



Empore[™] Extraction Disk Cartridges

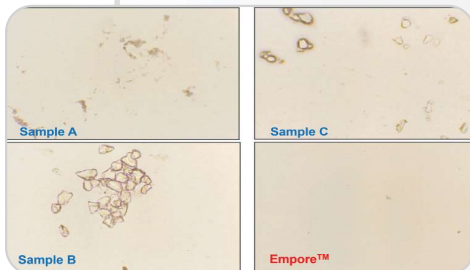
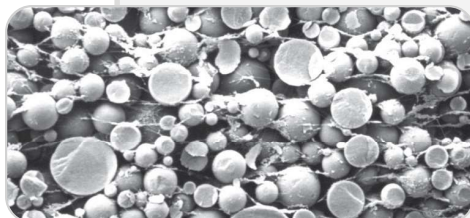
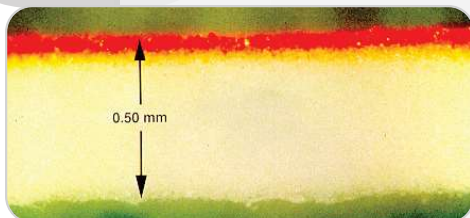
- Solid Phase Extraction Cartridges

Introduction

Empore solid phase extraction (SPE) products were originally developed in 1989 by the 3M Company producing high quality disks, cartridges, 96-well plates, and StageTips. As of 2019, CDS Analytical has become the proud new home of the Empore product line. With a new clean room at our facility in Oxford, PA, CDS Analytical continues to use the same formula and manufacturing process that brought users the historic quality of Empore products for more than 30 years.

Empore solid phase extraction products are produced by trapping sorbent particles within an inert matrix of an engineered polymer. The resulting particle loaded membrane, featuring sorbent particles in either a silica- or resin-based format, yields a more uniform and more densely packed particle bed than traditional loosely packed SPE products.

The resulting Empore product developed from our unique manufacturing process brings increased efficiency and reproducibility to SPE sample preparation methods.



Greatest Uniformity

Sorbent particles are packed uniformly in the Empore membrane providing superior extraction at high flow rates, making Empore excellent for high-throughput applications.

Highest Density

The high packing density of the Empore membrane reduces the distance between sorbent particles greatly improving extraction efficiency by eliminating the channeling effect.

Low Elution Volume

Sorbent particles are confined with the thin Empore membrane, which means less solvent is required for extraction, reducing or eliminating evaporation steps and reducing total solvent usage.

Less Fine Particles

The densely packed Empore membrane greatly reduces free fine particles resulting in a clean extract for analysis.

MADE IN THE USA



ISO-9 Clean Room

Empore products are manufactured at our brand new, GMP-compliant clean room at our facility in Oxford, Pennsylvania.

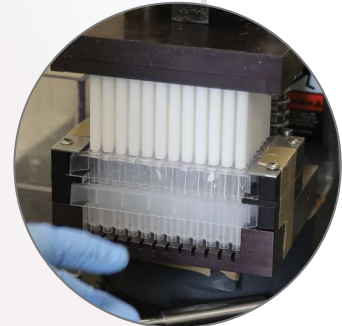
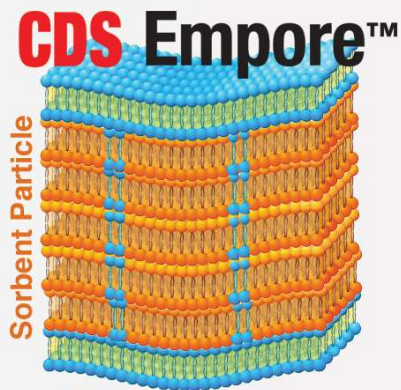
Our facility is equipped with the cutting-edge instruments needed to perform quality control and assurance to ensure that each product maintains the historic high quality of the Empore line.



Visual Inspection



QA/QC Analytical Lab

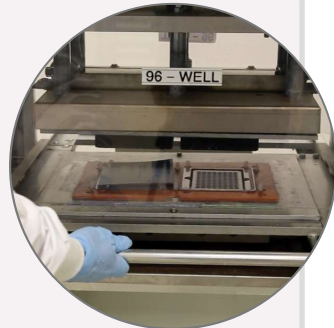


Automated Production



Highest Quality Chemicals

Application testing of Empore SPE products is performed in our state-of-the-art GC-MS instrument facility.



Precision Tooling



Flow Rate Testing

Cartridges

Empore™ Extraction Disk Cartridges

The cartridge is molded from a polypropylene resin. An Empore extraction disk is secured in place at the bottom of each cartridge with a sealing ring with a proprietary prefilter placed above the Empore disk. This prefilter aids in preventing particulates and macromolecules from reaching the underlying membrane and improves the flow of biological samples, such as serum and plasma, through the cartridge.

Product Listings: Silica-Based Sorbents

Sorbent	Suggested Application	Size	Quantity	VWR Catalog No.
C8-SD	Moderately nonpolar analytes	1 mL	100 / 300	76333-118
		3mL	50 / 150	76543-044
		3mL (2-layer)	50 / 150	76543-046
		6mL	30 / 90	76543-048
C8-SD	Moderately nonpolar analytes	6mL (2-layer)	30 / 90	76543-050
		C8-HD	Moderately nonpolar analytes	1 mL
C18-SD	Strongly nonpolar analytes	1 mL	100 / 300	76333-120
		3mL	50 / 150	76333-122
		3mL (2-layer)	50 / 150	76543-052
		6mL	30 / 90	76333-124
C18-SD	Strongly nonpolar analytes	6mL (2-layer)	30 / 90	76543-054
		Mixed Phase Cation (MPC)	Moderately nonpolar to moderately polar analytes	1 mL
3mL	50 / 150			76543-058
3mL (2-layer)	50 / 150			76543-060
6mL	30 / 90			76543-062
Mixed Phase Cation (MPC)	Moderately nonpolar to moderately polar analytes	6mL (2-layer)	30 / 90	76543-064

Product Listings: Polymer-Based Sorbents

Sorbent	Suggested Application	Size	Quantity	VWR Catalog No.
SDB-XC	Moderately nonpolar analytes plus pi-pi interactions	1 mL	100 / 300	76543-066
		3mL	50 / 150	76543-068
		3mL (2-layer)	50 / 150	76543-070
		6mL	30 / 90	76333-126
SDB-XC	Moderately nonpolar analytes plus pi-pi interactions	6mL (2-layer)	30 / 90	76543-072
		SDB-RPS	moderately nonpolar and cation exchange	1 mL
3mL	50 / 150			76543-076
3mL (2-layer)	50 / 150			76543-078
6mL	30 / 90			76543-080
SDB-RPS	moderately nonpolar and cation exchange	6mL (2-layer)	30 / 90	76543-082
		HLB	Moderately nonpolar to moderately polar analytes	1 mL
3mL	50 / 150			76543-108
3mL (2-layer)	50 / 150			76543-110
6mL	30 / 90			76543-112
HLB	Moderately nonpolar to moderately polar analytes	6mL (2-layer)	30 / 90	76543-114

HD = High Density
SD = Standard Density

SDB = styrenedivinylbenzene
RPS = Reverse Phase Sulfonated
HLB = Hydrophilic Lipophilic Balance



Product Listings: Polymer-Based Sorbents

Sorbent	Suggested Application	Size	Quantity	VWR Catalog No.
Anion-SR (SAX)	chromium, arsenic, selenium, carboxylic acids, etc.	1 mL	100 / 300	76543-084
		3mL	50 / 150	76543-086
		3mL (2-layer)	50 / 150	76543-088
		6mL	30 / 90	76543-090
		6mL (2-layer)	30 / 90	76543-092
Cation-SR (SCX)	metals, amines	1 mL	100 / 300	76543-094
		3mL	50 / 150	76543-096
		3mL (2-layer)	50 / 150	76543-098
		6mL	30 / 90	76543-100
		6mL (2-layer)	30 / 90	76543-102
Chelating	divalent metals and other divalent cations	6 mL	30 / 90	76543-104

Silica and HLB Bed Mass Equivalencies - Empore Membrane vs. Traditional Loose-Packed Sorbent: C8, C18, MPC, and HLB

Empore Effective Membrane Diameter	Cartridge Volume	Empore SD Sorbent Mass	Empore HD Sorbent Mass	Loose-Packed Sorbent Mass
4 mm	1 mL	5.5 mg	4 mg	50 mg
7mm	3 mL	17 mg	12 mg	100 mg
7mm	3 mL (2-layer)	34 mg	24 mg	200 mg
10 mm	6 mL	35 mg	24 mg	200 mg
10 mm	6 mL (2-layer)	70 mg	48 mg	500 mg

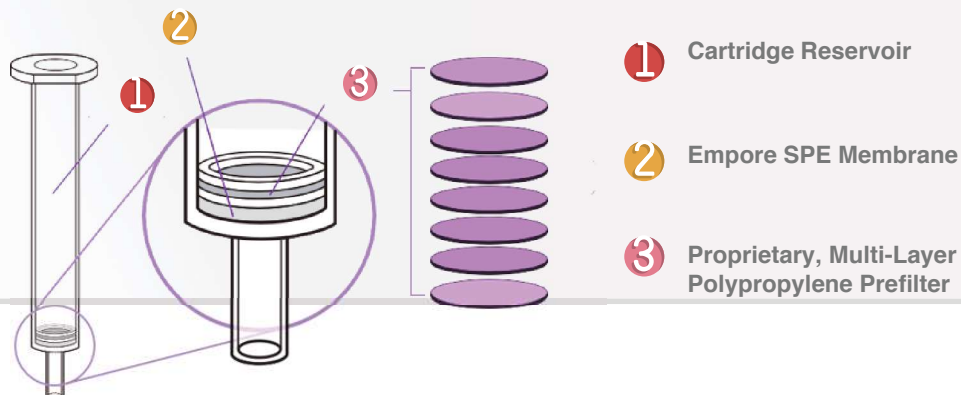
Polymer Bed Mass Equivalencies - Empore Membrane vs. Traditional Loose-Packed Sorbent: SDB-XC, SDB-RPS, SAX, SCX, and Chelating

Empore Effective Membrane Diameter	Cartridge Volume	Empore HD Sorbent Mass	Loose-Packed Sorbent Mass
4 mm	1 mL	2.2 mg	30 mg
7mm	3 mL	7.5 mg	60 mg
7mm	3 mL (2-layer)	15 mg	100 mg
10 mm	6 mL	15 mg	200 mg
10 mm	6 mL (2-layer)	30 mg	500 mg

Cartridge Applications:

Extraction Disk Cartridge	General Cartridge Selection Guide	
4mm / 1mL	<ul style="list-style-type: none"> •Miniaturizes SPE •Ideal for 0.05 to 0.5 mL sample volumes •Fast throughput using automation 	<ul style="list-style-type: none"> •Elution volumes are small and range from 100-200 μL •Small disk surface area results in slow flow characteristics if using vacuum •Centrifugation recommended as processing method
7mm / 3mL	<ul style="list-style-type: none"> •Most commonly used and versatile in size •Typically used for 0.5 to 2 mL sample volumes •Fast throughput using automation 	<ul style="list-style-type: none"> •Elution volumes range from 200-400 μL •Interchangeable with 100mg/1mL packed SPE columns
10mm / 6mL	<ul style="list-style-type: none"> •Used for larger sample volumes of several milliliters •Higher capacity 	<ul style="list-style-type: none"> •Elution volumes range from 600-1000 μL •Faster flow characteristics due to larger disk surface area

The prefilter is composed of polypropylene microfiber layers of graded densities. Three different densities are used, with the coarsest one on top and the finest at the bottom. The top two microfiber layers are individual layers of material. The third microfiber layer, having the smallest effective pore size, is on the bottom of the prefilter and contains five individual layers of material. A porous polypropylene support membrane comprises the final layer.



Cartridges

Cross-Reference Table - Cartridges

Empore Extraction Disk Cartridges

Sorbent	Size	VWR Catalog No.	Waters SKU
C8-HD	1 mL	76333-116	
C8-SD	1 mL	76333-118	WAT054965
	3 mL	76543-044	
	3 mL (2-layer)	76543-046	WAT054940
	6 mL	76543-048	
C18-SD	6 mL (2-layer)	76543-050	WAT054525
	1 mL	76333-120	WAT054955
	3 mL	76333-122	
	3 mL (2-layer)	76543-052	WAT054945
SDB-XC	6 mL	76333-124	
	6 mL (2-layer)	76543-054	WAT043395
	1 mL	76543-066	
	3 mL	76543-068	
SDB-RPS	3 mL (2-layer)	76543-070	
	6 mL	76333-126	
	6 mL (2-layer)	76543-072	
	1 mL	76543-094	
HLB	3 mL	76543-096	
	3 mL (2-layer)	76543-098	
	6 mL	76543-100	
	6 mL (2-layer)	76543-102	
Anion-SR	1 mL	76543-106	WAT094225
	3 mL	76543-108	WAT094226
	3 mL (2-layer)	76543-110	
	6 mL	76543-112	WAT106202
Cation-SR	6 mL (2-layer)	76543-114	186000115
	1 mL	76543-084	
	3 mL	76543-086	
	3 mL (2-layer)	76543-088	
Chelating	6 mL	76543-090	
	6 mL (2-layer)	76543-092	
	1 mL	76543-094	
	3 mL	76543-096	
Chelating	3 mL (2-layer)	76543-098	
	6 mL	76543-100	
	6 mL (2-layer)	76543-102	
	6 mL	76543-104	

Waters Analytical Solutions



Empore



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