

# Natural Gas

Analysis by Gas Chromatography



*Engineered Solutions, Guaranteed Results.*



# Natural Gas Analysis

## Wasson-ECE Instrumentation offers a wide variety of natural gas analyzers for your specific needs.

The natural gas refining process poses unique analytical challenges due to a wide variety of components and samples encountered. Because of the different sample compositions, Wasson-ECE has developed a family of gas chromatograph configurations for your unique natural gas needs.

The natural gas family of applications is designed to provide a flexible approach to meet your analytical requirements. As a Premier Channel Partner of Agilent Technologies, Wasson-ECE extends the capabilities of the 7890 GC to produce results with reliability, efficiency, and precision.

This brochure contains examples of specific analyzer configurations for the natural gas industry. If there is not something that fits your particular analytical needs, a GC can be customized for your unique sample and conditions.



Comparison Chart

	125-00	192-00	241-00	325-00	326-00
Run Time (minutes)	20	27	38	40	40
Detectors	TCD	TCD	TCD/FPD	TCD/FID	TCD/FID
Liquid Sample Valves	Optional	Optional	Optional	Optional	Optional
Electronic Pressure Control	Yes	Yes	Yes	Yes	Yes
On-Line Availability	Yes	Yes	Yes	Yes	Yes

# Natural Gas Analysis

## 326-00 Extended Natural Gas and Natural Gas Liquids with Oxygen/Nitrogen Separation Plus Hydrogen Sulfide

For this analysis of natural gas and natural gas liquids Wasson-ECE uses a TCD and packed columns to separate carbon dioxide, isobutane, n-butane, isopentane, n-pentane, ethane, hydrogen sulfide, propane, argon/oxygen composite, nitrogen, methane, and a C<sub>6</sub>+ backflush. An FID and capillary columns are used to separate and quantify hydrocarbons from C<sub>5</sub> to C<sub>12</sub>. This analysis is compliant with GPA method 2186 and 2286.

### Features:

- Simultaneous operation combines two independent analyses into one for a comprehensive 40 minute analysis
- Fixed gases and C<sub>1</sub> through C<sub>5</sub> paraffins are separated from the C<sub>6</sub>+ hydrocarbons
- C<sub>6</sub>+ components are backflushed to the TCD prior to the determination of all other components
- Optional H<sub>2</sub>S determination
- A capillary column and an FID perform the extended analysis of C<sub>5</sub> through C<sub>12</sub> hydrocarbons
- Liquid sample valves available for LPG samples

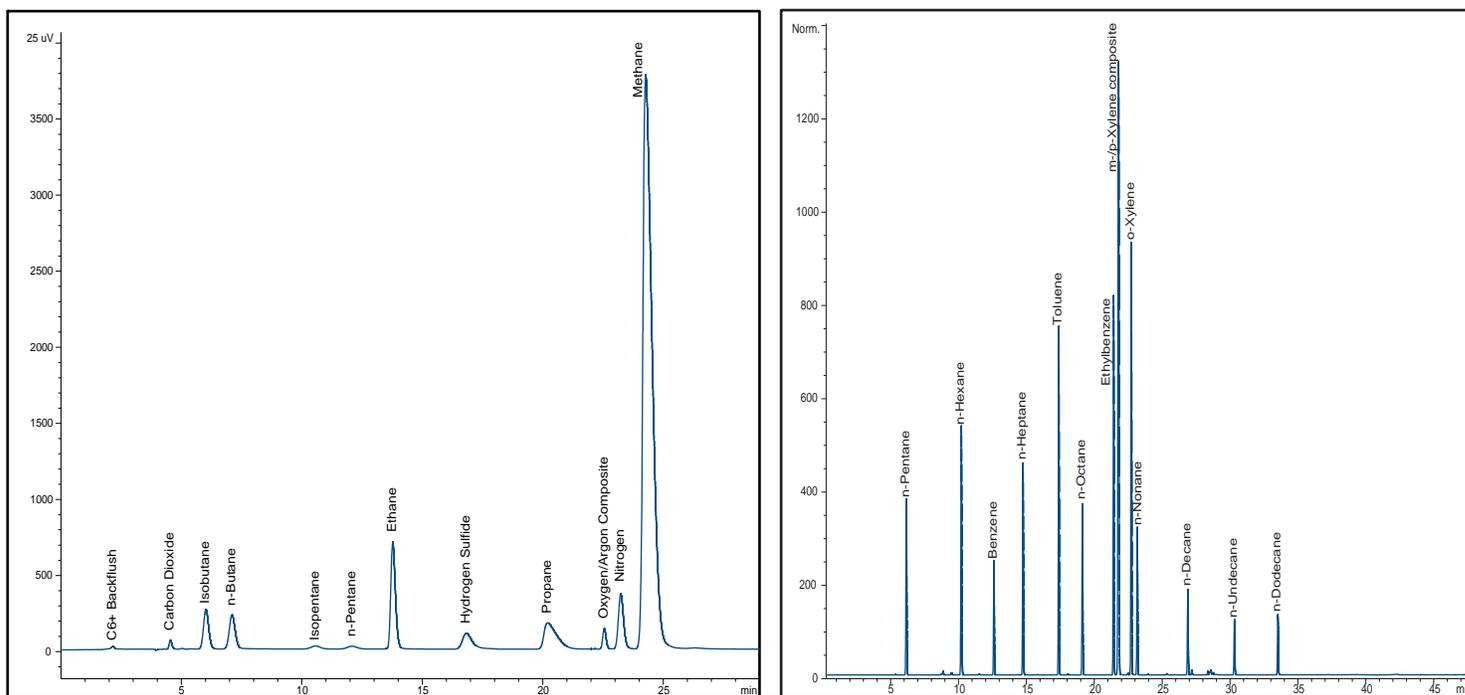


Figure 7 and 8: Analysis of natural gas spiked with hydrogen sulfide by TCD and analysis of C<sub>5</sub>-C<sub>12</sub> hydrocarbons + BTEX by FID

# Natural Gas Analysis

## 241-00 Natural Gas and Natural Gas Liquids Plus Trace Sulfurs

This system utilizes a TCD and FPD to quantify paraffins, fixed gases, and sulfur components in natural gas.

### Features:

- Two methods run simultaneously to provide a comprehensive analysis of natural gas
- The system ensures C<sub>6</sub>+ organic components do not elute to the columns
- Liquid sampling valves are available for LPG samples
- Analysis time: 18 minute sulfur analysis, 38 minute hydrocarbon and fixed gas analysis
- System can be configured per ASTM D6228 to analyze for odorants in natural gas and LPG

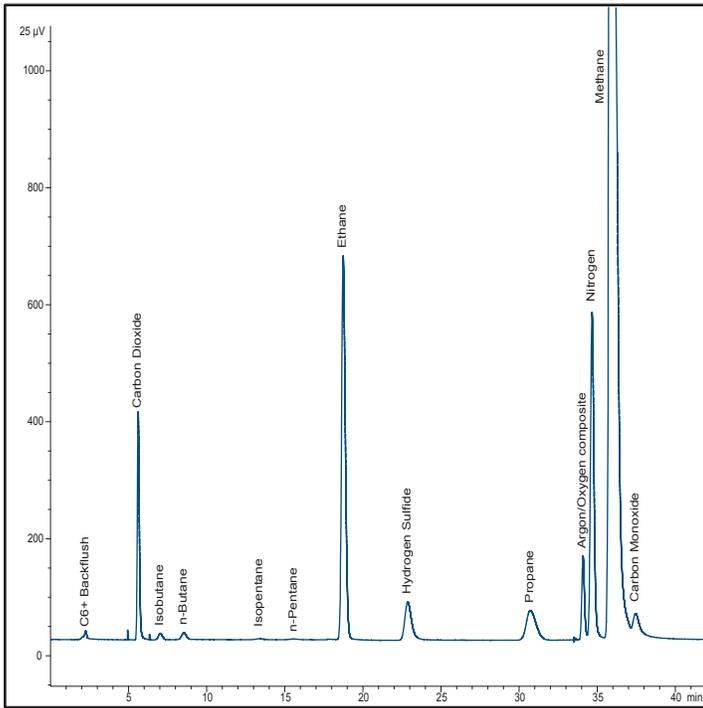


Figure 3: Natural gas spiked with carbon monoxide and hydrogen sulfide by TCD using a 1.0 mL gas sample injection

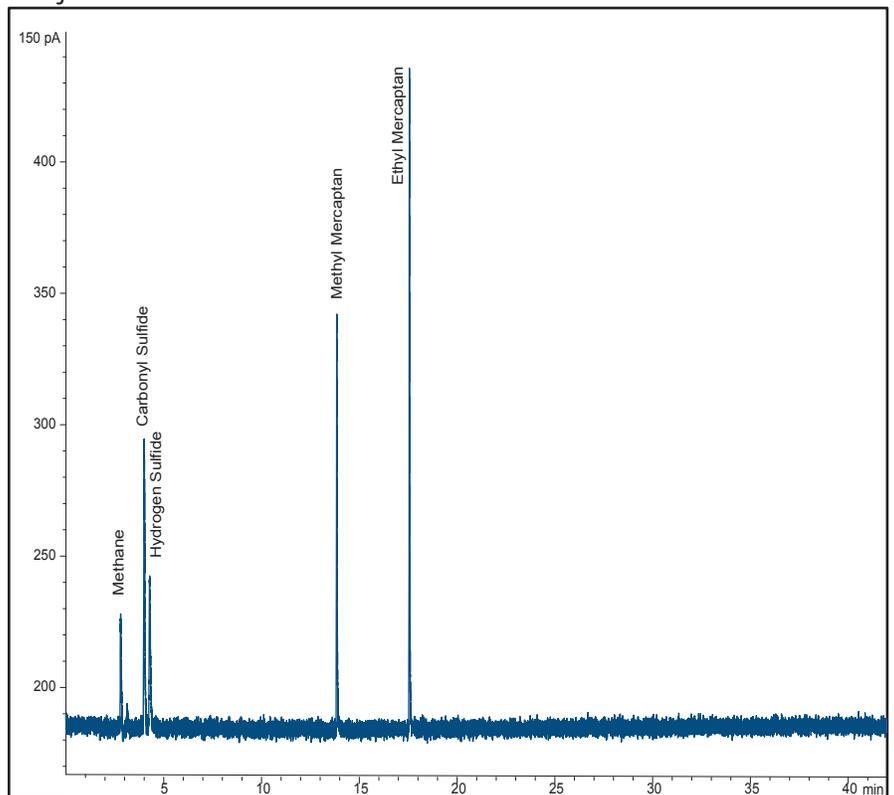


Figure 4: Low level sulfurs in natural gas by FPD with a 0.5 mL gas sample injection

# Natural Gas Analysis

## 325-00 Extended Natural Gas and Natural Gas Liquid Analysis

Analysis of natural gas and natural gas liquids using a TCD to quantify fixed gases, C<sub>1</sub> through C<sub>5</sub> paraffins, and hydrogen sulfide as well as an FID to perform the extended analysis of C<sub>5</sub> through C<sub>16</sub> hydrocarbons.

### Features:

- Simultaneous operation combines two independent analyses into one to form a comprehensive 40 minute analysis
- The extended analysis assists the operator in finding the major contributing components for BTU calculations
- Optional H<sub>2</sub>S analysis
- Liquid sample valves available for LPG samples

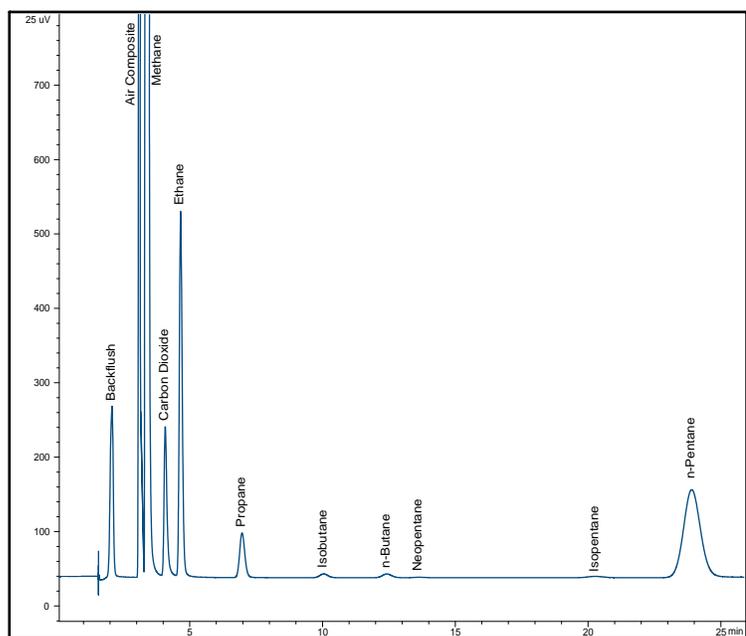


Figure 5: Natural gas analysis by TCD

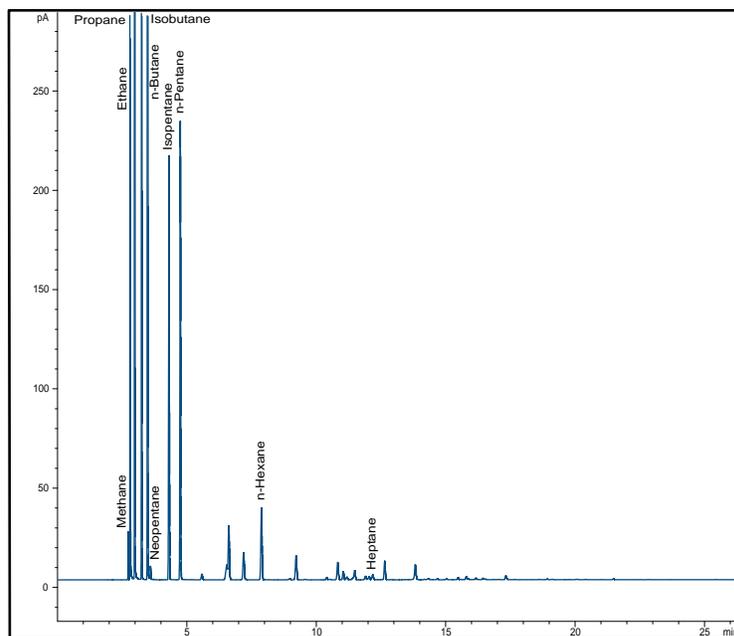


Figure 6: C<sub>1</sub>-C<sub>12</sub> and BTEX by FID

# Natural Gas Analysis

## 125-00 Fast Natural Gas and Natural Gas Liquids

This analysis uses a TCD and packed columns to separate and quantify an air composite (nitrogen, oxygen and argon), methane, carbon dioxide, ethane, propane, isobutane, n-butane, isopentane, n-pentane, and a C<sub>6</sub>+ composite in accordance with Gas Processing Association (GPA) methods 2261 and 2177.

### Features:

- Initial C<sub>6</sub>+ backflush
- Conforms to GPA methods 2177 and 2261
- Fast assay of natural gas and natural gas liquid
- Analysis time of approximately 20 minutes

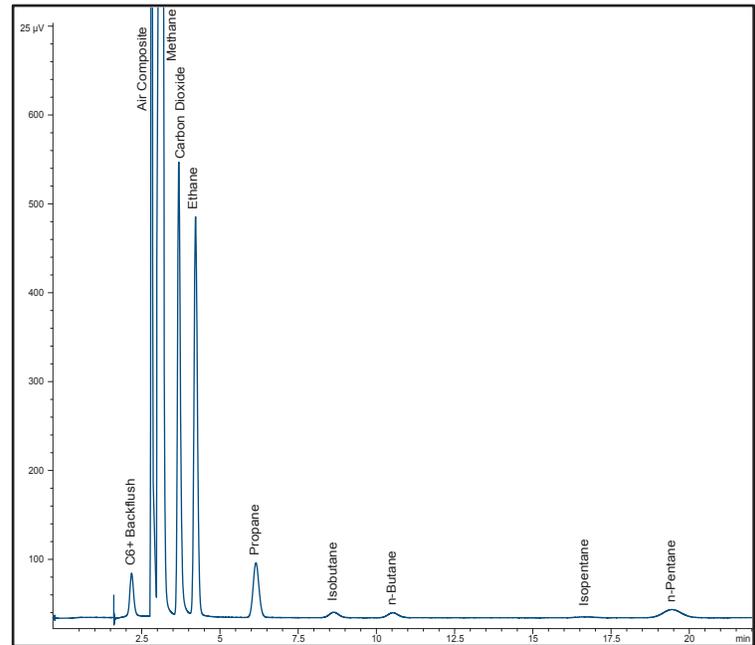


Figure 1: Natural gas analysis by TCD using a 1.0 uL liquid sample valve

## 192-00 Natural Gas and Natural Gas Liquids with Oxygen/Nitrogen Separation and Optional Hydrogen Sulfide Analysis

This system uses a TCD and packed columns to quantify and separate carbon dioxide, isobutane, n-butane, isopentane, n-pentane, ethane, propane, oxygen/argon composite, nitrogen, methane, and a C<sub>6</sub>+ composite backflush with the option for hydrogen sulfide analysis.

### Features:

- Initial C<sub>6</sub>+ backflush which allows an accurate analysis of the heavier hydrocarbons
- Complete separation of C<sub>1</sub> through C<sub>5</sub> saturated hydrocarbons and fixed gases
- Application can be configured for C<sub>1</sub> through C<sub>6</sub> saturates and H<sub>2</sub>S
- 27 minute analysis time, 18 minutes if samples do not contain H<sub>2</sub>S

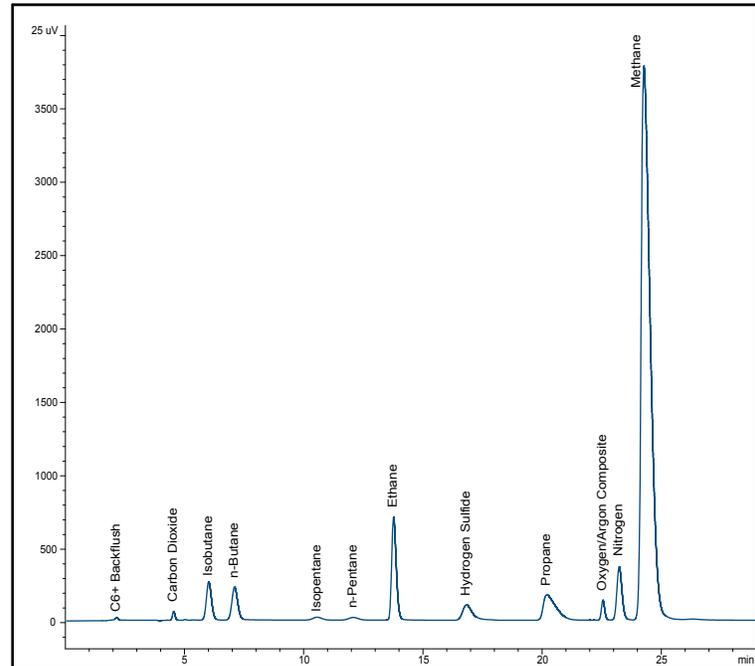


Figure 2: Natural gas analysis by TCD

## Wasson-ECE Instrumentation

### *Engineered Solutions, Guaranteed Results.*

Wasson-ECE Instrumentation specializes in configuring and modifying new or existing gas chromatographs exclusively from Agilent Technologies to become guaranteed, turn-key analytical systems. Our customers describe their objectives and samples: analytes, concentration ranges, phases, temperature, throughput, and any special needs. From this dialogue we configure a task specific instrument. We add extra ovens, valves, plumbing, flow control, columns, electronics, and software to yield a complete solution. This saves our clients valuable time and delivers instruments that are state-of-the-art and ready for use upon installation.

The complete analytical method is developed, tested, and documented utilizing our experience working with numerous companies with similar needs and goals. The resulting chromatograms and reports are inspected by our application chemists and you, to ensure system performance and design quality. Our field engineers then install each system and provide training. After installation, and throughout the life of the chromatograph, our support chemists are ready to help. We can assist with application details, questions, training, calibration, maintenance, and on-site service. Wasson-ECE brings experience and efficiency to projects and gives you confidence in the quality of the data.



Please contact us for more information.



*Engineered Solutions, Guaranteed Results.*