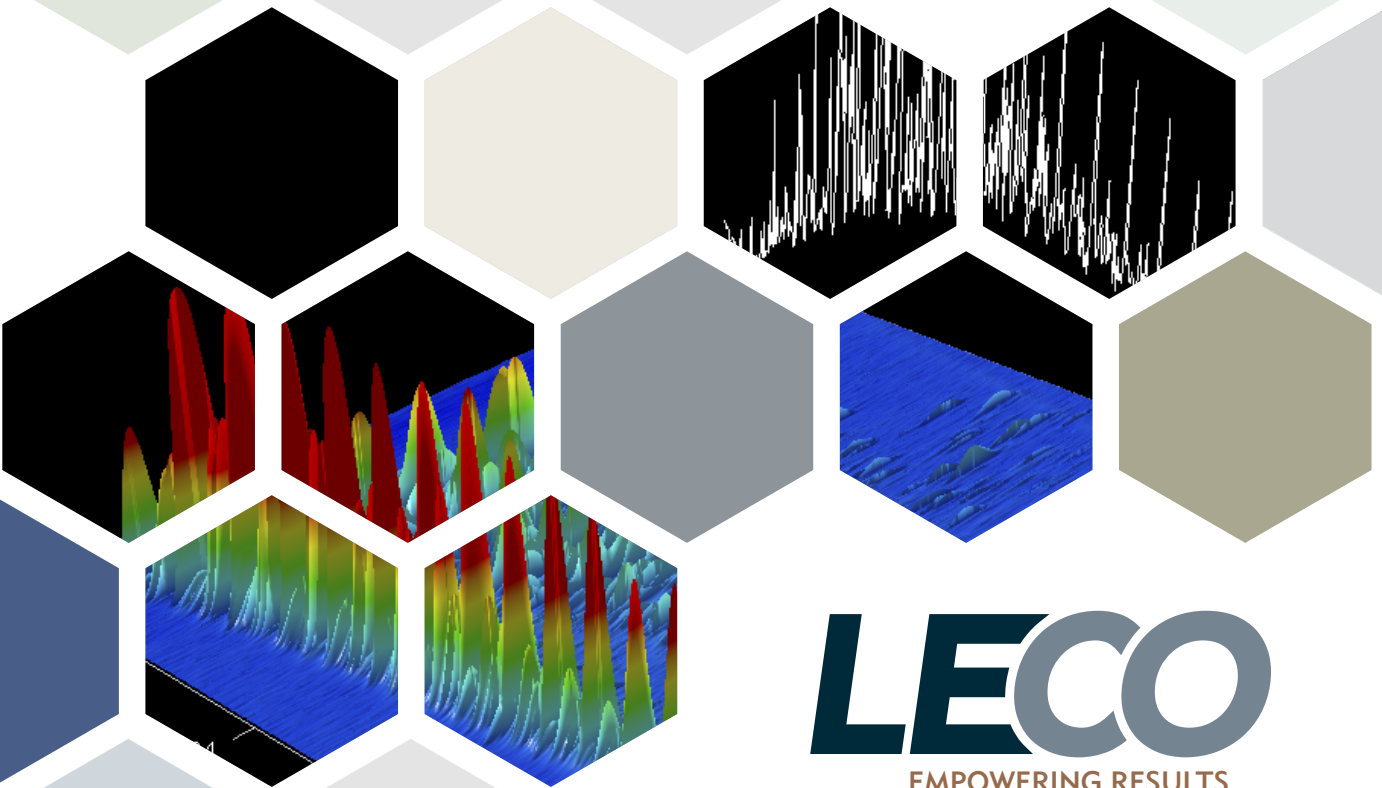


PEGASUS[®] HRT⁺ 4D



LECO
EMPOWERING RESULTS

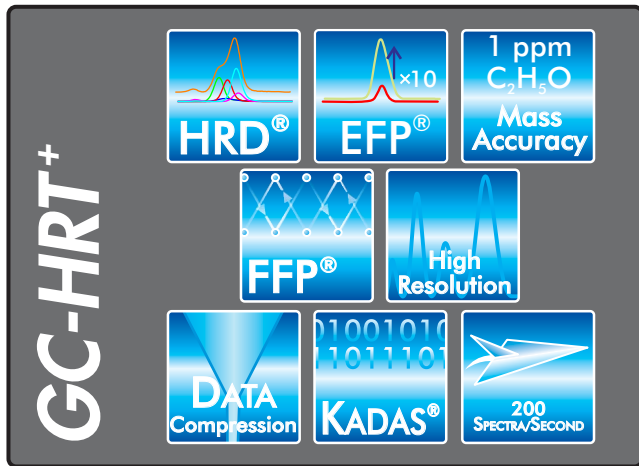


The Ultimate GCxGC Game Changing Technology

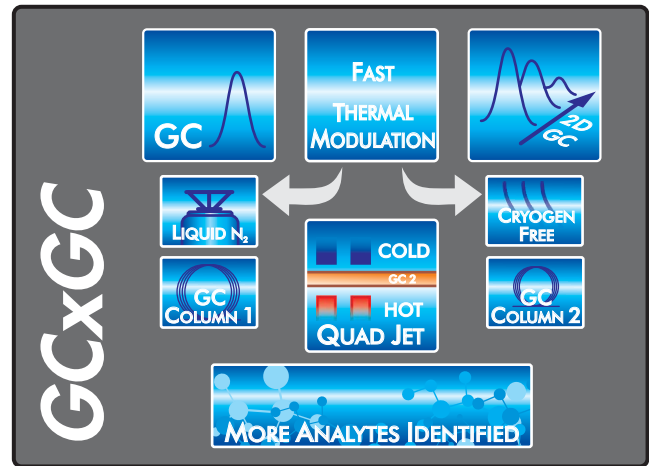
The solution for complex sample analysis has arrived. LECO's Pegasus GC-HRT⁺ 4D combines the highest performance Time-of-Flight Mass Spectrometer with industry leading GCxGC, giving analytical scientists the ability to identify components with more confidence, convert unknowns to real knowns, and find out what else is in their sample. The Pegasus GC-HRT⁺ 4D takes advantage of four dimensions of separation and resolution.

1. 1st dimension chromatographic resolution
2. 2nd dimension chromatographic resolution
3. High mass resolution and exceptional mass accuracy
4. High Resolution Deconvolution[®] (HRD[®]) from the leaders in deconvolution

An Integration of Two High Performance Technologies



+



• A combination of the highest performance GCxGC and TOF on the market gives users an unprecedented ability to interrogate complex samples

• Find more analytes than ever before and identify components with the ultimate confidence

• Mass accuracies of 1 ppm and peak capacities at least two times greater than any other product in the marketplace

• The industry's most established GCxGC system; thermal modulation with liquid nitrogen or cryogen-free versions

• Novel Encoded Frequent Pushing® (EFP®) allows increased sensitivity

• Chemical Ionization Source (HR-CI) data has the same mass accuracy and high resolution on pseudo-molecular ions, which complements the traditional Electron Ionization Source (HR-EI), to provide the comprehensive characterization of unknowns

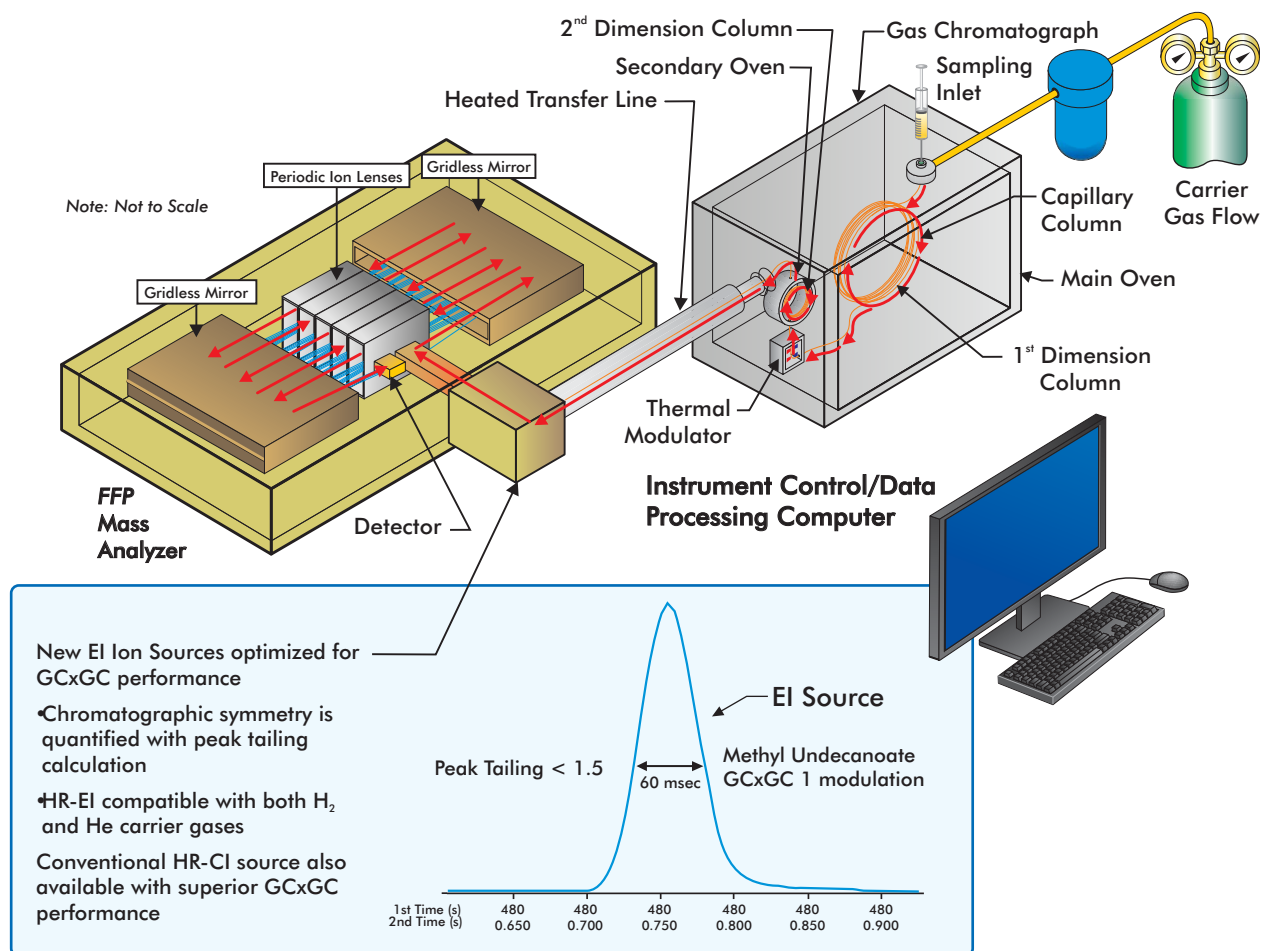
• Integrated software platform acquires data, controls all hardware, and analyzes and reports results with a high level of automation; tailored to get the most out of High Resolution TOF data

• Designed to maintain 1st dimension chromatographic separation and harness the power of a 2nd dimension of chromatography

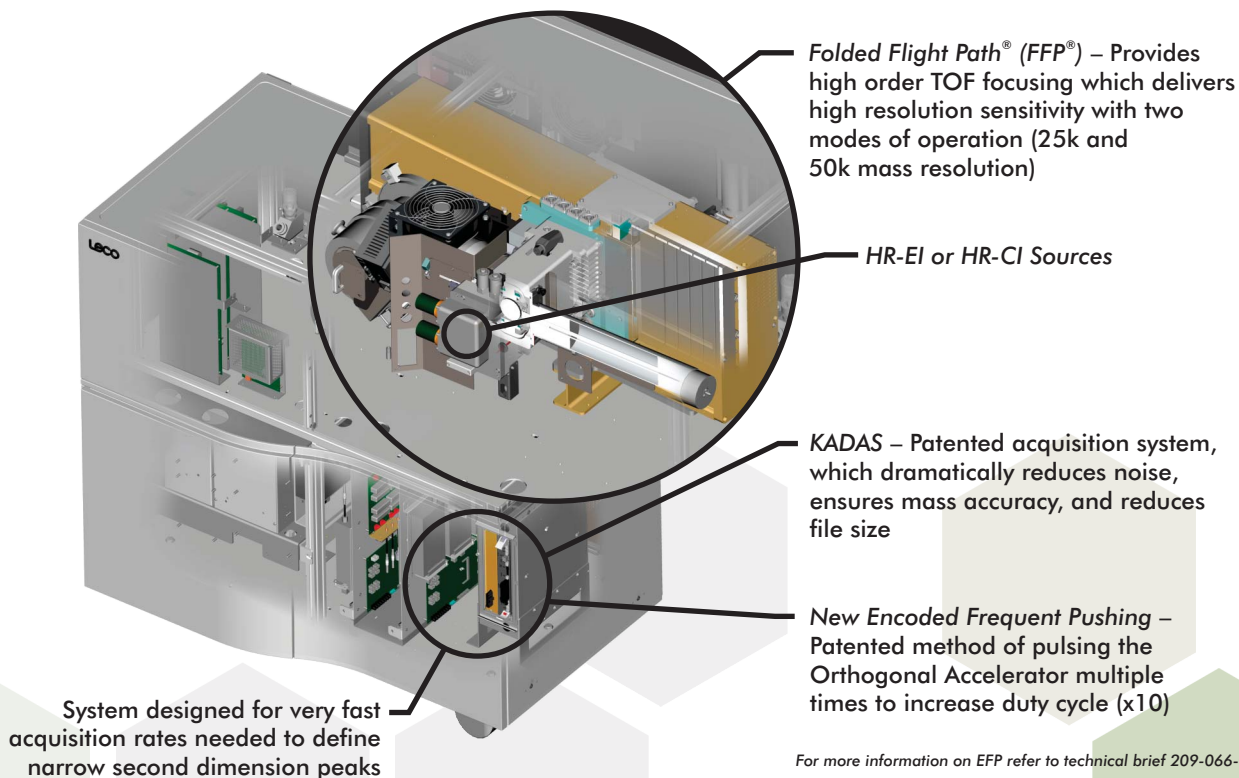


PEGASUS GC-HRT⁺ 4D Hardware

The industry's most established and reliable performance GCxGC technology.



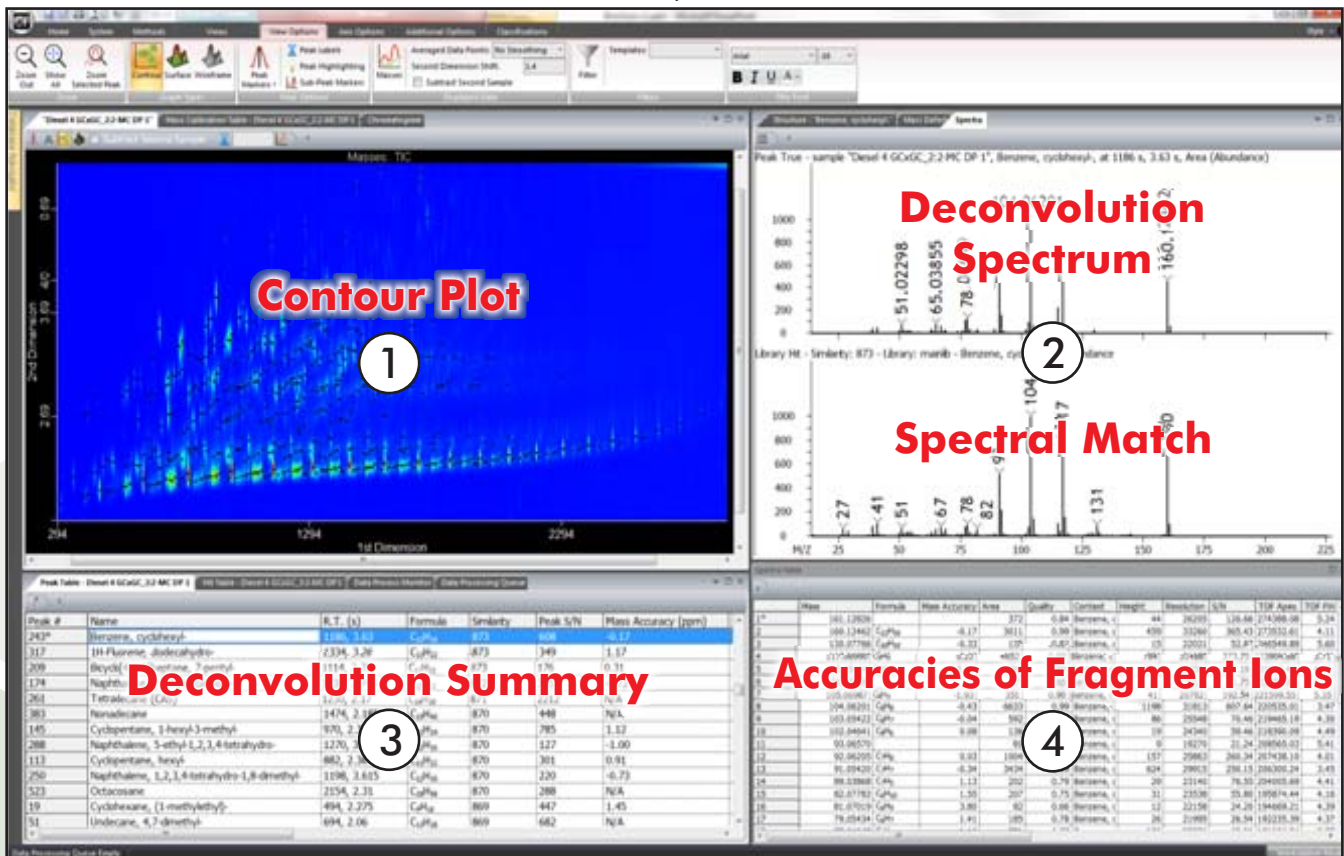
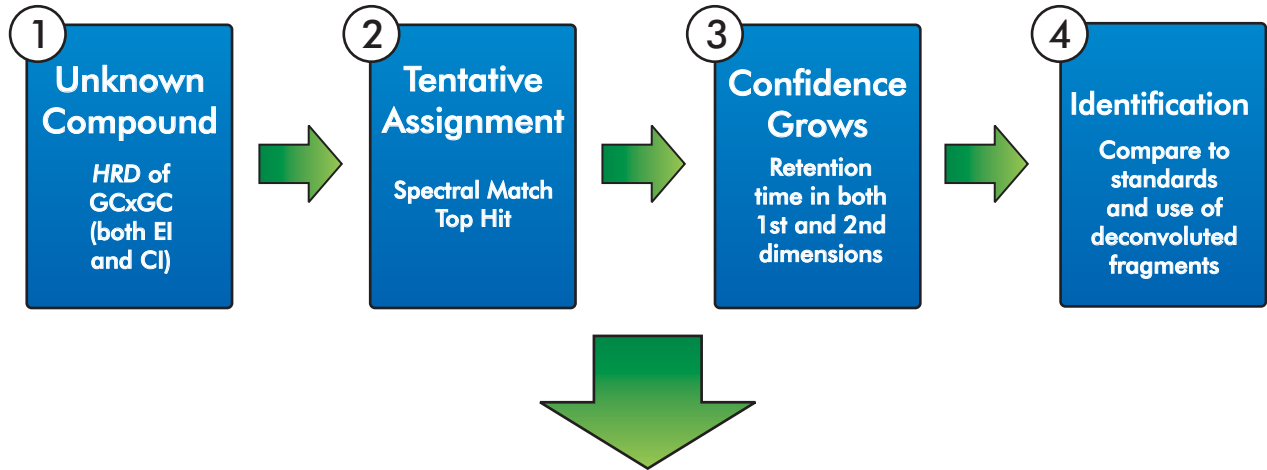
Capable of mass resolutions of up to 50,000 and acquisition rates up to 200 spectra/second.



For more information on EFP refer to technical brief 209-066-018.

PEGASUS GC-HRT⁺ 4D Software

Our integrated all-in-one ChromaTOF[®] brand software controls all hardware elements, automatically calculates mass accuracies, and identifies 2nd dimension peaks. With innovative features and functions based on our years of experience in GCxGC, the software is an exceptional tool to efficiently deliver maximum chemical information per sample.



Make GCxGC Easier

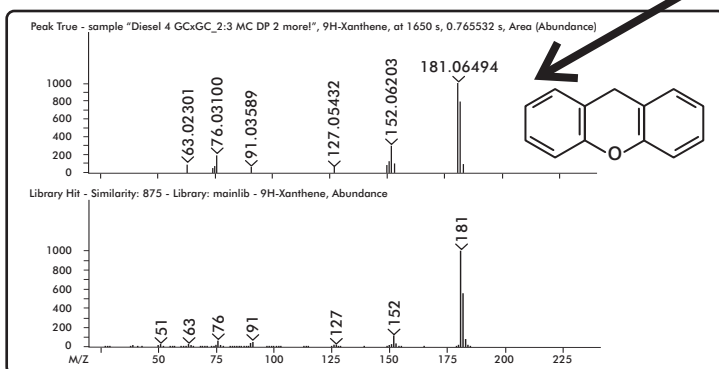
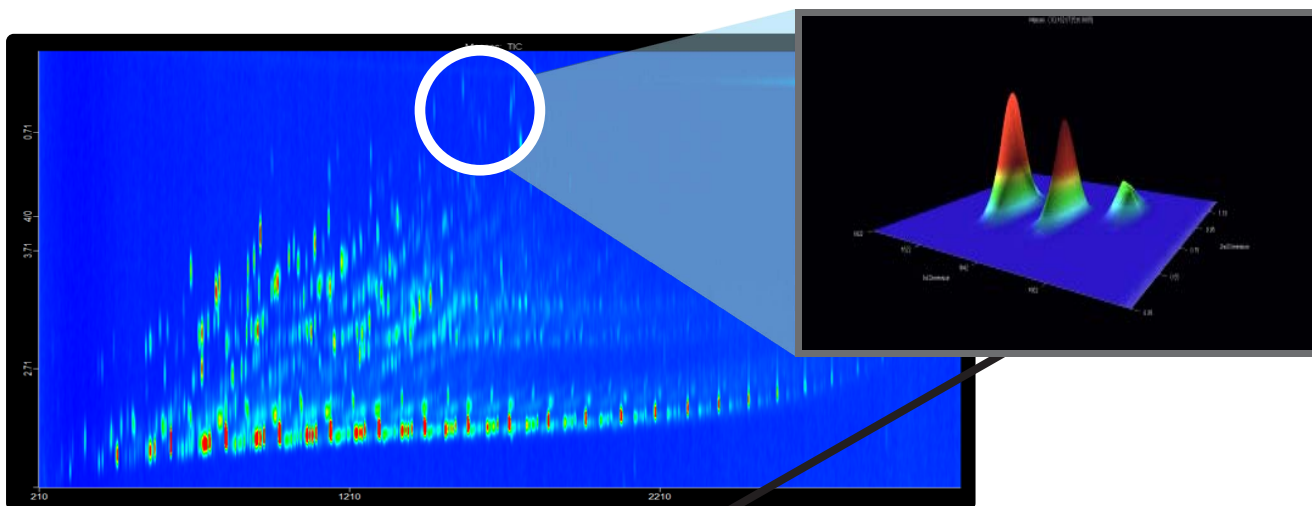
- Take advantage of the structured nature of GCxGC chromatograms with the Classification feature
- Simply GCxGC[®] method development tool
- A new standard GCxGC column setup and methods, allows users to be successful out of the box
- Easily switch between one-dimensional and GCxGC modes of operation

- GCxGC parameter checking for standard application column set
- Enhanced data filtering tools (peak true filter)
- Two-dimensional chromatographic resolution calculator

Identify Components with Confidence

High Resolution Deconvolution® (HRD®) Example: Diesel GCxGC

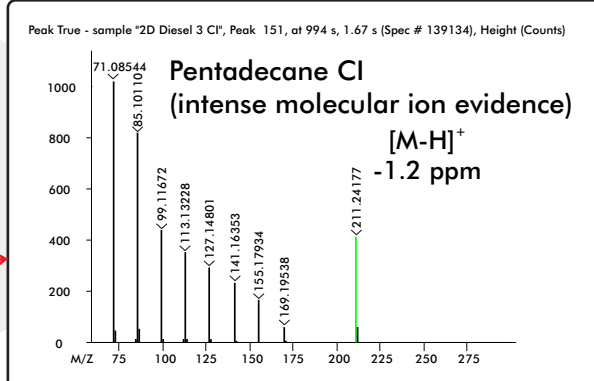
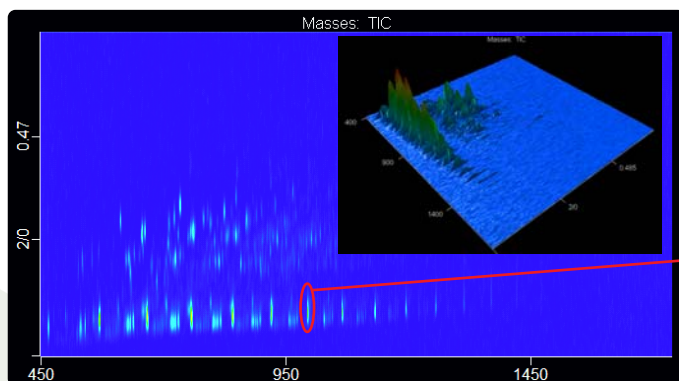
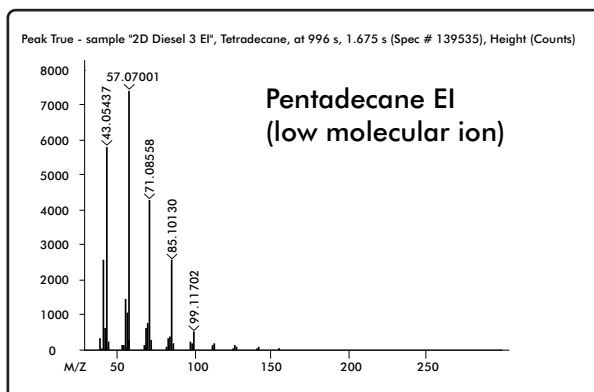
The combination of HRD and mass accuracy gives users exceptional confidence in identification.



Mass	Formula	Accuracy (ppm)
182.07233	C ₁₃ H ₁₀ O	-0.68
181.06494	C ₁₃ H ₉ O	0.80
152.06207	C ₁₂ H ₈	0.13

Identify More With Confidence

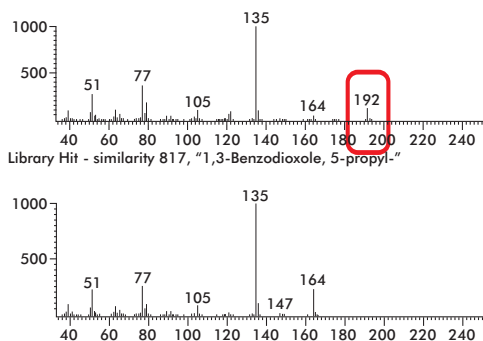
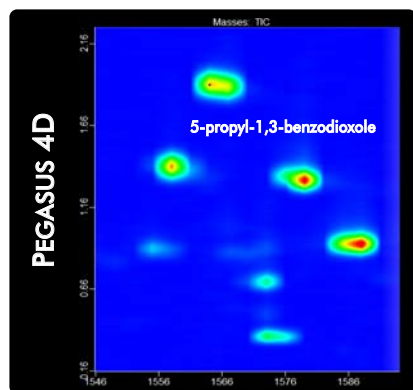
The complementary nature of HR-Cl is shown in this example. Pseudo-molecular ions (loss of H atom) confirm the presence of the identification of pentadecane from the CI mass spectrum.



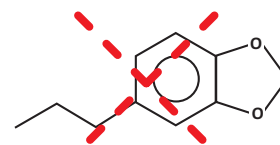
Make Your Unknowns → Known

Unknown identification is made easy with the Pegasus GC-HRT⁺ 4D. Example: Perfume Investigation

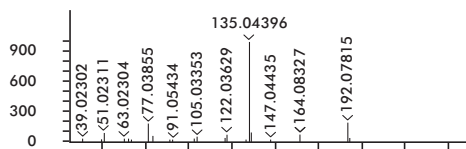
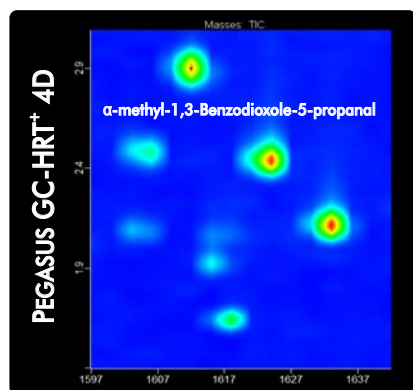
The process of improving identifications is simplified by the GC-HRT⁺ 4D. In this case, there is a moderate identification from our Pegasus 4D (top) of an analyte with very different odor properties. The Pegasus GC-HRT⁺ 4D (bottom) has improved the identification of this component to a more odor appropriate hit, as well as being more consistent with the data.



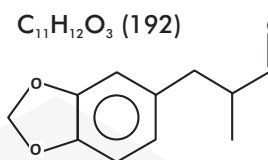
Identification close, but not precise.



Odor Type: Spicy



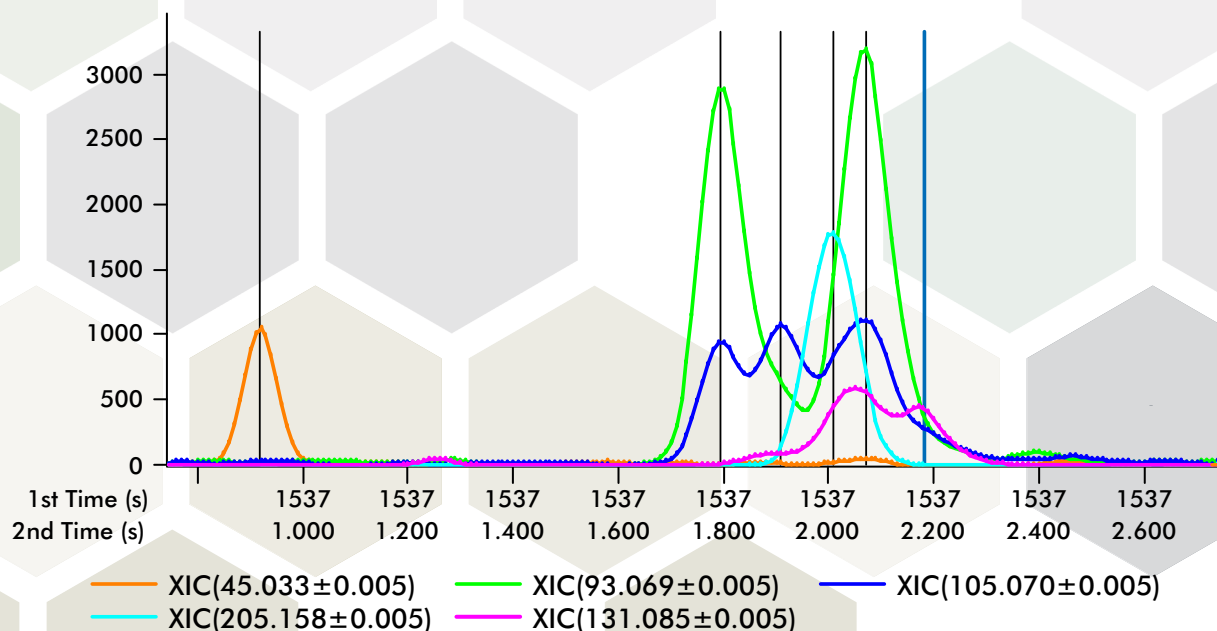
Formula	Observed Mass	Calculated Mass	Mass Accuracy (ppm)
C ₁₁ H ₁₂ O ₃	192.0782	192.0781	0.29
C ₁₀ H ₁₂ O ₂	164.0833	164.0832	0.53
C ₈ H ₈ O ₂	135.044	135.0441	-0.75
C ₇ H ₈ O ₂	122.0363	122.0362	0.47
C ₇ H ₈ O	105.0335	105.0335	0.38
C ₇ H ₈	77.03855	77.03858	-0.4



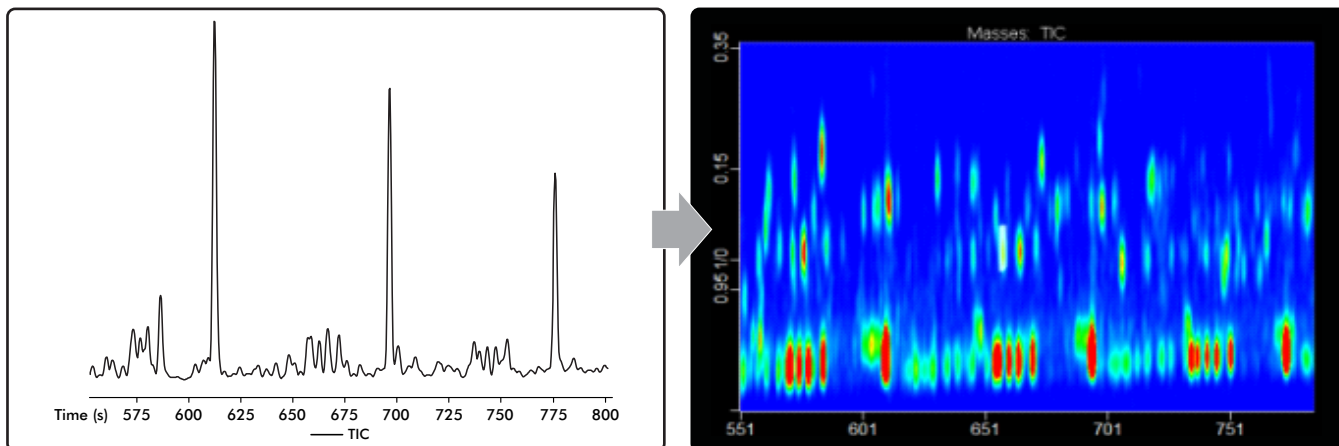
Odor Type: Floral

Find More Peaks

One modulation period is depicted below, fast spectra acquisition rates are vital to deconvolute complex regions of the chromatogram. Fast modulation is needed to maintain the first dimension of chromatography. If a peak in the second dimension chromatogram is 60 msec wide, it requires 200 Hz to sample appropriately for effective deconvolution.



Find More Peaks Using GCxGC and Discover What Else Is In Your Sample



Find more peaks than ever before using high resolution GCxGC. These insets of a diesel sample show the difference in data collected using one-dimensional (left) and two-dimensional chromatography (right).

Be More Confident In Your Assignments.

Better understand the chemistry of your sample by finding out what else is in your sample.

PEGASUS GC-HRT⁺ 4D

Deconvolution | GCxGC

Productivity | Reproducibility

Accurate Mass | Identification



Technical Research Center



Robert J Warren Customer Experience Center



Global Support Center

A Commitment to Quality and Service

LECO instruments are noted for superior precision, speed, and ease-of-use. We are an international company with over 25 subsidiaries worldwide. Our global network of sales/support is dedicated to customer service and satisfaction, and our commitment to quality is further underscored with ISO-9001:2015 certification. We conform to CE quality and safety specifications, fully testing our instruments at our on-site Compliance Testing Center.

LECO, Pegasus, ChromaTOF, Folded Flight Path, FFP, High Resolution Deconvolution, HRD, KADAS, Encoded Frequent Pushing, and EFP are registered trademarks of LECO Corporation. Microsoft, Windows are registered trademarks of Microsoft Corporation.

3000 Lakeview Avenue | St. Joseph, MI 49085 | 800-292-6141 | Phone: 269-985-5496
info@leco.com | www.leco.com | ISO-9001:2015 Q-994 | LECO is a registered trademark of LECO Corporation.