

Environmental analysis

Sample preparation workflow solutions from Biotage



CONTENTS

- 4** Pre-treatment
- 7** Analyte extraction and extract clean-up
- 9** Processing options
- 13** Drying
- 14** Evaporation
- 15** Highlighted application: SVOC in drinking water
- 16** Highlighted application: SVOC in wastewater and groundwater
- 17** Highlighted application: oil & grease
- 18** Highlighted application: per and polyfluoroalkyl substances
- 19** Highlighted application: pesticides & PCBs
- 20** Highlighted application: polycyclic aromatic hydrocarbons
- 21** Highlighted application: EPH fractionation

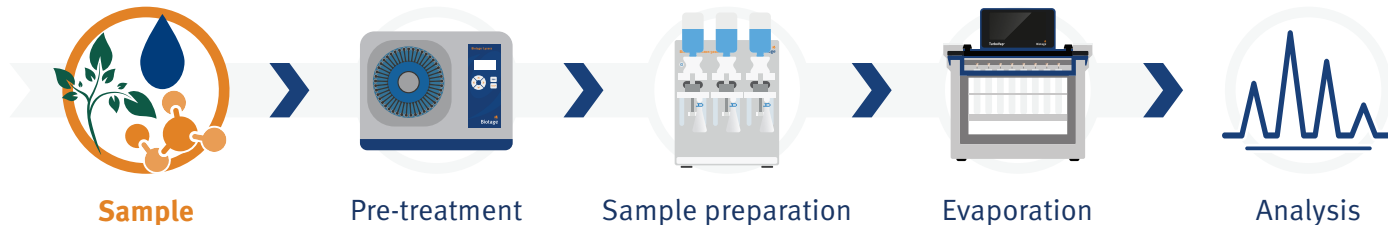
Sample preparation workflows for environmental analysis

The nature of an environmental sample can vary widely and each matrix can have any number of unique properties that can either help or hinder the preparation process. However, it does not matter if the matrix is solid or liquid, drinking water or wastewater, all samples require that the preparatory solutions used can be counted on to deliver the best results.

Learn more about our sample preparation solutions that can be used to simplify and streamline the process used in your workflows.



Sample



A word on sample matrices

The way a particular sample is treated often depends on its origin. While several matrices may share certain attributes (pH, percent solids, etc.), each can have its own unique challenges that will need to be taken into account during the preparation process.

Wastewater

Characterized frequently by high amounts of solids as well as various chemical additives from the treatment process, these samples are some of the most complex there are.

Seawater

A clear sample from the ocean hides high salt content which may interfere with the effectiveness of many extraction processes.

Groundwater

Often containing small, inorganic particulate these samples are generally easy to filter. However, samples taken from stagnant locations on the river can contain high amounts of algae and other organic content which can affect sample extraction.

Food production

These sample matrices vary depending very much on what is produced at that site. Samples from animal processing are vastly different from plant processing centers.

Agricultural runoff

Samples of this nature frequently contain high amounts of particulate and organic matter along with the pesticides, herbicides, and fertilizers used to treat the food products themselves.

Drinking water

Often thought of as easy, samples of this nature are often subject to some of the lowest limits around and can frequently challenge the analytical capabilities of a laboratory.

Soil

Ranging from beach sand, to soil from an active farm, to mud from an estuary, these samples often can contain varying amounts of organic material and water and often require secondary treatment steps to homogenize the samples prior to extraction.

Solids

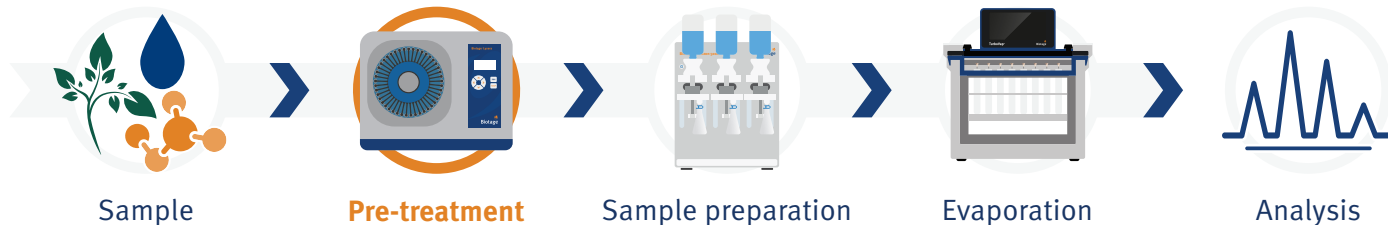
An all-encompassing word used for anything from a water sample that has too much sediment in it to a sample of concrete from a contaminated industrial site. This diversity often means that samples from certain locations or clients will have their own special protocols in laboratories.

Landfills (Leachate)

The nature of these trash repositories has changed a lot over the last 50 years and, while they now have strict regulations as to what can be buried now in some countries, others are still willing to include everything. So while these samples are aqueous in nature, they frequently can contain many different types of interferences.

These differences often drive changes in the preparation process to compensate. So while some matrices will require all of the following steps, many will skip one or more in an effort to save time and money.

Pre-treatment



Homogenization is used to ensure that the sample matrix being used is representative of the location that you wish to report on and that the extraction is as effective as possible.

Biotage® Lysera

Some samples may require only a simple blend in a food processor, but others may need something more. Biotage® Lysera is a bead homogenizer capable of preparing representative homogenates of even tough samples contain plant material or soil.



A range of tubes and beads support homogenization of any sample type

	Lyse/Disrupt	Homogenize			Grind	
Size	0.5 mm Glass	1.4 mm Ceramic	2.8 mm Ceramic	0.7 mm Garnet	2.4 mm Metal	0.25 mm Carbide
Part number	19-622	19-627	19-628	19-624	19-620	19-625
Fish/insects						
Insects		✓	✓			
Zebrafish	✓	✓		✓		
Plant						
Leaves			✓		✓	
Seeds			✓		✓	
Rice			✓		✓	
Wheat			✓		✓	
Stems			✓		✓	
Roots			✓		✓	
Moss		✓	✓		✓	
Soil						
Soil		✓	✓	✓	✓	✓
Sediment		✓		✓	✓	✓

QuEChERS

QuEChERS (an acronym for Quick, Easy, Cheap, Effective, Rugged, and Safe) is an extraction and clean-up technique originally developed for pesticides in fruit and vegetable samples. It is frequently applied to soils and other environmental biosolids for similar analytes. QuEChERS extraction followed by clean-up using GCB is used for extraction of PFAS from soils (EPA Method 1633).

QuEChERS extraction steps:

1. Salt assisted extraction into acetonitrile
2. Clean-up using dispersive (dSPE) or cartridge (cSPE) format

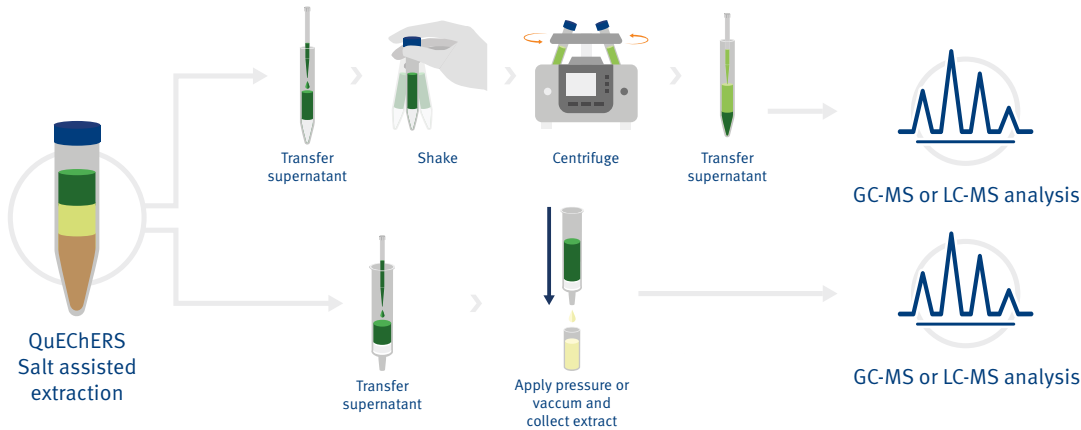


Table 1. QuEChERS extraction products for the initial salt assisted extraction

Description	Part number	Tube	Pack size				
50 ml Centrifuge tube with rack	Q0000-50V	50 mL	25				
Description	Part number	Tube	Pack size	MgSO ₄	Na Citrate	Na Citrate	NaCl
ISOLUTE® QuEChERS AOAC 15 g/15 mL Extraction Tube	Q0010-15V	15 mL	25	6 g	1.5 g		
ISOLUTE® QuEChERS EN 10 g/15 mL Extraction Tube	Q0020-15V	15 mL	25	4 g	1 g	0.5 g	1 g



In the clean-up step

- » PSA removes sugars, fatty acids, organic acids, some pigments
- » C18(EC) removes lipids and other non-polar interferences
- » GCB removes some pigments, sterols

QuEChERS clean-up products are available in pre-filled tubes, a range of flow-through cartridge formats, and bulk material.



Table 2. dSPE and cSPE products for QuEChERS

Media	Ratio	Pre-filled 15 mL tube dSPE format	Packed 3 mL cartridge cSPE format
PSA + MgSO ₄	1:3	Q0030-15V	Q0030-0020-BG
PSA + MgSO ₄	1:6	Q0035-15V	Q0035-0020-BG
PSA + C18 + MgSO ₄	1:1:3	Q0050-15V	Q0050-0035-BG
PSA + C18 + MgSO ₄	1:1:6	Q0060-15V	Q0060-0035-BG
PSA + GCB + MgSO ₄	1:1:3	Q0070-15V	Q0070-0022-BG
PSA + GCB + MgSO ₄	1:0.1:6	Q0080-15V	Q0080-0030-BG
PSA + GCB + MgSO ₄	1:0.3:6	Q0090-15V	Q0090-0050-BG
ISOLUTE® AOAC General 200 mg			Q0030-0020-BG
ISOLUTE® AOAC Pigment 150 mg			Q0070-0015-BG
ISOLUTE® AOAC Waxed 350 mg			Q0050-0035-BG
ISOLUTE® EN General 200 mg			Q0035-0020-BG
ISOLUTE® EN High Pigment 500 mg			Q0090-0050-BG
ISOLUTE® EN Pigment 300 mg			Q0080-0030-BG
ISOLUTE® EN Waxed 350 mg			Q0060-0035-BG

Table 3. Single media cSPE products

Media	Format	Part number
ISOLUTE® PSA	500 mg/6 mL	480-0050-C
ISOLUTE® PSA	1 g/6 mL	480-0100-C
ISOLUTE® C18(EC)	500 mg/6 mL	221-0050-C
ISOLUTE® C18(EC)	1 g/6 mL	221-0100-C
ISOLUTE® GCB *for EPA 1633	100 mg/6 mL	881-0010-C

Table 4. Bulk media for QuEChERS clean-up

Media	Format	Part number
ISOLUTE® PSA	100 g	9480-0100
ISOLUTE® C18(EC)	100 g	9221-0100

Analyte extraction and clean-up



The purpose of the extraction process is to isolate specific chemical compounds while simultaneously reducing the amount of interferences in the final sample that we are going to analyze. Broadly speaking, environmental samples for semi-volatile analysis can be broken down into two main categories: aqueous and solid.

The primary focus of Biotage is on using solid phase extraction (SPE) which targets the analytes that you want while avoiding the interferences in the sample matrix. Solid phase extraction begins by selecting the format that best suits the matrix you need to extract. For clean samples, ISOLUTE® and EVOLUTE® cartridges are available in a comprehensive range of media and sizes. For more complex matrices, Atlantic® and Pacific® disks allow you to extract the whole sample without the need of a secondary filtration process. Biotage has made it our business to deliver quality consumables that achieve high analyte recovery and reproducible performance no matter your matrix type.

Biotage provides a range of SPE cartridge and disk options with different chemical characteristics providing flexibility to tailor the extraction to the exact analytes and matrix requirements.

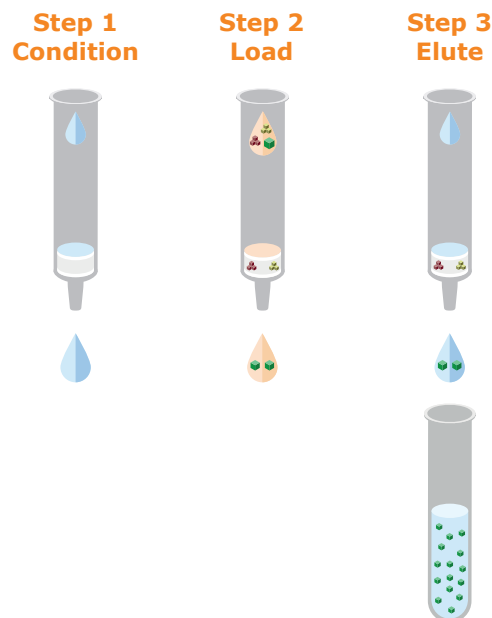
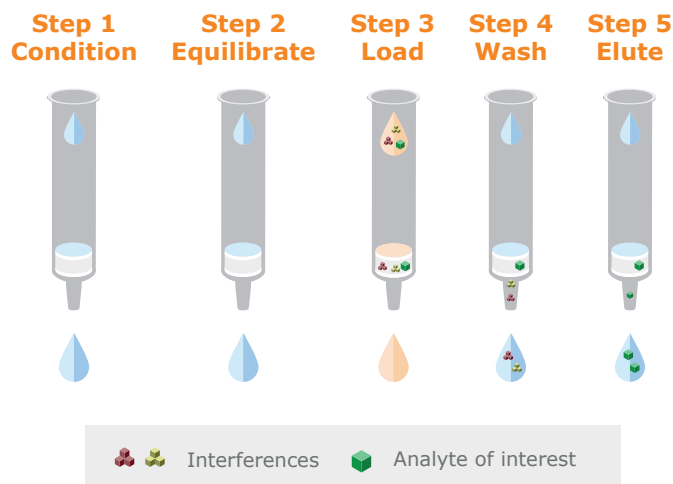


Extraction

Process the sample through the cartridge or disk to capture the analytes of interest on the adsorbent. The sample matrix and interferences flow out to waste and a small amount of solvent can be used to generate your extract.

Clean-up

Process the sample through the cartridge or disk and capture the interferences in the matrix on the adsorbent. The sample that flows comes through the SPE product is now clean and ready for the next step.



EVOLUTE® SPE products

Polymeric, water wettable, and pH 1-14 stable, with a range of functionality providing different selectivity. Packed into a range of SPE cartridge sizes, EVOLUTE® SPE products are best suited for clean water samples.

- » EVOLUTE® EXPRESS ABN – for simultaneous extraction of acidic, basic and neutral analytes. Useful for extraction of PPCPs and endocrine disrupters
- » EVOLUTE® EXPRESS CX – for extraction of basic analytes
- » EVOLUTE® EXPRESS AX – for extraction of acidic analytes
- » EVOLUTE® EXPRESS WCX – for extraction of strongly basic analytes
- » EVOLUTE® EXPRESS WAX – for extraction of strongly acidic analytes
- » EVOLUTE® WAX/GCB cartridges combine weak anion exchange (WAX) and graphitized carbon black (GCB) for effective PFAS analysis.
- » EVOLUTE® PFAS – high purity WAX sorbent and components that deliver high PFAS recoveries, but won't contaminate extracts. Compliant with EPA Method 533, ISO and DIN methods
- » EVOLUTE® PFAS+ - dual-layer WAX/DVB cartridges design for high recoveries across a wide PFAS range, including neutral and long-chain compounds.

ISOLUTE® SPE products

A wide range of non-polar, polar, ion exchange and mixed-mode SPE media providing solutions for many environmental extraction and clean-up applications. The range includes both high purity modified silica and polymeric SPE media. Packed into a range of SPE cartridge sizes, ISOLUTE® SPE products are best suited for clean water samples. Narrow particle size distribution and optimized packing techniques ensure excellent performance and reproducibility.

- » ISOLUTE® ENV+ is a high-capacity polymeric sorbent designed to deliver high recoveries of the most polar analytes such as phenols, even when loaded at high flow rates. Useful for analytes that don't retain efficiently on C18 or C8 media
- » ISOLUTE® 101 is a DVB based polymeric sorbent ideal for extraction of PFAS using EPA Method 537
- » ISOLUTE® C18 and ISOLUTE® C18(EC) are ideal for extraction of SVOCs and other organics
- » Layered cartridges can be used to extend the range of analytes extracted in a single extraction, or offer additional clean-up (ISOLUTE® PAH)
- » ISOLUTE® EPH - Reliably fractionate aliphatics from aromatics in soil and water extracts, for GC-FID or GC-MS analysis.

Atlantic® SPE disks

Biotage designs, tests and certifies Atlantic® SPE Disks to be compatible with automated or manual SPE methods. These 47 mm disks extract a wide range of sample matrices and work ideally in extracting analytes from drinking water, surface

water, sea water and particulate-laden wastewater. Lot certified batches ensure consistent results for lab testing needs. Combine with pre-filters to cope with challenging higher particulate samples.

- » Atlantic® C18 – low water retention for efficient extraction procedures
- » Atlantic® DVB - resistant to accidental drying
- » Atlantic® One Pass- Allows for extraction of acidic, basic and neutral compounds. *Combine with Carbon Cartridge for EPA 8270/625 analytes
- » Atlantic® HLB – Hydrophilic-Lipophilic balanced polymeric media. Choose low (L), medium (M) or high (H) capacity based on organic sample concentrations.

Atlantic® ReadyDisks

Atlantic® ReadyDisks are SPE disks conveniently pre-assembled into single use holders for processing on automated or manual systems. They are used for extracting organic and semi-volatile organic compounds from aqueous matrices. ReadyDisks are designed for extractions with maximum speed and convenience in mind.

- » ReadyDisk C18 - low water retention for efficient extraction procedures
- » ReadyDisk HC-C18 - increased capacity for improved retention of more polar analytes
- » ReadyDisk DVB - resistant to accidental drying

Pacific® O&G extraction

Pacific® Premium Oil and Grease SPE Disks provide fast flow rates for dirty samples while offering high recovery values for the oil and grease fraction of the sample. 47 mm and 90 mm options available. Combine with Pacific® pre-filters for the most challenging of contaminated samples. Add Pacific® Sodium Sulfate Drying Cartridges for efficient in-line drying.

Pacific® SPE Disks are economical alternatives to the higher performance Premium Disks, available in both a 47 mm and 90 mm size.

Clean-up

ISOLUTE® SPE cartridges packed with polar sorbents provide convenient flow-through removal of polar interferences. The high purity media and components will not contaminate extracts, and our ISO 9001 controlled manufacturing and QC processes ensure reproducible results time after time.

Processing options

Processing your samples is easy no matter if you want to use a cartridge or a disk. Biotage offers an array of options from simple manifolds to fully automated systems that are designed to meet your laboratory's needs.

Manual vacuum processing for cartridges

10 or 20 position Biotage® VacMaster™ manifolds with flexible rack options to accommodate a variety of collection vessels

- » Robust, inert construction materials
- » Accessories for easier sample loading and cartridge drying
- » Compatible with all cartridge sizes



Manual vacuum processing for disks

Biotage® VacMaster™ Disk is a single station manual extraction system designed specifically with dirtier samples in mind.

- » Intuitive and easy to use
- » Up to 8 units run on a single vacuum pump
- » Accommodates Atlantic® and Pacific® disks as well as Atlantic® ReadyDisks and DryDisk® Separation Membranes



Positive pressure processing for cartridges

Biotage® PRESSURE+ 48 Positive Pressure Manifolds deliver positive pressure and parallel processing for 1 mL, 3 mL, and 6 mL cartridges. The system utilizes a consistent, uniform flow to move both low and high viscosity liquids through SPE cartridges.

- » Easy to set up and use - only a gas source required
- » Uniform flow for enhanced recovery and reproducibility
- » Flexible sample processing for up to 48 samples
- » Avoid sample transfer steps using the TurboVap® P+ and racks



Automated processing for general semi-volatile organics using disks

Biotage® Horizon 5000 are programmable, multipurpose SPE systems capable of processing aqueous samples directly from their original containers. The fast parallel processing of up to three large volume samples at one time maximizes the productivity of your laboratory.

- » Designed to run both clean and dirty samples so labs can extract the whole sample
- » Use 47 mm and 90 mm disks in either reusable or disposable disk holders or run 6 mL cartridges
- » Accommodates 40-2000 mL sample volumes
- » Small footprint to save lab space
- » Run up to 4 modules at one time
- » Improves data consistency and accuracy



Automated processing for oil & grease using disks

Biotage® Horizon 3100 automates the extraction of n-hexane extractable material for general purpose Oil & Grease testing. Compliant with US EPA Method 1664, ISO 11349, and Standard Methods 5520G protocols, this system is built to handle even the dirtiest of your wastewater samples.

- » Use 47 mm and 90 mm disks and pre-filters
- » Rinses the original sample container
- » Small footprint to save lab space
- » Built in methods
- » In-line drying using Na_2SO_4 cartridges
- » Improves data consistency and accuracy

Automated positive pressure systems

Biotage® PrepXpert-8

Automated 8-channel system for aqueous sample preparation

Biotage® PrepXpert-8 is a fully automated 8-channel sample preparation system designed to simplify aqueous sample workflows in environmental and PFAS analysis. Built for moderate to high-volume processing, Biotage® PrepXpert-8 combines automation, traceability, and ease of use in a compact benchtop format. It supports regulated methods such as EPA 533, DIN EN 17892-09, and ESo4506.1, making it ideal for routine testing and method development.

- » PFAS-optimized flow path with minimal fluorinated materials
- » Automated parallel processing of up to 8 samples
- » Supports 10–1500 mL sample volumes and 1, 3, 6, and 15 mL cartridges
- » Cartridge clog detection and reagent/waste level monitoring reduce downtime
- » Quiet, automated bottle rinsing system for efficient sample handling
- » Direct sample feed simplifies solvent and sample management
- » Touchscreen interface with audit-friendly software and traceable run reports
- » Dual-method operation for simultaneous processing of different chemistries



Biotage® Extrahera™ workstations automate sample processing and do it with engineered precision. Positive pressure processing delivers reproducible, controlled flows in every position, even for viscous, slow flowing samples.

- » Optimized for solid phase extraction plus many other sample prep techniques
- » Extremely simple method set up
- » Save time, lab space and reduce solvent consumption
- » Improve data accuracy and consistency
- » Free up time for other activities

Biotage® Extrahera™ Classic

For high throughput small volume processing:

- » 24 position configuration can process 24 x 1 mL, 3 mL or 6 mL cartridges in parallel
- » 96 position configuration can process 96-well plates and up to 96 x 1 mL tabless cartridges
- » Accurately dispense 50 µL to 1 mL per channel
- » Sample volume range 50 µL–10 mL
- » Disposable 1 mL tips to avoid cross contamination
- » Switch between configurations quickly and easily for flexible processing



Biotage® Extrahera™ HV-5000

For automated processing of larger scale methods:

- » Same small footprint for maximum space efficiency
- » Process up to 48 x 3 mL, 24 x 6 mL and 12 x 10 mL or 15 mL tables cartridges simultaneously
- » Accurately dispense up to 5000 µL per channel
- » Disposable 5 mL tips to avoid cross contamination



Part number	Description
121-1010	Biotage® Vacmaster™ 10 sample processing station (with 10 mm rack)
121-1012	Biotage® Vacmaster™ 10 sample processing station (with 12 mm rack)
121-1016	Biotage® Vacmaster™ 10 sample processing station (with 16 mm rack)
121-1027	Biotage® Vacmaster™ 10 sample processing station (with 27 mm rack)
121-1015ML	Biotage® Vacmaster™ 10 sample processing station (with 15 mL rack)
VMD-0250	Biotage® Vacmaster™ disk
PPM-48	Biotage® Pressure+ 48 positive pressure manifold
SPE-DEX 3100	Biotage® Horizon 3100 oil & grease extractor
SPE-DEX 5000	Biotage® Horizon 5000
419800	Biotage® PrepXpert-8
414001	Biotage® Extrahera™ Classic
417002	Biotage® Extrahera™ HV-5000

Drying

Drying sample extracts can be fraught with challenges and many environmental methods don't give enough instructions to ensure that the same procedure is followed by everyone. Biotage offers a few easy ways to dry your extracts that take the guess-work out and ensure that both your extract and analytical equipment are safe.

Sodium sulfate cartridges

Offered in two convenient sizes, ISOLUTE® and Pacific® Sodium Sulfate Drying Cartridges are packed with high purity media to ensure that no contaminants are added to your extract.

Both cartridges have a male Luer fitting on one end and a female Luer fitting on the other allowing the cartridges to be stacked with themselves, for additional water capacity, or used inline with another cartridge.

Pacific® Sodium Sulfate Drying Cartridges are designed specifically for use on the automated Biotage® Horizon 3100 SPE platform.



Membrane drying using DryDisk®-R

DryDisk Separation Membranes offer an efficient means of drying solvents in organic extractions.

- » No special preparation
- » No hazardous waste created
- » No adsorption losses
- » Unlimited capacity for water

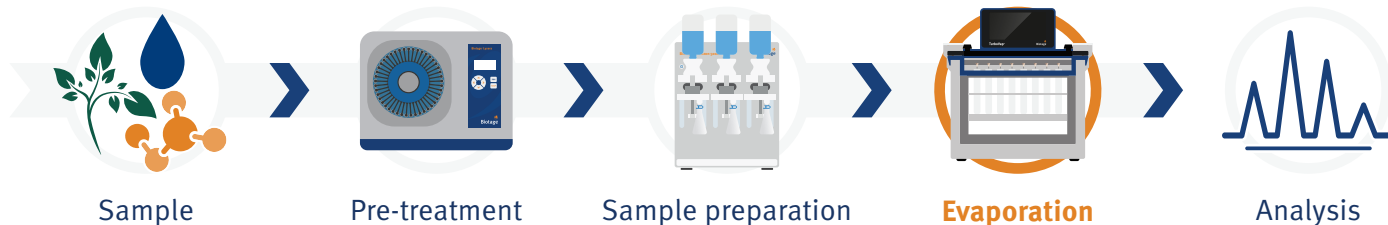
DryDisk® Solvent Drying System

DryDisk SDS is a stand-alone vacuum assisted device that allows for the fast drying of samples. Utilizing the DryDisk-R separation membrane, up to eight samples can be dried at a single time.

- » Compatible with standard extraction protocols (LLE, CLLE, SPE, etc.)
- » Available in 19/22 or 24/40 tapers to suit your laboratory's workflow.

Part number	Description
SDS-101-19/22	DryDisk® Solvent Drying System - SDS 101 - 19/22 taper
SDS-101-24/40	DryDisk® Solvent Drying System - SDS 101 - 24/40 taper
50-0749-01	Solvent Drying System - SDS 101 manifold assembly
40-1000-HT	DryDisk®-R 65 mm (100/pk)
802-0250-M	ISOLUTE® Sodium Sulfate Drying Cartridge (50/pk)
802-0550-BGC	Pacific® Sodium Sulfate Drying Cartridge, 5.5 g (50/pk)

Evaporation



Prior to analysis, an evaporation step is often needed for additional concentration or solvent exchange. TurboVap® blowdown evaporators use a patented vortex evaporation system that increases the speed of evaporation by a factor of 10 compared with other techniques

- » Faster evaporation and enhanced throughput
- » Simple set up and method optimization
- » Easy to use touch screen interface
- » Match your extract volume and throughput needs
- » Small footprint saves bench or hood space



TurboVap® LV

- » Evaporate up to 48 samples simultaneously
- » Flexible rack accommodates a wide selection of tubes

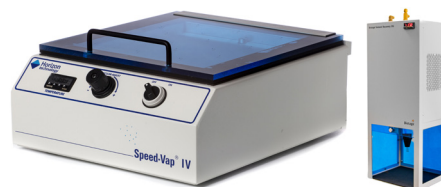
TurboVap® II

- » Parallel evaporation of up to 6 samples
- » Accommodates 50 mL or 200 mL glassware

Speed-Vap® and Solvent Recovery OG

Through a combination of vortex airflow and precise temperature control, this system quickly and safely evaporates n-hexane solvent from Oil & Grease extracts.

- » Controlled evaporation
- » Reduced exposure to hazardous solvents
- » Built in timer and chime
- » Compact size for a small footprint
- » Increases solvent evaporation over traditional techniques



Part number	Description
Evaporation	
415000	Turbovap® LV
415001	Turbovap® II
200-1000-04	Speed-Vap® - solvent evaporation system, 120v
200-1000-05	Speed-Vap® - solvent evaporation system, 220v
Solvent recovery	
200-2000-01	Biotage® Solvent Recovery OG (for use with Speed-Vap® only)

Semi-volatile organic compounds in drinking water

Highlighted application

General purpose semi-volatile methods for drinking water often contain one hundred or more compounds in their target category. The diversity of the compound classes that must be tested for simultaneously as well as the low concentration levels are what truly make these samples challenging.

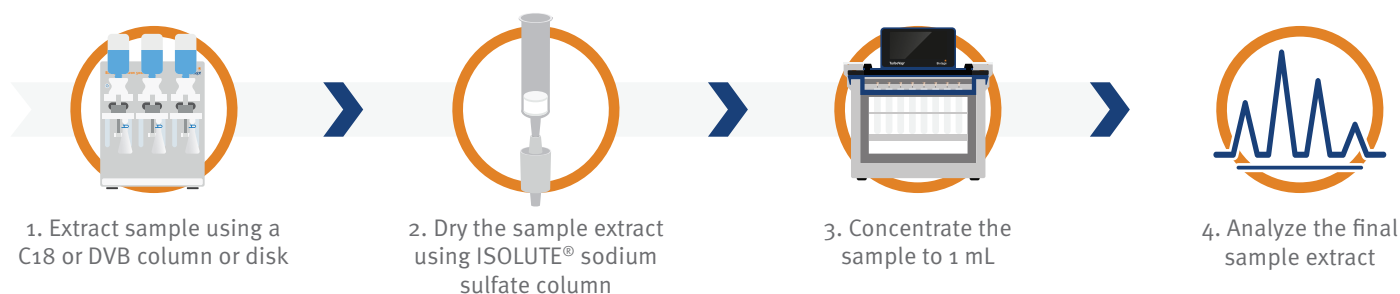
Atlantic® SPE Disks have been an integral part of laboratories testing for US EPA Methods 525.2 and 525.3 for many years. Available in multiple medias and bed masses which ensure that the regulatory needs of your lab are easily met.



Common consumables used

Part number	Description
Extraction	
47-2346-02	Atlantic® C-18 Disks, 47 mm
47-2346-06	Atlantic® DVB Disks, 47 mm
47-2346-13	Atlantic® High Capacity C18 disks, 47 mm
47-6001	Atlantic® ReadyDisk DVB
47-6005	Atlantic® ReadyDisk C18
47-6006	Atlantic® ReadyDisk HC-C18
220-0100-C	ISOLUTE® C18 1 g/6 mL
221-0100-C	ISOLUTE® C18(EC) 1 g/6 mL
610-0050-CXG	EVOLUTE® EXPRESS ABN 500 mg/6 mL (Tablets)
101-0020-C	ISOLUTE® 101 200 mg/6 mL
101-0050-C	ISOLUTE® 101 500 mg/6 mL
Drying	
802-0250-M	ISOLUTE® sodium sulfate drying cartridge

SVOC workflow for drinking water



Semi-volatile organic compounds in wastewater and groundwater

Highlighted application

Like their drinking water counterparts, a general purpose semi-volatile method for groundwater or wastewater will frequently contain many compounds from many different compound classes. As an added bonus, samples needing to be run for these tests also often contain high levels of particulates and the regulatory methods used require extractions under both acidic and basic conditions.

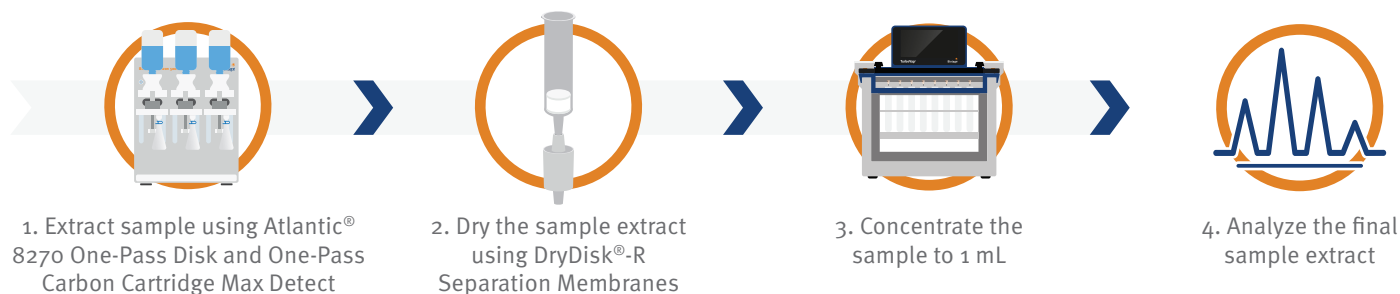
The Atlantic® 8270 One-Pass disk was the first SPE disk designed specifically for the challenges of US EPA Method 8270 and 625 and is the only SPE disk brand to take part in the testing protocols that were undertaken when US EPA revised US EPA 625.

Common consumables used

Part number	Description
Extraction	
47-2346-10	Atlantic® HLB-H Disks, 47 mm
47-2346-09	Atlantic® HLB-M Disks, 47 mm
47-2346-11	Atlantic® 8270 One Pass Disks, 47 mm
49-2620-01	One-Pass Carbon Cartridge Max Detect
Drying	
40-1000-HT	DryDisk®-R 65 mm (100/pk)



SVOC workflow for ground and wastewater



Oil & grease: EPA method 1664, ISO 11349, and standard methods 5520G

Highlighted application

The gravimetric measurement of Hexane Extractable Material (HEM) from an aqueous sample, commonly termed Oil & Grease, is one of the most common methods run world-wide. Samples for this test are often plagued by the amount of solids contained within their matrix and difficult samples can take hours to process.

The simple but effective workflow that Biotage offers includes standards, SPE disks and pre-filters, automated and manual extractors, and evaporation products. All designed with a comprehensive knowledge of the testing market that gives your labs world-class results.

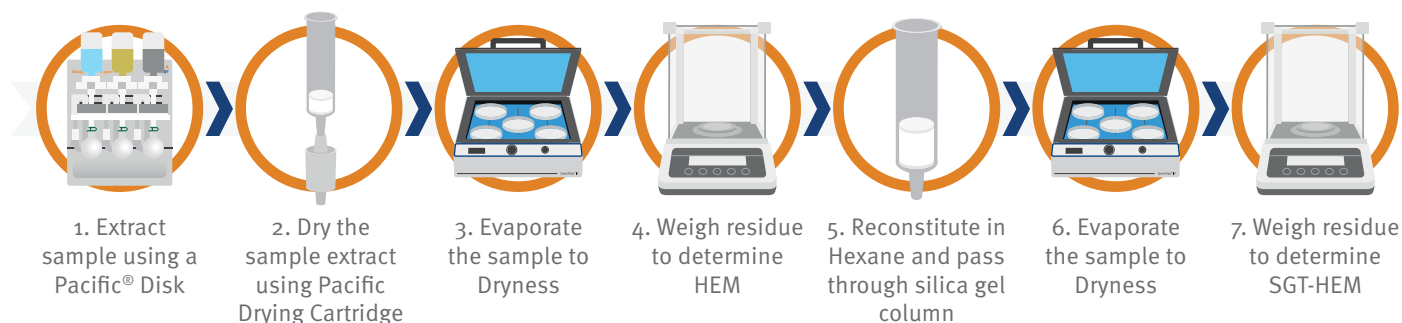


Common consumables used

Part number	Description
Standards	
50-003-HT	Oil & grease standards, 26 mL
50-021-HT	Oil & grease standards, 40 mg
Pacific® disks	
1664-47-HT	Pacific® Oil & Grease Disk, 47 mm
1664-90-HT	Pacific® Oil & Grease Disk, 90 mm
1664-100-PHT	Pacific® Premium Oil & Grease Disk, 90 mm
1664-47-PHT	Pacific® Premium Oil & Grease Disk, 47 mm
Weigh pans	
50-002-HT	Oil & grease aluminium weighing pans, 70 mm, 55mL
50-002-02-HT	Oil & grease aluminium weighing pans, 105 mm, 125 mL
Pre-Filters	
FFP-90-HT	Pacific® O&G Fast Flow Pre-Filter, 90 mm
FFP-47-HT	Pacific® O&G Fast Flow Pre-Filter, 47 mm
9800-0500	ISOLUTE® HM-N, bulk 500 g
9800-1000	ISOLUTE® HM-N, bulk 1 kg
9800-5000	ISOLUTE® HM-N, bulk 5 kg
Drying disks and cartridges	
802-0250-M	ISOLUTE® sodium sulfate drying cartridge
802-0550-BGC	Pacific® sodium sulfate drying cartridge
Specialty silica-gel cartridge	
946-0100	ISOLUTE® SI, bulk 100g

ISOLUTE® SI also available packed in a range of cartridge sizes

Oil & grease workflow



Per and polyfluoroalkyl substances

Highlighted application

Per and Polyfluoroalkyl Substances (PFAS) are a broad range of compounds that are used in many industries. The strength of the bond between the carbon and fluorine atoms in PFAS have meant that they do not break down easily in nature and so have been found to be present in water, air, soil, and animals around the world. Many governments are still developing protocols and setting regulatory limits for these compounds and this uncertainty means that laboratories are left trying to determine how to best anticipate the needs of their customers.

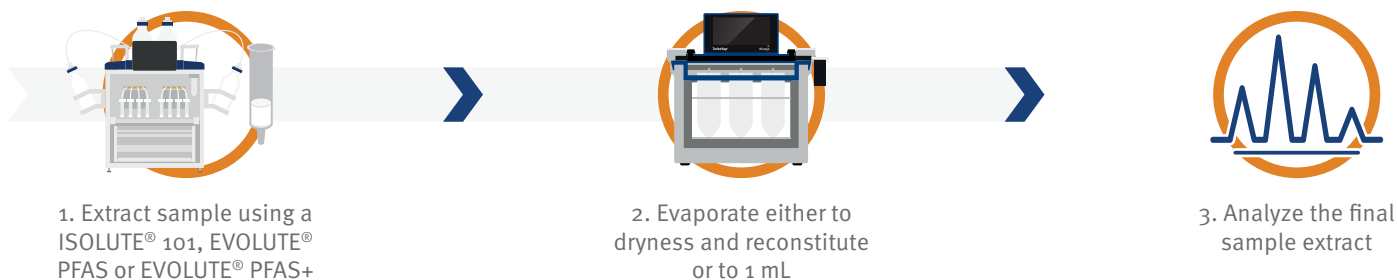
The ISOLUTE® and EVOLUTE® PFAS cartridges deliver superior results for PFAS extractions and the combination of our manual and automated sample preparation systems means that your laboratory will have consistent results each time you prepare a sample.

EVOLUTE® PFAS+ cartridges feature a dual-layer WAX/DVB design for high recoveries across a wide PFAS range, including neutral and long-chain compounds.

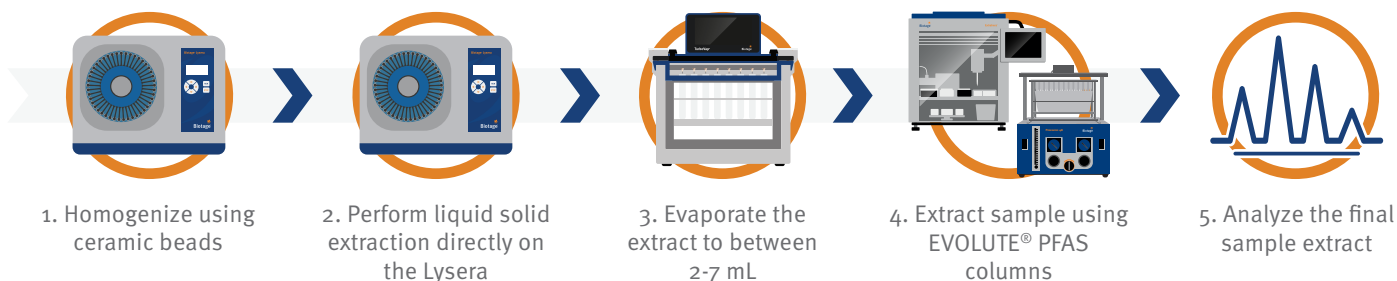
Common consumables used

Part number	Description
101-0050-C	ISOLUTE® 101 500 mg/6 mL
604-0020-C-533	EVOLUTE® PFAS 533 200 mg/6 mL
604-0050-C-533	EVOLUTE® PFAS 533 500 mg/6 mL
604-0015-CGP	EVOLUTE® PFAS 533 150 mg/6 mL
604-0015-CP	EVOLUTE® PFAS 533 150 mg/6 mL
614-0050-CP	EVOLUTE® PFAS 500 mg/6 mL
614-0015-CP	EVOLUTE® PFAS 150 mg/6 mL
614-0006-BP	EVOLUTE® PFAS 60 mg/3 mL
604-0015-CPGD	EVOLUTE® PFAS 150 mg/6 mL, Depth Filter (Tabless)
964-0030-C	EVOLUTE® PFAS+ 300 mg/6 mL
964-0030-CG	EVOLUTE® PFAS+ 300 mg/6 mL (Tabless)
634-0020-C	EVOLUTE® WAX/GCB 200 mg/6 mL
19-678	7 mL pre-filled bead mill tubes
19-6158	15 mL pre-filled bead mill tubes
19-6358	30 mL pre-filled bead mill tubes
19-6508	50 mL pre-filled bead mill tubes
19-645	Bulk 1.4 mm ceramic beads

PFAS workflow for drinking water



PFAS workflow for soils and tissues



Organochlorine and organophosphorous pesticides, polychlorinated biphenyls

Highlighted application

The persistence of pesticides and polychlorinated biphenyls (PCBs) in the environment make them one of the most frequently run tests in the world and the diversity of the matrices with regulations means that the tools and workflows used must be robust and easy to use.

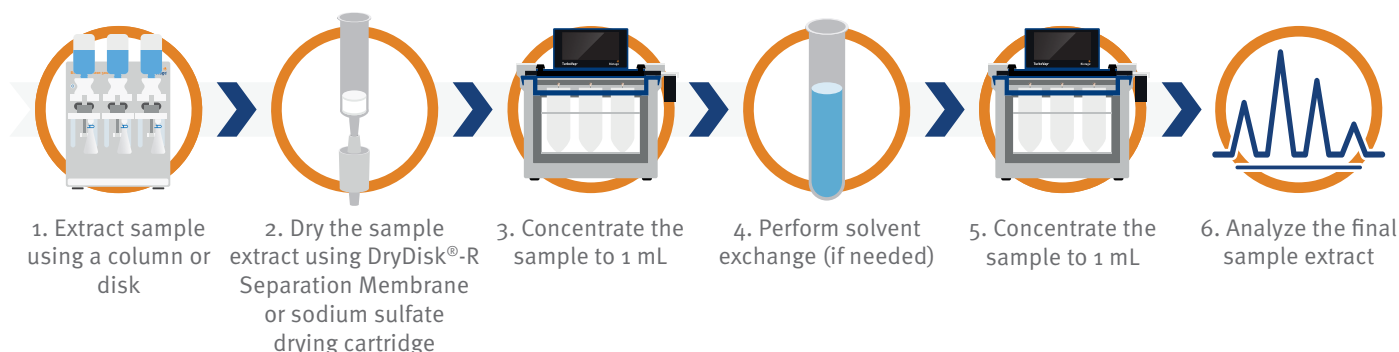
No matter if it's the ISOLUTE® ENV+ being used for very polar water-soluble pesticides in a clean extract, or the Atlantic® C18-HC disks for a sample with a lot of particulate, Biotage workflows include options that allow your laboratory to customize your workflow and select the best solution for your samples.

Common consumables used

Part number	Description
Atlantic® disks	
47-2346-02	Atlantic® C-18 disks, 47 mm
47-2346-06	Atlantic® DVB disks, 47 mm
47-2346-13	Atlantic® high capacity C18 disks, 47 mm
47-2346-10	Atlantic® HLB-H disks, 47 mm
47-2346-09	Atlantic® HLB-M disks, 47 mm
47-2346-08	Atlantic® HLB-L disks, 47 mm
47-6001	Atlantic® ReadyDisk DVB
47-6005	Atlantic® ReadyDisk C18
47-6006	Atlantic® ReadyDisk HC-C18

Part number	Description
ISOLUTE®	
715-0100-C	ISOLUTE® AI-B, 1 g/6 mL
712-0100-B	ISOLUTE® FL, 1 /3 mL
712-0100-C	ISOLUTE® FL 1 g/6 mL
712-0100-D	ISOLUTE® FL 1 g/15 mL
712-0100-B	ISOLUTE® FL, 1 g/3 mL
712-0100-C	ISOLUTE® FL 1 g/6 mL
460-0100-B	ISOLUTE® SI 1 g/3 mL
460-0100-C	ISOLUTE® SI 1 g /6 mL
460-0100-D	ISOLUTE® SI 1 g/15 mL
Drying disks and cartridges	
40-1000-HT	DryDisk®-R 65 mm
802-0250-M	ISOLUTE® Sodium Sulfate Drying Cartridge

Pesticide/PCB workflow for water



Polycyclic aromatic hydrocarbons

Highlighted application

Polycyclic aromatic hydrocarbons (PAHs) are found worldwide and emitted from several sources including fossil fuel, coal and shale oil derivatives, coke production and burning wood for home heating, generally arising from incomplete combustion. Considered by many to be carcinogenic, their characterization is a matter of public health and there exists a wide range of regulations for environmental samples.

Since PAHs can be extracted using a variety of medias, Biotage offers a number of high-quality products both in varying formats and bed masses.

C18 is a common, inexpensive sorbent

- » Octadecyl bonded silica
- » Good in moderate pH ranges (2-7)
- » Effective for many compound classes and cost effective
- » Must keep the disk wet during all precondition or “prewet” steps in order to effectively retain compounds onto the disk

Divinylbenzene sorbent is polymer-based

- » Lipophilic compound
- » Very effective for many compounds
- » Can go completely dry during prewets and still be as effective without sacrificing the retention of compounds

Hydrophilic-Lipophilic Balanced (HLB) reversed-phase polymeric sorbent

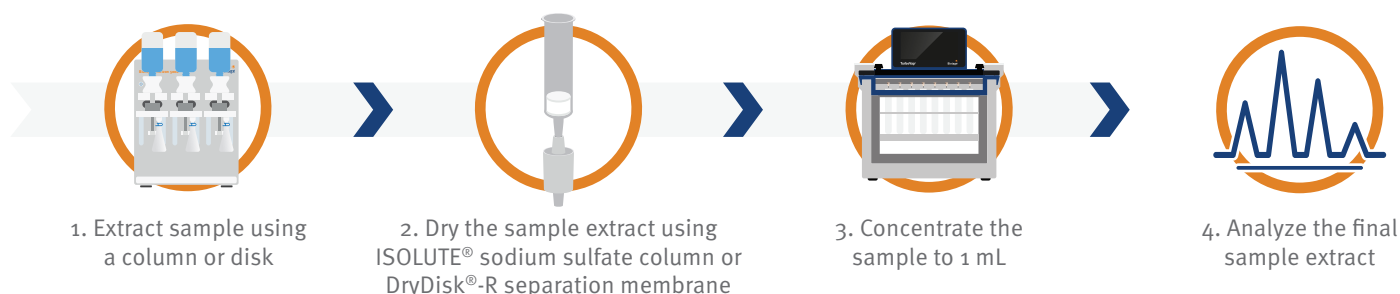
- » Combination of n-vinylpyrrolidone and divinylbenzene
- » Good for a wide range of pH levels
- » 3x the retention capacity of traditional silica-based sorbents
- » Can go completely dry during prewets and still be as effective without sacrificing the retention of compounds

Common consumables used

Part number	Description
Atlantic® disks	
47-2346-02	Atlantic® C-18 disks, 47 mm
47-2346-06	Atlantic® DVB disks, 47 mm
47-2346-13	Atlantic® high capacity C18 disks, 47 mm
47-2346-10	Atlantic® HLB-H disks, 47 mm
47-2346-09	Atlantic® HLB-M disks, 47 mm
47-2346-08	Atlantic® HLB-L disks, 47 mm
47-6001	Atlantic® ReadyDisk DVB
47-6005	Atlantic® ReadyDisk C18
47-6006	Atlantic® ReadyDisk HC-C18

Part Number	Description
ISOLUTE®	
927-0150-C	ISOLUTE® PAH 1.5 g/6 mL
927-0075-B	ISOLUTE® PAH 750 mg/3 mL
927-0075-BD	ISOLUTE® PAH 750 mg/3 mL DF
220-0100-C	ISOLUTE® C18 1 g/6 mL
220-0020-C	ISOLUTE® C18 200 mg/6 mL
220-0050-C	ISOLUTE® C18 500 mg/6 mL
915-0100-C	ISOLUTE® ENV+ 1 g/6 mL
915-0020-C	ISOLUTE® ENV+ 200 mg/6 mL
915-0050-C	ISOLUTE® ENV+ 500 mg/6 mL
Drying disks and cartridges	
40-1000-HT	DryDisk®-R 65 mm
802-0250-M	ISOLUTE® sodium sulfate drying cartridge

PAH Workflow for water with GC analysis



Extractable petroleum hydrocarbon fractionation

Highlighted application

Traditional methods for quantifying total petroleum hydrocarbons are inadequate at determining the full composition and therefore the risks associated with the hydrocarbons present at a contaminated site. The fractionation of extractable petroleum hydrocarbon (EPH) separates the aliphatic and aromatic compounds and allows for a more insightful approach to evaluating toxicity.

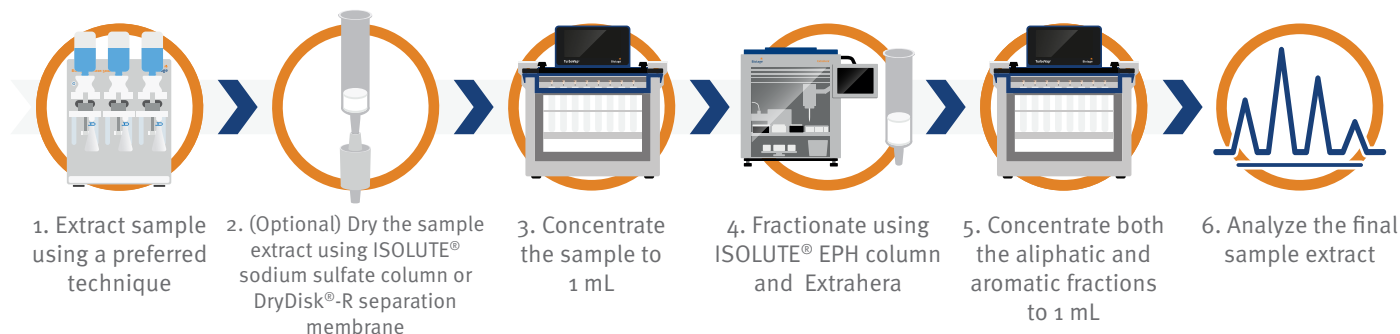
ISOLUTE® EPH cartridges are designed to fractionate pentane or hexane based extracts into aliphatic and aromatic fractions using a simple, easily automated procedure.



Common consumables used

Part number	Description
928-0145-B	ISOLUTE® EPH 1.45 g/3 mL
928-0500-E	ISOLUTE® EPH 5 g/25 mL

EPH fractionation workflow



Literature Number: PPS728

© 2025 Biotage. All rights reserved. No material may be reproduced or published without the written permission of Biotage. Information in this document is subject to change without notice and does not represent any commitment from Biotage. E&OE. A list of all trademarks owned by Biotage AB is available at www.biotage.com/legal. Other product and company names mentioned herein may be trademarks or registered trademarks and/or service marks of their respective owners, and are used only for explanation and to the owners' benefit, without intent to infringe.