GERSTEL

MAKING LABS WORK

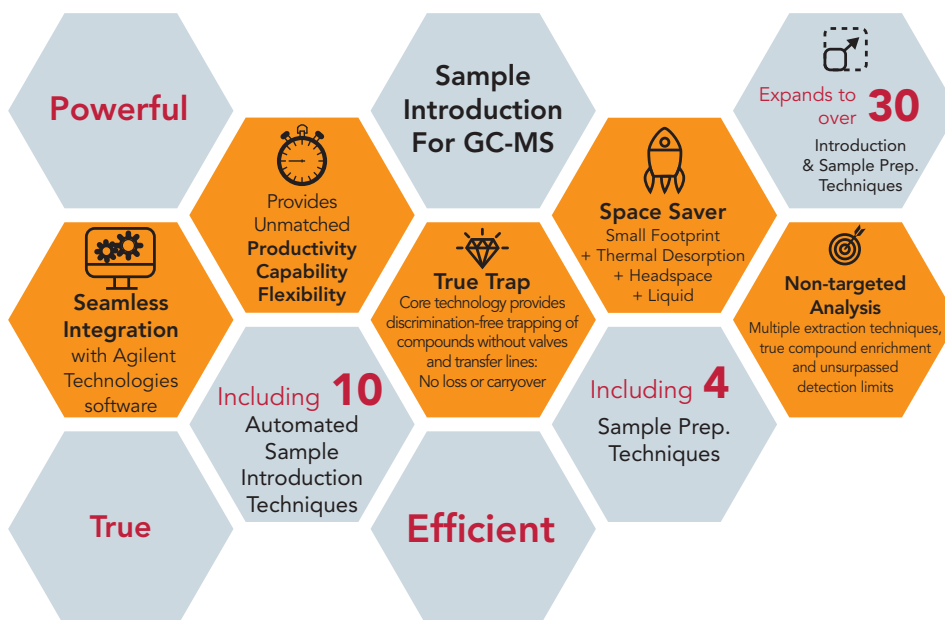**Universal** Platform

Eliminate Doubt, Discover the Unknown

- the only truly universal sample introduction system for GC-MS

MultiPurpose Sampler

Zwister
THE ORIGINAL

MPS Universal Platform

Powerful

Sample Introduction For GC-MS

Expands to over **30**
Introduction & Sample Prep. Techniques

Provides Unmatched **Productivity Capability Flexibility**

Space Saver
Small Footprint
+ Thermal Desorption
+ Headspace
+ Liquid

Seamless Integration
with Agilent Technologies software

True Trap
Core technology provides discrimination-free trapping of compounds without valves and transfer lines: No loss or carryover

Non-targeted Analysis
Multiple extraction techniques, true compound enrichment and unsurpassed detection limits

Including **10**
Automated Sample Introduction Techniques

Including **4**
Sample Prep. Techniques

True

Efficient

The GERSTEL MPS Universal Platform is the only truly universal system for sample introduction for GC-MS. It provides unmatched capability and flexibility in solving your critical challenges.

The standard platform provides 10 automated sample introduction techniques, all controlled by GERSTEL Maestro software which integrates seamlessly with Agilent® Technologies software.

There is no need to have a different instrument for each technique. Liquid, Headspace and Thermal Desorption are all included without the need for additional bench space.

MPS Universal Platform: 10 Standard Techniques

- Liquid Injection
- Large Volume Injection
- Headspace Injection
- Multiple Headspace Injection with Trapping
  True HS Enrichment
- Stir Bar Sorptive Extraction SBSE (Twister®)
- TF-SPME
- Direct Thermal Extraction of Solids
- Thermal Desorption of Sorbent Tubes
- Thermal Extraction of liquids in μ-Vials (ATEX)
- Sample Preparation

The MPS Universal Platform features TrueTrap technology that provides discrimination free trapping of compounds without the need for valves and transfer lines. This is a requirement for determination of unknown compounds (non-targeted analysis). This technology can be used with Headspace, Thermal Desorption, SBSE and TF - SPME for true compound enrichment, achieving unsurpassed detection limits. The MPS Universal Platform also has sample preparation capabilities, such as internal standard addition, sample dilution, mixing, derivatization, heating, and generation of calibration curves.

![GERSTEL — MAKING LABS WORK]
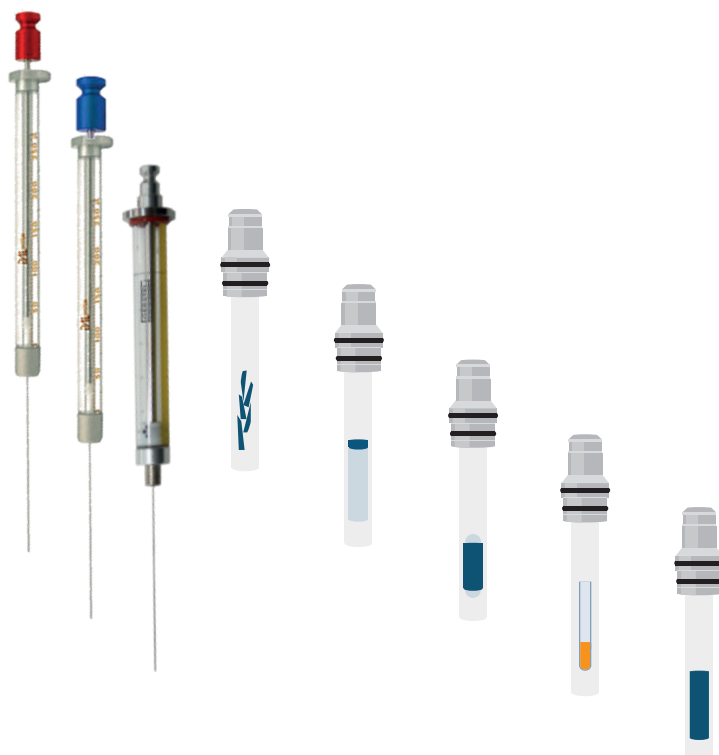
MPS Universal Platform Hardware Components

- **MultiPurpose Sampler (MPS) robotic**
  Automates all sample introduction techniques as well as sample preparation functions
- **Thermal Desorption Unit (TDU 2)**
  Provides analyte introduction for all types of sample matrices
- **Cooled Injection System (CIS 4)**
  PTV type inlet and universal trap for thermal desorption

MPS Universal Standard Sample Introduction Techniques

- Liquid, including sandwich technique
- Headspace
- Thermal Desorption

Key MPS Universal Platform Features

- 10 sample introduction techniques included in standard platform
- TrueTrap technology requires only one trap for all applications
- Cryogen free trapping for target analysis
- True Enrichment for HS, TD, Twister, TF-SPME and DHS techniques
- No valves or transfer lines - ideal for non-targeted analysis (unknowns)
- Easy addition of up to 20 additional sample introduction techniques
- Easy addition of more advanced analytical techniques (ODP, 1D/2D, etc.)
- GC inlet does not need to be reconfigured when switching between techniques
- Requires no additional bench space
- Maestro integration into Agilent software platforms

Dynamic Headspace
& DHS Large

µSPE*

Pyrolysis

Automated Liner
Exchange

GC-O

The MPS Universal Platform is easily expanded so that it can perform over 30 sample introduction and pre-paration techniques. For the researcher trying to quickly solve the most critical challenges, the MPS Universal Platform is the most powerful system available.

*Requires MPS robotic pro

Cooled Injection System CIS 4

The CIS 4 is the dedicated cold trap for the TDU in the MPS Universal Platform. The CIS 4 features True Trap Technology which uses a combination of forward flow, low temperature, and an inert trap surface to ensure there is no compounds loss, discrimination, or degradation during analyte transfer onto the GC column. This technology eliminates valves or transfer lines in the flow path and eliminates doubt with regard to analysis integrity especially when performing non-targeted analysis.

The CIS is a universal inlet for all injection techniques in GC and GC-MS analysis. In addition to conventional split/splitless injection, it enables on column injection and cooled PTV-type injection.

Temperature-programmed sample introduction using CIS eliminates compound discrimination and degradation during injection, while ensuring perfect analyte transfer for outstanding GC separation with ultra-sharp peaks. The septumless head (SLH) prevents contamination such as septum bleed or septum particles in the inlet liner and maintains column head pressure even after hundreds of injections.

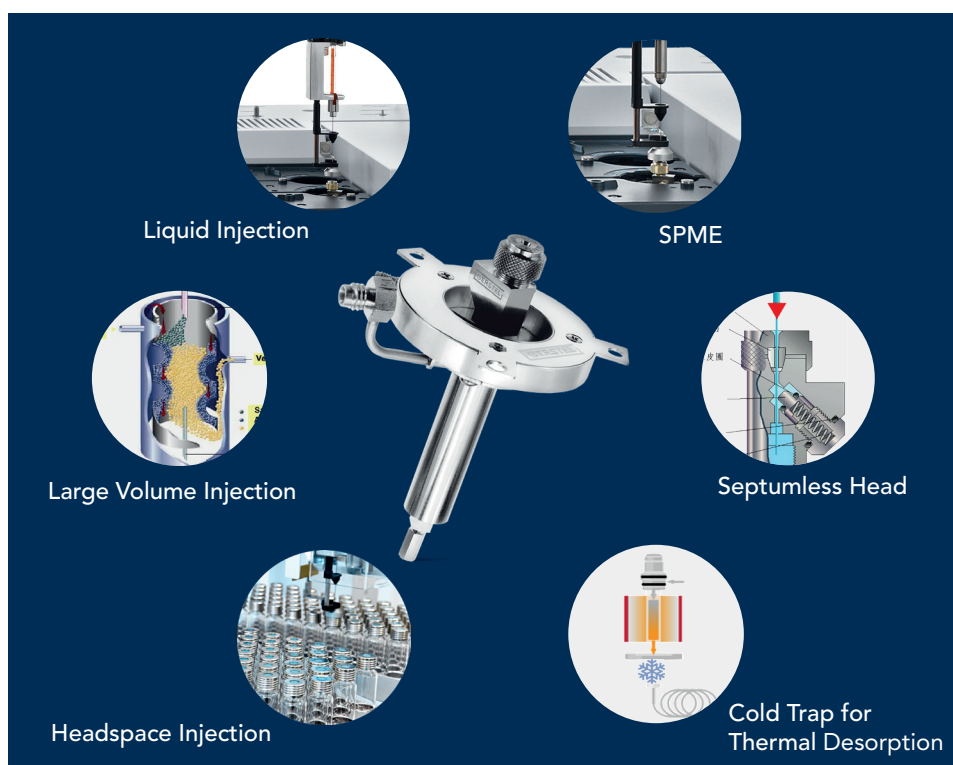## Minimum Temperatures with Cooling Options (GC oven at 70 °C)
- -150 °C with LN2 cooling
- -70 °C with LCO2 cooling
- -40 °C with cryostatic cooling device
- 10 °C with Universal Peltier Cooling device

Types of sample introduction
- Split/splitless
- Solvent venting
- Large volume
- On-column (requires optional kit)

Temperature program
- 2 temperature ramps
- 2 heating modes
- Heating rate max. 16 °C/s
- Start temperature max. 400 °C
- End temperature max. 450 °C
- Hold time max. 60 min per end temperature

Liquid Injection

SPME

Large Volume Injection

Septumless Head

Headspace Injection

Cold Trap for Thermal Desorption

Thermal Desorption Unit TDU 2

The TDU 2 performs thermal desorption of all sample matrices (gases, liquids, solids, and packed tubes) as weil as GERSTEL Twister and TF-SPME extraction devices. The system uses the CIS 4 inlet as cold trap featuring True Trap technology that eliminates doubt with regard to analysis integrity, especially for non-targeted analysis.

The system has a unique liner-in-liner interface between the TDU 2 and the CIS providing a completely inert flow path without valves or transfer lines that greatly simplifies the system configuration and eliminates dead volume. This results in excellent analyte recovery and robustness - as well as ultra-sharp peaks.

The TDU 2 system features advanced temperature and pneumatic control, providing almost unlimited flexibility in temperature and gas flow programming to achieve optimum analysis conditions; everything is controlled using the GERSTEL MAESTRO software with a simple to use graphical user interface. Sample analysis can be completely automated using the GERSTEL MultiPurpose Sampler.

Thermal Desorption Accessories

Tube Conditioner TC 2

■ Simultaneous thermal conditioning of up to 10 TD tubes / 60 Twisters under inert gas

Thermal Extractor

■ For thermal extraction of analytes from larger samples onto sorbent packed tubes

TubeSpikingSystem TSS

■ Accurate and reproducible generation of TD tube standards

TDU Tube Dimensions

■ Empty tubes, for GERSTEL Twister® and -TF-SPME, 60 mm L x 6 mm OD x 5 mm ID

■ Sorbent tubes, 60 mm L x 6 mm OD x 4 mm ID

Desorption temperature

■ Ambient to 350 °C

Temperature program

■ 2 temperature ramps

■ Heating rate max. 720 °C/min

■ Initial temperature 10 - 350 °C

■ First hold temperature 10 - 350 °C

■ Second hold temperature 10 - 350 °C

■ Maximum hold time 650 min per hold temperature

Desorption flow

■ Typically 50-100 mL/min, up to 200 mL/min

■ Gas saver flow between desorptions

Analyte transfer to CIS

■ Split

■ Splitless

■ Solvent venting

■ Low split mode with fixed low split ratio

Head & SPME Enrichment

Sorbent Tubes

μ-Vial

Direct Thermal Extraction

SBSE

TF-SPME

MultiPurpose Sampler MPS robotic

The MPS robotic is a highly efficient autosampler with extended functionality. The MPS robotic provides reliable and efficient processing of complex tasks. Syringes are mounted in individual syringe modules, which can be exchanged automatically within a running sequence when using the MPS robotic pro for maximum flexibility.

The GERSTEL USM is a universal syringe module for liquid syringes ranging from 1 to 1,000 µL total volume. Most application requirements can be met without changing syringe modules, saving time and money - and reducing the risk of error. The USM is compatible with the GERSTEL gripper enabling automation of multiple sample preparation techniques.

Sampler features

- X, Y, Z robot based, multifunctional, flexible autosampler for GC-MS and LC-MS
- Large sample capacity, high flexibility
- Manual syringe exchange
- Upgrade option to MPS robotic pro with automated tool exchange
- Fast injection
- Automatic recognition of actively communicating modules such as an agitator, centrifuge, etc.

Sample Capacity

- Up to 6 tray holders/4 stacks
    - Holds up to 1080/1296 2mL vials.
- 3 small or 1 large tray per tray holder
- 3 deepwell or microtiter plates per tray holder
- 6 deepwell or microtiter plates per stack
- Modular tray concept
- Up to three tray types on every tray holder

µSPE*

Heating, Agitation, Derivatization

SPME

Weighing

Standard & Calibration

Barcode Reader

Headspace Injection

Mixing

Evaporation

*Requires MPS robotic pro

GERSTEL MPS Universal Platform

-All Techniques in one Platform

For analysts that need to automate their GC-MS sample introduction processes and require maximum sample introduction and method flexibility with accurate results and no down time, the GERSTEL MPS Universal Platform is the only truly universal sampling platform available.

Unlike other limited platform approaches, the MPS Universal Platform includes over 10 sampling techniques and can be expanded with more than 20 additional techniques. All techniques are controlled through MAESTRO software that is integrated into Agilent GC-MS software.

GERSTEL' s modular approach to upgrading allows you to „Future Proof' your investment so that you can continually solve your most critical challenges while receiving lifetime support.

Sample introduction techniques

- Liquid Injection
- Large Volume Injection
- Headspace Injection (HS)
- Multiple HS Injections with Trapping
- Thermal Desorption with TDU
- Multi-Desorption Mode
- Twister
- TF-SPME
- Thermal Extraction in TD tubes
- Thermal Extraction of liquids in μ-vials

Optional Techniques

- Automated Liner Exchange (ALEX)
- SPME
- SPME Arrow
- Pyrolysis
  - Pulsed, Fractionated, and Smart Ramped
- Dynamic Headspace
  - Full Evaporation DHS
  - Multi-Volatiles Method (MVM)
- Dynamic Headspace - Large Vessel

Additonal modules for advanced problem solving

- Olfactory Detection Port (ODP)
- Preparative Fraction Collector (PFC)
- Cold Trapping System (CTS) - in oven
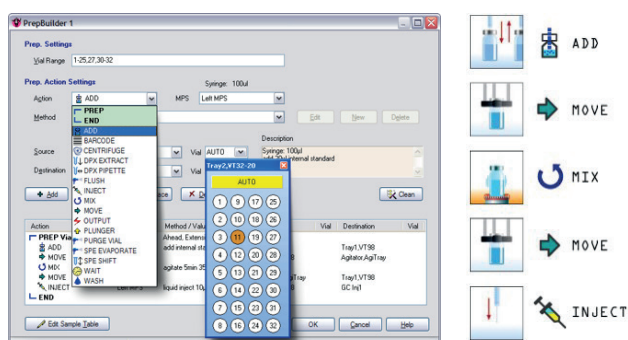- Selectable 1D/2D GC for Heartcutting

Sample Preparation Options

- Dilution
- Internal Standard Addition
- Calibration Curve preparation*
- Bar Code Reading
- Filtration*
- Evaporation
- Weighing
- Mixing
- Centrifugation
- Multiple SPE options*
- Sonication
- Cooled Trays and Stacks
- Custom Trays and Wash Stations
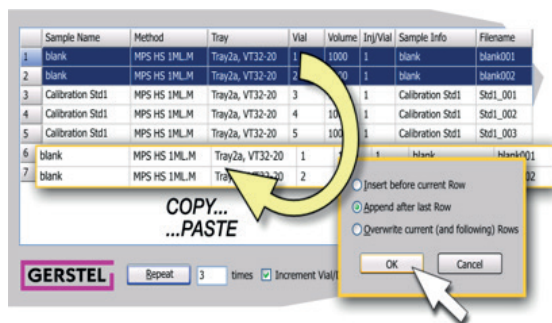
*Requires MPS robotic pro

MAESTRO Software

GERSTEL MAESTRO software provides a comprehensive and efficient solution for the modern laboratory. All GERSTEL modules and systems are operated in a simple, efficient and transparent manner in stand-alone mode or integrated with the GC-MS or LC-MS software. Just one sequence table and, depending on the system, one integrated method runs the complete system from sample preparation and sample introduction to GC/MS or LC/MS analysis.
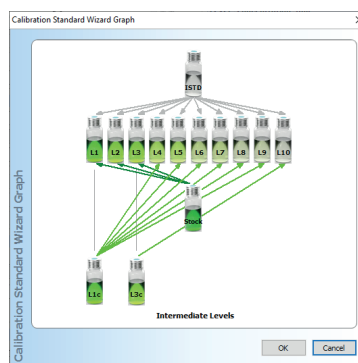
MAESTRO offers easy and intuitive control of the MPS. All steps from sample preparation to introduction to your GC-MS or LC-MS system are selected by mouse-click from a drop-down menu. Context-sensitive help is always at your finger-tips in case a question pops up.

PrepBuilder

PrepAhead

Simple User Interface

Calibration Standard Wizard

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