



INDUSTRY NOTE

REFINING

Hydrogen Monitoring in Oil Refineries

REAL TIME HYDROGEN MONITORING IN OIL REFINERIES CAN SAVE \$2 MILLION ANNUALLY

Measuring hydrogen with H2scan inline analyzers throughout the oil refining process helps:

- Provide meaningful real time information
- Improve overall hydrogen usage to reduce costs
- Eliminate errors from slow or indirect analyzers
- Ensure process optimization

In a typical refinery, there can be anywhere from 12 to 20 locations where hydrogen measurements are critical. Knowing the exact amount of hydrogen at the points throughout the plant provides a key indication of parameters that are crucial for optimizing profitability:

- Process efficiency
- Catalyst health
- Available net and recycle hydrogen (or the need for makeup hydrogen)
- Product quality
- Recycle purity
- Flare BTU monitoring



Having this information available in real time allows plant operators to make continuous adjustments that optimize hydrogen usage. For example, just maintaining the correct hydrogen to hydrocarbon ratio in certain processes can save up to \$2 million per year in hydrogen generation and energy costs. Similarly, big cost savings can come from making adjustments in real time that prevent coking, which can extend catalyst life by up to 6 months. Another area where significant savings can be realized is through

better control of recycle streams, potentially eliminating the need to purchase expensive merchant or 3rd party hydrogen.

Historically, hydrogen has been measured either using a thermal conductivity device or gas chromatograph. The shortcomings of these analyzers are well known: they tend to not work well with complex gas streams, may provide unreliable data in certain applications (often requiring a second analyzer to verify the results), or are expensive and difficult to use correctly. The delayed response time, complexity and maintenance requirements, and cost (both upfront and ongoing) can make the gas chromatograph an unappealing option.

Using an H2scan inline process monitor combines the value and measurement speed of a TCD with the accuracy of a GC. By having the hydrogen measurement available in real time, processes throughout the entire refinery can be tightly controlled for process optimization to maximize profitability.

H2scan's **HY-OPTIMA™ 2700-series** hydrogen specific analyzers measure hydrogen in complex gas streams. The H2scan solid state, non-consumable sensor technology provides real-time continuous hydrogen concentration data with no cross-sensitivity to any other gases in the stream, including CO and H₂S. No reference or carrier gas systems are required to reliably and accurately report real-time hydrogen measurements with fast response times. For more info please visit www.h2scan.com.