



GERSTEL

MAKING LABS WORK



GERSTEL SPE^{xos} II

2nd generation Online SPE with replaceable cartridges

- Lowest limits of detection
- Reliable results, no carry-over
- Less sample and solvent needed

- Improved sustainability
- No need for filtration before UHPLC



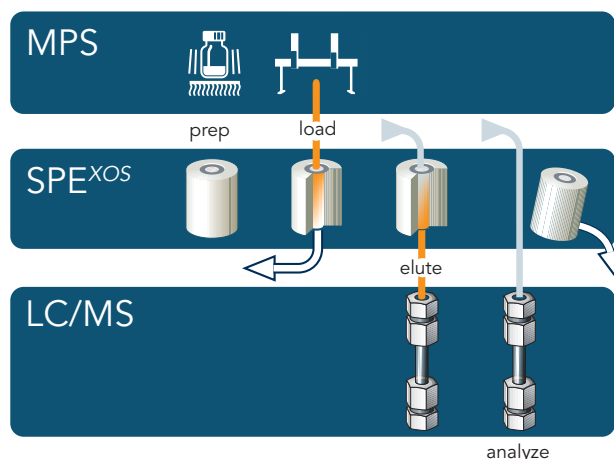
GERSTEL SPE^{xos} II

Online SPE system with replaceable cartridges: The best of all worlds

GERSTEL SPE^{xos} II adds on-line SPE to the MPS sample preparation portfolio. Compared with standard SPE, SPE^{xos} II relies on much smaller cartridges containing as little as 3-5 mg of sorbent and specified to pressures as high as 1000 bar for elution in the UHPLC mobile phase. Required detection limits can be reached with much smaller sample amounts and less solvent for analyte elution. Benefits are: Reduced cost, simplified logistics, and improved laboratory sustainability. The SPE process is completely integrated with the LC-MS/MS process. Eluted analytes can be transferred 100 % to the LC column for best possible recovery and limits of detection.

GERSTEL SPE^{xos} II is inserted into the overall LC-MS/MS system between the GERSTEL MultiPurpose Sampler (MPS) and the HPLC or UHPLC system. Online SPE can be combined with MPS sample preparation steps, including addition of standards, dilution, derivatization, and more. Prepared samples are introduced to SPE^{xos}. After the SPE process, analytes are eluted by the HPLC mobile phase and transferred directly to the LC column for maximum recovery and best possible limits of determination. Filtration is not needed.

The complete system including MPS and SPE^{xos} II is intuitively controlled by mouse click through the GERSTEL MAESTRO Software, integrated with the LC-MS/MS sequence table or in stand alone operation. The PrepAhead function enables multi-sample overlapping of sample preparation and LC-MS/MS analysis, for optimal system utilization and best possible Return on Investment (ROI).



SPE^{xos} cartridges

SPE^{xos} cartridges are available with all standard SPE phases. The amount of solid sorbent in the two cartridge versions ranges from 3-20 mg (see table). Trays with 96 cartridges are placed in the system and identified by the sampler: Elution can be performed with minimal solvent volumes resulting in excellent concentration factors. Performance cartridges are UHPLC compatible, the basic version is HPLC-compatible. They are inserted into the mobile phase for elution and up to 100 % recovery on the analytical column. The control software ensures that cartridges are used the number of times specified by the user.

SPE ^{xos} Cartridge version	Performance	Basic Version
Maximum Pressure	1000 Bar	300 Bar
Sorbent amount	3-5 mg	12-20 mg
Sorbent Selection	Full range	Limited range



Benefits of GERSTEL SPE^{XOS} II



User Selectable Cartridge exchange

- Reliable results through elimination of sample-to-sample carry-over as cartridges are replaced at user defined intervals.
- Cost savings through repeat use of cartridges for relatively clean samples

Eliminates the need for a filtration step prior to UHPLC analysis

- Time and cost savings

Sealed extraction system

- No evaporation of solvent, no ingress of impurities from laboratory air
- Improved laboratory air, less solvent needed, reliable results

Cartridge inserted into the HPLC mobile phase for elution

- Best possible analyte transfer to the analysis system, highest analyte recovery

100% Analyte transfer to the LC-MS/MS

- Simplified laboratory logistics, less sample and less solvent needed
- Reliable results even when less sample is available
- Lowest limits of detection, no further concentration steps needed

Small cartridges / small sorbent volume

- Best possible LC separation based on small elution volume
- High sensitivity and high concentration factor even when small sample volumes are used

Up to 9 different solvents

- Flexible change between solvents for multi-method operation
- Easy automated method development

Easily adapted for multi-method analysis

- Flexible and simple adaptation through simple valve switching
- Flexible sample preparation in combination with MPS Sample Prep Technologies
- Time savings and elimination of manual steps through comprehensive automation
- Highly flexible operation based on standard SPE sorbents

Control through GERSTEL MAESTRO Software

- Uniform and intuitive user interface for the complete sample preparation process, reduced risk of errors
- Best possible system utilization with intelligent PrepAhead synchronization of Sample Prep and analysis

SPE^{XOS} II is available in single clamp and in dual clamp configuration (shown). The dual clamp system offers increased flexibility, in terms of parallel processing, and higher throughput





- AppNote 237: PFAS in drinking Water by fully automated SPE-LC-MS/MS. PFAS is determined by automated weak anion exchange SPE coupled to LC-MS/MS. A 1mL sample provides LOQs below 1ng/L. Adsorption loss is eliminated.
- AppNote 247: PFAS in Meat, Fish, and Egg by automated SPE-LC-MS/MS. PFAS determined in QuEChERS extracts of meat, fish, and egg by automated WAX-SPE cleanup coupled to LC-MS/MS with LOQs ranging from 0.01 to 0.05 µg/kg
- SamplePrep configuration: Automated Derivatization, SPE Cleanup and LC-MS/MS Determination of Glyphosate, AMPA, and Glufosinate in Water based on DIN ISO 16308:2017-09

Sample Prep by Mouse-Click

The MultiPurpose Sampler (MPS) is an autosampler and sample preparation robot for GC and LC. Sample preparation is performed during analysis of the preceding sample for best possible system utilization and highest throughput. Sample preparation steps are performed in a controlled and highly accurate and reproducible manner for best possible results. Every step is selected by mouse-click from a pull-down menu in the MAESTRO software and added to the method. Available sample prep techniques are:

- Solid Phase Extraction (SPE)
- Derivatization, addition of standards
- Extraction, dilution, filtration
- Weighing, centrifugation, evaporation (^mVAP)
- Heating, conditioning, mixing, vortex (^{quick}MIX)
- Twister Back Extraction (TBE)

GERSTEL MAESTRO Software

MAESTRO optimizes performance and throughput of GERSTEL systems for automated sample preparation and sample introduction.

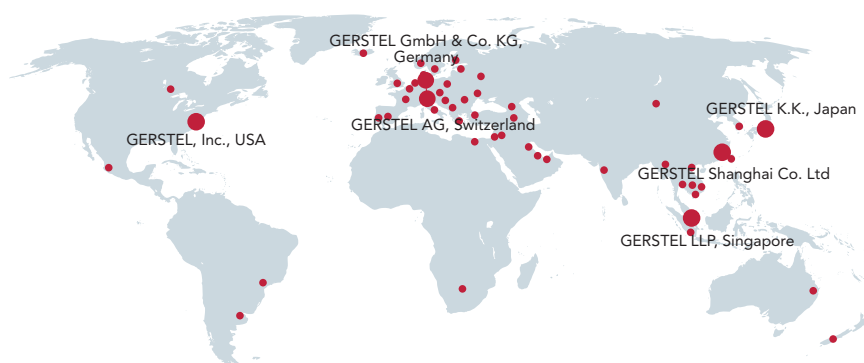
- Stand-Alone operation or fully integrated in the Agilent® Software
- One sequence table operates the entire system including LC/MS
- Sample Prep by Mouse-Click using PrepBuilder
- Scheduler for easy planning of sequences and laboratory workflow
- Multi-Sample PrepAhead Overlapping of sample prep and analysis for maximum throughput
- Priority samples can be added to the system at any point in the analysis sequence
- LOG file and Service LOG file for traceability
- E-mail notification if a sequence is stopped
- Interactive on-line help function.



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