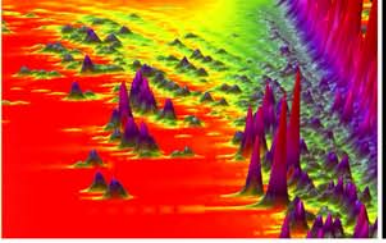
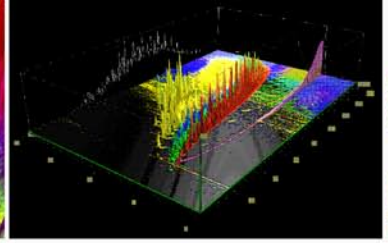
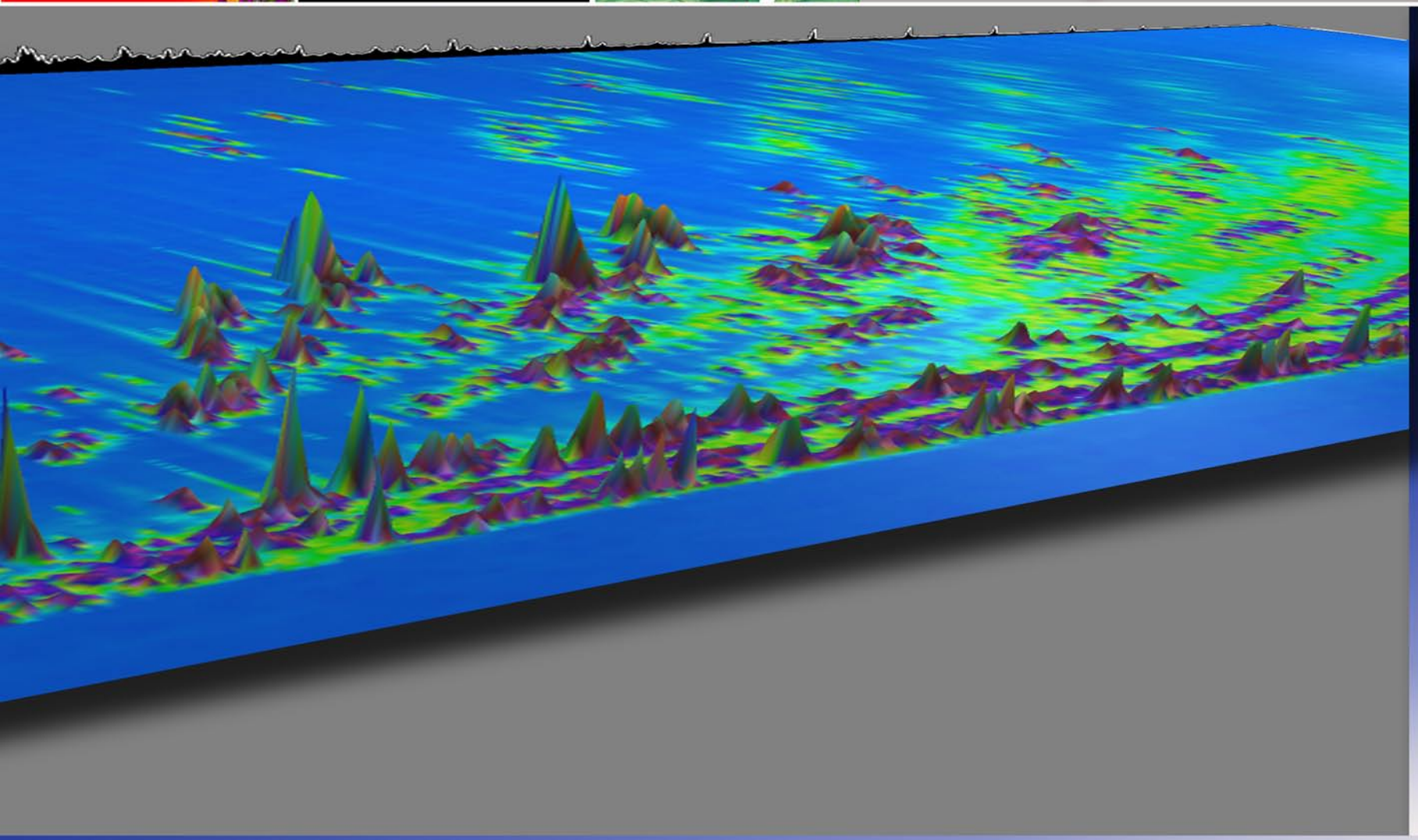




GC Image Software



ZOEX | CORPORATION

Introduction: Zoex GC Image and GC Project Software

GLOBAL LEADING SOFTWARE Welcome to the world's leading software for comprehensive two-dimensional gas chromatography (GC x GC). Under development for over a decade, GC Image is the most trusted software for identifying compounds and groups that standard GC does not resolve.

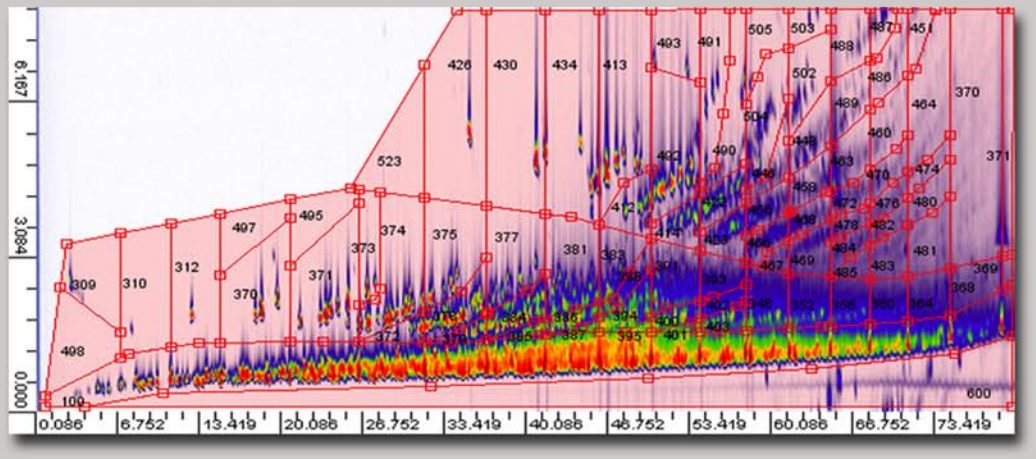
WHY DO I NEED GC IMAGE SOFTWARE? Comprehensive GC reveals chemical complexity obscured by one-dimensional GC. GC Image makes interpretation of GC x GC data routine.

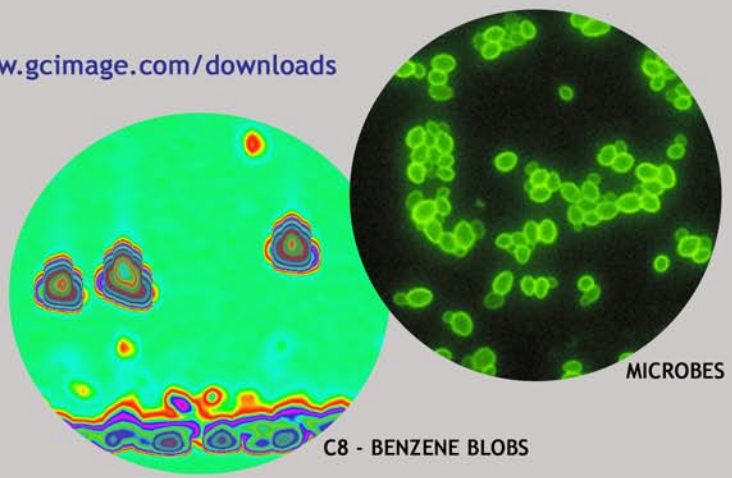
INNOVATIVE 2-in-1 SOFTWARE GC Image provides a 2-in-1 solution for identifying and quantifying compounds and groups in GC x GC images: (1) **GC Image** for manually processing individual GC x GC chromatograms; (2) **GC Project** for automatically processing multiple GC x GC chromatograms from autosampler sequences.

COMPATIBILITY GC Image works with most data files from most GC platforms.

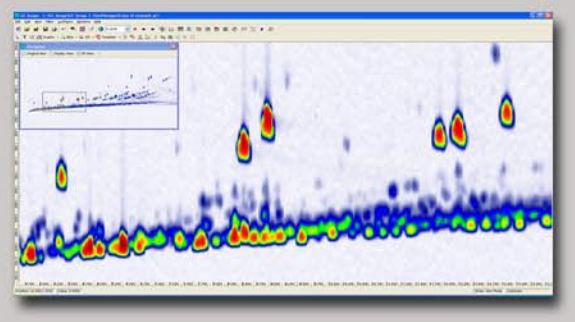
FREE TRIAL GC Image Software is available for a **FREE** trial. Download software at www.gcimage.com/downloads

BASIC FUNCTIONS Colorize images, zoom, pan and navigate. Read, save and print peak and compound class tables. Examine raw pixel data. Display, format, manipulate, save and print 3-D images. Annotate with text, graphics and chemical structures. Flatten baseline and detect Blobs (Peaks). Intuitive graphical user interfaces for every functionality.





"BLOBS" GC x GC peaks resemble microbes in photomicrographs which computer imaging experts call "blobs". The GC x GC community uses "Blobs" and "Peaks" interchangeably.



ADVANCED FUNCTIONS Detect compound classes with mass spectral criteria. NIST and Wiley MS library searches. Determine elemental compositions from HRMS data. Automatic quantitative analysis of complex mixtures. Extensive image comparison facilities.

" We currently use GC Image for the processing of GC x GC data coming from various instruments. We especially appreciate the reactivity of GC Image developers and the continuous improvements they bring to the software to make it compliant with the specificity of the Flavour and Fragrance field."
-- Dr. Frédéric Begnaud, Firmenich SA, Analytical Innovations - Corporate R&D Division

PEPPERMINT

TABLE OF CONTENTS

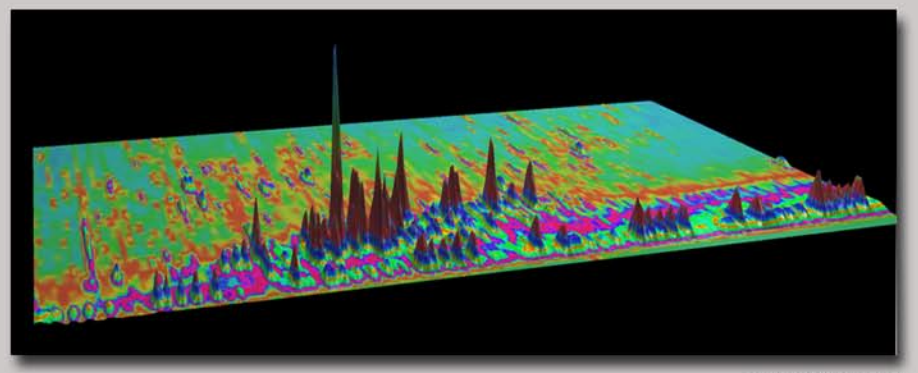
UNIQUE CAPABILITIES AND BENEFITS

TEMPLATES FOR TARGET ANALYTE IDENTIFICATION routinely identify, quantify, annotate and report multiple compounds and compound classes using "Smart-Templates"™ (page 5)

1-STEP COMPOUND CLASS IDENTIFICATION Identify compound classes using "CLIC" (Computer Language for Identifying Chemicals) (page 6)

IMAGE TILING FOR FAST DATA ANALYSIS Rapidly partition a GC Image into simple integration windows. (page 7)

FULLY AUTOMATED QUANTITATION & REPORTING Generate quantitation reports automatically with built-in GC Project software. (page 8)



PEPPERMINT OIL

IMAGE COMPARISON Image comparison tools cause minute differences between images to "pop out" visually. (page 9)

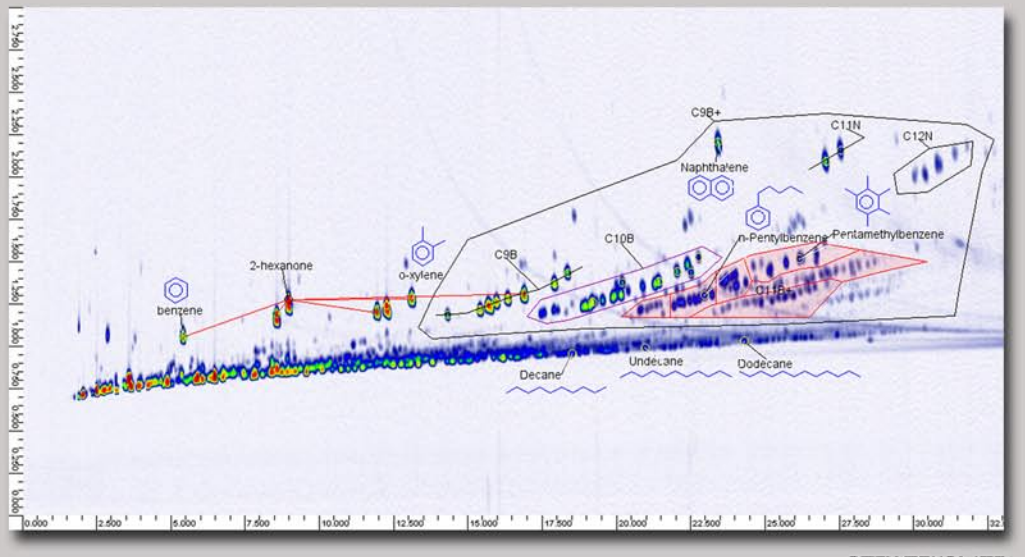
ELEMENTAL COMPOSITION DETERMINATION Determine elemental compositions derived from HRMS detection. (page 10)

SUPPORT Zoex provides the best software support in the industry.

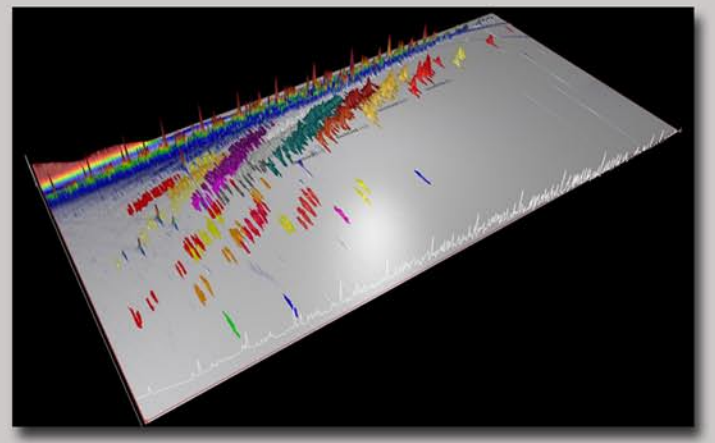
SMART-TEMPLATES™ FOR TARGET ANALYTE AND GROUP IDENTIFICATION

Smart-Templates™ are sophisticated “integration windows” that tell the computer how to label peaks and groups, append notations and chemical structures and extract quantitative information.
A variety of “Smart-Template Objects” support:

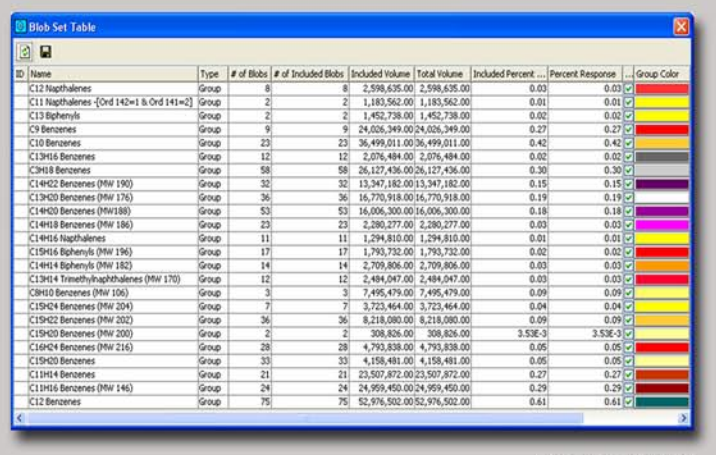
- Detecting blobs
- Detecting groups
- MS screening of blobs or groups
- Whole-image segmentation and analysis
- Spatial transformation (warps) of templates
- Simple integration areas (similar to 1DGC integration)
- Internal or external standard quantitation



BTEX TEMPLATE



CLIC GROUPS



ID	Name	Type	# of Blobs	# of Included Blobs	Included Volume	Total Volume	Included Percent ...	Percent Response	...	Group Color
	C12 Napthalenes	Group	8	8	2,598,635.00	2,598,635.00	0.03	0.03	☑	
	C11 Napthalenes -[Ord 142=1 & Ord 141=2]	Group	2	2	1,183,562.00	1,183,562.00	0.01	0.01	☑	
	C13 Biphenyls	Group	2	2	1,452,738.00	1,452,738.00	0.02	0.02	☑	
	C9 Benzenes	Group	9	9	24,026,349.00	24,026,349.00	0.27	0.27	☑	
	C10 Benzenes	Group	23	23	36,499,011.00	36,499,011.00	0.42	0.42	☑	
	C13H16 Benzenes	Group	12	12	2,076,484.00	2,076,484.00	0.02	0.02	☑	
	C9H18 Benzenes	Group	58	58	26,127,436.00	26,127,436.00	0.30	0.30	☑	
	C14H22 Benzenes (MW 190)	Group	32	32	13,347,182.00	13,347,182.00	0.15	0.15	☑	
	C13H20 Benzenes (MW 176)	Group	36	36	16,770,918.00	16,770,918.00	0.19	0.19	☑	
	C14H20 Benzenes (MW188)	Group	53	53	16,006,300.00	16,006,300.00	0.18	0.18	☑	
	C14H18 Benzenes (MW 186)	Group	23	23	2,280,277.00	2,280,277.00	0.03	0.03	☑	
	C14H16 Napthalenes	Group	11	11	1,294,810.00	1,294,810.00	0.01	0.01	☑	
	C15H16 Biphenyls (MW 196)	Group	17	17	1,793,732.00	1,793,732.00	0.02	0.02	☑	
	C14H14 Biphenyls (MW 182)	Group	14	14	2,709,806.00	2,709,806.00	0.03	0.03	☑	
	C13H14 Trimethylnaphthalenes (MW 170)	Group	12	12	2,484,047.00	2,484,047.00	0.03	0.03	☑	
	C8H10 Benzenes (MW 106)	Group	3	3	7,495,479.00	7,495,479.00	0.09	0.09	☑	
	C15H24 Benzenes (MW 204)	Group	7	7	3,723,464.00	3,723,464.00	0.04	0.04	☑	
	C15H22 Benzenes (MW 202)	Group	36	36	8,218,080.00	8,218,080.00	0.09	0.09	☑	
	C15H20 Benzenes (MW 200)	Group	2	2	308,826.00	308,826.00	3.53E-3	3.53E-3	☑	
	C16H24 Benzenes (MW 216)	Group	28	28	4,793,838.00	4,793,838.00	0.05	0.05	☑	
	C15H20 Benzenes	Group	33	33	4,158,481.00	4,158,481.00	0.05	0.05	☑	
	C11H14 Benzenes	Group	21	21	23,507,872.00	23,507,872.00	0.27	0.27	☑	
	C11H16 Benzenes (MW 146)	Group	24	24	24,959,450.00	24,959,450.00	0.29	0.29	☑	
	C12 Benzenes	Group	75	75	52,976,502.00	52,976,502.00	0.61	0.61	☑	

BLOB SET TABLE

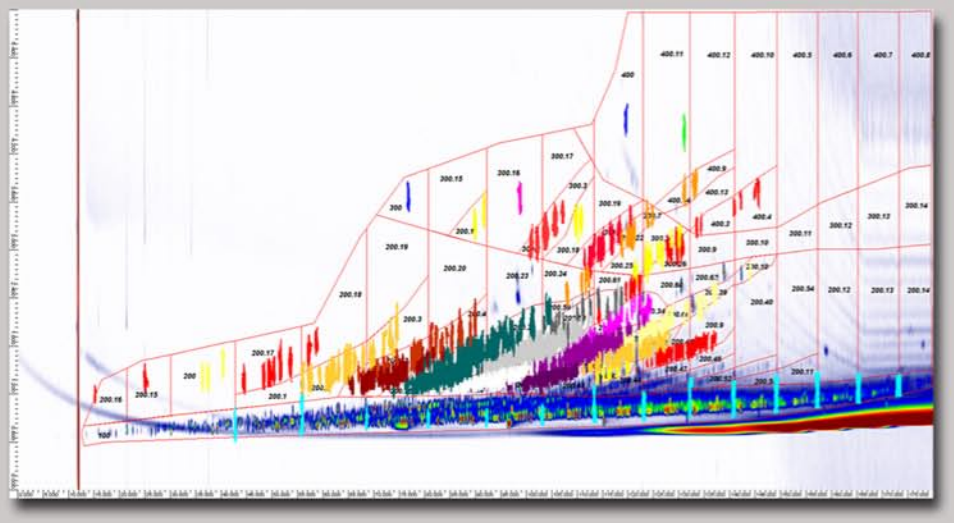
COMPOUND CLASS IDENTIFICATION

“CLIC Expressions” rapidly identify compound classes in a complex mixture. For example, classifying aromatics in diesel fuel takes less than a second, once the appropriate CLIC expressions have been recorded into a template.

"Excellent work! You solved the problem and made my day. By simply checking my desktop structure you found a shortcut which didn't belong. Once it was removed the latest version of GC Image was easily installed and is now working. This is highly appreciated!"
-- Patric Eckerle, Dow Chemical, Germany

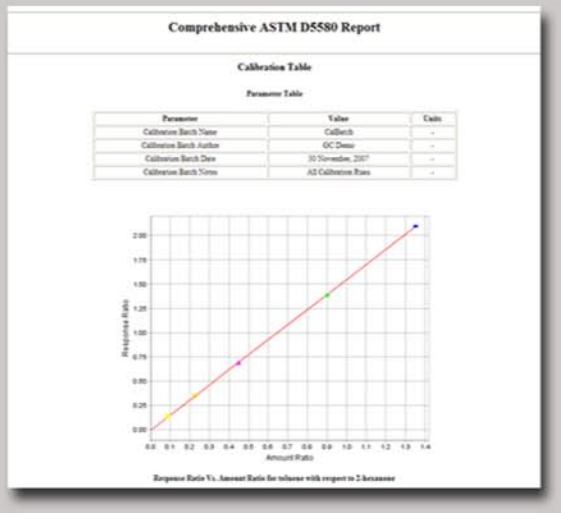
IMAGE TILING FOR FAST DATA QUANTITATION

Images can be partitioned into adjacent, non-overlapping, simple integration windows. Newly developed GC Image tiling tools make it fast and efficient to create complicated tilings like the one below. Once tiled, quantitation takes less than one second and can be fully automated.



GC PROJECT

GC Project, a companion application bundled with GC Image, automates analysis and reporting. For supported GC models, set up sequence tables from within GC Project and download them to the GC.

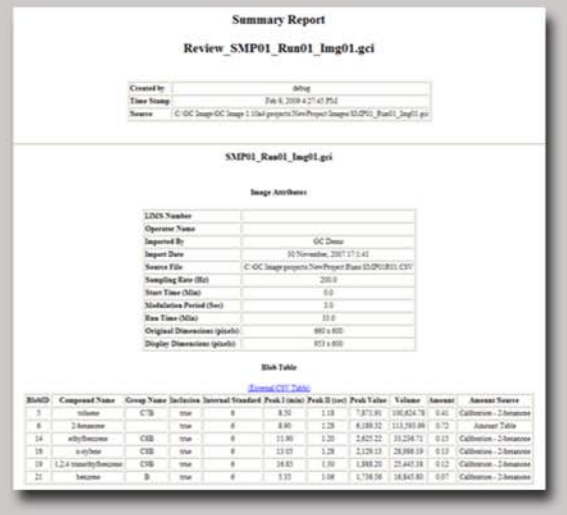

Comprehensive ASTM D5580 Report

Calibration Table

Parameter Table

Parameter	Value	Units
Calibration Batch Name	CalBatch	-
Calibration Batch Author	GC Demo	-
Calibration Batch Date	30 November, 2007	-
Calibration Batch Notes	All Calibration Runs	-

Response Ratio Vs. Amount Ratio for toluene with respect to 2-hexanone


Summary Report

Review_SMP01_Run01_Img01.gci

Created by	debug
Time Stamp	Feb 6, 2009 4:27:45 PM
Source	C:\GC Image\GC Image 2.11\bin\projects\NewProject\Images\SMP01_Run01_Img01.gci

SMP01_Run01_Img01.gci

Image Attributes

LIMS Number	
Operator Name	
Imported By	GC Demo
Import Date	30 November, 2007 17:1:41
Source File	C:\GC Image\projects\NewProject\Runs\SMP01\R01.CSV
Sampling Rate (Hz)	200.0
Start Time (Min)	0.0
Modulation Period (Sec)	3.0
Run Time (Min)	33.0
Original Dimensions (pixels)	680 x 600
Display Dimensions (pixels)	853 x 600

Blob Table

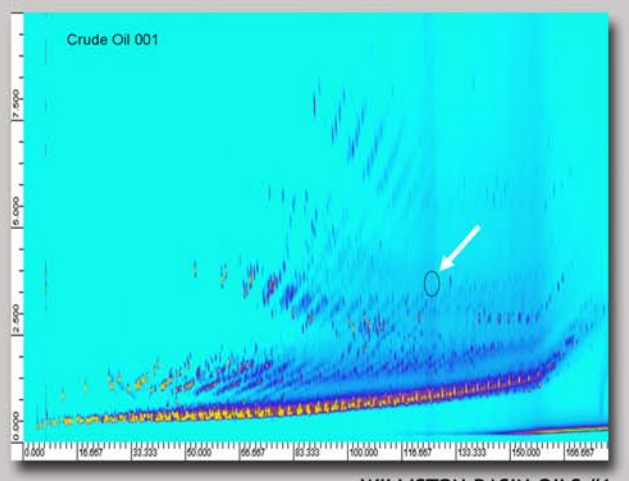
(Export CSV Table)

BlobID	Compound Name	Group Name	Inclusion	Internal Standard	Peak I (min)	Peak II (sec)	Peak Value	Volume	Amount	Amount Source
5	toluene	C7B	true	0	8.50	1.18	7,871.91	105,424.78	0.41	Calibration - 2-hexanone
6	2-hexanone		true	0	8.90	1.28	8,189.32	113,585.89	0.72	Amount Table
14	ethylbenzene	C8B	true	0	11.90	1.20	2,625.22	31,256.71	0.15	Calibration - 2-hexanone
15	o-xylene	C8B	true	0	13.05	1.28	2,129.13	28,900.19	0.13	Calibration - 2-hexanone
19	1,2,4 trimethylbenzene	C9B	true	0	16.85	1.30	1,988.20	25,445.38	0.12	Calibration - 2-hexanone
21	benzene	B	true	0	5.35	1.08	1,736.56	18,847.80	0.07	Calibration - 2-hexanone

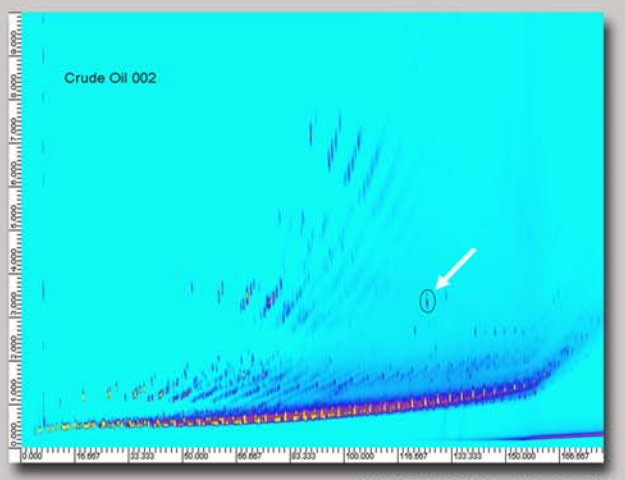
IMAGE COMPARISON

IMAGE ALGEBRA Add, subtract, multiply images and colorize the results.

BLINK TEST The Blink Test displays a pair of registered images alternately every half second. Compounds or groups present in one image, but not the other, will "blink". Long used by astronomers to detect planets and comets, the "blink" test allows you to discover small differences amongst thousands of resolved peaks.



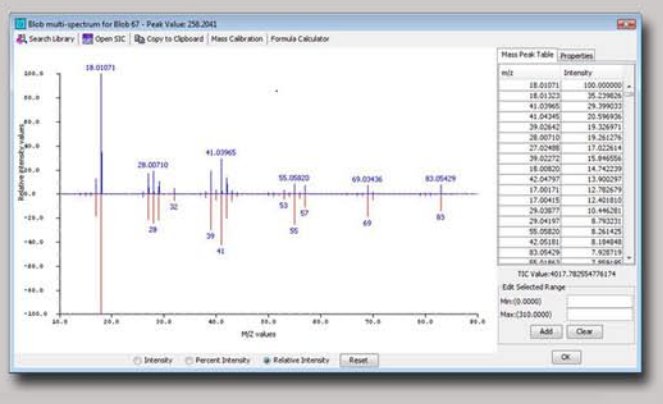
WILLISTON BASIN OILS #1

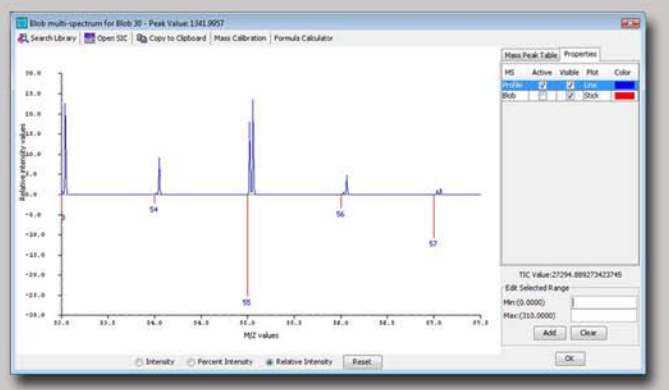


WILLISTON BASIN OILS #2

HIGH RESOLUTION MS DATA

High resolution MS data permits elemental composition determinations on the basis of exact mass measurements. Elemental composition lists can be pruned by a variety of methods, but GC x GC retention data, which provides compound class information is usually definitive.

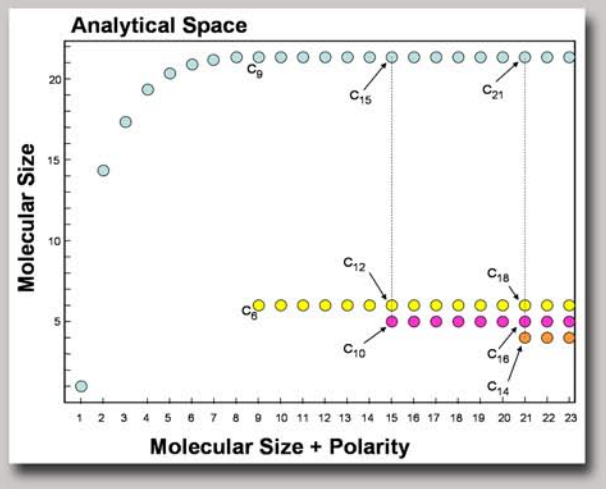


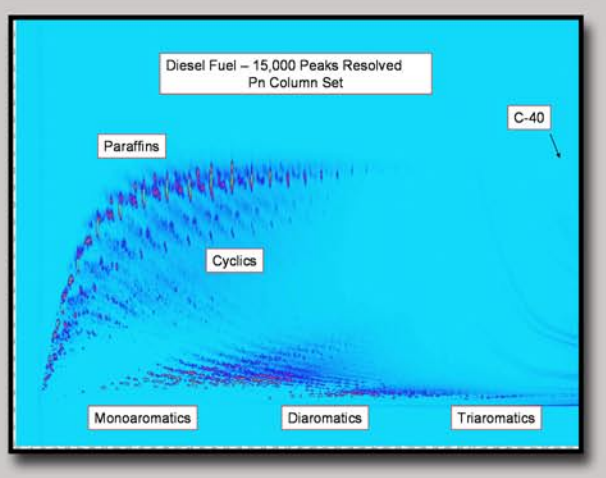


"I enjoyed the training very much. It was useful. The most important was the discussion of the test questions."
-- Erika Knapp, MOL Group, Hungary

TRAINING AND SUPPORT

GC Image is intuitive, but specialized professional software. We recommend classroom training. Analysts around the world attend Zoex software training courses and return home with the confidence to develop their methods.





LEARN TO:

- Colorize images, display 3-D perspectives
- Flatten baseline, detect peaks
- Identify compounds and groups
- Build templates
- Determine elemental compositions of targets
- Compare images
- Automate analysis

CLASSES

Zoex offers on-site and on-line training. Our on-site classes (held at our head-quarters in Houston, Texas and at our Zoex Europe office based in Eindhoven, The Netherlands) receive high praise from comprehensive GC analysts across the globe.

TELEPHONE SUPPORT

Zoex Corporation answers telephone calls in person during regular business hours. Any of our sales and service centers will be able to connect you to the right person.

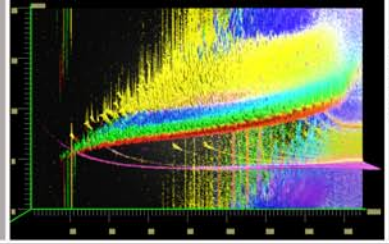
EMAIL SUPPORT

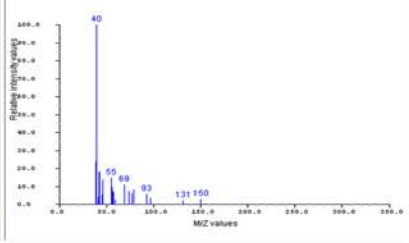
You may contact any member of our staff by email. We handle 95% of our service request calls with single emails within four hours.

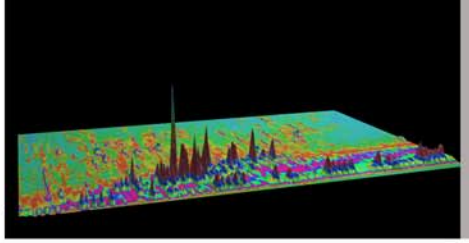
ONLINE MEETINGS

We invite online meetings with our technical staff at any time. Contact us to learn how easy and efficient it is to use our online training service and support facilities.

Visit www.zoex.com or www.zoex.eu for information on curriculum, pricing and class schedules.







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