High-throughput volatiles determinations

reliable operations, unparalleled flexibility

Thermo SCIENTIFIC

Reliable solution

for organic volatiles applications

In many modern laboratories, sample preparation often accounts for more than twice the time spent on the actual analyses. The continual pursuit for rapid response time and reduced costs calls for increased automations in each possible part of an analytical procedure. Assessing and improving sample handling is an effective way to positively impact laboratory efficiency. For any high-throughput environment interested in the analysis of volatiles, static headspace-gas chromatography with its simplicity and broad applicability is one of the most reliable and robust techniques.

The **Thermo Scientific™ TriPlus™ 300 Headspace** valve-and-loop autosampler offers the largest capacity of the sample tray and incubation oven enabling users to quickly analyze a larger number of samples and achieve unparalleled productivity. The superior sample integrity and traceability, thorough sample path inertness, seamless integration into multiple chromatography data systems, and the immediate local user interface further expand the reliability, flexibility and applicability of the autosampler.

Reliable Valve-and-loop Technology

Fully inert sample path for the highest compliance with any headspace method

Enhance Data Traceability and Quality

Barcode capability for sample tracking and management

Maximize Sample Integrity

Extended temperature range and automatic vial leak checks

Unprecedented Throughput

Automatic, unattended operations with the highest overlapping capacity

Conserve Gas and Energy

Gases and temperatures are reduced to specific values or shut down for conservation

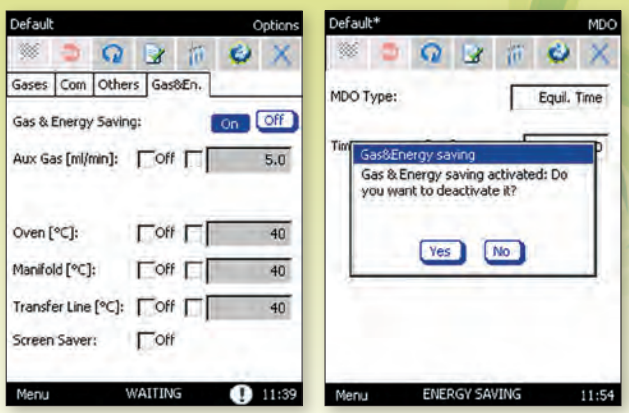
Enhanced Ease of Use and Rapid Method Implementation

Local touch screen for developing methods, building sequences, and monitoring the entire system

Energy Savings

Conserve Resources and Energy

Ideal for regulated pharmaceutical and forensic workflows, as well as environmental and food safety laboratories, this comprehensive, flexible sample handling solution enables you to customize and accelerate your organic volatiles determinations while minimizing down-time. Offering a wide range of temperatures for the entire sample path, the TriPlus 300 Headspace autosampler is delicate with biological samples and labile analytes and is also applicable for the fastest growing high-temperature headspace applications.



Energy-saving attributes are automatically built into the system to ensure efficient operations and conservation of power and resources

Maintain Flexibility

User-installable transfer line on the Thermo Scientific™ TRACE™ 1300 Series GC for a quick and easy shift from one GC to another without pneumatic modification

Centralized, Single Point of Control

Seamless integration in GC and GC/MS systems and software

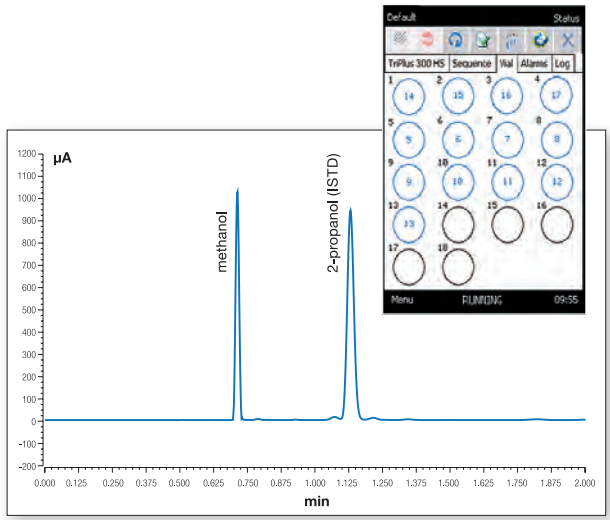
Highest throughput in volatiles analysis

unprecedented sample handling capabilities

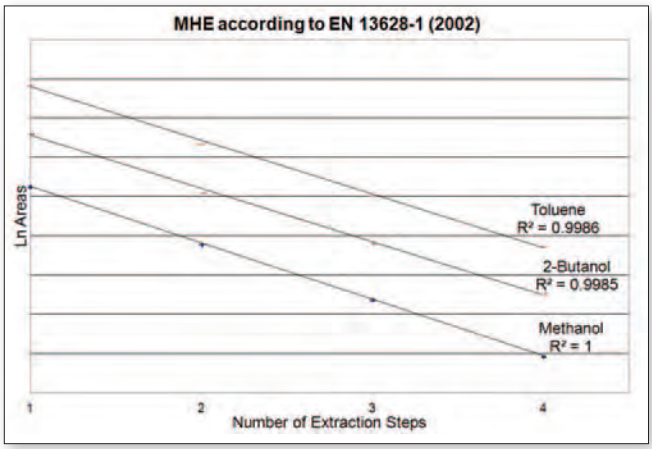
Overlapping capabilities are maximized by the 18-position oven

The TriPlus 300 Headspace autosampler offers the utmost sample capacity for a valve and loop autosampler. With its 120-position tray, the unsurpassed 18 positions for simultaneous incubation into the heated oven and the highest overlapping capability, the autosampler allows long unattended sequences to be run while maximizing sample throughput.

When specific determinations need a prompt solution, the TriPlus 300 Headspace autosampler offers unlimited priority sample positions. For real high-throughput applications, which also require the highest data quality, the system flexibility allows the running of sequences of non-consecutive vial positions while maintaining the overlapping capability. For example, this unique feature further enhances sample capacity for blood alcohol analysis. Instead of running one blank vial placed after each sample, a number of empty vials can be grouped in the sample tray and repeatedly used during a sequence to ensure the highest data confidence.



Determination of residual methanol in biodiesel according to EN 14110 method. GC run time is 2 minutes, and the vial equilibration time is 45 minutes. At least 13 samples can be overlapped into the oven of the autosampler, as shown by the oven status.



MHE according to EN 13628-1 (2002) for flexible packaging

Method Development Tools

Method development time is accelerated with the use of convenient tools

Vial-Shaking

Vial shaking is frequently used to speed up the equilibration phase time and increase efficiency improving, as a consequence, sensitivity and repeatability.

Method Development Optimization

Method Development Optimization [MDO]

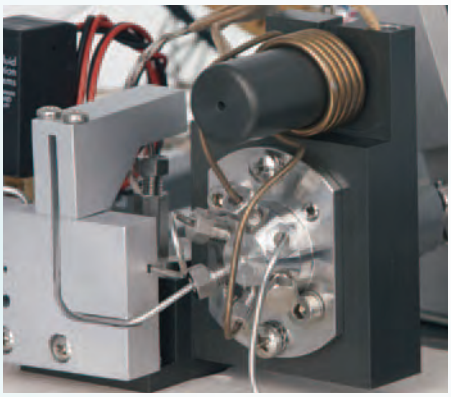
Heated zone temperatures, equilibration time, and shaking are automatically increased by a user-selectable value to speed up method development phases.

Multiple Headspace Extraction [MHE]

This mode is used for the quantification of VOCs in solid samples, for kinetic studies, or to demonstrate that headspace equilibrium conditions are reached. Each vial is automatically sampled up to 100 times, and an analysis is performed at each sampling.

Reliable valve-and-loop technology

with fully inert sample path



High-temperature six-port valve and the sampling loop

Valve and loop headspace is the sampling technique of choice when seeking accurate volatiles analytical results. In this operating mode, the sample is heated and pressurized with an independent and electronically-controlled inert gas and the loop of the six-port sampling valve is filled with the headspace. The loop content is then transferred with carrier gas to the GC injector, and the analysis begins. Sample integrity is ensured, and carryover effects are avoided because the entire sample path of the TriPlus 300 Headspace autosampler is chemically inert, and all the heated zones can be set between 30 °C and 300 °C for the widest applicability. Compatible with other chromatography data systems and GC instrumentation available on the market, the TriPlus 300 Headspace autosampler accommodates existing methods for rapid start-up.

How the System Works

Equilibration

The vial is automatically moved into the oven where it remains at a constant temperature for a certain time. Three shaking levels can be selected to accelerate this phase.

Pressurization

The vial septum is pierced and auxiliary gas enters into the vial.

Automatic Leak Check

During the pressure equilibration time of 0.2 min, the system performs an automatic vial leak check to ensure the highest sample integrity. If the vial does not pass the leak check, a message is shown in the log file.

Loop Fill

After the vial leak check, the overpressure inside the vial is expelled through the vent outlet thus filling the sampling loop.

Injection

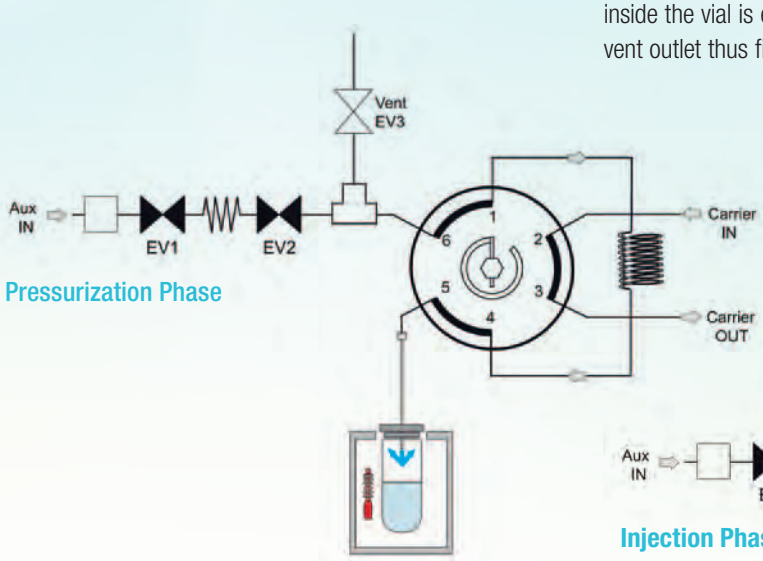
The six-port valve rotates, and the carrier gas intercepts the sampling loop, transferring its content to the GC column through the transfer line. The GC analysis begins.

Vial Venting

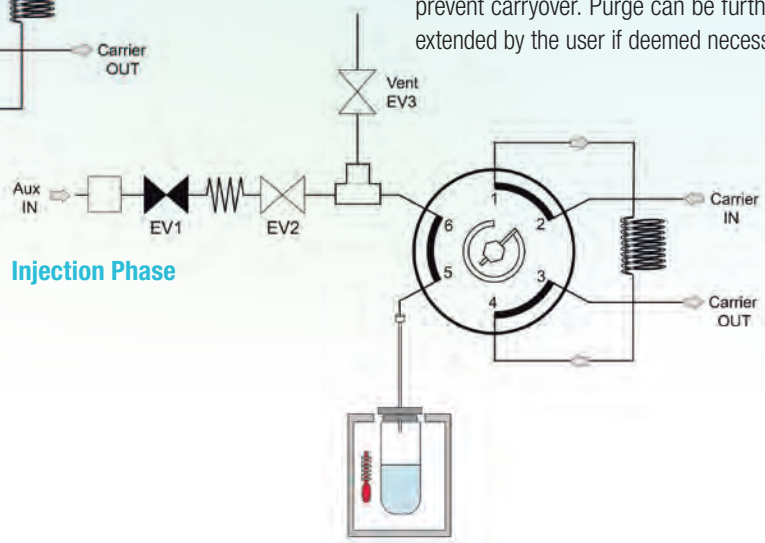
If selected, the residual pressure into the vial is automatically eliminated through the vent valve.

Purging

The vial is removed from the oven and the auxiliary gas flows at 100 mL/min for one minute through the sampling valve, the loop, the needle, and the vent valve to guarantee cleaning of the system and to prevent carryover. Purge can be further extended by the user if deemed necessary.



Pressurization Phase



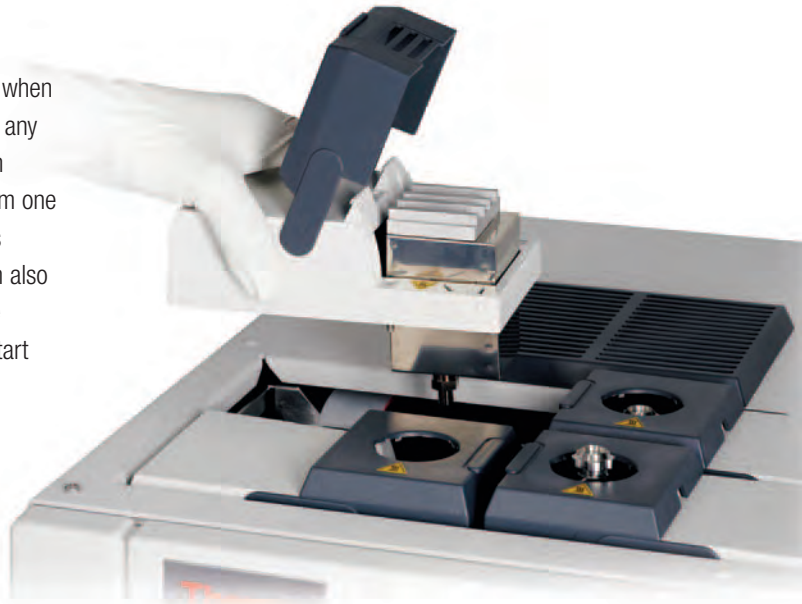
Injection Phase

Maximum flexibility

with GC modularity and user-installable connections

Extend Ground-Breaking GC Modularity to Headspace Determinations

The TriPlus 300 Headspace autosampler flexibility is maximized when connected to the revolutionary TRACE 1300 Series GC. Without any modification to the GC pneumatics, the modularity of the system enables the user to easily move this headspace autosampler from one GC to another, in a matter of minutes. Maintenance downtime is eliminated due to the possibility of swapping the injectors, which also guarantees the highest flexibility in the analytical laboratory. The operator can quickly obtain confirmation on a GC/MS system, start a new application on a different GC, or just satisfy incremental workloads in the shortest possible time.



The TriPlus 300 Headspace autosampler immediacy is supported by the wide, color touch screen local user interface. The interface is the ideal solution for rapid instrument control, method development and troubleshooting, as well as for those instances where the system is moved from one GC to another.

Convenient color touch screen local interface

Centralized, single point of control

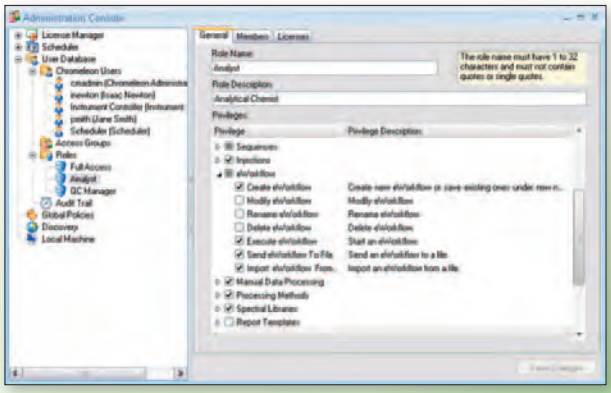
Seamless integration into GC and GC-MS hardware and chromatography data systems

The seamless integration of the Thermo Scientific™ Dionex™ Chromeleon™ Chromatography Data System with the TriPlus 300 Headspace autosampler allows a single point of control for the entire analytical workflow for unprecedented ease of use and comprehensive system management.

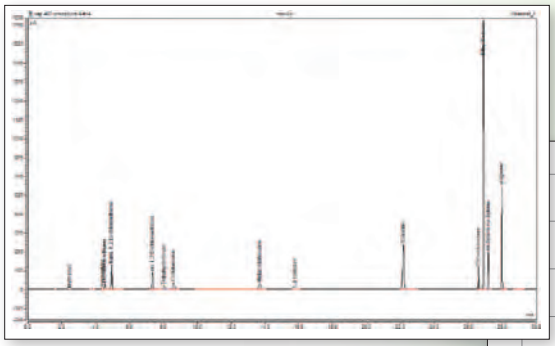
The Chromeleon CDS is the next generation Chromatography Data System which simplifies all chromatography processes. With its intelligent functionality, it does everything you need, and everything is fast and easy thanks to its Operational Simplicity™. The Chromeleon 7 software package uses eWorkflows™ to accelerate chromatography analysis minimizing operator tasks. Using an eWorkflow, the operator simply selects the method, the number of samples and the starting vial position in the autosampler, and begins the analysis. The software then runs the chromatography, processes the data, and produces final results and reports.

The Chromeleon CDS has been designed to fully meet the requirements of 21 CFR Part 11 Electronic Records and Electronic Signatures, providing features that allow users to implement controls in accordance with their interpretation.

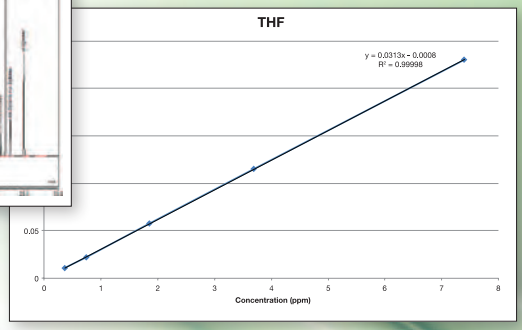
The Thermo Scientific™ Xcalibur™ data system is the common platform for all Thermo Scientific mass spectrometry systems. It provides confident control of the entire HS-GC/MS system from method development to reporting and is used to provide tools for generating and maintaining your own spectral libraries.



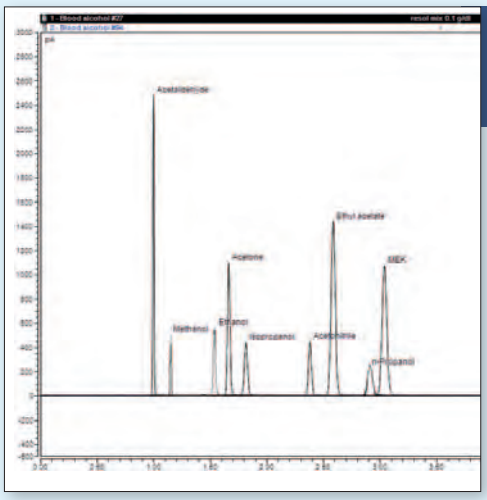
Chromeleon Chromatography Data System settings for user roles and privileges



Chromatogram displaying results from US Pharmacopeia (USP) Method 467 analysis



Calibration curve of THF for USP ‹467›



Barcode Reader for Sample Traceability and Management

For laboratories in need of complete and continued sample traceability, the TriPlus 300 Headspace autosampler barcode capability offers a flawless solution. The vials are automatically scanned, and the barcode is read before the sample is placed into the headspace oven for analysis with all the relevant information transferred to the data system.

In this way – without impacting the system productivity – forensic laboratories and high throughput environments maximize data quality, eliminating the possibility of dangerous vial misplacements.

Blood alcohol resolution mix

Chromatography Vials and Consumables

The perfect partner for optimal analytical performance

Thermo Scientific chromatography consumables are designed to complement our innovative range of GC and GC-MS systems together with their autosamplers. Get the most out of the TriPlus 300 Headspace autosampler by pairing it with advanced, high-performance Thermo Scientific products.

The TriPlus 300 Headspace autosampler can use 10 mL, 20 mL, and 22 mL vials with crimp or screw caps, and flat or rounded bottoms, without using any vial adapter. This flexibility ensures complete compatibility with existing methods meeting any analytical requirements.

The wide range of vials, septa, consumables and accessories offer customers applications-focused solutions in the pharmaceutical, forensics/toxicology, environmental, food analysis, petrochemical, and general analytical industries.

Comprehensive Thermo Scientific GC and GC-MS Solutions

TRACE 1300 Series GC

Tailor the Thermo Scientific TRACE 1300 Series GC to your needs and eliminate maintenance downtime with the proprietary user-exchangeable Instant Connect injector and detector modules. Swapping modules for continuous operation is easily done in a few minutes by the user without special tools.

ISQ Single Quadrupole GC-MS

The Thermo Scientific™ ISQ™ GC-MS system offers rugged and reliable performance and nonstop productivity. The ISQ GC-MS features a new source design ideal for continuous high-throughput operation.

ITQ Series Ion Trap GC-MS

The Thermo Scientific™ ITQ™ Series Ion Trap GC-MS offers outstanding full-scan electron ionization sensitivity and upgradeability.

TSQ 8000 Triple Quadrupole GC-MS/MS

The new high-performance Thermo Scientific™ TSQ™ 8000 triple quadrupole GC-MS system is a reliable, easy-to-use system that enables faster, more precise, error-free analyses, saving time and reducing laboratory costs.

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