

Liquid Chromatograph

chro~~zen~~ LC

A New Perspective of Smart LC



All New HPLC chroZen HPLC

Innovation Into a Smart Platform

The HPLC market is flooded with a numbers of HPLC suppliers and you might have faced an experience struggling with which HPLC to choose that best meets your requirement. However, you'll be able to end up with ChroZen HPLC once you define your goal and narrow down your needs such as quality of data, accuracy, and sensitivity. YoungIn Chromass proudly introduces our 5th generation of HPLC that delivers the most reliable data through the FlowMaster™ technology providing accurate and precise flow rate at any conditions. You can also get support next to your door by trained manpower through our worldwide network.



1989
M900 HPLC

2000
Acme 9000 HPLC

2008
YL9100 HPLC

2017
YL9100 Plus HPLC

2021
chroZen HPLC

chro~~zen~~ HPLC at a Glance

Looks Good? Works Better!

The Reliable



The Heart of HPLC, Reliable Evolution

- The most accurate and precise flow rate by FlowMaster™ Technology (RT Repeatability RSD <0.05 %, Area Repeatability RSD <0.3%)
- Superior resolution and reproducibility through smart air circulation fulfilling perfect uniformity and stability of column temperature. ($\pm 0.03^{\circ}\text{C}$)
- Fast response time by damper-less pump design & ultra-low carryover mixing valve
- Effective mixing in a mixing tee at forefront of pump head

The Productive



Productivity Fits the Bill

- Sufficient capacity for 30 cm columns up to 4 ea
- Active wash for low carry-over (<0.003%)
- Enlarged sample capacity (120 samples: 2ml vial)
- Direct & fast injection for low sample consumption

The Various



- Remarkable sensitivity & selectivity for any applications
- Versatile detectors available
 - : UV/Vis Detector
 - : Photo Diode Array Detector
 - : Refractive Index Detector
 - : Fluorescence Detector
 - : Evaporative Light Scattering Detector
 - : Electrochemical Detector



The Reliable Never Lies

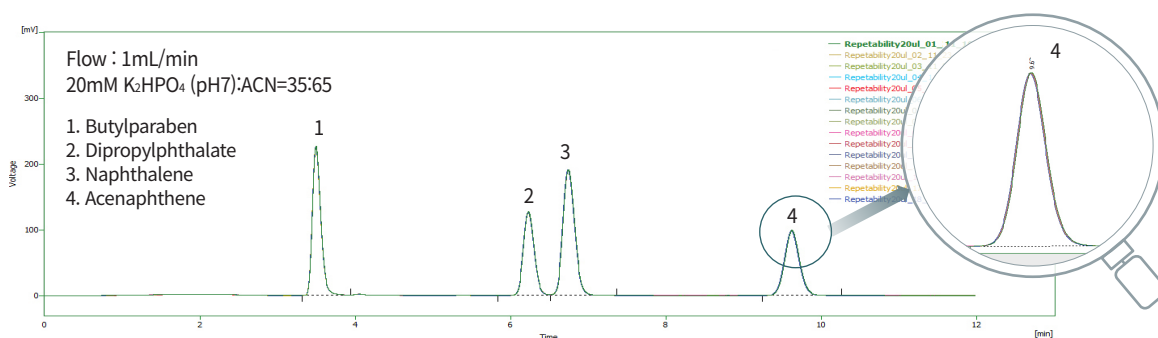
The foremost technique of ChroZen HPLC, FlowMaster™, yields the most accurate and precise flow rate by building an unique algorithm to make correct predictions for compressibility compensation of solvent in any condition. This enables to deliver extremely stable flow rate through monitoring flow fluctuation and provide the remarkable RT Repeatability as well as Area Repeatability.

RT(min)	Butylparaben	Naphthalene	Acenaphthene
1	3.4966667	6.7483333	9.6266667
2	3.4950000	6.7450000	9.6250000
3	3.4950000	6.7450000	9.6233333
4	3.4950000	6.7450000	9.6233333
5	3.4950000	6.7433333	9.6200000
6	3.4950000	6.7433333	9.6200000
7	3.4950000	6.7416667	9.6183333
8	3.4950000	6.7416667	9.6200000
9	3.4950000	6.7450000	9.6216667
10	3.4966667	6.7466667	9.6250000
11	3.4966667	6.7466667	9.6250000
12	3.4966667	6.7466667	9.6250000
13	3.4966667	6.7450000	9.6216667
14	3.4933333	6.7416667	9.6183333
15	3.4950000	6.7416667	9.6166667
%RSD	0.03	0.03	0.03

RT Repeatability RSD <0.03 %

Area(uV.s)	Butylparaben	Naphthalene	Acenaphthene
1	1665.203	2023.240	1324.013
2	1666.083	2022.766	1325.428
3	1663.016	2022.895	1323.520
4	1663.016	2022.895	1323.520
5	1663.055	2019.171	1322.135
6	1666.463	2022.453	1324.331
7	1663.651	2014.065	1320.989
8	1665.339	2022.787	1324.365
9	1665.457	2015.482	1320.537
10	1661.758	2013.228	1321.120
11	1658.465	2016.868	1320.258
12	1661.570	2013.994	1322.988
13	1662.056	2018.509	1322.162
14	1665.536	2018.553	1322.731
15	1667.259	2023.967	1323.803
%RSD	0.14	0.20	0.12

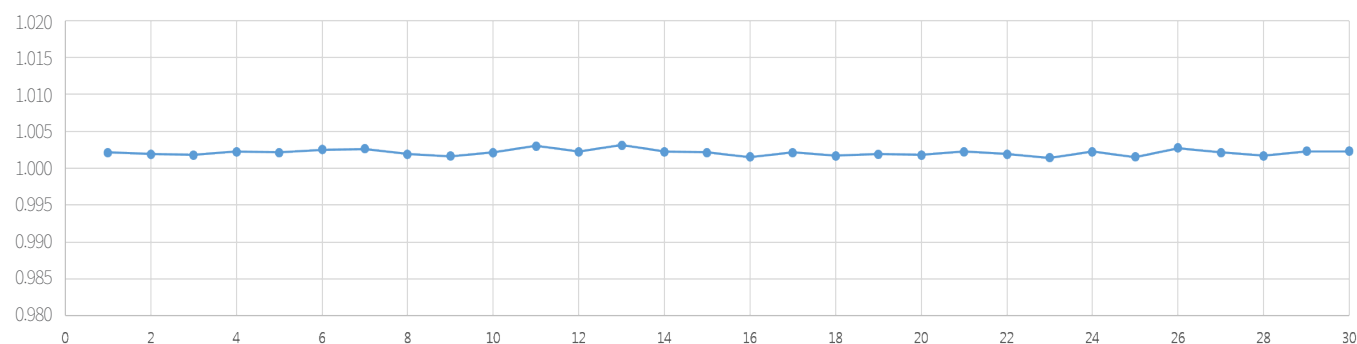
Area Repeatability RSD <0.2%



<RT Repeatability & Area Repeatability Data of 200 ppm sample in 15 Sequence Injections>

Flow Accuracy and Precision at 30 sequence test with flow rate change

	1	2	3	4	5		27	28	29	30	Ave.	Precision	Accuracy
0.5ml/min	0.5031	0.5031	0.5027	0.5033	0.5024		0.5031	0.5024	0.5025	0.5025	0.50284	0.066%	0.564%
1.0ml/min	1.0021	1.0019	1.0018	1.0022	1.0021		1.0021	1.0017	1.0023	1.0023	1.00209	0.041%	0.209%
1.5ml/min	1.5093	1.5081	1.5105	1.5101	1.5089		1.5093	1.5089	1.509	1.5095	1.50949	0.047%	0.629%
2.0ml/min	2.0012	2.0008	2.0005	2.0005	2.0015		2.0031	2.0033	2.0024	2.0024	2.00192	0.048%	0.096%



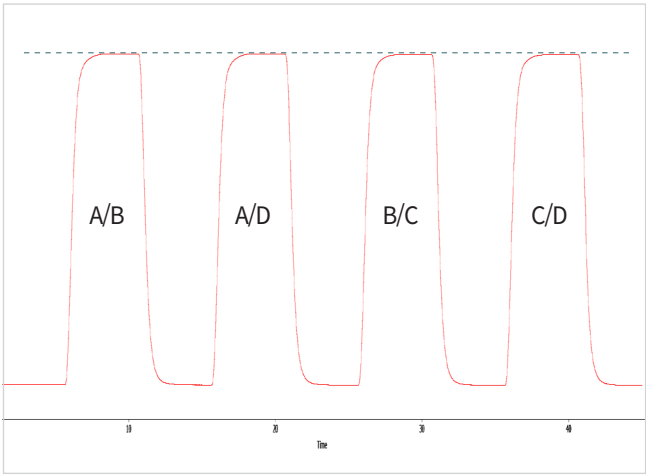
<Flow Test at 1.0 ml/min>

Faithful to the Basic

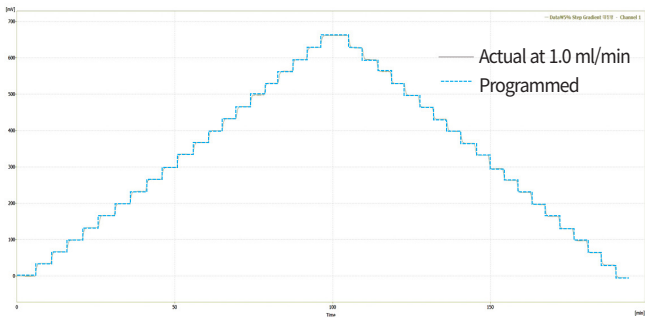
Gradient Proportioning Valve Test

In the low-pressure gradient mode, it is important to have the right proportion of each solvent and the accuracy of the desired mobile phase mixture relies on the performance of the proportioning valve and affects the gradient mixing efficiency.

Solvent	A	B	C	D
Initial (min)	50	0	50	0
5	50	0	50	0
5.1	10	90	0	0
10	10	90	0	0
10.1	50	0	50	0
15	50	0	50	0
15.1	10	0	0	90
20	10	0	0	90
20.1	50	0	50	0
25	50	0	50	0
25.1	0	90	10	0
30	0	90	10	0
30.1	50	0	50	0
35	50	0	50	0
35.1	0	0	10	90
40	0	0	10	90
40.1	50	0	50	0
45	50	0	50	0

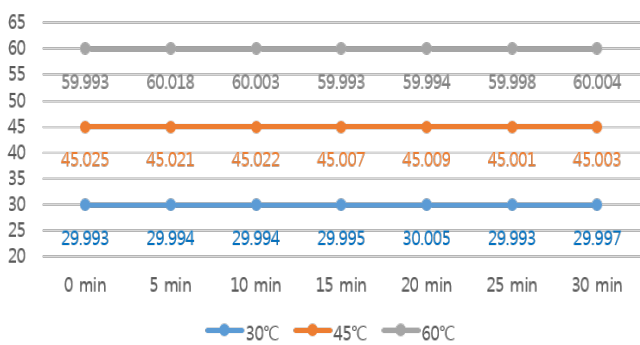


As shown on the gradient proportioning valve test, the plateau height and the shape of each peak are almost same and this assures the how effectively the proportioning valve works for mixing rate accuracy and reproducibility while applying the perfect compressibility compensation for the solvent mixture.



The damper-less pump design lowers the dwell volume for the faster response for the solvent mixing rate change to acquire the accuracy of step gradients and shortens the retention time with the sharper peaks which lead the superior resolution.

Column Oven Thermal Uniformity & Stability



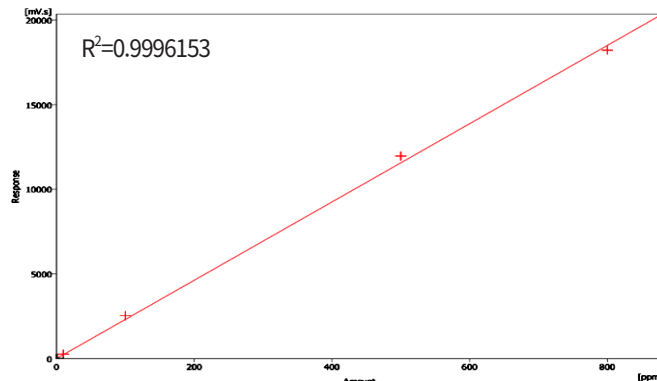
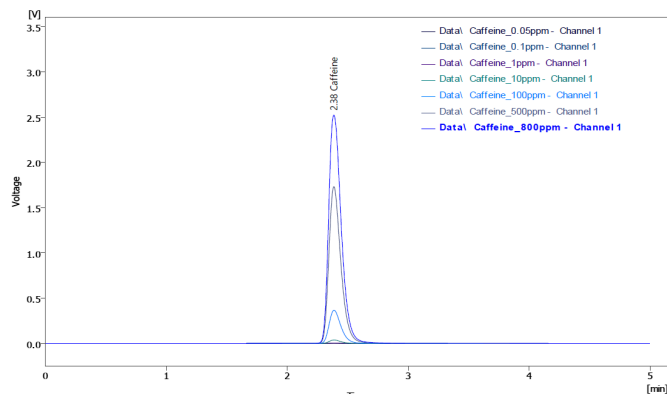
Oven Temperature Stability : ± 0.03°C

The smart air circulation mechanism enhances the thermal uniformity and stability inside of column oven with process safety and no thermal loss to maximize the separation efficiency. The peltier type temperature control fulfills the accurate and precise oven temperature and the dynamic oven fan motor speeds up the cooling time for faster run time.

Sensitivity & Variety, Let Them Rule

ChroZen HPLC UV/Vis detector

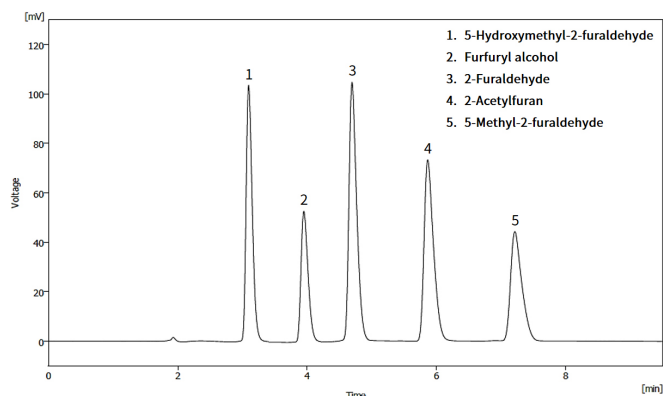
The most used HPLC detector, UV/Vis detector needs to be robust and sensitive enough to be utilized in various applications. ChroZen HPLC UV/Vis detector guarantees superior sensitivity and a wide dynamic range for universal detection



<Analysis of Caffeine at 0.05, 0.1, 1, 10, 100, 500, 800 ppm>

ChroZen HPLC PDA detector

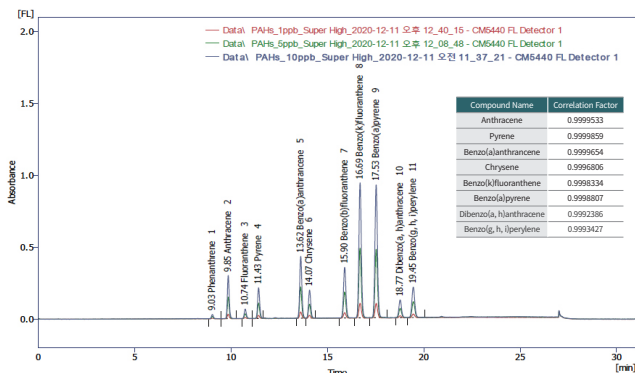
ChroZen HPLC PDA detector can provide the equivalent data results to UVD as well as the spectral information to determine the accurate peak qualification. The multiple PDA channels (1024 arrays) allow the high spectral resolution in the wide wavelength range (190~950 nm) at once.



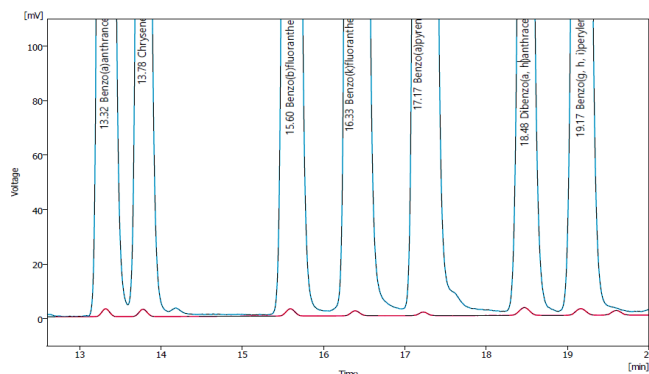
<Analysis of Furanic Compounds (1ppm) with ChroZen HPLC PDA Detector>

ChroZen HPLC Fluorescence Detector

ChroZen HPLC FLD is efficient to detect compounds having fluorophore with specific functional groups like these, these fluorescent substances with a remarkable selectivity using specified excitation and emission wavelengths. This offers the superior sensitivity up to 1000 times higher than UV absorption.



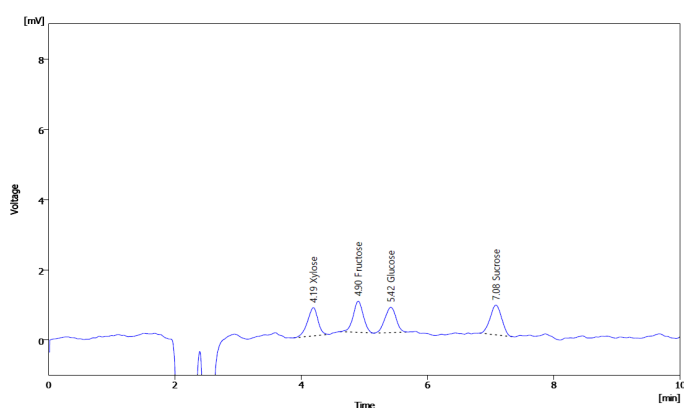
<Analysis of PAHs with ChroZen HPLC FLD at 1/5/10 ppb>



<Sensitivity Comparison of FLD vs UVD at 1 ppm PAHs sample>

ChroZen HPLC Refractive Index Detector

As a non-destructive and universal detector, ChroZen HPLC RID can be used for the analysis of compounds with low or no UV absorbance such as sugars and the identification of polymer characteristics with the rapid stabilization of baseline through the dual temperature control system.



<Analysis of Sugars at 50 ppm by ChroZen HPLC RID>

Electrochemical Detector(ECD)

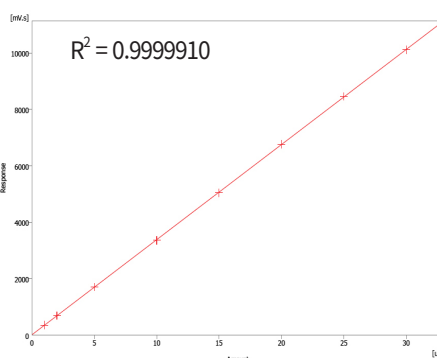
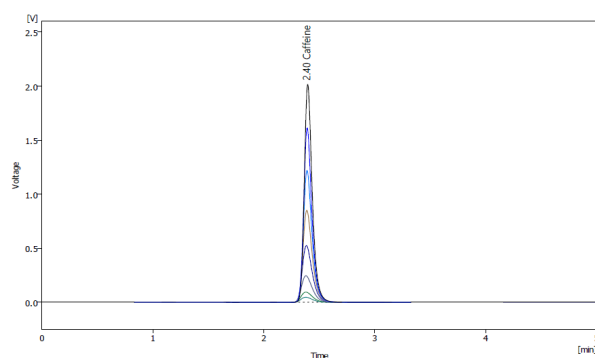
ECD is a detector for HPLC applied to variable analyses such as biogenic amines, phenols, vitamins, DNA adducts, inorganic ions and amino acids.

Evaporative Light Scattering Detector(ELSD)

- Universal detection with gradient availability
- Accurate quantification with superior sensitivity
- Suitable for Sugar analysis

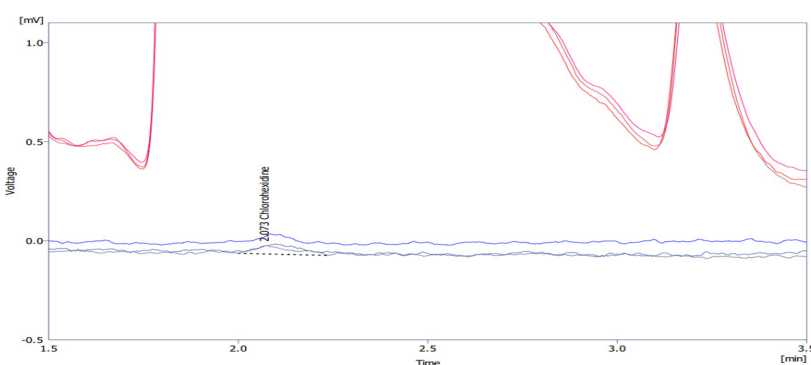
Productivity Empowers You

ChroZen HPLC Autosampler empowers your analysis stronger in enhanced productivity with the reproducible data and the minimized carry-over. The spray-type rinsing reduces the carry-over by washing off the contamination and the sophisticated sensors ensure the process safety to avoid damages.



<Area Linearity of Caffeine Analysis>

(μl)	Caffeine Area
1	350.4965
2	691.4658
5	1706.8665
10	3361.8368
15	5047.0202
20	6762.8316
25	8463.3508
30	10119.2275
R²	0.999991



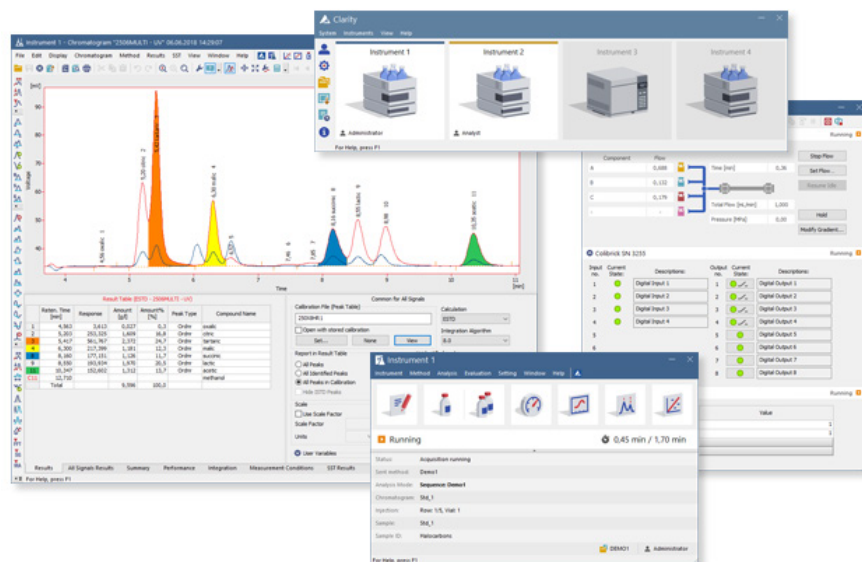
Vial No.	Chlorhexidine Area
Chlorhexidine -1	15857.039
Blank -1	0.197
Chlorhexidine -2	16887.621
Blank -2	0.362
Chlorhexidine -3	15904.902
Blank -3	0.311
Carry Over	0.0022%

<Analysis of 1,000 ppm Chlorhexidine and Blank Peak in Turn for Carry-over Evaluation>

YL-Clarity

Powerful and Intuitive Control

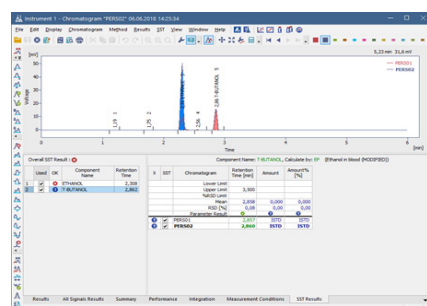
The sophisticated YL-Clarity chromatography data system is easy to use and offers extensive data management plus full control of all of YCM products by its intuitive user interface. The software is designed for 21 CFR Part 11 Compliance and full compatibility with MS Windows OS and seamlessly handles data processing and instrument control using an ultra-reliable LAN communication.



- **List of Controllable Instruments:** ChroZen HPLC, ChroZen UHPLC, ChroZen GC, ChroZen GC/MS, YL6500 GC, YL6900 GC/MS, YL9100 Plus HPLC, YL9300 HPLC, YoungIn Chromass autosamplers
- **MS Windows Compatibility:** Vista, 7, 8, 10
- **21 CFR Part 11 Compliance:** Management of user accounts, audit trail and electronic signature
- **Simultaneous data acquisition from up to four independent chromatographs:** Each chromatograph can acquire data from up to 32 detectors.

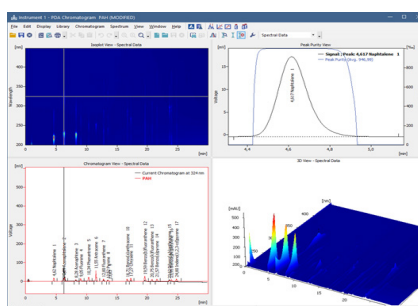
Optional Module for HPLC

SST (System Suitability Test)



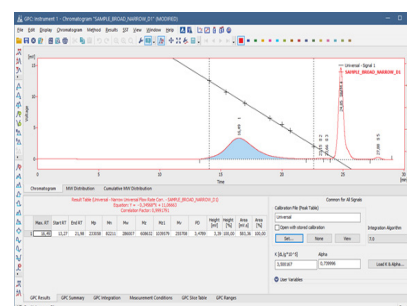
The program compares up to 12 selected parameters calculated according to one of three pre-selected methods (USP, EP, and JP). These calculated values are either compared to the users set limit values for each chromatogram separately or together for the selected series.

PDA Extension Validation Kit



This is to process data that has been acquired from selected photo diode array detectors. The spectral data, together with chromatograms, adds a third dimension to analytical data analysis.

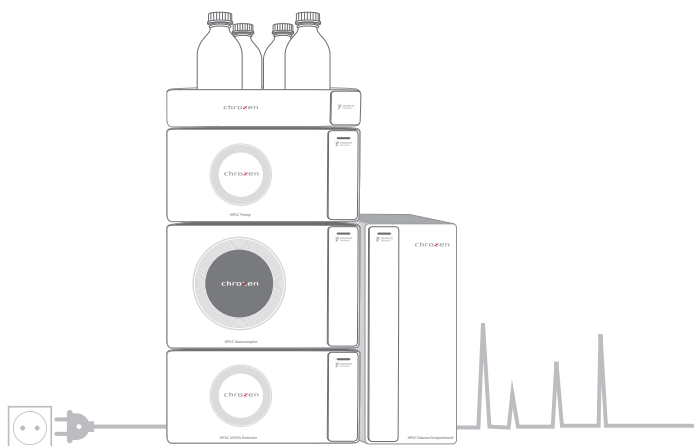
GPC Extension



This provides interactive and automated GPC analysis, including recalibration and GPC reporting, as well as simplifies the retrieval of GPC data.

Dedicated LC Analyzer

The Real Plug & Play Solution for all you need.



YoungIn Chromass's accumulated experience in chromatography and devotion for customers' satisfactions led to supply the solution-based application supports with the dedicated analyzers.

This dream solution includes:

- Smart Hardware Platform (Utilizing ChroZen HPLC)
- Smart Software Control (Chromatography Data System)
- All Related Consumables and Accessories
- The Real Plug & Play Solution
 - QC Report according to the specified application
 - Method Set-Up & File Embedded
 - Specified Easy Manual

Vitamin Analyzer

Vitamin analyzer is designed for analysis of vitamins to produce accurate and reproducible results while overcoming their easily degradable characteristic. With the column switching valve, it allows the trace level (ppb) of vitamin taking 3 steps which are pre-separation, concentration and analysis.

2D-LC System

2D-LC system maximizes the resolution efficiency for complex mixtures and enables the heart-cutting for targeted peaks by utilizing two different columns and the 2D-LC valve. The system controls the valve switching time with accuracy and precision and verifies its reliability by effectively determining each component.

Preservative Analyzer

Preservative Analyzer provides a photo diode array detector to check the exact spectrum and give reproducible and reliable chromatography with excellent peak shape and accurate qualitative analysis of preservatives such as Methylparaben and Phenoxyethanol, which are commonly used for cosmetics.

Amino Acid Analyzer

Amino Acid Analyzer using post-column derivatization method can analyze most of amino acids in protein hydrolysates (protein, collagen, peptides, and foods) as well as in native samples (physiologic fluids, tissue extracts, broths, musts feeds and beverages).

Sugar Analyzer

Sugar Analyzer provides a simple, easy and highly efficient method of analyzing sugars with an optimum detector and column as well as the analysis condition depending on the target sugars and their concentration.

Polyphenol Analyzer

Polyphenol Analyzer delivers the efficient analytical techniques from the sample preparation to the separation and quantification of numerous phenolic compounds based on their properties of absorption at UV/Vis wavelength.

Carbamate Analyzer

Carbamate Analyzer is a system for analysis of carbamate pesticides using post column derivatization method. It alternates the GC-ECD method and also analyzes 13 kinds of Carbamate pesticides not included in the 10 compounds specified by the U.S. Environmental Protection Agency (USEPA) Method 531.1 and AOAC Protocol 29.A05.

GPC System

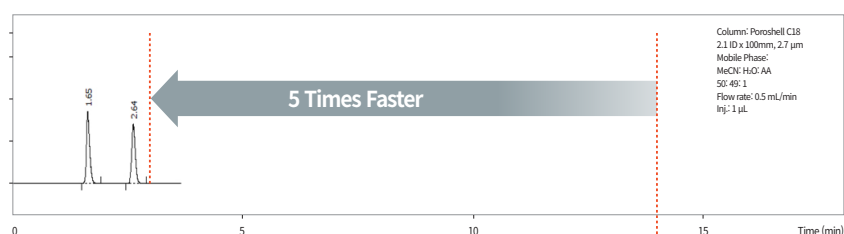
GPC system is to analyze various natural compounds or synthetic compounds with the data of relative molecular weight and the distribution of molecular weight. We increase the analysis efficiency by providing the right standards and columns depending on the sample.

chroZen UHPLC

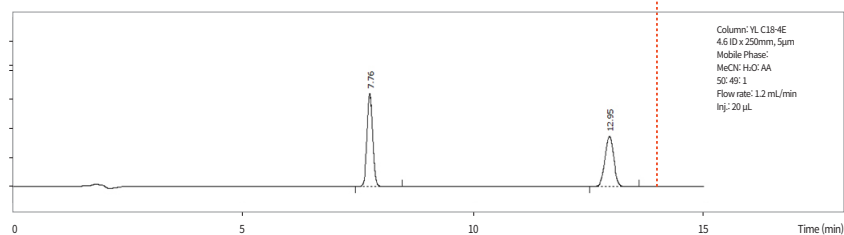
ChroZen UHPLC perfectly satisfies in terms of productivity and efficiency by producing the results 4~10 times faster than conventional HPLCs while ensuring both superior sensitivity and resolution. It allows you the operation with low flow rate and injection volume to minimize consumption of solvents and samples. In addition, the system endures real ultra-high pressure, up to 18,850 psi (1,300 bar), with the powerful pump providing the accurate and precise flow rate by applying the concept of linear drive technology for two pairs of serially coupled pump heads, which means you can fully utilize the UHPLC columns and have the reliable data.

Beyond the Productivity & Efficiency

- 4 to 10 times faster than typical runtimes on average
- The solvent selection valve equipped in the pump allows two solvents available per pump to increase your work efficiency
- Minimized consumption of solvents and samples



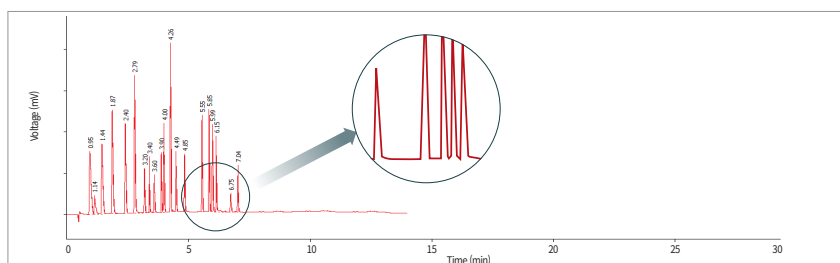
<Analysis of Naproxen & Butyrophene by ChroZen UHPLC>



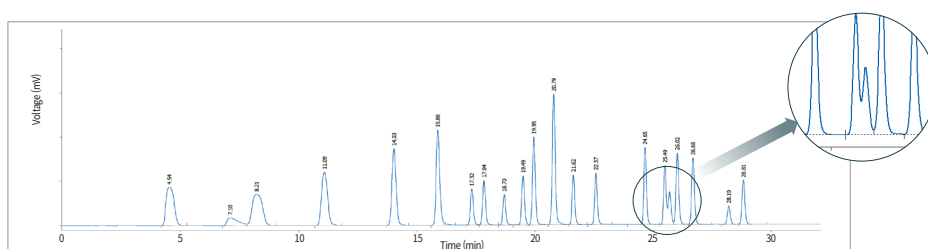
<Analysis of Naproxen & Butyrophene by Conventional HPLC>

Remarkable Resolution

- **Total reflection cell** to maintain the intensity in optical clarity, while minimizing the system dispersion
- The very fast data acquisition rate, 125 Hz, for the rapid data processing



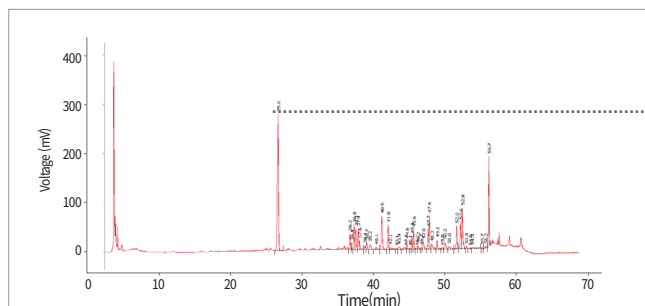
<Analysis of Residual Pesticides by ChroZen UHPLC>



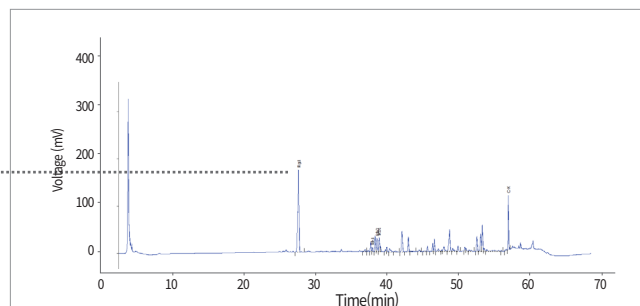
<Analysis of Residual Pesticides by Conventional HPLC>

Improved Sensitivity

Remarkably reduced system dead volume generates improved sensitivity than the conventional HPLC. The below data comparisons were performed in the same analysis condition, which means there's only difference in system, but still shows the sensitivity difference.



<Analysis of Saponine by ChroZen UHPLC (same amount)>



<Analysis of Saponine by Conventional HPLC (same amount)>

Available Detectors

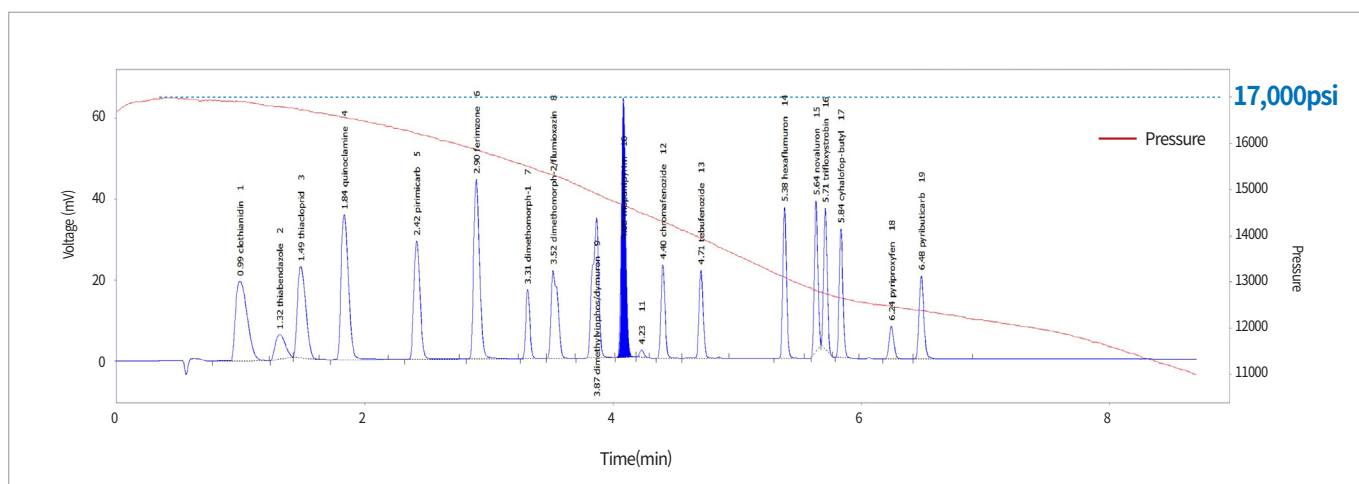
- ChroZen UHPLC UV/Vis Detector
- ChroZen UHPLC PDA Detector
- ChroZen UHPLC FL Detector
- ChroZen UHPLC RI Detector

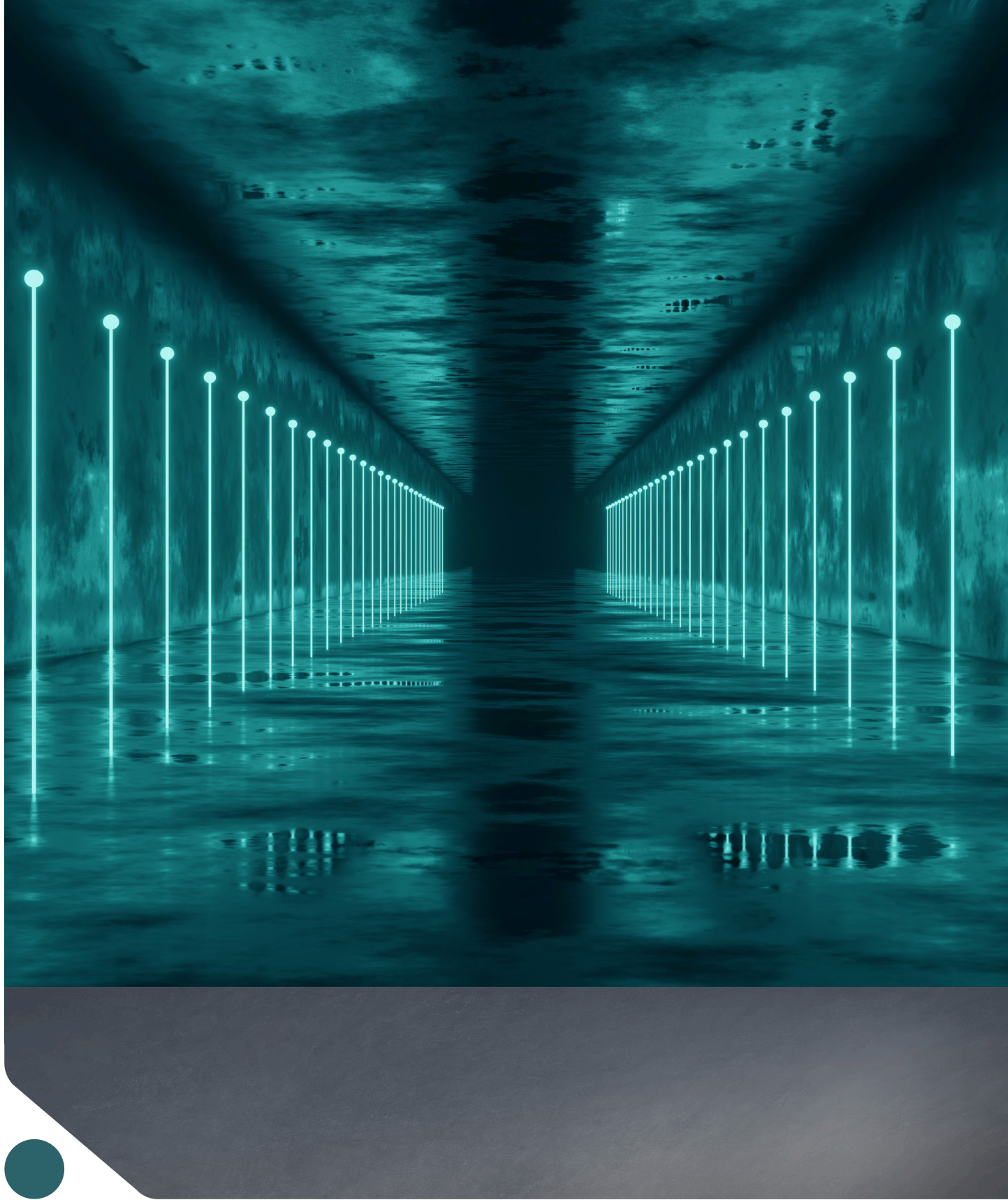
More than Reliability

- Stable, precise and accurate flow rate by truly automatic compressibility compensation
- Dual pistons in series pump with linear drive technology
- Lower than 0.05 % RT RSD by the precise flow rate at even the gradient mode.

High Pressure Endurability

The longer you use UHPLC columns, the higher backpressure the system has to endure. ChroZen UHPLC endures real ultrahigh pressure, up to 18,850 psi, that utilizes the life time of UHPLC columns as long as possible.





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