



**GERSTEL**

# Automated Solid Phase Extraction SPE



Accurately controlled sample prep for best results  
Rugged and reliable system  
Highest productivity and throughput

# Automated Solid Phase Extraction SPE

## GERSTEL MPS with SPE option

Performing Solid Phase Extraction (SPE) manually can be time consuming and nerve-racking, especially when recovery and reproducibility are lacking due to sample variability. If SPE can be reliably automated, it becomes a much more efficient and reproducible process. The GERSTEL Multi Purpose Sampler (MPS) with Automated SPE Option for standard cartridges provides several benefits compared with manual SPE:

- Improved recovery, precision and reproducibility
- Maximized sample throughput by performing SPE during GC or LC analysis of the preceding sample
- More than 50 percent time saving for overall analysis, compared to manual process



## Automated SPE performance

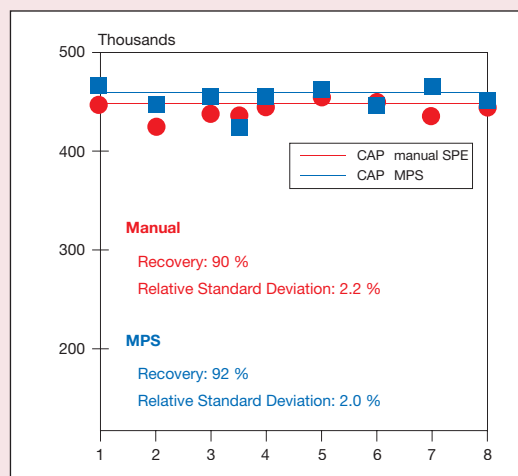
### Chloramphenicol (CAP) in food products

Food products of animal origin are regularly analyzed for the presence of restricted antibiotics such as chloramphenicol (CAP). The CAP concentration is determined using LC/MS, but detection limits achieved depend heavily on the sample preparation used. Even when the highly selective LC-MS/MS technique is used, an extreme matrix load could result in inaccurate quantitation.

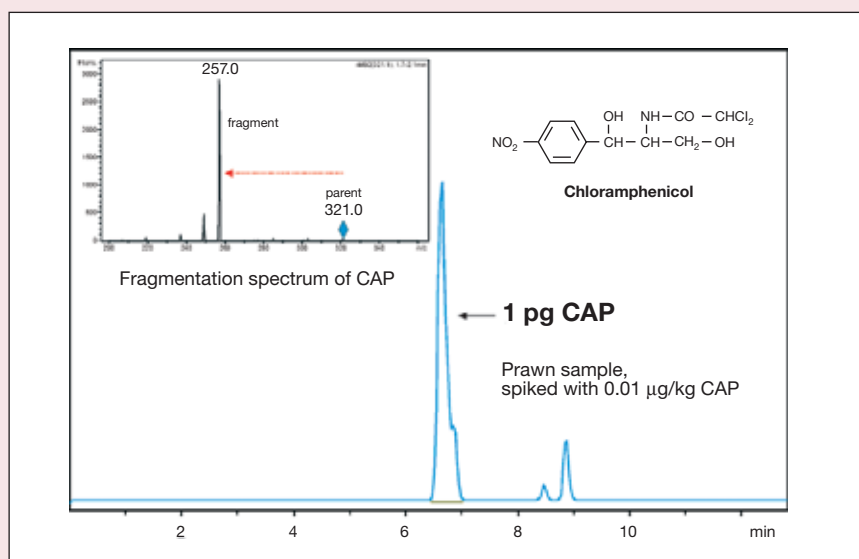
When analyzing food products for CAP, solid phase extraction (SPE) is the sample preparation technique of choice. Recovery and reproducibility for manual and automated SPE were compared. The best results obtained for manual processing were a 90 % recovery rate with a relative standard deviation of 2.2 %. These outstanding results were achieved by highly skilled and experienced lab personnel. The MPS fitted with Automated SPE Option performed even better, delivering a 92 % recovery rate with a relative standard deviation of 2.0 %.

The MPS with Automated SPE option makes it possible to prepare and analyze even complex samples in a simple and safe manner combining accurate results with high throughput.

**Detection** of 0.01 µg/kg chloramphenicol in shrimp meat by LC/MS/MS following automated SPE combined with automated sample concentration on a MultiPurpose Sampler (MPS).



**Comparison** of recovery and relative standard deviation for chloramphenicol determination in shrimp meat using manual (red line) and automated (blue line) solid phase extraction based on a GERSTEL MPS with Automated SPE option.





GERSTEL



## Automated Solid Phase Extraction SPE using the MPS

### 1 High throughput

Analysis of up to 98 samples including sample preparation using standard SPE cartridges.

### 2 Efficient

All sample preparation steps are performed during analysis of the preceding sample for highest productivity and system utilization.

### 3 Optimal timing

All samples receive identical treatment for best reproducibility. Sample introduction to the GC/MS or LC/MS system follows immediately after sample preparation.

### 4 Highly controlled analysis conditions

Defined volumes and constant flow rates provide highly reproducible conditions and optimal results.

### 5 Internal Standard Addition

Automated liquid standard addition provide improved Quality Assurance.

### 6 Contamination free

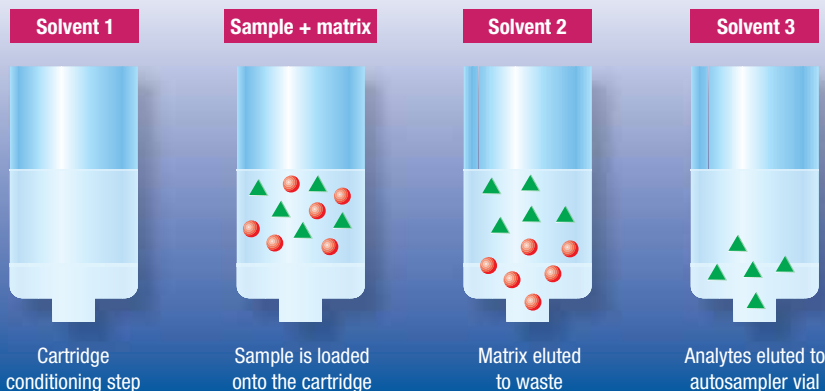
Transfer of eluent from the SPE cartridge to the sample vial is performed using a disposable syringe needle into a closed vial, eliminating the risk of carry over.

### 7 Simple concept, highly rugged and efficient

Conditioning, extraction and elution of the cartridge is performed in one dedicated module with minimal movement of the cartridge ensuring highest efficiency and ruggedness.

### 8 Easy transfer of your established manual methods

The MPS with automated SPE option is based on standard 1 mL, 3 mL, and 6 mL SPE cartridges. Manual SPE methods can be directly transferred to the MPS and automated. The complete system is easily and efficiently controlled from the Agilent ChemStation software or from the GERSTEL MAESTRO software. Sample preparation steps, including dilution, mixing, adding standards or derivatization are picked by mouse-click from a simple menu. One method and one sequence table control the complete system including sample prep and GC/MS or LC/MS analysis.





## GERSTEL MAESTRO Software

*Next generation software for automated sample preparation and sample introduction. MAESTRO optimizes performance and throughput of GERSTEL modules and systems.*

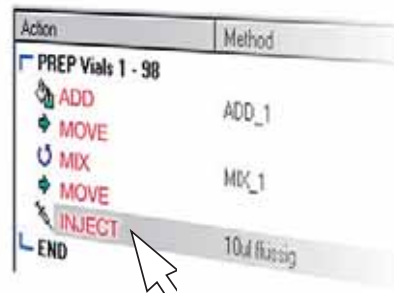
- Stand-Alone operation or fully integrated in the Agilent ChemStation Software
- One sequence table operates the entire system including LC/MS or GC/MS
- Sample Prep by mouse-click using the PrepBuilder functions
- Scheduler for easy planning
- PrepAhead: Automated overlapping of sample prep and analysis for optimum productivity and throughput
- Priority samples can be added to the system at any point in the analysis sequence
- LOG file and Service LOG file functions ensure traceability
- Automated E-mail notification in case the system is halted
- Control of up to 4 systems
- Real-time monitoring of all modules and parameters

## Sample prep by mouse click

The MPS is a fully automated autosampler for sample preparation and sample introduction robot for GC and LC.

Sample preparation steps are performed during the analysis of the preceding sample for best possible system utilization and highest sample throughput. Every step is 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 overall LC or LC/MS method. Available sample prep techniques are:

- Solid Phase Extraction (SPE)
- Standard addition
- Derivatization
- Extraction and dilution
- Heating, conditioning and mixing
- Twister Back Extraction (TBE)
- Automated Liner EXchange (ALEX)
- Automated Twister (SBSE) desorption and analysis
- Solid Phase Micro Extraction (SPME)
- Thermal Desorption (TDS)
- Dynamic Headspace (DHS)
- Multi Column Switching (MCS)



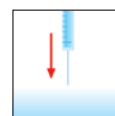
ADD



MOVE



MIX



INJECT

**GERSTEL**

GLOBAL ANALYTICAL SOLUTIONS

Agilent Technologies  
Premier Solution Partner



GERSTEL GmbH & Co. KG • Eberhard-Gerstel-Platz 1 • D-45473 Mülheim an der Ruhr ☎ +49 (208) 7 65 03-0 • E-mail: gerstel@gerstel.de  
 GERSTEL Inc. • 1510 Caton Center Drive, Suite H • Baltimore, MD 21227 • USA ☎ +1 (410) 247 5885 • E-mail: sales@gerstel.us.com  
 GERSTEL AG • Enterprise • Surentalstrasse 10 • CH-6210 Sursee ☎ +41 (41) 9 21 97 23 • E-mail: gerstel@ch.gerstel.com  
 GERSTEL K.K. • 2-13-18 Nakane, Meguro-ku 152-0031 • Tokyo ☎ +81 3 57 31 53 21 • E-mail: info@gerstel.co.jp

Information, descriptions and specifications in this publication are subject to change without notice. GERSTEL®, GRAPHPACK® and TWISTER® are registered trademarks of GERSTEL® GmbH & Co. KG. Printed in Germany. © Copyright by GERSTEL® GmbH & Co. KG

www.gerstel.com