

## Thermo Scientific TSQ Quantum Access MAX



### *Innovation, Simplicity, and Value*



Food Safety



Environmental Analysis



Drug Discovery and Pharmacokinetics



Clinical Research

## UNSURPASSED PRICE TO PERFORMANCE

From the company renowned for innovation in mass spectrometry, the Thermo Scientific TSQ Quantum Access MAX is the newest member of the successful TSQ product family.

The TSQ Quantum Access MAX™ offers several innovative features that provide real benefits:

- Superior detector response in negative ion mode for matrix intensive assays such as the analysis of the antibiotic chloramphenicol and steroids such as beta-estradiol
- Mass range up to  $m/z$  3000 supports a wide array of applications
- Fast +/- switching for multi-residue analyses
- QED-MS/MS and library search facilitate simultaneous quantitation and structural confirmation at the click of a button

Simple, intuitive software makes the system easy to use and enables faster method acceptance without operator retraining on complex hybrid technology.

The TSQ Quantum Access MAX redefines versatility, making it the value-conscious choice for a wide variety of applications, including: pharmaceutical, environmental, food safety, clinical research, and forensics. The TSQ Quantum Access MAX sets the benchmark for sensitivity in its class, providing unmatched specificity at an affordable price.

**Thermo Scientific Accela High Speed LC and TSQ Quantum Access MAX mass spectrometer. Accela™ LC system performs conventional and U-HPLC separations in one efficient and versatile system.**



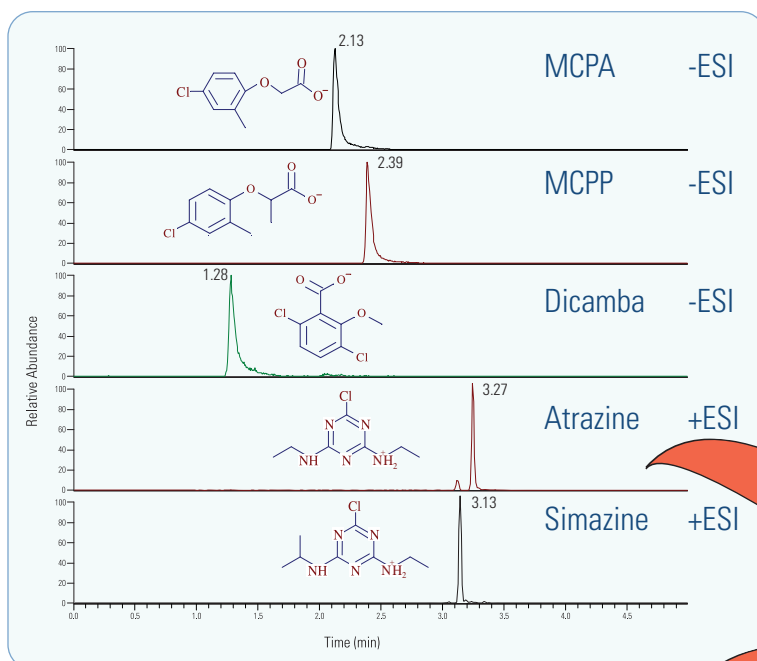
# SIMULTANEOUS QUANTITATION AND STRUCTURAL CONFIRMATION

Quantitation-Enhanced Data-Dependent MS/MS (QED-MS/MS) provides significant benefits for multi-residue screening and quantitation experiments.

With the ability to perform Highly Selective Reaction Monitoring (H-SRM), the MS/MS data is cleaner and less complex, making it easily searchable against a built-in library for added confirmation during screening assays.

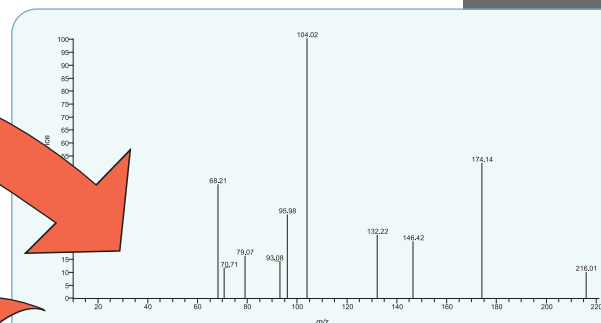
A related innovation is the reversed energy ramp (RER) feature, which allows the user to create libraries that are searchable on TSQ Series universally. The same library can be used in a laboratory in Shanghai,

China, and in Somerset, New Jersey – this is a first for triple stage quadrupole-based MS/MS structural identification.



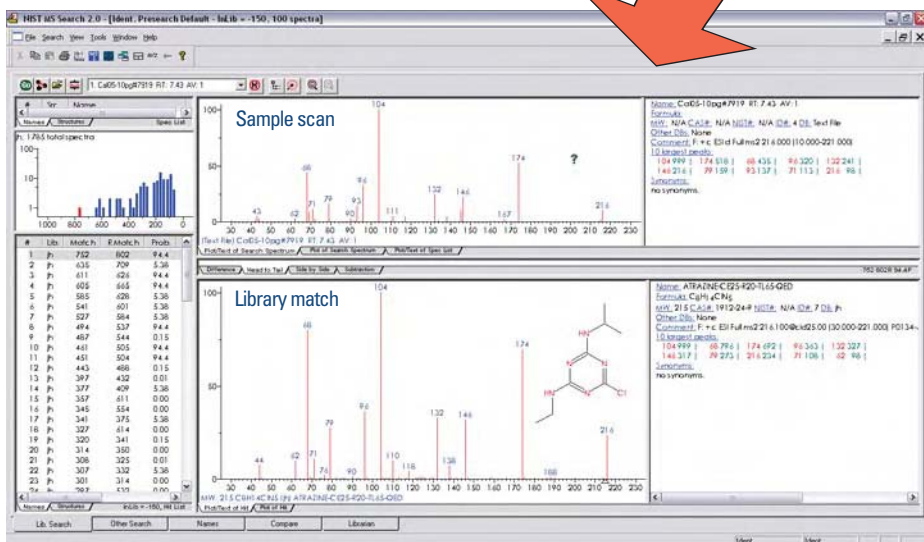
## QED-MS/MS of an Herbicide Mix

QED-MS/MS provides simultaneous quantitation and structural confirmation in metabolite identification or multi-residue screens. Chromatograms at left show a multi-residue screen of a pesticide mix using positive/negative switching and QED-MS/MS.



SRM Quantitation (Scan Event 1)

MS/MS Confirmation (Scan Event 2)



Sample scan (top) and library match (bottom) showing confirmation of atrazine

## ROBUST AND SENSITIVE IONIZATION SOURCES FOR ROUND-THE-CLOCK PRODUCTIVITY

### HESI-II Heated Electrospray Ionization Source

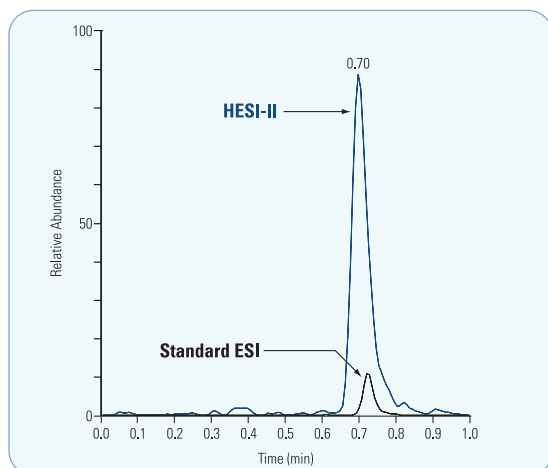
A design evolution, the HESI-II delivers greater desolvation and improved nozzle performance. The HESI-II can efficiently handle flow rates higher than 1 mL/min while maintaining superior low flow rate characteristics with optional use of gas assisted thermal desolvation.

A cleaner nozzle profile improves electrostatic fields which results in a single position that works for most flow rates.

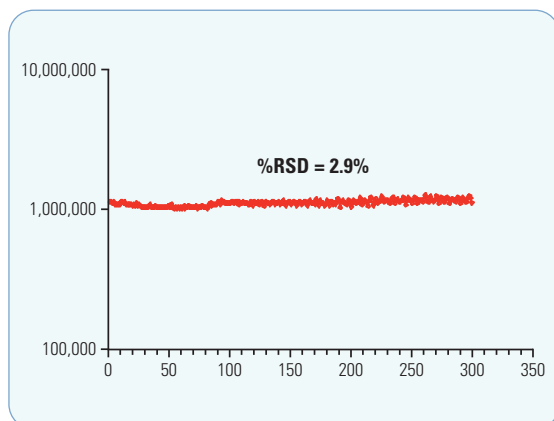
These improvements make the HESI-II the most versatile electrospray design on the market.

Improved heater design for better desolvation at higher flow rates

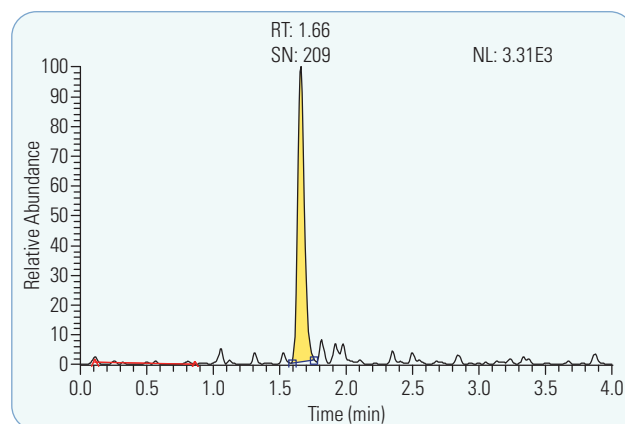
Contoured tip for stable low flow performance



The significant improvement in quantitative performance is shown for 10 pg/mL of Alprazolam injected on a Thermo Scientific Hypersil GOLD C-18 column (50 x 2.1 mm, 3 µm), using an isocratic solvent mixture of Acetonitrile:Water (0.1% formic acid, 65:35, v/v), at a flow rate of 400 µL/min.



**Robustness study on the TSQ Quantum Access MAX.**  
300 injections of 2 pg Cabergoline in pig plasma 400 µL/min, MeOH-Water (0.1% formic), Hypersil GOLD™ C-18, 50 x 2.1 mm



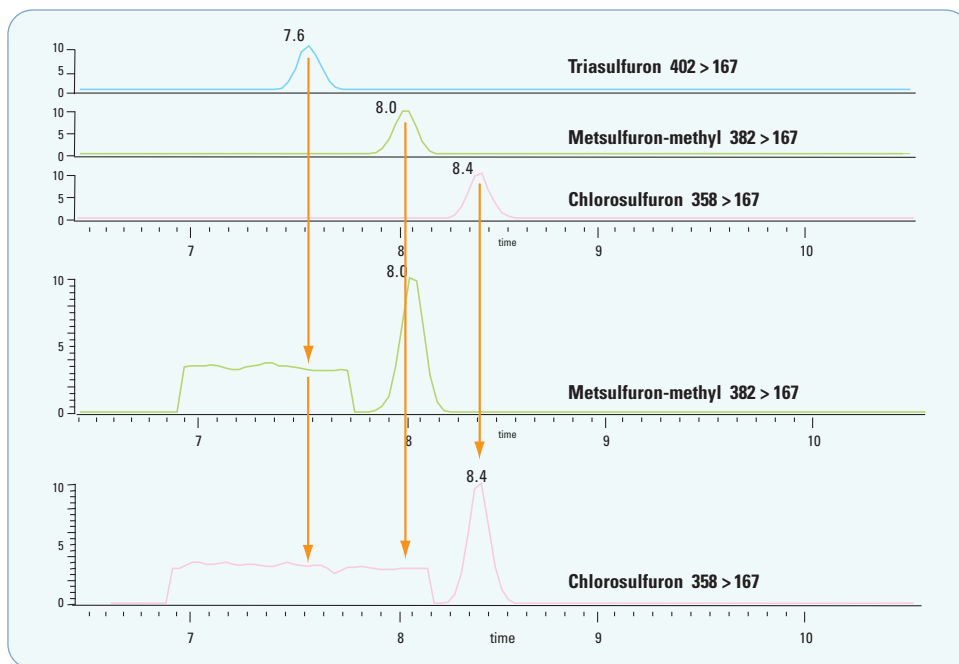
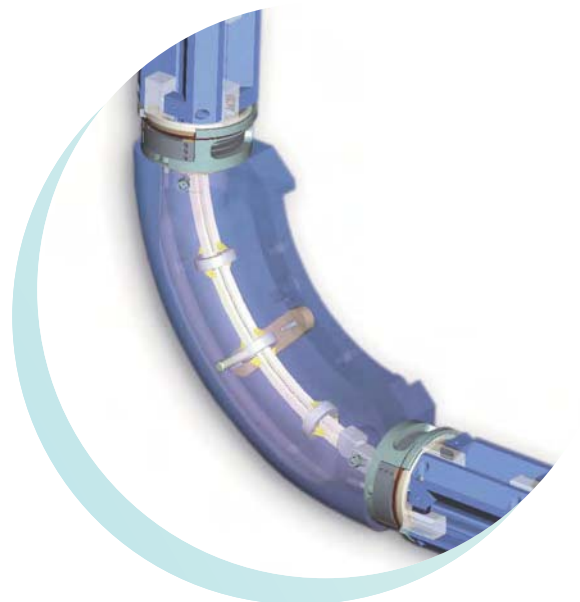
**Sensitivity study on the TSQ Quantum Access MAX showing a signal-to-noise in excess of 200:1 for 50 fg/uL of Alprazolam, in rat plasma 400 µL/min, MeOH-Water (0.1% formic), Hypersil GOLD C-18, 50 x 2.1 mm**

# ZERO CROSS-TALK COLLISION CELL AT 2 ms DWELL TIME

## High Speed Zero Cross-Talk Collision Cell

A long standing tradition of TSQ collision cell design has been the fact that they have had zero cross-talk. Cross-talk usually occurs when the instrument is set to scan very fast, resulting in residual signal from the previous SRM transition

appearing in the subsequent SRM channel when the product ion has the same nominal mass. This leads to false positive responses. The collision cell design allows the TSQ Quantum Access MAX to perform SRM scans at the fastest possible scan speeds, while ensuring zero cross-talk.



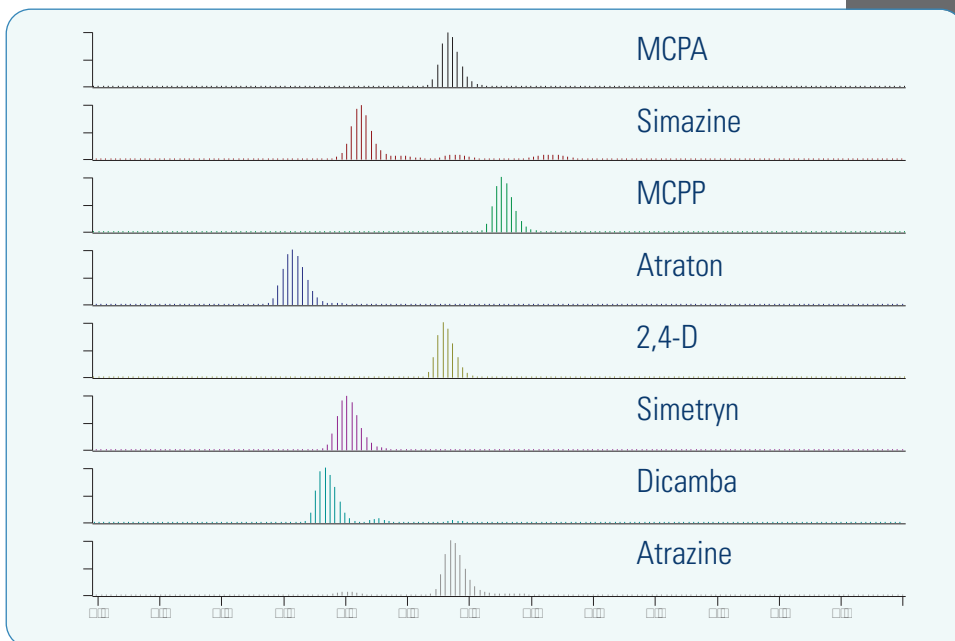
Characteristic of the three pesticides—triasulfuron, metsulfuron-methyl and chlorosulfuron—used to demonstrate zero cross-talk on the TSQ Quantum Access MAX. Baseline magnified  $\times 6000 = 0.01\%$ .

# Innov

# HIGHER PRODUCTIVITY THROUGH FAST POLARITY SWITCHING AND 3000 TIMED SRMS

## Fast Polarity Switching

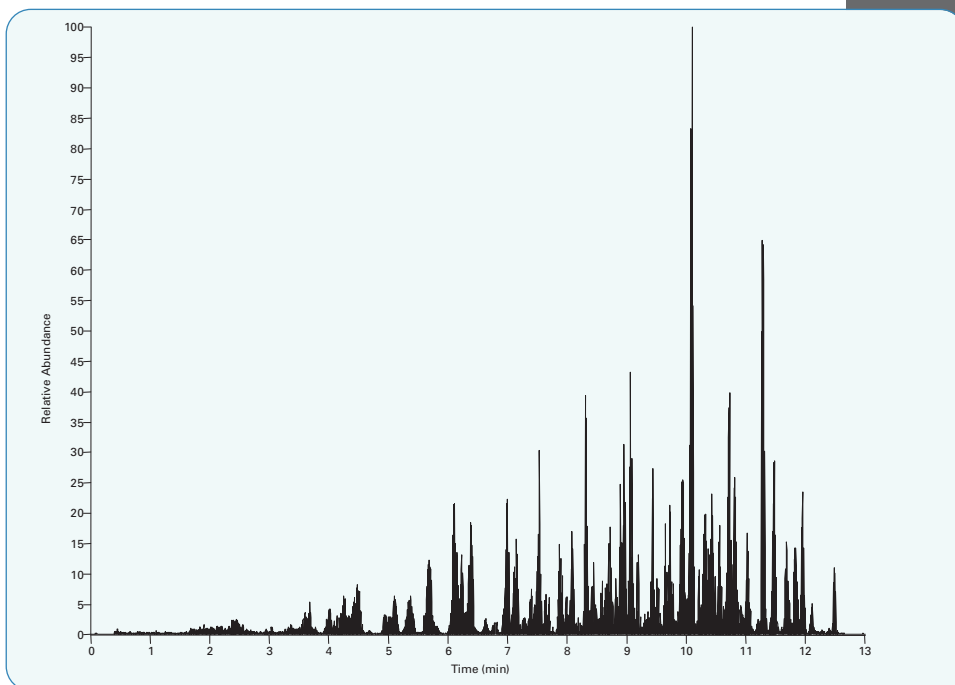
Being able to carry out multi-residue screening and quantitation simultaneously in both positive and negative ionization modes can reduce LC/MS analysis time by half. The fast switching power supply of the TSQ Quantum Access MAX allows positive/negative switching at  $\leq 25$  ms, allowing the instrument to capture high quality data in positive and negative ionization modes simultaneously. This is of significant value when analyzing multiple classes of compounds in one sample that require ionization in both polarities.



**1 ng mixture of eight acid herbicides and triazines collected with polarity switching at 25 msec. A total of 36 SRMs were collected in this experiment, 16 (8 +ESI, 8 -ESI, 2 SRMs per analyte) of which are shown here.**

## 3000 Timed SRMs

Further improvements in productivity arise from the ability of the TSQ Quantum Access MAX to perform up to 3000 Timed SRMs (T-SRMs) in one scan event. Using T-SRMs, the mass spectrometer is able to divide all the SRMs into individual smaller batches within a fixed chromatography timescale. In this way, less time is wasted scanning where there are no peaks, resulting in better data quality and improved sensitivity due to reduction of the cycle time and/or an increase of the individual scan time.



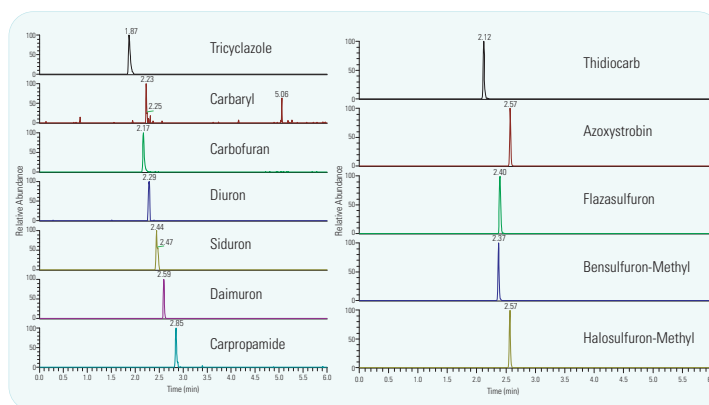
**250 pesticides in orange oil, combined positive and negative ionization modes**



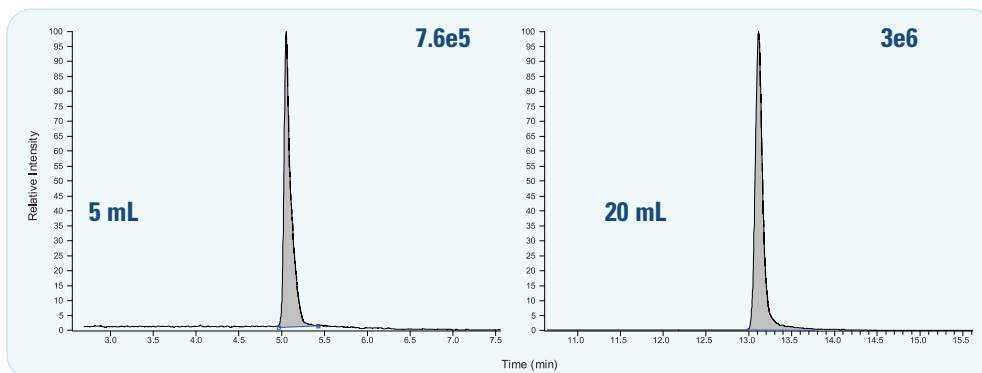
# THERMO SCIENTIFIC EQUAN ENVIRONMENTAL QUANTITATION SYSTEM

Thermo Scientific EQuan is a turnkey system incorporating the TSQ Series mass spectrometer for the analysis of pesticides, herbicides, antimicrobials, antibiotics, and other pharmaceuticals in water samples. The system's unique on-line sample enrichment technique significantly reduces analysis time – from days to minutes. Its high injection volume (1–20 mL) improves detection limits over conventional LC-MS/MS analysis.

- On-line clean-up of environmental samples results in improved throughput, sensitivity and RSDs
- Significant time savings over off-line sample cleanup and enrichment
- Enhanced resolution (H-SRM) for analyte specificity
- Simultaneous quantitation and structural confirmation with QED-MS/MS
- Extensive library of pesticides and pharmaceuticals
- Direct injection up to 20 mL



**Multi-residue pesticide analysis (10 ppt) using the TSQ Quantum Access MAX EQuan™ system with Accela high speed LC. All components eluted under 3 minutes (compared to 17 minutes using standard HPLC). 1 mL injection volume.**



**Chromatograms showing the injection of 5 and 20 mL injection volumes. The concentration of Simetryn is 1 pg/mL for both injections.**

## THERMO SCIENTIFIC APPLICATION-SPECIFIC SOFTWARE

**Xcalibur™ Data System**

Xcalibur is the most powerful and flexible MS data handling system available for Microsoft® Windows®. The software provides fully automated control of the TSQ Quantum series, Thermo Scientific Surveyor LC, and Accela, accelerating method development with intelligent optimization tools. The functional workspace-based instrument control view creates a simplified tune, calibrate, and compound optimization environment for analytical method development.

**LCQUAN™ – Quantitation Software for Regulated Laboratories**

LCQUAN is a secure data system for quantitative analysis. LCQUAN provides the necessary resources for importing sequence information from external systems, developing methods, reviewing data, processing data, reporting data, and exporting results to external systems; all within a 21 CFR Part 11 compliant environment. LCQUAN provides multilevel security access, giving system administrators the ability to set user privileges from full system access to data review only. LCQUAN offers the ability to safely process data stored on network-based computing systems.

**TraceFinder™ – Optimized Workflow for Trace Analysis**

The extensive menu of preconfigured methods and report formats in TraceFinder software makes routine screening and quantitation of contaminants a simple process, even for novice users. Choose the test, build the sample list, select the report options and submit the samples for analysis. The simple point-and-click interface prompts a user through the steps to create methods for targeted screening and quantitation.

**MetWorks™ – Metabolite Identification Software**

MetWorks streamlines the review of drug metabolism LC-MS/MS samples. It simplifies the process of generating reconstructed ion chromatograms, mass spectra, and summary reports from hundreds of MS/MS scans isolated in a typical metabolic run.

**Mass Frontier™ – Spectral Management Tools**

Mass Frontier provides rational understanding of compound structures and a mechanistic understanding of fragmentation schemes using proprietary mass spectral interpretation algorithms. In addition, relationships within datasets can be explored using various types of classification.

**TraceFinder Software****QuickQuan™ – Drug Discovery Quantitation**

QuickQuan accelerates data acquisition and processing for all target compounds in an analytical run and generates quantitative results automatically. The intelligent automation of data acquisition provides a total solution that speeds the pace of drug discovery.

**QuickCalc™ – Powering HT-ADME Research**

QuickCalc software is powered by GMSU (Gubbs Mass Spec Utilities) software to enhance the data processing and results display in high-throughput Absorption, Distribution, Metabolism and Excretion (HT-ADME) studies. QuickCalc reduces the time required to discover new compounds that will enter the drug development phase.

**ToxID™ – Automated Toxicology Screening Software**

ToxID is simple and easy-to-use software that substantially simplifies LC-MS/MS toxicology screening workflows for clinical research and forensic laboratories. This unique software provides powerful compound identification, automated workflows and concise reports.







Innovation, simplicity,  
and value

Innovation, simplicité, et valeur

혁신 간편 가치

Innovación, simplicidad, y valor



Innovazione,  
semplicità e valore

创新 精练 超值

Innovation, Einfachheit  
und Wert



### Signature Benefits

- TraceFinder method development software
- Built-in library of environmental and food safety contaminants
- H-SRM dwell time of 2 ms—Quantitate hundreds of compounds in a single run for multi-residue screening
- Mass range  $m/z$  10-3000—Small molecules to intact proteins
- QED-MS/MS—Simultaneous quantitation and structural confirmation
- 3000 Timed SRMs
- Zero Cross-Talk Collision Cell—Eliminate false positives
- 21 CFR Part 11 enabled software
- Fast pos/neg switching ( $\leq 25$  ms) for multi-residue assays

## Laboratory Solutions Backed by Worldwide Service and Support

Tap our expertise throughout the life of your instrument. Thermo Scientific Services extends its support throughout our worldwide network of highly trained and certified engineers who are experts in laboratory technologies and applications. Put our team of experts to work for you in a range of disciplines – from system installation, training and technical support, to complete asset management and regulatory compliance consulting. Improve your productivity and lower the cost of instrument ownership through our product support services. Maximize uptime while eliminating the uncontrollable cost of unplanned maintenance and repairs. When it's time to enhance your system, we also offer certified parts and a range of accessories and consumables suited to your application.

To learn more about our products and comprehensive service offerings, visit us at [www.thermo.com](http://www.thermo.com).



Complementing our instruments, Hypersil GOLD columns provide excellent peak shape and sensitivity, ideal for quantitation of all analyte types. Hypersil GOLD columns are available in an array of chemistries to optimize separations and maximize productivity. To learn more, visit [thermo.com/columns](http://thermo.com/columns).

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