

## ELIMINATING SMOKING PROCESS FLARES WITH MKS TUNABLE FILTER SPECTROSCOPY



### About the Customer

The customer is one of the largest petrochemical facilities in the US and a subsidiary of a global plastics, chemicals, and refining company that is one of the largest in the world. The parent company has produced high density polyethylene and other polyolefins and plastics for nearly a century and currently employs tens of thousands worldwide. The US subsidiary uses natural gas feedstock to produce polymer precursor compounds which are converted to plastic resins.



### THE CHALLENGE

The customer needed a more effective control technology for the elimination of smoke emissions from their process flare. Process flares are high-temperature oxidation systems (flames) that burn off combustible components in the emissions from chemical plants, helping the plant adhere to environmental regulatory standards from organizations such as the Environmental Protection Agency (EPA). Incomplete combustion in the process flare can produce unacceptable levels of smoke. Therefore, chemical plants use a combination of methane and steam injection into the flare to assist the combustion process, thereby controlling smoke emissions. The amount, responsiveness, and timing of methane and steam injections must be carefully controlled to balance losses in the destructive efficiency of the flare (too much steam) against smoke emissions (too little steam).

The customer faced significant challenges in remaining EPA-compliant with their steam-injected process flare system. Their existing methane and steam injection system had a slow response time and inadequate sensing of the flame chemistry, resulting in poor control over smoke emissions from the flare.



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### THE SOLUTION

With the MKS Precise<sup>®</sup> Gas Analyzer, the customer determined the composition of the total gas flow to the flare and then calculated the total mass gas flow and the steam/methane injection requirements to ensure complete combustion. The Precise Analyzer uses Tunable Filter Spectroscopy (TFS<sup>™</sup>), an optical analyzer technology with a 1-second response time, able to measure several hydrocarbon component concentrations with a single instrument. In this application, rapid identification of the hydrocarbon count allowed for tighter control of added makeup gas and reduced the amount of steam required. The MKS Precise<sup>®</sup> Analyzer provides real-time gas composition data with the accuracy and reproducibility of gas chromatographic measurements and requires only seconds to provide analytical data to a PLC for steam/methane injection and combustion control. Using the data from the MKS Precise Analyzer, the customer achieved 98% destructive efficiency of combustible emissions through the process flare.

### THE BENEFITS:

Using real-time data on the composition of the gas going to the process flare, the customer achieved precise control over the composition, ensuring continuous near-100% combustion efficiency in the flare.

### LEARN MORE

To learn more about how MKS Precise Analyzer can help you improve productivity in your process operations, go to: [www.mksinst.com/c/tunable-filter-spectrometers](http://www.mksinst.com/c/tunable-filter-spectrometers)

