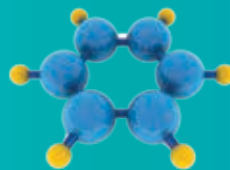


**SIEMENS**

*Ingenuity for life*

## Environmental monitoring solutions

Total solution for measuring benzene  
in gasoline



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# Environmental monitoring solutions

## Benzene Rules are Getting Stricter

EPA rule 40 CFR Parts 59, 80, 85, 86 (Control of Hazardous Air Pollutants From Mobile Sources) is about to reduce allowable emissions of benzene and other mobile source air toxics. It originally went into effect on April 27, 2007, with a recent Final Release on October 8, 2008.

On January 1, 2011, the rule limits the benzene content of reformulated gasoline (RFG) and conventional gasoline (CG) to an annual refinery average of 0.62 volume percent (vol%). If you are a refiner or importer, this rule applies to you.

On July 1, 2012, the rule establishes a maximum average standard of 1.3% benzene in gasoline by volume. This is the maximum when credits are used to meet the 0.62 vol% limit. Each refinery's annual average must be less than or equal to 1.3 vol% without the use of credits.

## ABT Program Allows Compliance Credits

EPA is finalizing a nationwide averaging, banking, and trading (ABT) program that allows you to choose the most economical compliance strategy (investment in technology, credits, or both). Between 2007 and 2010, you can "bank" credits by reducing benzene earlier than required.

In 2011, you can receive standard credits by producing and importing gasoline if it equals less than 0.62 vol% benzene annually. You can apply the credits toward compliance, bank them, or transfer them to other refiners and importers.

The rule does not apply to gasoline in California, which is already covered under that state's Phase 3 Reformulated Gasoline (Ca3RFG) program. Ca3RFG mandates an averaging limit of 0.7 vol%.

## Benzene Control Technologies

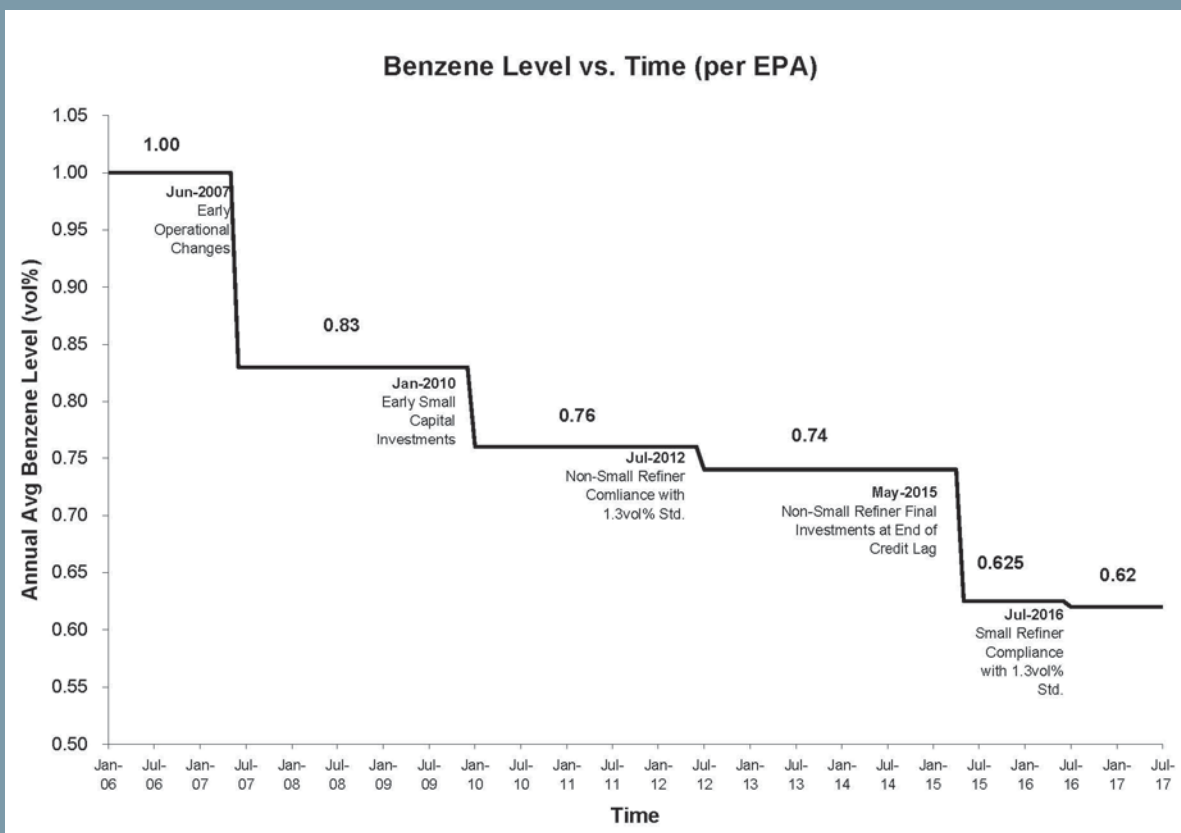
Several technologies reduce benzene by controlling the chemical in the reformer. Refiners typically rely on the reformer to produce aromatic compounds such as benzene for their octane content.

If you are not actively reducing benzene, EPA estimates that the reformer produces one half to three quarters of the benzene in your gasoline.

## Sampling, Testing, and Reporting

EPA proposes every-batch sampling for CG. RFG is already every-batch tested because of its 1.3 vol% per gallon cap, and the results must be available before the batch leaves the refinery.

To gauge the market for transfer credits, EPA is requiring you to submit pre-compliance reports before the program starts. For these reports, each sample must be tested using 80.46(e), ASTM D-3606-99 (Standard Test Method for Determination of Benzene and Toluene in Finished Motor and Aviation Gasoline by Gas Chromatography).







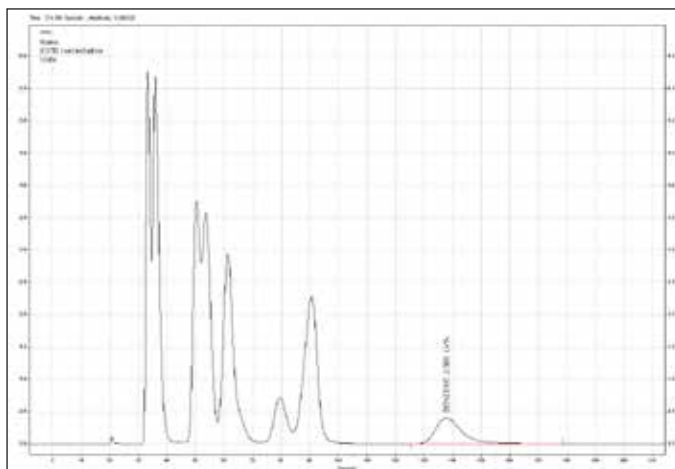
## Why choose Siemens

### Affordable Turnkey Solutions

Online process gas chromatography (PGC) helps you avoid costly lab tests and facilitates producing gasoline directly into the pipeline. Siemens offers a turnkey solution (MAXUM edition II PGC, Sample Conditioning System (SCS), and System Integration) for the most challenging process environments and monitoring requirements.

### MAXUM edition II Online Process Gas Chromatography (PGC)

The MAXUM edition II PGC is modular, which means you can configure it for many analysis tasks. Configurations maximize the accuracy of analytical results, while reducing maintenance costs and supporting many environmental monitoring applications, including the analysis of multiple components in complex vapor or liquid mixtures such as light or heavy hydrocarbons, inert gases, sulfur compounds or raw material pollutants, even at the trace level.



The MAXUM edition II PGC method for benzene in gasoline uses a simple backflush column-valve configuration and thermal conductivity detector with a 3-minute analysis time. This chromatogram shows the actual results for a benzene in gasoline measurement.

### Sample Conditioning Systems

The SCS adapts the sample conditions to the needs of the analyzer. We have vast experience designing standard and custom SCS's for environmental monitoring. For measuring benzene, we direct the liquid stream through a simple fast loop/analytical loop and then return it to the process.

### System Integration

System Integration occurs when we configure your analyzer and sample system for installation. Our goal is to ensure long-term operation and maintenance at an affordable price. We configure your solution to provide adequate environmental protection for local conditions, safeguard maintenance personnel, allow for remote operation (when available), minimize utility requirements, and simplify installation requirements.

Standard features include sun and rain protection, light and receptacle, 120 or 480 VAC power circuits, and a cylinder rack. Options may include ventilation fans, electric heat, exterior SCS, A/C, and hazardous area classification.

### Siemens - Single Source Supplier for Environmental Monitoring Solutions

Siemens has built an industry-leading reputation by investing in long-term security through continuous innovation, maximum compatibility, the largest number of field technicians, and superior expertise. For Environmental monitoring, Siemens offers Standard Solutions, preconfigured base systems with standard installation, and operation options. Siemens, along with the former Applied Automation, have over 2x40 years experience in process analyzers, and is a worldwide market leader for on-line Process Gas Chromatography. Siemens does not provide just products, but is utilizing a leading-edge portfolio for comprehensive measurement solutions, addressing life-cycle cost, long term performance and simplicity. When it comes to Environmental monitoring, our Customers want a long-term business relationship with a reliable partner.

Siemens' systems are validated and documented according to applicable EPA methods. Users have the certainty and confidence that the measurement system is compliant. Siemens guarantees compliance and functionality.

**For more information, please contact:**

Siemens Industry, Inc.  
5980 W. Sam Houston Pkwy North  
Ste 500  
Houston, TX 77041  
Phone: 713-939-7400  
Email: [ProcessAnalyticsSales.industry@siemens.com](mailto:ProcessAnalyticsSales.industry@siemens.com)

Siemens Industry, Inc  
100 Technology Drive  
Alpharetta, GA 30005

Customer Support Center.  
Phone: 1-800-241-4453  
E-mail: [info.us@siemens.com](mailto:info.us@siemens.com)  
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