

# Flare Gas

*Fast Fact*

## BTU, H<sub>2</sub>S and Total Sulfur with One Analyzer, Safe, Low-Sulfur Validation Standards

With new flare gas regulations taking effect in 2019, in markets worldwide, the industrial mass spectrometer's ability to measure the complete Flare Gas composition is more important than ever.

Flare streams often contain waste gas from several process units, and the composition can change dramatically from one minute to the next.

The MAX300-AIR measures hydrogen sulfide, total sulfur and BTU content in dynamic flare gas streams and delivers the data to the control system in real-time. It is optimized for the 24-7 analysis of complex gas samples, with hydrocarbon and sulfur concentrations that swing from ppm to high-percent levels.

### MAX300-AIR Real-Time Gas Analyzer Specifications:

- 24-7 Automated Flare Monitoring
- >99% Demonstrated Uptime
- Validations Use <300 ppm H<sub>2</sub>S Standards
- HF Resistant Configuration Available
- Low Maintenance
- No Carrier, Detector or Dilution Gases Required
- Monitor Multiple Flare Streams with One Analyzer

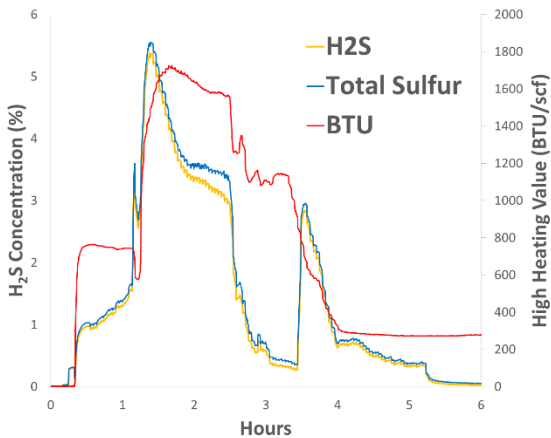


Figure 1. Sulfur and BTU Analysis in a Flare Gas Stream

### Refinery Flare Gas Measurements

- H<sub>2</sub>S (1 ppm to 100%)
- Total Sulfur (1 ppm to 100%)
- BTU
- Real-Time Speciated Flare Composition to enable effective Root Cause Analysis



Figure 2. The MAX300-AIR, real-time mass spectrometer, configured for Flare Gas Analysis

# Real-time Speciated Data from a Refinery Flaring Event

These three data sets were recorded simultaneously using a single MAX300-AIR on a refinery flare stream.

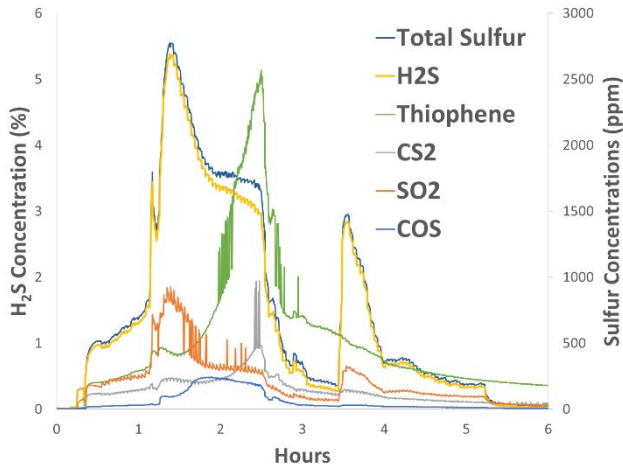


Figure 3. Total Sulfur shown along with the top 5 sulfur compounds measured during the flare event

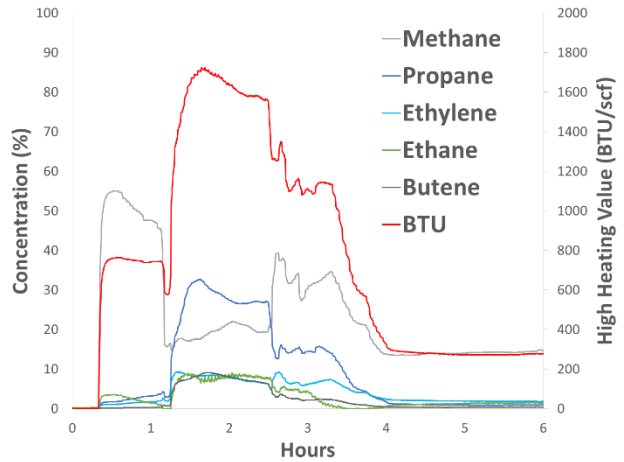


Figure 4. Flare stream BTU and the top 5 contributing hydrocarbons

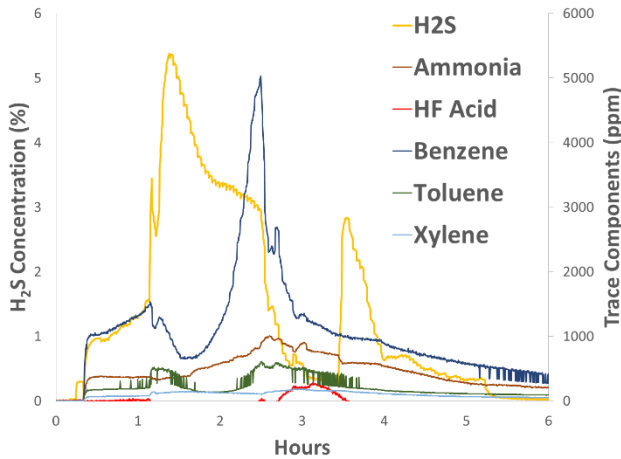


Figure 5. Here, trace components are shown along with the H<sub>2</sub>S trend, indicating the progression of the flaring event

In addition to providing the data necessary for calculating BTU and Total Sulfur, the full speciation of the flare gas stream indicates which process units contributed to the upset.

This makes root cause analysis, and corrective action planning fast and accurate.

The MAX300-AIR is linear across the entire detection range (ppm-100%) for all components. As a result, the EPA-approved daily validations use ppm-level H<sub>2</sub>S standards; there's no need for the refinery to keep dangerous, %-level sulfur bottles onsite. The analyzer validation procedure is safe and easy, even at sites with historical sulfur levels approaching 100%.

Table 1. A comparison of flare gas analysis technologies

Flare Gas Analyzers	Measurements					Operation			
	H <sub>2</sub> S (0-300 ppm)	Total Sulfur (0-100%)	BTU	Full Speciated Composition	Measures HF	No %-level Sulfur Validations	No Dilution Required	Low Maintenance	No Carrier or Detector Gas Required
MAX300-AIR	✓	✓	✓	✓	✓	✓	✓	✓	✓
TDL	✓	*						✓	✓
PUV		✓					✓		
GC-FPD	✓	✓							
GC-TCD	✓						✓		

\*Total Sulfur with TDL is typically accounted for by a correlation method using manual sampling and laboratory analysis

