plexa PCX
Pore size (nominal)	100 Å	100 Å
Particle size	45 μ m	45 μ m
Specific surface area m ² /g	450 m ² /g	450 m ² /g
pH range stability	1-14	1-14
Chemical resistance (solvents)	Broad range of protic and non-protic polar and non-polar solvents	Broad range of protic and non-protic polar and non-polar solvents
Retention capacity / Ion exchange capacity	10% of sorbent mass*	Cation exchange loading of 1.0 mmol/g (determined by elemental analysis of sulfur content)

These properties are characteristic but do not constitute specifications

**highly dependent on matrix type and specific analyte characteristics*

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

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, 1 mL	1/pk	A3968010
30 mg, 1 mL	1/pk	A3968030

To download the Agilent Bond Elut brochure, please visit
www.agilent.com/chem/BondElutSPE

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- **World class manufacturing and quality:** Unrivalled manufacturing control, plus exacting ISO 9001: 2000 compliant inspections guarantee the consistent quality of Bond Elut



Improve extraction performance and streamline method development with Agilent's new generation of polymeric SPE sorbent

Traditional SPE sorbents contain a large number of fines, which can cause sample blockage and lead to a slow, variable flow of solvent and analyte through the sorbent bed. As a result, assay variability with respect to recovery rates will increase.

In contrast, Agilent Bond Elut Plexa sorbent particles are nearly mono-dispersed in size, resulting in a very homogeneous packing, higher bed packing efficiency, and more consistent performance. A highly controlled sulfonation process minimizes fines for Plexa PCX.

Specifically designed for pharmaceutical bioanalysis, Agilent Bond Elut Plexa's advanced polymer technology delivers reproducible results with excellent recoveries and sharp elution profiles. These leading-edge SPE products are especially amenable to high-throughput or automated platforms, due to their excellent well-to-well and cartridge-to-cartridge flow reproducibility.

For more information

To learn more about Agilent Sample Preparation Products please visit www.agilent.com/chem/samplepreparation

Or call toll free 1-800-227-9770, option 3, then option 3 again (in the U.S. and Canada).

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Printed in the USA March 10, 2011
5990-7567EN



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