



Syringes and Accessories

## MEPS™ - Micro Extraction by Packed Sorbent

For more information about MEPS™ - Micro SPE, please refer to pages 222-225.

### Choose your MEPS™ syringe

The current range of syringes may be used manually or in autosamplers. To maximize flexibility, MEPS™ syringes are supplied without a needle. MEPS™ BIN (barrel insert needle) options are listed on page 225.

| Syringe Volume | PTFE Tipped Plunger | Autosampler  | Syringe Scale Length (mm) | Syringe Barrel OD (mm) | Replacement Plunger Part No. | Syringe Part No. |
|----------------|---------------------|--|---------------------------|------------------------|------------------------------|------------------|
| 100 µL         | ✓                   | Agilent Instrument 7693A   | 54.1                      | 6.5                    | 0318263                      | 005292           |
| 100 µL         | ✓                   | Shimadzu Instruments AOC20i  | 54.1                      | 6.7                    | 0318274                      | 005293           |
| 100 µL         | ✓                   | CTC Analytics, HTA 300APlus, Thermo Scientific and Varian 8400 systems | 60                        | 6.7                    | 031826                       | 005291           |
| 250 µL         | ✓                   | Agilent Instruments 7693A  | 54.1                      | 6.5                    | 0318303                      | 006293           |
| 250 µL         | ✓                   | Shimadzu Instruments AOC20i  | 54.1                      | 6.7                    | 0318305                      | 006294           |
| 250 µL         | ✓                   | HTA 300APlus, Thermo Scientific and Varian 8400 systems                | 60                        | 6.7                    | 031831                       | 006291           |
| 250 µL         | ✓                   | CTC Analytics systems  | 60                        | 7.8                    | 0318301                      | 006292           |



## eVol® MEPS™

eVol® is ideal for use with MEPS™. The eVol® custom programming function allows manual MEPS™ to be automated - the sampling, processing, extraction and injection steps are performed using the same syringe.

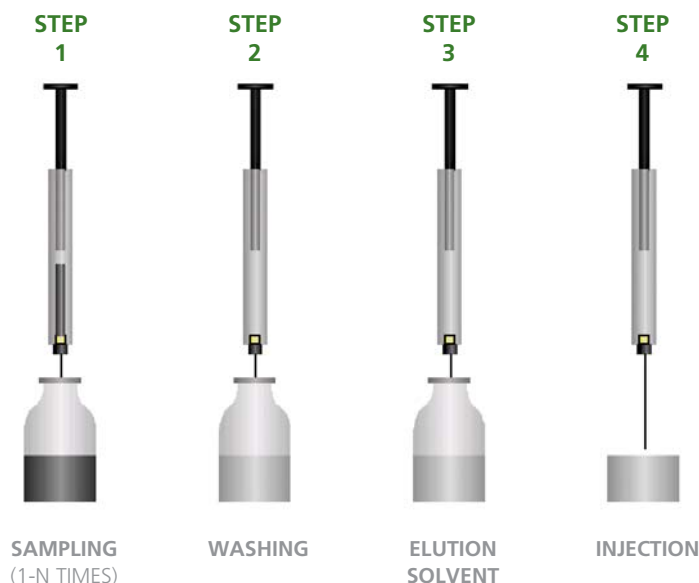
Refer to pages 21-24 for more information about eVol®.

| Syringe Volume | PTFE Tipped Plunger | Description                      | Replacement Plunger Part No. | Syringe Part No. |
|----------------|---------------------|----------------------------------|------------------------------|------------------|
| 50 µL          | ✓                   | eVol® XCHANGE™ Syringe for MEPS™ | 2910382                      | 2910027          |
| 500 µL         | ✓                   | eVol® XCHANGE™ Syringe for MEPS™ | 2910384                      | 2910026          |



## How To Use MEPS™

- Step 1: Pump the sample through the MEPS™ BIN (one or more volumes may be taken).
- Step 2: Wash the MEPS™ BIN once by pumping 20 µL to 50 µL of wash solution through the BIN to remove interferences.
- Step 3: Elute the analyte by drawing solvent through the BIN into the syringe barrel.
- Step 4: Inject the analyte directly into the injector.
- Pump 50 µL solvent followed by 50 µL wash solution to prepare BIN for the next sample.



HPLC Supplies and Accessories

## MEPS™ Is Reusable

Like conventional SPE, the number of times the cartridge can be reused is dependent on the sample matrix and the cleaning regime between elutions. Since only 3mg of stationary phase is used in MEPS™ it can be

washed effectively between each extraction without the need for large solvent volumes. For simple applications, MEPS™ devices have been used successfully for up to 50 cycles making it very cost effective.

## MEPS™ Can Be Semi or Fully Automated

Semi-automation of MEPS™ can be achieved by coupling MEPS™ syringes to SGE's eVol® automated analytical syringe to speed up repetitive SPE and is ideal for rapid method development. For more information on eVol® see pages 22-24.

MEPS™ can also be fully automated on autosamplers such as the CTC PAL for on-line SPE and injection.













## MEPS™ Has Proven Accuracy and Precision Compared to Other Sample Preparation Methods

| Method        | Ropivacaine LOD (nM) | Accuracy (%) | Precision (RSD%) (Inter-assay) | Handling Time |
|---------------|----------------------|--------------|--------------------------------|---------------|
| MEPS™ / GC-MS | 2                    | 105          | 5.0                            | 1 min         |
| LLE / GC-MS   | 2                    | 101          | 3.8                            | 20 min        |
| SPE / LC-UV   | 100                  | 101          | 3.0                            | 20 min        |
| SPME / GC-MS  | 5                    | 110          | 6.3                            | 40 min        |

Comparison of accuracy and precision between MEPS™ and other methods for ropivacaine (local anesthetics).

## MEPS™ Applications and Publications

MEPS™ micro SPE format is ideally suited to previously challenging applications. For an example of MEPS™ used in a forensic application see page 12.

| Industry   | Title   | Author                    | Journal   |
|--|---|---------------------------|---|
| Environmental<br><br>Environment  | Determination of organic priority pollutants and emerging compounds in wastewater and snow samples using multiresidue protocols on the basis of microextraction by packed sorbents coupled to large volume injection gas chromatography-mass spectrometry analysis. | Prieto et al              | J Chrom A, 2010, 1217: 6002-6011                                  |
| Forensic and Pharmaceutical<br><br>Forensics Pharmaceuticals                | Liquid chromatographic analysis of oxcarbazepine and its metabolites in plasma and saliva after a novel microextraction by packed sorbent procedure.  | Saracino et al            | Anal Chim Acta, 2010, 661: 222-228                                |
| Environmental<br><br>Environment  | At-line microextraction by packed sorbent-gas chromatography-mass spectrometry for the determination of UV filter and polycyclic musk compounds in water samples.   | Moeder et al              | JChrom A, 2010, 1217:2925-2932                                    |
| Forensic<br><br>Forensics   | Contribution of microextraction in packed sorbent for the analysis of cotinine in human urine by GC-MS.   | Lafay et al               | Anal Bioanal Chem, 2010, 396: 937-941                             |
| General Chemistry and Life Science<br><br>General Chemistry Life Sciences  | Recent advances in microextraction by packed sorbent for bioanalysis.   | Abdel-Rehim               | J Chrom A, 2010, 1217: 2569-2580                                  |
| Forensic<br><br>Forensics   | Rapid identification and quantification of methamphetamine and amphetamine in hair by gas chromatography/mass spectrometry coupled with micropulverized extraction, aqueous acetylation and microextraction by packed sorbent.                                      | Miyaguchi et al           | J. Chrom A, 2009, 1216: 4063-4070                                 |
| General Chemistry and Life Science<br><br>General Chemistry Life Sciences | Fully Automatic Sample Treatment by Integration of Microextraction by Packed Sorbents into Commercial Capillary Electrophoresis-Mass Spectrometry Equipment: Application to the Determination of Fluoroquinolones in Urine.   | Morales-Cid et al         | Anal. Chem., 2009, 81: 3188-3193                                  |
| Forensic<br><br>Forensics   | Screening of Cocaine and Its Metabolites in Human Urine Samples by Direct Analysis in Real-Time Source Coupled to Time-of-Flight Mass Spectrometry After Online Preconcentration Utilizing Microextraction by Packed Sorbent.                                       | Jagerdeo E, Abdel-Rehim M | J Am Soc Mass Spectrom. 2009 May;20(5):891-899                    |
| Food and Flavour<br><br>Food  | Determination of 2,4,6-Trichloroanisole and 2,4,6-Tribromoanisole in Wine using Microextraction in Packed Syringe and Gas Chromatography-Mass Spectrometry.   | Jönsson et al             | J. Agric. Food Chem., 2008, 56: 4962-4967                         |
| General Chemistry<br><br>General Chemistry                                | Study of the factors affecting the performance of microextraction by packed sorbent (MEPS) using liquid scintillation counter and liquid chromatography-tandem mass spectrometry.   | Altun and Abdel-Rehim     | Anal Chim Acta. 2008, 630:116-123                                 |
| Pharmaceutical<br><br>Pharmaceuticals                                     | MEPS™ as a rapid sample preparation method to handle unstable compounds in a complex matrix: determination of AZD3409 in plasma samples utilizing MEPS™-LC-MS-MS.   | Abdel-Rehim M et al       | J Chromatogr Sci. 2008 46:518-523                                 |
| Pharmaceutical and Life Science<br><br>Pharmaceuticals Life Sciences      | Rapid and Sensitive Method for Determination of Cyclophosphamide in Patients Plasma Samples Utilizing Microextraction by Packed Sorbent Online with Liquid Chromatography-Tandem Mass Spectrometry (MEPS™-LC-MS/MS).  | Said et al                | J. Liquid Chromatography & Related Technologies 2008, 31: 683-694 |

## MEPS™ Syringe Options

All syringes may be used manually as well as with the listed autosamplers.

| Description   | # per Pack | Part No. |
|---|------------|----------|
| 100 µL Removable needle MEPS™ syringe for CTC Analytics, HTA 300A Plus & Varian 8400 systems. | 1          | 005291   |
| Replacement plunger assembly for 005291.  | 1          | 031826   |
| 250 µL Removable needle MEPS™ syringe for CTC Analytics, HTA 300A Plus & Varian 8400 systems. | 1          | 006291   |
| Replacement plunger assembly for 006291.  | 1          | 031831   |
| 250 µL Removable needle MEPS™ syringe for CTC Analytics systems.                              | 1          | 006292   |
| Replacement plunger assembly for 006292.  | 1          | 031831   |
| 100 µL Removable needle MEPS™ syringe for Agilent systems.                                    | 1          | 005292   |
| Replacement plunger assembly for 005292.  | 1          | 0318263  |
| 250 µL Removable needle MEPS™ syringe for Agilent systems.                                    | 1          | 006293   |
| Replacement plunger assembly for 006293.  | 1          | 0318303  |
| 100 µL Removable needle MEPS™ syringe for Shimadzu systems.                                   | 1          | 005293   |
| Replacement plunger assembly for 005293.  | 1          | 0318274  |
| 250 µL Removable needle MEPS™ syringe for Shimadzu systems.                                   | 1          | 006294   |
| Replacement plunger assembly for 006294.  | 1          | 0318305  |

## MEPS™ Barrel Insert and Needle (BIN) Assembly Options

For GC applications, needle is 23 gauge, 0.63 mm OD, Cone point style.

| Description   | For Use with MEPS™ Syringe P/N | # per Pack | Part No. |
|---|--------------------------------|------------|----------|
| <b>MEPS™ BIN for CTC Analytics, HTA 300A Plus &amp; Varian 8400 systems</b> |                                |            |          |
| C18   | 005291 and 006291              | 5          | 2900101  |
| Silica  | 005291 and 006291              | 5          | 2900102  |
| C8+SCX*   | 005291 and 006291              | 5          | 2900103  |
| C2  | 005291 and 006291              | 5          | 2900104  |
| C8  | 005291 and 006291              | 5          | 2900106  |
| MEPS™ Development kit (contains 1 each of C18, C8, C2, SILICA and C8+SCX)   | 005291 and 006291              | 1          | 2900105  |
| <b>MEPS™ BIN for CTC Analytics systems using 250 µL syringes</b>            |                                |            |          |
| C18   | 006292                         | 5          | 2900301  |
| Silica  | 006292                         | 5          | 2900302  |
| C8+SCX*   | 006292                         | 5          | 2900303  |
| C2  | 006292                         | 5          | 2900304  |
| C8  | 006292                         | 5          | 2900306  |
| MEPS™ Development kit (contains 1 each of C18, C8, C2, SILICA and C8+SCX)   | 006292                         | 1          | 2900305  |
| <b>MEPS™ BIN for Agilent systems</b>  |                                |            |          |
| C18   | 005292 and 006293              | 5          | 2900601  |
| Silica  | 005292 and 006293              | 5          | 2900602  |
| C8+SCX*   | 005292 and 006293              | 5          | 2900603  |
| C2  | 005292 and 006293              | 5          | 2900604  |
| C8  | 005292 and 006293              | 5          | 2900606  |
| MEPS™ Development kit (contains 1 each of C18, C8, C2, SILICA and C8+SCX)   | 005292 and 006293              | 1          | 2900605  |
| <b>MEPS™ BIN for Shimadzu systems</b>                                       |                                |            |          |
| C18   | 005293 and 006294              | 5          | 2900601  |
| Silica  | 005293 and 006294              | 5          | 2900602  |
| C8+SCX*   | 005293 and 006294              | 5          | 2900603  |
| C2  | 005293 and 006294              | 5          | 2900604  |
| C8  | 005293 and 006294              | 5          | 2900606  |
| MEPS™ Development kit (contains 1 each of C18, C8, C2, SILICA and C8+SCX)   | 005293 and 006294              | 1          | 2900605  |

For LC Applications, needle is 22 gauge, 0.72 mm OD.

| Description   | For Use with MEPS™ Syringe P/N | # per Pack | Part No. |
|---|--------------------------------|------------|----------|
| <b>MEPS™ BIN for CTC Analytics, HTA 300A Plus &amp; Varian 8400 systems</b> |                                |            |          |
| C18   | 005291 and 006291              | 5          | 2900401  |
| Silica  | 005291 and 006291              | 5          | 2900402  |
| C8+SCX*   | 005291 and 006291              | 5          | 2900403  |
| C2  | 005291 and 006291              | 5          | 2900404  |
| C8  | 005291 and 006291              | 5          | 2900406  |
| SCX   | 005291 and 006291              | 5          | 2900408  |
| SAX   | 005291 and 006291              | 5          | 2900409  |
| MEPS™ Development kit (contains 1 each of C18, C8, C2, SILICA and C8+SCX)   | 005291 and 006291              | 1          | 2900405  |
| <b>MEPS™ BIN for CTC Analytics systems using 250 µL syringe</b>             |                                |            |          |
| C18   | 006292                         | 5          | 2900501  |
| Silica  | 006292                         | 5          | 2900502  |
| C8+SCX*   | 006292                         | 5          | 2900503  |
| C2  | 006292                         | 5          | 2900504  |
| C8  | 006292                         | 5          | 2900506  |
| SCX   | 006292                         | 5          | 2900508  |
| SAX   | 006292                         | 5          | 2900509  |
| MEPS™ Development kit (contains 1 each of C18, C8, C2, SILICA and C8+SCX)   | 006292                         | 1          | 2900505  |

Base material is silica with mean particle size of 45 µm and pore size of 60 Å. \*C8+SCX BINS are labelled as M1.

### HPLC Supplies and Accessories

