

Total Sulfur in Fuels



- ASTM D7041-04
- On-line Measurement of Total Sulfur
- Simple Analysis Method
- Minimal Hardware
- Proven Gas Chromatograph Flame Photometric Detection
- Low Range Sensitivity

Application

The demand for on-line measurement of fuel sulfurs in refineries is growing as environmental regulators enact more stringent limits on sulfur levels in motor fuels.

Availability of sweet crudes has decreased while legislation continues to lower the permissible levels of sulfur in motor fuels to decrease pollution.

As these sulfur limits continue dropping, very few on-line process analyzers can measure the total sulfur levels accurately and reliably. But, the PGC2007 Process Gas Chromatograph with a Flame Photometric Detector (FPD) by ABB Analytical provides a field-proven on-line method, measuring trace levels of Total Sulfur in fuels.

Method

The Environmental Regulations, which continue to evolve, set the anticipated limit for total sulfur in gasoline and diesel fuel. In response, various technologies for gasoline and diesel fuel analysis have appeared on the market: x-ray dispersion, electrochemical methods, lead acetate paper tapes, UV fluorescence and gas chromatography.

Recent ASTM test results show most of these methods to provide inadequate repeatability and reproducibility for both gasoline and diesel samples, especially at the lower ranges soon to be required. The method employed in the PGC2007 from ABB performs with excellent repeatability and reproducibility.

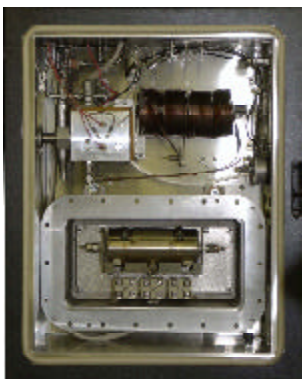
Process Gas Chromatograph PGC2007



The PGC2007 from ABB utilizes gas chromatography and an oxidation furnace for total sulfur measurement. Unlike some of the other more hardware-intensive methods mentioned, the PGC2007 utilizes our field-proven Flame Photometric (FPD), known for its reliability and simplicity. The features and performance of the complete analyzer system make ABB Analytical the leader in process chromatography for Total Sulfur.

Simplicity — Injection, Oxidation, Separation, Measurement

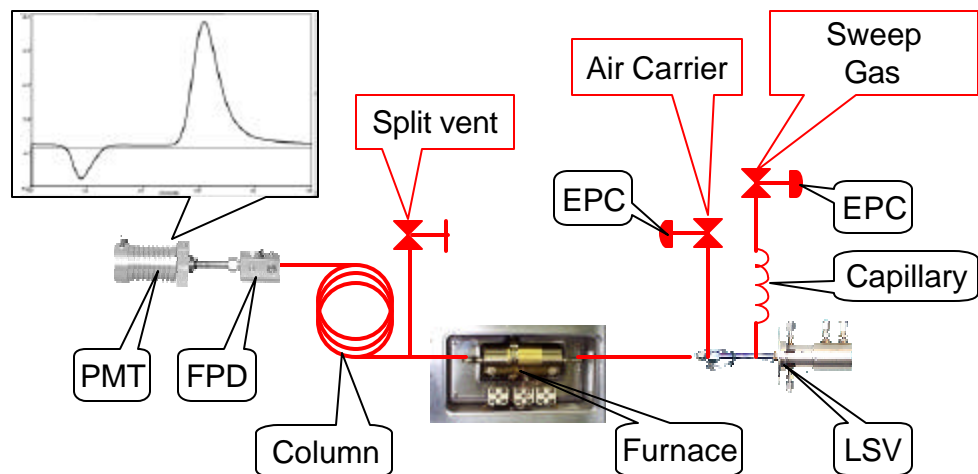
The platform is familiar to your technicians; in addition, its simple furnace converter, and proven FPD technology provide excellent analytical stability.



A total sulfur analysis takes about 5-6 minutes with the PGC2007:

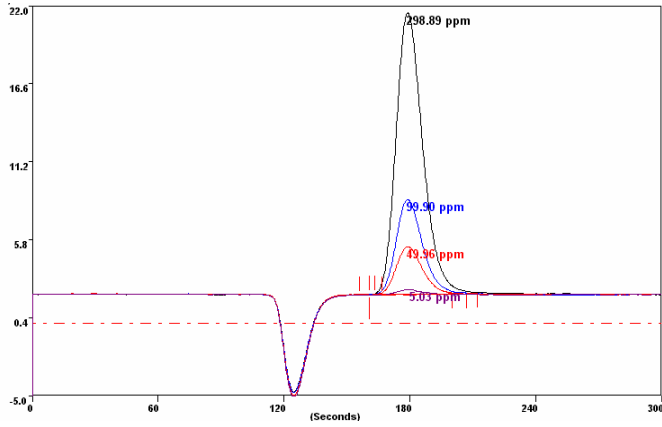
1. Using ABB's Liquid Injection Valve (LSV), a fixed volume of liquid fuel stream is injected.
2. Air carrier transports the sample to the furnace, where it oxidizes to carbon dioxide, water and sulfur dioxide.
3. Using packed columns these components are separated prior to passing into the FPD for measurement.
4. The FPD can measure the total sulfur below 1 ppm up to levels greater than 100 ppm.

Flow Schematic for Total Sulfur in Fuels Chromatograph

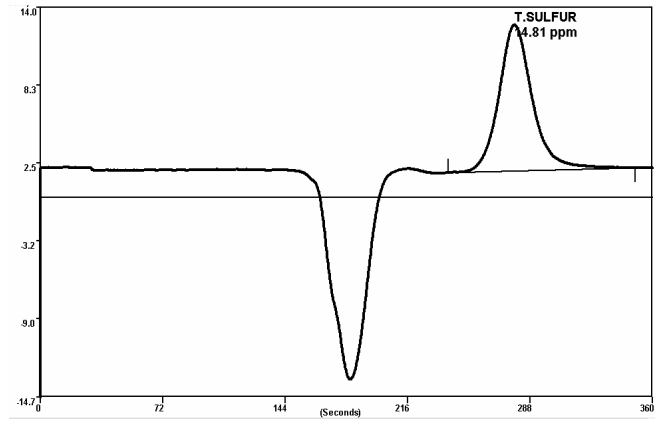


Superior Chromatography, Linearity & Reproducibility

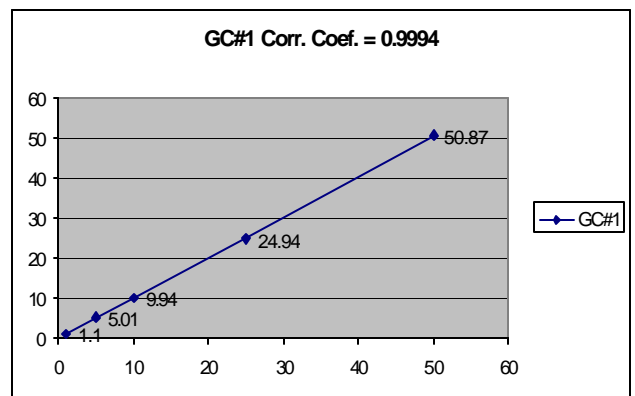
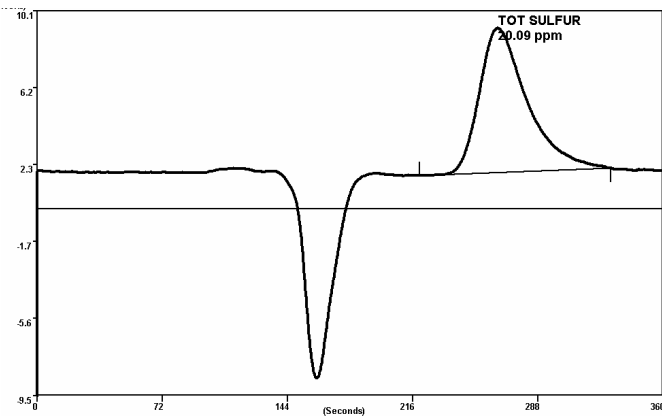
Overlay of Total Sulfur Chromatograms



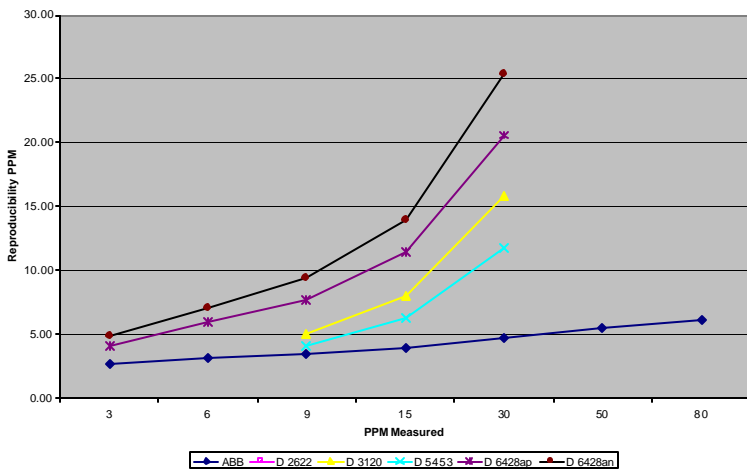
Total Sulfur in Gasoline - 14.8 PPM



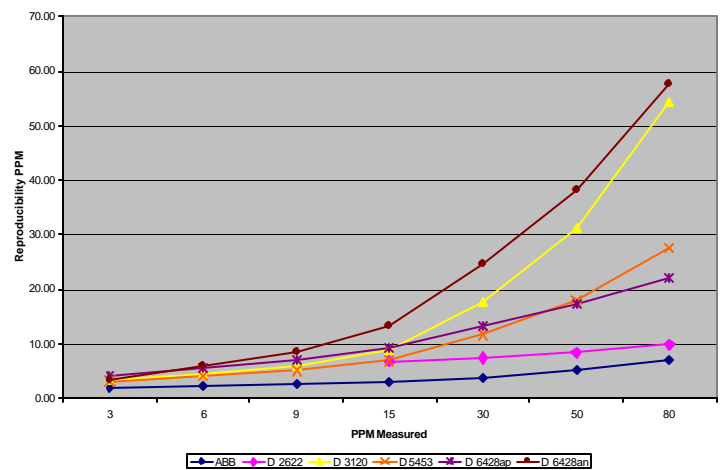
Total Sulfur in Diesel - 20 PPM



Diesel Reproducibility



Gasoline Reproducibility



A World Class Analyzer Meets World Standards

The PGC2007 is designed turnkey to meet current and emerging international standards such as ATEX, CSA, and NEC/NRTL. In most cases, the standard configuration meets all required international standards, minimizing analyzer variants and assuring consistent performance and safety.

Superior VN2300 Connectivity

Integration of the PGC2007 into the process control loop is readily achieved with the ABB VN2300 (formerly VistaNET) Integrated Process Analyzer Network Architecture. The network is an economical single-wire solution that enables seamless connectivity to existing Ethernet-based systems.

With VN2300, all process analytical equipment can share the same network for data exchange, with control systems and higher-level processes, in a true distributed network architecture. The VN2300 provides plant engineers, maintenance engineers and other data users with a common platform for data collection, presentation and analysis.

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