PRODUCE ACCURATE, RELIABLE DATA AND MAXIMIZE PRODUCT QUALITY

The Measure of Confidence

Agilent Natural Gas Analyzers

Natural gas is widely used as an energy source for heating, cooking, generating electricity and clean-burning combustible engines. This naturally occurring mixture consists primarily of methane; however, it can also include other hydrocarbons (C_1-C_{12} chain length), along with small amounts of oxygen, nitrogen, carbon dioxide, hydrogen, helium, and sulfur compounds.

Before it can be transported or sold, natural gas must meet specifications for calorific value and purity. Upstream and downstream activities – including exploration, extraction, production, transportation and distribution – all demand an array of analytical testing for relevant hydrocarbons, permanent gases, and impurities.

Start monitoring natural gas collection and processing immediately after installation

Based on Agilent 7890B GC and 490 Micro GC systems, **Agilent Natural Gas Analyzers** are factory-configured and chemically tested to help you evaluate the composition of natural gas, natural gas liquids, and processing by-products. They also let you measure permanent gases and hydrocarbon content (C_1-C_5 with C_{6+} as backflush), and perform extended analysis of hydrocarbons in natural gas to C_{12}.

Agilent Natural Gas Analyzers include innovative technology and reflect our stringent quality control process. Systems include:

Factory

- Setup and leak testing
- Instrument checkout
- Installation of appropriate columns
- Factory-run checkout method using application checkout mix

Delivery

- Instrument manual for running the method
- CD-ROM with method parameters and checkout data files for easy out-of-the-box operation
- Application related consumables included – no separate ordering required
- Easy consumables re-ordering information

Installation

- Duplicate factory checkout with checkout sample – onsite by factory-trained support engineer
- Optional application startup assistance

Agilent Technologies

Standard and Custom Natural Gas Analyzers

to monitor operations and finished products

7890B Extended Natural Gas Analyzer

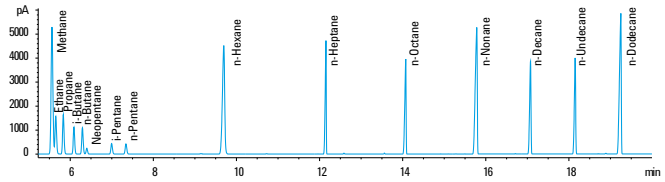
Reliably quantify components and ascertain quality

The Agilent Extended Natural Gas Analyzer measures C_1-C_{12} hydrocarbons – as well as permanent gases (oxygen, nitrogen, carbon dioxide, and carbon monoxide) – with features such as:

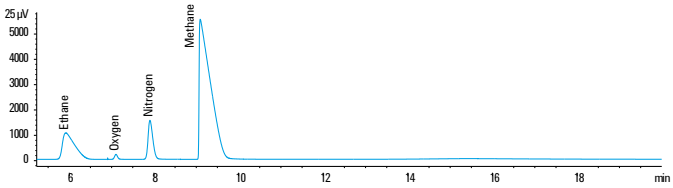
- Dual channel with TCD and FID detectors
- FID channel allows detection of C_3-C_{12}
- TCD channel with packed column for permanent gas analysis

Results are reported per GPA 2286.†

†Extended NGA analyzer does not calculate bridge components iC_5 and nC_5, although other analyzers with bridging calculations are available.



Hydrocarbons (C_3-C_{12}) separated on a PONA column and measured on FID.



Methane, Ethane, and Permanent Gases (Oxygen, Nitrogen, Carbon Dioxide) measured using a TCD channel with packed column.

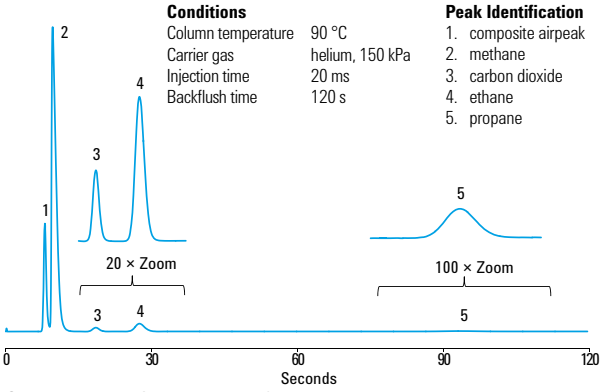
Micro GC Natural Gas Analyzer

Results you can count on when every second counts

In the lab or in the field, Agilent Micro GC Analyzers quickly deliver the data you need. Features include:

- Ready-to-go configuration with proven Micro GC hardware and software
- **Iso-thermal technology** that allows ultra-fast sequential operation
- Optional integrated micro-gasifier that allows you to analyze liquefied gases

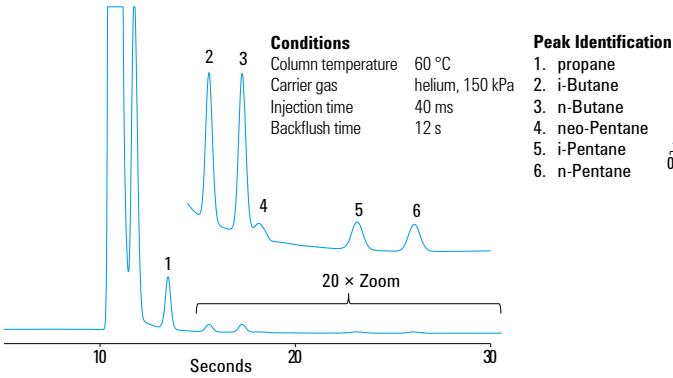
What's more, each channel is optimized for specific NGA analytes.



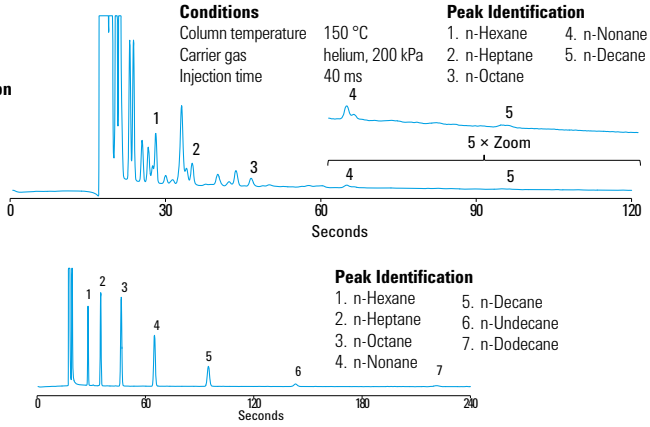
Channel 1: HayeSep A with Backflush

Micro GC NGA Chromatography

Note the excellent repeatability (RSD 0.5%)



Channel 2: CP-Sil 5 CB with Backflush



Channel 3: CP-Sil 5 CB

Summary of capabilities for Agilent NGA Analyzers

	Extended Natural Gas Analyzer	Conventional Natural Gas Analyzer	Full Range Hydrogen Natural Gas Analyzer	Sour Natural Gas Analyzer	Natural Gas Analyzer A by Micro GC	Natural Gas Analyzer A Extended by Micro GC	Natural Gas Analyzer B by Micro GC	Natural Gas Analyzer B Extended by Micro GC
Characteristics	(G3445B, #541)	(G3445B, #542)	(G3445B, #543)	(G3445B, #544)	(G3582A#120)	(G3582A#121)	(G3582A#122)	(G3582A#123)
No. of Channels	2	1	2	1	2	3	2	3
Analysis time	20 min	18 min	20 min	25 min	100 s until C_7 400 s until C_9	100 s until C_{10} 240 s until C_{12}	75 s until C_6 400 s until C_9	75 s until C_6 400 s until C_9
Hydrocarbon range	C_1 - C_{12}	C_1 - C_5, C_{6+} as backflush	C_1 - C_5, C_{6+} as backflush	C_1 - C_5, C_{6+} as backflush	C_1 - C_9	C_1 - C_{12}	C_1 - C_9	C_1 - C_9
Repeatability	<1%	<1%	<1%	<1%	<0.5%	<0.5%	<0.5%	<0.5%
Permanent gases	Oxygen, Nitrogen, CO, CO_2	Oxygen, Nitrogen, CO, CO_2	Hydrogen, Helium, Oxygen, Nitrogen, CO, CO_2	Oxygen, Nitrogen, CO, CO_2, Hydrogen Sulfide	CO_2, Air	CO_2, Air	CO_2, Air, Hydrogen Sulfide	Hydrogen*, Helium*, $COCO_2$, Oxygen, Nitrogen, Hydrogen Sulfide
Linear bench space required	59 cm (23 in)	59 cm (23 in)	59 cm (23 in)	59 cm (23 in)	15 cm (6 in)	15 cm (6 in)	15 cm (6 in)	15 cm (6 in)
Handles He plus full range of H_2 concentrations	No	No	Yes	No	No	No	No	Yes*
Minimum component detection level (hydrocarbons)	10 ppm for C_3 - C_{12}	0.01%	0.01%	0.01%	1-10 ppm	1-10 ppm	1-10 ppm	1-10 ppm
Minimum component detection level (permanent gases)	50 ppm	0.01%	0.01%	0.01%	1-10 ppm	1-10 ppm	1-10 ppm	1-10 ppm
Minimum component detection level (H_2S)	N/A	N/A (order 7890-0192)	N/A	500 ppm	N/A	N/A	10 ppm	10 ppm
Detectors	TCD/FID	TCD	TCD/TCD	TCD	µ-TCD (2)	µ-TCDs (3)	µ-TCD (2)	µ-TCDs (3)
No. of valves	3	3	4	3	N/A	N/A	N/A	N/A
No. of columns (type)	4 (PLOT and packed)	4 (packed)	6 (packed)	4 (packed)	2 (WCOT and PLOT)	3 (WCOT and PLOT)	2 (WCOT and PLOT)	3 (WCOT and PLOT)
Suitability								
Configured per	Results per GPA 2286, but calculation without bridge components iC_5 and nC_5	ASTM D1945, GPA 2261 (H_2 and He are not included)	ASTM D1945, GPA 2261	ASTM D1945, GPA 2261	ASTM D3588-98, GPA 2172, ISO 697, GOST	ASTM D3588-98, GPA 2172, ISO 697, GOST	ASTM D3588-98, GPA 2172, ISO 697, GOST	ASTM D3588-98, GPA 2172, ISO 6976, GOST, ASTM D1945, GPA 2261, ISO 6974-6

*Requires argon carrier gas on MolSieve 5Å channel.

Additional standard analyzers:

- Liquefied Natural Gas
- Conventional Natural Gas (large valve oven, with the flexibility to add another channel in the main GC oven)
- Sulfurs in Natural Gas

Fully customized Analyzers for your unique requirements

Let Agilent help you meet your most challenging demands with specialized technologies that significantly reduce your time from system arrival to final validation. With pre-configured hardware and method-specific separation tools, your analysts can spend *more time* on calibration and validation per your laboratory's SOPs.

To review our full line of analyzers, visit **agilent.com/chem/appkits**

Agilent has the technology and experience

to support your lab with fully customized solutions

Over the past four decades, Agilent has taken an active role in developing methods and applications – many of which have evolved into global standards for energy/fuels analysis.

Our 7890B GC, for example, is the world's most widely used GC system. It features accurate temperature controls and precise injection systems – plus enhanced Electronic Pneumatic Control (EPC) for the best retention times. Likewise, our 490 Micro GC is the industry leader for mud logging applications. Its ability to provide results in as little as 30 seconds allows geophysicists and petroleum engineers to make fast, accurate decisions about process optimization.

In addition, Agilent experts continue to be actively involved in ASTM – the world's most trusted source for standards development. We have applied this deep regulatory understanding toward developing methods for our Natural Gas Analyzers.

Beyond the box:

A full portfolio of customized products, advice, and support

High-quality columns and supplies from the world GC leader

Agilent-engineered GC columns and supplies deliver what your natural gas applications demand – including:

- Long-term reliability and robustness
- Trouble-free instrument operation
- Faster analysis *without* loss of resolution

Local, on-site assistance

No matter where you are on the energy/fuels supply chain, Agilent can help you increase production efficiency... reduce scrap and rework... and enhance product quality.

Best-in-class service and support

Whether you need support for a single instrument or a large-scale, multi-vendor operation, Agilent service professionals can help you solve problems quickly and increase your uptime, so you can focus on what *you* do best.

Custom GC and GC/MS configurations

Let Agilent customize a standard GC or GC/MS Analyzer with specialized columns, valves, tubing inlets, and other add-ons – including an extensive line of consumables and column modules.

Put your applications on the fast track.

Contact your local Agilent Representative
or Agilent Authorized Distributor at
agilent.com/chem/contactus

Or call **800-227-9770** (in the U.S. or Canada)

Visit **agilent.com/chem/appkits**
for a description of available Analyzers and Application Kits

Ordering information:

Extended Natural Gas Analyzer (G3445#541)
Conventional Natural Gas Analyzer (G3445#542)
Full Range Hydrogen Natural Gas Analyzer (G3445B#543)
Sour Natural Gas Analyzer (G3445B#544)
Natural Gas Analyzer A by Micro GC (G3582A#120)
Extended Natural Gas Analyzer A by Micro GC (G3582A#121)
Natural Gas Analyzer B by Micro GC (G3582A#122)
Extended Natural Gas Analyzer B by Micro GC (G3582A#123)

Printed in U.S.A., May 23, 2014
5991-4577EN

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