

Sample preparation

# Comprehensive workflow for solid and semi-solid samples

Sample preparation, gas chromatography, and data analysis



thermo scientific

# Thermo Scientific sample preparation GC workflow



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Extract and  
concentrate sample



2

Analyze  
sample



3

Report sample  
results



Maximize the operational efficiency and profitability of your laboratory by combining truly unattended sample to vial extraction and concentration with the productivity of the gas chromatographic analysis, and the reliable data processing enabled by the Thermo Scientific™ Chromeleon™ Chromatography Data System (CDS) Software.

## Extract and concentrate sample

### Accelerated solvent extraction

- Comprehensive and integrated workflow—seamlessly integrated sample extraction, in-cell cleanup, and concentration for effortless operation
- Improved throughput and efficiency—simultaneous extraction of four samples with faster concentration and artificial intelligence-driven endpoint detection
- Green technology—newly patented extraction method with gas assistance promotes solvent conservation for enhanced sustainability
- Streamlined walkaway solution—enhances data precision, reduces errors, and optimizes cost efficiency

## Analyze sample

### Gas chromatography

- High-throughput liquid injection. Simplified operation with autosampler self-alignment for quick and easy set-up.
- High repeatability for small and large sample volume injections
- Safer operations with automatic selection of the best injection mode to fit any workload demand with scalable, large sample capacity

### Advanced gas chromatography systems

- Instant connect modularity, for upmost configuration flexibility
- Highly sensitive MS detectors with extended dynamic range
- Extended uptime with quick and easy maintenance

## Report sample results

### Chromatography Data System (CDS)

- One intuitive, easy to use software solution for gas chromatography (GC), liquid chromatography (LC), ion chromatography (IC), and mass spectrometry (MS) analyses. Acquire and process data with a single software platform to boost laboratory efficiency.
- Accelerate data processing and reporting with dynamic updating and smart tools built-in
- Link to Thermo Scientific™ SampleManager LIMS™ Software to manage the complete laboratory workflow



# Extract and concentrate sample

## Sample preparation

The Thermo Scientific™ EXTREVA™ ASE™ Accelerated Solvent Extractor is a newly developed system based on many proprietary technologies including gas-assisted solvent delivery and parallel accelerated solvent extraction. This fully automated system combines the extraction and evaporation capabilities in one instrument, providing true walk-away automation for unattended operations and high productivity to any laboratory. With accelerated solvent extraction, extractions can be completed in very short periods of time and with minimal amounts of solvent compared to other conventional sample preparation instruments and manual sample extraction techniques such as Soxhlet and sonication.



### EXTREVA ASE accelerated solvent extractor key benefits

From sample to vial in one fully automated workflow without the need for user interaction

- Flexible parallel and serial extraction using up to six solvents for optimal scheduling and efficiency in daily operations
- Fully automated extraction and concentration of up to 16 samples in a single analytical batch without the need for manual intervention
- Efficient optimization of extraction time and solvent consumption achieved through a newly patented gas-assisted solvent delivery system
- Convenient collection of extracts in vials and bottles for evaporation to dryness, or in user-friendly assemblies for direct concentration into gas or liquid chromatography vials
- Efficient sample tracking enabled by a 2D barcode reader for accurate and automated identification
- Concentration with fully automated end point detection through artificial intelligence machine vision



[Learn more about the EXTREVA ASE system](#)



## Gas chromatography–mass spectrometry (GC-MS) sample analysis

Maximize instrument uptime and profitability of your lab with the Thermo Scientific™ TRACE™ 1600 Series Gas Chromatograph and its compact and modular concept offering flexible configurations, increased operational efficiency and reduced cost of ownership. The TRACE 1610 GC is designed to enhance the workflow experience for both new and expert users through its advanced multi-functional touch screen with instrument health monitoring and how-to videos for common maintenance procedures. With the integrated Thermo Scientific™ HeSaver-H<sub>2</sub>Safer™ technology, a standard instant connect SSL injector module can be self-upgraded to significantly reduce carrier gas consumption during analysis, mitigating helium gas shortage issues or, in case of using hydrogen as carrier, removing associated safety risks, and eliminating the need to install a hydrogen sensor.

When coupled with the Thermo Scientific™ ISQ™ 7610 Single Quadrupole Mass Spectrometer, the system delivers the required robustness and sensitivity to fulfill the most demanding analytical requirements for targeted and untargeted environmental analysis.



### TRACE 1600 Series GC key benefits

- Maximize uptime and profitability with a unique modular design that provides off-line maintenance and rapid troubleshooting capabilities
- Enhance efficiency with flexible GC configurations using interchangeable injectors and detectors to address evolving analytical demands
- Streamline operations with proprietary, tool-free Thermo Scientific™ iConnect™ Column Lock for quick, safe, and leak-free capillary column installation
- Conserve helium and reduce operational costs with HeSaver-H<sub>2</sub>Safer technology
- Save bench space and reduce power consumption with the most compact and highly configurable GC system in the market
- Ensure GLP compliance and avoid unplanned downtime through consumable usage tracking and replacement alerts
- Facilitate daily operations and routine maintenance with easy-to-follow video guides on the high-resolution touch screen

 [Learn more about the TRACE 1600 Series GC](#)



### ISQ 7610 Single Quadrupole GC-MS key benefits

- High sensitivity in full scan and SIM acquisition mode for trace detection levels of both targeted and untargeted analytes, with the Thermo Scientific™ ExtractaBrite™ ionization source. Increased sensitivity available with the Advanced Electron Ionization (AEI) Source in a dedicated configuration
- Remove tuning complexity with SmartTune, a simplified tuning tool to easily maintain consistent response over time
- Boost instrument productivity to unprecedented levels with the patented NeverVent™ technology
- Select from a fully upgradeable path, from base to advanced configurations, to increase flexibility and performance anytime you need it
- Allow method consolidation and increase instrument downtime with an extended dynamic range and lifetime detector
- Cost savings and efficient operations through Thermo Scientific™ SmartStatus™ intelligent instrument health software for data-driven decisions on instrument maintenance

 [Learn more about the ISQ 7610 GC-MS system](#)



# Report sample

## Data review and reporting

The EXTREVA ASE and the ISQ 7610 GC-MS systems are fully controlled by Chromeleon CDS that was designed to streamline your path from samples to results. With built-in smart tools to make your work easier and faster, you can consolidate your laboratory operations and achieve significant efficiency gains.



## Chromeleon CDS key benefits

- Benefit from Operational Simplicity™—simplify repetitive tasks, and reduce errors with an intuitive, customizable, and easy-to-navigate user interface
- Minimize out of specification results, with automated system suitability testing (SST) and intelligent run control (IRC) enabling more 'right-first-time' analyses
- Increase productivity and reduce errors with Chromeleon eWorkflow™ procedures, streamline sequence creation, in as little as two clicks, to minimize training requirements
- Eliminate the need to export to other software packages and ensure no transcription errors with built-in report templates and a flexible Excel-style reporting module enabling faster result review
- Designed to make it easier to achieve, maintain, and demonstrate compliance with secure, administrator-controlled user access and permissions to enable compliance with GxP and 21 CFR Part 11

 Learn more about Chromeleon CDS

 Learn more at [thermofisher.com/soil](https://thermofisher.com/soil)

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