PRODUCE ACCURATE, RELIABLE DATA AND MAXIMIZE COMBUSTION EFFICIENCY

The Measure of Confidence

Agilent Reformulated Fuel Analyzers

Fuels such as gasoline undergo reformulation to improve combustion efficiency, and to meet strict U.S. EPA limits for volatile organic compounds (VOCs) and other emissions. For example, catalytic restructuring of hydrocarbon molecules in naphtha feedstock produces more complex structures, while oxygenate blending increases octane ratings. But no matter how your company reprocesses its fuel, you must be certain that your final product conforms to regulations.

Get application workflows up and running reliably from *day one*

Agilent Reformulated Fuel Analyzers are based on the Agilent 7890B GC system. Each is factory pre-tested and pre-configured to save precious start-up time for your analysis of oxygenates, benzene, and heavier aromatics per industry reference methods.

Standard Configurations

- Each includes Capillary Flow Technology (CFT) Dean's Switch and Backflush to reduce analysis time, improve data, and reduce system maintenance

Large Valve Oven (LVO) Configuration

- External oven expands analytical capabilities with six positions for valves and/or columns
- Single heated GC zone controls the external valve oven's isothermal temperature
- 3-in-1 analysis of fuels per ASTM D4815, D3606, and D5580

Agilent Reformulated Fuel Analyzers reflect innovative technology and a stringent quality control process. Systems include:

Factory

- System 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

Reformulated Fuel Analyzers *with* or *without* the Large Valve Oven

To generate data about operations, processes, and product quality

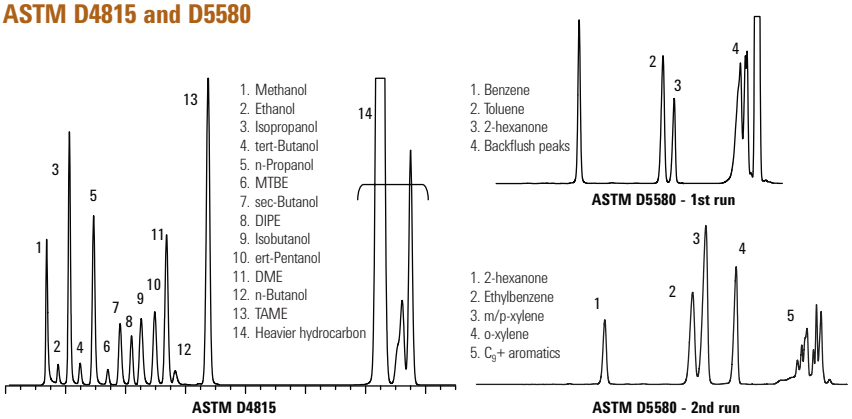
Standard GC Analyzers for Reformulated Fuel

Configured to meet ASTM and CEN analysis/reporting requirements

Expedite your evaluation of oxygenate concentrations, benzene, and heavier aromatics with our ready-to-go systems that comply with:

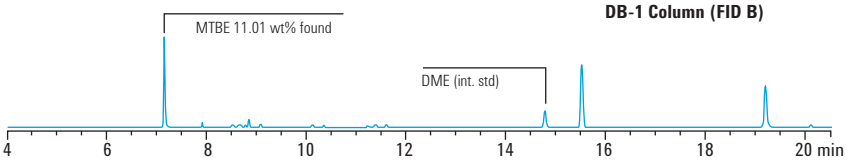
- ASTM Methods D4815, D5580 and D3606
- CEN Methods EN 13132 and EN 12177

Dual-parallel-channel analysis of oxygenates and aromatics in fuel per ASTM D4815 and D5580

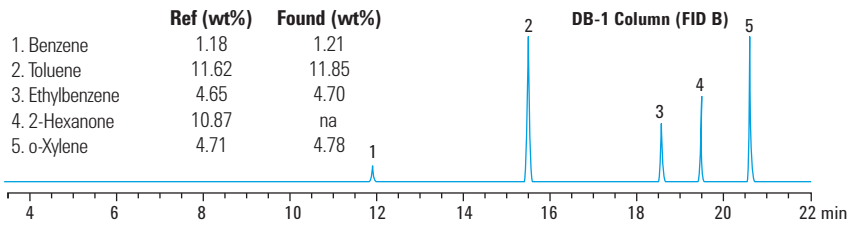


Here, dual parallel channels were configured on one GC system. Both oxygenates and aromatics were precisely determined in gasoline.

Oxygenates and aromatics in gasoline per EN 13132 and EN 12177



	Ref (wt%)	Found (wt%)
1. Benzene	1.18	1.21
2. Toluene	11.62	11.85
3. Ethylbenzene	4.65	4.70
4. 2-Hexanone	10.87	na
5. o-Xylene	4.71	4.78



This analysis used Capillary Flow Technology (CFT) Deans Switch to simplify method setup, eliminate carryover, and minimize peak tailing for very polar compounds. Backflush was also used to reduce analysis time.

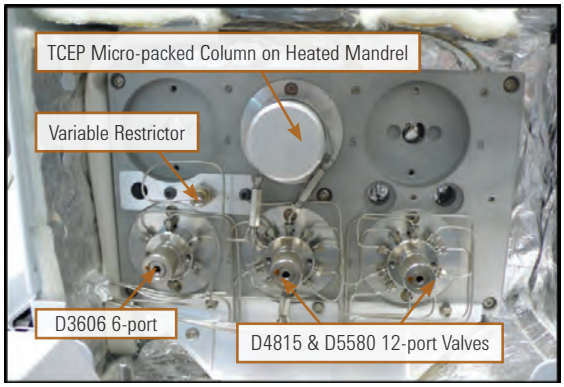
Three-in-one Reformulated Fuel Analyzer

Perform ASTM D4815, D3606 and D5580 on a *single system*

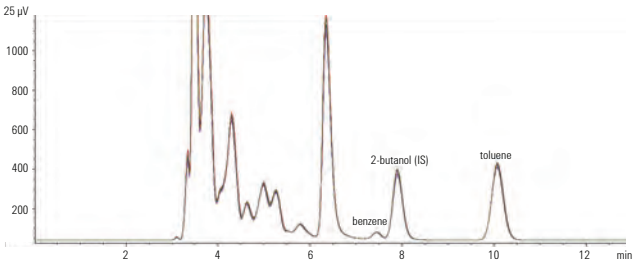
Expand your analytical capabilities with this versatile system that combines a Large Valve Oven (LVO) with the industry-leading Agilent 7890 GC system. The additional thermal zone provided by the LVO gives you the advantages of:

- Increased flexibility for analyses requiring multiple valves and columns.
- Rapid switching between methods – the higher main oven temperature does not affect the LVO temperature, so you don't have to wait for valve oven equilibration when changing from D3606 to D4815/D5580 analysis.

Column and valve configuration: Reformulated Fuel Analyzer with LVO

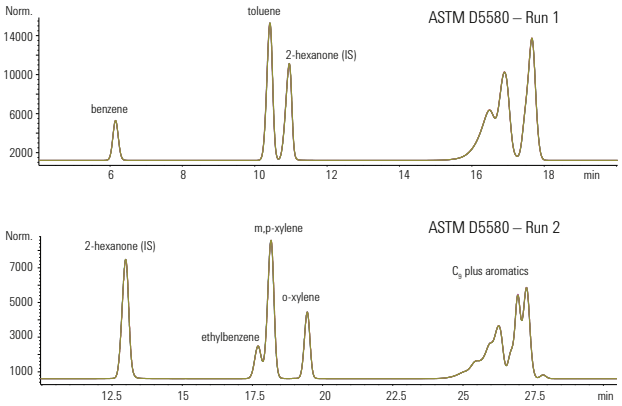


Analysis of benzene and toluene in gasoline per ASTM D3606



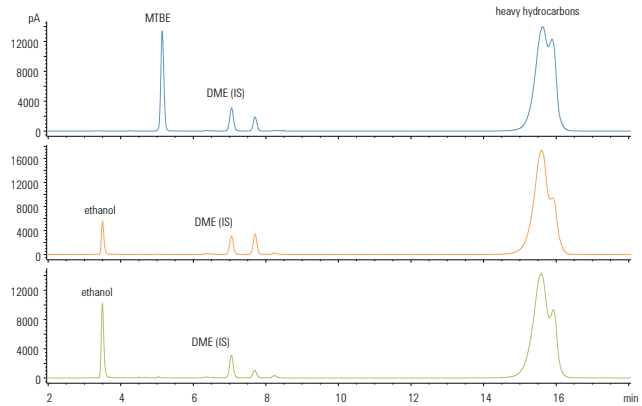
This overlay represents 10 samples prepared with the Agilent 7696A Sample Prep WorkBench. EPA method standards specify 0.1-5.0 vol% for benzene and 2-20 vol% for toluene.

Aromatics in gasoline separation per ASTM D5580



Overlay of 5 samples prepared with the Agilent 7696A Sample Prep WorkBench. This method measures benzene (0.1-5%), toluene (1-15%), C_8 aromatics (0.5-10%), C_9 plus aromatics (5-30%), and total aromatics (10-80%)

Analysis of oxygenated additives per ASTM D4815



14 different ethers and alcohols from 0.1-15 wt% were detected. Samples were prepared with the Agilent 7696A Sample Prep WorkBench.

We also offer fully customized Analyzers for your unique requirements

Agilent, together with our Channel Partners, can 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 7890 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.

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 Reformulated Fuel 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 analysts 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 multi-vendor operation, Agilent service professionals can help 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 a GC/MS analyzer with specialized columns, valves, tubing inlets, and other add-ons – including an extensive line of consumables and column modules.

Ordering information:

Part Number	Analyzer Description
G3445 Series #611	Oxygenates and aromatics in finished gasoline per ASTM D4815 and ASTM D5580
G3445 Series #612	Parallel channel oxygenates and aromatics per ASTM D4815 and ASTM D5580
G3445 Series #614	Oxygenates in finished gasoline per ASTM D4815
G3445 Series #615	Benzene in finished motor and aviation fuels per ASTM D3606
G3445 Series #616	Aromatics in finished gasoline per ASTM D5580
G3445 Series #617	Oxygenates and aromatics in commercial and raw gasoline per EN 13132 and EN 12177
G3445 Series #618	Low-level oxygenates in light hydrocarbons per ASTM D7423
G3445 Series #621	3-in-1 per ASTM D3606, D5580, and D4815 using Large Valve Oven
G3445 Series #482	FAME Contamination in jet fuel per IP 585

Put your lab on the productivity 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

Printed in U.S.A., October 9, 2014
5991-5043EN

Agilent Technologies