



GERSTEL

Automated **SPME**-analysis Multi Fiber EXchange **MFX**



Simple and effective analyte extraction and concentration

Fast and easy optimization of fiber selection

Highest throughput

Superior selectivity and detection limits through use of multiple phases

Solid Phase Micro-Extraction SPME

Automated SPME using the GERSTEL MultiPurpose Sampler (MPS)

Solid Phase Micro-Extraction (SPME) is a well established technique for extraction of organic compounds from a wide variety of matrices. SPME fibers coated with an adsorbent phase are used to extract and concentrate analytes either from the headspace above a sample or directly from the liquid sample. SPME is easily automated using the GERSTEL MultiPurpose Sampler (MPS), enabling reproducible and efficient concentration of many types of analytes covering a wide polarity range.

Following the concentration step, the SPME fiber is inserted into a GERSTEL Cooled Injection System (CIS), a PTV-type GC inlet, for thermal desorption and transfer of analytes to the GC/MS system. The CIS uses a SPME-friendly Septumless Head sealing system, eliminating the common problems with septum coring seen with blunt-tipped SPME needles and standard GC inlets. The CIS inlet also has narrow bore inlet liners for use with SPME fibers to give optimal peak shape enabling efficient, discrimination free transfer of analytes covering a wide boiling point range from VOCs to SVOCs. Derivatization can be

automatically performed directly on the fiber, either prior to or following the SPME extraction step, enabling the use of water sensitive derivatization reagents even for aqueous samples.

GERSTEL MAESTRO software enables highly flexible and efficient SPME analysis. The user simply sets up the method and the sequence table and clicks run. MAESTRO controls the entire SPME process, from extraction to GC/MS analysis. Even if different GC/MS methods are used, MAESTRO PrepAhead ensures that extraction and GC/MS analysis are performed in parallel, maximizing sample throughput.

GERSTEL Solutions are highly flexible and based on a modular concept. Your system can always be upgraded or adapted to meet new analytical challenges. SPME systems can be upgraded with automated SPME Multi Fiber Exchange (MFX) and with a long list of other options that can cover your every need.

GERSTEL Solutions for Automated SPME

1 Maximum flexibility

- The Multi Fiber Exchange System (MFX) performs automated exchange of SPME fibers: New methods are quickly and conveniently developed based on one or more fiber types, and multi-method sequences can be executed using different types of SPME fibers
- Standard techniques including dilution, internal standard addition, derivatization, or a combination of these are easily set up and automatically performed using the MPS PrepStation
- Pre- and post-extraction on-fiber derivatization is performed simply by mouse-click
- Multi-method sequences enable efficient and flexible analysis and fast method development

2 Rugged and reliable operation

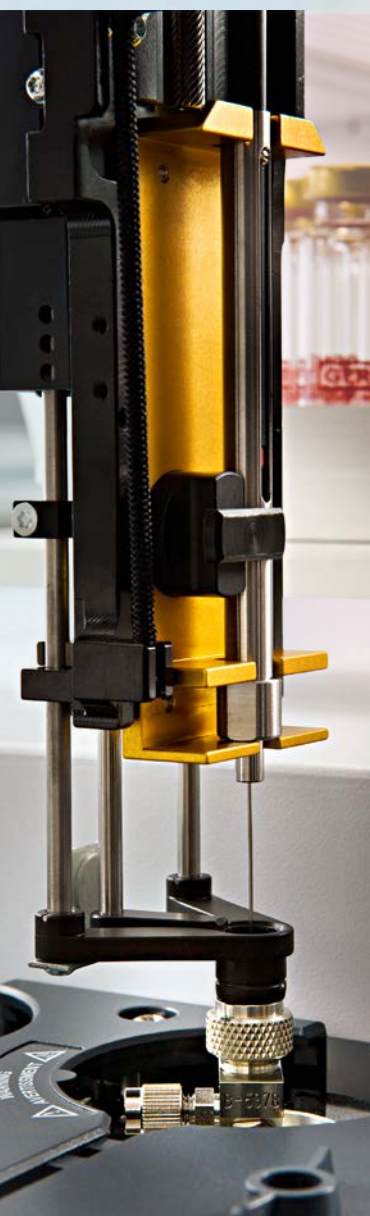
- Manually performed SPME fiber exchange can lead to damage to the sensitive SPME fibers - unlike automated SPME Multi Fiber EXchange (MFX) using the GERSTEL MPS
- The GERSTEL CIS with patented Septum-Less Head (SLH) eliminates septum coring and build up of septum particles in the inlet liner. The SPME fibers experience less stress, and their life expectancy is extended significantly.
- The MPS Agitator/Stirrer allows samples to be either shaken or stirred. Stirring reduces mechanical stress on the SPME fiber, leading to extended fiber life, higher productivity and lower cost.
- E-mail notification of sequence interruption enables the analyst to quickly correct problems and reduce downtime.

3 Accurate and reproducible results

- Automated bake-out of the SPME fiber in a conditioning station ensures lowest possible background and minimal analyte carry-over. Alternatively, SPME fibers can be baked out in the CIS inlet.

4 Convenient and intuitive operation

- Easy selection of sample preparation steps from a pull-down menu in the MAESTRO PrepBuilder
- No need for macros.
- On screen prompts with recommended parameter values help method editing
- Context-sensitive Help menu.
- One integrated method and one sequence table operate the complete system including GC/MS





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Automated SPME fiber change

Multi Fiber EXchange MFX

SPME is easily automated, but until now, replacing a fiber had to be performed manually, limiting the scope of automated method development and making it difficult to run large series of analyses due to limited fiber life span. The Multi Fiber Exchange (MFX) accessory for the GERSTEL MultiPurpose Sampler (MPS) enables fully automated exchange of SPME fibers within a sequence. MFX allows both analysis conditions and SPME fibers to be easily and automatically changed at any time within a method or a sequence. MFX simplifies method development and enhances the productivity of routine SPME analysis by allowing samples to be run without interruption - 24/7 while delivering accurate results.

System control

GERSTEL MAESTRO software allows SPME analysis to be performed with maximum flexibility and efficiency. The user sets up the method and sequence table by mouse-click and clicks run – it's that simple. MAESTRO controls the entire SPME process, from extraction to GC/MS analysis, whether using Agilent ChemStation or GC QQQ MassHunter. Alternatively, MAESTRO can be operated in stand-alone mode, independent of the GC/MS software. GERSTEL MFX dramatically enhances system flexibility and productivity. Even when different GC/MS methods are used, MAESTRO PrepAhead sets up extraction and GC/MS analysis in parallel. Using PrepAhead, the next run can be started immediately when the GC/MS has finished the ongoing analysis.

GERSTEL Multi Fiber Exchange performance:

- Automated SPME fiber exchange at user-defined intervals. Large series of analyses can be executed overnight or through the weekend – including recalibration of the method following fiber change.
- Fast and flexible SPME method development using multiple fibers and phases
- Automated analysis of SPME fibers that have been used as passive air samplers
- MFX tray for three or 25 fibers available
- Automated analysis of samples using multiple fibers, covering a wide range of analytes
- Multi-method sequences using different SPME phases for more selectivity
- Longer fiber life expectancy, mechanical impact is minimized during fiber change and operation.
- Standard SPME Fast Fit Fiber Assemblies available from Supelco.



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GERSTEL MAESTRO Software

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

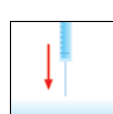
- Stand-Alone operation or fully integrated in the Agilent MassHunter Software
- One sequence table operates the entire system including LC/MS or GC/MS
- Sample Prep by Mouse-Click using the PrepBuilder functions
- Scheduler for easy planning of sequences and of laboratory work-flow
- PrepAhead / Multiple Sample Overlap: Automated overlapping of sample preparation 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 functions ensure traceability
- Automated E-mail notification if the sequence is stopped
- Control of up to 4 systems from one PC
- Real-time monitoring of all modules and parameters
- Interactive on-line help function



Sample Prep by Mouse-Click

The MultiPurpose Sampler (MPS) is an autosampler and sample preparation 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. 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 overall GC/MS or LC/MS method. Available sample prep techniques are:

- Solid Phase Extraction (SPE)
- Dispersive SPE (DPX)
- Derivatization, addition of standard
- Extraction, dilution, filtration
- Weighing, sonication, centrifugation and evaporation (^mVAP)
- Heating, conditioning, mixing and vortex (^mVORX)
- Automated Liner EXchange (ALEX)
- Automated TDU-Liner EXchange (ATEX) and thermal extraction in micro-vials
- Automated Twister desorption and analysis (SBSE)
- Thermal Desorption and Thermal Extraction (TDS/TDU)
- Pyrolysis (PYRO)
- Dynamic Headspace (DHS)
- SPME and SPME MultiFiber Exchange (MFX)
- Multidimensional GC (MCS)



Action	Method / Value
PREP Vials 1-98	Ahead, Extensive
ADD	Standard-Zugabe 100 µl
MOVE	
MIX	Mischen 5 min, 40°C
MOVE	
INJECT	Flüssiginjektion 10 µl.mth
END	

MAESTRO Software enables Sample Prep by Mouse-Click. All sample preparation steps are conveniently and easily selected from a drop down menu and added to the method. Example:



ADD

Add solvent, internal standard or reagent



MOVE

Move the vial or cartridge



MIX

Agitate or stir and incubate the sample at a set temperature



INJECT

Introduce an aliquot of the sample to the GC or LC system

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