



Global
Analyser
Solutions

Benzene, toluene, ethanol in spark ignition fuels

PF300



- EN 12177 and improved ASTM D3606 performance
- No benzene / ethanol interference
- Ethanol analysis is included
- High uptime

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PF300v1

Benzene, toluene, ethanol in spark ignition fuels

Accurate benzene and toluene analysis is essential, as incorrect measurements can lead to erroneous octane ratings and off-specification products. The standard method for this analysis is described in ASTM D3606, which utilises packed columns. However, the presence of ethanol can complicate the measurement and affect accuracy. To address these challenges, GAS offers an advanced solution based on capillary columns, providing improved separation and reliability. This analyser is also suitable for determining benzene content in unleaded gasoline in accordance with EN 12177.

Principle of operation

Figure 1 shows the analyser diagram. The sample is injected onto the non-polar pre-column (Restek Rtx-1) using a split injector. After the elution of octane, the flow in the pre-columns is reversed, thereby back-flushing the higher-boiling components. Benzene, toluene, and ethanol are analysed on the analytical column (TCEP), and MEK is used as the internal standard. Thanks to the use of capillary columns, all components of interest are well separated, including ethanol and benzene.

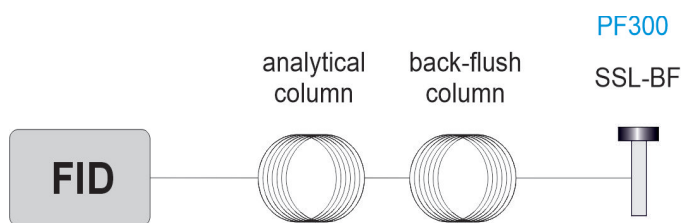


Figure 1 Diagram ASTM D3606 analyser

Instrument specification

- Thermo Trace GC1600 with iConnect SSL-BF (Split-splitless with back-flush), capillary columns and FID
- Chromeleon chromatography data system
- Runtime 9 minutes

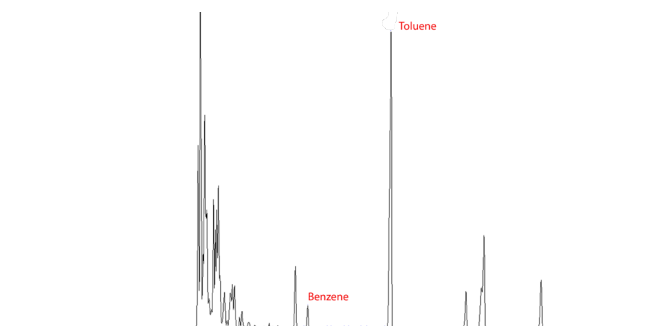


Figure 2 Benzene and toluene in finished gasoline

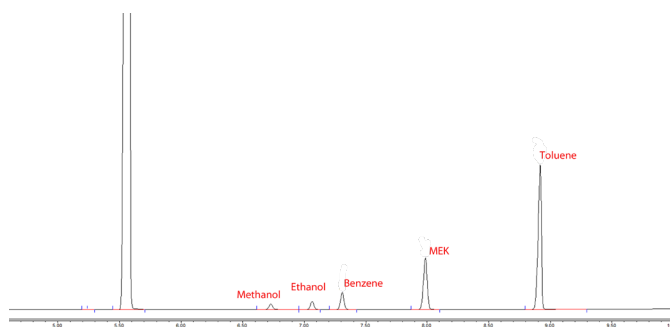


Figure 3 ASTM D3606 calibration standard spiked with alcohols

		Benzene	MEK	Toluene
## D3606 mix Repro	Unknown	8.808	29.300	69.678
## D3606 mix Repro	Unknown	8.661	28.545	69.347
## D3606 mix Repro	Unknown	8.736	28.942	69.394
## D3606 mix Repro	Unknown	8.723	28.845	69.461
## D3606 mix Repro	Unknown	8.744	28.779	70.012
## D3606 mix Repro	Unknown	8.891	29.526	70.443
## D3606 mix Repro	Unknown	8.718	28.879	69.389
## D3606 mix Repro	Unknown	9.273	30.524	74.097
## D3606 mix Repro	Unknown	8.720	28.855	69.466
## D3606 mix Repro	Unknown	8.656	28.515	69.305
Maximum		9.273	30.524	74.097
Average		8.793	29.071	70.059
Minimum		8.656	28.515	69.305
Standard Deviation		0.182	0.596	1.463
Relative Standard Deviation		2.07%	2.05%	2.09%

Figure 4 Method repeatability

Ordering information	PF30X - ABCDE			
code X	0	1	2	3
GC model, power	1600, 230V	1610, 230V	1600, 115V	1610, 115V

For the selection of options (e.g. GC oven cryo valves, Power plug type and more), see the options table in the order guide.

About GAS

Global Analyser Solutions provides GC & GC-MS solutions for Energy, Refinery, Chemical and Environmental markets. Our analysers address a broad spectrum of measuring requirements with high precision and reliability. Please reach out for more information on our website. www.gassite.com