



Thermo Scientific TRACE 1110
Gas Chromatograph



Winning qualities

performance • multiple options • easy operation

Thermo
SCIENTIFIC



the performance you expect

from technology with the right blend
of expertise and excellence

Every gas chromatographer looks forward to a GC with the right blend of high performance, multiple options and ease of use for their routine work in QA/QC and R&D laboratories.

The Thermo Scientific™ TRACE™ 1110 Gas Chromatograph concentrates all these qualities in a world class instrument, equipped with latest technology, with multiple options and advanced accessories making routine and challenging analysis finally easy and affordable. The TRACE 1110 GC is fully supported by efficient application, maintenance and training support.

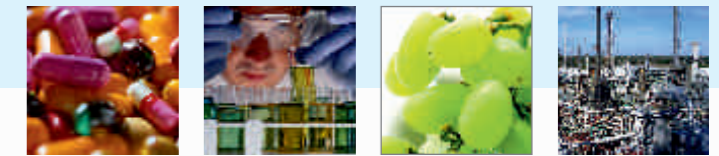


winning qualities for routine and demanding applications

The TRACE 1110 GC is a new multi-channel, high performance, flexible and robust gas chromatograph offering the largest number of injectors and detectors running simultaneously on the same GC. This capability allows users to efficiently switch between different applications on the same GC.

The TRACE 1110 GC provides advanced technology:

- New injectors with enhanced performance and increased sample throughput even with dirtier matrices.
- High performance detectors delivering enhanced sensitivity for trace level analysis.
- Latest generation of electronic pneumatics leading to excellent pressure and flow control for consistent retention time reproducibility.
- Customized solution for turnkey applications.



All these proven technologies are supported by a wide network of customer support centers assisting in application and method development. The TRACE 1110 GC delivers the right blend of experience, expertise and excellence fulfilling the expectation of all gas chromatographers.

High reliability even in tougher environment

For laboratories lacking power supply stability TRACE 1110 can be supplied with an optional, incorporated mini UPS. This solution provides a smart integrated back-up system capable of keeping the instrument up, preventing loss of results in the event of power failure.

Wider choice of options for routine and challenging applications

The TRACE 1110 GC is available with packed and capillary columns configurations, with an array of injection and detection options, smart accessories and ancillary devices able to satisfy the most demanding applications. User can select between integrated Electronic Pressure Control (EPC) or easier and simpler manual pneumatic control of gases. The electronic pressure control results in excellent retention time reproducibility. It also offers gas saver facility to reduce consumption of carrier gas and save running costs.

multiple injection options



The universal injector base body design offers the flexibility to choose from a wide range of system configurations to exactly fit the needs of a laboratory. Up to four injection ports and four detectors can run simultaneously on the same TRACE 1110 GC providing the largest flexibility in setting up the application.

Four injection ports and four detectors

Packed Injector

The standard packed injectors are easy to use on-column injection type. The sample is directly injected onto the column minimising the dead volume.

Wide Bore Injector

The packed injection port can be easily and quickly modified, using a specific adapter, to fit wide bore columns (from 0.53 mm I.D. or larger). Direct on-column injection into wide bore columns ensures minimum dead volume and hence no decomposition or adsorption of sample components.

Capillary Injector

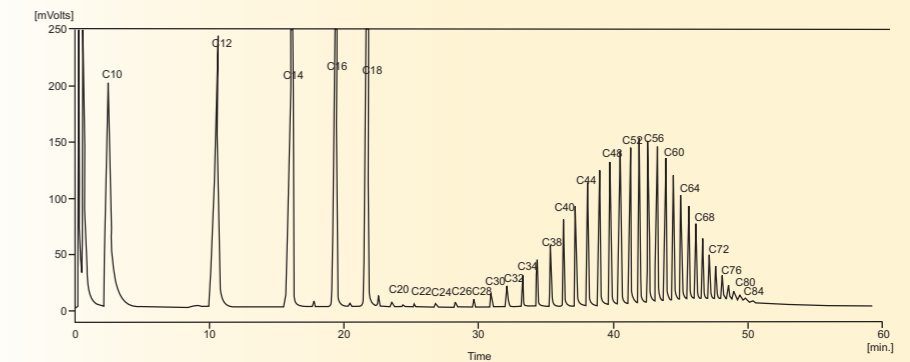
The split/splitless injector features an advanced new thermal control, ensuring total temperature uniformity, thus minimizing any sample discrimination. The design of the capillary inlet allows easy access and maintenance of the liner. Easy replacement with tapered liners for special applications makes this injector a tireless and reliable tool for critical analysis. An inert liner in the vaporization chamber eliminates any artifacts resulting from sample interaction or absorption along the flow path. This results in reduced band broadening, greater precision and sharper peaks, even injecting small sample volumes; characteristic important for any high-resolution capillary chromatography analysis. The capillary injector is equipped with split and splitless modes of operation, which can be used in conjunction with the optionally available automatic programmable splitting valve and the gas saver.

Programmable Temperature Vaporizing injector

The innovative design of the PTV injector offering accurate control of temperature ramping, limited thermal mass for rapid heating/cooling and micro-fan for accelerated cooling, provides an effective tool to overcome limitations of conventional capillary injection system. Injecting sample as a liquid followed by flash evaporation, allows the sample to be introduced into the column without discriminating between low and high boiling compounds, with controlled thermal increase and the number of ramps to reach the final temperature.

PTV offers great versatility thanks to:

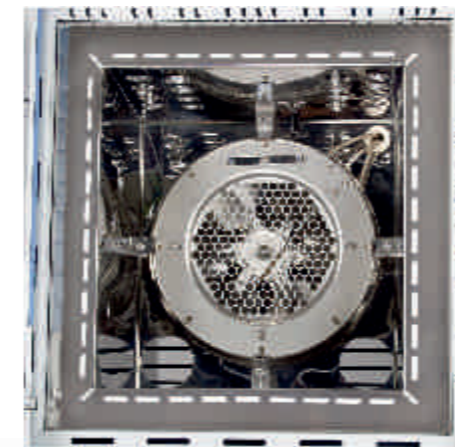
- Injection onto the column in Split, Splitless and Solvent split modes
- Multiple injection of samples for trace enrichment
- Cold injection of sample and subsequent vaporization by accurate linear heating at a programmed temperature



GC chromatogram of Polywax 655 plus C6-C18 analysis

largest oven size in the market

The TRACE 1110 GC is a powerful combination of robust design and user-friendly features. The large oven size (22.62 liters) can accommodate maximum number of capillary columns leading to increased productivity, performance and safety. The column oven offers a temperature range from 5 °C above ambient to 500 °C expanding the GC application range. The rapid cooling time from 400 °C to 50 °C in 6 minutes ensures quick GC cycle time for extended productivity.



Large size column oven

Enhanced safety for user

All column oven inner components are designed to deliver maximum safety to the user, during columns installation and maintenance.



Detectors...

leave nothing undetected

The widest detection capability

A wide range of detectors is available to meet the needs of any laboratory and application as well as to configure customised solutions. The range of detectors available include: Flame Ionisation, Thermal Conductivity, Electron Capture, Nitrogen Phosphorous, Flame Photometric detector. All these detectors feature an open-ended base design that ensures easy maintenance operation.

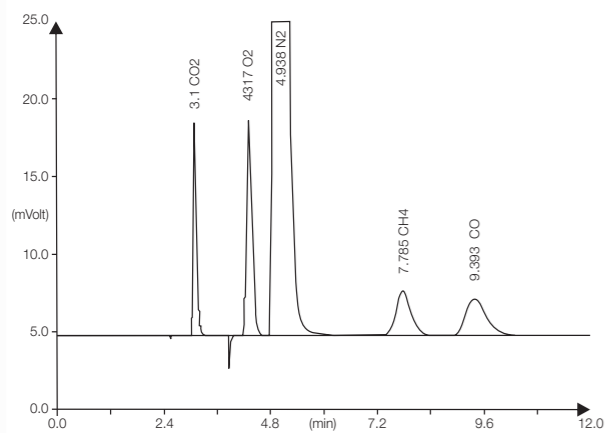
Besides conventional detectors the TRACE 1110 GC is designed to accommodate third-party ultra-specialised detectors, such as a pulse discharge detector, to leave practically nothing undetected from volatile organic gaseous compounds. Complete detector control through GC keyboard or instrument software makes parameter setting and detector operation precise and reliable.

Flame Ionisation Detector (FID)

FID is a commonly used detector and is very sensitive to most organic compounds. This stainless steel-bodied detector incorporates the grounded jet design for enhanced ruggedness and ease of maintenance. The design is such that the jet can be removed easily for regular cleaning. Auto-ignition through the keyboard, high sensitivity electrometer amplifier and a wide dynamic range make this detector suitable for critical applications. The FID response is stable since the detector is not easily contaminated by dirty samples or column bleed. With gas flow and pressure control through EPC, the user can be assured of improved accuracy.

Thermal Conductivity Detector (TCD)

The TCD is a universal detector since it can detect almost any volatile organic gaseous compound. TCD is used for packed column applications and is commonly used for fixed gas analysis (O₂, N₂, CO, CO₂, H₂S, NO₂ etc.). Precise temperature control gives excellent stability to the TCD.



Flue Gas analysis by GC-TCD

Sample name	CO ₂	O ₂	N ₂	CH ₄	CO
Flue Gas Mix002	828921	1224548	14643030	696541	810227
Flue Gas Mix003	830019	1225539	14639834	694738	797767
Flue Gas Mix004	830464	1224914	14643026	684647	798594.5
Flue Gas Mix005	823019	1223752	14631452	689465	801356.5
Flue Gas Mix006	822968	1226574	14629706	708777	812695
	827078	1225065	14637410	694834	804128
	3770.89	1062.52	6400.17	9082.00	6880.30
	0.4559	0.0867	0.0437	1.3071	0.8556

Area repeatability data of Flue gas on TRACE 1110 with Valve Oven

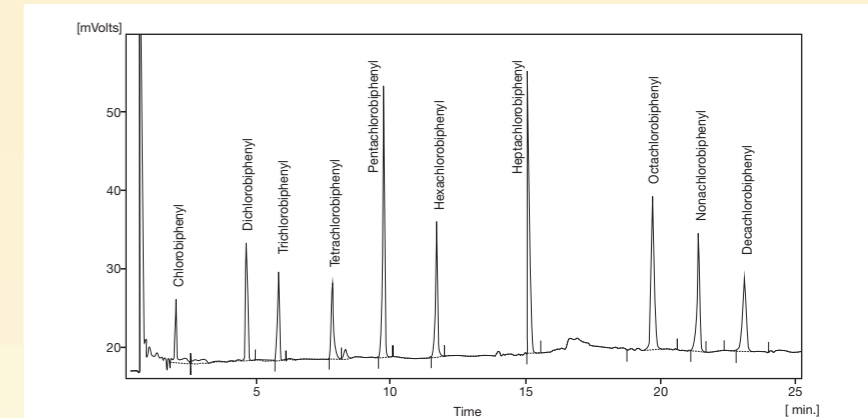
Flame Photometric Detector (FPD)

The FPD shows high selectivity and sensitivity for phosphorus and sulphur containing compounds. The FPD has single and dual flame modes of operation with interchangeable filters for phosphorus and sulphur analysis. This detector uses a unique differentiated combustion technique to prevent the "quenching effect" of hydrocarbons. It prevents the flame from extinguishing when a large quantity of solvent passes through the detector.



Electron Capture Detector (ECD)

This detector finds wide applications in trace analysis of electronegative compounds such as halides and nitro compounds. The co-axial geometry design of this ECD and the use of a 10 mci electron source in Ni63 ensures selective and sensitive detection. It has an extended dynamic range and can be used in the constant current modulated frequency mode. The constant current mode minimises the effect of contamination of the source and the detector electrode. The detector can be used with either nitrogen or argon methane as the carrier gas.



GC Chromatogram of PCB residues extracted from spiked water sample by GC-ECD

No.	Component Name	Conc in ppb	No.	Component Name	Conc in ppb
1	2-Chlorobiphenyl	1.374	6	2,2',3,3',6,6'-Hexachlorobiphenyl	0.264
2	3,3'-Dichlorobiphenyl	1.712	7	2,2',3,4,5,5',6-Heptachlorobiphenyl	0.131
3	2,4,5-Trichlorobiphenyl	0.281	8	2,2',3,3',4,4',5,5'-Octachlorobiphenyl	0.135
4	2,2',4,4'-Tetrachlorobiphenyl	0.268	9	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	0.133
5	2,3',4,5',6-Pentachlorobiphenyl	0.271	10	2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	0.140

GC Chromatogram of PCB residues extracted from spiked water sample

Nitrogen Phosphorous Detector (NPD)

The NPD uses a special alkaline heated source for detection and can be installed on the FID base of the GC. This detector shows high sensitivity and selectivity for the analysis of organic phosphorus and nitrogen compounds. The source is coated on a ceramic surface for high temperature stability and a long life.

full spectrum of sampling systems for all needs

Unattended around-the-clock operation

Liquid Sampling Systems

The Thermo Scientific 1310 Series autosampler is the optimum choice for gas chromatography liquid sampling. Engineered to meet the highest level of ruggedness and ease of use, this product can perfectly fulfill the requirements of both QA/QC and high throughput environments.

The AI 1310 Auto-injector is an 8-position sampling module. It combines the high precision of an automatic injection system with the ease of use of the Plug & Play concept, and represents the ideal answer to labs requiring highly reliable results even for small batches of samples.

A special upgrade option allows you to turn the AI 1310 Auto-injector into the high throughput AS 1310 Auto-sampler with the addition of a 155 sample tray, making the initial investment a worthwhile choice.



TriPlus RSH Autosampler, HS and SPME* Autosampler

Conceived around a triple axis (X-Y-Z) model, the Thermo Scientific™ TriPlus™ RSH Autosampler provides the highest flexibility together with extreme ease of use. The TriPlus RSH (Robotic Sample Handling) Autosampler is available in the following configurations:

- TriPlus RSH for automated liquid sampling
- TriPlus RSH for static headspace automation
- TriPlus RSH for automatic liquid and headspace sampling and injection
- TriPlus RSH for Solid Phase Micro Extraction sampling and injection

Additionally unbeatable features such as, large sample capacity, accurate micro-sample injection through bottom sensing capability, advance sample preparation cycles, make this autosampler a standard masterpiece for any routine laboratory.

Accessories

- Pyrolyzer
- Purge and Trap
- Thermal Desorber

• Optional built-in mini UPS

The TRACE 1110 GC has an innovative back-up system for electronics. This option helps during a power failure situation, preventing loss of ongoing analysis. In event of power failure the CPU & related electronics automatically changes over to mini UPS back up (approx. 10 min.) keeping electronics active for electronic pneumatic control, detector amplifiers while heaters are switched off for safety.

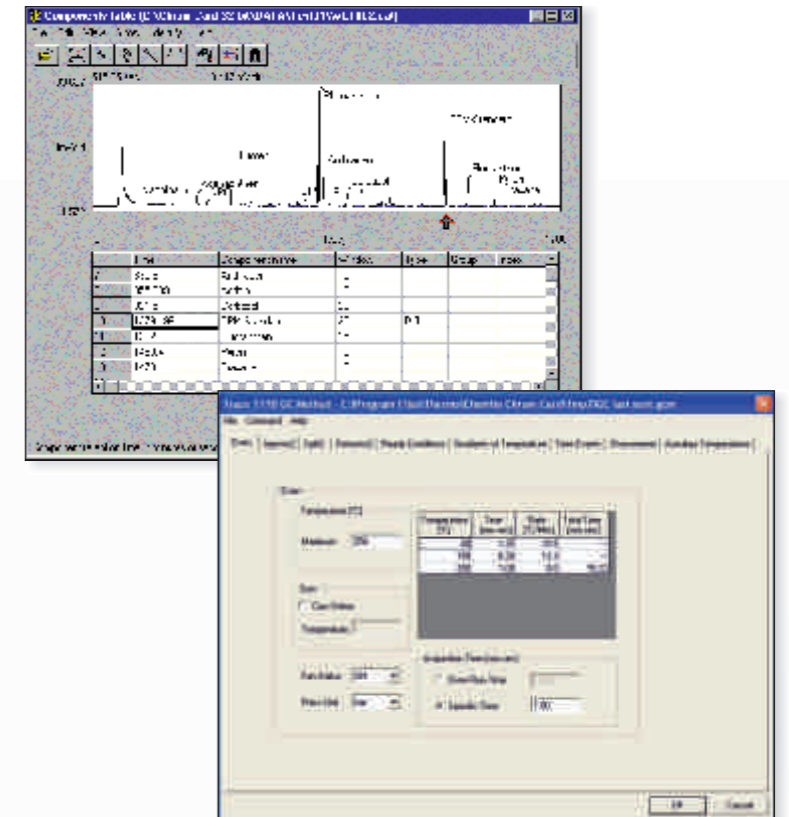
software... powerful kernel friendly Interface

Chrom-Card Software

The TRACE 1110 GC is fully controlled by Chrom-Card software

This software benefits from the extensive gas chromatography knowledge typically available in the analytical laboratory, and is a cost-effective software solution for rapid instrument control and data acquisition and handling.

Shaped around the Thermo Scientific TRACE GC Ultra system and the concept of simplicity, the Thermo Scientific™ Chrom-Card™ software is the right choice for GC specific laboratories. Redundancies that unnecessarily complicate data handling systems are eliminated, bringing the user to higher level of productivity in a very short time.



additional software platforms



The TRACE 1110 GC is also controlled by other software platforms including Thermo Scientific™ Dionex™ Chromeleon™ 6.8 Chromatography Data System, the Simply Intelligent™ chromatography package that streamlines your path from sample to results. The Chromeleon 6.8 software adapts to your needs with its simplified user interface, innovative e-workflows, powerful data mining and analysis tools, and unrivaled reporting capabilities.

turnkey analyzers

critical solutions simplified

The TRACE 1110 GC is available in a number of customised configurations to suit specific analytical needs especially present in the petroleum and petrochemical industry. These custom tailored configurations are fully certified and are designed according to various methodologies such as ASTM, CARB, CGSB, DIN, EPA, GPA, UOP and others.

Natural Gas Analyzer (NGA)

The NGA is configured for complete analysis of natural gas in a single run, without the inconvenience of switching or changing columns. The system is also capable of separating a number of other components commonly found in natural gas, including hydrogen sulphide, hydrogen and carbon monoxide.

Refinery Gas Analyzer (RGA)

The RGA provides a complete solution system for refineries, research and development, plant laboratories, as well as other allied oil and gas industries. The RGA performs complicated separations of light hydrocarbons and permanent gases from refinery gas in a single injection (C1 to C5 saturates and unsaturates with the initial backflush of C6+).

PIONA / PONA Analyzer (DHA)

The analysis of petroleum streams is extremely essential for monitoring refinery operations, product specifications and development of petroleum related processes. The PIONA / PONA analyser with a special column and software can be used for rapid analysis of Paraffins, Iso-paraffins, Olefins, Napthenes and Aromatics (PIONA / PONA), in a single run.

Other Configurations

TOGA Analyzer, Simulated Distillation Analyzer (SDA), Benzene Toluene Analyzer BTEX Analyzer, MTBE Analyzer, LPG Analyzer, Greenhouse Gas Analyzer, Trace Sulfur Analyzer, Beverage Grade CO₂ Analyzer etc.

Thermo Scientific columns and consumables

For today's chromatographer, Thermo Scientific™ TraceGOLD™, TRACE and TracePLOT columns provide excellent quality and performance, with guaranteed reproducibility. Syringes, injection port liners, ferrules, gas filters, o-rings, and septa are designed to complement our innovative GC and GC/MS systems. This wide range of consumables and accessories is designed to offer application-focused solutions to customers in the petrochemical, food and beverage and environmental industries.

- Wide range of low-bleed, high temperature columns
- Consumables tested and certified on Thermo Scientific instruments
- Gas filters to improve column lifetimes and system stability
- Vials guaranteed for the Thermo Scientific autosampler systems



laboratory solutions

backed by worldwide service and support

Tap our expertise throughout the life of your instrument. Thermo Scientific services extend 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 please visit:

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ISO 9001
Certified System

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