

广州绿百草生物科技有限公司是一家经营色谱分析仪器、实验室用品及耗材配件的专业公司。

我们自成立以来，一直保持着高速稳定的发展步伐。

我们向全国的科学工作者提供各类实验设备、化学品、试剂、耗材等科研用品。

我们坚持给客户提供最佳最快捷的服务，诚信为本。

主要经营的和有优势的产品：

一级代理品牌：

WATERS,岛津色谱配件，Merck（色谱柱、薄层板、填料、试剂），瓦里安色谱耗材，贺利氏氙灯，Inertsil 色谱柱，Sigma-Aldrich 试剂及分析产品

自主品牌：

Ecosil C18 色谱柱（日本进口），2ml 样品瓶（德国进口），PEEK 接头、堵头（德国进口），SPE 小柱转换接头，Kromasil 国产色谱柱，YWG 国产色谱柱，葡聚糖 G-10 国产色谱柱

其他代理品牌：

Kromasil（进口原装及国内组装色谱柱），YMC,天津津腾，英国 PL 聚合物色谱柱及标准品，Millipore 针头滤器，美国剑桥 CIL 同位素标准品，USP 标准品，日本 TOSOH（TSK 色谱柱、树脂填料），Hypersil 及热电配件（热电报价的95折），RHEODYNE（液相进样阀），UPCHURCH（管路接头），日本 SHODEX（GPC 系列），德国 DR 标准品、Daicel 手性柱，美国 B&J 色谱试剂、三菱化学大孔树脂，兰化所 GC 色谱柱，德国 Brand（移液器，玻璃容器等），Agilent，phenomenex，日本信和，Hamilton、SGE 进样针。

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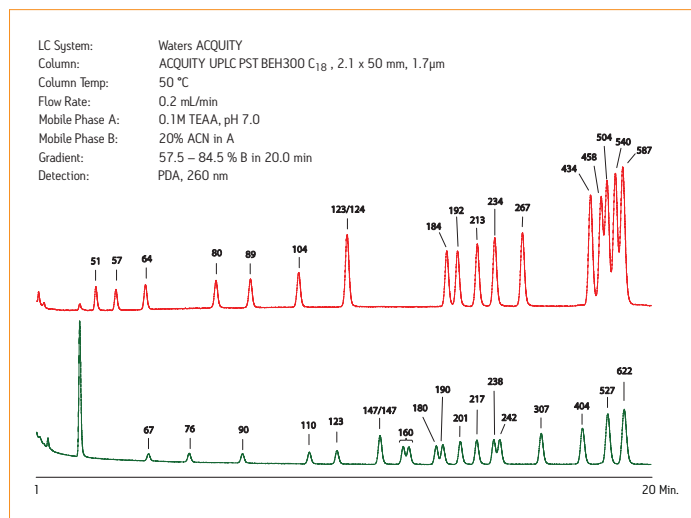
www.lubex.com.cn, www.gzlbc.com

Columns for Large DNA/RNA Species

In general, molecular biology methods for manipulation of DNA rely on restriction enzymes, polymerase-chain reaction (PCR), and sequencing techniques. Using these methods, genomic DNA is typically converted into shorter double stranded (ds)DNA sequences, typically 100-1000 base pairs (bp) in length. The shorter dsDNA molecules are often analyzed or isolated by methods such as slab gel or capillary electrophoresis. Use of Waters ACQUITY BEH300 C₁₈ reversed-phase or GenPak FAX anion-exchange columns offer alternatives to more traditional electrophoretic methods and are particularly well suited for various analytical and small-scale purification applications.

Description	Dimension	Particle Size	Part No.
ACQUITY UPLC BEH300 C ₁₈	2.1 x 50 mm	1.7 µm	186003685

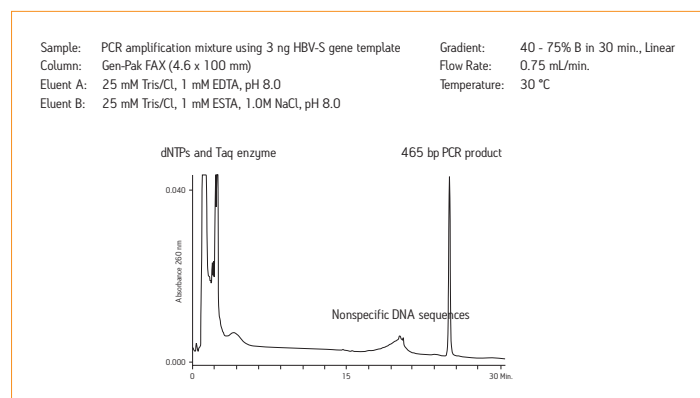
Separation of Duplex DNA Fragments: HaeIII and MspI Restriction Enzyme Digests of pBR322 Plasmid



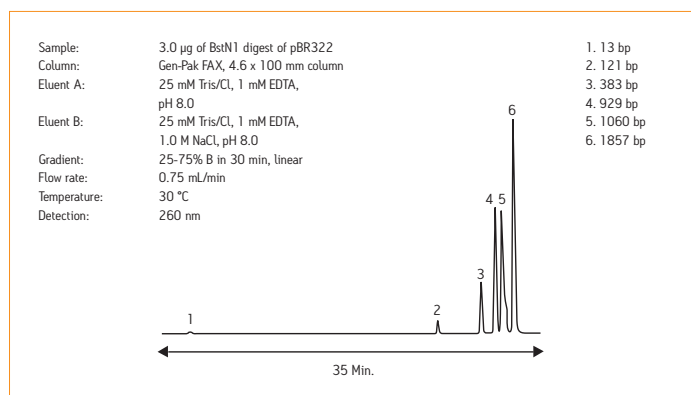
Gen-Pak FAX Anion-Exchange Column

Waters Gen-Pak FAX columns offer the highest resolution available in anion-exchange HPLC of nucleic acids. The Gen-Pak FAX column contains a weak anion exchanger based on DEAE functionalized non-porous resin. It contains 2.5 µm particles and is well suited for analytical and micro-preparative applications.

Chromatography of a PCR Amplification Mixture Generated using 3 ng and 1 fg of HBV S-gene Template



Separation of DNA Restriction Fragments



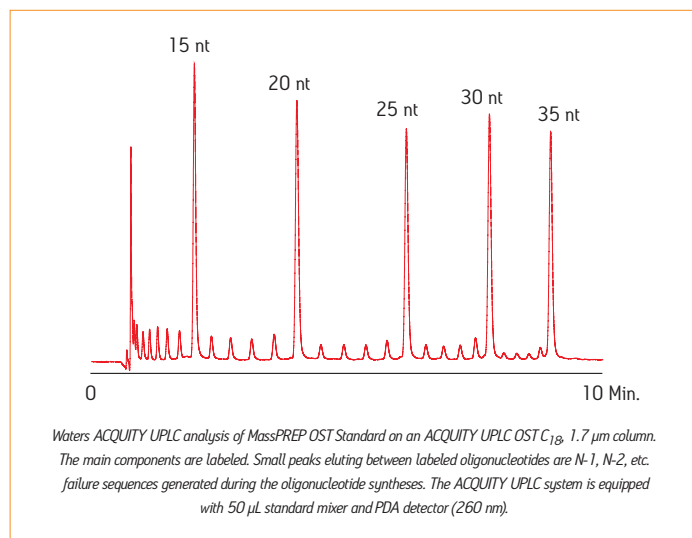
Description	Dimensions	Part No.
Gen-Pak FAX Column	4.6 x 100 mm	WAT015490

MassPREP OST Standard

- Contains a carefully defined mixture of synthesized oligodeoxythymidine fragments
- Useful in testing and confirming HPLC/UPLC, LC/MS, and column performance for oligo applications
- Each QC tested and shipped with a certificate of analysis

The pre-packaged MassPREP Oligonucleotide Separation Technology (OST) Standard is designed for verification of HPLC/UPLC instrument and column performance for analysis of synthetic oligonucleotides. Approximately equimolar amounts of 15, 20, 25, 30, and 35 nucleotide (nt) long oligodeoxythymidines are lyophilized and packaged in 1.5 ml LC vials. These vials are vacuum-sealed in foil pouches to reduce degradation that can occur by excessive exposure to light and air. Approximately 1 nmole of each oligonucleotide is present in the vial.

Description	Qty.	Part No.
MassPREP OST Standard	1/pk	186004135



Oasis μ Elution Plates

Oligonucleotide Desalting by Solid-Phase Extraction

- Removes salt prior to MS analysis
- Low elution volumes
- High sensitivity
- Sample concentrating
- High throughput

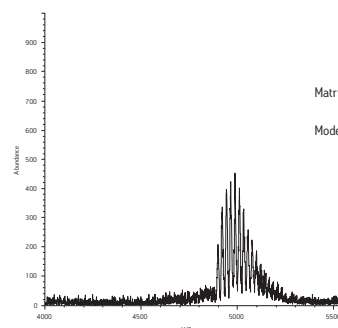


Desalting of synthetic oligonucleotides is essential for MS analysis (QC, genotyping applications and SNP analysis). Waters new μ Elution plate is an excellent choice for high throughput analysis with minimal amount of sample. The Oasis[®] μ Elution plate combines patented plate design, proven Oasis chemistries, and generic protocols enabling elution volumes as low as 25 μ L. Now for the first time you can perform SPE clean-up and concentration of very small sample volumes. The Oasis HLB sample extraction products incorporate a patented copolymer made from a balanced ratio of two monomers; the lipophilic divinylbenzene and the hydrophilic N-vinylpyrrolidone that is ideally suited for this application.

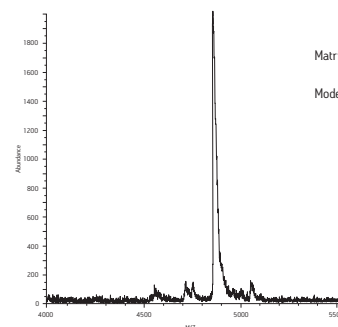
Description	Part No.
Oasis HLB μ Elution Plate (for oligonucleotides)	186001828BA

Effective Use of Oasis HLB for Oligonucleotide Desalting Prior to MALDI-TOF MS

MALDI-TOF Spectrum of 16 mer Prior to Desalting



MALDI-TOF Spectrum of 16 mer After Desalting using Oasis HLB μ Elution Plate



[EXCELLENCE]

BETTER RESULTS FROM YOUR
MS OR LC/MS SYSTEM

GREATER ACCURACY
INCREASED SENSITIVITY
REPRODUCIBLE DATA

MassPREP™

MASSPREP™ SAMPLE PREP FOR MASS SPECTROMETRY AND LC/MS

You need high quality results from your research and have made a significant investment in your mass spectrometry equipment. Obtain the best possible results by using the highest quality MS consumables from Waters.

The MassPREP™ family of products includes conveniently packaged standards, sample prep plates, and application specific kits.

To discover how Waters consumables can help you, visit
www.waters.com/biosep

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Waters

THE SCIENCE OF WHAT'S POSSIBLE.™

MS and LC/MS Consumables for Biomolecules

The use of mass spectrometry is increasing in laboratories involved with proteomics and the characterization of biopharmaceuticals. Sample preparation, the testing of system performance with simple standards, the use high quality reagents and matrices, and the LC process are critical to the quality of results.

Only when all these elements are considered can the highest quality results can be obtained. Waters has developed MS and LC/MS consumables specifically designed to ensure the best results from MS and LC/MS systems.



The MassPREP family of products includes conveniently packaged, highly-purified standards, specialty plates, and kits and reagents.

LC/MS

Proteomics

RapiGest SF
MassPREP Protein Digestion Standards
MassPREP Digestion Standards Mixtures
MassPREP Peptide Reference Standards
MassPREP Phosphopeptide Standards
NanoEase Traps, Capillary, and Nano Columns
MassPREP Phosphopeptide Enrichment Kit
nanoACQUITY UPLC Traps, Capillary, and Nano Column and 2D Kit

Protein Characterization/QC

RapiGest SF
MassPREP OST Standard
MassPREP Protein Digestion Standards
MassPREP Peptide Reference Standards
MassPREP Desalting Cartridges
NanoEase Traps, Capillary, and Nano Columns
nanoACQUITY UPLC Traps, Capillary, and Nano Column and 2D Kit



The NanoEase family contains high performance capillary, nano-scale, and trapping columns.



nanoACQUITY UPLC columns consist of a complete line of columns specifically designed for the nanoACQUITY UPLC system.

RapiGest SF and MassPREP Oligonucleotide, Peptide, and Protein Digest Standards

Prepackaged MassPREP synthetic oligonucleotide peptide and protein digest standards eliminate the need to prepare, test, and store these materials for use in LC or LC/MS applications. In addition, *RapiGest*™ SF Surfactant is valuable in the enzymatic digestion of proteins for faster, higher quality, and more reproducible sample preparation.



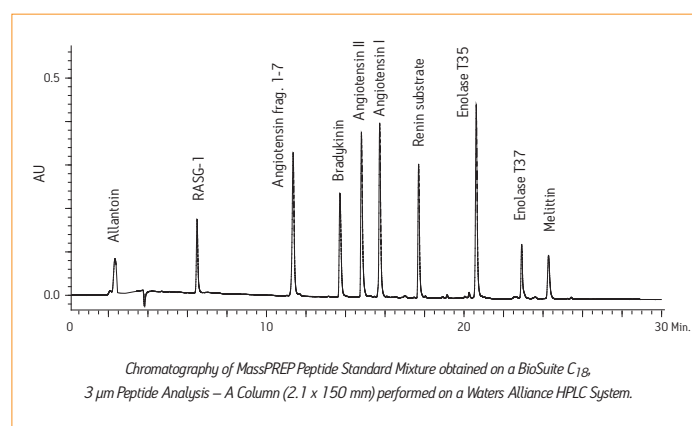
MassPREP Peptide Standards

The MassPREP peptide standard mixture contains a void volume (V_0) column marker and nine carefully selected peptides with a broad range of polarities and isoelectric points. The MassPREP standard is useful to test UPLC and HPLC columns and systems dedicated to peptide separations.

Components contained in MassPREP Peptide Standard Mixture

Peak #	Component name	Molecular weight ** (g/mol)	p <i>K</i> _a	Peptide sequence
1	Allantoin (V_0 marker)	158.0440	—	—
2	RASG-1	1000.4938	9.34	RGDSPASSKP
3	Angiotensin frag. 1-7	898.4661	7.35	DRVYIHP
4	Bradykinin	1059.5613	12.00	RPPGFSPFR
5	Angiotensin II	1045.5345	7.35	DRVYIHPF
6	Angiotensin I	1295.6775	7.51	DRVYIHPFHL
7	Renin substrate	1757.9253	7.61	DRVYIHPFHLVYS
8	Enolase T35	1871.9604	7.34	WLTGPQLADLYHSLMK
9	Enolase T37	2827.2806	3.97	YPIVSIEDPFAEDDWEAWSHFFK
10	Melittin	2845.7381	12.06	GIGAVLKVLTTGLPALISWIKRQQ

Baseline HPLC Resolution of Nine Peptides Contained in MassPREP Standard Mixture



Description	Qty./Pack	Part No.
MassPREP Peptide Standards	1 vial	186002337
MassPREP Peptide Standards	5 vials	186002338

Note: The peptide mixture contains approximately 1.5 μ g (~1 nmole) of each peptide

* BioSuite C₁₈ 3 μ m, Peptide Analysis - A Column (2.1 x 150 mm). Eluent A: 0.02% TFA in water, Eluent B: 0.016% TFA in acetonitrile. Gradient: 0-50% B in 30 minutes. Flow: 0.20 mL/min. Temp: 40 °C.

** Monoisotopic molecular weight



MassPREP Protein Digestion Standards

The MassPREP protein digestion standards are prepared under strict quality control and contain no undigested standard proteins, trypsin, or other hydrophilic components. Test results from each batch of digestion standards are provided on the included Certificate of Analysis report.

Description	Qty./Pack	Part No.
MassPREP Digestion Standard Kit	1 vial from each digestion	186002330
Standard (5 vials total) Kit Consists of:		
MassPREP Phosphorylase b Digestion Standard	1 vial	186002326
MassPREP Bovine Hemoglobin Digestion Standard	1 vial	186002327
MassPREP ADH Digestion Standard	1 vial	186002328
MassPREP BSA Digestion Standard	1 vial	186002329
MassPREP Enolase Digestion Standard	1 vial	186002325

MassPREP Phosphopeptide Standards

- Contains phosphoserine, phosphotyrosine, and phosphothreonine peptides
- Use to optimize phosphopeptide detection in LC/MS, LC/UV, and MALDI-MS
- Can be used as control samples

Phosphorylated protein and peptides are difficult to detect and characterize due to their low abundance and low ionization efficiency. Using these standards, scientists have greater control over sample preparation, with the option to use pure peptides or to define phosphopeptides to unmodified peptide ratios.

The MassPREP phosphopeptide standard-enolase contains four phosphopeptides based on tryptic yeast enolase peptides. The MassPREP enolase digest with phosphopeptide mix contains equimolar mixture of enolase digest and four phosphopeptides.

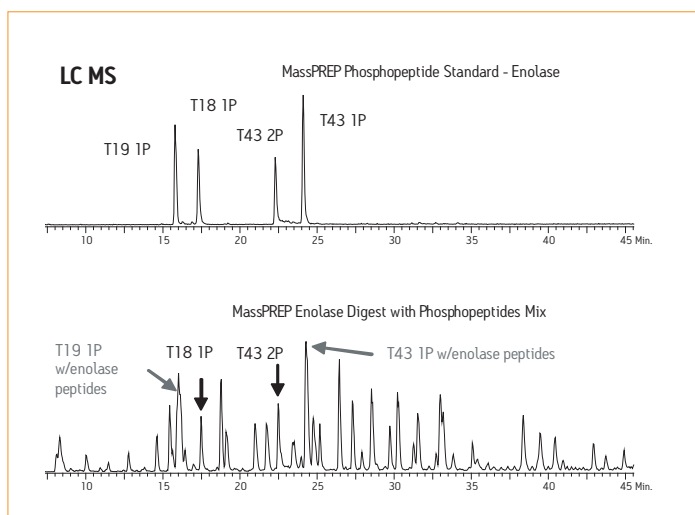
Each new phosphopeptide standard contains the following four purified peptides:

Synthetic Phosphopeptides	Sequence	Amino Acid Residue	[M + H] ⁺	[M + 2H] ²⁺
Enolase T18 1P	NVPL(pY) K	126-131	813.3912	407.1995
Enolase T19 1P	HLADL (pS)K	132-138	863.4028	432.2053
Enolase T43 1P	VNQIG (pT) LSES IK	346-357	1368.6776	684.8428
Enolase T43 2P	VNQIG TL(pS)E(pS) IK	346-357	1448.6439	724.8259

These standards can be used on many Waters instrument systems, including the MALDI micro MX[™], ACQUITY UPLC, Alliance, ZQ[™], Q-ToF[™], LCT Premier, and nanoACQUITY UPLC systems. Either UV or MS detection is possible.

MassPREP Phosphopeptide Standards

Description	Qty./Pack	Part No.
MassPREP Phosphopeptide Standard Enolase		186003285
MassPREP Enolase Digest with Phosphopeptides Mix		186003286
MassPREP Phosphopeptide Sample Kit - Enolase	2 vials -	186003287
Kit Consists of:		
MassPREP Phosphopeptide Standard Enolase	1 nmol/vial, 1 vial	186003285
MassPREP Enolase Digestion Standard	1 vial	186002325



MassPREP Digestion Standard Mixtures

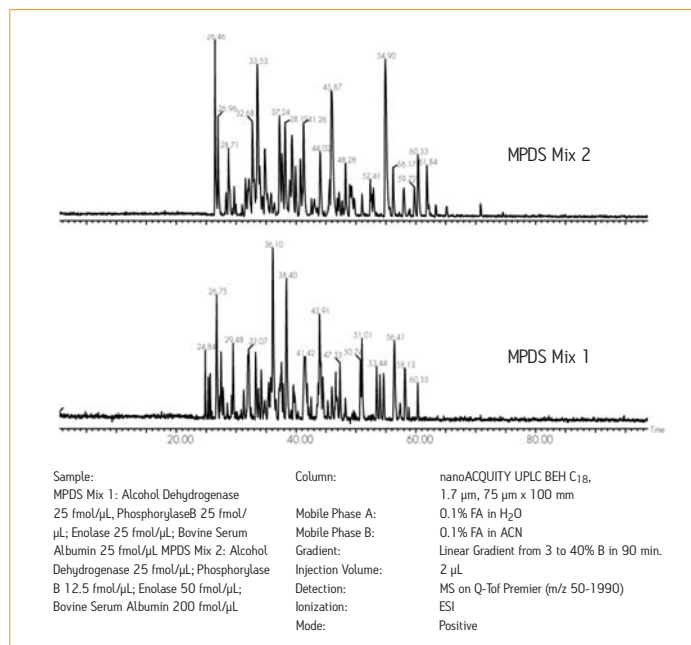
- Used to ensure an analytical system's ability to provide both qualitative protein analysis and relative protein quantification
- Yields high confidence and coverage during expression profiling of complex protein samples (by spiking the standards)
- Designed as standards for the Waters Protein Expression System

MassPREP Digestion Standards consist of two standard mixtures (MPDS Mix 1 and MPDS Mix 2), which were prepared by individually digesting Yeast Alcohol Dehydrogenase (ADH, SwissProt P00330), Rabbit Glycogen Phosphorylase b (GPB, SwissProt P00489), Bovine Serum Albumin (BSA, SwissProt P02769), and Yeast Enolase I (ENO, SwissProt P00924) with sequencing grade trypsin, and producing mixtures in the indicated molar ratios. The MPDS mixtures are purified, and do not contain undigested target protein, trypsin, other hydrophilic components or salts.

MPDS Mix 1 and Mix 2 Contents

Protein	MPDS Mix 1 [Molar ratio, Amount (pmol)]	MPDS Mix 2 [Molar ratio, Amount (pmol)]
ADH	1.0, 50 pmol	1.0, 50 pmol
GPB	1.0, 50 pmol	0.5, 25 pmol
ENO	1.0, 50 pmol	2.0, 100 pmol
BSA	1.0, 50 pmol	8.0, 400 pmol

MPDS Mix 1 and MPDS Mix 2 Separation Using ACQUITY UPLC BEH C₁₈, 1.7 μ m, 75 μ m x 100 mm nanoACQUITY UPLC Column



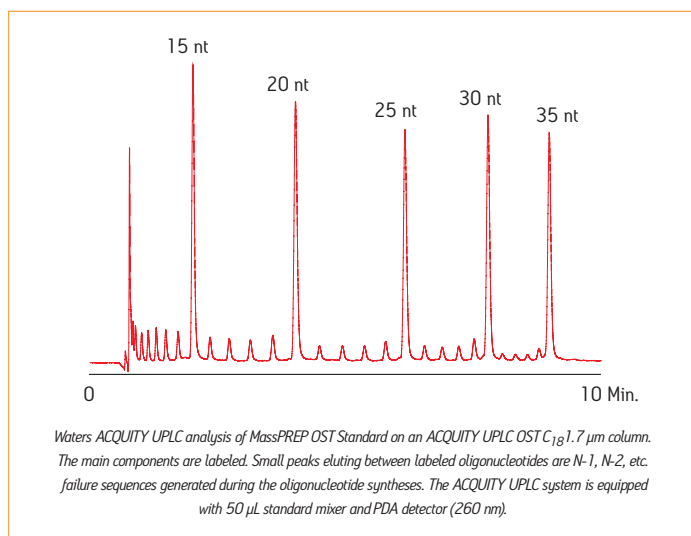
Description	Qty.	Part No.
MassPREP Digestion Standard Mix 1	1/pk	186002865
MassPREP Digestion Standard Mix 2	1/pk	186002866

MassPREP OST Standard

- Contains a carefully defined mixture of synthesized oligodeoxythymidine fragments
- Useful in testing and confirming HPLC/UPLC, LC/MS, and column performance for oligo applications
- Each QC tested and shipped with a certificate of analysis

The pre-packaged MassPREP Oligonucleotide Separation Technology (OST) Standard is designed for verification of HPLC/UPLC instrument and column performance for analysis of synthetic oligonucleotides. Approximately equimolar amounts of 15, 20, 25, 30, and 35 nucleotide (nt) long oligodeoxythymidines are lyophilized and packaged in 1.5 ml LC vials. These vials are vacuum-sealed in foil pouches to reduce degradation that can occur by excessive exposure to light and air. Approximately 1 nmole of each oligonucleotide is present in the vial.

Description	Qty./Pack	Part No.
MassPREP OST Standard	1 vial	186004135



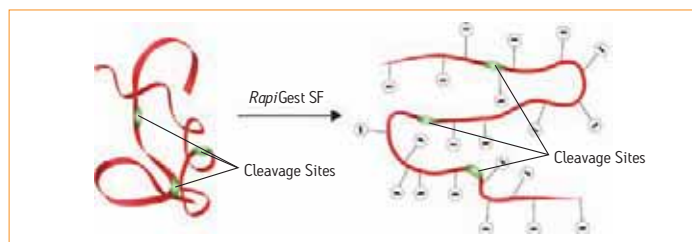
RapiGest SF Protein Digestion Surfactant

RapiGest SF, a novel Surfactant improves protein enzymatic digestion in terms of speed and peptide recovery. The unique features of this product are:

- Improves solubility of hydrophobic proteins for improved enzymatic digest
- Compatible with various enzymes
- Unlike conventional denaturants, RapiGest SF does not inhibit enzyme activity
- Reduces the digestion time, requires less enzyme to achieve optimum digestion
- Improves the digestion of enzyme resistant proteins such as membrane proteins
- Compatible with current protein sample prep protocols.
- Decomposes at low pH and degradation products do not interfere with LC/MS or MALDI MS analysis
- Does not cause protein modifications

Numerous published scientific articles and presentations have documented the benefits of RapiGest SF use to improve the protein sequence coverage and reduce the sample preparation time. The areas of application are diverse, ranging from proteomic research to therapeutic protein characterization and is effective for in-solution digestion protocols.

How RapiGest SF works

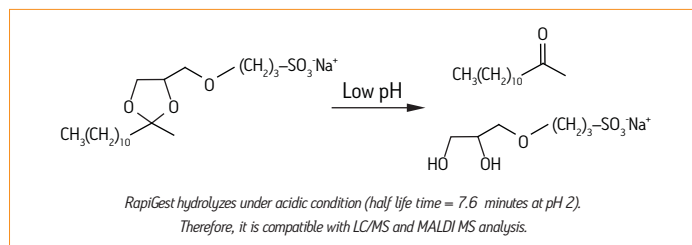


RapiGest shows significant advantage over other denaturants since it is not disruptive to endoprotease activity.

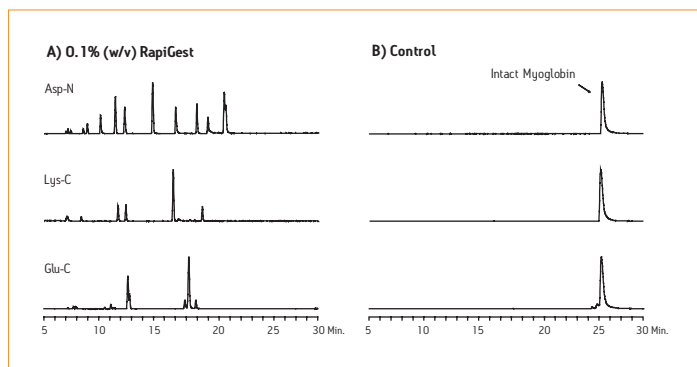
Trypsin * Solution	Trypsin Activity (%) **	Trypsin * Solution	Trypsin Activity (%) **
No additive	100	0.1% SDS/0.1% RapiGest	67
0.1% RapiGest	100	50% Methanol	29
0.5% RapiGest	100	50% Acetonitrile	87
0.1% SDS	24	1M Urea	97
0.5% SDS	1	2M Urea	83

* .5 µg of trypsin in 50 mM ammonium bicarbonate, pH 7.9; 0.2 mM of BEAA

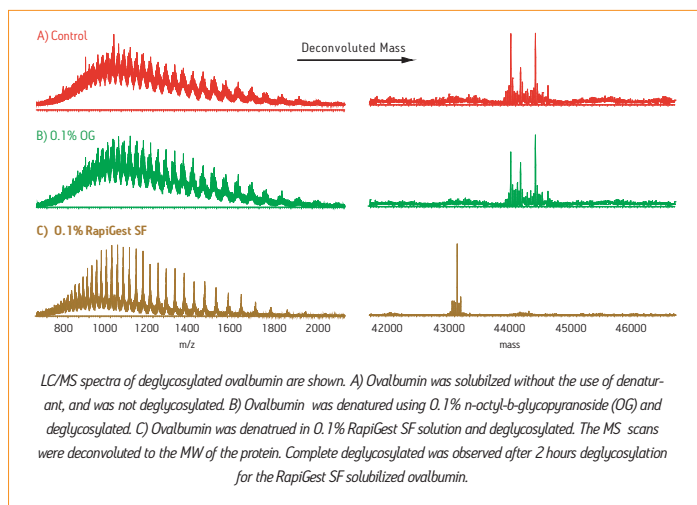
** Measured as delta BEAA absorbance @ 253 nm (slope within 5 min)



1 hour Proteolysis of Myoglobin Using Various Endoproteases



Use of RapiGest SF to Assist in Protein Deglycosylation



Description	Part No.
RapiGest SF 1 mg vial	186001860
RapiGest SF 1 mg vial (5 pack)	186001861
RapiGest SF 10 mg vial	186002123
RapiGest SF 50 mg vial	186002122
RapiGest SF Custom	186002118



Literature References

Enzyme-Friendly, Mass Spectrometry-Compatible Surfactant for In-Solution Enzymatic Digestion of Proteins, Yu YQ, Gilar M, Lee PJ, Bouvier ES, Gebler JC, *Anal Chem.* **2003** Nov 1; 75(21):6023-8.

A complete peptide mapping of membrane proteins: a novel surfactant aiding the enzymatic digestion of bacteriorhodopsin, Yu YQ, Gilar M, Gebler JC, *Rapid Commun Mass Spectrom.* **2004**; 18 (6):711-5.

A rapid sample preparation method for mass spectrometric characterization of N-linked glycans, Ying Qing Yu, Martin Gilar, Jennifer Kaska and John C. Gebler, *Rapid Commun Mass Spectrom.* **2005**; 19: 2331-2336.



MassPREP On-Line Desalting Devices

- Effectively desalts proteins yielding improved LC/MS results
- Fast on-line method for high throughput applications
- Excellent protein recoveries and no detectable carryover
- >100 injections from a single cartridge



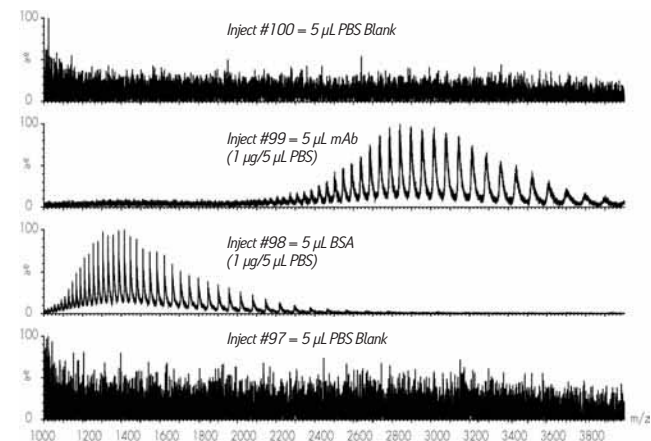
The MassPREP on-line desalting column can effectively desalt proteins prior to LC/MS analyses. Because non-volatile salts (e.g., NaCl) can suppress ionization of intact proteins leading to poor detection sensitivity, it is important to remove or significantly minimize the introduction of these compounds into the mass analyzer. The reversed-phase, phenyl material contained in MassPREP on-line column successfully “traps” proteins, allowing the salts to be washed to waste prior to protein elution into the mass spectrometer. With an optimized LC/MS method, cycle times as low as 4 minutes (for intact antibody) and 10 minutes (for reduced antibody) are achievable.

Description	Qty.	Part No.
MassPREP Micro Desalting Column	1/pk	186004032
MassPREP On-line Desalting Cartridge (2.1 x 10 mm)*	2/pk	186002785
UPLC Intact Mass Analysis Application Kit** (Includes MassPREP Micro Desalting Column and ACQUITY Tubing Kit)	1/pk	176001519
Sentry 2.1 x 10 mm Guard Cartridge Holder.*		
Required for use of MassPREP On-line Desalting Cartridge	1/pk	WAT097958

** See: UPLC Intact Mass Analysis Application Kit Manual (715001664)

Waters MassPREP On-Line Desalting Cartridge (2.1 x 10 mm)

Experimental
LC System: Alliance 2796 Separation Module
MS System: Q-ToF micro™, ESI Positive
Eluent A: 0.1% Formic Acid (H₂O) Eluent B: 0.1% Formic Acid (ACN)

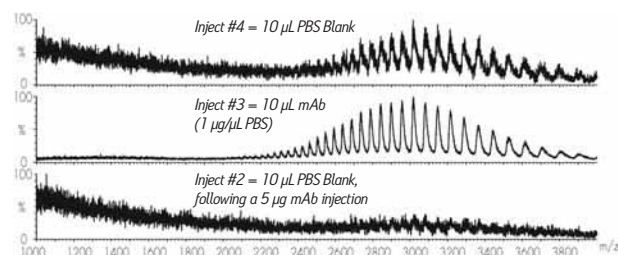


Over a series of 100 injections, satisfactory results were obtained for BSA and a mAb, as shown for injections #97–100 on a MassPREP on-line desalting cartridge.

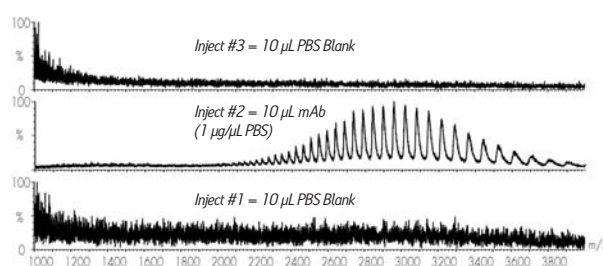
Reference Desalting of Proteins Using MassPREP On-line Desalting Cartridges Prior to Mass Spectrometry. 2005 Waters Applications Note 72000107EN

Excellent Recovery with No Detectable Carryover

Competitor's On-Line Desalting Cartridge



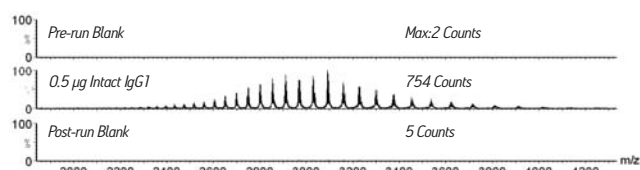
Waters MassPREP On-Line Desalting Cartridge



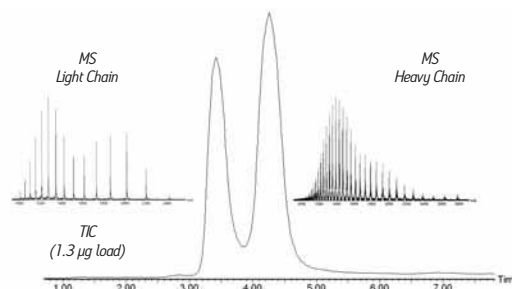
“Column-related carryover” from previous protein sample injections can compromise the integrity of collected LC/MS data. Compared to results obtained on a competitive on-line desalting cartridge (top), excellent sample recovery is obtained with Waters MassPREP on-line desalting cartridge (bottom).

Waters MassPREP Micro Desalting Column (2.1 x 5 mm)

Experimental
LC System: Waters ACQUITY UPLC system
MS System: Waters LCT Premier™ ESI-TOF MS/Synapt HDMS
Ionization Mode: ESI Positive, V mode
Eluent A: 0.1% Formic Acid (H₂O)
Eluent B: 0.1% Formic Acid (ACN)
Column temp: 80 °C



Combined ESI-TOF mass spectra of an intact IgG1 antibody from a 4 minutes LC/MS analysis. The results reveal no detectable carryover following a 0.5 μ g injection of the antibody.



Total ion chromatogram (TIC) from UPLC/MS analysis of light and heavy chains from a reduced IgG1 antibody. A 10 min LC/MS run largely resolved the earlier eluting light chain from the later eluting glycosylated heavy chains.



NanoEase Trap, Capillary, and Nano Columns

Waters NanoEase Trapping, Capillary, and Nano columns, contain carefully-selected, reversed-phase and ion-exchange chemistries for bioseparations. The column offerings are developed and intended for use on various traditional low pressure, capillary, and nano flow LC Systems.

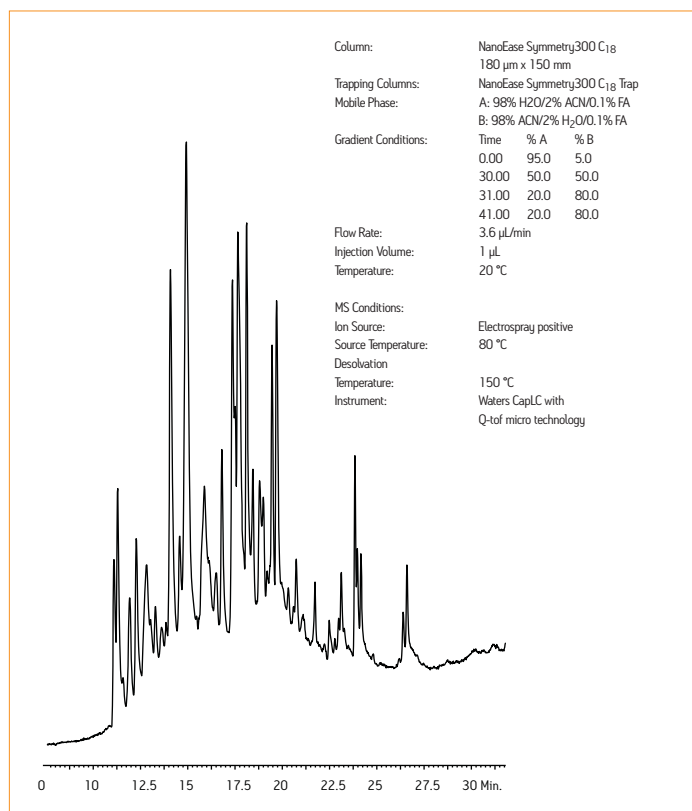
NanoEase Trapping Columns

- NanoEase trap “direct connect” design minimizes band broadening
- SCX offering for 2D applications
- RP offerings for sample desalting or concentration



Symmetry300 C₁₈, Atlantis dC₁₈, and strong cation-exchange (SCX) NanoEase trap columns are robust devices that can effectively separate complex samples or remove buffers and high concentrations of salts through many injections. The reversed-phase trap design minimizes peak band broadening while the design of the SCX device provides increased binding capacity. These devices generate low backpressure and yield good recovery to the subfemtomole peptide level. In addition, NanoEase trap column “direct connect” design allows for easy configuration and replacement in a six or a ten-port valve for either one-dimensional or two-dimensional LC/MS analyses.

BSA Digest Using NanoEase Symmetry300 C₁₈ Trap Columns



Description	Particle Size	Dimension	Part No.
Symmetry300 C ₁₈ Trap Column 5/pack	5 µm	0.18 x 23.5 mm	186002622
Atlantis dC ₁₈ Trap Column 5/pack	5 µm	0.18 x 23.5 mm	186002574
SCX 300Å Trap Column 5/pack	5 µm	0.50 x 23.5 mm	186002623
Symmetry C ₁₈ Trap Column 5/pack	5 µm	0.18 x 23.5 mm	186002808
0.18 i.d. Custom Trap Column 5/pack	Custom	0.18 x 23.5 mm	186002687
0.50 i.d. Custom Trap Column 5/pack	Custom	0.50 x 23.5 mm	186002806

NanoEase Trap Column hardware obtained from Optimize Technologies Inc., Oregon City, OR, 97045-0009, USA



NanoEase Nano and Capillary Columns

NanoEase columns contain high performance, small particle sorbents. Exacting manufacturing and QC production procedures ensure consistent column performance. Superior column longevity is ensured by a novel frit technology that minimizes bed disturbance throughout the life of the column.

- Superior chromatographic performance
- Available in variety of Waters stationary phases
- Robust and easy to handle
- Can be used with any capillary LC system

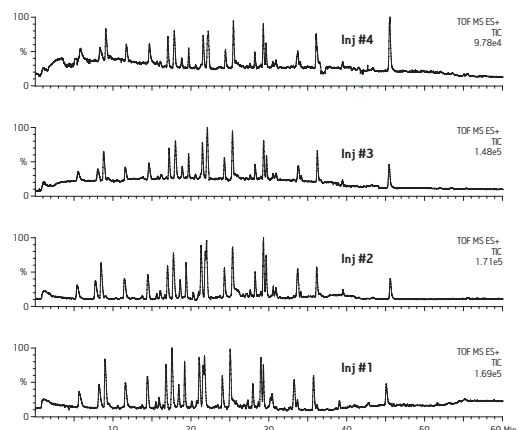


NanoEase LC/MS Nano Column Reproducibility

500 fmol Enolase Digest

Column: NanoEase Symmetry C₁₈,
3.5 µm, 75 µm x 100 mm
Eluent A: 0.1% FA in water
Eluent B: 0.1% FA, 2% water in acetonitrile

Gradient: 5-50% B in 60 min
Flow Rate: 400 nL/min
System: Waters CapLC™ operated in split flow mode, Q-ToF micro™



Description	Inner Diameter	Length	Particle Size	Part No.
Symmetry C ₁₈	75 µm	50 mm	3.5 µm	186002188
Symmetry C ₁₈	75 µm	100 mm	3.5 µm	186002189
Symmetry C ₁₈	75 µm	150 mm	3.5 µm	186002190
Symmetry300 C ₁₈	75 µm	50 mm	3.5 µm	186002191
Symmetry300 C ₁₈	75 µm	100 mm	3.5 µm	186002192
Symmetry300 C ₁₈	75 µm	150 mm	3.5 µm	186002193
Atlantis dC ₁₈	75 µm	50 mm	3 µm	186002194
Atlantis dC ₁₈	75 µm	100 mm	3 µm	186002195
Atlantis dC ₁₈	75 µm	150 mm	3 µm	186002197
Symmetry C ₁₈	100 µm	50 mm	3.5 µm	186002201
Symmetry C ₁₈	100 µm	100 mm	3.5 µm	186002202
Symmetry C ₁₈	100 µm	150 mm	3.5 µm	186002203
Symmetry300 C ₁₈	100 µm	50 mm	3.5 µm	186002204
Symmetry300 C ₁₈	100 µm	100 mm	3.5 µm	186002205
Symmetry300 C ₁₈	100 µm	150 mm	3.5 µm	186002206
Atlantis dC ₁₈	100 µm	50 mm	3 µm	186002207
Atlantis dC ₁₈	100 µm	100 mm	3 µm	186002208
Atlantis dC ₁₈	100 µm	150 mm	3 µm	186002209
Symmetry C ₁₈	150 µm	50 mm	3.5 µm	186002459
Symmetry C ₁₈	150 µm	100 mm	3.5 µm	186002460
Symmetry C ₁₈	150 µm	150 mm	3.5 µm	186002461
Symmetry300 C ₁₈	150 µm	50 mm	3.5 µm	186002462
Symmetry300 C ₁₈	150 µm	100 mm	3.5 µm	186002463
Symmetry300 C ₁₈	150 µm	150 mm	3.5 µm	186002464
Atlantis dC ₁₈	150 µm	50 mm	3 µm	186002466
Atlantis dC ₁₈	150 µm	100 mm	3 µm	186002467
Atlantis dC ₁₈	150 µm	150 mm	3 µm	186002468

Description	Inner Diameter	Length	Particle Size	Part No.
Custom	75 µm	Custom	Custom	186002213
Custom	100 µm	Custom	Custom	186002214
Custom	150 µm	Custom	Custom	186002472
Symmetry C ₁₈	300 µm	50 mm	3.5 µm	186002581
Symmetry C ₁₈	300 µm	100 mm	3.5 µm	186002582
Symmetry C ₁₈	300 µm	150 mm	3.5 µm	186002583
Symmetry C ₁₈	300 µm	50 mm	5 µm	186002584
Symmetry C ₁₈	300 µm	100 mm	5 µm	186002585
Symmetry C ₁₈	300 µm	150 mm	5 µm	186002586
Symmetry300 C ₁₈	300 µm	50 mm	3.5 µm	186002587
Symmetry300 C ₁₈	300 µm	100 mm	3.5 µm	186002588
Symmetry300 C ₁₈	300 µm	150 mm	3.5 µm	186002589
Symmetry300 C ₁₈	300 µm	50 mm	5 µm	186002590
Symmetry300 C ₁₈	300 µm	100 mm	5 µm	186002591
Symmetry300 C ₁₈	300 µm	150 mm	5 µm	186002592
Atlantis dC ₁₈	300 µm	50 mm	3 µm	186002593
Atlantis dC ₁₈	300 µm	100 mm	3 µm	186002594
Atlantis dC ₁₈	300 µm	150 mm	3 µm	186002595
Atlantis dC ₁₈	300 µm	50 mm	5 µm	186002596
Atlantis dC ₁₈	300 µm	100 mm	5 µm	186002597
Atlantis dC ₁₈	300 µm	150 mm	5 µm	186002598
XBridge BEH130 C ₁₈	300 µm	50 mm	5 µm	186003682
Custom	300µm	Custom	Custom	186002605

**For Peptide Separation Technology NanoEase
and Capillary Columns, See Page 192**



nanoACQUITY UltraPerformance LC Columns

- Novel frit technology and design for extended column life
- Capable of operation up to 10,000 PSI
- Easily interfaces with LC/MS/MS systems
- Available with ACQUITY UPLC C₁₈, 1.7 μ m BEH Technology particles

nanoACQUITY UPLC System



Waters nanoACQUITY Trapping, Capillary, and Nano columns are designed specifically for use on Waters nanoACQUITY UPLC System. As with our line of NanoEase columns, these offerings containing carefully selected reversed-phase and ion-exchange chemistries for bioseparations.

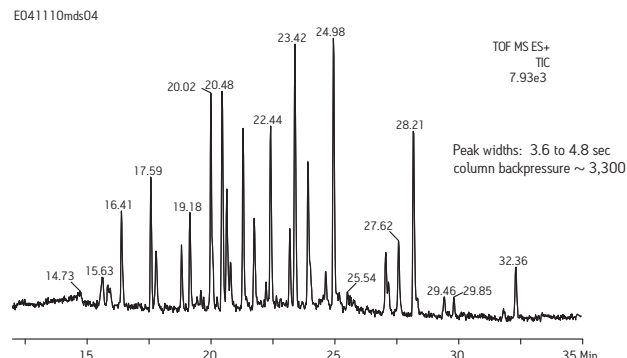


Column i.d.	Flow Rate
300 μ m	4 μ L/min
150 μ m	1 μ L/min
75 μ m	250 nL/min

Flow Rates and Column Internal Diameters for Capillary and Nanoflow. Capillary-scale separations are done in a flow rate range of 1 μ L/min to 10 μ L/min on columns with internal diameters (i.d.) ranging from 300 μ m to 100 μ m. Nanoflow is <1 μ L/min on columns with i.d. $\geq$ 75 μ m.

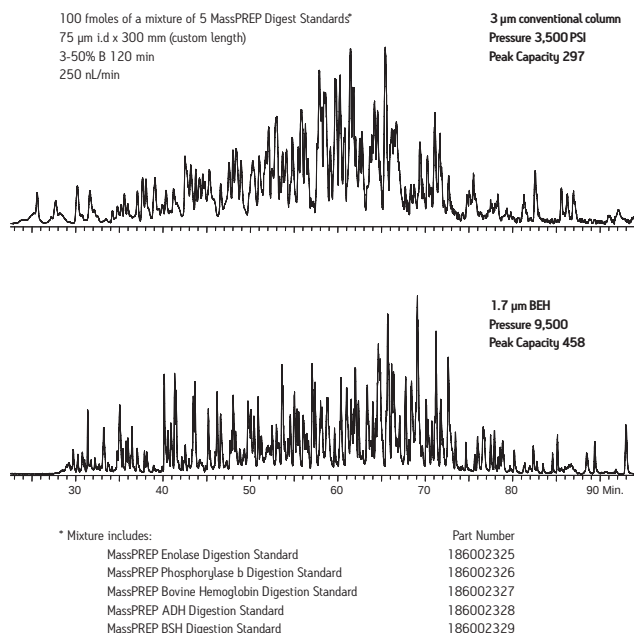
Separation of Enolase Digest

200 fmol enolase digest, 5% B - 60% B in 30 minutes, 250 nL/min flow rate



The ability to operate at higher pressures enables the use of longer columns (up to and including 250 mm in length) and further leverage the separation power of 1.7 μ m particles. Thus, the nanoACQUITY UPLC chemistry offering now includes the Peptide Separation Technology nanoACQUITY UPLC columns, which incorporate the 1.7 μ m BEH130 material.

Increased Peak Capacity Separations



nanoACQUITY UPLC Columns (10,000 psi)

Description	Particle Size	Inner Diameter	Length	Part No.
Symmetry C ₁₈	3.5 µm	75 µm	100 mm	186003491
Symmetry C ₁₈	3.5 µm	75 µm	150 mm	186003492
Symmetry C ₁₈	3.5 µm	100 µm	100 mm	186003493
Symmetry C ₁₈	3.5 µm	100 µm	150 mm	186003494
Symmetry C ₁₈	3.5 µm	150 µm	100 mm	186003495
Symmetry C ₁₈	3.5 µm	150 µm	150 mm	186003496
Symmetry C ₁₈	3.5 µm	300 µm	100 mm	186003497
Symmetry C ₁₈	3.5 µm	300 µm	150 mm	186003498
Atlantis dC ₁₈	3 µm	75 µm	100 mm	186003499
Atlantis dC ₁₈	3 µm	75 µm	150 mm	186003500
Atlantis dC ₁₈	3 µm	100 µm	100 mm	186003501
Atlantis dC ₁₈	3 µm	100 µm	150 mm	186003502
Atlantis dC ₁₈	3 µm	150 µm	100 mm	186003503
Atlantis dC ₁₈	3 µm	150 µm	150 mm	186003504
Atlantis dC ₁₈	3 µm	300 µm	100 mm	186003505
Atlantis dC ₁₈	3 µm	300 µm	150 mm	186003506
nanoACQUITY UPLC Trap, SCX (std fitting)		180 µm	20 mm	186003507
nanoACQUITY UPLC Trap, Symmetry C ₁₈ , (std fitting)	5 µm	180 µm	20 mm	186003514
nanoACQUITY UPLC Trap Symmetry C ₁₈ , (w/v fitting)	5 µm	180 µm	20 mm	186004630
Custom				186003513

Peptide Separation Technology Columns

BEH130 C ₁₈	1.7 µm	75 µm	100 mm	186003542
BEH130 C ₁₈	1.7 µm	75 µm	150 mm	186003543
BEH130 C ₁₈	1.7 µm	75 µm	200 mm	186003544
BEH130 C ₁₈	1.7 µm	75 µm	250 mm	186003545
BEH130 C ₁₈	1.7 µm	100 µm	100 mm	186003546
BEH130 C ₁₈	1.7 µm	150 µm	100 mm	186003550
BEH300 C ₄	1.7 µm	75 µm	100 mm	186004639
BEH300 C ₄	1.7 µm	100 µm	100 mm	186004640
BEH300 C ₄	1.7 µm	150 µm	100 mm	186004641

For use with nanoACQUITY UPLC systems rated to 10,000 psi only. Not for use with nanoACQUITY UPLC systems rated to 5,000 psi.

nanoACQUITY UPLC Columns (5,000 psi)

Description	Particle Size	Inner Diameter	Length	Part No.
Symmetry C ₁₈	3.5 µm	75 µm	100 mm	186002821
Symmetry C ₁₈	3.5 µm	75 µm	150 mm	186002822
Symmetry C ₁₈	3.5 µm	100 µm	100 mm	186002823
Symmetry C ₁₈	3.5 µm	100 µm	150 mm	186002824
Symmetry C ₁₈	3.5 µm	150 µm	100 mm	186002825
Symmetry C ₁₈	3.5 µm	150 µm	150 mm	186002826
Symmetry C ₁₈	3.5 µm	300 µm	100 mm	186002827
Symmetry C ₁₈	3.5 µm	300 µm	150 mm	186002828
Atlantis dC ₁₈	3 µm	75 µm	100 mm	186002829
Atlantis dC ₁₈	3 µm	75 µm	150 mm	186002830
Atlantis dC ₁₈	3 µm	100 µm	100 mm	186002831
Atlantis dC ₁₈	3 µm	100 µm	150 mm	186002832
Atlantis dC ₁₈	3 µm	150 µm	100 mm	186002833
Atlantis dC ₁₈	3 µm	150 µm	150 mm	186002834
Atlantis dC ₁₈	3 µm	300 µm	100 mm	186002835
Atlantis dC ₁₈	3 µm	300 µm	150 mm	186002836
BEH130 C ₁₈	1.7 µm	75 µm	100 mm	186002837
BEH130 C ₁₈	1.7 µm	100 µm	100 mm	186002838
BEH130 C ₁₈	1.7 µm	150 µm	100 mm	186002839
Custom				186002840
Symmetry C ₁₈ Trap Column 5 µm		180 µm	20 mm	186002841

For use with nanoACQUITY UPLC systems rated to 5,000 psi only. Not for use with nanoACQUITY UPLC systems rated to 10,000 psi.

nanoACQUITY UPLC 2D Kit

The two-dimensional (2D) LC/MS Kit for the nanoACQUITY UPLC System provides high efficiency on-line 2D-LC/MS analysis for complex proteomics samples, such as protein global digests.

The first and second dimensions are strong cation exchange (SCX) and reversed phase (RP), respectively.



The nanoACQUITY UPLC on-line 2D-LC/MS kit contains the tubing to configure the system for 2-pump trapping in conjunction with online 2D operations, the nanoACQUITY UPLC SCX, trapping and RP analytical columns, and MassPREP Protein digest standards.

First-Dimension Separation

The first-dimension separation employs the Waters nanoACQUITY UPLC 180 µm x 23 mm SCX column. Two step gradients, a salt gradient and then an organic gradient, are applied to the SCX column. While the salt gradient separates peptides that have different charge properties, the organic gradient gradually elutes the hydrophobic peptides that remain on the SCX column after the salt gradient is applied. A nanoACQUITY UPLC trapping column collects the peptides that elute.

Second-Dimension Separation

The second-dimension separation employs a RP gradient to separate each SCX fraction with a nanoACQUITY UPLC 75 µm x 100 mm reversed-phase analytical column. The reversed-phase analytical column is used to separate the peptides collected on the trapping column. The separated peptides are then directed to an on-line MS system for characterization.

nanoACQUITY UPLC 10,000 psi On-Line 2D Kit

Description	Part No.
nanoACQUITY UPLC (10K psi) on-line 2D-LC/MS kit	176001367
Kit consists of:	
Assembly, 25 µm, capillary, BSM (binary solvent manager) to trap valve	430001575
Assembly, 40 µm capillary, ASM (auxiliary solvent manager) to injection valve	430001576
Assembly, capillary tubing, injection valve to trap valve	430001577
Assembly, capillary tubing, injection to trap valve	430001629
nanoACQUITY UPLC SCX column, 5 µm, 180 µm x 23 mm	186003507
nanoACQUITY UPLC trapping column, 5 µm Symmetry C ₁₈ , 180 µm x 20 mm	186003514
nanoACQUITY UPLC analytical column, 1.7 µm BEH C ₁₈ , 75 µm x 100 mm	186003542
MassPREP 5 Protein Digest Standard Kit	186002330
nanoACQUITY UPLC on-line 2D-LC/MS User's Guide	715001357

MassPREP Kits

Water MassPREP Glycoanalysis, Phosphopeptide Enrichment, and Protein Expression Kits were developed to address important sample preparation needs required prior to subsequent LC, MS, or LC/MS analyses. Each application specific kit contains a comprehensive, fully-tested set of reagents and documentation regarding effective use.

- Simple protocols and easy to use
- Enables high-throughput sample preparation
- Highly reproducible and consistent sample prep results

MassPREP Glycoanalysis Kit

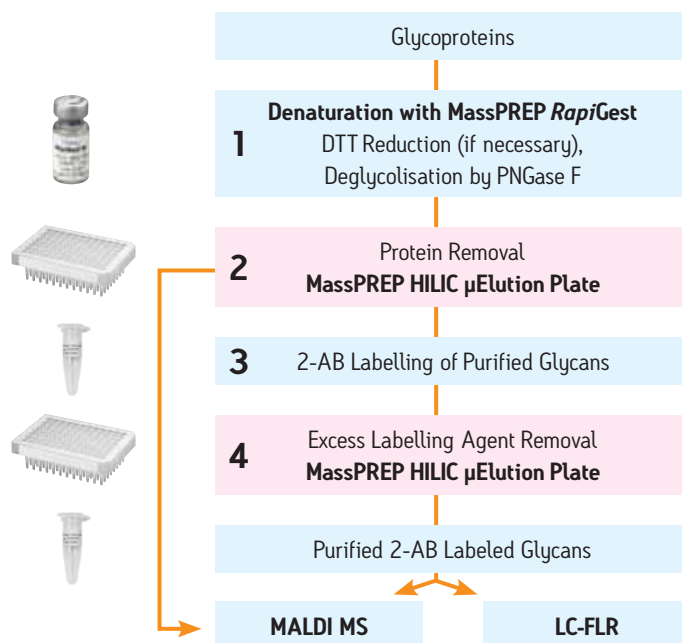


- Optimize protein deglycosylation reactions with *RapiGest* SF surfactant
- Minimize sample manipulations
- Effective desalting /sample clean-up method
- Compatible with MALDI MS and other glycan analysis techniques
- Assist in isolation of 2-AB labeled glycans

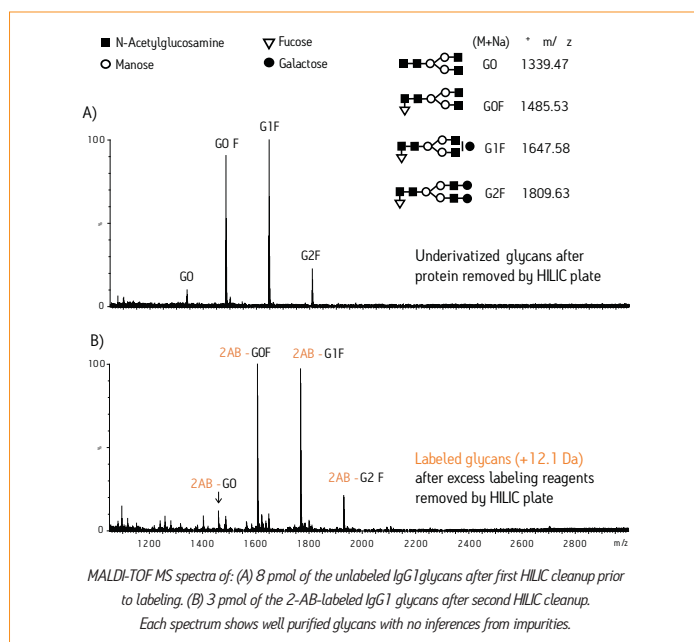
Glycosylation is one of the most important types of post-translational modification (PTM) in eukaryotic proteins. Efficient sample deglycosylation and sample preparation is a key requirement for successful and sensitive glycan analysis. In addition, the preparation and purification 2-AB-labeled glycans released from glycoproteins can also be an important step in their successful analyses.

The MassPREP Glycoanalysis kit provides simple and robust sample preparation without compromising sample recovery. As shown (right), unlabeled or 2-AB labeled glycans can be successfully analyzed by MALDI-MS or by LC with fluorescence detection following MassPREP Glycoanalysis Kit use.

Sample Preparation from Glycoprotein to Purified 2-AB Labeled Glycans



MALDI MS Mass Profiling of Native and 2AB-Labeled IgG Glycans



Description	Dimensions/Qty.	Part No.
MassPREP Glycoanalysis Kit (includes, MassPREP HILIC μ Elution Plate, <i>RapiGest</i> SF, and MassPREP MALDI Matrix DHB)		186002817
Kit Consists of:		
MassPREP HILIC μ Elution Plate	96-well	186002780
<i>RapiGest</i> SF	1 mg vial	186001860
MassPREP MALDI Matrix DHB	10 mg vial 5/pk	186002333

For more information see *RapiGest* SF Page 233

MassPREP Phosphopeptide Enrichment Kit

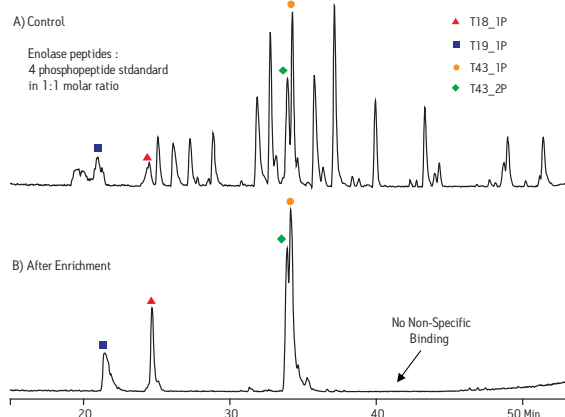


- Selective enrichment of phosphopeptides from complex proteomic samples
- Highly efficient and reproducible affinity-based enrichment
- Easy to use
- Application in high-throughput analysis

MassPREP Phosphopeptide Enrichment Kit, developed for selective enrichment of phosphopeptides from complex samples, includes a 96-well microscale, solid-phase extraction (SPE) plate packed with an affinity sorbent. The kit also includes a unique chemical (Enhancer™) that can be added to further improve the selectivity of phosphopeptides. In contrast to currently popular immobilized metal affinity chromatography (IMAC) technology, this isolation method does not require pre-loading the sorbent with metal chelator. This phosphopeptide enrichment protocol is simplified. The robustness of this method is provided by the sorbent that has high native affinity towards phosphopeptides and the Enhancer which yields superior selectivity of the sorbent towards phosphopeptides.

Phosphopeptide Analysis without (top) and with (bottom) MassPREP Phosphopeptide Kit Enrichment

Column: Symmetry C₁₈ nanoACQUITY Trapping Column, 5 µm, 180 µm x 20 mm.
 Trapping Mode: 5 µl/min for 3 minutes (100% aqueous).
 Column: nanoACQUITY Atlantis dC₁₈ 3 µm, 75 µm x 100 µm
 Solvent A: 0.1% formic acid in 100% Milli Q water
 Solvent B: 0.1% formic acid in 100% acetonitrile
 Flow Rate: 300 nL/min
 Gradient: 2% -40% B, 1% B per minute
 Injection Volume: 2 µl



Description	Units/Kit	Amt/Unit	Part No.
MassPREP Phosphopeptide Enrichment Kit			186003864
Kit Consists of:			
MassPREP Phosphopeptide Enrichment µElution Plate	1	1 plate	186003820
MassPREP Enolase/Phosphopeptide Standard	1	1 nmole	186003286
MassPREP Enhancer	10	500 mg	186003821
MassPREP Enhancer	5	500 mg	186003863

For more information see Phosphopeptide Standards on page 231

Waters Protein Expression System Kits

The Protein Expression System consists of nanoACQUITY UPLC system, Q-ToF Premier, MassLynx™ ProteinLynx™ Global Server bioinformatics software, and Waters MassPREP chemistry consumables and kits.

Microscale Kit

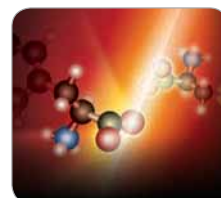
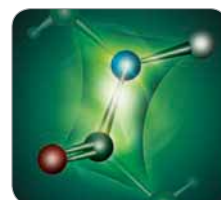
Description	Qty.	Part No.
Microscale Kit		186003903
Kit Contains :		
nanoACQUITY UPLC 300 µm x 150 mm		
Atlantis dC ₁₈ 3 µm Column	1	186003506
MPDS Mix 1	1	186002865
MPDS Mix 2	1	186002866
MPDS Enolase	1	186002325
RapiGest SF, 1 mg	1	186001860

MassPREP Chemistry Consumable Kits for the Protein Express System include nanoACQUITY UPLC columns, MassPREP Protein Digestion Standards Mix 1 and 2, MassPREP Enolase Digest Standard, and RapiGest SF Surfactant. Both Microscale and a Nanoscale Kits are available.

Nanoscale Kit

Description	Qty.	Part No.
Nanoscale Kit		186003904
Kit Contains :		
nanoACQUITY UPLC 75 µm x 150 mm		
Atlantis dC ₁₈ 3 µm Column	1	186003500
nanoACQUITY UPLC 180 µm x 20 mm		
Symmetry C ₁₈ 5 µm Trap Column	1	186003514
MPDS Mix 1	1	186002865
MPDS Mix 2	1	186002866
MPDS Enolase	1	186002325
RapiGest SF, 1 mg	1	186001860

UPLC Technology for Biomolecules



Waters offers a collection of powerful tools for characterizing biopharmaceuticals. These solutions are designed specifically to provide more accurate, reliable, and robust results, simplify your analyses and thereby increase productivity. Our system solutions combine Waters market-leading instrumentation, column chemistries, and software and informatics products, that leverage the sensitivity and resolution of UltraPerformance LC (UPLC) Technology.

UPLC Technology was introduced by Waters as a novel chromatographic technique that takes full advantage of sub-2 μm column chemistries used in a system optimized for pressures necessary to produce best-in-class separations. By packing columns with very small particles, band-broadening during separation is minimized. In addition, since distances are reduced in small particles, separations can be optimized using higher linear velocities (i.e., flow rates), while maintaining chromatographic equilibrium. The result of these chromatographic developments is separations with dramatically increased resolution, sensitivity, and speed.

The properties of these columns places a new level of demand on the chromatographic system, and Waters has holistically developed the ACQUITY UPLC and nanoACQUITY UPLC systems to take advantage of these chromatographic principles.

To gain the benefits of the small particles columns, the system must generate exceptionally accurate and precise gradients at relatively high operation pressures. The sample manager must provide accurate, small-volume injections with minimum cycle time. Furthermore, the detectors must truly minimize band-broadening while providing high signal-to-noise ratios for peaks that are narrow in both time and volume.

Based on chromatographic principles, Waters synergistically developed the columns and the instrumentation that combine to make UPLC technology a reality—and now a proven success in laboratories around the world. While the first successful application of UPLC technology was in small molecule pharmaceuticals, Waters dedication to developing impactful laboratory innovations quickly saw the benefits of UPLC technology applied to the separation of biological and biochemically-significant macromolecules.

UPLC technology brings a new level of separation and detection performance to the analysis of biomolecules, whether from complex peptide mixtures or from a potentially life saving monoclonal antibody biotherapeutic. Today, Waters UPLC technology provides improvements in the resolution, sensitivity, separation, and detection efficiency for amino acids, peptides, proteins, and synthetic DNA and RNA oligonucleotides that help scientists and chromatographers achieve desired objectives.



Peptide Mapping



Waters UPLC Peptide Analysis Solution, including UPLC Peptide Separation Technology columns, delivers maximum resolution and sensitivity. UPLC chromatographic improvements have lead to greater confidence in protein identification with improved determination of modified peptides, including glycopeptides. In the comparison of separations using 3.5 μm particles and 1.7 μm particles, peaks are clearly sharper, and more small peaks are resolved using UPLC technology.

Synthetic Oligonucleotides Analysis



The UPLC Oligonucleotide Analysis Solution and UPLC Oligonucleotide Separation Technology (OST) columns provide higher resolution in less time of synthetic oligonucleotide target products from contaminating failure sequences. This Waters technology leads to better resolution and increased sample throughput compared to use of traditional HPLC methods.

Protein Analysis



UPLC/MS technology is available for rapid, efficient mass profiling of protein samples, including intact antibodies and their associated variants. Samples can be successfully desalted on-line using the UPLC Intact Mass Analysis Kit, which ensures a high resolution spectrum with good signal-to-noise. The resulting total ion chromatograms (TICs), combined ESI-TOF mass spectra, and MaxEnt1 deconvolution mass spectrum of the intact IgG1 quickly confirm the identity of the molecule while providing a measure of the degree of modification of the protein in this sample.

In addition, reversed-phase separations of proteins are improved with UPLC Protein Separation Technology columns, used with ACQUITY UPLC. The BEH300 C₄ column gives good peak shape for wide range of proteins with minimized carryover. This column chemistry is available in 3.5 and 1.7 μm particles for UPLC separations and can be effectively used to analyze reduced and alkylated monoclonal antibodies.

Amino Acid Analysis



The UPLC Amino Acid Analysis Solution is a total application solution optimized for an accurate, reliable, and reproducible analysis of amino acids. Combining Waters new AccQ•Tag Ultra chemistry and ACQUITY UPLC system, performance is assured in the areas of protein characterization, cell culture monitoring, and the nutritional analysis of foods and feeds. The enhanced resolution and sensitivity of the separation ensures that the analysis yields accurate and precise qualitative and quantitative results. This complete solution includes the instrument, derivitization and separation chemistry, software, and comprehensive support for a true amino acid analyzer solution.

Click anywhere on page. Type desired page number. Click OK.

Supplies and Hardware

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Column and Cartridge Fittings and Accessories

ACQUITY Column Replacement Parts

ACQUITY UPLC® Column In-Line Filter Unit



Description	Part No.
In-line filter holder and six 0.2 µm stainless steel replacement filters	205000343
Five 0.2 µm stainless steel replacement filters and End Nuts for 205000343	700002775

ACQUITY UPLC Column Replacement Parts



Description	Part No.
Three 0.2 µm Inlet/Outlet Frits for 2.1 mm i.d. UPLC Columns	700003776
Three 0.2 µm Inlet/Outlet Frits for 1.0 mm i.d. UPLC Columns	700003775
One Inlet End Nut for 2.1 mm i.d. UPLC Column	700003779
One Outlet End Nut for 2.1 mm i.d. UPLC Column	700003780
One Inlet End Nut for 1.0 mm i.d. UPLC Column	700003777
One Outlet End Nut for 1.0 mm i.d. UPLC Column	700003778

Waters Column and Cartridge Replacement Parts

End Connector Kit

(endfittings for cartridge columns)



Description	Part No.
End connector kit (contains 1 pair of endfittings, c-clips and coupling)	WAT037525
Replacement o-ring 2/pkg	WAT023401
Replacement c-clip 1/pkg	WAT037560

Replacement Filter Assemblies for Columns



Column i.d.	Porosity	Part No.
1 mm	2 µm	600000175
1 mm	0.5 µm	600000176
2.1 mm	2 µm	600000177
2.1 mm	0.5 µm	600000178
3.0, 3.9, 4.6 mm	2 µm	600000179
3.0, 3.9, 4.6 mm	0.5 µm	600000180
7.8 mm	2 µm	600000181
7.8 mm	5 µm	600000182
19 mm	2 µm	600000183
30 mm	2 µm	600000184

Parker Style Cartridge Fittings and Accessories

These endfittings and accessories can be used with 4.6 mm, 4.0 mm, or 3.0 mm i.d. cartridges.



Description	Qty.	Part No.
Removable Column Endfitting	2/pk	PSS614100
Frit Assembly (2 µm)	5/pk	PSS614103
Frit Assembly (0.5 µm)	5/pk	PSS614104
Column Coupler	2/pk	PSS614102
Long Tail Endfitting	2/pk	PSS614101
Extended Endfitting for use with 10 mm Integral Guard	1/pk	PSS614108
Nylon Column Plugs for Storage of Complete Column	1/pk	WAT015674
Nylon Column Caps for Storage of Replacement Cartridge Column	10/pk	PSS614113
Inline 10 mm Guard Cartridge Holder Kit for use with above items		PSS830008

¹ 30 mm Stand Alone Guard/Column (endfittings not included)

² Extended endfitting for use with 10 mm Integral Guard: PSS614108

³ 10 mm Integral Guard Column

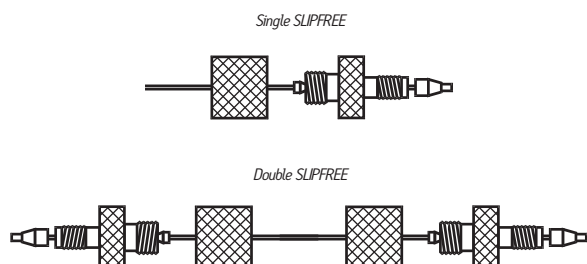
⁴ Column Coupler : PSS614102

Tubing and Fittings

SLIPFREE Connectors

New Generation HPLC Column Connector

- Guarantees a void-free connection because it pushes the tubing into the end-fitting; This design must come installed on the tubing.
- Fingertight to 10,000 psi—Never need wrenches.
- Readjusts to all column end-fittings; Compatible with all commercially available end-fittings that we have tried.
- Stainless steel tread for good stability and no particle generation.
- Unique design separates tube holding function from sealing function.



SLIPFREE Fittings

Part No.

Single SLIPFREE, 6 cm long, 0.005 in. i.d.	PSL618000
Single SLIPFREE, 20 cm long, 0.005 in. i.d.	PSL618004
Single SLIPFREE, 6 cm long, 0.010 in. i.d.	PSL618006
Single SLIPFREE, 10 cm long, 0.010 in. i.d.	PSL618008
Single SLIPFREE, 20 cm long, 0.010 in. i.d.	PSL618010
Double SLIPFREE, 6 cm long, 0.005 in. i.d.	PSL618001
Double SLIPFREE, 10 cm long, 0.005 in. i.d.	PSL618003
Double SLIPFREE, 20 cm long, 0.005 in. i.d.	PSL618005
Double SLIPFREE, 6 cm long, 0.010 in. i.d.	PSL618007
Double SLIPFREE, 10 cm long, 0.010 in. i.d.	PSL618009
Double SLIPFREE, 20 cm long, 0.010 in. i.d.	PSL618011

The SLIPFREE connector comes standard with a replaceable Vespel ferrule.

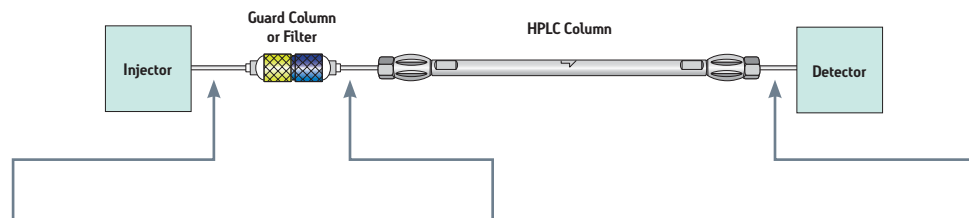
0.010 inch i.d. is recommended for routine work.

0.005 inch i.d. is recommended for column connection to short 4.6 mm i.d. and for small-bore or microbore connections.

0.020 inch i.d. is recommended for prep or semi-prep connections, or for connections ahead of the injector.

How to Use a SLIPFREE Connector

Place a SLIPFREE® connector at any location in the HPLC system where fittings must be frequently made or broke. Choose the single for installation to the injector or at any other fitting with conventional nuts and ferrules that would seldom need to be removed. Choose the double SLIPFREE connector for column coupling or places where both ends must be loosened frequently.



Single SLIPFREE (Length as needed)

A single SLIPFREE Connector has the SLIPFREE design only on one end. This end should be placed where connections and disconnections are going to be made frequently, such as the end-fitting of a column or detector. In this example, the other end-fitting is seated into the injector using a stainless steel nut and ferrule that is compatible with the brand of injector.

Double SLIPFREE (60 mm Length)

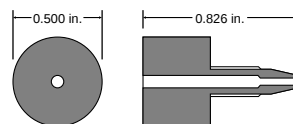
A Double SLIPFREE Connector has a SLIPFREE design on both ends. It should be placed where both connections and disconnections are going to be made frequently, such as between a column and guard column. Very short (6 cm), small i.d. connectors are available to minimize extra dead-volume. Because SLIPFREE Connectors fit any column manufacturer's end-fitting, the two items being connected do not have to be from the same manufacturer.

Single SLIPFREE (Length as needed)

A Single SLIPFREE Connector has the SLIPFREE design only on one end. This end should be placed where connections and disconnections are going to be made frequently, such as the end-fitting of a column or detector. In this example, the other end of the tubing is seated into the detector using a stainless steel nut and ferrule (one that is compatible with the brand of detector. If there is not a convenient way to attach it to the detector, a union can be used.

PEEK One-Piece Fingertight Fitting, 1/16 in., 10-32 Thread

This high performance fingertight is recommended for the most demanding applications and will resist pressures up to 6000 psi (420 Bar). The diameter of the head of the nuts has been increased to facilitate tightening without tools—it is still a genuine fingertight. Nut and ferrule are made from a single piece of PEEK™.



PSL613315

PEEK Fingertight One-Piece Fitting

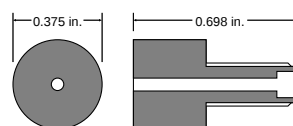
Part No.

PEEK Fingertight One-Piece Fitting

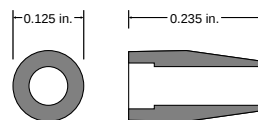
PSL613315

PEEK Two-Piece Fingertight Fittings, 1/16 in., 10-32 Thread

These fittings allow connections to be made by hand with a pressure rating of 4000 psi (280 Bar). The inexpensive PEEK ferrules will last for at least 50 connections before it has to be replaced. The nuts may be reused again and again. The PEEK ferrule is highly chemically inert and may be used with any mobile phase. This fitting provides a budget alternative for HPLC plumbing—which will fit virtually all existing HPLC fittings including Swagelok, Parker, Rheodyne, Beckman, Valco, Waters, etc—all having 10-32 female threads.



PSL613322



PSL613316

PEEK Fingertight Two-Piece Fittings

Part No.

PEEK Fingertight Two-Piece Nut

PSL613322

PEEK Single Ferrule

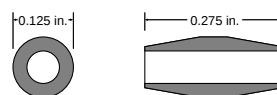
PSL613316

PEEK Fittings with Double-Ferrules, 1/16 in., 10-32 Thread

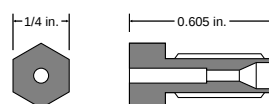
These fittings use a DOUBLE-FERRULE made of PEEK which grips the tubing in two places for unmatched reliability. These ferrules actually provide twice the holding power of single-ferrule fittings, and are ideal for use with PEEK and Tefzel tubing, which will often slip when used with single-ferrule fittings. When used with stainless steel or titanium tubing, Double-Ferrule Fittings grip tighter for a more reliable connection at high pressure.

We offer both fingertight and hex-head nuts for use with Double-Ferrules. The fingertight version may be hand-tightened for operation at up to 6,000 psi. Use the hex-head version for connections that are difficult to reach or closely spaced.

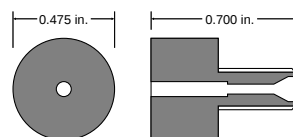
These fittings fit virtually any female 1/16 in. fitting—Parker, Swagelok, Waters, Valco, Rheodyne, Upchurch, etc—all having 10-32 threads.



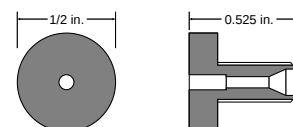
PSL613302



PSL613324



PSL613301



PSL613325

PEEK Fittings With Double-Ferrules

Part No.

PEEK Double-Ferrule

PSL613302

PEEK Hex-Head Nut

PSL613324

PEEK Fingertight Nut

PSL613301

Stainless Steel Fingertight Nut

PSL613325

PTFE/ETFE Tubing and Fittings

o.d. Inches (mm)	i.d. Inches (mm)	Length/Material	Part No.
0.125 (3.2)	0.062 (1.57)	25 ft. (7.6 m), PTFE	WAT026808
0.149 (3.8)	0.119 (30.0)	25 ft. (7.6 m), PTFE	WAT026809
0.250 (6.3)	0.190 (4.8)	10 ft. (3 m), PTFE	WAT026810
0.080 (2.0)	0.058 (1.5)	25 ft. (7.6 m), PTFE	WAT026974
0.178 (4.52)	0.148 (3.76)	25 ft. (7.6 m), PTFE	WAT051041
0.149 (3.8)	0.119 (30.0)	20 ft. (6 m), PTFE	WAT051052
0.125 (3.2)	0.020 (0.508)	10 ft. (3 m), PTFE	WAT088430
0.125 (3.2)	0.009 (0.228)	10 ft. (3 m), PTFE	WAT088431
0.125 (3.2)	0.040 (1.0)	10 ft. (3 m), PTFE	WAT088432
0.062 (1.57)	0.009 (0.228)	36 in. (1 m), ETFE	WAT088561
0.062 (1.57)	0.040 (1.0)	36 in. (1 m), PTFE	WAT088563
0.0625 (1.57)		25 ft Black Teflon	WAT077045
PTFE Adapter, 0.125 (3.2) to 0.065 (1.6) 5/pkg			WAT005137

Compression Screws & Ferrules

Description	Part No.
Ferrule, 01, Stainless Steel, 10/pk	WAT005063
Compression Screw, 0.0625 in., 10/pk	WAT005070
Compression Fitting Plug, Stainless Steel, 5/pk	WAT005079
Rheodyne Ferrule, 10/pk	WAT007020
Ferrule, Stainless Steel	WAT022330
Ferrule, 1/16 in. o.d., PEEK	WAT021817
Compression Screw, Stainless Steel	WAT025313
Compression Fitting Plug, Stainless Steel	WAT025566
Compression Screws & Ferrules, 0.166 in., 5/pk	WAT025604
Compression Screws, 0.125 in., PEEK, 2/pk	WAT046-12
Compression Screw, Long, 1/16 in.	WAT021812
Compression Screw, Short, PEEK 1/16 in.	WAT021815
Extra Long Compression Screw, Stainless Steel, 10/pk	WAT060051
Finger Tight Poly Knob used with compression screws plus PEEK ferrules	WAT021816
Tee, 0.0625 in. Compression Screw, Stainless Steel	WAT075215
Tubing Cap, Hex Stainless Steel	WAT084078
Union, 0.0625 in. Stainless Steel	WAT097332

Stainless Steel Tubing and Fittings

o.d. Inches (mm)	i.d. Inches (mm)	Length/Material	Part No.
0.0625 (1.6)	0.005 (0.127)	10 ft. (3 m), SS	WAT241039
0.0625 (1.6)	0.020 (0.508)	10 ft. (3 m), SS	WAT026804
0.0625 (1.6)	0.030 (0.762)	10 ft. (3 m), SS	430000366
0.0625 (1.6)	0.040 (1.020)	10 ft. (3 m), SS	WAT026805
0.125 (3.2)	0.062 (1.57)	10 ft. (3 m), SS	WAT026806
0.125 (3.2)	0.093 (2.36)	10 ft. (3 m), SS	WAT026807
0.0625 (1.6)	0.009 (0.228)	10 ft. (3 m), SS	WAT026973
0.0625 inch o.d. Stainless Steel Tubing Cutter with 3 Blades			WAT022384
Replacement Blades for WAT022384, 3/pk			WAT022385

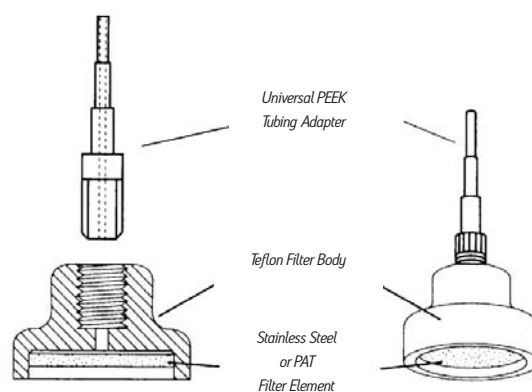
PEEK Tubing and Fittings

o.d. Inches (mm)	i.d. Inches (mm)	Length/Material	Part No.
0.0625 (1.6)	0.005 (0.127)	5 ft. (1.5 m), PEEK	WAT022995
0.0625 (1.6)	0.010 (0.254)	5 ft. (1.5 m), PEEK	WAT022996
0.0625 (1.6)	0.015 (0.381)	5 ft. (1.5 m), PEEK	WAT022997
0.0625 (1.6)	0.020 (0.508)	5 ft. (1.5 m), PEEK	WAT022998
0.0625 (1.6)	0.005 (0.127)	2 ft. (0.609 m), PEEK	WAT033390
0.0625 (1.6)	0.010 (0.254)	2 ft. (0.609 m), PEEK	WAT033391
0.0625 (1.6)	0.020 (0.508)	2 ft. (0.609 m), PEEK	WAT033392
PEEK Tubing Cutter			WAT031795
PEEK Tubing and Fitting Kit			WAT022999
PEEK Union, 0.0625 in.			WAT026-04

Last Drop Mobile Phase Filters

The Last Drop™ Mobile Phase Filter utilizes a flat filter element which sits parallel to the bottom of the reservoir. This design allows the filter to draw all but the last 2% of the mobile phase from the reservoir without drawing air into the system. Last Drop Filters are available with 316L Stainless Steel or PAT™ (PEEK alloyed with Teflon) filter elements in inert Teflon housings. The top of the housing has a PEEK tripod which fits into 1.5, 2.2 or 3.5 mm id pump inlet lines.

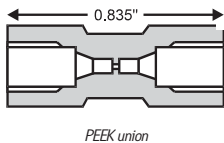
Last Drop Mobile Phase Filter	Part No.
with 2 µm Stainless Steel Filter	PSL901290
with 10 µm Stainless Steel Filter	PSL901291
with 2 µm PAT Filter	PSL901292
with 5 µm PAT Filter	PSL901294



PEEK Unions, Tees, and Crosses

The PEEK union allows you to connect two pieces of 1/16 in. tubing quickly and reliably and can be used up to 6000 psi. Because this is a PEEK union, it is absolutely inert and biocompatible. PEEK Tees and Crosses may be used up to 10,000 psi.

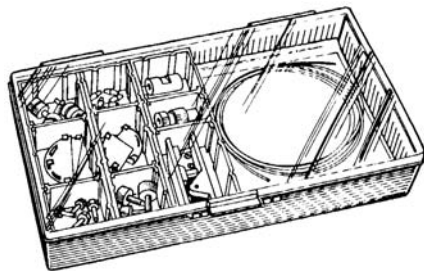
- Connects any 1/16 in. Tubing PEEK, SS, Ti, Tefzel)
- Low Dead Volume
- 10-32 Thread



Description	Part No.
PEEK Union with 2 PEEK Fingertight Nuts and Double Ferrules 1/16 in.	PSL613312
PEEK Union without Nuts and Ferrules 1/16 in.	PSL613313
PEEK TEE with One Piece Fingertight Fitting	PSL613317
PEEK CROSS with One Piece Fingertight Fitting	PSL613319
PEEK TEE Without Fittings	PSL613318
PEEK CROSS Without Fittings	PSL613320
PEEK One Piece Fingertight Fitting	PSL613315

PEEK Starter Kit

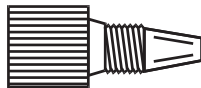
By replacing stainless steel parts, such as tubings, fittings, ferrules, mobile phase filters, in-line filters, etc. you are creating a biocompatible and metal-free environment for your samples and mobile phase. The PEEK Starter Kit is a collection of items which we believe is a good start for everybody working in the field of Biochromatography. Each kit is supplied in a sturdy plastic case. There is an approximate saving of 25% in buying this kit compared to the individual components.



Description	Part No.
PEEK Starter Kit	PSL613321
Contains the following :	
PEEK Fingertight One-Piece (6), PEEK Handtight Nut (4), PEEK Hex-Head Nut (4), PEEK Double Ferrules (20), PEEK Tubing 1/16 in. x 0.25 mm (1 x 3 m), PEEK Tubing 1/16 in. x 0.50 mm (1 x 3 m), PEEK Union (1), Elbow 90 Degrees (2), Elbow 180 Degrees (2), Guillotine Cutter (1), PAT Mobile Phase Filter - "Last Drop" (1)	

Handilok CTFE Fittings

Handilok™ fittings can replace conventional compression fittings used with 1/16 in. tubing without the need for tools and are compatible with all internal fittings having a 10-32 thread. They meet rigid high pressure requirements and will stand pressures in excess of 4000 psi.



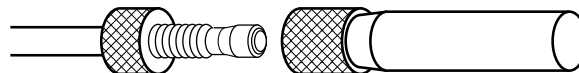
Handilok CTFE Fitting
Part No.: PSL618021

Handilok Fittings	Qty.	Part No.
1/16 in. fitting	1/pk	PSL618021
1/16 in. fitting	10/pk	PSL618022



PEEK Biocompatible Mobile Phase Filter

The mobile phase filter protects your HPLC pumping system against small particles in the mobile phase. Many macromolecules are fairly labile and require not only biocompatible chromatographs, but also mobile phase filters which are totally inert. These filters are designed from inert polymeric components, which effectively eliminate metal from the fluid path. With a porosity of 5 μm all fittings, including the inlet tube, are manufactured in totally inert PEEK.

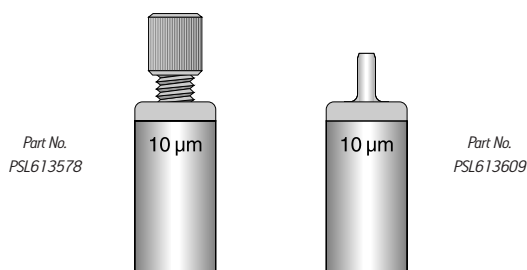


Description	Part No.
Biocompatible Mobile Phase Filter	PSL901282

Solvent Inlet Filters

It is good practice to always filter your solvents to prevent any pump damage. These 10 μm filters provide the pump protection required. Their large surface area means long life without pump cavitation.

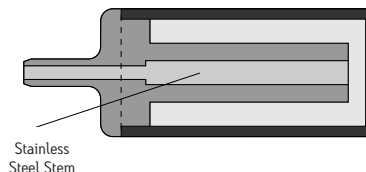
Filters should be changed periodically depending on usage and mobile phase. Replacing the filter is easy; no tools are needed. The unique Plastictight male nut is screwed into the filter and tightened by hand. Finger tightening is all that is necessary; the Plastictight fitting holds without flanging.



Description	Part No.
Solvent Inlet Filter Kits	
Solvent Inlet Filter Kit - Contains one 3 in. length of Teflon Tubing, 1 Plastictight Fitting, 5 Replacement 10 μm Filters	PSL613600
Plastictight Fitting with Teflon Tubing 1/16 in. i.d. x 1/8 in. o.d. x 3 ft.	PSL613602
Replacement Filter 10 μm 5/pk	PSL613604
Solvent Inlet Filters for General Use	
Solvent Inlet Filter 10 μm with 1/16 in. o.d. stem for 1/8 in. o.d. tubing	PSL613570
Solvent Inlet Filter 10 μm with flangeless fittings for 1/8 in. o.d. tubing	PSL613578
Solvent Inlet Filters for Preparative HPLC	
Solvent Inlet Filter 10 μm with 1/16 in. o.d. stem for 1/8 in. o.d. tubing	PSL613607
Solvent Inlet Filter 10 μm with flangeless fittings for 1/8 in. o.d. tubing	PSL613608
Solvent Inlet Filters for Waters HPLC Systems	
Solvent Inlet Filter 10 μm with 1/8 in. o.d. stem for 3/16 in. o.d. tubing	PSL613609

Bottom-of-the-Bottle Solvent Filters

This filter has been designed after the original Bottom-of-the-Bottle™ replaceable filters. This unique filter has a stainless steel stem on top to accommodate 1/16 in. i.d. tubings. The lower stem which goes directly into the 10 μm filter reaches to within 0.06 in. of the Bottom-of-the-Bottle filters. The Bottom-of-the-Bottle Solvent Filter has a 10 μm filter that can easily handle flow rates up to 10 mL/min.



Bottom-of-the-Bottle Solvent Filter	Part No.
Stainless Steel Filter Assembly	PSL613457



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Environmental Resource Associates



An organization committed to customer satisfaction.

We want to thank you for all of your loyalty and business year after year. It is the privilege of being able to work for each of you that keeps us coming back every day and enjoying what we do. We want to make certain that working with ERA is valuable to you, and therefore we continue to push our customer and technical service to be the benchmark in the industry. When you reach out to us, we want to answer every call with a positive attitude and a desire to help that is tangible. We want you to feel the difference in our level of customer service.

As you may know, ERA was recently acquired by Waters Corporation, and we want to assure all of our customers that each of us will remain true to the core values that have made us the leading provider of quality assurance, validation and certified reference materials (CRM) in the industry. We are the same people that you have seen in our catalogs year after year and we are excited about this new phase in the life of ERA. We are also committed to customer satisfaction and we believe it shows.

ERA's Certified Reference Materials

The word that best describes ERA's Certified Reference Materials (CRM) standards is "true". We prepare every standard with starting materials traced to NIST or the highest possible metrological authority, and we verify the preparation, production and packaging via exhaustive in-house analyses. We analyze and test every Lot for stability, accuracy and precision. We scrutinize analytical data to make certain there are no unexpected problems with the standards, and then, only after all of that, we sell them to you. When you purchase Certified Reference Standards from ERA, you are looking for the truth. We guarantee that is what you will find.





Wastewater Inorganics CRM

**UP
TO
12**

UNIQUE LOTS
AVAILABLE PER YEAR

The industry standard for 30 years! ERA Wastewater Inorganics CRM standards provide you the easiest way to verify the accuracy of all your water and Wastewater analyses. Use these “known” CRM standards any time to compare your results against ERA’s certified values and acceptance limits. Our acceptance limits, derived from over two million data points, will let you know with absolute confidence whether your analytical performance is where you need it to be.



Minerals/Solids CRMs

Minerals 186004350

One 500 mL Whole-Volume bottle is ready to analyze.

Total alkalinity as CaCO ₃	10-120 mg/L
Chloride.....	35-275 mg/L
Fluoride.....	0.3-4 mg/L
Potassium.....	4-40 mg/L
Sodium.....	6-100 mg/L
Specific conductance at 25°C.....	200-930 µmhos/cm
Sulfate.....	5-125 mg/L
Total dissolved solids at 180°C.....	140-650 mg/L
Total solids at 105°C.....	140-675 mg/L

Hardness 186004351

One 500 mL Whole-Volume bottle is ready to analyze.

Calcium.....	3.5-110 mg/L
Calcium hardness as CaCO ₃	8.7-275 mg/L
Total hardness as CaCO ₃	17-440 mg/L
Magnesium.....	2-40 mg/L
Non-filterable residue (TSS).....	23-100 mg/L

pH 186004381

One 250 mL Whole-Volume bottle is ready to analyze.

Use with electrometric methods.

pH.....	5-10 units
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Settleable Solids 186004375

One 60 mL poly bottle with a solid concentrate yields 1 liter after dilution.

Settleable solids.....	5-100 mL/L
------------------------	------------

Volatile Solids 186004376

One 12 mL screw-top vial with a solid concentrate yields 1 liter after dilution.

Volatile solids.....	100-500 mg/L
----------------------	--------------

Trace Metals CRMs

Trace Metals 186004345

One 15 mL screw-top vial yields up to 1 liter of sample after dilution.

Use with AA, ICP-OES or ICP-MS and selected colorimetric methods.

Aluminum.....	200-4,000 µg/L
Antimony.....	95-900 µg/L
Arsenic.....	70-900 µg/L
Barium.....	100-2,500 µg/L
Beryllium.....	8-900 µg/L
Boron.....	800-2,000 µg/L
Cadmium.....	8-750 µg/L
Chromium.....	17-1,000 µg/L
Cobalt.....	28-1,000 µg/L
Copper.....	40-900 µg/L
Iron.....	200-4,000 µg/L
Lead.....	70-3,000 µg/L
Manganese.....	70-4,000 µg/L
Molybdenum.....	60-600 µg/L
Nickel.....	80-3,000 µg/L
Selenium.....	90-2,000 µg/L
Silver.....	26-600 µg/L
Strontium.....	30-300 µg/L
Thallium.....	60-900 µg/L
Vanadium.....	55-2,000 µg/L
Zinc.....	100-2,000 µg/L

Mercury 186004354

One 15 mL screw-top vial yields up to 1 liter after dilution. Contains both inorganic and organic mercury to test both digestion and analysis procedures. Use with CVAA, ICP-MS or CVAFS methods.

Mercury, total.....	2-30 µg/L
---------------------	-----------

Low-Level Mercury 186004380

Designed for ng/L level testing. One 5 mL flame-sealed ampule yields up to 4 liters after dilution. Contains organic and inorganic mercury to test both digestion and analysis procedures. Use with sensitive CVAA methods.

Mercury, total.....	1-100 ng/L
---------------------	------------

Hexavalent Chromium 186004202

One 15 mL screw-top vial yields up to 2 liters after dilution.

Use with colorimetric or IC methods.

Hexavalent chromium.....	45-880 µg/L
--------------------------	-------------

Tin and Titanium 186004357

One 15 mL screw-top vial yields up to 1 liter after dilution.

Use with AA, ICP-OES or ICP-MS methods.

Tin.....	1,000-5,000 µg/L
Titanium.....	80-300 µg/L



Wastewater Inorganics CRM

Demand CRMs

Demand	186004356
One 15 mL screw-top vial yields up to 2 liters after dilution.	
5-day BOD	15-250 mg/L
Carbonaceous BOD	15-250 mg/L
COD	30-250 mg/L
TOC	6-100 mg/L

Nutrient CRMs

Simple Nutrients	186004349
One 15 mL screw-top vial yields up to 2 liters after dilution. Use with colorimetric, ion selective electrode or ion chromatography methods.	
Ammonia as N	0.65-19 mg/L
Nitrate as N	0.25-40 mg/L
Nitrate plus nitrite as N	0.25-40 mg/L
Orthophosphate as P	0.5-5.5 mg/L

Complex Nutrients	186004361
One 15 mL screw-top vial yields up to 2 liters after dilution. Use with digestion followed by colorimetric, ISE or ICP methods.	
Total Kjeldahl-nitrogen as N	1.5-35 mg/L
Total phosphorus as P	0.5-10 mg/L

Nitrite	186004370
One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Use with ion chromatography or colorimetric methods.	
Nitrite as N	0.4-4 mg/L

Wastewater Inorganics CRM Set

Includes the Minerals (186004350), Hardness (186004351), pH (186004381), Trace Metals (186004345), Mercury (186004354), Demand (186004356), Simple Nutrients (186004349), Complex Nutrients (186004361), Oil and Grease (186004348), Total Residual Chlorine (186004346) and Cyanide and Phenol (186004347) CRM standards.

Single Set Purchase	186004342
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ERA CRM standards help you ensure the quality of your everyday data.



Wastewater Inorganics CRM

Oil and Grease CRMs

Oil and Grease 186004348

One 250 mL Whole-Volume bottle is ready to analyze.

Certified values are provided for IR and gravimetric methods.

Oil and Grease 20-100 mg/bottle

1 liter Oil and Grease 186004358

One liter Whole-Volume glass bottle with a 33-430 thread is ready to analyze.

Oil and Grease 20-100 mg/L

1 liter Boston Round Oil and Grease 186004374

One liter Whole-Volume bottle is ready to analyze. Designed for SPE equipment with Boston Round glass bottles with a 33-400 thread.

Oil and Grease 20-100 mg/L

HEM / SGT-HEM 186004359

One 5 mL flame-sealed ampule yields up to 2 liters after dilution.

Contains both hexadecane and stearic acid.

HEM 5-100 mg/L

SGT-HEM 5-100 mg/L

Total Petroleum Hydrocarbons (TPH) in Water # 1 186004363

One liter Whole-Volume bottle is ready to analyze for Total Petroleum Hydrocarbons without interfering fatty acids.

Total Petroleum Hydrocarbons 20-170 mg/L

Total Petroleum Hydrocarbons (TPH) in Water # 2 186004364

One liter Whole-Volume bottle is ready to analyze for Total Petroleum Hydrocarbons in the presence of interfering fatty acids.

Total Petroleum Hydrocarbons 20-170 mg/L

Microbiology CRMs

All ERA microbiology standards are lyophilized and require re-hydration before analysis—sterile fluid provided. This ensures stability and provides flexibility when the samples can be analyzed!

Wastewater Coliforms 186004384

Each set contains two lyophilized samples, one quantitative positive and one negative. Use with all CWA quantitative methods – MF and MPN.

Each set can be used for total coliforms and/or fecal coliforms as E.coli, which are present in the range 20–2,400 CFU/100 mL or MPN/100 mL.

Enterococci 186004383

Each set contains two lyophilized samples, one quantitative positive and one negative, for Enterococci and/or Fecal Streptococci, MF or MPN, in the range 20–1,000 CFU/ 100 mL or MPN/100 mL.

Note that a hazardous materials shipping charge will apply.

Physical Property CRMs

Color 186004340

One 125 mL Whole-Volume bottle is ready to analyze.

Color 10-75 PC units

Turbidity 186004373

One 15 mL screw-top vial yields up to 1 liter after dilution.

Use with nephelometric methods.

Turbidity 1-20 NTU





Chemical CRMs

Acidity	186004377
One 250 mL Whole-Volume bottle is ready to analyze as received. Designed for use with titrimetric methods to a pH endpoint of 8.3.	
Acidity as CaCO_3	650-1,800 mg/L

Boron	186004379
One unpreserved 60 mL poly bottle yields in excess of 2 liters after dilution. Designed for colorimetric methods.	
Boron.....	0.8-2 mg/L

Bromide	186004369
One 2 mL flame-sealed ampule yields up to 1 liter after dilution. Use with ion chromatography or colorimetric methods.	
Bromide.....	1-10 mg/L

For bromate/chlorate/chlorite CRMs see page 267.

Total Residual Chlorine	186004346
One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Use with titrimetric or colorimetric methods.	
Total Residual Chlorine.....	0.5-3 mg/L

Low-Level Total Residual Chlorine	186004378
Designed for testing at low $\mu\text{g/L}$ levels. One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Use with sensitive titrimetric or colorimetric methods.	
Total Residual Chlorine.....	20-250 $\mu\text{g/L}$

Cyanide and Phenol	186004347
One 15 mL screw-top vial yields up to 2 liters after dilution. As appropriate for each analyte use with digestion or distillation followed by colorimetric, titrimetric or ISE methods.	
Total Cyanide	0.1-1 mg/L
Phenol	0.06-5 mg/L

Total Organic Halides (TOX)	186004242
One 2 mL flame-sealed ampule yields up to 2 liters of TOX standard after dilution. Use with adsorption pyrolysis titrimetric methods.	
TOX.....	300-1,500 $\mu\text{g/L}$

For perchlorate CRMs see page 246.

Total Phenolics (4-AAP)	186004355
One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Analyze for a mixture of phenolic compounds using 4-AAP methods.	
Total phenolics by 4-AAP	0.06-5 mg/L

Silica	186004371
One unpreserved 60 mL poly bottle yields up to 1 liter after dilution. Use with colorimetric or ICP methods.	
Silica as SiO_2	50-250 mg/L

Sulfide	186004341
One 10 mL flame-sealed ampule yields up to 1 liter after dilution. Use with titrimetric or colorimetric methods. Guaranteed stable for one year.	
Sulfide	1-10 mg/L

Surfactants-MBAS	186004372
One 10 mL flame-sealed ampule yields up to 2 liters after dilution.	
Surfactants-MBAS	0.2-1 mg/L





Small Lab Wastewater CRM

4

UNIQUE LOTS
AVAILABLE PER YEAR

Each ERA Small Lab Wastewater CRM standard is a “known” that comes with certified values and acceptance limits so you can get immediate feedback about the accuracy of your water and Wastewater analyses. Use our CRM standards routinely for staff training and periodic evaluation or to troubleshoot problems.

Whole-Volume CRMs

The following Whole-Volume standards are ready to use as provided and require no dilution before analysis.

Small Lab Minerals 186004353

One 500 mL Whole-Volume bottle. The concentration of all solids analytes is designed to mimic the samples commonly found in treatment plant labs.

pH.....	5-10 units
Total solids at 105°C.....	500-2,500 mg/L
Total dissolved solids at 180°C.....	500-2,000 mg/L
Non-filterable residue (TSS).....	20-120 mg/L

Oil and Grease 186004348

One 250 mL Whole-Volume bottle. Certified values are provided for IR and gravimetric methods.

Oil and Grease.....	20-100 mg/bottle
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ERA Whole-Volume Minerals and Oil and Grease standards are easier to use and have proven for thirty years to be more reliable!

Concentrate CRMs

The following standards are provided as concentrates that require dilution before analysis.

Demand 186004356

One 15 mL screw-top vial yields up to 2 liters after dilution.

5-day BOD.....	15-250 mg/L
Carbonaceous BOD.....	15-250 mg/L
COD.....	30-250 mg/L
TOC.....	6-100 mg/L

Simple Nutrients 186004349

One 15 mL screw-top vial yields up to 2 liters after dilution.

Use with colorimetric, ion selective electrode or ion chromatography methods.

Ammonia as N.....	0.65-19 mg/L
Nitrate as N.....	0.25-40 mg/L
Nitrate plus nitrite as N.....	0.25-40 mg/L
Orthophosphate as P.....	0.5-5.5 mg/L

Complex Nutrients 186004361

One 15 mL screw-top vial yields up to 2 liters after dilution. Use with digestion followed by colorimetric, ISE or ICP methods.

Total Kjeldahl-nitrogen as N.....	1.5-35 mg/L
Total Phosphorus as P.....	0.5-10 mg/L

Small Lab Wastewater CRM Set

Includes one of each CRM standard listed on this page.

Single Set Purchase	186004343
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Ready-to-Use Wastewater CRM



ERA Ready-to-Use Wastewater are Whole-Volume CRM standards that require no dilution before analysis. Each CRM standard comes with certified values and acceptance limits so you can get immediate feedback on the quality of your results. The Ready-to-Use standards are guaranteed stable for a minimum of one month after receipt at your facility. Just order, open and analyze!

Whole-Volume CRMs

The following Whole-Volume standards are ready to use as provided and require no dilution before analysis.

Minerals 186004350
One 500 mL bottle to be analyzed for alkalinity as CaCO_3 , chloride, conductivity at 25 °C, fluoride, potassium, sodium, sulfate, total dissolved solids at 180 °C and total solids at 105 °C.

Hardness 186004351
One 500 mL bottle to be analyzed for calcium, magnesium, total hardness as CaCO_3 , calcium hardness as CaCO_3 and non-filterable residue or total suspended solids (TSS).

pH 186004381
One 250 mL bottle to be analyzed for pH. Use with electrometric methods.

Oil and Grease 186004348
One 250 mL Whole-Volume bottle. Certified values are provided for IR and gravimetric methods. For additional Oil and Grease CRMs see page 241.

Trace Metals 186004366
One 500 mL bottle to be analyzed for aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, strontium, thallium, vanadium and zinc. Use with AA, ICP-OES or ICP-MS methods.

Demand 186004368
One 500 mL bottle to be analyzed for 5-day BOD, carbonaceous BOD, COD and TOC.

Simple Nutrients 186004365
One 500 mL bottle to be analyzed for ammonia as N, nitrate as N, nitrate plus nitrite as N and orthophosphate as P. Use with colorimetric, ion selective electrode or ion chromatography methods.

Complex Nutrients 186004367
One 500 mL bottle to be analyzed for total Kjeldahl-nitrogen as N and total phosphorus as P. Use with digestion followed by colorimetric, ISE or ICP methods.

Ready-to-Use Wastewater CRM Set

Includes one of each CRM standard listed on this page.

Set Purchase 186004344

Just open and analyze!





Wastewater Organics CRM

UP
TO
12

UNIQUE LOTS
AVAILABLE PER YEAR

All ERA CRM standards are provided with certified values and acceptance limits, which are derived from over two million data points. You can rely on them with absolute confidence to identify whether your analytical performance is where you need it to be. Use ERA's Organics standards to help you make your every-day CRM program even more effective.

Volatiles CRMs

Volatiles 186004389

One 2 mL flame-sealed ampule yields in excess of 200 mL after dilution. Each standard contains at least 27 VOA analytes, randomly selected from the list below, at 5-300 µg/L after dilution. All unspiked analytes are certified at <5 µg/L.

Acetone	1,2-Dibromoethane (EDB)	Methyl tert-butyl ether (MTBE)
Acetonitrile	Dibromomethane	4-Methyl-2-pentanone (MIBK)
Acrylonitrile	1,2-Dichlorobenzene	Naphthalene
Acrolein	1,3-Dichlorobenzene	Styrene
Benzene	1,4-Dichlorobenzene	1,1,1,2-Tetrachloroethane
Bromodichloromethane	Dichlorodifluoromethane	1,1,2,2-Tetrachloroethane
Bromoform	1,1-Dichloroethane	Tetrachloroethene
Bromomethane	1,2-Dichloroethane	Toluene
2-Butanone (MEK)	1,1-Dichloroethene	1,2,4-Trichlorobenzene
Carbon disulfide	cis-1,2-Dichloroethene	1,1,1-Trichloroethane
Carbon tetrachloride	trans-1,2-Dichloroethene	1,1,2-Trichloroethane
Chlorobenzene	1,2-Dichloropropane	Trichloroethene
Chlorodibromomethane	cis-1,3-Dichloropropene	Trichlorofluoromethane
Chloroethane	trans-1,3-Dichloropropene	1,2,3-Trichloropropane
2-Chloroethyl vinyl ether	Ethylbenzene	Vinyl acetate
Chloroform	Hexachlorobutadiene	Vinyl chloride
Chloromethane	2-Hexanone	Xylenes, total
1,2-Dibromo-3-chloropropane (DBCP)	Methylene chloride	

BTEX and MTBE in Water 186004399

One 2 mL flame-sealed ampule yields in excess of 200 mL after dilution. Contains all BTEX analytes below and Methyl tert-butyl ether (MTBE) all at 7-300 µg/L after dilution.

Benzene	Methyl tert-butyl ether (MTBE)	Toluene
Ethylbenzene		Xylenes, total

For Gasoline Additives CRMs see page 247.

Gasoline Range Organics (GRO) in Water 186004400

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Contains unleaded regular gasoline in the range of 200-4,000 µg/L after dilution. Also certified for all BTEX analytes.



We provide performance acceptance limits with our CRM standards. They allow you to reliably compare your performance to other experienced labs!



Wastewater Organics CRM

Semivolatiles CRMs

Base/Neutrals 186004390

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard contains at least 31 analytes, randomly selected from the list below, at 10-225 µg/L (except Benzidine at 200-1,000 µg/L) after dilution. All unspiked analytes are certified at <10 µg/L.

Acenaphthylene	4-Chlorophenyl	Isophorone
2-Amino-1-methylbenzene	-phenylether	2-Methylnaphthalene
(o-Toluidine)	Chrysene	Naphthalene
Aniline	Dibenz(a,h)anthracene	2-Nitroaniline
Anthracene	Dibenzofuran	3-Nitroaniline
Benzidine	1,2-Dichlorobenzene	4-Nitroaniline
Benzo(a)anthracene	1,3-Dichlorobenzene	Nitrobenzene
Benzo(b)fluoranthene	1,4-Dichlorobenzene	N-Nitrosodiethylamine
Benzo(k)fluoranthene	3,3'-Dichlorobenzidine	N-Nitrosodimethylamine
Benzo(g,h,i)perylene	Diethyl phthalate	N-Nitroso-
Benzo(a)pyrene	Dimethyl phthalate	di-n-propylamine
Benzyol alcohol	Di-n-butylphthalate	N-Nitrosodiphenylamine
4-Bromophenyl	2,4-Dinitrotoluene	Pentachlorobenzene
-phenylether	2,6-Dinitrotoluene	Phenanthrene
Butylbenzylphthalate	Di-n-octylphthalate	Pyrene
Carbazole	bis(2-Ethylhexyl)phthalate	Pyridine
4-Chloroaniline	Fluoranthene	1,2,4,5-
bis(2-Chloroethoxy)	Fluorene	Tetrachlorobenzene
methane	Hexachlorobenzene	1,2,4-Trichlorobenzene
bis(2-Chloroethyl)ether	Hexachlorobutadiene	
bis(2-Chloroisopropyl)	Hexachlorocyclopentadiene	
ether	Hexachloroethane	
1-Chloronaphthalene	Indeno(1,2,3-cd)pyrene	
2-Chloronaphthalene		

Acids

186004391

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard contains at least 13 analytes, randomly selected from the list below, at 30-200 µg/L after dilution. All unspiked analytes are certified at <30 µg/L.

Benzoic Acid	2,4-Dinitrophenol	Pentachlorophenol
4-Chloro-3-methylphenol	2-Methyl-4,6-dinitrophenol	Phenol
2-Chlorophenol	2-Methylphenol	2,3,4,6-Tetrachlorophenol
2,4-Dichlorophenol	3 & 4-Methylphenol	2,4,5-Trichlorophenol
2,6-Dichlorophenol	2-Nitrophenol	2,4,6-Trichlorophenol
4-Dimethylphenol	4-Nitrophenol	

Low-Level Nitroaromatics and Nitramines 186004388

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard contains at least 12 analytes, randomly selected from the list below, at 1-20 µg/L after dilution.

4-Amino-2,6-dinitrotoluene	HMX	RDX
2-Amino-4,6-dinitrotoluene	Nitrobenzene	Tetryl
1,3-Dinitrobenzene	2-Nitrotoluene	1,3,5-Trinitrobenzene
2,4-Dinitrotoluene	3-Nitrotoluene	2,4,6-Trinitrotoluene
2,6-Dinitrotoluene	4-Nitrotoluene	

Diesel Range Organics (DRO) in Water 186004401

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Contains No. 2 Diesel for use with modified EPA 8015 methods. DRO is in the concentration range of 500-4,000 µg/L after dilution.

Low-Level PAHs 186004393

One 2 mL flame-sealed ampule yields up to 2 liters of sample after dilution. Each standard includes at least 13 analytes, randomly selected from the list below, at 0.3-10 µg/L after dilution. The UV absorbing and fluorescent analytes are present at 2-10 and 0.3-2 µg/L, respectively.

Acenaphthene	Benzo(g,h,i)perylene	Indeno(1,2,3-cd)pyrene
Acenaphthylene	Benzo(a)pyrene	Naphthalene
Anthracene	Chrysene	Phenanthrene
Benzo(a)anthracene	Dibenz(a,h)anthracene	Pyrene
Benzo(b)fluoranthene	Fluoranthene	
Benzo(k)fluoranthene	Fluorene	

PCBs CRMs

PCBs in Water 186004398

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard includes a different Aroclor, randomly selected from the list below, at 1-15 µg/L after dilution. All unspiked Aroclors are certified at <1 µg/L.

Aroclor 1016	Aroclor 1242	Aroclor 1254
Aroclor 1221	Aroclor 1248	Aroclor 1260
Aroclor 1232		

PCBs in Oil 186004397

One 10 mL flame-sealed ampule is ready to analyze. Each standard contains a different Aroclor, randomly selected, at 12-50 mg/kg.



Wastewater Organics CRM Set

Includes the Volatiles (186004389), Base/Neutrals (186004390), Acids (186004391), PCBs in Water (186004398) and Organochlorine Pesticides (186004392) CRM standards.

Set Purchase 186004304

Wastewater Organics CRM

Pesticides CRMs

Organochlorine Pesticides 186004392

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard contains at least 16 analytes, randomly selected from the list below, at 0.5-20 µg/L after dilution. All unspiked analytes are certified at <0.5 µg/L.

Aldrin	4,4'-DDD	Endrin
alpha-BHC	4,4'-DDE	Endrin aldehyde
beta-BHC	4,4'-DDT	Endrin ketone
delta-BHC	Dieldrin	Heptachlor
gamma-BHC (Lindane)	Endosulfan I	Heptachlor epoxide (beta)
alpha-Chlordane	Endosulfan II	Methoxychlor
gamma-Chlordane	Endosulfan sulfate	

Carbamate Pesticides 186004409

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard now contains at least 10 analytes, randomly selected from the list below, at 5-200 µg/L after dilution. All unspiked analytes are certified at <5 µg/L.

Aldicarb	Carbaryl	Methiocarb
Aldicarb sulfone	Carbofuran	Methomyl
Aldicarb sulfoxide	Diuron	Oxamyl (Vydate)
Baygon	3-Hydroxycarbofuran	Protham

Nitrogen Pesticides 186004387

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard contains at least 8 analytes, randomly selected from the list below, at 2-20 µg/L after dilution. All unspiked analytes are certified at <2 µg/L.

Alachlor	Deethyl atrazine	Prometon
Ametryn	Deisopropyl atrazine	Prometryn
Anilazine	Diaminotrazine	Pronamide
Atraton	EPTC (Eptam)	Propachlor
Atrazine	Hexazinone	Propazine
Bromacil	Metolachlor	Simazine
Butachlor	Metribuzin	Terbacil
Butylate	Napropamide	Trifluralin
Cyanazine		

Chlordane 186004394

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard contains technical chlordane at 3-25 µg/L after dilution.

Toxaphene 186004395

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard contains toxaphene at 20-100 µg/L after dilution.

Organophosphorus Pesticides (OPP) 186004386

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard contains Diazinon, Disulfoton, Ethyl Parathion, Malathion and Azinphos-methyl and at least 4 additional OPP analytes, randomly selected from the list below, at 2-20 µg/L after dilution.

Azinphos-methyl (Guthion)	Dioxathion	Methyl Parathion
Carbophenothion	Disulfoton	Phorate
Chlorpyrifos	Ethion	Phosmet
Demeton O and S	Ethoprop	Ronnel
Diazinon	Ethyl Parathion (Parathion)	Stirophos (Tetrachlorovinphos)
Dichlorvos (DDVP)	Famphur	Terbufos
Dimethoate	Fonofos	
	Malathion	

Herbicides CRM

Chlorinated Acid Herbicides 186004396

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Four herbicides – 2,4-D, Dicamba, 2,4,5-T, and 2,4,5-TP (Silvex) – are included in every standard at 2-10 µg/L after dilution. At least 6 additional analytes, randomly selected from the list shown below, are included in every standard at 2-10 µg/L, except MCPA and MCPP, which if spiked, are included at 10-100 µg/L after dilution. All unspiked analytes are certified at <2 µg/L.

Acifluorfen	Dalapon	MCPP
Bentazon	Dicamba	4-Nitrophenol
Chloramben	3,5-Dichlorobenzoic acid	Pentachlorophenol
2,4-D	Dichlorprop	Picloram
2,4-DB	Dinoseb	2,4,5-T
Dacthal diacid (DCPA)	MCPA	2,4,5-TP (Silvex)

ERA Cal 1000 mg/L Standards



ERA 1000 mg/L standards can be used for primary calibration or to prepare second source calibration check standards. They are traceable to NIST Standard Reference Materials, where available, and are guaranteed stable for one year. The certification documentation includes manufacturing uncertainties, traceability summaries and densities to aid in performing quantitative dilutions. The documentation for metal standards includes impurities.

Inorganics - 1000 mg/L

Chemical Oxygen Demand (COD)	186004225 (500 mL Bottle)
	186004216 (125 mL Bottle)

One 1,000 mg/L standard preserved with HCl in an amber glass bottle.

Total Kjeldahl-Nitrogen (TKN)	186004230 (500 mL Bottle)
	186004217 (125 mL Bottle)

One 1,000 mg/L standard preserved with HCl in a poly bottle.

MBAS/LAS Surfactants	186004226
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One 10 mL flame-sealed ampule containing 1,000 mg/L LAS preserved with H₂SO₄.

Total Organic Carbon (TOC)	186004228
One 500 mL 1,000 mg/L amber glass bottle preserved with H ₂ SO ₄ .	

Total Organic Halides (TOX)	186004227
One 2 mL flame-sealed ampule at 1,000 mg/L in MeOH.	

Phenol	186004229
A 500 mL 1,000 mg/L amber glass bottle preserved with H ₂ SO ₄ .	

Sulfide	186004233
One 10 mL flame-sealed ampule with 1,000 mg/L sulfide preserved with NaOH and zinc acetate.	

Ions – 1000 mg/L Parameter	Matrix	500 mL Bottle Part No.	125 mL Bottle Part No.
Ammonia as NH ₃	H ₂ O	186004157	186004139
Ammonia as N	H ₂ O	186004156	186004140
Bromate	H ₂ O	–	186004152
Bromide	H ₂ O	186004158	186004141
Chlorate	H ₂ O	–	186004153
Chloride	H ₂ O	186004159	186004142
Chlorite	H ₂ O	–	186004154
Free cyanide	NaOH	186004231	186004143
Complex cyanide	NaOH	186004232	186004144
Fluoride	H ₂ O	186004160	186004145
Nitrate as NO ₃	H ₂ O	186004163	186004146
Nitrate as N	H ₂ O	186004162	186004147
Nitrite as N	H ₂ O	186004161	186004148
Perchlorate	H ₂ O	–	186004155
Phosphate as PO ₄	H ₂ O	186004165	186004149
Phosphate as P	H ₂ O	186004164	186004150
Sulfate	H ₂ O	186004166	186004151

Metals – 1000 mg/L Parameter	Matrix	125 mL Bottle Part No.
Aluminum	HNO ₃	186004170
Antimony	HNO ₃	186004171
Arsenic	HNO ₃	186004172
Barium	HNO ₃	186004173
Beryllium	HNO ₃	186004174
Bismuth	HNO ₃	186004203
Boron	HNO ₃	186004175
Cadmium	HNO ₃	186004176
Calcium	HNO ₃	186004177
Cerium	HNO ₃	186004211
Chromium VI	H ₂ O	186004178
Total chromium	HNO ₃	186004179
Cobalt	HNO ₃	186004180
Copper	HNO ₃	186004181
Holmium	HNO ₃	186004204
Indium	HNO ₃	186004205
Iron	HNO ₃	186004182
Lead	HNO ₃	186004183
Lithium	HNO ₃	186004206
Magnesium	HNO ₃	186004184
Manganese	HNO ₃	186004185
Mercury	HNO ₃	186004186
Molybdenum	HNO ₃	186004187
Nickel	HNO ₃	186004188
Phosphorus	HNO ₃	186004200
Potassium	HNO ₃	186004189
Rhodium	HCl	186004207
Scandium	HNO ₃	186004208
Selenium	HNO ₃	186004190
Silica	H ₂ O	186004201
Silicon	HNO ₃	186004191
Silver	HNO ₃	186004192
Sodium	HNO ₃	186004193
Strontium	HNO ₃	186004194
Terbium	HNO ₃	186004209
Thallium	HNO ₃	186004195
Tin	HCl	186004196
Titanium	HCl	186004197
Vanadium	HNO ₃	186004198
Yttrium	HNO ₃	186004210
Zinc	HNO ₃	186004199



ERA Cal Metals, Anions, and pH Buffer Standards

ICP-MS Metals

These standards come with a Certificate of Traceability and Uncertainty. Use for initial as well as continuing calibration and tuning verification. Provided as convenient concentrates with densities allowing you to easily perform gravimetric dilutions.

ICP-MS Trace Metals 186004212

One 125 mL concentrate is preserved with HNO₃ and tartaric acid. Contains aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, thallium, thorium, uranium, vanadium and zinc, each at 10.0 mg/L.

ICP-MS Major Cations 186004213

One 125 mL concentrate is preserved with HNO₃. Contains calcium, magnesium, potassium and sodium, each at 50.0 mg/L.

ICP-MS Tuning Standard 186004215

One 125 mL concentrate is preserved with HNO₃ and HCl. Contains barium, beryllium, cerium, cobalt, indium, lead, lithium, magnesium, rhodium, thallium, uranium and yttrium, each at 10.0 mg/L.

ICP-MS Calibration/CRM Set

Includes the ICP-MS Trace Metals (186004212) and Cations (186004213) standards.

Set Purchase 186004214

Anions

Ion Chromatography 186004382

One 15 mL screw-top vial yields up to 200 mL after dilution. Designed to calibrate or verify IC calibrations. Comes with a Certificate of NIST Traceability. Call for anion standards at lower levels.

Bromide.....	0.2-20 mg/L
Chloride.....	0.2-20 mg/L
Fluoride.....	0.1-10 mg/L
Nitrate as N.....	0.2-20 mg/L
Phosphate as P.....	0.5-30 mg/L
Sulfate.....	0.5-30 mg/L



pH Buffers

ERA Cal pH Buffers are directly traceable to NIST SRMs, mercury free, guaranteed stable for at least one year after your receipt, and are supplied with a full certificate of analysis. Choose single bottles or convenient 6-bottle cases.

Value	Volume	Single Bottles Part No.	Case of 6 Bottles Part No.
pH 4.00	1 pint	186004218	186004219
pH 7.00	1 pint	186004220	186004221
pH 10.00	1 pint	186004222	186004223
2 each of pH 4, 7 and 10	1 pint	—	186004224

AA/ICP Metals

All metals standards come with a Certificate of Traceability. The ICP Trace Metals standard also includes uncertainties. Use as initial as well as continuing calibration verification.

Flame AA Trace Metals 186004352

One 20 mL screw-top vial, preserved with HNO₃, yields up to 500 mL after dilution. Designed for flame AA. Provided with a Certificate of NIST Traceability. Includes aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, strontium, thallium, vanadium and zinc.

Flame AA/ICP Cations 186004362

One 15 mL screw-top vial, preserved with HNO₃, yields up to 250 mL after dilution. Use with ICP and AA methods.

Calcium	10-200 mg/L
Magnesium.....	10-200 mg/L
Potassium.....	5-100 mg/L
Sodium.....	10-250 mg/L

ICP Trace Metals 186004360

Designed for radial and axial-view ICP. One 500 mL Whole-Volume standard, preserved with HNO₃ and HCl, is ready to use. Includes antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, chromium, cobalt, copper, lead, manganese, molybdenum, nickel, phosphorus, strontium, tin, vanadium and zinc, each at 1.0 mg/L, plus aluminum, calcium, iron, potassium, lanthanum, magnesium, selenium and sodium, each at 10.0 mg/L.



Whole Effluent Toxicity (WET) CRM

ERA recognizes that Whole Effluent Toxicity (WET) testing has its own unique characteristics. That's why we derive the expected performance on our WET CRM standards directly from the results of our historical proficiency testing studies. They include the largest pool of participant toxicity testing laboratories available. ERA's acceptance limits, which are provided for each WET standard, are derived from these data.

ERA WET CRM standards allow you to assess the consistency and quality of your routine aquatic toxicology analyses. All toxicants are supplied as ready-to-use concentrates – simply dilute and test.



Whole Effluent Toxicity (WET) Testing CRMs

Reference Toxicant for Test Organism and Conditions	EPA Test Code	EPA Method Code	Part No.
Fathead minnow (<i>Pimephales promelas</i>) 48-hour acute, non-renewal, 20°C, MHSF	11	2000.0	186004410
Fathead minnow (<i>Pimephales promelas</i>) 48-hour acute, non-renewal, 25°C, MHSF	13	2000.0	186004411
Fathead minnow (<i>Pimephales promelas</i>) 48-hour acute, non-renewal, 25°C, 20% DMW	14	2000.0	186004412
Fathead minnow (<i>Pimephales promelas</i>) 7-day short-term chronic, daily renewal, 25°C, MHSF	15	1000.0	186004413
Fathead minnow (<i>Pimephales promelas</i>) 7-day short-term chronic, daily renewal, 25°C, 20% DMW	16	1000.0	186004414
Ceriodaphnia dubia 48-hour acute, renewal, 20°C, MHSF	17	2002.0	186004415
Ceriodaphnia dubia 48-hour acute, renewal, 20°C, 20% DMW	18	2002.0	186004416
Ceriodaphnia dubia 48-hour acute, renewal, 25°C, MHSF	19	2002.0	186004417
Ceriodaphnia dubia 48-hour acute, renewal, 25°C, 20% DMW	20	2002.0	186004418
Ceriodaphnia dubia 7-day short-term chronic, daily renewal, 25°C, MHSF	21	1002.0	186004419
Ceriodaphnia dubia 7-day short-term chronic, daily renewal, 25°C, 20% DMW	22	1002.0	186004420
Daphnia magna 48-hour acute, non-renewal, 20°C, MHSF	32	2021.0	186004421
Daphnia pulex 48-hour acute, non-renewal, 20°C, MHSF	36	2021.0	186004422
Daphnia pulex 48-hour acute, non-renewal, 25°C, MHSF	38	2021.0	186004423
Mysid (<i>Mysidopsis bahia</i>) 48-hour acute, non-renewal, 20°C, 40 fathoms seawater	42	2007.0	186004424
Mysid (<i>Mysidopsis bahia</i>) 7-day short-term chronic, daily renewal, 26°C, 40 fathoms seawater	43	1007.0	186004425
Inland silverside (<i>Menidia beryllina</i>) 48-hour acute, non-renewal, 20°C, 40 fathoms seawater	44	2006.0	186004426
Sheepshead minnow (<i>Cyprinodon variegatus</i>) 48-hour acute, non-renewal, 20°C, 40 fathoms seawater	46	2004.0	186004427
Sheepshead minnow (<i>Cyprinodon variegatus</i>) 7-day short-term chronic, daily renewal, 25°C, 40 fathoms seawater	47	1004.0	186004428

Microbiology CRM



ERA standards provide you the easiest way to evaluate and improve every aspect of your microbiology analyses from dilution technique to viability of your media. Use these “known” CRM standards any time to compare your results against ERA’s certified values and acceptance limits, which will let you know with absolute confidence whether your performance is where you need it to be.

All ERA Microbiology standards are lyophilized and require re-hydration before analysis—sterile fluid provided. This ensures stability and provides maximum flexibility when the samples can be analyzed!



Wastewater CRMs

Wastewater Coliforms

186004384

Each set contains two lyophilized samples, one quantitative positive and one negative. Use with all CWA quantitative methods – MF and MPN. Each set can be used for total coliforms and/or fecal coliforms as *E.coli*, which are present in the range 20–2,400 CFU/100 mL or MPN/100 mL.

Enterococci

186004383

Each set contains two lyophilized samples, one quantitative positive and one negative, which after re-hydration can be analyzed for Enterococci and/or Fecal Streptococci, MF or MPN in the range 20–1,000 CFU/100 mL or MPN/100 mL. Note that a hazardous materials shipping charge will apply.

Drinking Water CRMs

Source Water *E.coli*

186004257

One quantitative lyophilized sample containing *E.coli*. Formulated for all SDWA quantitative methods. Also use for CRM for the Long Term 2 Enhanced Surface Water Treatment Rule. Each standard contains *E.coli* in the range 10–300 CFU/100 mL.

Drinking Water Coliforms

186004259

Each set now contains five lyophilized samples including one total and fecal positive (*Escherichia coli*), one total positive and fecal negative (*Enterobacter cloacae*), two total and fecal negative (*Proteus mirabilis* and *Pseudomonas aeruginosa*), and one blank. Use with all SDWA methods - MF, MPN, presence/absence and ONPG-MUG. Each set can be used for total coliforms and/or fecal coliforms as *E.coli*.

Heterotrophic Plate Count

186004258

One quantitative lyophilized sample containing a Heterotrophic bacteria present in the range 5–500 CFU/mL. Use to CRM your recreational, drinking and Wastewater analyses. Use with Standard Method 9215B-Pour Plate and Most Probable Number (MPN) Method (Simplate).



Drinking Water Inorganics CRM



ERA Drinking Water Inorganics CRM standards provide you the simplest way to verify the accuracy of your analyses of drinking and ground water samples. Use these “known” CRM standards any time to compare your results against ERA’s certified values and acceptance limits. Our acceptance limits, derived from over two million data points, will let you know with absolute confidence whether your analytical performance is where you need it to be.



Minerals/Solids CRMs

Hardness 186004244

One 250 mL Whole-Volume bottle is ready to analyze. Use with AA, ICP-OES, ICP-MS or titrimetric methods.

Calcium	30-90 mg/L
Calcium hardness as CaCO ₃	75-375 mg/L
Total hardness as CaCO ₃	83-307 mg/L
Magnesium	2-20 mg/L
Sodium	12-24 mg/L

Inorganics 186004248

One 500 mL Whole-Volume bottle is ready to analyze. Also includes sodium at an intentionally higher range than in the Hardness standard.

Alkalinity as CaCO ₃	25-200 mg/L
Chloride	5-100 mg/L
Fluoride	1-8 mg/L
Nitrate as N	3-10 mg/L
Nitrate plus Nitrite as N	3.5-9 mg/L
Potassium	10-40 mg/L
Sodium	10-400 mg/L
Specific Conductance at 25°C	250-2,500 µmhos/cm
Sulfate	5-500 mg/L
Total filterable residue (TDS) at 180°C	200-450 mg/L

pH 186004250

One 250 mL Whole-Volume bottle is ready to analyze. Use with electrometric methods.

pH	5-10 units
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Trace Metals CRMs

Metals 186004247

One 15 mL screw-top vial yields up to 2 liters after dilution.

Use with AA, ICP-OES or ICP-MS methods.

Aluminum	130-2,500 µg/L
Antimony	6-50 µg/L
Arsenic	5-50 µg/L
Barium	500-3,000 µg/L
Beryllium	1-10 µg/L
Boron	800-2,000 µg/L
Cadmium	2-50 µg/L
Chromium	10-200 µg/L
Copper	50-2,000 µg/L
Iron	100-1,800 µg/L
Lead	5-100 µg/L
Manganese	40-900 µg/L
Molybdenum	15-130 µg/L
Nickel	10-500 µg/L
Selenium	10-100 µg/L
Silver	20-300 µg/L
Thallium	2-10 µg/L
Vanadium	315-2,500 µg/L
Zinc	400-2,500 µg/L

Mercury 186004239

One 15 mL screw-top vial yields up to 1 liter after dilution. Contains both organic and inorganic mercury to test both digestion and analysis procedures.

Use with CVAA, ICP-MS or CVAFS methods. For a ng/L level mercury standard see page 239.

Mercury, total	0.5-10 µg/L
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Hexavalent Chromium 186004236

One 15 mL screw-top vial yields up to 2 liters after dilution.

Use with colorimetric or IC methods.

Hexavalent Chromium	5-50 µg/L
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Uranium 186004254

One 15 mL screw-top vial yields up to 1 liter after dilution. Use with ICP-MS methods.

For uranium CRMs in different matrices.

Uranium	3-104 µg/L
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Vanadium 186004237

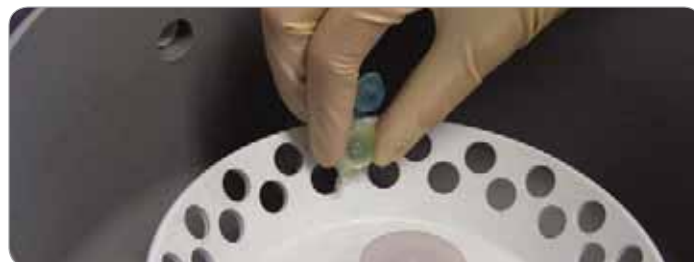
One 15 mL screw-top vial yields up to 2 liters after dilution.

Use with AA, ICP-OES or ICP-MS methods.

Vanadium	5-50 µg/L
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Drinking Water Inorganics CRM



Drinking Water Inorganics CRM Set

Includes the Hardness (186004244), Inorganics (186004248), pH (186004250), Metals (186004247), Mercury (186004239), Drinking Water Coliforms (186004259), Nitrite (186004245), Residual Chlorine (186004246) and Turbidity (186004249) CRM standards.

Single Set Purchase

186004235 Single

Inorganic Disinfection By-Products CRMs

Bromide, Bromate and Chlorate 186004243

One 2 mL flame-sealed ampule yields up to 2 liters after dilution.
Use with colorimetric, ion chromatography or ISE methods.

Bromate.....	7-50 µg/L
Bromide.....	75-500 µg/L
Chlorate.....	60-180 µg/L

Chlorite 186004234

One 2 mL flame-sealed ampule yields up to 2 liters after dilution.
Use with ion chromatography methods.

Chlorite	100-1,000 µg/L
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Nutrients CRMs

Nitrite 186004245

One 2 mL flame-sealed ampule yields up to 2 liters after dilution.
Use with colorimetric or ISE methods.

Nitrite as N.....	0.4-2 mg/L
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o-Phosphate Nutrients 186004240

One 15 mL screw-top vial yields up to 2 liters after dilution.
Use with colorimetric or IC methods.

ortho-Phosphate as P	0.5-5.5 mg/L
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Microbiology CRMs

All ERA microbiology standards are lyophilized and require re-hydration before analysis—sterile fluid provided. This ensures stability and provides maximum flexibility when the samples can be analyzed!

Drinking Water Coliforms 186004259

Each set now includes five lyophilized standards: one total and fecal positive (*Escherichia coli*), one total positive and fecal negative (*Enterobacter cloacae*), two total and fecal negative (*Proteus mirabilis* and *Pseudomonas aeruginosa*), and one blank. Use for all SDWA methods—MF, MPN, presence/absence and ONPG-MUG. Can be used for total coliforms and/or fecal coliforms as *E. coli*.

Heterotrophic Plate Count 186004258

One quantitative lyophilized sample containing a Heterotrophic bacteria present in the range 5-500 CFU/mL. Use to CRM your recreational, drinking and Wastewater analyses. Use with Standard Method 9215B—Pour Plate and Most Probable Number (MPN) Method (Simplate).

Source Water *E.coli* 186004257

One quantitative lyophilized standard containing *E.coli* is formulated for all SDWA quantitative methods. Also use for CRM under proposed monitoring for the Long Term 2 Enhanced Surface Water Treatment Rule. Each standard contains *E.coli* in the range 10-300 CFU/100 mL.



Drinking Water Inorganics CRM



Additional Inorganic CRMs

Residual Chlorine 186004246

One 2 mL flame-sealed ampule yields up to 2 liters after dilution.
Use with titrimetric or colorimetric methods. For µg/L level residual chlorine CRMs see page 242.

Total residual chlorine..... 0.5-3 mg/L
Free residual chlorine..... 0.5-3 mg/L

Cyanide 186004256

One 15 mL screw-top vial yields up to 2 liters after dilution.
Use with digestion and/or colorimetric, titrimetric or ISE methods.

Cyanide 0.1-0.5 mg/L

Organic Carbon 186004241

One 15 mL screw-top vial yields up to 1 liter after dilution.
Use for total (TOC) and dissolved (DOC) organic carbon with combustion or persulfate oxidation procedures.

Total Organic Carbon..... 1.2-4.9 mg/L
Dissolved Organic Carbon 1.2-4.9 mg/L

Perchlorate 186004253

One 15 mL screw-top vial yields up to 2 liters after dilution.
Use with IC or IC-MS methods. Call for ng/L level Perchlorate CRM standards.

Perchlorate 4-20 µg/L

Silica 186004252

One 60 mL poly bottle yields 1 liter after dilution.
Use with colorimetric or ICP methods.

Silica as SiO₂..... 5-50 mg/L

Surfactants - MBAS 186004251

One 10 mL flame-sealed ampule yields up to 2 liters after dilution.

Surfactants - MBAS 0.05-1 mg/L

For total organic halides (TOX) CRMs see page 242.

Physical Property CRMs

Corrosivity 186004255

One 500 mL Whole-Volume bottle is ready to use. Use for corrosivity, calcium carbonate saturation and Langelier saturation index.

Corrosivity -4 to +4 SI units

Turbidity 186004249

One 15 mL screw-top vial yields up to 1 liter after dilution.

Use with nephelometric methods.

Turbidity 0.5-8 NTU

UV 254 Absorbance 186004238

One 15 mL screw-top vial yields up to 1 liter after dilution.

Use with Standard Method 5910B.

UV 254 Absorbance..... 0.02-0.7 cm⁻¹



Drinking Water Organics CRM



ERA Drinking Water Organics CRM standards provide you the simplest way to verify the accuracy of your analyses of drinking and ground waters as well as other clean water samples. Use these “known” CRM standards any time to compare your results against ERA’s certified values and acceptance limits. Our acceptance limits are derived from over two million data points. They will let you know with absolute confidence whether your analytical performance is where you need it to be.



Volatile Organics CRMs

Halomethanes (THMs) 186004273

One 2 mL flame-sealed ampule yields in excess of 200 mL after dilution.
Each standard is certified for all analytes below at 10-50 µg/L after dilution.

Bromodichloromethane	Chlorodibromomethane
Bromoform	Chloroform

Regulated Volatiles 186004274

One 2 mL flame-sealed ampule yields in excess of 200 mL after dilution.
Each standard contains all the analytes below at 1-50 µg/L after dilution.

Benzene	cis-1,2-Dichloroethene	Toluene
Carbon tetrachloride	trans-1,2-Dichloroethene	1,2,4-Trichlorobenzene
Chlorobenzene	1,2-Dichloropropane	1,1,1-Trichloroethane
1,2-Dichlorobenzene	Ethylbenzene	1,1,2-Trichloroethane
1,4-Dichlorobenzene	Methylene Chloride	Trichloroethylene
1,2-Dichloroethane	Styrene	Vinyl chloride
1,1-Dichloroethene	Tetrachloroethylene	Xylenes, total

Gasoline Additives 186004281

One 2 mL flame-sealed ampule yields in excess of 200 mL after dilution.
Each standard contains all the analytes below at 5-50 µg/L after dilution.

tert-Amylmethylether (TAME)	Methyl tert-butyl ether (MTBE)	Trichlorotrifluoroethane
tert-Butyl Alcohol	Trichlorofluoromethane	(Freon® 113)
Di-isopropylether (DIPE)	(Freon® 11)	
Ethyl tert-butyl ether (ETBE)		

Unregulated Volatiles 186004268

One 2 mL flame-sealed ampule yields in excess of 200 mL after dilution.
Each standard contains at least 20 analytes, randomly selected from the list below, at 5-50 µg/L, except naphthalene, which if spiked, is included at 2-50 µg/L after dilution. All unspiked analytes are certified at <5 µg/L.

Bromobenzene	1,3-Dichlorobenzene	4-Isopropyltoluene
Bromochloromethane	Dichlorodifluoromethane	Methyl tert-butyl ether
Bromomethane	1,1-Dichloroethane	(MTBE)
n-Butylbenzene	1,3-Dichloropropane	Naphthalene
sec-Butylbenzene	2,2-Dichloropropane	n-Propylbenzene
tert-Butylbenzene	1,1-Dichloropropene	1,1,1,2-Tetrachloroethane
Chloroethane	cis-1,3-Dichloropropene	1,1,2,2-Tetrachloroethane
Chloromethane	trans-1,3-Dichloropropene	1,2,3-Trichlorobenzene
2-Chlorotoluene	Fluorotrichloromethane	1,2,3-Trichloropropane
4-Chlorotoluene	Hexachlorobutadiene	1,2,4-Trimethylbenzene
Dibromomethane	Isopropylbenzene	1,3,5-Trimethylbenzene

Semivolatile Organics CRMs

Dioxin 186004266

One 2 mL flame-sealed ampule yields up to 2 liters after dilution.
Each standard contains 2,3,7,8-TCDD at 25-80 µg/L after dilution.

PCBs as Decachlorobiphenyl 186004279

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. This standard can also be used for Aroclor identification and quantitation. Each standard includes a different Aroclor, randomly selected from the list below, at 0.5-5 µg/L as decachlorobiphenyl after dilution.

Aroclor 1016	Aroclor 1242	Aroclor 1254
Aroclor 1221	Aroclor 1248	Aroclor 1260
Aroclor 1232		

Semivolatiles # 1 186004270

Includes PAHs, phthalates and adipates. One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each lot contains Benzo(a)pyrene, bis(2-Ethylhexyl)adipate, and bis(2-Ethylhexyl)phthalate plus at least 13 additional analytes, selected from the list below, at 0.2-50 µg/L after dilution.

Acenaphthene	Butylbenzylphthalate	bis(2-Ethylhexyl)phthalate
Acenaphthylene	Chrysene	Fluoranthene
Anthracene	Dibenz(a,h)anthracene	Fluorene
Benzo(a)anthracene	Di-n-butylphthalate	Indeno(1,2,3-cd)pyrene
Benzo(b)fluoranthene	Diethylphthalate	Naphthalene
Benzo(k)fluoranthene	Dimethylphthalate	Phenanthrene
Benzo(g,h,i)perylene	Di-n-octylphthalate	Pyrene
Benzo(a)pyrene	bis(2-Ethylhexyl)adipate	

For Regulated Semivolatiles # 2 Herbicides CRMs see page 248.

Disinfection-by-Products CRMs

Chloral Hydrate 186004267

One 2 mL flame-sealed ampule yields in excess of 200 mL after dilution.
Each standard contains Chloral Hydrate at 4-30 µg/L after dilution.

Haloacetic Acids (HAA) 186004269

One 2 mL flame-sealed ampule yields up to 2 liters after dilution.
Each standard contains all six analytes listed below at 10-50 µg/L after dilution.

Bromochloroacetic Acid	Dichloroacetic Acid	Monochloroacetic Acid
Dibromoacetic Acid	Monobromoacetic Acid	Trichloroacetic Acid



Drinking Water Organics CRM



Our CRM acceptance limits will let you know with absolute confidence whether your analytical performance is where you need it to be!

Pesticides CRMs

Pesticides 186004280

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard contains at least 16 analytes, randomly selected from the list below, at 0.1-100 µg/L after dilution. All unspiked analytes are certified at <0.1 µg/L. Includes organochlorine, nitrogen and organophosphorus pesticides.

Alachlor	Heptachlor	Molinate (Ordram)
Aldrin	Heptachlor epoxide (beta)	Prometon
Atrazine	Hexachlorobenzene	Propachlor
Bromacil	Hexachlorocyclopentadiene	Simazine
Butachlor	Lindane (gamma-BHC)	Thiobencarb
Diazinon	Methoxychlor	Trifluralin
Dieldrin	Metolachlor	
Endrin	Metribuzin	

Carbamate/Carbamoxylloxime Pesticides 186004278

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard contains all analytes below at 15-150 µg/L after dilution.

Aldicarb	Carbaryl	Methiocarb
Aldicarb sulfone	Carbofuran	Methomyl
Aldicarb sulfoxide	3-Hydroxycarbofuran	Oxamyl (Vydate)
Baygon		

Chlordane 186004276

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard contains technical chlordane at 2-20 µg/L after dilution.

Toxaphene 186004272

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard contains toxaphene at 3-20 µg/L after dilution.

EDB/DBCP/TCP 186004277

One 2 mL flame-sealed ampule yields in excess of 200 mL after dilution. Each lot contains all analytes below at 0.1-2 µg/L after dilution.

- 1,2-Dibromo-3-chloropropane (DBCP)
- Ethylene Dibromide (EDB)
- 1,2,3-Trichloropropane (1,2,3-TCP)

Herbicides CRMs

Chlorinated Acid Herbicides 186004275

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard contains at least 13 analytes, randomly selected from the list below, at 1-150 µg/L after dilution. All unspiked analytes are certified at <1 µg/L.

Acifluorfen	Dalapon	Pentachlorophenol
Bentazon	Dicamba	Picloram
Chloramben	3,5-Dichlorobenzoic acid	2,4,5-T
2,4-D	Dichlorprop	2,4,5-TP (Silvex)
2,4-DB	Dinoseb	
Dacthal diacid (DCPA)	4-Nitrophenol	

Semivolatiles #2 Herbicides 186004271

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Each standard contains all the analytes below at 8-800 µg/L after dilution.

Diquat	Glyphosate
Endothall	Paraquat

Drinking Water Organics CRM Set

Includes the Halomethanes (186004273), Regulated Volatiles (186004274), Unregulated Volatiles (186004268), Pesticides (186004280), Carbamate/Carbamoxylloxime Pesticides (186004278), Chlordane (186004276), Toxaphene (186004272), EDB/DBCP/TCP (186004277) and Chlorinated Acid Herbicides (186004275) CRM standards.

Set Purchase 186004265

Unregulated Contaminant Monitoring Rule 2 (UCMR 2) CRM

ERA is a provider of standards for UCMR 2. We are making these CRM standards available to laboratories looking to prepare for analysis of these new contaminants that are soon to become regular test analytes. Call us if you have any questions about analyzing these compounds.



Unregulated Contaminant Monitoring Rule 2 (UCMR 2) Drinking Water CRMs

UCMR 2 Pesticides and Flame Retardants in Water 186004260

One 2 mL flame-sealed ampule yields in excess of 2 liters after dilution.
Each standard contains all analytes below at 0.5-10 µg/L after dilution.

Dimethoate

2,2',4,4',5-Pentabromodiphenyl ether (BDE-99)

2,2',4,4',6-Pentabromodiphenyl ether (BDE-100)

2,2',4,4',5,5'-Hexabromobiphenyl (245-HBB)

2,2',4,4',5,5'-Hexabromodiphenyl ether (BDE-153)

Terbufos sulfone

2,2',4,4'-Tetrabromodiphenyl ether (BDE-47)

UCMR 2 Nitrosamines in Water 186004262

One 2 mL flame-sealed ampule yields in excess of 2 liters after dilution.
Each standard contains all analytes below at 5-100 ng/L after dilution.

N-Nitrosodiethylamine (NDEA)

N-Nitrosodimethylamine (NDMA)

N-Nitrosodi-n-butylamine (NDBA)

N-Nitrosodi-n-propylamine (NDPA)

N-Nitrosomethylethylamine (NMEA)

N-Nitrosopyrrolidine (NPYR)

UCMR 2 Explosives in Water 186004261

One 2 mL flame-sealed ampule yields in excess of 2 liters after dilution.
Each standard contains all analytes below at 1-15 µg/L after dilution.

1,3-Dinitrobenzene

Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)

2,4,6-Trinitrotoluene (TNT)

UCMR 2 Chlorinated Pesticides in Water 186004263

One 2 mL flame-sealed ampule yields in excess of 2 liters after dilution.
Each standard contains all analytes below at 1-20 µg/L after dilution.

Acetochlor

Alachlor

Metolachlor

UCMR 2 Herbicide Degradates in Water 186004264

One 2 mL flame-sealed ampule yields in excess of 2 liters after dilution.
Each standard contains all analytes below at 1-20 µg/L after dilution.

Acetochlor ethane sulfonic acid (ESA)

Acetochlor oxanilic acid (OA)

Alachlor ethane sulfonic acid (ESA)

Alachlor oxanilic acid (OA)

Metolachlor ethane sulfonic acid (ESA)

Metolachlor oxanilic acid (OA)



Blank Soil CRM

Certified clean ERA Blank Soils allow you to evaluate any potential contamination during sample collection, preparation and analysis. They provide the perfect way to comply with all CRM program requirements. For volatile and inorganic analyses you can select between sand and soil matrices, whichever is most appropriate to your specific need.



Volatile Blank Sand 186004302

One 40 g clean sand sample in a VOA vial. The certified concentrations of all analytes are below the lowest NELAC required spiking concentration level of <20 µg/kg.

Volatile Blank Soil 186004301

One 40 g clean soil sample in a VOA vial. The certified concentrations of all analytes are below the lowest NELAC required spiking concentration levels of <20 µg/kg, except acetone at <150 µg/kg, and MEK, 2-hexanone and MIBK at <50 µg/kg.

Semivolatile Blank Soil 186004303

One 60 g certified-clean soil sample in a screw-top bottle. The certified concentration of all analytes are below the lowest NELAC required spiking concentration levels of <500 µg/kg for BNAs and PCBs, <100 µg/kg for chlordane and toxaphene, <5 µg/kg for pesticides and <10 µg/kg for herbicides. In addition, the concentration of total petroleum hydrocarbons (TPH), diesel range organics (DRO) and gasoline range organics (GRO) are certified to be <20 mg/kg.

Metals and Cyanide Blank Sand 186004283

One 40 g sand sample in a screw-top bottle. The concentrations of all EPA/NELAC including the Priority Pollutant metal and cyanide analytes are below the CLP Required Detection Limits (CRDLs) except iron, which is <250 mg/kg.

Metals and Cyanide Blank Soil 186004282

One 40 g soil sample in a screw-top bottle. The concentrations of all of the following analytes are below the CLP CRDL's: antimony, arsenic, beryllium, cadmium, cobalt, mercury, nickel, selenium, silver, sodium, thallium and cyanide. The concentrations of the following analytes are below 10X the CLP CRDL's: barium, chromium, copper, lead, magnesium, potassium and vanadium. The concentrations of manganese and zinc are <750 mg/kg. The concentration range for aluminum, calcium and iron is 3,000-25,000 mg/kg.

Inorganics in Soil CRM

4

UNIQUE LOTS
AVAILABLE PER YEAR

In order to ensure the quality and long-term consistency of our Inorganics in Soil CRM standards, ERA uses very carefully selected and prepared substrates along with systematic fortification, homogenization and packaging processes. We verify the accuracy, homogeneity and stability of every analyte in every standard.



Metals CRMs

Metals in Soil 186004288

Use for all ICP and AA, RCRA and Superfund methods. One 40 g soil standard in a screw-top bottle designed and certified for use with digestion methods 3050 hot plate and 3051 microwave. Certified values provided for the hot plate and microwave digestion procedures.

Aluminum	1,000-50,000 mg/kg
Antimony	80-300 mg/kg
Arsenic	50-400 mg/kg
Barium	80-3,000 mg/kg
Beryllium	30-200 mg/kg
Boron	80-200 mg/kg
Cadmium	40-300 mg/kg
Calcium	1,500-25,000 mg/kg
Chromium	40-300 mg/kg
Cobalt	30-200 mg/kg
Copper	40-200 mg/kg
Iron	1,000-22,000 mg/kg
Lead	50-250 mg/kg
Magnesium	1,200-25,000 mg/kg
Manganese	150-2,000 mg/kg
Mercury	1-50 mg/kg
Molybdenum	5-250 mg/kg
Nickel	40-250 mg/kg
Potassium	1,400-25,000 mg/kg
Selenium	50-250 mg/kg
Silver	50-250 mg/kg
Sodium	150-15,000 mg/kg
Strontium	5-250 mg/kg
Thallium	50-250 mg/kg
Tin	75-250 mg/kg
Titanium	10-2,000 mg/kg
Vanadium	50-250 mg/kg
Zinc	70-1,500 mg/kg

Hexavalent Chromium in Soil 186004336

One 40 g soil standard in a screw-top bottle for use with all promulgated hexavalent chromium methods.

Hexavalent chromium	40-300 mg/kg
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TCLP Metals in Soil 186004292

One 105 g ready-to-extract soil standard in a screw-top bottle designed specifically to verify the quality of TCLP metals analysis methods. Certified concentrations are provided for antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver, and zinc.

Metals in Sewage Sludge 186004285

One 40 g sludge standard in a screw-top bottle that is ideal for quality control in Wastewater treatment plant laboratories.

Aluminum	1,000-50,000 mg/kg
Antimony	80-300 mg/kg
Arsenic	50-400 mg/kg
Barium	250-2,000 mg/kg
Beryllium	30-200 mg/kg
Cadmium	40-300 mg/kg
Calcium	5,000-70,000 mg/kg
Chromium	40-300 mg/kg
Cobalt	5-50 mg/kg
Copper	40-1,000 mg/kg
Iron	1,000-50,000 mg/kg
Lead	50-250 mg/kg
Magnesium	1,200-25,000 mg/kg
Manganese	100-2,000 mg/kg
Mercury	1-50 mg/kg
Molybdenum	5-250 mg/kg
Nickel	40-250 mg/kg
Potassium	1,400-25,000 mg/kg
Selenium	50-250 mg/kg
Silver	50-250 mg/kg
Sodium	150-15,000 mg/kg
Strontium	200-2,000 mg/kg
Thallium	50-250 mg/kg
Vanadium	5-250 mg/kg
Zinc	70-1,500 mg/kg

Inorganics in Soil CRM Set

Includes the Metals (186004288), Hexavalent Chromium (186004336) and Cyanide in Soil (186004289) CRM standards.

Set Purchase	186004284
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Inorganics in Soil CRM



The reliability of our “new” perchlorate CRM standards has been confirmed over the past several years in extensive round-robin testing.

Inorganics CRMs

Anions in Soil 186004291

CRM all major anions in soil. One 40 g soil standard designed for use with DI water extraction procedures.

Bromide.....	10–200 mg/kg
Chloride.....	25–500 mg/kg
Fluoride.....	25–500 mg/kg
Nitrate as N.....	25–500 mg/kg
Phosphate as P.....	10–200 mg/kg
Sulfate.....	25–1,000 mg/kg

Cyanide in Soil 186004289

One 40 g soil standard in a screw-top bottle for use with distillation/ colorimetric methods.

Total cyanide.....	25–500 mg/kg
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Nutrients in Soil 186004290

One 40 g soil standard in a screw-top bottle is ready for analysis.

Ammonia as N.....	50–1,000 mg/kg
Total Kjeldahl-nitrogen as N.....	100–2,000 mg/kg
Total organic carbon (TOC).....	2,000–15,000 mg/kg
Total phosphorus as P.....	100–2,000 mg/kg

Nutrients in Sludge 186004293

One 40 g sludge standard in a screw-top bottle is ready for analysis.

Ammonia as N.....	0.5–3% (w/w)
Total Kjeldahl-nitrogen as N.....	2–10% (w/w)
Total organic carbon (TOC).....	20–40% (w/w)
Total phosphorus as P.....	2–10% (w/w)

Physical Parameters in Soil CRMs

Corrosivity/pH in Soil 186004299

One 100 g soil standard in a screw-top bottle.

Ignitability/Flash Point 186004300

One standard in a 125 mL bottle. Note that a hazardous materials shipping charge will apply.

Perchlorate CRMs

All perchlorate standards are certified at a specific concentration in the µg/kg range.

Perchlorate in Soil 186004294

One screw-top bottle containing 40 g of soil suitable for deionized water leach and perchlorate analysis using any of the currently available methodologies.

Perchlorate in Sludge 186004295

One screw-top bottle containing 40 g of sludge suitable for deionized water leach and perchlorate analysis using any of the currently available methodologies.

Perchlorate in Vegetation 186004296

One screw-top bottle containing 30 g of freeze-dried vegetable tissue suitable for deionized water leach and perchlorate analysis methods.

TPH in Soil CRMs

Total Petroleum Hydrocarbons (TPH) in Soil # 1 186004297

One screw-top bottle contains 50 g of soil that contains TPH without interfering fatty acids. TPH is present in the range of 250–3,000 mg/kg.

Total Petroleum Hydrocarbons (TPH) in Soil # 2 186004298

One screw-top bottle contains 50 g of soil with TPH in the presence of interfering fatty acids. TPH is present in the range of 250–3,000 mg/kg.



Organics in Soil CRM

4

UNIQUE LOTS
AVAILABLE PER YEAR

Over the past 15 years, ERA has refined the selection and preparation of our soil substrates for all our organic standards to ensure consistent extraction and analyte recovery. The accuracy, homogeneity and stability of every analyte in every standard is verified according to NELAC and ISO protocols.

ERA's Organics in Soil CRM standards provide the simplest way to verify the accuracy of your analyses from extraction through analysis. Use these "known" CRM standards any time to compare your results against ERA's certified values and acceptance limits.

Volatiles in Soil CRMs

Volatiles in Soil

186004316

One 2 mL flame-sealed ampule that requires spiking onto 10 g of provided solid matrix. By altering the amount of concentrate, this can be used for both low and medium level methods. Each standard contains at least 22 of the analytes, randomly selected from the list below at 20-200 µg/kg for low level and 1,000-10,000 µg/kg for medium level. All unspiked analytes are certified at <20 µg/kg for low level and <1,000 µg/kg for medium level.

Acetone	1,2-Dibromoethane (EDB)	Methyl tert-butyl ether (MTBE)
Acetonitrile	Dibromomethane	4-Methyl-2-pentanone (MIBK)
Acrolein	1,2-Dichlorobenzene	Styrene
Benzene	1,3-Dichlorobenzene	1,1,1,2-Tetrachloroethane
Bromodichloromethane	1,4-Dichlorobenzene	1,1,2,2-Tetrachloroethane
Bromoform	Dichlorodifluoromethane	Tetrachloroethene
Bromomethane	1,1-Dichloroethane	Toluene
2-Butanone (MEK)	1,2-Dichloroethane	1,1,1-Trichloroethane
Carbon disulfide	1,1-Dichloroethylene	1,1,2-Trichloroethane
Carbon tetrachloride	cis-1,2-Dichloroethylene	Trichloroethene
Chlorobenzene	trans-1,2-Dichloroethylene	Trichlorofluoromethane
Chlorodibromomethane	1,2-Dichloropropane	1,2,3-Trichloropropane
Chloroethane	cis-1,3-Dichloropropylene	Vinyl acetate
2-Chloroethylvinylether	trans-1,3-Dichloropropylene	Vinyl chloride
Chloroform	Ethylbenzene	Xylenes, total
Chloromethane	2-Hexanone	
1,2-Dibromo-3-chloropropane (DBCP)	Methylene chloride	

Ready-to-Use VOAs in Soil

186004337

One 20 mL flame-sealed ampule with 10 g of soil and 10 mL of methanol is ready to analyze. Each standard contains at least 22 analytes, randomly selected from the list below, at 500-13,000 µg/kg. All unspiked analytes are certified at <1,000 µg/kg.

Acetone	1,2-Dichlorobenzene	4-Methyl-2-pentanone (MIBK)
Acetonitrile	1,3-Dichlorobenzene	Naphthalene
Acrolein	1,4-Dichlorobenzene	Nitrobenzene
Benzene	Dichlorodifluoromethane	Styrene
Bromobenzene	1,1-Dichloroethane	1,1,1,2-Tetrachloroethane
Bromodichloromethane	1,2-Dichloroethane	1,1,2,2-Tetrachloroethane
Bromoform	1,1-Dichloroethene	Tetrachloroethene
Bromomethane	cis-1,2-Dichloroethylene	Toluene
2-Butanone (MEK)	trans-1,2-Dichloroethylene	1,2,4-Trichlorobenzene
Carbon disulfide	1,2-Dichloropropane	1,1,1-Trichloroethane
Carbon tetrachloride	cis-1,3-Dichloropropylene	1,1,2-Trichloroethane
Chlorobenzene	trans-1,3-Dichloropropylene	Trichloroethene
Chlorodibromomethane	Ethylbenzene	Trichlorofluoromethane
Chloroethane	2-Hexanone	1,2,3-Trichloropropane
2-Chloroethylvinylether	Hexachlorobutadiene	Vinyl acetate
Chloroform	Hexachloroethane	Vinyl chloride
Chloromethane	Isopropylbenzene	Xylenes, total
1,2-Dibromo-3-chloropropane (DBCP)	Methylene chloride	
1,2-Dibromoethane (EDB)	Methyl tert-butyl ether (MTBE)	
Dibromomethane		



Organics in Soil CRM



With decades of experience performing environmental analyses, we know what it takes to make soil standards that work for you!

Semivolatiles in Soil CRMs

Nitroaromatics and Nitramines in Soil

186004335

Two flame-sealed ampules, each with 30 g of soil are ready to analyze. Each standard contains at least 9 analytes, randomly selected from the list below, at 500-15,000 µg/kg. All unspiked analytes are certified at <500 µg/kg.

4-Amino-2,6-dinitrotoluene	2,6-Dinitrotoluene	4-Nitrotoluene
2-Amino-4,6-dinitrotoluene	HMX	RDX
1,3-Dinitrobenzene	Nitrobenzene	Tetryl
2,4-Dinitrotoluene	2-Nitrotoluene	1,3,5-Trinitrobenzene
	3-Nitrotoluene	2,4,6-Trinitrotoluene

Base/Neutrals and Acids in Soil

186004322

Two 30 g flame-sealed ampules are ready to analyze. Each standard contains at least 36 Base/Neutral and Acid analytes at 500-16,000 µg/kg. All unspiked analytes are certified at <500 µg/kg.

Acenaphthene	4-Chlorophenyl-phenylether	2-Methyl-4,6-dinitrophenol
Acenaphthylene	Chrysene	2-Methylnaphthalene
2-Amino-1-methylbenzene (o-Toluidine)	Dibenz(a,h)anthracene	2-Methylphenol
Aniline	Dibenzofuran	3 & 4-Methylphenol
Anthracene	Di-n-butylphthalate	Naphthalene
Benazidine	1,2-Dichlorobenzene	2-Nitroaniline
Benzoic acid	1,3-Dichlorobenzene	3-Nitroaniline
Benzo(a)anthracene	1,4-Dichlorobenzene	4-Nitroaniline
Benzo(b)fluoranthene	3,3'-Dichlorobenzidine	Nitrobenzene
Benzo(k)fluoranthene	2,4-Dichlorophenol	2-Nitrophenol
Benzo(g,h,i)perylene	2,6-Dichlorophenol	4-Nitrophenol
Benzo(a)pyrene	Diethylphthalate	N-Nitrosodiethylamine
Benzyl alcohol	2,4-Dimethylphenol	N-Nitrosodimethylamine
4-Bromophenyl-phenylether	Dimethylphthalate	N-Nitrosodiphenylamine
Butylbenzylphthalate	2,4-Dinitrophenol	N-Nitroso-di-n-propylamine
Carbazole	2,4-Dinitrotoluene	Pentachlorobenzene
4-Chloroaniline	2,6-Dinitrotoluene	Pentachlorophenol
bis(2-Chloroethoxy)methane	Di-n-octylphthalate	Phenanthrene
bis(2-Chloroethyl)ether	bis(2-Ethylhexyl)phthalate	Phenol
bis(2-Chloroisopropyl)ether	Fluoranthene	Pyrene
4-Chloro-3-methylphenol	Fluorene	Pyridine
1-Chloronaphthalene	Hexachlorobenzene	1,2,4,5-Tetrachlorobenzene
2-Chloronaphthalene	Hexachlorobutadiene	2,3,4,6-Tetrachlorophenol
2-Chlorophenol	Hexachlorocyclopentadiene	1,2,4-Trichlorobenzene
	Hexachloroethane	2,4,5-Trichlorophenol
	Indeno(1,2,3-cd)pyrene	2,4,6-Trichlorophenol
	Isophorone	

Low-Level PAHs in Soil

186004317

Two flame-sealed ampules each with 30 g of soil are ready to analyze. Includes at least 13 analytes, randomly selected from the list below, at 50-1,000 µg/kg. Includes both UV absorbing PAHs at 100-1,000 µg/kg and fluorescent PAHs at 50-200 µg/kg.

Acenaphthene	Benzo(g,h,i)perylene	Fluorene
Acenaphthylene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene
Anthracene	Chrysene	Naphthalene
Benzo(a)anthracene	Dibenz(a,h)anthracene	Phenanthrene
Benzo(b)fluoranthene	Fluoranthene	Pyrene
Benzo(k)fluoranthene		

Base/Neutrals and Acids and Pesticides in Soil CRM Set

Includes the Base/Neutrals and Acids (186004322) and Organochlorine Pesticides in Soil (186004323) CRM standards.

Set Purchase

186004315

Organics in Soil CRM Set

Includes the Volatiles (186004316), Base/Neutrals and Acids (186004322) and Organochlorine Pesticides in Soil (186004323) CRM standards.

Set Purchase

186004305

Organics in Soil CRM

Pesticides in Soil CRMs

Organochlorine Pesticides in Soil 186004323

Two 30 g flame-sealed ampules are ready to analyze. Each standard includes at least 17 pesticides, randomly selected from the list below at 5-500 µg/kg. All unspiked analytes are certified at <5 µg/kg.

Aldrin	4,4'-DDD	Endrin
alpha-BHC	4,4'-DDE	Endrin aldehyde
beta-BHC	4,4'-DDT	Endrin ketone
delta-BHC	Dieldrin	Heptachlor
gamma-BHC (Lindane)	Endosulfan I	Heptachlor epoxide
alpha-Chlordane	Endosulfan II	Methoxychlor
gamma-Chlordane	Endosulfan sulfate	

Chlordane in Soil 186004320

One screw-top bottle containing 50 g of soil is ready to analyze. Certified for technical chlordane at 100-500 µg/kg.

Toxaphene in Soil 186004319

One screw-top bottle containing 50 g of soil is ready to analyze. Certified for toxaphene at 100-500 µg/kg.

Carbamate Pesticides in Soil 186004339

Two flame-sealed ampules, each with 30 g of soil are ready to analyze. Each standard includes at least 7 analytes, randomly selected from the list below, at 250-2,500 µg/kg. All unspiked analytes are certified at <250 µg/kg.

Aldicarb sulfone	Diuron	Oxamyl
Aldicarb sulfoxide	3-Hydroxycarbofuran	Promecarb
Carbaryl	Methiocarb	Propham
Carbofuran	Methomyl	Propoxur
Dioxacarb		

Organophosphorus Pesticides (OPP) in Soil 186004338

Two flame-sealed ampules, each with 30 g of soil are ready to analyze. Each standard includes Disulfoton at 5-500 µg/kg and at least 8 additional analytes, randomly selected from the list below, at 250-2,500 µg/kg. All unspiked analytes are certified at <250 µg/kg.

Azinophos-methyl (Guthion)	Dichlorvos (DDVP)	Phorate
Chlorpyrifos	Disulfoton	Ronnel
Demeton O & S	Ethyl Parathion (Parathion)	Stirophos (tetrachlorovinphos)
Diazinon	Malathion	Terbufos
	Methyl Parathion	

Herbicides in Soil CRMs

Chlorinated Acid Herbicides in Soil 186004318

Two flame-sealed ampules, each with 30 g of soil are ready to analyze. Each standard includes 2,4-D, Dicamba, 4-Nitrophenol, Pentachlorophenol, 2,4,5-T and 2,4,5-TP (Silvex) at 5-10,000 µg/kg and at least 6 additional analytes, randomly selected from the list shown below at 250-2,500 µg/kg. All unspiked analytes are certified at <250 µg/kg.

Acifluorfen	Dalapon	MCP
Bentazon	Dicamba	4-Nitrophenol
Chloramben	3,5-Dichlorobenzoic acid	Pentachlorophenol
2,4-D	Dichlorprop	Picloram
2,4-DB	Dinoseb	2,4,5-T
Dacthal diacid (DCPA)	MCPA	2,4,5-TP (Silvex)

PCBs in Soil CRMs

PCBs in Soil 186004321

One screw-top bottle containing 50 grams of sample is ready to analyze. Each standard includes a different Aroclor, randomly selected from the list below, at 500-50,000 µg/kg.

Aroclor 1016	Aroclor 1242	Aroclor 1254
Aroclor 1221	Aroclor 1248	Aroclor 1260
Aroclor 1232		



PCBs in Soil/Oil/Water CRM

ERA PCBs in Soil/Oil/Water CRM standards provide you the simplest and most reliable way to verify the accuracy of your PCB analyses including extraction, clean-up and calibration. Over the past 15 years, ERA has refined the selection and preparation of our substrates to ensure consistent extraction and analyte recovery. Use these “known” CRM standards any time to compare your results against ERA’s certified values and acceptance limits.

Soil

PCBs in Soil

PCBs in soil standards are sold individually in screw-top bottles containing 50 g of soil. LOW LEVEL standards contain an Aroclor in the range 0.5-50 ppm. HIGH LEVEL standards contain an Aroclor in the range 51-500 ppm.

Part No.	Concentration	Aroclor
186004307	LOW	1242
186004308	HIGH	1242
186004313	LOW	1248
186004314	HIGH	1248
186004309	LOW	1254
186004310	HIGH	1254
186004311	LOW	1260
186004312	HIGH	1260

Oil

PCBs in Oil

PCBs in oil standards are sold individually in ready-to-use flame-sealed ampules with 5 g of oil. LOW LEVEL standards contain an Aroclor in the range 10-50 ppm. HIGH LEVEL standards contain an Aroclor in the range 51-500 ppm.

Part No.	Concentration	Aroclor
186004327	LOW	1242
186004328	HIGH	1242
186004333	LOW	1248
186004334	HIGH	1248
186004329	LOW	1254
186004330	HIGH	1254
186004331	LOW	1260
186004332	HIGH	1260

Water

PCBs in Water

PCBs in water standards are sold individually in 2 mL flame-sealed ampules that yield 1 liter after dilution. Each standard contains an Aroclor at 1-15 µg/L after dilution.

Part No.	Aroclor
186004402	1016
186004403	1221
186004404	1232
186004405	1242
186004406	1248
186004407	1254
186004408	1260





Hydrocarbon Fuels in Water/Soil CRM

4

UNIQUE LOTS
AVAILABLE PER YEAR

ERA Hydrocarbon Fuels in Water and Soil CRM standards provide you the simplest and most reliable way to verify your GC/FID hydrocarbon analyses. See the following pages for state-specific UST standards. Use these “known” CRM standards any time to compare your results against ERA’s certified values and acceptance limits. Our acceptance limits are derived from over two million data points. They will let you know with absolute confidence whether your analytical performance is where you need it to be.

Hydrocarbon Fuels in Water CRMs

BTEX and MTBE in Water 186004399

One 2 mL flame-sealed ampule yields in excess of 200 mL after dilution. Each standard includes all analytes below at 7-300 µg/L after dilution.

Benzene	Methyl tert-butyl ether (MTBE)	Toluene
Ethylbenzene		Xylenes, total

Gasoline Range Organics (GRO) in Water 186004400

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Use with purge and trap methods. Contains unleaded regular gasoline at 200-4,000 µg/L after dilution. Also certified for all BTEX compounds.

Diesel Range Organics (DRO) in Water 186004401

One 2 mL flame-sealed ampule yields up to 2 liters after dilution. Contains No. 2 Diesel. DRO is at 500-4,000 µg/L after dilution.

**Designed for GC/FID
hydrocarbon methods!**



Hydrocarbon Fuels in Water CRM Set

Includes the BTEX and MTBE (186004399), GRO (186004400) and DRO (186004401) in Water CRM standards.

Set Purchase	186004385
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Hydrocarbon Fuels in Soil CRM Set

Includes the BTEX and MTBE (186004324), GRO (186004325) and DRO (186004326) in Soil CRM standards.

Set Purchase	186004306
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Designed for GC/FID Hydrocarbon methods!

Hydrocarbon Fuels in Soil CRMs

BTEX and MTBE in Soil 186004324

Includes one 2 mL flame-sealed ampule with all analytes below to be spiked onto 10 g of provided soil matrix. All analytes are at 7-500 µg/kg after spiking onto the soil.

Benzene	Methyl tert-butyl ether (MTBE)	Toluene
Ethylbenzene		Xylenes, total

Gasoline Range Organics (GRO) in Soil 186004325

One flame-sealed ampule with 20 g of soil spiked with unleaded regular gasoline at 100-2,000 mg/kg. Use with purge and trap methods. Also certified for all BTEX compounds.

Diesel Range Organics (DRO) in Soil 186004326

One flame-sealed ampule with 20 g of soil spiked with No. 2 Diesel fuel at 100-5,000 mg/kg.





Total Petroleum Hydrocarbons in Water/Soil CRM

4

UNIQUE LOTS
AVAILABLE PER YEAR

For both TPH in Water and Soil, standard #1 contains TPH only and standard #2 contains TPH plus interfering fatty acids. These standards are designed specifically to evaluate both your clean-up and analysis techniques and to work with all IR and gravimetric TPH methods.

TPH in Water CRMs

Total Petroleum Hydrocarbons (TPH) in Water # 1 186004363

One liter Whole-Volume bottle is ready to analyze for TPH in water without interfering fatty acids.

TPH.....20-170 mg/L

Total Petroleum Hydrocarbons (TPH) in Water # 2 186004364

One liter Whole-Volume bottle is ready to analyze for TPH in water in the presence of interfering fatty acids.

TPH.....20-170 mg/L

TPH in Water CRM Set

Includes the TPH # 1 (186004363) and TPH # 2 (186004364) in Water CRM standards.

Set Purchase 186004287



Designed to work with all IR and gravimetric TPH methods!

TPH in Soil CRMs

Total Petroleum Hydrocarbons (TPH) in Soil #1 186004297

One screw-top bottle contains 50 g of soil that contains total petroleum hydrocarbons without interfering fatty acids. TPH is present in the range of 250-3,000 mg/kg.

Total Petroleum Hydrocarbons (TPH) in Soil #2 186004298

One screw-top bottle contains 50 g of soil with total petroleum hydrocarbons in the presence of interfering fatty acids. TPH is present in the range of 250-3,000 mg/kg.

TPH in Soil CRM Set

Includes the TPH # 1 (186004297) and TPH # 2 (186004298) in Soil CRM standards.

Set Purchase 186004286



Air and Emissions CRM

Volatiles Standards

Volatiles in Gas Cylinder 186004508

One pressurized gas cylinder for use with EPA Methods TO-14 and TO-15.

Contains at least 10 analytes, randomly selected from the list below, at 1-25 ppb.

Benzene	(Freon 12)	Propylene
Bromodichloromethane	1,1-Dichloroethane	1,1,1,2-Tetrachloroethane
Bromoform	1,2-Dichloroethane	1,1,2,2-Tetrachloroethane
Bromomethane	1,1-Dichloroethylene	Tetrachloroethylene
2-Butanone (MEK)	cis-1,2-Dichloroethylene	Toluene
tert-Butyl methyl ether (MTBE)	1,2-Dichloropropane	1,1,1-Trichloroethane
Carbon tetrachloride	cis-1,3-Dichloropropylene	1,1,2-Trichloroethane
Chlorobenzene	trans-1,3-Dichloropropylene	Trichlorotrifluoromethane (Freon 11)
Chlorodibromomethane	1,2-Dichlorotetrafluoroethane (Freon 114)	Trichlorofluoromethane (Freon 113)
Chloroethane	Ethylbenzene	1,2,4-Trimethylbenzene
Chloroform	p-Ethyltoluene	1,3,5-Trimethylbenzene
Chloromethane	n-Heptane	Vinyl bromide
Cyclohexane	Hexachlorobutadiene	Vinyl chloride
1,2-Dibromoethane (EDB)	n-Hexane	Xylenes, total
1,2-Dichlorobenzene	2-Hexanone	
1,4-Dichlorobenzene	4-Methyl-2-pentanone (MIBK)	
Dichlorodifluoromethane		

Volatiles on Sorbent 186004509

One 2 mL flame-sealed ampule for spiking client-specific sorbent. Use with EPA

Methods TO-17, 0030, and 0031. Contains at least 24 analytes, randomly selected from the list below, at 50-2,000 ng/sample (200-3,000 ng/sample for Total Xylenes) after preparation.

Acetone	1,2-Dibromo-3-chloropropane (DBCP)	2-Hexanone
Acetonitrile	1,2-Dibromoethane (EDB)	Methylene Chloride
Acrolein	Dibromomethane	4-Methyl-2-pentanone (MIBK)
Acrylonitrile	1,2-Dichlorobenzene	Naphthalene
Benzene	1,3-Dichlorobenzene	Styrene
Bromodichloromethane	1,4-Dichlorobenzene	1,1,1,2-Tetrachloroethane
Bromoform	Dichlorodifluoromethane (Freon 12)	1,1,2-Tetrachloroethane
Bromomethane	1,1-Dichloroethane	Tetrachloroethane
2-Butanone (MEK)	1,2-Dichloroethane	Toluene
tert-Butyl methyl ether (MTBE)	1,1-Dichloroethene	1,2,4-Trichlorobenzene
Carbon disulfide	cis-1,2-Dichloroethene	1,1,1-Trichloroethane
Carbon tetrachloride	trans-1,2-Dichloroethene	1,1,2-Trichloroethane
Chlorobenzene	1,2-Dichloropropane	Trichloroethylene
Chlorodibromomethane	cis-1,3-Dichloropropene	Trichlorofluoromethane
Chloroethane	trans-1,3-Dichloropropene	1,2,3-Trichloropropane
Chloroform	Ethylbenzene	Vinyl acetate
Chloromethane	Hexachlorobutadiene	Vinyl chloride
		Xylenes, total

Semivolatiles Standards

Semivolatiles on PUF 186004510

Two 2 mL flame-sealed ampules plus one polyurethane foam (PUF).

Use with EPA Method 0010. Contains at least 42 analytes, randomly selected from the list below, at 10-225 µg/sample (200-1,000 µg/sample for Benzidine) after preparation.

Acenaphthene	Di-n-butylphthalate	N-Nitrosodiphenylamine
Acenaphthylene	1,2-Dichlorobenzene	N-Nitroso-di-n-propylamine
Aniline	1,3-Dichlorobenzene	Pentachlorobenzene
Anthracene	1,4-Dichlorobenzene	Phenanthrene
Benzidine	3,3'-Dichlorobenzidine	Pyrene
Benzo(a)anthracene	Diethyl phthalate	Pyridine
Benzo(b)fluoranthene	Dimethyl phthalate	o-Toluidine
Benzo(k)fluoranthene	2,4-Dinitrotoluene	1,2,4,5-Tetrachlorobenzene
Benzo(g,h,i)perylene	2,6-Dinitrotoluene	1,2,4-Trichlorobenzene
Benzo(a)pyrene	Di-n-octylphthalate	Benzoic Acid
Benzyl alcohol	Fluoranthene	4-Chloro-3-methylphenol
4-Bromophenyl-phenylether	Fluorene	2-Chlorophenol
Butylbenzylphthalate	Hexachlorobenzene	2,4-Dichlorophenol
Carbazole	Hexachlorobutadiene	2,6-Dichlorophenol
4-Chloroaniline	Hexachlorocyclo-pentadiene	2,4-Dimethylphenol
Bis(2-chloroethoxy) methane	Hexachloroethane	2,4-Dinitrophenol
Bis(2-chloroethyl)ether	Indeno(1,2,3-cd)pyrene	2-Methyl-4,6-dinitrophenol
Bis(2-chloroisopropyl) ether	Isophorone	2-Methylphenol (o-Cresol)
Bis(2-ethylhexyl) phthalate	2-Methylnaphthalene	4-Methylphenol (p-Cresol)
1-Chloronaphthalene	Naphthalene	2-Nitrophenol
2-Chloronaphthalene	2-Nitroaniline	4-Nitrophenol
4-Chlorophenyl-phenylether	3-Nitroaniline	Pentachlorophenol
Chrysene	4-Nitroaniline	Phenol
Dibenz(a,h)anthracene	Nitrobenzene	2,3,4,6-Tetrachlorophenol
Dibenzofuran	N-Nitrosodiethylamine	2,4,5-Trichlorophenol
	N-Nitrosodimethylamine (NDMA)	2,4,6-Trichlorophenol

Organochlorine Pesticides on PUF 186004511

One 2 mL flame-sealed ampule plus one polyurethane foam (PUF). Use with

EPA Methods TO-04A and TO-10A. Contains at least 16 analytes, randomly selected from the list below, at 0.5-20 µg/sample after preparation.

aldrin	4,4'-DDD	Endrin
Alpha-BHC	4,4'-DDE	Endrin aldehyde
beta-BHC	4,4'-DDT	Endrin ketone
delta-BHC	Dieldrin	Heptachlor
gamma-BHC (Lindane)	Endosulfan I	Heptachlor Epoxide (beta)
alpha-Chlordane	Endosulfan II	Methoxychlor
gamma-Chlordane	Endosulfan sulfate	

PAHs on PUF 186004513

One 2 mL flame-sealed ampule plus one polyurethane foam (PUF). Use with EPA Method TO-13A. Contains at least 13 analytes, randomly selected from the list below, at 10-200 µg/sample after preparation.

Acenaphthene	Benzo(g,h,i)perylene	Fluorene
Acenaphthylene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene
Anthracene	Chrysene	Naphthalene
Benzo(a)anthracene	Dibenz(a,h)anthracene	Phenanthrene
Benzo(b)fluoranthene	Fluoranthene	Pyrene
Benzo(k)fluoranthene		

Aldehydes and Ketones on Sorbent 186004514

One 2 mL flame-sealed ampule to be spiked onto Sorbent. Use with EPA method TO-11A. Contains at least 4 analytes, randomly selected from the list below, at 0.5-10 µg/sample after preparation.

Acetaldehyde	2,5-Dimethylbenzaldehyde	Propionaldehyde (propanal)
Acetone	Formaldehyde	o-Tolualdehyde
Benzaldehyde	Hexaldehyde (hexanal)	m-Tolualdehyde
Butyraldehyde (butanal)	Isovaleraldehyde	p-Tolualdehyde
Crotonaldehyde	Methyl Ethyl Ketone	Valeraldehyde (pentanal)

PCBs on PUF 186004512

One 2 mL flame-sealed ampule plus one polyurethane foam (PUF). Use with EPA

Methods TO-04A and TO-10A. Contains one Aroclor, randomly selected from the list below, at 1-15 µg/sample after preparation.

Aroclor 1016	Aroclor 1242	Aroclor 1254
Aroclor 1221	Aroclor 1248	Aroclor 1260
Aroclor 1232		



Air and Emissions CRM

Metals Standards

Metals on Filter Paper 186004515

One filter paper sample ready for use with EPA method 29.
Contains the metals listed below at 30-1,200 µg/filter.

Antimony	Cobalt	Phosphorus
Arsenic	Copper	Selenium
Barium	Lead	Silver
Beryllium	Manganese	Thallium
Cadmium	Nickel	Zinc
Chromium		

Metals in Impinger Solution 186004516

One impinger solution sample for use with EPA method 29.
Contains the metals listed below at 0.1-10 µg/mL after dilution.

Antimony	Cobalt	Phosphorus
Arsenic	Copper	Selenium
Barium	Lead	Silver
Beryllium	Manganese	Thallium
Cadmium	Nickel	Zinc
Chromium		

Mercury on Filter Paper 186004517

One filter paper sample ready for use with EPA method 29.
Contains Mercury at 0.3-9 µg/filter.

Mercury in Impinger Solution 186004518

One impinger solution sample for use with EPA methods 29 and 101a.
Contains Mercury at 1-30 ng/mL after dilution.

Lead on Filter Paper 186004519

One filter paper sample ready for use with EPA method 12.
Contains Lead at 25-750 µg/filter.

Lead in Impinger Solution 186004520

One impinger solution sample for use with EPA method 12.
Contains Lead at 0.1-3 µg/mL after dilution.

Chromium on Filter Paper 186004521

One filter paper sample for use with CARB method 425.
Contains Total and Hexavalent Chromium each at 1-20 µg/filter.

Hexavalent Chromium in Impinger Solution 186004522

One impinger solution sample for use with EPA method 0061/7199.
Contains Hexavalent Chromium at 45-880 µg/L after dilution.

Inorganic Standards

Hydrogen Halides and Halogens in Impinger Solution 186004523

Two impinger solution samples for use with EPA Methods 26 and 26a.
Contains Total Halides and Total Halogens each at 5-100 mg/L after dilution.

Fluoride in Impinger Solution 186004524

One impinger solution sample for use with EPA Methods 13a, 13b and 14. Contains Fluoride at 1-50 µg/mL after dilution.

Nitrogen Oxide in Impinger Solution 186004525

One impinger solution sample for use with EPA Method 7.
Contains Nitrogen Oxide at 2-400 mg/dscm after dilution.

Sulfur Dioxide in Impinger Solution 186004526

One impinger solution sample for use with EPA Method 6.
Contains Sulfur Dioxide at 200-2,400 mg/dscm after dilution.

Sulfuric Acid and Sulfur Dioxide in Impinger Solution 186004527

One impinger solution sample for use with EPA Method 8. Contains Sulfuric Acid and Sulfur Dioxide each at 1-120 mg/dscm after dilution.

Ammonia in Impinger Solution 186004528

One impinger solution sample for use with EPA CTM 027.
Contains Ammonium at 0.1-10 mg/L after dilution.

Particulate Matter on Filter Paper 186004529

One filter paper sample ready for use with EPA Methods 5, 5A, 5B, 5D, and 5F. Contains Particulate Matter at 50-600 mg/filter.

Particulate Matter in Impinger Solution 186004530

One impinger solution sample ready for use with EPA Methods 5, 5A, 5B, 5D, and 5F. Contains Particulate Matter at 140-675 mg/L.



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