

Gas Chromatograph

Brevis GC-2050



Brevis™ GC-2050

Small but Mighty

"Smaller, simpler, and easier to use – without compromising performance." That's the demand from analysts. And that's why Shimadzu developed the Brevis GC-2050. This new space-saving GC delivers uncompromising analytical performance in a modern yet rugged design, easily meeting the analysis needs of laboratories in a range of industries.



01 Compact without Compromise

02 Built-in Analytical Intelligence

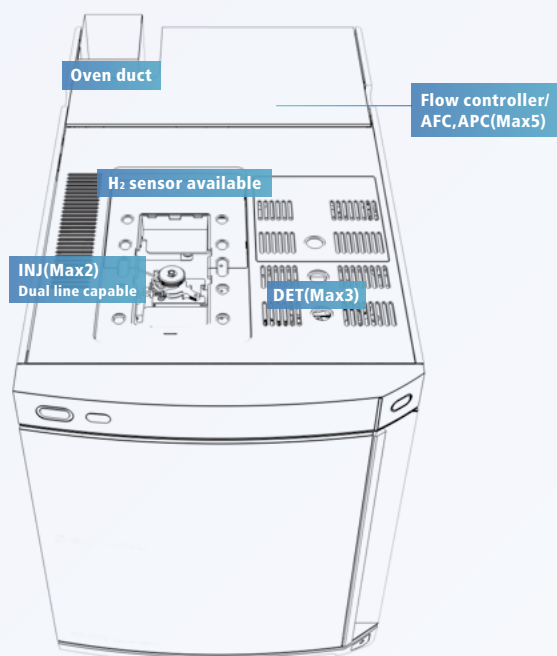
03 Best-in-Class Performance



Compact without Compromise

Space-saving yet expandable design

The compact Brevis GC-2050, with a 350 mm system width, including an auto-injector (AOC™-30i), makes even more use of lab space. Compared to the flagship Nexis™ GC-2030, the system's width has been reduced by approximately 35 %. At the same time, it is possible to connect additional headspace samplers, a mass spectrometer, and other accessories (available soon), providing the scalability to cover the analytical needs of today's GC/GCMS users.



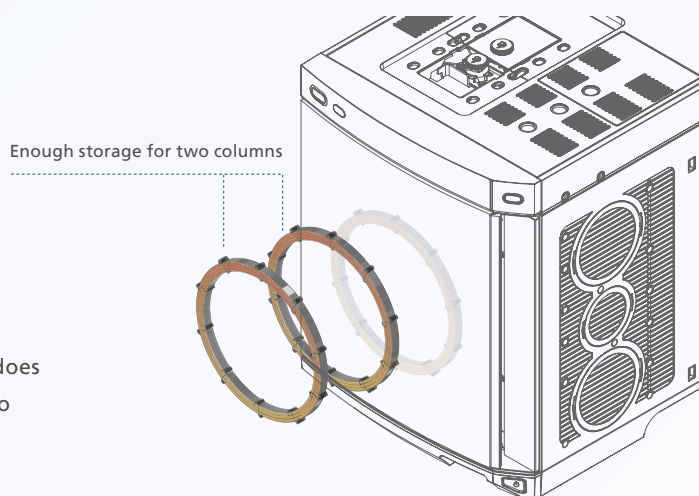
Sufficient GC oven size

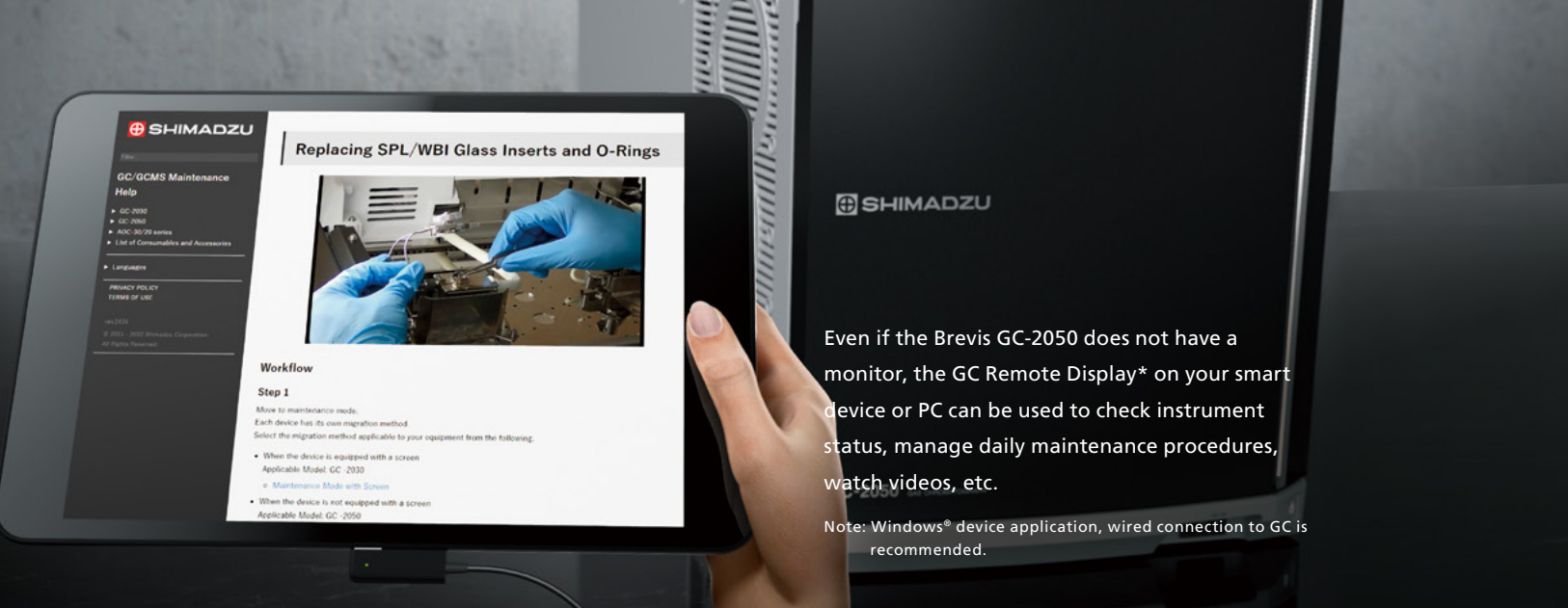
Despite its space-saving design, this GC oven does not require a dedicated column, and up to two general capillary columns can be used.



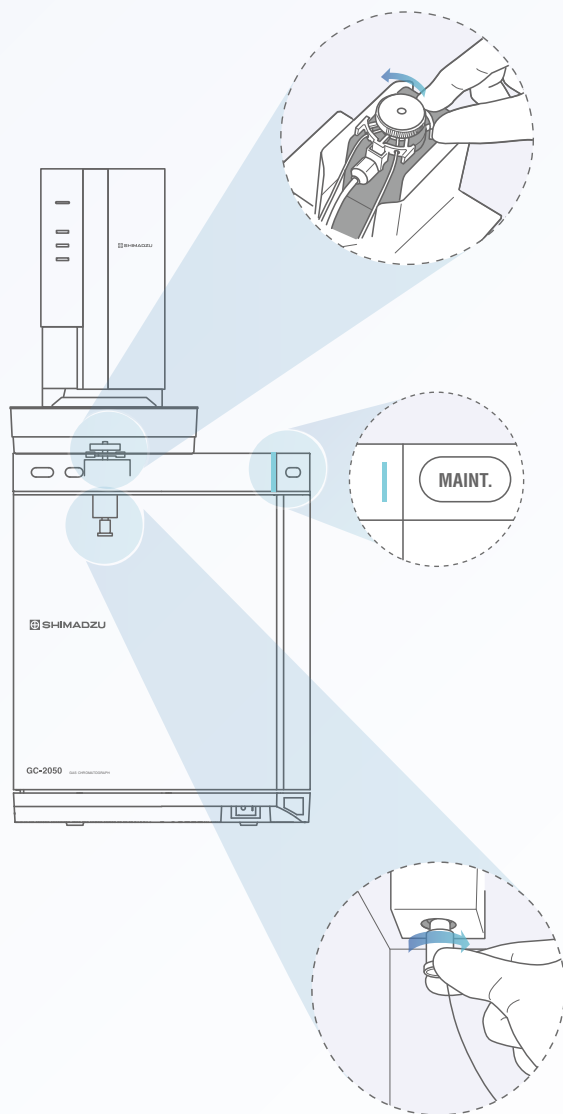
Compact system configuration

During development of the Brevis GC-2050, the injection ports, detectors, electrical boards, etc. were rearranged to achieve a flexible system configuration while maintaining a slim system width.





Compact and easy to maintain



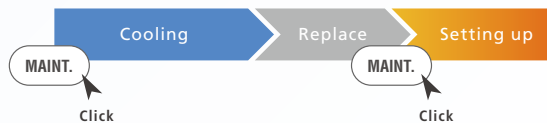
One-touch inlet maintenance

The injection port can be opened or closed without tools by simply sliding the ClickTek™ Nut lever. Replace the insert, slide the lever, and feel the click to ensure leak-free performance.

Fast inlet maintenance, Easy sTop

Clicking the Maint. (Maintenance) button on the GC front will start lowering the temperature of the GC inlet and oven, and stop the gas supply automatically*. After maintenance of the inlet, clicking the button again will return the instrument to standby after an automatic leak check. Routine maintenance procedures can be further simplified.

Note: Disabling the automatic gas supply shutdown to protect the MS detector is possible.



Tool-less column installation

The ClickTek makes column attachment a one-touch operation. A noticeable clicking sensation signals a secure column connection, putting the user at ease.

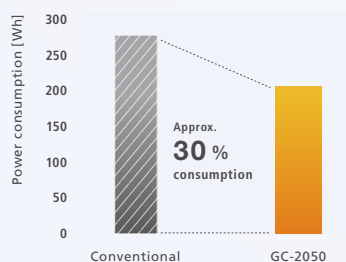
Note: The ClickTek connector is optional.

Less Energy and Gas Consumption

ECO design

The Brevis GC-2050 consumes 30 % less power than conventional GCs. It also minimizes helium usage and supports operations with alternative carrier gases.

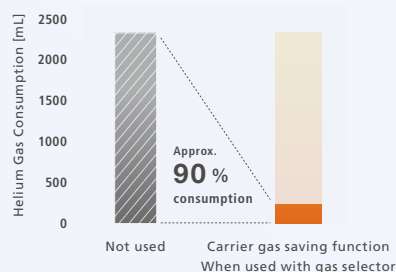
Comparison of power consumption on a GC run cycle.



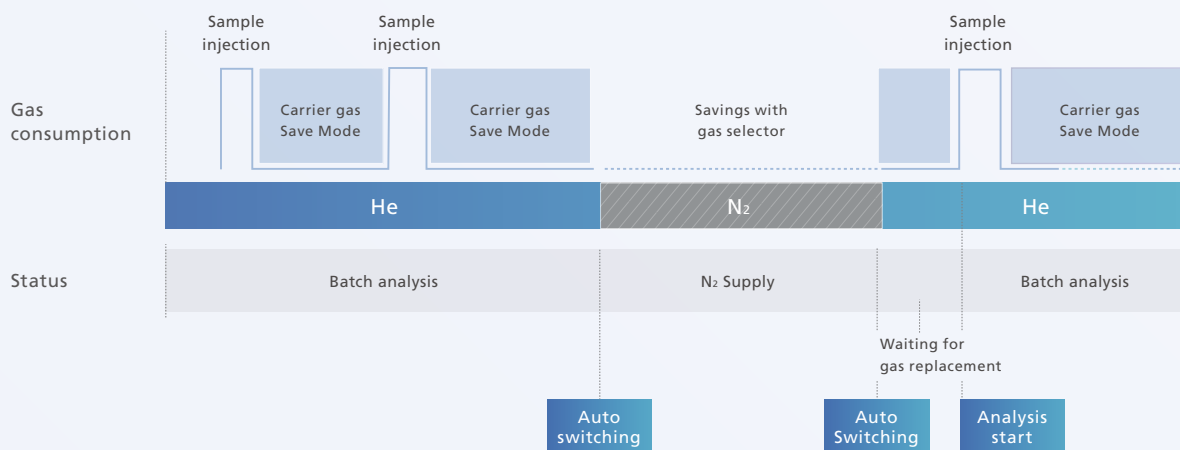
High-performance insulating materials and a smaller oven have eliminated heat loss. As a result, the Brevis GC-2050 achieves about a 30 % reduction in power consumption during analysis compared to conventional GCs.

The amount of electricity consumed will vary depending on the laboratory environment.

Minimizing helium gas usage



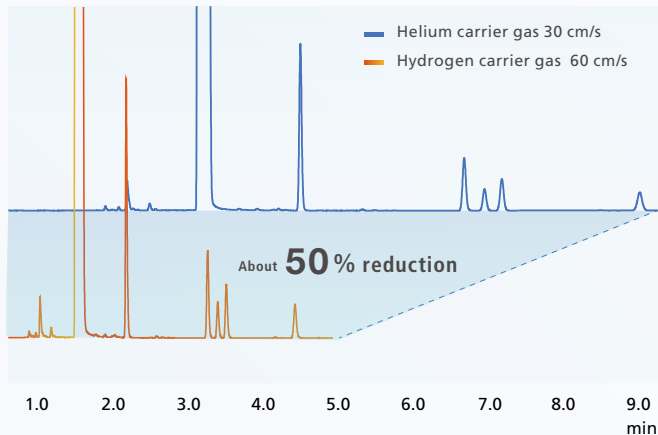
In the split/splitless sample introduction method, the carrier gas save mode can reduce the amount of carrier gas released from the split flow path to outside the GC system after sample transfer to the column for analysis. Further gas savings can be achieved by using the optional gas selector to automatically switch the gas from He to an alternative one such as N₂ except during analysis.



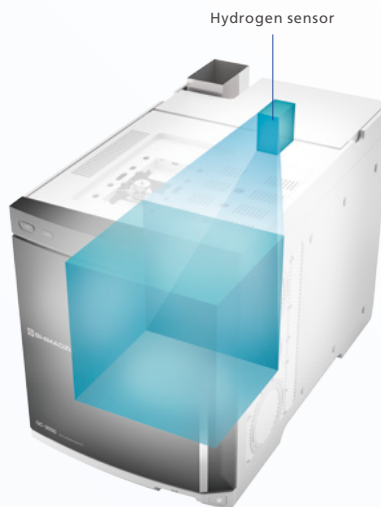
- Analysis time: 30 minutes; Split ratio: 100
- Total analysis time per day: 5 hours

- Carrier gas save mode: Split ratio set to 10 one minute after sample injection

Safer and even faster analysis with H₂ gas

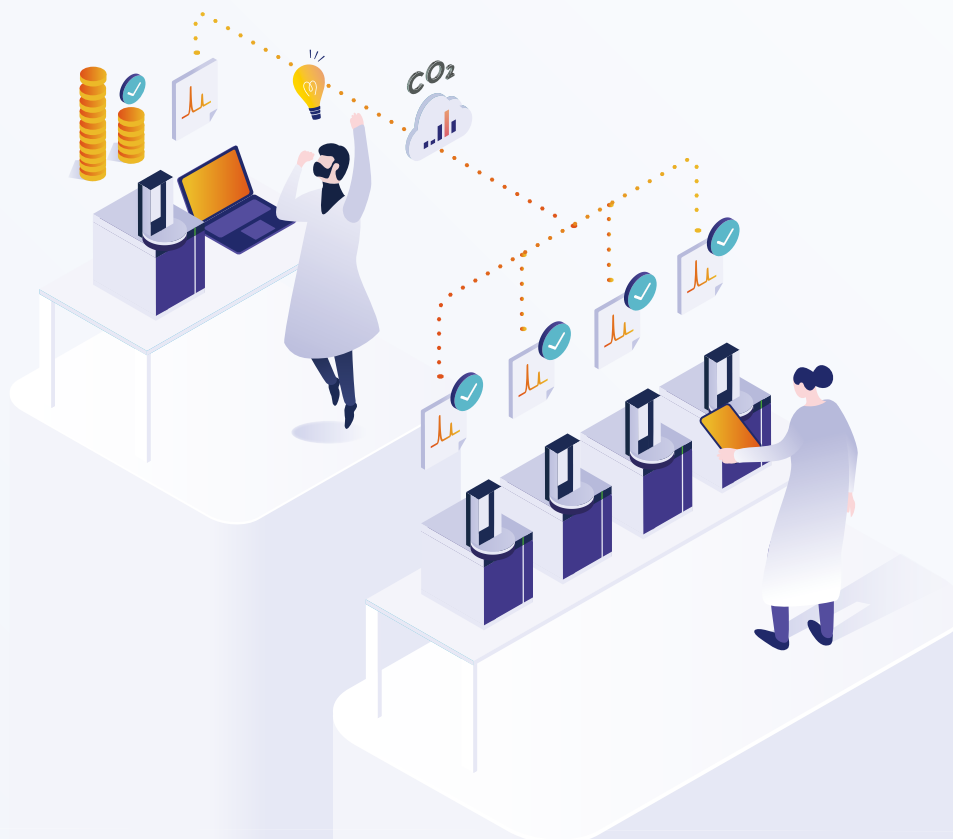


High-speed analysis of impurities in benzene using hydrogen carrier gas



The Brevis GC-2050 can be equipped with a hydrogen sensor. Not only does it enable early detection of potential leaks in the oven and maintain a safe standby mode, but if a hydrogen leak occurs, it turns off the main power to prevent an accident. In addition, the GC main unit has an automatic carrier gas leak check function that supports the use of hydrogen carrier gas. Furthermore, a gas selector* can switch the carrier gas to nitrogen after an analysis has been completed to enhance safety. Hydrogen carrier gas enables fast analysis (application example above) and maximizes throughput in the laboratory.

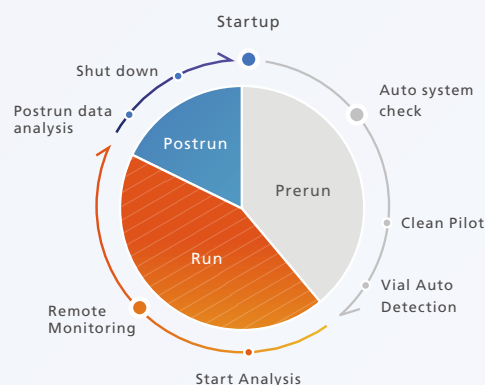
* Hydrogen sensor and gas selector are options.



Built-in Analytical Intelligence

Automatic remote operation

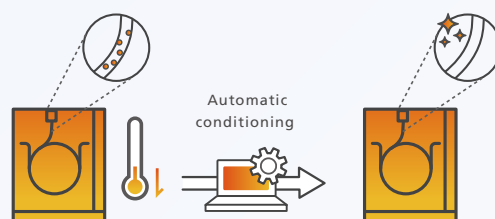
With Remote Display and LabSolutions™ Direct, GC systems can be accessed from anywhere with a smart device or a PC, dramatically improving the analysis workflow and enabling new ways of working.



Automating the Procedures of Experienced Analysts, Clean Pilot

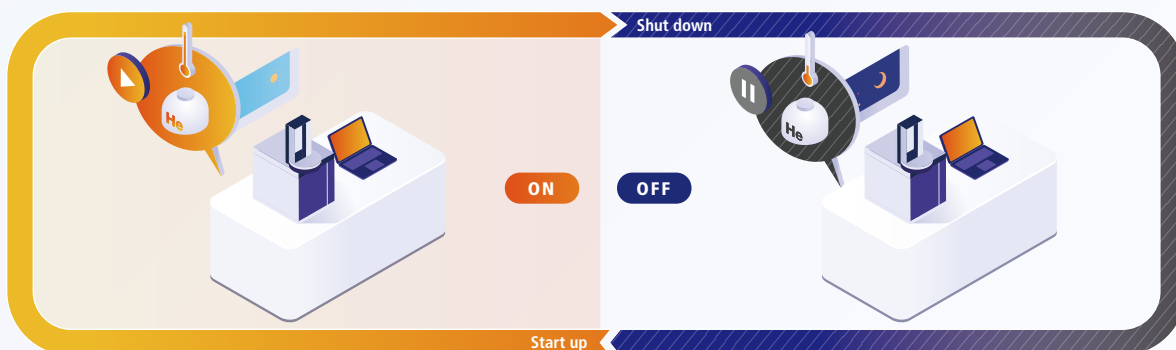


Baselines can be unstable during GC startup. The Clean Pilot feature provides quick and efficient automatic conditioning to provide stable analytical results while reducing the burden on laboratory personnel.



Analysis Starts Immediately under the Optimal Conditions, Automatic Start and Stop Function

The Brevis GC-2050 automatically performs gas and temperature control, allowing the system to shut down and start up unattended. When not performing analysis, the system can be shut down to reduce unnecessary power and gas consumption, thereby reducing running costs.

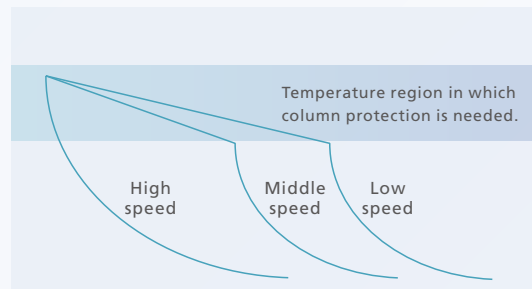


Protecting Columns



ANALYTICAL
INTELLIGENCE

Temperature



Time

The column oven temperature during cooling

The column oven cooling speed can be configured separately from the oven temperature program. This protects columns, which are sensitive to abrupt temperature changes.

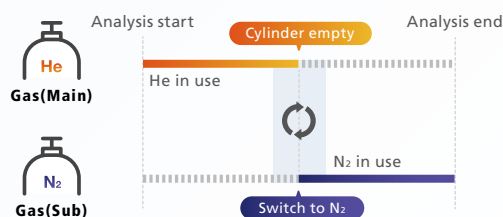


Supply Gas Check



ANALYTICAL
INTELLIGENCE

When connecting a main and a spare gas cylinder to the gas selector (option), the gas selector will monitor the main gas cylinder pressure and automatically switch the gas supply to the backup line when the cylinder becomes empty. This prevents problems before they occur and allows you to continue analysis with peace of mind.



ANALYTICAL
INTELLIGENCE

- Automated support functions utilizing digital technologies, such as M2M, IoT, and Artificial Intelligence (AI), that enable higher productivity and maximum reliability.
- Allows a system to monitor and diagnose itself, handle any issues during data acquisition without user input, and automatically behave as if it were operated by an expert.
- Supports the acquisition of high quality, reproducible data regardless of an operator's skill level for both routine and demanding applications.

Data Management

Providing reliable data management and a comfortable analysis environment, LabSolutions™

Centralized Management of Data and User Information

LabSolutions™ DB, CS and LC/GC offer rich features to help meet FDA 21 CFR Part 11 and the Japanese Ministry of Health, Labour and Welfare guidelines on electronic records and electronic signatures.

They also include functions for data integrity to prevent data falsification and replacement. User information and operation histories are managed in a database, allowing optimal user management based on roles, such as system administrator and analyst.



Enabling Remote Control and Monitoring, LabSolutions Direct



Remote operation and monitoring

LabSolutions Direct, a standard feature of LabSolutions, allows you to monitor instrument status and chromatographic signals, start and stop the instrument, and start the analysis from a web browser on a PC or smart device at a remote location.



Early detection of malfunctions

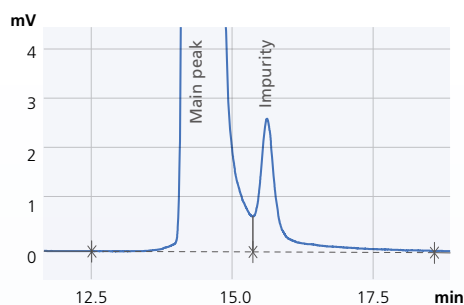
You can remotely monitor the system's operational status. The early detection of defects prevents downtime and eliminates valuable sample loss.

High Precision Data Processing in a Single Step

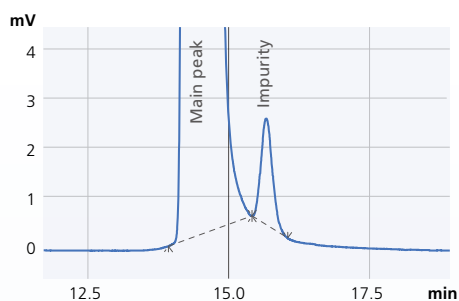
i-PeakFinder™ Automatic Peak Integration Function



The manual integration of unresolved peaks is a labor-intensive process prone to inconsistent results depending upon the experience level of the user. Shimadzu's proprietary i-PeakFinder peak integration algorithm is perfect for such situations. i-PeakFinder processes large volumes of data with high precision in a single step, saving time and increasing the consistency of results.



Conventional peak integration

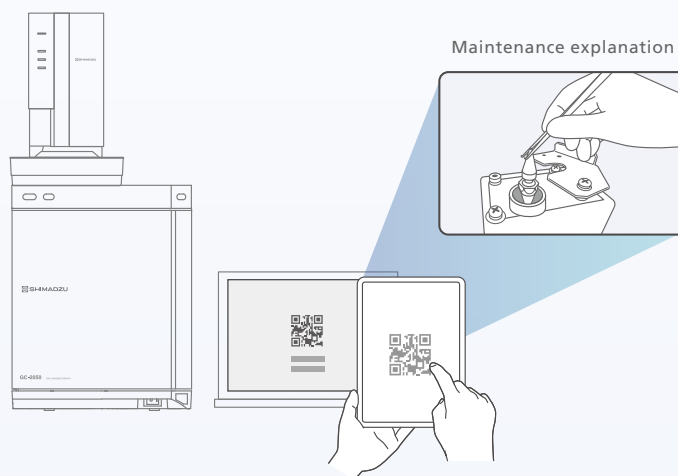


i-PeakFinder

Making Routine Analysis More Convenient

2D Code Navigation

When a smart device reads the code or clicks the URL link on a PC, a solution, including procedures or videos, is presented for a quick recovery.



Connected to Your Current Software, GC Drivers

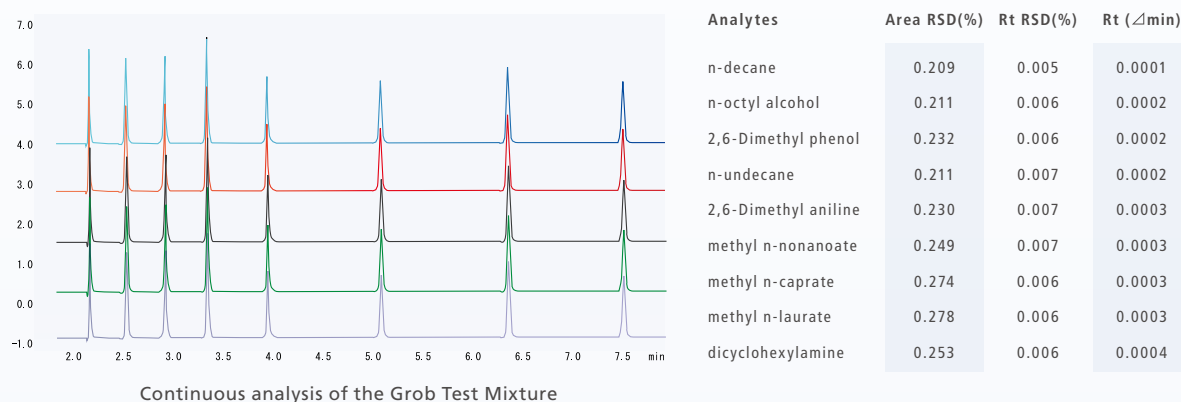
Using the GC driver, the Brevis GC-2050 and other Shimadzu GC instruments can be connected to other companies' CDS (Chromatographic Data System), such as OpenLab™, Chromeleon™, Empower™, etc. Shimadzu GCs can be operated without changing your instrument control or analysis environment.

(For details, please check the latest GC driver compatibility status separately.)

Best-in-Class Performance

Outstanding Analytical Reproducibility

The Brevis GC-2050 provides best-in-class analytical precision. The latest auto-injector, AOC-30i, enables continuous analysis with a high level of precision that cannot be achieved with manual operation. In addition, the flow controller (AFC) with a built-in CPU supports constant linear velocity, constant flow rate, and constant pressure control of carrier gas to achieve outstanding analytical reproducibility with ultra-high speed and ultra-precise control.



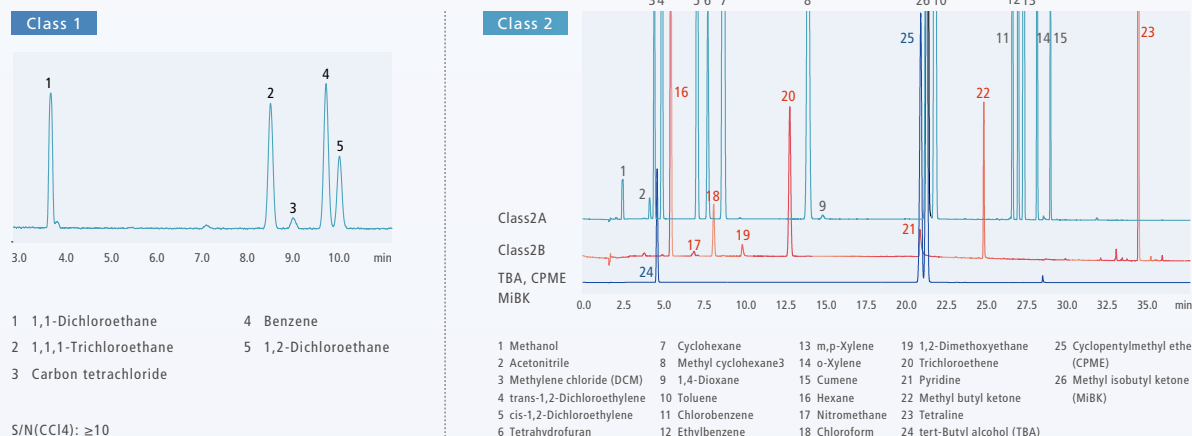
Application examples

Brevis GC-2050 enables analysis with He as the carrier gas and with alternative carrier gases, N₂ and H₂.

Pharmaceutical

Residual solvent analysis in pharmaceuticals according to USP <467> using H₂ carrier gas

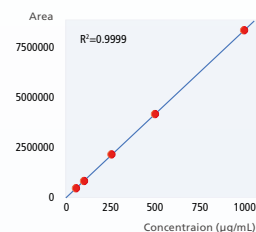
Shown here are the results from an analysis of a standard solution for operating method A (water-soluble samples). In the analysis of carbon tetrachloride, which requires sensitivity confirmation, against residual solvents in Class 1, a good S/N ratio was achieved. Furthermore, excellent separation analysis is possible for Methyl Isobutyl Ketone (MIBK), which has been added to the Class 2 list.



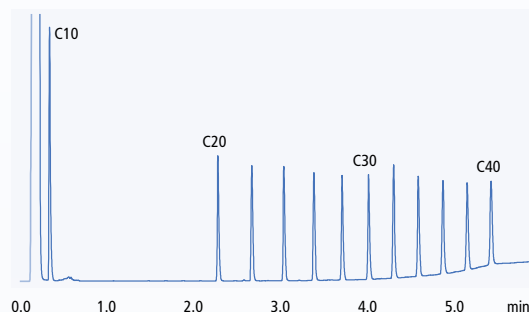
Environmental

Fast analysis of Total Petroleum Hydrocarbon (TPH) using H₂ carrier gas with dual injectors

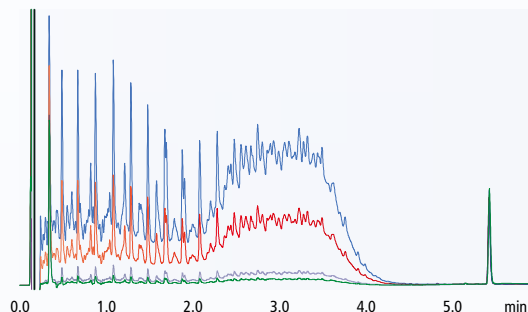
Despite its compact body, the Brevis GC-2050 is capable of simultaneous dual-line analysis. In this example, dual-line, high-speed TPH analysis was performed to maximize analytical throughput with a single GC.



Calibration curve of Mineral Oil.



Chromatogram of n-alkane mixture samples

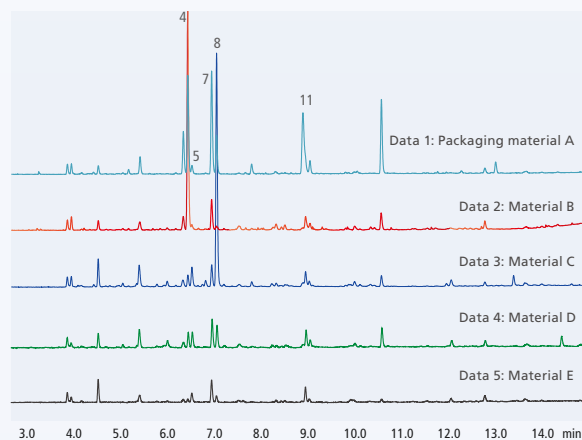


Overlaid chromatograms of QC standard solutions

Chemical

Analysis of residual organic solvents in packaging materials using N₂ carrier gas with and the HS-20 NX headspace sampler

The headspace GC method is effective for analysis of residual organic solvents in packaging materials, which are solid samples, and providing high sensitivity and reliability.



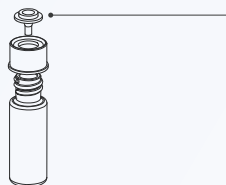
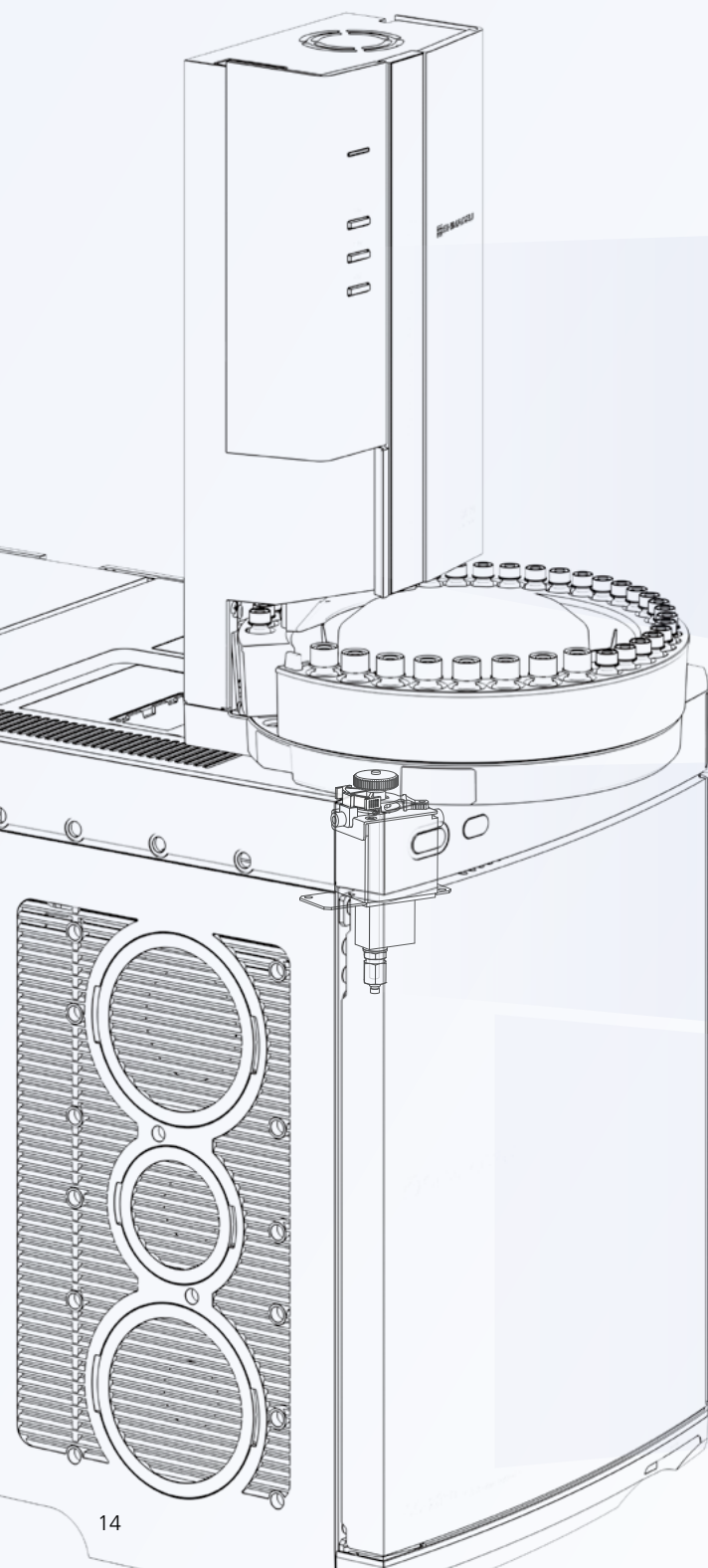
	4 Ethyl acetate	5 Methanol	7 i-Propanol	8 Ethanol	11 n-Propanol
Packaging material A	0.056	0.14	0.107	0.042	0.087
Material B	0.253	.....	0.032	.....	.....
Material C	.....	.....	0.08	.....	.....
Material D	.....	.....	0.01	.....	.....
Material E	.....	.....	.....	.....	.....

Quantification results (mg/m²)

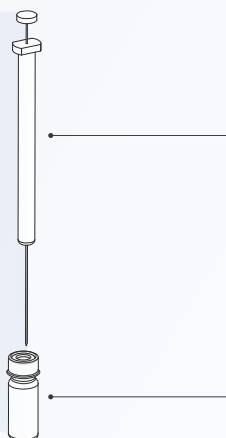
Tested & Proven Consumables

Genuine consumables of reliable quality

Proven quality consumables are critical to getting the right analysis results and minimizing downtime. Shimadzu offers a wide range of consumables to maximize the performance of GC/GCMS systems.



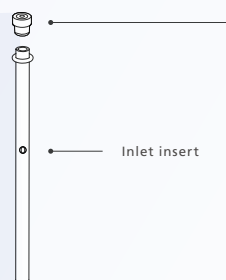
Xtra Clean Conical Cap



Xtra Life Microsyringe



Certified Quality (CQ) Vial

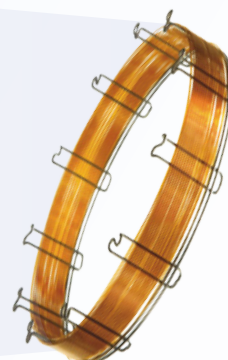


Xtra Life Inlet Septa



Inlet insert

Shimadzu SH series column



Founded in 1875, Shimadzu Corporation has been developing gas chromatography products for over half a century and, in 2022, we celebrated the 65th anniversary of Shimadzu GC. Shimadzu's pride in craftsmanship and technological expertise have always been hallmarks of our products. And, today, our tradition of quality excellence continues with GC solutions created to meet the needs of laboratories worldwide.



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