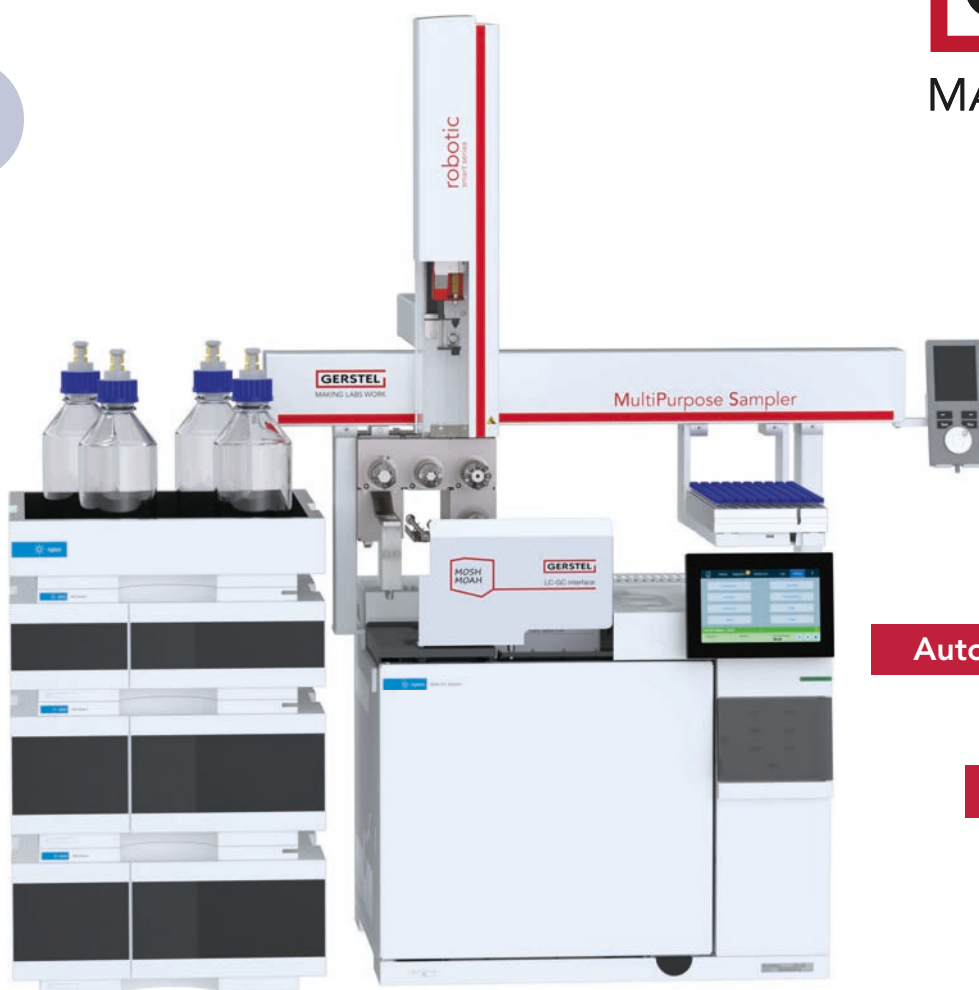




**GERSTEL**

MAKING LABS WORK



Automated Sample Preparation

Convenient Operation

Modular and Expandable

# Sample Prep Solution MOSH/MOAH

MOSH/MOAH analysis simplified

Automated Sample Preparation and Introduction

Complete MOSH/MOAH analysis in just 30 minutes

Simple and efficient batch processing of data



# GERSTEL Sample Prep Solution MOSH/MOAH

The GERSTEL-MOSH/MOAH Sample Prep Solution performs fully automated sample preparation and sample introduction for efficient determination of mineral oil residues in extracts of food, feed, body care products and packaging. The system is based on an online-coupled HPLC-GC/FID system using the GERSTEL MultiPurpose Sampler (MPS) for automated sample preparation and introduction.

In the initial LC step, mineral oil residue is separated into two fractions: Mineral oil saturated hydrocarbons (MOSH) and mineral oil aromatic hydrocarbons (MOAH). These fractions are subsequently transferred to two separate GC columns for individual analysis in a combined dual channel GC system.

## Automated Sample Preparation Workstation

The standalone sample prep station allows for most efficient sample processing by handling six samples in parallel. It works independent from the measuring instrument, allowing greater flexibility and increased robustness.

The solution meets the requirements of the ISO 20122, DIN 16995 and JRC Guideline Standard. The dual channel GC separation with FID detection enables a complete MOSH/MOAH analysis in only 30 minutes.

LC- and GC chromatograms are displayed in real time to facilitate method development or method optimization, for example, adjusting switching times for MOSH and MOAH fractions.

The GERSTEL MOSH/MOAH solution is based on HPLC and GC instruments from Agilent® Technologies, adding automation and sample preparation modules developed and manufactured by GERSTEL®. No additional control box is required to set up and control method parameters such as carrier gas pressure or flow.



The GERSTEL MAESTRO software is fully integrated with the Agilent OpenLab™ CDS software. The combined software controls all method parameters for sample preparation, HPLC and GC. The entire workflow is conveniently and efficiently processed under one integrated user interface and sequence table and one datafile is created for the full analysis.

The MOSH/MOAH Sample Prep Solution can be extended to perform additional widely used sample preparation steps depending on your requirements:

- Epoxidation to remove interfering naturally occurring olefins
- AlOx clean-up to retain and remove long chain n-alkanes of plant origin
- Saponification / alkaline digestion: to clean up very fatty or protein-rich samples and concentrate the extract for a lower LOD / LOQ



# The GERSTEL MOSH/MOAH Sample Prep Solution delivers...

Fast answers and reliable results based on efficient automation and intuitively operated software.

- Determination of MOSH and MOAH in 30 minutes
- Efficient processing and reporting of MOSH/MOAH data, including data generated with other analysis systems, using GERSTEL ChromOH Software
- Specially developed algorithms for hump- and peak detection ensure fast and efficient data processing and correct results



1



2

## 1 GERSTEL Early Vapor Exit

In the Early Vapor Exit, excess HPLC eluent is removed from the MOSH and MOAH fractions before they are transferred to their respective GC separation columns.

## 2 Direct On Column Injection

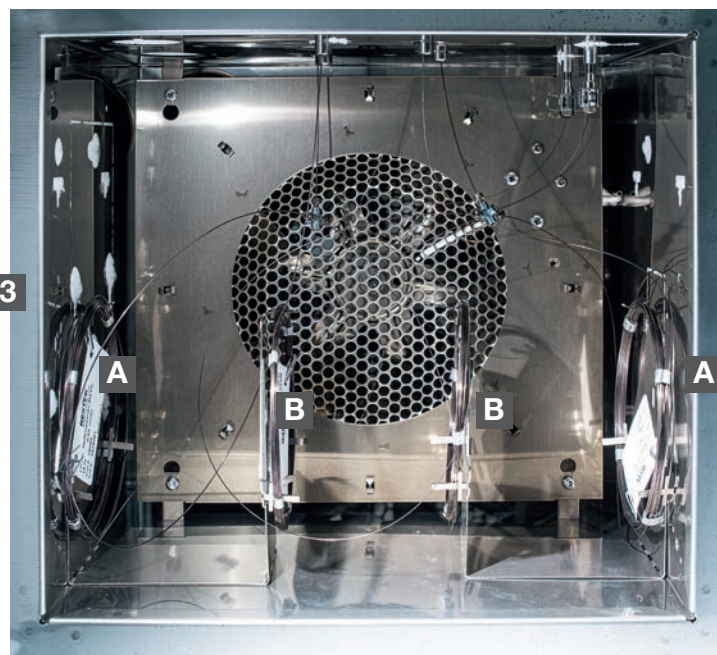
The Septum-Less Head (SLH) included in the system shipment is easily mounted enabling on-column injection for GC check-up and troubleshooting independent of the HPLC system or injection of manually prepared samples.

## Simple and efficient operation

- Unique transverse mounting of GC columns enables easy access and simplified maintenance (see Figure 3)
- Integrated user interface for the complete system
- Only one method file including sample preparation and one data file for LC and GC

## Flexible adaptation to individual requirements

- Modular addition of Sample Preparation steps, such as, for example, automated epoxidation or AlOx clean-up
- Different report formats available: Microsoft Excel (.xlsx), Adobe PDF (.pdf) or universal text (.txt) format



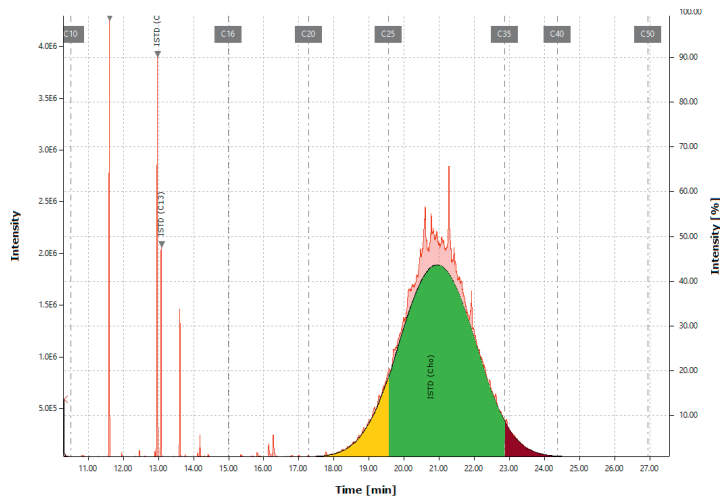
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## 3 GC oven

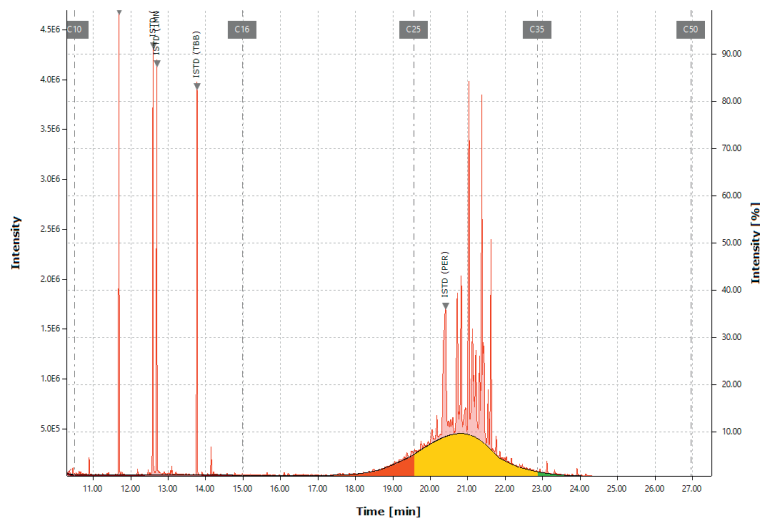
Perfectly organized: In the GC oven, the retention gaps (A) and GC columns (B) are transverse mounted and positioned for easy access.

The GERSTEL ChromOH software enables efficient and reproducible automated integration and batch re-integration of the MOSH and MOAH humps including custom hydrocarbon size ranges.

### (MOSH)



### (MOAH)



MOSH and MOAH fractions extracted from an edible oil sample and integrated using the GERSTEL ChromOH. The colored hump areas represent individual hydrocarbon size ranges. The total amounts are calculated as the sum of all c-fractions between n-C<sub>10</sub> and n-C<sub>50</sub>. The values are included in the final report.

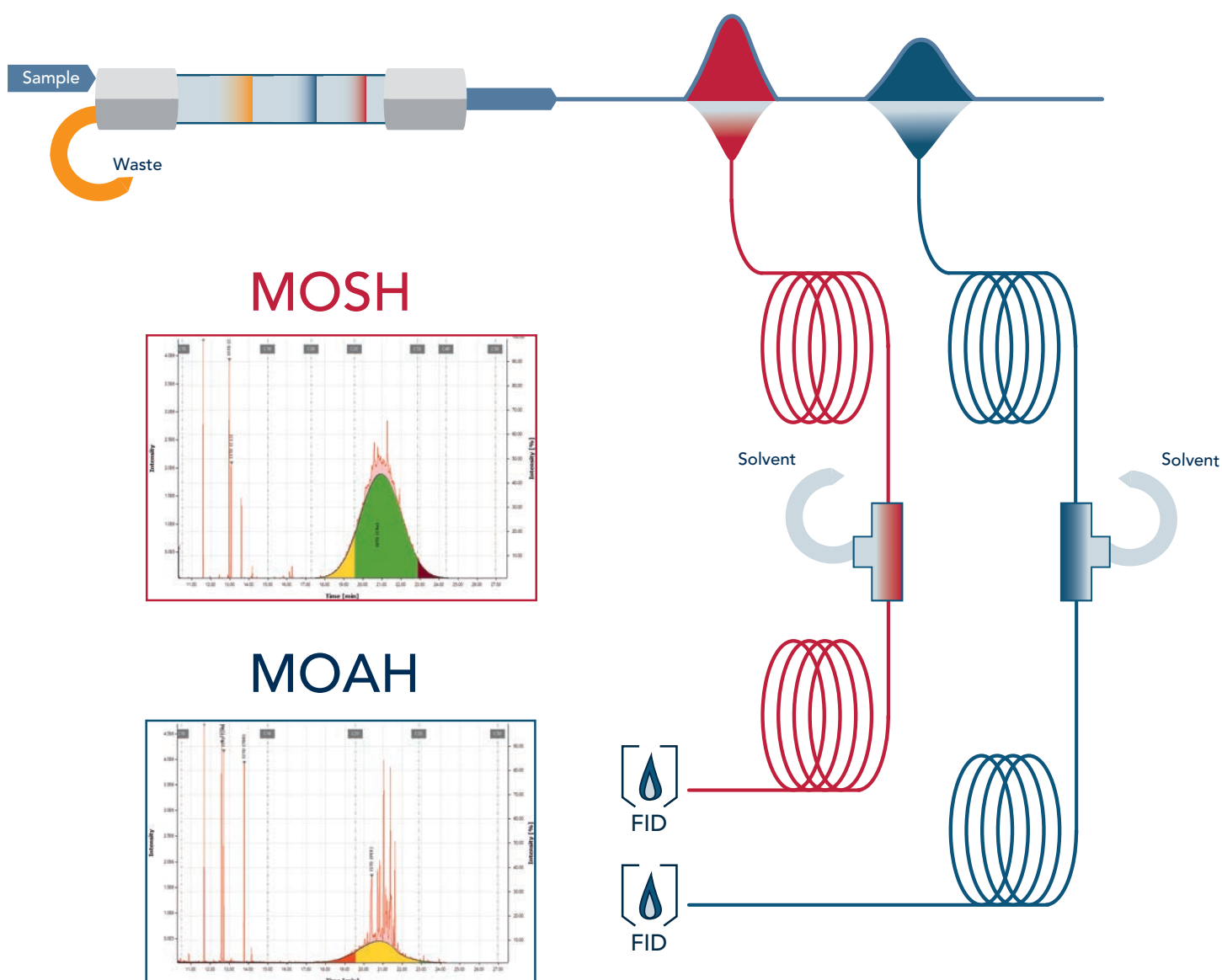
## Analysis details

The MOSH and MOAH fractions are separated by HPLC and individually transferred to their designated GC channel. The HPLC separation is performed using a normal phase silica gel column and n-hexane/dichloromethane mobile phase.

The individual 450  $\mu\text{L}$  fractions are transferred to their respective GC channels while triglycerides and other matrix compounds are retained on the HPLC column.

During the GC run, the HPLC column is back-flushed and cleaned. This ensures that correct results can be obtained for the following sample while safeguarding reliable system operation.

In the Early Vapor Exit, excess HPLC eluent is removed before the MOSH and MOAH fractions are transferred to their respective GC separation columns.



# MOSH/MOAH analysis results in a few easy steps

The GERSTEL ChromOH Software uses dedicated algorithms developed specifically for hump- and peak detection to ensure efficient data processing

as well as accurate results and reporting. Manual adjustments and batch reintegration are easily performed at any time.

## 1 Data import

Batch processing of a large number of chromatograms using standardized conditions ensures high throughput.

## 2 Automated handling of sample information

All relevant details for sample processing are saved and can be applied to every batch of samples, there is no need for manual input of sample information in routine data evaluation.

## 3 Definition of integration intervals

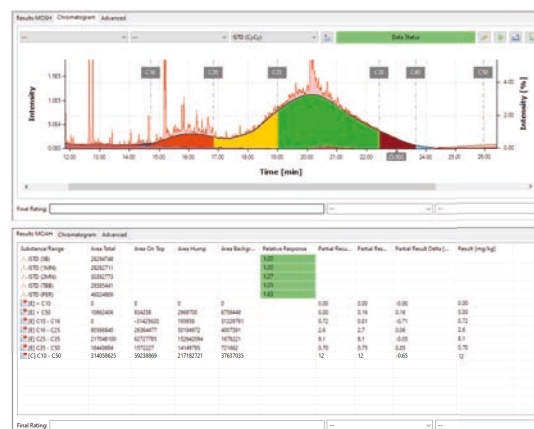
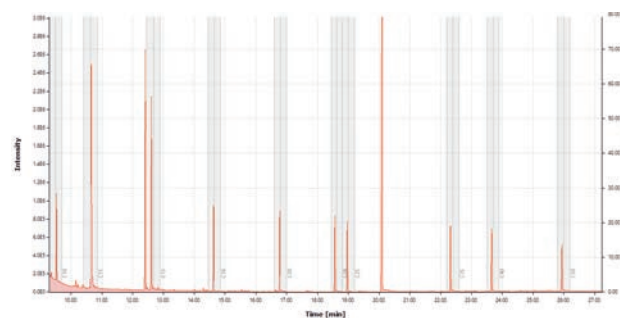
The expected integration intervals for internal standards and alkanes are clearly displayed and can be adjusted as required, enabling fast visual inspection and reliable identification of standard peaks.

## 4 Selection of hydrocarbon size ranges

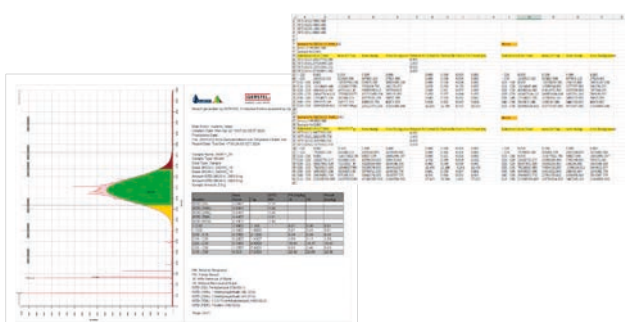
Integration windows for MOSH and MOAH are selected by mouse-click.

## 5 Visual inspection of chromatograms and results

The relative response of internal standards is automatically compared to expected values and visual feedback is given for easy inspection at a glance. All peak / hump areas and intermediate results are displayed for transparency. In the chromatogram view, the size ranges are marked in color and the blank correction is shown as well.



## Report Generation



Reports can be generated in Microsoft Excel or Adobe PDF format, optionally including chromatograms.

## Looking for more?

GERSTEL delivers integrated sample preparation solutions for GC (GC-MS/MS) and HPLC (LC-MS/MS), upon special request adapted to your requirements.

Our proven solutions are based on intelligent combination of market leading Agilent® Technologies instruments

with GERSTEL sample preparation technology under integrated software control.

To ensure your success, GERSTEL provides comprehensive technical and application support by a team of highly experienced and motivated colleagues. For more information, contact your local GERSTEL representative.

## Service from day one

### Installation and familiarization by fully trained technical staff

Following installation, your system is tested and the service engineer provides the user with a system and software familiarization to ensure that he or she can operate the system and reliably generate results.

### Training courses

Comprehensive training courses given by experienced application chemists are available as options. Courses include classroom presentations as well as hands-on instrument operation and maintenance.

GERSTEL systems and solutions are developed, produced and distributed under a quality system certified to meet the demanding ISO 9001:2015 quality standard. Before an instrument or Sample Prep Solution is brought into operation it is tested for technical and application functionality to ensure that it reliably operates to specification.



## Service and Support

Support to us includes all aspects of our customers' needs: We provide comprehensive professional advice, reliable delivery and thorough training. Whenever technical issues arise, we respond promptly and bring to bear the latest support and communication technology to ensure the fastest possible resolution no matter where in the world our customer is located.

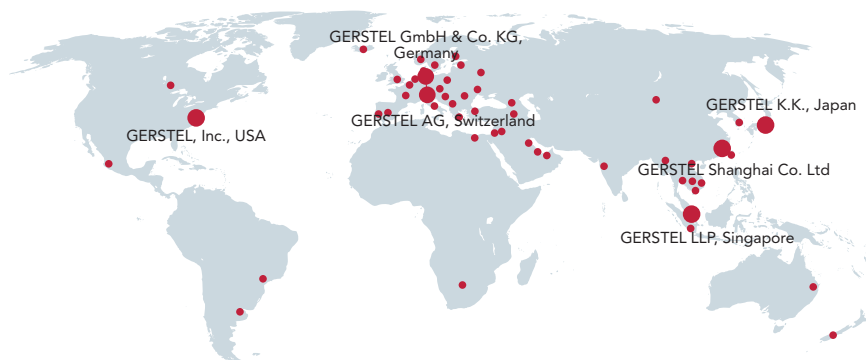
GERSTEL is represented in more than 70 countries worldwide. In territories, where we do not have a GERSTEL Service Organization, our network of trained and certified distributors provide timely, high quality support. Leading laboratories world-wide rely on GERSTEL solutions.



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